

PRODUCT CATALOG 2025-2026

Autonics



Designing A Better Future By Connecting People And Technology

Advancements in technology helped create the world we live in today, and will continue to shape the future of humanity. At Autonics, we strive to create new technology that will change the way we live tomorrow.

Technology has evolved quickly in recent years to help connect people with each other, inanimate objects, and even industries. In order to adjust to the rapidly changing manufacturing industry and requirements, Autonics continues to offer new solutions for the automation industry that will raise production efficiency, processing capabilities, manufacturing optimization, and cost reduction.

We will continue to build on our technology to help innovate production lines and bring us closer to a better tomorrow. As a partner of global industries, a provider of automations, and an architect of new industrial cultures, we are committed to building roads connecting our present to the future.





Autonics

Trusted Provider Of Industrial Automation Solutions

Autonics is a leading provider of automation solutions from South Korea. We develop and manufacture a wide range of automation products which are marketed worldwide.

With nearly half a century experience in automation, over 1,600 employees in 13 international offices, and 3 manufacturing centers, we offer optimized solutions for customers across the globe.

Autonics offers a wide range of products for all three main components of automation: sensors, controllers, and actuators.

We offer automation solutions to raise production efficiency and make automation easier for users.

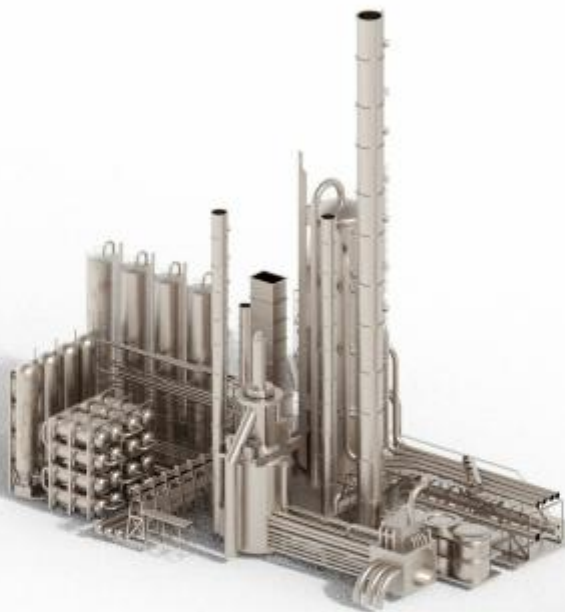
Our technology is trusted and adopted in various industrial applications and also applied in day-to-day automation devices, to help contribute to the improvement of quality of life. We will continue to build on our technology and solutions to make industrial processes easier, more flexible, and more convenient.



Autonics

Autonics R&D Center

* Seoul, Korea



Metal / Chemical

Autonics offers optimized solutions for the industry with various products that can withstand high temperatures, shocks, vibrations and corrosion.



Logistics / Packaging

Autonics offers a diverse range of products to help improve the speed, accuracy, safety and efficiency of logistics operations and offers ideal solutions for the packaging industry with high efficiency and precision.



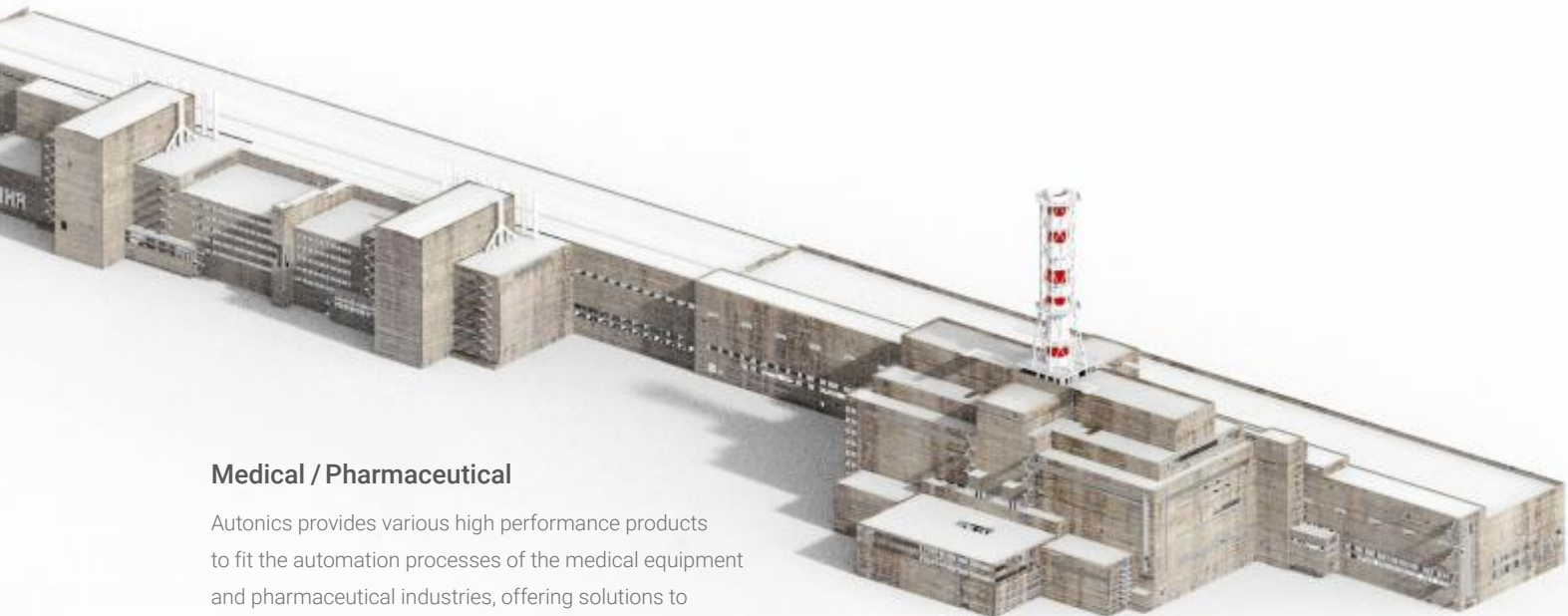
Oil / Gas

Autonics offers a wide range of products that can help automate processes by providing accurate and precise measurements in the industry where advanced control and measurement is required.



Marine

Autonics offers durable and reliable products and solutions with our expertise in both factory and process automation.



Medical / Pharmaceutical

Autonics provides various high performance products to fit the automation processes of the medical equipment and pharmaceutical industries, offering solutions to improve the quality of lives.



Water / Wastewater

Autonics provides various solutions to improve water safety and increase efficiency of water treatment including water purification, treatment, intake, treatment, and discharge of industrial water and wastewater processing.

Battery / Semiconductor

Autonics offers various products and solutions to improve quality and productivity in various processes including sputtering, metal layering, integrated circuit packaging, cleaning, assembly, and more.



Power / Energy

Autonics provides measurement and control solutions for a wide variety of energy industries, including production and control of coal, electricity, gas, oil, and nuclear power as well as renewable energy production.

Industrial Solutions to Increase Safety, Productivity, and Efficiency


Global Business

KOREA	<ul style="list-style-type: none">· Seoul· Busan· Daegu· Cheonan
CHINA	<ul style="list-style-type: none">· Jiaxing· Shanghai· Guangzhou· Chengdu· Nanjing· Qingdao· Tianjin· Ningbo· Shenzhen
INDIA	<ul style="list-style-type: none">· Mumbai· Delhi· Chennai· Pune· Gujarat· Bangalore· Punjab
INDONESIA	<ul style="list-style-type: none">· Jakarta· Bandung· Semarang· Surabaya
JAPAN	<ul style="list-style-type: none">· Tokyo· Osaka
MALAYSIA	<ul style="list-style-type: none">· Selangor· Penang· Johor Bahru
VIETNAM	<ul style="list-style-type: none">· Ho Chi Minh City· Ha Nam· Hanoi
TÜRKIYE	<ul style="list-style-type: none">· Istanbul
GERMANY	<ul style="list-style-type: none">· Frankfurt
BRAZIL	<ul style="list-style-type: none">· Sao Paulo· Porto Alegre
MEXICO	<ul style="list-style-type: none">· Naucalpan· Queretaro· Monterrey
USA	<ul style="list-style-type: none">· Illinois· California

Manufacturing

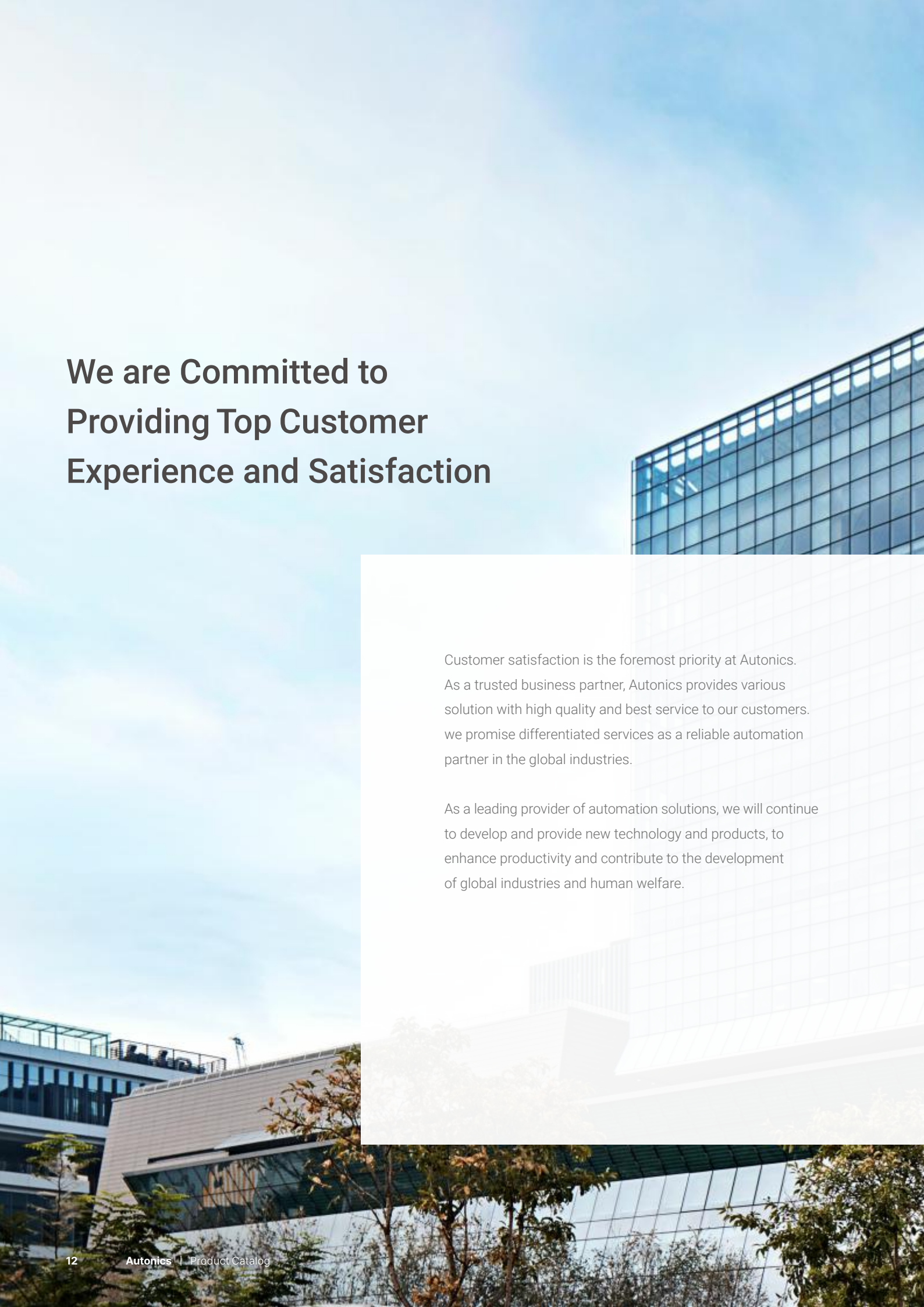
KOREA	<ul style="list-style-type: none">· Busan· Yangsan
CHINA	<ul style="list-style-type: none">· Jiaxing
VIETNAM	<ul style="list-style-type: none">· Ha Nam





Global Sales, Service, and Production Network

Autonics global network consists of 13 international offices and 150 distributors spanning over 100 countries. With a vast sales and technical support network, Autonics is able to provide comprehensive automation solutions for our customers across the globe. We will continue to dedicate our efforts into the research and development of new technology and products to deliver globally competitive solutions for our customers around the world.



We are Committed to Providing Top Customer Experience and Satisfaction

Customer satisfaction is the foremost priority at Autonics. As a trusted business partner, Autonics provides various solution with high quality and best service to our customers. we promise differentiated services as a reliable automation partner in the global industries.

As a leading provider of automation solutions, we will continue to develop and provide new technology and products, to enhance productivity and contribute to the development of global industries and human welfare.



Authorized Service

Product replacement or refurbished products are possible, if the product is used under normal operating conditions and within the covered warranty period but cannot be repaired due to performance failures.

* Please check the global service network information for available regions.



Education / Training

Autonics offers various technical education courses, multiple seminars and webinars at various locations around the world. The training programs are designed to provide in-depth knowledge of products and automation to average users and industrial automation professionals.



e-Edu Library

e-Edu Library offers tutorial videos on various topics including Autonics product installation, parameter configuration, operation settings, and industry applications for the enhancement of our customer's knowledge and improve their productivity.



Solution Consulting

Autonics offers solution consulting through technical support for our products and technology. Customer can make appointment to request technical support or to have remote support service on technical difficulties. Live chat service availability may vary depending on countries.



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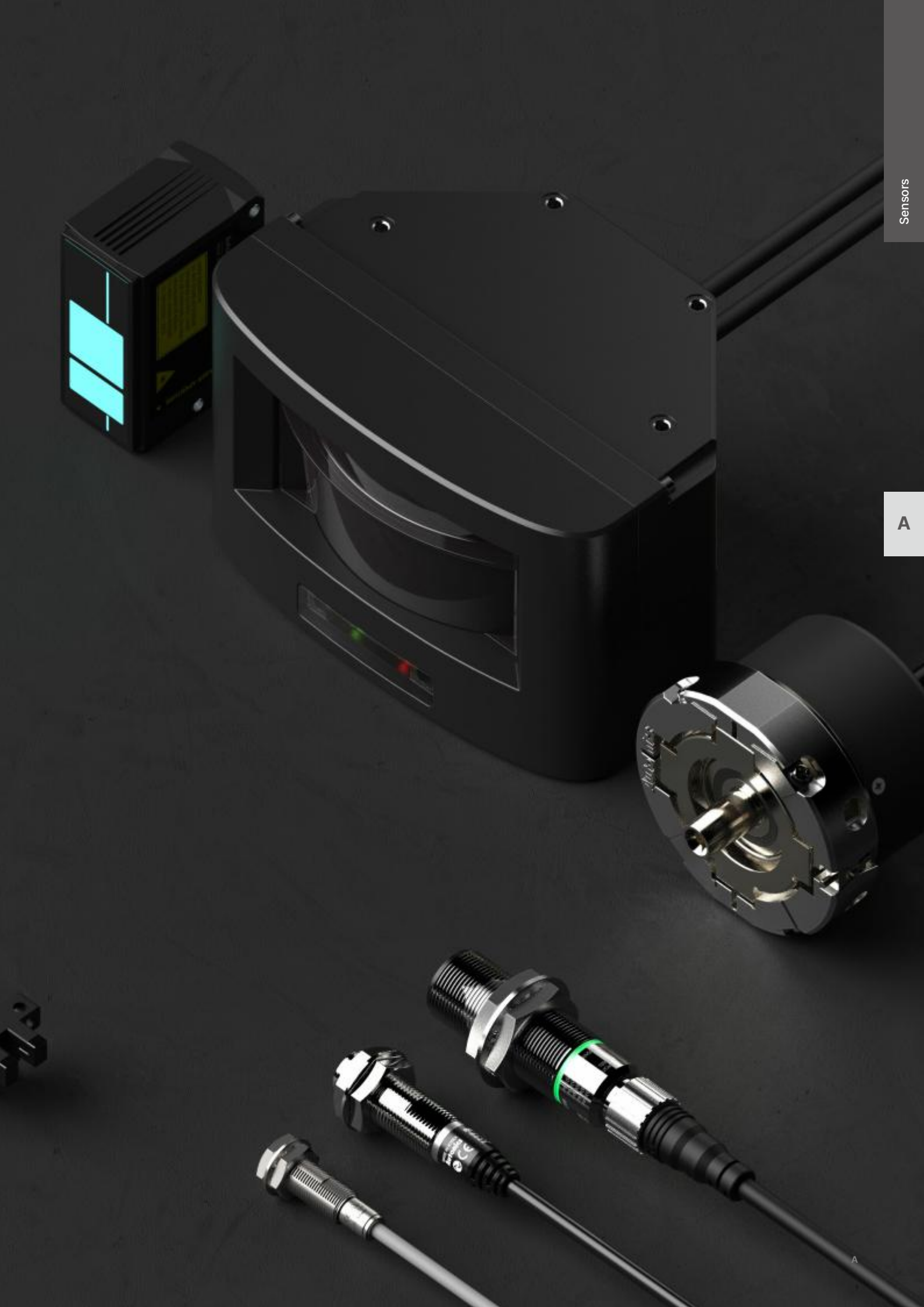
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A. Sensors

Sensors are commonly used components in automation used to detect changes in the environment and transmit the information electronically

- A1. Photoelectric Sensors
- A2. Photomicro Sensors
- A3. Fiber Optic Sensors
- A4. Displacement Sensors
- A5. LiDAR
- A6. Ultrasonic Sensors
- A7. Door Sensors
- A8. Area Sensors
- A9. Proximity Sensors
- A10. Linear Positioning Sensors
- A11. Rotary Encoders







A1. Photoelectric Sensors

Photoelectric sensors are used to detect distance, absence or presence of objects using a light transmitter and receiver.

A1-1	Rectangular	BTS Series	W 7.2 mm Photoelectric Sensors
		BJ Series	Rectangular Photoelectric Sensors (Cable Type)
			Rectangular Photoelectric Sensors (Connector Type)
		BJX Series	Rectangular Photoelectric Sensors
		BM Series	General Photoelectric Sensors
		BMS Series	Side Sensing Photoelectric Sensors
		BY Series	Photoelectric Sensors with Synchronous Detection
		BYD Series	Photoelectric Sensors with Built-In Timer
		BH Series	Front / Side Mount Photoelectric Sensors
A1-2	Compact	BA Series	Diffuse Reflective Long-Distance Photoelectric Sensors
		BTF Series	L 3.7 mm Flat Photoelectric Sensors
		BPS Series	L 7.5 mm Flat Photoelectric Sensors
A1-3	Cylindrical	BRQ Series	Cylindrical Photoelectric Sensors (Front Sensing Type)
			Cylindrical Photoelectric Sensors (Side Sensing Type)
		BR Series	Cylindrical Photoelectric Sensors
A1-4	U-Shaped	BUM Series	4-Channel U-Shaped Photoelectric Sensors
		BUP Series	1-Channel U-Shaped Photoelectric Sensors
A1-5	AC / DC	BEN Series	Universal AC / DC Photoelectric Sensors
		BX Series	Universal AC / DC Photoelectric Sensors
A1-6	PCB Detection	BJP Series	Photoelectric Sensors for PCB Detection
A1-7	Oil-Resistant / Oil-Proof	BJR Series	Oil-Resistant Photoelectric Sensors
		BJR-F Series	Oil-Proof Photoelectric Sensors
A1-8	Color Mark	BC Series	Color Mark Photoelectric Sensors
A1-9	Liquid Level	BL Series	Liquid Level Photoelectric Sensors

W 7.2 mm

Photoelectric Sensors

BTS Series



Features

- W 7.2 mm Photoelectric Sensors
 - W 7.2 × H 18.6 × L 9.5 mm (Through-beam type)
 - W 7.2 × H 24.6 × L 10.8 mm (Retroreflective, convergent reflective type)
- Detection methods and minimum target size
 - Through-beam type (BTS1M): Ø 2 mm
 - Retroreflective type (BTS200): Ø 2 mm (sensing distance: 100 mm)
 - Convergent reflective type (BTS15/BTS30): Ø 0.15 mm (sensing distance: 10 mm)
- Maximum sensing distance: 1 m (Through-beam type)
- Operation indicator (red) and stability indicator (green) show operation status
- Stainless steel (SUS304) mounting brackets
- Protection structure: IP67

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series
- Bracket B
- Slit for through-beam type: BTS1M-ST (sticker), BTS1M-ST-T (SUS material)

Specifications

Model	BTS1M-TDT□-□	BTS200-MDT□-□	BTS□-LDT□-□
Sensing type	Through-beam	Retroreflective	Convergent reflective
Sensing distance	1 m	10 to 200 mm ⁰¹⁾	5 to 15 mm ⁰²⁾ 5 to 30 mm ⁰²⁾
Sensing target	Opaque materials	≥ Ø 27 mm Opaque materials	Opaque materials, translucent materials
Min. sensing target	≥ Ø 2 mm	≥ Ø 2 mm ⁰³⁾	≥ Ø 0.15 mm ⁰⁴⁾
Hysteresis	-	-	≤ 15 % of sensing distance
Response time	≤ 1 ms		
Light source	Red LED		
Peak emission wavelength	650 nm		
Operation mode	Light ON mode / Dark ON mode model		
Indicator	Operation indicator (red), stability indicator (green)		
Approval	CE ENEC	CE ENEC	CE ENEC
Unit weight (packaged)	≈ 40 g (≈ 65 g)	≈ 25 g (≈ 45 g)	≈ 25 g (≈ 45 g)

01) Reflector (MS-6)

02) Non-glossy white paper 50 × 50 mm

03) Sensing distance 100 mm

04) Sensing distance 10 mm

Power supply	12-24 VDC≒ ±10 % (ripple P-P: ≤ 10%)
Current consumption	It depends on the sensing type
Through-beam	Emitter: ≤ 20 mA, receiver: ≤ 20 mA
Reflective	≤ 20 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 26.4 VDC≒
Load current	≤ 50 mA
Residual voltage	NPN : ≤ 1 VDC≒, PNP : ≤ 2 VDC≒
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)
Noise immunity	±240 VDC≒ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 10,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-20 to 55 °C, storage: -30 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP67 (IEC standard)
Connection	Cable type
Cable spec.	Ø 2.5 mm, 3-wire (emitter: 2-wire), 2 m
Wire spec.	AWG 28 (0.08 mm, 19-core), insulator outer diameter: Ø 0.9 mm
Material	Case: PBT, sensing part: PMMA, bracket: SUS304, bolt: SWCH10A



View product detail

Rectangular Photoelectric Sensors (Cable Type)

BJ Series



Features

- Compact size: W 10.6 × H 32 × L 20 mm
- Adjuster for selecting Light ON / Dark ON mode
- Built-in sensitivity adjustment adjuster (except BJG30-DDT)
- Reverse power protection circuit, output short overcurrent protection circuit
- Mutual interference prevention function (except through-beam and BGS reflective type)
- Excellent noise immunity and minimal influence from ambient light
- Protection structure: IP65

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series
- Bracket B: BJ BRACKET B

Specifications

Model	BJ□-TDT-□			BJ3M-PDT-□	BJ□-BDT-□		BJN□-NDT-□	
Sensing type	Through-beam			Polarized retroreflective	BGS reflective		Narrow beam reflective	
Sensing distance	7 m	10 m	15 m	3 m ⁽¹⁾	10 to 30 mm ⁽²⁾	10 to 50 mm ⁽²⁾	30 to 70 mm ⁽³⁾	70 to 130 mm ⁽³⁾
Sensing target	Opaque materials			Opaque materials	Opaque materials, translucent materials		Opaque materials, translucent materials	
Min. sensing target	≥ Ø 8 mm	≥ Ø 12 mm		≥ Ø 75 mm	-		≥ Ø 0.2 mm (copper wire)	
Hysteresis	-			-	≤ 10% of sensing distance		≤ 25% of sensing distance	≤ 20% of sensing distance
Black/white difference	-			-	≤ 10% of sensing distance		-	
Response time	≤ 1 ms			≤ 1 ms	≤ 1.5 ms		≤ 1 ms	
Light source	Red	Red	Infrared	Red	Red		Red	
Peak emission wavelength	650 nm	660 nm	850 nm	660 nm	660 nm		650 nm	
Min. spot size	-			-	≈ Ø 5.0 mm	≈ Ø 4.5 mm	≈ Ø 2.0 mm	≈ Ø 2.5 mm
Sensitivity adjustment	YES (Adjuster)			YES (Adjuster)	YES (Adjuster) ⁽⁴⁾		YES (Adjuster)	
Mutual interference prevention	-			YES	-		YES	
Operation mode	Light ON mode - Dark ON mode selectable (Adjuster)							
Indicator	Operation indicator (red), stability indicator (green), power indicator (green) ⁽⁵⁾							
Approval	CE UK ENEC			CE UK ENEC	CE UK ENEC		CE UK ENEC	
Unit weight (packaged)	≈ 90 g (≈ 115 g)			≈ 60 g (≈ 85 g)	≈ 50 g		≈ 45 g	

01) Reflector (MS-2A)

02) Non-glossy white paper 50 × 50 mm

03) Non-glossy white paper 100 × 100 mm

04) -10% of max. sensing distance, Non-glossy white paper

05) Only for the emitter



View product detail

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Model	BJ□-DDT-□			BJG30-DDT
Sensing type	Diffuse reflective			Diffuse reflective
Sensing distance	100 mm ⁰¹⁾	300 mm ⁰¹⁾	1 m ⁰²⁾	15 mm ⁰³⁾ or 30 mm ⁰¹⁾
Sensing target	Opaque materials, translucent materials			Transparent glass or opaque materials, translucent materials
Hysteresis	≤ 20% of sensing distance			≤ 20% of sensing distance
Response time	≤ 1 ms			≤ 1 ms
Light source	Infrared	Red	Infrared	Infrared
Peak emission wavelength	850 nm	660 nm	850 nm	850 nm
Sensitivity adjustment	YES (Adjuster)			-
Mutual interference prevention	YES			YES
Operation mode	Light ON mode - Dark ON mode selectable (Adjuster)			Light ON
Indicator	Operation indicator (red), stability indicator (green)			Operation indicator (red), stability indicator (green)
Approval	CE UK ENEC			CE UK ENEC
Unit weight (packaged)	≈ 45 g (≈ 70 g)			≈ 45 g

01) Non-glossy white paper 100 × 100 mm

02) Non-glossy white paper 300 × 300 mm

03) Transparent Glass 50 × 50 mm, t = 3.0 mm

Power supply	12-24 VDC≡ ±10 % (ripple P-P: ≤ 10%)
Current consumption	It depends on the sensing type
Through-beam	Emitter: ≤ 20 mA, receiver: ≤ 20 mA
Reflective	≤ 30 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 26.4 VDC≡
Load current	≤ 100 mA
Residual voltage	NPN : ≤ 1 VDC≡, PNP : ≤ 2.5 VDC≡ (BGS reflective type : ≤ 2 VDC≡)
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)
Noise immunity	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-25 to 55 °C, storage: -40 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP65 (IEC standard)
Connection	Cable type
Cable spec.	Ø 3.5 mm, 3-wire (emitter: 2-wire), 2 m
Wire spec.	AWG24 (0.08 mm, 40-core), insulator outer diameter: Ø 1 mm
Material	Case: PC+ABS, CAP: PC, sensing part: PMMA, bracket: SUS304, bolt: SCM, nut: SCM, sleeve: Brass, Ni-plate

Rectangular Photoelectric Sensors (Connector Type)

BJ Series



Features

- Compact size: W 10.6 × H 32 × L 20 mm
- Adjuster for selecting Light ON / Dark ON mode
- Built-in sensitivity adjustment adjuster
- Reverse power protection circuit, output short overcurrent protection circuit
- Mutual interference prevention function
- Excellent noise immunity and minimal influence from ambient light
- High performance lens with long sensing distance
- Long sensing distance :
Through-beam type 15 m,
diffuse reflective type 1 m,
polarized retroreflective type 3 m (MS-2A)
- M.S.R. (Mirror Surface Rejection) function
(Polarized retroreflective type)
- Protection structure: IP67

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series
- Bracket A
- M8 connector cable: CID(H)408-□,
CLD(H)408-□



View product detail

Specifications

Model	BJ□-TDT-C-□	BJ3M-PDT-C-□	BJ□-DDT-C-□
Sensing type	Through-beam	Polarized retroreflective	Diffuse reflective
Sensing distance	10 m 15 m	3 m ⁰¹⁾	100 mm ⁰²⁾ 300 mm ⁰³⁾ 1 m ⁰³⁾
Sensing target	Opaque materials	Opaque materials	Opaque materials, translucent materials
Min. sensing target	≥ Ø 12 mm	≥ Ø 75 mm	-
Hysteresis	-	-	≤ 20% of sensing distance
Response time	≤ 1 ms	≤ 1 ms	≤ 1 ms
Light source	Red Infrared	Red	Infrared Red Infrared
Peak emission wavelength	660 nm 850 nm	660 nm	850 nm 660 nm 850 nm
Sensitivity adjustment	YES (Adjuster)	YES (Adjuster)	YES (Adjuster)
Mutual interference prevention	-	YES	YES
Operation mode	Light ON mode - Dark ON mode selectable (Adjuster)		
Indicator	Operation indicator (red), stability indicator (green), power indicator (green) ⁰⁴⁾		
Approval	CE ENEC	CE ENEC	CE ENEC
Unit weight (packaged)	≈ 20 g (≈ 45 g)	≈ 30 g (≈ 55 g)	≈ 10 g (≈ 35 g)

01) Reflector (MS-2A)

02) Non-glossy white paper 100 × 100 mm

03) Non-glossy white paper 300 × 300 mm

04) Only for the emitter

Power supply	12-24 VDC≡ ±10 % (ripple P-P: ≤ 10%)
Current consumption	It depends on the sensing type
Through-beam	Emitter: ≤ 20 mA, receiver: ≤ 20 mA
Reflective	≤ 30 mA
Control output	NPN open collector output / PNP open collector output Model
Load voltage	≤ 26.4 VDC≡
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC≡, PNP: ≤ 2.5 VDC≡
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)
Noise immunity	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-25 to 55 °C, storage: -40 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP67 (IEC standard)
Connection	Connector type
Connector	M8 4-pin plug type
Material	Case: PC+ABS, CAP: PC, sensing part: PMMA, bracket: SUS304, bolt: SCM, nut: SCM, sleeve: Brass, Ni -plate

Rectangular Photoelectric Sensors

BJX Series



Features

- Long sensing distance with high quality lens:
Through-beam type 30 m,
diffuse reflective type 1 m,
polarized retroreflective type 3 m (MS-2A)
- M.S.R. (Mirror Surface Rejection) function
(Polarized retroreflective type)
- Compact size : W 11 × H 32 × L 20 mm
- Switch for selecting Light ON/Dark ON mode
- Built-in sensitivity adjustment adjuster
- Reverse power protection circuit,
output short overcurrent protection circuit
- Mutual interference prevention function
(except through-beam type)
- Excellent noise immunity and
minimal influence from ambient light
- Protection structure: IP65

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series
- Bracket A, B
- M8 connector cable: CID(H)408-□,
CLD(H)408-□



View product detail

Specifications

Model	BJX□-TDT-□-□			BJX3M-PDT-□-□	BJX□-DDT-□-□		
Sensing type	Through-beam			Polarized retroreflective	Diffuse reflective		
Sensing distance	10 m	15 m	30 m	3 m ⁰¹⁾	100 mm ⁰²⁾	300 mm ⁰²⁾	1 m ⁰³⁾
Sensing target	Opaque materials			Opaque materials	Opaque materials, translucent materials		
Min. sensing target	≥ Ø 15 mm			≥ Ø 75 mm	-		
Hysteresis	-			-	≤ 20 % of sensing distance		
Response time	≤ 1 ms						
Light source	Red	Infrared	Red	Red	Infrared	Red	Red
Peak emission wavelength	660 nm	850 nm	660 nm	660 nm	850 nm	660 nm	660 nm
Sensitivity adjustment	YES (Adjuster)			YES (Adjuster)	YES (Adjuster)		
Mutual interference prevention	-			YES	YES		
Operation mode	Light ON mode - Dark ON mode selectable (Adjuster)						
Indicator	Operation indicator (yellow), stability indicator (green), power indicator (red) ⁰⁴⁾						
Approval	CE ENEC EAC			CE ENEC EAC	CE ENEC EAC		

01) Reflector (MS-2A)

02) Non-glossy white paper 100 × 100 mm

03) Non-glossy white paper 300 × 300 mm

04) Only for the emitter

Unit weight (packaged)	Through-beam	Polarized retroreflective	Diffuse reflective
Cable type	≈ 95 g (≈ 145 g)	≈ 50 g (≈ 115 g)	≈ 50 g (≈ 100 g)
Connector type	≈ 12 g (≈ 65 g)	≈ 6 g (≈ 75 g)	≈ 6 g (≈ 60 g)
Power supply	10-30 VDC±10 % (ripple P-P: ≤ 10 %)		
Current consumption	It depends on the sensing type		
Through-beam	Emitter: ≤ 20 mA, receiver: ≤ 20 mA		
Reflective	≤ 30 mA		
Control output	NPN open collector output / PNP open collector output model		
Load voltage	≤ 30 VDC±		
Load current	≤ 100 mA		
Residual voltage	NPN: ≤ 1 VDC±, PNP: ≤ 2 VDC±		
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit		
Insulation resistance	≥ 20 MΩ (500 VDC± megger)		
Noise immunity	±240 VDC± the square wave noise (pulse width: 1 μs) by the noise simulator		
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min		
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times		
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx		
Ambient temperature	-25 to 60 °C, storage: -40 to 70 °C (no freezing or condensation) ⁰¹⁾		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Protection rating	IP65 (IEC standard)		
Connection	Cable type / Connector type model		
Cable spec.	Ø 4 mm, 3-wire (Emitter: 2-wire), 2 m		
Wire spec.	AWG26 (0.52 mm, 20-core), insulator outer diameter: Ø 1 mm		
Connector	M8 4-pin plug type		
Material	Case: PC, CAP: PC, sensing part: PMMA		

01) UL approved ambient temperature: 40 °C

General

Photoelectric

Sensors

BM Series



Features

- Easy to mount at a narrow space with small size and light weight
- Built-in external sensitivity adjuster (Diffuse reflective type only)
- Easy to mount by screw type in mounting hole
- Built-in reverse power protection circuit and output short overcurrent protection circuit

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series

Specifications

Model	BM3M-TDT	BM1M-MDT	BM200-DDT
Sensing type	Through-beam	Retroreflective	Diffuse reflective
Sensing distance	3 m	1 m ⁰¹⁾	200 mm ⁰²⁾
Sensing target	Opaque materials	Opaque materials	Opaque materials, translucent materials
Min. sensing target	≥ Ø 8 mm	≥ Ø 60 mm	-
Hysteresis	-	-	≤ 10 % of sensing distance
Response time	≤ 3 ms		
Light source	Infrared		
Peak emission wavelength	940 nm		
Sensitivity adjustment	-	-	YES (Adjuster)
Operation mode	Dark ON mode	Dark ON mode	Light ON mode (option: Dark ON mode)
Indicator	Operation indicator (red)		
Approval	CE	CE	CE
Unit weight (packaged)	≈ 170 g (≈ 240 g)	≈ 105 g (≈ 188 g)	≈ 88 g (≈ 156 g)

01) Reflector (MS-2)

02) Non-glossy white paper 200 × 200 mm

Power supply	12-24 VDC≡ ±10 % (ripple P-P: ≤ 10 %)
Current consumption	It depends on the sensing type
Through-beam	Emitter: ≤ 45 mA, receiver: ≤ 45 mA
Reflective	≤ 40 mA
Control output	NPN open collector output
Load voltage	≤ 30 VDC≡
Load current	≤ 100 mA
Residual voltage	≤ 1.5 VDC≡
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)
Noise immunity	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-10 to 60 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	-
Connection	Cable type
Cable spec.	Ø 4 mm, 3-wire, 2 m (Emitter: Ø 3 mm, 2-wire, 2 m)
Wire spec.	AWG22 (0.08 mm, 60-core), insulator outer diameter: Ø 1.25 mm
Material	Case: ABS, sensing part: PC (through-beam type) or Acrylic (retroreflective, diffuse reflective type), bracket: SPCC, bolt: SCM, nut: SCM



View product detail

Side Sensing Photoelectric Sensors

BMS Series



Features

- Built-in reverse polarity protection circuit and output short overcurrent protection circuit
- Response time: Max. 1 ms
- Light ON / Dark ON mode selectable by control wire
- Sensitivity adjuster (except for through-beam type)

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series

Specifications

Model	BMS5M-TDT-□	BMS2M-MDT-□	BMS300-DDT-□
Sensing type	Through-beam	Retroreflective	Diffuse reflective
Sensing distance	5 m	0.1 to 2 m ⁰¹⁾	300 mm ⁰²⁾
Sensing target	Opaque materials	Opaque materials	Opaque materials, translucent materials
Min. sensing target	≥ Ø 10 mm	≥ Ø 60 mm	-
Hysteresis	-	-	≤ 20 % of sensing distance
Response time	≤ 1 ms		
Light source	Infrared		
Peak emission wavelength	940 nm		
Sensitivity adjustment	-	YES (Adjuster)	YES (Adjuster)
Operation mode	Light ON mode - Dark ON mode selectable (control wire)		
Indicator	Operation indicator (red), power indicator (red) ⁰³⁾		
Approval	CE UK ENEC	CE UK ENEC	CE UK ENEC
Unit weight	≈ 180 g	≈ 110 g	≈ 100 g

01) Reflector (MS-2)

02) Non-glossy white paper 100 × 100 mm

03) Only for the emitter

Power supply	12-24 VDC≐ ±10 % (ripple P-P: ≤ 10%)
Current consumption	It depends on the sensing type
Through-beam	Emitter: ≤ 50 mA, receiver: ≤ 50 mA
Reflective	≤ 45 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 30 VDC≐
Load current	≤ 200 mA
Residual voltage	NPN: ≤ 1 VDC≐, PNP: ≤ 2.5 VDC≐
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≐ megger)
Noise immunity	±240 VDC≐ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-10 to 60 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	-
Connection	Cable type
Cable spec.	Ø 5 mm, 4-wire (Emitter: 2-wire), 2 m
Wire spec.	AWG22 (0.08 mm, 60-core), insulator outer diameter: Ø 1.25 mm
Material	Case: ABS, sensing part: PC (through-beam type) or Acrylic (retroreflective, diffuse reflective type), bracket: SPCC, bolt: SCM, nut: SCM



View product detail

Photoelectric Sensors

with Synchronous Detection

BY Series



Features

- Small size: W 12 × H 30 × L 16 mm
- Minimize malfunction by extraneous light by synchronizing emitter and receiver
- Reverse power protection circuit, output short overcurrent protection circuit
- Fast response speed: Max.1 ms

Specifications

Model	BY□500-TDT
Sensing type	Through-beam
Sensing distance	500 mm
Sensing target	Opaque materials
Min. sensing target	≥ Ø 5 mm
Response time	≤ 1 ms
Light source	Infrared
Peak emission wavelength	940 nm
Operation mode	Dark ON mode
Indicator	Operation indicator (red)
Approval	
Unit weight	≈ 150 g
Power supply	12-24 VDC±10% (ripple P-P: ≤ 10%)
Current consumption	Emitter: ≤ 30 mA, receiver: ≤ 30 mA
Control output	NPN open collector output
Load voltage	≤ 30 VDC±
Load current	≤ 100 mA
Residual voltage	≤ 1 VDC±
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC± megger)
Noise immunity	±240 VDC± the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-10 to 60 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection	Cable type
Cable spec.	Ø 4 mm, 4-wire (Emitter: 3-wire), 2 m
Wire spec.	AWG22 (0.08 mm, 60-core), insulator outer diameter: Ø 1.25 mm
Material	Case: PC, sensing part: PC, bracket: SPCC, bolt: SCM, nut: SCM



View product detail

Photoelectric Sensors

with Built-In Timer

BYD Series



Features

- Easy installation by compact size
- Superior detection not affected by color of target (convergent reflective type)
- Operation indicator is located on the top (BYD30-DDT-U, BYD50-DDT-U)
- Easy to adjust the response time via timer function (OFF Delay Time: 0.1 to 2 sec)
- Reverse power protection circuit, output short overcurrent protection circuit

* Sold Separately

- Bracket B
- Slit for through-beam type: BYD3M-ST (sticker)

Specifications

Model	BYD3M-TDT-□	BYD100-DDT	BYD□-DDT-□
Sensing type	Through-beam	Diffuse reflective	Convergent reflective
Sensing distance	3 m	100 mm ⁰¹⁾	10 to 30 mm ±10% ⁰¹⁾ 10 to 50 mm ±10% ⁰¹⁾
Sensing target	Opaque materials	Opaque materials, translucent materials	Opaque materials, translucent materials
Min. sensing target	≥ Ø 6 mm	-	-
Hysteresis	-	≤ 25 % of sensing distance	≤ 10 % of sensing distance
Response time	≤ 1 ms	Operation: ≤ 3 ms Return: ≤ 100 ms	Operation: ≤ 3 ms Return: ≤ 100 ms ⁰²⁾
Light source	Infrared	Infrared	Infrared
Sensitivity adjustment	-	YES (Adjuster)	-
Timer function	-	-	OFF delay mode: 0.1 to 2 sec (Adjuster)
Operation mode	Dark ON mode	Light ON mode	Light ON mode
Indicator	Front	Front	Front / Upper operation indicator model
	Operation indicator (red)		
Approval	CE UK ENEC EAC	CE UK ENEC EAC	CE UK ENEC EAC
Unit weight (packaged)	≈ 80 g (≈ 105 g)	≈ 38 g (≈ 75 g)	≈ 38 g (≈ 75 g)

01) Non-glossy white paper 50 × 50 mm

02) When the timer adjuster is set to min (0.1 sec).

Power supply	12-24 VDC ±10 % (ripple P-P: ≤ 10 %)
Current consumption	It depends on the sensing type
Through-beam	Emitter: ≤ 30 mA, receiver: ≤ 30 mA
Reflective	≤ 35 mA
Control output	Through-beam type : NPN open collector output / PNP open collector output model Diffuse reflective, convergent reflective type : NPN open collector output
Load voltage	≤ 30VDC
Load current	Through-beam type : ≤ 100 mA Diffuse reflective, convergent reflective type : ≤ 50 mA
Residual voltage	NPN: ≤ 1 VDC, PNP: ≤ 2.5 VDC
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC megger)
Noise immunity	±240 VDC the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC ~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-20 to 65 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	Through-beam, convergent reflective type (front operation indicator model) : IP64 (IEC standard), Others: IP50 (IEC standard)
Connection	Cable type
Cable spec.	Ø 3.5 mm, 3-wire (Emitter: 2-wire), 2 m
Wire spec.	AWG24 (0.08 mm, 40-core), insulator outer diameter: Ø 1 mm
Material	Case: PC, sensing part: PC, bracket: SPCC, bolt: SCM, nut: SCM, sleeve: Brass, Ni-plate



View product detail

Front / Side Mount

Photoelectric

Sensors

BH Series



Features

- Easy front (M18 nut) and side (M3 bolt/nut) installation
- NPN open collector / PNP open collector simultaneous output
- Sensing distance:
Through-beam type 20 m /
Polarized retroreflective type 4 m /
Diffuse reflective type 1 m, 300 mm
- Small size: W 14 × H 34.5 × L 28 mm
- M.S.R. (Mirror Surface Rejection) function prevents malfunction from reflective objects such as metals or mirrors (polarized retroreflective type)
- Built-in sensitivity adjuster
- Light ON / Dark ON selectable by switch
- Operation indicator (red), stability indicator (green)
- Reverse power protection circuit, output short overcurrent protection circuit
- Mutual interference prevention function (except through-beam type)
- Protection structure: IP67


* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series



View product detail

Specifications

Model	BH20M-TDT	BH4M-PDT	BH□-DDT	
Sensing type	Through-beam	Polarized retroreflective	Diffuse reflective	
Sensing distance	20 m	4 m ⁰¹⁾	300 mm ⁰²⁾	1 m ⁰³⁾
Sensing target	Opaque materials	Opaque materials	-	
Min. sensing target	≥ Ø 20 mm	≥ Ø 75 mm	-	
Hysteresis	-	-	≤ 20 % of sensing distance	
Response time	≤ 1 ms			
Light source	Red	Red	Red	Infrared
Peak emission wavelength	660 nm	660 nm	660 nm	850 nm
Sensitivity adjustment	YES (Adjuster)	YES (Adjuster)	YES (Adjuster)	
Mutual interference prevention	-	YES	YES	
Operation mode	Light ON mode - Dark ON mode selectable (Adjuster)			
Indicator	Operation indicator (red), stability indicator (green), power Indicator (green) ⁰⁴⁾			
Approval	CE  ENEC	CE  ENEC	CE  ENEC	
Unit weight (packaged)	≈ 120 g (= 190 g)	≈ 60 g (= 140 g)	≈ 60 g (= 130 g)	

01) Reflector (MS-2A)

02) Non-glossy white paper 100 × 100 mm

03) Non-glossy white paper 300 × 300 mm

04) Only for the emitter

Power supply	12-24 VDC≒ ±10 % (ripple P-P: ≤ 10%)
Current consumption	It depends on the sensing type
Through-beam	Emitter: ≤ 20 mA, receiver : ≤ 20 mA
Polarized retroreflective	≤ 30 mA
Diffuse reflective (300 mm)	≤ 30 mA
Diffuse reflective (1 m)	≤ 35 mA
Control output	NPN open collector - PNP open collector simultaneous output
Load voltage	≤ 26.4 VDC≒
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC≒, PNP: ≤ 2.5 VDC≒
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-25 to 55 °C, storage: -40 to 70 °C ⁰¹⁾ (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP67 (IEC standard)
Connection	Cable type
Cable spec.	Ø 4 mm, 4-wire (Emitter: 2-wire), 2.1 m
Wire spec.	AWG24 (0.08 mm, 40-core), insulator outer diameter: Ø 1.03 mm
Material	Case: PC, CAP: PC, sensing part: PMMA

01) UL approved ambient temperature 40°C

Diffuse Reflective Long-Distance Photoelectric Sensors

BA Series



Features

- Realization of long sensing distance (2 m) by special optical design
- Protection structure: IP64
- Built-in stability indicator
- Sensitivity adjustment function
- 2 color display

Specifications

Model	BA2M-DDT□-□
Sensing type	Diffuse reflective
Sensing distance	2 m ⁰¹⁾
Sensing target	Opaque materials, translucent materials
Hysteresis	≤ 20 % of sensing distance
Response time	≤ 1 ms
Light source	Infrared
Peak emission wavelength	850 nm
Sensitivity adjustment	YES (Adjuster)
Operation mode	Light ON mode / Dark ON mode model
Indicator	Operation indicator (red), stability indicator (Light ON: orange, Dark ON: green)
Approval	CE UK ENEC
Unit weight	≈ 50 g

01) Non-glossy white paper 200 × 200 mm

Power supply	12-24 VDC≡ ±10 % (ripple P-P: ≤ 10%)
Current consumption	≤ 15 mA (output ON: ≤ 30 mA)
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 26.4 VDC≡
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC≡, PNP: ≤ 2.5 VDC≡
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)
Noise immunity	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-25 to 55 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP64 (IEC standard)
Connection	Cable type
Cable spec.	Ø 3 mm, 3-wire, 2 m
Wire spec.	AWG24 (0.08 mm, 40-core), insulator outer diameter: Ø 1 mm
Material	Case: ABS, CAP: PC, sensing part: PC, adjuster: IXEF



View product detail

L 3.7 mm Flat

Photoelectric

Sensors

BTF Series



Features

- Ultra-thin size of only 3.7 mm
 - W 13 × H 19 × L 3.7 mm (Through-beam type)
 - W 13 × H 24 × L 3.7 mm (Diffuse reflective type, BGS reflective type)
- Detection methods and minimum target size
 - Through-beam type (BTF1M): Ø 2 mm
 - Diffuse reflective type (BTF30): Ø 0.2 mm (sensing distance: 10 mm)
 - BGS reflective type (BTF15): Ø 0.2 mm (sensing distance: 10 mm)
- BGS (background suppression) minimizes detection errors from background objects and the color or material of target objects.
- Maximum sensing distance: 1 m (Through-beam type)
- Operation indicator (red) and stability indicator (green) show operation status
- Stainless steel (SUS304) mounting brackets
- Protection structure: IP67

Specifications

Model	BTF1M-TDT□-□	BTF30-DDT□-□	BTF15-BDT□-□
Sensing type	Through-beam	Diffuse reflective	BGS reflective
Sensing distance	1 m	5 to 30 mm ⁰¹⁾	1 to 15 mm ⁰¹⁾
Sensing target	Opaque materials	Opaque materials, translucent materials	Opaque materials, translucent materials
Min. sensing target	≥ Ø 2 mm	≥ Ø 0.2 mm ⁰²⁾	≥ Ø 0.2 mm non-illuminated objects ⁰²⁾
Hysteresis	-	≤ 20% of sensing distance	≤ 5% of sensing distance
Black/white difference	-	-	≤ 15% of sensing distance
Response time	≤ 1 ms		
Light source	Red		
Peak emission wavelength	650 nm		
Operation mode	Light ON mode / Dark ON mode model		
Indicator	Operation indicator (red), stability indicator (green)		
Approval	CE ENEC	CE ENEC	CE ENEC
Unit weight (packaged)	≈ 40 g (≈ 70 g)	≈ 25 g (≈ 40 g)	≈ 25 g (≈ 40 g)

01) Non-glossy white paper 50 × 50 mm

02) Sensing distance 10 mm

Power supply	12-24 VDC= ±10 % (ripple P-P: ≤ 10%)
Current consumption	It depends on the sensing type
Through-beam	Emitter: ≤ 20 mA, receiver: ≤ 20 mA
Reflective	≤ 20 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 26.4 VDC=
Load current	≤ 50 mA
Residual voltage	NPN: ≤ 1 VDC=, PNP: ≤ 2 VDC=
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC= megger)
Noise immunity	±240 VDC= the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 10,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-25 to 55 °C, storage: -40 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP67 (IEC standard)
Connection	Cable type
Cable spec.	Ø 2.5 mm, 3-wire (emitter: 2-wire), 2 m
Wire spec.	AWG 28 (0.08 mm, 19-core), insulator outer diameter: Ø 0.9 mm
Material	Case: PBT, sensing part: PMMA, bracket: SUS304, bolt: carbon steel, sleeve: SUS304



View product detail

L 7.5 mm Flat Photoelectric Sensors

BPS Series



Features

- Easy to mount by flat type
- Realization of 3m sensing distance as small size
- Protection structure: IP67

- * Sold Separately
- Cover

Specifications

Model	BPS3M-TDT□-□
Sensing type	Through-beam
Sensing distance	3 m
Sensing target	Opaque materials
Min. sensing target	≥ Ø 5 mm
Response time	≤ 1 ms
Light source	Infrared
Peak emission wavelength	850 nm
Operation mode	Light ON mode / Dark ON mode model
Indicator	Power Indicator of emitter (red), operation indicator of receiver (red)
Approval	CE EAC UKCA
Unit weight	≈ 66 g
Power supply	12-24 VDC≒ ±10 % (ripple P-P: ≤ 10 %)
Current consumption	Emitter: ≤ 20 mA, receiver: ≤ 20 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 30 VDC≒
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC≒, PNP: ≤ 2.5 VDC≒
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)
Noise immunity	±240 VDC≒ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-25 to 65 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 90 %RH (no freezing or condensation)
Protection rating	IP67 (IEC standard)
Connection	Cable type
Cable spec.	Ø 3 mm, 3-wire (Emitter: 2-wire), 2 m
Wire spec.	AWG24 (0.08 mm, 40-core), insulator outer diameter: Ø 1 mm
Material	Case: PC, bolt: SCM, nut: SCM



View product detail

Cylindrical Photoelectric Sensors

(Front Sensing Type)

BRQ Series



Features

- Excellent noise immunity and minimal influence from ambient light
- Mutual interference prevention function (except through-beam type)
- Sensitivity adjuster
- Various materials:
Plastic, Metal (Ni-plated Brass), SUS316L
- Long sensing distance:
30 m (through-beam type)
- Body size
 - BRQT, BRQM: Standard
 - BRQP: Standard, Short body
- Protection structure:
 - BRQT : IP67, IP69K
 - BRQM, BRQP: IP67
- * Sold Separately
- Reflector: MS Series
- Retroreflective tape: MST Series
- Bracket: BK-BR-A
- M12 connector cable: C□D(H)4-□-□
- Fixing cap for plastic short body: BK-BR-B



View product detail

Specifications

Model	BRQ□□-TDT□-□-□	BRQ□3M-PDT□-□-□	BRQ□□-DDT□-□-□		
Sensing type	Through-beam	Polarized retroreflective	Diffuse reflective		
Sensing distance	5 m 20 m 30 m	3 m ⁽⁰¹⁾	100 mm ⁽⁰²⁾ 400 mm ⁽⁰²⁾ 1 m ⁽⁰³⁾		
Sensing target	Opaque materials	Opaque materials	Opaque, translucent materials		
Min. sensing target	≥ Ø 7 mm	≥ Ø 75 mm	-		
Hysteresis	-	-	≤ 20 % of sensing distance		
Response time	≤ 1 ms				
Light source	Red	Red	Infrared	Red	Red
Peak emission wavelength	660 nm	660 nm	850 nm	660 nm	660 nm
Sensitivity adjustment	YES (Adjuster)	YES (Adjuster)	YES (Adjuster)		
Mutual interference prevention	-	YES	YES		
Operation mode	Light ON mode - Dark ON mode selectable (Control wire)				
Indicator	Operation indicator (yellow), stability indicator (green), power indicator (red) ⁽⁰⁴⁾				
Approval	CE  				

01) Reflector (MS-2A)

02) Non-glossy white paper 100 × 100 mm

03) Non-glossy white paper 300 × 300 mm

04) Only for the emitter

Unit weight (packaged)	Material	Through-beam	Polarized retroreflective, Diffuse reflective
Cable type	SUS316L	≈ 140 g (≈ 220 g)	≈ 70 g (≈ 150 g)
	Brass, Ni-plate	≈ 140 g (≈ 220 g)	≈ 70 g (≈ 150 g)
	Plastic	≈ 110 g (≈ 160 g)	≈ 60 g (≈ 120 g)
	Plastic (short)	≈ 100 g (≈ 150 g)	≈ 50 g (≈ 120 g)
Connector type	SUS316L	≈ 50 g (≈ 160 g)	≈ 30 g (≈ 140 g)
	Brass, Ni-plate	≈ 50 g (≈ 160 g)	≈ 30 g (≈ 140 g)
	Plastic	≈ 25 g (≈ 110 g)	≈ 15 g (≈ 110 g)
	Plastic (short)	≈ 20 g (≈ 100 g)	≈ 10 g (≈ 100 g)

Power supply	10-30 VDC≒ ±10 % (ripple P-P: ≤ 10 %)
Current consumption	It depends on the sensing type
Through-beam	Emitter: ≤ 20 mA, receiver: ≤ 20 mA
Reflective	≤ 30 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 30 VDC≒
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 2 VDC≒, PNP: ≤ 2 VDC≒
Protection circuit	Reverse power/output protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)
Noise immunity	±240 VDC≒ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-25 to 60 °C, storage: -30 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP67 (IEC standard), SUS316L material model: IP67 (IEC standard), IP69K (DIN standard)
Connection	Cable type / Connector type model
Cable spec.	Ø 4 mm, 4-wire, (Emitter: 2-wire), 2 m
Wire spec.	AWG26 (0.52 mm, 20-core), insulator outer diameter: Ø 1 mm
Connector	M12 4-pin plug type
Material	Case: It depends on the model. (refer to 'Ordering Information'), lens and lens cover: PMMA

Cylindrical Photoelectric Sensors

(Side Sensing Type)

BRQ Series



Features

- Excellent noise immunity and minimal influence from ambient light
- Reverse power protection circuit, reverse output protection circuit, output short overcurrent protection circuit
- Mutual interference prevention function (except through-beam type)
- Sensitivity adjuster
- Light ON / Dark ON mode selectable by control wire
- Protection structure: IP67

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series
- Bracket: BK-BR-A
- M12 connector cable: C□D(H)4-□-□

Specifications

Model	BRQPS□-TDTA-□-□	BRQPS3M-PDTA-□-□	BRQPS□-DDTA-□-□
Sensing type	Through-beam	Polarized retroreflective	Diffuse reflective
Sensing distance	10 m 20 m	3 m ⁰¹⁾	100 mm ⁰²⁾ 400 mm ⁰²⁾ 700 mm ⁰³⁾
Sensing target	Opaque materials	Opaque materials	Opaque, translucent materials
Min. sensing target	≥ Ø 7 mm	≥ Ø 75 mm	-
Hysteresis	-	-	≤ 20 % of sensing distance
Response time	≤ 1 ms		
Light source	Red	Red	Red
Peak emission wavelength	660 nm	660 nm	660 nm
Sensitivity adjustment	YES (Adjuster)	YES (Adjuster)	YES (Adjuster)
Mutual interference prevention	-	YES	YES
Operation mode	Light ON mode - Dark ON mode selectable (Control wire)		
Indicator	Operation indicator (yellow), stability indicator (green), power indicator (red) ⁰⁴⁾		
Approval	CE UK  ENEC	CE UK  ENEC	CE UK  ENEC

01) Reflector (MS-2S)

02) Non-glossy white paper 100 × 100 mm

03) Non-glossy white paper 200 × 200 mm

04) Only for the emitter

Unit weight (packaged)	Through-beam	Polarized retroreflective, Diffuse reflective
Cable type	≈ 120 g (≈ 170 g)	≈ 70 g (≈ 130 g)
Connector type	≈ 35 g (≈ 120 g)	≈ 25 g (≈ 120 g)
Power supply	10-30 VDC≡ ±10 % (ripple P-P: ≤ 10 %)	
Current consumption	It depends on the sensing type	
Through-beam	Emitter: ≤ 20 mA, receiver: ≤ 20 mA	
Reflective	≤ 30 mA	
Control output	NPN open collector output / PNP open collector output model	
Load voltage	≤ 30 VDC≡	
Load current	≤ 100 mA	
Residual voltage	NPN: ≤ 2 VDC≡, PNP: ≤ 2 VDC≡	
Protection circuit	Reverse power/output protection circuit, output short overcurrent protection circuit	
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)	
Noise immunity	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator	
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min	
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times	
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx	
Ambient temperature	-25 to 60 °C, storage: -30 to 70 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating	IP67 (IEC standard)	
Connection	Cable type / Connector type model	
Cable spec.	Ø 4 mm, 4-wire, (Emitter: 2-wire), 2 m	
Wire spec.	AWG26 (0.52 mm, 20-core), insulator outer diameter: Ø 1 mm	
Connector	M12 4-pin plug type	
Material	Case: PC, lens and lens cover: PMMA	



View product detail

Cylindrical Photoelectric Sensors

BR Series



Features

- Superior noise resistance with digital signal processing
- High-speed response time under 1 ms
- Built-in reverse power protection circuit and output short overcurrent protection circuit
- Suitable for sensing in narrow space (narrow beam type)
- External sensitivity adjustment
- Light ON / Dark ON mode selectable by control wire
- Protection structure: IP66

* Sold Separately

- M12 connector cable: C□D(H)4-□-□

Specifications

Model	BR□200-DDTN-□-□
Sensing type	Narrow beam reflective
Sensing distance	200 mm ⁰¹⁾
Sensing target	Opaque materials, translucent materials
Hysteresis	≤ 20 % of sensing distance
Response time	≤ 1 ms
Light source	Infrared
Peak emission wavelength	850 nm
Sensitivity adjustment	YES (Adjuster)
Operation mode	Light ON mode - Dark ON mode selectable (Control wire)
Indicator	Operation indicator (red)
Approval	CE ENEC

01) Non-glossy white paper 100 × 100 mm

Unit weight (packaged)	Metal material model	Plastic material model
Cable type	≈ 120 g (≈ 160 g)	≈ 100 g (≈ 140 g)
Connector type	≈ 50 g (≈ 90 g)	≈ 30 g (≈ 70 g)
Power supply	12-24 VDC≒ ±10 % (ripple P-P: ≤ 10 %)	
Current consumption	≤ 45 mA	
Control output	NPN open collector output / PNP open collector output model	
Load voltage	≤ 30 VDC≒	
Load current	≤ 200 mA	
Residual voltage	NPN: ≤ 1 VDC≒, PNP: ≤ 2.5 VDC≒	
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit	
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)	
Noise immunity	±240 VDC≒ the square wave noise (pulse width: 1 μs) by the noise simulator	
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min	
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times	
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx	
Ambient temperature	-10 to 60 °C, storage: -25 to 75 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating	IP66 (IEC standard)	
Connection	Cable type / Connector type model	
Cable spec.	Ø 5 mm, 4-wire, 2 m	
Wire spec.	AWG22 (0.08 mm, 60-core), insulator outer diameter: Ø 1.25 mm	
Connector	M12 4-pin plug type	
Material	Case: Brass, Ni-plate (metal material model) or PA Black (plastic material model), sensing part: PC lens	



View product detail

4-Channel U-Shaped Photoelectric Sensors

BUM Series



Features

- Highly reliable 4 channel detection
- High-speed response time under 1 ms
- Built-in reverse power protection circuit and output short overcurrent protection circuit
- Protection structure: IP65

Specifications

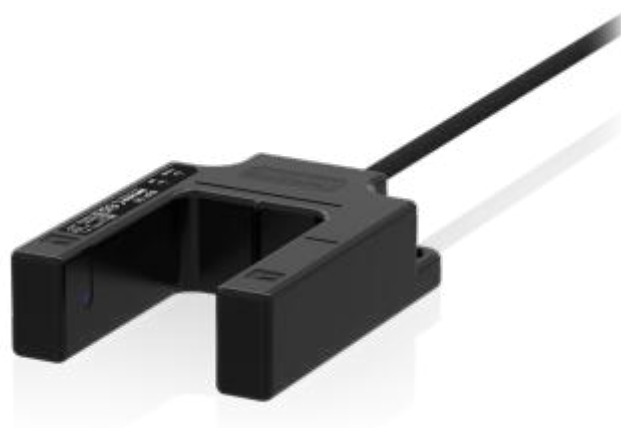
Model	BUM4-40D-W-4M	BUM4-40D-W-□/A	BUM4-40D-W-□/B
Sensing type	Through-beam		
Sensing distance	40 mm		
Sensing target	Opaque materials		
Min. sensing target	≥ Ø 4 mm		
Response time	≤ 1 ms		
Light source	Infrared		
Peak emission wavelength	940 nm		
Operation mode	Dark ON mode		
Indicator	Output Indicator (red), power indicator (green)		
Approval	CE UK ENEC		
Unit weight (packaged)	≈ 500 g (≈ 510 g)	≈ 500 g (≈ 1.5 kg)	≈ 500 g (≈ 1.5 kg)
Power supply	18-35 VDC≡ ±10 % (ripple P-P: ≤ 10%)		
Current consumption	≤ 50 mA		
Control output	NPN open collector output (individual 4 output)		
Load voltage	≤ 35 VDC≡		
Load current	≤ 100 mA		
Residual voltage	≤ 4 VDC≡		
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit		
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)		
Noise immunity	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator		
Dielectric strength	Between the charging part and the case : 1,000 VAC~ 50/60 Hz for 1 min		
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times		
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx		
Ambient temperature	-25 to 65 °C, storage: -25 to 70 °C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Protection rating	IP65 (IEC standard)		
Connection	Cable type		
Cable spec.	Ø 6 mm, 8-wire, 2 m / 3 m / 4 m model		
Wire spec.	AWG22 (1.2 mm, 60-core)		
Material	Case, cover: ABS		



View product detail

1-Channel U-Shaped Photoelectric Sensors

BUP Series



Features

- Various sensing distance's lineup:
30 mm, 50 mm models
- High speed response type: Max. 1 ms
- Offers the sensitivity adjustable model
- Light ON / Dark ON operation mode
selectable by control wire

Specifications

Model	BUP-□-□		BUP-□-E		BUP-□S-□	
Sensing type	Through-beam					
Sensing distance	30 mm	50 mm	30 mm	50 mm	30 mm	50 mm
Sensing target	Opaque materials					
Min. sensing target	≥ Ø 4 mm				≥ Ø 1.5 mm	
Response time	≤ 1 ms					
Light source	Infrared					
Peak emission wavelength	940 nm					
Sensitivity adjustment	Fixed				YES (Adjuster)	
Operation mode	Light ON mode - Dark ON mode selectable (Control wire)					
Indicator	Operation indicator (red), power indicator (green)					
Approval	CE UK ENEC		CE UK		CE UK ENEC	
Unit weight (packaged)	≈ 85 g (≈ 120 g)	≈ 115 g (≈ 160 g)	≈ 60 g (≈ 95 g)	≈ 90 g (≈ 125 g)	≈ 85 g (≈ 120 g)	≈ 115 g (≈ 160 g)
Power supply	12-24 VDC≒ ±10 % (ripple P-P: ≤ 10%)					
Current consumption	≤ 30 mA					
Control output	NPN open collector output / PNP open collector output model					
Load voltage	≤ 30 VDC≒					
Load current	≤ 200 mA					
Residual voltage	NPN: ≤ 1 VDC≒, PNP: ≤ 2.5 VDC≒					
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit					
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)					
Noise immunity	±240 VDC≒ the square wave noise (pulse width: 1 μs) by the noise simulator					
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min					
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours					
Shock	500 m/s ² (= 50 G) in each X, Y, Z direction for 3 times					
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx					
Ambient temperature	Fixed sensitivity model: -25 to 65 °C, storage: -25 to 70 °C (no freezing or condensation) Sensitivity adjustable model: -10 to 60 °C, storage: -25 to 70 °C (no freezing or condensation)					
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)					
Protection rating	Fixed sensitivity model: IP66 (IEC standard) Sensitivity adjustable model: IP50 (IEC standard)					
Connection	Cable type, cable connector type					
Cable spec.	Cable type: Ø 4 mm, 4-wire, 2 m Cable connector type: Ø 4 mm, 4-wire, 0.5 m					
Wire spec.	AWG22 (0.08 mm, 60-core), insulator outer diameter: Ø 1.25 mm					
Connector	5-pin socket type					
Material	Case: ABS, CAP: PC					



View product detail

Universal AC / DC

Photoelectric

Sensors

BEN Series



Features

- Small and power supply built-in type
- Easy installation with indicators on product
- Light ON / Dark ON mode selectable by switch
- Status and output indication
- Built-in IC photo diode for disturbing light and electrical noise

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series

Specifications

Model	BEN10M-T	BEN5M-M	BEN3M-P	BEN300-D
Sensing type	Through-beam	Retroreflective	Polarized retroreflective	Diffuse reflective
Sensing distance	10 m	0.1 to 5 m ⁰¹⁾	0.1 to 3 m ⁰¹⁾	300 mm ⁰²⁾
Sensing target	Opaque materials	Opaque materials	Opaque materials	Opaque, translucent materials
Min. sensing target	≥ Ø 16 mm	≥ Ø 60 mm	≥ Ø 60 mm	-
Hysteresis	-	-	-	≤ 20 % of sensing distance
Response time	AC/DC power, relay contact output model: ≤ 20 ms DC power, solid state (transistor) output model: ≤ 1 ms			
Light source	Infrared	Infrared	Red	Infrared
Peak emission wavelength	850 nm	940 nm	660 nm	940 nm
Sensitivity adjustment	-	YES (Adjuster)	YES (Adjuster)	YES (Adjuster)
Operation mode	Light ON mode - Dark ON mode selectable (Adjuster)			
Indicator	Operation indicator (red), stability indicator (green), power indicator (red) ⁰³⁾			
Approval	CE UK ENEC			
Unit weight (AC/DC power)	≈ 354 g	≈ 208 g	≈ 208 g	≈ 195 g
Unit weight (DC power)	≈ 342 g	≈ 200 g	≈ 200 g	≈ 187 g

01) Reflector (MS-2)

02) Non-glossy white paper 100 × 100 mm

03) Only for the emitter

Output method	AC/DC power, relay contact output	DC power, solid state (transistor) output
Power supply	24-240 VAC ~ ± 10 % 50/60 Hz 24-240 VDC = ± 10 % (ripple P-P: ≤ 10 %)	12-24 VDC = ± 10 % (ripple P-P: ≤ 10 %)
Power / current consumption	≤ 4 VA	It depends on the sensing type
Through-beam	-	Emitter: ≤ 50 mA, receiver: ≤ 50 mA
Reflective	-	≤ 50 mA
Control output	Relay contact output	NPN open collector - PNP open collector simultaneous output
Load voltage	-	≤ 30 VDC =
Load current	-	≤ 200 mA
Residual voltage	-	NPN: ≤ 1 VDC =, PNP: ≤ 2.5 VDC =
Protection circuit	-	Reverse power protection circuit, output short overcurrent protection circuit
Protection rating	IP50 (IEC standard)	
Connection	Cable type	
Material	Case and case cover: heat resistant ABS, sensing part: PC (polarized retroreflective: PMMA)	



View product detail

Universal AC / DC

Photoelectric

Sensors

BX Series



Features

- Built-in sensitivity adjuster
- Timer function (built-in timer model)
 - ON Delay, OFF Delay, One-shot Delay
- NPN / PNP open collector simultaneous output (DC power Type)
- Self-diagnosis function
(green lights up in the stable level)
- Built-in reverse power protection circuit and output short overcurrent protection circuit
- Wide power supply range:
Universal 24-240 VDC \equiv / 24-240 VAC \sim
- Protection structure: IP65

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series



View product detail

Specifications

Model	BX15M-T□-□	BX5M-M□-□	BX3M-P□-□	BX700-D□-□
Sensing type	Through-beam	Retroreflective	Polarized retroreflective	Diffuse reflective
Sensing distance	15 m	0.1 to 5 m ⁰¹⁾	0.1 to 3 m ⁰²⁾	700 mm ⁰³⁾
Sensing target	Opaque materials	Opaque materials	Opaque materials	Opaque, translucent materials
Min. sensing target	≥ Ø 15 mm	≥ Ø 60 mm	≥ Ø 60 mm	-
Hysteresis	-	-	-	≤ 20 % of sensing distance
Response time	AC/DC power, relay contact output model: ≤ 20 ms DC power, solid state (transistor) output model: ≤ 1 ms			
Light source	Infrared	Infrared	Red	Infrared
Peak emission wavelength	850 nm	940 nm	660 nm	940 nm
Sensitivity adjustment	YES (Adjuster)	YES (Adjuster)	YES (Adjuster)	YES (Adjuster)
Timer mode ⁰⁴⁾	OFF, ON Delay, OFF Delay, One Shot Delay mode selectable (Switch): 0.1 to 5 sec (Adjuster)			
Operation mode	Light ON mode - Dark ON mode selectable (Switch)			
Indicator	Operation indicator (yellow), self-diagnosis indicator (green), power indicator (yellow) ⁰⁵⁾			
Approval	CE ENEC	CE ENEC	CE ENEC	CE ENEC
Unit weight	Based on the standard model, timer model: weight + 1 g			
AC/DC power	≈ 225 g	≈ 130 g	≈ 148 g	≈ 115 g
DC power	≈ 211 g	≈ 123 g	≈ 141 g	≈ 116 g

01) Reflector (MS-2)

02) Reflector (MS-3)

03) Non-glossy white paper 200 × 200 mm

04) Only for the timer model

05) Only for the emitter

Output method	AC/DC power, relay contact output	DC power, Transistor solid state output
Power supply	24-240 VAC \sim ± 10 % 50/60 Hz 24-240 VDC \equiv ± 10 % (ripple P-P: ≤ 10 %)	12-24 VDC \equiv ± 10 % (ripple P-P: ≤ 10 %)
Power / current consumption	≤ 3 VA	It depends on the sensing type
Through-beam		Emitter: ≤ 50 mA, receiver: ≤ 50 mA
Reflective		≤ 50 mA
Control output	Relay contact output	NPN open collector - PNP open collector simultaneous output
Contact capacity	250 VAC \sim 3 A of resistance load, 30 VDC \equiv 3 A of resistance load	-
Contact composition	1c	
Relay life cycle	Mechanical: ≥ 50,000,000 Electrical: ≥ 100,000	
Load voltage	-	≤ 30 VDC \equiv
Load current	-	≤ 200 mA
Residual voltage	-	NPN: ≤ 1 VDC \equiv , PNP: ≤ 2.5 VDC \equiv
Self-diagnosis output	-	NPN open collector output ⁰¹⁾
Protection circuit	-	Reverse power protection circuit, output short overcurrent protection circuit

01) Load voltage: ≤ 30 VDC \equiv , load current: ≤ 50 mA, residual voltage: ≤ 1 VDC \equiv (50 mA), ≤ 0.4 VDC \equiv (16 mA)

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Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)	
Insulation type	Double or strong insulation (dielectric voltage between the measured input and the power : 1.5 kV)	-
Noise immunity	± 1,000 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,500 VAC~ 50/60 Hz for 1 min	
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx	
Ambient temperature	-20 to 55 °C, storage: -25 to 70 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating	IP65 (IEC standard)	
Connection	Terminal type	
Material	Case, lens cover: PC, sensing part: Acrylic, bracket: SPCC, bolt: SCM, nut: SCM	

Photoelectric Sensors

for PCB Detection

BJP Series



Features

- 30 mm × 3 mm of rectangular light beam (at 30 mm distance) provides accurate detection of PCBs regardless of holes, incomplete fabrication, protrusions, or intrusions on the boards.
- Background suppression (BGS) sensing method allows stable detection regardless of the color, texture or surface of the background object.
- Sensing distance: 10 to 100 mm (adjustable distance: 20 to 100 mm)
- Switch for selecting Light ON / Dark ON mode
- Reverse power protection circuit, output short overcurrent protection circuit
- Protection structure: IP65

* Sold Separately

- Bracket B: BJ BRACKET B

Specifications

Model	BJP100-BDT-□
Sensing type	BGS reflective
Sensing distance	10 to 100 mm ⁰¹⁾ (at sensing distance: 100 mm)
Sensing target	Opaque materials
Sensing distance setting	20 to 100 mm ⁰¹⁾
Hysteresis	≤ 10 % of setting distance ⁰¹⁾
Response time	≤ 1.5 ms
Light source	Red
Peak emission wavelength	660 nm
Beam spot size	W 3 × L 30 mm (at sensing distance: 30 mm)
Operation mode	Light ON mode - Dark ON mode selectable (Adjuster)
Indicator	Operation indicator (red), stability indicator (green)
Approval	CE ENEC
Unit weight (packaged)	≈ 50 g (≈ 105 g)

⁰¹⁾ Non-glossy white paper 100 × 100 mm

Power supply	12-24 VDC≒ ±10 % (ripple P-P: ≤ 10 %)
Current consumption	≤ 30 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 26.4 VDC≒
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC≒, PNP: ≤ 2 VDC≒
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)
Noise immunity	±240 VDC≒ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 10,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-25 to 55 °C, storage: -40 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP65 (IEC standard)
Connection	Cable type
Cable spec.	Ø 3.5 mm, 3-wire, 2 m
Wire spec.	AWG24 (0.08 mm, 40-core), insulator outer diameter: Ø 1 mm
Material	Case: PC+ABS, CAP: PC, sensing part: PMMA



View product detail

Oil-Resistant Photoelectric Sensors

BJR Series



Features

- Long sensing distance with lens of high performance: Through-beam type 15 m, diffuse reflective type 1 m, polarized retroreflective type 3 m (MS-2S)
- M.S.R. (Mirror Surface Rejection) function (Polarized retroreflective type)
- Reverse power protection circuit and output short overcurrent protection circuit
- Mutual interference prevention function (except through-beam type)
- Stronger in the environment with full of cutting fluid or lubricating oil (optimized for automobile and machine tool industry)
- Protection structure: IP67, IP67G

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series
- Bracket B (BJP SERIES BRACKET B)
- M12 connector cable: CID(H)3-□, CLD(H)3-□

Specifications

Model	BJR15M-TDT-□-□	BJR3M-PDT-□-□	BJR□-DDT-□-□	
Sensing type	Through-beam	Polarized retroreflective	Diffuse reflective	
Sensing distance	15 m	3 m ⁰¹⁾	100 mm ⁰²⁾	1 m ⁰³⁾
Sensing target	Opaque materials	Opaque materials	Opaque materials, translucent materials	
Min. sensing target	≥ Ø 12 mm	≥ Ø 75 mm	-	-
Hysteresis	-	-	≤ 20 % of sensing distance	
Response time	≤ 1 ms			
Light source	Infrared	Red	Infrared	Red
Peak emission wavelength	850 nm	660 nm	850 nm	660 nm
Sensitivity adjustment	YES (Adjuster)	YES (Adjuster)	YES (Adjuster)	
Mutual interference prevention	-	YES	YES	
Operation mode	Light ON mode - Dark ON mode selectable (Adjuster)			
Indicator	Operation indicator (yellow), stability indicator (green), power indicator (red) ⁰⁴⁾			
Approval	CE ENEC	CE ENEC	CE ENEC	

01) Reflector (MS-2S)

02) Non-glossy white paper 100 × 100 mm

03) Non-glossy white paper 300 × 300 mm

04) Only for the emitter

Unit weight (packaged)	Through-beam	Polarized retroreflective	Diffuse reflective
Cable type	≈ 95 g (≈ 145 g)	≈ 50 g (≈ 115 g)	≈ 50 g (≈ 100 g)
Cable connector type	≈ 55 g (≈ 105 g)	≈ 30 g (≈ 95 g)	≈ 30 g (≈ 80 g)
Power supply	10-30 VDC≡ ±10 % (ripple P-P: ≤ 10 %)		
Current consumption	It depends on the sensing type		
Through-beam	Emitter: ≤ 20 mA, receiver: ≤ 20 mA		
Reflective	≤ 30 mA		
Control output	NPN open collector output / PNP open collector output model		
Load voltage	≤ 30 VDC≡		
Load current	≤ 100 mA		
Residual voltage	NPN: ≤ 1 VDC≡, PNP: ≤ 2 VDC≡		
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit		
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)		
Noise immunity	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator		
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min		
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times		
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx		
Ambient temperature	-25 to 60 °C, storage: -40 to 70°C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Protection rating	IP67 (IEC standard), IP67G (JEM standard)		
Connection	Cable type / Cable connector type model		
Cable spec.	Ø 4 mm, 3-wire (emitter: 2-wire), cable type: 2 m, cable connector type: 300 mm		
Wire spec.	AWG26 (0.52 mm, 20-core), insulator outer diameter: Ø 1 mm		
Connector	M12 4-pin plug type		
Material	Case: ABS, CAP: PA12, sensing part: PMMA		



View product detail

Oil-Proof Photoelectric Sensors

BJR-F Series



Features

- Long sensing distance with lens of high performance: Through-beam type 15 m, diffuse reflective type 1 m, polarized retroreflective type 3 m (MS-2S)
- M.S.R. (Mirror Surface Rejection) function (Polarized retroreflective type)
- Built-in reverse polarity protection circuit and output short overcurrent protection circuit
- Mutual interference prevention function (except through-beam type)
- Excellent noise immunity and minimal influence from ambient light
- Stronger in the environment with full of cutting fluid or lubricating oil (optimized for automobile and machine tool industry)
- Protection structure: IP67, IP67F

* Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series
- M8 connector cable: CID(H)408-□, CLD(H)408-□
- M12 connector cable: CID(H)3-□, CLD(H)3-□

[View product detail](#)

Specifications

Model	BJR□-TDT-□-□- F		BJR3M-PDT-□-□- F	BJR□-DDT-□-□- F	
Sensing type	Through-beam		Polarized retroreflective	Diffuse reflective	
Sensing distance	10 m	15 m	3 m ⁽⁰⁾	100 mm ⁽²⁾	1 m ⁽³⁾
Sensing target	Opaque materials		Opaque materials	Opaque materials, translucent materials	
Min. sensing target	≥ Ø 12 mm		≥ Ø 75 mm	-	-
Hysteresis	-		-	≤ 20 % of sensing distance	
Response time	≤ 1 ms				
Light source	Red LED	Infrared LED	Red LED	Infrared LED	Red LED
Peak emission wavelength	660 nm	850 nm	660 nm	850 nm	660 nm
Sensitivity adjustment	YES (Adjuster)		YES (Adjuster)	YES (Adjuster)	
Mutual interference prevention	-		YES	YES	
Operation mode	Light ON mode - Dark ON mode selectable (Adjuster)				
Indicator	Operation indicator (yellow), stability indicator (green), power indicator (red) ⁽⁴⁾				
Certification	CE 		CE 	CE 	

01) Reflector (MS-2S)

02) Non-glossy white paper 100 × 100 mm

03) Non-glossy white paper 300 × 300 mm

04) Only for the emitter

Unit weight (packaged)	Through-beam	Polarized retroreflective	Diffuse reflective
Cable type	≈ 95 g (≈ 145 g)	≈ 50 g (≈ 115 g)	≈ 50 g (≈ 100 g)
Connector type	≈ 12 g (≈ 65 g)	≈ 6 g (≈ 75 g)	≈ 6 g (≈ 60 g)
Cable connector type	≈ 55 g (≈ 105 g)	≈ 30 g (≈ 95 g)	≈ 30 g (≈ 80 g)
Power supply	10-30 VDC≡ ±10 % (ripple P-P: ≤ 10 %)		
Current consumption	It depends on the sensing type		
Through-beam	Emitter: ≤ 20 mA, receiver: ≤ 20 mA		
Reflective	≤ 30 mA		
Control output	NPN open collector output / PNP open collector output Model		
Load voltage	≤ 30 VDC≡		
Load current	≤ 100 mA		
Residual voltage	NPN: ≤ 1 VDC≡, PNP: ≤ 2 VDC≡		
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit		
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)		
Noise immunity	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator		
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min		
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times		
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx		
Ambient temperature	-25 to 60 °C, storage: -40 to 70°C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Protection rating	IP67 (IEC standard), IP67F (JEM standard)		
Connection	Cable type / Connector type / Cable connector type model		
Cable spec.	Ø 4 mm, 3-wire (Emitter: 2-wire), cable type: 2 m, cable connector type: 300 mm		
Wire spec.	AWG26 (0.52 mm, 20-core), insulator outer diameter: Ø 1 mm		
Connector	Connector type: M8 4-pin plug type, cable connector type: M12 4-pin plug type		
Material	Case: ABS, CAP: PA12, sensing part: PMMA		

Color Mark

Photoelectric

Sensors

BC Series



Features

- Outstanding color matching accuracy
 - R.G.B light emitting diodes and 12-bit resolution
 - 2 detection modes (color only / color + intensity)
 - 3-step sensitivity adjustment for each mode (fine, normal, rough)
- External light interference reduction minimizes errors and allows stable detection
- Check reference color with teaching indicator
- Operation indicator (red), stability indicator (green), timer indicator (orange)
- Configure operation functions with external input from wiring
- W 1.24 × L 6.7 mm spot size for detection of tiny targets and color marks
- Protection structure: IP67

- * Sold Separately
- M12 connector cable: C□D(H)4-□-□

Specifications

Model	BC15-LDT-C-□
Sensing type	Convergent reflective
Sensing distance	15 mm ± 2 mm
Sensing target	Opaque materials, translucent materials
Hysteresis	≤ 20 % of sensing distance (may vary by sensing mode or sensitivity)
Response time	≤ 500 μs
Light source	Full Color (Red, Green, Blue)
Min. spot size	W 1.24 × L 6.7 mm
Sensing mode	C mode (color only) - C+I mode (color + intensity) selectable (SET key or SET cable)
Sensitivity adjustment	YES (SET key or SET cable)
Operation mode	Color match (Normally Open) - Color mismatch (Normally Closed) mode selectable (Adjuster)
Teaching	YES
Timer	OFF-delay mode: 40 ms
Indicator	Operation indicator (red), stability indicator (green), teaching indicator (full color), timer indicator (orange)
Approval	CE UK ENEC
Unit weight (packaged)	≈ 14 g (≈ 80 g)
Power supply	12-24 VDC≒ ±10 % (ripple P-P: ≤ 10 %)
Current consumption	≤ 30 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 30 VDC≒
Load current	≤100 mA
Residual voltage	NPN: ≤ 1 VDC≒, PNP: ≤ 2.5 VDC≒
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)
Noise immunity	±240 VDC≒ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Incandescent lamp: ≤ 3,000 lx
Ambient temperature	-10 to 55 °C, storage: -25 to 75 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP67 (IEC standard)
Connection	Connector type
Connector	M12 4-pin plug type
Material	Case: PC, sensing part: Acrylic, bracket: SUS304, bolt: Carbon Steel



View product detail

Liquid Level

Photoelectric

Sensors

BL Series



Features

- Detects liquid in a transparent / semitransparent pipe diameter Ø6 to 13 mm, thickness 1 mm
- Compact size: W 23 × H 14 × L 13 mm
- Selectable Light ON / Dark ON mode by operation mode switching button
- Easy to check operation status by operation mode indicator [green (Light ON: on, Dark ON: off)], operation indicator [red]
- Built-in reverse power protection circuit and output short overcurrent protection circuit
- Protection bracket (sold separately) helps to minimize the effects of external environment [Ø 12.7 mm (1/2 inch) pipes]
- Protection structure: IP64

* Sold Separately

- Protection bracket for Ø 12.7 mm (1/2 inch) pipes: BK-BL13-P

Specifications

Model	BL13-TDT-□
Sensing type	Through-beam
Applicable pipe	Transparent pipes in 1mm thickness (FEP (fluoroplastic) or with equivalent transparency) Using binding band: Ø 6 to 13 mm Using protection bracket: Ø 12.7 mm (1/2 inch)
Sensing target	Liquid in a pipe ⁰¹⁾
Response time	≤ 2 ms
Light source	Infrared
Peak emission wavelength	950 nm
Operation mode	Light ON mode - Dark ON mode selectable (Button)
Indicator	Operation indicator (red), operation mode indicator (green)
Approval	CE, RoHS, ENEC
Unit weight (packaged)	≈ 13 g (≈ 50 g)
Power supply	12-24 VDC= ±10 % (ripple P-P: ≤ 10 %)
Current consumption	≤ 30 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 30 VDC=
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC=, PNP: ≤ 1 VDC=
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC= megger)
Noise immunity	±240 VDC= the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 3,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP64 (IEC standard)
Connection	Cable type
Cable spec.	Ø 2.5 mm, 3-wire, 1 m
Wire spec.	AWG28 (0.08 mm, 19-core), insulator outer diameter: Ø 0.9 mm
Material	Case: PC

01) This may not detect the liquid with low transparent, with high viscosity, or with floating matters.



View product detail



A2. Photomicro Sensors

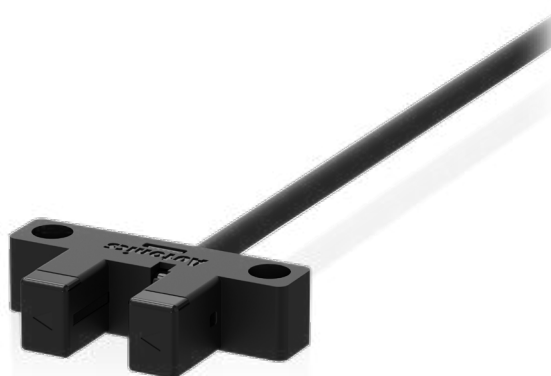
Photomicro sensors are compact sized photoelectric sensors with built-in amplifiers used to detect presence of mechanical parts in equipments.

A2-1	Through-Beam	BS3 Series	Groove-Depth 6.5 mm Photomicro Sensors
		BS4 Series	Groove-Depth 6.5 mm Photomicro Sensors with Built-In Connector
		BS5 Series	Groove-Depth 9 mm Photomicro Sensors
A2-2	Push-Button	BS5-P Series	Push-Button Type Photomicro Sensors

Groove-Depth 6.5 mm

Photomicro Sensors

BS3 Series



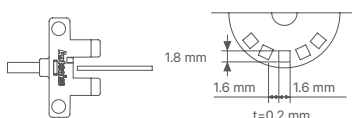
Features

- Ultra compact size
- Select appearance depending on the installation environment (K, F, R, U, L type)
- Minimize malfunction and improve visibility
 - Minimize sensing part, gap and flush of the body to reduce malfunctions caused by a foreign substance
 - Built-in the operation indicator can be checked in many directions
- Selectable models for the operation of indicator
 - Indicator turns ON under the light received condition
 - Indicator turns ON under the light interrupted condition
- Resistant structure for shock and vibration
 - Shock 15,000 m/s² (approx. 1,500 G)
 - Vibration 10 to 2,000 Hz (1.5 mm double amplitude)
- Selectable operation modes (Light ON / Dark ON)
- High-frequency response: 2 kHz

Specifications

Series	BS3
Sensing type	Through-beam
Sensing distance	5 mm
Sensing target	Opaque materials
Min. sensing target	≥ 0.8 mm × 1.8 mm
Hysteresis	≤ 0.05 mm
Response time	Received light: ≤ 20 μs, Interrupted light: ≤ 100 μs
Response frequency ⁰¹⁾	2 kHz
Light source	Infrared LED
Peak emission wavelength	940 nm
Operation mode	Built-in Light ON / Dark ON
Indicator	Operation indicator (red)
Approval	CE UK RoHS
Unit weight	≈ 50 g

01) Response frequency is the value getting from revolving the circle panel below.



Power supply	5-24 VDC≒ ±10% (ripple P-P: ≤ 10%)
Current consumption	≤ 15 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 24 VDC≒
Load current	≤ 50 mA
Residual voltage	NPN: ≤ 1.2 VDC≒, PNP: ≤ 1.2 VDC≒
Protection circuit	Reverse power polarity protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (250 VDC≒ megger)
Noise immunity	± 240 VDC≒ square wave noise (pulse width 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude (max. acceleration 196 m/s ²) at frequency of 10 to 2,000 Hz in each X, Y, Z direction for 2 hours
Shock	15,000 m/s ² (≈ 1,500 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Fluorescent lamp: ≤ 1,000 lx
Ambient temperature	-20 to 55 °C, storage: -25 to 85 °C (no freezing or condensation environment)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation environment)
Protection rating	IP50 (IEC standard)
Connection method	Cable type
Cable spec.	Ø 2.5 mm, 4-wire, 1 m
Wire spec.	AWG28 (0.08 mm, 19-core), insulator outer diameter: Ø 0.65 mm
Material	Case: PBT, sensing part: PC



View product detail

Groove-Depth 6.5 mm

Photomicro Sensors with Built-In Connector

BS4 Series



Features

- Compact size with built-in connector
- Dedicated connector cables (sold separately) and universal connector cables supported
- Various shapes available for installation flexibility (K, L, R, T, TA, F, Y types)
- Level sensing side and body for minimal detection errors
- Operation indicators viewable from multiple directions
- Indicator ON when light received and indicator ON when light blocked models available
- High shock and vibration resistance
- High-speed response frequency: 2kHz
- Standard and flexible connector cables (sold separately)

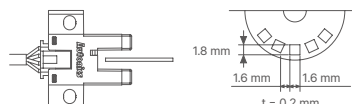
* Sold Separately

- Connector: CT-03□, CT-04□

Specifications

Series	BS4
Sensing type	Through-beam
Sensing distance	5 mm
Sensing target	Opaque materials
Min. sensing target	≥ 0.8 mm × 1.8 mm
Hysteresis	≤ 0.05 mm
Response time	Received light: ≤ 20 μs, Interrupted light: ≤ 80 μs
Response frequency	2 kHz ⁰¹⁾
Light source	Infrared LED
Peak emission wavelength	940 nm
Operation mode	Built-in Light ON / Dark ON
Indicator	Operation indicator (Red)
Approval	CE UK RoHS
Unit weight	≈ 2.4 g

01) Response frequency is the value getting from revolving the circle panel below.



Power supply	5-24 VDC≒ ±10% (ripple P-P: ≤ 10%)
Current consumption	≤ 15 mA
Control output	NPN open collector output / PNP open collector output Model
Load voltage	≤ 24 VDC≒
Load current	≤ 50 mA
Residual voltage	NPN: ≤ 1.2 VDC≒, PNP: ≤ 1.2 VDC≒
Protection circuit	Reverse power polarity protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (250 VDC≒ megger)
Noise immunity	± 240 VDC≒ square wave noise (pulse width 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude (max. acceleration 196 m/s ²) at frequency of 10 to 2,000 Hz in each X, Y, Z direction for 2 hours
Shock	15,000 m/s ² (≈ 1,500 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Fluorescent lamp: ≤ 1,000 lx
Ambient temperature	-20 to 55°C, Storage: -25 to 85°C (no freezing or condensation environment)
Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH (no freezing or condensation environment)
Protection rating	IP50 (IEC standard)
Connection method	Connector type
Material	Case: PBT, sensing part: PC

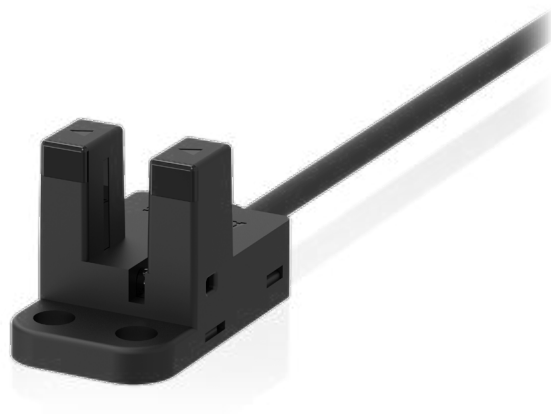


View product detail

Groove-Depth 9 mm

Photomicro Sensors

BS5 Series



Features

- Various shapes available for installation flexibility (K, T, V, L, Y, F, R, TA types)
- Level sensing side and body for minimal detection errors
- Operation indicators viewable from multiple directions
- Indicator ON when light received and indicator ON when light blocked models available
- High shock and vibration resistance
- High-speed response frequency: 2kHz
- Standard and flexible type cables available

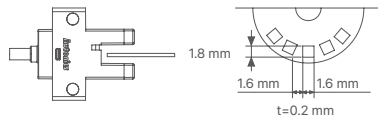
* Sold Separately

- Connector type connector: CT-01
- Cable type connector: CT-02-□

Specifications

Series	BS5
Sensing type	Through-beam
Sensing distance	5 mm
Sensing target	Opaque materials
Min. sensing target	≥ 0.8 mm × 2 mm
Hysteresis	≤ 0.05 mm
Response time	Received light: ≤ 20 μs , Interrupted light: ≤ 100 μs
Frequency response	2 kHz ⁰¹⁾
Light source	Infrared LED
Peak emission wavelength	940 nm
Operation mode	Light ON-Dark ON selectable (control wire)
Indicator	Operation indicator (red)
Approval	CE UK EAC
Unit weight	Cable type: ≈ 50 g, Connector type: ≈ 30 g

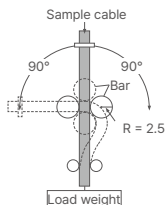
01) Response frequency is the value getting from revolving the circle panel below.



Power supply	5-24 VDC≒ ±10 % (ripple P-P: ≤ 10 %)
Current consumption	≤ 30 mA
Control output	NPN open collector / PNP open collector output model
Load voltage	≤ 30 VDC≒
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1.2 VDC≒, PNP: ≤ 1.2 VDC≒
Protection circuit	Reverse power polarity protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (250 VDC≒ megger)
Noise immunity	The square wave noise (pulse width: 1μs) by the noise simulator ± 240 VDC≒
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 minute
Vibration	1.5 mm double amplitude (max. acceleration 196 m/s ²) at frequency of 10 to 2,000 Hz in each X, Y, Z direction for 2 hours
Shock	15,000 m/s ² (approx. 1,500 G) in each X, Y, Z direction for 3 times
Ambient illumination (receiver)	Fluorescent lamp: ≤ 1,000
Ambient temperature	-20 to 55 °C, storage: -25 to 85 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection method	Cable / Connector type model
Cable spec.	Standard / Flexible 01) cable model: Ø 3 mm, 4-wire, 1 m
Wire spec.	AWG28 (0.08 mm, 19-core), insulator outer diameter: Ø 0.88 mm
Material	Case: PBT, Sensing part: PC

01) The flexible cable model has achieved durability of approximately 20,000 cycles in our bending test.

[Bending test]



- Bending angle: Left and right 90°
- Load weight: 500 g
- Bending radius: 2.5 mm
- Bending speed: 60 cycles/min (180° = 1 cycle)



View product detail

Push-Button Type Photomicro Sensors

BS5-P Series



Features

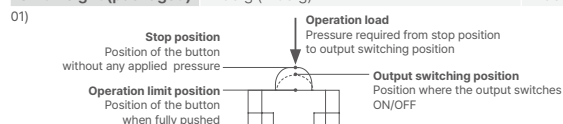
- Button operation enables accurate detection regardless of material, color, or reflectance of target object
- Optimized for transport detection of semiconductor wafer enclosures (FOUP, FOSB, etc.)
- Optical detection of button operation guarantees 5 million operations of the mechanical life cycle
- Total of 4 red LED indicators (side: 2, top: 2) for higher visibility of operation status
- Increased product durability with steel mounting brackets
- Emitter OFF function and check stable operation functions
- Built-in reverse polarity protection circuit and output short overcurrent protection circuit



View product detail

Specifications

Model	BS5-P1M□-□	BS5-P1M□-□-U
Sensing type	Push button type	
Button stop position ⁰¹⁾	5.0 ± 0.4 mm	
Button output switching position ⁰¹⁾	4.0 ± 0.5 mm	
Button operation limit position ⁰¹⁾	≤ 0 mm	
Operation load ⁰¹⁾	≤ 3 N	
Light source	Infrared LED	
Peak emission wavelength	940 nm	
Emitter OFF	YES (External input ⁰²⁾)	
Check stable operation	YES (External input ⁰²⁾)	
Operation mode	Light ON (Unpressed button, output ON) / Dark ON (Pressed button, output ON) mode model	
Indicator	Operation indicator (red)	
Approval	CE UK ENEC	CE UK ENEC
Unit weight (packaged)	≈ 30 g (≈ 50 g)	≈ 30 g (≈ 50 g)



⁰²⁾	External input	NPN output	PNP output
	Emitter OFF	Short at 0 V or ≤ 0.25 VDC≡ (outflow current ≤ 30 mA)	Short at +V or +V ≥ -0.25 VDC≡ (absorption current ≤ 30 mA)
	Emitter ON	Open (leakage current ≤ 0.4 mA)	Open (leakage current ≤ 0.4 mA)
	Response time	≤ 1 ms	

Power supply	12-24 VDC≡ ±10 % (ripple P-P: ≤ 10 %)
Current consumption	≤ 35 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 26.4 VDC≡
Load current	≤ 50 mA
Residual voltage	NPN: ≤ 1.5 VDC≡, PNP: ≤ 1.5 VDC≡
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (250 VDC≡ megger)
Noise immunity	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ at 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at 10 to 55 Hz frequency in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Mechanical life cycle	≥ 5,000,000 operations (1 operation = stop position - operation limit position - stop position)
Ambient illumination (receiver)	Fluorescent lamp: ≤ 1,000 lx
Ambient temperature	-20 to 55 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP40 (IEC standard)
Connection method	Cable type
Cable spec.	Ø 3 mm, 4-wire, 1 m
Wire spec.	Refer to the specifications below depending on the models.
BS5-P1M□-□-□	AWG26 (0.08 mm, 30-core), insulator outer diameter: Ø 0.93 mm
BS5-P1M□-□-U	AWG26 (0.08 mm, 28-core), insulator outer diameter: Ø 0.9 mm
Material	Refer to the specifications below depending on the models.
BS5-P1M□-□-□	Case: PC + G, button: POM, sleeve: SUS304
BS5-P1M□-□-U	Case: PC, button: POM, sleeve: SUS304



A3. Fiber Optic Sensors

Fiber optic sensors combine optic fiber cables and amplifiers to provide accurate detection of objects in various applications.

A3-1	Fiber Optic Amplifiers	BF5 Series	Single / Dual Display Fiber Optic Amplifiers
		BF4 Series	Button Adjustment Fiber Optic Amplifiers
		BF3 Series	Volume Adjustment Fiber Optic Amplifiers
		BFX Series	Dual Display Fiber Optic Amplifiers
		BFC Series	Fiber Optic Amplifier Communication Converters
A3-2	Fiber Optic Units	FT / GT Series	Through-Beam Type Fiber Optic Units
		FD / GD Series	Retroreflective Type Fiber Optic Units
		FL / GL Series	Convergent Reflective Type Fiber Optic Units

Single / Dual Display Fiber Optic Amplifiers

BF5 Series



Features

- Dual-display for light incident level and setting value (BF5□-D)
- Enables to detect the minute object with 1 / 10,000 high resolution
- Enables to detect with high-speed moving object (response time 50 μs)
- 5 response times:
 - ultra fast mode (50 μs), fast mode (150 μs), standard mode (500 μs), long distance mode (4 ms), ultra long distance mode (10 ms)
- Anti-saturation setting function prevents malfunction by saturated light
- Easy sensitivity setting
- Long lasting amplifier regardless of element's life degradation or temperature change
- Multiple sensitivity setting modes available: auto-tuning, 1-point (maximum sensitivity), 2-point, positioning teaching

Specifications

Model	BF5R-D1-□	BF5G-D1-□	BF5B-D1-□
Light source	Red LED	Green LED	Blue LED
Peak emission wavelength	660 nm, modulated	530 nm, modulated	470 nm, modulated
Response time	Standard (500 μs), Long distance (4 ms), Ultra long distance (10 ms), Ultra fast (50 μs), Fast (150 μs) mode		
Sensitivity setting	Manual, Teaching (Auto-tuning, 1-point, 2-point, positioning)		
Operation mode	Light ON, Dark ON		
Measured value display	7-segment LCD, 4-digit (decimal, percentage)		
Operation mode of the timer	OFF, OFF Delay, ON Delay, One-shot		
Max. cascading units	≤ 31 units		
Mutual interference prevention	≤ 8 units		
Indicator	Operation indicator (red), display screen (PV display part: red LED, SV display part: green LED)		
Approval	CE UK EAC	CE UK EAC	CE UK EAC
Unit weight (packaged)	≈ 20 g (≈ 138 g)	≈ 20 g (≈ 138 g)	≈ 20 g (≈ 138 g)

Model	BF5R-S1-□
Light source	Red LED
Peak emission wavelength	660 nm, modulated
Response time	Standard (500 μs), Long distance (4 ms), Fast (150 μs) mode
Sensitivity setting	Manual, Teaching (Auto-tuning)
Operation mode	Light ON, Dark ON
Measured value display	7-segment LCD, 4-digit (decimal, percentage)
Operation mode of the timer	OFF Delay (time range: OFF, 10 ms, 40 ms)
Mutual interference prevention	≤ 8 units
Indicator	Operation indicator (red), display screen (PV / SV display part: red LED)
Approval	CE UK EAC
Unit weight (packaged)	≈ 20 g (≈ 138 g)



View product detail

- Up to 8 units enable to connect with mutual interference prevention function using side connectors
- Auto channel setting function for multiple installations
- Adopts red, green, blue light sources
- Slim design with depth 10 mm (W 10 × H 30 × L 70 mm)

※ Sold Separately

- Fiber optic units
- Communication converter: BFC Series

Power supply	12-24 VDC≒ ±10% (ripple P-P: ≤ 10%)
Current consumption	≤ 50 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 24 VDC≒
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC≒, PNP: ≤ 3 VDC≒
Protection circuit	Reverse power protection circuit, output short over current protection circuit, surge protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-10 to 50 °C, storage: -20 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection rating	IP40 (IEC standard)
Connection	Connector cable
Cable spec.	Ø 4 mm, 3-wire, 2 m
Wire spec.	AWG22 (0.08 mm, 60-core), insulator outer diameter: Ø 1.25 mm
Tightening torque for fiber optic unit	≥ 2kgf
Material	Case: PBT, cover: PC

Button Adjustment

Fiber Optic Amplifiers

BF4 Series



Features

- High response time: max. 0.5 ms
- Auto sensitivity setting (button setting) / remote sensitivity setting type
- External synchronization input, mutual interference protection, self-diagnosis
- Reverse power protection and output short overcurrent protection circuit
- Timer function: OFF delay timer approx. 40 ms fixed.
(standard type, remote sensitivity setting type only)
- Automatically selectable Light ON / Dark ON
- Precise detection of small target and easy to install in the complicated place

- * Sold Separately
- Fiber optic units

Specifications

Model	BF4R□□-□	BF4G□□-□
Light source	Red LED	Green LED
Peak emission wavelength	660 nm, modulated	525 nm, modulated
Response time	Built-in 2 differential frequencies (frequency 1: ≤ 0.5 ms, frequency 2: ≤ 0.7 ms)	
Sensitivity setting	Button / Remote sensitivity setting	
Operation mode	Light ON / Dark ON selectable	
Self-diagnosis output	YES	
Load voltage	≤ 30 VDC≡	
Load current	≤ 50 mA	
Residual voltage	NPN: ≤ 1 VDC≡ (load current: 50 mA), ≤ 0.4 VDC≡ (load current: 16 mA) PNP: ≤ 2.5 VDC≡	
Indicator	Operation indicator (red), stability indicator (green)	
Approval	CE ENEC	CE ENEC
Unit weight (packaged)	≈ 65 g (≈ 120 g)	≈ 65 g (≈ 120 g)
Power supply	12-24 VDC≡ ±10% (ripple P-P: ≤ 10%)	
Current consumption	≤ 45 mA	
Control output	NPN open collector output / PNP open collector output model	
Load voltage	≤ 30 VDC≡	
Load current	≤ 100 mA	
Residual voltage	NPN: ≤ 1 VDC≡ (load current: 100 mA), ≤ 0.4 VDC≡ (load current: 16 mA) PNP: ≤ 2.5 VDC≡	
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit	
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)	
Noise immunity	±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator	
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min	
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z directions for 3 times	
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx	
Ambient temperature	-10 to 50 °C, storage: -20 to 70 °C (no freezing or condensation)	
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Cable spec.	Standard type: Ø 4 mm, 4-wire, 2 m External synchronization input, remote sensitivity setting type: Ø 4 mm, 6-wire, 2 m	
Wire spec.	Standard type: AWG22 (0.08 mm, 60-core), insulator outer diameter: Ø 1.25 mm External synchronization input, remote sensitivity setting type: AWG24 (0.08 mm, 40-core), insulator outer diameter: Ø 1 mm	
Material	Case: heat-resistance ABS, cover: PC	



View product detail

Volume Adjustment

Fiber Optic Amplifiers

BF3 Series



Features

- Convenient DIN rail mounting type
- Response time: max. 1 ms
- Enables to adjust sensitivity with high accuracy by coarse and fine adjuster
- Selectable Light ON / Dark ON operation mode by control wire
- Reverse power protection and output short overcurrent protection circuit
- Adjustable length with free cut type fiber optic unit

- * Sold Separately
- Fiber optic units
(except GT-420-13H2 model)

Specifications

Model	BF3RX-□
Light source	Red LED
Peak emission wavelength	660 nm, modulated
Response time	≤ 1 ms
Sensitivity setting	Manual sensitivity setting (adjuster)
Operation mode	Light ON / Dark ON selectable (control wire)
Indicator	Operation indicator (red)
Approval	EN61010
Unit weight	≈ 90 g
Power supply	12-24 VDC≒ ±10% (ripple P-P: ≤ 10%)
Current consumption	≤ 40 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 30 VDC≒
Load current	≤ 200 mA
Residual voltage	NPN: ≤ 1 VDC≒, PNP: ≤ 2.5 VDC≒
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)
Noise immunity	±240 VDC≒ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case : 1,000 VAC~ 50 / 60 Hz for 1 min
Vibration	1 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-10 to 50 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Cable spec.	Ø 5 mm, 4-wire, 2 m
Wire spec.	AWG24 (0.08 mm, 40-core), insulator outer diameter: Ø 1 mm
Material	Case: ABS, cover: PC



View product detail

Dual Display

Fiber Optic Amplifiers

BFX Series



Features

- Dual-display for light incident level and setting value
- Enables to detect the minute object with 1/10,000 high resolution
- Enables to detect with high-speed moving object (response time 50 μ s)
- 5 response times:
ultra fast mode (50 μ s), fast mode (150 μ s), standard mode (500 μ s), long distance mode (4 ms), ultra long distance mode (10 ms)
- Anti-saturation setting function prevents malfunction by saturated light
- External input: emitter OFF, remote sensitivity setting, peak reset, output ON/OFF/Keep, energy saving OFF
- Multiple sensitivity setting modes available:
auto tuning (fine-adjusting sensitivity)
teaching sensitivity setting
(button or external input auto-tuning, 1-point, 2-point, positioning)

* Sold Separately

- Bracket: BFX-BRACKET
- Fiber optic units

Specifications

Model	BFX-D1-□
Light source	Red LED
Peak emission wavelength	660 nm, modulated
Response time	Standard (500 μ s), Long distance (4 ms), Ultra long distance (10 ms), Ultra fast (50 μ s), Fast (150 μ s) mode
Sensitivity setting	Manual, Teaching (Auto-tuning, 1-point, 2-point, positioning)
Operation mode	Light ON, Dark ON
Measured value display	7-segment LCD, 4-digit (decimal, percentage)
Operation mode of the timer	OFF, OFF Delay, ON Delay, One-shot
External input	Teaching sensitivity, initialization of the incident light level, emitter OFF, control output setting, energy saving mode release
Indicator	Operation indicator (red), display screen (PV display part: red LED, SV display part: green LED)
Approval	CE UK ENEC
Unit weight (packaged)	≈ 16 g (≈ 115 g)
Power supply	12-24 VDC≐ ±10% (ripple P-P: ≤ 10%)
Current consumption	≤ 50 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 24 VDC≐
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC≐, PNP: ≤ 3 VDC≐
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit, surge protection circuit
Insulation resistance	≥ 20 M Ω (500 VDC≐ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature ⁰¹⁾	-10 to 50 °C, storage: -20 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection rating	IP40 (IEC standard)
Connection	Connector cable
Cable spec.	Ø 4 mm, 4-wire, 2 m
Wire spec.	AWG22 (0.08 mm, 60-core), insulator outer diameter: Ø 1.25 mm
Tightening torque for fiber optic unit	≥ 2kgf
Material	Case: POK, cover: PC

01) 1 to 2 units: -10 to 50 °C, 3 to 8 units: -10 to 35 °C

Be cautious about the heat transfer when the number of connected units is more than 8.

The ambient temperature varies with the number of connected amplifiers that are mounted on the DIN rail. Be sure to check the temperatures when installing in the enclosed area.



View product detail

Fiber Optic Amplifier Communication Converters

BFC Series




Features

- Sets all Functional performance and parameters from external devices (PC, PLC)
- Supports various communications:
RS485 communication,
Serial Communication, SW input
- Connected up to 32 amplifiers (BF5 series)
- Slim design with depth 10 mm
(W 10 × H 30 × L 70 mm)

* Sold Separately

- Fiber optic amplifier: BF5 series
- Communication converter: SCM series

Specifications

Model	BFC-□
Supported amplifier	BF5 Series
Comm. function	RS485, Serial communication, Switch (SW) input
Switch (SW) input	HIGH: 5-24 VDC≒, LOW: 0-1 VDC≒
Function	Real-time monitoring (incident light level, output state), Executes all functions and sets the parameters of BF5 Series via external devices (PC, PLC)
Indicator	TX indicator (red), RX indicator (green), display screen (PV display part: red LED, SV display part: green LED)
Approval	CE  ENEC
Unit weight	≒ 15 g
Power supply	12-24 VDC≒ ±10% (using the power supply of the connected amplifier)
Current consumption	≒ 40 mA
Control output	NPN solid-state input / PNP solid-state input model
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≒ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection rating	IP40 (IEC standard)
Connection	Connector cable
Cable spec.	Ø 4 mm, 4-wire, 2 m
Wire spec.	AWG22 (0.08 mm, 60-core), insulator outer diameter: Ø 1.25 mm
Material	Case: PBT, cover: PC
Comm. protocol	Modbus RTU



View product detail

Through-Beam Type

Fiber Optic Units

FT / GT Series


























Features




- Various head types and sensing methods for diverse environments
 - Thread, cylindrical, flat, L-shaped, plastic, perpendicular, stainless steel, U-shaped and area detection head types for various user requirements
 - Through-beam, retroreflective and convergent reflective methods are available for diverse working conditions



- * Sold Separately
- Included items for the vacuum-resistant fiber
 - Fiber optic coupler: FU-VC□
 - Atmospheric side fiber: FU-VA□
- Lens unit for increasing sensing distance: FTL-M□□
- Fiber cutter: FC-3
- Cable protection tube: FTH-□□
- Adapter

Line Up

	Standard	Heat-resistant	Vacuum-resistant	Bending-resistant	Flexible
Threaded head 	Std.				
Cylindrical head 	Std.				
Flat head 					
L-shaped head 	Std.				
Molded plastic head 	Std.				
Perpendicular head 					
SUS head 	Std.				
U-shaped head 					
Wide area head 					

* Icon Overview

-  **Std.** Standard:
Fiber optic units for general purpose
-  **Heat-resistant:**
Fiber optic units for the high-temperature environment (-60 to 350°C)
-  **Vacuum-resistant:**
Fiber optic units for the high-temperature (-60 to 250°C) and vacuum environment

-  **Flexible (R1, R2):**
Fiber optic units for withstanding repeated flexing
-  **Bending-resistant (R5):**
Fiber optic units for withstanding repeated bending



View product detail

Retroreflective Type

Fiber Optic Units

FD / GD Series
























Features

- Various head types and sensing methods for diverse environments
- Thread, cylindrical, flat, L-shaped, plastic, perpendicular, stainless steel, U-shaped and area detection head types for various user requirements
- Through-beam, retroreflective and convergent reflective methods are available for diverse working conditions

* Sold Separately

- Included items for the vacuum-resistant fiber
 - Fiber optic coupler: FU-VC□
 - Atmospheric side fiber: FU-VA□
- Lens unit for a micro spot: FDC-2
- Fiber cutter: FC-3
- Cable protection tube: FTH-□□
- Adapter

Line Up

	Standard	Heat-resistant	Vacuum-resistant	Bending-resistant	Flexible
Threaded head 	Std.				
Cylindrical head 	Std.				
Flat head 					
L-shaped head 					
Molded plastic head 	Std.				
Perpendicular head 					
SUS head 	Std.				
Wide area head 					

* Icon Overview



Standard:
Fiber optic units for general purpose



Heat-resistant:
Fiber optic units for the high-temperature environment (-60 to 350°C)



Vacuum-resistant:
Fiber optic units for the high-temperature (-60 to 250°C) and vacuum environment



Flexible (R1, R2):
Fiber optic units for withstanding repeated flexing



Bending-resistant (R5):
Fiber optic units for withstanding repeated bending



View product detail

Convergent Reflective Type Fiber Optic Units

FL / GL Series








Features



- Various head types and sensing methods for diverse environments
 - Thread, cylindrical, flat, L-shaped, plastic, perpendicular, stainless steel, U-shaped and area detection head types for various user requirements
 - Through-beam, retroreflective and convergent reflective methods are available for diverse working conditions



- * Sold Separately
- Included items for the vacuum-resistant fiber
 - Fiber optic coupler: FU-VC□
 - Atmospheric side fiber: FU-VA□
- Fiber cutter: FC-3
- Adapter

Line Up

	Standard	Heat-resistant	Vacuum-resistant	Flexible
Flat head (flat view) 	Std.			
Flat head (top view) 	Std.			

* Icon Overview

-  Standard:
Fiber optic units for general purpose
-  Heat-resistant:
Fiber optic units for the high-temperature environment (-60 to 350°C)

-  Vacuum-resistant:
Fiber optic units for the high-temperature (-60 to 250°C) and vacuum environment
-  Flexible (R1, R2):
Fiber optic units for withstanding repeated flexing



View product detail



A4. Displacement Sensors

Displacement sensors can measure thickness, width, level difference, disparity, curve, evenness of target objects by detecting the amount of displacement using laser beams.

A4-1	Displacement Sensors	BD Series	Laser Displacement Sensors (Sensor Head and Amplifier Unit)
		BD-C Series	Laser Displacement Sensor Communication Converter

Laser Displacement Sensor (Sensor Head)

BD Series



Features

- Reference distance :
 - Diffuse reflective type:
30 / 65 / 100 / 300 / 600 mm
 - Regular reflective type: 30 / 65 / 100 mm
- Easy maintenance with detachable sensor head / amplifier unit
- Maximum resolution: 1μm (vary by model)
- Accurate measurement with minimal influence from target color or material (diffuse reflective type)
- Stable measurement of reflective or transparent material (regular reflective type)
- Interconnection of up to 8 sensor amplifier units: Mutual interference prevention function and auto channelsorting

Specifications

[Sensor head]

Model	BD-030R	BD-065R	BD-100R
Beam shape	Standard		
Spot diameter (near)	≈ 100×100 μm	≈ 150×150 μm	≈ 200×200 μm
Spot diameter (reference)	≈ 100×100 μm	≈ 150×150 μm	≈ 220×220 μm
Spot diameter (far)	≈ 100×100 μm	≈ 150×150 μm	≈ 240×240 μm
Resolution ⁰¹⁾	1 μm	2 μm	4 μm
Reference distance	27.3 mm	62.9 mm	98.3 mm
Max. measurement range	24.9 to 29.7 mm	56.9 to 68.9 mm	86.3 to 110.3 mm
Rated measurement range ⁰²⁾	25.3 to 29.3 mm	57.9 to 67.9 mm	88.3 to 108.3 mm
Linearity ⁰³⁾	± 0.1% of F.S.		
Temperature characteristic ⁰⁴⁾	± 0.05% of F.S./°C		
Light source	Red semiconductor laser (wavelength: 660 nm, IEC 60825-1:2014)		
Optical method	Regular reflection		
Laser class	Class 1 (IEC/EN), Class I (FDA (CDRH) CFR Part 1002)		
Output	≤ 300 μW		
Laser Pulse duration	Max. 2 ms		
Material	Case: PC, Cable: PVC, Sensing part: Glass		
Certification	CE UK RoHS		
Unit weight (packaged)	≈ 55 g (≈ 205 g)	≈ 66 g (≈ 228 g)	≈ 66 g (≈ 228 g)

01) When measuring mirror in stop state at the reference distance with belows.
[Conditions] reference temperature 25°C, reference distance response time 1 ms, average 128 times
02) The rated measurement range guarantees linearity.
03) Measurement error for linear displacement of white matte paper in the rated measurement range.
04) Value measured by using an aluminum jig fix the sensor head and non-glossy white paper.



View product detail

- Various filter functions for stable measurement (movement average, differential, median)
- Auto sensitivity adjustment (1-point, 2-point teaching)
- Dedicated software provided (atDisplacement)
- Brackets for different installation angles (regular reflective type)
- DIN rail and wall mount support (bracket accessory required for wall mount)
- Protection structure: IP67

※ Sold Separately

- Laser displacement sensor communication converter: BD-C Series
- Extension cable: [General type] CID6P-□-SI-BD, [Robot type] CIDR6P-□-SI-BD
- Fixing bracket: BK-BD-□

Model	BD-030	BD-065	BD-100	BD-300	BD-600
Beam shape	Standard				
Spot diameter (near)	≈ 290×790 μm (25 mm)	≈ 360×1,590 μm (55 mm)	≈ 480×1,870 μm (80 mm)	≈ 990×1,000 μm (160 mm)	≈ 1,140×1,175 μm (250 mm)
Spot diameter (reference)	≈ 240×660 μm (30 mm)	≈ 290×1,180 μm (65 mm)	≈ 410×1,330 μm (100 mm)	≈ 490×510 μm (300 mm)	≈ 860×830 μm (600 mm)
Spot diameter (far)	≈ 190×450 μm (35 mm)	≈ 210×830 μm (75 mm)	≈ 330×950 μm (120 mm)	≈ 365×355 μm (450 mm)	≈ 800×775 μm (1,000 mm)
Resolution ⁰¹⁾	1 μm	2 μm	4 μm	20 μm	40 μm
Reference distance	30 mm	65 mm	100 mm	300 mm	600 mm
Max. measurement range	20 to 40 mm	50 to 80 mm	70 to 130 mm	160 to 450 mm	250 to 1,000 mm
Rated measurement ranges ⁰²⁾	25 to 35 mm	55 to 75 mm	80 to 120 mm	160 to 450 mm	250 to 1,000 mm
Linearity ⁰³⁾	± 0.1% of F.S.	± 0.1% of F.S.	± 0.15% of F.S.	± 0.25% of F.S.	± 0.25% of F.S. (250 to 600 mm) ± 0.5% of F.S. (600 to 1,000 mm)
Temperature characteristic ⁰⁴⁾	0.05% of F.S./°C	0.06% of F.S./°C		0.08% of F.S./°C	
Light source	Red semiconductor laser (wavelength: 660 nm, IEC 60825-1:2014)				
Optical method	Diffuse reflection				
Laser class	Class 1 (IEC/EN), Class I (FDA (CDRH) CFR Part 1002)	Class 2 (IEC/EN), Class II (FDA (CDRH) CFR Part 1002)			
Output	≤ 300 μW	≤ 1 mW			
Laser Pulse duration	2 ms Max.				
Material	Case: PC, Cable: PVC, Sensing part: Glass			Front case: AL, Rear case: PC, Cable: PVC, Sensing part: Glass	
Certification	CE UK ENEC EAC			CE UK ENEC	
Unit weight (packaged)	≈ 56 g (≈ 209 g)	≈ 68 g (≈ 233 g)	≈ 68 g (≈ 233 g)	≈ 151 g (≈ 330 g)	≈ 153 g (≈ 332 g)

01) When measuring white paper in stop state at the reference distance with belows.
[Conditions] reference temperature 25°C, reference distance response time (BD-030 / 065 / 100) 1 ms, (BD-300 / 600) 2 ms, average 128 times

02) The rated measurement range guarantees linearity.

03) Measurement error for linear displacement of white matte paper in the rated measurement range.

04) Value measured by using an aluminum jig fix the sensor head and non-glossy white paper.

Supported amplifier	Amplifier unit (BD-A1) ⁰¹⁾
Power supply	From the amplifier unit (BD-A1)
Operation indicator	Power indicator (red), Laser emission indicator (green), NEAR/FAR indicator (green)
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)
Noise immunity	Square shaped noise by noise simulator (pulse width: 1μs) ±500V
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 minute
Vibration	1.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient illumination	≤ 10,000 lx incandescent lamp
Ambient temperature	-10 to 50 °C, Storage: -15 to 60 °C (no freezing or condensation)
Ambient humidity	35 ~ 85%RH, Storage: 35 ~ 85%RH (no freezing or condensation)
Protection structure	IP67 (IEC Standards, except connector of extension cable)

01) Sensor head model BD-300/600 supports only over 5.0 firmware version of the amplifier unit (BD-A1) and communication converter (BD-C).

Laser Displacement Sensors (Amplifier Unit)

BD-A1



Specifications

[Amplifier unit]

Model	BD-A1
Power supply	10 - 30 VDC \pm 10% (when connecting BD-C Series communication converter, 12-30 VDC \pm)
Power consumption ⁰¹⁾	\leq 2,800 mW (30 VDC \pm)
Control Input	Hold trigger, Output reset, Laser OFF, Zero-point adjustment, BANK-A/B combinations : No-voltage input
Judgment output (HIGH/GO/LOW)	NPN or PNP open collector output (load current: \leq 100 mA)
Alarm output	NPN or PNP open collector output (load current: \leq 100 mA)
Analog output	Voltage: -5 - 5 V, 0 - 5 V, 1 - 5 V (resistance: 100 Ω , \pm 0.05% F.S., at 10 V) Current: 4 - 20 mA 4 - 20 mA (load resistance: \leq 350 Ω , \pm 0.2% F.S., at 16 mA)
Residual voltage	NPN: \leq 1.5 V, PNP: \leq 2.5 V
Protection circuit	Reverse polarity protection circuit, output over current (short-circuit) protection circuit
Response Time	0.33 / 0.5 / 1 / 2 / 5 ms
Min. display unit	[BD-030 / 065 / 100 / 030R / 065R / 100R] 1 μ m [BD-300 / 600] 10 μ m ⁰²⁾
Display type	11 segment (red, green), 6-digit, LED
Display range ⁰³⁾	[BD-030 / 065 / 100 / 030R / 065R / 100R] \pm 99.999 to \pm 99 mm (4-step parameter set) [BD-300 / 600] \pm 999.99 to \pm 999 mm (3-step parameter set)
Display period	\approx 100 ms
Insulation resistance	\geq 20 M Ω (500 VDC \pm megger)
Noise immunity	Square shaped noise by noise simulator (pulse width: 1 μ s) \pm 500 V
Dielectric strength	Between the charging part and the case: 1,000 VAC \sim 50/60 Hz for 1 minute
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (approx. 30 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 50 °C, Storage: -15 to 60 °C (no freezing or condensation)
Ambient humidity	\leq 85%RH, Storage: \leq 85%RH (no freezing or condensation)
Material	Case: PC, Cover: PC, cable: PVC
Supported sensor head	Sensor head (BD-□) ⁰⁴⁾
Supported communication converter	Communication converter (BD-C) ⁰⁵⁾
Protection structure	IP40 (IEC standard)
Approval	CE UK RoHS ENEC
Unit weight (packaged)	\approx 126 g (\approx 228 g)

01) Power to the load is not included.

02) Sensor head model BD-600 displays values per min. display unit (10 μ m) but actual value is increased/decreased per 20 μ m.

03) Setting range is assigned automatically when connecting sensor head.

04) Sensor head model BD-300 / 600 / 030R / 065R / 100R supports only over 5.0 firmware version of the amplifier unit (BD-A1).

05) The communication converter (BD-C) over 5.0 firmware version of supports only over 5.0 firmware version of the amplifier unit (BD-A1).



View product detail

Laser Displacement Sensor Communication Converter

BD-C Series



Features

- Supports both RS232C and RS485 communication in one device:
Separate ports for RS232C and RS485
- Connect up to 8 amplifier units
- Can be powered directly by amplifier units without additional wiring
- Support for dedicated device management software (atDisplacement)
 - : Batch parameter settings with save / load function
 - : Monitor measured values and outputs in real-time
- Set communication speed and addresses using DIP switch without connecting to host devices

* Sensor head model BD-300/600 supports only over 5.0 firmware version of the amplifier unit (BD-A1).

* Sold Separately

- Laser displacement sensor : BD Series

Specifications

Model	BD-CRS
Supported amplifier	Amplifier unit (BD-A1) ⁰¹⁾
Power supply	From the amplifier unit (BD-A1) (12 - 30 VDC=)
Power Consumption	≤ 2.3 W
Communication Protocol	Modbus RTU
Connection type	RS-232C, RS-485
Communication speed	9600, 19200, 38400, 115200 bps (default)
Function	Executes every BD-Series feature, sets parameter and real-time monitoring by external device (Master)
Ambient temperature	-10 to 50 °C, Storage: -15 to 60 °C (no freezing or condensation)
Ambient humidity	≤ 85%RH, Storage: ≤ 85%RH (no freezing or condensation)
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Protection structure	IP40 (IEC standard)
Material	Case: PC
Accessory	Side connector, Connector for RS485
Sold separately	Communication converter: SCM Series
Certification	CE, ENEC, UL, ENEC
Unit weight (packaged)	≈ 49 g (≈ 91 g)

01) Communication converter (BD-C) firmware 5.0 and later only supports amplifier unit (BD-A1) firmware 5.0 and later.

Software

Download the installation file and the manuals from the Autonics website.

[atDisplacement]

atDisplacement is a PC software for BD series laser displacement sensors. It is available for parameter setting, monitoring and data management. Visit our website (www.autonics.com) to download the user manual and the program.



View product detail



A5. LiDAR

Laser scanners utilize time-of-flight (ToF) method to measure the round trip time of the infrared laser beam, to accurately detect presence of objects within a wide range area.

A5-1	2D Laser Scanners	LSC Series	2D 270° Laser Scanners
		LSE2 Series	2D 90° 1-Channel Laser Scanners
		LSE3 Series	2D 90° 4-Channel Laser Scanners

2D 270° Laser Scanners

LSC Series



Features

- Wide detection range up to 270°, 25 m
- Supports flexible field configuration with a total of 16 field sets (1 set: 3 fields)
- Accurate and stable object detection by supporting various filter functions
- Small size (L 60 × W 60 × H 86 mm) suitable for various installation environments
- Supports Ethernet communication
- Supports atLiDAR dedicated software
- ROS, API supported

*** Sold Separately**

- M12 connector cable: C□D-□-VG, C□D12-□
- M12 connector communication cable: C18-□R-A, C48-□R-A

Specifications

Model	LSC-C5CT3-ET	LSC-C10CT3-ET	LSC-C25CT3-ET
Environment of use	Indoor		
Emitting property	Infrared laser		
Laser class	CLASS 1		
Wave length band	905 nm		
Max. pulse output power	6 W		
Light beam emitting angle	14.5 mrad		
Scanning frequency	15 Hz		
Response time	Typ. 67 ms		
Detection distance range	0.05 to 5 m	0.05 to 10 m	0.05 to 25 m
Max. detection distance of 10 % reflector	5 m	8 m	
Detection distance error	System error (accuracy): Typ. ± 60 mm Statistical error (repeat accuracy): σ < 20 mm		
Min. object size ⁰¹⁾	At detection distance of 8 m: ≈ 167.6 mm		
Angular resolution	0.33°		
Aperture angle	270°		
Object reflectivity	> 4 %		
Number of field sets	16 (1 set: Consists of subfields 1, 2, 3)		
Number of field sets that can be used concurrently	1		
Unit weight (package)	≈ 228 g (314 g)		
Certification	CE UK ENEC		

01) Even objects smaller than the set min. object size can be detected depending on the environment.

Power supply	9 - 28 VDC≒
Power consumption ⁰¹⁾	< 4 W
Input	4: Photocoupler inputs H: ≥ 9 - 28 VDC≒, L: ≤ 3 VDC≒
Output signal	4: 3-output + 1-Ready / Error, Sync output NPN-PNP open collector output (software setting)
Load voltage	9 - 28 VDC≒
Load current	≤ 100 mA
Residual voltage	≤ 3.0 VDC≒
Insulation resistance	≥ 5 MΩ (500 VDC≒ megger)
Dielectric strength	Between the charging part and the case: 500 VAC~ 50 / 60 Hz for 1 minute
Vibration	10 sweep cycles in each X, Y, Z axes at sine wave, 10 to 500 Hz, acceleration 5 G
Vibration (malfunction)	10 minutes in each X, Y, Z axes at sine wave, 10 to 500 Hz, acceleration 5 G
Vibration (irregular)	5 hours in each X, Y, Z axes at 5 to 250 Hz, 42.4 m/s ² RMS
Shock	3 times in each X, Y, Z axes at sine half wave, acceleration 50 G, duration 11 ms 1000 times in each X, Y, Z axes at sine half wave, acceleration 25 G, duration 6 ms 5000 times in each X, Y, Z axes at sine half wave, acceleration 50 G, duration 3 ms

01) Excluding power supplied to the load



View product detail

Shock (malfunction)	6 times in each X, Y, Z axes at sine half wave, acceleration 50 G, duration 11 ms
Ambient illuminance	≤ 80,000 lx
Ambient temperature	-10 to 50 °C, storage: -30 to 70 °C (no freezing or condensation)
Ambient humidity	0 to 95 %RH, storage: 0 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standard)
Connector specification	Power I / O: M12 12-pin, Ethernet: M12 8-pin
Material	Case: AL, Window: PC
Comm. protocol	TCP/IP

Software

Download the installation file and the manuals from the Autonics website. Supported devices are different for each software version.

[atLiDAR (V2.0 or later)]

atLiDAR is the management program for laser scanner parameter settings, status information and monitoring data, etc.

This program communicates with the laser scanner via Ethernet communication.

2D 90° 1-Channel Laser Scanners

LSE2 Series



Features

- 90° detection angle,
5.6 × 5.6 m detection range
- Compact size for flexible installation
(W 120 × H 47.5 × L 89.4 mm)
- Various filter function to prevent malfunction
due to fog, rain, snow and dusts
- Operation indicator to identify operation
status and errors:
check status even in unstable conditions or
change in installation location
- Ethernet communication supported
- Dedicated software atLiDAR provided:
PC, Mobile (Android)

* Sold Separately

- Main bracket: BK-LSE2
- Sub bracket: BK-LSE2-SUB

Specifications

Model	LSE2-A5R2-ET
Laser for detection emitting property	Infrared laser: 1
Laser class	CLASS 1
Wave length band	905 nm
Max. pulse output power	27 W
Laser for installation emitting property	Visible light laser: 2
Laser class	CLASS 3R
Wave length band	650 nm
Max. CW ⁰¹⁾ output power	4 mW
Min. object size ⁰²⁾	OFF, 5, 8, 10, 15, 20, 25, 30, 35, 40 cm
Scanning frequency	25 Hz
Response time	≤ 50 ms + monitoring time
Monitoring zone ⁰³⁾	≤ 5.6 × 5.6 m
Angular resolution	0.25°
Aperture angle	90°
Object reflectivity ⁰⁴⁾	≥ 2 %
Approval	CE UK ENEC
Korean Railway Standards	KRS SG 0068
Unit weight (package)	≈ 0.8 kg (≈ 1 kg)

01) Continuous wave

02) It is based on a white reflector.

Even objects smaller than the set min. object size can be detected depending on the environment.

03) At detection distance: 4 m, object reflectivity: 5 %, fog filter level: 0

04) At detection distance: 1.5 m, fog filter level: 0, object size = W 700 × H 300 × L 200 mm

Power supply	24 VDC± 15 %
Power consumption	< 10 W
Input	Photocoupler input: 1 H ⁰¹⁾ : ≥ 8 ~ 30 VDC±, L: ≤ 3 VDC±
Output	PhotoMOS relay output: 2 Resistive load: 30 VDC± / 24 VAC~, ≤ 80 mA
Vibration	2 G
Shock	30 G / 18 ms
Ambient illuminance	≤ 100,000 lx
Ambient temperature	-30 to 60 °C, storage: -30 ~ 70 °C (no freezing or condensation)
Ambient humidity	0 to 95 %RH, storage: 0 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standard)
Cable spec.	Power I / O cable: Ø 5 mm, 8-wire, 5 m Ethernet cable: Ø 5 mm, 4-wire, 3 m, shield cable, RJ45 connector
Wire spec.	AWG26 (0.16 mm, 7-core), insulator outer diameter: Ø 1 mm
Material	Case: AL, Window: PC
Comm. protocol	TCP/IP

01) Operates as output test mode and outputs obstacle detection output and error status output.



View product detail

Software

Download the installation file and the manuals from the Autonics website. Supported devices are different for each software version.

[atLiDAR (PC, V2.1 or later)]

atLiDAR is the management program for laser scanner parameter settings, status information and monitoring data, etc.

This program communicates with the laser scanner via Ethernet communication.

[atLiDAR (mobile)]

atLiDAR is Android only mobile application that can manage monitoring data such as laser scanner parameter settings and status information.

Connect the laser scanner with atLiDAR by connecting the USB-C to Ethernet gender.

2D 90° 4-Channel Laser Scanners

LSE3 Series



Features

- 90 ° detection angle, up to 10 × 10 m detection area
- Supports up to 4-channels
- Aluminum die-cast housing minimizes interference from 5G communication repeaters
- Various filter functions to prevent malfunction due to fog, rain, snow and dust
- Operation indicator to identify operation status and errors:
check status even in unstable conditions or change in installation location
- Ethernet communication supported
- Dedicated software atLiDAR provided: PC, Mobile (Android)

- * Sold Separately
- Main bracket: BK-LSE3
- Sub bracket: BK-LSE2-SUB

Specifications

Model	LSE3-4A5R2-ET	LSE3-4A10R2-ET
Laser for detection emitting property	Infrared laser: 1	
Laser class	CLASS 1	
Wave length band	905 nm	
Max. pulse output power	80 W	
Laser for installation emitting property	Visible light laser: 3	
Laser class	CLASS 3R	
Wave length band	650 nm	
Max. CW output power	4 mW	
Min. object size ⁰¹⁾	Detection distance of 3 m : 2.1 × 2.1 × 2.1 cm Detection distance of 5 m : 3.5 × 3.5 × 3.5 cm	Detection distance of 3 m : 2.1 × 2.1 × 2.1 cm Detection distance of 5 m : 3.5 × 3.5 × 3.5 cm Detection distance of 10 m : 7.0 × 7.0 × 7.0 cm
Scanning frequency	15 Hz	
Response time	≤ 20 to 80 ms + monitoring time	
Scanning mode	Motion and presence	
Monitoring zone ⁰²⁾	0.3 × 0.3 to 5.6 × 5.6 m	0.3 × 0.3 to 10 × 10 m
Front contamination ⁰³⁾	Normal operation with max. 30 % contamination of one material	
Angular resolution	0.4 °	
Aperture angle	90 °	
Object reflectivity ⁰⁴⁾	≥ 2 %	
Certification	CE UKA	
Korean Railway Standards	KRS SG 0068	
Unit weight (package)	≈ 0.9 kg (≈ 1.1 kg)	

01) At object reflectivity: 90 % (Kodak Gray card R-27, White), min. object size: OFF
02) At object reflectivity: 10 %, fog filter level: 0, based on the concentrated monitoring zone 0.3 m setting
03) At object reflectivity: 90 %, fog filter level: 0
04) At detection distance: 2.5 m, fog filter level: 0, object size = W 700 × H 300 × L 200 mm



View product detail

Power supply	10 to 35 VDC \equiv
Power consumption	≤ 10 W
Input	Photocoupler input: 1 H ⁽⁰¹⁾ : $\geq 8 - 30$ VDC \equiv , L: ≤ 3 VDC \equiv
Output	PhotoMOS relay output: 2 Resistive load: 35 VDC \equiv / 24 VAC \sim , ≤ 80 mA
Vibration	2 G (RMS 18.7 m/s ²)
Shock	30 G / 18 ms
Ambient illuminance	$\leq 100,000$ lx
Ambient temperature	-30 to 60 °C, storage: -30 to 70 °C (no freezing or condensation)
Ambient humidity	0 to 95 %RH, storage: 0 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standard)
Cable spec.	Power I / O cable: \varnothing 5 mm, 8-wire, 5 m Ethernet cable: \varnothing 5 mm, 4-wire, 3 m, shield cable, RJ45 connector
Wire spec.	AWG26 (0.16 mm, 7-core), insulator outer diameter: \varnothing 1 mm
Material	Case: AL, Window: PC
Comm. protocol	TCP/IP

01) Operates as output test mode and outputs obstacle detection output and error status output.

Software

Download the installation file and the manuals from the Autonics website. Supported devices are different for each software version.

[atLiDAR (PC, V2.1 or later)]

atLiDAR is the management program for laser scanner parameter settings, status information and monitoring data, etc.

This program communicates with the laser scanner via Ethernet communication.

[atLiDAR (mobile)]

atLiDAR is Android only mobile application that can manage monitoring data such as laser scanner parameter settings and status information.

Connect the laser scanner with atLiDAR by connecting the USB-C to Ethernet gender.



A6. Ultrasonic Sensors

Ultrasonic sensors can detect and measure distance of objects by emitting and receiving high frequency sound waves and measuring the time lapse in between.

A6-1 Cylindrical

UTR Series

Cylindrical Ultrasonic Sensors

Cylindrical Ultrasonic Sensors

UTR Series



Features

- Detect and measure various material and surface types with ultrasonic sensing
- Sensing distance (by mount diameter)
 - M18 Model: 30 to 350 mm / 65 to 600 mm / 120 to 1,300 mm
 - M30 Model: 600 to 8,000 mm
- Temperature compensation (auto / manual) and detection width conversion function for high accuracy
- 316L stainless steel body for high corrosion resistance
- 360° ring type indicator to check operation status from any direction
- Digital output (Push-Pull) support
- IO-Link models, Simultaneous digital and analog output models available
- Configure settings and monitor status with ultrasonic sensor programming units (UT-P)
- Protection structure: IP66, IP67, IP68, IP69K (may vary by model)

* Sold Separately

- Ultrasonic sensor programming unit: UT-P Series
- M12 connector cable: CID5-□, C1D5-□

Specifications

Model	UTRCM18-350□-□	UTRCM18-600□-□	UTRCM18-1300□-□	UTRCM30-8M□□-□-□
Sensing distance	30 to 350 mm	65 to 600 mm	120 to 1300 mm	600 to 8000 mm
Blind zone ⁰¹⁾	0 to 27 mm	0 to 59 mm	0 to 115 mm	0 to 590 mm
Foreground suppression ⁰¹⁾	30 to 90 mm	65 to 195 mm	120 to 360 mm	600 to 1800 mm
Max. setting zone	350 mm	600 mm	1300 mm	8000 mm
Transducer frequency	305 kHz	305 kHz	200 kHz	80 kHz
Switching frequency	≥ 25 Hz	≥ 12.5 Hz	≥ 10 Hz	≥ 3 Hz
Response time	≤ 32 ms	≤ 64 ms	≤ 100 ms	≤ 300 ms
Hysteresis ⁰²⁾	3 mm	5 mm	20 mm	100 mm
Standard sensing target: Aluminum	200 × 200 mm	200 × 200 mm	200 × 200 mm	500 × 500 mm
Resolution	≥ 0.069 mm	≥ 0.069 mm	≥ 0.175 mm	≥ 0.180 mm
Accuracy ⁰³⁾	± 1 % F.S.			
Repeat accuracy	± 0.15 % F.S.			
Weight (packaged)	≈ 30 g (≈ 85 g)	≈ 30 g (≈ 85 g)	≈ 32 g (≈ 90 g)	≈ 210 g (≈ 330 g)

01) If a sensing target is detected in over blind zone and below foreground suppression range, the distance value is displayed as foreground suppression value.




02) Set parameter or dedicated software (atDistance)

03) Ambient temperature 25 °C, temperatures characteristic ± 0.1 % F.S. / °C

Model	UTRCM18-350-□	UTRCM18-350D-□	UTRCM18-600-□	UTRCM18-600D-□	UTRCM18-1300-□	UTRCM18-1300D-□	UTRCM30-8M-□-□	UTRCM30-8MDB-□-□
Power supply	12 - 30 VDC≡ (ripple P-P: ≤ 10 %)							
Current consumption	≤ 40 mA (no load)				≤ 45 mA (no load)		≤ 80 mA (no load)	
Digital output	Push-pull							
Load voltage	≤ 30 V							
Load current	≤ 100 mA							
Residual voltage	≤ 3 V							
Analog output	[current output] DC 4 - 20 mA / [voltage output] DC 0 - 10 V							
Current output	-	●	-	●	-	●	-	●
Voltage output	-	-	-	-	-	-	-	●
Load resistance	[voltage output] 12 - 30 VDC≡: ≥ 100 kΩ [current output] 12 - 20 VDC≡: ≤ 100 Ω / 20 - 30 VDC≡: ≤ 500 Ω							



View product detail

Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	$\geq 50 \text{ M}\Omega$ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC \sim 50 / 60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (\approx 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -40 to 85 °C (no freezing or condensation)
Protection structure	UTRCM18-350, UTRCM18-600 : IP66, IP67 (IEC standard), IP69K (DIN standard), IP68 UTRCM18-1300: IP66, IP67 (IEC standard), IP69K (DIN standard) UTRCM30-8M: IP66, IP67 (IEC standard)
Connection	Connector models
Connector spec.	M12 5-pin plug connector
Material	Case: mount - SUS316L, body - PC transducer: polyurethane foam, epoxy resin with glass
Certification	CE    IO-Link ⁰¹⁾
Comm. protocol	IO-Link

01) It is applied to UTRCM□-□□□-□-□-IL2 model.

Software

Download the installation file and the manuals from the Autonics website.

[atDistance]

It is the monitoring data management program for installation of the ultrasonic sensor, parameter setting, and status information.

[atIOLink]

atIOLink with purposes for setting, diagnosis, and maintenance of IO-Link device via IODD file is provided as the Port and Device Configuration Tool (PDCT).



A7. Door Sensors

Door sensors are special-purpose photoelectric sensors generally used in automatic door management systems.

A7-1	Door Sensors	ADS-A Series	Automatic Door Sensors
A7-2	Door Side Sensors	ADS-SE1/2 Series	Automatic Door Side Sensors

Automatic Door Sensors

ADS-A Series



Features

- Adjustable hold time switch (2, 7, 15 sec)
- 4-step detection angle adjustment (7.5°, 14.5°, 21.5°, 28.5°)
- Adjustable sensing area (left / right area elimination)
- Power supply:
24 - 240 VAC~ / 24 - 240 VDC= (universal AC / DC type),
12 - 24 VAC~ / 12 - 24 VDC= (universal AC / DC type)
- Built-in microprocessor
- Max. sensing area: 2460 × 86 mm (installation height 2.7 m)

Specifications

Model	ADS-A□
Mounting height	2.0 to 2.7 m ⁰¹⁾
Sensing area	9-point
Sensing method	Infrared reflection method
Output holding time	Time delay = 0.5 sec
Stationary sensing time	2 sec, 7 sec, 15 sec (holding time setting switch)
Interference prevention	H, L (interference prevention switch)
Adjust angle	7.5 °, 14.5 °, 21.5 °, 28.5 ° (angle adjustment lever)
Eliminate right / left sensing area	(1, 2, 3 area), (7, 8, 9 area) (eliminating right / left sensing area lever)
Light source	Infrared chip diode (modulated)
Indicator	Operation indicator (orange, green, red)
Approval	UL
Weight	≈ 320 g
⁰¹⁾ In case of installing the unit higher than 2.7 m height, the unit may not detect small children. In case of installing the unit lower than 2.0 m height the unit may not work normally.	
Power supply	ADS-AF: 24 - 240 VAC~, 50 / 60 Hz, 24 - 240 VDC= (ripple P-P: ≤ 10 %) ADS-AE: 12 - 24 VAC~, 50 / 60 Hz, 12 - 24 VDC= (ripple P-P: ≤ 10 %)
Power consumption	ADS-AF: ≤ 4 VA (≤ 240 VAC~ at 50 / 60 Hz) ADS-AE: ≤ 2 VA (≤ 24 VAC~ at 50 / 60 Hz)
Control output	Relay contact output
Relay contact capacity ⁰¹⁾	50 VDC= 0.1 A (resistive load)
Relay contact composition	1a
Relay life cycle	Mechanical: ≥ 20,000,000 times, electrical: ≥ 50,000 times
Insulation resistance	≥ 20 MΩ (500 VDC= megger)
Noise immunity	± 2,000 VDC= the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient illumination (receiver)	Sunlight: ≤ 3,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-20 to 50 °C, storage: -20 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection	IP50 (IEC standard)
Connection	Cable connector type
Material	Case: ABS, lens: acryl, lens cover: acryl

⁰¹⁾ Do not use the load which is beyond the rated capacity of contact point of relay.
It may cause bad insulation, contact fusion, bad contact, relay breakdown, and fire etc.



View product detail

Automatic Door Side Sensors

ADS-SE1/2 Series



Features

- Long sensing distance: 0 to 10 m
- High ambient intensity of illumination:
max. 100,000 lx of sunlight
- Easy to connect the sensor head
to the controller
- Easy sensitivity setting (automatic
sensitivity setting by one push method)
- Self-diagnosis function
- Compact Size (W 77 × L 44 × H 24 mm)

Specifications

Model	ADS-SE1	ADS-SE2
Available sensor sets	1 channel	2 channels
Sensing distance	0 to 10 m	
Sensing target	Opaque materials	
Min. sensing target	≥ Ø 20 mm	
Sensing method	Through-beam type	
Response time	≈ 50 ms (from interrupted light)	
Output holding time	≈ 500 ms (from received light)	
Light source	Infrared LED (850 nm modulated)	
Indicator	OUT 1 indicator (red), OUT 2 indicator (green)	
Approval	CE ENEC	
Weight (packaged)	≈ 300 g (≈ 450 g)	
Power supply	12 - 24 VAC ~ ± 10 %, 50 / 60 Hz / 12 - 24 VDC = ± 10 % (ripple P-P: ≤ 10 %)	
Power consumption	AC: ≤ 2 VA / DC: ≤ 50 mA	
Control output	Relay contact output	
Relay contact capacity ⁰¹⁾	50 VDC = 0.3 A (resistive load)	
Relay contact composition	1c	
Relay life cycle	Mechanical: ≥ 5,000,000 times, electrical: ≥ 100,000 times	
Insulation resistance	≥ 20 MΩ (500 VDC = megger)	
Vibration	1 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times	
Ambient illumination (receiver)	Sunlight: ≤ 100,000 lx	
Ambient temperature	-20 to 55 °C, storage: -25 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection structure	IP30 (IEC standard)	
Connection	Cable connector type	
Sensor cable	Ø 2.4 mm, 1-wire, 5 m	
Wire spec.	AWG26 (0.16 mm, 7-core), insulator outer diameter: Ø 1.32 mm	
Material of the controller	Housing: ABS, cover: ABS, bolt: SCM (brass, Ni-plate)	
Material of the sensor	Holder: ABS, lens: PMMA, lens guide: PC, nut: PC	

⁰¹⁾ Do not use the load which is beyond the rated capacity of contact point of relay.
It may cause bad insulation, contact fusion, bad contact, relay breakdown, and fire etc.



View product detail



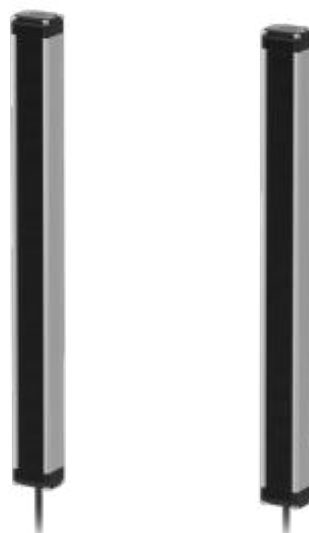
A8. Area Sensors

Area sensors are convenient, general purpose light screens used to detect passing of objects in specified areas.

A8-1	Area Sensors	BWC Series	Cross-Beam Area Sensors
		BW Series	Single-Beam Area Sensors
		BWP Series	Slim Plastic Single-Beam Area Sensors
		BWPK Series	Slim Plastic Single-Beam Picking Sensors
A8-2	Mapping Sensors	BWM Series	Double-Scan Mapping Sensors (CC-Link, EtherCAT)
		BWML Series	Line-Beam Mapping Sensors (CC-Link, EtherCAT)

Cross-Beam Area Sensors

BWC Series



Features

- 3-point cross-beam type detection minimizes non-detection area
- Long sensing distance up to 7 m
- 14 configurations (number of optics: 4 to 20 / optical pitch: 40, 80 mm / detection area: 120 to 1,040 mm)
- Easy installation with installation mode function
- Mutual interference prevention function, self-diagnosis function
- Self-diagnosis output: sensing screen pollution and blocking of optical axis can be checked from external device
- Bright LED indicators on emitter and receiver
- Korean Railway Standard compliant (BWC80-14HD models)
- Protection structure: IP67

* Sold Separately

- M12 Connector cable: CID4-□T(R) (1 set - emitter and receiver)

Specifications

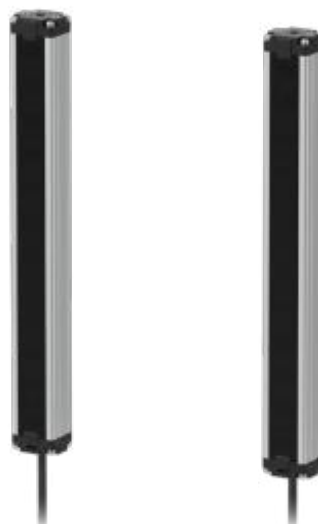
Model	BWC40-□□H	BWC40-□□HD	BWC80-14H	BWC80-14HD
Sensing method	Through-beam			
Beam pattern	3-point cross beam netting type			
Light source	Infrared LED (850 nm modulated light)			
Sensing distance	1.0 to 7.0 m			
Sensing target	Opaque material			
Min. sensing target	≥ Ø 50 mm		≥ Ø 90 mm	
Number of optical axes	4 / 10 / 12 / 16 / 18 / 20		14	
Sensing height	120 to 760 mm		1,040 mm	
Optical axis pitch	40 mm		80 mm	
Response time	≤ 50 ms			
Operation mode	Light ON	Dark ON	Light ON	Dark ON
Functions	Self-diagnosis output (front screen pollution, covering optical axis), self-diagnosis			
Installation mode	YES			
Interference protection	Interference protection by frequency changing setting			
Synchronization type	Timing method by synchronous line			
Indicator	Emitter: Operation indicator (green, red), frequency indicator (green) Receiver: Operation indicator (red, yellow, green)			
Approval	CE UK ENEC	CE UK ENEC	CE UK ENEC	CE UK ENEC
Korean Railway Standards	-			KRS SG 0068
Weight (packaged)	≈ 1.7 kg (≈ 2.1 kg) (based on BWC80-14H)			
Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %)			
Current consumption	Emitter: ≤ 100 mA, receiver: ≤ 100 mA			
Control output	NPN open collector output			
Load voltage	≤ 30 VDC≡			
Load current	≤ 100 mA (self-diagnosis output: ≤ 50 mA)			
Residual voltage	≤ 1 VDC≡			
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit			
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)			
Noise immunity	± 240 V the square wave noise (pulse width: 1μs) by the noise simulator			
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1minute			
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Shock	500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times			
Ambient illuminance	Ambient light: ≤ 100,000 lx			
Ambient temperature	-10 to 55 °C, storage: -20 to 60 °C (no freezing or condensation)			
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)			
Protection rating	IP67 (IEC standard)			
Wire spec.	Ø 5 mm, 4-wire, 300 mm			
Connector spec.	M12 plug connector			
Material	Case: AL, sensing part and indicator: acryl			



View product detail

Single-Beam Area Sensors

BW Series



Features

- 20 mm optical pitch minimizes non-detection area (BW20-□)
- Long sensing distance up to 7 m
- 22 configurations (number of optics: 4 to 48 / optical pitch: 20, 40 mm / detection area: 120 to 940 mm)
- Mutual interference prevention function, self-diagnosis function, stable operation test
- Bright LED indicators on emitter and receiver
- Ambient illuminance: 100,000 lux (upgraded feature)
- Protection structure: IP65

* Sold Separately

- M12 Connector cable: CID4-□T(R) (1 set - emitter and receiver)

Specifications

Model	BW20-□(P)	BW40-□(P)
Sensing method	Through-beam	
Light source	Infrared LED (850 nm modulated light)	
Sensing distance	0.1 to 7.0 m	
Sensing target	Opaque material	
Min. sensing target	≥ Ø 30 mm	≥ Ø 50 mm
Number of optical axes	8 to 48	4 to 24
Sensing height	140 to 940 mm	120 to 920 mm
Optical axis pitch	20 mm	40 mm
Response time	≤ 10 ms	
Operation mode	Light ON	
Functions	Emitter OFF (external diagnosis), self-diagnosis	
Interference protection	Interference protection by MASTER / SLAVE function ⁰¹⁾	
Synchronization type	Timing method by synchronous line	
Indicator	Emitter: Operation indicator (green, red), receiver: Operation indicator (red, yellow, green)	
Approval	CE UK ENEC	CE UK ENEC
Weight (packaged)	≈ 1.4 kg (≈ 2.1 kg) (based on BW20-48)	≈ 1.4 kg (≈ 2.1 kg) (based on BW40-24)

⁰¹⁾ Connect 'TEST/M/S' of SLAVE emitter to 'SYNC' of MASTER. Refer to the product manual.

Power supply	12 - 24 VDC= (ripple P-P: ≤ 10 %)
Current consumption	Emitter / receiver: ≤ 120 mA
Control output	NPN or PNP open collector output
Load voltage	≤ 30 VDC=
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC=, PNP: ≤ 2.5 VDC=
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC= megger)
Noise immunity	± 240 V the square wave noise (pulse width 1μs) by the noise simulator
Dielectric strength	Between the charging part and the case :1,000 VAC~ 50 / 60 Hz for 1minute
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illumination (receiver)	Ambient light: ≤ 100,000 lx
Ambient temperature	-10 to 55 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP65 (IEC standard)
Cable spec.	Ø 5 mm, 4-wire, 300 mm
Connector spec.	M12 plug connector
Material	Case: AL, front cover and sensing part: acryl



View product detail

Slim Plastic Single-Beam Area Sensors

BWP Series



Features

- Flat body (13 mm) area sensors with Fresnel lens
- High strength PC / ABS plastic body
- High-speed response time under 7ms
- 4 configurations (optical axis: 8 to 20, detection area: 140 to 380 mm)
- Operation test (emitter stop) function, mutual interference prevention function, Job indicator ON/FLASHING switch, Light ON / Dark ON operation mode switch
- Bright LED indicators on emitter and receiver
- Protection structure: IP40

* Sold Separately

- Flat bracket (BK-BWP-ST)
- Protection bracket (BK-BWP-P□)
- L-shaped bracket (BK-BWP-L)

Specifications

Model	BWP20-08(P)	BWP20-12(P)	BWP20-16(P)	BWP20-20(P)
Sensing method	Through-beam			
Light source	Infrared LED (850 nm modulated light)			
Sensing distance	0.1 to 5.0 m			
Sensing target	Opaque material			
Min. sensing target	≥ Ø 30 mm			
Number of optical axes	8	12	16	20
Sensing height	140 mm	220 mm	300 mm	380 mm
Optical axis pitch	20 mm			
Response time	≤ 6 ms (frequency B: ≤ 7 ms)			
Operation mode	Light ON / Dark ON (switch)			
Functions	Emitter OFF, operation mode change, Job indicator ON / flashing			
Interference protection	Interference protection by transmission frequency selection			
Synchronization type	Timing method by synchronous line			
Indicator	Emitter: frequency A indicator (green), frequency B indicator (yellow) Receiver: operation indicator (red), stable indicator (green) Emitter / receiver: Job indicator (red)			
Approval	CE UK ENEC		CE UK ENEC	
Weight (packaged)	≈ 280 g (≈ 480 g)	≈ 320 g (≈ 520 g)	≈ 360 g (≈ 620 g)	≈ 430 g (≈ 680 g)
Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %)			
Current consumption	Emitter / receiver: ≤ 80 mA			
Control output	NPN / PNP open collector output model			
Load voltage	≤ 30 VDC≡			
Load current	≤ 150 mA			
Residual voltage	NPN: ≤ 1 VDC≡, PNP: ≤ 2.5 VDC≡			
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit			
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)			
Noise immunity	± 240 V the square wave noise (pulse width: 1μs) by the noise simulator			
Dielectric strength	Between the charging part and the case :1,000 VAC~ 50 / 60 Hz for 1minute			
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Shock	500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times			
Ambient illumination (receiver)	Ambient light: ≤ 100,000 lx			
Ambient temperature	-10 to 55 °C, storage: -20 to 60 °C (no freezing or condensation)			
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)			
Protection rating	IP40 (IEC standard)			
Cable spec.	Ø 3.5 mm, 4-wire, 3 m			
Wire spec.	AWG 24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm			
Material	Case: PC / ABS, sensing part: PMMA			



View product detail

Slim Plastic Single-Beam Picking Sensors

BWPK Series



Features

- Flat and compact size:
W 30 × H 140 × D 9.9 mm
- High strength PC / ABS plastic body
- Sensing distance switch
(long / short mode switch)
- Mutual interference prevention function
(frequency switching), Picking indicators
on emitter and receiver, Light ON / Dark ON
operation mode switch
- Protection structure: IP40

* Sold Separately

- Flat bracket (BK-BWPK-ST)
- L-shaped bracket (BK-BWPK-L)
- Protection bracket (BK-BWPK-P)



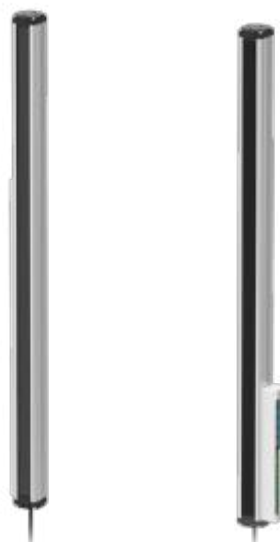
View product detail

Specifications

Model	BWPK25-05(P)
Sensing method	Through-beam
Light source	Infrared LED (850 nm modulated light)
Sensing distance	Long / Short mode (switch)
Long mode	0.1 to 3.0 m
Short mode	0.05 to 1.0 m
Sensing target	Opaque material
Min. sensing target	≥ Ø 35 mm
Number of optical axes	5
Sensing height	100 mm
Optical axis pitch	25 mm
Response time	≤ 30 ms
Operation mode	Light ON / Dark ON (switch)
Functions	Selection for sensing distance, selection for operation mode, Picking indicator ON / flashing
Interference protection	Interference protection by transmission frequency selection
Synchronization type	Timing method by synchronous line
External picking input	Non-contact or contact input NPN open collector output: lighting (0 - 2 V), light out (5 - 30 V or open) PNP open collector output: lighting (4 - 30 V), light out (0 - 3 V or open)
Indicator	Emitter / receiver: operation indicator (red, green, yellow)
Approval	CE ENEC
Weight (packaged)	≈ 180 g (≈ 220 g)
Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %)
Current consumption	Emitter / receiver: ≤ 60 mA
Control output	NPN / PNP open collector output model
Load voltage	≤ 30 VDC≡
Load current	≤ 150 mA
Residual voltage	NPN: ≤ 1 VDC≡, PNP: ≤ 2.5 VDC≡
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)
Noise immunity	± 240 V the square wave noise (pulse width: 1μs) by the noise simulator
Dielectric strength	Between the charging part and the case :1,000 VAC~ 50 / 60 Hz for 1minute
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illum. (receiver)	Sunlight: 10,000 lx, incandescent lamp: 3,000 lx
Ambient temp.	-10 to 55 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP40 (IEC standard)
Cable spec.	Ø 4 mm, 4-wire, 2 m (emitter: 3-wire)
Wire spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Material	Case: PC / ABS, sensing part: PMMA

Double-Scan Mapping Sensors (CC-Link, EtherCAT)

BWM Series



Features

- Stable glass substrate detection with using double scan method
- Sensing distance: glass G size +30 %
- Customized models available:
sensing channels (4 to 62 channels),
optical axis pitch (25 to 200 mm)
- Communication output:
CC-Link (ver 1.1, 2.0), EtherCAT
- Easy installation with
installation instruction mode
- Mutual interference prevention, bent optical
axis alarm, 9-stage sensing level setting,
emitter error alarm
- Bright status indicators on slave units

* Sold Separately

- M17 connector cable: C5D617-□P

Specifications

Model	BWM
Sensing method	Through-beam
Beam pattern	Double scan type
Light source	Infrared LED (850 nm modulated light)
Sensing distance	Glass + 30 %
Sensing target	Transparent or opaque glass plate
CH ordering orientation ⁰¹⁾	Forward (bottom = 1 CH) / Backward (top = 1 CH)
Sensing CH ⁰¹⁾	4 to 62 CH
Optical axis pitch ⁰¹⁾	25 to 200 mm
Response time	≤ 120 ms
Operation mode ⁰¹⁾	Light ON / Dark ON
Function	Installation guide mode, sensing level setting, optical axis misalignment alarm (low light intensity alarm), emitter damage alarm, self-diagnosis
Interference protection	Interference protection by transmission frequency selection
Synchronization type	Timing method by synchronous line
Indicator	Output indicator (red), stability indicator (green), status indicator (green, yellow, red)
Approval	CE UK ⁰²⁾ CC-Link EtherCAT
Weight (packaged)	CC-Link: ≈ 3.2 kg (≈ 5.3 kg) (based on BWM82-24CLD-T) EtherCAT: ≈ 3.42 kg (≈ 5.52 kg) (based on BWM28-50ECD-T)

01) This product is order made.

02) Please refer to the website for KC certification model.

Power supply	24 VDC≡ (ripple P-P: ≤ 10 %)
Current consumption	Master: ≤ 200 mA, slave: ≤ 150 mA
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≡ megger)
Noise immunity	The square wave noise by the noise simulator (voltage: 500 V, period: 10 ms, pulse width: 1 us)
Dielectric strength	Between the charging part and the case : 500 VAC~ 50 / 60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	210 m/s ² (≈ 21 G) in each X, Y, Z direction for 3 times
Ambient illumination	Light bulb: 5,000 lx, semiconductor: 5,000 lx
Ambient temperature	15 to 35 °C, storage: 15 to 35 °C (no freezing or condensation)
Ambient humidity	35 to 85 %, storage: 35 to 85 % (no freezing or condensation)
Cable spec.	Ø 5 mm, 6-wire, 250 mm
Connector spec.	M17 plug connector
Output connector spec.	Connector type: 4-pin, 6-pin connector (5.08 mm pitch) / terminal type: 10-pin terminal
Material	Case: AL / ABS, sensing part and Indicator part: PMMA
Comm. protocol	CC-Link, EtherCAT



View product detail

Line-Beam Mapping Sensors (CC-Link, EtherCAT)

BWML Series



Features

- Stable glass substrate detection using line beam detection with minimal non-detection area
- Sensing distance: 95 ± 10 mm
- Customized models available:
sensing channels (4 to 62 CH),
sensing target pitch (≥ 20 mm),
sensing area (280 to 1,775 mm)
- Communication output:
CC-Link (ver 1.1, 2.0), EtherCAT
- Easy installation with installation instruction mode and background sensing mode
- Channel interference alarm, 5-stage sensing level setting, emitter / receiver error alarm
- Bright status indicators

Specifications

Model	BWML
Sensing method	Diffuse reflective type
Beam pattern	Line-beam type
Light source	Infrared LED (850 nm modulated light)
Sensing distance	$95 \text{ mm} \pm 10 \text{ mm}$
Sensing target	Transparent or opaque glass plate
CH ordering orientation ⁰¹⁾	Forward (bottom = 1 CH) / Backward (top = 1 CH) (parameter setting)
Sensing CH ⁰¹⁾	4 to 62 CH
Sensing target pitch ⁰¹⁾	20 mm to ordered specification
Response time	$\leq 120 \text{ ms}$
Operation mode ⁰¹⁾	Light ON / Dark ON (parameter setting)
Function	Background sensing mode, installation guide mode, sensing level setting, output option, self-diagnosis
Indicator	Output indicator (red), stability indicator (green), status indicator (green, yellow, red)
Approval	CE ENEC ⁰²⁾ CC-Link EtherCAT
Weight (packaged)	$\approx 3.64 \text{ kg}$ ($\approx 4.8 \text{ kg}$) (based on BWML82-20CLL)

01) This product is order made.

02) Please refer to the website for KC certification model.

Power supply	24 VDC \equiv (ripple P-P: $\leq 10 \%$)
Current consumption	$\leq 1.0 \text{ A}$
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	$\geq 20 \text{ M}\Omega$ (500 VDC \equiv megger)
Noise immunity	The square wave noise by the noise simulator (voltage: 500 V, period: 10 ms, pulse width: 1 μ s)
Dielectric strength	Between the charging part and the case : 500 VAC \sim 50 / 60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	210 m/s ² ($\approx 21 \text{ G}$) in each X, Y, Z direction for 3 times
Ambient temperature	15 to 35 °C, storage: -10 to 50 °C (no freezing or condensation)
Ambient humidity	35 to 55 %, storage: 35 to 85 % (no freezing or condensation)
Protection rating	IP40 (IEC standard)
Material	Case: AL, sensing part and Indicator part: PMMA
Comm. protocol	CC-Link, EtherCAT



View product detail



A9. Proximity Sensors

Proximity sensors are common, reliable, and durable solutions for applications requiring non-contact detection.

A9-1	Inductive	PRD Series	Cylindrical Inductive Long-Distance Proximity Sensors (DC 3-Wire)
			Cylindrical Inductive Long-Distance Proximity Sensors (DC 2-Wire)
			Cylindrical Inductive Long-Distance Proximity Sensors (IO-Link)
		PR Series	Cylindrical Inductive Proximity Sensors (DC 3-Wire)
			Cylindrical Inductive Proximity Sensors (DC 2-Wire)
			Cylindrical Inductive Proximity Sensors (AC 2-Wire)
		PRFD Series	Cylindrical Inductive Full-Metal Long-Distance Proximity Sensors (DC 3-Wire)
			Cylindrical Inductive Full-Metal Long-Distance Proximity Sensors (DC 2-Wire)
			Cylindrical Inductive Full-Metal Long-Distance Proximity Sensors (IO-Link)
		PRF Series	Cylindrical Inductive Full-Metal Proximity Sensors (DC 2-Wire)
		PET Series	Cylindrical Inductive Transmission Couplers
		PS Series	Rectangular Inductive Proximity Sensors (DC 3-Wire, □ 8 / 12 / 50 mm)
			Rectangular Inductive Proximity Sensors (DC 3-Wire, □ 17 / 25 / 30 / 40 mm)
			Rectangular Inductive Proximity Sensors (DC 2-Wire)
			Rectangular Inductive Proximity Sensors (AC 2-Wire)
		AS Series	Rectangular Inductive Long-Distance Proximity Sensors (DC 4-Wire)
		PFI Series	Rectangular Flat-Type Inductive Proximity Sensors (DC 3-Wire)
			Rectangular Flat-Type Inductive Proximity Sensors (AC 2-Wire)
A9-2	Capacitive	CR Series	Cylindrical Capacitive Proximity Sensors (DC 3-Wire)
			Cylindrical Capacitive Proximity Sensors (AC 2-Wire)
A9-3	Magnetic	MU Series	U-Shaped Magnetic Proximity Sensors

Cylindrical Inductive Long-Distance Proximity Sensors (DC 3-Wire)

PRD Series



Features

- Operation indicator (red LED)
- Strain relief cables: improved flexural strength of cable connecting component (except M8 models)
- PTFE coating prevents malfunctions caused by welding spatter (spatter-resistant model)
- Protection structure: IP67

* Sold Separately

- M12 Connector cable: C□D(H)3-□
- Fixing bracket: P90-R□
- Spatter protection cover: P90-M□

Specifications

Installation	Flush type			
General	PRD□08-2D□	PRD□12-4D□	PRD□18-7D□	PRD□30-15D□
Spatter-resistant	-	PRD□12-4D□	PRD□18-7D□	PRD□30-15D□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	2 mm	4 mm	7 mm	15 mm
Setting distance	0 to 1.4 mm	0 to 2.8 mm	0 to 4.9 mm	0 to 10.5 mm
Hysteresis	≤ 15 % of sensing distance	≤ 10 % of sensing distance		
Standard sensing target: iron	8 × 8 × 1 mm	12 × 12 × 1 mm	20 × 20 × 1 mm	45 × 45 × 1 mm
Response frequency ⁰¹⁾	1 kHz	500 Hz	300 Hz	100 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C (DIA. of sensing side Ø 8 mm: ≤ ± 15 %)			
Indicator	Operation indicator (red)			
Certification	CE UK ENEC	CE UK ENEC	CE UK ENEC	CE UK ENEC

Installation	Non-flush type			
General	PRD□08-4D□	PRD□12-8D□	PRD□18-14D□	PRD□30-25D□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Setting distance	0 to 2.8 mm	0 to 5.6 mm	0 to 9.8 mm	0 to 17.5 mm
Sensing distance	4 mm	8 mm	14 mm	25 mm
Hysteresis	≤ 15 % of sensing distance	≤ 10 % of sensing distance		
Standard sensing target: iron	12 × 12 × 1 mm	25 × 25 × 1 mm	40 × 40 × 1 mm	75 × 75 × 1 mm
Response frequency ⁰¹⁾	800 Hz	400 Hz	200 Hz	100 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C (DIA. of sensing side Ø 8 mm: ≤ ± 15 %)			
Indicator	Operation indicator (red)			
Certification	CE UK ENEC	CE UK ENEC	CE UK ENEC	CE UK ENEC

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Unit weight (package)		Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Cable	Normal	≈ 43 g (≈ 63 g)	≈ 62 g (≈ 74 g)	≈ 97 g (≈ 115 g)	≈ 143 g (≈ 180 g)
	Long	-	≈ 82 g (≈ 94 g)	≈ 127 g (≈ 145 g)	≈ 183 g (≈ 220 g)
Cable connector	Normal	≈ 25 g (≈ 45 g)	≈ 37 g (≈ 67 g)	≈ 62 g (≈ 80 g)	≈ 108 g (≈ 145 g)
	Long	-	≈ 32 g (≈ 55 g)	≈ 92 g (≈ 110 g)	≈ 130 g (≈ 203 g)
Connector	Normal	≈ 12 g (≈ 32 g)	≈ 20g (≈ 49 g)	≈ 41 g (≈ 81 g)	≈ 138 g (≈ 197 g)
	Long	-	≈ 24 g (≈ 54 g)	≈ 60 g (≈ 78 g)	≈ 193 g (≈ 252 g)



View product detail

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Current consumption	≤ 10 mA
Control output	≤ 200 mA
Residual voltage	DIA. of sensing side Ø 8mm: ≤ 2 V DIA. of sensing side Ø 12 mm, Ø 18 mm, Ø 30 mm: ≤ 1.5 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	DIA. of sensing side Ø 8mm : 1,000 VAC~ 50/60 Hz for 1 min (between the charging part and the case) (connector type: 1,500 VAC~ 50/60 Hz for 1 min (between the charging part and the case)) DIA. of sensing side Ø 12 mm, Ø 18 mm, Ø 30 mm : 1,500 VAC~ 50/60 Hz for 1 min (between the charging part and the case)
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (non-freezing or non-condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (non-freezing or non-condensation)
Protection structure	IP67 (IEC standards)
Connection	Cable type ⁰¹⁾ / Cable connector type ⁰¹⁾ / Connector type model
Cable spec. ⁰²⁾	DIA. of sensing side Ø 8 mm: Ø 3.5 mm, 3-wire DIA. of sensing side Ø 12 mm: Ø 4 mm, 3-wire DIA. of sensing side Ø 18 mm, Ø 30 mm: Ø 5 mm, 3-wire
Wire spec.	Ø 3.5 mm cable : AWG 24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm Ø 4 mm, Ø 5 mm cable : AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Connector spec.	M12 connector
Material	Standard type cable (black): polyvinyl chloride (PVC) Oil resistant cable (gray): polyvinyl chloride (oil resistant PVC)
General	Case/Nut: nickel plated brass (DIA. of sensing side Ø 8 mm connector type case: SUS303), washer: nickel plated iron, sensing side: PBT
Spatter-resistant	Case/Nut: PTFE coated brass, washer: PTFE coated iron, sensing side: PTFE

01) Except spatter-resistant type

02) Cable type: 2 m, Cable connector type: 300 mm

Cylindrical Inductive Long-Distance Proximity Sensors (DC 2-Wire)

PRD Series



Features

- Operation indicator (red LED)
- Strain relief cables: improved flexural strength of cable connecting component (except M8 models)
- PTFE coating prevents malfunctions caused by welding spatter (spatter-resistant model)
- Protection structure: IP67

* Sold Separately

- M12 Connector cable:
C□D(H)2-□ (C□D(H)2-□-I)
- Spatter protection cover: P90-M□
- Fixing bracket: P90-R□

Specifications

Installation	Flush type			
General	PRD□T08-2□	PRD□T12-4□	PRD□T18-7□	PRD□T30-15□
Spatter-resistant	-	PRDA□T12-4□	PRDA□T18-7□	PRDA□T30-15□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	2 mm	4 mm	7 mm	15 mm
Setting distance	0 to 1.4 mm	0 to 2.8 mm	0 to 4.9 mm	0 to 10.5 mm
Hysteresis	≤ 15 % of sensing distance			
Standard sensing target: iron	8 × 8 × 1 mm	12 × 12 × 1 mm	20 × 20 × 1 mm	45 × 45 × 1 mm
Response frequency ⁰¹⁾	1 kHz	450 Hz	250 Hz	100 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C (DIA. of sensing side Ø 8 mm: ≤ ± 15 %)			
Indicator	Operation indicator (red)			
Certification	CE UK ENEC	CE UK ENEC	CE UK ENEC	CE UK ENEC

Installation	Non-flush type			
General	PRD□T08-4□	PRD□T12-8□	PRD□T18-14□	PRD□T30-25□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	4 mm	8 mm	14 mm	25 mm
Setting distance	0 to 2.8 mm	0 to 5.6 mm	0 to 9.8 mm	0 to 17.5 mm
Hysteresis	≤ 15 % of sensing distance			
Standard sensing target: iron	12 × 12 × 1 mm	25 × 25 × 1 mm	40 × 40 × 1 mm	75 × 75 × 1 mm
Response frequency ⁰¹⁾	800 Hz	400 Hz	200 Hz	100 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C (DIA. of sensing side Ø 8 mm: ≤ ± 15 %)			
Indicator	Operation indicator (red)			
Certification	CE UK ENEC	CE UK ENEC	CE UK ENEC	CE UK ENEC

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Unit weight (package) ⁰¹⁾		Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Cable	Normal	≈ 43 g (≈ 63 g)	≈ 62 g (≈ 74 g)	≈ 97 g (≈ 115 g)	≈ 143 g (≈ 180 g)
	Long	-	≈ 72 g (≈ 84 g)	≈ 122 g (≈ 134 g)	≈ 221 g (≈ 184 g)
Cable connector	Normal	≈ 25 g (≈ 45 g)	≈ 32 g (≈ 55 g)	≈ 62 g (≈ 80 g)	≈ 130 g (≈ 145 g)
	Long	-	≈ 42 g (≈ 54 g)	≈ 65 g (≈ 77 g)	≈ 143 g (≈ 155 g)
Connector	Normal	≈ 10 g (≈ 32 g)	≈ 20g (≈ 50 g)	≈ 42 g (≈ 60 g)	≈ 110 g (≈ 150 g)
	Long	-	≈ 26g (≈ 38 g)	≈ 49g (≈ 61 g)	≈ 134 g (≈ 146 g)
		-	-	≈ 60 g (≈ 78 g)	≈ 150 g (≈ 190 g)

01) In case of normal body length, it is written in General type order. In case of long body length, it is only available Spatter-resistant type.



View product detail

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Leakage current	DIA. of sensing side Ø 8mm: ≤ 0.8 mA DIA. of sensing side Ø 12 mm, Ø 18 mm, Ø 30 mm: ≤ 0.6 mA
Control output	2 to 100 mA
Residual voltage ⁰¹⁾	≤ 3.5 V (Non-polarity: ≤ 5 V)
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	DIA. of sensing side Ø 8 mm : 1,000 VAC~ 50/60 Hz for 1 min (between the charging part and the case) (connector type: 1,500 VAC~ 50/60 Hz for 1 min (between the charging part and the case)) DIA. of sensing side Ø 12 mm, Ø 18 mm, Ø 30 mm : 1,500 VAC~ 50/60 Hz for 1 min (between the charging part and the case)
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (non-freezing or non-condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (non-freezing or non-condensation)
Protection structure	IP67 (IEC standards)
Connection	Cable type / Cable connector type / Connector type model
Cable spec. ⁰²⁾	DIA. of sensing side Ø 8 mm: Ø 3.5 mm, 2-wire DIA. of sensing side Ø 12 mm: Ø 4 mm, 2-wire DIA. of sensing side Ø 18 mm, Ø 30 mm: Ø 5 mm, 2-wire
Wire spec.	Ø 3.5 mm cable : AWG 24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm Ø 4 mm, Ø 5 mm cable : AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Connector spec.	M12 connector
Material	Standard type cable (black): polyvinyl chloride (PVC) Oil resistant cable (gray): polyvinyl chloride (oil resistant PVC)
General	Case/Nut: nickel plated brass (DIA. of sensing side Ø 8 mm connector type case: SUS303), washer: nickel plated iron, sensing side: PBT
Spatter-resistant	Case/Nut: PTFE coated brass, washer: PTFE coated iron, sensing side: PTFE

01) Check the condition of connected device.

02) Cable type: 2 m, Cable connector type: 300 mm

Cylindrical Inductive Long-Distance Proximity Sensors (IO-Link)

PRD Series



Features

- Communication indicator (orange, green LED)
- Strain relief cables: improved flexural strength of cable connecting component (except M8 models)
- PTFE coating prevents malfunctions caused by welding spatter (spatter-resistant model)
- Protection structure: IP67

* Sold Separately

- M12 Connector cable: C□DH4-□(-□)
- Fixing bracket: P90-R□
- Spatter protection cover: P90-M□

Specifications

Installation	Flush type		
Model	PRD□12-4D-□-IL2	PRD□18-7D-□-IL2	PRD□30-15D-□-IL2
DIA. of sensing side	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	4 mm	7 mm	15 mm
Setting distance	0 to 2.8 mm	0 to 4.9 mm	0 to 10.5 mm
Hysteresis	≤ 10 % of sensing distance		
Standard sensing target: iron	12 × 12 × 1 mm	20 × 20 × 1 mm	45 × 45 × 1 mm
Response frequency ⁰¹⁾	500 Hz	250 Hz	100 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C		
Indicator ⁰²⁾	IO-Link mode, SIO mode (varies by mode)		
IO-Link mode	Communication indicator (flashing green), operation indicator (orange), Abnormal detect indicator (cross-flashing green, orange)		
SIO mode	Operation indicator (orange), stable indicator (green), Abnormal detect indicator (cross-flashing green, orange)		
Certification	CE ㉔ ㉔ ㉔ IO-Link		

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

02) In case of SIO mode, use the device within the range where the stable indicator (green) is ON.

If the sensing target is in the too close detection distance, the stable indicator turns OFF, but it is in a stable detection state.

In case of IO-Link mode, use the device within the range where unstable detection (Byte0_bit6) turns 0.

If the sensing target is in the too close detection distance, the too close detection (Byte0_bit5) is 1, but it is a stable detection state.

Installation	Non-flush type		
Model	PRD□12-8D-□-IL2	PRD□18-14D-□-IL2	PRD□30-25D-□-IL2
DIA. of sensing side	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	8 mm	14 mm	25 mm
Setting distance	0 to 5.6 mm	0 to 9.8 mm	0 to 17.5 mm
Hysteresis	≤ 10 % of sensing distance		
Standard sensing target: iron	25 × 25 × 1 mm	40 × 40 × 1 mm	75 × 75 × 1 mm
Response frequency ⁰¹⁾	400 Hz	200 Hz	100 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C		
Indicator ⁰²⁾	IO-Link mode, SIO mode (varies by mode)		
IO-Link mode	Communication indicator (flashing green), operation indicator (orange), Abnormal detect indicator (cross-flashing green, orange)		
SIO mode	Operation indicator (orange), stable indicator (green), Abnormal detect indicator (cross-flashing green, orange)		
Certification	CE ㉔ ㉔ ㉔ IO-Link		

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

02) In case of SIO mode, use the device within the range where the stable indicator (green) is ON.

If the sensing target is in the too close detection distance, the stable indicator turns OFF, but it is in a stable detection state.

In case of IO-Link mode, use the device within the range where unstable detection (Byte0_bit6) turns 0.

If the sensing target is in the too close detection distance, the too close detection (Byte0_bit5) is 1, but it is a stable detection state.

Unit weight (package)	Ø 12 mm	Ø 18 mm	Ø 30 mm
Cable	≈ 62 g (≈ 74 g)	≈ 97 g (≈ 115 g)	≈ 143 g (≈ 180 g)
Cable connector	≈ 37 g (≈ 67 g)	≈ 62 g (≈ 80 g)	≈ 108 g (≈ 145 g)
Connector	≈ 20g (≈ 49 g)	≈ 41 g (≈ 81 g)	≈ 138 g (≈ 197 g)



View product detail

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Current consumption	IO-Link mode: ≤ 25 mA, SIO mode: ≤ 20 mA
Control output	≤ 100 mA
Residual voltage ⁰¹⁾	≤ 2 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	1000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times
Ambient temp. ⁰²⁾	-25 to 70 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humi.	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection rating	IP67 (IEC standard)
Connection	Cable / Cable connector / connector models
Cable spec. ⁰³⁾	DIA. of sensing side Ø 12 mm: Ø 4 mm, 4-wire DIA. of sensing side Ø 18 mm, Ø 30 mm : Ø 5 mm, 4-wire
Wire spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Connector spec.	M12 plug connector
Material	Standard type cable (black): polyvinyl chloride (PVC), Oil resistant cable (gray): polyvinyl chloride (oil resistant PVC), case / nut: nickel plated brass, washer: nickel plated iron, sensing side: PBT
Comm. protocol	IO-Link

01) Load current: 100 mA, cable length: 2 m

02) UL approved surrounding air temperature 40 °C

03) Cable type: 2 m, Cable connector type: 300 mm

Software

Download the installation file and the manuals from the Autonics website.

[atIOLink]

atIOLink with purposes for setting, diagnosis, and maintenance of IO-Link device via IODD file is provided as the Port and Device Configuration Tool (PDCT).

[IODD (IO Device Description)]

This file contains information such as manufacturer information, process data, diagnostic data, and parameter setting of a sensor using IO-Link communication. By uploading the IODD file to PDCT Software, you can check the setting and communication data according to the user interface. Download the IODD file from the Autonics website.

Cylindrical Inductive Proximity Sensors

(DC 3-Wire)

PR Series



Features

- Spatter-resistant type:
PTFE coated for high heat resistance
(prevent malfunction from welding spatter)
- Operation indicator (red LED)
- Protection structure: IP67

- * Sold Separately
- M12 Connector cable: C□D(H)3-□
 - Fixing bracket: P90-R□
 - Spatter protection cover: P90-M□

Specifications

Installation	Flush type			
General	PR□08-1.5D□	PR□12-2D□	PR□18-5D□	PR□30-10D□
Spatter-resistant	-	PRA□12-2D□	PRA□18-5D□	PRA□30-10D□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	1.5 mm	2 mm	5 mm	10 mm
Setting distance	0 to 1.05 mm	0 to 1.4 mm	0 to 3.5 mm	0 to 7 mm
Hysteresis	≤ 10 % of sensing distance (DIA. of sensing side Ø 8 mm connector type: ≤ 15 %)			
Standard sensing target: iron	8 × 8 × 1 mm	12 × 12 × 1 mm	18 × 18 × 1 mm	30 × 30 × 1 mm
Response frequency ⁰¹⁾	1.5 kHz	1.5 kHz	500 Hz	400 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C (DIA. of sensing side Ø 8 mm: ≤ ± 20 %)			
Indicator	Operation indicator (red)			
Certification	CE ㉔ ㉔			

Installation	Non-flush type			
General	PR□08-2D□	PR□12-4D□	PR□18-8D□	PR□30-15D□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	2 mm	4 mm	8 mm	15 mm
Setting distance	0 to 1.4 mm	0 to 2.8 mm	0 to 5.6 mm	0 to 10.5 mm
Hysteresis	≤ 10 % of sensing distance (DIA. of sensing side Ø 8 mm connector type: ≤ 15 %)			
Standard sensing target: iron	8×8×1 mm	12×12×1 mm	25×25×1 mm	45×45×1 mm
Response frequency ⁰¹⁾	1.0 kHz	500 Hz	350 Hz	200 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C (DIA. of sensing side Ø 8 mm: ≤ ± 20 %)			
Indicator	Operation indicator (red)			
Certification	CE ㉔ ㉔			

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Unit weight (package)		Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Cable	Normal	≈ 52 g (≈ 64 g)	≈ 72 g (≈ 84 g)	≈ 110 g (≈ 122 g)	≈ 170 g (≈ 207 g)
	Short	-	≈ 70 g (≈ 82 g)	-	-
	Long	≈ 54 g (≈ 66 g)	≈ 76 g (≈ 88 g)	≈ 130 g (≈ 142 g)	≈ 210 g (≈ 247 g)
Cable connector	Normal	≈ 32 g (≈ 44 g)	≈ 42 g (≈ 54 g)	≈ 58 g (≈ 70 g)	≈ 122 g (≈ 134 g)
	Long	≈ 34 g (≈ 46 g)	-	≈ 78 g (≈ 90 g)	≈ 158 g (≈ 195 g)
Connector	Normal	≈ 10 g (≈ 32 g)	≈ 26 g (≈ 38 g)	≈ 49 g (≈ 61 g)	≈ 134 g (≈ 146 g)
	Long	-	-	≈ 73 g (≈ 85 g)	≈ 169 g (≈ 181 g)



View product detail

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Current consumption	≤ 10 mA
Control output	≤ 200 mA
Residual voltage	DIA. of sensing side Ø 8 mm: ≤ 2.0 V DIA. of sensing side Ø 12 mm, Ø 18 mm, Ø 30 mm: ≤ 1.5 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,500 VAC~ 50 / 60Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standards)
Connection	Cable type / Cable connector type ⁰¹⁾ / Connector type model
Cable spec. ⁰²⁾	DIA. of sensing side Ø 8 mm: Ø 3.5 mm, 3-wire DIA. of sensing side Ø 12 mm: Ø 4 mm, 3-wire DIA. of sensing side Ø 18 mm, Ø 30 mm: Ø 5 mm, 3-wire
Wire spec.	Ø 3.5 mm cable : AWG 24 (0.08 mm, 40-core), insulator DIA.: Ø 1 mm Ø 4 mm, Ø 5 mm cable : AWG 22 (0.08 mm, 60-core), insulator DIA.: Ø 1.25 mm
Connector spec.	M12 connector
Material	Standard type cable (black): polyvinyl chloride (PVC) Oil resistant cable (gray): polyvinyl chloride (oil resistant PVC)
General	Case/Nut: nickel plated brass (DIA. of sensing side Ø 8 mm connector type case: SUS303), washer: nickel plated iron, sensing side: PBT
Spatter-resistant	Case/Nut: PTFE coated brass, washer: PTFE coated iron, sensing side: PTFE

01) Except spatter-resistant type

02) Cable type: 2 m, cable connector type: 300 mm

Cylindrical Inductive Proximity Sensors

(DC 2-Wire)

PR Series



Features

- Spatter-resistant type:
PTFE coated for high heat resistance
(prevent malfunction from welding spatter)
- Operation indicator (red LED)
- Protection structure: IP67
- * Sold Separately
 - M12 Connector cable:
C□D(H)2-□ (C□D(H)2-□-I)
 - Fixing bracket: P90-R□
 - Spatter protection cover: P90-M□

Specifications

Installation	Flush type			
General	PR□T08-1.5□	PR□T12-2□	PR□T18-5□	PR□T30-10□
Spatter-resistant	-	PRA□T12-2□	PRA□T18-5□	PRA□T30-10□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	1.5 mm	2 mm	5 mm	10 mm
Setting distance	0 to 1.05 mm	0 to 1.4 mm	0 to 3.5 mm	0 to 7 mm
Hysteresis	≤ 10 % of sensing distance (DIA. of sensing side Ø 8 mm connector type: ≤ 15 %)			
Standard sensing target: iron	8 × 8 × 1 mm	12 × 12 × 1 mm	18 × 18 × 1 mm	30 × 30 × 1 mm
Response frequency ⁰¹⁾	1.5 kHz	1.5 kHz	500 Hz	400 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C (DIA. of sensing side Ø 8 mm: ≤ ± 20 %)			
Indicator	Operation indicator (red)			
Certification	CE EAC			

Installation	Non-flush type			
General	PR□T08-2□	PR□T12-4□	PR□T18-8□	PR□T30-15□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	2 mm	4 mm	8 mm	15 mm
Setting distance	0 to 1.4 mm	0 to 2.8 mm	0 to 5.6 mm	0 to 10.5 mm
Hysteresis	≤ 10 % of sensing distance (DIA. of sensing side Ø 8 mm connector type: ≤ 15 %)			
Standard sensing target: iron	8 × 8 × 1 mm	12 × 12 × 1 mm	25 × 25 × 1 mm	45 × 45 × 1 mm
Response frequency ⁰¹⁾	1.0 kHz	500 Hz	350 Hz	200 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C (DIA. of sensing side Ø 8 mm: ≤ ± 20 %)			
Indicator	Operation indicator (red)			
Certification	CE EAC	CE EAC	CE EAC	CE EAC

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Unit weight (package)	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Cable	≈ 52 g (≈ 64 g)	≈ 72 g (≈ 84 g)	≈ 110 g (≈ 122 g)	≈ 170 g (≈ 207 g)
Cable connector	≈ 32 g (≈ 44 g)	≈ 42 g (≈ 54 g)	≈ 58 g (≈ 70 g)	≈ 122 g (≈ 134 g)
Connector	≈ 10 g (≈ 32 g)	≈ 26 g (≈ 38 g)	≈ 49 g (≈ 61 g)	≈ 142 g (≈ 154 g) ⁰¹⁾

01) Spatter-resistant type: ≈ 134 g (≈ 146 g)



View product detail

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Leakage current	≤ 0.6 mA
Control output	2 to 100 mA
Residual voltage	≤ 3.5 V (non-polarity ⁰¹⁾ ; ≤ 5 V)
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,500 VAC~ 50 / 60 Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standards)
Connection	Cable type / Cable connector type / Connector type model
Cable spec.⁰²⁾	DIA. of sensing side Ø 8 mm: Ø 3.5 mm, 2-wire DIA. of sensing side Ø 12 mm: Ø 4 mm, 2-wire DIA. of sensing side Ø 18 mm, Ø 30 mm: Ø 5 mm, 2-wire
Wire spec.	Ø 3.5 mm cable : AWG 24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm Ø 4 mm, Ø 5 mm cable : AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Connector spec.	M12 connector
Material	Standard type cable (black): polyvinyl chloride (PVC) Oil resistant cable type cable (gray): polyvinyl chloride (oil resistant PVC)
General	Case/Nut: nickel plated brass (DIA. of sensing side Ø 8 mm connector type case: SUS303), washer: nickel plated iron, sensing side: PBT
Spatter-resistant	Case/Nut: PTFE coated brass, washer: PTFE coated iron, sensing side: PTFE

01) Check the condition of connected device.

02) Cable type: 2 m, cable connector type: 300 mm

Cylindrical Inductive Proximity Sensors

(AC 2-Wire)

PR Series



Features

- Spatter-resistant type: PTFE coated for high heat resistance (prevent malfunction from welding spatter)
- Operation indicator (red LED)
- Protection structure: IP67

- * Sold Separately
- M12 Connector: C□A(H)2-□
 - Fixing bracket: P90-R□
 - Spatter protection cover: P90-M□

Specifications

Installation	Flush type		
General	PR□12-2A□	PR□18-5A□	PR□30-10A□
Spatter-resistant	PRA□12-2A□	PRA□18-5A□	PRA□30-10A□
DIA. of sensing side	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	2 mm	5 mm	10 mm
Setting distance	0 to 1.4 mm	0 to 3.5 mm	0 to 7 mm
Hysteresis	≤ 10 % of sensing distance		
Standard sensing target: iron	12 × 12 × 1 mm	18 × 18 × 1 mm	30 × 30 × 1 mm
Response frequency ⁰¹⁾	20 Hz		
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C		
Indicator	Operation indicator (red)		
Certification	CE ㉔ ㉔		

Installation	Non-flush type		
General	PR□12-4A □	PR□18-8A □	PR□30-15A □
DIA. of sensing side	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance	4 mm	8 mm	15 mm
Setting distance	0 to 2.8 mm	0 to 5.6 mm	0 to 10.5 mm
Hysteresis	≤ 10 % of sensing distance		
Standard sensing target: iron	12 × 12 × 1 mm	25 × 25 × 1 mm	45 × 45 × 1 mm
Response frequency ⁰¹⁾	20 Hz		
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C		
Indicator	Operation indicator (red)		
Certification	CE ㉔ ㉔		


01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Unit weight (package)		Ø 12 mm	Ø 18 mm	Ø 30 mm
Cable	Normal	≈ 72 g (≈ 84 g) ⁰¹⁾	≈ 118 g (≈ 130 g) ⁰²⁾	≈ 170 g (≈ 207 g)
	Long	-	≈ 130 g (≈ 142 g)	≈ 208 g (≈ 245 g)
Cable connector	Normal	≈ 42 g (≈ 54 g)	≈ 66 g (≈ 78 g)	≈ 122 g (≈ 134 g)
	Long	-	≈ 78 g (≈ 90 g)	≈ 158 g (≈ 195 g)
Connector	Normal	≈ 30 g (≈ 42 g)	≈ 54 g (≈ 66 g)	≈ 142 g (≈ 154 g)
	Long	-	≈ 66 g (≈ 78 g)	≈ 182 g (≈ 194 g)

01) Spatter-resistant type: ≈ 66 g (≈ 78 g)
02) Spatter-resistant type: ≈ 106 g (≈ 118 g)



View product detail

Power supply	100 - 240 VAC~ 50 / 60 Hz, operating voltage: 85 - 264 VAC~
Leakage current	≤ 2.5 mA
Control output	DIA. of sensing side Ø 12 mm: 5 to 150 mA DIA. of sensing side Ø 18 mm, Ø 30 mm: 5 to 200 mA
Residual voltage	≤ 10 V
Protection circuit	Surge protection circuit
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Insulation type	Double insulation or reinforced insulation (symbol: ) dielectric strength between the measuring input part and the power part: general type 1 kV, spatter-resistant type 1.5 kV
Dielectric strength	General type : 2,500 VAC~ 50/60 Hz for 1 min (between the charging part and the case) Spatter-resistant type : 1,500 VAC~ 50/60 Hz for 1 min (between the charging part and the case)
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standards)
Connection	Cable type / Cable connector type ⁰¹⁾ / Connector type ⁰¹⁾ model
Cable spec. ⁰²⁾	DIA. of sensing side Ø 12 mm: Ø 4 mm, 2-wire DIA. of sensing side Ø 18 mm, Ø 30 mm: Ø 5 mm, 2-wire
Wire spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Connector spec.	M12 connector
Material	Standard type cable (black): polyvinyl chloride (PVC)
General	Case/Nut: nickel plated brass, washer: nickel plated iron, sensing side: PBT
Spatter-resistant	Case/Nut: PTFE coated brass, washer: PTFE coated iron, sensing side: PTFE

01) Except spatter-resistant type

02) Cable type: 2 m, cable connector type: 300 mm

Cylindrical Inductive Full-Metal Long-Distance Proximity Sensors (DC 3-Wire)

PRFD Series

Features

- High resistance to impact and wear caused by contact with workpieces or wire brushes (sensor head / housing : stainless steel)
- Reduced risk of malfunction caused by aluminum chips
- Spatter-resistant type:
PTFE coating prevents malfunctions caused by welding spatter360° ring type operation indicator (red LED) (except Ø 8 mm model)
- 360° ring type operation indicator (red LED) (except Ø 8 mm model)
- Oil resistant cable
- Protection structure: IP66, IP67, IP67G, IP68

* Sold Separately


- M12 Connector cable: C□D(H)3-□
- Fixing bracket: P90-R□
- Spatter protection cover: P90-M□



View product detail



Specifications

Installation	Flush type			
General	PRFD□08-2D□-□	PRFD□12-3D□-□	PRFD□18-7D□-□	PRFD□30-12D□-□
Spatter-resistant	PRFDA□08-2D□-□	PRFDA□12-3D□-□	PRFDA□18-7D□-□	PRFDA□30-12D□-□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance ⁰¹⁾	2 mm	3 mm	7 mm	12 mm
Setting distance	0 to 1.4 mm	0 to 2.1 mm	0 to 4.9 mm	0 to 8.4 mm
Hysteresis	≤ 15 % of sensing distance			
Standard sensing target: iron	12 × 12 × 1 mm	12 × 12 × 1 mm	30 × 30 × 1 mm	54 × 54 × 1 mm
Response frequency ⁰²⁾	150 Hz	80 Hz	80 Hz	50 Hz
Affection by temperature	≤ ± 20 % for sensing distance at ambient temperature 20 °C			
Indicator	Operation indicator (orange), stable indicator (green), Abnormal detect indicator (cross-flashing green, orange)			
Certification	CE UK 			
Unit weight (package)	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Cable type	≈ 60 g (≈ 85 g)	≈ 80 g (≈ 110 g)	≈ 100 g (≈ 135 g)	≈ 165 g (≈ 220 g)
Cable connector type	≈ 25 g (≈ 50 g)	≈ 35 g (≈ 60 g)	≈ 55 g (≈ 90 g)	≈ 120 g (≈ 180 g)
Connector type	≈ 10 g (≈ 35 g)	≈ 15 g (≈ 40 g)	≈ 32 g (≈ 67 g)	≈ 85 g (≈ 140 g)
Power supply	10 - 30 VDC≡ (ripple P-P: ≤ 10 %)			
Current consumption	≤ 20 mA			
Control output	≤ 100 mA			
Residual voltage	≤ 2.5 V			
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection			
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)			
Dielectric strength	1,000 VAC~ 50 / 60Hz for 1 minute (between all terminals and case)			
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 10 times (DIA. of sensing side Ø 8 mm : 500 m/s ² (≈ 50 G) in each X, Y, Z direction for 10 times)			
Ambient temp. ⁰¹⁾	-25 to 70 °C, storage: -25 to 70 °C (no freezing or condensation)			
Ambient humi.	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)			
Protection rating	Cable type, cable connector type: IP66, IP67 (IEC standard) Connector type: IP66, IP67 (IEC standard), IP67G (JEM standard), IP68			
Connection	Cable type / Cable connector type / Connector type model			
Cable spec.	DIA. of sensing side Ø 8 mm: Ø 4 mm, 4-wire ⁰²⁾ , DIA. of sensing side Ø 12 mm, Ø 18 mm, Ø 30 mm: Ø 5 mm, 3-wire			
Wire spec.	AWG 23 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm			
Connector	M12 plug connector			
Material	Oil resistant cable (dark gray): oil resistant polyvinyl chloride (PVC)			
General	Case / Nut: stainless steel 303 (SUS303), washer: stainless steel 304 (SUS304), sensing side ⁰³⁾ : stainless steel 303 (SUS303)			
Spatter-resistant	Case / Nut: stainless steel 303 (SUS303, PTFE coated), washer: stainless steel 304 (SUS304), sensing side ⁰³⁾ : stainless steel 303 (SUS303, PTFE coated)			

01) UL approved surrounding air temperature 60 °C

02) The white wire of DIA. of sensing side Ø 8 mm is not used.

03) Thickness: DIA. of sensing side Ø 8 mm: 0.2 mm / DIA. of sensing side Ø 12 mm, Ø 18 mm: 0.4 mm / DIA. of sensing side Ø 30 mm: 0.5 mm

Cylindrical Inductive Full-Metal Long-Distance Proximity Sensors (DC 2-Wire)



PRFD Series

Features

- High resistance to impact and wear caused by contact with workpieces or wire brushes (sensor head / housing : stainless steel)
- Reduced risk of malfunction caused by aluminum chips
- Spatter-resistant type:
PTFE coating prevents malfunctions caused by welding spatter
- 360° ring type operation indicator (red LED) (except Ø 8 mm model)
- Oil resistant cable
- Protection structure: IP66, IP67, IP67G, IP68

* Sold Separately

- M12 Connector cable: C□D(H)2-□-I
- Fixing bracket: P90-R□
- Spatter protection cover: P90-M□



View product detail

Specifications

Installation	Flush type			
General	PRFD□T08-2DO-□	PRFD□T12-3DO-□	PRFD□T18-7DO-□	PRFD□T30-12DO-□
Spatter-resistant	PRFDA□T08-2DO-□	PRFDA□T12-3DO-□	PRFDA□T18-7DO-□	PRFDA□T30-12DO-□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance ⁰¹⁾	2 mm	3 mm	7 mm	12 mm
Setting distance	0 to 1.4 mm	0 to 2.1 mm	0 to 4.9 mm	0 to 8.4 mm
Hysteresis	≤ 15 % of sensing distance			
Standard sensing target: iron	12 × 12 × 1 mm	12 × 12 × 1 mm	30 × 30 × 1 mm	54 × 54 × 1 mm
Response frequency ⁰²⁾	150 Hz	80 Hz	80 Hz	50 Hz
Affection by temperature	≤ ± 20 % for sensing distance at ambient temperature 20 °C			
Indicator	Stability indicator (green), operation indicator (red)			
Certification	CE UK ENEC EAC	CE UK ENEC EAC	CE UK ENEC EAC	CE UK ENEC EAC
Unit weight (package)	≈ 55 g (≈ 80 g)	≈ 83 g (≈ 110 g)	≈ 97 g (≈ 132 g)	≈ 170 g (≈ 225 g)

⁰¹⁾ Use accessories (nut, washer) made of SUS. Or, sensing distance cannot be guaranteed.

⁰²⁾ The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Leakage current	≤ 0.8 mA
Control output	3 to 100 mA
Residual voltage	≤ 3.5 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 10 times (DIA. of sensing side Ø 8 mm: : 500 m/s ² (≈ 50 G) in each X, Y, Z direction for 10 times)
Ambient temp. ⁰¹⁾	-25 to 70 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humi.	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection	IP67 (IEC standards)
Connection	Cable type / Cable connector type model
Cable spec. ⁰²⁾	DIA. of sensing side Ø 8 mm: Ø 4 mm, 2-wire DIA. of sensing side Ø 12 mm, Ø 18 mm, Ø 30 mm: Ø 5 mm, 2-wire
Wire spec.	AWG 22 (0.08 mm, 60-wire), insulator diameter: Ø 1.25 mm
Connector	M12 connector
Material	Oil resistant cable (dark gray): oil resistant polyvinyl chloride (PVC)
General	Case / Nut: stainless steel 303 (SUS303), washer: stainless steel 304 (SUS304), sensing side ⁰³⁾ : stainless steel 303 (SUS303)
Spatter-resistant	Case / Nut: stainless steel 303 (SUS303, PTFE coated), washer: stainless steel 304 (SUS304), sensing side ⁰³⁾ : stainless steel 303 (SUS303, PTFE coated)

⁰¹⁾ UL approved surrounding air temperature 40 °C

⁰²⁾ Cable type: 2 m (option: 5 m), cable connector type: 300 mm

⁰³⁾ Thickness: DIA. of sensing side Ø 8 mm: 0.2 mm / DIA. of sensing side Ø 12 mm, Ø 18 mm: 0.4 mm / DIA. of sensing side Ø 30 mm: 0.5 mm

Cylindrical Inductive Full-Metal Long-Distance Proximity Sensors (IO-Link)

PRFD Series





Features

- High durability against contact with workpieces or wire brushes (sensor head / housing: stainless steel)
- Reduced risk of malfunction caused by aluminum chips
- 2-color LED indicator for easy status monitoring
- Malfunction identification and predictive maintenance with real-time monitoring
- Oil resistant cable
- PTFE coating prevents malfunctions caused by welding spatter (spatter-resistant PRFDA□ models)
- Protection structure: IP66, IP67, IP67G, IP68

* Sold Separately

- M12 Connector cable: C□D(H)3-□
- Fixing bracket: P90-R□
- Spatter protection cover: P90-M□

Specifications

Installation	Flush type			
General	PRFDCM08-2D-IL2	PRFDCM12-3D-IL2	PRFDCM18-7D-IL2	PRFDCM30-12D-IL2
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance ⁰¹⁾	2 mm	3 mm	7 mm	12 mm
Setting distance	0 to 1.4 mm	0 to 2.1 mm	0 to 4.9 mm	0 to 8.4 mm
Hysteresis	≤ 15 % of sensing distance			
Standard sensing target: iron	12 × 12 × 1 mm	12 × 12 × 1 mm	30 × 30 × 1 mm	54 × 54 × 1 mm
Response frequency ⁰²⁾	150 Hz	80 Hz	80 Hz	50 Hz
Affection by temperature	≤ ± 20 % for sensing distance at ambient temperature 20 °C			
Indicator ⁰³⁾	IO-Link mode, SIO mode			
IO-Link mode	Communication indicator (flashing green), operation indicator (orange), Abnormal detect indicator (cross-flashing green, orange)			
SIO mode	Operation indicator (orange), stable indicator (green), Abnormal detect indicator (cross-flashing green, orange)			
Certification	CE UK   IO-Link			
Unit weight (package)	≈ 10 g (≈ 35 g)	≈ 15 g (≈ 40 g)	≈ 32 g (≈ 67 g)	≈ 85 g (≈ 140 g)

01) Use accessories (nut, washer) made of SUS. Or, sensing distance cannot be guaranteed.

02) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

03) In case of SIO mode, use the device within the range where the stable indicator (green) is ON.
In case of IO-Link mode, use the device within the range where unstable detection (Byte0_bit6) turns 0.

Power supply	10 - 30 VDC≡ (ripple P-P: ≤ 10 %)
Current consumption	≤ 20 mA
Control output	≤ 100 mA
Residual voltage	≤ 2.5 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	1,000 VAC~ 50 / 60Hz for 1 minute (between all terminals and case)
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 10 times (DIA. of sensing side Ø 8 mm) : 500 m/s ² (≈ 50 G) in each X, Y, Z direction for 10 times)
Ambient temp. ⁰¹⁾	-25 to 70 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humi.	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection rating	IP66, IP67 (IEC standard), IP67G (JEM standard), IP68
Connection	Connector models
Connector	M12 plug connector
Material	Case / Nut: stainless steel 303 (SUS303), washer: stainless steel 304 (SUS304), sensing side ⁰²⁾ : stainless steel 303 (SUS303)
Comm. protocol	IO-Link

01) UL approved surrounding air temperature 60 °C

02) Thickness: DIA. of sensing side Ø 8 mm: 0.2 mm / DIA. of sensing side Ø 12 mm, Ø 18 mm: 0.4 mm / DIA. of sensing side Ø 30 mm: 0.5 mm



View product detail

Software

Download the installation file and the manuals from the Autonics website.

[atIOLink]

atIOLink with purposes for setting, diagnosis, and maintenance of IO-Link device via IODD file is provided as the Port and Device Configuration Tool (PDCT).

[IODD (IO Device Description)]

This file contains information such as manufacturer information, process data, diagnostic data, and parameter setting of a sensor using IO-Link communication. By uploading the IODD file to PDCT Software, you can check the setting and communication data according to the user interface.

Download the IODD file from the Autonics website.

Cylindrical Inductive Full-Metal Proximity Sensors (DC 2-Wire)

PRF Series



Features

- High resistance to impact and wear caused by contact with workpieces or wire brushes (sensor head / housing: stainless steel)
- Reduced risk of malfunction caused by aluminum chips
- Spatter-resistant type: PTFE coating prevents malfunctions caused by welding spatter
- 360° ring type operation indicator (red LED) (except Ø 8 mm model)
- Oil resistant cable
- Protection structure: IP67

* Sold Separately

- M12 Connector cable: C□D(H)2-□-I
- Fixing bracket: P90-R□
- Spatter protection cover: P90-M□

Specifications

Installation	Flush type			
General	PRF□T08-1.5DO-□	PRF□T12-2DO-□	PRF□T18-5DO-□	PRF□T30-10DO-□
Spatter-resistant	PRFA□T08-1.5DO-□	PRFA□T12-2DO-□	PRFA□T18-5DO-□	PRFA□T30-10DO-□
DIA. of sensing side	Ø 8 mm	Ø 12 mm	Ø 18 mm	Ø 30 mm
Sensing distance ⁰¹⁾	1.5 mm	2 mm	5 mm	10 mm
Setting distance	0 to 1.05 mm	0 to 1.4 mm	0 to 3.5 mm	0 to 7 mm
Hysteresis	≤ 15 % of sensing distance			
Standard sensing target: iron	8 × 8 × 1 mm	12 × 12 × 1 mm	30 × 30 × 1 mm	54 × 54 × 1 mm
Response frequency ⁰²⁾	200 Hz	100 Hz	80 Hz	50 Hz
Affection by temperature	≤ ± 20 % for sensing distance at ambient temperature 20 °C			
Indicator	Operating indicator (red)			
Certification	CE UK ENEC EAC	CE UK ENEC EAC	CE UK ENEC EAC	CE UK ENEC EAC
Unit weight (package)	≈ 55 g (≈ 80 g)	≈ 83 g (≈ 110 g)	≈ 97 g (≈ 132 g)	≈ 170 g (≈ 225 g)

01) Use accessories (nut, washer) made of SUS. Or, sensing distance cannot be guaranteed.

02) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Leakage current	≤ 0.8 mA
Control output	3 to 100 mA
Residual voltage	≤ 3.5 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60Hz for 1 minute
Vibration	1.5 mm amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for hours
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 10 times (DIA. of sensing side Ø 8 mm : 500 m/s ² (≈ 50 G) in each X, Y, Z direction for 10 times)
Ambient temp. ⁰¹⁾	-25 to 70 °C, storage: -25 to 70 °C (non-freezing or non-condensation)
Ambient humi.	35 to 95 %RH, storage: 35 to 95 %RH (non-freezing or non-condensation)
Protection	IP67 (IEC standards)
Connection	Cable type / Cable connector type model
Cable spec. ⁰²⁾	DIA. of sensing side Ø 8 mm: Ø 4 mm, 2-wire DIA. of sensing side Ø 12 mm, Ø 18 mm, Ø 30 mm: Ø 5 mm, 2-wire
Wire spec.	AWG 22 (0.08 mm, 60-wire), insulator diameter: Ø 1.25 mm
Connector	M12 connector
Material	Oil resistant cable (dark gray): oil resistant polyvinyl chloride (PVC)
General	Case/Nut: SUS303, washer: SUS304, sensing side ⁰³⁾ : SUS303
Spatter-resistant	Case/Nut: SUS303 (PTFE coated), washer: SUS304, sensing side ⁰³⁾ : SUS303 (PTFE coated)

01) UL approved surrounding air temperature 40 °C

02) Cable type: 2 m (option: 5 m), cable connector type: 300 mm

03) Thickness: 0.8 mm (DIA. of sensing side Ø 8 mm: 0.4 mm)



View product detail

Cylindrical Inductive Transmission Couplers

PET Series



Features

- Inductive coupling allows signals to be generated and transmitted without additional power supply
- Stable operation in various environmental settings including dust or oil
- Applications: drilling, robotics, automated conveyors system, etc.

Specifications

Installation	Flush type
Model	PET18-5
Transmitting distance	5 mm
Setting distance	1 to 4.5 mm
Response time	≤ 1 ms
Indicator	Operation indicator (red)
Certification	CE
Unit weight (package)	≈ 121 g (≈ 133 g)
Insulation type	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,500 VAC~ 50 / 60 Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) X, Y, Z directions for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standards)
Connection	Cable type model
Wire spec.	Ø 5 mm, 2-wire, 2 m
Connector spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Contact switch spec.	Contact resistance is ≤ 300 mΩ, open resistance is ≥ 10 MΩ, leakage current at OFF is zero.
Material	Nut/Case: nickel plated brass, washer: nickel plated steel, sensing side: PBT, Standard type cable (black): polyvinyl chloride (PVC)



View product detail

Rectangular Inductive

Proximity Sensors

(DC 3-Wire,
□ 8 / 12 / 50 mm)




PS Series



Features

- Operation indicator (red LED)
- Protection structure: IP67

Specifications

Installation	Standard type / Upper side type		
Model	PS08-2.5D□□	PS12-4D□□	PS50-30D□
Sensing side length	8 mm	12 mm	50 mm
Sensing distance	2.5 mm	4 mm	30 mm
Setting distance	0 to 1.75 mm	0 to 2.8 mm	0 to 21 mm
Hysteresis	≤ 10 % of sensing distance (sensing side length 8 mm: ≤ 20 %)		
Standard sensing target: iron	8 × 8 × 1 mm	12 × 12 × 1 mm	90 × 90 × 1 mm
Response frequency ⁰¹⁾	1 kHz	500 Hz	50 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C (sensing side length 8 mm: ≤ ± 15 %)		
Indicator	Operating indicator (red)		
Certification	CE  ENEC	CE  ENEC	CE  ENEC
Unit weight (package)	≈ 16 g (≈ 30 g)	≈ 62 g (≈ 77 g)	≈ 220 g (≈ 256 g)

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Current consumption	≤ 10 mA
Control output	Sensing side length 8 mm: ≤ 100 mA Sensing side length 12 mm, 50 mm: ≤ 200 mA
Residual voltage	Sensing side length 8 mm: ≤ 1.0 V Sensing side length 12 mm, 50 mm: ≤ 1.5 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,500 VAC~ 50 / 60Hz for 1 minute (sensing side length 8 mm - between the charging part and the case: 1,000 VAC~ 50 / 60Hz for 1 minute)
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each of X, Y, Z directions for 2 hours
Shock	500 m/s ² (≈ 50 G) X, Y, Z directions for 3 times
Ambient temp.	-25 to 70 %RH, storage: -30 to 80 %RH (no freezing or condensation)
Ambient humi.	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection rating	IP67 (IEC standards)
Connection	Cable type
Cable spec.	Sensing side length 8 mm: Ø 2.5 mm, 3-wire, 1 m Sensing side length 12 mm: Ø 4 mm, 3-wire, 2 m Sensing side length 50 mm: Ø 5 mm, 3-wire, 2 m
Wire spec.	Ø 2.5 mm cable : AWG 28 (0.08 mm, 19-core), insulator diameter: Ø 0.9 mm Ø 4 mm, Ø 5 mm cable : AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Material	Sensing side length 8 mm Case: PC, Sensing side length 12 mm Case: Heat-resistant ABS, Sensing side length 50 mm Case: PBT, standard cable (black): polyvinyl chloride (PVC)



View product detail

Rectangular Inductive Proximity Sensors

(DC 3-Wire,

□ 17 / 25 / 30 / 40 mm)

PS Series



Features

- Alternate frequency models allow adjacent installation of multiple sensors without interference (PSN17-□-F model)
- Operation indicator (red LED)
- Protection structure: IP67

Specifications

Installation	Standard type / Upper side type		Standard type			
Model	PSN17-5D□□-□	PSN17-8D□□-□	PSN25-5D□	PSN30-10D□	PSN30-15D□	PSN40-20D□
Sensing side length	18 mm	18 mm	25 mm	30 mm	30 mm	40 mm
Sensing distance	5 mm	8 mm	5 mm	10 mm	15 mm	20 mm
Setting distance	0 to 3.5 mm	0 to 5 mm	0 to 3.5 mm	0 to 7 mm	0 to 10.5 mm	0 to 14 mm
Hysteresis	≤ 10 % of sensing distance					
Standard sensing target: iron	18 × 18 × 1 mm	25 × 25 × 1 mm	25 × 25 × 1 mm	30 × 30 × 1 mm	45 × 45 × 1 mm	60 × 60 × 1 mm
Response frequency ⁰¹⁾	700 Hz	200 Hz	300 Hz	250 Hz	200 Hz	100 Hz
Affection by temperature	± 10 % for sensing distance at ambient temperature 20 °C					
Indicator	Operation indicator (red)					
Certification	CE UK ENEC	CE UK ENEC	CE UK ENEC	CE UK ENEC	CE UK ENEC	CE UK ENEC
Unit weight (package)	≈ 62 g (≈ 83 g)	≈ 62 g (≈ 83 g)	≈ 71 g (≈ 103 g)	≈ 96 g (≈ 165 g)	≈ 96 g (≈ 165 g)	≈ 135 g (≈ 225 g)

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Current consumption	≤ 10 mA
Control output	≤ 200 mA
Residual voltage	≤ 1.5 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation type	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,500 VAC~ 50/60 Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temp.	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humi.	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standard)
Connection	Cable type model
Wire spec.	Ø 4 mm, 3-wire, 2 m
Connector spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Material	Case: Heat-resistant ABS, standard type cable (black): polyvinyl chloride (PVC)



View product detail

Rectangular Inductive Proximity Sensors

(DC 2-Wire)


PS Series



Features

- Operation indicator (red LED)
- Protection structure: IP67

Specifications

Installation	Standard type / Upper side type
Model	PSNT17-5D□□
Sensing side length	18 mm
Sensing distance	5 mm
Setting distance	0 to 3.5 mm
Hysteresis	≤ 10 % of sensing distance
Standard sensing target: iron	18 × 18 × 1 mm
Response frequency ⁰¹⁾	700 Hz
Affection by temperature	± 10 % for sensing distance at ambient temperature 20 °C
Indicator	Operation indicator (red)
Certification	CE  ENEC
Unit weight (package)	≈ 58 g (≈ 79 g)

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Leakage current	≤ 0.6 mA
Control output	2 to 100 mA
Residual voltage	≤ 3.5 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation type	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,500 VAC~ 50 / 60 Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standards)
Connection	Cable type model
Wire spec.	Ø 4 mm, 2-wire, 2 m
Connector spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Material	Case: PBT, standard type cable (black): polyvinyl chloride (PVC)

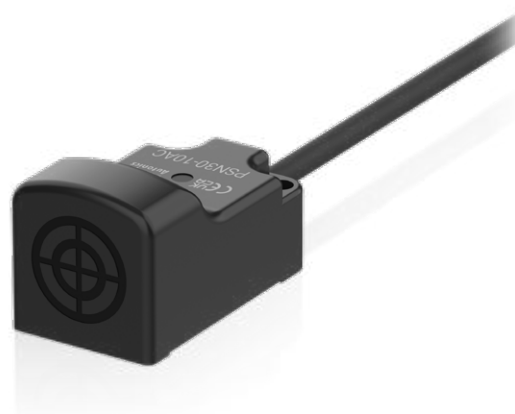


View product detail

Rectangular Inductive Proximity Sensors

(AC 2-Wire)

PS Series



Features

- Operation indicator (red LED)
- Protection structure: IP67

Specifications

Installation	Standard type			
Model	PSN25-5A□	PSN30-10A□	PSN30-15A□	PSN40-20A□
Sensing side length	25 mm	30 mm	30 mm	40 mm
Sensing distance	5 mm	10 mm	15 mm	20 mm
Setting distance	0 to 3.5 mm	0 to 7 mm	0 to 10.5 mm	0 to 14 mm
Hysteresis	≤ 10 % of sensing distance			
Standard sensing target: iron	25 × 25 × 1 mm	30 × 30 × 1 mm	45 × 45 × 1 mm	60 × 60 × 1 mm
Response frequency ⁰¹⁾	20 Hz			
Affection by temperature	± 10 % for sensing distance at ambient temperature 20 °C			
Indicator	Operation indicator (red)			
Certification	CE UK EAC	CE UK EAC	CE UK EAC	CE UK EAC
Unit weight (package)	≈ 66 g (≈ 98 g)	≈ 92 g (≈ 161 g)	≈ 92 g (≈ 161 g)	≈ 130 g (≈ 219 g)

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	100 - 240 VAC ~ 50 / 60 Hz, operating voltage: 85 - 264 VAC ~
Leakage current	≤ 2.5 mA
Control output	5 to 200 mA
Residual voltage	≤ 10 V
Protection circuit	Surge protection circuit
Insulation type	≥ 50 MΩ (500 VDC ≡ megger)
Dielectric strength	Between the charging part and the case: 1,500 VAC ~ 50/60 Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection rating	IP67 (IEC standards)
Connection	Cable type model
Wire spec.	Ø 4 mm, 2-wire, 2 m
Connector spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Material	Case: Heat-resistant ABS, standard type cable (black): polyvinyl chloride (PVC)



View product detail

Rectangular Inductive Long-Distance Proximity Sensors (DC 4-Wire)

AS Series



Features

- Long sensing distance 50 mm
- Power supply: 12 - 48 VDC \equiv
(operating voltage: 10 - 65 VDC \equiv)
- Simultaneous output
(Normally Open + Normally Closed)
- Power indicator (green LED) and
operation indicator (red LED)
- Protection structure: IP67

Specifications

Installation	Upper side type
Model	AS80-50D□
Sensing side length	80 mm
Sensing distance	50 mm
Setting distance	0 to 35 mm
Hysteresis	≤ 15 % of sensing distance
Standard sensing target: iron	150 × 150 × 1 mm
Response frequency ⁰¹⁾	30 Hz
Affection by temperature	± 10 % for sensing distance at ambient temperature 20 °C
Indicator	Power indicator (green), operation indicator (yellow)
Certification	CE  ENEC
Unit weight	≈ 470 g

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	12 - 48 VDC \equiv (ripple P-P: ≤ 10 %), operating voltage: 10 - 65 VDC \equiv
Current consumption	≤ 20 mA
Control output	≤ 200 mA
Residual voltage	≤ 2 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation type	≥ 50 MΩ (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 1,500 VAC~ 50/60 Hz for 1 minute
Vibration	1 mm double amplitude at frequency 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) X, Y, Z directions for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standard)
Connection	Cable type model
Wire spec.	Ø 5 mm, 4-wire, 2 m
Connector spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Material	Case: PC+ABS, standard type cable (black): polyvinyl chloride (PVC)



View product detail

Rectangular Flat-Type Inductive Proximity Sensors (DC 3-Wire)

PFI Series



Features

- Flat, compact design (10 mm height) allows easy installation in limited spaces
- Operation indicator (red LED)
- Protection structure: IP67

Specifications

Installation	Upper side type
Model	PFI25-8D□
Sensing side length	25 mm
Sensing distance	8 mm
Setting distance	0 to 5.6 mm
Hysteresis	≤ 10 % of sensing distance
Standard sensing target: iron	25 × 25 × 1 mm
Response frequency ⁰¹⁾	200 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C
Indicator	Operation indicator (red)
Certification	CE ENEC
Unit weight	≈ 70 g

⁰¹⁾ The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	12 - 24 VDC≐ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≐
Current consumption	≤ 10 mA
Control output	≤ 200 mA
Residual voltage	≤ 1.5 V
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection
Insulation type	≥ 50 MΩ (500 VDC≐ megger)
Dielectric strength	Between the charging part and the case: 1,500 VAC~ 50 / 60 Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standards)
Connection	Cable type model
Wire spec.	Ø 4 mm, 3-wire, 2 m
Connector spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Material	Case: PPS, standard type cable (black): polyvinyl chloride (PVC)



View product detail

Rectangular Flat-Type Inductive Proximity Sensors

(AC 2-Wire)

PFI Series



Features

- Flat, compact design (10 mm height) allows easy installation in limited spaces
- Operation indicator (red LED)
- Protection structure: IP67

Specifications

Installation	Upper side type
Model	PFI25-8A□
Sensing side length	25 mm
Sensing distance	8 mm
Setting distance	0 to 5.6 mm
Hysteresis	≤ 10 % of sensing distance
Standard sensing target: iron	25 × 25 × 1 mm
Response frequency ⁰¹⁾	20 Hz
Affection by temperature	≤ ± 10 % for sensing distance at ambient temperature 20 °C
Indicator	Operation indicator (red)
Certification	CE UK ENEC
Unit weight	≈ 70 g

01) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	100 - 240 VAC~ 50 / 60 Hz, operating voltage: 85 - 264 VAC~
Leakage current	≤ 2.5 mA
Control output	5 to 150 mA
Residual voltage	≤ 10 V
Protection circuit	Surge protection circuit
Insulation type	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,500 VAC~ 50/60 Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standards)
Connection	Cable type model
Wire spec.	Ø 4 mm, 2-wire, 2 m
Connector spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Material	Case: PPS, standard type cable (black): polyvinyl chloride (PVC)



View product detail

Cylindrical Capacitive Proximity Sensors

(DC 3-Wire)

CR Series



Features

- Detect various materials including metal, iron, stone, plastic, water, and grain
- Built-in sensitivity adjuster for convenient configuration
- Operation indicator (red)
- Ideal for level detection and position control

* Sold Separately

- Fixing bracket: P90-R□
- Spatter protection cover: P90-M□

Specifications

Installation	Non-flush type	
Model	CR18-8D□	CR30-15D□
DIA. of sensing side	Ø 18 mm	Ø 30 mm
Sensing distance ⁰¹⁾	8 mm	15 mm
Setting distance	0 to 5.6 mm	0 to 10.5 mm
Hysteresis	≤ 20 % of sensing distance	
Standard sensing target: iron	50 × 50 × 1 mm	
Response frequency ⁰²⁾	50 Hz	
Affection by temperature	≤ ± 20 % for sensing distance at ambient temperature 20 °C	
Indicator	Operation indicator (red)	
Certification	ERL	ERL
Unit weight (package)	≈ 76 g (≈ 88 g)	≈ 206 g (≈ 243 g)

01) Based on grounding status of the standard target.

02) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	12 - 24 VDC≡ (ripple P-P: ≤ 10 %), operating voltage: 10 - 30 VDC≡
Current consumption	≤ 15 mA
Control output	≤ 200 mA
Residual voltage	≤ 1.5 V
Protection circuit	Surge protection circuit, reverse polarity protection
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case : 1,500 VAC~ 50 / 60Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	DIA. of sensing side Ø 18 mm: IP66 (IEC standard) / DIA. of sensing side Ø 30 mm: IP65 (IEC standard)
Connection	Cable type
Cable spec.	DIA. of sensing side Ø 18 mm: Ø 4 mm, 3-wire, 2 m DIA. of sensing side Ø 30 mm: Ø 5 mm, 3-wire, 2 m
Wire spec.	AWG 22 (0.08 mm, 60-core), insulator DIA.: Ø 1.25 mm
Material	Standard type cable (black): polyvinyl chloride (PVC)
DIA. of sensing side Ø 18 mm	Case / Nut: PA6
DIA. of sensing side Ø 30 mm	Case / Nut: nickel-plated brass, washer: nickel-plated iron, sensing side: PBT



View product detail

Cylindrical Capacitive Proximity Sensors

(AC 2-Wire)

CR Series



Features

- Detect various materials including metal, iron, stone, plastic, water, and grain
- Built-in sensitivity adjuster for convenient configuration
- Operation indicator (red)
- Ideal for level detection and position control

* Sold Separately

- Fixing bracket: P90-R□
- Spatter protection cover: P90-M□

Specifications

Installation	Non-flush type	
Model	CR18-8A□	CR30-15A□
DIA. of sensing side	Ø 18 mm	Ø 30 mm
Sensing distance ⁰¹⁾	8 mm	15 mm
Setting distance	0 to 5.6 mm	0 to 10.5 mm
Hysteresis	≤ 20 % of sensing distance	
Standard sensing target: iron	50 × 50 × 1 mm	
Response frequency ⁰²⁾	20 Hz	
Affection by temperature	≤ ± 20 % for sensing distance at ambient temperature 20 °C	
Indicator	Operation indicator (red)	
Certification	CE	CE
Unit weight (package)	≈ 70 g (≈ 82 g)	≈ 200 g (≈ 237 g)

01) Based on grounding status of the standard target.

02) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

Power supply	100 -240 VAC~ 50 / 60 Hz, operating voltage: 85 - 264 VAC~
Leakage current	≤ 2.2 mA
Control output	≤ 5 to 200 mA
Residual voltage	≤ 20 V
Protection circuit	Surge protection circuit
Insulation resistance	≥ 50 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case : 1,500 VAC~ 50 / 60Hz for 1 min
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection structure	DIA. of sensing side Ø 18 mm: IP66 (IEC standard) / DIA. of sensing side Ø 30 mm: IP65 (IEC standard)
Connection	Cable type
Cable spec.	DIA. of sensing side Ø 18 mm: Ø 4 mm, 2-wire, 2 m DIA. of sensing side Ø 30 mm: Ø 5 mm, 2-wire, 2 m
Wire spec.	AWG 22 (0.08 mm, 60-core), insulator DIA.: Ø 1.25 mm
Material	Standard type cable (black): polyvinyl chloride (PVC)
DIA. of sensing side Ø 18 mm	Case / Nut: PA6
DIA. of sensing side Ø 30 mm	Case / Nut: nickel-plated brass, washer: nickel-plated iron, sensing side: PBT



View product detail

U-Shaped Magnetic Proximity Sensors


MU Series



Features

- Non-voltage magnetic detection method
- Two wiring specifications of cable / cable connector type
- Protection structure: IP67

Specifications

Model	MU-1A-30-□	MU-1B-30-□
Contact	N.O.	N.C.
Operating distance ⁰¹⁾	OFF → ON	± 10 mm
	ON → OFF	± 20 mm
Standard sensing target	Steel plate - a galvanized steel sheet 1.6t	
Operating time	≤ 2 ms	
Release time	≤ 1 ms	
Operating frequency	≤ 500 Hz	
Certification	CE 	
Unit weight (package)	Cable type: ≈ 132.5 g (≈ 172.3 g) Cable connector type: ≈ 107 g (≈ 147.2 g)	

01) Rated at the ambient temperature of 23 °C. It can be differed up to ±20 % according to the ambient temperature.

Switching voltage	≤ 24 VDC
Life expectancy	≥ 100 million times (at a resistive load of 5 VDC=10 mA)
Insulated resistance	≥ 1,000 MΩ (500 VDC= megger)
Dielectric strength	Between the charging part and the case: 500 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 65 °C, storage: -10 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standard)
Connection	Cable type / Cable connector type
Cable	Cable type: Ø 4, 2-wire, 2 m (UL Style 20276, AWG22) Cable connector type: Ø 4, 2-wire, 0.5 m (UL Style 20276, AWG22)
Material	Cover/Case: PC (915R)

[Applied REED SWITCH]

Model	ORD324-10-15 (STANDEX MEDER)
Contact	A (SPST-NO: single pole, single throw, normally open)
Contact rating ⁰¹⁾	≤ 10 W/VA
Voltage	Switching: ≤ 200 VDC, Breakdown: ≥ 250 VDC
Current	Switching: ≤ 0.5 A, Carry: ≤ 1.0 A
Ambient temperature	-40 to 125 °C, storage : -65 to 125 °C ⁰²⁾
Material	Body: glass, leads: tin-plated Ni-Fe wire

01) Switching voltage and current should never exceed the wattage rating.

02) Long time exposure at elevated temperature may degrade solderability of the leads.



View product detail



A10. Linear Positioning Sensors

Linear positioning sensors are non-contact sensors that can detect linear movement and position of metal objects within the detection range.

A10-1 Inductive Linear Positioning Sensors

LPD Series

Inductive Linear Positioning Sensors

Inductive Linear Positioning Sensors

LPD Series





Features

- Detect linear movement of metallic objects using inductive detection method
- PCB circuit pattern to minimize risk of damage from impact
- Detection range: 14 mm, 103 mm
- Analog voltage / current output, IO-Link output
- Various functions: teaching mode, OOR (Out-of Range) output function, etc.
- Oil resistant cable
- Protection structure: IP67

* Sold Separately

- M8 Connector cable: C□D4-□EB, C□DH4-□EB
- M12 Connector cable: C□D4-□, C□DH4-□
- Target: TG-LPD-T8

Specifications

Model	LPD-14-V-□	LPD-14-C-□	LPD-14-IL2-□	LPD-103-□	LPD-103-IL2-□
Detection range	14 mm			103 mm	
Detection object distance	0.5 to 2.0 mm			0.5 to 3.0 mm	
Function	Positioning				
Detection type	Inductive				
Linearity	± 250 μm			± 400 μm	
Repeatability	± 80 μm				
Response time	≤ 30 ms				
Power supply	15 - 30 VDC≡ , Rated voltage: 24 VDC≡				
Max. power ripple	10 % of rated voltage			10 % of rated voltage	15 % of rated voltage
Output spec. ⁰¹⁾	0 - 10 VDC≡	DC 4 - 20 mA	IO-Link COM2	0 - 10 VDC≡ DC 4 - 20 mA	IO-Link COM2
OOR ⁰²⁾ output	10 VDC≡	20 mA	IO-Link COM2	11 ± 0.5 VDC≡ DC 24 ± 2.5 mA	IO-Link COM2
Load resistance	≥ 2,000 Ω	≤ 500 Ω	-	Voltage: ≥ 2,000 Ω Current: ≤ 500 Ω	-
Current consumption (no load)	≤ 20 mA			≤ 30 mA	≤ 35 mA
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)				
Dielectric strength	Between the charging part and the case: 500 VAC~ 50 / 60 Hz for 1 min				
Vibration	1.0 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 30 min.				
Shock	Half-sinus, 30 g , 11 ms (EN 60068-2-27, Shock)				
Protection circuit	Output short over current protection circuit, reverse polarity protection circuit				
Ambient temp. ⁰³⁾	-25 to 70 °C, storage: -25 to 70 °C (no freezing or condensation)			-25 to 85 °C, storage: -25 to 85 °C (no freezing or condensation)	
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)				
Protection rating	IP67 (IEC standard)				
Standard detection object material	Steel for general structure (SS275, SM45C, etc.).				
Material	Housing, sensing part: PBT				
Certification	CE UK   IO-Link ⁰⁴⁾				
Comm. protocol	IO-Link				

01) For more information, refer to 'Analog Output Feature Data'.

02) Out of Range. When there is no detection object within the detection range or teaching range

03) UL approved ambient temperature: 70 °C

04) It is applied to IO-Link communication output model.



View product detail

Model	LPD-14-□-□		LPD-103-□-□	
Connection type	Cable type	Cable connector type	Connector type	
Connector spec.	-	M12 4-pin plug	M8 4-pin plug	M12 4-pin plug
Cable spec.	Ø 4 mm, 4-wire (oil resistant PVC)	Ø 4 mm, 4-wire (oil resistant PVC)	-	
Cable length	2 m	300 mm		
Wire spec.	AWG 23 (0.08 mm, 60-core)	AWG 23 (0.08 mm, 60-core)		
Insulator diameter	Ø 1.28 mm	Ø 1.28 mm		
Unit weight (package)	≈ 67.74 g (≈ 76.7 g)	≈ 33.06 g (≈ 42.6 g)	≈ 49.4 g (≈ 74.8 g)	≈ 53.5 g (≈ 79.0 g)

Software

Download the installation file and the manuals from the Autonics website.

[atIOLink]

atIOLink with purposes for setting, diagnosis, and maintenance of IO-Link device via IODD file is provided as the Port and Device Configuration Tool (PDCT).

[IODD (IO Device Description)]

This file contains information such as manufacturer information, process data, diagnostic data, and parameter setting of a sensor using IO-Link communication. By uploading the IODD file to PDCT Software, you can check the setting and communication data according to the user interface. Download the IODD file from the Autonics website.



A11. Rotary Encoders

Rotary encoders are used to electronically monitor the position of a rotating shaft by converting shaft rotation into electronic pulses.

A11-1	Incremental	E18 Series	18 mm Diameter Incremental Rotary Encoders
		E20 Series	20 mm Diameter Incremental Rotary Encoders
		E30 Series	30 mm Diameter Incremental Rotary Encoders
		E40 Series	40 mm Diameter Incremental Rotary Encoders
		E50 Series	50 mm Diameter Incremental Rotary Encoders
		E58 Series	58 mm Diameter Incremental Rotary Encoders
		E60 Series	60 mm Diameter Incremental Rotary Encoders
		E68 Series	68 mm Diameter Incremental Rotary Encoders
		E80 Series	80 mm Diameter Incremental Rotary Encoders
		E88 Series	88 mm Diameter Incremental Rotary Encoders
		E100 Series	100 mm Diameter Incremental Rotary Encoders
		ENA Series	Side Mount Type Incremental Rotary Encoders
		ENC Series	Wheel Type Incremental Rotary Encoders
A11-2	Incremental (Sine Wave)	E58-A Series	58 mm Diameter Sine Wave Incremental Rotary Encoders
		E60-A Series	60 mm Diameter Sine Wave Incremental Rotary Encoders
A11-3	Absolute (Single-Turn)	EP50 Series	50 mm Diameter Absolute Single-Turn Rotary Encoders (Optical)
		EP58 Series	58 mm Diameter Absolute Single-Turn Rotary Encoders (Optical)
		ENP Series	60 mm Diameter Absolute Single-Turn Rotary Encoders (Optical)
		EWLS50 Series	50 mm Wire-Type Linear Scale Absolute Encoders (Optical)
		MGA50 Series	50 mm Diameter Absolute Single-Turn Rotary Encoders (Magnetic)
A11-4	Absolute (Multi-Turn)	EPM50 Series	50 mm Diameter Absolute Multi-Turn Rotary Encoders (Optical)
		MGAM50 Series	50 mm Diameter Absolute Multi-Turn Rotary Encoders (Magnetic)
A11-5	Manual Handle	ENH Series	Manual Handle Type Pulse Generators
		ENHP Series	Portable Manual Handle Type Pulse Generators
A11-6	Flexible Coupling	ERB Series	Flexible Shaft Coupling

18 mm Diameter Incremental Rotary Encoders

E18 Series



Features

- Ultra-compact (Ø 18 mm) housing and ultra-lightweight (12 g) design
- Easy installation in tight or limited spaces
- Low shaft moment of inertia
- Various resolutions:
100, 200, 300, 400 pulses per revolution
- Power supply:
5 VDC± 5%

Specifications

Model	E18S□-□-1-N-5-□	E18S□-□-1-V-5-□
Resolution	100 / 200 / 300 / 400 PPR model	
Control output	NPN open collector output	Voltage output
Output phase	A	
Inflow current	≤ 30 mA	-
Residual voltage	≤ 0.4 VDC±	≤ 0.4 VDC±
Outflow current	-	≤ 10 mA
Response speed ⁰¹⁾	≤ 1 μs	
Max. response freq.	25 kHz	
Max. allowable revolution ⁰²⁾	6,000 rpm	
Starting torque	≤ 9.8 × 10 ⁻⁴ N m	
Inertia moment	≤ 0.5 g·cm ² (5 × 10 ⁻⁸ kg·m ²)	
Allowable shaft load	Radial: ≤ 200 gf, Thrust: ≤ 200 gf	
Unit weight (packaged)	Shaft outer diameter Ø 2 mm model: ≈ 12 g (≈ 35.4 g) Shaft outer diameter Ø 2.5 mm model: ≈ 12 g (≈ 34.2 g)	
Approval	CE UK RoHS EAC	

01) Based on cable length: 1 m, I sink: 20 mA

02) Select resolution to satisfy Max. allowable revolution ≥ Max. response revolution

[max. response revolution (rpm) = $\frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$]

Power supply	5 VDC± 5% (ripple P-P: ≤ 5%)
Current consumption	≤ 50 mA (no load)
Insulation resistance	≥ 100 MΩ (500 VDC± megger)
Dielectric strength	Between the charging part and the case: 500 VAC~ 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 50 G
Ambient temperature	-10 to 70 °C, storage: -20 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection	Axial / Radial cable type model
Cable spec.	Ø 1.28 mm, 3-wire, 150 mm, flat ribbon cable
Wire spec.	AWG26 (0.16 mm, 7-core), insulator diameter: Ø 1.28 mm



View product detail

20 mm Diameter Incremental Rotary Encoders

E20 Series



Features

- Ultra-compact (Ø 20 mm) housing and lightweight (35 g) design
- Easy installation in tight or limited spaces
- Low shaft moment of inertia
- Various resolutions: 100, 200, 320, 360 pulses per revolution
- Various control output options
- Power supply: 5 VDC \pm 5%, 12 VDC \pm 5%

Specifications

Model	E20□□-□-3-N-□-□	E20□□-□-3-V-□-□	E20□□-□-6-L-5-□
Resolution	100 / 200 / 320 / 360 PPR model		
Control output	NPN open collector output	Voltage output	Line driver output
Output phase	A, B, Z	A, B, Z	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Inflow current	≤ 30 mA	-	≤ 20 mA
Residual voltage	≤ 0.4 VDC \equiv	≤ 0.4 VDC \equiv	≤ 0.5 VDC \equiv
Outflow current	-	≤ 10 mA	≤ -20 mA
Output voltage	-	-	≥ 2.5 VDC \equiv
Response speed ⁰¹⁾	≤ 1 μ s		≤ 0.5 μ s
Max. response frequency	100 kHz		
Max. allowable revolution ⁰²⁾	6,000 rpm		
Starting torque	$\leq 5 \times 10^{-4}$ N m		
Inertia moment	≤ 0.5 g \cdot cm ² (5×10^{-8} kg \cdot m ²)		
Allowable shaft load	Radial: ≤ 200 gf, Thrust: ≤ 200 gf		
Unit weight	≈ 35 g		
Approval	CE ENEC	CE ENEC	ENEC

01) Based on cable length: 1 m, I sink: 20 mA

02) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Model	E20□□-□-3-N-□-□	E20□□-□-3-V-□-□	E20□□-□-6-L-5-□
Power supply	5 VDC \pm 5% (ripple P-P: $\leq 5\%$) / 12 VDC \pm 5% (ripple P-P: $\leq 5\%$) model		5 VDC \pm 5% (ripple P-P: $\leq 5\%$)
Current consumption	≤ 60 mA (no load)		≤ 50 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)		
Dielectric strength	Between the charging part and the case: 500 VAC \sim 50 / 60 Hz for 1 minute		
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	≤ 50 G		
Ambient temp.	-10 to 70 °C, storage: -20 to 80 °C (no freezing or condensation)		
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)		
Protection rating	IP50 (IEC standard)		
Connection	Axial / Radial cable type model		
Cable spec.	Ø 3 mm, 5-wire (Line driver output: 8-wire), 1 m, shield cable		

View product detail



Shaft Type



Blind Hollow
Shaft Type

30 mm Diameter Incremental Rotary Encoders

E30 Series



Features

- Compact Ø 30 mm housing, Ø 4 mm solid shaft
- Easy installation in tight or limited spaces
- Low shaft moment of inertia
- Various resolutions: up to 3000 pulses per revolution
- Various control output options
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

* Sold Separately

- M17 connector cable: CID6S-□, CID9S-□

Specifications

Model	E30S4-□- 3-T-□-□	E30S4-□- 3-N-□-□	E30S4-□- 3-V-□-□	E30S4-□- 6-L-5-□
Resolution	100 / 200 / 360 / 500 / 1,000 / 1,024 / 3,000 PPR model			
Control output	Totem pole output	NPN open collector output	Voltage output	Line driver output
Output phase	A, B, Z	A, B, Z	A, B, Z	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Inflow current	≤ 30 mA	≤ 30 mA	-	≤ 20 mA
Residual voltage	≤ 0.4 VDC \pm	≤ 0.4 VDC \pm	≤ 0.4 VDC \pm	≤ 0.5 VDC \pm
Outflow current	≤ 10 mA	-	≤ 10 mA	≤ -20 mA
Output voltage (5 VDC \pm)	≥ (power supply -2.0) VDC \pm	-	-	≥ 2.5 VDC \pm
Output voltage (12 - 24 VDC \pm)	≥ (power supply -3.0) VDC \pm	-	-	-
Response speed ⁰¹⁾	≤ 1 μs		≤ 1 μs ⁰²⁾ ≤ 2 μs ⁰³⁾	≤ 0.5 μs
Max. response freq.	300 kHz			
Max. allowable revolution ⁰⁴⁾	5,000 rpm			
Starting torque	≤ 0.002 N m			
Inertia moment	≤ 20 g·cm ² (2 × 10 ⁻⁶ kg·m ²)			
Allowable shaft load	Radial: ≤ 2 kgf, Thrust: ≤ 1 kgf			
Unit weight	≈ 80 g			
Approval	CE ENEC	CE ENEC	CE ENEC	ENEC

01) Based on cable length: 2 m, I sink: 20 mA

02) Based on power supply: 5 VDC \pm , output resistance: 820 Ω

03) Based on power supply: 12 - 24 VDC \pm , output resistance: 4.7 kΩ

04) Select resolution to satisfy Max. allowable revolution ≥ Max. response revolution

$$[\text{max.response revolution (rpm)}] = \frac{\text{max.response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Model	E30S4-□- 3-T-□-□	E30S4-□- 3-N-□-□	E30S4-□- 3-V-□-□	E30S4-□- 6-L-5-□
Power supply	5 VDC \pm 5% (ripple P-P: ≤ 5%) / 12-24 VDC \pm 5% (ripple P-P: ≤ 5%) model			5 VDC \pm 5% (ripple P-P: ≤ 5%)
Current consumption	≤ 80 mA (no load)			≤ 50 mA (no load)
Insulation resistance	≥ 100 MΩ (500 VDC \pm megger)			
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.			
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Shock	≤ 50 G			
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)			
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)			
Protection rating	IP50 (IEC standard)			
Connection	Axial cable type / cable connector type model			
Cable spec.	Ø 5 mm, 5-wire (Line driver output: 8-wire), shield cable cable type: 2 m, cable connector type: 250 mm			
Wire spec.	AWG24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm			
Connector spec.	M17 6-pin plug type			M17 9-pin plug type



View product detail

50 mm Diameter Incremental Rotary Encoders

E50 Series






Features

- Ø 50 mm housing, Ø 8 mm solid shaft
- Accurate measurement of angle, position, revolution, speed, acceleration, and distance
- Cable type, cable connector type, axial / radial connector types available
- Various resolutions:
1 to 8000 pulses per revolution
- Various control output options
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

* Sold Separately

- M17 connector cable: CID6S-□, CID9S-□

Specifications

Model	E50S8-□-□-□-□-□	E50S8-□-□-□-□-□	E50S8-□-□-□-□-□	E50S8-□-□-□-□-□
Resolution	1 / 2 / 5 PPR ⁰¹⁾ 10 to 8,000 PPR model			
Control output	Totem pole output	NPN open collector output	Voltage output	Line driver output
Output phase	A, B, Z	A, B, Z	A, B, Z	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Inflow current	\leq 30 mA	\leq 30 mA	-	\leq 20 mA
Residual voltage	\leq 0.4 VDC \pm	\leq 0.4 VDC \pm	\leq 0.4 VDC \pm	\leq 0.5 VDC \pm
Outflow current	\leq 10 mA	-	\leq 10 mA	\leq -20 mA
Output voltage (5 VDC \pm)	\geq (power supply -2.0) VDC \pm	-	-	\geq 2.5 VDC \pm
Output voltage (12 - 24 VDC \pm)	\geq (power supply -3.0) VDC \pm	-	-	\geq (power supply -3.0) VDC \pm
Response speed ⁰²⁾	\leq 1 μ s			\leq 0.5 μ s
Max. response freq.	300 kHz			
Max. allowable revolution ⁰³⁾	5,000 rpm			
Approval	CE  ENEC	CE  ENEC	CE  ENEC	CE  ENEC

01) Depending on the control output, only A, B or A, \bar{A} , B, \bar{B} are output.

02) Based on cable length: 2 m, I sink: 20 mA

03) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution

[max. response revolution (rpm)] = $\frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$

Connection	Axial cable type	Axial cable connector type	Axial connector type	Radial connector type
Starting torque	\leq 0.007 N m		\leq 0.078 N m	
Inertia moment	\leq 80 g·cm ² (8×10^{-6} kg·m ²)		\leq 400 g·cm ² (4×10^{-5} kg·m ²)	
Allowable shaft load	Radial: \leq 10 kgf, Thrust: \leq 2.5 kgf			
Unit weight (packaged)	\approx 275 g (\approx 363 g)		\approx 180 g (\approx 268 g)	
Power supply	5 VDC \pm 5% (ripple P-P: \leq 5%) / 12 - 24 VDC \pm 5% (ripple P-P: \leq 5%) model			
Current consumption	Totem pole, NPN open collector, Voltage output: \leq 80 mA (no load) Line driver output: \leq 50 mA (no load)			
Insulation resistance	\geq 100 M Ω (500 VDC \pm megger)			
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.			
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Shock	\leq 75 G			
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)			
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)			
Protection rating	Axial cable type / cable connector type: IP50 (IEC standard) ⁰¹⁾ Axial / Radial connector type: IP64 (IEC standard)			
Cable spec.	Ø 5 mm, 5-wire (Line driver output: 8-wire), shield cable cable type: 2 m, cable connector type: 250 mm			
Wire spec.	AWG24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm			
Connector spec.	Totem pole, NPN open collector, Voltage output: M17 6-pin plug type Line driver output: M17 9-pin plug type			

01) Protection structure IP64 option is also available to order.

(starting torque: \leq 0.078 N m, inertia moment: \leq 400 g·cm² (4×10^{-5} kg·m²))



View product detail

58 mm Diameter Incremental Rotary Encoders

E58 Series



Features

- Ø 58 mm flange incremental rotary encoders
- Accurate measurement of angle, position, revolution, speed, acceleration, and distance
- Shaft, hollow shaft, blind hollow shaft models available
- Cable type, cable connector type, axial / radial connector types available
- Various resolutions:
1 to 8000 pulses per revolution
- Various control output options
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

* Sold Separately

- M17 connector cable: CID6S-□, CID9S-□

View product detail



Clamping
Shaft Type



Synchro
Shaft Type



Hollow Shaft Type



Blind Hollow
Shaft Type

Specifications

Model	E58□□-□-□-□-□-□ □-T-□-□	E58□□-□-□-□-□-□ □-N-□-□	E58□□-□-□-□-□-□ □-V-□-□	E58□□-□-□-□-□-□ □-L-□-□
Resolution	1 / 2 / 5 / 12 PPR ⁰¹⁾ 10 to 8,000 PPR model			
Control output	Totem pole output	NPN open collector output	Voltage output	Line driver output
Output phase	A, B, Z	A, B, Z	A, B, Z	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Inflow current	≤ 30 mA	≤ 30 mA	-	≤ 20 mA
Residual voltage	≤ 0.4 VDC \pm	≤ 0.4 VDC \pm	≤ 0.4 VDC \pm	≤ 0.5 VDC \pm
Outflow current	≤ 10 mA	-	≤ 10 mA	≤ -20 mA
Output voltage (5 VDC \pm)	≥ (power supply -2.0) VDC \pm	-	-	≥ 2.5 VDC \pm
Output voltage (12 - 24 VDC \pm)	≥ (power supply -3.0) VDC \pm	-	-	≥ (power supply -3.0) VDC \pm
Response speed ⁰²⁾	≤ 1 μs			≤ 0.5 μs
Max. response freq.	300 kHz			
Max. allowable revolution ⁰³⁾	5,000 rpm			
Approval	CE UK ENEC	CE UK ENEC	CE UK ENEC	ENEC

01) Depending on the control output, only A, B or A, \bar{A} , B, \bar{B} are output.

02) Based on cable length: 2 m, I sink: 20 mA

03) Select resolution to satisfy Max. allowable revolution ≥ Max. response revolution.

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Shaft type	Shaft clamping type	Shaft synchro type	Hollow type	Hollow Built-in type
Starting torque	≤ 0.004 N m		≤ 0.009 N m	
Inertia moment	≤ 15 g·cm ² (1.5 × 10 ⁻⁶ kg·m ²)		≤ 20 g·cm ² (2 × 10 ⁻⁶ kg·m ²)	
Allowable shaft load	Radial: ≤ 10 kgf, Thrust: ≤ 2.5 kgf		Radial: ≤ 2 kgf, Thrust: ≤ 1 kgf	
Unit weight (packaged)	Varies according to connection type			
Cable type, cable connector type	≈ 310 g (≈ 420 g)	≈ 285 g (≈ 395 g)	≈ 270 g (≈ 380 g)	≈ 270 g (≈ 380 g)
Connector type	≈ 230 g (≈ 340 g)	≈ 205 g (≈ 315 g)	-	≈ 200 g (≈ 310 g)
Power supply	5 VDC \pm 5% (ripple P-P: ≤ 5%) / 12 - 24 VDC \pm 5% (ripple P-P: ≤ 5%) model			
Current consumption	Totem pole, NPN open collector, Voltage output: ≤ 80 mA (no load) Line driver output: ≤ 50 mA (no load)			
Insulation resistance	≥ 100 MΩ (500 VDC \pm megger)			
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.			
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Shock	≤ 75 G			
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)			
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)			
Protection rating	IP50 (IEC standard)			
Connection	Shaft type, Hollow Built-in type : Axial cable type / Axial cable connector type / Axial connector type / Radial connector type model Hollow type: Radial cable type / Radial cable connector type model			
Cable spec.	Ø 5 mm, 5-wire (Line driver output: 8-wire), shield cable cable type: 2 m, cable connector type: 250 mm			
Wire spec.	AWG24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm			
Connector spec.	Totem pole, NPN open collector, Voltage output: M17 6-pin plug type Line driver output: M17 9-pin plug type			

60 mm Diameter Incremental Rotary Encoders

E60 Series



Features

- Ø 60 mm housing, Ø 20 mm hollow shaft
- Accurate measurement of angle, position, revolution, speed, acceleration, and distance
- Various resolutions:
up to 8192 pulses per revolution
- Various control output options
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

* Sold Separately

- M17 connector cable: CID6S-□, CID9S-□

Specifications

Model	E60H20-□-3-T-□-□	E60H20-□-3-N-□-□	E60H20-□-3-V-□-□	E60H20-□-6-L-□-□
Resolution	100 / 1,024 / 5,000 / 8,192 PPR model			
Control output	Totem pole output	NPN open collector output	Voltage output	Line driver output
Output phase	A, B, Z	A, B, Z	A, B, Z	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Inflow current	≤ 30 mA	≤ 30 mA	-	≤ 20 mA
Residual voltage	≤ 0.4 VDC \pm	≤ 0.4 VDC \pm	≤ 0.4 VDC \pm	≤ 0.5 VDC \pm
Outflow current	≤ 10 mA	-	≤ 10 mA	≤ -20 mA
Output voltage (5 VDC \pm)	≥ (power supply -2.0) VDC \pm	-	-	≥ 2.5 VDC \pm
Output voltage (12 - 24 VDC \pm)	≥ (power supply -3.0) VDC \pm	-	-	≥ (power supply -3.0) VDC \pm
Response speed ⁰¹⁾	≤ 1 μs			≤ 0.5 μs
Max. response frequency	300 kHz			
Max. allowable revolution ⁰²⁾	6,000 rpm			
Starting torque	≤ 0.0147 N m			
Inertia moment	≤ 110 g·cm ² (11 × 10 ⁻⁶ kg·m ²)			
Allowable shaft load	Radial: ≤ 5 kgf, Thrust: ≤ 2.5 kgf			
Unit weight (packaged)	≈ 300 g (≈ 397 g)			
Approval	CE ENEC	CE ENEC	CE ENEC	ENEC

01) Based on cable length: 2 m, I sink: 20 mA

02) Select resolution to satisfy Max. allowable revolution ≥ Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Power supply	5 VDC \pm 5% (ripple P-P: ≤ 5%) / 12 - 24 VDC \pm 5% (ripple P-P: ≤ 5%) model
Current consumption	Totem pole, NPN open collector, Voltage output: ≤ 80 mA (no load) Line driver output: ≤ 50 mA (no load)
Insulation resistance	≥ 100 MΩ (500 VDC \pm megger)
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 100 G
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection	Radial cable type / Cable connector type model
Cable spec.	Ø 5 mm, 5-wire (line driver output: 8-wire), shield cable cable type: 2 m, cable connector type: 250 mm
Wire spec.	AWG24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm
Connector spec.	Totem pole, NPN open collector, Voltage output: M17 6-pin plug type Line driver output: M17 9-pin plug type



View product detail

68 mm Diameter Incremental Rotary Encoders

E68 Series



Features

- Ø 68 mm housing, Ø 15 mm solid shaft
- High-strength shaft
(radial load: 20 kgf, thrust load: 10 kgf)
- 180 kHz response frequency
- Radial connector type
- Various resolutions:
500, 600, 1024 pulses per revolution
- Power supply:
5 VDC \pm 5%
- Protection structure: IP65

Specifications

Model	E68S15-□-6-L-5
Resolution	500 / 600 / 1,024 PPR model
Control output	Line driver output
Output phase	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Inflow current	≤ 20 mA
Residual voltage	≤ 0.5 VDC \equiv
Outflow current	≤ -20 mA
Output voltage	≥ 2.5 VDC \equiv
Response speed ⁰¹⁾	≤ 0.5 μ s
Max. response freq.	180 kHz
Max. allowable revolution ⁰²⁾	6,500 rpm
Starting torque	≤ 0.15 N m
Allowable shaft load	Radial: ≤ 20 kgf, Thrust: ≤ 10 kgf
Unit weight	≈ 550 g
Approval	CRC

01) Based on cable length: 1 m, I sink: 20 mA

02) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Power supply	5 VDC \equiv \pm 5% (ripple P-P: \leq 5%)
Current consumption	≤ 50 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 50 G
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP65 (IEC standard)
Connection	Radial connector type
Connector spec.	1-1/4-18UNEF-2A plug type (MS3102A20-29P, Yeonhab precision Co. LTD.)



View product detail

80 mm Diameter Incremental Rotary Encoders

E80 Series



Features

- Ø 80 mm housing,
Ø 30 mm / Ø 32 mm hollow shaft
- Install directly on motors or rotating shaft.
Couplings not required.
- Various resolutions:
up to 3200 pulses per revolution
- Various control output options
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

* Sold Separately

- M17 connector cable: CID6S-□, CID9S-□

Specifications

Model	E80H□-□- 3-T-□-□	E80H□-□- 3-N-□-□	E80H□-□- 3-V-□-□	E80H□-□- 6-L-5-□
Resolution	60 / 100 / 360 / 500 / 512 / 1,024 / 3,200 PPR model			
Control output	Totem pole output	NPN open collector output	Voltage output	Line driver output
Output phase	A, B, Z	A, B, Z	A, B, Z	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Inflow current	≤ 30 mA	≤ 30 mA	-	≤ 20 mA
Residual voltage	≤ 0.4 VDC \equiv	≤ 0.4 VDC \equiv	≤ 0.4 VDC \equiv	≤ 0.5 VDC \equiv
Outflow current	≤ 10 mA	-	≤ 10 mA	≤ -20 mA
Output voltage (5 VDC \equiv)	\geq (power supply -2.0) VDC \equiv	-	-	≥ 2.5 VDC \equiv
Output voltage (12 - 24 VDC \equiv)	\geq (power supply -3.0) VDC \equiv	-	-	\geq (power supply -3.0) VDC \equiv
Response speed ⁰¹⁾	≤ 1 μ s			≤ 0.5 μ s
Max. response freq.	200 kHz			
Max. allowable revolution ⁰²⁾	3,600 rpm			
Starting torque	≤ 0.02 N m			
Inertia moment	≤ 800 g \cdot cm ² (8×10^{-5} kg \cdot m ²)			
Allowable shaft load	Radial: ≤ 5 kgf, Thrust: ≤ 2.5 kgf			
Unit weight	≈ 560 g			
Approval	CE EMC	CE EMC	CE EMC	EMC

01) Based on cable length: 2 m, I sink: 20 mA

02) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Model	E80H□-□- 3-T-□-□	E80H□-□- 3-N-□-□	E80H□-□- 3-V-□-□	E80H□-□- 6-L-5-□
Power supply	5 VDC \pm 5% (ripple P-P: $\leq 5\%$) / 12 - 24 VDC \pm 5% (ripple P-P: $\leq 5\%$) model			
Current consumption	Totempole, NPN open collector, Voltage output: ≤ 80 mA (no load) Line driver output: ≤ 50 mA (no load)			
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)			
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min			
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Shock	≤ 75 G			
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)			
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)			
Protection rating	IP50 (IEC standard)			
Connection	Radial cable type / cable connector type model			
Cable spec.	Ø 5 mm, 5-wire (Line driver output: 8-wire), shield cable cable type: 2 m, cable connector type: 250 mm			
Wire spec.	AWG24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm			
Connector spec.	Totempole, NPN open collector, Voltage output: M17 6-pin plug type Line driver output: M17 9-pin plug type			



View product detail

88 mm Diameter Incremental Rotary Encoders

E88 Series



Features

- Ø 88 mm housing / Ø 30 mm hollow shaft
- Install directly on rotating shafts of elevator winding machines. No couplings required.
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%
- Output types: complementary, line driver

Specifications

Model	E88H30-1024-2-15	E88H30-1024-2-L-5
Resolution	1,024 PPR	
Control output	Complemental output	Line driver output
Output phase	A, B	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Inflow current	≤ 15 mA	≤ 20 mA
Residual voltage	≤ 2.0 VDC \equiv	≤ 0.5 VDC \equiv
Outflow current	≤ 15 mA	≤ -20 mA
Output voltage	≥ 10 VDC \equiv	≥ 2.5 VDC \equiv
Response speed	$\leq 1 \mu\text{s}$ ⁰¹⁾	$\leq 0.5 \mu\text{s}$ ⁰²⁾
Max. response freq.	150 kHz	
Max. allowable revolution ⁰³⁾	3,600 rpm	
Starting torque	≤ 0.06 N m	
Inertia moment	≤ 800 g·cm ² (8×10^{-5} kg·m ²)	
Allowable shaft load	Radial: ≤ 5 kgf, Thrust: ≤ 2.5 kgf	
Unit weight	≈ 1.45 kg (≈ 1.49 kg)	
Approval	CE ENEC	ENEC

01) Based on cable length: 8 m, load resistance: 1 k Ω

02) Based on cable length: 8 m, I sink: 20 mA

03) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

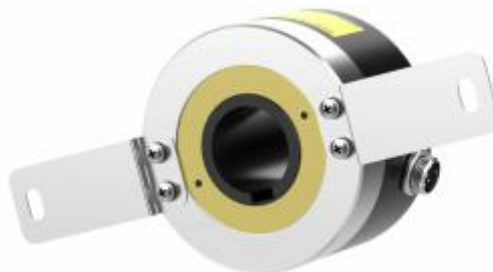
Model	E88H30-1024-2-15	E88H30-1024-2-L-5
Power supply	15 VDC \pm 5% (ripple P-P: $\leq 5\%$)	5 VDC \pm 5% (ripple P-P: $\leq 5\%$)
Current consumption	≤ 60 mA (no load)	≤ 50 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)	
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.	
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Shock	≤ 100 G	
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)	
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)	
Protection rating	IP50 (IEC standard)	
Connection	Radial cable type	
Cable spec.	Ø 6 mm, 6-wire (Line driver output: 8-wire), 8 m, shield cable	
Wire spec.	AWG24 (0.16 mm, 11-core), insulator diameter: Ø 1 mm	AWG24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm



View product detail

100 mm Diameter Incremental Rotary Encoders

E100 Series



Features

- Ø 100 mm housing, Ø 35 mm hollow shaft
- Ideal for application in elevator systems
- Various resolutions:
512, 1024, 10000 pulses per revolution
- Various control output options
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

Specifications

Model	E100H35-□-3-T-□	E100H35-□-3-N-□	E100H35-□-3-V-□	E100H35-□-6-L-□
Resolution	512 / 1,024 / 10,000 PPR model			
Control output	Totem pole output	NPN open collector output	Voltage output	Line driver output
Output phase	A, B, Z	A, B, Z	A, B, Z	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Inflow current	≤ 30 mA	≤ 30 mA	-	≤ 20 mA
Residual voltage	≤ 0.4 VDC \equiv	≤ 0.4 VDC \equiv	≤ 0.4 VDC \equiv	≤ 0.5 VDC \equiv
Outflow current	≤ 10 mA	-	≤ 10 mA	≤ -20 mA
Output voltage (5 VDC \equiv)	\geq (power supply -2.0) VDC \equiv	-	-	≥ 2.5 VDC \equiv
Output voltage (12 - 24 VDC \equiv)	\geq (power supply -3.0) VDC \equiv	-	-	\geq (power supply -3.0) VDC \equiv
Response speed ⁰¹⁾	≤ 1 μ s			≤ 0.5 μ s
Max. response freq.	300 kHz			
Max. allowable revolution ⁰²⁾	3,600 rpm			
Starting torque	≤ 0.03 N m			
Inertia moment	≤ 800 g \cdot cm ² (8×10^{-5} kg \cdot m ²)			
Allowable shaft load	Radial: ≤ 5 kgf, Thrust: ≤ 2.5 kgf			
Unit weight	≈ 1130 g (≈ 1400 g)			
Approval	CE UK ENEC	CE UK ENEC	CE UK ENEC	ENEC

01) Based on cable length: 2 m, I sink: 20 mA

02) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Power supply	5 VDC \pm 5% (ripple P-P: $\leq 5\%$) / 12 - 24 VDC \pm 5% (ripple P-P: $\leq 5\%$) model
Current consumption	Totem pole, NPN open collector, Voltage output: ≤ 80 mA (no load) Line driver output: ≤ 50 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency or 300 m/s ² 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 75 G
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection	Radial connector type
Cable spec.	Ø 5 mm, 5-wire (line driver output: Ø 6 mm, 8-wire), 2 m, shield cable
Wire spec.	AWG24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm
Connector spec.	Totem pole, NPN open collector, Voltage output: SCN-16-7P Line driver output: SCN-20-10P



View product detail

Side Mount Type Incremental Rotary Encoders


ENA Series



Features

- Die-cast external housing provides excellent immunity to impact
- Designed to mount directly onto frames
- Various resolutions:
1 to 5000 pulses per revolution
- Various control output options
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

Specifications

Model	ENA-□-□-T-□	ENA-□-□-N-□	ENA-□-□-V-□
Resolution	1 / 2 / 5 PPR ⁰¹⁾ 10 to 5,000 PPR model		
Control output	Totem pole output	NPN open collector output	Voltage output
Output phase	A, B / A, B, Z output model	A, B / A, B, Z output model	A, B / A, B, Z output model
Inflow current	≤ 30 mA	≤ 30 mA	-
Residual voltage	≤ 0.4 VDC \pm	≤ 0.4 VDC \pm	≤ 0.4 VDC \pm
Outflow current	≤ 10 mA	-	≤ 10 mA
Output voltage (5 VDC\pm)	≥ (power supply -2.0) VDC \pm	-	-
Output voltage (12 - 24 VDC\pm)	≥ (power supply -3.0) VDC \pm	-	-
Response speed⁰²⁾	≤ 1 μs		
Max. response freq.	300 kHz		
Max. allowable revolution⁰³⁾	5,000 rpm		
Starting torque	≤ 0.007 N m		
Inertia moment	≤ 80 g·cm ² (8 × 10 ⁻⁶ kg·m ²)		
Allowable shaft load	Radial: ≤ 10 kgf, Thrust: ≤ 2.5 kgf		
Unit weight	≈ 345 g		
Approval	CE  ENEC		

01) Depending on the control output, only A, B are output.

02) Based on cable length: 2 m, I sink: 20 mA

03) Select resolution to satisfy Max. allowable revolution ≥ Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

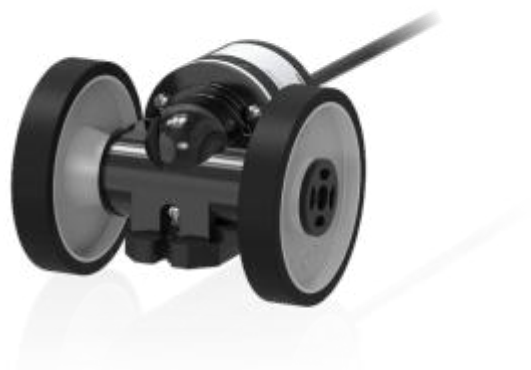
Power supply	5 VDC \pm 5% (ripple P-P: ≤ 5%) / 12 - 24 VDC \pm 5% (ripple P-P: ≤ 5%) model
Current consumption	≤ 80 mA (no load)
Insulation resistance	≥ 100 MΩ (500 VDC \pm megger)
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 minute
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 75 G
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection	Radial connector type
Cable spec.	Ø 5 mm, 2 m, shield cable A, B phase output model: 4-wire / A, B, Z phase output model: 5-wire
Wire spec.	AWG24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm
Connector spec.	A, B phase output model: SCN-16-4P socket type A, B, Z phase output model: SCN-16-5P socket type



View product detail

Wheel Type Incremental Rotary Encoders

ENC Series



Features

- Wheel type encoders ideal for measuring length or speed of continuously moving objects
- Output waveform of measured distance is proportional to International Weights and Measures (meters / inches)
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

* Sold Separately

- M17 connector cable: CID6S-□

Specifications

Model	ENC-1-□-T-□-□	ENC-1-□-N-□-□	ENC-1-□-V-□-□
Min. measuring unit [pulse]	1 mm / 1 cm / 1 m / 0.01 yd / 0.1 yd / 1 yd model		
Control output	Totem pole output	NPN open collector output	Voltage output
Output phase	A, B	A, B	A, B
Inflow current	≤ 30 mA	≤ 30 mA	-
Residual voltage	≤ 0.4 VDC \equiv	≤ 0.4 VDC \equiv	≤ 0.4 VDC \equiv
Outflow current	≤ 10 mA	-	≤ 10 mA
Output voltage (5 VDC \equiv)	\geq (power supply -2.0) VDC \equiv	-	-
Output voltage (12 - 24 VDC \equiv)	\geq (power supply -3.0) VDC \equiv	-	-
Response speed ⁰¹⁾	≤ 1 μ s		
Max. response freq.	180 kHz		
Max. allowable revolution ⁰²⁾	5,000 rpm		
Starting torque	Dependent on the coefficient of friction		
Unit weight	≈ 494 g		
Approval	CE UK ENEC	CE UK ENEC	CE UK ENEC

01) Based on cable length: 2 m, I sink: 20 mA

02) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution
[max. response revolution (rpm) = $\frac{\text{max. response frequency}}{\text{resolution}} \times 60$ sec]

Power supply	5 VDC \pm 5% (ripple P-P: $\leq 5\%$) / 12 - 24 VDC \pm 5% (ripple P-P: $\leq 5\%$) model
Current consumption	≤ 80 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 75 G
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection	Axial cable type / Cable connector type model
Cable spec.	$\varnothing 5$ mm, 4-wire, shield cable cable type: 2 m, cable connector type: 250 mm
Wire spec.	AWG24 (0.08 mm, 40-core), insulator diameter: $\varnothing 1$ mm
Connector spec.	M17 6-pin plug type



View product detail

58 mm Diameter Sine Wave Incremental Rotary Encoders


E58-A Series



Features

- Tapered shaft
- Analog sine wave operational amplifier (OP Amp.) output
- Power supply:
5 VDC \pm 5%

Specifications

Model	E58S9.25-2048-10-A-5-□
Resolution	2,048 PPR
Control output	Analog sine wave OP Amp. output
Output phase	A, \bar{A} , B, \bar{B} , Z, \bar{Z} , C, \bar{C} , D, \bar{D}
Output current	≤ 10 mA
Output voltage V_{p-p}	0.5 ± 0.1 VDC \equiv
DC OFFSET V_{ref}	2.5 ± 0.3 VDC \equiv
Max. response frequency	200 kHz
Max. allowable revolution	6,000 rpm
Shaft	Taper shaft $\varnothing 9.25$ mm, Taper 1 : 10
Starting torque	≤ 0.0098 N m
Inertia moment	≤ 15 g \cdot cm 2 (1.5×10^{-6} kg \cdot m 2)
Allowable shaft load	Radial: ≤ 10 kgf, Thrust: ≤ 2.5 kgf
Unit weight (packaged)	≈ 930 g (≈ 1.02 kg)
Approval	CE  ENEC
Power supply	5 VDC \equiv $\pm 5\%$ (ripple P-P: $\leq 5\%$)
Current consumption	≤ 120 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 750 VAC ~ 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 100 G
Ambient temp.	-20 to 100 °C, storage: -25 to 100 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection	Axial / Radial cable type model
Cable spec.	$\varnothing 6$ mm, 17-wire, 9 m, shield cable
Wire spec.	AWG28 (0.08 mm, 17-core), insulator diameter: $\varnothing 0.8$ mm



View product detail

60 mm Diameter Sine Wave Incremental Rotary Encoders

E60-A Series



Features

- Ø 60 mm housing, Ø 20 mm hollow shaft
- Analog sine wave operational amplifier (op-amp) output
- Power Supply:
5 VDC \pm 5%

Specifications

Model	E60H20-2048-10-A-5-□
Resolution	2,048 PPR
Control output	Analog sine wave OP Amp. output
Output phase	A, \bar{A} , B, \bar{B} , Z, \bar{Z} , C, \bar{C} , D, \bar{D}
Output current	≤ 10 mA
Output voltage V_{P-P}	0.5 ± 0.1 VDC \equiv
DC OFFSET $V_{DC\equiv}$	2.5 ± 0.3 VDC \equiv
Max. response frequency	200 kHz
Max. allowable revolution	6,000 rpm
Starting torque	≤ 0.02 N m
Inertia moment	≤ 110 g \cdot cm ² (11×10^{-6} kg \cdot m ²)
Allowable shaft load	Radial: ≤ 5 kgf, Thrust: ≤ 2.5 kgf
Unit weight (packaged)	≈ 720 g (≈ 750 g)
Approval	CE  ENEC
Power supply	5 VDC \pm 5% (ripple P-P: $\leq 5\%$)
Current consumption	≤ 120 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 100 G
Ambient temp.	-20 to 100 °C, storage: -25 to 100 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP40 (IEC standard)
Connection	Axial / Radial cable type model
Cable spec.	Ø 6 mm, 17-wire, 9 m, shield cable
Wire spec.	AWG28 (0.08 mm, 17-core), insulator diameter: Ø 0.8 mm



View product detail



58 mm Diameter Absolute Single-Turn Rotary Encoders (Optical)

EP58 Series



Features

- Ø 58 mm flange single-turn absolute rotary encoders
- Shaft, blind hollow shaft models available
- Various output codes available:
BCD, binary, Gray code
- Various resolutions:
up to 10-bit (1024 divisions)
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

Specifications

Model	EP58□-□-□□-N-□	EP58□-□-□□-P-□
Resolution ⁰¹⁾	≤ 1024 division	
Output code	BCD / Binary / Gray code model	
Control output	NPN open collector output	PNP open collector output
Inflow current	≤ 32 mA	-
Residual voltage	≤ 1 VDC \equiv	-
Outflow current	-	≤ 32 mA
Output voltage	-	≥ (power supply - 1.5) VDC \equiv
Response speed ⁰²⁾	T _{ON} ≤ 800 nsec, T _{OFF} ≤ 800 nsec	
Max. response freq.	35 kHz	
Max. allowable revolution ⁰³⁾	3,000 rpm	
Approval	CE UK ENEC	

01) Refer to resolution in 'Output Phase / Output Angle'

02) Based on cable length: 2 m, I sink = 32 mA

03) Select resolution to satisfy Max. allowable revolution ≥ Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Shaft type	Shaft clamping type	Shaft synchro type	Hollow Built-in type
Starting torque	≤ 0.004 N m		≤ 0.009 N m
Inertia moment	≤ 15 g·cm ² (1.5 × 10 ⁻⁶ kg·m ²)		≤ 20 g·cm ² (2 × 10 ⁻⁶ kg·m ²)
Allowable shaft load	Radial: ≤ 10 kgf, Thrust: ≤ 2.5 kgf		Radial: ≤ 2 kgf, Thrust: ≤ 1 kgf
Unit weight (packaged)	≈ 435 g (≈ 545 g)	≈ 415 g (≈ 525 g)	≈ 410 g (≈ 520 g)
Power supply	5 VDC \pm 5% (ripple P-P: ≤ 5%) / 12 - 24 VDC \pm 5% (ripple P-P: ≤ 5%) model		
Current consumption	≤ 100 mA (no load)		
Insulation resistance	≥ 100 MΩ (500 VDC \equiv megger)		
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.		
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	≤ 50 G		
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)		
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)		
Protection rating	IP50 (IEC standard)		
Connection	Axial cable type (cable gland)		
Cable spec.	Ø 7 mm, 15-wire, 2 m, shield cable		

View product detail



Clamping
Shaft Type



Synchro
Shaft Type



Hollow Shaft Type



Blind Hollow
Shaft Type

60 mm Diameter Absolute Single-Turn Rotary Encoders (Optical)

ENP Series



Features

- Ø 60 mm housing, Ø 10 mm solid shaft
- Output code: BCD code
- Various resolutions: up to 360 divisions
- Power supply:
5 VDC \pm 5%, 12 ~ 24 VDC \pm 5%

Specifications

Model	ENP-1□□□-□-N	ENP-1□□□-□-P
Resolution ⁰¹⁾	\leq 360 division	
Output code	BCD code	
Control output	NPN open collector output	PNP open collector output
Inflow current	\leq 32 mA	-
Residual voltage	\leq 1 VDC \approx	-
Outflow current	-	\leq 32 mA
Output voltage	-	\geq (power supply - 1.5) VDC \approx
Response speed ⁰²⁾	$T_{ON} \leq 800$ nsec, $T_{OFF} \leq 800$ nsec	
Max. response freq.	20 kHz	
Max. allowable revolution ⁰³⁾	3,600 rpm	
Starting torque	≤ 0.05 N m	
Inertia moment	≤ 300 g \cdot cm ² (3×10^{-5} kg \cdot m ²)	
Allowable shaft load	Radial: 10 kgf, Thrust: 2.5 kgf	
Unit weight (packaged)	≈ 400 g (≈ 478 g)	
Approval	EAC	

01) Refer to resolution in 'Output Phase / Output Angle'.

02) Based on cable length: 1 m, I sink = 32 mA

03) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Power supply	5 VDC \pm 5% (ripple P-P: $\leq 5\%$) / 12 ~ 24 VDC \pm 5% (ripple P-P: $\leq 5\%$) model
Current consumption	≤ 100 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \approx megger)
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	$\lesssim 75$ G
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection	Axial cable type
Cable spec.	Ø 8 mm, 12-wire, 1 m, double shield cable
Wire spec.	AWG24 (0.08 mm, 40-core), insulator diameter - power wire: Ø 1.5 mm, signal wire: Ø 1 mm



View product detail

50 mm Wire-Type Linear Scale Absolute Encoders (Optical)


EWLS50 Series



Features

- Resolution: 0.1 mm
- Maximum measurement range: 512 mm
- Various output code options:
Binary, Gray code

Specifications

Model	EWLS50-512-B-PN-24	EWLS50-512-G-PN-24
Measuring range	512 mm	
Max. output pulse	5,120 division / 512 mm	
Min. resolution	0.1 mm	
Accuracy	± 0.1 / 100 mm	
Response speed	≤ 500 mm / sec	
Wire movement limit when power is OFF ⁰¹⁾	≤ ± 20 mm	
Output code	Binary	Gray
Output signal	Data, Overflow alarm (OVF)	
Control output	Parallel NPN open collector output	
Inflow current	≤ 32 mA	
Residual voltage	≤ 1 VDC≡	
Output logic	Negative logic output	
Response speed ⁰²⁾	≤ 1 μs	
Input signal	Reset signal input (Reset)	
Input level	H: 5 - 24 VDC≡, L: 0 - 1.2 VDC≡	
Input logic	Low Active, OPEN or HIGH for common use	
Input time	≥ 100 ms	
Max. response freq.	50 kHz	
Wire tensile force	0.5 to 4 N (50 to 400 g·f)	
Unit weight	≈ 450 g	
Approval	CE  ENEC	

01) The product cannot process data when the power is OFF. It calibrates the data comparing values of before and after power ON status.
It shall be used on the condition that wire movement limit because proper data may not be available if any wire movement occurred over ±20mm from the position when power is off.

02) Based on cable length: 2 m, I sink = 32 mA

Power supply	12 - 24 VDC≡ ± 5% (ripple P-P: ≤ 5%)
Current consumption	≤ 150 mA (no load)
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 750 VAC~ 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Shock	≤ 50 G
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Connection	Axial cable type (cable gland)
Cable spec.	Ø 6 mm, 17-wire, 2 m, shield cable
Wire spec.	AWG28 (0.08 mm, 19-core), insulator diameter: Ø 0.8 mm
Material	Cap: SPCD, Body: A2024, Wire: SUS303



View product detail

50 mm Diameter Absolute Single-Turn Rotary Encoders (Magnetic)

MGA50 Series



Features

- High accuracy in harsh environments including shock, vibration, dust, and humidity (compared to optical encoders)
- Longer service life compared to optical encoders
- Various output code options: BCD, binary, Gray
- Various resolutions: up to 10-bit (1024 divisions)
- Power supply: 5 VDC \pm 5%, 12 - 24 VDC \pm 5%

Specifications

Model	MGA50S8-□-□□-N-□
Resolution ⁰¹⁾	≤ 1024 division
Output code	BCD / Binary / Gray code model
Control output	NPN open collector output
Inflow current	≤ 32 mA
Residual voltage	≤ 1 VDC \approx
Output logic	Negative logic output
Response speed ⁰²⁾	≤ 1 μs
Max. response freq.	30 kHz
Max. allowable revolution ⁰³⁾	3,000 rpm
Starting torque	≤ 0.007 N m
Inertia moment	≤ 80 g·cm ² (8 × 10 ⁻⁶ kg·m ²)
Allowable shaft load	Radial: 10 kgf, Thrust: 2.5 kgf
Unit weight (packaged)	≈ 270 g (≈ 400 g)
Approval	CE ENEC

01) Refer to resolution in 'Output Phase / Output Angle'.

02) Based on cable length: 2 m, I sink = 32 mA

03) Select resolution to satisfy Max. allowable revolution ≥ Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Power supply	5 VDC \pm 5% (ripple P-P: ≤ 5%) / 12 - 24 VDC \pm 5% (ripple P-P: ≤ 5%) model
Current consumption	≤ 60 mA (no load)
Insulation resistance	≥ 100 MΩ (500 VDC \approx megger)
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 75 G
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection	Axial (cable gland)
Cable spec.	Ø 6 mm, 17-wire, 2 m, shield cable
Wire spec.	AWG28 (0.08 mm, 17-core), insulator diameter: Ø 0.8 mm



View product detail

50 mm Diameter Absolute Multi-Turn Rotary Encoders (Optical)

EPM50 Series



Features

- Ø 50 mm housing, Ø 8 mm solid shaft
multi-turn absolute rotary encoders
- Output interface options:
Parallel, SSI (Synchronous Serial Interface)
- 23-bit (8,388,608) total resolution
 - 10-bit single-turn (1,024 divisions)
 - 13-bit multi-turn (8,192 revolutions)
- Zero-point reset with single-turn data reset
and multi-turn count reset functions
- Position memory backup
- CW / CCW direction setting function
- Overflow alarm (OVF) function
- Latch function (Parallel output type only)
- Protection structure: IP64

Specifications

Model	EPM50S8-1013-B-PN-24-□	EPM50S8-1013-B-S-24-□
Resolution	• Single-turn: 1024 division, 10 bit • Multi-turn: 8192 revolution, 13 bit	
Rotation limit when power OFF ⁰¹⁾	± 90°	
Output code	Binary 2 code	24 bit, Binary 2 code
Output signal	Single-turn data, Multi-turn count, Overflow alarm (OVF) ⁰²⁾	
Control output	Parallel NPN open collector output	SSI (Synchronous Serial Interface) Line driver output
Inflow current	≤ 32 mA	≤ 20 mA
Residual voltage	≤ 1 VDC≐	≤ 0.5 VDC≐
Outflow current	-	≤ -20 mA
Output voltage	-	≥ 2.5 VDC≐
Output logic	Negative logic output	-
Response speed ⁰³⁾	≤ 1 μs	-
Single-turn data reset ⁰⁴⁾ Multi-turn count reset ⁰⁵⁾ Direction Clear	Input level: 0 ~ 1 VDC≐ Input logic: Low Active, OPEN or HIGH in common use Input time: ≥ 100 ms	
Latch	Input level: 0 ~ 1 VDC≐ Input logic: Low Active, OPEN or HIGH in common use Input time: ≥ 500 μs	-
Clock	-	Input level: 5 VDC≐ ± 5% Input frequency: 100 kHz to 1 MHz
Max. response freq.	50 kHz	-
Max. allowable revolution ⁰⁶⁾	3,000 rpm	
Starting torque	≤ 0.0069 N m	
Inertia moment	≤ 40 g·cm ² (4 × 10 ⁻⁶ kg·m ²)	
Allowable shaft load	Radial: 10 kgf, Thrust: 2.5 kgf	
Unit weight (packaged)	≈ 475 g (≈ 560 g)	≈ 324 g (≈ 409 g)
Approval	CE ENEC	

01) It calibrates the multi-turn count by comparing single-turn data before/after power off without counting multi-turn count when power off. Correct multi-turn count cannot be obtained if a rotating operation exceeding ± 90° is performed at the rotation position when power off.

02) Outputs when multi-turn count is out of counting range (0 to 8191 revolution).

03) Based on cable length: 2 m, I sink = 32 mA

04) If the single-turn data reset signal is applied, the single-turn data will be initialized to 0.

05) If the multi-turn count reset signal is applied, the multi-turn count will be initialized to 0.

06) For parallel model Select resolution to satisfy Max. allowable revolution ≥ Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Power supply	12 ~ 24 VDC≐ ± 5% (ripple P-P: ≤ 5%)
Current consumption	Parallel NPN open collector output: ≤ 100 mA (no load) SSI Line driver output: ≤ 150 mA (no load)
Insulation resistance	≥ 100 MΩ (500 VDC≐ megger)
Dielectric strength	Between the charging part and the case: 750 VAC~ 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 50 G
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	Axial cable type: IP64 (IEC standard), Radial cable type: IP50 (IEC standard)
Connection	Axial / Radial cable type model (cable gland)
Cable spec.	Ø 6 mm, 2 m, shield cable Parallel NPN open collector output: 17-wire × 2, SSI Line driver output: 10-wire
Wire spec.	AWG28 (0.08 mm), insulator diameter: Ø 0.8 mm Parallel NPN open collector output: 17-core, SSI Line driver output: 19-core



View product detail

50 mm Diameter Absolute Multi-Turn Rotary Encoders (Magnetic)

MGAM50 Series



Features

- High accuracy in harsh environments including shock, vibration, dust, and humidity (compared to optical encoders)
- Longer service life compared to optical encoders
- Output code: binary
- Output interface options: Parallel, SSI (Synchronous Serial Interface)
- 23-bit (8,388,608) total resolution
 - 10-bit single-turn (1024 divisions)
 - 13-bit multi-turn (8192 revolutions)
- Power supply:
 - 12 - 24 VDC \pm 5%
- Overflow alarm (OVF) function

Specifications

Model	MGAM50S8-1013-B-F-PN-24	MGAM50S8-1013-B-F-S-24
Resolution	• Single-turn: 1024 division • Multi-turn: 8192 revolution	
Rotation limit when power OFF ⁰¹⁾	$\pm 90^\circ$	
Hysteresis	$\pm 0.1^\circ$	
Positioning error ⁰²⁾	± 1 bit (LSB: Least Significant Bit)	
Output code	Binary 2 code	24 bit, Binary 2 code
Output signal	Single-turn data, Multi-turn count, Overflow alarm (OVF) ⁰³⁾	
Control output	Parallel NPN open collector output	SSI (Synchronous Serial Interface) Line driver output
Inflow current	≤ 20 mA	≤ 20 mA
Residual voltage	≤ 1 VDC \approx	≤ 0.5 VDC \approx
Outflow current	-	≤ -20 mA
Output voltage	-	≥ 2.5 VDC \approx
Output logic	Negative logic output	-
Response speed ⁰⁴⁾	≤ 1 μ s	-
Multi-turn count reset	Input level: 0 - 1 VDC \approx Input logic: Low Active, Open for common use Input time: ≥ 100 ms	
Clock	-	Input level: 5 VDC \approx $\pm 5\%$ Input frequency: 100 kHz to 1 MHz
Max. response freq.	30 kHz	-
Max. allowable revolution ⁰⁵⁾	3,000 rpm	
Starting torque	≤ 0.0069 N m	
Inertia moment	≤ 80 g \cdot cm ² (8×10^{-6} kg \cdot m ²)	
Allowable shaft load	Radial: 10 kgf, Thrust: 2.5 kgf	
Unit weight (packaged)	≈ 393 g (≈ 523 g)	≈ 261 g (≈ 391 g)
Approval	CE 标志	

01) It calibrates the multi-turn count by comparing single-turn data before/after power off without counting multi-turn count when power off. Correct multi-turn count cannot be obtained if a rotating operation exceeding $\pm 90^\circ$ is performed at the rotation position when power off. Use within the condition of rated rotating operation.

02) When power ON / OFF the unit, ± 1 bit (LSB) can be changed at current position due to hysteresis.

03) Outputs when multi-turn count is out of counting range (0 to 8191 revolution).

04) Based on cable length: 2 m, I sink = 20 mA

05) For parallel model Select resolution to satisfy Max. allowable revolution \geq Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Power supply	12 - 24 VDC \approx $\pm 5\%$ (ripple P-P: $\leq 5\%$)
Current consumption	Parallel NPN open collector output ≤ 100 mA (no load) SSI Line driver output ≤ 150 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \approx megger)
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 50 G
Ambient temp.	-10 to 70 $^\circ$ C, storage: -25 to 85 $^\circ$ C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP50 (IEC standard)
Connection	Axial cable type (cable gland)
Cable spec.	$\varnothing 6$ mm, 2 m, shield cable Parallel NPN open collector output: 17-wire \times 2, SSI Line driver output: 10-wire
Wire spec.	AWG28 (0.08 mm), insulator diameter: $\varnothing 0.8$ mm Parallel NPN open collector output: 17-core, SSI Line driver output: 19-core



View product detail

Manual Handle Type Pulse Generators

ENH Series



Features

- Ideal for manual pulse input applications including NC machinery and milling machines
- Terminal connection type
- Resolutions: 25, 100 pulses per revolution
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

Specifications

Model	ENH-□-□-T-□	ENH-□-□-V-□	ENH-□-□-L-5
Resolution	25 / 100 PPR model		
Control output	Totem pole output	Voltage output	Line driver output
Output phase	A, B	A, B	A, B, \bar{A} , \bar{B}
Inflow current	≤ 30 mA	-	≤ 20 mA
Residual voltage	≤ 0.4 VDC \equiv	≤ 0.4 VDC \equiv	≤ 0.5 VDC \equiv
Outflow current	≤ 10 mA	≤ 10 mA	≤ -20 mA
Output voltage (5 VDC \equiv)	\geq (power supply -2.0) VDC \equiv	-	≥ 2.5 VDC \equiv
Output voltage (12 - 24 VDC \equiv)	\geq (power supply -3.0) VDC \equiv	-	-
Response speed ⁰¹⁾	≤ 1 μ s	≤ 1 μ s	≤ 0.2 μ s
Max. response freq.	10 kHz		
Max. allowable revolution ⁰²⁾	Normal: ≤ 200 rpm, Peak: ≤ 600 rpm		
Starting torque	≤ 0.098 N m		
Allowable shaft load	Radial: ≤ 2 kgf, Thrust: ≤ 1 kgf		
Unit weight (packaged)	≈ 260 g (≈ 330 g)		
Approval	CE UK ENEC	CE UK ENEC	ENEC

01) Based on cable length: 1 m, I sink: 20 mA

02) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Model	ENH-□-□-T-□	ENH-□-□-V-□	ENH-□-□-L-5
Power supply	5 VDC \pm 5% (ripple P-P: $\leq 5\%$) / 12 - 24 VDC \pm 5% (ripple P-P: $\leq 5\%$) model		5 VDC \pm 5% (ripple P-P: $\leq 5\%$)
Current consumption	≤ 40 mA (no load)		≤ 50 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)		
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.		
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	≤ 50 G		
Ambient temp.	-10 to 70 $^{\circ}$ C, storage: -25 to 85 $^{\circ}$ C (no freezing or condensation)		
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)		
Protection rating	IP50 (IEC standard)		
Connection	Terminal block type		



View product detail

Portable Manual Handle Type Pulse Generators

ENHP Series



Features

- Ideal for manual pulse input applications including NC machinery and milling machines
- Emergency stop switch, enable operation switch
- 6-position axis selector switch, 4-position rate selector switch
- Resolution: 100 pulses per revolution
- Power supply:
5 VDC \pm 5%, 12 - 24 VDC \pm 5%

Specifications

Model	ENHP-100-□-T-□	ENHP-100-□-L-5
Resolution	100 PPR	
Control output	Totem pole output	Line driver output
Output phase	A, B	A, \bar{A} , B, \bar{B}
Rotary switch output	BCD code: Rate select switch (R1, R2, R3, R4) Axis select switch (OFF, X, Y, Z, A, B)	
Inflow current	≤ 30 mA	≤ 20 mA
Residual voltage	≤ 0.4 VDC \approx	≤ 0.5 VDC \approx
Outflow current	≤ 10 mA	≤ -20 mA
Output voltage (5 VDC \approx)	\geq (power supply -2.0) VDC \approx	≥ 2.5 VDC \approx
Output voltage (12 - 24 VDC \approx)	\geq (power supply -3.0) VDC \approx	-
Response speed ⁰¹⁾	≤ 1 μ s	≤ 0.5 μ s
Max. response freq.	10 kHz	
Max. allowable revolution ⁰²⁾	Normal: ≤ 200 rpm, Peak: ≤ 600 rpm	
Starting torque	≤ 0.098 N m	
Allowable shaft load	Radial: ≤ 2 kgf, Thrust: ≤ 1 kgf	
Unit weight	≈ 730 g	
Approval	CE ENEC	ENEC

01) Based on cable length: 1 m, I sink: 20 mA

02) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution

$$[\text{max. response revolution (rpm)}] = \frac{\text{max. response frequency}}{\text{resolution}} \times 60 \text{ sec}$$

Model	ENHP-100-□-T-□	ENHP-100-□-L-5
Power supply	5 VDC \pm 5% (ripple P-P: $\leq 5\%$) / 12 - 24 VDC \pm 5% (ripple P-P: $\leq 5\%$) model	5 VDC \pm 5% (ripple P-P: $\leq 5\%$)
Current consumption	≤ 40 mA (no load)	≤ 50 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \approx megger)	
Dielectric strength	Between the charging part and the case: 750 VAC \sim 50 / 60 Hz for 1 min.	
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Shock	≤ 50 G	
Ambient temp.	-10 to 70 °C, storage: -25 to 85 °C (no freezing or condensation)	
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)	
Protection rating ⁰¹⁾	IP67 (IEC standard)	
Connection	connector type	
Cable spec.	$\varnothing 5$ mm, 18-wire, 8 m, spring code cable	
Wire spec.	AWG28 (0.08 mm, 18-core), insulator diameter: $\varnothing 0.7$ mm	
Connector spec.	25-pin D-SUB	

01) It is protection for the back case and the wiring part.



View product detail

Flexible Shaft Coupling

ERB Series



Features

- Zero backlash
- High-strength aluminum alloy (AL7075-T6), High elasticity
- Alumite treated surface provides high corrosion resistance
- 2 connection types (clamp type, screw type)

Specifications

Model	ERB-A-19C-□	ERB-A-19S-□	ERB-A-26C-□	ERB-A-26S-□
Connection type	Clamp	Set screw	Clamp	Set screw
Max. revolution	8,000 rpm	20,000 rpm	6,000 rpm	15,000 rpm
Max. torque	1.2 N m		3.0 N m	
Rated torque	0.6 N m		1.5 N m	
Mounting bolt (mounting torque)	M2.5 (1 N m)	M3 (0.7 N m)	M3 (0.7 N m)	M4 (1.7 N m)
Torsional stiffness	140 N m / rad		240 N m / rad	
Inertia moment	6.4 × 10 ⁻⁷ kg·m ²		3.4 × 10 ⁻⁶ kg·m ²	
Max. allowable misalignment	Angular misalignment: ≤ 2.5° Parallel misalignment: ≤ 0.15 mm End-play: ≤ ± 0.3 mm		Angular misalignment: ≤ 2.5° Parallel misalignment: ≤ 0.2 mm End-play: ≤ ± 0.4 mm	
Standard bore diameter (tolerance h7)	Ø 4, Ø 5, Ø 6 mm		Ø 6, Ø 8 mm	
Max. allowable diameter	Ø 4 to 8 mm		Ø 5 to 12 mm	
Material	Aluminum (AL 7075-T6), Alumite surface			
Unit weight (packaged)	≈ 14.4 g (≈ 14.9 g)		≈ 36.7 g (≈ 37.3 g)	



View product detail

B. Field Instruments

Field instruments including pressure and temperature transmitters measure and transmit important data in industrial applications and other diverse settings.

- B1. Temperature Sensors
- B2. Temperature Transmitters
- B3. Pressure Sensors
- B4. Pressure Transmitters







B1. Temperature Sensors

Temperature sensors are used to measure temperature of gases or liquids using thermocouples and thermoresistors.

Temperature / Humidity Sensors

THD Series



Features

- Compact design
- Built-in high accuracy temperature / humidity sensor
- 7 segment LED display (THD-DD / THD-WD)
- Various output options: DC4 - 20 mA, 1 - 5 VDC=, RS485 (Modbus RTU)
- Wide measurable range of temperature / humidity: -19.9 to 60.0 °C / 0.0 to 99.9 %RH
- Communication speed: 115200 bps

Specifications

Model	THD-R-PT			
Sensor type	Temperature sensor			
Display type	Non-display type			
Temp. measuring range	-19.9 to 60.0 °C			
Temp. accuracy	± 0.8 °C			
Temp. output	DPT100Ω resistance value (TCR: 3850 ppm/°C)			
Protection structure	IP10 (IEC standards)			
Ambient temperature	-20 to 60 °C, Storage: -20 to 60 °C (rated at no freezing or condensation)			
Certification	CE ENEC			

Model	THD-R-PT/C	THD-R-C THD-R-V THD-R-T	THD-D□-□ THD-W□-□	THD-DD□-□ THD-WD□-□
Power supply	24 VDC≡			
Permissible voltage range	90 to 110 % of rated voltage			
Power consumption	≤ 2.4W			
Sensor type	Temperature/Humidity Sensor			
Sensor response time	10 sec			
Display type	Non-display type			7 seg. LED display
Display digit	-			Each 3 digits for temp. / humi.
Temp. measuring range	-19.9 to 60.0 °C			
Humi. measuring range	0.0 to 99.9 %RH (THD-R is required to attend for using over 90 %RH)			
Temp. accuracy	± 1.0 °C (at room temp.)			
Humi. accuracy	± 3 %RH (30 to 70 %RH, at room temp.) ± 4 %RH (10 to 90 %RH)		Typ. ±2 %RH (10 to 90 %RH, at room temp.) ≤ ± 2.5 %RH	
Temp. output	DPT100Ω resistance value (TCR: 3850 ppm/°C)	DC 4-20 mA (allowable impedance: ≤ 600 Ω), 1-5 VDC≡, RS485 Communication (Modbus RTU)		
Humi. output	DC 4-20 mA (allowable impedance: ≤ 600 Ω)			
Resolution	1/1000			
Sampling period	0.5 sec			
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)			
Dielectric strength	Between the charging part and the case: 500 VAC~ 50/60 Hz for 1 min			
Noise immunity	±0.3 kV the square wave noise (pulse width: 1 μs) by the noise simulator			
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour			
Vibration (Malfunction)	0.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour			
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times			
Shock (Malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times			
Protection structure	IP10 (IEC standards)		IP65 (except sensor part, IEC standards)	
Ambient temperature	-20 to 60 °C, Storage: -20 to 60 °C (rated at no freezing or condensation)			
Cable spec.	-		Ø4 mm, 4-wire, length: 2 m	
Wire spec.	-		AWG22 (0.08 mm, 60-wire), Insulator diameter: Ø1.25 mm	
Certification	CE ENEC (only for THD-□-T model) ENEC			
Comm. protocol	Modbus RTU			



View product detail



B2. Temperature Transmitters

Temperature transmitters measure temperature value from temperatures sensors (thermocouples, RTD, etc) and transmits the data in voltage or current.

B2-1 Temperature Transmitters

KT-502H Series

HART Protocol Transmitters

CN-502H Series

HART Protocol Cylindrical Temperature Transmitters

HART Protocol

Transmitters

KT-502H Series



Features

- HART protocol
- 330 ° rotatable display for environment conditions
- Increased visibility with backlight function
- Multi-input (order 1 input type among 22 types)
 - RTD 8 types
 - Thermocouple 8 types
 - mV 4 types
 - Resistor 2 types
- Explosion class: Ex d IIC T6
- Protection structure: IP67

Specifications

Model	KT-502H
Power supply	10.5-45 VDC≐ (with backlight LCD)
Output	DC 4-20 mA (2-wire)
Input specifications	Refer to 'Input Specifications'
Accuracy	± 0.3 %
Display method	PV display part: 7 segment 5 digit (character size: W4×H8 mm), Parameter display part: 14 segment 8 digit (character size: W2.6×H4.8 mm), 52 bar meter
Display range	-19,999 to 99,999
Setting method	HART-protocol (no setting key)
Response time	1 sec
Alarm	≤ 3.8 mA, > 20.5 mA / Sensor break 3.6 mA
Load	≤ (V power supply - 7.5 V) / 0.22 A
Galvanic insulation	2 kVAC~ (Input/Output)
Unit weight (Packaged)	≈ 1.2 kg (≈ 1.4 kg)
Ambient temp.	-20 to 70 °C, Storage: 20 to 80 °C (rated at no freezing or condensation)
Ambient humi.	0 to 85 %RH, Storage: 0 to 85 %RH (rated at no freezing or condensation)
Protection structure	IP67 (IEC standard)
Material	Body: Aluminum (AlDc.8S), Cover O-Ring: Buna N
Explosion class ⁰¹⁾	Ex d IIC T6
Certification	CE UKCA ENEC ATEX IECEx

01) The explosion class specification is acquired and managed by KONICS.

Input Specifications

Input type		Input range (°C)	Input range (°F)
Thermocouple	K (NiCr-Ni)	-270 to 1,372	-454 to 2,501.6
	J (Fe-CuNi)	-210 to 1,200	-346 to 2,192
	E (NiCr-CuNi)	-270 to 1,000	-454 to 1,832
	T (Cu-CuNi)	-270 to 400	-454 to 752
	B (PtRh30-PtRh6)	0 to 1,820	32 to 3,308
	R (PtRh13-Pt)	-50 to 1,768	-58 to 3,214.4
	S (PtRh10-Pt)	-50 to 1,768	-58 to 3,214.4
	N (NiCrSi-NiSi)	-270 to 1,300	-454 to 2,372
RTD	Cu50 Ω	-50 to 150	-58 to 302
	Cu100 Ω	-50 to 150	-58 to 302
	DPT100 Ω	-200 to 850	-328 to 1,562
	DPT500 Ω	-200 to 250	-328 to 482
	DPT1000 Ω	-200 to 250	-328 to 482
	Ni100 Ω	-60 to 180	-76 to 356
	Ni500 Ω	-60 to 180	-76 to 356
	Ni1000 Ω	-60 to 150	-76 to 302
Resistance transmitter	Resistance (Ω)	0 to 400 Ω	-
		0 to 2000 Ω	-
Analog	Voltage	-10 - 75 mV	-
		-100 - 100 mV	-
		-100 - 500 mV	-
		-100 - 2,000 mV	-



View product detail

HART Protocol Cylindrical Temperature Transmitters

CN-502H Series



Features

- HART protocol
- Multi-input
 - RTD 8 types
 - Thermocouple 7 types
 - mV 4 types
 - Resistor 2 types
- Small size: $\varnothing 44 \times 24$ H
- High accuracy: ± 0.3 % F.S.

Specifications

Model	CN-502H
Power supply	11-35 VDC=
Power consumption	≤ 1 W
Display method ⁰¹⁾	No mark
Measurable current	50 μ A (3-wire), 100 μ A (4-wire)
Resistance	≤ 5 Ω
Input specification	Refer to 'Input Specifications'
Input accuracy	± 0.1 % F.S.
Output	DC 4-20 mA (2-wire)
Output accuracy	± 0.1 % F.S.
Response time	1 sec (10 to 90 % of output)
Load	\leq (Power supply-11 VDC=) / 0.023 A
Setting method	HART-protocol (no setting key)
Alarm	≤ 3.8 mA, > 21.0 mA, sensor break 22 mA or 3.6 mA
Sampling period	500 ms
Unit weight (Packaged)	≈ 26 g (≈ 66 g)
⁰¹⁾ Parameter setting and state monitoring are available through an external device such as HART communicator or loader.	
Dielectric strength	1000 VAC \sim 50/60 Hz 1 min (between all terminals and case)
Noise immunity	IEC 61326-1
Vibration	0.75 mm amplitude a frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours
Insulation resistance	≥ 100 M Ω (500VDC= megger)
Memory protection	≈ 10 years (when using non-volatile semiconductor memory)
Tightening torque	Housing: 1 N m, Terminal: 0.9 N m
Galvanic insulation	1 kVAC \sim (Input/Output)
Ambient temperature	-40 to 85 $^{\circ}$ C, Storage: -40 to 85 $^{\circ}$ C (rated at no freezing or condensation)
Ambient humidity	5 to 95 %RH, Storage: 5 to 95 %RH (rated at no freezing or condensation)
Protection structure	Housing: IP40 (IEC standard), Terminal: IP00 (IEC standard)
Material	Case: PC
Certification	CE UK HART IAH



View product detail



B3. Pressure Sensors

Pressure sensors are devices used in a variety of applications requiring precise and accurate pressure measurement of gases or liquids.

B3-1	Digital Display	PSQ Series	Dual Display Type Pressure Sensors
		PSAN Series	Display Type Pressure Sensors
		PSB Series	Display Type Pressure Sensors
B3-2	Non-Indicating	PSS Series	Compact Pressure Sensors
B3-3	Indicators	PSM Series	Multi-Channel Pressure Sensor Indicators

Dual Display Type Pressure Sensors

PSQ Series



Features

- Pressure measurement of any gas, liquid or oil [fluid type] except substances which may corrode stainless steel 316L
- Dual display for simultaneous display of process value (PV) and setpoint value (SV)
- Secondary (SV) display: setpoint value, pressure unit, or display-OFF
- Switch between NPN and PNP open collector output via parameter configuration
- Measurement range: -100.0 to 100.0 kPa / -100 to 1000 kPa
(Pneumatic type: compound pressure, Fluid type: sealed gauge pressure)
- Analog output: voltage (1 - 5 VDC \equiv), current (DC 4 - 20 mA)
- Copy parameter settings function
- External input: Auto-Shift, Remote, Hold (PSQ-□C□□U-□ models only)
- Forced output control mode for device testing and inspection
- Display resolution: 0.1 kPa / 1 kPa (by model)

* Sold Separately

- Integrated installation set: Front cover (PSO-P01), Panel bracket (PSO-B02)
- Separate installation set ⁰¹⁾: Front cover (PSO-P02), Front / rear panel bracket set (PSO-B04)
- M5 gender ⁰¹⁾ (PSO-Z01)

⁰¹⁾ Only for pneumatic type model

Specifications

Model	PSQ-C□C□-□	PSQ-BC□□-□
Applicable medium	Pneumatic type (air, non-corrosive gas)	Fluid type (non-corrosive gas and fluid that do not corrode stainless steel 316L)
Pressure type	Gauge pressure	Sealed gauge pressure ⁰¹⁾
Rated pressure range	-100.0 to 100.0 kPa / -100 to 1,000 kPa model	
Display and setting pressure range	Different by rated pressure range	
-100.0 to 100.0 kPa model	-101.3 to 110.0 kPa	
-100 to 1,000 kPa model	-101 to 1,100 kPa	
display type	PV / SV display part: 12 segment LCD, 4digit	
Display accuracy	-10 to 0 °C: ≤ ±1% F.S., 0 to 50 °C: ≤ ±0.5% F.S.	
Min. display unit	Different by rated pressure range	
-100.0 to 100.0 kPa model	0.1 kPa	
-100 to 1,000 kPa model	1 kPa	
min. display interval	Different by pressure unit ⁰²⁾	
Max. pressure range	Different by rated pressure range	
-100.0 to 100.0 kPa model	Rated pressure × 2	Rated pressure × 3
-100 to 1,000 kPa model	Rated pressure × 1.5	
Connection	Connector type	Cable type
Cable	Ø 4 mm, 5 core, 2 m	Ø 4 mm, 5 core, 3 m
Wire	AWG 24 (0.08 mm, 40 seam) insulator diameter: Ø 1 mm	
Material	Front case: PC, back case: PBT+G15%, pressure port: SUS303	Front case: PC, back case: PA6, pressure port: SUS316L
Protection structure	IP40 (IEC standard)	IP65 (IEC standard)
Certification	CE, RoHS, REACH	
Unit weight (packaged)	≈ 80 g (≈ 165 g)	≈ 125 g (≈ 210 g)

⁰¹⁾ The unit is sealed structure. It is based on atmospheric pressure 101.3kPa.

⁰²⁾ Refer to 'Minimum Display Interval per Pressure Unit'.

Power supply	12 - 24 VDC \equiv (ripple P-P: ≤ 10%)
Allowable voltage range	90 to 110% of rated voltage
Current consumption	≤ 50 mA (analog output model: ≤ 70 mA)
Control output	NPN or PNP open collector output
Load voltage	≤ 30 VDC \equiv
Load current	≤ 100 mA
Residual voltage	≤ 2 VDC \equiv
Hysteresis	Different by output operation mode (parameter) ⁰¹⁾
Repeat error	±0.2% F.S. ±min. display interval
Response time	2.5 to 5,000 ms (parameter)
Protection circuit	Output short over current protection circuit
Insulation resistance	≥ 50 MΩ (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz. for 1 min
Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	30 to 80%RH, storage: 30 to 80%RH (no freezing or condensation)

⁰¹⁾ Refer to 'Output operation mode'.



View product detail

External input	Auto shift - Remote zero - Hold (parameter)
ON / OFF voltage input	ON voltage: $\leq 0.4 \text{ VDC}$, OFF voltage: 5-Vin or open, input impedance: $\approx 100 \text{ k}\Omega$
Resolution	1 / 2,000
Option output	Analog voltage - Analog current output (parameter)
Analog voltage output	1 - 5 VDC $\pm 2.5\%$ F.S., output impedance: $\approx 240 \Omega$
Analog current output	DC4 - 20 mA $\pm 2.5\%$ F.S., output impedance: $\approx 100 \text{ k}\Omega$
Linearity	$\leq \pm 1\%$ F.S.
Resolution	1 / 2,000
Response time	50 ms

Display Type

Pressure Sensors

PSAN Series



Features

- Pressure measurement of any gas, liquid or oil (except substances which may corrode stainless steel 304 / 316L)
- Auto shift function: with change in the original pressure, the external input adjusts the determined level to match the change in pressure (only available in models with auto shift/hold function)
- Hold function: hold current display value or control output
- Forced output control mode for device testing and maintenance
- One-touch connector type for easy wiring and maintenance
- Zero-point adjustment function, peak value monitoring function, chattering prevention function

* Sold Separately

- Front cover (PSO-P01),
Panel bracket (PSO-B02 / B03)
- Pneumatic type: M5 gender (PSO-Z01)

Specifications

Model	PSAN- □V01C□□-□	PSAN- □01C□□-□	PSAN- □1□□□-□	PSAN- □C01□□□-□
Pressure Type	Pneumatic type model: Gauge pressure Fluid type model: Gauge pressure ⁰¹⁾ or sealed gauge pressure ⁰²⁾			
Pressure	Negative	Static		Compound
Min display unit	0.1 kPa	0.1 kPa	1 kPa	0.1 kPa
Rated pressure range	0.0 to -101.3 kPa	0.0 to 100.0 kPa	0 to 1,000 kPa	-101.3 to 100.0 kPa
Display & setting pressure range	5.0 to -101.3 kPa	-5.0 to 110.0 kPa	-101.3 to 1,100 kPa	-101.3 to 110.0 kPa
Display type	7 Segment LED, 4 ½ digit			
Display accuracy	-10 to 0 °C: ≤ ±1% F.S., 0 to 50 °C: ≤ ±0.5% F.S.			
Max. pressure	Rated pressure ×2	Rated pressure ×2	• Pneumatic type: Rated pressure ×1.5 • Fluid type: Rated pressure ×2	Rated pressure ×2

01) Only for static pressure, rated pressure range 100.0 kPa model

02) The unit is sealed structure. It is based on atmospheric pressure 101.3 kPa.

Applicable medium	Pneumatic type (air, non-corrosive gas)	Fluid type (non-corrosive gas and fluid that do not corrode stainless steel 316L)
Connection type	Connector type	Cable type / connector type
Cable	Ø 4 mm, 5-core, 2 m	Connector type: Ø 4 mm, 5-core, 2 m Cable type: Ø 4 mm, 5-core, 3 m
Wire spec.	AWG24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm	
Material	Front case: PC Back case: (back port) PC / (bottom port) PBT+GF15% Pressure port: Brass-nickel plated	Front case: PC Back case: PA6 Pressure port: SUS304/SUS316L
Protection structure	Connector type: IP40 (IEC standard)	Connector type: IP40 (IEC standard) Cable type: IP65 (IEC standard)
Certification	CE ENEC	
Unit weight (packaged)	Back port: ≈ 80 g (≈ 165 g) Bottom port: ≈ 85 g (≈ 170 g)	Connector type: ≈ 88 g (≈ 173 g) Cable type: ≈ 90 g (≈ 167 g)



View product detail

Power supply	12 - 24 VDC \equiv (ripple P-P: \leq 10%)
Allowable voltage range	90 to 110% of rated voltage
Current consumption	\leq 50 mA ⁰¹⁾
Control output	NPN open collector output / PNP open collector output model
Load voltage	\leq 30 VDC \equiv
Load current	\leq 100 mA
Residual voltage	NPN: \leq 1 VDC \equiv , PNP: \leq 2 VDC \equiv
Hysteresis	According to output operation mode ⁰²⁾
Repeat error	\pm 0.2% F.S. \pm min display interval
Response time	2.5, 5, 100, 500, 1000 ms
Protection circuit	Output short over-current protection circuit
Insulation resistance	\geq 50 M Ω (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC \sim 50 / 60 Hz for 1 min
Vibration	1.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Ambient temperature	-10 to 50 °C, Storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	30 to 80%RH, Storage: 30 to 80%RH (no freezing or condensation)

01) Current output: \leq 75 mA

02) Refer to 'Output operation mode'. \pm 1digit error may occur due to pressure unit operation.

Analog output	Voltage (1 - 5 VDC\equiv \pm2% F.S)	Current (DC 4 - 20mA \pm2% F.S)
Output impedance	1 k Ω	-
Linearity	\leq \pm 1% F.S	\leq \pm 1% F.S
Zero-point	\leq 1 VDC \equiv \pm 2% F.S.	\leq DC 4 mA \pm 2% F.S.
Span	\leq 4 VDC \equiv \pm 2% F.S.	\leq DC 16 mA \pm 2% F.S.
Resolution	1/1000 or 1/2000 (different by pressure type and display unit)	
Response time	50 ms	70 ms

Display Type

Pressure Sensors

PSB Series



Features

- High accuracy digital pressure sensor
- Bright red LED display
(character height: 9.5 mm)
- High display resolution
: negative pressure 0.1 kPa /
standard pressure 0.1 kPa, 1 kPa /
compound pressure 0.2 kPa
- Unit conversion function
- negative, compound pressure: kPa, kgf/cm²,
bar, psi, mmHg, mmH₂O, inHg
- standard pressure: kPa, kgf/cm², bar, psi
- Various output modes: hysteresis mode,
automatic sensitivity adjustment mode,
independent 2-point output mode,
window comparison output mode
- Chattering prevention function
(response time: 2.5 ms, 5 ms, 100 ms, 500 ms)
- Analog output (1 - 5 VDC≐) scale function
- Zero-point adjustment function
- Peak value and low value hold function
- Built-in reverse polarity protection circuit,
overcurrent protection circuit

Specifications

Model	PSB-V01□□-□	PSB-01□□-□	PSB-1□□-□	PSB-C01□□-□
Pressure type	Gauge pressure			
Applicable medium	Air, Non-corrosive gas			
Pressure	Negative	Static		Compound
Min display interval	1-digit ⁰¹⁾	1-digit ⁰¹⁾		2-digit
Rated pressure range	0.0 to -101.3 kPa	0.0 to 100.0 kPa	0 to 1,000 kPa	-100.0 to 100.0 kPa
Display & setting pressure range	5.0 to -101.3 kPa	-5.0 to 110.0 kPa	-50 to 1,100 kPa	-101.2 to 110.0 kPa
Display type	7 segment LED, 3 1/2 digit			
Display accuracy	-10 to 0 °C: ≤ ±2% F.S., 0 to 50 °C: ≤ ±1% F.S.			
Max. pressure	Rated pressure ×2	Rated pressure ×2	Rated pressure ×1.5	Rated pressure ×2

01) psi unit: 2-digit

Connection type	Cable type / Connector type model
Cable	• Cable type: Ø 4 mm, 5-core, 2 m • Connector type: 5-core, 3 m
Wire spec.	AWG 24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm
Material	Case, Pressure port, Cover: IXEF
Guaranteed parameter write life	100,000 times
Protection structure	IP40 (IEC standard)
Certification	CE, RoHS, REACH
Unit weight (packaged)	≈ 70 g (≈ 160 g)

Power supply	12 - 24 VDC≐ ±10% (ripple P-P: ≤ 10%)
Current consumption	≤ 50 mA
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 30 VDC≐
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC≐, PNP: ≤ 2 VDCT
Hysteresis	Negative / Static: 1-digit (psi unit: 2-digit) Compound: 2-digit ⁰¹⁾
Repeat error	Negative / Static: ±0.2% F.S. ±1digit Compound: ±0.2% F.S.±2digits
Response time	2.5, 5, 100, 500 ms
Protection circuit	Output short over-current protection circuit
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)

01) Due to the pressure unit operation, ± 1digit errors may occur in the hysteresis.

Analog output	Voltage (1 - 5 VDC≐ ±2% F.S)
Output impedance	1 kΩ
Linearity	≤ ±2% F.S
Zero-point	≤ 1 VDC≐ ±2% F.S.
Span	≤ 4 VDC≐ ±2% F.S.
Resolution	1/200



View product detail

Compact Pressure Sensors

PSS Series




Features

- Rated pressure range
 - negative pressure: -101.3 to 0.0 kPa
 - positive pressure: 0 to 100.0 kPa, 0 to 1,000 kPa
 - compound pressure: -101.3 to 100.0 kPa
- Compact design :
 - R1/8 port:
 - W 11.8 mm x H 29.3 mm x L 24.8 mm (including pressure port)
 - Reducer port:
 - W 11.8 mm x H 31.3 ~ 32.8 mm x L 24.8 mm (including pressure port)
 - M3 port:
 - W 11.8 mm x H 26.1 mm x L 24.8 mm (including pressure port)
- Analog output:
 - voltage (1-5VDC), current (DC 4-20mA)
- Power supply: 12-24 VDC $\pm 10\%$

* Sold Separately

- Sensor connector plug: CNE-P04-□
- Pressure sensor indicators: PSM Series

Specifications

Model	PSS-V01□-□	PSS-01□-□	PSS-1□-□	PSS-C01□-□
Applicable medium	Air, Non-corrosive gas			
Pressure type	Negative	Static		Compound
Rated pressure range	0.0 to -101.3 kPa	0.0 to 100.0 kPa	0 to 1,000 kPa	-101.3 to 100.0 kPa
Expanded analog output range	5.0 to -101.3 kPa	-5.0 to 110.0 kPa	-50 to 1,100 kPa	-101.3 to 110.0 kPa
Max. pressure range	Rated pressure × 2	Rated pressure × 2	Rated pressure × 1.5	Rated pressure × 2
Cable	Ø 3 mm, 4-core, 3 m			
Wire	AWG28 (0.08 mm, 19-core) insulator diameter: Ø 0.88 mm			
Protection structure	IP40 (IEC standard)			
Certification	CE 			

Model	PSS-□□-R1/8	PSS-□□-R04	PSS-□□-R06	PSS-□□-M3
Pressure port	R1/8 (Standard)	R04 reducer	R06 reducer	M3 screw
Material	Front/Rear case: PBT, Pressure port: Nickel plated brass	Front/Rear case and pressure port: PBT		Front/Rear case: PBT, Pressure port: STS 303
Unit weight (packaged)	≈ 50 g (≈ 110 g)	≈ 45 g (≈ 105g)		
Power supply	12 - 24 VDC=±10% (ripple P-P: ≤ 10%)			
Current consumption	Voltage output model: ≤ 15 mA			
Effect by power supply	≤ ±0.3% F.S			
Protection circuit	Reverse polarity protection circuit			
Voltage output	1 - 5 VDC= ±2% F.S.			
Linearity	≤ ±1% F.S.			
Output impedance	1 kΩ			
Current output	DC 4 -20 mA ±2% F.S.			
Linearity	≤ ±1% F.S.			
Analog output temp. characteristic	≤ ±2% F.S. (in 0 to 50 °C temperature range, at 25 °C)			
Insulation resistance	≥ 50 MΩ (500 VDC= megger)			
Dielectric strength	Between the charging part and the case: 2,000 VAC~ 50/60 Hz for 1 min			
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Ambient temperature	0 to 50 °C, storage: -10 to 60 °C (no freezing or condensation)			
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)			



View product detail

Multi-Channel Pressure Sensor Indicators

PSM Series



Features

- Display 8 (PSM8) or 4 (PSM4) channels of pressure value from pressure sensors
- Input range: 1 - 5 VDC \equiv , DC 4 - 20 mA (by model)
- Pressure sensor model auto recognition (Autonics PSS Series pressure sensors)
- Set PV display color by control output type (red / green)
- Individual output indicators for each channel
- RS485 (Modbus RTU) communication support
- Refrigeration pressure control mode
- Easy wiring and connection with sensor connectors (CNE)
- Power supply: 12 - 24 VDC \equiv \pm 10%

* Sold Separately

- Sensor connector plug: CNE-P04-□
- Pressure sensor: PSS Series
- Connector socket: HIF3BA-20D-2.54R
- Communication converter: SCM-US
- I/O cable: CO20-HP□-□

Specifications

Model	PSM4-□□□	PSM8-□□□
Display pressure range	Refer to 'Rated Pressure and Max. Pressure Display Range'.	
Max. inputs	4	8
Sensor input	• 1 - 5 VDC \equiv (Input impedance: \approx 300 k Ω) • DC 4 - 20 mA model (Input impedance: \approx 100 Ω)	
Sensor supply power	12 - 24 VDC \equiv , 40 mA per channel (1 - 4 ch max. current: \leq 100 mA, 5 - 8 ch max. current: \leq 100 mA)	
Display type	7 Segment LED 4 digit	
Display accuracy	\pm 0.1% F.S. \pm 2 digit (at 23 \pm 5 $^{\circ}$ C)	
Control output and display temp. characteristic	-10 to 0 $^{\circ}$ C: \pm 0.3% F.S. \pm 2 digit 0 to 50 $^{\circ}$ C: \pm 0.2% F.S. \pm 2 digit (at 25 $^{\circ}$ C)	
Option input	Digital input 1	
Contact input	[L]: \leq 0.2 V	
Solid state input	Residual voltage \leq 1.0 V, Leakage current \leq 0.1 mA	
Protection structure	Front: IP65, the others: IP30 (IEC standard)	
Certification	CE UK ENEC	
Unit weight (packaged)	\approx 65 g (\approx 108 g)	
Power supply	12 - 24 VDC \equiv \pm 10% (ripple P-P: \leq 10%)	
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	\leq 3 W	
Current consumption	\leq 100 mA ⁰¹⁾	
Control output	NPN open collector output / PNP open collector output model	
Load voltage	\leq 30 VDC \equiv	
Load current	\leq 100 mA	
Residual voltage	NPN: \leq 1 VDC \equiv , PNP: \leq 2 VDC \equiv	
Hysteresis	Different by output operation mode ⁰²⁾	
Repeat error	\pm 0.1% F.S. \pm Min display interval	
Response time	• 4 CH model: 2.5, 100, 500, 1000 ms • 8 CH model: 5, 100, 500, 1000 ms	
RS485 comm.	Modbus RTU	
Protection circuit	Output short over-current protection circuit, power supply reverse connection protection circuit	
Insulation resistance	\geq 100 M Ω (500 VDC \equiv megger)	
Dielectric strength	Between the charging part and the case: 1,000 VAC \sim 50 / 60 Hz for 1 min	
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Ambient temperature	-10 to 50 $^{\circ}$ C, storage: -20 to 60 $^{\circ}$ C (rated at no freezing or condensation)	
Ambient humidity	30 to 85%RH, storage: 30 to 85%RH (rated at no freezing or condensation)	
Comm. protocol	Modbus RTU	

01) Except sensor consumption current.
All output indicators ON: \leq 120 mA / RS485 communication connection: 120 mA
02) Refer to output operation mode.



View product detail



B4. Pressure Transmitter

Pressure transmitters measure pressure of gas or liquid and transmit the measurement data in 4-20 mA signals

B4-1	Pressure Transmitter	KT-302H Series	Display Type Pressure Transmitters
		PTF30 Series	Display Type Pressure Transmitters
		TPS20 Series	Non-Indicating Pressure Transmitters
		TPS30 Series	Stainless Steel Pressure Transmitters

Display Type

Pressure

Transmitters

KT-302H Series



Features

- HART protocol
- Display rotation in 330 ° range
- Better visibility with supporting backlight function
- Excellent corrosion resistance with stainless steel housing
- High accuracy $\pm 0.2\%$ F.S.
- Self-stable and filter device
- Explosion-proof specification: Ex D IIC T6
- Protection structure: IP67

Specifications

Series	KT-302H
Applicable medium	Gas, liquid, oil (except corrosive environment of SUS316)
Power supply	9 - 45 VDC \equiv
Output	DC 4 - 20 mA (2-wire, low limit: 3.8 mA, high limit: 22.8 mA)
Accuracy ⁰¹⁾	$\pm 0.2\%$ of F.S. (at 25 °C)
Sampling period	200 ms
Display type	PV display part: 7 segment 5 digit, parameter display part: 16 segment 8 digit, bar LED: 52
Display range	-9999 to 99999
Setting method	Front key, HART-protocol
Certification	CE CC-Link ENEC
Unit weight (packaged)	≈ 1.4 kg (≈ 1.7 kg)
Ambient temperature	-20 to 70 °C, storage: -40 to 85 °C (rated at no freezing or condensation)
Ambient humidity	0 to 85 %RH, storage: 0 to 85 %RH (rated at no freezing or condensation)
Protection structure	IP67 (IEC standard)
Material	Body: aluminum (AlDc.8S), cover O - Ring: Buna N, diaphragm: SUS316, connection: SUS316
Explosion class ⁰²⁾	Ex d IIC T6

01) F.S. is rated pressure range.

02) This explosion class is acquired and managed by Konics co., Ltd.

[Rated pressure range]

Code	Gauge	Absolute
01	0 ~ 35 kPa	0 ~ 35 kPa
02	0 ~ 0.1 MPa	0 ~ 0.1 MPa
03	0 ~ 0.2 MPa	0 ~ 0.2 MPa
04	0 ~ 0.7 MPa	0 ~ 0.7 MPa
05	0 ~ 2 MPa	0 ~ 2 MPa
06	0 ~ 3.5 MPa	0 ~ 3.5 MPa
07	0 ~ 7 MPa	-
08	0 ~ 21 MPa	-
09	0 ~ 35 MPa	-
	Sealed gauge	
14	-0.1 ~ 0 MPa	
15	-0.1 ~ 0.2 MPa	
16	-0.1 ~ 0.7 MPa	
17	-0.1 ~ 2 MPa	
18	-0.1 ~ 3.5 MPa	
Z	Custom	



View product detail

Display Type

Pressure

Transmitters

PTF30 Series



Features

- Minimized disturbance effect by improving noise resistance
- Excellent corrosion resistance with stainless steel housing
- High accuracy $\pm 0.2\%$ F.S.
- Various functions
 - User input range, display scale, output scale, digital filter, multi display selection, abnormal operation display, TUF (Two Unit Function), etc.
- Explosion-proof specification: Ex d IIC T6
- Protection structure: IP67
- Applications
 - Indoor heating, water supply and sewage, and incinerator and small and medium sized projects

Specifications

Series	PTF30
Applicable medium	Gas, liquid, oil (except corrosive environment of SUS316)
Power supply	15 - 35 VDC \equiv
Output	DC 4 - 20 mA (2-wire, impedance: $\leq 30 \Omega$, low limit: 3.6 mA (- 2.5 %), high limit: 21.6 mA (+ 10 %)
Accuracy ⁰¹⁾	$\pm 0.2\%$ of F.S. (at 25 °C)
Temperature characteristic	$\pm (0.075\% \times \text{URL} + 0.15\% \times \text{Span})$ (at 20 °C)
Sampling period	300 ms
Setting method	Front key
Display type	12 segment LCD, 4 digit
Certification	CE ENEC
Unit weight	≈ 1.2 kg

01) F.S. is rated pressure range.

Insulation Resistance	$\geq 100 \text{ M}\Omega$ (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC \sim for 1 min
Vibration	0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours
Noise immunity	Square shaped noise by noise simulator (pulse width 1 μ s) $\pm 240 \text{ V}$
Memory retention	≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature	-20 to 70 °C, storage: -20 to 80 °C (rated at no freezing or condensation)
Ambient humidity	0 to 85 %RH (rated at no freezing or condensation)
Protection structure	IP67 (IEC standard)
Material	Body: aluminum (AlDc.8S), cover O - Ring: Buna N, diaphragm: SUS316, connection: SUS316
Explosion class ⁰¹⁾	Ex d IIC T6

01) This explosion class is acquired and managed by Konics Co., Ltd.

[Rated pressure range]

Code	Gauge	Absolute
1	0 ~ 35 kPa	0 ~ 35 kPa
2	0 ~ 0.1 MPa	0 ~ 0.1 MPa
3	0 ~ 0.2 MPa	0 ~ 0.2 MPa
4	0 ~ 0.7 MPa	0 ~ 0.7 MPa
5	0 ~ 2 MPa	0 ~ 2 MPa
6	0 ~ 3.5 MPa	0 ~ 3.5 MPa
7	0 ~ 7 MPa	-
8	0 ~ 21 MPa	-
9	0 ~ 35 MPa	-
	Sealed gauge	
A	-35 ~ 0 kPa	
C	-0.1 ~ 0 MPa	
F	-0.1 ~ 0.2 MPa	
H	-0.1 ~ 0.7 MPa	
M	-0.1 ~ 2 MPa	
O	-0.1 ~ 3.5 MPa	
Z	Custom	



View product detail

Non-Indicating Pressure Transmitters

TPS20 Series



Features

- Excellent corrosion resistance with stainless steel housing
- High accuracy $\pm 0.3\%$ F.S.
- Various connection method
 - Head type, DIN connector type, connector cable type
- Various user friendly function
 - Built-in zero-point, span adjustment (head type)

* Sold Separately

- M12 Connector cable: C□D3-2 / C□D3-5

Specifications

Series	TPS20		
Applicable medium	Gas, liquid, fluid (except corrosive environment of SUS316)		
Pressure Type	Gauge pressure	Absolute pressure	Compound pressure
Rated Pressure range ⁰¹⁾	0 to 0.2, 350 kgf / cm ² (different by model)	0 to 1.0, 35 kgf / cm ² (different by model)	-1.03 to 0, 35 kgf / cm ² (different by model)
Max. pressure	300 % of max. rated pressure		
Response time	≤ 100 ms		
Protection circuit	Reverse polarity protection circuit		
Tightening torque	≥ Industrial plug 5 N		
Material	Sealing: SUS316, O-ring: fluoro rubber, diaphragm: SUS316, connection: SUS316		
Connection	+, -		
Case structure	Drip-proof structure		
Certification	CE UK		
Unit weight (packaged)	≈ 320 g (≈ 350 g), based on head type		
01) It is different by model. Refer to 'Ordering Information'.			
Power supply	15 - 35 VDC≡		
Allowable voltage range	90 to 110% of rated voltage		
Current consumption	≤ 50 mA		
Current Output	DC 4 - 20 mA		
Linearity	± 0.3 % F.S. (-10 to 50 °C), ± 0.5 % F.S. (50 to 70 °C)		
Hysteresis	± 0.3 % F.S.		
Temp. Zero Shift	± 0.03 % F.S.		
Temp. Span Shift	± 0.03 % F.S. (at 25 °C)		
Load resistance	≤ 600 Ω		
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)		
Dielectric strength	Between the charging part and the case: 500 VAC~ 50 / 60 Hz for 1 minute		
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	95 m/s ²		
Ambient temperature	-10 to 70 °C, storage: -10 to 70 °C (no freezing or condensation)		
Ambient humidity	5 to 95% RH, storage: 5 to 95% RH (no freezing or condensation)		



View product detail

[Rated Pressure range]Number: rated pressure range (unit: kgf/cm²)

Code	Gauge pressure	Absolute pressure
1	0 ~ 0.2	-
2	0 ~ 0.5	
3	0 ~ 1	0 ~ 1
4	0 ~ 2	0 ~ 2
5	0 ~ 7	0 ~ 7
6	0 ~ 10	0 ~ 10
7	0 ~ 20	0 ~ 20
8	0 ~ 35	0 ~ 35
9	0 ~ 70	
A	0 ~ 100	
C	0 ~ 200	
F	0 ~ 300	
H	0 ~ 350	
	Compound pressure	
M	-1.03 ~ 0	-
O	-1.03 ~ 1	
Q	-1.03 ~ 7	
V	-1.03 ~ 10	
X	-1.03 ~ 20	
Y	-1.03 ~ 35	
Z	User pressure range	

Stainless Steel

Pressure

Transmitters

TPS30 Series



Features

- Robust build allows high or low pressure measurement in high and low temperature environments
 - : High pressure (0 to 60 MPa/0 to 600 bar), low pressure (0 to 2 MPa/0 to 20bar)
 - : Sealed gauge pressure (-0.1 to 2 MPa / -1 to 20 bar), absolute pressure (0 to 2 MPa / 0 to 20 bar), gauge pressure (0 to 60 MPa/0 to 600 bar)
 - : Temperature range (-40° to 125 °C) (may vary by model)
 - Pressure measurement of any gas, liquid, or oil
 - 1 ms high-speed response rate
 - Analog output: current (DC 4-20 mA), voltage (1-5 VDC=)
 - Various connector types: cable type, DIN43650-A connector type, DT04-3P connector type, M12 connector type, head type
 - Available thread sizes: G3/8, G1/4, R1/2
 - Protection structure: IP67 (DIN43650-A connector type: IP65)
- * Sold Separately
- DT04-3P connector: CS-DT3P
 - M12 Connector cable: C□D3-2 / C□D3-5

Specifications

[Common]

Output	Voltage (1 - 5 VDC=) output	Current (DC 4 - 20 mA) output
Accuracy	≤ ± 0.5 %F.S. (including linearity, hysteresis, repeatability)	
Linearity	≤ ± 0.2 %F.S.	
Hysteresis	≤ ± 0.2 %F.S.	
Temp. zero shift	≤ ± 0.1 %F.S. / 10 °C (standard), ≤ ± 0.25 %F.S. / 10 °C (max.)	
Temp. span shift	≤ ± 0.1 %F.S. / 10 °C (standard), ≤ ± 0.25 %F.S. / 10 °C (max.)	
Load resistance	-	≤ 700 Ω (supplying 24 VDC=)
Power supply	8 - 36 VDC= (ripple P-P: ≤ 10 %)	11 - 36 VDC= (ripple P-P: ≤ 10 %)
Allowable voltage range	90 to 110 % of rated voltage	
Current consumption	≤ 20 mA	≤ 30 mA
Connection	+, -, Vout	+, -
Applicable medium	Gas, liquid, oil (except corrosive environment of SUS316)	
Pressure type	Gauge pressure, absolute pressure, sealed gauge pressure	
Rated pressure range	Different by model	
Response time	≤ 1 ms	
Insulation resistance	≥ 100 MΩ (500 VDC= megger)	
Dielectric strength	Between the charging part and the case: 500 VAC~ 50/60 Hz for 1 minute	
Tightening torque	≤ 10 Nm	
Ambient temperature ⁰¹⁾	-40 to 125 °C, storage: -40 to 125 °C (no freezing or condensation)	-40 to 85 °C, storage: -40 to 125 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Medium temperature range	-40 to 125 °C	
Protection circuit	Reverse polarity protection circuit	
Material	SUS316L, SUS630 (Different by model), water-proof rubber: Silicon, head part of head type: Aluminium diecasting, connector: Polybutylene terephthalate G30	
Protection structure ⁰²⁾	IP67 (IEC standard)	
Certification	CE UK	
Unit weight (packaged)	Head type: ≈ 250 g (≈ 330 g) DIN43650-A / M12 / DT04-3P connector type: ≈ 50 g (≈ 130 g) cable type: ≈ 120 g (≈ 200 g)	

01) Cable type: -40 to 80 °C, storage: -40 to 80 °C (no freezing or condensation)
02) DIN43650-A connector type: IP65 (IEC standard)



View product detail

[Rated Pressure range]

Code	Gauge pressure	Absolute pressure
3	0 ~ 0.1 MPa	0 ~ 0.1 MPa
4	0 ~ 0.2 MPa	0 ~ 0.2 MPa
5	0 ~ 0.7 MPa	0 ~ 0.7 MPa
6	0 ~ 1 MPa	0 ~ 1 MPa
7	0 ~ 2 MPa	0 ~ 2 MPa
8	0 ~ 3.5 MPa	-
9	0 ~ 5 MPa	
A	0 ~ 10 MPa	
B	0 ~ 20 MPa	
C	0 ~ 40 MPa	
D	0 ~ 50 MPa	
E	0 ~ 60 MPa	
	Sealed gauge pressure	
F	-0.1 ~ 0 MPa	
G	-0.1 ~ 0.1 MPa	
H	-0.1 ~ 0.7 MPa	
J	-0.1 ~ 1 MPa	
K	-0.1 ~ 2 MPa	
Z	Others	

G1/4 is the standard pressure port of part number 8 to 9, A to E. For the other pressure ranges, G3/8, R1/2 are standard pressure ports.

C. Machine Vision

Machine vision smart camera systems offer ideal machine vision solutions for identifying various objects during manufacturing processes.

C1. Smart Camera







C1. Smart Camera

Smart cameras can be used to analyze and process images captured by the embedded processor.

In addition to the function of the vision sensor, various inspections such as barcode, OCR, and pattern recognition are possible.

C1-1	Smart Cameras	VC Series	5M Monochrome Smart Cameras (External Illumination)
	Vision Sensors	VG Series	0.4M Monochrome / Color Vision Sensors (Internal Illumination)

5M

Monochrome

Smart Cameras

(External Illumination)

VC Series



Features

- Various inspection functions
- Inspection simulator function
- Set up to 64 separate work group
(32 inspection points per work group)
- Save data to FTP servers
- Support smart camera software (atVision)
 - Inspection simulator function, manage parameters and work group, inspection results monitoring, send data to FTP, multilingual support, etc.
- C-Mount type
- Gigabit Ethernet communication
- Protection structure: IP67

* Sold Separately

- Waterproof lens cover (HL-□-VC)
- M12 connector cable (C□DM8-□-A)
- M12 connector communication cable (C□M8-□PR(-A), C□8-□PR(-A))

Specifications

Model	VC-M50T-CE
Image element	1 inch mono CMOS
Resolution	5 MP (2,560 × 2,048 pixel)
Frame per second ⁰¹⁾	16 fps
Bit Depth	8 bit (256 gray level)
Shutter	Global shutter
Exposure time	3 μs to 3 sec
Lens type	C-Mount
eMMC	8 GB
DDR4	2 GB (LPDDR4), 512 MB (DDR4)
Inspection work group	64 (simultaneous inspection: 32)
Trigger mode	Continuous, External Trigger, Manual, Ethernet, RS232
Communication	Ethernet (TCP/IP, 10 / 100 / 1000 Base-T), Modbus (TCP, RTU)
FTP trans. output	YES
Certification	CE, RoHS, REACH, ENEC
Unit weight (packaged)	≈ 600 g (≈ 780 g)

01) The number of camera frames per second can be different by image setting or inspection item.

Power supply	24 VDC± ±10%
Current consumption	≤ 1 A
Rated input signal	24 VDC± ±10%
Output signal	NPN-PNP open collector output setting (software)
HS OUT 0	Strobe OUT
HS OUT 1	Inspection complete, Inspection result output (PASS / FAIL), Alarm, Camera work
Load voltage	24 VDC±
Load current	≤ 100 mA
Residual voltage	≤ 2.5 VDC±
Protection circuit	Output short overcurrent protection circuit, reverse voltage polarity protection circuit
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 45 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humi.	0 to 95%RH, storage: 0 to 95%RH (no freezing or condensation)
Protection structure	IP67 (IEC standard / When mounting waterproof lens cover)
Connection	Connector type
Connector spec.	Power I/O: M12 8-pin, Ethernet: M12 8-pin / RJ45 (cable tightening torque: 0.4 N m)
Material	Die-cast Aluminum Housing

Software

Download the installation file and the manuals from the Autonics website.

[atVision]

The program allows setting of smart camera parameters and management of monitoring data such as inspection status and status information.



View product detail

0.4M Monochrome / Color

Vision Sensors (Internal Illumination)

VG Series



Features

- Vision sensors with integrated LED lighting
- Global shutter method for accurate image capturing with minimal motion blur
- Enhanced optical performance with light interference prevention technology
- Tight lens cover attachment allows application in environments with dust or shock
- Various inspection functions
- Save data to FTP servers
- Free vision sensor software included (Vision Master): inspection simulator function, manage parameters and work group, etc.
- Protection structure: IP67

* Sold Separately

- Bracket B (BK-VG-B)
- Ethernet connector protection cover (P96-M12-1)
- Light (LR-□-06-VG), Color filter (FL-□-VG), Polarizing filter (FL-□-VG)
- M12 connector cable (C□D-□-VG, C□D12-□)
- M12 connector communication cable (C□R-□-VG, C□M8-□PR, C□8-□PR)

Specifications

Model	VG-M04□-□E			VG-C04□-□E		
Effective focal length	8 mm	16 mm	25 mm	8 mm	16 mm	25 mm
Min. working distance	50 mm	100 mm	200 mm	50 mm	100 mm	200 mm
Image filter	Preprocessing, external filter (color filter, polarizing filter)					
Image element	1/3 inch mono CMOS			1/3 inch color CMOS		
Resolution	0.4 MP (752 × 480 pixel)					
Image snap camera frame per second ⁰¹⁾	≦ 60 fps					
Shutter	Global shutter					
Exposure time	20 to 50,000 μs					
Inspection work group	32 (simultaneous inspection: 64)					
Light ON/OFF method	Pulse					
Light color ⁰²⁾	White / Red / Green / Blue mode					
Trigger mode	External - Internal - Free run setting (software)					
Communication	Ethernet(TCP/IP), 100BASE-TX/10BASE-T					
FTP trans. output	YES					
Certification	CE UK ENEC					
Unit weight (package)	≈ 273 g (≈ 415 g)	≈ 274 g (≈ 416 g)	≈ 274 g (≈ 416 g)	≈ 273 g (≈ 415 g)	≈ 274 g (≈ 416 g)	≈ 274 g (≈ 416 g)

01) The number of camera frames per second can be different by image setting or inspection item.
02) Available to buy separately and replace.

Power supply	24 VDC±10%
Current consumption	1 A
Rated input signal	24 VDC±10%
Output signal	NPN-PNP open collector output setting (software)
Load voltage	24 VDC±
Load current	≤ 50 mA
Residual voltage	≤ 1.5 VDC±
Protection circuit	Output short over current protection circuit
Insulation resistance	≥ 20MΩ (500 VDC± megger)
Dielectric strength	500 VAC~ 50/60 Hz for 1 min.
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temperature	0 to 45 °C, storage: -20 to 70 °C (non-freezing or non-condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (non-freezing or non-condensation)
Protection structure	IP67 (IEC standards)
Connection	Connector type
Connector	Power I/O: M12 12-pin, Ethernet: M12 8-pin-RJ45
Material	Case: AL, lens cover: PC, focus adjuster: SUS, cable: PUR

Software

Download the installation file and the manuals from the Autonics website.

[Vision Master]

Vision Master is the vision sensor program that allows setting of vision sensor parameters and management of monitoring data such as inspection status and status information.

View product detail



Monochrome
Type

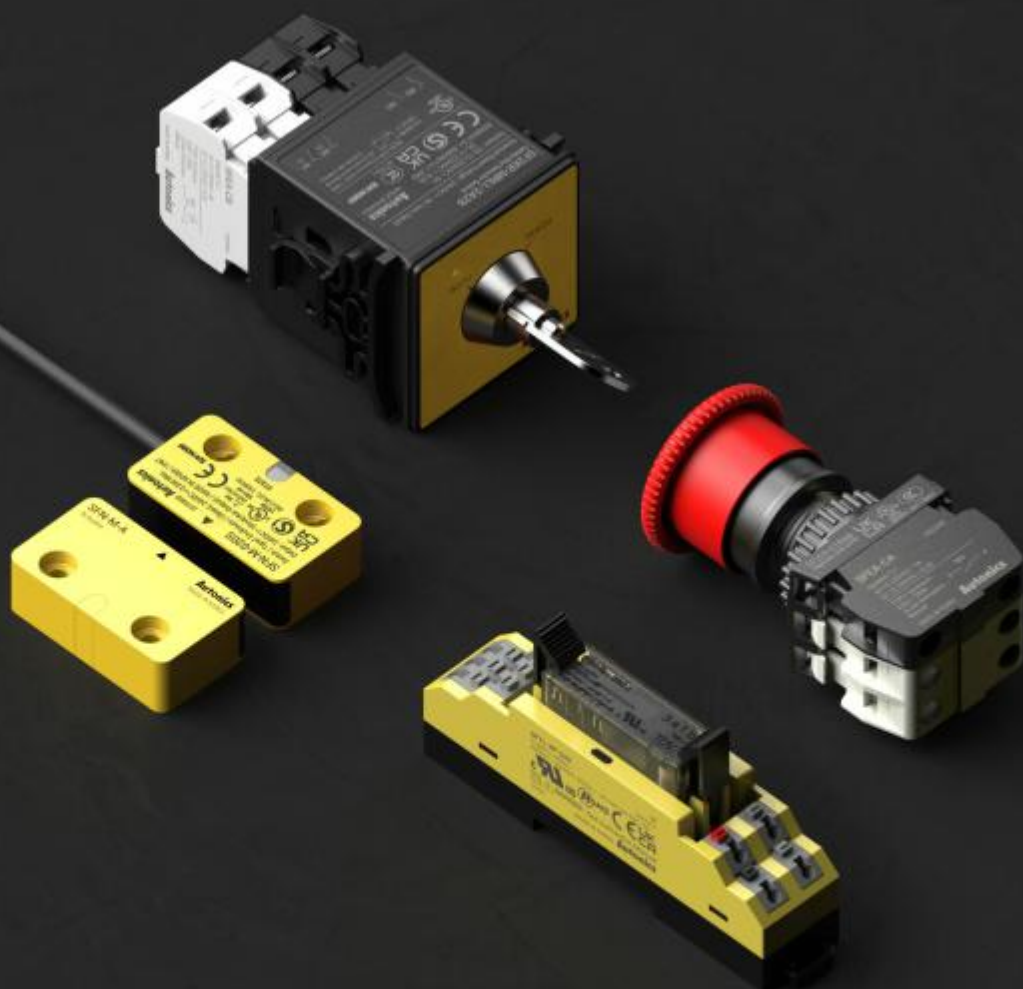


Color Type

D. Safety

Safety products are installed in potentially dangerous or hazardous areas to safeguard personnel from injury and protect equipment from damage.

- D1. Safety Sensors
- D2. Safety Controllers
- D3. Safety Door Switches
- D4. Safety Switches
- D5. Safety I/O Terminal Blocks







D1. Safety Sensors

Safety sensors are comprised of emitters and receivers. Operation of potentially dangerous machines are turned off when an object or person is detected between the emitter and receiver.

D1-1 Safety Light Curtains

SFL / SFLA Series

Safety Light Curtains (Standard Type / Advanced Type)

Safety Light Curtains

(Standard Type /
Advanced Type)

SFL / SFLA Series



Features

- International safety standard and regulation compliance
: Type 4 ESPE (AOPD), SIL3, SIL CL3, Category 4, PL e, CE, UKCA, UL Listed, S-Mark, KCs (industrial robot protection device)
- Available in 3 detection type models (finger, hand, hand-body detection) and various protection height models
- Various safety-related functions & self-diagnosis functions
- Various status readings with 7-segment display and status indicators
- Easy beam adjustment with top and bottom beam indicators
- Upper OSSD indicator to check operation status and muting status (separate muting lamp not required)

Specifications

Type	Standard type		
Models	SFL14-□-□	SFL20-□-□	SFL30-□-□
Sensing type	Through-beam		
Light source	Infrared LED (855 nm)		
Effective aperture angle (EAA)	Within ± 2.5 ° when the sensing distance is greater than 3 m for both emitter and receiver.		
Sensing distance	Short - Long mode (setting switch)		
Short mode	0.2 to 5 m	0.2 to 8 m	0.2 to 8 m
Long mode	0.2 to 10 m	0.2 to 15 m	0.2 to 15 m
Detection capability	Ø 14 mm (finger)	Ø 20 mm (hand)	Ø 30 mm (hand-body)
Detection object	Opaque object		
Number of optical axes ⁰¹⁾	15 to 111	12 to 68	42 to 75
Protective height	144 to 1,008 mm	183 to 1,023 mm	1,043 to 1,868 mm
Optical axis pitch	9 mm	15 mm	25 mm
Series connection	Max. 3 SET (≤ 300 optical axes)		

Type	Advanced type		
Models	SFLA14-□-□	SFLA20-□-□	SFLA30-□-□
Sensing type	Through-beam		
Light source	Infrared LED (855 nm)		
Effective aperture angle (EAA)	Within ± 2.5 ° when the sensing distance is greater than 3 m for both emitter and receiver.		
Sensing distance	Short - Long mode (setting switch or atLightCurtain)		
Short mode	0.2 to 5 m	0.2 to 8 m	0.2 to 8 m
Long mode	0.2 to 10 m	0.2 to 15 m	0.2 to 15 m
Detection capability	Ø 14 mm (finger)	Ø 20 mm (hand)	Ø 30 mm (hand-body)
Detection object	Opaque object		
Number of optical axes ⁰¹⁾	15 to 199	12 to 124	9 to 75
Protective height	144 to 1,800 mm	183 to 1,863 mm	218 to 1,868 mm
Optical axis pitch	9 mm	15 mm	25 mm
Series connection	Max. 4 SET (≤ 400 optical axes)		

⁰¹⁾ It may differ depending on the models. For more information, refer to the "SFL/SFLA User Manual."

View product detail



Standard Type



Advanced Type

- 4 non-safety outputs for various applications (2 AUX, 2 lamp)
- Stable operation in diverse conditions including low temperature, oil, high pressure water
 - Protection rating: IP65, IP67, IP67G, IP69K
 - Ambient temperature: -30 to 60 °C
- Additional functions and configuration available with dedicated software (atLightCurtain) (SFLA Series)

※ Sold Separately

- Power I / O cable: SFL-BCT(R), SFL-C□T(R)
- M12 connector cable
 - : CID8-□T(R), CID8-□T(R)
- Y type connector cable: SFL-YC, SFL-YCR
- Series connector cable: SFL-EC□T(R)
- Lamp output cable: SFL-LC
- Bracket: BK-SFL- □□
- SFL / SFLA dedicated USB to Serial communication converter: SCM-SFL
- Test piece: SFL-T□
- LOTO (Lockout-Tagout) device: SFL-LT□

Power supply	24 VDC≐ ± 20 % (Ripple P-P: ≤ 10 %)
Current consumption ⁰¹⁾	Emitter: ≤ 106 mA, receiver: ≤ 181 mA
Response time ⁰¹⁾	T _{OFF} (ON → OFF): ≤ 19.9 ms, T _{ON} (OFF → ON): ≤ 49.7 ms
Safety related output : OSSD output	NPN or PNP open collector Load voltage ⁰²⁾ : ON - 24 VDC≐ (except for the residual voltage), OFF - 0 VDC≐, Load current ⁰³⁾ : ≤ 300 mA, Residual voltage ⁰⁴⁾ : ≤ 2 VDC≐ (except for voltage drop due to wiring), Load capability: ≤ 2.2 μF, Leakage current: ≤ 2.0 mA, Wire resistance of load: ≤ 2.7 Ω
Auxiliary output (AUX 1/2) ⁰⁵⁾	NPN or PNP open collector Load voltage: ≤ 24 VDC≐, Load current: ≤ 100 mA, Residual voltage: ≤ 2 VDC≐ (except for voltage drop due to wiring)
Lamp output (LAMP 1/2) ⁰⁵⁾	NPN or PNP open collector Load voltage: ≤ 24 VDC≐, Load current: ≤ 300 mA
External input	Reset input, mute 1/2 input, EDM, external test When setting NPN output ON: 0 - 3 VDC≐, OFF: 9 - 24 VDC≐ or open, short-circuit current: ≤ 3 mA When setting PNP output ON: 9 - 24 VDC≐, OFF: 0 - 3 VDC≐ or open, short-circuit current: ≤ 3 mA
Protection circuit	Reverse power polarity, reverse output polarity, output short-circuit over-current protection
Safety-related functions	Interlock (reset hold), external device monitoring (EDM), muting/override, Blanking (fixed blanking, floating blanking), reduced resolution
General functions	Self-test, alarm for reduction of incident light level, mutual interference prevention
Others functions	Change of sensing distance, switching to NPN or PNP, external test (light emission stops), auxiliary output (AUX 1, 2), lamp output (LAMP1, 2)
Synchronization type	Timing method by RS485 synchronous line
Insulation resistance	≥ 20MΩ (at 500 VDC≐ megger)
Noise immunity	± 240 VDC≐ the square wave noise (pulse width: 1μs) by the noise simulation
Dielectric strength	1,000 VAC~ 50 / 60 Hz for 1 minute
Vibration ⁰⁶⁾	10 mm double amplitude at frequency of 5 to 150 Hz, 10 sweeps in each X, Y, Z direction
Shock ⁰⁶⁾	250 m/s ² (≈ 25 G), pulse width 6 ms in each X, Y, Z direction for 100 times
Ambient illumination (receiver)	Incandescent lamp: ≤ 3,000 lx, sunlight: ≤ 10,000 lx
Ambient temperature	-30 to 60 °C, storage: -30 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Protection rating ⁰⁷⁾	IP65, IP67 (IEC standard), IP67G (JEM Standard), IP69K (DIN standard)
Material	Case: Aluminum, Front cover and sensing part: Polymethyl methacrylate, End cap: polycarbonate, Power I/O cable and connector cable: polyurethane (PUR) or polyvinyl chloride (PVC), Y type connector cable: polyvinyl chloride (PVC), lamp output cable and series connector cable: polyurethane (PUR), Top / Bottom adjustable bracket and Top / Bottom bracket: SUS304, Side adjustable bracket and Side bracket: nickel plated Zn
Approval	CE, TÜV, TÜV NORD, S, S (industrial robot protection device) ⁰⁸⁾
International standards	UL 508, CSA C22.2 No. 14, ISO 13849-1 (PL e, Cat. 4), ISO 13849-2 (PL e, Cat. 4), UL 61496-1 (Type 4, ESPE), UL 61496-2 (Type 4, AOPDs), IEC/EN 61496-1 (Type 4, ESPE), IEC/EN 61496-2 (Type 4, AOPDs), IEC/EN 61508-1~-7 (SIL 3), IEC/EN 62061 (SIL CL 3)

01) It may differ depending on the models. For more information, refer to the "SFL/SFLA User Manual."

02) The values of load voltage were drawn with PNP output, and in case of NPN output, apply these in reverse.

03) Be sure that the load current should be greater than 6 mA.

04) The residual voltage was drawn with 300 mA of load current.

05) It is the non-safety output. Do not use it for safety purposes.

06) Testing according to IEC 61496-1 standards.

07) Approved certification protection ratings are IP65 and IP67.

08) The certified models for S-mark and KCs (industrial robot protection device) have the same functional basis.

Software

Download the installation file and the manuals from the Autonics website.

[atLightCurtain]

It is that provides configuration and monitoring of light curtain.

In case of SFL (Standard type), only monitoring function is supported, and in case of SFLA (advanced type), all functions such as parameter setting are available.



D2. Safety Controllers

Safety controllers are used to transmit input and output signals of safety devices and prevent dangerous situations.

Safety Controllers / Safety Relay Unit



SFC / SFC-R Series



Features

- Slim size (17.5 / 22.5 / 35 mm) for saving installation space
- Various LED indicators for displaying status (power / input / logic input / error / feed back / output)
- Screw / Screwless connection models
- P channel FET / Relay contact safety output models
- Available off-delay output and time setting (advanced/non-contact door switch / relay output models)
- Available logic (AND) connection and extension relay unit connection (advanced / non-contact door switch models)
- The product structure conforms with international safety regulations and standards: SIL3, SIL CL3, PLe, CE, UL Listed, and S Mark

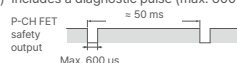
Specifications

Unit	Basic	Advanced	Non-contact door switch
Model	SFC-422-□	SFC-A322-2□-□	SFC-N322-2□-□
Power supply	24 VDC=		
Allowable voltage range	85 to 110% of rated voltage		
Power consumption ⁰¹⁾	≤ 2.5 W	≤ 3.0 W	≤ 3.5 W
Input	ON: ≥ 11 VDC= ≥ 5 mA, OFF: ≤ 5 VDC= ≤ 1 mA		
Input time	≥ 50 ms, feedback start (manual) : ≥ 100 ms		
Cable	≤ 100 m (≤ 100Ω, ≤ 10nF)		
Safety output	P channel FET ⁰²⁾		
Instantaneous	4 ×	3 × ⁰³⁾	3 × ⁰³⁾
Off-delay ⁰⁴⁾	-	2 × ⁰³⁾	2 × ⁰³⁾
Time accuracy	-	≤ ± 5%	≤ ± 5%
Load current	Below 2-point output: ≤ DC 1 A, Over 3-point output: ≤ DC 0.8 A		
Leakage current	≤ 0.1 mA		
Operating time (OFF → ON) ⁰⁵⁾	Safety input: ≤ 50 ms		
	-	Logic input: ≤ 200 ms	-
	-	-	Non-contact door switch input: ≤ 100 ms
Response (return) time (ON → OFF) ⁰⁵⁾	≤ 15 ms, non-contact door switch input or logic input: ≤ 20 ms		
Auxiliary output	2 × PNP transistor: X1, X2 (error)		
Load current	≤ 100 mA		
Leakage current	≤ 0.1 mA		
Logical AND connections	No. of connections: max. 4 units, no. of total connections: max. 20 units No. of layers: max. 5 layers, cable length: ≤ 100 m		
SFN connections ⁰⁶⁾	-	-	Max. 30 units
Approval	IEC/EN 61508 (SIL3), IEC/EN 62061 (SILCL3) IEC/EN 60947-5-1, EN ISO 13849-1 (Category 4, PLe) UL listed E249635		
Certification	CE (TUV NORD)   ENEC		
Unit weight (package)	≈ 70 g (≈ 120 g)	≈ 90 g (≈ 140 g)	≈ 100 g (≈ 150 g)

01) Not include the power consumption of loads.

(SFC-N exclude the power supplied to the non-contact door switch.)

02) Includes a diagnostic pulse (max. 600 μs). Be cautious when using the output signal as an input signal for the control device.



03) Available changing via setting switch on the back side of the product.

04) Available to set Off-delay time (max. 3 sec. / 300 sec., depends on model)

05) The operation (response) time of each model. The time increases when a logical connection or expansion relay unit is connected.

06) SFC-N units can only be connected to Autonics non-contact door switch units SFN Series.

View product detail



Controllers



Relay Units

Unit	Expansion relay	Relay		
Model	SFC-ER412-□	SFC-R412-□	SFC-R212-□	SFC-R212-R2□-□
Power supply	24 VDC≒			
Allowable voltage range	85 to 110% of rated voltage			
Power consumption ⁰¹⁾	≤ 2.5 W	≤ 4.0 W	≤ 4.0 W	≤ 6.0 W
Input	ON: ≥ 11 VDC≒ ≥ 5 mA, OFF: ≤ 5 VDC≒ ≤ 1 mA			
Input time	≥ 50 ms, feedback start (manual) : ≥ 100 ms			
Cable	≤ 100 m (≤ 100Ω, ≤ 10nF)			
Safety output	Relay (A contact)	Relay (A contact)		
Instantaneous	4 ×	4 ×	2 ×	2 ×
Off-delay ⁰²⁾	-	-	-	2 ×
Time accuracy	-	-	-	≤ ± 5%
Capacity	240 VAC~ 5 A resistance load, 30 VDC≒ 5 A resistance load			
Life expectancy	Mechanical: ≥ 10,000,000 operations, Malfunction: ≥ 50,000 operations			
Contact resistance	≤ 100 mΩ			
Inductive load switching	IEC60947-5-1: AC-15(230 V/2 A), DC-13(24 V/1.5 A), UL508: B300/R300			
Conditional short-circuit current	100 A ⁰³⁾			
Operating time (OFF → ON) ⁰⁴⁾	≤ 30 ms ⁰⁵⁾	≤ 100 ms		
Response (return) time (ON → OFF) ⁰⁴⁾	≤ 10 ms	≤ 15 ms		
Auxiliary output	1 × PNP transistor: X2 (error)	1 × PNP transistor: X1		
Load current	≤ 100 mA	≤ 100 mA		
Leakage current	≤ 0.1 mA			
Expansion units connections	Max. 5 units	-		
Approval	IEC/EN 61508 (SIL3), IEC/EN 62061 (SILCL3) IEC/EN 60947-5-1, EN ISO 13849-1 (Category 4, PLe) UL listed E249635			
Certification	CE UKCA (E) EN IEC EAC (TUV NORD) UKCA (E) EN IEC EAC			
Unit weight (package)	≈ 100 g (≈ 150 g)	≈ 110 g (≈ 160 g)	≈ 80 g (≈ 130 g)	≈ 110 g (≈ 150 g)

01) Not include the power consumption of loads.

02) Available to set Off-delay time (max. 3 sec. / 30 sec., depends on model)

03) Use 6 A fast-blow fuse under the IEC 60127 standard as a short-circuit protection device.

04) The operation (response) time of each model. The time increases when a logical connection or expansion relay unit is connected.

05) Except operation time of advanced unit, non-contact door switch unit

Pollution	3
Overvoltage category	III
Impulse withstand voltage for relay unit (IEC/EN 60947-5-1)	Input terminals and relay output terminals: 6 kV Relay contacts between 13-14 / 23-24 and 33-34 / 43-44 (37-38 / 47-48): 6 kV between 13-14 and 23-24: 4 kV between 33-34 and 43-44 (37-38 and 47-48): 4 kV
Dielectric strength	[Basic / Advanced / Non-contact door switch unit] Between all terminals and case: 500 VAC~ 50/60 Hz for 1 min. [Expansion relay / Relay unit] Between all terminals and case: 1,500 VAC~ 50/60 Hz for 1 min. Between input terminals and output terminals ⁰¹⁾ : 2,500 VAC~ 50/60 Hz for 1 min.
Insulation resistance	≥ 100 MΩ (500 VDC≒ megger)
Vibration ⁰²⁾	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunc.) ⁰²⁾	0.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes
Shock ⁰²⁾	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunc.) ⁰²⁾	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Protection rating	IP20 (IEC standard)
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	25 to 85 %RH, storage: 25 to 85 %RH (no freezing or condensation)

01) In case of relay unit, output terminals between 13-14, 23-24 and 33-34, 43-44 (37-38, 47-48)

02) This data based on the product is mounted with bolts. When installing DIN rail, use the product in an environment with small vibration (condition: less than 0.4 mm double amplitude)



D3. Safety Door Switches

Safety door switches can detect opening and closing of doors in machines, and also keep the door locked during potentially dangerous operation.

D3-1	Safety Door Lock Switches	SFDL Series	Safety Door Lock Switches
D3-2	Safety Flat Type Door Lock Switches	SFDL2 Series	Safety Flat Type Door Lock Switches
D3-3	Safety Door Switches	SFD Series	Safety Door Switches
D3-4	Safety Non-Contact Door Switches	SFN Series	Safety Non-Contact Door Switches

Safety

Door Lock Switches

SFDL Series



Features

- Head unit can be rotated to change insert direction of operation key:
Operation key can be inserted from 5 directions (top / sides)
- Various contact types:
4-contact (connected), 4-contact (not connected), 5-contact, 6-contact
- Connector type (easy installation) and terminal type (easy maintenance) available
- Manual unlock function (release key) for emergency and testing:
Standard (cross) type and special type release keys available
- Minimized solenoid heat with stable current supply
- High durability with metallic head
- Various applications with slide key unit accessory
- Certifications: IEC/EN 60947-5-1, EN ISO 14119, GS-ET-15, UL 508, S-Mark

* Sold Separately

- Operation key: SFD-K□□
- Connector cable: SFDL-CND10-□
- Safety door lock slide unit: SFDL-SD
- Group locking device: SFD-LT□ /
Connecting cable: SFD-LT-C□

Specifications

Model	SFDL-□□□-□□	SFDL-□□□-C□□
Directing opening force	≥ 80 N	
Directing opening distance	≥ 10 mm	
Locking pullout strength	≥ 1,300 N	
Operating speed	0.05 to 1 m/s	
Operating frequency	≤ 20/min	
Mechanical life cycle	≥ 1,000,000 operations (20/min)	
Vibration (malfunction)	0.35mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	80 m/s ² (≈ 8 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-10 to 55°C ⁰¹⁾ , storage: -25 to 65 °C (a non freezing or condensation environment)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (a non freezing or condensation environment)	
Protection structure	IP67 ⁰²⁾ (IEC standard, except for head)	
Material	Head: zinc, case: polyamide 66, operation key: stainless steel 304	
Approval	CE (TUV NORD) UK KEMA ENEC EAC	
Accessory	SFDL-□□□-□□K (Special type release key) : rotating key	
Applicable cable	AWG22	—
Connection type	Terminal type	Connector type
Unit weight (packaged)	≈ 375 g (≈ 440 g)	≈ 325 g (≈ 395 g)

01) UL approved ambient temperature: 50°C

02) Rated protection structure is for the switch body. Be cautious about preventing the head part from entering the foreign materials such as dust and water.

Contact block	
Rated voltage/current for load	Resistive load: 1 A/120 VAC~, 0.22 A/125 VDC= Inductive load (IEC): AC-15 1 A/120 VAC~, DC-13 0.22 A/125 VDC= Inductive load (UL): C150, R150
Impulse dielectric strength	Between the terminals of same polarity: 1.5 kV Between the terminals of different polarity: 1.5 kV Between each terminal and non-live part: 2.5kV
Insulation resistance	≥ 100 MΩ (500 VDC= megger)
Contact resistance	≤ 200 mΩ
Electrical life cycle	≥ 100,000 operations (125 VAC~/1 A)
Conditional short-circuit current	100 A
Solenoid	
Rated voltage	24 VDC=, class 2
Current consumption	Supplying power: 0.26A Normal: max. 0.2A (approx. 3 seconds after supplying power)
Insulation class	Class E



View product detail

Safety

Flat Type Door Lock Switches

SFDL2 Series



Features

- Slim size W 90 x H 105 x D 35.5 mm
- Head unit can be rotated to change insert direction of operation key:
Operation key can be inserted from 4 directions (top / sides)
- Various contact types (up to 6-contacts):
Lock N.C. 2 / N.O. 1 + Door N.C. 2 / N.O.1
Lock N.C. 3 + Door N.C. 2 / N.O.1
Lock N.C. 2 / N.O. 1 + Door N.C. 3
Lock N.C. 3 + Door N.C. 3
- Manual unlock function (release key) for emergencies during installation or testing:
Standard (cross) type and special type release keys, rear release button
- Two lock-release methods:
Mechanical lock-solenoid release, solenoid lock-mechanical release models
- Different installation types depending on operation key insertion position:
Front / rear installation models
- Excellent strength and durability with metal head model

* Sold Separately

- Operation key: SFD-K□□
- Safety door lock slide unit: SFDL2-SD
- Rear release extension button (SFDL2-RE□□)
- Group locking device: SFD-LT□□ /
Connecting cable: SFD-LT-C□□



View product detail

Specifications

Model	SFDL2-□□□□-□□□□-□□ SFDL2-□□□□-□□□□-□□K-□	SFDL2-□□□□-□□□□-□□□□ SFDL2-□□□□-□□□□-□□□□KB-□
Directing opening force	≥ 80 N	
Directing opening distance	≥ 10 mm	
Locking pullout strength	≥ 1,300 N	
Operating speed	0.05 to 1 m/s	
Operating frequency	≤ 20/min	
Mechanical life cycle	≥ 1,000,000 operations (20/min)	
Indicator	Solenoid status or contact status (orange, depending on connection)	-
Vibration (malfunction)	0.35mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	80 m/s ² (≈ 8 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-10 to 55°C, storage: -25 to 65 °C (a non freezing or condensation environment)	
Ambient humidity	35 to 85 %RH , storage: 35 to 85 %RH (a non freezing or condensation environment)	
Protection structure	IP67 ⁰¹⁾ (IEC standard, except for head)	
Material	Head: zinc or PA, case: PA	
Approval	CE (TUV NORD) UKCA (UKCA mark) S ENEC	
Accessory	SFDL2-□□□□-□□□□K/KB-□ (Special type release key): rotating key	
Unit weight (packaged)	Normal type: ≈ 400 g (≈ 490 g), rear release button type:≈ 395 g (≈ 485 g)	
01) Rated protection structure is for the switch body. Be cautious about preventing the head part from entering the foreign materials such as dust and water.		
Contact block		
Rated voltage/current for load	Resistive load: 6 A/250 VAC~, 0.6 A/250 VDC=	
	Inductive load (IEC): AC-15 3 A/240 VAC~, DC-13 0.27 A/250 VDC=	
	Inductive load (UL): A300, Q300	
Impulse dielectric strength	Between the terminals of same polarity: 2.5 kV	
	Between the terminals of different polarity: 4 kV	
	Between each terminal and non-live part: 6 kV	
Insulation resistance	≥ 100 MΩ (500 VDC= megger)	
Contact resistance	≤ 100 mΩ	
Electrical life cycle	≥ 100,000 operations (250 VAC~/6 A)	
Conditional short-circuit current	100 A	
Solenoid		
Rated voltage	24 VDC=, class 2	
Current consumption	Supplying power: 0.26A	
	Normal: max. 0.2A (approx. 3 seconds after supplying power)	
Insulation class	Class E	
Indicator LED		
Rated voltage	24 VDC=	
Current consumption	2.2 mA	

Safety

Non-Contact Door Switches

SFN Series





Features

- Electromagnetic induction method
- Control up to 30 units with a single controller (SFC-N)
- Easy installation with cable connector models and cable / connector accessories
- Stable detection of actuators in front / rear, top / bottom, right / left direction doors
- U-shaped design with 2-color operation indicators visible from 3 sides (ON: green, OFF: red)
- Protection structure: IP67
- SIL 3, PL e rating when used with SFC-N series safety non-contact switch controllers

* Sold Separately

- Safety controller non-contact door switch unit: SFC-N322
- M12 Connector cable: CID5-□, CID5-□P
- Branch connector: CCD5-SFN, CYD5-SFN
- Loop connector: CND5-SFN

Specifications

Model		SFN-M-□
Operating distance ⁰¹⁾	OFF→ON	≥ 5 mm
	ON→OFF	≤ 15 mm
Approval		CE (TUV NORD) UK   EAC
Unit weight (packaged)	Cable type (2 m): ≈ 100.5 g (≈ 113.8 g)	
	Cable type (5 m): ≈ 199.5 g (≈ 214.8 g)	
	Cable connector type: ≈ 58.1 g (≈ 71.6 g)	

01) It is rated at 23°C by ambient temperature, and it may be differed up to ± 20 % by ambient temperature.

Power supply	24 VDC≐ (± 10 %)
Operating frequency	100 Hz
Power consumption ⁰¹⁾	≤ 0.8 W
Auxiliary output	PNP open collector output - 24 VDC≐, 10 mA
Operation indicator	ON: green, OFF: red
Life expectancy	≥ 20,000,000 times (with low load)
Insulation resistance	≥ 50 MΩ (500 VDC≐ megger)
Protection circuit	Surge protection circuit, output short over current protection circuit, reverse polarity protection circuit
Dielectric strength	1,500 VAC~ 50/60Hz for 1 minute
Vibration	1.0 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.0 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	300m/s ² (≈ 30G) in each X, Y, Z direction in output ON/OFF status for 3 times
Ambient temperature	-10 to 55 °C, storage : -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	IP67 (IEC standard)
Connection	Cable type / cable connector type model
Cable	Ø 5 mm, 5-wire, cable type: 2 m / 5 m, cable connector type: 0.3 m
Wire	AWG26 (0.08 mm), 28-core, core diameter: Ø 0.74 mm
Connector spec.	M12 plug connector
Material	Body/CAP: PC

01) Power to the load is not included.

Characteristic level / Safety category (with SFC-N322)	IEC 61508 SIL 3 IEC 62061 SIL CL 3 ISO 13849-1 PLe Cat.4 - HFT = 1 - Diagnostic Coverage : 99 % (high) - MTTFd = 100 year (high) - Mission time = 20 year - PFH = 3.88E-09
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Safety status in case of error: the switch does not have an internal error recognition function, so it cannot maintain a safety status in the event of error. Error recognition is processed in the connected controller (SFC-N322).



View product detail



D4. Safety Switches

Safety switches safeguard personnel from injury and protect equipment from damage in potentially dangerous areas.

D4-1	Emergency Stop Switches	SF2ER Series	Ø 22 / 25 mm Round Mount Emergency Stop Switches
D4-2	Safety Enabling Switches	SFEN Series	Safety Grip Type Enabling Switches
D4-3	Safety Key Selector Switches	SF2KR Series	Safety Key Selector Switches

Ø 22 / 25 mm Round Mount Emergency Stop Switches

SF2ER Series



Features

- Easy installation and removal of contact blocks using levers
- Install up to 3 contact blocks on a single switch
- Compatible with O type and Ytype terminals
- Direct opening mechanism allows interruption of circuit flow to prevent errors such as contact welding
- Various accessories available:
Guard ring to protect switch from accidental operation by users (SEM-S2)
: Ø60 / Ø90 name plates
: Radial support
- Certifications: EN 60947-5-1,
EN ISO 13850, UL 508, S-Mark
- Protection structure: IP65 (control panel)

* Sold Separately

- Protection guard ring
- Name plate
- Protection guard ring + Name plate set
- Radial support rubber packing / Radialsupport
- Contact block
- Switch nut fixing handle

Specifications

Model	SF2ER-□□□□-□
Rated voltage / current	IEC: AC-15 (220 VAC~, 3 A), DC-13 (220 VDC=, 0.2 A) UL: A300, Q300
Contact operating power	3.0 to 8.0 N/ 1 contact
Operation distance	5.0 mm (0/-0.5)
Rotation angle	CW (clock wise) 52°
Allowable operation frequency ⁰¹⁾	Mechanical: 20 times/minute, electrical: 20 times/minute
Life cycle	Mechanical: ≥ 250,000 times, electrical: ≥ 100,000 times
Applicable wire	AWG 18 (0.823 mm ²)
Insulation resistance	≥ 100 MΩ (500 VDC= megger)
Dielectric strength	2,500 VAC~ 50/60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes
Shock	1,000 m/s ² (≈ 100 g) in each X, Y, Z direction for 3 times
Shock (malfunction)	250 m/s ² (≈ 25 g) in each X, Y, Z direction for 3 times
Ambient temperature	-20 to 65°C ⁰²⁾ , storage : -40 to 70 °C (at no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (at no freezing or condensation)
Protection structure	IP65 ⁰³⁾ (oil resistant, IEC standards)
Material	Button: PC, body: PA6, lever in fixing unit: PA6
Approval	CE (TUV NORD)
Weight ⁰⁴⁾	≈ 66g

01) Setting and resetting once is counted as one operation.

02) UL approved ambient temperature: 55 °C

03) It is only for part from front of the panel. Protection structure is guaranteed only when the switch is installed on flat and smooth surface with mounting holes Ø22mm.

04) It is switch with three contact blocks.

[Contact capacity]

IEC (EN60947-5-1)

Rated current		10 A			
Rated voltage		24 V	110 V	220 V	380 V
AC	Resistive load (AC-12)	10 A	10 A	6 A	3 A
	Inductive load (AC-15)	10 A	5 A	3 A	2 A
DC	Resistive load (DC-12)	10 A	2 A	0.6 A	0.2 A
	Inductive load (DC-13)	1.5 A	0.5 A	0.2 A	0.1 A

UL / CSA (UL508, CSA C22.2 No. 14)

A300

Rated voltage	Through current	Current (A)		Volt ampere (VA)	
		Making	Breaking	Making	Breaking
AC120 V	10 A	60	6	7,200	720
AC240 V		30	3		

Q300

Rated voltage	Through current	Current (A)		Volt ampere (VA)	
		Making	Breaking	Making	Breaking
DC125 V	2.5 A	0.55	0.55	69	69
DC250 V		0.27	0.27		



View product detail

Safety

Grip Type Enabling Switches

SFEN Series



Features

- Models: Standard / Stop button / Momentary button type
- High operation sensitivity with 3-position snap action
- Enable operation indicator (green LED)
- Various contact types
 - : Standard type N.O. 2 + N.C. 1
 - : Stop button type N.O. 2 + N.C. 2
 - : Momentary button type N.O. 2 + N.O. 2
- Secure connection with cable gland
- Holding key SFEN-HK (sold separately): for connection with safety door switch (SFD Series)

* Sold Separately

- Mounting bracket: BK-SFEN
- Holding key: SFEN-HK



View product detail

Specifications

[Enable switch]

Rated Insulation Voltage	250 VAC~
Rated through current	2.5 A
Rated inductive load	AC-15 (0.75 A / 240 VAC~), DC-13 (0.55 A / 125 VDC=)
Rated resistive load ⁰¹⁾	0.75 A / 240 VAC~, 0.55 A / 125 VDC=
Controller strength ⁰²⁾	Operation direction: 200 N, for 1 min
Operating frequency	Electrical: ≤ 20 / min, Mechanical: ≤ 20 / min
Dielectric strength	Between terminals of same polarity, between terminals of different polarity, between terminal and non-live part : 2,500 VAC~ 50 / 60 Hz for 1 min (impulse dielectric strength)
Electrical life cycle	≥ 100,000 operations (rated load)
Mechanical life cycle	OFF → ON → OFF: ≥ 100,000 operations / OFF → ON: ≥ 1,000,000 operations

01) Use a 10 A fuse gl or gG conforming to IEC60269 as short-circuit protection. The body does not have a built-in fuse.

02) Do not use the switch more than the controller strength. Failure to follow this instruction may result in product damage.

[Stop button]

Rated Insulation Voltage	250 VAC~
Rated through current	3 A
Rated resistive load ⁰¹⁾	AC-12 (3 A / 250 VAC~), DC-12 (3 A / 30 VDC=)
Controller strength ⁰²⁾	Operation direction: 400 N, for 1 min (operation direction: 0.5 N m, for 1 min)
Operating frequency	Electrical: ≤ 10 / min, Mechanical: ≤ 10 / min
Dielectric strength	Between terminals of same polarity: 1,000 VAC~ 50 / 60 Hz for 1 min. between terminals of different polarity, between terminal and non-live part : 2,000 VAC~ 50 / 60 Hz for 1 min.
Electrical life cycle	≥ 100,000 operations (rated load) (Push / Release 1 time)
Mechanical life cycle	≥ 100,000 operations (Push / Release 1 time)

01) Use a 10 A fuse gl or gG conforming to IEC60269 as short-circuit protection. The body does not have a built-in fuse.

02) Do not use the button more than the controller strength. Failure to follow this instruction may result in product damage.

[Momentary button]







Rated Insulation Voltage	125 VAC~
Rated through current	0.1 A
Rated resistive load ⁰¹⁾	AC-12 (0.1 A / 125 VAC~), DC-12 (0.1 A / 30 VDC=)
Controller strength ⁰²⁾	Operation direction: 10 N, for 1 min
Operating frequency	Electrical: ≤ 25 / min, Mechanical: ≤ 60 / min
Dielectric strength	Between terminals of same polarity: 600 VAC~ 50 / 60 Hz for 1 min. between terminals of different polarity, between terminal and non-live part : 1,000 VAC~ 50 / 60 Hz for 1 min.
Electrical life cycle	≥ 100,000 operations (rated load)
Mechanical life cycle	≥ 1,000,000 operations

01) Use a 10 A fuse gl or gG conforming to IEC60269 as short-circuit protection. The body does not have a built-in fuse.

02) Do not use the button more than the controller strength. Failure to follow this instruction may result in product damage.

Next Page ►

[Common spec.]

Conditional short circuit current	100 A
Min. applied load	DC24 V 4 mA
Directing opening force	30 N ± 10
Directing opening distance	4.8 mm ± 0.5
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock (malfunction)	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Insulation class	Class II (double insulation)
Indicator	Enable operation indicator (green)
Protection structure	SFEN: IP66 (IEC standard) SFEN-B, SFEN-M: IP65 (IEC standard)
Applicable wire	AWG 20 to 18 (0.5 to 0.75 mm ²)
Connection type	M20 connector cable grand
Material	Cover: PA66, button: PC, rubber grip: Silicone
International standards	IEC 60947-5-1, IEC 60947-5-8, UL 60947-5-1
Approval	     
Unit weight (package)	SFEN: ≈ 238 g (≈ 363 g) SFEN-B: ≈ 268 g (≈ 388 g) SFEN-M: ≈ 252 g (≈ 376 g)

[Contact composition]

	SFEN	SFEN-B	SFEN-M
Enable switch	2 N.O.	2 N.O.	2 N.O.
Option output	1 N.C.	-	-
Stop button	-	2 N.C.	-
Momentary button	-	-	2 N.O.

Safety

Key Selector Switches

SF2KR Series



Features

- Easy to check the lock / unlock status by the front solenoid operation indicator (lockable model: SF2KR-M)
- Various line-up of key free location, N.C. contact powered location, and lock location depending on the general / lockable type
- Contact block option up to 4 contacts: N.O. 1 + N.C. 2, N.C. 3, N.O. 2 + N.C. 2
- 10 different types of keys

* Sold Separately

- Name plate (SF2KR-□-NP□)
- Contact block (SFEA-C□)

Specifications

Model	SF2KR-□-□-□	SF2KR-M□-□-□
Solenoid input voltage	-	Non-polar 24 VDC \pm (± 10%)
Solenoid current consumption	-	38.7 mA \pm 5%
Conditional short circuit current	100 A	
Indicator	-	Solenoid operation (green)
Applicable wire	Contact: AWG 18 (0.823 mm ²)	Solenoid power: AWG 24 - 18 Contact: AWG 18 (0.823 mm ²)
Allowable operation frequency ⁰¹⁾	30 times/minute	
Life cycle	Mechanical: \geq 100,000 times, electrical: \geq 100,000 times	
Key pushing force	\geq 20 N	
Key rotating torque	0.2 to 1.8 N·m	
Insulation resistance	\geq 100 M Ω (500 VDC \pm megger)	
Dielectric strength	2,500 VAC \sim 50/60 Hz for 1 minute	
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes	
Shock	300 m/s ² (\approx 30 g) in each X, Y, Z direction for 3 times	
Shock (malfunction)	150 m/s ² (\approx 15 g) in each X, Y, Z direction for 3 times	
Ambient temperature	-20 to 70°C ⁰²⁾ , storage: -40 to 70 °C (at no freezing or condensation)	-10 to 55°C ⁰²⁾ , storage: -20 to 70 °C (at no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (at no freezing or condensation)	
Protection structure	IP65 (front panel, IEC standard)	
Material	PC, POM	
Approval	CE (TUV NORD) UK CA ENEC S	
Unit weight (packaged) ⁰³⁾	\approx 130 g (\approx 192 g)	\approx 152 g (\approx 213 g)

01) Rotating and retuning once is counted as one operation.

02) UL approved ambient temperature: 55 °C

03) It is switch with contact blocks.

[Contact capacity]

IEC (EN60947-5-1)

Rated current		10 A			
Rated voltage		24 V			
AC	Resistive load (AC-12)	10 A	110 V	220 V	380 V
	Inductive load (AC-15)	10 A	10 A	6 A	3 A
DC	Resistive load (DC-12)	10 A	2 A	0.6 A	0.2 A
	Inductive load (DC-13)	1.5 A	0.5 A	0.2 A	0.1 A

UL / CSA (UL508, CSA C22.2 No. 14)

A300

Rated voltage	Through current	Current (A)		Volt ampere (VA)	
		Making	Breaking	Making	Breaking
AC120 V	10 A	60	6	7,200	720
AC240 V		30	3		

Q300

Rated voltage	Through current	Current (A)		Volt ampere (VA)	
		Making	Breaking	Making	Breaking
DC125 V	2.5 A	0.55	0.55	69	69
DC250 V		0.27	0.27		



View product detail



D5. Safety I/O Terminal Blocks

Safety relay terminal blocks allow safer control system operation with redundant circuits.

Safety

Relay Terminal Blocks

SFT Series



Features

- Relays with force guided contacts for safe control system (IEC 61810-3)
- For driving various loads using PLC output signals
- Redundant circuits and signal feedback for safety
- Available in 4-pole and 6-pole models
- Compact, space-saving size
- Available in screw type and screwless type models
- Operation indicator (green LED) for easy status monitoring
- DIN rail mount and screw mount installation (varies by models)

Specifications

Model	SFTS-4P-24V-□	SFTS-6P-24V-□	SFTL-4P-24V-□	SFTL-6P-24V-□
No. of pole	4	6	4	6
Applied relay ⁰¹⁾	4-pole - SFS2-DC24V: 2A2B, SFS3-DC24V: 3A1B 6-pole - SFS4-DC24V: 4A2B, SFS5-DC24V: 5A1B, SFS6-DC24V: 3A3B			
Power supply	24 VDC≒ ±10 %			
Rated load voltage	250 VAC~ 50/60 Hz, 30 VDC≒			
Continuous current	6 A ⁰²⁾			
Indicator	Operation indicator: green			
Terminal type	Screw		Screwless	
Applicable wire - solid	Ø 0.3 to Ø 1.2 mm		Ø 0.6 to 1.25 mm ⁰³⁾	
Applicable wire - stranded	AWG 22-16 (0.30 to 1.25 mm ²)		AWG 22-18 (0.30 to 0.80 mm ²) ^{03) 04)}	
Crimp terminal connection tensile strength	≥ 30 N		-	
Tightening torque	0.5 to 0.6 N m		-	
Stripped length	-		8 to 10 mm	
Insulation resistance	≥ 1,000 MΩ (500 VDC≒ megger)			
Dielectric strength (coil-contact)	4,000 VAC~ 50/60 Hz for 1 minute			
Dielectric strength (different poles contact)	2,500 VAC~ 50/60 Hz for 1 minute			
Dielectric strength (same polarity contact)	2,500 VAC~ 50/60 Hz for 1 minute			
Vibration	0.75 mm amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Vibration (malfunction)	0.75 mm amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 10 minutes			
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times			
Shock (malfunction)	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times			
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)			
Ambient humidity	25 to 85 % RH, storage: 25 to 85 % RH (no freezing or condensation)			
Protection structure	IP20 (IEC standard)			
Material	CASE, BASE, COVER: PC Terminal: C2680		CASE, BASE: PC, Terminal: PA66, Copper, Stainless Steel	
Certification	   			
Unit weight (packaged)	≈ 37.8 g (≈ 85.8 g)	≈ 51.2 g (≈ 99.2 g)	≈ 39.8 g (≈ 88 g)	≈ 51.2 g (≈ 99.2 g)

01) For the detailed specification, refer to the materials from the manufacturer (PANASONIC).
02) Continuous current is the maximum current at each contact and must not exceed the total current depending on the number of contacts.
03) Use the cable of copper conductor in 60°C temperature class.
04) When using the stranded wire, use End Sleeve (Ferrule Terminal).



View product detail

E. Controllers

Controllers are widely used in industrial control systems to adjust or maintain desired outputs of specific processes within a desired range.

- E1. Temperature Controllers
- E2. Digital Panel Meters
- E3. Digital Display Units
- E4. Sensor Controllers
- E5. Recorders
- E6. HMI
- E7. Counters
- E8. Timers
- E9. Industrial PC







E1. Temperature Controllers

Temperature controllers are used to identify measured temperature and release output to maintain desired temperatures.

E1-1	Panel Mount	TN Series	Two-Degree-of-Freedom PID Temperature Controllers
		TX Series	LCD PID Temperature Controllers
		TK Series	Simultaneous Heating & Cooling Output PID Temperature Controllers
		KPN Series	Bar Graph Temperature Controllers
		TCN Series	Dual Display PID Temperature Controllers
		TC Series	Single Display PID Temperature Controllers
		TA Series	Analog Non-Indication Type PID Temperature Controllers
		TF3 Series	Refrigeration Temperature Controllers
		TC3YF Series	Refrigeration Temperature Controllers
		TH4M Series	LCD Temperature / Humidity Controllers
		T3 / T4 Series	Thumbwheel Switch Temperature Controllers
		T3 / T4 Series	1-Channel Digital Temperature Indicators
		KN-1000B Series	Bar Graphic Temperature Indicators
		KN-2000W Series	1-Channel Digital Temperature Indicators
E1-2	DIN-Rail Mount	TMH Series	Modular 2 / 4-Channel PID Temperature Controllers with Screw Connector
		TM Series	Modular 2 / 4-Channel PID Temperature Controllers with Screwless Connector
		TR1D Series	Independent Single Display PID Temperature Controllers

Two-Degree-of-Freedom

PID Temperature Controllers

TN Series



Features

- 2-DOF PID algorithm optimized for various control environments
- 50 ms high-speed sampling and $\pm 0.2\%$ display accuracy
- Program control and fixed control models available
 - Up to 10 patterns X 20 steps program setting (program control model)
 - Timer function for preset operation (fixed control model)
- Simultaneous heating / cooling and automatic / manual control function
- Control functions: Group PID, Zone PID, Anti Reset Windup (ARW)
- Control status monitoring of up to 10 events
- RS485 communication output model available
 - Communication protocols: Modbus RTU / ASCII, PLC ladderless, Sync-Master
 - Communication speed: up to 115,200bps
- Parameter setting via PC






* Sold Separately

- Front cover: FSA / FHA / FLA-COVER
- Terminal protection cover: RSA / RMA / RHA / RLA-COVER
- Communication Converter: SCM-US / SCM-38I / SCM-US48I / SCM-WF48
- Current transformer (CT)



View product detail

Specifications

Model		TN Series
Power supply		100 - 240 VAC~, 50/60 Hz
Permissible voltage range		90 to 110 % of rated voltage
Power consumption		≤ 8 VA
Display type		11 segment, LCD type (operating value display part: 7 segment)
Sampling period		50 / 100 / 250 ms (parameter)
Input specification		Refer to Autonics website
Option input	CT	• 0.0-50.0 A (primary current measurement range) • CT ratio: 1/1,000 • Measurement accuracy: $\pm 5\%$ F.S. ± 1 digit
	Digital	• Contact - ON: ≤ 2 k Ω , OFF: ≥ 90 k Ω • Non contact - residual voltage ≤ 1.0 V, leakage current ≤ 0.1 mA • Outflow current: ≈ 0.5 mA per input
Control output	Relay	250 VAC~ 3A 1a
	SSR	12 VDC= ± 2 V, ≤ 20 mA
	Current	DC 0 - 20 mA or DC 4 - 20 mA (parameter), Load resistance: ≤ 500 Ω
Option output	Alarm	250 VAC~ 3 A 1a
	Transmission	DC 4 - 20 mA (load resistance: ≤ 500 Ω , output accuracy: $\pm 0.3\%$ F.S.)
	Communication	RS485
Control type	Type	ON/OFF, P, PI, PD, PID
	Multi SV	≤ 4 SV
	Group PID	≤ 8 group
	Zone PID	4 zones
	ARW (Anti Reset Windup)	50 to 200 %
Program control	Program	≤ 10 patterns
	Step	≤ 200 steps (1 pattern: ≤ 20 steps)
	Setting type	Time setting
Hysteresis		• Thermocouple, RTD: 1 to 100 (0.1 to 100.0) $^{\circ}\text{C}/^{\circ}\text{F}$ • Analog: 1 to 100 digit
Proportional band (P)		0.1 to 999.9 $^{\circ}\text{C}$ (0.1 to 999.9%)
Integral time (I)		0 to 9,999 sec
Derivative time (D)		0 to 9,999 sec
Control cycle (T)		• Relay / SSRP output: 0.1 to 120.0 sec • Selectable current or SSR drive output: 1.0 to 120.0 sec
Manual reset		0.0 to 100.0%
Dielectric strength		Between the charging part and the case: 3,000 VAC~ 50/60 Hz for 1 min
Vibration		0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours
Relay life cycle	Mechanical	• OUT1/2: $\geq 5,000,000$ operations • AL1/2/3/4/5/6: $\geq 20,000,000$ operations
	Electrical	• OUT1/2: $\geq 200,000$ operations • AL1/2/3/4/5/6: $\geq 100,000$ operations
Insulation resistance		≥ 100 M Ω (500 VDC= megger)
Insulation type		Double insulation or reinforced insulation (mark:  , dielectric strength between the measuring input part and the power part: 3 kV)
Noise immunity		± 2 kV square shaped noise by noise simulator (pulse width: 1 μs) R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 $^{\circ}\text{C}$, storage: -20 to 60 $^{\circ}\text{C}$ (no freezing or condensation)
Ambient humidity		35 to 85%RH
Protection structure		IP65 (Front panel, IEC standards)
Loader port		• TNS: top side • TNH, TNL: front side
Accessory		Bracket
Unit weight (packaged)		• TNS: ≈ 128 g (≈ 156 g) • TNH: ≈ 184 g (≈ 286 g) • TNL: TNL: ≈ 301 g (≈ 443 g)
Certification		CE    
Comm. protocol		Modbus RTU/ASCII, Sync-Master, PLC ladderless

LCD

PID Temperature Controllers

TX Series



Features

- 50 ms high-speed sampling rate and $\pm 0.3\%$ display accuracy
- Large LCD display with easy-to-read white PV characters
- Switch between current output and SSR drive output
- SSR drive output (SSRP function) control options: ON / OFF control, cycle control, phase control
- Communication output model available: RS485 (Modbus RTU)
- Parameter configuration via PC (RS485 communication): DAQMaster software included (comprehensive device management software)
- Compact, space-saving design with 45 mm depth: 30% rear-length size reduction compared to similar-sized (48 × 48 mm) models from Autonics Terminal protection cover sold separately: RSA-COVER
- * Sold Separately
- Terminal protection cover: RSA / RMA / RHA / RLA-COVER
- Communication Converter: SCM-US / SCM-38I / SCM-US48I / SCM-WF48



View product detail

Specifications

Model		TX Series
Power supply		100 - 240 VAC~ 50/60 Hz
Permissible voltage range		90 to 110 % of rated voltage
Power consumption		≤ 8 VA
Sampling period		50 ms
Input specification		Refer to Autonics website
Control output	Relay	250 VAC~ 3 A, 30 VDC= 3 A, 1a
	SSR	TX4S: 12 VDC= ± 2 V, ≤ 20 mA TX4M/H/L: 13 VDC= ± 3 V, ≤ 20 mA
	Current	DC 4-20 mA or DC 0-20 mA (parameter), Load resistance: $\leq 500 \Omega$
Alarm output	Relay	AL1/2: 250 VAC~ 3 A 1a
Option output	PV transmission	DC 4 - 20 mA (Load resistance: $\leq 500 \Omega$, Output Accuracy: $\pm 0.3\%$ F.S.)
	RS485 Comm.	Modbus RTU
Display type		11 Segment (Red, Green, Yellow), LCD type
Control type	Heating, Cooling	ON/OFF, P, PI, PD, PID Control
	Heating& Cooling	
Hysteresis		1 to 100 (0.1 to 50.0) °C/°F
Proportional band (P)		0.1 to 999.9 °C/°F
Integral time (I)		0 to 9,999 sec
Derivative time (D)		0 to 9,999 sec
Control cycle (T)		0.5 to 120.0 sec
Manual reset		0.0 to 100.0%
Relay life cycle	Mechanical	$\geq 5,000,000$ operations
	Electrical	$\geq 200,000$ operations (resistance load: 250 VAC~ 3 A)
Dielectric strength		Between the charging part and the case: 3,000 VAC~ 50/60 Hz for 1 min
Vibration		0.75 mm amplitude at frequency 5 to 55Hz in each X, Y, Z direction for 2 hours
Insulation resistance		≥ 100 M Ω (500 VDC= megger)
Noise immunity		± 2 kV square shaped noise (pulse width 1 μ s) by noise simulator R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection structure		IP50 (Front panel, IEC standards)
Insulation type		Double or reinforced insulation (mark: \square), dielectric strength between primary circuit and secondary circuit: 3 kV)
Certification		CE, ENEC, TUV, ENEC, ENEC
Unit weight (packaged)		• TX4S: ≈ 87 g (≈ 146 g) • TX4M: ≈ 143 g (≈ 233 g) • TX4H: ≈ 133 g (≈ 214 g) • TX4L: ≈ 206 g (≈ 290 g)
Comm. protocol		Modbus RTU

Simultaneous Heating & Cooling Output PID Temperature Controllers

TK Series



Features

- 50 ms high-speed sampling rate and $\pm 0.3\%$ display accuracy
- Simultaneous heating and cooling control function
- Switch between current output and SSR drive output
- SSR drive output (SSRP function) control options:
ON / OFF control, cycle control, phase control
- User-friendly parameter features
- Heater disconnect alarm function (CT input)
- Current transformer (CT) sold separately
- SV preset function (up to 4 set values)
using digital input terminals

* Sold Separately






- Current transformer (CT)
- Terminal protection cover: RSA / RMA / RHA / RLA-Cover
- Communication Converter: SCM-US / SCM-38I / SCM-US48I / SCM-WF48
- 11-pin controller socket: PG-11, PS-11(N)

Specifications

Model		TK4N	TK4SP	TK4S	TK4M
Power supply	AC type	100 - 240 VAC~ 50/60 Hz			
	AC/DC type	-	24 VAC~ 50/60 Hz, 24-48 VDC==		
Permissible voltage range		90 to 110 % of rated voltage			
Power consumption	AC type	≤ 6 VA	≤ 8 VA		
	AC/DC type	-	AC: ≤ 8 VA, DC ≤ 5W		
Unit weight (packaged)		≈ 70 g (= 140 g)	≈ 85 g (= 130 g)	≈ 105 g (= 150 g)	≈ 140 g (= 210 g)
Model		TK4W	TK4H		TK4L
Power supply	AC type	100 - 240 VAC~ 50/60 Hz			
	AC/DC type	24 VAC~ 50/60 Hz, 24-48 VDC==			
Permissible voltage range		90 to 110 % of rated voltage			
Power consumption	AC type	≤ 8 VA			
	AC/DC type	AC: ≤ 8 VA, DC ≤ 5W			
Unit weight (packaged)		≈ 141 g (= 211 g)	≈ 141 g (= 211 g)		≈ 198 g (= 294 g)
Sampling period		50 ms			
Input specification		Refer to Autonics website			
Option input	CT input	• 0.0-50.0 A (primary current measurement range) • CT ratio: 1/1,000 • Measurement accuracy: ±5% F.S. ±1digit			
	Digital input	• Contact - ON: ≤ 2 kΩ, OFF: ≥ 90 kΩ • Non contact - residual voltage ≤ 1.0 V, leakage current ≤ 0.1 mA • Outflow current: ≈ 0.5 mA per input			
Control output	Relay	250 VAC~ 3 A, 30 VDC== 3 A 1a			
	SSR	11 VDC==±2 V, ≤ 20 mA			
	Current	DC 4-20 mA or DC 0-20 mA (parameter), Load resistance: ≤ 500 Ω			
Alarm output	Relay	AL1, AL2: 250 VAC~ 3 A 1a • TK4N AL2: 250 VAC~ 0.5 A 1a (≤ 125 VA)			
	Transmission	DC 4 - 20 mA (Load resistance: ≤ 500 Ω, Output accuracy: ±0.3% F.S.)			
Option output	RS485 comm.	Modbus RTU			
Display type		7 segment (red, green, yellow), LED type			
Control type	Heating, Cooling	ON/OFF, P, PI, PD, PID Control			
	Heating & Cooling				
Hysteresis		• Thermocouple, RTD: 1 to 100 (0.1 to 100.0) °C/°F • Analog: 1 to 100 digit			
Proportional band (P)		0.1 to 999.9 °C/°F (0.1 to 999.9%)			
Integral time (I)		0 to 9,999 sec			
Derivative time (D)		0 to 9,999 sec			
Control cycle (T)		• Relay output, SSR drive output: 0.1 to 120.0 sec • Selectable current or SSR drive output: 1.0 to 120.0 sec			
Manual reset		0.0 to 100.0%			
Relay life cycle	Mechanical	OUT1/2: ≥ 5,000,000 operations AL1/2: ≥ 20,000,000 operations (TK4H/W/L: ≥ 5,000,000 operations)			
	Electrical	≥ 100,000 operations			
Dielectric strength		Dependent on the power supply			
AC voltage type		Between the charging part and the case: 3,000 VAC ~ 50/60 Hz for 1 minute			
AC / DC voltage type		Between the charging part and the case: 2,000 VAC ~ 50/60 Hz for 1 minute			



View product detail

Vibration	0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)
Noise immunity	±2 kV square shaped noise by noise simulator (pulse width: 1 μs) R-phase, S-phase
Memory retention	≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection structure	IP65 (Front panel, IEC standards) • TK4SP: IP50 (Front panel, IEC standards)
Insulation type	Double insulation or reinforced insulation (mark:  , dielectric strength between the measuring input part and the power part: 2 kV)
Certification	   
Comm. protocol	Modbus RTU

Bar Graph Temperature Controllers

KPN Series



Features

- High speed sampling of 50 ms and $\pm 0.3\%$ display accuracy
- Enable to check control output operation amount by adopting bar graph
- Simultaneous heating / cooling control and automatic / manual control for high performance control
- Selection function of current output or SSR drive output
- Parameter setting available via PC
- Communication converter sold separately: SCM-US (USB / Serial converter), SCM-38I (RS232C / RS485 converter), SCM-US48I (USB / RS485 converter)
- Multi-SV (Max. 4) function (select via digital input terminal)
- Heater break alarm
- CT sold separately
- Multi input / multi range
- ※ Sold Separately
- Terminal protection cover: RHA / RLA-COVER
- Communication Converter: SCM-US / SCM-38I / SCM-US48I / SCM-WF48
- Current transformer (CT)



View product detail

Specifications

Model		KPN Series
Power supply		100 - 240 VAC ~ 50/60 Hz
Permissible voltage range		90 to 110 % of rated voltage
Power consumption		≤ 15 VA
Sampling period		50 ms
Input specification		Refer to Autonics website
Option input	CT input	• 0.0-50.0 A (primary current measurement range) • CT ratio: 1/1,000
	Remote SV	1 - 5 VDC \equiv or 4 - 20 mA (Current Input: External resistance 250 Ω)
	Digital input	• Contact - ON: ≤ 2 k Ω , OFF: ≥ 90 k Ω • Non contact - residual voltage ≤ 1.0 V, leakage current ≤ 0.1 mA
Control output	Relay	250 VAC ~ 5 A 1a
	SSR	11 VDC \equiv ± 2 V, ≤ 20 mA
	Current	DC 4-20 mA or DC 0-20 mA (parameter), load resistance: ≤ 500 Ω
Alarm output	Relay	250 VAC ~ 3 A 1a
Option output	Transmission	DC 4 - 20 mA (load resistance: ≤ 500 Ω , output accuracy: $\pm 0.3\%$ F.S. ± 1 -digit)
	RS485 Comm.	Modbus RTU
Display type		7 segment (red, green), control output bar graph (red, green), LED type
Control type	Heating, Cooling	ON/OFF, P, PI, PD, PID Control
	Heating & Cooling	
Hysteresis		• Thermocouple, RTD: 1 to 100 (0.1 to 100.0) $^{\circ}\text{C}/^{\circ}\text{F}$ • Analog: 1 to 100 digit
Proportional band (P)		0.1 to 999.9 $^{\circ}\text{C}/^{\circ}\text{F}$ (0.1 to 999.9%)
Integral time (I)		0 to 9,999 sec
Derivative time (D)		0 to 9,999 sec
Control cycle (T)		• 0.1 to 120.0 sec [relay output model] • 1.0 to 120.0 sec [SSR drive output model]
Manual reset		0.0 to 100.0%
Relay life cycle	Mechanical	$\geq 10,000,000$ operations
	Electrical	$\geq 100,000$ operations (load resistance: 250 VAC ~ 3 A)
Dielectric strength		Between the charging part and the case: 3,000 VAC ~ 50/60 Hz for 1 minute
Vibration		0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours
Insulation resistance		≥ 100 M Ω (500 VDC \equiv megger)
Noise immunity		± 2 kV square shaped noise (pulse width 1 μs) by noise simulator R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 $^{\circ}\text{C}$, storage: -20 to 60 $^{\circ}\text{C}$ (no freezing or condensation)
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection structure		IP65 (front panel, IEC standards)
Insulation type		Double or reinforced insulation (mark: \square , dielectric strength between the measuring input part and the power part: 2 kV)
Accessory		Bracket
Certification ⁰¹⁾		CE 
Unit weight (packaged)		• KPN52□-□: ≈ 160 g (≈ 230 g) • KPN53□-□: ≈ 160 g (≈ 230 g) • KPN55□-□: ≈ 220 g (≈ 316 g)
Comm. protocol		Modbus RTU

01) Certification attainment may vary depending on the model. Check the certification on the Autonics website.

Dual Display PID Temperature Controllers

TCN Series



Features

- Dual digital display (PV / SV)
 - 100 ms high-speed sampling rate and $\pm 0.5\%$ display accuracy
 - Switch between relay output and SSR drive output
 - SSR drive output (SSRP function) control options: ON / OFF control, cycle control, phase control
 - Compact design with large display panels for easier reading
 - Connector plug types offer easier wiring and maintenance (TCN4S-□-P)
- * Sold Separately
- Terminal protection cover: RSA / RMA / RHA / RLA-COVER

Specifications

Model	TCN4□-22R-□	TCN4□-24R-□
Power supply	24 VAC~ 50/60 Hz 24 - 48 VDC=	100 - 240 VAC~ 50/60 Hz
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	AC: ≤ 5 VA, DC: ≤ 3 W	≤ 5 VA
Sampling period	100 ms	
Input specification	Refer to Autonics website	
Control output	Relay	250 VAC~ 3A, 30 VDC= 3A, 1a
	SSR	12 VDC= ± 2 V, ≤ 20 mA
Alarm output	250 VAC~ 1 A 1a	
Display type	7 Segment (red, green), LED type	
Control type	Heating, Cooling	ON/OFF, P, PI, PD, PID Control
Hysteresis	1 to 100 (0.1 to 50.0) °C/°F	
Proportional band (P)	0.1 to 999.9 °C/°F	
Integral time (I)	0 to 9,999 sec	
Derivative time (D)	0 to 9,999 sec	
Control cycle (T)	0.5 to 120.0 sec	
Manual reset	0.0 to 100.0%	
Relay life cycle	Mechanical	$\geq 5,000,000$ operations
	Electrical	OUT1/2: $\geq 200,000$ operations (load resistance: 250 VAC~ 3 A) AL1/2: $\geq 300,000$ operations (load resistance: 250 VAC~ 1 A)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min	Between the charging part and the case: 2,000 VAC~ 50/60 Hz for 1 min
Vibration	0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours	
Insulation resistance	≥ 100 M Ω (500 VDC= megger)	
Noise immunity	± 2 kV square shaped noise (pulse width: 1 μ s) by noise simulator R-phase, S-phase	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Insulation type	Mark: □, double or reinforced insulation (dielectric strength between the measuring input part and the power part: 1 kV)	Mark: □, double or reinforced insulation (dielectric strength between the measuring input part and the power part: 2 kV)
Certification	CE, ENEC, ENEC, ENEC	
Unit weight (packaged)	• TCN4S: ≈ 100 g (≈ 147 g) • TCN4M: ≈ 133 g (≈ 203 g) • TCN4H: ≈ 124 g (≈ 194 g) • TCN4L: ≈ 179 g (≈ 275 g)	



View product detail

Single Display

PID Temperature

Controllers

TC Series



Features

- Single digital display
(switch between PV and SV)
 - 100 ms high-speed sampling rate and
± 0.5 % display accuracy
 - Switch between relay output and
SSR drive output
 - SSR drive output (SSRP function) control
options: ON / OFF control, cycle control,
phase control
 - Compact design with large display panels
for easier reading
 - Connector plug types offer easier wiring
and maintenance (TCN4S-□-P)
- * Sold Separately
- 11-pin controller socket: PG-11, PS-11(N)
 - Terminal protection cover: RSA / RMA / RHA /
RLA-COVER

Specifications

Model	TC4□-□2□	TC4□-□4□
Power supply	24 VAC~ 50/60 Hz 24-48 VDC≒	100 - 240 VAC~ 50/60 Hz
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	AC: ≤ 5 VA, DC: ≤ 3 W	≤ 5 VA
Sampling period	100 ms	
Input specification	Refer to Autonics website	
Control output	Relay	250 VAC~ 3 A, 30 VDC≒ 3 A, 1a
	SSR	12 VDC≒±2 V, ≤ 20 mA
Alarm output	250 VAC~ 1 A 1a	
Display type	7 Segment (red, green, yellow), LED type	
Control type	Heating, Cooling	ON/OFF, P, PI, PD, PID Control
Hysteresis	1 to 100 (0.1 to 50.0) °C/°F	
Proportional band (P)	0.1 to 999.9 °C/°F	
Integral time (I)	0 to 9,999 sec	
Derivative time (D)	0 to 9,999 sec	
Control cycle (T)	0.5 to 120.0 sec	
Manual reset	0.0 to 100.0%	
Relay life cycle	Mechanical	OUT1/2, AL1/2: ≥ 5,000,000 operations
	Electrical	OUT1/2: ≥ 200,000 operations (load resistance: 250 VAC~ 3A) AL1/2: ≥ 300,000 operations (load resistance: 250 VAC~ 1 A)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min	Between the charging part and the case: 2,000 VAC~ 50/60 Hz 1 min
Vibration	0.75 mm amplitude at frequency 5 to 55Hz in each X, Y, Z direction for 2 hours	
Insulation resistance	≥ 100 MΩ (500 VDC≒ megger)	
Noise immunity	Square shaped noise (pulse width: 1 μs) by noise simulator ±2 kV R-phase, S-phase	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Insulation type	Mark: □, double or reinforced insulation (dielectric strength between the measuring input part and the power part: 1 kV)	Mark: □, double or reinforced insulation (dielectric strength between the measuring input part and the power part: 2 kV)
Certification	CE UK ENEC EAC	
Unit weight (packaged)	• TC4S: ≈ 94 g (≈ 141 g) • TC4SP: ≈ 76 g (≈ 123 g) • TC4Y: ≈ 85 g (≈ 174 g) • TC4M: ≈ 133 g (≈ 204 g) • TC4W: ≈ 122 g (≈ 194 g) • TC4H: ≈ 122 g (≈ 194 g) • TC4L: ≈ 155 g (≈ 254 g)	



View product detail

Analog Non-Indication Type PID Temperature Controllers

TA Series



Features

- Auto-tuning PID temperature control
- PID and ON / OFF control:
toggle via external switch
- Deviation indicators (green, red LED)
- Control output indicator (red LED)
- Stop control output function using analog dial
- Sensor disconnect display function
- Built-in microprocessor

* Sold Separately

- 8-pin controller socket: PG-08, PS-08(N)
- Terminal protection cover: RMA / RLA-COVER

Specifications

Model		TA Series
Power supply		100 - 240 VAC~ 50/60 Hz
Permissible voltage range		90 to 110 % of rated voltage
Power consumption		≤ 4 VA
Sampling period		100 ms
Input specification		<ul style="list-style-type: none"> • RTD: DPt100Ω (allowable line resistance per a wire: ≤5 Ω) • Thermocouple: K (CA), J (IC)
Control output	Relay	250 VAC~ 3 A, 30 VDC= 1 A 1c
	SSR	12 VDC=±2 V, ≤ 20 mA
Display type		PV deviation, Error display (red, green), LED type
Setting method		Front dial
Setting accuracy		<ul style="list-style-type: none"> • At room temperature (23 °C ±5 °C) Over 100 °C model: F.S.±2%, below 100 °C model: F.S.±3% • Out of room temperature range Over 100 °C model: F.S.±3%, below 100 °C model: F.S.±4%
Control type	ON / OFF	Hysteresis: 2°C (fixed)
	PID Control	Control cycle: relay output 20 sec / SSR drive output 2 sec
Relay life cycle	Mechanical	≥ 10,000,000 operations (18,000 operations/time)
	Electrical	≥ 100,000 operations (900 operations/time)
Dielectric strength		Between the charging part and the case: 2,000 VAC~ 50/60 Hz for 1 min
Vibration		0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours
Insulation resistance		≥ 100 MΩ (500 VDC= megger)
Noise immunity		Square shaped noise (pulse width: 1 μs) by noise simulator ±2 kV R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Insulation type		Double or reinforced insulation (mark: □, dielectric strength between the measuring input part and the power part: 2 kV)
Certification		CE, ENEC, UL, ENEC
Unit weight (packaged)		• TAS: ≈ 69 g (≈ 107 g) • TAM: ≈ 109 g (≈ 171 g) • TAL: ≈ 147 g (≈ 232 g)



View product detail

Refrigeration Temperature Controllers

TF3 Series



Features

- Standard installation size for refrigeration panels (W 70.3 × H 28.2mm)
 - Various compressor load current capacity:
5 A, 16 A, 20 A
 - Various user-friendly functions
 - Defrost sync function : simultaneous defrost operation of multiple controllers (up to 6 units)
 - RTC (Real Time Clock) function : night mode operation and real-time defrost control
 - Built-in alarm function
 - Remote monitoring of real-time temperature and output control (using TFD series remote display unit, sold separately)
 - Communication output models available:
RS485 (Modbus RTU)
 - Parameter configuration via PC
(RS485 communication):
DAQMaster software included
(comprehensive device management software)
 - Protection structure: IP65 (control panel)
- * Sold Separately
- Dedicated remote display unit for TF3: TFD Series
 - Communication Converter: SCM-US / SCM-38I / SCM-US48I / SCM-WF48

Specifications

Model		TF3 Series
Power supply	AC	100 - 240 VAC~ 50/60 Hz
	AC / DC	24 VAC~ 50/60 Hz, 12-24 VDC=
Permissible voltage range		90 to 110 % of rated voltage
Power consumption	AC	≤ 8 VA
	AC / DC	AC: ≤ 5 VA, DC: ≤ 3 W
Sampling period		500 ms
Input specification		Refer to Autonics website
Option input	Digital input	<ul style="list-style-type: none"> • Contact - ON: ≤ 1 kΩ, OFF: ≥ 100 kΩ • Non contact - residual voltage ≤ 1 V, leakage current ≤ 1 mA • Outflow current: ≈ 4 uA
Control output	Compressor (COMP)	250 VAC~ 5 A / 30 VDC= 5 A / 1a 250 VAC~ 16 A / 24 VDC= 16 A / 1c 250 VAC~ 20 A 1a
	Defrost (DEF)	250 VAC~ 10 A / 24 VDC= 10 A / 1a
	Auxiliary (AUX)	250 VAC~ 5 A / 30 VDC= 5 A / 1a
RS485 communication		Modbus RTU
Display type		7 segment (red), LED type
Control type		ON/OFF Control
Hysteresis		0.5 to 5.0 °C, 2 to 10 °F
Relay life cycle	Mechanical	<ul style="list-style-type: none"> • COMP (5 A 1a), AUX: ≥ 5,000,000 operations • COMP (16 A 1c), DEF: ≥ 20,000,000 operations • COMP (20 A 1a): ≥ 10,000,000 operations
	Electrical	<ul style="list-style-type: none"> • COMP (5 A 1a), AUX: ≥ 50,000 operations (load resistance: 250 VAC~ 5 A) • COMP (16 A 1c): ≥ 30,000 operations (load resistance: 250 VAC~ 16 A) • COMP (20 A 1a): ≥ 100,000 operations (load resistance: 250 VAC~ 20 A) • DEF: ≥ 100,000 operations (load resistance: 250 VAC~ 10 A)
Dielectric strength	AC	Between the charging part and the case: 3,000 VAC~ 50 / 60 Hz for 1 min
	AC / DC	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Vibration		1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Insulation resistance		≥ 100 MΩ (500 VDC= megger)
Noise immunity		Square shaped noise by noise simulator (pulse width 1 μs) ±2 kV R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection structure		IP65 (front panel, IEC standards)
Certification		CE, RoHS, REACH, ENEC
Unit weight (packaged)		≈ 105 g (≈ 207 g)
Comm. protocol		Modbus RTU



View product detail

Refrigeration Temperature Controllers

TC3YF Series



Features

- ON / OFF control
- Standard input type: thermistor (NTC)
 - RTD (Pt100Ω) input models available upon request.
- Temperature range
 - Thermistor (NTC):
-40.0 to 99.9 °C -40 to 212 °F)
 - RTD (Pt100 Ω):
-99.9 to 99.9 °C (-148 to 212 °F)
- Various functions available for optimal cooling control
 - Auto / manual defrost selection, compressor start-up delay, restart delay, minimum ON time, end-defrost delay, evaporator fan operation delay
- Input correction function
- Operation cycle programming available to protect contents in case of error

Specifications

Model		TC3YF Series
Power supply	AC	100 - 240 VAC~ 50/60 Hz
	DC	12-24 VDC=
Permissible voltage range		90 to 110% of rated voltage
Power consumption	AC	≤ 4 VA
	DC	≤ 8 W
Sampling period		500 ms
Input specification		Refer to Autonics website
Display accuracy		At room temperature (23 ±5 °C): (PV ±0.5% or 1 °C higher one) rdg ±1 digit Out of room temperature range: (PV ±0.5% or 1 °C higher one) rdg ±1 °C
Control output	Compressor (COMP)	250 VAC~ 5 A 1a, 30 VDC= 5 A 1a
	Defrost (DEF)	250 VAC~ 10 A 1a
	Evaporation-fan (FAN)	250 VAC~ 5 A 1a, 30 VDC= 5 A 1a
Display type		7 segment (red), LED type
Control type		ON/OFF Control
Hysteresis		0.5 to 5.0 °C, 2 to 50 °F
Relay life cycle	Mechanical	≥ 20,000,000 operations
	Electrical	• COMP, DEF: ≥ 50,000 operations (load resistance: 250 VAC~ 5 A) • FAN ≥ 100,000 operations (load resistance: 250 VAC~ 10 A)
Dielectric strength		Between the charging part and the case: 2,000 VAC~ 60 Hz for 1 min
Vibration		0.75 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Malfunction vibration		0.5mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 min
Insulation resistance		≥ 100 MΩ (500 VDC= megger)
Noise immunity	AC	±2 kV square shaped noise (pulse width 1 μs) by noise simulator R-phase, S-phase
	DC	±500 V square shaped noise (pulse width 1 μs) by noise simulator R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection structure		IP65 (Front panel, IEC standards)
Certification	AC	UL, CE (Except RTD option models) ENEC
	DC	UL
Unit weight (packaged)		≈ 143 g (≈ 229 g)



View product detail

LCD

Temperature / Humidity Controllers

TH4M Series



Features

- Simultaneous control of temperature and humidity
- LCD display with easy-to-read white and blue characters
- Input correction of temperature and humidity
- Output delay time setting
- Deviation high / low-limit alarm output
- Dedicated temperature / humidity sensor THD-RM (accessory)

* Sold Separately

- Terminal protection cover: RMA-COVER
- Temperature / Humidity Transducers : THD Series

Specifications

Model		TH4M-24R
Power supply		100 - 240 VAC~ 50/60 Hz
Permissible voltage range		90 to 110 % of rated voltage
Power consumption		≤ 8 VA
Sampling period		1 sec
Display accuracy	Temperature	• At room temperature (25 °C ±5 °C): ≤ ±1.0 °C • Out of room temperature range: ≤ ±2.0 °C
	Humidity	• At room temperature (25 °C ±5 °C): ≤ ±3.0%RH (20 to 90%RH), ≤ ±5.0%RH (below 20%RH, over 90%RH) • Out of room temperature: ≤ ±5.0%RH (all range)
Display range	Temperature	-20.0 to 60.0 °C
	Humidity	10.0 to 100.0%RH
Using range	Temperature	-20.0 to 60.0 °C
	Humidity	10.0 to 100.0%RH
Control output ⁰¹⁾	Temperature (OUT1)	Relay: 250 VAC~ 3 A, 30 VDC= 3 A, 1a
	Humidity (OUT2)	Relay: 250 VAC~ 3 A, 30 VDC= 3 A, 1a
Alarm output	Relay	AL1/2: 250 VAC~ 3 A, 1a
Display type ⁰²⁾		11-Segment (temperature: white, humidity: blue), other display (yellow) LCD type
Control type		ON/OFF control
Relay life cycle	Mechanical	≥ 5,000,000 operations
	Electrical	≥ 200,000 operations (resistance load: 250 VAC~ 3 A)
Dielectric strength		Between the charging part and the case: 3,000 VAC~ 50/60 Hz for 1 min
Vibration		0.75 mm amplitude at frequency 5 to 55Hz in each X, Y, Z direction for 2 hours
Insulation resistance		≥ 100 MΩ (500 VDC= megger)
Noise immunity		±2 kV square shaped noise (pulse width 1 μs) by noise simulator R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Insulation type		Double or reinforced insulation (mark: □, dielectric strength between primary circuit and secondary circuit: 3 kV)
Certification		CE UK
Unit weight		≈ 144 g


01) Connect to a load using the same power supply. Connecting to a load from a different power supply may cause safety issues.

02) When using the unit at low temperature (below 0°C), display cycle is slow.



View product detail

[Temperature / Humidity sensor]

Model		THD-RM
Power supply		3.3 VDC \pm 2%
Power consumption		\leq 1.3mA
Response time		15 sec
Sensing accuracy	Temperature	<ul style="list-style-type: none"> At room temperature (25 °C \pm 5 °C): \leq \pm1.0 °C Out of room temperature: \leq \pm2.0 °C
	Humidity	<ul style="list-style-type: none"> At room temperature (25 °C \pm 5 °C): \leq \pm3.0%RH (20 to 90%RH), \leq \pm5.0%RH (below 20%RH, over 90%RH) Out of room temperature: \leq \pm5.0%RH (all range)
Sensing range	Temperature	-20.0 to 60.0 °C
	Humidity	10.0 to 100.0%RH
Communication type		I2C communication output
Dielectric strength		Between the charging part and the case: 500 VAC \sim 50/60 Hz for 1 min
Vibration		0.75 mm amplitude at frequency 5 to 55Hz in each X, Y, Z direction for 2 hours
Ambient temperature		-20 to 60 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity		0 to 100%RH, storage: 35 to 85%RH (no freezing or condensation)
Cable		\varnothing 4 mm, 4 seam , 2 m (tensile strength: 1kgf/s)
Certification		CE 
Unit weight		\approx 56 g

Thumbwheel Switch

Temperature Controllers

T3 / T4 Series



Features

- Various control output options:
relay, SSR drive, current
- 2 independent set points and control outputs
for heating and cooling control (T4LP)
- Various sizes (W 48 × H 48, W 48 × H 96,
W 72 × H 72, W 96 × H 96 mm)

* Sold Separately

- 8-pin controller socket: PG-8, PS-8(N)
- Terminal protection cover: RMA / RHA /
RLA-COVER

Specifications

Model		T3/T4 Series
Power supply		100 - 240 VAC~ 50/60 Hz
Permissible voltage range		90 to 110 % of rated voltage
Power consumption		≤ 5 VA
Sampling period		100 ms
Input specification		Refer to Autonics website
Display accuracy ⁰¹⁾		• At room temperature (23 °C ±5 °C): (PV ±0.5% or ±1°C higher one) ±1 digit • Out of room temperature range: (PV ±0.5% or ±2 °C higher one) ±1 digit
Control output	Relay ⁰²⁾	OUT1: 250 VAC~ 5 A / 30 VDC≡ 5A 1c, OUT2: 250 VAC~ 2 A / 30 VDC≡ 2A 1c
	SSR	12 VDC≡±2 V, ≤ 20 mA
	Current	DC 4-20 mA, Load resistance: ≤ 500 Ω
Option output		250 VAC~ 2 A 1c
Alarm output setting range		F.S. 0 to 10% (volume switch)
Option output setting range		0 to 50 °C (volume switch)
Reset range		F.S. -3 to 3% (volume switch)
Display type		7 segment (red), LED type
Control type		ON/OFF, Proportional control
Hysteresis		F.S. 0.2 to 3% (T3S: F.S. 0.5%) (volume switch)
Proportional band		F.S. 1 to 10% (T3S: F.S. 3%) (volume switch)
Proportional cycle		20 sec
Relay life cycle	Mechanical	≥ 5,000,000 operations
	Electrical	OUT1: ≥ 100,000 operations, OUT2: ≥ 200,000 operations
Dielectric strength		Between the charging part and the case: 2,000 VAC~ 50/60 Hz for 1 min
Vibration		0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Insulation resistance		≥ 100 MΩ (500 VDC≡ megger)
Noise immunity		±2 kV square shaped noise by noise simulator (pulse width 1 μs) R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Certification ⁰³⁾		CE
Unit weight (packaged)		• T3S: ≈ 95 g (≈ 135 g) • T3H, T3HA, T3HS: ≈ 176 g (≈ 239 g) • T4M, T4MA: ≈ 180 g (≈ 246 g) • T4L, T4LA, T4LP: ≈ 222 g (≈ 310 g)

01) In case of the T3S Series and the decimal point display models

At room temperature (23 °C ±5 °C): (PV ±0.5% or ±2 °C higher one) ±1 digit

Out of room temperature range: (PV ±0.5% or ±3 °C higher one) ±1 digit

02) Dual setting output of the T4LP is fixed as relay output and, it is also available as alarm output.

03) Certification attainment may vary depending on the model. Check the certification on the Autonics website.



View product detail

1-Channel Digital Temperature Indicators

T3 / T4 Series



Features

- Various control output options :
relay, SSR drive, current
- 2 independent set points and control outputs
for heating and cooling control (T4LP)
- Various sizes (W 48 × H48, W 48 × H 96,
W 72 × H 72, W 96 × H 96 mm)

* Sold Separately

- 8-pin controller socket: PG-8, PS-8(N)
- Terminal protection cover: RMA / RHA /
RLA-COVER

Specifications

Model	T3/T4 Series
Power supply	100 - 240 VAC~ 50/60 Hz (T3NI: 12 -24 VDC=)
Permissible voltage range	90 to 110 % of rated voltage
Power consumption	≤ 5 VA (T3NI: ≤ 1 W)
Input specification	Refer to Autonics website
Display accuracy ⁰¹⁾	<ul style="list-style-type: none"> • At room temperature (23 °C ±5 °C): (PV ±0.5% or ±1°C higher one) ±1 digit • Out of room temperature range: (PV ±0.5% or ±2 °C higher one) ±1 digit
Display type	7 Segment (red), LED type
Dielectric strength	Between the charging part and the case: 2,000 VAC~ 50/60 Hz for 1 min
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Insulation resistance	≥ 100 MΩ (500 VDC= megger)
Noise immunity	±2 kV square shaped noise (pulse width 1 μs) by noise simulator R-phase, S-phase
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Certification	CRC
Unit weight (packaged)	<ul style="list-style-type: none"> • T3NI: ≈ 25 g (= 48 g) • T4YI: ≈ 123 g (= 181 g) • T4WI: ≈ 140 g (= 231 g) • T3SI: ≈ 80 g (= 120 g) • T3HI: ≈ 137 g (= 203 g) • T4MI: ≈ 137 g (= 202 g) • T4LI: ≈ 185 g (= 274 g)

⁰¹⁾ In case of T3NI, T3SI Series and the decimal point display models
At room temperature (23 °C ±5 °C): (PV ±0.5% or ±2 °C higher one) ±1 digit
Out of room temperature range: (PV ±0.5% or ±3 °C higher one) ±1 digit



View product detail

Bar Graphic Temperature Indicators


KN-1000B Series



Features

- High accuracy with 16 bit ADC ($\pm 0.2\%$ F.S.)
- Multi-input
 - Thermometer 12 types
 - RTD 5 types
 - Analog: current 2 types / voltage 4 types
- 101 LED bar graph (green)
- Various output options
 - Alarm output: 2 points / 4 points
 - 4 ~ 20 mA transmission output (isolated), RS485 Communication output
- Various functions
 - Bar graph alarm display
 - High / Low peak input monitoring
 - Alarm output (upper / lower, sensor break)
 - Transmission output / display scale
 - Digital input (DI), etc.
- Built-in power supply for sensor / transmitter (24 VDC=)
- Small size (rear length: 70 mm)

Specifications

Model		KN-1000B Series	
		AC voltage	DC voltage
Power supply		100 ~ 240 VAC~ 50/60 Hz	24 VDC=
Permissible voltage range		90 to 110% of rated voltage	
Power consumption		≤ 6 VA	≤ 4 W
Sampling period		• Thermocouple, RTD: 250 ms • Analog: 100 ms	
Input specification		Refer to Autonics website	
Digital input	Contact	• ON: ≤ 2 k Ω • OFF: ≥ 90 k Ω	
	Non contact	• Residual voltage: ≤ 1.0 V • leakage current: ≤ 0.03 mA	
Option output	Outflow current	≈ 0.2 mA	
	Alarm	• 2 point relay: 250 VAC~ 3 A 1c • 4 point relay: 250 VAC~ 1 A 1a	
	PV transmission	ISOLATED DC 4-20 mA (Load resistance: ≤ 600 Ω)	
RS485 comm.		Modbus RTU	
Display type		7 Segment (red), Graph bar (green)	
Alarm output Hysteresis		1 to 999 digit	
Relay life cycle	Mechanical	• 2 point: $\geq 10,000,000$ operations • 4 point: $\geq 20,000,000$ operations	
	Electrical	• 2 point: $\geq 100,000$ operations (load resistance: 250 VAC~ 3 A) • 4 point: $\geq 500,000$ operations (load resistance: 250 VAC~ 1 A)	
Dielectric strength		Between the charging part and the case: 2,000 VAC~ 50/60 Hz for 1 min	
Vibration		0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours	
Insulation resistance		≥ 100 M Ω (500 VDC= megger)	
Noise immunity		± 2 kV square shaped noise (pulse width 1 μ s) by noise simulator	
Memory retention		≈ 10 years (non-volatile semiconductor memory type)	
Ambient temperature		-10 to 50 $^{\circ}$ C, storage: -20 to 60 $^{\circ}$ C (no freezing or condensation)	
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Certification		CE  ENEC	
Unit weight (packaged)		≈ 182 g (≈ 304 g)	
Comm. protocol		Modbus 1.1 RTU	



View product detail

1-Channel Digital Temperature Indicators

KN-2000W Series



Features

- High accuracy with 16 bit ADC ($\pm 0.2\%$ F.S.)
- Max. display range: -19999 to 19999
- Multi-input
 - Thermometer 12 types
 - RTD 5 types
 - Analog: Current 2 types / voltage 6 types
- Auto display color change function
 - Selectable indicator colors when error occurs or alarm operates
- Various output options
 - Alarm output: 2 points / 4 points
 - 4 - 20 mA transmission output (isolated), RS485 Communication output
- Various functions
 - High / Low peak input monitoring
 - Alarm output (upper / lower, sensor break)
 - Transmission output/display scale
 - Digital input (DI), etc.
- Built-in power supply for sensor / transmitter (24 VDC)

Specifications

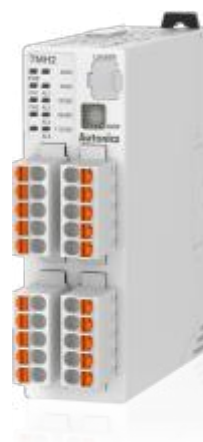
Model		KN-2000W Series	
		AC voltage	DC voltage
Power supply		100 - 240 VAC~ 50/60 Hz	24 VDC=
Permissible voltage range		90 to 110 % of rated voltage	
Power consumption		≤ 8 VA	≤ 3 W
Sampling period		• Thermocouple, RTD: 250 ms • Analog: 100 ms	
Input specification		Refer to Autonics website	
Digital input	Contact	• ON: ≤ 2 k Ω • OFF: ≥ 90 k Ω	
	Non contact	• Residual voltage: ≤ 1.0 V • Leakage current: ≤ 0.03 mA	
Option output	Outflow current	≈ 0.2 mA	
	Alarm	• 2 point relay: 250 VAC~ 3 A 1c • 4 point relay: 250 VAC~ 1 A 1a	
	PV Transmission	ISOLATED DC 4-20 mA (Load resistance: ≤ 600 Ω)	
RS485 comm.		Modbus RTU	
Display type		7 Segment (Red, Green, Yellow), LED type	
Alarm output Hysteresis		1 to 999 digit	
Relay life cycle	Mechanical	• 2 point: $\geq 10,000,000$ operations • 4 point: $\geq 20,000,000$ operations	
	Electrical	• 2 point: $\geq 100,000$ operations (Load resistance: 250 VAC~ 3 A) • 4 point: $\geq 500,000$ operations (Load resistance: 250 VAC~ 1 A)	
Dielectric strength		Between the charging part and the case: 2,000 VAC~ 50/60 Hz for 1 min	
Vibration		0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours	
Insulation resistance		≥ 100 M Ω (500 VDC= megger)	
Noise immunity		± 2 kV square shaped noise (pulse width 1 μ s) by noise simulator	
Memory retention		≈ 10 years (non-volatile semiconductor memory type)	
Ambient temperature		-10 to 50 $^{\circ}$ C, storage: -20 to 60 $^{\circ}$ C (no freezing or condensation)	
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Certification		CE UK ENEC	
Unit weight (packaged)		≈ 200 g (≈ 332 g)	
Comm. protocol		Modbus 1.1 RTU	



View product detail

Modular 2/4-Channel PID Temperature Controllers with Screw Connector

TMH Series



Features

[Common]

- Easy maintenance with detachable body and base terminal
- Power supply and communication with expansion connectors (up to 32 units)
- Screw / screwless connection type models

[TMH2/4 Series (Control Modules)]

- Multi-channel (2-channel / 4-channel) input and output control
- Expandable up to 32 units (up to 128 channels)
- 50 ms high-speed sampling rate and $\pm 0.3\%$ measurement accuracy
- 50 ms high-speed sampling rate and up to $\pm 0.3\%$ measurement accuracy
- Simultaneous heating and cooling control and auto / manual control mode available

[TMHC (Communication Modules)]

- Allows connection of control modules and option modules to master devices
- Connect up to 32 control / option modules (up to 1,024 channels) per module
- RS422 / RS485 (PLC Ladderless, Modbus RTU), Ethernet Communication

Specifications

[Control module]

Model	TMH2-□□□	TMH2-□□□-L	TMH4-□□□	TMH4-□□□-L
No. of channels	2 channels		4 channels	
Sampling period	50 ms (2 channels or 4 channels synchronous sampling)			
Input specification	Thermocouple, RTD, Analog (refer to 'Input Specification')			
CT input	・ 0.0 - 50.0A (primary current measurement range) ・ CT ratio: 1/1,000, ・ Measurement accuracy: ±5% F.S. ±1 digit			
Digital input	・ Connect input ON: ≤ 1 kΩ, OFF: ≥ 100 kΩ ・ Solid state input Residual voltage: ≤ 0.9 V, Leakage current: ≤ 0.5 mA ・ Outflow current: ≈ 0.3 mA per input		-	
Control type	Heating, cooling, heating & cooling: ON/OFF, P, PI, PD, PID control			
Control output	・ Relay: 250 VAC~ 3 A 1a mechanical life cycle: ≥ 10,000,000 operations, electrical life cycle: ≥ 100,000 operations ・ SSR: 12 VDC≐ ±3 V, ≤ 20 mA ・ Current ⁰¹⁾ : DC 4 - 20 mA or DC 0 - 20 mA (Load: ≤ 500 Ω)			
Alarm output	250 VAC~ 3 A 1a Mechanical life cycle: ≥ 10,000,000 operations Electrical life cycle: ≥ 100,000 operations		-	
Communication	Modbus RTU			
Hysteresis	・ Thermocouple / RTD: 1 to 100 (0.1 to 100.0) °C/°F ・ Analog: 1 to 100 digit			
Proportional band (P)	・ Thermocouple / RTD: 0.1 to 999.9 °C/°F ・ Analog: 0.1 to 999.9 %			
Integral time (I)	0 to 9,999 sec			
Derivative time (D)	0 to 9,999 sec			
Control period (T)	・ Relay output, SSR drive output: 0.1 to 120.0 sec ・ Selectable current or SSR drive output: 1.0 to 120.0 sec			
Manual reset	0 to 100 (0.0 to 100.0) %			
Insulation type	Double insulation or reinforced insulation (mark: □, dielectric strength between the measuring input part and the power part: 1 kV)			
Unit weight (packaged)	≈ 174 g (= 249 g)	≈ 162 g (= 261 g)	≈ 154 g (= 229 g)	≈ 151 g (= 250 g)

01) When the control output is set to the current output, the heater current value monitoring function through the CT input terminals is not available.



View product detail

[TMHA (Analog Input / Output Option Modules)]

- 4 channels, various input types / temperature ranges / transmission outputs
- 50 ms high-speed sampling rate and up to ±0.3% measurement accuracy

[TMHE (Digital Input / Alarm Output Option Modules)]

- 8 digital inputs / 8 alarm outputs

[TMHCT (CT Input Option Modules)]

- 8 CT inputs

* Sold Separately

- Current transformer (CT)
- Communication Converter: SCM-US / SCM-38I / SCM-US48I / SCM-WF48
- CT connector cable: CICT4-□
- Terminal Protection Cover: TMH-COVER

[Option module]

Model	TMHA-42A	TMHA-42A-L
No. of channels	4 channels	
Sampling period	50 ms (4 channels synchronous sampling)	
Input specification	Thermocouple, RTD, analog (refer to 'Input Specification')	
Transmission output	DC 4 ~ 20 mA or DC 0 ~ 20 mA (Load: ≤ 500 Ω)	
Communication	Modbus RTU	
Insulation type	Double insulation or reinforced insulation (mark: □, dielectric strength between the measuring input part and the power part: 1 kV)	
Unit weight (packaged)	≈ 160 g (≈ 235 g)	≈ 148 g (≈ 247 g)

Model	TMHE-82R	TMHE-82R-L	TMHCT-82N	TMHCT-82N-L
No. of I/O points	8 points		8 points	
Input specification	<div>- Digital input</div> <div>- Connect input</div> <div>ON: ≤ 1 kΩ, OFF: ≥ 100 kΩ</div> <div>- Solid state input</div> <div>Residual voltage: ≤ 0.9 V,</div> <div>Leakage current: ≤ 0.5 mA</div> <div>- Outflow current: ≈ 0.3 mA per input</div>		<div>- CT input</div> <div>• 0.0-50.0 A (primary current measurement range)</div> <div>• CT ratio: 1/1,000</div> <div>• Measurement accuracy: ±5% F.S. ±1 digit</div>	
Alarm output	250 VAC~ 3 A 1a, <div>• Mechanical life cycle: ≤ 10,000,000 operations</div> <div>• Electrical life cycle: ≤ 100,000 operations</div>		-	
Communication	Modbus RTU			
Insulation type	Double insulation or reinforced insulation (mark: □, dielectric strength between the measuring input part and the power part: 1 kV)		-	
Unit weight (packaged)	≈ 163 g (≈ 239 g)	≈ 151 g (≈ 250 g)	≈ 144 g (≈ 219 g)	≈ 133 g (≈ 232 g)

[Communication module]

Model		TMHC-22L	TMHC-22L-L	TMHC-22E
Communication	COM1	• Connection type: RS422 / RS485 • Protocol: Modbus RTU, PLC Ladderless communication		• Connection type: Ethernet (10/100BaseT) • Protocol: Modbus TCP
	COM2			
Insulation type		Double insulation or reinforced insulation (mark: □, dielectric strength between the measuring input part and the power part: 1 kV)		
Unit weight (packaged)		≈ 147 g (≈ 222 g)	≈ 137 g (≈ 236 g)	≈ 129 g (≈ 204 g)

[Common]

Power supply	24 VDC≡
Permissible voltage range	90 to 110% of rated voltage
Power Consumption	≤ 5 W (for max. load)
Display type	None- parameter setting and monitoring is available at external devices
Memory retention	≈ 10 years (non-volatile semiconductor memory type)
Insulation resistance	100 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC ~ 50/60 Hz for 1 min
Vibration	0.75mm amplitude at frequency of 5 to 55Hz in each X, Y, Z direction for 2 hours
Noise immunity	Square shaped noise by noise simulator (pulse width 1 μs) ±0.5 kV
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH (no freezing or condensation)
Protection structure	IP20 (IEC standard)
Certification	CE UK RoHS REACH

Modular 2/4-Channel PID Temperature Controllers with Screwless Connector

TM Series



Features

- Multi-channel (4-channel : TM4 / 2-channel : TM2) input and output control
- Module connection and expansion with expansion connectors
 - Communication between modules
 - No additional power supply wiring
 - Expandable up to 31 units (124-channels / 62-channels)
- High-speed sampling cycle (4-channel : 100ms / 2-channel : 50ms)
- Simultaneous heating and cooling control function
- Parameter configuration via PC
- RS485 Communication
 - Protocol : Modbus RTU or ASCII
 - Communication speed : Max. 115,200bps
- Screwless push-in type connection for simple and easy connection
- Heater disconnect alarm function (CT input)
 - * Current transformer (CT) sold separately: CSTC-E80LN, CSTC-E200LN, CSTS-E80PP

* Sold Separately

- Current transformer (CT)
- Communication Converter: SCM-US / SCM-38I / SCM-US48I / SCM-WF48

Specifications

Model		TM2	TM4
No. of channels		2 channels	4 channels
Power supply		24 VDC≒	
Permissible voltage range		90 to 110% of rated voltage	
Power consumption		≤ 5 W (for Max. load)	
Sampling period		50 ms (2 channels synchronous sampling)	100 ms (4 channels synchronous sampling)
Input specification		Refer to Autonics website	
Option input	CT input	<ul style="list-style-type: none"> • 0.0-50.0 A (primary current measurement range) • CT ratio: 1/1,000 • Measurement accuracy: ±5% F.S. ±1 digit 	-
	Digital input	<ul style="list-style-type: none"> • Contact ON: ≤ 1 kΩ, OFF: ≥ 100 kΩ • Non contact residual voltage: ≤ 1.5 VDC≒ • leakage current: ≤ 0.1 mA • Outflow current: ≈ 0.5 mA per input 	-
Control output	Relay	250 VAC~ 3 A 1a, 30 VDC≒ 3 A 1a	
	SSR	12 VDC≒ ±3 V, ≤ 30 mA	22 VDC≒ ±3 V, ≤ 30 mA
	Current	DC 4 - 20 mA or DC 0 - 20 mA (Load resistance: ≤ 500 Ω)	
Alarm output		250 VAC~ 3 A 1a	-
RS485 Comm.		Modbus ASCII / RTU	
Display type		None- parameter setting and monitoring is available at external devices	
Control type	Heating, Cooling	ON/OFF, P, PI, PD, PID Control	
	Heating & Cooling		
Hysteresis		1 to 100 (0.1 to 100) °C/°F	
Proportional band (P)		0.1 to 999.9 °C/°F	
Integral time (I)		0 to 9,999 sec	
Derivative time (D)		0 to 9,999 sec	
Control cycle (T)		0.1 to 120.0 sec	
Manual reset		0.0 to 100.0 %	
Relay life cycle	Mechanical	≥ 10,000,000 operations	
	Electrical	≥ 100,000 operations (250 VAC~ 3 A load resistance)	
Dielectric strength		Between the charging part and the case: 2,000 VAC~ 50/60 Hz for 1 min	
Vibration		0.75 mm amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours	
Insulation resistance		100 MΩ (500 VDC≒ megger)	
Noise immunity		±0.5 kV square shaped noise (pulse width 1 μs) by noise simulator	
Ambient temperature		-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Channel insulation		Dielectric strength 1,000 VAC~	
Insulation type		Double insulation or reinforced insulation (mark: □, dielectric strength between the measuring input part and the power part: 1 kV)	
Certification		CE, ENEC, UL, ENEC, ENEC	
Unit weight (packaged)		<ul style="list-style-type: none"> • Basic module: ≈ 152 g (≈ 217 g) • Expansion module: ≈ 143 g (≈ 208 g) 	<ul style="list-style-type: none"> • Basic module: ≈ 174 g (≈ 239 g) • Expansion module: ≈ 166 g (≈ 231 g)
Comm. protocol		Modbus ASCII / RTU	



View product detail

Independent Single Display PID Temperature Controllers

TR1D Series



Features

- Compact, space-saving design with 22.5 mm width size
- 50 ms high-speed sampling and $\pm 0.3\%$ display accuracy
- Simultaneous heating / cooling and automatic / manual control function
- Switch between current output and SSR drive output
- Easy mount on DIN rails
- RS485 communication output model available
 - Protocol: Modbus RTU or ASCII
 - Communication speed: up to 115,200 bps
- Parameter setting via PC (USB or RS485 communication)
 - Comprehensive device management software (DAQMaster) provided
- Heater disconnect alarm function (CT input)
 - * Current transformer (CT) sold separately: CSTC-E80LN, CSTC-E200LN, CSTS-E80PP
- Screen protection function

Specifications

Model		TR1D Series
Power supply		100 - 240 VAC~ 50/60 Hz
Permissible voltage range		90 to 110% of rated voltage
Power consumption		≤ 8 VA
Sampling period		50, 100, 250 ms
Input specification		Refer to Autonics website
Option input	CT input	<ul style="list-style-type: none"> • 0.0-50.0 A (primary current measurement range) • CT ratio: 1/1,000, • Measurement accuracy: $\pm 5\%$ F.S. ± 1digit
Control output	Relay	250 VAC~ 3 A 1a
	SSR	12 VDC ± 3 V, ≤ 20 mA
	Current	DC 4-20 mA or DC 0-20 mA (parameter), Load: $\leq 500 \Omega$
Option output	Alarm	AL1, AL2: 250 VAC~ 3 A 1a
	Transmission	DC4-20 mA (Load resistance: $\leq 500 \Omega$, Output accuracy: $\pm 0.3\%$ F.S.)
	RS485 comm.	Modbus RTU / ASCII
Display type		7 segment (red), 4-digit
Control type		ON/OFF, P, PI, PD, PID Control
Hysteresis		Control output: 1 to 100 °C/°F (0.1 to 100.0 °C/°F) Alarm output: 1 to 100 °C/°F (0.1 to 50.0 °C/°F)
Proportional band (P)		0.1 to 999.9 °C
Integral time (I)		0 to 9,999 sec
Derivative time (D)		0 to 9,999 sec
Control cycle (T)		Relay output: 0.5 to 120.0 sec, SSR drive output: 0.5 to 120.0 sec
Manual reset		0.0 to 100.0%
Dielectric strength		Between the charging part and the case: 3,000 VAC~ 50/60 Hz for 1 min
Vibration		0.75 mm amplitude at frequency of 5 to 55Hz in each X, Y, Z direction for 2 hours
Relay life cycle	Mechanical	OUT1/2, AL1/2: $\geq 5,000,000$ operations
	Electrical	OUT1/2, AL1/2: $\geq 100,000$ operations (resistance load: 250 VAC~ 5 A)
Insulation resistance		≥ 100 M Ω (500 VDC \equiv megger)
Insulation type		Double insulation or reinforced insulation (dielectric strength between the power part and the case: 3 kV)
Noise immunity		Square shaped noise (pulse width: 1 μ s) by noise simulator ± 2 kV R-phase, S-phase
Memory retention		≈ 10 years (non-volatile semiconductor memory type)
Ambient temperature		-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity		35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Certification		CE ENEC
Unit weight (packaged)		≈ 123.5 g (≈ 194.5 g)
Comm. protocol		Modbus RTU / ASCII



View product detail



E2. Digital Panel Meters

Multi panel meters are used to measure and monitor various industrial processes including voltage, current, frequency, and pressure.

E2-1	Panel Meters	MX4W Series	LCD Multi Panel Meters
		MT4N Series	4-Digit Multi Panel Meters
		MT4W Series	4-Digit Multi Panel Meters
		MT4Y Series	4-Digit Multi Panel Meters
		M4NN Series	4-Digit Multi Panel Meters
		M4N Series	Panel Meters (Indicator)
		M4M Series	Indicator / Thumbwheel Switch Panel Meters
		M4W Series	Indicator / Thumbwheel Switch Panel Meters
		M4Y Series	Panel Meters (Indicator)
		M5W Series	Panel Meters (Indicator)
		M4NS / M4YS Series	Loop-Power Panel Meters (Indicator)
		M4V Series	Digital Panel Meters for Mosaic Panels (Indicator)
E2-2	Pulse Meters	LR5N-B Series	Revolutions / Frequency Pulse Meters (Indicator)
		MP5M Series	Thumbwheel Switch Multi Pulse Meters
		MP5S / MP5Y / MP5W Series	Multi Pulse Meters

LCD Multi

Panel Meters




MX4W Series



Features

- LCD display with easy-to-read white PV characters
- Isolated input and power modules allow powering of multiple units using a single power supply
- Compact, space-saving design (rear-length: 20 mm): reduced rear-length size by 80 % compared to same DIN size panel meters (MT4W)
- Various input options (by model)
 - Input options: DC / AC voltage, DC / AC current
- Maximum allowed input:
500 VDC $\overline{=}$, 500 VAC \sim , DC 5 A, AC 5 A
- Display range: -9999 to 9999
- High / low-limit display scale function
- AC frequency measurement
(range: 0.100 to 1200 Hz)
- Preset output: OUT1, OUT2
(NPN / PNP open collector output)
- Power factor display / output function: displays analog outputs (1 - 5 V, 4 - 20 mA) from power factor converters as -0.50 to 1.00 to 0.50
- Various functions: peak display value monitoring, display cycle delay, zero-point adjustment, peak display value correction, etc.
- Power supply: 24 - 240 VAC \sim 50 / 60 Hz, 24 - 240 VDC $\overline{=}$ universal


Specifications

Model	MX4W-V-F□	MX4W-A-F□
Input type	DC / AC voltage	DC / AC current
Max. allowable input	Dependent on the input type	
+DC input	≈ -10 to 110 % F.S. for each measured input range	
-DC input	≈ -110 to 110 % F.S. for each measured input range	
AC input	≈ 110 % F.S. for each measured input range	
Display method	12-segment LCD ⁰¹⁾ - measurement value display part: white, character height: 19 mm - other display parts: red, green, yellow (indicator: white)	
Display accuracy	Dependent on the ambient temperature	
23 \pm 5 °C (DC input)	± 0.1 % F.S. rdg ± 2 -digit	± 0.1 % F.S. rdg ± 2 -digit ⁰²⁾
23 \pm 5 °C (AC input)	± 0.3 % F.S. rdg ± 3 -digit	± 0.3 % F.S. rdg ± 3 -digit
0 to 50 °C	± 0.5 % F.S. rdg ± 3 -digit	± 0.5 % F.S. rdg ± 3 -digit ⁰³⁾
Display cycle	0.2 to 5.0 sec (select per 0.1 sec)	
Display scale	-9999 to 9999 (4-digit)	
A / D conversion method	$\Sigma\Delta$ (Sigma Delta) analog-to-digital converter	
Sampling cycle (DC input)	50 ms	
Sampling cycle (AC input)	16.6 ms	
Resolution	1 / 20,000	
Preset output	NPN / PNP open collector output model	
Load voltage	≤ 30 VDC $\overline{=}$	
Load current	≤ 100 mA	
Residual voltage	NPN open collector output: ≤ 1 VDC $\overline{=}$ / PNP open collector output: ≤ 2 VDC $\overline{=}$	
Unit weight (packaged)	≈ 77 g (≈ 100 g)	
Certification	CE   	

01) When using the unit at low temperature (below 0 °C), display cycle is slow due to characteristics of LCD. Control output operates normally.

02) 5 A terminal: ± 0.3 % F.S. rdg ± 3 -digit

03) 5 A terminal: ± 1 % F.S. rdg ± 3 -digit

Power supply	24 - 240 VDC $\overline{=}$, 24 - 240 VAC \sim 50 / 60 Hz
Permissible voltage range	90 to 110 % of rated voltage
Power consumption	DC: ≤ 3 W, AC: ≤ 5 VA
Insulation resistance	≥ 100 M Ω (500 VDC $\overline{=}$ megger)
Dielectric strength	Between the charging part and the case: 3,000 VAC \sim 50 / 60 Hz for 1 min
Noise immunity	± 2 kV square wave noise (pulse width: 1 μ s) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Insulation type	Symbol:  double or reinforced insulation (dielectric strength between the measurement input part and the power part: 1 kV)



View product detail

4-Digit Multi Panel Meters

MT4N Series




Features

- Various input / output options (by model)
 - Input options: DC voltage, DC current, AC voltage, AC current
 - Output options: RS485 communication output, transmission output (DC 4 - 20 mA), NPN / PNP open collector output, relay contact output (default option: indicator / no output)
- Maximum allowed input:
50 VDC \approx , DC 500 mA, 250 VAC \sim , AC 5A
- Display range: -1999 to 9999
- High / low-limit display scale function
- AC frequency measurement
(range: 0.1 to 9999 Hz)
- Various functions:
peak display value monitoring, display cycle delay, zero-point adjustment, peak display value correction, PV transmission output (DC 4 - 20 mA) scale, etc.
- Power supply:
12 - 24 VDC \approx / VAC \sim , 100 - 240 VAC \sim



View product detail

Specifications

Model	MT4N-DV-□□	MT4N-DA-□□	MT4N-AV-□□	MT4N-AA-□□
Input type	DC voltage	DC current	AC voltage ⁰¹⁾	AC current ⁰¹⁾
Max. allowable input	Dependent on the input type			
DC input	-5 to 110 % F.S. for each measured input range			
AC input	10 to 110 % F.S. for each measured input range			
Display method	7-segment (red) LCD ⁰²⁾ (character height: 9 mm)			
Display accuracy	Dependent on the ambient temperature			
23 ± 5 °C	± 0.1 % F.S. rdg ± 2 digit ⁰³⁾		± 0.3 % F.S. rdg ± 3 digit	
-10 to 50 °C	± 0.5 % F.S. rdg ± 3 digit			
Max. display range	-1999 to 9999 (4 digit)			
A / D conversion method	ΣΔ (Sigma Delta) ADC			
Sampling cycle	50 ms		16.6 ms	
Unit weight (packaged)	≈ 64 g (≈ 127 g)			
Certification	CE  ENEC ⁰⁴⁾			

01) Available frequency display, Display accuracy (23 ± 5 °C): ± 0.1 % F.S. rdg ± 2 digit

02) When using the unit at low temperature (below 0 °C), display cycle is slow due to characteristics of LCD. Control output operates normally.

03) 5 A terminal: ± 0.3 % F.S. rdg ± 3 digit

04) Except MT4N-DV/AV-E□ model

Preset output	None (indicator) / Relay / NPN open collector / PNP open collector output model
Relay	Contact capacity: 125 VAC \sim 0.3 A, 30 VDC \approx 1 A Contact composition: N.O (1a)
NPN / PNP open collector	Output capacity: ≤ 12 - 24 VDC \approx ± 2 VDC \approx , 50 mA resistive load
Sub output	None (indicator) / Transmission (DC 4 - 20 mA) / RS485 communication output model
Transmission (DC 4 - 20 mA)	Resolution: 1/12,000 (load resistance: ≤ 600 Ω) Response time ⁰¹⁾ : ≤ 500 ms Output accuracy (23 ± 5 °C): ± 0.3 % F.S.
RS485 communication	Protocol: Modbus RTU

01) Based on the display cycle of 0.2 seconds.

Deviations may occur depending on the device environment and the display cycle of the product.

Response time: Time taken to proportional output to the rapidly changing input from 15 → 95 % or 95 → 15 %.

Model	MT4N-□-E□	MT4N-□-4□
Power supply	12 - 24 VDC \approx , 12 - 24 VAC \sim 50 / 60 Hz	100 - 240 VAC \sim 50 / 60 Hz
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	3 W / 5 VA ⁰¹⁾	5 VA
Insulation resistance	Between external terminal and case: ≥ 20 M Ω (500 VDC \approx megger)	
Dielectric strength	Between the charging part and the case : 2,000 VAC \sim 50 / 60 Hz for 1 min	Between the charging part and the case : 3,000 VAC \sim 50 / 60 Hz for 1 min
Noise immunity	± 500 V square wave noise (pulse width: 1 μ s) by the noise simulator	± 2 kV square wave noise (pulse width: 1 μ s) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Relay life cycle	Mechanical: ≥ 5,000,000 operations Electrical: ≥ 100,000 operations (125 VAC \sim 0.3A resistive load)	
Ambient temp.	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Insulation type	Symbol: double or reinforced insulation (dielectric strength between the measurement input part and the power part: 1 kV)	
Comm. protocol	Modbus RTU	

01) Except MT4N-□-E□: 5 W / 8 VA

4-Digit Multi Panel Meters




MT4W Series



Features

- Various input / output options (by model)
 - Input options: DC voltage, DC current, AC voltage, AC current
 - Output options: RS485 communication output, low speed serial output, BCD dynamic output, transmission output (DC 4 - 20 mA), NPN / PNP open collector output, relay contact output (default option: indicator / no output)
- Maximum allowed input:
500 VDC≒, DC 5 A, 500 VAC~, AC 5 A
- Display range: -1999 to 9999
- High / low-limit display scale function
- AC frequency measurement
(range: 0.1 to 9999 Hz)
- Various functions: peak display value monitoring, display cycle delay, zero-point adjustment, peak display value correction, PV transmission output (DC 4 - 20 mA) scale, etc.
- Power supply:
12 - 24 VDC≒, 100 - 240 VAC~
- DIN W 72 × H 36 mm
- * Sold Separately
- Terminal protection cover: M6P / M9P-COVER

Specifications

Model	MT4W-DV-□□	MT4W-DA-□□	MT4W-AV-□□	MT4W-AA-□□
Input type	DC voltage	DC current	AC voltage ⁰¹⁾	AC current ⁰¹⁾
Max. allowable input	Dependent on the input type			
DC input	-5 to 110 % F.S. for each measured input range			
AC input	10 to 110 % F.S. for each measured input range			
Display method	7-segment (red) LED (character height: 14.2 mm)			
Display accuracy	Dependent on the ambient temperature			
23 ± 5 °C	± 0.1 % F.S. rdg ± 2 digit ⁰²⁾		± 0.3 % F.S. rdg ± 3 digit	
-10 to 50 °C	± 0.5 % F.S. rdg ± 3 digit			
Max. display range	-1999 to 9999 (4 digit)			
A / D conversion method	ΣΔ (Sigma Delta) ADC			
Sampling cycle	50 ms		16.6 ms	
Unit weight (packaged)	≈ 211 g (≈ 326 g)			
Certification	CE UK  ⁰³⁾  ⁰⁴⁾ 			

01) Available frequency display, Display accuracy (23 ± 5 °C): ± 0.1 % F.S. rdg ± 2 digit

02) 5 A terminal: ± 0.3 % F.S. rdg ± 3 digit

03) Except MT4W-□-1□ model


04) Except MT4W-DA-19 and MT4W-DV/AV-1□ model

Preset output	None (indicator) / Relay / NPN open collector / PNP open collector output model	
Relay	Contact capacity: 250 VAC~ 3 A, 30 VDC≒ 3 A Contact composition: N.O (1a)	
NPN / PNP open collector	Output capacity: ≤ 12 - 24 VDC≒ ± 2 VDC≒, 50 mA resistive load	
Sub output	None (indicator) / BCD Dynamic / Transmission (DC 4 - 20 mA) / Low speed serial / RS485 Communication output model	
BCD Dynamic / Low speed serial	NPN open collector output Output capacity: ≤ 12 - 24 VDC≒, 50 mA resistive load	
Transmission (DC 4 - 20 mA)	Resolution: 1/12,000 (load resistance: ≤ 600 Ω) Response time ⁰¹⁾ : ≤ 550 ms Output accuracy (23 ± 5 °C): ± 0.3 % F.S.	
RS485 communication	Protocol: Modbus RTU	

01) Based on the display cycle of 0.2 seconds.

Deviations may occur depending on the device environment and the display cycle of the product.

Response time: Time taken to proportional output to the rapidly changing input from 15 → 95 % or 95 → 15 %.

Model	MT4W-□□-1□	MT4W-□□-4□
Power supply	12 - 24 VDC≒	100 - 240 VAC~ 50 / 60 Hz
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	3 W ⁰¹⁾	5 VA
Insulation resistance	Between external terminal and case: ≥ 100 MΩ (500 VDC≒ megger)	
Dielectric strength	Between the charging part and the case : 2,000 VAC~ 50 / 60 Hz for 1 min	Between the charging part and the case : 3,000 VAC~ 50 / 60 Hz for 1 min
Noise immunity	± 500 V square wave noise (pulse width: 1 μs) by the noise simulator	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Relay life cycle	Mechanical: ≥ 20,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 3A resistive load)	
Ambient temp.	-10 to 50 °C, storage: -20 to 60 °C (freezing or condensation)	
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (freezing or condensation)	
Insulation type	Symbol:  double or reinforced insulation (dielectric strength between the measurement input part and the power part: 1 kV)	
Comm. protocol	Modbus RTU	

01) Except MT4W-□-15: 5 W



View product detail

4-Digit Multi Panel Meters

MT4Y Series






Features

- Various input / output options (by model)
 - Input options: DC voltage, DC current, AC voltage, AC current
 - Output options: RS485 communication output, low speed serial output, BCD dynamic output, transmission output (DC 4 - 20 mA), NPN / PNP open collector output, relay contact output (default option: indicator / no output)
- Maximum allowed input:
500 VDC \sim , DC 5 A, 500 VAC \sim , AC 5 A
- Display range: -1999 to 9999
- High / low-limit display scale function
- AC frequency measurement
(range: 0.1 to 9999 Hz)
- Various functions: peak display value monitoring, display cycle delay, zero-point adjustment, peak display value correction, PV transmission output (DC 4 - 20 mA) scale, etc.
- Power supply:
12 - 24 VDC \sim , 100 - 240 VAC \sim
- DIN W 96 \times H 48 mm
- * Sold Separately
- Terminal protection cover: M6P / M7P-COVER



View product detail

Specifications

Model	MT4Y-DV-4□	MT4Y-DA-4□	MT4Y-AV-4□	MT4Y-AA-4□
Input type	DC voltage	DC current	AC voltage ⁰¹⁾	AC current ⁰¹⁾
Max. allowable input	Dependent on the input type			
DC input	-5 to 110 % F.S. for each measured input range			
AC input	10 to 110 % F.S. for each measured input range			
Display method	7-segment (red) LED (character height: 14.2 mm)			
Display accuracy	Dependent on the ambient temperature			
23 ± 5 °C	± 0.1 % F.S. rdg ± 2 digit ⁰²⁾		± 0.3 % F.S. rdg ± 3 digit	
-10 to 50 °C	± 0.5 % F.S. rdg ± 3 digit			
Max. display range	-1999 to 9999 (4 digit)			
A / D conversion method	ΣΔ (Sigma Delta) ADC			
Sampling cycle	50 ms		16.6 ms	
Unit weight (packaged)	≈ 134 g (≈ 213.5 g)			
Certification	CE   			


01) Available frequency display, Display accuracy (23 \pm 5 °C): \pm 0.1 % F.S. rdg \pm 2 digit
02) 5 A terminal: \pm 0.3 % F.S. rdg \pm 3 digit

Preset output	None (indicator) / Relay / NPN open collector / PNP open collector output model
Relay	Contact capacity: 250 VAC \sim 3 A, 30 VDC \sim 3 A Contact composition: N.O (1a)
NPN / PNP open collector	Output capacity: \leq 12 - 24 VDC \sim \pm 2 VDC \sim , 50 mA resistive load
Sub output	None (indicator) / BCD Dynamic / Transmission (DC 4 - 20 mA) / Low speed serial / RS485 Communication output model
BCD Dynamic / Low speed serial	NPN open collector output Output capacity: \leq 12 - 24 VDC \sim , 50 mA resistive load
Transmission (DC 4 - 20 mA)	Resolution: 1/12,000 (load resistance: \leq 600 Ω) Response time ⁰¹⁾ : \leq 550 ms Output accuracy (23 \pm 5 °C): \pm 0.3 % F.S.
RS485 communication	Protocol: Modbus RTU

01) Based on the display cycle of 0.2 seconds.

Deviations may occur depending on the device environment and the display cycle of the product.

Response time: Time taken to proportional output to the rapidly changing input from 15 \rightarrow 95 % or 95 \rightarrow 15 %.

Power supply	100 - 240 VAC \sim 50 / 60 Hz
Permissible voltage range	90 to 110 % of rated voltage
Power consumption	5 VA
Insulation resistance	Between external terminal and case: \geq 100 M Ω (500 VDC \sim megger)
Dielectric strength	Between the charging part and the case: 3,000 VAC \sim 50 / 60 Hz for 1 min
Noise immunity	\pm 2 kV square wave noise (pulse width: 1 μ s) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (\approx 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (\approx 10 G) in each X, Y, Z direction for 3 times
Relay life cycle	Mechanical: \geq 20,000,000 operations Electrical: \geq 100,000 operations (250 VAC \sim 3A resistive load)
Ambient temp.	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Insulation type	Symbol:  double or reinforced insulation (dielectric strength between the measurement input part and the power part: 1 kV)
Comm. protocol	Modbus RTU

4-Digit Multi Panel Meters

M4NN Series



Features

- Various input / output options (by model)
 - Input options: DC voltage, DC current, AC voltage, AC current
 - Output options: NPN open collector / PNP open collector (default: indicator / no output)
- Isolated input and power modules allow powering of multiple units using a single power supply
- Display range: -1999 to 9999
- High / low-limit display scale function
- AC frequency measurement (range: 0.1 to 9999 Hz)
- Preset output mode: OUT1, GO, OUT2 (NPN / PNP open collector output)
- Power factor display function: displays analog input (1 - 5 V, 4 - 20 mA) from power factor converters as -0.50 to 1.00 to 0.50
- Various functions: peak display value monitoring, display cycle delay, zero-point adjustment, peak display value correction
- Power supply: 5 - 24 VDC \equiv (isolated type)


Specifications

Model	M4NN-DV-1□	M4NN-DA-1□	M4NN-AV-1□	M4NN-AA-1□
Input type	DC voltage	DC current	AC voltage ⁰¹⁾	AC current ⁰¹⁾
Max. allowable input	Dependent on the input type			
+DC input	≈ -10 to 110 % F.S. for each measured input range		-	
-DC input	≈ -110 to 110 % F.S. for each measured input range		-	
AC input	-		≈ 110 % F.S. for each measured input range	
Display method	7-segment (red) LED (character height: 11 mm)			
Display accuracy	Dependent on the ambient temperature			
23 ± 5 °C	± 0.1 % F.S. rdg ± 2-digit	± 0.1 % F.S. rdg ± 2-digit ⁰²⁾	± 0.3 % F.S. rdg ± 3-digit	± 0.3 % F.S. rdg ± 3-digit
-10 to 50 °C	± 0.5 % F.S. rdg ± 3-digit	± 0.5 % F.S. rdg ± 3-digit ⁰³⁾	± 0.5 % F.S. rdg ± 3-digit	± 0.5 % F.S. rdg ± 3-digit ⁰³⁾
Display cycle	0.1 to 5.0 sec (select per 0.1 sec)			
Display scale	-1999 to 9999 (4-digit)			
A / D conversion method	Practical oversampling using successive approximation ADC			
Sampling cycle	50 ms		16.6 ms	
Resolution	1 / 12,000			
Preset output	NPN / PNP open collector output model			
Load voltage	≤ 30 VDC≡			
Load current	≤ 100 mA			
Residual voltage	NPN open collector output: ≤ 1 VDC≡ / PNP open collector output: ≤ 2 VDC≡			
Protection rating	IP53 (front part, IEC standard)			
Unit weight (packaged)	≈ 46.8 g (= 83.7 g)		≈ 46.9 g (= 83.8 g)	
Certification	CE 标志		CE 标志	

01) Available frequency display

02) 5 A terminal: ± 0.3 % F.S. rdg ± 3-digit

03) 5 A terminal: ± 1 % F.S. rdg ± 3-digit

Power supply	5 - 24 VDC \equiv
Permissible voltage range	90 to 110 % of rated voltage (low-limit: 5 VDC \equiv fixed)
Power consumption	≤ 3 W
Insulation resistance	≥ 100 MΩ (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 3,000 VAC~ 50 / 60 Hz for 1 min
Noise immunity	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Insulation type	Symbol:  double or reinforced insulation (dielectric strength between the measurement input part and the power part: 1 kV)
Connection	Plug type - socket type terminal



View product detail

Panel Meters

(Indicator)

M4N Series



Features

- Input options (by model)
 - Input options: DC voltage, DC current
- Auto-zero adjustment and hold display value function
- Max display value: 1999
- 7-segment LED display
- Compact size: DIN W 48 × H 24 mm
- Power supply: 5 VDC \equiv , 12 - 24 VDC \equiv

Specifications

Model	M4N-DV-□□	M4N-DA-□□	M4N-DI-□X
Input type	DC voltage	DC current	DC 4 - 20 mA
Max. allowable input	≈ 150 % F.S. for each measured input range		
Display method	7-segment (red) LED (character height: 10 mm)		
Display accuracy	0.2 % F.S. rdg ± 1-digit		
Sampling time	2.5 times / sec		
Display scale	-1999 (4-digit)		
Operation method	Dual integral method		
Sampling cycle	300 ms		
Response speed	≈ 2 sec (0 to 1999)		
Unit weight	≈ 44 g		
Certification	EAC		
Power supply	5 VDC \equiv / 12 - 24 VDC \equiv model		
Permissible voltage range	90 to 110 % of rated voltage		
Power consumption	2 W		
Insulation resistance	≥ 100 MΩ (500 VDC \equiv megger)		
Dielectric strength	Between the charging part and the case: 2,000 VAC~ 50 / 60 Hz for 1 min		
Noise immunity	±100 V square wave noise (pulse width: 1 μs) by the noise simulator		
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hours		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times		
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		



View product detail

Indicator / Thumbwheel Switch Panel Meters

M4M Series



Features

- Max. display value: 1999
- Auto-zero function and hold display value function
- Linear display based on input specification
- Display output values (0 - 10 VDC $\overline{=}$) from power converters (options available for DC 4 - 20 mA, 1 - 5 VDC $\overline{=}$)
- RMS or AVG value selection (AC voltage)
- 7-segment LED display
- DIN standard size models

Specifications

Input type	DC voltage	AC voltage	DC current	AC current	Power	Rotation, speed	Scaling
Max. allowable input	≤ 300 VDC $\overline{=}$	≤ 400 VAC \sim	\leq DC 2 A	\leq AC 5 A	≤ 10 VDC $\overline{=}$	≤ 10 VDC $\overline{=}$ ≤ 10 VAC \sim	DC 4 - 20 mA
	≈ 150 % F.S. for each measured input range ⁰¹⁾						
Display method	7-segment (red) LED (character height: 10 mm)						
Display accuracy	Dependent on the input type						
DC input	± 0.2 % F.S. rdg ± 1 -digit						
AC input	± 0.5 % F.S. rdg ± 1 -digit						
Display scale	1999						
Sampling time	2.5 times / sec						
Response speed	≈ 2 sec (0 to 1999)						
Sampling cycle	300 ms						
Operation method	Dual integral method						
Unit weight	Dependent on the output						
Indicator	≈ 262 g						
Single setting	≈ 290 g						
Dual setting	≈ 316 g						
Certification	EAC						

01) At 400 VAC \sim input: ≈ 120 % F.S. for each measured input range

Output	Indicator	Single setting	Dual setting
Power supply ⁰¹⁾	110 / 220 VAC \sim 50 / 60 Hz		
Permissible voltage range	90 to 110 % of rated voltage		
Power consumption	Dependent on the input type		
DC input	2 W	3 W	3 W
AC input	4 VA	5 VA	5 VA
Contact capacity	-	250 VAC \sim 3 A, 150 VDC $\overline{=}$ 3 A	250 VAC \sim 3 A, 150 VDC $\overline{=}$ 3 A
Contact composition	-	1c x 1	1c x 2
Insulation resistance	≥ 100 M Ω (500 VDC $\overline{=}$ megger)		
Dielectric strength	Between the charging part and the case: 3,000 VAC \sim 50 / 60 Hz for 1 min		
Noise immunity	± 1 kV square wave noise (pulse width: 1 μ s) by the noise simulator		
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hours		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical: $\geq 10,000,000$ operations Electrical: $\geq 100,000$ operations (250 VAC \sim 3A resistive load)		
Ambient temperature	-10 to 50 $^{\circ}$ C, storage: -25 to 65 $^{\circ}$ C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		

01) Power supply 24 - 70 VDC $\overline{=}$, 100 - 240 VAC \sim 50 / 60 Hz options are also available to order.

View product detail



Voltmeter



Scaling



Ammeter



Wattmeter



Tachometer /
Speed Meter

Indicator / Thumbwheel Switch Panel Meters

M4W Series



Features

- Max. display value: 1999
- Auto-zero function and hold display value function
- Linear display based on input specification
- Display output values (0 - 10 VDC \approx) from power converters
(options available for DC 4 - 20 mA, 1 - 5 VDC \approx)
- RMS or AVG value selection (AC voltage)
- 7-segment LED display
- DIN standard size models

Specifications

Input type	DC voltage	AC voltage	DC current	AC current	Power	Rotation, speed	Scaling
Max. allowable input	≤ 300 VDC≡	≤ 400 VAC~	≤ DC 2 A	≤ AC 5 A	≤ 10 VDC≡	≤ 10 VDC≡ ≤ 10 VAC~	DC 4 - 20 mA
	≈ 150 % F.S. for each measured input range ⁰¹⁾						
Display method	7-segment (red) LED (character height: 14 mm)						
Display accuracy	Dependent on the input type						
DC input	± 0.2 % F.S. rdg ± 1-digit					± 0.3 % F.S. rdg	
AC input	± 0.5 % F.S. rdg ± 1-digit					± 1-digit	
Display scale	1999						
Sampling time	2.5 times / sec						
Response speed	≈ 2 sec (0 to 1999)						
Sampling cycle	300 ms						
Operation method	Dual integral method						
Unit weight	Dependent on the output type						
Indicator	≈ 168 g						
Single setting	≈ 253 g						
Dual setting	≈ 278 g						
Certification	EAC						

01) At 400 VAC \sim input: $\approx 120\%$ F.S. for each measured input range

Output type	Indicator	Single setting	Dual setting
Power supply ⁰¹⁾	110 / 220 VAC \sim 50 / 60 Hz		
Permissible voltage range	90 to 110 % of rated voltage		
Power consumption	Dependent on the input type		
DC input	2 W	3 W	3 W
AC input	4 VA	5 VA	5 VA
Contact capacity	-	250 VAC \sim 3 A, 150 VDC \approx 3 A	250 VAC \sim 3 A, 150 VDC \approx 3 A
Contact composition	-	1c x 1	1c x 2
Insulation resistance	≥ 100 M Ω (500 VDC \approx megger)		
Dielectric strength	Between the charging part and the case: 3,000 VAC \sim 50 / 60 Hz for 1 min		
Noise immunity	± 1 kV square wave noise (pulse width: 1 μ s) by the noise simulator		
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hours		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical: $\geq 10,000,000$ operations Electrical: $\geq 100,000$ operations (250 VAC \sim 3A resistive load)		
Ambient temperature	-10 to 50 $^{\circ}$ C, storage: -25 to 65 $^{\circ}$ C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		

01) Power supply 24 - 70 VDC \approx , 100 - 240 VAC \sim 50 / 60 Hz options are also available to order.

View product detail



Voltmeter



Scaling



Ammeter



Wattmeter



Tachometer /
Speed Meter

Panel Meters

(Indicator)

M4Y Series



Features

- Max. display value: 1999
- Auto-zero function and hold display value function
- Linear display based on input specification
- Display output values (0 - 10 VDC $\overline{=}$) from power converters (options available for DC 4 - 20 mA, 1 - 5 VDC $\overline{=}$)
- RMS or AVG value selection (AC voltage)
- 7-segment LED display
- DIN standard size models

Specifications

Input type	DC voltage	AC voltage	DC current	AC current	Power	Rotation, speed	Scaling
Max. allowable input	≤ 300 VDC $\overline{=}$	≤ 400 VAC \sim	\leq DC 2 A	\leq AC 5 A	≤ 10 VDC $\overline{=}$	≤ 10 VDC $\overline{=}$ ≤ 10 VAC \sim	DC 4 - 20 mA
	≈ 150 % F.S. for each measured input range ⁰¹⁾						
Display method	7-segment (red) LED (character height: 14 mm)						
Display accuracy	Dependent on the input type						
DC input	± 0.2 % F.S. rdg ± 1 -digit						
AC input	± 0.5 % F.S. rdg ± 1 -digit						
Display scale	1999						
Sampling time	2.5 times / sec						
Response speed	≈ 2 sec (0 to 1999)						
Sampling cycle	300 ms						
Operation method	Dual integral method						
Unit weight	≈ 144 g						
Certification	EAC						

01) At 400 VAC \sim input: ≈ 120 % F.S. for each measured input range

Power supply ⁰¹⁾	100 - 240 VAC \sim ± 10 % 50 / 60 Hz
Power consumption	Dependent on the input type
DC input	2 W
AC input	4 VA
Insulation resistance	≥ 100 M Ω (500 VDC $\overline{=}$ megger)
Dielectric strength	Between the charging part and the case: 3,000 VAC \sim 50 / 60 Hz for 1 min
Noise immunity	± 1 kV square wave noise (pulse width: 1 μ s) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hours
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 50 $^{\circ}$ C, storage: -25 to 65 $^{\circ}$ C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)

01) Power supply 24 - 70 VDC $\overline{=}$ option is also available to order.

View product detail



Voltmeter



Scaling



Ammeter



Wattmeter



Tachometer /
Speed Meter

Panel Meters

(Indicator)

M5W Series



Features

- Max. display value: 19999
- Linear display based on input specification
- Display output values (0 - 10 VDC=) from power converters (options available for DC 4 - 20 mA, 1 - 5 VDC=)
- RMS or AVG value selection (AC voltage)
- 7-segment LED display
- DIN standard size models

Specifications

Input type	DC voltage	DC current	Power	Rotation, speed	Scaling
Max. allowable input	≤ 300 VDC=	≤ DC 2 A	≤ 10 VDC=	≤ 10 VDC=	DC 4 - 20 mA
	≈ 150 % F.S. for each measured input range				
Display method	7-segment (red) LED (character height: 14 mm)				
Display accuracy	± 0.2 % F.S. rdg ± 1-digit				
Display scale	19999				
Sampling time	2.5 times / sec				
Response speed	≈ 2 sec (0 to 19999)				
Sampling cycle	300 ms				
Operation method	Dual integral method				
Unit weight	≈ 172 g				
Certification	EAC				
Power supply ⁰¹⁾	100 - 240 VAC~ 50 / 60 Hz				
Permissible voltage range	90 to 110 % of rated voltage				
Power consumption	2 W				
Insulation resistance	≥ 100 MΩ (500 VDC= megger)				
Dielectric strength	Between the charging part and the case: 3,000 VAC~ 50 / 60 Hz for 1 min				
Noise immunity	± 1 the square wave noise (pulse width: 1 μs) by the noise simulator				
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hours				
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min				
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times				
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times				
Ambient temperature	0 to 50 °C, storage: -25 to 65 °C (no freezing or condensation)				
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)				

01) Power supply 24 - 70 VDC= option is also available to order.

View product detail



Voltmeter



Scaling



Ammeter



Wattmeter



Tachometer /
Speed Meter

Loop-Power

Panel Meters

(Indicator)

M4NS / M4YS Series



Features

- Loop-powered: power supplied by loop current
- Measured input: DC 4 - 20 mA
- Display range: -1999 to 9999
- High / low-limit display scale function
- Decimal point setting function
- Input high / low-value correction function
- Display peak value monitoring function
- Set peak value monitoring delay time
- Display cycle time setting
(0.5 / 1 / 2 / 3 / 4 / 5 seconds)
- Error display function
 - M4NS: DIN W 48 × H 24 mm
 - M4YS: DIN W 72 × H 36 mm

* Sold Separately
• [M4YS-NA] Terminal protection cover:
M7P-COVER

Specifications

Model	M4NS-NA		M4YS-NA
Input type	DC 4 - 20 mA		
Impedance between input lines ⁰¹⁾	≤ 600 Ω		
Display method	7-segment (red) LED (character height: 10 mm)		7-segment (red) LED (character height: 14 mm)
Display accuracy	Dependent on the ambient temperature		
25 ± 5 °C	0.3 % F.S. rdg ± 1-digit		
-10 to 50 °C	0.4 % F.S. rdg ± 1-digit		
Display scale	-1999 to 9999 (4-digit)		
Display cycle	0.5, 1, 2, 3, 4, 5 sec		
Resolution	1 / 12,000		
Unit weight	≈ 44 g	≈ 110 g	
Certification	EAC		

01) Based on input power 24 VDC≡

Power supply	Loop powered type
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case : 2,000 VAC~ 50 / 60 Hz for 1 min
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hours
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (= 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (= 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 50 °C, storage: -25 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)



View product detail

Digital Panel Meters for Mosaic Panels (Indicator)

M4V Series



Features

- Various input options:
0 - 2 VDC $\overline{=}$, 0 - 10 VDC $\overline{=}$, 1 - 5 VDC $\overline{=}$,
DC 0 - 1 mA, DC 4 - 20 mA
- High / low-limit display scale function
- Display range: -999 to 9999
- Display accuracy: F.S \pm 2 % rdg \pm 1-digit
- Error display function
- Built-in microprocessor

Specifications

Model	M4V
Input type	DC voltage, DC current
Measurement input type	0 - 2 VDC $\overline{=}$, 1 - 5 VDC $\overline{=}$, 0 - 10 VDC $\overline{=}$, DC 0 - 1 mA, DC 4 - 20 mA
Max. allowable input	\approx 110 % F.S. for each measured input range
Display method	7 -segment (red) LED (character height: 14 mm)
Display accuracy	Dependent on the ambient temperature
0 to 50 °C	\pm 0.2 % F.S. rdg \pm 1-digit
-10 to 0 °C	\pm 0.3 % F.S. rdg \pm 1-digit
Display cycle	0.5 sec
Unit weight	\approx 83 g
Certification	CE
Power supply	12 - 24 VDC $\overline{=}$
Permissible voltage range	90 to 110 % of rated voltage
Power consumption	\leq 2 W
Insulation resistance	\geq 100 M Ω (500 VDC $\overline{=}$ megger)
Dielectric strength	Between the charging part and the case: 2,000 VAC \sim 50 / 60 Hz for 1 min
Noise immunity	\pm 300 V square wave noise (pulse width: 1 μ s) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hours
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (\approx 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (\approx 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)



View product detail

Revolutions / Frequency Pulse Meters

(Indicator)

LR5N-B Series



Features

- 1-pulse input per revolution
- Display up to 10,000 RPM
- Built-in internal battery (power supply not required)
- Display RPM or RPS of rotating shaft or disc
- AC voltage frequency display function
- Protection structure: IP66 (front panel)

Specifications

Model	LR5N-B		
Display digits	4½-digit		
Display type	LCD Zero Blanking (character size: H 8.7 mm)		
Input type	IN 1: No-voltage input	IN 2: Voltage input 1	IN 3: Voltage input 2
Input signal level	Short-residual voltage : ≤ 0.5 V	High input voltage range : 4.5 - 30 VDC≡	30 - 240 VAC~
	Short-circuit impedance : ≤ 10 kΩ	Low input voltage range : 0 - 2 VDC≡	
	Open-circuit impedance : ≥ 500 kΩ	Voltage: 3 - 30 VAC~	
HOLD	YES		
Unit weight (packaged)	≈ 59 g (≈ 91.5 g)		
Certification	CE ENEC ENEC		
Power supply	Built-in battery (CR2477)		
Battery life cycle	≥ 3 years (at ≈ 20 °C)		
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)		
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50 / 60 Hz for 1 min (Cutoff current = 10 mA)		
Vibration	0.75 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunc.)	0.3 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minute		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunc.)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times		
Ambient temp.	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humid.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Protection rating	IP66 (when using waterproof rubber for front panel), terminal cover (finger protector)		
Display unit	Display range	Display accuracy	
RPM	1 to 10000 RPM	1 to 5000 RPM: F.S. ± 0.05 % ± 1-digit	
		5001 to 10000 RPM: F.S. ± 0.1 % ± 1-digit	
0.1RPM	0.1 to 1000.0 RPM	F.S ± 0.05 % ± 1-digit	
Hz	1 to 1000 Hz	F.S ± 0.1 % ± 1-digit	
0.1Hz	0.1 to 100.0 Hz		
RPS	1 to 1000 RPS		



View product detail

Thumbwheel Switch Multi Pulse Meters

MP5M Series





Features

- 14 operation modes
 - Frequency / revolutions / speed, passing speed, cycle, passing time, time interval
 - Time differential, absolute ratio, density, length measurement 1 / 2, interval
 - Accumulation, addition / subtraction (individual input), addition / subtraction (phase difference input)
- Various output models
 - Relay single (high-limit) / double (high / low-limit) + NPN open collector output
- Various functions
 - Prescale, monitoring delay, hysteresis, auto-zero, parameter lock
- NPN input (non-contact / contact) or PNP input (non-contact / contact)
- Display range: -19999 to 99999
- Various display units
- Power supply
 - 100 - 240 VAC ~ 50 / 60 Hz (AC type)
 - 24 VAC ~ 50 / 60 Hz, 24 - 48 VDC (AC / DC type)
- * Sold Separately
- Terminal protection cover: RMA-COVER



View product detail

Specifications

Model	MP5M-□N	MP5M-□1	MP5M-□2
Input signal ⁰¹⁾	Solid state input 1: ≤ 50 kHz (pulse width: ≥ 10 μs) Solid state input 2 ⁰²⁾ : ≤ 5 kHz (pulse width: ≥ 100 μs) Contact input: ≤ 45 Hz (contact: ≥ 12 VDC≐ 5 mA, pulse width: ≥ 11 ms)		
Voltage input	Input impedance: 3.9 kΩ, [H]: 4.5 - 24 VDC≐, [L]: 0 - 1 VDC≐		
No-voltage input	Short-circuit impedance: ≤ 80 Ω, residual voltage: ≤ 1 VDC≐, open-circuit impedance: ≥ 100 kΩ		
Display method	7-segment LED (zero blanking method)		
Character size	W 4 × H 8 mm		
Prescale	0.0001 × 10 ⁻⁹ to 9.9999 × 10 ⁹		
Hysteresis	-	0 to 9999 ⁰³⁾	
Display cycle	OFF ⁰⁴⁾ , 0.05, 0.5, 1, 2, 4, 8 sec (same as update output cycle)		
Display range	-19999 to 99999		
Contact control output	Relay		
Type	-	1c × 1	1a × 2
Capacity	-	250 VAC~ 3 A, 30 VDC≐ 3 A resistive load	250 VAC~ 3 A, 30 VDC≐ 3 A resistive load
Solid-state control output	NPN open collector		
Type	-	× 1	× 2
Capacity	-	≤ 30 VDC≐ 100 mA	≤ 30 VDC≐ 100 mA
Certification	CE   ENEC		
Unit weight (package)	≈ 168 g (≈ 243 g)	≈ 181g (≈ 256g)	≈ 190 g (≈ 265 g)

01) Standard duty ratio 1:1

02) Operation mode F7, F8: ≤ 1 kHz (pulse width: ≥ 500 μs)

03) The hysteresis setting range varies according to the decimal point setting position.

04) Only available operation mode F2, F14

Input	AC voltage	AC / DC voltage
Power supply	100 - 240 VAC ~ 50 / 60 Hz	24 VAC ~ 50 / 60 Hz, 24 - 48 VDC =
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	≤ 9 VA	AC: ≤ 6.5 VA, DC: ≤ 5 W
External power supply	≤ 12 VDC = ±10 % 80 mA	
Memory retention	Number of inputs: 100,000 operations (non-volatile semiconductor memory type)	
Relay life cycle	Mechanical: ≥ 5,000,000 operations Electrical: ≥ 100,000 operations (250 VAC ~ 3 A resistive load)	
Insulation resistance	≥ 100 MΩ (500 VDC = megger)	
Dielectric strength	Between the charging part and the case: 3,000 VAC ~ 60 Hz for 1 min	
Noise immunity	± 2 kV the square wave noise (pulse width: 1 μs) by the noise simulator	
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	300m / s ² (≈ 30G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100m / s ² (≈ 30G) in each X, Y, Z direction for 3 times	
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	

Multi Pulse Meters

MP5S / MP5Y / MP5W Series



Features

- 16 operation modes
 - Frequency / revolutions / speed, passing speed, cycle, passing time, time interval
 - Time differential, absolute ratio, error ratio, density, error, length measurement 1 / 2, interval
 - Accumulation, addition / subtraction (individual input), addition / subtraction (phase difference input)
- Various output models
 - Relay triple / quintuple output, NPN / PNP open collector quintuple output
 - BCD Dynamic output, PV transmission output (current output)
 - RS485 communication output (Modbus RTU)
- Various function
 - Prescale, delay monitoring, hysteresis, auto-zero, parameter lock, data bank (MP5W only)
- Display range: -19999 to 99999
- Various display units

* Sold Separately

- [MP5W] Terminal protection cover: M6P / M9P-COVER

Specifications

Model	MP5S	MP5Y	MP5W
Input signal ⁰¹⁾	Solid state input 1: ≤ 50 kHz (pulse width: ≥ 10 μs) Solid state input 2 ⁰²⁾ : ≤ 5 kHz (spulse width: ≥ 100 μs) Contact input: ≤ 45 Hz (contact: 12 VDC≡ ≥ 5 mA, (pulse width: ≥ 11 ms)		
Voltage input	Input impedance: 3.9 kΩ, [H]: 4.5 - 24 VDC≡, [L]: 0 - 1 VDC≡		
No-voltage input	Short-circuit impedance: ≤ 80 Ω, residual voltage: ≤ 1 VDC≡, open-circuit impedance: ≥ 100 kΩ		
Display method	7-segment LED (zero blanking method)		
Character size	W 4 × H 8 mm	W 7 × H 14 mm	
Prescale	0.0001 × 10 ⁻⁹ to 9.9999 × 10 ⁹		
Hysteresis	0 to 9999 ⁰³⁾		
Display cycle	OFF ⁰⁴⁾ , 0.05, 0.5, 1, 2, 4, 8 sec (same as update output cycle)		
Display range	-19999 to 99999		
Output	Depending on models		
Relay	250 VAC~ 3 A, 30 VDC≡ 3 A resistive load		
NPN / PNP open collector	≤ 30 VDC≡ 30 mA		
BCD Dynamic	NPN open collector ≤ 30 VDC≡ 30 mA (Dynamic COM cycle (T) = 40 ms)		
PV transmission (DC 4 - 20 mA, DC 0 - 20 mA)	Resolution - 1/ 8,000 (DC 4 - 20 mA), 1/10,000 (DC 0 - 20 mA) Load resistance: ≤ 500 Ω Response time ⁰⁵⁾ : ≤ 300 ms, Output accuracy (23 ± 5 °C): ± 0.3 % F.S.		
RS485 communication	Modbus RTU		
Product components	Product, instruction manual		
Bracket	Mounted	× 2	× 2
Unit sticker	× 1	× 1	× 2
Unit weight (package)	≈ 132 g (≈ 191 g)	≈ 140 g (≈ 230 g)	≈ 210 g (≈ 334 g)
Certification	CE UK ENEC EBC		

01) Standard duty ratio 1:1

02) Operation mode F7, F8, F9, F10: ≤ 1 kHz (pulse width: ≥ 500 μ s)

03) The hysteresis setting range varies according to the decimal point setting position.

04) Only available operation mode F2, F16

05) Based on the display cycle of 0.2 seconds.

Deviations may occur depending on the device environment and the display cycle of the product.

Response time: Time taken to proportional output to the rapidly changing input from 15 \rightarrow 95 % or 95 \rightarrow 15 %.

Input	AC voltage	AC / DC voltage
Power supply	100 - 240 VAC ~ 50 / 60 Hz	24 VAC~ 50 / 60 Hz, 24 - 48 VDC==
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	Depending on Series / power supply	
MP5S	≤ 7,5 VA	AC: ≤ 6 VA, DC: ≤ 4.5 W
MP5Y	≤ 9 VA	AC: ≤ 7 VA, DC: ≤ 6.2 W
MP5W	≤ 15 VA	AC: ≤ 11 VA, DC: ≤ 7 W
External power supply	≤ 12 VDC== ± 10 % 80 mA	
Sub power supply ^{on)}	≤ 24 VDC== 30 mA	
Memory retention	Number of inputs: 100,000 operations (non-volatile semiconductor memory type)	
Relay life cycle	Mechanical: ≥ 10,000,000 operations (switching frequency 180 operations / min) Electrical: ≥ 100,000 operations (250 VAC~ 3 A, 30 VDC== 3 A resistive load) (switching frequency 20 operations / min)	
Insulation resistance	≥ 100 MΩ (500 VDC== megger)	
Dielectric strength	Between the charging part and the case: 3,000 VAC~ 60 Hz for 1 min	
Noise immunity	±2 kV the square wave noise (pulse width: 1μs) by the noise simulator	



View product detail

Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300m / s ² (≈ 30G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100m / s ² (≈ 30G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Comm. protocol	Modbus RTU (16-bit CRC)

01) Only for MP5W



E3. Digital Display Units

Digital display units are available in various sizes, can display over 60 different characters and signals for various monitoring purposes.

E3-1	Display Units	DS / DA Series	High Performance Display Units (Serial / Parallel Input)
			High Performance Display Units (RS485 Input)
		D1AA Series	W 11 × H 22 mm 16-Segment Display Units
		D1SA Series	W 11 × H 22 mm 7-Segment Display Units
		D1SC-N Series	W 32 × H 57 mm 7-Segment Display Units
E3-2	Panel Mount Display Units	D5Y / D5W Series	Panel Mount 5 Digit Display Units

High Performance

Display Units

(Serial / Parallel Input)

DS / DA Series



Features

- Simple wiring without soldering
 - multi-stage connection using expansion connectors or ribbon cables
- Various input options
 - Serial input
 - Dynamic Parallel input
 - PT temperature sensor input
 - PT temperature sensor + RS485 communication input
- Expandable up to 24 units with multi-stage connection
- Available in various sizes:
 - 16 mm, 22.5 mm, 40 mm, 60 mm
- High luminance LED display
- Various display types
 - 7-segment display and 16-segment
 - Red and green display types
 - Display 64 characters

* Sold Separately

- Expansion unit (DS□-□E / DA□-□E)
- 16 / 22 mm middle bracket (BK-D□R)
- 16 / 22 mm unit-display unit (DU□-□)

Specifications

Model	DS16-□□	D□22-□□	D□40-□□	D□60-□□
Display color	Red / green model			
Power supply	12 - 24 VDC≒			
Permissible voltage range	90 to 110 % of rated voltage			
Current consumption (red)	≤ 20 mA	≤ 25 mA	≤ 55 mA	≤ 65 mA
Current consumption (green)	≤ 15 mA	≤ 20 mA	≤ 40 mA	≤ 45 mA
Characters size (W×H)	9 × 16 mm	11.2 × 22.5 mm	22.4 × 40 mm	33.6 × 60 mm
Noise immunity	± 500 V the square wave noise (pulse width: 1 μs) by the noise simulator			
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)			
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)			
Protection rating	IP40 (front part)			
Certification	CE ENEC			
Weight (packaged) ⁰¹⁾	≈ 12 g (≈ 52 g)	≈ 17 g (≈ 58 g)	≈ 28 g (≈ 63 g)	≈ 60 g (≈ 110 g)

01) The package weight of 16 mm / 22 mm expansion unit varies, it based on 3 packages.
16 mm: ≈ 77 g / 22 mm: ≈ 92 g

Model	D□□-□S	D□□-□P
Input method	Serial	Parallel
Max. Clock ⁰¹⁾	≤ 2 kHz	Dynamic 1: ≤ 3 kHz Dynamic 2: ≤ 1.5 kHz
Input logic	Positive logic (PNP), negative logic (NPN)	
Input resistance	20 kΩ	
Input level	High: 4.5 - 24 VDC≒, Low: 0 - 1.2 VDC≒	
Display character	64 characters and symbols display: 0 to 9, A to Z, 27 symbols, decimal point	
Max. number of multi-stage	24-unit	Dynamic 1: 6-unit (4-bit) or 4 units (6-bit) Dynamic 2: 24-unit (6-bit)

01) Based on 50 : 50 (%) of duty ratio (ON / OFF)



View product detail

High Performance

Display Units

(RS485 Input)

DS / DA Series



Features

- Simple wiring without soldering
 - multi-stage connection using expansion connectors or ribbon cables
- Various input options
 - Serial input
 - Dynamic Parallel input
 - PT temperature sensor input
 - PT temperature sensor + RS485 communication input
- Expandable up to 24-units with multi-stage connection
- Available in various sizes:
 - 16 mm, 22.5 mm, 40 mm, 60 mm
- High luminance LED display
- Various display types
 - 7-segment display and 16-segment
 - Red and green display types
 - Display 64 characters

Specifications

Model	DS16-□□	D□22-□□	D□40-□□	D□60-□□
Display color	Red / green model			
Power supply	12 - 24 VDC=			
Permissible voltage range	90 to 110 % of rated voltage			
Current consumption (red)	≤ 20 mA	≤ 25 mA	≤ 55 mA	≤ 65 mA
Current consumption (green)	≤ 15 mA	≤ 20 mA	≤ 40 mA	≤ 45 mA
Character size (W×H)	9 × 16 mm	11.2 × 22.5 mm	22.4 × 40 mm	33.6 × 60 mm
Noise immunity	±500 V the square wave noise (pulse width: 1 μs) by the noise simulator			
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (non freezing or condensation)			
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (non freezing or condensation)			
Protection rating	IP40 (front part)			
Certification	CE ENEC			
Weight (packaged) ⁰¹⁾	≈ 12 g (≈ 52 g)	≈ 17 g (≈ 58 g)	≈ 28 g (≈ 63 g)	≈ 60 g (≈ 110 g)
Comm. protocol	Modbus RTU			

01) The package weight of 16 mm / 22 mm expansion unit varies, it based on 3 packages.
16 mm: ≈ 77 g / 22 mm: ≈ 92 g

Model	D□□-□T	DS□-□C
Input method	RS485 communication	RS485 communication (time)
Directly connected Autonics Series	CT6, CT4, MP5, MT4, TK / TX, TM2, TM4, THD	-
Display character (range)	64 characters and symbols display: 0 to 9, A to Z, 27 symbols, decimal point	World local time, 12/24-hour, summer time
Max. number of multi-stage	24-unit	10-unit
Comm. protocol	Modbus RTU	

* Sold Separately

- Expansion unit (DS□-□E / DA□-□E)
- 16 / 22 mm middle bracket (BK-D□R)
- 16 / 22 mm unit-display unit (DU□-□)



View product detail

W 11 × H 22 mm

16-Segment

Display Units

D1AA Series



Features

- Displays 61 types of characters and signs (0 to 9, A to Z, 24 symbols, decimal point)
- Selectable input logic (positive / negative), data input type (parallel / serial)
- 16-segment in red / green
- Wide range of input signal level (Low : 0 - 1.2 VDC \equiv , High : 4.5 - 24 VDC \equiv)
- 12 - 24 VDC \equiv power supply
- Multi-stage connection available

- * Sold Separately
- Caps: DAR (L)-R (1 set - left and right, D1SA-RN dedicated)
 - Caps: DAR (L)-BL (1 set - left and right, D1SA-GN dedicated)

Specifications

Model	D1AA-RN	D1AA-GN
Display method	16-segment LED (red)	16-segment LED (green)
Power supply	12 - 24 VDC \equiv	
Permissible voltage range	90 to 110 % of rated voltage	
Current consumption	\leq 32 mA	
Character size	W 11 × H 22 mm	
Display character	61 characters and symbols (0 to 9, A to Z, 24 symbols, decimal point)	
Input	Parallel: Parallel 6 bits data, LATCH, decimal point Serial : Serial 6 / 7 bits data, CLOCK, LATCH, decimal point ⁰¹⁾	
Input resistance	20 k Ω	
Input level	High: 4.5 - 24 VDC \equiv , Low: 0 - 1.2 VDC \equiv	
Max. Clock ⁰²⁾	\leq 3 kHz	
Output	Data output (serial input)	
Input logic	Positive logic (PNP), negative logic (NPN) selectable (by inner soldering)	
Noise immunity	\pm 300 V the square wave noise (pulse width: 1 μ s) by the noise simulator	
Ambient temperature	0 to 60 °C, storage: -10 to 85 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH (no freezing or condensation)	
Certification	EAC	
Weight (packaged) ⁰³⁾	\approx 16 g (\approx 131 g)	

01) When applying the serial 6 bits input.
02) Max. Clock is for 50 : 50 (%) of duty ratio (ON, OFF ratio).
03) The package weight is based on four.



View product detail

W 11 × H 22 mm

7-Segment

Display Units

D1SA Series



Features

- Selectable decimal (0 to 9) / hexadecimal (0 to 9, A to F) display, input logic (positive / negative), data input method (serial / parallel)
- 7-segment, red / green display
- 12 - 24 VDC \equiv power supply
- Wide range on signal input voltage level (Low: max. 0 - 1.2 VDC \equiv , High: 4.5 - 24 VDC \equiv)
- Easy multi-stages connection
- Zero blanking function

* Sold Separately

- Caps: DAR (L)-R
(1 set - left and right, D1SA-RN dedicated)
- Caps: DAR (L)-BL
(1 set - left and right, D1SA-GN dedicated)

Specifications

Model	D1SA-RN	D1SA-GN
Display method	7-segment LED (red)	7-segment LED (green)
Power supply	12 - 24 VDC \equiv	
Permissible voltage range	90 to 110 % of rated voltage	
Current consumption	\leq 35 mA	
Character size	W 11 × H 22 mm	
Display character	Decimal number: 0 to 9, decimal point Hexadecimal number: 0 to 9, A to F, decimal point	
Input	Parallel: Parallel 4-bit data, LATCH, Zero Blanking, decimal point Serial: Serial 4 / 5-bit data, CLOCK, Zero Blanking, LATCH, decimal point ⁰¹⁾	
Input resistance	20 k Ω	
Input level	High: 4.5 - 24 VDC \equiv , Low: 0 - 1.2 VDC \equiv	
Max. Clock ⁰²⁾	\leq 3 kHz	
Output	Data output (serial input), Zero Blanking output	
Input logic	Positive logic (PNP), negative logic (NPN) selectable (function set switches)	
Noise immunity	\pm 300 V the square wave noise (pulse width: 1 μ s) by the noise simulator	
Ambient temperature	0 to 60 °C, storage: -10 to 85 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH (no freezing or condensation)	
Certification	EAC	
Weight (packaged) ⁰³⁾	\approx 16 g (\approx 131 g)	

01) When applying the serial 4-bit input.

02) Max. Clock is for 50 : 50 (%) of duty ratio (ON, OFF ratio).

03) The package weight is based on four.



View product detail

W 32 × H 57 mm

7-Segment

Display Units

D1SC-N Series



Features

- Selectable decimal (0 to 9) / hexadecimal (0 to 9, A to F) display, input logic (positive / negative), data input method (serial / parallel)
- 12 - 24 VDC power supply
- Wide range on signal input voltage level (Low: max. 0 - 1.2 VDC, High: 4.5 - 24 VDC)
- Zero blanking function

Specifications

Model	D1SC-N
Display method	7-segment LED (red)
Power supply	12 - 24 VDC
Permissible voltage range	90 to 110 % of rated voltage
Current consumption	≤ 70 mA
Character size (W×H)	32 × 57 mm
Display character	Decimal number: 0 to 9, decimal point, Minus Hexadecimal number: 0 to 9, A to F, decimal point, Minus
Input method	Parallel: Parallel 4-bit data, LATCH, Zero Blanking, decimal point Serial : Serial 4/5-bit data, CLOCK, Zero Blanking, LATCH, decimal point ⁰¹⁾
Input resistance	12 kΩ
Input level	High: 4.5 - 24 VDC, Low: 0 - 1.2 VDC
Max. Clock ⁰²⁾	≤ 3 kHz
Output	Data output (serial input), Zero Blanking output
Input logic	Positive logic (PNP), negative logic (NPN) selectable (function set switches)
Insulation resistance	≥ 100 MΩ (500 VDC megger)
Noise immunity	Between the power terminals or input terminals: ± 300 V the square wave noise (pulse width: 1 μs) by the noise simulator
Ambient temperature	0 to 60 °C, storage: -10 to 85 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH (no freezing or condensation)
Weight	≈ 100 g

01) When applying the serial 4-bit input.

02) Max. Clock is for 50 : 50 (%) of duty ratio (ON, OFF ratio).



View product detail

Panel Mount 5 Digit Display Units

D5Y / D5W Series



Features

- Various input specifications
 - Static Parallel input, Dynamic Parallel input, 4 / 5-bit Serial input, 16 / 20 / 25-bit Serial input method
- Decimal point, minus sign display selection function
 - Display type by serial input, external DP terminal and Minus terminal
- Positive / negative logic input selection function
- Display digit selection function
 - 4-digit (-9999 to 9999), 5-digit (0 to 99999)
- Zero blanking function
- Selectable reversion function of latch signal

Specifications

Model	D5Y-M	D5W-M	D5W-MX
Power supply	12 - 24 VDC≡		110 / 220 VAC~ 50 / 60 Hz
90 to 110 % of rated voltage	90 to 110 % of rated voltage		
Current consumption	1.1 W		2 VA
Size (W×H)	DIN 72 × 36 mm	DIN 96 × 48 mm	
Display method	7-segment LED Display		
Display digit / display range	4-digit / -9999 to 9999 5-digit ⁰¹⁾ / 0 to 99999		
Max. Clock ⁰²⁾	100 Hz to 5 kHz		
Input level	High: 5 - 24 VDC≡, Low: 0 - 1.2 VDC≡		
Input logic	Positive logic (PNP), negative logic (NPN)		
Input method	Static, Dynamic, 4 / 5-bit serial, Serial (16 / 20 / 25-bit)		
Insulation resistance	100 MΩ (500 VDC≡ megger)		
Dielectric strength	Between the charging part and the case: 2,000 VAC~ 50 / 60 Hz for 1 min		
Noise immunity	±1 kV the square wave noise (pulse width: 1 μs) by the noise simulator		
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each of X, Y, Z directions for 1 hour		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each of X, Y, Z directions for 10 min		
Shock	300 m / s ² (≈ 30 G) in X, Y, Z directions for 3 times		
Shock (malfunction)	100 m / s ² (≈ 10 G) in X, Y, Z directions for 3 times		
Ambient temperature	-10 to 50 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Certification	EAC		
Weight	≈ 75 g	≈ 165 g	≈ 267 g

01) Except for Static input method

02) Max. Clock is for 50 : 50 (%) of duty ratio (ON, OFF ratio).



View product detail



E4. Sensor Controllers

Sensors controllers are used to apply various forms of logic and functions to input signals from sensors and transmit relay or transistor signals.

E4-1 Sensor Controllers

PA10 Series

Sensor Controllers

PA-12 Series

8-Pin Plug Sensor Controllers

Sensor Controllers

PA10 Series



Features

- High-speed output response
- DIN rail or panel mount installation
- Various models
 - PA10-V: general-purpose controllers
 - PA10-W: 2-channel controllers
 - PA10-U: high performance controllers
- PA10-U features
 - 13 operation modes (DIP switches)
 - Flip-flop mode for level control
 - Timer operation mode
- Wide range power supply:
100 - 240 VAC~ 50 / 60 Hz

Specifications

Model	PA10-U	PA10-V□	PA10-W□
Power supply	100 - 240 VAC~ ± 10 % 50 / 60 Hz		
Power consumption	≤ 10 VA (12 VDC= / 200 mA load)		
Sensor supply power	12 VDC= ± 10 % ≈ 200 mA ⁰¹⁾		
Input logic	AND, OR (switch)	AND	Individual
Input method	NPN input	NPN / PNP input model	
No-voltage input	Short-circuit impedance: ≤ 680 Ω Short-circuit residual voltage: ≤ 0.8 V Open-circuit impedance: ≥ 100 kΩ	Short-circuit impedance: ≤ 300 Ω Short-circuit residual voltage: ≤ 2 V Open-circuit impedance: ≥ 100 kΩ	
Voltage input	-	Input impedance: 5.6 kΩ [H]: 5 - 30 VDC= [L]: 0 - 2 VDC=	
Output	O.C OUT1 / 2	O.C OUT1	OUT1, OUT2
Contact output	250 VAC~ 3 A resistance load		
Solid-state output	NPN open collector output ≤ 30 VDC=, ≤ 100 mA	-	
Output response time	Relay output: ≤ 10 ms, Transistor output: ≤ 0.05 ms		
Function	Operation mode (1 to 12, DIP switch)	-	-
Relay life cycle	Mechanical: Min. 10,000,000 times Electrical: Min. 100,000 times (250 VAC~ 3 A resistance load)		
Dielectric strength	2000 VAC~ 50 / 60 Hz for 1 min		
Insulation resistance	≥ 100 MΩ (500 VDC= megger)		
Ambient temperature	-10 to 55 °C, storage: -25 to 60 °C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Approval	EAC		
Unit weight	≈ 150 g		≈ 160 g

01) If the load is connected over 200 mA at the sensor output, it may cause mechanical trouble.



View product detail

8-Pin Plug Sensor Controllers

PA-12 Series



Features

- 110 / 220 VAC~ dual voltage
- NPN / PNP input switch
- High contact capacity
(250 VAC~ 3 A, 30 VDC= 3 A resistive load)
- Socket plug-in type (8-pin)
- N.O. or N.C. relay output available

* Sold Separately

- 8-Pin socket: PS-08(N)

Specifications

Model	PA-12	PA-12-PG	PA-12-PGP
Type	NPN / PNP switching	NPN open collector	PNP open collector
Power supply	110 / 220 VAC~ switching 50 / 60 Hz	110 / 220 VAC~ 50 / 60 Hz	
Power consumption	≈ 4 VA		
Sensor supply power ⁰¹⁾	12 VDC≡ ± 10 % 50 mA	12 VDC≡ ± 10 % 30 mA	
Control output	Relay contact output ⁰²⁾	NPN open collector output	PNP open collector output
	Contact capacity: 250 VAC~ 3 A, 30 VDC≡ 3 A resistance load, Contact configuration: 1 a 1 b	Allowable input voltage: ≤ 30 VDC≡ Rated current: ≤ 50 mA	
NPN input signal	Short-circuit impedance : ≤ 1 kΩ Residual voltage : ≤ 2 VDC≡ Open-circuit impedance : ≥ 100 kΩ	Short-circuit impedance : ≤ 1 kΩ Residual voltage : ≤ 2 VDC≡ Open-circuit impedance: ≥ 100 kΩ	-
PNP input signal	High: 7 - 12 VDC≡ Low: 0 - 5 VDC≡	-	High: 7 - 12 VDC≡ Low: 0 - 5 VDC≡
Input resistance	10 kΩ	-	-
Response time	Input: ≥ 0.2 ms, Output: ≥ 10 ms		
Ambient temperature	-10 to 50 °C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH (no freezing or condensation)		
Approval	EAC		
Unit weight	≈ 269 g		

01) Make sure that total consumption current shall not exceed sensor's power supply capacity when connecting a sensor.
02) Electrical life cycle: ≥ 10,000,000 operations, Mechanical life cycle: ≥ 100,000 operations



View product detail



E5. Recorders

Recorders are devices which display and record various measured inputs including temperature, humidity, flux, and pressure.

E5-1	Paperless	KR1000 Series	LCD Touchscreen Paperless Recorders
E5-2	Paper	KR100 Series	100 mm Hybrid Recorders
		KR50 Series	50 mm Hybrid Recorders

LCD Touchscreen Paperless Recorders



KRN1000 Series



Features

- 5.6-inch color TFT LCD (640 × 480) touchscreen display with excellent readability and intuitive control interface
- Supports maximum 16 input channel and 27 input types
- Various communication methods (default option: RS422 / 485, Ethernet, USB)
- 25 to 250 ms high-speed sampling, 1 to 3600 sec recording cycle
- 200 MB internal memory and external SD / USB memory (up to 32 GB) support
- Store and backup internal data to external SD / USB memory
- 9 different graph types available
- 4 types of option input / output available:
 - digital input (non-contact / contact), alarm output, power output for transmitter
- Compact, space-saving design (depth: 69.2 mm)

Specifications

Model	KRN1000
Screen size	5.6 inch
LCD type	TFT Color LCD
Resolution	640 × 480 pixel
Brightness adjustment	3-level (Min. / Standard / Max.)
Touch	Resistive type
No of input channel	4 / 8 / 12 / 16 CH model
Universal input	Refer to Autonics website
Sampling cycle ⁰¹⁾	1 to 4 CH: 25 ms / 125 ms / 250 ms, 5 to 16 CH: 125 ms / 250 ms
Recording cycle	1 to 3,600 sec
Internal memory	≈ 200 MB
External memory ⁰²⁾	SD / USB memory maximum 32 GB
01) Internal sampling cycle is average movement filter and alarm output operation unit time. 02) USB memory is included in the box. If you use USB memory you purchased separately, it could not be recognized.	
Power supply	100-240 VAC ~ 50 / 60 Hz
Permissible voltage range	85 to 110 % of rated power supply
Power consumption	≤ 23 VA
Dielectric strength	Between the charging part and the case: 2,300 VAC ~ 50 / 60 Hz for 1 minute (except Ethernet and USB device)
Vibration	10 to 60 Hz 4.9 m / s ² X, Y, Z in each X, Y, Z direction for 1 hour
Vibration (malfunction)	10 to 60Hz 1 m / s ² X, Y, Z in each X, Y, Z direction for 10 minutes
Insulation resistance	≥ 20 MΩ (500 VDC ≡ megger)
Noise immunity	Square shaped noise by noise simulator (pulse width 1 μs) ± 2 kV
Time accuracy	Within ± 2 min / year (available up to 2099 year)
Protection structure	IP50 (front part, IEC standard)
Ambient temperature	0 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Certification	CE  ENEC 
Unit weight (packaged)	≈ 590 to 700 g (≈ 1,290 to 1,400 g)



View product detail

100 mm Hybrid Recorders

KRN100 Series



Features

- 100 mm paper recorder
- Enables to record data without paper with the data logger function (internal memory and external memory supported to backup data)
- High speed sampling of 25 to 250 ms and high speed record of 240 mm / H in high speed graph mode
- 6 recording colors
- Easy parameter setting by quick menu setting
- Enables to set parameters and monitor with USB, RS485, Ethernet communication
- Supports up to 12 channels with slot type input cards
- Supports total 27 kinds of input types (weight, voltage, current, frequency potentiometer, and etc.)

* Sold Separately

- Universal input card: KRN-UI2
- Transistor alarm output card: KRN-AT6
- Transmitter power output card: KRN-24V3
- Digital input card: KRN-DI6
- Relay alarm output card: KRN-AR4
- Communication output card: KRN-COM

Specifications

Model	KRN100
LCD type	STN Graphic LCD
Resolution	320 × 120 pixel
Brightness adjustment	4-level (OFF / Min / Standard / Max)
Backlight	White LED, 2-level (Temp / Always)
No of input channel	2 / 4 / 6 / 8 / 10 / 12 CH model (2 CH / universal input card)
Universal input	Refer to Autonics website
Sampling cycle ⁰¹⁾	1 to 4 CH: 25 ms / 125 ms / 250 ms, 5 to 12 CH: 125 ms / 250 ms (thermocouple (TC) - R, U, S, T: ≥ 50 ms)
Graph mode recording speed	10, 20, 40, 60, 120, 240 mm / H
Recording accuracy	± 0.5 % F.S.
Saving cycle	1 to 3600 sec (inner log file is saved at 1 sec interval)
Internal memory	512 MB
External memory ⁰²⁾	USB memory max. 32 GB
Recording paper	113 mm × 9 m
Ink cartridge	Normal printing is available after going and returning printing maximum 5 times within 7 days after opening the unit
Ink dry time	≤ 15 minutes
Power supply	100-240 VAC ~ 50 / 60 Hz
Permissible voltage range	85 to 110 % of rated power supply
Power consumption	≤ 23 VA
Dielectric strength	Between the charging part and the case: 2500 VAC ~ 50 / 60 Hz for 1 minute (except Ethernet and USB device)
Vibration (conveying and storing)	10 to 60 Hz 4.9 m / s ² X, Y, Z in each X, Y, Z direction for 1 hour
Vibration (operating)	10 to 60 Hz 1 m / s ² X, Y, Z in each X, Y, Z direction for 10 minutes
Insulation resistance	≥ 20 MΩ (500 VDC = megger)
Noise immunity	± 2 kV square wave noise (pulse width 1 μs) by noise simulator
Time accuracy	Within ± 2 min / year (available up to 2100 year)
Protection structure	IP50 (front part, IEC standard)
Ambient temperature	0 to 50 °C, storage: -20 to 60 °C (without the ink cartridge, no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Certification	CE ENEC ETL
Unit weight (packaged)	≈ 1.7 to 2.0 kg (≈ 2.4 to 2.7 kg)

01) Internal sampling cycle is average movement filter and alarm output operation unit time.

02) USB memory is included in the box. If you use USB memory you purchased separately, it could not be recognized.



View product detail

50 mm Hybrid Recorders

KRN50 Series



Features

- 50mm thermal transfer method of paper recorder
- Enables to record data without paper with the data logger function
- Support two recording modes: graph mode, digital mode
- Simultaneous recording of two channels
- Enables to set parameters and monitor with RS485 communication and dedicated communication port
- Multi-input with high accuracy 0.2 % level (RTD, TC, Voltage, Current (shunt))
- Supports various option I/O function
- Small size (W 96 × H 96 × L 100mm), light weight

Specifications

Model	KRN50	
LCD type	LCD dot matrix display	
Resolution	128 × 32 pixel	
No of input channel	1 / 2 CH model	
Input type	Refer to Autonics website	
Alarm output	CH1 (AL1, AL2), CH2 (AL1, AL2) relay output	
Alarm output adjustment sensitivity	Alarm output ON/OFF interval setting: 1 to 999 digit variable	
Communication output	RS485 communication output (Modbus RTU protocol method)	
Setting method	Setting with front key	
Sampling cycle	500 ms/CH (2 CH = 1,000 ms)	
Recording accuracy	± 0.5 % F.S.	
Graph mode recording speed	10, 30, 60, 120, 240, 480, 960 mm/H	
Graph mode memo speed	30 s, 1 min, 5 min, 10 min, 15 min, 30 min, 1 hour, 2 hour, 3 hour, 4 hour, 8 hour, 16 hour, 24 hour	
TEXT mode recording speed	00m 05s to 99m 59s	
Recording paper	Thermal Direct Receipt Paper (57 mm × 16 m)	
Recording paper supply method	Clamshell type	
Print method	Direct thermal line print	
Print resolution	80 dot/mm	
No. of print dot	384 dot/Line	
Print life cycle	50 km	
Language	Korean, English	
Input	AC voltage type	DC voltage type
Power supply	100-240 VAC~ 50/60 Hz	24 VDC=
Permissible voltage range	85 to 110 % of power supply	90 to 110 % of power supply
Power consumption	≤ 34 VA	≤ 79 W
Dielectric strength	Between the charging part and the case: 2300 VAC~ 50/60 Hz for 1 minute	
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each of X, Y, Z directions for 1 hour	
Insulation resistance	≥ 100 MΩ (500 VDC= megger)	
Noise immunity	Square shaped noise by noise simulator (pulse width 1 μs) ±2 kV	
Ambient temperature	0 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Certification	CE UK ENEC	
Unit weight	≈ 700 g	



View product detail



E6. HMIs

HMIs provide users with an interface to directly interact with machines in order to control and monitor various processes.

E6-1	Logic Panels	LP-A Series	Color LCD Logic Panels
E6-2	Graphic Panels	GP-A Series	Color LCD Graphic Panels

Color LCD Logic Panels

LP-A Series



Features

- Equipped with TFT LCD for realizing True color
- Easier system configuration and use with PLC, HMI, I/O all-in-one design
- Horizontal / Vertical installation according to environment
- Available to monitor device of the connected controllers even without user screen data
- Using user screen drawing program 'atDesigner'
 - : More variety functions, objects and library image
 - : Intuitive user interface
 - : Multilingual table function: switching language of user screen by touching a button
- Various communication interface: RS232C, RS422, Ethernet, CAN

* Sold Separately

- Communication cable
- Terminal block connector: D3500000381

Specifications

Model	LP-A070-T9D□-C5□	LP-A104-T9D□-C6□
Screen size	7.0 inch	10.4 inch
LCD type	TFT Color LCD	
Resolution	800×480 pixel	800×600 pixel
Pixel pitch (W×H)	0.19 × 0.19 mm	0.26 × 0.26 mm
Display area	154.4×93.44 mm	211.2×158.4 mm
Display color	16,777,216 color	
LCD view angle (top/bottom/left/right)	Within 50°/60°/65°/65° of each	Within 60°/70°/80°/70° of each
Backlight	White LED	
Backlight life cycle	≥ 50,000 hours ⁰¹⁾	
Luminance adjustment	Adjustable by software	
Touch	Analog resistive film method	
Touch panel resolution	800 × 480 cell	800 × 600 cell
Touch panel life cycle	≥ 1 million times	
Sound	Magnetic buzzer (≥ 85 dB)	
Input	16-point	32-point
Insulation method	Photo coupler insulation	
Rated input voltage	24 VDC≡	
Max. allowable voltage	28.8 VDC≡ (using the ambient temperature below 45°C)	
Input format	Source input	
Rated input current	X0 to X8: ≈ 10 mA, X9 to XF: ≈ 4 mA	X0 to X8: ≈ 10 mA, X9 to X1F: ≈ 4 mA
Voltage range	19.2-28.8 VDC≡	
Input resistance	X0 to X8: 3.3 kΩ, X9 to XF: 5.6 kΩ	X0 to X8: 3.3 kΩ, X9 to X1F: 5.6 kΩ
Response time	0.5 ms	
Number of commons	2-point	
Common method	16-point/1COM	16-point/1COM, 16-point/1COM
Applicable wire	Stranded wire 0.3 to 0.7 mm ²	
Output	16-point	32-point
Output terminals	Terminal block or ribbon cable	
Power supply	24 VDC≡	
Insulation method	Photo coupler insulation	
Rated load voltage	24 VDC≡	
Load voltage range	19.2-28.8 VDC≡	
Max. load current	0.1 A/1-point, 1.6 A/1COM	
Min. load current	1 mA	
Max. voltage falling when ON	≤ 0.2 VDC≡	
Output delay time	0.5 ms	
Leakage current when OFF	≤ 0.1 mA	
Clamp voltage	45 V	
Output type	Transistor output	
Number of commons	2-point	
Common method	16-point/1COM	16-point/1COM, 16-point/1COM
External connection	16-pin connector (shared with input)	16-pin connector ×2 (shared with input)
Applicable wire	Stranded wire 0.3 to 0.7 mm ²	
Certification	CE, RoHS, ENEC	
Unit weight (package)	≈ 540 g (≈ 742 g)	≈ 1.10 kg (≈ 1.66 kg)

⁰¹⁾ Based on 25 °C, time until brightness reaches 50% when continuously ON

View product detail



7.0 inch



10.4 inch

Command	Basic command: 28, application command: 236
Program capacity	8 K step
Program area	64 MB
Processing speed	Average: approx. 1μs/basic command, application command
I/O control method	Batch processing
Computer control method	Repeated-doubling method, interrupt processing
Device range	Refer to 'LP-A Series user manual'
Special function	Positioning function, motion controller, high speed counter
Serial interface	RS232C, RS422 (Half Duplex)
USB interface	Host: USB 2.0 (Type A) × 1, Device: USB 2.0 (mini-B) × 1
USB HOST power supply	5 VDC± 5%
USB HOST output current	500 mA
USB comm. distance	Host: < 2 m, Device: < 2 m
Ethernet interface	Ethernet: IEEE802.3(U), 10/100Base-T, connector: RJ45
CAN interface	24V CAN transceiver
External storage	Micro SD max. 32 GB (FAT16/32)
Printer	PCL3 GUI protocol (USB Host)
Processor	ATMEL ARM Cortex-A5 Single core (536 MHz)
RAM	DDR2 133 MHz 256 MB
Flash	256 MB
Backup memory	SRAM 1MB (lithium battery(1/2 AA))
Backup type	Logging/alarm, non-volatile device
Battery life cycle	5 years at 25°C
Clock	RTC embedded

Supportive interface can be different up to model. Please refer to 'Ordering Information' for the supportive interface per model and 'LP-A Series user manual' and 'GP/LP user manual for communication' for the detailed information about each interface.

[Online user manual \(PDF\)](#)
[User manual for communication](#)
[For the detailed information about each interface](#)

Memory for user screen	64MB			
Number of user screen	100 pages			
System menu language	Korean, English			
Font	Bitmap font: 8 × 8, 8 × 16, 16 × 16, 32 × 32 pixel Vector font: 5 to 625 pixel			
Font magnification	Bitmap fonts: 1 to 8 times width / height			
Number of display characters (character × line)	Characters	Pixel	LP-A070	LP-A104
	English / Numbers	6 × 8	133 × 60	133 × 75
		8 × 8	100 × 60	100 × 75
	Korean / Chinese characters	16 × 16	50 × 30	50 × 37

Power supply	24 VDC≡		
Permissible voltage range	90 to 110% of power supply		
Allowable momentary outage time	≤ 10 ms		
Power consumption		LP-A070	LP-A104
	Power consumption	≤ 7.2 W	≤ 8 W
	Excluding external supply power	≤ 6 W	≤ 7 W
	Backlight OFF (standby mode)	≤ 4.5 W	≤ 5 W
	Backlight ON (based on 20% brightness)	≤ 5 W	≤ 5.5 W
Inrush current	≤ 20 A		
Insulated resistance	Between the charging part and the case: ≥ 100 MΩ (500 VDC≡ megger)		
Surge voltage	± 500 V		
Ground	3rd grounding (≤ 100 Ω)		
Cooling method	Natural air cooling		
Noise immunity	The square wave noise (pulse width: 1μs) by the noise simulator ± 0.5 kV		
Static discharge endurance	Contact discharge ± 5 kV		
Dielectric strength	Between the charging part and the case: 500 VAC~ 50/60 Hz for 1 min		
Vibration	0.75 double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes		
Shock	147 m/s ² (approx. 15 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (approx. 10 G) in each X, Y, Z direction for 3 times		
Ambient temperature	0 to 50°C, storage: -20 to 60°C (a non freezing or condensation environment)		
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (a non freezing or condensation environment)		
Protection structure	IP65 (front panel, IEC standard)		
Material	Case: ABS flame retardant		

Software

Visit Autonics web site to download software.

[atDesigner]

atDesigner is a dedicated screen editor software used to create, edit, and monitor the screen data of LP/GP-A devices. All data arrangement, layout, shapes, properties can be edited using atDesigner. The screen data, project admin account, security level, language, and script can all.

[atLogic]

atLogic is for create, edit, and debug programs for LP series logic panels.

[Firmware]

Please refer to 'LP-A Series user manual' for firmware upgrade.

Color LCD

Graphic Panels

GP-A Series



Features

- Equipped with TFT LCD for realizing True color
- Horizontal / Vertical installation according to environment
- Available to monitor device of the connected controllers even without user screen data
- Using user screen drawing program 'atDesigner'
 - : More variety functions, objects and library image
 - : Intuitive user interface
 - : Multilingual table function: switching language of user screen by touching a button
- Various communication interface: RS232C, RS422, Ethernet, CAN

Specifications

Model	GP-A046	GP-A057	GP-A070	GP-A104
Screen size	4.6 inch	5.7 inch	7.0 inch	10.4 inch
LCD type	TFT Color LCD			
Resolution	800×320 pixel	640×480 pixel	800×480 pixel	800×600 pixel
Pixel pitch (W×H)	0.13 × 0.13 mm	0.18 × 0.18 mm	0.19 × 0.19 mm	0.26 × 0.26 mm
Display area	108×43.2 mm	115.2×86.4 mm	154.4×93.44 mm	211.2×158.4 mm
Display color	16,777,216 color	262,144 color	16,777,216 color	16,777,216 color
LCD view angle (top/bottom/left/right)	Within 75°/70°/80°/80° of each	Within 70°/70°/80°/80° of each	Within 50°/60°/65°/65° of each	Within 60°/70°/80°/70° of each
Backlight	White LED			
Backlight life cycle	≥ 50,000 hours ⁰¹⁾			
Luminance adjustment	Adjustable by software			
Touch	Analog resistive film method			
Touch panel resolution	800 × 320 cell	640 × 480 cell	800 × 480 cell	800 × 600 cell
Touch panel life cycle	≥ 1 million times			
Sound	Magnetic buzzer (≥ 85 dB)			
Certification	CE UK ENEC			
Unit weight (packaged)	≈ 272 g (≈ 382 g)	≈ 489 g (≈ 644 g)	≈ 520 g (≈ 706 g)	≈ 1.07 kg (≈ 1.62 kg)

⁰¹⁾ Based on 25 °C, time until brightness reaches 50% when continuously ON

Serial interface	RS232C, RS422 (Half Duplex)
USB interface	Host: USB 2.0 (Type A) × 1, Device: USB 2.0 (mini-B) × 1
USB HOST power supply	5 VDC±5%
USB HOST output current	500 mA
USB comm. distance	Host: < 2 m, Device: < 2 m
Ethernet interface	Ethernet: IEEE802.3(U), 10/100Base-T, connector: RJ45
CAN interface	24V CAN transceiver
External storage	Micro SD up to 32GB (FAT16/32)
Printer	PCL3 GUI protocol (USB Host)
Processor	ATMEL ARM Cortex-A5 Single core (536 MHz)
RAM	DDR2 133 MHz 256 MB
Flash	256 MB
Backup memory	SRAM 1MB (lithium battery(1/2 AA))
Backup type	Logging/alarm, non-volatile device
Battery life cycle	5 years at 25°C
Clock	RTC embedded

Supportive interface can be different up to model. For the detailed information, please refer to 'Ordering Information'.

View product detail



4.6 inch



5.7 inch



7 inch



10.4 inch

Memory for user screen	64MB					
Number of user screen	100 pages					
System menu language	Korean, English					
Font	Bitmap font: 8 × 8, 8 × 16, 16 × 16, 32 × 32 pixel Vector font: 5 to 625 pixel					
Font magnification	Bitmap fonts: 1 to 8 times width / height					
Number of display characters (character × line)	Characters	Pixel	GP-A046	GP-A057	GP-A070	GP-A104
	English / Numbers	6 × 8	133 × 40	106 × 60	133 × 60	133 × 75
		8 × 8	100 × 40	80 × 60	100 × 60	100 × 75
	Korean / Chinese characters	16 × 16	50 × 20	40 × 30	50 × 30	50 × 37
Power supply	24 VDC≒					
Permissible voltage range	90 to 110% of power supply					
Allowable momentary outage time	≤ 10 ms					
Power consumption			GP-A046	GP-A057/070	GP-A104	
	Power consumption		≤ 4.8 W	≤ 7.2 W	≤ 8 W	
	Excluding external supply power		≤ 4 W	≤ 6 W	≤ 7 W	
	Backlight OFF (standby mode)		≤ 3.3 W	≤ 4.5 W	≤ 5 W	
	Backlight ON (based on 20% brightness)		≤ 3.5 W	≤ 5 W	≤ 5.5 W	
Inrush current	≤ 20 A					
Insulated resistance	Between the charging part and the case: ≥ 100 MΩ (500 VDC≒ megger)					
Surge voltage	± 500 V					
Ground	3rd grounding (≤ 100 Ω)					
Cooling method	Natural air cooling					
Noise immunity	The square wave noise (pulse width: 1μs) by the noise simulator ± 0.5 kV					
Static discharge endurance	Contact discharge ± 5 kV					
Dielectric strength	Between the charging part and the case: 500 VAC~ 50/60 Hz for 1 min					
Vibration	0.75 double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour					
Vibration (malfunction)	0.5 double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes					
Shock	147 m/s ² (approx. 15 G) in each X, Y, Z direction for 3 times					
Shock (malfunction)	100 m/s ² (approx. 10 G) in each X, Y, Z direction for 3 times					
Ambient temperature	0 to 50°C, storage: -20 to 60°C (a non freezing or condensation environment)					
Ambient humidity	35 to 85%RH, storage : 35 to 85%RH (a non freezing or condensation environment)					
Protection structure	IP65 (front panel, IEC standard)					
Material	Case: ABS flame retardant					

Software

Visit Autonics web site to download software and manuals.

[atDesigner]

atDesigner is a dedicated screen editor software used to create, edit, and monitor the screen data of LP/GP-A devices. All data arrangement, layout, shapes, properties can be edited using atDesigner. The screen data, project admin account, security level, language, and script can all.

[Firmware]

Please refer to 'GP-A Series user manual' for firmware upgrade.



E7. Counters

Counters, widely used in manufacturing lines and automation systems, display and control received pulse signals from input devices.

E7-1	Counters / Timers	CM6M Series	30-Channel Counters
		CX Series	LCD Counters / Timers
		CT Series	Programmable Digital Counters / Timers
		FXS Series	Digital Counters / Timers
		FXM / FXH Series	Digital Counters / Timers
		FXY Series	Digital Counters / Timers (Indicator)
E7-2	Counters (Indicator Only)	LA8N Series	LCD Digital Counters (Indicator)
E7-3	8-Pin Plug	FS Series	8-Pin Plug Digital Counters
E7-4	Measure	FM Series	Digital Measure Counters

30-Channel Counters

CM6M Series



Features

- Max. counting speed: 20 cps
- Compact rear-length size (64.5 mm)
- Count up to 30 channels (individual output indicators for each channel)
- 6-digit display (0 to 999999 range)
- Front panel button lock function

Specifications

Model	CM6M-30B2	
Display digits	Counting / Setting value display: 6-digit CH display: 2-digit	
Display method	7-segment LED method - Counting value / CH display: red - Alarm output indicator / Setting value display: green	
Alarm output indicator (W×H)	2.7 × 3.3 mm	
Character size (W × H)	Setting value display: 5.5 × 11 mm Counting value display: 8 × 16 mm	
Number of channels	Max. 30CH	
Max. counting speed	20 cps	
Counting range	0 to 999999	
Min. signal width	RESET signal: ≥ 100 ms Counting value signal: ≥ 50 ms	
Input method	BCD code (positive logic)	
Input level	[H]: 16 - 30 VDC≒, [L]: 0 - 3 VDC≒	
Alarm output	Contact	Solid state
Type	SPST (1a) × 1	NPN open collector output × 1
Capacity	250 VAC~ 3 A resistive load	≤ 30 VDC≒ 100 mA
Certification	CE ENEC	
Unit weight (packaged)	≈ 145 g (≈ 215 g)	
Power supply	24 VDC≒	
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	2.6 W	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Insulation resistance	≥ 100 MΩ (500 VDC≒ megger)	
Dielectric strength	Between the charging part and the case : 2,000 VAC~ 50 / 60 Hz for 1 minute	
Noise immunity	± 500 V square wave noise (pulse width: 1 μs) by the noise simulator	
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Relay life cycle	Mechanical: ≥ 10,000,000 operations Electrical: ≥ 100,000 operations	
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection structure	IP54 (front part, IEC standard)	



View product detail

LCD

Counters / Timers

CX Series



Features

- LCD display with easy-to-read white PV characters
- Input type: voltage input (PNP) / no-voltage input (NPN) selectable (through parameter setting), universal voltage input type available
- One-shot output time: 0.01 to 99.99 seconds (in 0.01 second increments)
- Compact rear-length size (64.5 mm)

[Counter]

- Prescale value setting range:
0.00001 to 99999.9
- Various input / output modes
(11 input modes, 11 output modes)
- Set start point function
- Total count display mode: displays current count and aggregate count simultaneously

[Timer]

- Various output modes (15 output modes)
- Time setting range:
0.001 second to 99999.9 hours
- Set output time to 0 feature

* Sold Separately

- Terminal cover: RSA-COVER, RMA-COVER

Specifications

Model	CX6S-1P□□	CX6S-2P□□	CX6M-1P□□	CX6M-2P□□
Display digits	6-digit			
Display method	7-segment (1st, 2nd digits of counting value display: white, setting value display: green), 11-segment (the other digits of counting value display: white) LCD			
Character size	W × H (unit: mm)			
Counting value	4.1 × 10.1		6.2 × 15.2	
Setting value	3.3 × 8.1		5 × 12.3	
Counter	Count up, count down, count up / down			
Counting range ⁽¹⁾	-99999 to 999999			
Timer	Count up, count down			
Repeat / SET / voltage / Temp. Error	CX6 - P : Power ON Start: ≤ ± 0.01 % ± 0.05 sec Signal ON Start: ≤ ± 0.01 % ± 0.03 sec CX6 - P F: Power ON Start: ≤ ± 0.01 % ± 0.08 sec Signal ON Start: ≤ ± 0.01 % ± 0.06 sec			
Input logic (CX6□-□P□)	Voltage input (PNP) - input impedance: 10.8 kΩ, [H]: 5 - 30 VDC=, [L]: 0 - 2 VDC= No-voltage input (NPN) - short-circuit impedance: ≤ 1 kΩ, short-circuit residual voltage: ≤ 2 VDC=			
Input logic (CX6□-□P□F)	Free voltage input - INA (START), INB (INHIBIT) input, [H]: 24 - 240 VAC~ 50 / 60 Hz / 24 - 240 VDC= [L]: 0 - 10 VAC~ / VDC= No-voltage input - RESET input, short-circuit impedance: ≤ 1 kΩ, short-circuit residual voltage: ≤ 2 VDC=			
One-shot output time	0.01 to 99.99 s			
Unit weight (packaged)	Dependent on the model			
CX6□-□P4	≈ 112 g (≈ 157 g)	≈ 117 g (≈ 162 g)	≈ 170 g (≈ 235 g)	≈ 175 g (≈ 240 g)
CX6□-□P4F	≈ 110 g (≈ 155 g)	≈ 115 g (≈ 160 g)	≈ 168 g (≈ 233 g)	≈ 173 g (≈ 238 g)
CX6□-□P2	≈ 111 g (≈ 156 g)	≈ 116 g (≈ 161 g)	≈ 169 g (≈ 234 g)	≈ 174 g (≈ 239 g)
CX6□-□P2F	≈ 109 g (≈ 154 g)	≈ 114 g (≈ 159 g)	≈ 167 g (≈ 232 g)	≈ 172 g (≈ 237 g)
Certification	CE UKCA			

01) It varies depending on the setting of decimal points.

Model	CX6S-□P□□	CX6M-□P□□
Contact control output	Relay	
Type (1-stage)	SPDT (1c) × 1	SPDT (1c) × 1
Type (2-stage)	SPST (1a) × 2	SPDT (1c) × 2
Capacity	≤ 250 VAC ~ 3 A, ≤ 30 VDC = 3 A resistive load	≤ 250 VAC ~ 3 A, ≤ 30 VDC = 3 A resistive load
Solid-state control output	-	NPN open collector
Type (1-stage)	-	× 1
Type (2-stage)	-	× 2
Capacity	-	≤ 30 VDC =, 100 mA

[View product detail](#)

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Voltage	AC voltage type		AC / DC voltage type
Power supply	100 - 240 VAC~ 50 / 60 Hz		24 VAC~ 50 / 60 Hz, 24 - 48 VDC=
Permissible voltage range	90 to 110 % of rated voltage		
Power consumption	Dependent on the model		
CX6S-1P□	≤ 6.4 VA		AC: ≤ 5.5 VA, DC: ≤ 3.5 W
CX6S-1P□F	≤ 4.2 VA		AC: ≤ 3.6 VA, DC: ≤ 2.5 W
CX6S-2P□	≤ 6.7 VA		AC: ≤ 5.6 VA, DC: ≤ 3.6 W
CX6S-2P□F	≤ 4.9 VA		AC: ≤ 4.0 VA, DC: ≤ 2.8 W
CX6M-1P□	≤ 7.1 VA		AC: ≤ 6.2 VA, DC: ≤ 4 W
CX6M-1P□F	≤ 4.7 VA		AC: ≤ 3.9 VA, DC: ≤ 2.9 W
CX6M-2P□	≤ 7.5 VA		AC: ≤ 6.3 VA, DC: ≤ 4.1 W
CX6M-2P□F	≤ 5.4 VA		AC: ≤ 4.5 VA, DC: ≤ 3.3 W
External power supply ⁰¹⁾	≤ 12 VDC= 100 mA		
Memory retention	≈ 10 years (non-volatile semiconductor memory type)		
Insulation resistance	≥ 100 MΩ (500 VDC= megger)		
Dielectric strength	Between the charging part and the case: 3,000 VAC~ 50 / 60 Hz for 1 minute		
Noise immunity	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator	± 500 V square wave noise (pulse width: 1 μs) by the noise simulator	
Vibration	0.75 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minute		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical: ≥ 5,000,000 operations Electrical: ≥ 100,000 operations		
Ambient temp.	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Protection rating	IP65 (front part, IEC standard)		

01) This is for the CX6□-□P□ model.

Programmable Digital Counters / Timers

CT Series



Features

- Communication function supported (communication model): RS485 (Modbus RTU)
- One-shot output time setting range: 0.01 sec to 99.99 sec by setting per 10ms

[Counter]

- Prescale value setting range:
6-digit model: 0.00001 to 99999.9 /
4-digit model: 0.001 to 999.9
- Various input / output modes (9 input / 11 output modes)
- BATCH counter, count Start Point (counting initial value) setting function



[Timer]

- Various output modes (13 modes)
- Various time setting range:
6-digit model: 0.001 sec to 99999.9 hour /
4-digit model: 0.001 sec to 9999 hour
- '0' time setting function
- Selectable timer memory retention function for indicator model.

* Sold Separately

- Terminal protection cover: M6P / M7P-COVER

Specifications

Model	CTS□-□□□		CTY□-□□□	CTM□-□□□
Display digits	4-digit	6-digit	6-digit	6-digit
Display method	7-segment (counting value: red, setting value: green) LED			
Character size	W × H (unit: mm)			
Counting value	6.5 × 10	4.5 × 10	4.2 × 9.5	6.6 × 13
Setting value	4.5 × 8	3.5 × 7	3.5 × 7	5 × 9
Counter	Count up, count down, count up / down			
Counting range ⁽¹⁾	-999 to 9999	-99999 to 999999		
Timer	Count up, count down			
Error	Repeat / SET / voltage / Temp. - Power ON Start: ≤ ± 0.01 % ± 0.05 sec Signal ON Start: ≤ ± 0.01 % ± 0.03 sec			
Input logic	Voltage input (PNP) - input impedance: 5.4 kΩ, [H]: 5 - 30 VDC≡, [L]: 0 - 2 VDC≡ No-voltage input (NPN) - short-circuit impedance: ≤ 1 kΩ, short-circuit residual voltage: ≤ 2 VDC≡			
One-shot output time	0.01 to 99.99 s			
Product components	Product, instruction manual			
Bracket	Mounted	× 2		× 2
Unit weight (packaged)	≈ 159 g (≈ 212 g)	≈ 140 g (≈ 228 g)		≈ 252 g (≈ 322 g)
Certification	CE  			

⁽¹⁾ It varies depending on the setting of decimal points.

Model	CTS□-□□□	CTY□-□□□	CTM□-□□□
Contact control output	Relay		
Type (1-stage)	SPDT (1c) × 1	SPDT (1c) × 1	SPDT (1c) × 1
Type (2-stage)	SPST (1a) × 2	Standard: SPST (1a) × 1, SPDT (1c) × 1 Communication: SPST (1a) × 2	SPST (1a) × 1, SPDT (1c) × 1
Capacity	250 VAC \sim 5 A, 30 VDC \equiv 5 A resistive load	250 VAC \sim 3 A, 30 VDC \equiv 3 A resistive load	250 VAC \sim 5 A, 30 VDC \equiv 5 A resistive load
Solid-state control output	NPN open collector		
Type (1-stage)	Standard: × 1, Communication: -	Standard: × 1, Communication: × 1	Standard: × 2, Communication: × 2
Type (2-stage)	Standard: × 1, Communication: -	Standard: × 1, Communication: -	Standard: × 3, Communication: × 2
Capacity	≤ 30 VDC \equiv , 100 mA	≤ 30 VDC \equiv , 100 mA	≤ 30 VDC \equiv , 100 mA



View product detail

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Voltage	AC voltage type	AC / DC voltage type
Power supply	100 - 240 VAC~ 50 / 60 Hz	24 VAC~ 50 / 60 Hz, 24 - 48 VDC≡
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	≤ 12 VA	AC: ≤ 10 VA, DC: ≤ 8 W
External power supply	≤ 12 VDC≡ ± 10 % 100 mA	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)	
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50 / 60 Hz for 1 minute	Between the charging part and the case : 2,000 VAC~ 50 / 60 Hz for 1 minute
Noise immunity	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator	± 500 V square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Relay life cycle	Mechanical: ≥ 1,000,000 operations, Electrical: ≥ 100,000 operations	
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating	IP65 (front part, IEC standard)	
Comm. protocol	Modbus RTU (16-bit CRC)	

Digital Counters / Timers

FXS Series



Features

- Counting speed: 1 cps / 30 cps / 2 kcps / 5 kcps
- Selectable voltage input (PNP) or no-voltage input (NPN)
- Input mode: Up, Down, Up / Down
- Dot for Decimal Point, Hour / Min / Second by RESET key
- Wide range of input power supply
: 100 - 240 VAC~ 50 / 60 Hz, 24 VAC~ 50 / 60 Hz, 24 - 48 VDC= universal
- Selectable Counter / Timer by DIP switch

[Counter]

- 20 input modes / 18 output modes

[Timer]

- 16 output modes
- Various time setting range
 - 5-digit model: 0.01 sec to 9999.9 hour
 - 4-digit model: 0.01 sec to 9999 hour
- Output: indicator, 1-stage setting



View product detail

Specifications

Model	FX4S-1P□	FX5S-1□
Display digits	4-digit	5-digit
Character size	W 3.8 × H 7.6 mm	W 4 × H 8 mm
Max. counting speed	1 / 30 / 2 k / 5 kcps	
Return time	≤ 500 ms	
Min. signal width	INHIBIT, RESET: ≈ 20 ms	
Input logic	Voltage input (PNP) - input impedance: ≤ 10.8 kΩ, [H]: 5 - 30 VDC=, [L]: 0 - 2 VDC= No-voltage input (NPN) - short-circuit impedance: ≤ 470 Ω, short-circuit residual voltage: ≤ 1 VDC= open-circuit impedance: ≥ 100 kΩ	
One-shot output time	0.05 to 5 sec	
Error	Repeat / SET / voltage / Temp.: ≤ ± 0.01 % ± 0.05 s	
Contact control output	Relay	-
Type	Instantaneous SPDT (1c) × 1	-
Capacity	250 VAC~ 3 A, 30 VDC= 3 A resistive load	-
Solid-state control output	NPN open collector × 1	-
Capacity	≤ 30 VDC=, 100 mA	-
Unit weight (packaged)	≈ 110 g (≈ 171 g)	≈ 95 g (≈ 156 g)
Certification	CE, RoHS, ENEC, EAC	
Voltage type	AC voltage	AC / DC voltage
Power supply	100 - 240 VAC~ 50 / 60 Hz	24 VAC~ 50 / 60 Hz, 24 - 48 VDCt
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption (FX4S-1P□)	≤ 4.6 VA	AC: ≤ 3.5 VA DC: ≤ 2.3 W
Power consumption (FX5S-1□)	≤ 3.8 VA	AC: ≤ 3 VA DC: ≤ 1.8 W
External supply power	≤ 12 VDC= ± 10 % 50 mA	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Insulation resistance	≥ 100 MΩ (500 VDC= megger)	
Dielectric strength	Between the charging part and the case: 3,000 VAC~ 50 / 60 Hz for 1 minute	Between the charging part and the case: 2,000 VAC~ 50 / 60 Hz for 1 minute
Noise immunity	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator	± 500 V square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Relay life cycle	Mechanical: ≥ 5,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 3 A resistive load)	
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating	IP20 (front part, IEC standard)	

Digital Counters / Timers

FXM / FXH Series



Features

- Counting speeds: 1 cps / 30 cps / 2 kcps / 5kcps
- Switch between counter and timer operation using DIP switch
- No-voltage input (NPN) using DIP switch
- Operation modes: count-up, count-down, count-up / down
- Set decimal point, hr / min / sec display with RESET key

[Counter]

- 20 input modes, 18 output modes

[Timer]

- Various output modes (16 output modes)
- Various time setting ranges:
 - 8-digit models: 0.01 sec to 99999 hr 59.9 min
 - 6-digit models: 0.1 sec to 99999.9 hr
 - 4-digit models: 0.01 sec to 9999 hr
- Output model types: single preset, dual preset, indicator only
- Power supply: 100 - 240 VAC ~ 50 / 60 Hz

* Sold Separately

- Terminal protection cover: RMA⁽⁰¹⁾ / RHA-COVER

⁰¹⁾ Not supported for 2-stage setting models

Specifications

Model	FX4□-□4	FX6M-□4	FX8M-□4
Display digits	4-digit	6-digit	8-digit
Character size	W 6 × H 10 mm	W 4 × H 8 mm	W 3.8 × H 7.6 mm
Max. counting speed	1 / 30 / 2 k / 5 k cps		
Return time	≤ 500 ms		
Min. signal width	INHIBIT, RESET: ≈ 20 ms		
Input logic	Voltage input (PNP) - input impedance: ≤ 10.8 kΩ, [H]: 5 - 30 VDC≡, [L]: 0 - 2 VDC≡ No-voltage input (NPN) - short-circuit impedance: ≤ 470 Ω, short-circuit residual voltage: ≤ 1 VDC≡, open-circuit impedance: ≥ 100 kΩ		
One-shot output time	Dependent on the output		
1-stage setting	0.05 to 5 sec		
2-stage setting	OUT1: 0.5 sec fixed, OUT2: 0.05 to 5 sec		
Error	Repeat / SET / voltage / Temp.: ≤ ± 0.01 % ± 0.05 s		
Contact control output	Relay		
Type (1-stage)	Instantaneous SPDT (1c) × 1		
Type (2-stage)	Instantaneous SPDT (1c) × 2		
Capacity	250 VAC ~ 3 A, 30 VDC ≡ 3 A resistive load		
Solid-state control output	NPN open collector		
Type (1-stage)	× 1		
Type (2-stage)	× 2		
Capacity	≤ 30 VDC ≡, 100 mA, residual voltage: ≤ 1 VDC ≡		
Unit weight (packaged)	1-stage setting: ≈ 180 g (= 245 g), 2-stage setting: ≈ 200 g (= 265 g), Indicator: ≈ 160 g (= 225 g)		
Certification	CE UK RoHS REACH		
Power supply	100 - 240 VAC ~ 50 / 60 Hz		
Permissible voltage range	90 to 110 % of rated voltage		
Power consumption	Dependent on the output		
1-stage setting	≤ 4.6 VA		
2-stage setting	≤ 5.8 VA		
Indicator	≤ 3.8 VA		
External supply power	≤ 12 VDC ≡ ± 10 % 50 mA		
Memory retention	≈ 10 years (non-volatile semiconductor memory type)		
Insulation resistance	≥ 100 MΩ (500 VDC ≡ megger)		
Dielectric strength	Between the charging part and the case: 3,000 VAC ~ 50 / 60 Hz for 1 min		
Noise immunity	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator		
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minute		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical: ≥ 10,000,000 operations Electrical: ≥ 100,000 operations (250 VAC ~ 3 A resistive load)		
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Protection rating	IP20 (front part, IEC standard)		



View product detail

Digital Counters / Timers (Indicator)

FXY Series



Features

- Counting speeds: 1 cps / 30 cps / 2 kcps / 5 kcps
- Switch between counter and timer operation using DIP switch
- Switch between voltage input (PNP) and no-voltage input (NPN) using DIP switch
- Set decimal point, hr / min / sec display with RESET key
- Operation modes: count-up, count-down, count-up / down (counter)

[Counter]

- 20 input modes

[Timer]

- Various time setting ranges
 - 6-digit models: 0.01 sec to 99999.9 hr
 - 4-digit models: 0.01 sec to 9999 hr
- Power supply
 - 100 - 240 VAC~ 50 / 60 Hz (AC type)
 - 24 VAC~ 50 / 60 Hz,
 - 24 - 48 VDC= (AC / DC universal type)

* Sold Separately

- Terminal protection cover: M7P-COVER

Specifications

Model	FX4Y-I□	FX6Y-I□
Display digits	4-digit	6-digit
Character size	W 8 × H 14 mm	W 4 × H 8 mm
Max. counting speed	1 / 30 / 2 k / 5 k cps	
Return time	≤ 500 ms	
Min. signal width	INHIBIT, RESET: ≈ 20 ms	
Input logic	Voltage input (PNP) - input impedance: ≤ 10.8 kΩ, [H]: 5 - 30 VDC=, [L]: 0 - 2 VDC= No-voltage input (NPN) - short-circuit impedance: ≤ 470 Ω, short-circuit residual voltage: ≤ 1 VDC= open-circuit impedance: ≥ 100 kΩ	
Error	Repeat / SET / voltage / Temp.: ≤ ± 0.01 % ± 0.05 s	
Unit weight (packaged)	≈ 120 g (≈ 175 g)	
Certification	CE, RoHS, ENEC	
Voltage type	AC voltage	AC / DC voltage
Power supply	100 - 240 VAC~ 50 / 60 Hz	24 VAC~ 50 / 60 Hz, 24 - 48 VDC=
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	≤ 3.8 VA	AC: ≤ 2.8 VA DC: ≤ 1.8 W
External supply power	≤ 12 VDC= ± 10 % 50 mA	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Insulation resistance	≥ 100 MΩ (500 VDC= megger)	
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50 / 60 Hz for 1 min	Between the charging part and the case : 2,000 VAC~ 50 / 60 Hz for 1 min
Noise immunity	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator	± 500 V square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minute	
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating	IP40 (front part, IEC standard)	



View product detail

LCD Digital Counters (Indicator)

LA8N Series



Features

- No additional power due to internal battery
- Signal input method: No-voltage input, voltage input, free voltage input
- Screw terminal type (attaching terminal cover)
- LCD display, backlight model
- Protection structure: IP66

Specifications

Model	LA8N-BN	LA8N-BN-L	LA8N-BV	LA8N-BV-L	LA8N-BF
Display digits	8-digit				
Display method	LCD Zero Blanking (character size: W 3.4 × H 8.7 mm)				
Max. counting speed	1 cps, 30 cps, 1 kcps				20 cps
Operation method	Count up, count down, count up/down	Count up	Count up, count down, count up/down	Count up	Count up
Counting range	-9999999 to 99999999	0 to 99999999	-9999999 to 99999999	0 to 99999999	0 to 99999999
Input method	No-voltage input		Voltage input		Free voltage input
Counting input (H)	Short Residual voltage: ≤ 0.5 VDC≡ Max. impedance: ≤ 10 kΩ		4.5 - 30 VDC≡		24 - 240 VAC~ / 6 - 240 VDC≡
Counting input (L)	Open Min. impedance: ≥ 750 kΩ		0 - 2 VDC≡		0 - 2 VAC~ / 0 - 2.4 VDC≡
RESET input	No-voltage input		Voltage input		No-voltage input
Min. signal width (UP, DOWN)	≈ 20 ms	-	≈ 20 ms	-	-
Min. signal width (RESET)	≈ 20 ms				
Unit weight (packaged)	≈ 50 g (≈ 96 g)				
Certification	CE UK RoHS ENEC				
Power supply	Built-in battery (CR2477)				
Battery life cycle	≥ 7 years (at ≈ 20 °C)				
Backlight power	24 VDC≡ ± 10 %				
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)				
Dielectric strength	Between the charging part and the case: 2,000 VAC~ 60 Hz for 1 min				
Vibration	0.75 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour				
Vibration (malfunction)	0.3 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minute				
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times				
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times				
Ambient temp.	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)				
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)				
Protection rating	IP66 (front part, when using the rubber waterproof ring, IEC standard)				



View product detail

8-Pin Plug Digital Counters

FS Series



Features

- Counting speeds: 1 cps / 30 cps / 2 kcps / 5 kcps
- Switch between voltage input (PNP) and no-voltage input (PNP) using DIP switch
- Operation modes: count-up, count-down
- Decimal point display function (fixed decimal point)
- 10 year memory protection (using non-volatile semiconductor)
- Output model types: single preset, indicator only
- Power supply
 - 100 - 240 VAC~ 50 / 60 Hz (AC type)
 - 24 VAC~ 50 / 60 Hz,
 - 24 - 48 VDC≐ (AC / DC universal type)
- * Sold Separately
- 8-pin controller socket: PG-08, PS-08(N)

Specifications

Model	FS4-1P□	FS5-I4
Display digits	4-digit	5-digit
Character size	W 3.8 × H 7.6 mm	W 4 × H 8 mm
Max. counting speed	1 / 30 / 2 k / 5 k cps	
Return time	≤ 500 ms	
Min. signal width	RESET: ≈ 20 ms	
Input logic	Voltage input (PNP) - input impedance: ≤ 10.8 kΩ, [H]: 5 - 30 VDC≐, [L]: 0 - 2 VDC≐ No-voltage input (NPN) - short-circuit impedance: ≤ 470 Ω, short-circuit residual voltage: ≤ 1 VDC≐ open-circuit impedance: ≥ 100 kΩ	
One-shot output time	0.05 to 5 sec	
Contact control output	Relay	-
Type	Instantaneous SPST (1a) × 1	-
Capacity	250 VAC~ 3 A, 30 VDC≐ 3 A resistive load	-
Unit weight (packaged)	≈ 90 g (≈ 130 g)	≈ 80 g (≈ 120 g)
Certification	CE, RoHS, REACH, ENEC	
Voltage type	AC voltage	AC / DC voltage
Power supply	100 - 240 VAC~ 50 / 60 Hz	24 VAC~ 50 / 60 Hz, 24 - 48 VDC≐
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption (FS4-1P□)	≤ 4.6 VA	AC: ≤ 3.5 VA DC: ≤ 2.3 W
Power consumption (FS5-I4)	≤ 3.8 VA	-
External supply power	≤ 12 VDC≐ ± 10 % 50 mA	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Insulation resistance	≥ 100 MΩ (500 VDC≐ megger)	
Dielectric strength	Between the charging part and the case: 3,000 VAC~ 50 / 60 Hz for 1 minute	Between the charging part and the case: 2,000 VAC~ 50 / 60 Hz for 1 minute
Noise immunity	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator	± 500 V square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Relay life cycle	Mechanical: ≥ 5,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 3 A resistive load)	
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating	IP20 (front part, IEC standard)	



View product detail

Digital Measure Counters

FM Series



Features

- Measure counting: multiply-mode / divide-mode
- Operation modes: count-up, count-down, count-up / down
- Counting speeds: 1 cps / 30 cps / 300 cps / 2 kcps / 5 kcps
- Parameter configuration settings: input / output operation mode, max. counting speed, decimal point location, OUT1 / OUT2 output time (0.01 to 99.99 sec), no-voltage (NPN) / voltage (PNP) input selection, multiply-mode / divide-mode selection
- 10 year memory protection (using non-volatile semiconductor)
- Power supply: 100 - 240 VAC ~ 50 / 60 Hz

- * Sold Separately
- Terminal protection cover: RMA-COVER

Specifications

Model	FM4M-□4	FM6M-□4
Display digits	4-digit	6-digit
Character size	W 6 × H 10 mm	W 4 × H 8 mm
Max. counting speed	1 / 30 / 300 / 2 k / 5 k cps	
Return time	≤ 500 ms	
Min. signal width	RESET: ≈ 20 ms	
Input logic	Voltage input (PNP) - input impedance: ≤ 10.8 kΩ, [H]: 5 - 30 VDC≡, [L]: 0 - 2 VDC≡ No-voltage input (NPN) - short-circuit impedance: ≤ 470 Ω, short-circuit residual voltage: ≤ 1 VDC≡ open-circuit impedance: ≥ 100 kΩ	
One-shot output time	0.01 to 99.99 s	
Contact control output	Relay	
Type (1-stage)	Instantaneous SPDT (1c) × 1	
Type (2-stage)	Instantaneous SPST (1a) × 2	
Capacity	250 VAC ~ 3 A, 30 VDC≡ 3 A resistive load	
Solid-state control output	NPN open collector	
Type (1-stage)	× 1	
Type (2-stage)	× 2	
Capacity	≤ 30 VDC≡, 100 mA, residual voltage: ≤ 1 VDC≡	
Unit weight (packaged)	1-stage setting: ≈ 180 g (≈ 245 g) 2-stage setting: ≈ 200 g (≈ 265 g) Indicator: ≈ 160 g (≈ 225 g)	
Certification	CE, RoHS, REACH	
Power supply	100 - 240 VAC ~ 50 / 60 Hz	
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	Dependent on the output	
1-stage setting	≤ 4.6 VA	
2-stage setting	≤ 5.8 VA	
Indicator	≤ 3.8 VA	
External supply power	≤ 12 VDC≡ ± 10 % 50 mA	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)	
Dielectric strength	Between the charging part and the case : 3,000 VAC ~ 50 / 60 Hz for 1 min	
Noise immunity	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator	
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minute	
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Relay life cycle	Mechanical: ≥ 5,000,000 operations Electrical: ≥ 100,000 operations (250 VAC ~ 3 A resistive load)	
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating	IP20 (front part, IEC standard)	



View product detail



E8. Timers

Analog and digital timers are widely used in various industrial processes to control timing of devices or monitor life cycles of devices.

E8-1	Analog	ATM Series	W 21.5 × H 28 mm Analog Timers
		ATS Series	W 38 × H 42 mm Analog Timers
		ATS8W / 11W Series	W 38 × H 42 mm Twin Analog Timers
		ATS8P Series	W 38 × H 42 mm Power OFF Delay Analog Timers
		ATS8SD-4 Series	W 38 × H 42 mm Star-Delta Analog Timers
		ATN Series	W 48 × H 48 mm Analog Timers
		AT8PSN / AT8PMN Series	W 48 × H 48 mm Power OFF Delay Analog Timers
		ATE8 Series	W 48 × H 48 mm Power ON Delay Analog Timers
		AT8SDN Series	W 48 × H 48 mm Star-Delta Analog Timers
E8-2	Digital	LE4S Series	LCD Digital Timers
		LE7M-2 Series	W 72 × H 72 mm LCD Week / Year Digital Timers
		LE8N Series	LCD Digital Timers (Indicator)
E8-3	8-Pin Plug	FSE Series	8-Pin Plug Digital Timers with Thumbwheel Switch

W 21.5 × H 28 mm

Analog Timers

ATM Series



Features

- Miniature Size (W 21.5 × H 28 × L 59.3 mm)
- 4c (4PDT) contact (250 VAC~, 3 A)
- High precise time control
- Easy time setting using dial
- Various time ranges:
0.1 sec to 3 hour
(11 time ranges, different by models)
- Power supply
ATM4-2: 24 VDC=
ATM4-5: 220 VAC~ 50 / 60 Hz
ATM4-6: 110 VAC~ 50 / 60 Hz

Specifications

Model	ATM4-2□□	ATM4-5□□	ATM4-6□□
Function	Power ON Delay		
Return time	≤ 100 ms		
Time operation	Power ON Start		
Control output	Relay		
Contact type	4PDT (4c)		
Contact capacity	250 VAC~ 3 A, 24 VDC= 3 A resistive load		
Error	Repeat: ≤ ± 0.5% ± 10 ms SET: ≤ ± 10% ± 50 ms Voltage: ≤ ± 0.5% ± 10 ms Temp.: ≤ ± 2% ± 10 ms		
Certification	CE UK ENEC		
Unit weight (packaged)	≈ 42 g (≈ 48 g)		
Power supply	24 VDC=	220 VAC~50 / 60 Hz	110 VAC~50 / 60 Hz
Allowable voltage range	21.6 - 26.4 VDC=	200 - 230 VAC~ 50 / 60 Hz	100 - 120 VAC~ 50 / 60 Hz
Power consumption	≈ 1.2 W	≈ 3 VA	≈ 3 VA
Insulation resistive	≥ 100 MΩ (500 VDC= megger)		
Dielectric strength	Between the charging part and the case : 3,000 VAC~ at 50 / 60 Hz for 1 min		
Noise immunity	± 2 kV square-wave noise by noise simulator (pulse width 1 μs)		
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) In each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical: ≥ 10,000,000 operations Electrical: ≥ 200,000 operations		
Ambient temperature	-10 to 50 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)		



View product detail

W 38 × H 42 mm

Analog Timers

ATS Series



Features

- Wide power supply range:
100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC==
/ 24 VAC~ 50 / 60 Hz, 24 VDC== / 12 VDC==
- Various output operations (6 operation modes)
- Multi time range (12 types of time range)
- Wide time setting range (0.1 sec to 30 hour)
- Close and DIN rail mounting with the dedicated socket (PS-M8) width 41 mm (ATS8)
- Easy mounting and installation / maintenance with the dedicated bracket for DIN 48 × 48 mm

* Sold Separately

- 8-pin controller socket: PG-08, PS-08(N), PS-M8
- 11-pin controller socket: PG-11, PS-11(N)

Specifications

Model	ATS8-□□□	ATS11-□□D	ATS11-□□E
Function	Multi Function Timer		
Return time	≤ 100 ms		
Time operation	Power ON Start	Signal ON Start	
Input	-	START, INHIBIT, RESET	
Min. signal width	-	≈ 50ms	
No-voltage input	-	Short-circuit impedance: ≤ 1 kΩ Short-circuit residual voltage: ≤ 0.5 VDC≡ Open-circuit impedance: ≥ 100 kΩ	
Control output	Relay		
Contact type	Time limit DPDT (2c), Instantaneous SPDT (1c) + Time limit SPDT (1c)	Time limit DPDT (2c)	Instantaneous SPDT (1c) + Time limit SPDT (1c)
Contact capacity	250 VAC~ 3 A, 30 VDC≡ 3 A resistive load	250 VAC~ 3 A, 24 VDC≡ 3 A resistive load	
Error	Repeat: ≤ ± 0.2% ± 10 ms SET: ≤ ± 5% ± 50 ms Voltage: ≤ ± 0.5% Temp.: ≤ ± 2%		
Certification	CE, RoHS, ENEC, EAC		
Unit weight (packaged)	≈ 70 g (≈ 95 g)		
Power supply	12 VDC≡	24 VAC~ 50 / 60 Hz, 24 VDC≡	100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC≡
Permissible voltage range	90 to 110 % of rated voltage		
Power consumption	It depends on the plug type and output.		
ATS8-□□□	DC: ≤ 1.5 W	AC: ≤ 4.5 VA DC: ≤ 2 W	AC: ≤ 4.2 VA DC: ≤ 2 W
ATS11-□□D	DC: ≤ 1 W	AC: ≤ 4 VA DC: ≤ 1.5 W	AC: ≤ 3.5 VA DC: ≤ 2 W
ATS11-□□E	DC: ≤ 1.5 W	AC: ≤ 4.5 VA DC: ≤ 2 W	AC: ≤ 4.2 VA DC: ≤ 2 W
Insulation resistive	≥ 100 MΩ (500 VDC≡ megger)		
Dielectric strength	Between the charging part and the case : 3,000 VAC~ at 50 / 60 Hz for 1 min		
Noise immunity	It depends on the power supply.		
ATS□-1□□	± 500 V square-wave noise by noise simulator (pulse width 1 μs)		
ATS□-2□□			
ATS□-4□□	± 2kV square-wave noise by noise simulator (pulse width 1 μs)		
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) In each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical: ≥ 10,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 3 A resistive load)		
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		



View product detail

W 38 × H 42 mm

Twin

Analog Timers

ATS8W / 11W Series



Features

- Wide power supply range:
100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC== universal / 24 VAC~ 50 / 60 Hz, 24 VDC== / 12 VDC==
- Various output operations (6 operation modes)
- Multi time range (12 types of time range)
- Twin timer to set ON / OFF time individually
- Close and DIN rail mounting with the dedicated socket (PS-M8) width 41 mm (ATS8W)
- Easy installation / maintenance with the dedicated bracket for DIN 48 × 48 mm

* Sold Separately

- 8-pin controller socket: PG-08, PS-08(N), PS-M8
- 11-pin controller socket: PG-11, PS-11(N)

Specifications

Model	ATS□W-1□	ATS□W-2□	ATS□W-4□
Function	ON / OFF Flicker operation		
Return time	≤ 100 ms		
Time operation	Power ON Start		
Control output	Relay		
Contact type	Time limit DPDT (2c), Instantaneous SPDT (1c) + Time limit SPDT (1c)		
Contact capacity	250 VAC~ 3 A, 30 VDC== 3 A resistive load		
Error	Repeat: ≤ ± 0.2% ± 10 ms SET: ≤ ± 5% ± 50 ms Voltage: ≤ ± 0.5% Temp.: ≤ ± 2%		
Certification	CE UK RoHS REACH		
Unit weight (packaged)	≈ 75 g (≈ 100 g)		
Power supply	12 VDC==	24 VAC~50 / 60 Hz, 24 VDC==	100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC==
Permissible voltage range	90 to 110 % of rated voltage		
Power consumption	DC: ≤ 1.5 W	AC: ≤ 4.5 VA DC: ≤ 2 W	AC: ≤ 4.2 VA DC: ≤ 2 W
Insulation resistive	≥ 100 MΩ (500 VDC== megger)		
Dielectric strength	Between the charging part and the case : 3,000 VAC~ at 50 / 60 Hz for 1 min		
Noise immunity	± 500 V square-wave noise by noise simulator (pulse width 1 μs) ± 2kV square-wave noise by noise simulator (pulse width 1 μs)		
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) In each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical: ≥ 10,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 3 A resistive load)		
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)		



View product detail

W 38 × H 42 mm

Power OFF Delay

Analog Timers

ATS8P Series



W 38 × H 42 mm

Star-Delta

Analog Timers

ATS8SD-4 Series



Features

- Wide power supply range:
100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC==
- Wide time setting range and switching time
 - T1 (setting time): selectable 0.5 to 100 sec
 - T2 (switching time): selectable 0.05, 0.1, 0.2, 0.3, 0.4, 0.5 sec
- Close and DIN rail mounting with the dedicated socket (PS-M8) width 41 mm
- Easy installation / maintenance with the dedicated bracket for DIN 48 × 48 mm
- Application: Starting large capacity motors

* Sold Separately

- 8-pin controller socket: PG-08, PS-08(N), PS-M8

Specifications

Model	ATS8SD-4
Function	Star-Delta Timer
Return time	≤ 100 ms
Time operation	Power ON Start
Control output	Relay
Contact type	Y Contact: Time limit SPST (1a), ΔContact: Time limit SPST (1a)
Contact capacity	250 VAC~ 3 A, 30 VDCc 3 A resistive load
Error	Repeat: ≤ ± 0.2% ± 10 ms Voltage: ≤ ± 0.5% Temp.: ≤ ± 2% Y setting time : ≤ ± 5% ± 50 ms Y - Δswitching time: ≤ ± 25%
Certification	CE UK RoHS ENEC
Unit weight	≈ 72 g
Power supply	100 - 240 VAC~50 / 60 Hz, 24 - 240 VDC==
Permissible voltage range	90 to 110 % of rated voltage
Power consumption	AC: ≤ 3 VA, DC: ≤ 1.5 W
Insulation resistive	≥ 100 MΩ (500 VDC== megger)
Dielectric strength	Between the charging part and the case : 3,000 VAC~ at 50 / 60 Hz for 1 min
Noise immunity	± 2 kV square-wave noise by noise simulator (pulse width 1 μs)
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) In each X, Y, Z direction for 3 times
Relay life cycle	Mechanical: ≥ 10,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 3 A resistive load)
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)



View product detail

W 48 × H 48 mm

Analog Timers

ATN Series



Features

- Wide range of power supply:
100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC~
/ 24 VAC~ 50 / 60 Hz, 24 VDC~ / 12 VDC~
- Various output operation (6 operation modes)
- Multi time range (16 types of time range)
- Wide control time (0.05 sec to 100 hour)
- Easy setting of time, time range, output operation mode
- Easy to check output status by indicator

※ Sold Separately

- 8-pin controller socket: PG-08, PS-08(N)
- 11-pin controller socket: PG-11, PS-11(N)

Specifications

Model	AT8N-□	AT11DN-□	AT11EN-□
Function	Multi Function Timer		
Return time	≤ 100 ms		
Time operation	Power ON Start	Signal ON Start	
Input	-	INHIBIT, START, RESET	
Min. signal width	-	≈ 50 ms	
No-voltage input	-	Short-circuit impedance: ≤ 1 kΩ Short-circuit residual voltage: ≤ 0.5 VDC≡ Open-circuit impedance: ≥ 100 kΩ	
Control output	Relay		
Contact type	Time limit DPDT (2c), Time limit SPDT (1c) + Instantaneous SPDT (1c)	Time limit DPDT (2c)	Time limit SPDT (1c) + Instantaneous SPDT (1c)
Contact capacity	250 VAC~ 5 A, 30 VDC≡ 5 A resistive load	250 VAC~ 5 A, 24 VDC≡ 5 A resistive load	250 VAC~ 5 A, 30 VDC≡ 5 A resistive load
Error	Repeat: ≤ ± 0.2% ± 10 ms SET: ≤ ± 5% ± 50 ms Voltage: ≤ ± 0.5% Temp.: ≤ ± 2%		
Certification	CE ENEC ENEC ENEC		
Unit weight (packaging)	≈ 86.71 g (≈ 134.12 g)	≈ 85 g (≈ 132.2 g)	≈ 87.5 g (≈ 134.7 g)
Power supply	100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC≡	12 VDC≡	24 VAC~ 50 / 60 Hz, 24 VDC≡
Power consumption	It depends on the model.		
AT8N-□	AC: ≤ 4.3 VA DC: ≤ 2 W	DC: ≤ 1.5 W	AC: ≤ 4.5 VA DC: ≤ 2 W
AT11DN-□	AC: ≤ 3.5 VA DC: ≤ 1.5 W	DC: ≤ 1 W	AC: ≤ 4 VA DC: ≤ 1.5 W
AT11EN-□	AC: ≤ 4.3 VA DC: ≤ 2 W	DC: ≤ 1.5 W	AC: ≤ 4.5 VA DC: ≤ 2 W
Insulation resistive	≥ 100 MΩ (500 VDC≡ megger)		
Dielectric strength	Between the charging part and the case : 3,000 VAC~ at 50 / 60 Hz for 1 min		
Noise immunity	± 2 kV square-wave noise by noise simulator (pulse width 1 μs)	± 500 V square-wave noise by noise simulator (pulse width 1 μs)	
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 30 G) In each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical: ≥ 10,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 5 A resistive load)		
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)		



View product detail

W 48 × H 48 mm

Power OFF Delay

Analog Timers

AT8PSN / AT8PMN Series



Features

- Time setting range (AT8PSN: 0.05 to 10 sec, AT8PMN: 0.05 to 10 min)
- Simple time setup and direct read of time range
- Power supply:
100 - 120 VAC~ 50 / 60 Hz / 200 - 240 VAC~ 50 / 60 Hz / 100/110 VDC= / 24 VAC~ 50 / 60 Hz, 24 VDC=
- Application: Protect circuit when momentary power failure and start it again

- * Sold Separately
- 8-pin controller socket: PG-08, PS-08(N)

Specifications

Model	AT8P□	AT8P□-2	AT8P□-6	AT8P□-7
Function	Power OFF Delay			
Time operation	Power OFF Start			
Control output	Relay			
Contact type	Time limit DPDT (2c)			
Contact capacity	250 VAC~ 3 A, 30 VDC= 3 A resistive load			
Error	Repeat: ≤ ± 0.2% ± 10 ms SET: ≤ ± 5% ± 50 ms Voltage: ≤ ± 0.5% Temp.: ≤ ± 2%			
Certification	CE ENEC UL EAC			
Unit weight	≈ 100 g			
Power supply	200 - 240 VAC~ 50 / 60 Hz	24 VAC~50 / 60 Hz, 24 VDC=	100 - 120 VAC~ 50 / 60 Hz	100 / 110 VDC=
Permissible voltage range	90 to 110 % of rated voltage			
Power consumption	AC: ≤ 1.5 VA	AC: ≤ 0.2 VA DC: ≤ 0.2 W	AC: ≤ 1.5 VA	DC: ≤ 0.8 W
Insulation resistive	≥ 100 MΩ (500 VDC= megger)			
Dielectric strength	Between the charging part and the case: 3,000 VAC~ at 50 / 60 Hz for 1 min			
Noise immunity	± 2 kV square-wave noise by noise simulator (pulse width 1 μs)			
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour			
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min			
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times			
Shock (malfunction)	100 m/s ² (≈ 10 G) In each X, Y, Z direction for 3 times			
Relay life cycle	Mechanical: ≥ 10,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 3 A resistive load)			
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)			
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)			



View product detail

W 48 × H 48 mm

Power ON Delay

Analog Timers

ATE8 Series



Features

- DIN W 48 × H 48 mm
- Easy and simple time setting
- Cost-effective
- Easy time setting
- Wide range of time
- Power supply: 100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC=

* Sold Separately

- Bracket: BK-S
- 8-pin controller socket: PG-08, PS-08(N)

Specifications

Model	ATE8-4□	ATE8-4□D	ATE8-4□E
Function	Power ON Delay		
Return time	≤ 200 ms		
Time operation	Power ON Start		
Control output	Relay		
Contact type	Time limit SPDT (1c) + Instantaneous SPST (1a)	Time limit DPDT (2c)	Time limit SPDT (1c) + Instantaneous SPDT (1c)
Contact capacity	250 VAC~ 3A, 30 VDC= 3 A resistive load		
Error	Repeat: ≤ ± 0.3% ± 10 ms SET: ≤ ± 10% ± 50 ms Voltage: ≤ ± 0.5% ± 10 ms Temp.: ≤ ± 2% ± 10 ms		
Certification	CE, RoHS, REACH		
Unit weight (packaged)	≈ 75 g (≈ 122.2 g)		
Power supply	100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC=		
Permissible voltage range	90 to 110 % of rated voltage		
Power consumption	AC: ≤ 3.5 VA, DC: ≤ 2 W		
Insulation resistive	≥ 100 MΩ (500 VDC= megger)		
Dielectric strength	Between the charging part and the case : 3,000 VAC~ at 50 / 60 Hz for 1 min		
Noise immunity	± 2kV square-wave noise by noise simulator (pulse width 1 μs)		
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) In each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical: ≥ 5,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 3 A resistive load)		
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)		
Protection rating	IP40 (front part, IEC standard)		



View product detail

W 48 × H 48 mm

Star-Delta

Analog Timers

AT8SDN Series



Features

- Wide range of power supply:
100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC≡ universal
- Wide range of setting time and switching time
 - T1 (setting time): Selectable 0.5 to 100 sec
 - T2 (switching time): Selectable 0.05, 0.1, 0.2, 0.3, 0.4, 0.5 sec
- Simple setting time, switching time operation
- Easy to check output status by LED display
- Application: Starting large capacity motors

- * Sold Separately
- 8-pin controller socket: PG-08, PS-08(N)

Specifications

Model	AT8SDN
Function	Star-Delta Timer
Return time	≤ 100 ms
Time operation	Power ON Start
Control output	Relay
Contact type	Y Contact: Time limit SPST (1a), ΔContact: Time limit SPST (1a)
Contact capacity	250 VAC~ 5 A, 30 VDC≡ 5 A resistive load
Error	Repeat: ≤ ± 0.2% ± 10 ms Voltage: ≤ ± 0.5% Temp.: ≤ ± 2% Y setting time : ≤ ± 5% ± 50 ms Y - Δswitching time: ≤ ± 25%
Certification	CE UK RoHS REACH
Weight	≈ 90 g
Power supply	100 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC≡
Permissible voltage range	90 to 110 % of rated voltage
Power consumption	AC: ≤ 3.2 VA, DC: ≤ 1.5 W
Insulation resistive	≥ 100 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case : 3,000 VAC~ at 50 / 60 Hz for 1 min
Noise immunity	± 2 kV square-wave noise by noise simulator (pulse width 1 μs)
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) In each X, Y, Z direction for 3 times
Relay life cycle	Mechanical: ≥ 10,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 5 A resistive load)
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)



View product detail

LCD

Digital Timers

LE4S Series



Features

- Mounting space saving with compact design: downsized by approx. 22 % in depth compared to existing models (length of panel on the back side is 56 mm)
- Available to set each value and time range separately when choosing Flicker (FK, FK I) or ON-OFF Delay (ON OFF D, ON OFF D I) output mode
- Adds Flicker 1 mode (LE4SA)
- Settable One-shot output time (0.01 to 99.99 sec) (existing model: fixed 0.5 sec)
- Configurable time range (added 9.999 sec): settable by 0.001 sec unit
- Selectable min. input time: 1 ms or 20 ms (LE4S)
- Improved return time: 100 ms
- Backlight ON / OFF function
- Wide time range (0.01 sec to 9999 hour)
- Lock setting function for saving setting data
- Soft touch setting
- High visibility display with backlight

Specifications

Model		LE4S	LE4SA
Function		MULTI time, MULTI operation	
Display method		LCD (Backlight)	
Return time		≤ 100 ms	
Time operation		Signal ON Start	Power ON Start
Input signal		START, INHIBIT, RESET	
Min. signal width		≈ 1, 20 ms	-
No-voltage input		Short-circuit impedance: ≤ 1 kΩ Short-circuit residual voltage : ≤ 0.5 VDC≡ Open-circuit impedance: ≥ 100 kΩ	-
Control output		Relay	
Contact type		Time limit SPDT (1c)	Time limit DPDT (2c), Time limit SPDT (1c) + Instantaneous SPDT (1c) (depends on operation mode)
Contact capacity		250 VAC~ 5 A, 30 VDC≡ 5 A resistive load	250 VAC~ 3 A, 30 VDC≡ 3 A resistive load
Error	Repeat	Power ON Start	≤ ± 0.01% ± 0.05 sec
	SET	: ≤ ± 0.01% ± 0.05 sec	
	Voltage	Signal ON Start : ≤ ± 0.005% ± 0.03 sec	
	Temp.		
Certification		CE UK ENEC EAC	
Unit weight		≈ 98 g	

Model		LE4S	LE4SA
Power supply		24 - 240 VAC~ 50 / 60 Hz, 24 - 240 VDC≐	
Permissible voltage range		90 to 110 % of rated voltage	
Power consumption		AC: ≤ 4.5 VA, DC: ≤ 2 W	AC: ≤ 4 VA, DC: ≤ 1.6 W
Insulation resistive		100 MΩ (500 VDC≐ megger)	
Dielectric strength		Between the charging part and the case: 3000 VAC~ at 50 / 60 Hz for 1 min	
Noise immunity		± 2 kV square-wave noise by noise simulator (pulse width 1 μs)	
Vibration		0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)		0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock		300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)		100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Relay life cycle		Mechanical: ≥ 10,000,000 operations Electrical: ≥ 100,000 operations	
Ambient temperature		-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity		35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	



View product detail

W 72 × H 72 mm

LCD Week / Year

Digital Timers

LE7M-2 Series



Features

- Various external input functions
- Clear display with built-in backlight
- Easy to check and change the program setting
- Customizable weekly or yearly unit time setting and control by user
- Includes daylight saving time function
- Built-in 2 independent control output (relay)
- Flush mount or Surface / DIN rail mount available (depending on the model)

* Sold Separately

- Bracket (model name: 2BD00099AB)
- Base plate (model name: DRW180858AA)

Specifications

Model	LE7M-2B	LE7M-2D
Number of steps for the program	64 steps for weekly, 32 steps for yearly	
Operation mode	Weekly: ON/OFF, pulse, cycle operation Yearly: ON/OFF, pulse operation	
Temperature error	≤ (±0.01%±0.05 sec), at a ratio by the setting time	
Cyclic error	±15 sec/month (25 °C, ±4 sec/1 week)	
Memory retention	≥ 5 years (25 °C)	
External input	Open or short circuit by a contact device (switch or relay)	
Mounting type	Flush mount	Surface or DIN rail mount
Certification	CE ENEC UL ENEC ENEC	CE ENEC UL ENEC ENEC
Unit weight (packaged)	≈ 207 g (≈ 337 g)	≈ 208 g (≈ 361 g)
Power supply	100 - 240 VAC~50/60 Hz	
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	≤ 4.2 VA	
Control output	Relay	
Contact type	SPDT (1c)	
Contact capacity	Resistive load: 250 VAC~ 15 A	
Number of circuits	Independent 2 circuits (1c × 2)	
Mechanical life expectancy	≥ 10,000,000 operations (switching capacity: 30 times/min)	
Electrical life expectancy	≥ 50,000 operations (switching capacity: 20 times/min, resistive load: 250 VAC~ 15 A)	
Insulation resistive	≥ 100 MΩ (500 VDC= megger)	
Noise immunity	± 2 kV square-wave noise by noise simulator (pulse width 1 μs)	
Dielectric strength	Between the charging part and the case : 3,000 VAC~ at 50 / 60 Hz for 1 min	
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	



View product detail

LCD

Digital Timers

(Indicator)





LE8N Series



Features

- No additional power due to internal battery
- Signal input method: no-voltage input, voltage input, free voltage input
- Screw terminal type (attaching terminal cover)
- LCD display, backlight model
- Protection structure: IP66

Specifications

Model	LE8N-BN	LE8N-BN-L	LE8N-BV	LE8N-BV-L	LE8N-BF
Display digits	8-digit				
Display method	LCD Zero Blanking (character size: W 3.4 × H 8.7 mm)				
Operation method	Count up				
Time range	0 to 99999999				
Error	Time / Temp.: ± 0.01%				
Input method	No-voltage input		Voltage input		Free voltage input
Counting input (H)	Short Residual voltage: ≤ 0.5 VDC≡ Max. impedance: ≤ 10 kΩ		4.5 - 30 VDC≡		24 - 240 VAC~ / 6 - 240 VDC≡
Counting input (L)	Open Min. impedance: ≥ 750 kΩ		0 - 2 VDC≡		0 - 2 VAC~ / 0 - 2.4 VDC≡
RESET input	No-voltage input		Voltage input		No-voltage input
Min. signal width	SIGNAL INPUT, RESET: ≥ 20 ms				
Unit weight (packaged)	≈ 50 g (≈ 96 g)				
Certification	   				
Power supply	Built-in battery (CR2477)				
Battery life cycle	≥ 10 years (at ≈ 20 °C)				
Backlight power	24 VDC≡ ± 10%				
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)				
Dielectric strength	Between the charging part and the case: 2,000 VAC~ at 50 / 60 Hz for 1 min				
Vibration	0.75 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour				
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 min				
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times				
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times				
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)				
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)				
Protection rating	IP66 (front part, when using the rubber waterproof ring, IEC standard)				



View product detail

8-Pin Plug Digital Timers with Thumbwheel Switch

FSE Series



Features

- Wide range of the time selection
(0.01 sec to 9999.9 hour)
- Selectable voltage input (PNP) method or
no-voltage input (NPN) method
- Dot for Decimal Point / Hour. Min. Sec. by
RESET key
- Wide range of power supply:
100 - 240 VAC~ 50 / 60 Hz, 24 VAC~
50 / 60 Hz, 24 - 48 VDC= universal
- Memory protection for 10 years
(using non-volatile semiconductor)
- Built-in Microprocessor

* Sold Separately

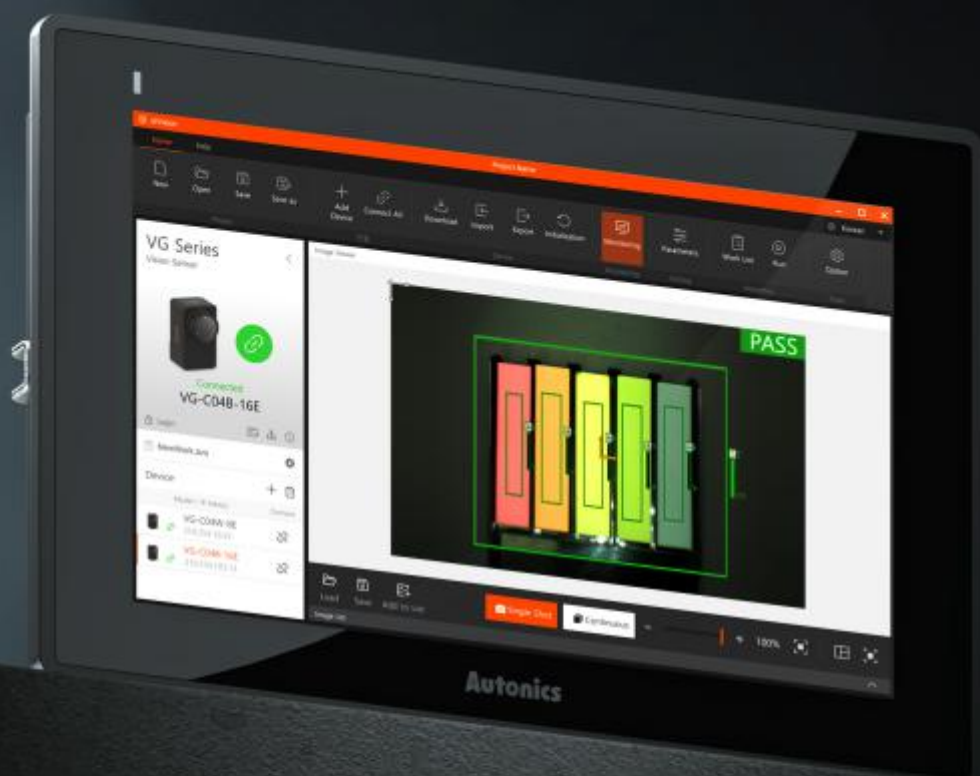
- 8-pin controller socket: PG-08, PS-08(N)

Specifications

Model	FS4E-1P2	FS4E-1P4	FS5E-I4
Display digits	4-digit		5-digit
Character size	W 3.8 × H 7.6 mm		W 4 × H 8 mm
Return time	≤ 500 ms		
Time operation	Power ON Start		
Min. signal width	RESET, INHIBIT: ≈ 20 ms		
Input logic	Voltage input (PNP) - input impedance: ≤ 10.8 kΩ, [H]: 5 - 30 VDC≡, [L]: 0 - 2 VDC≡ No-voltage input (NPN) - short-circuit impedance: ≤ 470 Ω, - short-circuit residual voltage: ≤ 1 VDC≡ - open-circuit impedance: ≥ 100 kΩ		
One-shot output time	0.05 to 5 sec		
Control output	Relay		-
Contact type	Time limit SPDT (1c)		-
Contact capacity	250 VAC~ 3 A, 30 VDC≡ 3 A resistive load		-
Error	Repeat / SET / Voltage / Temp.: ≤ ± 0.01% ± 0.05 sec		
Unit weight (packaged)	≈ 90 g (≈ 130 g)		≈ 80 g (≈ 120 g)
Certification			
Voltage type	AC voltage type		AC / DC voltage type
Power supply	100 - 240 VAC~50 / 60 Hz		24 VAC~50 / 60 Hz, 24 - 48 VDC≡
Permissible voltage range	90 to 110 % of rated voltage		
Power consumption	Varied by models		
FS4E-1P2	-	AC: ≤ 3.5 VA DC: ≤ 2.3 W	
FS4E-1P4	≤ 4.6 VA	-	
FS5E-I4	≤ 3.8 VA	-	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)		
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)		
Dielectric strength	Between the charging part and the case: 3,000 VAC~ at 50 / 60 Hz for 1 min		Between the charging part and the case: 2,000 VAC~ at 50 / 60 Hz for 1 min
Noise immunity	± 2 kV square-wave noise by noise simulator (pulse width 1 μs)		± 500 V square-wave noise by noise simulator (pulse width 1 μs)
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical: ≥ 5,000,000 operations Electrical: ≥ 100,000 operations (250 VAC~ 3 A resistive load)		
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)		
Protection rating	IP20 (front part, IEC standard)		



View product detail



E9. Industrial PC

Industrial PCs can increase production efficiency and optimize performance of equipment by offering control and management solutions in industrial environments.

Panel PC

APC Series



Features

- Integrated PC with display
- Microsoft Windows 10 included
- Quad-core processor
- 10.1 inch IPS TFT color LCD display
- Resistive touchscreen allows operation with gloved fingers, pens or stylus
- Supports various connection interfaces
: Ethernet, Serial (RS232C / RS485 / RS422), USB, VGA, HDMI, Audio
- Various installation methods: panel mount, bracket mount
- 1 port supports 3 communication types (RS232C / RS485 / RS422)

Specifications

Model	APC-1021
Screen size	10.1 inch
LCD type	IPS TFT Color LCD
Resolution	WXGA 1280 × 800 pixel
Contrast	16:10
Display area	216.96 × 135.6 mm
Display color	16,777,216 color
LCD view angle (top/bottom/left/right)	Within 85° of each
Backlight	White LED
Backlight MTBF	50,000 hrs (LED Backlighting)
Luminance	550 cd/m ²
Touch	Resistive type
CPU	Integrated Intel®J6412/2.0 GHz Quad core processor, TDP 10 W
Operating system	Windows 10 IoT Enterprise Entry (64 bit)
Hard disk	mSATA 64 GB SSD
System memory	DDR4 8 GB
Indicator	Power indicator (green)
Speaker	Stereo speaker 2 W + 2 W
Watch dog timer	Watch dog timer (1 to 255 seconds, software setting)
Battery life cycle	5 years at 25°C
Real-time controller	RTC embedded
Language	Korean, English
Approval	CE, FCC, RoHS
Unit weight (packaged)	≈ 1.6 kg (≈ 2 kg)
Serial interface	× 1 (RS232C / RS485 / RS422)
USB 3.0 port	× 2
USB 2.0 port	× 1
Ethernet port	× 2 (10 / 100 / 1000 Base-T)
HDMI port	× 1
VGA port	× 1
Audio port	× 1
Power supply	24 VDC=
Allowable voltage range	90 to 110 % of power supply
Power consumption	≤ 30 W
Insulation resistance	≥ 100 MΩ (500 VDC= megger)
Ground	3rd ground (≤ 100 Ω)
Noise immunity	±0.5 kV square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	Between the charging part and the case: 500 VAC~ 50/60 Hz for 1 minute
Vibration	0.75 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction
Ambient temperature	0 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection structure	IP65 (front panel, IEC standard)



View product detail

F. Power Electronics

Power electronics, including switching mode power supplies, solid state relays, and power controllers, help maintain stable and efficient power supply.

F1. SMPS

F2. Solid State Relays

F3. Power Controllers







F

F1. Switching Mode Power Supplies

Switching mode power supplies are electronic power supplies which convert electrical power efficiently using a switching regulator.

F1-1	DIN-Rail Mount	SPB-A Series	DIN Rail Switching Mode Power Supplies
F1-2	Panel Mount	SPA Series	Panel Mount Switching Mode Power Supplies
		SPA-400-24 Series	Panel Mount Switching Mode Power Supplies

DIN-Rail

Switching Mode Power Supplies



SPB-A Series



Features

- Various lineups for diverse applications (15 W ~ 480 W)
- Compact size for maximum space efficiency
- Improved power factor with PFC circuit
- Outstanding environmental resistance : overcurrent / overvoltage protection and overheating prevention, wide temperature range
- Low output voltage indicator (red LED), output indicator (green LED)
- Simple and easy installation

* Sold Separately

- Bracket: BK-SPB-F01 (SPB-A015 / 030 / 060-□)
- BK-SPB-F02 (SPB-A120 / 240 / 480-□)

Specifications

Indicator	Output indicator (green), output low voltage indicator (red)
Over-current protection	≥ 121 %
Over-voltage protection ⁰¹⁾	≈ 130 %
Output short-circuit protection	Built-in
Overheat protection	Built-in
Parallel operation ⁰²⁾	Available
Insulation resistance	Among all input terminals, all output terminals and PE : ≥ 100 MΩ (500 VDC≡ megger)
Dielectric strength	Among all input terminals and all output terminals: 3 kVAC~, Cutoff current = 20 mA Among all input terminals and PE: 2 kVAC~, Cutoff current = 20 mA Among all output terminals and PE: 1 kVAC~, Cutoff current = 20 mA
Vibration ⁰³⁾	10 to 55 Hz, 0.75 mm double amplitude, in each X, Y, Z direction for 2 hours
Shock	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times
EMS	Conforms to EN61000-6-2
EMI	Conforms to EN61000-6-4
Ambient temperature ⁰⁴⁾	-20 to 70 °C, storage: -25 to 80 °C (no freezing or condensation)
Ambient humidity	20 to 90 %RH, storage: 20 to 90 %RH (no freezing or condensation)
Life expectancy ⁰⁵⁾	10 years
Protection structure	IP20 (IEC standard)
Certification ⁰⁶⁾	CE UK RoHS REACH

01) To reset the overvoltage protection, shut off input power for at least 5 minutes and then restart.

02) For more information, refer the product manuals.

03) Applies when the device is installed vertically to the ground. For non-vertical installation, secure the product to withstand vibration and shock.

04) UL approved ambient temperature 40 °C, refer to the 'Derating Curve'.

05) If complying with the followings, the rated voltage input, ambient temperature ≤ 40 °C, average load factor ≤ 50 %, 'Mounting' and 'Cautions during Installation'.

06) It is for 100 - 240 VAC~ / VDC≡ power input only.

Model	SPB-A015-05	SPB-A015-12	SPB-A015-24	SPB-A030-05	SPB-A030-12	SPB-A030-24
Input						
Voltage ⁰¹⁾	100 - 240 VAC~ / 90 - 350 VDC≡ (allowable voltage: 85 - 264 VAC~)					
Current ⁰²⁾ (Typical)	115 VAC~	0.32 A	0.29 A	0.31 A	0.54 A	0.58 A
	230 VAC~	0.21 A	0.19 A	0.2 A	0.33 A	0.36 A
Frequency	50 / 60 Hz (allowable frequency: 47 - 63 Hz)					
Efficiency ⁰²⁾ (Typical)	115 VAC~	0.72	0.78	0.75	0.73	0.82
	230 VAC~	0.70	0.74	0.75	0.71	0.82
Power factor ⁰²⁾ (Typical)	115 VAC~	0.56	0.56	0.57	0.5	0.51
	230 VAC~	0.44	0.47	0.45	0.44	0.41
Power factor correction circuit (PFC)	Not available					
Inrush current ⁰³⁾ (Typical)	115 VAC~	16 A				
	230 VAC~	32 A				
Leakage current (Typical)	115 VAC~	0.21 mA			0.16 mA	
	230 VAC~	0.28 mA			0.25 mA	



View product detail

Output							
Voltage	5 VDC≡		12 VDC≡	24 VDC≡	5 VDC≡	12 VDC≡	24 VDC≡
Current	3 A		1.2 A	0.65 A	5 A	2.5 A	1.3 A
Power	15 W		14.4 W	15.6 W	25 W	30 W	31.2 W
Power boost ⁰⁴⁾	120 % of rated current						
Voltage adjustment range	-10 to 15 % (with V.Adjust)						
Ripple ^{02) 05)}	260 mV _{p-p}		150 mV _{p-p}	170 mV _{p-p}	120 mV _{p-p}	120 mV _{p-p}	150 mV _{p-p}
Input variation ⁰⁶⁾	≤ 0.5 %						
Load variation ⁰⁷⁾	≤ 3.0 %		≤ 2.0 %	≤ 1.5 %	≤ 3.0 %	≤ 2.0 %	≤ 1.5 %
Temperature variation	≤ 0.05 % / °C						
Start-up time ⁰²⁾ (Typical)	115 VAC~	720 ms	810 ms	820 ms	580 ms	650 ms	850 ms
	230 VAC~	330 ms	400 ms	650 ms	670 ms	510 ms	710 ms
Hold time ⁰²⁾ (Typical)	115 VAC~	32 ms	33 ms	43 ms	33 ms	29 ms	28 ms
	230 VAC~	136 ms	146 ms	140 ms	149 ms	131 ms	129 ms
Output low voltage indicate	4.2 V (± 10 %)		9.6 V (± 10 %)	20.0 V (± 10 %)	4.2 V (± 10 %)	9.6 V (± 10 %)	20.0 V (± 10 %)
Unit weight (Package)	≈ 135 g (≈ 230 g)			≈ 170 g (≈ 265 g)			
Model	SPB-A060-12		SPB-A060-24		SPB-A120-12		SPB-A120-24
Input							
Voltage ⁰¹⁾		100 - 240 VAC~ / 90 - 350 VDC≡ (allowable voltage: 85 - 264 VAC~)					
Current ⁰²⁾ (Typical)	115 VAC~	1.05 A		1.1 A		1.3 A	
	230 VAC~	0.6 A		0.7 A		0.7 A	
Frequency		50 / 60 Hz (allowable frequency: 47 - 63 Hz)					
Efficiency ⁰²⁾ (Typical)	115 VAC~	0.81		0.85		0.82	
	230 VAC~	0.82		0.87		0.84	
Power factor ⁰²⁾ (Typical)	115 VAC~	0.54		0.54		0.99	
	230 VAC~	0.46		0.46		0.92	
Power factor correction circuit (PFC)		Not available			Available		
Inrush current ⁰³⁾ (Typical)	115 VAC~	16 A					
	230 VAC~	32 A					
Leakage current (Typical)	115 VAC~	0.16 mA			0.3 mA		
	230 VAC~	0.3 mA			0.38 mA		
Output							
Voltage		12 VDC≡		24 VDC≡		12 VDC≡	
Current		4.5 A		2.5 A		10 A	
Power		54 W		60 W		120 W	
Power boost ⁰⁴⁾		120 % of rated current					
Voltage adjustment range		-10 to 15 % (with V.Adjust)					
Ripple ^{02) 05)}		460 mV _{p-p}		110 mV _{p-p}		470 mV _{p-p}	
Input variation ⁰⁶⁾		≤ 0.5 %					
Load variation ⁰⁷⁾		≤ 2.0 %		≤ 1.5 %		≤ 2.0 %	
Temperature variation		≤ 0.05 % / °C					
Start-up time ⁰²⁾ (Typical)	115 VAC~	635 ms		830 ms		740 ms	
	230 VAC~	655 ms		770 ms		710 ms	
Hold time ⁰²⁾ (Typical)	115 VAC~	23 ms		22 ms		32 ms	
	230 VAC~	106 ms		103 ms		31 ms	
Output low voltage indicate		9.6 V (± 10 %)		20.0 V (± 10 %)		9.6 V (± 10 %)	
Unit weight (Package)		≈ 230 g (≈ 325 g)			≈ 565 g (≈ 725 g)		

Model		SPB-A240-12	SPB-A240-24	SPB-A240-48	SPB-A480-24	SPB-A480-48
Input						
Voltage ⁰¹⁾		100 - 240 VAC~ / 90 - 350 VDC≡ (allowable voltage: 85 - 264 VAC~)				
Current ⁰²⁾ (Typical)	115 VAC~	2.5 A			4.8 A	
	230 VAC~	1.3 A			2.4 A	
Frequency		50 / 60 Hz (allowable frequency: 47 - 63 Hz)				
Efficiency ⁰²⁾ (Typical)	115 VAC~	0.86	0.89	0.90	0.88	0.89
	230 VAC~	0.89	0.92	0.93	0.91	0.92
Power factor ⁰²⁾ (Typical)	115 VAC~	0.99			0.99	
	230 VAC~	0.9			0.97	
Power factor correction circuit (PFC)		Available				
Inrush current ⁰³⁾ (Typical)	115 VAC~	16 A			40 A	
	230 VAC~	32 A			55 A	
Leakage current (Typical)	115 VAC~	0.14 mA			0.13 mA	
	230 VAC~	0.25 mA			0.24 mA	
Output						
Voltage		12 VDC≡	24 VDC≡	48 VDC≡	24 VDC≡	48 VDC≡
Current		20 A	10 A	5 A	20 A	10 A
Power		240 W			480 W	
Power boost ⁰⁴⁾		120 % of rated current				
Voltage adjustment range		-10 to 15 % (with V.Adjust)				
Ripple ^{02) 05)}		430 mV _{p-p}	300 mV _{p-p}	360 mV _{p-p}	270 mV _{p-p}	320 mV _{p-p}
Input variation ⁰⁶⁾		≤ 0.5 %				
Load variation ⁰⁷⁾		≤ 2.0 %	≤ 1.5 %		≤ 1.5 %	
Temperature variation		≤ 0.05 % / °C				
Start-up time ⁰²⁾ (Typical)	115 VAC~	290 ms	310 ms	390 ms	430 ms	290 ms
	230 VAC~	250 ms	250 ms	290 ms	300 ms	260 ms
Hold time ⁰²⁾ (Typical)	115 VAC~	36 ms	40 ms	36 ms	31 ms	22 ms
	230 VAC~	39 ms	38 ms	36 ms	30 ms	21 ms
Output low voltage indicate		9.6 V (± 10 %)	20.0 V (± 10 %)	43.0 V (± 10 %)	20.0 V (± 10 %)	43.0 V (± 10 %)
Unit weight (Package)		≈ 850 g (≈ 1,050 g)			≈ 1,350 g (≈ 1,570 g)	

01) For DC voltage input, install a external fuse to ensure safety.

Model	Fuse specification
SPB-A015 / 030-□	≥ 350 VDC≡, 4 A
SPB-A060 / 120-□	≥ 350 VDC≡, 6 A
SPB-A240 / 480-□	≥ 350 VDC≡, 12 A

02) Based on 100 % load

03) When cold start operation at 25 °C.

04) For more information, refer the product manuals.

05) Based on 20 MHz (Typ).

Data measured by connecting capacitors of 22 µF (Aluminum electrolytic capacitor) and 0.1 µF (Film capacitor) to 150 mm from the output terminal. Ripple specifications change when operating in Burst mode.

06) Based on 85 - 264 VAC~ input, 100 % load

07) Based on 0 to 100 % load

Panel Mount Switching Mode Power Supplies

SPA Series



Features

- Stable power supply with minimal noise and ripple
- Built-in overcurrent protection circuit, output short-circuit protection circuit, overheat protection circuit, and overvoltage protection circuits (overvoltage protection: SPA-075 / 100 only)
- EN 60950 (Safety of information technology equipment) compliant
- EN 50178 (Electronic equipment for use in power installations) compliant
- EN 61000-6-2 (EMC: immunity for industrial environments) compliant
- EN 61000-6-4 (EMC: emission standard for industrial environments) compliant
- Output voltage:
5 VDC \equiv , 12 VDC \equiv , 24 VDC \equiv
- Output power: 30 W, 50 W, 75 W, 100 W

Specifications

Output range		30 to 50 W					
Model		SPA-030-05	SPA-050-05	SPA-030-12	SPA-050-12	SPA-030-24	SPA-050-24
Output power		30 W	50 W	30 W	50 W	30 W	50 W
Input condition							
Voltage ⁰¹⁾		100 - 240 VAC~					
Permissible voltage range		85 - 264 VAC~					
Frequency		50 / 60 Hz					
Efficiency ⁰²⁾ (typical)		≥ 60%	≥ 67%	≥ 74%		≥ 80%	
Current consumption ⁰²⁾ (typical)		≤ 1.2 A	≤ 1.6 A	≤ 1.0 A	≤ 1.4 A	≤ 0.8 A	≤ 1.1 A
Inrush current protection (typical)	100 VAC~	≤ 30 A		≤ 20 A		≤ 20 A	
	240 VAC~	≤ 40 A		-		-	
Output characteristics							
Voltage		5 VDC≡		12 VDC≡		24 VDC≡	
Current		6 A	10 A	2.5 A	4.2 A	1.5 A	2.1 A
Voltage adjustment range ⁰³⁾		≤ ±5%		≤ ±5%		≤ ±5%	
Input variation ⁰⁴⁾		≤ ±0.5%		≤ ±0.5%		≤ ±0.5%	
Load variation ⁰²⁾		≤ ±2%		≤ ±1%		≤ ±1%	
Ripple noise ⁰²⁾		≤ ±1%		≤ ±1%		≤ ±1%	
Start-up time ⁰²⁾ (typical)		≤ 200 ms		≤ 150 ms		≤ 150 ms	
Hold time ⁰²⁾ (typical)		≥ 10 ms		≥ 10 ms		≥ 10 ms	
Protection							
Over-current protection ⁰⁵⁾		≥ 110%		≥ 110%		≥ 110%	
Over-voltage protection ⁰³⁾		-		-		-	
Output short-circuit protection		≤ 5 ms		≤ 5 ms		≤ 5 ms	
Approval		CE UKCA		CE UKCA		CE UKCA	
Unit weight		≈ 350 g		≈ 350 g		≈ 350 g	



View product detail

Next Page ►

Output range	75 to 100 W					
Model	SPA-075-05	SPA-100-05	SPA-075-12	SPA-100-12	SPA-075-24	SPA-100-24
Output power	75 W	100 W	75 W	100 W	75 W	100 W
Input condition						
Voltage ⁰¹⁾	100 - 120 / 200 - 240 VAC~ (permissible voltage: 85 - 264 VAC~) switching type					
Frequency	50 / 60 Hz					
Efficiency ⁰²⁾ (typical)	≥ 70%		≥ 78%	≥ 72%	≥ 78%	≥ 80%
Current consumption ⁰²⁾ (typical)	≤ 3.0 A		≤ 2.0 A	≤ 3.0 A	≤ 2.0 A	≤ 2.5 A
Inrush current protection (typical)	100 VAC~	≤ 45 A	≤ 35 A	≤ 45 A	≤ 35 A	
	240 VAC~	≤ 50 A	≤ 40 A	≤ 50 A	≤ 40 A	
Output characteristics						
Voltage	5 VDC≡		12 VDC≡		24 VDC≡	
Current	15 A	20 A	6.3 A	8.5 A	3.2 A	4.2 A
Voltage adjustment range ⁰³⁾	≤ ±5%		≤ ±5%		≤ ±5%	
Input variation ⁰⁴⁾	≤ ±0.5%		≤ ±0.5%		≤ ±0.5%	
Load variation ⁰²⁾	≤ ±2%		≤ ±1%		≤ ±1%	
Ripple noise ⁰²⁾	≤ ±1%		≤ ±1%		≤ ±1%	
Start-up time ⁰²⁾ (typical)	≤ 250 ms		≤ 250 ms		≤ 250 ms	
Hold time ⁰²⁾ (typical)	≥ 5 ms		≥ 10 ms	≥ 5 ms	≥ 10 ms	
Protection						
Over-current protection ⁰⁵⁾	≥ 110%	≥ 105%	≥ 110%		≥ 110%	
Over-voltage protection ⁰³⁾	6.5 V ±10%		16.0 V ±10%		30.0 V ±10%	
Output short-circuit protection	≤ 10 ms		≤ 5 ms	≤ 10 ms	≤ 5 ms	
Approval	CE UK		CE UK		CE UK	
Unit weight	≈ 400 g		≈ 400 g		≈ 400 g	
Indicator	Output indicator (green)					
Insulation resistance	Between all inputs and outputs: ≥ 100 MΩ (500 VDC≡ megger)					
Dielectric strength	Between all inputs and outputs: 3,000 VAC~ 50/60 Hz for 1 min Between the charging part and the F.G.: 1,500 VAC~ 50/60 Hz for 1 min					
Vibration	10 to 55 Hz amplitude at frequency 0.75 mm in each X, Y, Z direction for 2 hours					
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times					
EMS	EN61000-6-2 conformation					
EMI	EN61000-6-4 conformation					
Safety standards	EN60950, EN50178					
Ambient temperature	-10 to 50 °C (SPA-050-05, SPA-030-12, SPA-050-12: -10 to 40 °C), storage: -25 to 65 °C (no freezing or condensation)					
Ambient humidity	25 to 85%RH, storage: 25 to 90%RH (no freezing or condensation)					

01) Since there is no separate input over-voltage protection for the voltage over the rated input voltage range, Supplying over-voltage may result in product damage.

02) It is in the rated input voltage 100 VAC~ with 100% load.

03) Use the output voltage adjusting volume within the voltage variable range. If the voltage exceeds the output voltage range, overvoltage protection function is activated and the output is cut off.

04) Rate input voltage

SPA-030 / 050 series: 100 - 240 VAC~ (85 - 264 VACT) with 100% of load

SPA-075 / 100 series: 100 - 120 / 200 - 240 (85 - 132 / 170 - 264 VAC~) with 100% of load

SPA-100-05 model: 100 - 120 / 200 - 240 VAC~ (100 - 132 / 190 - 264 VAC~) with 100% of load

05) It is for rate input voltage 100 VAC~.

Panel Mount Switching Mode Power Supplies


SPA-400-24 Series



Features

- Built-in over-current protection circuit, output short-circuit protection circuit, and over-voltage protection circuit
- EN 60950 (Safety of information technology equipment) compliant
- EN 50178 (Electronic equipment for use in power installations) compliant
- EN 61000-6-2 (EMC: immunity for industrial environments) compliant
- EN 61000-6-4 (EMC: emission standard for industrial environments) compliant
- Output voltage: 24 VDC=
- Output power: 400 W

Specifications

Model	SPA-400-24
Output power	400.8 W
Voltage ⁰¹⁾	200 - 240 VAC~ (permissible voltage: 190 - 264 VAC~)
Frequency	50 / 60 Hz
Efficiency ⁰²⁾ (typical)	≥ 85% (10 min after power ON)
Current consumption ⁰²⁾ (typical)	≤ 4.6 A
Leakage current ⁰²⁾ (typical)	≤ 1 mA
Inrush current protection ⁰²⁾ (typical)	40 A
Voltage	24 VDC=
Current	16.7 A
Voltage adjustment range ⁰³⁾	± 5%
Input variation	± 0.5%
Load variation	± 1%
Temperature drift	360 mV
Ripple noise	≤ 290 mV
Start-up time ⁰²⁾ (typical)	1,800 to 2,300 ms
Hold time ⁰²⁾ (typical)	≥ 17 ms
Over-current protection	110 to 160% (recovers automatically after the cause for over current is removed)
Over-voltage protection ⁰³⁾	27 - 33 VDC=
Temperature rising limit	Yes
Remote control	Yes (output voltage ON for shorting, output voltage OFF for open)
Product Components	• Product • Instruction manual
Certification	CE 
Unit weight (package)	≈ 885 g (≈ 975 g)
Indicator	Output indicator (green)
Insulation resistance	Between all input terminals and F.G.: ≥ 100 MΩ (at 500VDC= megger)
Dielectric strength	Between all input and output terminals: 3,000 VAC~ 50/60 Hz for 1 min Between the charging part and the F.G.: 2,000 VAC~ 50/60 Hz for 1 min
Vibration	0.75 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
EMS	EN61000-6-2 compliant
EMI	EN61000-6-4 compliant
Safety standards	EN60950, EN50178
Ambient temperature	-10 to 50 °C, storage: -20 to 75 °C (no freezing or condensation)
Ambient humidity	20 to 90%RH, storage: 20 to 90%RH (no freezing or condensation)
Fan life cycle	70,000 hours (based on 40 °C of ambient temperature)

01) Since there is no separate input overvoltage protection for the voltage over the rated input voltage range, supplying overvoltage may result in product damage.

02) It is for 220 VAC~, 100% load.

03) Use the output voltage adjusting volume within the voltage variable range. If the voltage exceeds the output voltage range, overvoltage protection function is activated and the output is cut off.



View product detail



F2. SSR

Solid state relays (SSR) are highly durable and reliable electronics switching devices which are ideal alternatives for mechanical relays.

F2-1	Single-Phase / Integrated Heatsink	SRH1 Series	Single-Phase SSR with Integrated Heatsink (Current Input Type)
			Single-Phase SSR with Integrated Heatsink (Voltage Input Type)
F2-2	Single-Phase / Detachable Heatsink	SRHL1 Series	Single-Phase Alarm Output SSR with Integrated Heatsink
		SR1 Series	Single-Phase SSR with Detachable Heatsink
		SRC1 Series	Single-Phase Slim SSR with Detachable Heatsink
		SRS1 Series	Single-Phase Socket SSR with Detachable Heatsink
F2-3	Three-Phase Integrated / Detachable	SR3 / SRH3 Series	3-Phase SSR with Detachable / Integrated Heatsink

Single-Phase

SSR with Integrated

Heatsink

(Current Input Type)

SRH1 Series



Features

- High heat dissipation efficiency with ceramic PCB and integrated heatsink
- Input Indicator (green)
- DIN rail mount or panel mount installation
- Phase control (power equality division / phase equality division), cycle control (fixed cycle/variable cycle)
- Improved dielectric strength: 4,000 VAC~

Specifications

[Input]

Rated input current	4 - 20 mA
Allowable input voltage range	50 mA
Pick-up current	≥ 4.2 mA
Static off current	≤ 4.0 mA
Power factor	≥ 0.9 (difference between voltage phase and current phase: ≤ 25 °)
Start-up time	60 Hz: 200 ms / 50 Hz: 250 ms
Operating time	60 Hz: 16.6 ms / 50 Hz: 20 ms
Operating mode ⁰¹⁾	Phase control (power equality division type / phase equality division type) Cycle control(variable cycle / fixed cycle)

01) You can change operation mode by jumper pin. Default is Phase control (power equality division type).
For more information, see the 'Operation Mode.'

[Output]


Rated load voltage range		100 - 240 VACrms~ (50 / 60 Hz)			200 - 480 VACrms~ (50 / 60 Hz)		
Allowable load voltage range		90 - 264 VACrms~ (50 / 60 Hz)			200 - 528 VACrms~ (50 / 60 Hz)		
Rated load current	Resistive load (AC-51) ⁰¹⁾	20 Arms	30 Arms	60 Arms	20 Arms	30 Arms	60 Arms
Min. load current		0.5 Arms			0.5 Arms		
Max. 1 cycle surge current (60 Hz)		300 A	500 A	1000 A	300 A	500 A	1000 A
Max. non-repetitive surge current (I ² t, t = 8.3 ms)		350 A ² s	1000 A ² s	4000 A ² s	350 A ² s	1000 A ² s	4000 A ² s
Peak voltage (non-repetitive)		600 V			1000 V		
Leakage current (Ta = 25 °C)		≤ 10 mArms (240 VAC~/ 60 Hz)			≤ 10 mArms (480 VAC~/ 60 Hz)		
Output ON voltage drop [Vpk] (max. load current)		≤ 1.6 V					
Static off state dv/dt		500 V/μs					

01) AC-51 is utilization category at IEC60947-4-3.



View product detail

[General specifications]

Output range (phase control)	0 - 99 %
Frequency reading function	YES
Dielectric strength (Vrms)	Between the charging part and the case : 4000 VAC ~ 50 / 60 Hz for 1 min
Insulation resistance	≥ 100 MΩ (500 VDC ≡ megger)
Indicator	Input indicator (green)
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Ambient temperature ⁰¹⁾	-20 to 70 °C, storage: -20 to 100 °C (no freezing or condensation)
Ambient humidity	45 to 85 %RH, storage: 45 to 85 %RH (no freezing or condensation)
Input terminal connection	≥ 1×0.5 mm ² (1×AWG 20), ≤ 1×16 mm ² (1×AWG 6) or ≤ 2×1.5 mm ² (2×AWG 16)
Output terminal connection ⁰²⁾	≥ 1×1.5 mm ² (1×AWG 16), ≤ 1×16 mm ² (1×AWG 6) or ≤ 2×6 mm ² (2×AWG 10)
Input terminal fixed torque	0.75 to 0.95 N m
Output terminal fixed torque	1.6 to 2.2 N m
Approval	CE UK  ENEC
Weight	Rated load current 20 / 30 A: ≈ 410 g Rated load current 60 A: ≈ 680 g

01) See the 'SSR Derating Curve' in the product manual because the capacity of the rated load current is differ depending on the ambient temperature.

02) Connect the wire met the capacity of the load current to the output terminal.

Single-Phase

SSR with Integrated

Heatsink

(Voltage Input Type)

SRH1 Series



Features

- High heat dissipation efficiency with ceramic PCB and integrated heatsink
- Input Indicator (green)
- DIN rail mount or panel mount installation
- Zero cross turn-on / Random turn-on models available

Specifications

[Input]

Rated input voltage range		4 - 30 VDC≒	24 VACrms~ (50 / 60 Hz)	90 - 240 VACrms~ (50 / 60 Hz)
Allowable input voltage range		4 - 32 VDC≒	19 - 30 VACrms~ (50 / 60 Hz)	85 - 264 VACrms~ (50 / 60 Hz)
Max. input current		18 mA	15 mArms (24 VACrms~)	18 mArms (240 VACrms~)
Operating voltage		≥ 4 VDC≒	≥ 19 VACrms~	≥ 85 VACrms~
Releasing voltage		≤ 1 VDC≒	≤ 4 VACrms~	≤ 10 VACrms~
Operating time	Zero cross turn-on	≤ 0.5 cycle of load power + 1 ms	≤ 2 cycle of load power + 1 ms	≤ 2 cycle of load power + 1 ms
	Random turn-on	≤ 1 ms	-	-
Releasing time		≤ 0.5 cycle of load power + 1 ms	≤ 2 cycle of load power + 1 ms	≤ 2 cycle of load power + 1 ms

[Output]

Rated load voltage range		24 - 240 VACrms~(50 / 60 Hz)					
Allowable load voltage range		24 - 264 VACrms~(50 / 60 Hz)					
Rated load current	Resistive load (AC-51) ^{①)}	10 Arms	15 Arms	20 Arms	30 Arms	40 Arms	60 Arms
Min. load current		0.15 Arms	0.15 Arms	0.2 Arms	0.5 Arms	0.5 Arms	0.5 Arms
Max. 1 cycle surge current(60 Hz)		160 A	160 A	250 A	400 A	500 A	1000 A
Max. non-repetitive surge current (I ² t, t = 8.3 ms)		130 A ² s	130 A ² s	300 A ² s	910 A ² s	1000 A ² s	4000 A ² s
Peak voltage (non-repetitive)		600 V					
Leakage current (Ta = 25 °C)		≤ 10 mArms (240 VAC~/60 Hz)					
Output ON voltage drop [Vpk](max. load current)		≤ 1.6 V					
Static off state dv/dt		500 V/μs					







View product detail

Rated load voltage range		48 - 480 VACrms~(50 / 60 Hz)					
Allowable load voltage range		48 - 528 VACrms~ (50 / 60 Hz)					
Rated load current	Resistive load (AC-51) ⁰¹⁾	10 Arms	15 Arms	20 Arms	30 Arms	40 Arms	60 Arms
Min. load current		0.5 Arms	0.5 Arms	0.5 Arms	0.5 Arms	0.5 Arms	0.5 Arms
Max. 1 cycle surge current(60 Hz)		300 A	300 A	300 A	500 A	500 A	1000 A
Max. non-repetitive surge current (I ² t, t = 8.3 ms)		350 A ² s	350 A ² s	350 A ² s	1000 A ² s	1000 A ² s	4000 A ² s
Peak voltage (non-repetitive)		1200 V (Zero cross turn-on), 1000 V (Random turn-on)					
Leakage current (Ta = 25 °C)		≤ 10 mArms (480 VAC~/60 Hz)					
Output ON voltage drop [Vpk](max. load current)		≤ 1.6 V					
Static off state dv/dt		500 V/μs					

01) AC-51 is utilization category at IEC60947-4-3.

[General specifications]

Dielectric strength (Vrms)	Between the charging part and the case : 2500 VAC ~ 50 / 60 Hz for 1 min
Insulation resistance	Input-output, input/output-case : ≥ 100 MΩ (500 VDC≡ megger)
Indicator	Input indicator (green)
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature ⁰¹⁾	-30 to 80 °C (in case of the rated input voltage 90 - 240 VAC~: -20 to 70 °C), storage: -30 to 100 °C (no freezing or no condensation)
Ambient humidity	45 to 85 %RH, storage: 45 to 85 %RH (no freezing or no condensation)
Input terminal connection	≥ 1×0.5 mm ² (1×AWG 20), ≤ 1×1.5 mm ² (1×AWG 16) or ≤ 2×1.5 mm ² (2×AWG 16)
Output terminal connection ⁰²⁾	Rated load current 10 / 15 / 20 A : ≥ 1×0.75 mm ² (1×AWG 18), ≤ 1×4 mm ² (1×AWG 12) or ≤ 2×2.5 mm ² (2×AWG 14) Rated load current 30 / 40 / 60 A : ≥ 1×1.5 mm ² (1×AWG 16), ≤ 1×16 mm ² (1×AWG 6) or ≤ 2×6 mm ² (2×AWG 10)
Input terminal fixed torque	0.75 to 0.95 N m
Output terminal fixed torque	Rated load current 10 / 15 / 20 A: 1.0 to 1.35 N m Rated load current 30 / 40 / 60 A: 1.6 to 2.2 N m
Approval	   
Weight (packaged)	Rated load current 10 / 15 / 20 A: ≈ 225 g (≈ 298 g) Rated load current 30 / 40 A: ≈ 410 g (≈ 500 g) Rated load current 60 A: ≈ 680 g (≈ 770 g)

01) See the 'SSR Derating Curve' in the product manual because the capacity of the rated load current is differ depending on the ambient temperature.

02) Connect the wire met the capacity of the load current to the output terminal.

Single-Phase Alarm Output SSR with Integrated Heatsink

SRHL1 Series



Features

- Rated input voltage: 10 - 30 VDC \equiv , 90 - 240 VAC \sim
- Rated load voltage: 24 - 240 VAC \sim , 48 - 480 VAC \sim
- Rated load current: 10 A, 15 A, 20 A, 25 A, 40 A
- Zero cross turn-on / Random turn-on models available
- Input indicator (green)
- Overheat prevention function
 - Rated load current 10 / 15 / 20 / 25 A: alarm indicator (red)
 - Rated load current 40 A: alarm output indicator (red), alarm output
- DIN Rail or panel mount installation

Specifications

[Input]

Rated input voltage range		10 - 30 VDC \equiv	90 - 240 VACrms \sim (50 / 60 Hz)	
Allowable input voltage range		9 - 32 VDC \equiv	85 - 264 VACrms \sim (50 / 60 Hz)	
Max. input current		15 mA	22 mA	
Operating voltage		≥ 9 VDC \equiv	≥ 85 VACrms \sim	
Releasing voltage		≤ 1 VDC \equiv	≤ 10 VACrms \sim	
Operating time	Zero cross turn-on	≤ 0.5 cycle of load power + 1 ms	≤ 2 cycle of load power + 1 ms	
	Random turn-on	≤ 1 ms	-	
Releasing time		≤ 0.5 cycle of load power + 1 ms	≤ 2 cycle of load power + 1 ms	

[Output]

Rated load voltage range		24 - 240 VACrms \sim (50 / 60 Hz)				
Allowable load voltage range		24 - 264 VACrms \sim (50 / 60 Hz)				
Rated load current	Resistive load (AC-51) ⁰¹⁾	10 Arms	15 Arms	20 Arms	25 Arms	40 Arms
Min. load current		0.15 Arms	0.15 Arms	0.2 Arms	0.2 Arms	0.5 Arms
Max. 1 cycle surge current(60 Hz)		160 A	160 A	250 A	250 A	400 A
Max. non-repetitive surge current (I ² t, t = 8.3 ms)		130 A ² s	130 A ² s	300 A ² s	300 A ² s	910 A ² s
Peak voltage (non-repetitive)		600 V				
Leakage current (Ta = 25 °C)		≤ 10 mA Arms (240 VAC \sim /60 Hz)				
Output ON voltage drop [Vpk](max. load current)		≤ 1.6 V				
Static off state dv/dt		500 V/ μ s				



View product detail

Rated load voltage range		48 - 480 VACrms~ (50 / 60 Hz)				
Allowable load voltage range		48 - 528 VACrms~ (50 / 60 Hz)				
Rated load current	Resistive load (AC-51) ⁰¹⁾	10 Arms	15 Arms	20 Arms	25 Arms	40 Arms
Min. load current		0.5 Arms				
Max. 1 cycle surge current (60 Hz)		300 A	300 A	500 A	500 A	500 A
Max. non-repetitive surge current (I ² t, t = 8.3 ms)		350 A ² s	350 A ² s	1000 A ² s	1000 A ² s	1000 A ² s
Peak voltage (non-repetitive)		1200 V (zero cross turn-on), 1000 A (random turn-on)				
Leakage current (Ta = 25 °C)		≤ 10 mArms (480 VAC~/60 Hz)				
Output ON voltage drop [Vpk] (max. load current)		≤ 1.6 V				
Static off state dv/dt		500 V/μs				

01) AC-51 is utilization category at IEC60947-4-3.

[Overheat prevention function]

Overheat prevention function is when SSR internal temperature is overheated, the load output is cut off to prevent internal device damage and also the alarm indicator and alarm output turn ON. The operating temperature of the overheat prevention function may vary depending on the external environment, product configuration, and load current.

Rated input voltage range	10 - 30 VDC==	90 - 240 VACrms~ (50 / 60 Hz)
Load voltage	≤ 30 VDC==	≤ 30 VDC==
Load current	≤ 50 mA	≤ 50 mA
Turn-off time	≤ 50 ms	≤ 100 ms

• Alarm output is only for the rated load current 40 A model, in case of the rated load current 10 / 15 / 20 / 25 A model, the alarm indicator turns ON without the alarm output.

• To clear alarm, cut off the input signal during over the alarm output return time at the rated ambient temperature.

[General specifications]

Dielectric strength (Vrms)	Between the charging part and the case: 4,000 VAC~ 50 / 60 Hz for 1 min
Insulation resistance	Input-output, input/output-case: ≥ 100 MΩ (500 VDC== megger)
Indicator	Input indicator (green), alarm indicator (red)
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature ⁰¹⁾	-30 to 70 °C, storage: -30 to 100 °C (no freezing or condensation)
Ambient humidity	45 to 85 %RH, storage: 45 to 85 %RH (no freezing or condensation)
Input terminal connection	≥ 1×0.5 mm ² (1×AWG 20), ≤ 1×4 mm ² (1×AWG 12) or ≤ 2×1.5 mm ² (2×AWG 16)
Output terminal connection ⁰²⁾	Rated load current 10 / 15 / 20 / 25 A : ≥ 1×0.75 mm ² (1×AWG 18), ≤ 1×6 mm ² (1×AWG 10) or ≤ 2×2.5 mm ² (2×AWG 14) Rated load current 40 A : ≥ 1×1.5 mm ² (1×AWG 16), ≤ 1×16 mm ² (1×AWG 6) or ≤ 2×6 mm ² (2×AWG 10)
Input terminal fixed torque	0.75 to 0.95 N m
Output terminal fixed torque	Rated load current 10 / 15 / 20 / 25 A: 1.0 to 1.35 N m Rated load current 40 A: 1.6 to 2.2 N m
Approval	CE, RoHS, REACH
Weight (packaged)	Rated load current 10 / 15 / 20 / 25 A: ≈ 192 g (≈ 270 g) Rated load current 40 A: ≈ 372 g (≈ 468 g)

01) See the 'SSR Derating Curve' because the capacity of the rated load current is differ depending on the ambient temperature.

02) Connect the wire met the capacity of the load current to the output terminal.

Single-Phase

SSR with

Detachable

Heatsink

SR1 Series



Features

- Compact, universal design for flexible installation
- High heat dissipation efficiency with ceramic PCB
- Zero cross turn-on, random turn-on models available
- Input Indicator (green)

Specifications

[Input]

Rated input voltage range		4 - 30 VDC $\overline{=}$	90 - 240 VACrms \sim (50 / 60 Hz)
Allowable input voltage range		4 - 32 VDC $\overline{=}$	85 - 264 VACrms \sim (50 / 60 Hz)
Max. input current		18 mA	18 mArms (240 VACrms \sim)
Operating voltage		\geq 4 VDC $\overline{=}$	\geq 85 VACrms \sim
Releasing voltage		\leq 1 VDC $\overline{=}$	\leq 10 VACrms \sim
Operating time	Zero cross turn-on	\leq 0.5 cycle of load power + 1 ms	\leq 2 cycle of load power + 1 ms
	Random turn-on	\leq 1 ms	-
Releasing time		\leq 0.5 cycle of load power + 1 ms	\leq 2 cycle of load power + 1 ms

[Output]

Rated load voltage range		24 - 240 VACrms~ (50 / 60 Hz)							
Allowable load voltage range		24 - 264 VACrms~ (50 / 60 Hz)							
Rated load current	Resistive load (AC-51) ^{①)}	10 Arms	15 Arms	20 Arms	25 Arms	30 Arms	40 Arms	50 Arms	75 Arms
Min. load current		0.15 Arms		0.2 Arms		0.2 Arms		0.5 Arms	
Max. 1 cycle surge current(60 Hz)		160 A		250 A		400 A		1000 A	
Max. non-repetitive surge current (I ² t, t = 8.3 ms)		130 A ² s		300 A ² s		910 A ² s		4000 A ² s	
Peak voltage (non-repetitive)		600 V							
Leakage current (Ta = 25 °C)		≤ 10 mArms (240 VAC~/60 Hz)							
Output ON voltage drop [Vpk] (max. load current)		≤ 1.6 V							
Static off state dv/dt		500 V/μs							



View product detail

Rated load voltage range		48 - 480 VACrms~(50 / 60 Hz)							
Allowable load voltage range		48 - 528 VACrms~ (50 / 60 Hz)							
Rated load current	Resistive load (AC-51) ⁰¹⁾	10 Arms	15 Arms	20 Arms	25 Arms	30 Arms	40 Arms	50 Arms	75 Arms
Min. load current		0.5 Arms		0.5 Arms		0.5 Arms		0.5 Arms	
Max. 1 cycle surge current (60 Hz)		300 A		500 A		500 A		1000 A	
Max. non-repetitive surge current (I ² t, t = 8.3 ms)		350 A ² s		1000 A ² s		1000 A ² s		4000 A ² s	
Peak voltage (non-repetitive)		1200 V (zero cross turn-on), 1000 V (random turn-on)							
Leakage current (Ta = 25 °C)		≤ 10 mArms (480 VAC~/ 60 Hz)							
Output ON voltage drop[Vpk] (max. load current)		≤ 1.6 V							
Static off state dv / dt		500 V/μs							

01) AC-51 is utilization category at IEC60947-4-3.

[General specifications]

Dielectric strength (Vrms)	Between the charging part and the case : 2500 VAC~ 50 / 60 Hz for 1 min
Insulation resistance	Input-output, input / output-case : ≥ 100 MΩ (500 VDC== megger)
Indicator	Input indicator (green)
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature ⁰¹⁾	-30 to 80 °C (in case of the rated input voltage 90 - 240 VAC~: -20 to 70 °C), storage: -30 to 100 °C (no freezing or condensation)
Ambient humidity	45 to 85 %RH, storage: 45 to 85 %RH (no freezing or condensation)
Input terminal connection	≥ 1×0.5 mm ² (1×AWG 20), ≤ 1×1.5 mm ² (1×AWG 16) or ≤ 2×1.5 mm ² (2×AWG 16)
Output terminal connection ⁰²⁾	≥ 1×1.5 mm ² (1×AWG 16), ≤ 1×16 mm ² (1×AWG 6) or ≤ 2×6 mm ² (2×AWG 10)
Input terminal fixed torque	0.75 to 0.95 N m
Output terminal fixed torque	1.6 to 2.2 N m
Approval	CE UK RoHS ENEC
Weight (packaged)	≈ 73 g (≈ 111g)

01) Please refer to Autonics website.

02) Connect the wire met the capacity of the load current to the output terminal.

Single-Phase Slim

SSR with

Detachable

Heatsink

SRC1 Series



Features

- Slim, compact size (22.5 mm width)
- High heat dissipation efficiency with ceramic PCB
- Zero cross turn-on, random turn-on models available
- Input Indicator (green)

Specifications

[Input]

Rated input voltage range		4 - 30 VDC $\overline{=}$	90 - 240 VACrms \sim (50 / 60 Hz)
Allowable input voltage range		4 - 32 VDC $\overline{=}$	85 - 264 VACrms \sim (50 / 60 Hz)
Max. input current		18 mA	18 mArms (240 VACrms \sim)
Operating voltage		≥ 4 VDC $\overline{=}$	≥ 85 VACrms \sim
Releasing voltage		≤ 1 VDC $\overline{=}$	≤ 10 VACrms \sim
Operating time	Zero cross turn-on	≤ 0.5 cycle of load power + 1 ms	≤ 2 cycle of load power + 1 ms
	Random turn-on	≤ 1 ms	-
Releasing time		≤ 0.5 cycle of load power + 1 ms	≤ 2 cycle of load power + 1 ms

[Output]

Rated load voltage range		24 - 240 VACrms \sim (50 / 60 Hz)		
Allowable load voltage range		24 - 264 VACrms \sim (50 / 60 Hz)		
Rated load current	Resistive load (AC-51) ⁰¹⁾	15 Arms	20 Arms	30 Arms
	Min. load current	0.15 Arms	0.2 Arms	0.5 Arms
Max. 1 cycle surge current (60 Hz)		160 A	250 A	400 A
Max. non-repetitive surge current (I ² t, t = 8.3 ms)		130 A ² s	300 A ² s	910 A ² s
Peak voltage (non-repetitive)		600 V		
Leakage current (Ta = 25 °C)		≤ 10 mArms (240 VAC \sim /60 Hz)		
Output ON voltage drop [Vpk](Max. load current)		≤ 1.6 V		
Static off state dv / dt		500 V/ μ s		



View product detail

Rated load voltage range		48 - 480 VACrms~(50 / 60 Hz)
Allowable load voltage range		48 - 528 VACrms~ (50 / 60 Hz)
Rated load current	Resistive load (AC-51) ⁰¹⁾	20 Arms
Min. load current		0.5 Arms
Max. 1 cycle surge current (60 Hz)		300 A
Max. non-repetitive surge current (I^2t, $t = 8.3$ ms)		350 A ² s
Peak voltage (non-repetitive)		1200 V (zero cross turn-on), 1000 V (random turn-on)
Leakage current (Ta = 25 °C)		≤ 10 mArms (480 VAC~/60 Hz)
Output ON voltage drop [Vpk] (Max. load current)		≤ 1.6 V
Static off state dv/dt		500V/μs

01) AC-51 is utilization category at IEC60947-4-3.

[General specifications]

Dielectric strength (Vrms)	Between the charging part and the case : 2500 VAC~ 50 / 60 Hz for 1 min
Insulation resistance	Input-output, input / output-case : ≥ 100 MΩ (500 VDC≡ megger)
Indicator	Input indicator (green)
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature ⁰¹⁾	-30 to 80 °C (in case of the rated input voltage 90 - 240 VAC~: -20 to 70 °C), storage: -30 to 100 °C (no freezing or condensation)
Ambient humidity	45 to 85 %RH, storage: 45 to 85 %RH (no freezing or condensation)
Input terminal connection	≥ 1×0.5 mm ² (1×AWG 20), ≤ 1×1.5 mm ² (1×AWG 16) or ≤ 2×1.5 mm ² (2×AWG 16)
Output terminal connection ⁰²⁾	≥ 1×0.75 mm ² (1×AWG 16), ≤ 1×4 mm ² (1×AWG 12) or ≤ 2×2.5 mm ² (2×AWG 14)
Input terminal fixed torque	0.75 to 0.95 N m
Output terminal fixed torque	1.0 to 1.35 N m
Approval	CE UK ENEC
Weight (packaged)	≈ 85 g (≈ 119 g)

01) See the 'SSR Derating Curve' because the capacity of the rated load current is differ depending on the ambient temperature.

02) Connect the wire met the capacity of the load current to the output terminal.

Single-Phase Socket

SSR with
Detachable
Heatsink

SRS1 Series





Features

- Dielectric strength : 2,500 VAC~
- Rated input voltage
 - SRS1-A: AC, DC, AC / DC
 - SRS1-B: AC
 - SRS1-C: AC, DC, AC / DC
- Socket type for easier installation and maintenance
 - SRS1-A: Autonics SK-G05 sockets
 - SRS1-B: General LY2 sockets
 - SRS1-C: General MY4 sockets
- Zero cross turn-on, random turn-on models available
- Input indicator (red)

Specifications

[Input]

Model	SRS1-A	SRS1-B	SRS1-C120 	SRS1-C1 
Rated input voltage range	4 - 24 VDC \equiv	4 - 30 VDC \equiv	4 - 30 VDC \equiv	4 - 24 VDC \equiv
Allowable input voltage range	4 - 26.4 VDC \equiv	4 - 32 VDC \equiv	4 - 32 VDC \equiv	4 - 26.4 VDC \equiv
Max. input current	15 mA (Random turn-on)	13 mA (Random turn-on)	13 mA (Random turn-on)	15 mA
Operating voltage	\geq 4 VDC \equiv			
Releasing voltage	\leq 1 VDC \equiv			

[Output (AC load)]

Model	SRS1-A			SRS1-B / SRS1-C		
	1202(R)	1203(R)	1205(R)	1202(R)-2	1203(R)-1	1205(R)-1
Rated input load range	24 - 240 VACrms~ (50 / 60 Hz)			90 - 240 VACrms~ (50 / 60 Hz)		
Allowable input load range	24 - 264 VACrms~ (50 / 60 Hz)			90 - 264 VACrms~ (50 / 60 Hz)		
Rated load current Resistive load (AC-51 ⁰¹⁾)	2 Arms	3 Arms	5 Arms	2 Arms	3 Arms	5 Arms
Min. load current	0.15 Arms	0.2 Arms		0.15 Arms		
Max. 1 cycle surge current (60 Hz)	126 A	250 A		126 A		250 A
Max. non-repetitive surge current (I ² t, t = 8.3 ms)	65 A ² s	400 A ² s		65 A ² s		220 A ² s
Peak voltage (non-repetitive)	600 V					
Leakage current (Ta = 25 °C)	≤ 2 mArms (240 VAC~ 50/60 Hz)					
Output ON voltage drop [Vpk] (Max. load current)	≤ 1.6 V					
Static off state dv/dt	500 V/μs					
Operating time	Zero cross turn-on: ≤ 0.5 cycle of load power + 1 ms Random turn-on: ≤ 1 ms					
Releasing time	≤ 0.5 cycle of load power + 1 ms					

01) AC-51 is utilization category at IEC60947-4-3.



View product detail

[Output (DC load)]

Model	SRS1-A1D101	SRS1-A1D102	SRS1-A1D201	SRS1-C1D102-1
Rated input load range	5 - 100 VDC≡		5 - 200 VDC≡	5 - 100 VDC≡
Allowable input load range	3 - 120 VDC≡		3 - 220 VDC≡	3 - 120 VDC≡
Rated load current Resistive load (AC-51 ⁰¹⁾)	1 Adc	2 Adc	1 Adc	2 Adc
Min. load current	10 mA			
Max. surge current (t=10 ms)	5 A	10 A	4 A	10 A
Leakage current (Ta = 25 °C)	≤ 100 µA			
Output ON voltage drop [Vpk] (Max. load current)	≤ 1.1 V			
Static off state dv/dt	500 V/µs			-
Operating time	≤ 1 ms	≤ 2 ms	≤ 1 ms	≤ 1 ms
Releasing time	≤ 1 ms			

01) AC-51 is utilization category at IEC60947-4-3.

[Output (AC / DC load)]

Model	SRS1-A1X201	SRS1-C1X201-1
Rated input load range	5 - 240 VACrms~ (50 / 60 Hz) / 5 - 200 VDC≡	
Allowable input load range	3 - 264 VACrms~ (50 / 60 Hz) / 3 - 220 VDC≡	
Rated load current Resistive load (AC-51 ⁰¹⁾)	1 Arms / 1 Adc	
Min. load current	10 mA	
Max. surge current (t=10 ms)	4 A	
Leakage current (Ta = 25 °C)	≤ 2 mArms	≤ 2 mArms (240 VAC~ 50 / 60 Hz)
Output ON voltage drop [Vpk] (Max. load current)	≤ 2.2 V	
Static off state dv/dt	500 V/µs	-
Operating time	≤ 2 ms	
Releasing time	≤ 1 ms	

01) AC-51 is utilization category at IEC60947-4-3.

[General specifications]

Dielectric strength (Vrms)	Between the charging part and the case: 2500 VAC~ 50/60 Hz for 1 min
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)
Indicator	Input indicator (red)
Ambient temperature ⁰¹⁾	-20 ~ 80 °C (SRS1-A: -20 ~ 70 °C), storage: -30 ~ 100 °C (no freezing or no condensation)
Ambient humidity	45 ~ 85 %RH, storage: 45 ~ 85 %RH (no freezing or condensation)
Protection	According to protection of the using socket
Approval	CE UK ENEC TUV

01) Refer to the 'SSR Derating Curve' because the capacity of the rated load current is differ depending on the ambient temperature.

Model	SRS1-A	SRS1-B	SRS1-C
Weight (packaged) ⁰¹⁾	≤ 3 A: ≈ 17 g (≈ 270 g), 5 A: ≈ 28 g (≈ 380 g)	≈ 30 g (≈ 400 g)	≈ 30 g (≈ 400 g)

01) The weight is per 10 units with packing and the weight of parenthesis is per 1

3-Phase

SSR with Integrated / Detachable Heatsink

SR3 / SRH3 Series



Features

- Two mounting hole types and sizes
- Alarm function (overheat prevention):
alarm indicator (red), disconnect output, alarm output
- Improved dielectric strength: 4,000 VAC~
(some are 2,500 VAC~ model)
- Rated input voltage: 4 - 30 VDC~, 24 VAC~, 90 - 240 VAC~
- Rated load voltage:
24 - 240 VAC~, 48 - 480 VAC~
- Rated load current:
15 A, 30 A, 40 A, 50 A, 75 A
- High heat dissipation efficiency with ceramic PCB and integrated heatsink
- Zero cross turn-on /
Random turn-on models available
- Input indicator (green)

Specifications

[Input]

Rated input voltage range		4 - 30 VDC~	240 VACrms~ (50/60 Hz)	90 - 240 VACrms~ (50/60 Hz)
Allowable input voltage range		4 - 32 VDC~	19 - 26.4 VACrms~ (50/60 Hz)	85 - 264 VACrms~ (50/60 Hz)
Max. input current		25 mA	15 mA	25 mA
Operating voltage		≥ 4 VDC~	≥ 19 VACrms~	≥ 85 VACrms~
Releasing voltage		≤ 1 VDC~	≤ 4 VACrms~	≤ 10 VACrms~
Operating time	Zero cross turn-on	≤ 0.5 cycle of load power + 1 ms	≤ 1.5 cycle of load power + 1 ms	≤ 1.5 cycle of load power + 1 ms
	Random turn-on	≤ 1 ms	-	-
Releasing time		≤ 0.5 cycle of load power + 1 ms	≤ 1.5 cycle of load power + 1 ms	≤ 1.5 cycle of load power + 1 ms

[Output]

Rated load voltage range		24 - 240 VACrms~ (50/60 Hz)			
Allowable load voltage range		24 - 264 VACrms~ (50/60 Hz)			
Rated load current	Resistive load (AC-51) ⁰¹⁾	15 Arms	30 Arms	50 Arms	75 Arms
	Min. load current	0.15 Arms	0.2 Arms	0.5 Arms	0.5 Arms
Max. 1 cycle surge current (60 Hz)		250 A	400 A	1000 A	1000 A
Max. non-repetitive surge current (I ² t, t = 8.3 ms)		340 A ² s	1000 A ² s	4000 A ² s	4000 A ² s
Peak voltage (non-repetitive)		600 V			
Leakage current (Ta = 25 °C)		≤ 10 mA Arms (240 VAC~/60 Hz)			
Output ON voltage drop [Vpk] (max. load current)		≤ 1.6 V			
Static off state dv/dt		500 V/μs			

[View product detail](#)



Detachable
heatsink type



Integrated
heatsink type

Rated load voltage range		48 - 480 VACrms~ (50/60 Hz)				
Allowable load voltage range		48 - 528 VACrms~ (50/60 Hz)				
Rated load current	Resistive load (AC-51) ⁰¹⁾	15 Arms	30 Arms	40 Arms	50 Arms	75 Arms
Min. load current		0.5 Arms				
Max. 1 cycle surge current (60 Hz)		300 A	500 A	500 A	1000 A	1000 A
Max. non-repetitive surge current (I ² t, t = 8.3 ms)		350 A ² s	1000 A ² s	1000 A ² s	4000 A ² s	4000 A ² s
Peak voltage (non-repetitive)		1200 V (zero cross turn-on), 1000 A (random turn-on)				
Leakage current (Ta = 25 °C)		≤ 10 mA _{Arms} (480 VAC~/60 Hz)				
Output ON voltage drop [V _{pk}] (max. load current)		≤ 1.6 V				
Static off state dv/dt		500 V/μs				

01) AC-51 is utilization category at IEC609s47-4-3.

[Alarm output (overheat prevention function)]

Rated input voltage range	4 - 30 VDC≡	24 VACrms~ (50/60 Hz)	90 - 240 VACrms~ (50/60 Hz)
Load voltage	≤ 30 VDC≡	≤ 30 VDC≡	≤ 30 VDC≡
Load current	≤ 100 mA	≤ 50 mA	≤ 50 mA
Turn-off time	≤ 20 ms	≤ 40 ms	≤ 40 ms

• Overheat prevention function is when SSR internal temperature is overheated, the load output is cut off to prevent internal device damage and also the alarm indicator and alarm output turn ON.

[General specifications]

Dielectric strength (Vrms) : 24-240 VAC~	Rated load current 15 / 30 A - Between the charging part and the case : 2500 VAC~ 50/60 Hz for 1 min Rated load current 50 / 75 A - Between the charging part and the case : 4000 VAC~ 50/60 Hz for 1 min
Dielectric strength (Vrms) : 48-480 VAC~	Between the charging part and the case : 4000 VAC~ 50/60 Hz for 1 min
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger) (input-output, input/output-case)
Indicator	Input indicator (green), alarm indicator (red)
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature ⁰¹⁾	-30 to 80 °C (in case of the rated input voltage 90 - 240 VAC~: -30 to 70 °C), storage: -30 to 100 °C (no freezing or condensation)
Ambient humidity	45 to 85%RH, storage: 45 to 85%RH (no freezing or condensation)
Input terminal connection / alarm output terminal connection	≥ 1×0.5 mm ² (1×AWG 20), ≥ 1×1.5 mm ² (1×AWG 16) or ≤ 2×1.5 mm ² (2×AWG 16)
Output terminal connection ⁰²⁾	≥ 1×1.5 mm ² (1×AWG 16), ≥ 1×16 mm ² (1×AWG 6) or ≤ 2×6 mm ² (2×AWG 10)
Input terminal fixed torque	0.75 to 0.95 N m
Output terminal fixed torque	1.6 to 2.2 N m
Approval	CE UK RoHS ENEC

01) Refer to the 'SSR Derating Curve' in the product manual because the capacity of the rated load current is differ depending on the ambient temperature.

02) Connect the wire met the capacity of the load current to the output terminal.

		Weight (packaged)
Detachable heatsink type		≈ 275 g (≈ 365 g)
Integrated heatsink type	15 / 30 / 40 A	≈ 686 g (≈ 896 g)
	50 A	≈ 1268 g (≈ 1508 g)
	75 A	≈ 2064 g (≈ 2354 g)



F

F3. Power Controllers

Power controllers are used to control the amount of electric currents in devices such as heaters, furnaces, thermostats, or motors.

F3-1	Multi-Channel	SPRM Series	Multi-Channel Power Controllers
F3-2	Single-Phase	SPR Series	Single-Phase / 3-Phase Slim Power Controllers
		DPU Series	Single-Phase / 3-Phase Digital Power Controllers
		SPC Series	Single-Phase Power Controllers

Multi-Channel Power Controllers



PINUP
2020

SPRM Series



Features

- Single-phase control / three-phase control
- Supports a wide range of rated voltages from 220 to 440 VAC~
- Various rated current models of 25 / 40 / 55 / 70 / 90 / 110 / 160 A
- Improved visibility with 4-line LCD display
- Monitoring load current / voltage / output / resistance / heatsink temperature / power
- Detachable display module can be installed on a separate panel
- Supports various alarms, heater brake, partial heater brake, fuse break, heatsink over heat, overcurrent, FAN error, etc. and saving alarm history
- Improved fuse replacement convenience with open / close structure
- Supports RS485, EtherCAT communication

Specifications

Model	SPRM3-F□R	SPRM3-F□EC
Control phases	Single phase 3 Ch or 3-phase	
Rated load voltage	Free voltage 220 - 440 VAC~ 50 / 60 Hz	
Rated load current ⁰¹⁾	25 / 40 / 55 / 70 / 90 / 110 / 160 A	
Display method	5 digit 11 segment LCD (white) × 4, Output BAR	
Auto control input	Current ⁰²⁾ : DC 4 ~ 20 mA × 3 Ch, voltage: 0 - 5 / 1 - 5 / 0 - 10 VDC~, External adjuster (10 kΩ), communication: RS485, EtherCAT	
Manual control input	Parameter setting	
Digital input (DI)	RUN / STOP selectable, AUTO / MANU selectable, RESET	
Alarm output	250 VAC~ 2 A, 30 VDC~ 2 A, 1c resistance load	
Comm. output	RS485	RS485, EtherCAT
Cooling method	Rated load current 25 / 40 / 55 A: natural cooling Rated load current 70 / 90 / 110 / 160 A: forced air cooling (with cooling fan)	
Unit weight (packaged)	Rated load current 25 / 40 / 55 A: ≈ 4.75 kg (≈ 5.75 kg) Rated load current 70 A: ≈ 4.8 kg (≈ 5.8 kg) Rated load current 90 / 110 / 160 A: ≈ 9.42 kg (≈ 10.55 kg)	
Certification	CE, UKCA, UL, IEC, RoHS	
SCCR Rating	100 kA (UL certification)	

01) It is the rated load current of each channel in single-phase operation.

02) Input impedance = 100 Ω

Control method	Phase control	Cycle control
Control mode	Normal / Constant current feedback / Constant voltage feedback / Constant power feedback	Fixed cycle / Variable cycle
Applied load	Resistance load, inductive load	Resistance load
Output range	Resistance load: 0 to 98 % Inductive load: 5 to 98 %	0 to 100 %
Output accuracy	Varies by control mode	
Normal	Within ± 10 % F.S. of rated load voltage	-
Constant current / voltage / power feedback	Within ± 3 % F.S. of rated load current / voltage / power	-
Power supply	24 VDC ± 10 %	
Permissible voltage range	90 to 110 % of rated voltage	
Min. load current	1 A	
Power consumption	≤ 15 W	
Insulation resistance	≥ 200 MΩ (500 VDC ~ megger)	
Dielectric strength	Between the charging part and the case: 3,000 VAC ~ 50 / 60 Hz for 1 min	
Output leakage current	≤ 10 mA _{rms}	
Noise immunity	± 500 V square wave noise (pulse width: 1 μs) by the noise simulator	
Memory retention	≈ 10 years (when using non-volatile semiconductor memory type)	
Vibration	0.5 mm double amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	0.5 mm double amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 10 min	
Ambient temperature	-10 to 40 °C, storage: -20 to 80 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Comm. protocol	Modbus RTU (16 bit CRC), Modbus ASCII, EtherCAT	



View product detail

Single-Phase / 3-Phase Slim Power Controllers

SPR Series



Features

- Slim and elegant design
- LED display allows real-time monitoring of control input, load voltage, load current, load power, load resistance, and heat-sink temperature
- Stable control with feedback control (constant current, constant voltage, constant power)
- Communication output models available: RS485 (Modbus RTU)
- Parameter configuration via PCs (RS485): Free device management software (DAQMaster)
- Various alarm functions (alarm output): over current, over voltage, heater disconnection, fuse break, heat-sink over heat, diode (SCR) error
- Easy installation with mounting brackets
- Easy fuse replacement and maintenance
- High performance SCR (IXYS) diode

Specifications

[Single-Phase]

Model	SPR1-1	SPR1-2	SPR1-	SPR1-4
Control phase	Single-phase			
Rated load voltage	110 VAC~ 50 / 60 Hz 220 VAC~ 50 / 60 Hz 380 VAC~ 50 / 60 Hz 440 VAC~ 50 / 60 Hz			
Rated load current	25 / 35 / 50 / 70 / 100 /150 A			
Display method	3-digit 7segment LED			
Indicators	Operation / manual control indicator (green) Alarm / output / unit (V, A) indicator (red)			
Auto control input	Current: DC 4 - 20 mA, voltage: 1 - 5 VDC=, contact (non-voltage): ON / OFF, contact (voltage): 5 - 12 VDC=, communication: RS485			
Manual control input	External adjuster (10 kΩ), output control adjuster (OUT ADJ)			
Digital input (DI)	RUN / STOP selectable, AUTO / MAN selectable, RESET			
Alarm output	250 VAC~ 3 A, 30 VDC= 3 A, 1c resistance load			
RS485 comm. output	Modbus RTU method			
Cooling method	Rated load current 25 / 35 / 50 A: natural cooling Rated load current 70 / 100 / 150 A: forced air cooling (with cooling fan)			
Unit weight (packaged)	Rated load current 25 / 35 / 50 A: ≈ 1.3 kg (≈ 1.6 kg) Rated load current 70 A: ≈ 1.35 kg (≈ 1.65 kg) Rated load current 100 / 150 A: ≈ 2.8 kg (≈ 3.2 kg)			
Approval	CE UK			
Control method	Phase control	Cycle control	ON/OFF control	
Control mode	Normal, constant current feedback/ constant voltage feedback/ constant power feedback	Fixed cycle / variable cycle	-	
Applied load	Resistance load, inductive load	Resistance load	Resistance load, inductive load	
Output range	0 to 98 %	0 to 100 %	0 / 100 %	
Output accuracy	Varies by control mode			
Normal	Within ± 10 % F.S. of rated load voltage	-	-	
Constant current / voltage / power feedback	Within ± 3 % F.S. of rated load current / voltage / power	-	-	

View product detail



Single-Phase








3-Phase

Next Page ►

Power supply	100 - 240 VAC ~ ± 10 % 50 / 60Hz
Permissible voltage range	90 to 110 % of rated voltage
Min. load current	1 A
Power consumption	Rated load current 25 / 35 / 50 A: ≤ 7 VA Rated load current 70 / 100 / 150 A: ≤ 12 VA
Insulation resistance	≥ 200 MΩ (500 VDC ≡ megger)
Dielectric strength	Between the charging part and the case: 2,000 VAC ~ 50 / 60 Hz for 1 min
Output leakage currents	≤ 10 mArms
Noise immunity	±2 kV square wave noise (pulse width: 1 μs) by the noise simulator
Memory retention	≈ 10 years (when using non-volatile semiconductor memory type)
Vibration	0.75 mm double amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.5 mm double amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 10 min
Ambient temp.	-10 to 55 °C, storage: -20 to 80 °C (no freezing or condensation)
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Comm. protocol	Modbus RTU

[3-Phase]

Model	SPR3-1 	SPR3-2 	SPR3-3 	SPR3-4 
Control phase	3-Phase			
Rated load voltage	110 VAC ~ 50 / 60 Hz	220 VAC ~ 50 / 60 Hz	380 VAC ~ 50 / 60 Hz	440 VAC ~ 50 / 60 Hz
Rated load current	25 / 35 / 50 / 70 / 100 / 150 A			
Display method	3-digit 7segment LED			
Indicators	Operation / manual control indicator (green) Alarm / output / unit (V, A) indicator (red)			
Auto control input	Current: DC 4 - 20 mA, voltage: 1 - 5 VDC=, contact (non-voltage): ON / OFF, contact (voltage): 5 - 12 VDC=, communication: RS485			
Manual control input	External adjuster (10 kΩ), output control adjuster (OUT ADJ)			
Digital input (DI)	RUN / STOP selectable, AUTO / MAN selectable, RESET			
Alarm output	250 VAC ~ 3 A, 30 VDC= 3 A, 1c resistance load			
RS485 comm. output	Modbus RTU method			
Cooling method	Rated load current 25 / 35 / 50 A: natural cooling Rated load current 70 / 100 / 150 A: forced air cooling (with cooling fan)			
Unit weight (packaged)	Rated load current 25 / 35 / 50 A: ≈ 4.1 kg (≈ 4.9 kg) Rated load current 70 A: ≈ 4.2 kg (≈ 5 kg) Rated load current 100 / 150 A: ≈ 8.7 kg (≈ 9.7 kg)			
Approval	CE 			
Control method	Phase control	Cycle control	ON/OFF control	
Control mode	Normal / constant current feedback / constant voltage feedback / constant power feedback	Fixed cycle	-	
Applied load	Resistance load, inductive load	Resistance load	Resistance load, inductive load	
Output range	0 to 98 %	0 to 100 %	0 / 100 %	
Phase control output accuracy	• Normal control: within ± 10 % F.S. of rated load voltage • Constant current feedback control: within ± 3 % F.S. of rated load current • Constant voltage feedback control: within ± 3 % F.S. of rated load voltage • Constant power feedback control: within ± 3 % F.S. of rated load power			
Power supply	100 - 240 VAC ~ ± 10 % 50 / 60 Hz			
Permissible voltage range	90 to 110 % of rated voltage			
Min. load current	1 A			
Power consumption	Rated load current 25 / 35 / 50 A: ≤ 14 VA Rated load current 70 A: ≤ 22 VA Rated load current 100 / 150 A: ≤ 32 VA			
Insulation resistance	≥ 200 MΩ (500 VDC= megger)			
Dielectric strength	Between the charging part and the case: 2,000 VAC ~ 50 / 60 Hz for 1 min			
Output leakage currents	≤ 10 mArms			
Noise immunity	±2 kV square wave noise (pulse width: 1 μs) by the noise simulator			
Memory retention	≈ 10 years (when using non-volatile semiconductor memory type)			
Vibration	0.75 mm double amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours			
Vibration (malfunction)	0.5 mm double amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 10 min			
Ambient temp.	-10 to 55 °C, storage: -20 to 80 °C (no freezing or condensation)			
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)			
Comm. protocol	Modbus RTU			

Series	DPU1	DPU3
Power supply	110 / 220 / 380 / 440 VAC~ model	110 / 220 / 380 / 440 / 480 VAC~ model
Allowable voltage range	90 to 110 % of power supply	85 to 115 % of power supply
Min. load current	1 A	
Control power supply	Included in power supply	115 / 220 VAC~ model 50 / 60 Hz
Power consumption	≤ 40 W (control power, include FAN)	≤ 60 W (control power, include FAN)
Insulation resistance	≥ 200 MΩ (500 VDC≡ megger)	
Dielectric strength	Between the charging part and the case: 3,000 VAC~ 50 / 60 Hz for 1 min	
Vibration	0.75 mm double amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours	
Noise immunity	±2 kV square wave noise (pulse width: 1 μs) by the noise simulator	
Ambient temp.	-10 to 50 °C, storage: -20 to 80 °C (no freezing or condensation)	
Ambient humidity	5 to 90 %RH, storage: 5 to 90 %RH (no freezing or condensation)	
Comm. protocol	Modbus RTU	
Unit weight (packaged)	DPU1	DPU3
A	≈ 3.0 kg (≈ 3.2 kg)	≈ 6.5 kg (≈ 7.6 kg)
B	≈ 3.0 kg (≈ 5.6 kg)	≈ 11.5 kg (≈ 13.0 kg)
C	≈ 11.0 kg (≈ 12.1 kg)	≈ 20.0 kg (≈ 21.1 kg)
D	≈ 11.0 kg (≈ 19.3 kg)	≈ 30.8 kg (≈ 35.7 kg)

Single-Phase Power Controllers

SPC Series



Features

- Various and simple input specification
 - DC 4 - 20 mA, 1 - 5 VDC \Rightarrow , External 24 VDC \Rightarrow
 - External adjuster (1 k Ω)
 - External contact (ON / OFF)
- Various function
 - Out ADJ (output limit) function
 - Soft Start function
(except for ON / OFF control type)
 - Out display function
 - 50 / 60 Hz automatic converting function
- Various control by mode switches
 - Phase control
 - Cycle control (zero cross turn-on)
 - ON / OFF control (zero cross turn-on)

Specifications

Model	SPC1-35		SPC1-50
Control phase	Single-phase		
Rated load current	35 A	50 A	
Indicator	Output indicator (red)		
Control input	1 - 5 VDC≡, DC 4 - 20 mA (250 Ω), ON / OFF (external contact or 24 VDC≡), external adjuster (1 kΩ), output limit input (front output limit adjuster)		
Cooling method	Natural air cooling		
Control circuit	MICOM control method		
Unit weight	≈ 1 kg		
Approval	EAC		
Control method	Phase control	Cycle control	ON/OFF control
Control mode	Normal	Fixed cycle	-
Applied load	Resistance load		
Output range	0 to 98 %	0 to 100 %	0 / 100 %
Power supply	220 VAC~50 / 60Hz		
Permissible voltage range	90 to 110 % of rated voltage		
Operating freq. fluctuation	± 1 Hz		
Min. load current	5 % of rated load current		
Insulation resistance	100 MΩ(500 VDC≡ megger)		
Dielectric strength	Between the charging part and the case: 3,000 VAC~ 50 / 60 Hz for 1 min		
Noise immunity	± 2 kV square wave noise (pulse width: 1 μs) by the noise simulator		
Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min		
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times		
Shock (malfunction)	100 m/s ² (≈ 10 G) In each X, Y, Z direction for 3 times		
Ambient temperature	0 to 50 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Wiring specification	Rated load current 35 A: AWG 16 to 8 Rated load current 50 A: AWG 8 to 6		



View product detail

G. Motion Devices

Motion devices are used to convert electrical energy into mechanical energy acting as actuators in automation processes.

G1. 2-Phase Closed Loop Stepper System

G2. 2-Phase Stepper Motor Drivers

G3. 5-Phase Stepper Motor & Drivers

G4. Motion Controllers







G1. 2-Phase Closed-Loop Stepper System

Closed-loop stepper motor systems consist of motors with integrated encoders for feedback and higher precision control.

G1-1	Closed-Loop Stepper Motor System	AiS Series	2-Phase Closed-Loop Stepper Motor System
		AiSA Series	AC Power Input 2-Phase Closed-Loop Stepper Motor System
		AiC Series	2-Phase Closed-Loop Stepper Motor System with Integrated Controller
		AiC-CL Series	CC-Link Comm. Type 2-Phase Closed-Loop Stepper Motor System
		AiC-EC Series	EtherCAT Comm. Type 2-Phase Closed-Loop Stepper Motor System
		AiC-MT Series	Modbus TCP Comm. Type 2-Phase Closed-Loop Stepper Motor System
		AiCA Series	AC Power 2-Phase Closed Loop Stepper Motor System with Integrated Controllers
		AiCA-EC Series	AC Power Input EtherCAT Comm. Type 2-Phase Closed-Loop Stepper Motor System
	Closed-Loop Stepper Motor	Ai-M / Ai-M-B Series	Standard / Built-In Brake Type 2-Phase Closed-Loop Stepper Motor
		Ai-M Series	Standard Type 2-Phase Closed-Loop Stepper Motor
		Ai-M-G / Ai-M-R Series	Built-In Gear / Rotary Actuator Type 2-Phase Closed-Loop Stepper Motor
		AiA-M / AiA-M-B Series	Standard / Built-In Brake Type AC Power Input 2-Phase Closed-Loop Stepper Motor
		AiA-M-G / AiA-M-R Series	Built-In Gear / Rotary Actuator Type AC Power Input 2-Phase Closed-Loop Stepper Motor

2-Phase Closed-Loop Stepper Motor System

AiS Series



Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Easy operation setting with external adjuster (Gain, Speed filter, In-position, Resolution)
- Built-in brake type motors available (AiS-D-B Series)

[Supported Motor]

- Standard type: 20, 28, 35, 42, 56, 60 mm
- Built-in brake type: 42, 56, 60 mm
- Built-in gear type: 42, 60 mm
- Built-in rotary actuator type: 60 mm

* Sold Separately

- Power cable: CJ-PW-□
- Motor + Encoder cable:
C1D14M-□ (fixed type),
C1DF14M-□ (flexible type)
- I/O cable: CO20-MP□-R
(specifications: AiS TAG)

Specifications

[Supported Driver]

Model	AiS-D-20□A	AiS-D-28□B	AiS-D-35□B
Power supply	24 VDC≡		
Permissible voltage range	90 to 110% of rated voltage		
Max. RUN power ⁰¹⁾	≤ 50 W	≤ 60 W	
Stop power ⁰²⁾	≤ 10 W		
Max. RUN current ⁰³⁾	0.6 A / Phase	1.0 A / Phase	1.2 A / Phase
Stop current	25% or 50% (factory default: 50%) of max. RUN current		
Resolution	500 (factory default), 1000, 1600, 2000, 3600, 4000, 5000, 6400, 7200, 10000 PPR	500 (factory default), 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000, 16000 PPR	

Model	AiS-D-42□A-□	AiS-D-56□A-□	AiS-D-60□A-□
Power supply	24 VDC≡		
Permissible voltage range	90 to 110% of rated voltage		
Max. RUN power ⁰¹⁾	≤ 60 W	≤ 120 W	≤ 240 W
Stop power ⁰²⁾	S: ≤ 7 W (≤ 16 W) M: ≤ 7.5 W (≤ 16 W) L: ≤ 8 W (≤ 17 W)	S: ≤ 9.5 W (≤ 23 W) M: ≤ 10 W (≤ 23 W) L: ≤ 11 W (≤ 25 W)	S: ≤ 12 W (≤ 25 W) M: ≤ 13 W (≤ 26 W) L: ≤ 14 W (≤ 26 W)
Max. RUN current ⁰³⁾	1.7 A / Phase	3.5 A / Phase	
Stop current	25% or 50% (factory default: 50%) of max. RUN current		
Resolution	500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR		

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.

02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%. The value in the bracket indicates built-in brake type.

03) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	(P Gain, I Gain)=(1, 1), (2, 1), (3, 1), (4, 1), (5, 1), (1, 2), (2, 2), (3, 2), (4, 2), (5, 2), (1, 3), (2, 3), (3, 3), (4, 3), (5, 3)
Max. rotation speed	3000 rpm
In-Position	Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7
Rotation direction	CW (factory default), CCW
Input	CW/CCW (RUN pulse), Servo ON/OFF, Alarm Reset (Photocoupler input)
Output	In-Position, Alarm Out (Photocoupler output), Encoder Signal (A, \bar{A} , B, \bar{B} , Z, \bar{Z} , Line driver output), Brake (at supplying: 0.2 sec 24 VDC≒, normal status: 11.5 VDC≒ ±10%)
Pulse input method	1 pulse, 2 pulse (factory default)
Pulse input voltage	CW, CCW-[H]: 4 - 8 VDC≒, [L]: 0 - 0.5 VDC≒, Servo ON/OFF, Alarm Reset-[H]: 24 VDC≒, [L]: 0 - 0.5 VDC≒
Max. input pulse frequency	□ 20 / 28 / 35 mm: CW, CCW: 800 kHz □ 42 / 56 / 60 mm: CW, CCW: 500 kHz
Pulse width	CW, CCW: Input Pulse Frequency Duty 50% (□ 20 mm: ≥ 2 μs, □ 28 / 35 mm: ≥ 1.25 μs) Servo ON/OFF: ≥ 1 ms Alarm Reset: ≥ 20 ms
Rise fall time	CW, CCW: < 0.5 μs



View product detail

Input resistance	220 Ω (CW, CCW), 10 kΩ (Servo ON/OFF, Alarm Reset)
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)
Dielectric strength	Between the all charging part and the case: 1,000 VAC~ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	<input type="checkbox"/> 20 / 28 / 35 mm: 0 to 50°C, storage: -20 to 70°C (no freezing or condensation) <input type="checkbox"/> 42 / 56 / 60 mm: 0 to 50°C, storage: -10 to 60°C (no freezing or condensation) Built-in brake type: 0 to 50°C, storage: -20 to 70°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Certification	CE ENEC
Unit weight (packaged)	≈ 290 g (≈ 400 g)

AC Power Input

2-Phase Closed-Loop Stepper Motor System

AiSA Series



Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Supports 200 - 240 VAC~ AC power
- Easy operation setting with external adjuster (Gain, Speed filter, In-position, Resolution)
- 7 segment display for alarm / status reading
- Supports torque mode
- Supports Auto Current Down mode
- Built-in brake type motors available (AiSA-D-B Series)

[Supported Motor]

- Standard type: 60, 86 mm
- Built-in brake type: 60, 86 mm
- Built-in gear type: 60, 86 mm
- Built-in rotary actuator type: 60 mm

* Sold Separately

- Motor + Encoder cable: C1D14M-□ (fixed type), C1DF14M-□ (flexible type)
- I/O cable: CO20-MP□-R (specifications: AiS TAG)

Specifications

[Supported Driver]

Model		AiSA-D-60MA-□	AiSA-D-60LA-□	AiSA-D-86MA-□	AiSA-D-86LA-□
Main	Power supply	200 - 240 VAC~ 50 / 60 Hz			
	Max. RUN power ⁰¹⁾	≤ 800 VA			
	Stop power ⁰²⁾	≤ 60 VA		≤ 65 VA	≤ 70 VA
AUX ⁰³⁾	Power supply	24 VDC≡			
	Input current	0.3 A		0.5 A	
Max. RUN current ⁰⁴⁾		2.0 A / Phase			
Stop current		20% to 100% of max. RUN current			
Resolution		500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR			

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.

02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%

03) Auxiliary power is only available in built-in brake type and not available in standard type.

04) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable (factory default), 2, 4, 6, 8, 10, 20, 40, 60, 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	Standard Gain: 0 to F, Inertia Gain: 0 to F
Max. rotation speed	3000 rpm
In-Position	Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7
Rotation direction	CW (factory default), CCW
Operation mode	Standard mode, Torque mode
Input	CW/CCW (RUN pulse), Servo ON/OFF, Alarm Reset (Photocoupler input)
Output	In-Position, Alarm Out (Photocoupler output), Encoder Signal (A, \bar{A} , B, \bar{B} , Z, \bar{Z} , Line driver output)
Pulse input method	1 pulse, 2 pulse (factory default)
Pulse input voltage	CW, CCW-[H]: 4 - 8 VDC≡, [L]: 0 - 0.5 VDC≡, Servo ON/OFF, Alarm Reset-[H]: 24 VDC≡, [L]: 0 - 0.5 VDC≡
Max. input pulse frequency	CW, CCW: 500 kHz
Pulse width	CW, CCW: Input pulse frequency duty 50% Servo ON/OFF: ≥ 1 ms Alarm Reset: ≥ 10 ms
Rise fall time	CW, CCW: < 0.5 μs
Input resistance	4.7 kΩ (Anode Pull-Up)
Insulation resistance	≥ 200 MΩ (500 VDC≡ megger)
Dielectric strength	Between the all charging part and the case: 1,500 VAC~ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Certification	CE, RoHS, ENEC
Unit weight (packaged)	≈ 780 g (≈ 1,020 g)



View product detail

2-Phase Closed-Loop Stepper Motor System with Integrated Controller

AiC Series



Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Motor driver+Controller integrated type
- Control up to 31 axes with RS-485 communication
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 4 operation mode: Jog mode, Continuous mode, Index mode, Program Mode
- Built-in brake type motors available (AiC-D-B Series)

[Supported Motor]

- Standard type: 20, 28, 35, 42, 56, 60 mm
- Built-in brake type: 42, 56, 60 mm
- Built-in gear type: 42, 60 mm
- Built-in rotary actuator type: 60 mm

* Sold Separately

- Power cable: CJ-PW-□
- Motor + Encoder cable:
C1D14M-□ (fixed type),
C1DF14M-□ (flexible type)
- I/O Cable: CO50-MP□-R
(specifications: AiC TAG)



View product detail

Specifications

[Supported Driver]

Model	AiC-D-20□A	AiC-D-28□B	AiC-D-35□B
Power supply	24 VDC≒		
Permissible voltage range	90 to 110% of rated voltage		
Max. RUN power ⁰¹⁾	≤ 60 W		
Stop power ⁰²⁾	≤ 10 W		
Max. RUN current ⁰³⁾	0.6 A / Phase	1.0 A / Phase	1.2 A / Phase
Stop current	20 to 100% of max. RUN current (factory default: 50%)		
Resolution	500 (factory default), 1000, 1600, 2000, 3600, 4000, 5000, 6400, 7200, 10000 PPR	500 (factory default), 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000, 16000 PPR	

Model	AiC-D-42□A-□	AiC-D-56□A-□	AiC-D-60□A-□
Power supply	24 VDC≒		
Permissible voltage range	90 to 110% of rated voltage		
Max. RUN power ⁰¹⁾	≤ 60 W	≤ 120 W	≤ 240 W
Stop power ⁰²⁾	≤ 10 W	≤ 12 W	≤ 15 W
Max. RUN current ⁰³⁾	1.7 A / Phase	3.5 A / Phase	
Stop current	20 to 100% of max. RUN current (factory default: 50%)		
Resolution	500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR		

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.

02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%

03) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	0 (factory default) ~ 14, Fine Gain
Max. rotation speed	3000 rpm
Positioning range	-2,147,483,648 to +2,147,483,647
In-Position	Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7
Rotation direction	CW (factory default), CCW
Operation mode	Jog mode, Continuous mode, Index mode, Program mode
Home search mode	General mode, Limit mode, Zero point mode, Torque mode
Index step	64 step
Program step	256 step
Program function	Power On Program Start, Power On Home Search
Control command	ABS, INC, HOM, ICJ, IRD, OPC, OPT, JMP, REP, RPE, END, POS, TIM, CMP
I/O voltage level	[H]: 5 - 30 VDC≒, [L]: 0 - 2 VDC≒
Input ⁰¹⁾	Exclusive input: 20, General input: 9
Output	Standard type - Exclusive output: 4, General output: 10 Built-in brake type - Exclusive output: 6, General output: 9
External power supply	VEX (recommended: 24 VDC≒): 2, GEX (GND): 2
Insulation resistance	≥ 100 MΩ (500 VDC≒ megger)
Dielectric strength	Between the all charging part and the case: 1,000 VAC~ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Certification	CE, RoHS, REACH
Unit weight (packaged)	≈ 300 g (≈ 460 g)

01) Brake ON/OFF function can be changed from general input IN8 in case of built-in brake type.

CC-Link Comm. Type

2-Phase Closed-Loop Stepper Motor System

AiC-CL Series



Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Multi-axis simultaneous control with CC-Link communication
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 7 segment display for alarm / status reading
- Built-in brake type motors available (AiC-D-B-CL Series)

[Supported Motor]


- Standard type: 20, 28, 35, 42, 56, 60 mm
- Built-in brake type: 42, 56, 60 mm
- Built-in gear type: 42, 60 mm
- Built-in rotary actuator type: 60 mm


* Sold Separately

- Power cable: CJ-PW-□
- Motor + Encoder cable: C1D14M(B)-□ (fixed type), C1DF14M(B)-□ (flexible type)
- I/O Cable: CO50-MP□-R (specifications: AiC TAG)

Specifications

[Supported Driver]

Model	AiC-D-20□A-CL	AiC-D-28□B-CL	AiC-D-35□B-CL
Power supply	24 VDC \pm 10%		
Permissible voltage range	90 to 110% of rated voltage		
Max. RUN power ⁰¹⁾	\leq 60 W		
Stop power ⁰²⁾	\leq 10 W		
Max. RUN current ⁰³⁾	0.6 A / Phase	1.0 A / Phase	1.2 A / Phase
Stop current	20 to 100% of max. RUN current (factory default: 50%)		
Certification	CE 		
Resolution	500 (factory default), 1000, 1600, 2000, 3600, 4000, 5000, 6400, 7200, 10000 PPR	500 (factory default), 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000, 16000 PPR	

Model	AiC-D-42□A-□-CL	AiC-D-56□A-□-CL	AiC-D-60□A-□-CL
Power supply	24 VDC± ±10%		
Permissible voltage range	90 to 110% of rated voltage		
Max. RUN power ⁰¹⁾	≤ 60 W	≤ 120 W	≤ 240 W
Stop power ⁰²⁾	≤ 10 W	≤ 12 W	≤ 15 W
Max. RUN current ⁰³⁾	1.7 A / Phase	3.5 A / Phase	
Stop current	20 to 100% of max. RUN current (factory default: 50%)		
Certification	CE 		
Resolution	500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR		

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.

02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%

03) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	0 (factory default) to 14, Fine Gain
Max. rotation speed	3000 rpm
Positioning range	-2,147,483,648 to +2,147,483,647
In-Position	Fast response: 0 (factory default) to 7, Accurate response: 0 to 7
Rotation direction	CW (factory default), CCW
Operation mode	Jog mode, Continuous mode, Index mode, Program mode
Home search mode	General mode, Limit mode, Zero point mode, Torque mode
Index steps	64 step
Program steps	256 step
Program function	Power On Program Start, Power On Home Search
Control command	ABS, INC, HOM, ICJ, IRD, OPC, OPT, JMP, REP, RPE, END, POS, TIM



View product detail

I/O voltage level	[H]: 5 - 30 VDC≡, [L]: 0 - 2 VDC≡
Input	Exclusive input: 3, General input: 8
Output	General output: 7
External power supply	VEX (recommended: 24 VDC≡), GEX (GND)
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)
Dielectric strength	Between the all charging part and the case: 1,000 VAC~ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Unit weight (packaged)	≈ 320 g (≈ 470 g)
Comm. protocol	CC-Link Ver.1.10, Modbus RTU

EtherCAT Comm. Type

2-Phase Closed-Loop Stepper Motor System

AiC-EC Series



Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Multi-axis simultaneous control with EtherCAT communication
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 7-segment display for alarm / status reading
- Built-in brake type motors available (AiC-D-B-EC Series)

[Supported Motor]

- Standard type: 20, 28, 35, 42, 56, 60 mm
- Built-in brake type: 42, 56, 60 mm
- Built-in gear type: 42, 60 mm
- Built-in rotary actuator type: 60 mm

* Sold Separately

- Power cable: CJ-PW-□
- I/O cable: CO20-MP□-R
(specifications: AiC-EC TAG)
- Motor + Encoder cable:
C1D14M(B)-□ (fixed type),
C1DF14M(B)-□ (flexible type)

Specifications

[Supported Driver]

Model	AiC-D-20□A-EC	AiC-D-28□B-EC	AiC-D-35□B-EC
Power supply	24 VDC \pm 10%		
Permissible voltage range	90 to 110% of rated voltage		
Max. RUN power ⁰¹⁾	\leq 60 W		
Stop power ⁰²⁾	\leq 10 W		
Max. RUN current ⁰³⁾	0.6 A / Phase	1.0 A / Phase	1.2 A / Phase
Stop current	20 to 100% of max. RUN current		
Basic step angle	1.8° / Phase		
Resolution	500, 1000, 1600, 2000, 3600, 4000, 5000, 6400, 7200, 10000 (factory default) PPR	500, 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000 (factory default), 16000 PPR	

Model	AiC-D-42□A-□-EC	AiC-D-56□A-□-EC	AiC-D-60□A-□-EC
Power supply	24 VDC≡ ±10%		
Permissible voltage range	90 to 110% of rated voltage		
Max. RUN power ⁰¹⁾	≤ 60 W	≤ 120 W	≤ 240 W
Stop power ⁰²⁾	≤ 10 W	≤ 12 W	≤ 15 W
Max. RUN current ⁰³⁾	1.7 A / Phase	3.5 A / Phase	
Stop current	20 to 100% of max. RUN current		
Basic step angle	1.8° / Phase		
Resolution	500, 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 (factory default) PPR		

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.



02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%

03) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	0 (factory default) to 15, (15: Fine Gain)
Max. rotation speed	3,000 rpm
In-Position	Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7
Operation mode	CSP, CSV, PP, PV, HM
Home search	Homing on the negative limit switch and index pulse Homing on the positive limit switch and index pulse Homing on the home switch and index pulse (Positive) Homing on the home switch and index pulse (Negative) Homing without an index pulse (negative limit switch) Homing without an index pulse (positive limit switch) Homing without an index pulse (Positive and Home sensor ON) Homing without an index pulse (Negative and Home sensor ON) Homing on the index pulse (Negative) Homing on the index pulse (Positive) Set the Origin with Home offset Set the Origin and Reset Current Position Torque Homing Search- with Home offset Torque Homing Search+ with Home offset



View product detail

I/O voltage level	[H]: 5 - 30 VDC≐, [L]: 0 - 2 VDC≐
Input	Exclusive input: 7, General input: 5
Output	Exclusive output: 2, General output: 4
External power supply	VEX (Default: 24 VDC≐), GEX (GND)
Insulation resistance	≥ 100 MΩ (500 VDC≐ megger)
Dielectric strength	Between the all charging part and the case: 1,000 VAC~ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Certification	CE  
Unit weight (packaged)	≈ 350 g (≈ 500 g)
Comm. protocol	EtherCAT

Modbus TCP Comm.Type

2-Phase Closed-Loop Stepper Motor System

AiC-MT Series



Features

- Closed-loop system with real-time position control
- High speed and high torque drive without missed steps
- Ethernet based Modbus TCP protocol
- Control up to 254 axes with Modbus TCP communication, with daisy-chaining method LAN connection (2 Port Ethernet switching hub included)
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 7-segment display for alarm / status reading
- Built-in brake / gear / rotary actuator type motors available

[Supported Motor]

- Standard type: 42, 56, 60 mm
- Built-in brake type: 42, 56, 60 mm
- Built-in gear type: 42, 60 mm
- Built-in rotary actuator type: 60 mm

* Sold Separately

- Power cable: CJ-PW-□
- I/O cable: CO20-MP□-R
- Motor + Encoder cable:
C1D14M(B)-□ (fixed type),
C1DF14M(B)-□ (flexible type)

Specifications

[Supported Driver]

Model	AiC-D-42□A-MT	AiC-D-56□A-MT	AiC-D-60□A-MT
	AiC-D-42□A-B-MT	AiC-D-56□A-B-MT	AiC-D-60□A-B-MT
Power supply	24 VDC± 10%		
Permissible voltage range	90 to 110% of rated voltage		
Max. RUN power ⁰¹⁾	≤ 60 W	≤ 120 W	≤ 240 W
Stop power ⁰²⁾	≤ 10 W	≤ 12 W	≤ 15 W
Max. RUN current ⁰³⁾	1.7 A / Phase	3.5 A / Phase	
Stop current	20 to 100% of max. RUN current		
Resolution	500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR		

01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.

02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%

03) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also depending on the load change.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	0 (factory default) to 14, 15 (Fine Gain)
Max. rotation speed	3,000 rpm
Position setting range	-2,147,483,648 to 2,147,483,647 (resolution setting: 10,000)
In-Position	Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7
Operation mode	Jog mode / Continuous mode / Index mode / Program mode / Homing mode / Position determining mode
Home search	Home Search, Limit Home Search, Zero point Home Search, Torque Home Search
No. of program step	256-step
Program function	Power On Program Start, Power On Home Search
Control command	ABS, INC, HOM, ICJ, IRD, OPC, OPT, JMP, REP, RPE, END, POS, TIM, CMP
Input	Exclusive input: 3 (ORG, +Limit, -Limit), General input: 9
Output	General output: 6, Brake output: 2 (built-in brake type)
External power supply	VEX (Default: 24 VDC \pm), GEX (GND)
Insulation resistance	≥ 100 MΩ (500 VDC \pm megger)
Dielectric strength	Between the all charging part and the case: 1,000 VAC \sim 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (\approx 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Certification	CE
Unit weight (packaged)	\approx 330 g (\approx 460 g)
Comm. protocol	Ethernet Modbus TCP



View product detail

AC Power

2-Phase Closed-Loop Stepper Motor System with Integrated Controllers

AiCA Series



Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Supports 200 - 240 VAC~ AC power
- Motor driver+Controller integrated type
- Control up to 31 axes with RS-485 communication
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 4 operation mode: Jog mode, Continuous mode, Index mode, Program Mode
- 7 segment display for alarm / status reading
- Built-in brake type motors available (AiCA-D-B Series)

[Supported Motor]

- Standard type: 60, 86 mm
- Built-in brake type: 60, 86 mm
- Built-in gear type: 60, 86 mm
- Built-in rotary actuator type: 60 mm

* Sold Separately

- Motor + Encoder cable: C1D14M-□ (fixed type), C1DF14M-□ (flexible type)
- I/O Cable: CO50-MP□-R (specifications: AiC TAG)



View product detail

Specifications

[Supported Driver]

Model		AiCA-D-60MA-□	AiCA-D-60LA-□	AiCA-D-86MA-□	AiCA-D-86LA-□
Main	Power supply	200 - 240 VAC~ 50 / 60 Hz			
	Max. RUN power ⁰¹⁾	≤ 800 VA			
	Stop power ⁰²⁾	≤ 60 VA		≤ 65 VA	
AUX ⁰³⁾	Power supply	24 VDC≡			
	Input current	0.3 A		0.5 A	
Max. RUN current ⁰⁴⁾		2.0 A / Phase			
Stop current		20 to 100% of max. RUN current			
Resolution		500 (factory default), 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 PPR			
01) When changing the load rapidly, instantaneous peak current may increase. The capacity of power supply should be over 1.5 to 2 times of max. RUN power.					
02) Based on ambient temp. 25°C, ambient humi. 55%RH, stop current 50%					
03) Auxiliary power is only available in built-in brake type and not available in standard type.					
04) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.					
Run method		2-phase bipolar closed-loop control method			
Speed filter		Disable, 2, 4, 6, 8, 10, 20, 40, 60 (factory default), 80, 100, 120, 140, 160, 180, 200 ms			
Control Gain		0 (factory default) to 30, Fine Gain			
Max. rotation speed		3000 rpm			
Position setting range		-2,147,483,648 to +2,147,483,647			
In-Position		Fast Response: 0 (factory default) to 7, Accurate Response: 0 to 7			
Rotation direction		CW (factory default), CCW			
Operation mode		Jog mode, Continuous mode, Index mode, Program mode			
Home search mode		General mode, Limit mode, Zero point mode, Torque mode			
Index step		64 step			
Program step		256 step			
Program function		Power On Program Start, Power On Home Search			
Control command		ABS, INC, HOM, ICJ, IRD, OPC, OPT, JMP, REP, RPE, END, POS, TIM, CMP, TOQ			
I/O voltage level		[H]: 5 - 30 VDC≡, [L]: 0 - 2 VDC≡			
Input ⁰¹⁾		Exclusive input: 20, General input: 9			
Output		Exclusive output: 4, General output: 10			
External power supply		VEX (24 VDC≡ fixed): 2, GEX (GND): 2			
Input resistance		4.7 kΩ (Anode Pull-up)			
Insulation resistance		≥ 200 MΩ (500 VDC≡ megger)			
Dielectric strength		Between the all charging part and the case: 1,500 VAC~ 60 Hz for 1 minute			
Vibration		1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Shock		300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times			
Ambient temp.		0 to 50°C, storage: -10 to 60°C (no freezing or condensation)			
Ambient humi.		35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)			
Protection rating		IP20 (IEC standard)			
Certification		CE ENEC			
Unit weight (packaged)		≈ 780 g (≈ 1,050 g)			
Comm. protocol		Modbus RTU			

01) Brake ON/OFF function can be changed from general input IN8 in case of built-in brake type.

AC Power Input EtherCAT Comm. Type 2-Phase Closed-Loop Stepper Motor System

AiCA-EC Series



Features

- Closed-loop system with real-time position control
- High speed & high torque drive without missing steps
- Supports 200 - 240 VAC~ AC power
- Multi-axis simultaneous control with EtherCAT communication
- Windows-based software (atMotion) for easy parameter setting and monitoring
- 7-segment display for alarm / status reading
- Built-in brake type motors available (AiCA-D-B-EC Series)
- Built-in geared / rotary actuator type motors available

[Supported Motor]

- Standard type: 60, 86 mm
- Built-in brake type: 60, 86 mm
- Built-in gear type: 60, 86 mm
- Built-in rotary actuator type: 60 mm

* Sold Separately

- I/O cable: CO20-MP□-R (specifications: AiC-EC TAG)
- Motor + Encoder cable: C1D14M(B)-□ (fixed type), C1DF14M(B)-□ (flexible type)

Specifications

[Supported Driver]

Model		AiCA-D-60MA-□-EC	AiCA-D-60LA-□-EC	AiCA-D-86MA-□-EC	AiCA-D-86LA-□-EC
Main power	Power supply	200 - 240 VAC~ 50/60 Hz			
	Max. RUN power ⁰¹⁾	≤ 800 VA			
	Stop power ⁰²⁾	≤ 60 VA			≤ 65 VA
AUX power ⁰³⁾	Power supply	24 VDC≡			
	Input current	0.3 A			0.5 A
	Max. RUN current ⁰⁴⁾	2.0 A / Phase			
	Stop current	20 to 100% of max. RUN current			
	Resolution	500, 1000, 1600, 2000, 3200, 3600, 5000, 6400, 7200, 10000 (factory default) PPR			

01) When changing the load rapidly, instantaneous peak current may increase.

The capacity of power supply should be over 1.5 to 2 times of max. RUN power.

02) Based on ambient temp. 25 °C, ambient humi. 55 %RH, stop current 20%

03) Auxiliary power is only available in built-in brake type and not available in standard type.

04) RUN current varies depending on the input RUN frequency and max. RUN current at the moment varies also.

Run method	2-phase bipolar closed-loop control method
Speed filter	Disable, 2, 4, 6, 8, 10, 20, 40, 60(factory default), 80, 100, 120, 140, 160, 180, 200 ms
Control Gain	0 (factory default) to 31, (31: Fine Gain)
Max. rotation speed	3,000 rpm
In-Position	Fast Response: 0 to 7 (factory default), Accurate Response: 0 to 7
Operation mode	CSP, CSV, CST, PP, PV, HM
Home search	Homing on the negative limit switch and index pulse Homing on the positive limit switch and index pulse Homing on the home switch and index pulse (Positive) Homing on the home switch and index pulse (Negative) Homing without an index pulse (negative limit switch) Homing without an index pulse (positive limit switch) Homing without an index pulse (Positive and Home sensor ON) Homing without an index pulse (Negative and Home sensor ON) Homing on the index pulse (Negative) Homing on the index pulse (Positive) Set the Origin with Home offset Set the Origin and Reset Current Position Torque Homing Search- with Home offset Torque Homing Search+ with Home offset

Input	Exclusive input: 7, General input: 5
Output	Exclusive output: 2 General output: 4
External power supply	VEX (Default: 24 VDC≡), GEX (GND)
Input resistance	4.7 kΩ (Anode Pull-Up)
Insulation resistance	≥ 200 MΩ (500 VDC≡ megger)
Dielectric strength	Between the all charging part and the case: 1,500 VAC~ 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 10 to 90%RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Certification	CE UK ENEC
Unit weight (packaged)	≈ 770 g (≈ 1,040 g)
Comm. protocol	EtherCAT



View product detail

Standard / Built-In Brake Type

2-Phase Closed-Loop Stepper Motor

Ai-M / Ai-M-B Series



Features

- Supports □ 42 mm, □ 56 mm, □ 60 mm
- Non-excitation electromagnetic built-in brake type motor (Ai-M-B Series)

* Sold Separately

- Motor + Encoder cable: C1D14M-□ (fixed type), C1DF14M-□ (flexible type)
- Flexible coupling: ERB Series

Specifications

Model	Ai-M-42SA-□	Ai-M-42MA-□	Ai-M-42LA-□
Max. stop torque	0.25 N m	0.4 N m	0.48 N m
Rotor inertia moment	$35 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$54 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$77 \times 10^{-7} \text{ kg} \cdot \text{m}^2$
Rated current	1.7 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	1.7 Ω / Phase ±10%	1.85 Ω / Phase ±10%	2.1 Ω / Phase ±10%
Inductance	1.9 mH / Phase ±20%	3.5 mH / Phase ±20%	4.4 mH / Phase ±20%
Unit weight (packaged) ⁰¹⁾	≈ 0.34 kg (≈ 0.45 kg) ≈ 0.67 kg (≈ 0.77 kg)	≈ 0.41 kg (≈ 0.52 kg) ≈ 0.73 kg (≈ 0.83 kg)	≈ 0.48 kg (≈ 0.59 kg) ≈ 0.80 kg (≈ 0.90 kg)

Model	Ai-M-56SA-□	Ai-M-56MA-□	Ai-M-56LA-□
Max. stop torque	0.6 N m	1.2 N m	2.0 N m
Rotor inertia moment	$140 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$280 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$480 \times 10^{-7} \text{ kg} \cdot \text{m}^2$
Rated current	3.5 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	0.55 Ω / Phase ±10%	0.57 Ω / Phase ±10%	0.93 Ω / Phase ±10%
Inductance	1.05 mH / Phase ±20%	1.8 mH / Phase ±20%	3.7 mH / Phase ±20%
Unit weight (packaged) ⁰¹⁾	≈ 0.62 kg (≈ 0.76 kg) ≈ 1.15 kg (≈ 1.30 kg)	≈ 0.85 kg (≈ 0.99 kg) ≈ 1.38 kg (≈ 1.52 kg)	≈ 1.22 kg (≈ 1.36 kg) ≈ 1.75 kg (≈ 1.90 kg)

Model	Ai-M-60SA-□	Ai-M-60MA-□	Ai-M-60LA-□
Max. stop torque	1.1 N m	2.2 N m	2.9 N m
Rotor inertia moment	$240 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$490 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$690 \times 10^{-7} \text{ kg} \cdot \text{m}^2$
Rated current	3.5 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	1.0 Ω / Phase ±10%	1.23 Ω / Phase ±10%	1.3 Ω / Phase ±10%
Inductance	1.5 mH / Phase ±20%	2.6 mH / Phase ±20%	3.8 mH / Phase ±20%
Unit weight (packaged) ⁰¹⁾	≈ 0.75 kg (≈ 0.89 kg) ≈ 1.36 kg (≈ 1.53 kg)	≈ 1.13 kg (≈ 1.27 kg) ≈ 1.74 kg (≈ 1.90 kg)	≈ 1.44 kg (≈ 1.58 kg) ≈ 2.07 kg (≈ 2.23 kg)

⁰¹⁾ Listed in order of Standard type
Built-in brake type

Motor phase	2-phase
RUN method	Bipolar
Insulation class	B type (130°C)
Insulation resistance	Between the motor coil and the case: ≥ 100 MΩ (500 VDC= megger)
Dielectric strength	Between the all charging part and the case: 500 VAC ~ 50 / 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 50 G
Ambient temp.	0 to 50°C, storage: -20 to 70°C (no freezing or condensation)
Ambient humi.	20 to 85%RH, storage: 15 to 90%RH (no freezing or condensation)
Protection rating	IP30 (IEC34-5 standard)
Certification	CE ENEC
Stop angle error	± 0.09° (Full step, no load)
Shaft vibration	0.03 mm T.I.R.
Radial movement ⁰¹⁾	≤ 0.025 mm T.I.R.
Axial movement ⁰²⁾	≤ 0.01 mm T.I.R.
Shaft concentricity	0.05 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

⁰¹⁾ Amount of radial shaft displacement when applying radial load (25 N) to the end of the shaft.

⁰²⁾ Amount of axial shaft displacement when applying axial load (50 N) to the motor shaft.

View product detail



Standard Type



Built-in Brake
Type

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Encoder type	Incremental rotary encoder		
Power supply	5 VDC≡ ± 5% (ripple P-P: ≤ 5%)		
Current consumption	≤ 50 mA (no load)		
Resolution	10,000 PPR (2,500 PPR × 4)		
Control output	Line driver output		
Output phase	A, \bar{A} , B, \bar{B} , Z, \bar{Z}		
Output waveform	Output duty rate: $\frac{T}{2} \pm \frac{T}{4}$, A-B phase difference: $\frac{T}{4} \pm \frac{T}{8}$ (T = 1 cycle of A)		
Inflow current	≤ 20 mA		
Residual voltage	≤ 0.5 VDC≡		
Outflow current	≤ -20 mA		
Output voltage	≥ 2.5 VDC≡		
Response speed	≤ 0.5 μs (based on cable length: 2 m, I sink = 20 mA)		
Max. response freq.	300 kHz		
Built-in brake type frame size	<input type="checkbox"/> 42 mm	<input type="checkbox"/> 56 mm	<input type="checkbox"/> 60 mm
Rated excitation voltage 01)	24 VDC≡ ±10%		
Rated excitation current	0.208 A	0.275 A	
Static friction torque	≥ 0.18 N·m	≥ 0.8 N·m	
Rotation part inertia moment	6×10 ⁻⁷ kg·m ²	19×10 ⁻⁷ kg·m ²	
Insulation class	B type (130°C)		
B type brake	Brake is released when power ON, brake is locked when power OFF		
Operating time	≤ 25 ms	≤ 30 ms	
Releasing time	≤ 10 ms	≤ 20 ms	

01) In order to reduce the heat generation of the built-in brake, the voltage drops from 24 VDC \pm to 11.5 VDC \pm to control.

Standard Type

2-Phase Closed-Loop Stepper Motor

Ai-M Series




Features

- Supports □ 20 mm, □ 28 mm, □ 35 mm

* Sold Separately

- Motor + Encoder cable: C1D14M-□ (fixed type), C1DF14M-□ (flexible type)
- Flexible coupling: ERB Series

Specifications

Model	Ai-M-20MA		Ai-M-20LA
Max. stop torque	0.018 N m		0.035 N m
Rotor inertia moment	2×10 ⁻⁷ kg · m ²		
Rated current	0.6 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	6.6 Ω / Phase ±10%		10.5 Ω / Phase ±10%
Inductance	2.1 mH / Phase ±20%		4.0 mH / Phase ±20%
Unit weight (packaged)	≈ 0.092 kg (≈ 0.192 kg)		≈ 0.120 kg (≈ 0.219 kg)
Model	Ai-M-28SB	Ai-M-28MB	Ai-M-28LB
Max. stop torque	0.05 N m	0.14 N m	0.16 N m
Rotor inertia moment	9×10 ⁻⁷ kg · m ²	12×10 ⁻⁷ kg · m ²	18×10 ⁻⁷ kg · m ²
Rated current	1.0 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	5.78 Ω / Phase ±10%	8.8 Ω / Phase ±10%	10.1 Ω / Phase ±10%
Inductance	3.2 mH / Phase ±20%	6.0 mH / Phase ±20%	6.2 mH / Phase ±20%
Unit weight (packaged)	≈ 0.162 kg (≈ 0.260 kg)	≈ 0.222 kg (≈ 0.318 kg)	≈ 0.248 kg (≈ 0.342 kg)
Model	Ai-M-35SB	Ai-M-35MB	Ai-M-35LB
Max. stop torque	0.07 N m	0.13 N m	0.31 N m
Rotor inertia moment	8×10 ⁻⁷ kg · m ²	14×10 ⁻⁷ kg · m ²	22×10 ⁻⁷ kg · m ²
Rated current	1.2 A / Phase		
Basic step angle	1.8° / 0.9° (Full / Half step)		
Resistance	2.1 Ω / Phase ±10%	3.25 Ω / Phase ±10%	5.0 Ω / Phase ±10%
Inductance	1.25 mH / Phase ±20%	2.85 mH / Phase ±20%	5.6 mH / Phase ±20%
Unit weight (packaged)	≈ 0.180 kg (≈ 0.278 kg)	≈ 0.250 kg (≈ 0.347 kg)	≈ 0.366 kg (≈ 0.456 kg)
Motor phase	2-phase		
Run method	Bipolar		
Insulation class	B type (130°C)		
Insulation resistance	Between the motor coil and the case: ≥ 100 MΩ (500 VDC== megger)		
Dielectric strength	Between the all charging part and the case: 500 VAC≡ 50 / 60 Hz for 1 minute		
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	≤ 50 G		
Ambient temp.	0 to 50°C, storage: -20 to 70°C (no freezing or condensation)		
Ambient humi.	20 to 85%RH, storage: 15 to 90%RH (no freezing or condensation)		
Protection rating	IP30 (IEC34-5 standard)		
Certification	CE 		
Stop angle error	± 0.09° (Full step, no load)		
Shaft vibration	0.03 mm T.I.R.		
Radial movement ⁰¹⁾	≤ 0.025 mm T.I.R.		
Axial movement ⁰²⁾	≤ 0.005 mm T.I.R.		
Shaft concentricity	0.05 mm T.I.R.		
Shaft perpendicularity	0.075 mm T.I.R.		

01) Amount of radial shaft displacement when adding a radial load (450 g) to the top of the shaft.
02) Amount of radial shaft displacement when adding a axial load (920 g) to the shaft.



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Encoder type	Incremental Rotary Encoder		
Frame size	<input type="checkbox"/> 20 mm	<input type="checkbox"/> 28 mm	<input type="checkbox"/> 35 mm
Power supply	5 VDC≡ ± 5% (ripple P-P: ≤ 5%)		
Current consumption	≤ 50 mA (No load)		
Resolution	4,000 PPR (1,000 PPR × 4)	16,000 PPR (4,000 PPR × 4)	
Control output	Line driver Output		
Output phase	A, \bar{A} , B, \bar{B} , Z, \bar{Z}		
Output waveform	Output phase: $\frac{T}{2} \pm \frac{T}{3}$, A-B phase difference: $\frac{T}{4} \pm \frac{T}{4}$ (T = 1 cycle of A)		
Inflow current	≤ 20 mA		
Residual voltage	≤ 0.5 VDC≡		
Outflow current	≤ -20 mA		
Output voltage	≥ 2.5 VDC≡		
Response speed ⁰¹⁾	≤ 1.5 μs	≤ 1 μs	
Max. response freq.	200 kHz	1,000 kHz	

01) Cable length: 2 m, I sink = 20 mA

Built-In Gear / Rotary Actuator Type 2-Phase Closed-Loop Stepper Motor

Ai-M-G / Ai-M-R Series



Features

- Built-in planetary gear type motor (Ai-M-G)
- Built-in rotary actuator type motor (Ai-M-R)
- Supports □ 42 mm, □ 60 mm

* Sold Separately

- Motor + Encoder cable: C1D14M-□ (fixed type), C1DF14M-□ (flexible type)
- Flexible coupling: ERB Series

Specifications

Model	Ai-M-42MA-G5	Ai-M-42MA-G7.2	Ai-M-42MA-G10
Max. stop torque	1.5 N m	2 N m	2 N m
Rotor inertia moment	54×10 ⁻⁷ kg · m ²		
Rated current	1.7 A / Phase		
Allowable torque	1 N m	1.5 N m	1.5 N m
Standard step angle	0.36°	0.25°	0.18°
Backlash	35 min (0.58°)		
Resistance	1.85 Ω / Phase ±10%		
Inductance	3.5 mH / Phase ±20%		
Unit weight (packaged)	≈ 0.58 kg (≈ 0.70 kg)		

Model	Ai-M-60MA-□5	Ai-M-60MA-□7.2	Ai-M-60MA-□10
Max. stop torque	7 N m	9 N m	11 N m
Rotor inertia moment	490×10 ⁻⁷ kg · m ²		
Rated current	3.5 A / Phase		
Allowable torque	5 N m	6 N m	7 N m
Standard step angle	0.36°	0.25°	0.18°
Backlash	35 min (0.58°)		
Resistance	1.23 Ω / Phase ±10%		
Inductance	2.6 mH / Phase ±20%		
Unit weight (packaged)	≈ 1.52 kg (≈ 1.68 kg)		
	≈ 1.60 kg (≈ 1.76 kg)		

01) Listed in order of Built-in gear type
Built-in rotary actuator type

Motor phase	2-phase
Run method	Bipolar
Insulation class	B type (130°C)
Insulation resistance	Between the motor coil and the case: ≥ 100 MΩ (500 VDC= megger)
Dielectric strength	Between the all charging part and the case: 500 VAC~ 50 / 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 50 G
Ambient temp.	0 to 50°C, storage: -20 to 70°C (no freezing or condensation)
Ambient humi.	20 to 85%RH, storage: 15 to 90%RH (no freezing or condensation)
Protection rating	IP30 (IEC standard)
Certification	CE
Stop angle error	± 0.09° (Full step, no load)
Shaft vibration	0.03 mm T.I.R.
Radial Movement ⁰¹⁾	≤ 0.025 mm T.I.R.
Axial Movement ⁰²⁾	≤ 0.01 mm T.I.R.
Shaft concentricity	0.05 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) Amount of radial shaft displacement when applying radial load (25 N) to the end of the motor shaft

02) Amount of axial shaft displacement when applying axial load (50 N) to the motor shaft



View product detail

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Encoder type	Incremental Rotary Encoder
Power supply	5 VDC \pm 5% (ripple P-P: \leq 5%)
Current consumption	\leq 50 mA (no load)
Resolution	10,000 PPR (2,500 PPR \times 4-multiply)
Control output	Line driver output
Output phase	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Output waveform	Output duty rate: $\frac{T}{2} \pm \frac{T}{4}$, A-B phase difference $\frac{T}{4} \pm \frac{T}{8}$ (T = 1 cycle of A)
Inflow current	\leq 20 mA
Residual voltage	\leq 0.5 VDC \pm
Outflow current	\leq -20 mA
Output voltage	\geq 2.5 VDC \pm
Response speed	\leq 0.5 μ s (based on cable length: 2 m, I sink = 20 mA)
Max. response frequency	300 kHz

Standard / Built-In Brake Type AC Power Input 2-Phase Closed-Loop Stepper Motor

AiA-M / AiA-M-B Series



Features

- Supports □ 60 mm, □ 86 mm
- Non-excitation electromagnetic built-in brake type Motor (AiA-M-B Series)
- * Sold Separately
- Motor + Encoder cable: C1D14M-□ (fixed type), C1DF14M-□ (flexible type)
- Flexible coupling: ERB Series

Specifications

Model	AiA-M-60MA-□	AiA-M-60LA-□
Max. stop torque	1.1 N m	2.2 N m
Rotor inertia moment	$240 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$490 \times 10^{-7} \text{ kg} \cdot \text{m}^2$
Rated current	2.0 A / Phase	
Basic step angle	1.8° / 0.9° (Full / Half step)	
Resistance	1.5 Ω / Phase ±10%	2.4 Ω / Phase ±10%
Inductance	3.9 mH / Phase ±20%	8.5 mH / Phase ±20%
Unit weight (packaged) ⁰¹⁾	≈ 0.75 kg (≈ 0.95 kg) ≈ 1.35 kg (≈ 1.53 kg)	≈ 1.15 kg (≈ 1.35 kg) ≈ 1.75 kg (≈ 1.90 kg)
Model	AiA-M-86MA-□	AiA-M-86LA-□
Max. stop torque	2.8 N m	4.0 N m
Rotor inertia moment	$1,100 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$1,800 \times 10^{-7} \text{ kg} \cdot \text{m}^2$
Rated current	2.0 A / Phase	
Basic step angle	1.8° / 0.9° (Full / Half step)	
Resistance	2.3 Ω / Phase ±10%	1.9 Ω / Phase ±10%
Inductance	11.5 mH / Phase ±20%	16.2 mH / Phase ±20%
Unit weight (packaged) ⁰¹⁾	≈ 1.70 kg (≈ 2.00 kg) ≈ 2.50 kg (≈ 2.76 kg)	≈ 2.30 kg (≈ 2.60 kg) ≈ 3.10 kg (≈ 3.36 kg)

01) Listed in order of Standard type
Built-in brake type

Motor phase	2-phase
Run method	Bipolar
Insulation class	B type (130°C)
Insulation resistance	Between the motor coil and the case: $\geq 100 \text{ M}\Omega$ (500 VDC= megger)
Dielectric strength	Between the all charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	$\leq 50 \text{ G}$
Ambient temp.	0 to 50°C, storage: -20 to 70°C (no freezing or condensation)
Ambient humi.	20 to 85%RH, storage: 15 to 90%RH (no freezing or condensation)
Protection rating	IP30 (IEC34-5 standard)
Certification	CE
Stop angle error	± 0.09° (Full step, no load)
Shaft vibration	0.03 mm T.I.R.
Radial movement ⁰¹⁾	≤ 0.025 mm T.I.R.
Axial movement ⁰²⁾	≤ 0.01 mm T.I.R.
Shaft concentricity	0.05 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) Amount of radial shaft displacement when applying radial load (25 N) to the end of the shaft.
02) Amount of axial shaft displacement when applying axial load (50 N) to the shaft.

View product detail



Standard Type



Built-in Brake
Type

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Encoder type	Incremental Rotary Encoder	
Power supply	5 VDC \pm 5% (ripple P-P: \leq 5%)	
Current consumption	\leq 50 mA (No load)	
Resolution	10,000 PPR (2,500 PPR \times 4)	
Control output	Line driver Output	
Output phase	A, \bar{A} , B, \bar{B} , Z, \bar{Z}	
Output waveform	Output Duty rate: $\frac{T}{2} \pm \frac{T}{4}$, A-B phase difference: $\frac{T}{4} \pm \frac{T}{8}$ (T = 1 cycle of A)	
Inflow current	\leq 20 mA	
Residual voltage	\leq 0.5 VDC \pm	
Outflow current	\leq -20 mA	
Output voltage	\geq 2.5 VDC \pm	
Response speed	\leq 0.5 μ s (Cable length: 2 m, I sink = 20 mA)	
Max. response freq.	300 kHz	
Built-in brake type frame size	<input type="checkbox"/> 60 mm	<input type="checkbox"/> 86 mm
Rated excitation voltage	24 VDC \pm 10%	
Rated excitation current	0.275 A	0.479 A
Static friction torque	0.75 N m	2.6 N m
Rotation part inertia moment	1.9×10^{-6} kg \cdot m ²	12×10^{-6} kg \cdot m ²
Insulation class	B type (130°C)	
B type brake	Brake is released when power ON, brake is locked when power OFF	
Operating time	30 ms	40 ms
Releasing time	10 ms	25 ms

Built-In Gear / Rotary Actuator Type AC Power Input 2-Phase Closed-Loop Stepper Motor

AiA-M-G / AiA-M-R Series



Features

- Built-in planetary gear type motor (AiA-M-G)
- Built-in rotary actuator type motor (AiA-M-R)
- Supports □ 60 mm, □ 86 mm

* Sold Separately

- Motor + Encoder cable: C1D14M-□
(fixed type), C1DF14M-□ (flexible type)
- Flexible coupling: ERB Series

Specifications

Model	AiA-M-60LA-□5	AiA-MA-60LA-□7.2	AiA-MA-60LA-□10
Max. stop torque	7 N m	9 N m	11 N m
Rotor inertia moment	490×10 ⁻⁷ kg · m ²		
Rated current	2.0 A / Phase		
Allowable torque	5 N m	6 N m	7 N m
Standard step angle	0.36°	0.25°	0.18°
Backlash	35 min (0.58°)		
Resistance	2.4 Ω / Phase ±10%		
Inductance	8.5 mH / Phase ±20%		
Unit weight (packaged) ⁰¹⁾	≈ 1.54 kg (≈ 1.70 kg)		
	≈ 1.62 kg (≈ 1.78 kg)		

01) Listed in order of Built-in gear type
Built-in rotary actuator type

Model	AiA-M-86LA-G5	AiA-M-86LA-G7.2	AiA-M-86LA-G10
Max. stop torque	20 N m	28 N m	35 N m
Rotor inertia moment	1800×10 ⁻⁷ kg m ²		
Rated current	2.0 A / Phase		
Allowable torque	14 N m	20 N m	20 N m
Standard step angle	0.36°	0.25°	0.18°
Backlash	35 min (0.58°)		
Resistance	1.9 Ω / Phase ±10%		
Inductance	16.2 mH / Phase ±20%		
Unit weight (packaged)	≈ 3,700 kg (≈ 3,950 kg)		
Motor phase	2-phase		
Run method	Bipolar		
Insulation class	B type (130°C)		
Insulation resistance	Between the motor coil and the case: ≥ 100 MΩ (500 VDC= megger)		
Dielectric strength	Between the all charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 minute		
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock	≤ 50 G		
Ambient temp.	0 to 50°C, storage: -20 to 70°C (no freezing or condensation)		
Ambient humi.	20 to 85%RH, storage: 15 to 90%RH (no freezing or condensation)		
Protection rating	IP30 (IEC standard)		
Certification	CE		
Stop angle error	± 0.09° (Full step, no load)		
Shaft vibration	0.05 mm T.I.R.		
Radial Movement ⁰¹⁾	≤ 0.025 mm T.I.R.		
Axial Movement ⁰²⁾	≤ 0.01 mm T.I.R.		
Shaft concentricity	0.075 mm T.I.R.		
Shaft perpendicularity	0.075 mm T.I.R.		

01) Amount of radial shaft displacement when applying radial load (25 N) to the end of the motor shaft
02) Amount of axial shaft displacement when applying axial load (50 N) to the motor shaft



View product detail

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Encoder type	Incremental Rotary Encoder
Power supply	5 VDC \pm 5% (ripple P-P: \leq 5%)
Current consumption	\leq 50 mA (no load)
Resolution	10,000 PPR (2,500 PPR \times 4-multiply)
Control output	Line driver output
Output phase	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Output waveform	Output Duty rate: $\frac{T}{2} \pm \frac{T}{4}$, A-B phase difference: $\frac{T}{4} \pm \frac{T}{8}$ (T = 1 cycle of A)
Inflow current	\leq 20 mA
Residual voltage	\leq 0.5 VDC \pm
Outflow current	\leq -20 mA
Output voltage	\geq 2.5 VDC \pm
Response speed	\leq 0.5 μ s (based on cable length: 2 m, I sink = 20 mA)
Max. response frequency	300 kHz



G2. 2-Phase Stepper Motor Drivers

Stepper motor drivers receive pulse signals from a controlling unit such as a motion controller and transmits electric currents to motors.

G2-1	2-Phase Stepper Motor Drivers	MD2U-ID20 Series	Intelligent Type 2-Phase Stepper Motor Drivers
		MD2U-MD20 Series	Micro Step 2-Phase Stepper Motor Drivers

Intelligent Type

2-Phase Stepper

Motor Drivers


MD2U-ID20 Series



Features

- Unipolar constant current drive method
- STOP current setting provides holding torque (brake function)
- Isolated photocoupler input design minimizes influence from electrical noise
- Power supply Range: 24 - 35 VDC≐

Specifications

Model	MD2U-ID20
Power supply ⁰¹⁾	24 - 35 VDC≐ ± 10%
Permissible voltage range	90 to 110% of rated voltage
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current ⁰²⁾	0.5 - 2 A / Phase
STOP current	20 to 70% of RUN current (set by STOP current setting rotary switch)
RUN method	Unipolar constant current drive
Standard step angle	1.8° / Step
Max. RUN speed	1500 rpm
Input resistance	3.3 kΩ (CW/CCW, RUN/STOP, HOLD OFF)
Insulation resistance	Between the charging part and the case: ≥ 200 MΩ (500 VDC≐ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Noise immunity	± 500 VDC≐ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Certification	CE  ENEC
Unit weight (packaged)	≈ 109 g (≈ 303 g)

01) If a power supply is over 30 VDC≐, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area.

02) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.



View product detail

Micro Step

2-Phase Stepper

Motor Drivers

MD2U-MD20 Series



Features

- Unipolar constant current drive method
- STOP current setting provides holding torque (brake function)
- Low vibration operation with micro stepping drive
- Isolated photocoupler input design minimizes influence from electrical noise
- Power supply Range: 24 - 35 VDC

Specifications

Model	MD2U-MD20
Power supply ⁰¹⁾	24 - 35 VDC \pm 10%
Permissible voltage range	90 to 110% of rated voltage
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current ⁰²⁾	0.5 - 2 A / Phase
STOP current	20 to 70% of RUN current (set by stop current setting rotary switch)
RUN method	Unipolar constant current drive
Basic step angle	1.8° / Step
Resolution	1, 2, 4, 5, 8, 10, 16, 20 division (1.8° to 0.09° / Step)
Pulse width	\geq 10 μ s (CW / CCW), 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	\leq 0.5 μ s (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC, [L]: 0 - 0.5 VDC
Pulse input current	4 mA (CW / CCW), 10 mA (HOLD OFF)
Max. input pulse frequency	\leq 50 kHz (CW / CCW)
Input resistance	300 Ω (CW / CCW), 390 Ω (HOLD OFF)
Insulation resistance	Between the charging part and the case: \geq 200 M Ω (500 VDC megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC \sim 50 / 60 Hz for 1 min
Noise immunity	\pm 500 VDC square wave noise (pulse width: 1 μ s) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (\approx 30 G) in each X, Y, Z direction for 3 times
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Certification	CE
Unit weight (packaged)	\approx 180 g (\approx 295 g)

01) If a power supply is over 30 VDC, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area. The torque may vary depending on power supply.

02) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.



View product detail



G3. 5-Phase Stepper Motor & Drivers

Stepper motors are electric motors which rotate by converting electric current from motor drivers into equally divided steps of a full rotation.

G3-1	5-Phase Stepper Motors	AK Series	Standard / Built-In Brake Type 5-Phase Stepper Motors (□ 24 / 42 / 60 / 85 mm)
		AHK Series	Hollow Shaft Type 5-Phase Stepper Motor (□ 42 / 60 / 85 mm)
		AK-G / AK-R Series	Built-In Gear / Rotary Actuator Type 5-Phase Stepper Motors (□ 42 / 60 / 85 mm)
G3-2	5-Phase Stepper Drivers	MD5-HD14 Series	Micro Step 5-Phase Stepper Motor Drivers
		MD5-HF14 Series	Micro Step 5-Phase Stepper Motor Drivers
		MD5-HF14-AO Series	Micro Step 5-Phase Stepper Motor Drivers
		MD5-HF28 Series	Micro Step 5-Phase Stepper Motor Drivers
		MD5-ND14 Series	Micro Step 5-Phase Stepper Motor Drivers
		MD5-HD14-2X / MD5-HD14-3X Series	Micro Step 5-Phase Stepper Motor Drivers

Standard / Built-In Brake Type

5-Phase Stepper Motors

(□ 24 / 42 / 60 / 85 mm)

AK Series



Features

- Compact and light weight with high accuracy, high speed and high torque
- Ideal for building compact sized system
- Low price for improved cost efficiency
- In pursuit of compact equipment applied with □ 42 mm, □ 60 mm, □ 85 mm built-in brake type (AK-B Series)
- Brake releases when power is applied on brake wire (AK-B Series)

Specifications

Model	02K-S523□	04K-S525□	
Max. stop torque	0.18 kgf cm (0.018 N m)	0.28 kgf cm (0.028 N m)	
Rotor inertia moment	4.2×10 ⁻⁷ kg · m ²	8.2×10 ⁻⁷ kg · m ²	
Rated current	0.75 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged)	≈ 0.08 kg (≈ 0.10 kg)		≈ 0.12 kg (≈ 0.16 kg)
Model	A1K-S543□-□	A2K-S544□-□	A3K-S545□-□
Max. stop torque	1.3 kgf cm (0.13 N m)	1.8 kgf cm (0.18 N m)	2.4 kgf cm (0.24 N m)
Rotor inertia moment	35×10 ⁻⁷ kg · m ²	54×10 ⁻⁷ kg · m ²	68×10 ⁻⁷ kg · m ²
Rated current	0.75 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged) ⁰¹⁾	≈ 0.25 kg (≈ 0.34 kg)	≈ 0.30 kg (≈ 0.39 kg)	≈ 0.40 kg (≈ 0.49 kg)
	≈ 0.39 kg (≈ 0.44 kg)	≈ 0.44 kg (≈ 0.49 kg)	≈ 0.54 kg (≈ 0.59 kg)
Model	A4K-□564□-□	A8K-□566□-□	A16K-□569□-□
Max. stop torque	4.2 kgf cm (0.42 N m)	8.3 kgf cm (0.83 N m)	16.6 kgf cm (1.66 N m)
Rotor inertia moment	175×10 ⁻⁷ kg · m ²	280×10 ⁻⁷ kg · m ²	560×10 ⁻⁷ kg · m ²
Rated current	S: 0.75 A / Phase M: 1.4 A / Phase G: 2.8 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged) ⁰¹⁾	≈ 0.60 kg (≈ 0.85 kg)	≈ 0.80 kg (≈ 1.05 kg)	≈ 1.30 kg (≈ 1.55 kg)
	≈ 0.95 kg (≈ 1.03 kg)	≈ 1.25 kg (≈ 1.33 kg)	≈ 1.65 kg (≈ 1.73 kg)
Model	A21K-□596□-□	A41K-□599□-□	A63K-□5913□-□
Max. stop torque	21 kgf cm (2.1 N m)	41 kgf cm (4.1 N m)	63 kgf cm (6.3 N m)
Rotor inertia moment	1,400×10 ⁻⁷ kg · m ²	2,700×10 ⁻⁷ kg · m ²	4,000×10 ⁻⁷ kg · m ²
Rated current	M: 1.4 A / Phase G: 2.8 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged) ⁰¹⁾	≈ 1.70 kg (≈ 2.15 kg)	≈ 2.80 kg (≈ 3.25 kg)	≈ 3.80 kg (≈ 4.25 kg)
	≈ 2.64 kg (≈ 2.74 kg)	≈ 3.74 kg (≈ 3.84 kg)	≈ 4.74 kg (≈ 4.84 kg)

01) Listed in order of Standard type
Built-in brake type




[View product detail](#)



Standard type



Built-in brake type

Motor phase	5-phase
Insulation class	B type (130°C)
Insulation resistance	Between the charging part and the case: $\geq 100 \text{ M}\Omega$ (500 VDC≡ megger)
Dielectric strength ⁰¹⁾	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Temperature rise	$\leq 80^\circ\text{C}$ (5-phase excitation for rated current, while stop)
Ambient temp.	-10 to 50°C, storage: -25 to 85°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection rating	IP30 (IEC34-5 standard)
Certification	  
Stop angle error	$\pm 3'$ ($\pm 0.05^\circ$) (Full step, no load)
Shaft vibration	0.05 mm T.I.R.
Radial movement ⁰²⁾	$\leq 0.025 \text{ mm}$ T.I.R.
Axial movement ⁰³⁾	$\leq 0.075 \text{ mm}$ T.I.R.
Shaft concentricity	0.075 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) In case of rated current: 0.75 A / Phase, Between motor coil and case: 500 VAC~ 50 / 60 Hz for 1 minute

02) Amount of radial shaft displacement when applying radial load (5 N) to the end of the shaft.

03) Amount of axial shaft displacement when applying axial load (10 N) to the shaft.

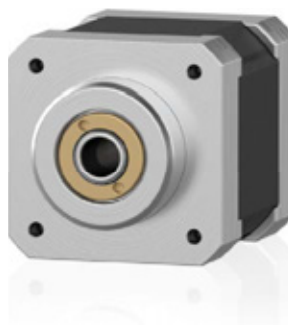
Built-in brake type Frame size	<input type="checkbox"/> 42 mm	<input type="checkbox"/> 60 mm	<input type="checkbox"/> 85 mm
Rated excitation voltage	24 VDC≡ $\pm 10\%$		
Rated excitation current	0.2 A	0.33 A	0.62 A
Static friction torque	$\geq 0.18 \text{ N}\cdot\text{m}$	$\geq 0.8 \text{ N}\cdot\text{m}$	$\geq 4.0 \text{ N}\cdot\text{m}$
Rotation part inertia moment	$3 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$29 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$153 \times 10^{-7} \text{ kg} \cdot \text{m}^2$
Insulation class	B type (130°C)		
B type brake	Brake is released when power ON, brake is locked when power OFF		
Operating time	$\leq 25 \text{ ms}$	$\leq 25 \text{ ms}$	$\leq 60 \text{ ms}$
Releasing time	$\leq 15 \text{ ms}$	$\leq 20 \text{ ms}$	$\leq 15 \text{ ms}$

Hollow Shaft Type

5-Phase Stepper Motors

(□ 42 / 60 / 85 mm)


AHK Series



Features

- Direct connection of Ball-screw, TM-screw and etc. without couplings
- No resonance (vibration, noise) due to removed coupling
- Low cost of applied system by improving the coupling accuracy and reducing the number of parts and installation process
- Compact and light weight with high accuracy, high speed and high torque
- Ideal for building compact sized system

Specifications

Model	AH1K-S543-□	AH2K-S544-□	AH3K-S545-□
Max. stop torque	1.3 kgf cm (0.13 N m)	1.8 kgf cm (0.18 N m)	2.4 kgf cm (0.24 N m)
Rotor inertia moment	$35 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$54 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$68 \times 10^{-7} \text{ kg} \cdot \text{m}^2$
Rated current	0.75 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged)	≈ 0.25 kg (≈ 0.35 kg)	≈ 0.30 kg (≈ 0.40 kg)	≈ 0.40 kg (≈ 0.50 kg)
Model	AH4K-□564□-□	AH8K-□566□-□	AH16K-□569□-□
Max. stop torque	4.2 kgf cm (0.42 N m)	8.3 kgf cm (0.83 N m)	16.6 kgf cm (1.66 N m)
Rotor inertia moment	$175 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$280 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$560 \times 10^{-7} \text{ kg} \cdot \text{m}^2$
Rated current	S: 0.75 A / Phase M: 1.4 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged)	≈ 0.60 kg (≈ 0.87 kg)	≈ 0.80 kg (≈ 1.07 kg)	≈ 1.30 kg (≈ 1.57 kg)
Model	AH21K-□596□-□	AH41K-□599□-□	AH63K-□5913□-□
Max. stop torque	21 kgf cm (2.1 N m)	41 kgf cm (4.1 N m)	63 kgf cm (6.3 N m)
Rotor inertia moment	$1,400 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$2,700 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$4,000 \times 10^{-7} \text{ kg} \cdot \text{m}^2$
Rated current	M: 1.4 A / Phase G: 2.8 A / Phase		
Basic step angle	0.72° / 0.36° (Full / Half step)		
Unit weight (packaged)	≈ 1.70 kg (≈ 2.18 kg)	≈ 2.80 kg (≈ 3.28 kg)	≈ 3.80 kg (≈ 4.28 kg)
Motor phase	5-phase		
Insulation class	B type (130°C)		
Insulation resistance	Between the charging part and the case: ≥ 100 MΩ (500 VDC≡ megger)		
Dielectric strength ⁰¹⁾	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 minute		
Temperature rise	≤ 80°C (5-phase excitation for rated current, while stop)		
Ambient temp.	-10 to 50°C, storage: -25 to 85°C (no freezing or condensation)		
Ambient humi.	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)		
Protection rating	IP30 (IEC34-5 standard)		
Certification	CE 		

01) In case of rated current: 0.75 A / Phase, Between motor coil and case: 500 VAC~ 50 / 60 Hz for 1 minute



View product detail

Built-In Gear / Rotary Actuator Type 5-Phase Stepper Motors

(□ 42 / 60 / 85 mm)

AK-G / AK-R Series



Features

- Ideal for building compact sized system
- Low price for improved cost efficiency
- Backlash □ 42 mm: ± 35' (0.58°),
□ 60 mm: ± 20' (0.33°), □ 85 mm: ± 15' (0.25°)
- Brake releases when 24 VDC is applied on
brake wire (AK-GB Series, AK-RB Series)
- Basic step angle 1:5 → 0.144°, 1:7.2 → 0.1°,
1:10 → 0.072°
- Allowable speed 1:5 → 0 to 360 rpm,
1:7.2 → 0 to 250 rpm, 1:10 → 0 to 180 rpm

Specifications

Model	A10K-S545□-□5	A15K-S545□-□7.2	A15K-S545□-□10
Max. allowable torque	10 kgf cm (1.0 N m)	15 kgf cm (1.5 N m)	
Rotor inertia moment ⁰¹⁾	68×10 ⁻⁷ kg · m ²		
Rated current	0.75 A / Phase		
Basic step angle	0.144° / 0.072° (Full / Half step)	0.1° / 0.05° (Full / Half step)	0.072° / 0.036° (Full / Half step)
Allowable speed range	0 to 360 rpm	0 to 250 rpm	0 to 180 rpm
Backlash	± 35' (0.58°)		
Unit weight (packaged) ⁰²⁾	≈ 0.58 kg (≈ 0.68 kg) ≈ 0.72 kg (≈ 0.78 kg)		
Model	A35K-M566□-□5	A40K-M566□-□7.2	A50K-M566□-□10
Max. allowable torque	35 kgf cm (3.5 N m)	40 kgf cm (4.0 N m)	50 kgf cm (5.0 N m)
Rotor inertia moment ⁰¹⁾	280×10 ⁻⁷ kg · m ²		
Rated current	1.4 A / Phase		
Basic step angle	0.144° / 0.072° (Full / Half step)	0.1° / 0.05° (Full / Half step)	0.072° / 0.036° (Full / Half step)
Allowable speed range	0 to 360 rpm	0 to 250 rpm	0 to 180 rpm
Backlash	± 20' (0.33°)		
Unit weight (packaged) ⁰²⁾	Built-in gear type: ≈ 1.30 kg (≈ 1.57 kg) Built-in rotary actuator type: ≈ 1.30 kg (≈ 1.40 kg) Built-in gear type: ≈ 0.95 kg (≈ 1.03 kg) Built-in rotary actuator type: ≈ 1.60 kg (≈ 1.70 kg)		
Model	A140K-□599□-□5	A200K-□599□-□7.2	A200K-□599□-□10
Max. allowable torque	140 kgf cm (14.0 N m)	200 kgf cm (20.0 N m)	
Rotor inertia moment ⁰¹⁾	2,700×10 ⁻⁷ kg · m ²		
Rated current	M: 1.4 A / Phase G: 2.8 A / Phase		
Basic step angle	0.144° / 0.072° (Full / Half step)	0.1° / 0.05° (Full / Half step)	0.072° / 0.036° (Full / Half step)
Allowable speed range	0 to 360 rpm	0 to 250 rpm	0 to 180 rpm
Backlash	± 15' (0.25°)		
Unit weight (packaged) ⁰¹⁾	≈ 4.40 kg (≈ 4.88 kg) ≈ 2.64 kg (≈ 2.74 kg)		

01) Listed in order of Standard type
Built-in brake type

View product detail



Built-in gear type



Geared type
with built-in brakes



Rotary actuator type



Rotary actuator type
with built-in brakes

Next Page ►

Motor phase	5-phase
Insulation class	B type (130°C)
Insulation resistance	Between the charging part and the case: $\geq 100 \text{ M}\Omega$ (500 VDC≡ megger)
Dielectric strength ⁰¹⁾	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 minute
Temperature rise ⁰²⁾	$\leq 80^\circ\text{C}$ (5-phase excitation for rated current, while stop)
Ambient temp.	-10 to 50°C, storage: -25 to 85°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Protection rating	IP30 (IEC34-5 standard)
Certification	  
Stop angle error ⁰²⁾	$\pm 3'$ ($\pm 0.05^\circ$) (Full step, no load)
Absolut position error ⁰³⁾	$\pm 20'$ ($\pm 0.33^\circ$)
Lost motion ⁰³⁾	$\pm 20'$ ($\pm 0.33^\circ$)
Shaft vibration	0.05 mm T.I.R.
Radial movement ⁰⁴⁾	$\leq 0.025 \text{ mm}$ T.I.R.
Axial movement ⁰⁵⁾	$\leq 0.075 \text{ mm}$ T.I.R.
Shaft concentricity	0.075 mm T.I.R.
Shaft perpendicularity	0.075 mm T.I.R.

01) In case of rated current: 0.75 A / Phase, Between motor coil and case: 500 VAC~ 50 / 60 Hz for 1 minute

02) The corresponding value is only available in built-in gear type.

03) The corresponding value is only available in built-in rotary actuator type.

04) Amount of radial shaft displacement when applying radial load (5 N) to the end of the shaft.

05) Amount of axial shaft displacement when applying axial load (10 N) to the shaft.

Built-in brake type Frame size	<input type="checkbox"/> 42 mm	<input type="checkbox"/> 60 mm	<input type="checkbox"/> 85 mm
Rated excitation voltage	24 VDC≡ $\pm 10\%$		
Rated excitation current	0.2 A	0.33 A	0.62 A
Static friction torque	$\geq 0.18 \text{ N}\cdot\text{m}$	$\geq 0.8 \text{ N}\cdot\text{m}$	$\geq 4.0 \text{ N}\cdot\text{m}$
Rotation part inertia moment	$3 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$29 \times 10^{-7} \text{ kg} \cdot \text{m}^2$	$153 \times 10^{-7} \text{ kg} \cdot \text{m}^2$
Insulation class	B type (130°C)		
B type brake	Brake is released when power ON, brake is locked when power OFF		
Operating time	$\leq 25 \text{ ms}$	$\leq 25 \text{ ms}$	$\leq 60 \text{ ms}$
Releasing time	$\leq 15 \text{ ms}$	$\leq 20 \text{ ms}$	$\leq 15 \text{ ms}$

Micro Step

5-Phase Stepper

Motor Drivers

MD5-HD14 Series



Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Low speed rotation and extreme precision control with micro stepping drive (Max. resolution is 250 divisions. In case of 5 phase stepper motor with 0.72° basic step angle, it can be controlled down to 0.00288° per pulse, 125000 pulses are required for a single revolution.)
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-HD14
Power supply ⁰¹⁾	20 - 35 VDC≒
Permissible voltage range	90 to 110% of rated voltage
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current ⁰²⁾	0.4 - 1.4 A / Phase
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)
RUN method	Bipolar constant current pentagon drive
Basic step angle	0.72° / Step
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)
Pulse width	≥ 10 μs (CW / CCW), ≥ 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 130 ns (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC≒, [L]: 0 - 0.5 VDC≒
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF, DIVISION SELECTION, ZERO OUT)
Max. input pulse freq.	≤ 500 kHz (CW / CCW)
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF, DIVISION SELECTION), 10 Ω (ZERO OUT)
Insulation resistance	Between the charging part and the case: ≥ 100 MΩ (500 VDC≒ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Noise immunity	± 500 VDC≒ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 10 minutes
Ambient temp.	0 to 40°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Certification	CE
Unit weight (packaged)	≈ 220 g (≈ 327.5 g)

01) If a power supply is over 30 VDC≒, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area. The torque may vary depending on power supply.

02) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.



View product detail

Micro Step

5-Phase Stepper

Motor Drivers

MD5-HF14 Series



Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Low speed rotation and extreme precision control with micro stepping drive (Max. resolution is 250 divisions. In case of 5 phase stepper motor with 0.72° basic step angle, it can be controlled down to 0.00288° per pulse, 125000 pulses are required for a single revolution.)
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-HF14
Power supply	100 - 220 VAC~ 50 / 60 Hz
Permissible voltage range	90 to 110% of rated voltage
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current ⁰¹⁾	0.4 - 1.4 A / Phase
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)
RUN method	Bipolar constant current pentagon drive
Basic step angle	0.72° / Step
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)
Pulse width	≥ 1 μs (CW / CCW), ≥ 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 130 ns (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC≡, [L]: 0 - 0.5 VDC≡
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF, DIVISION SELECTION, ZERO OUT)
Max. input pulse freq.	≤ 500 kHz (CW / CCW)
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF, DIVISION SELECTION), 10 Ω (ZERO OUT)
Insulation resistance	Between the charging part and the case: ≥ 100 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Noise immunity	± 2000 VDC≡ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 10 minutes
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Certification	CE, RoHS, REACH, ENEC
Unit weight (packaged)	≈ 690 g (≈ 840 g)

01) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.



View product detail

Micro Step

5-Phase Stepper

Motor Drivers

MD5-HF14-AO Series



Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Low speed rotation and extreme precision control with micro stepping drive (Max. resolution is 250 divisions. In case of 5 phase stepper motor with 0.72° basic step angle, it can be controlled down to 0.00288° per pulse, 125000 pulses are required for a single revolution.)
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-HF14-AO
Power supply	100 - 220 VAC~ 50 / 60 Hz
Permissible voltage range	90 to 110% of rated voltage
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current ⁰¹⁾	0.4 - 1.4 A / Phase
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)
RUN method	Bipolar constant current pentagon drive
Basic step angle	0.72° / Step
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)
Pulse width	≥ 1 μs (CW / CCW), ≥ 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 130 ns (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC≡, [L]: 0 - 0.5 VDC≡
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF)
Max. input pulse freq.	≤ 500 kHz (CW / CCW)
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF), 10 Ω (ALARM)
Insulation resistance	Between the charging part and the case: ≥ 100 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Noise immunity	± 2000 VDC≡ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 10 minutes
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Certification	CE, RoHS, REACH
Unit weight (packaged)	≈ 660 g (≈ 820 g)

01) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.



View product detail

Micro Step

5-Phase Stepper

Motor Drivers

MD5-HF28 Series



Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Low speed rotation and extreme precision control with micro stepping drive (Max. resolution is 250 divisions. In case of 5 phase stepper motor with 0.72° basic step angle, it can be controlled down to 0.00288° per pulse, 125000 pulses are required for a single revolution.)
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-HF28
Power supply	100 - 220 VAC~ 50 / 60 Hz
Permissible voltage range	90 to 110% of rated voltage
Max. current consumption	5 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current ⁰¹⁾	1.0 - 2.8 A / Phase
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)
RUN method	Bipolar constant current pentagon drive
Basic step angle	0.72° / Step
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)
Pulse width	≥ 1 μs (CW / CCW), ≥ 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 130 ns (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC≡, [L]: 0 - 0.5 VDC≡
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF, DIVISION SELECTION, ZERO OUT)
Max. input pulse freq.	≤ 500 kHz (CW / CCW)
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF, DIVISION SELECTION), 10 Ω (ZERO OUT)
Insulation resistance	Between the charging part and the case: ≥ 100 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Noise immunity	± 2000 VDC≡ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 10 minutes
Ambient temp.	0 to 50°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Certification	CE, RoHS, REACH, ENEC
Unit weight (packaged)	≈ 1.2 kg (≈ 1.35 kg)

01) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.



View product detail

Micro Step

5-Phase Stepper

Motor Drivers

MD5-ND14 Series



Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-ND14
Power supply ⁰¹⁾	20 - 35 VDC≒
Permissible voltage range	90 to 110% of rated voltage
Max. current consumption	3 A (based on ambient temp. 25°C, ambient humi. 55%RH)
RUN current ⁰²⁾	0.5 - 1.5 A / Phase
Stop current	25 to 75% of RUN current (set by STOP current setting rotary switch)
RUN method	Bipolar constant current pentagon drive
Basic step angle	0.72° / Step
Resolution	1 division (0.72° / Step), 2 division (0.36° / Step)
Pulse width	≥ 10 μs (CW / CCW), 1 ms (HOLD OFF)
Duty rate	50% (CW / CCW)
Rise, Fall time	≤ 130 ns (CW / CCW)
Pulse input voltage	[H]: 4 - 8 VDC≒, [L]: 0 - 0.5 VDC≒
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF)
Max. input pulse freq.	≤ 50 kHz (CW / CCW)
Input resistance	390 Ω (CW/CCW, HOLD OFF)
Insulation resistance	Between the charging part and the case: ≥ 100 MΩ (500 VDC≒ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Noise immunity	± 500 VDC≒ square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 10 minutes
Ambient temp.	0 to 40°C, storage: -10 to 60°C (no freezing or condensation)
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)
Certification	CE ENEC
Unit weight (packaged)	≈ 130 g (≈ 183 g)

⁰¹⁾ If a power supply is over 30 VDC≒, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area. The torque may vary depending on power supply.

⁰²⁾ RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.



View product detail

Micro Step

5-Phase Stepper

Motor Drivers

MD5-HD14-2X / MD5-HD14-3X Series



Features

- Bipolar constant current pentagon drive method
- Various built-in functions including auto current down and self-diagnosis
- Isolated photocoupler input design minimizes influence from electrical noise

Specifications

Model	MD5-HD14-2X	MD5-HD14-3X
Number of axes	2-axis	3-axis
Power supply ⁰¹⁾	20 - 35 VDC≡	
Permissible voltage range	90 to 110% of rated voltage	
Max. current consumption ⁰²⁾	5 A	7 A
RUN current ⁰³⁾	0.4 - 1.4 A / Phase	
Stop current	27 to 90% of RUN current (set by STOP current setting rotary switch)	
RUN method	Bipolar constant current pentagon drive	
Basic step angle	0.72° / Step	
Resolution	1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250 division (0.72° to 0.00288° / Step)	
Pulse width	≥ 1 μs (CW / CCW), ≥ 1 ms (HOLD OFF)	
Duty rate	50% (CW / CCW)	
Rise, Fall time	≤ 130 ns (CW / CCW)	
Pulse input voltage	[H]: 4 - 8 VDC≡, [L]: 0 - 0.5 VDC≡	
Pulse input current	7.5 - 14 mA (CW / CCW), 10 - 16 mA (HOLD OFF, ZERO OUT ⁰⁴⁾)	
Max. input pulse freq.	≤ 500 kHz (CW / CCW)	
Input resistance	270 Ω (CW / CCW), 390 Ω (HOLD OFF), 10 Ω (ZERO OUT ⁰⁴⁾)	
Insulation resistance	Between the charging part and the case: ≥ 100 MΩ (500 VDC≡ megger)	
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min	
Noise immunity	± 500 VDC≡ square wave noise (pulse width: 1 μs) by the noise simulator	
Vibration	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	1.5 mm double amplitude at frequency 5 to 60 Hz in each X, Y, Z direction for 10 minutes	
Ambient temp.	0 to 40°C, storage: -10 to 60°C (no freezing or condensation)	
Ambient humi.	35 to 85% RH, storage: 35 to 85% RH (no freezing or condensation)	
Certification	CE UK ENEC	
Unit weight (packaged)	≈ 292 g (≈ 446 g)	≈ 411 g (≈ 597 g)

01) If a power supply is over 30 VDC≡, the torque characteristics in the high speed range will improve, but the driver's temperature will increase as well. Install the unit in well-ventilated area. The torque may vary depending on power supply.

02) Based on ambient temp. 25°C, ambient humi. 55%RH

03) RUN current varies depending on the RUN frequency, and the max. instantaneous RUN current varies depending on load.

04) ZERO OUT is only available for MD5-HD14-3Xand option.



View product detail



G4. Motion Controllers

Motion controllers are devices that generate pulse signals for precise and proper control of stepper motor drivers and stepper motors.

G4-1	Stand-Alone	PMC-1HS / PMC-2HS Series	1 Axis / 2 Axis Motion Controllers
		PMC-2HSP Series	2 Axis Interpolation Type Motion Controllers
G4-2	PCI Card	PMC-4B-PCI Series	4 Axis Board Type Motion Controllers

1 Axis / 2 Axis

Motion Controllers

PMC-1HS / PMC-2HS Series



Features

- High-speed processing up to 4 Mpps
- 4 operation modes: Scan mode, Continuous mode, Index mode, Program mode
- 12 control commands and up to 64 steps of programming per axis
- Parallel interface input / output terminal to communicate with various PLCs
- Operation programming, parameter configuration and editing with dedicated software
- Joystick signal support for convenient XY stage control
- Remote controlling possible with serial port (RS232C) on all models
- Teaching and monitoring with Teaching Unit (PMC-2TU-232)

- * Sold Separately
- Teaching unit (PCM-2TU-232)

Specifications

Model	PMC-1HS-232	PMC-1HS-USB	PMC-2HS-232	PMC-2HS-USB
Power supply	24 VDC \pm 10%			
Power consumption	\leq 6 W			
Control axes	1 axis		2 axis (each axis can be programmed independently)	
Motor control	Pulse input stepper motor or servo motor			
In-Position setting	ABSOLUTE method / INCREMENTAL method			
In-Position range	-8,388,608 to +8,388,607 (available pulse scaling function)			
Drive speed	1 pps to 4 Mpps (1 to 8000 \times magnification 1 to 500)			
Pulse output method	2 pulse output method (line driver output)			
Operation mode	Jog mode, Continuous mode, Index mode, Program mode			
No. of drive speed	4			
Program save	EEPROM			
Index steps	64 step per each axis			
Steps	64 Step			
Control command	ABS, INC, HOM, IJP, OUT, OTP, JMP, REP, RPE, END, TIM, NOP			
Program function	Power On Program Start, Power On Home Search			
Home search mode	High speed near home search (STEP1) \rightarrow Low speed near home search (STEP2) \rightarrow Encoder Z phase search (STEP3) \rightarrow Offset movement (STEP4) Configuring the detection direction and Enable/Disable in each step			
General output	1 point		2 point	
Control interface	Parallel I/F			
Ambient temp.	0 to 45°C (no freezing or condensation)			
Ambient humi.	35 to 85%RH (no freezing or condensation)			
Certification	CE UK ENEC			
Unit weight (packaged)	\approx 96.8 g (\approx 386 g)	\approx 96.9 g (\approx 421.6 g)	\approx 100.2 g (\approx 393.6 g)	\approx 100.4 g (\approx 432.2 g)



View product detail

2 Axis Interpolation Type Motion Controllers

PMC-2HSP Series



Features

- High speed independent 2 axis control with processing speed up to 4 Mpps
- Supports linear and circular interpolation control
- 17 control commands and up to 200 steps of operation programming
- Supports various control interfaces (USB, RS232C, RS485, Parallel I/F)
- Multiple control of up to 32 axes (16 units) with RS485 communication (Modbus RTU)
- 4 operation modes: Jog mode, Continuous mode, Index mode, Program mode
- Symmetrical / asymmetrical trapezoid or S-shaped acceleration/deceleration control

Specifications

Model	PMC-2HSP-USB	PMC-2HSP-485
Power supply	24 VDC \pm 10%	
Power consumption	\leq 6 W	
Control output	50 mA	
Control axes	2 axis	
Motor control	Pulse input stepper motor or servo motor	
In-Position range	-8,388,608 to +8,388,607 (selectable absolute / relative value, available pulse scaling function)	
Drive speed	1 pps to 4 Mpps (1 to 8,000 pps \times magnification 1 to 500)	
Pulse output method	1 pulse / 2 pulse output method (line driver output)	
Operation mode	Jog mode, Continuous mode, Index mode, Program mode	
Index steps	64 step for each axis	
Steps	200 steps	
Control command	ABS, INC, HOM, LID, CID, FID, RID, FRID, TIM, JMP, REP, RPE, ICJ, IRD, OPC, OPT, NOP, END	
Program function	Power On Program Start, Power On Home Search	
Home search mode	High speed near home search (STEP1) \rightarrow Low speed near home search (STEP2) \rightarrow Encoder Z phase search (STEP3) \rightarrow Offset movement (STEP4)	
I/O	Parallel I/F (CN3): 13 inputs, 4 outputs X axis (CN4): 8 inputs, 6 outputs (2 general input, 2 general output) Y axis (CN5): 8 inputs, 6 outputs (2 general input, 2 general output)	
Ambient temp.	0 to 45°C, storage: -15 to 70°C (no freezing or condensation)	
Ambient humi.	20 to 90%RH, storage: 20 to 90%RH (no freezing or condensation)	
Certification	CE	CE
Unit weight (packaged)	\approx 101.5 g (\approx 344 g)	\approx 101.6 g (\approx 308.7 g)



View product detail

4 Axis

Board Type

Motion Controllers

PMC-4B-PCI Series



Features

- Independent 4-axis control of AC servo motors and stepper motors
- PC-PCI card type
- Auto home search function and synchronous operation
- Interpolation control for circular, linear, bit pattern, continuous, acceleration, and deceleration drives
- 2-axis / 3-axis constant linear velocity
- Supports Windows 98, NT, 2000, XP, Windows 7
- Labview library and help, and C language library and samples available on www.autonics.com

Specifications

Model	PMC-4B-PCI
Power supply	5 VDC \pm 10% (using PC internal power)
External power supply	12 - 24 VDC \pm 10%
Control axes	4 axis
CPU data bus	8 / 16 bit selection
Ambient temp.	0 to 45°C, storage: -10 to 55°C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)
Certification	CE UK ENEC
Unit weight (packaged)	\approx 100.4 g (\approx 654.4 g)
2/3 axis linear interpolation range	-2,147,483,648 to +2,147,483,647 for each axis
2/3 axis linear interpolation speed	1 pps to 4 Mpps
2/3 axis linear interpolation position accuracy	$\leq \pm 0.5$ LBS (within all interpolation range)
2/3 axis bit pattern interpolation speed	1 pps to 4 Mpps (depending on CPU data setup time)
Circular interpolation range	-2,147,483,648 to +2,147,483,647 for each axis
Circular interpolation speed	1 pps to 4 Mpps
Circular interpolation position accuracy	$\leq \pm 1$ LBS (within all interpolation range)
Other interpolation function	Select specific axis, constant linear velocity, continuous interpolation step transmission (command, external signal)



[View product detail](#)

Encoder input pulse	2-phase pulse / up down pulse input, 2-phase pulse 1 / 2 / 4-multiply selection
Logic pos. counter range	-2,147,483,648 to +2,147,483,647 (for output pulse)
Actual pos. counter range	-2,147,483,648 to +2,147,483,647 (for input pulse)
Compare register	Comp. ±register pos. comparison range: -2,147,483,648 to +2,147,483,647 Output and signal output when the current counter value and the user position counter are same Software limit operation
Auto home search	High speed near home search (step1) → Low speed near home search (step2)
Interrupt function (except interpolation)	1 drive pulse output: when changing position counter ≥ Comp.-, when changing position counter ≥ Comp.+, when changing position counter < Comp.-, when changing position counter < Comp.+, when starting constant speed in accel/decel drive, when ending constant speed in accel/decel drive, when ending drive auto home search, when ending auto home search, when running synchronous operation
Drive control by external signal	± direction fixed/continuous pulse drive by EXP+, EXP- signal 2-phase encoder signal mode (encoder input) drive
External deceleration stop / immediate stop signal	IN 0 to 3 each axis 4 point Select signal valid/invalid and logic level selection, use general input
Servo motor input signal	Select alarm, INPOS signal valid/invalid and logic level
General output signal	OUT4 to 7 each axis 4 point (both drive status output signal and terminal)
Drive status signal output	ASND (while acceleration), DSND (while deceleration)
Overrun limit signal input	Select +direction, -direction each 1 point and logic level Select stop/deceleration stop at active
Emergency stop signal input	EMG 1 point, stop drive pulse for all axes by low level
Integral filter	Built-in integral filter at each input signal input terminal, pass time (8 type) selection
Others	Select specific axis, constant linear velocity, continuous interpolation, interpolation step transmission (command, external signal)
Drive pulse output (X, Y axis common)	
Output speed range	1 pps to 4 Mpps
Output speed accuracy	≤ ± 0.1% (for setting value)
Speed magnification	1 to 500
S jerk speed	954 to 62.5×10 ⁶ pps / sec (magnification = 1)
Accel/Decel increase rate	477×10 ³ to 31.25×10 ⁹ pps/sec (magnification = 500)
Accel/Deceleration	125 to 1×10 ⁶ pps / sec (magnification = 1) 62.5×10 ³ to 500×10 ⁶ pps / sec (magnification = 500)
Initial velocity	1 to 8,000 pps (magnification = 1) 500 to 4×10 ⁶ pps (magnification = 500)
Drive speed	1 to 8,000 pps (magnification = 1) 500 to 4×10 ⁶ pps (magnification = 500)
No. of output pulse	0 to 4,294,967,295 (fixed pulse drive)
Speed curve	Constant speed, Symmetric/Asymmetric linear accel/deceleration, parabola S curve drive
Fixed pulse drive deceleration mode	Auto deceleration (asymmetric linear Accel/Deceleration) / Manual deceleration
Others	Changing output pulse, drive speed while driving Select individual 2 pulse / 1 pulse direction method Select drive pulse logic level Changing output terminal

H. Industrial Networking

Industrial networking devices allow communication between devices using various protocols such as Ethernet, offering safe transmission of real-time data to control systems.

H1. Network Converters

H2. Remote I/O System

H3. Signal Conditioners







H1. Network Converters

Network Converters allow networking between devices with communication capability.

H1-1	Wireless Communication	SCM-WF48 Series	Wireless Serial Communication Converters
H1-2	Communication	SCM Series	Serial Communication Converters

Wireless Serial Communication Converters

SCM-WF48 Series



Features

- Converting USB or RS485 signal to Wi-Fi signal, and wireless communication up to max. 100 m
- Compact size
(W 48 × H 25.6 × L 76.3 mm, except antenna)
- Built-in surge protection circuit, reverse polarity protection circuit
- Supports AP mode and station mode
- Various mounting methods (DIN rail, panel)

Specifications

Model	SCM-WF48
Power supply	24 VDC≒
Allowable voltage range	12 - 28 VDC≒
Power consumption	≒ 3 W
Communication type	RS485, USB, WiFi
Isolation resistance	Between the all terminals and the case: ≥ 200 MΩ (at 500 VDC≒ megger)
Protection circuit	Reverse polarity protection circuit, surge protection circuit
Dielectric strength	Between the all terminals and the case: 1,000 VAC~ 50/60 Hz for 1 min
Noise immunity	± 500 VDC≒ the square wave noise (pulse width: 1μs) by the noise simulator
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≒ 50 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 55 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 80 %RH, storage: 35 to 80 %RH (no freezing or condensation)
Protection rating	IP20 (IEC standards)
Installation method	DIN rail or panel mounting
Accessory	USB 2.0 Mini B type cable (length: 1 m): 1, Connector for RS485 (4-pin, male type): 1
Indicator	Indicates state of mode
Certification	CE, RoHS, ENEC
Unit weight (packaged)	≒ 57 g (≒ 160 g)

Communication Interface

[WiFi]

Comm. protocol	TCP/IP (IPv4)
Application standard	802.11b/g/n (IEEE 802.11b) compatible
Comm. distance	≤ 100 m
Comm. speed	≤ 11 Mbps
Frequency range	2.4 to 2.497 GHz
Security	WEP, WPA, WPA2-PSK, Enterprise
Antenna	2dBi external antenna

[RS485]

Application standard	EIA RS485
Max. connection	≤ 31-unit
Comm. synchronous method	Asynchronous
Comm. method	2-wire half duplex
Comm. distance	≤ 800 m
Comm. speed ⁰¹⁾	4,800 / 9,600 (default) / 19,200 / 38,400 / 57,600 / 115,200 bps
Data bit	5 bit, 6 bit, 7 bit, 8 bit (default)
Parity bit	None (default), Even, Odd
Stop bit	1 bit (default), 2 bit
Connection type	4-wire screw terminal (2-wire communication method)

01) You can set via DAQMaster.



View product detail

[USB]

Power	5 VDC \pm , 500 mA
Application standard	USB 2.0 (compatible sub-transmission)
Comm. method	2-wire half duplex
Comm. distance	$\leq 1 \text{ m} \pm 30\%$
Connection type	USB 2.0 Mini B type (male)

Serial Communication Converters

SCM Series



Features

[SCM-US / SCM-USP / SCM-SFL: USB ↔ Serial]

- Both USB 1.1 and USB 2.0 HOST controller compatible
- Data transmission / power supply indicating LED
- Easy to connect with PC
- Built-in protection circuit
- Ferrite core cable for noise reduction
- Non-isolation type

[SCM-38I: RS232C ↔ RS485]

- Built-in surge protection circuit
- The insulation type of signal line (insulating RS232C and RS485)
- Create Tx-Enable signal automatically

[SCM-US48I: USB ↔ RS485]

- Available to transmit signals to max. 1.2 km by converting USB signal to RS485 signal
- Realizing electrical insulation (2500 VRMS) between USB port and RS485 port through RS485 transceiver
- Improved stability and durability with built-in surge protection circuit
- Easy connections between devices with bus power supplied from USB host controller without external power supply
- Offering USB 2.0 A / B type cable with built-in ferrite core for noise reduction
- User friendly features through compatibility with USB 1.1 and USB 2.0

Specifications

There might be some differences depending on PC environment.
(Supported OS: Microsoft Windows)

Model	SCM-US	SCM-USP / SCM-SFL
Power supply	5 VDC≡ USB bus power ⁰¹⁾	
Power consumption	≈ 1 W	
Max. com. speed ⁰²⁾	1,200 to 115,200 bps (recommended: 9,600 bps)	
Communication type	Half duplex type	
Available com. distance	1.5 m (not extension)	
Connection type	USB: USB 2.0 A type (male) Earphone jack (4 pole stereo phone plug)	4-pin connector for communication
Isolation type	Non-isolation	
Indicator	A.C.C (green), O.P.R (red)	
Certification	CE ENEC ETL	CE ENEC
Unit weight (packaged)	≈ 41 g (≈ 80 g)	

Model	SCM-38I	SCM-US48I
Power supply	12 ~ 24 VDC≡ ±10 %	5 VDC≡ USB bus power ⁰¹⁾
Power consumption	≈ 1.7 W	≈ 1 W
Max. com. speed ⁰²⁾	1,200 to 115,200 bps (recommended: 9,600 bps)	
Communication type	Half duplex type	
Available com. distance	≤ 1.2 km	USB: ≤ 1 m ± 30 %, RS485: ≤ 1.2 km
Multi-drop	≤ 31 Multi-drop	
Protocol ⁰²⁾	Data bit: 5bit, 6bit, 7bit, 8bit / Stop bit: 1bit, 2bit / Parity bit: None, Odd, Even	
Connection type	RS232C: D-sub 9-pin RS485: 4-wire screw terminal (2-wire communication type)	USB: USB 2.0 B type (male)
Protection circuit	Surge protection circuit	
Isolation type	Isolation	
Dielectric strength	Between the all terminals and the case: 2,000 VAC~ 50/60 Hz for 1 min Between the RS232C and the RS485: 2,500 VAC~ 50/60 Hz for 1 min	Between the all terminals and the case: 2,500 VAC~ 50/60 Hz for 1 min Between the RS232C and the RS485: 2,500 VAC~ 50/60 Hz for 1 min
Isolation resistance	≥ 100 MΩ (500 VDC≡ megger)	
Noise immunity	±500 VDC≡ the square wave noise (pulse width: 1μs) by the noise simulator	
Indicator	RUN (red)	
Accessory	-	USB 2.0 AB type cable (length: 1 m, sold separately, model: USB AB CABLE)
Certification	CE ENEC ETL	
Unit weight (packaged)	≈ 46 g (≈ 106 g)	≈ 34.5 g (≈ 197 g)

01) USB bus Power is supplied from PC or USB host controller.

02) They are set by Hyper terminal, DAQMaster, ParaSet, and Modbus Poll.

Vibration	0.75 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) X, Y, Z in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 55 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)



View product detail



H2. Remote I/O System

Remote I/O systems allow transmission of input and output signals between secondary devices and master devices such as PCs or PLCs through various open protocol networks.

H2-1	Remote I/O Boxes	ADIO Series	Remote I/O Boxes (EtherCAT)
			Remote I/O Boxes (EtherNet/IP)
			Remote I/O Boxes (PROFINET)
			Remote I/O Boxes (IO-Link Hub Type Digital I/O, Digital Input Type)
			Remote I/O Boxes (IO-Link Hub Type Analog Input Type)
H2-2	Slim Remote I/O	ARIO Series	Slim Remote I/O
H2-3	Remote I/O	ARD-D Series	DeviceNet Remote I/O (Standard Terminal Block Type)
		ARD-D Series	DeviceNet Remote I/O (Sensor Connector Type)
		ARD-A Series	DeviceNet Remote I/O (Analog, Terminal Block Type)
		ARM Series	Modbus Remote I/O

Remote I/O Boxes (EtherCAT)

ADIO Series








Features

- Upper level communication protocol: EtherCAT
 - Lower level communication protocol: IO-Link ver. 1.1 (port class: Class A)
 - Daisy chain connection (network communication and power supply)
 - Maximum output current per port: 2 A
 - Housing material: Zinc Die casting
 - I/O port setting and status monitoring (cable short circuit / disconnection, connection status, etc.)
 - Protection structure: IP67, IP69K
- * Sold Separately
- Name plates (NAMEP-1-10)
 - Waterproof cover (P96-M12-2)
 - Comm. cable for the PDCT port (SCM-USM12)

Specifications

[Electrical / Mechanical specifications]

Model	ADIO-EC
Supply voltage	18 - 30 VDC≡
Rated voltage	24 VDC≡
Current consumption	2.4 W (≦ 216 W)
Supplying current per port	≦ 2 A/Port
Sensor current (US)	≦ 9 A
Dimensions	W 66 × H 215 × D 38 mm
Material	Zinc Die casting
Ethernet port	M12 (Socket-Female), 4-pin, D-coded, Push-Pull Number of ports: 2 (IN/OUT) Supported function: daisy chain
Power supply port	Input: 7/8" (Plug-Male), 5-pin Output: 7/8" (Socket-Female), 5-pin Number of ports: 2 (IN/OUT) Supported function: daisy chain
PDCT port	M12 (Socket-Female), 5-pin, A-coded, Push-Pull Number of ports: 1 Connection method: USB serial communication
I/O port	M12 (Socket-Female), 5-pin, A-coded, Push-Pull Number of ports: 8
Mounting method	Mounting hole: fixed with M4 screw
Grounding method	Grounding hole: fixed with M4 screw
Unit weight (packaged)	≈ 700 g (≈ 900 g)
Comm. protocol	EtherCAT, IO-Link
Certification	CE     

[Mode specifications]

Mode	Digital Input
Number of channels	16-CH (I/Q: 8-CH, C/Q: 8-CH)
I/O common	NPN / PNP
Input current	5 mA
ON voltage/current	Voltage: ≧ 15 VDC≡ Current: ≧ 5 mA
OFF voltage	≦ 5 VDC≡
Mode	Digital Output
Number of channels	8-CH (C/Q)
I/O common	NPN / PNP
Power supply	24 VDC≡ (18 - 30 VDC≡), Max. 300 mA
Leakage current	≦ 0.1 mA
Residual voltage	≦ 1.5 VDC≡
Short circuit protection	YES
Mode	IO-Link
Input current	2 mA
ON voltage / current	Voltage: ≧ 15 VDC≡ Current: ≧ 2 mA
OFF voltage	≦ 5 VDC≡



View product detail

Remote I/O Boxes (EtherNet/IP)

ADIO Series



Features

- Upper level communication protocol: EtherNet/IP
 - Lower level communication protocol: IO-Link ver. 1.1 (port class: Class A)
 - Daisy chain connection (network communication and power supply)
 - Maximum output current per port: 2 A
 - Housing material: Zinc Die casting
 - I/O port setting and status monitoring (cable short circuit / disconnection, connection status, etc.)
 - Protection structure: IP67
- * Sold Separately
- Name plates (NAMEP-1-10)
 - Waterproof cover (P96-M12-2)
 - Comm. cable for the PDCT port (SCM-USM12)

Specifications

[Electrical / Mechanical specifications]

Model	ADIO-EI
Supply voltage	18 - 30 VDC≒
Rated voltage	24 VDC≒
Current consumption	2.4 W (≤ 216 W)
Supplying current per port	≤ 2 A/Port
Sensor current (US)	≤ 9 A
Dimensions	W 66 × H 215 × D 38 mm
Material	Zinc Die casting
Ethernet port	M12 (Socket-Female), 4-pin, D-coded, Push-Pull Number of ports: 2 (IN / OUT) Supported function: daisy chain
Power supply port	Input: 7/8" (Plug-Male), 5-pin Output: 7/8" (Socket-Female), 5-pin Number of ports: 2 (IN / OUT) Supported function: daisy chain
PDCT port	M12 (Socket-Female), 5-pin, A-coded, Push-Pull Number of ports: 1 Connection method: USB serial communication
I/O port	M12 (Socket-Female), 5-pin, A-coded, Push-Pull Number of ports: 8
Mounting method	Mounting hole: fixed with M4 screw
Grounding method	Grounding hole: fixed with M4 screw
Unit weight (packaged)	≈ 700 g (≈ 900 g)
Comm. protocol	EtherNet/IP, IO-Link
Certification	CE, RoHS, REACH, IEC, EtherNet/IP™, IO-Link

[Mode specifications]

Mode	Digital Input
Number of channels	16-CH (I/Q: 8-CH, C/Q: 8-CH)
I/O common	NPN / PNP
Input current	5 mA
ON voltage/current	Voltage: ≥ 15 VDC≒ Current: ≥ 5 mA
OFF voltage	≤ 5 VDC≒
Mode	Digital Output
Number of channels	8-CH (C/Q)
I/O common	NPN / PNP
Power supply	24 VDC≒ (18 - 30 VDC≒), Max. 300 mA
Leakage current	≤ 0.1 mA
Residual voltage	≤ 1.5 VDC≒
Short circuit protection	YES
Mode	IO-Link
Input current	2 mA
ON voltage / current	Voltage: ≥ 15 VDC≒ Current: ≥ 2 mA
OFF voltage	≤ 5 VDC≒



View product detail

Remote I/O Boxes (PROFINET)

ADIO Series



Features

- Upper level communication protocol:
PROFINET
 - Lower level communication protocol:
IO-Link ver. 1.1 (port class: Class A)
 - Daisy chain connection
(network communication and power supply)
 - Maximum output current per port: 2 A
 - Housing material: Zinc Die casting
 - I/O port setting and status monitoringx
(cable short circuit / disconnection,
connection status, etc.)
 - Protection structure: IP67
- * Sold Separately
- Name plates (NAMEP-1-10)
 - Waterproof cover (P96-M12-2)
 - Comm. cable for the PDCT port (SCM-USM12)

Specifications

[Electrical / Mechanical specifications]

Model	ADIO-PN
Supply voltage	18 - 30 VDC≒
Rated voltage	24 VDC≒
Current consumption	2.4 W (≦ 216 W)
Supplying current per port	≦ 2 A/Port
Sensor current (US)	≦ 9 A
Dimensions	W 66 × H 215 × D 38 mm
Material	Zinc Die casting
Ethernet port	M12 (Socket-Female), 4-pin, D-coded, Push-Pull Number of ports: 2 (IN/OUT) Supported function: daisy chain
Power supply port	Input: 7/8" (Plug-Male), 5-pin Output: 7/8" (Socket-Female), 5-pin Number of ports: 2 (IN/OUT) Supported function: daisy chain
PDCT port	M12 (Socket-Female), 5-pin, A-coded, Push-Pull Number of ports: 1 Connection method: USB serial communication
I/O port	M12 (Socket-Female), 5-pin, A-coded, Push-Pull Number of ports: 8
Mounting method	Mounting hole: fixed with M4 screw
Grounding method	Grounding hole: fixed with M4 screw
Unit weight (packaged)	≈ 700 g (≈ 900 g)
Comm. protocol	PROFINET, IO-Link
Certification	CE UK UL CE UL IO-Link

[Mode specifications]

Mode	Digital Input
Number of channels	16-CH (I/Q: 8-CH, C/Q: 8-CH)
I/O common	NPN / PNP
Input current	5 mA
ON voltage/current	Voltage: ≧ 15 VDC≒ Current: ≧ 5 mA
OFF voltage	≦ 5 VDC≒
Mode	Digital Output
Number of channels	8-CH (C/Q)
I/O common	NPN / PNP
Power supply	24 VDC≒ (18 - 30 VDC≒), Max. 300 mA
Leakage current	≦ 0.1 mA
Residual voltage	≦ 1.5 VDC≒
Short circuit protection	YES
Mode	IO-Link
Input current	2 mA
ON voltage / current	Voltage: ≧ 15 VDC≒ Current: ≧ 2 mA
OFF voltage	≦ 5 VDC≒



View product detail

Remote

I/O Boxes

(IO-Link Hub

Digital I/O, Digital Input Type)

ADIO Series



Features

- Upper level communication protocol:
IO-Link ver. 1.1 (port class: Class A)
- Housing material: Zinc die casting
- I/O port setting and status monitoring
(cable short circuit and connection status, etc.)
- Protection structure: IP67, IP69K

* Sold Separately

- Name plates (NAMEP-1-10)
- Waterproof cover (P96-M12-2)

Specifications

[Electrical / Mechanical specifications]

Type	Digital Input/Output	Digital Input
Model	ADIO-IL-MA08B□-HUB3	ADIO-IL-MA08CA□-HUB3
Rated voltage / current	24 VDC $\overline{\text{=}}$, $\leq 9 \text{ A}$ ($\pm 10\%$)	24 VDC $\overline{\text{=}}$, $\leq 4 \text{ A}$ ($\pm 10\%$)
Supply current	300 mA $\pm 10\%$	150 mA $\pm 10\%$
Dimensions	W 66 × H 165 × D 32 (20) mm	
Material	Zinc die casting	
IO-Link port	M12 (Plug-Male), 4-pin, A-coded Number of ports: 1	
Auxiliary power port	7/8" (Plug-Male), 5-pin Number of ports: 1	-
Standard I/O port	M12 (Socket-Female), 4-pin, A-coded Push-Pull connector supported Number of ports: 8	
Mounting method	Mounting hole: fixed with M4 screw	
Grounding method	Grounding hole: fixed with M4 screw	
Unit weight (packaged)	$\approx 550 \text{ g}$ ($\approx 750 \text{ g}$)	$\approx 550 \text{ g}$ ($\approx 750 \text{ g}$)
Certification	CE IO-Link	

[Digital input/output specifications]

Type	Digital Input/Output	Digital Input
Number of channels	16-CH (2 channels in each port)	
Digital input	It depends on the I/O specifications.	
NPN (sink type)	ON state: 5 VDC $\overline{\text{=}}$, $\leq 1.5 \text{ mA}$	
	OFF state: 11 VDC $\overline{\text{=}}$, $\geq 2 \text{ mA}$	
	Leakage current: -	
PNP (source type)	ON state: 11 VDC $\overline{\text{=}}$, $\geq 2 \text{ mA}$	
	OFF state: 5 VDC $\overline{\text{=}}$, $\leq 1.5 \text{ mA}$	
	Leakage current: $\leq 0.1 \text{ mA}$	-
Input filter	none / 0.5 / 1 (default value) / 2 / 4 / 8 / 16 / 32 / 64 / 128 ms	
Digital output	It depends on the I/O specifications.	-
NPN (sink type)	Output current: $\leq 1.0 \text{ A/CH}$	
	Leakage voltage: -	
PNP (source type)	Output current: $\leq 1.0 \text{ A/CH}$	
	Leakage voltage: $\leq 1.2 \text{ VDC}$	



View product detail

Remote

I/O Boxes

(IO-Link Hub Type
Analog Input Type)

ADIO Series





Features

- Upper level communication protocol:
IO-Link ver. 1.1 (port class: Class A)
 - Housing material: Zinc die casting
 - I/O port setting and status monitoring
(cable short circuit and connection status, etc.)
 - Protection structure: IP67, IP69K
- ※ Sold Separately
- Name plates (NAMEP-1-10)
 - Waterproof cover (P96-M12-2)

Specifications

[Electrical / Mechanical specifications]

Type	Analog Input	
Model	ADIO-IL-MA08EAA1-HUB3	
Rated voltage / current	24 VDC≒, ≤ 4 A (±10%)	
Supply current	150 mA ±10%	
Dimensions	W 66 × H 165 × D 32 (20) mm	
Material	Zinc die casting	
IO-Link port	M12 (Plug-Male), 4-pin, A-coded Number of ports: 1	
Standard I/O port	M12 (Socket-Female), 4-pin, A-coded Push-Pull connector supported Number of ports: 8	
Mounting method	Mounting hole: fixed with M4 screw	
Grounding method	Grounding hole: fixed with M4 screw	
Unit weight (packaged)	≈ 550 g (≈ 750 g)	
Certification	CE   IO-Link	

[Analog input specifications]

Type	Analog Input	
Number of input channels	8-CH (1 channel in each port)	
Input type	Voltage input	Current input
Input range	-10 to 10 VDC≒ (default value), 0 to 10 VDC≒	0 to 20 mA, 4 to 20 mA
Input allowable range	±5% F.S.	±5% F.S.
Input impedance	≥ 500 kΩ	≤ 30 Ω
Resolution	10 / 12 / 14 / 16-bit (default value)	
Accuracy ⁰¹⁾	At room temperature: PV ±0.1% F.S. At out of room temperature: PV ±0.3% F.S.	

01) The range of room temperature: 25 °C ±5 °C



View product detail

Slim Remote I/O

ARIO Series



Features

- Industrial Ethernet / Fieldbus serial communication I/O for Smart Factory
- Multiple I/O distribution control using PLCs and industrial PCs.
- Coupler: available in 8 different communication protocols
 - EtherCAT, CC-Link V1/V2, ProfiNet, ProfiBus, EtherNet/IP, DeviceNet, Modbus TCP compatible, Modbus RTU compatible
- Module: various input / output modules, power module
 - Bus power + Field power, Bus power / Field power, digital input/output (4 / 8 / 16 channels), analog input/output (2 / 4 / 8 channels), temperature input (4 / 8 channels)
 - Expandable up to 64 modules (may vary by communication type)
- Hot-swap feature: Terminal and body units can be removed / swapped during operation for easy maintenance
- Push-in connection method: easy wire connection without requiring additional tools
- Easy module attachment and removal on DIN rails
- Comprehensive device management software DAQMaster for improved convenience



View product detail

Specifications

[Power module general specifications]

Transmission speed (ABUS)	4 Mbps
Protection circuit ⁰¹⁾	Reverse bus power protection circuit, Bus power short circuit protection circuit
Indicator ⁰²⁾	Power status indicator (green)
Material	Terminal: PBT, body: PC, base: PA6, POM
Installation method	DIN rail 35 mm
Unit weight (packaged)	≈ 75 g (≈ 108 g)

01) Applicable models: ARIO-P-B, ARIO-P-M

02) ARIO-P1-T5 model: Does not support the indicator.

[Bus power modules]

Model	ARIO-P-B
Number of terminal holes	12 holes
System bus power	≤ 2 A @ 24 VDC ≡ (≤ 48 W)/hole, (up to 4 A)
Internal system bus power	≤ 1.5 A @ 5 VDC ≡ (≤ 7.5 W)

[Field power modules]

Model	ARIO-P-F1	ARIO-P-F2
Number of terminal holes	12 holes	
Field power configuration	24 VDC ≡ × 6 0 VDC ≡ × 2	24 VDC ≡ × 2 0 VDC ≡ × 6
Field power	≤ 2 A @ 24 VDC ≡ (≤ 48 W)/hole, (up to 4 A)	
Internal field power	≤ 2 A @ 24 VDC ≡ (≤ 48 W)/hole, (up to 4 A)	

[Bus + Field power modules]

Model	ARIO-P-M
Number of terminal holes	12 holes
System bus power	≤ 2 A @ 24 VDC ≡ (≤ 48 W)/hole, (up to 4 A)
Internal system bus power	≤ 1.5 A @ 5 VDC ≡ (≤ 7.5 W)
Field power	≤ 2 A @ 24 VDC ≡ (≤ 48 W)/hole, (up to 4 A)
Internal field power	≤ 2 A @ 24 VDC ≡ (≤ 48 W)/hole, (up to 4 A)

Next Page ►






* Sold Separately

- Connectable components (terminal, body, base)
- Couplers
- Digital input modules
- Digital output modules
- Analog input modules
- Analog output modules
- Temperature input modules
- Bus power modules
- Field power modules
- Bus + Field power modules
- Terminal power modules

[Terminal power modules]

Model	ARIO-P-T1		ARIO-P-T2	
Number of terminal holes	12 holes			
Field power configuration	24 VDC≡ × 8 0 VDC≡ × 4		24 VDC≡ × 4 0 VDC≡ × 8	
Field output power	≤ 2 A @ 24 VDC≡ (≤ 48 W)/hole, (up to 4 A)			
Model	ARIO-P1-T3	ARIO-P1-T4	ARIO-P1-T5	ARIO-P1-T6
Number of terminal holes	16 holes			
Field power configuration	24 VDC≡ × 16	0 VDC≡ × 16	F.G. × 16	24 VDC≡ × 8 0 VDC≡ × 8
Field output power	≤ 2 A @ 24 VDC≡ (≤ 48 W)/hole, (up to 4 A)			

[Coupler]

Model	ARIO-C-EC	ARIO-C-CL	ARIO-C-CL1
Communication protocol	 EtherCAT	 CC-Link (ver. 2.0)	 CC-Link (ver. 1.1)
Transfer rate	100 Mbps	10 Mbps	10 Mbps
Comm. connector	RJ45 × 2	5-pin PCB × 1	5-pin PCB × 1
Memory size	1024-byte	512-byte	96-byte
Number of connectable modules	≤ 64	≤ 32	≤ 32
Maximum connectable length	≤ 768 mm	≤ 384 mm	≤ 384 mm
Model	ARIO-C-PN	ARIO-C-PB	ARIO-C-EI
Communication protocol	 Modbus	 Modbus	EtherNet/IP
Transfer rate	100 Mbps	12 Mbps	10/100 Mbps
Comm. connector	RJ45 × 2	9-pin D SUB × 1	RJ45 × 2
Memory size	1024-byte	488-byte	1008-byte
Number of connectable modules	≤ 64	≤ 32	≤ 64
Maximum connectable length	≤ 768 mm	≤ 384 mm	≤ 768 mm
Model	ARIO-C-DN	ARIO-C-MT	ARIO-C-MR
Communication protocol	DeviceNet	Modbus/TCP compatible	Modbus/RTU compatible
Transfer rate	500 kbps	10/100 Mbps	115.2 kbps
Comm. connector	5-pin PCB × 1	RJ45 × 2	5-pin PCB × 1
Memory size	510-byte	1024-byte	512-byte
Number of connectable modules	≤ 32	≤ 64	≤ 32
Maximum connectable length	≤ 384 mm	≤ 768 mm	≤ 384 mm

[Digital input modules]

Model	ARIO-S-DI□P	ARIO-S1-DI□P
Input specifications	PNP type	
Channels	4-CH / 8-CH	4-CH / 8-CH / 16-CH
Data size	4-bit / 8-bit	4-bit / 8-bit / 16-bit
ON input voltage	≥ 15 VDC \equiv	
OFF input voltage	≤ 5 VDC \equiv	
Signal delay time	≤ 1.5 ms	
Sensor connection method	2-wire / 3-wire	1-wire / 2-wire / 2-wire + FG / 3-wire + FG
Max. current consump.	6 mA/CH @ 24 VDC \equiv	
Power consump. (ABUS)	≤ 100 mA @ 5 VDC \equiv (≤ 0.5 W)	≤ 70 mA @ 5 VDC \equiv (≤ 0.35 W)
Power consump. (Field)	≤ 65 mA @ 24 VDC \equiv (≤ 1.56 W)	≤ 30 mA @ 24 VDC \equiv (≤ 0.72 W)
Model	ARIO-S-DI□N	ARIO-S1-DI□N
Input specifications	NPN type	
Channels	4-CH / 8-CH	4-CH / 8-CH / 16-CH
Data size	4-bit / 8-bit	4-bit / 8-bit / 16-bit
ON input voltage	≤ 5 VDC \equiv	
OFF input voltage	≥ 15 VDC \equiv	
Signal delay time	≤ 1.5 ms	
Sensor connection method	2-wire / 3-wire	1-wire / 2-wire / 2-wire + FG / 3-wire + FG
Max. current consump.	6 mA/CH @ 24 VDC \equiv	
Power consump. (ABUS)	≤ 100 mA @ 5 VDC \equiv (≤ 0.5 W)	≤ 70 mA @ 5 VDC \equiv (≤ 0.35 W)
Power consump. (Field)	≤ 65 mA @ 24 VDC \equiv (≤ 1.56 W)	≤ 85 mA @ 24 VDC \equiv (≤ 2.04 W)

[Digital output modules]

Model	ARIO-S-DO□P	ARIO-S1-DO□P
Output specifications	PNP type	
Channels	4-CH / 8-CH	4-CH / 8-CH / 16-CH
Data size	4-bit / 8-bit	4-bit / 8-bit / 16-bit
Max. output current	0.5 A/CH @ 24 VDC≡	
Output leakage voltage	≤ 1.2 VDC≡	
Signal delay time	≤ 1.5 ms	
Actuator connection method	2-wire / 3-wire	1-wire / 2-wire / 2-wire + FG / 3-wire + FG
Power consump. (ABUS)	≤ 100 mA @ 5 VDC≡ (≤ 0.5 W)	≤ 85 mA @ 5 VDC≡ (≤ 0.43 W)
Power consump. (Field)	It depends on the number of channels.	
4 channels	≤ 2 A @ 24 VDC≡ (≤ 48 W)	
8 / 16 channels	≤ 4 A @ 24 VDC≡ (≤ 96 W)	

Model	ARIO-S-DO□N	ARIO-S1-DO□N
Output specifications	NPN type	
Channels	4-CH / 8-CH	4-CH / 8-CH / 16-CH
Data size	4-bit / 8-bit	4-bit / 8-bit / 16-bit
Max. output current	0.5 A/CH @ 24 VDC≡	
Output leakage voltage	≤ 1.2 VDC≡	
Signal delay time	≤ 1.5 ms	
Actuator connection method	2-wire / 3-wire	1-wire / 2-wire / 2-wire + FG / 3-wire + FG
Power consump. (ABUS)	≤ 100 mA @ 5 VDC≡ (≤ 0.5 W)	≤ 85 mA @ 5 VDC≡ (≤ 0.43 W)
Power consump. (Field)	It depends on the number of channels.	
4 channels	≤ 2 A @ 24 VDC≡ (≤ 48 W)	
8 / 16 channels	≤ 4 A @ 24 VDC≡ (≤ 96 W)	

[Analog input modules]

Model	ARIO-S-AI□V1	ARIO-S-AI□V2
Input specifications	Voltage input	
Channels	2-CH / 4-CH	
Data size	4-byte / 8-byte	
Input range	±10 VDC≡	0 to 10 VDC≡
Allowable limit range	±12 VDC≡	-1.0 to 11 VDC≡
Resolution	12-bit	
Accuracy	At room temperature: ±0.3% F.S / Outside room temperature: ±0.6% F.S	
Input impedance	≥ 1 MΩ	
Sensor connection method	2-wire / 2-wire + FG	
Power consump. (ABUS)	≤ 180 mA @ 5 VDC≡ (≤ 0.9 W)	
Power consump. (Field)	≤ 15 mA @ 24 VDC≡ (≤ 0.36 W)	

Model	ARIO-S1-AI08V3	
Input specifications	Voltage input	
Channels	8-CH	
Data size	16-byte	
Input range	±10 VDC≡ / 0 to 10 VDC≡ (default)	
Allowable limit range	±11 VDC≡ / -0.5 to 10.5 VDC≡	
Resolution	16-bit	
Accuracy	At room temperature: ±0.1% F.S / Outside room temperature: ±0.5% F.S	
Input impedance	≥ 550 kΩ	
Sensor connection method	2-wire	
Power consump. (ABUS)	≤ 100 mA @ 5 VDC≡ (≤ 0.5 W)	
Power consump. (Field)	≤ 0 mA @ 24 VDC≡ (≤ 0.0 W)	

Model	ARIO-S-AI□C1	ARIO-S-AI□C2
Input specifications	Current input	
Channels	2-CH / 4-CH	
Data size	4-byte / 8-byte	
Input range	0 to 20 mA	4 to 20 mA
Allowable limit range	0 to 22 mA	2.4 to 21.6 mA
Resolution	12-bit	
Accuracy	At room temperature: ±0.3% F.S / Outside room temperature: ±0.6% F.S	
Input impedance	≤ 250 Ω	
Sensor connection method	2-wire / 2-wire + FG	
Power consump. (ABUS)	≤ 180 mA @ 5 VDC≡ (≤ 0.9 W)	
Power consump. (Field)	≤ 15 mA @ 24 VDC≡ (≤ 0.36 W)	

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Model	ARIO-S1-AI08C3
Input specifications	Current input
Channels	8-CH
Data size	16-byte
Input range	0 to 20 mA / 4 to 20 mA (default)
Allowable limit range	0 to 21 mA / 3.2 to 20.8 mA
Resolution	16-bit
Accuracy	At room temperature: $\pm 0.1\%$ F.S / Outside room temperature: $\pm 0.5\%$ F.S
Input impedance	$\leq 150 \Omega$
Sensor connection method	2-wire
Power consump. (ABUS)	$\leq 100 \text{ mA @ } 5 \text{ VDC} \Rightarrow (\leq 0.5 \text{ W})$
Power consump. (Field)	$\leq 0 \text{ mA @ } 24 \text{ VDC} \Rightarrow (\leq 0.0 \text{ W})$

[Analog output modules]

Model	ARIO-S-AO□V1	ARIO-S-AO□V2
Output specifications	Voltage output	
Channels	2-CH / 4-CH	
Data size	4-byte / 8-byte	
Output range	$\pm 10 \text{ VDC} \Rightarrow$	0 to 10 VDC \Rightarrow
Resolution	12-bit	
Accuracy	At room temperature: $\pm 0.3\%$ F.S / Outside room temperature: $\pm 0.6\%$ F.S	
Load resistance	$\geq 5 \text{ k}\Omega$	
Actuator connection method	2-wire / 2-wire + FG	
Power consump. (ABUS)	$\leq 180 \text{ mA @ } 5 \text{ VDC} \Rightarrow (\leq 0.9 \text{ W})$	
Power consump. (Field)	$\leq 15 \text{ mA @ } 24 \text{ VDC} \Rightarrow (\leq 0.36 \text{ W})$	

Model	ARIO-S1-AO08V3
Output specifications	Voltage output
Channels	8-CH
Data size	16-byte
Output range	$\pm 10 \text{ VDC} \Rightarrow$ / 0 to 10 VDC \Rightarrow (default)
Resolution	14-bit
Accuracy	At room temperature: $\pm 0.1\%$ F.S / Outside room temperature: $\pm 0.5\%$ F.S
Load resistance	$\geq 5 \text{ k}\Omega$
Actuator connection method	2-wire
Power consump. (ABUS)	$\leq 70 \text{ mA @ } 5 \text{ VDC} \Rightarrow (\leq 0.35 \text{ W})$
Power consump. (Field)	$\leq 55 \text{ mA @ } 24 \text{ VDC} \Rightarrow (\leq 1.32 \text{ W})$

Model	ARIO-S-AO□C1	ARIO-S-AO□C2
Output specifications	Current output	
Channels	2-CH / 4-CH	
Data size	4-byte / 8-byte	
Output range	0 to 20 mA	4 to 20 mA
Resolution	12-bit	
Accuracy	At room temperature: $\pm 0.3\%$ F.S / Outside room temperature: $\pm 0.6\%$ F.S	
Load resistance	$\leq 350 \Omega$	
Actuator connection method	2-wire / 2-wire + FG	
Power consump. (ABUS)	$\leq 100 \text{ mA @ } 5 \text{ VDC} \Rightarrow (\leq 0.5 \text{ W})$	
Power consump. (Field)	$\leq 60 \text{ mA @ } 24 \text{ VDC} \Rightarrow (\leq 1.44 \text{ W})$	

Model	ARIO-S1-AO08C3
Output specifications	Current output
Channels	8-CH
Data size	16-byte
Output range	0 to 20 mA / 4 to 20 mA (default)
Resolution	14-bit
Accuracy	At room temperature: $\pm 0.1\%$ F.S / Outside room temperature: $\pm 0.5\%$ F.S
Load resistance	$\leq 350 \Omega$
Actuator connection method	2-wire
Power consump. (ABUS)	$\leq 70 \text{ mA @ } 5 \text{ VDC} \Rightarrow (\leq 0.35 \text{ W})$
Power consump. (Field)	$\leq 140 \text{ mA @ } 24 \text{ VDC} \Rightarrow (\leq 3.36 \text{ W})$


























[Thermocouple (TC) input modules]

Model	ARIO-S-AI04TC	ARIO-S1-AI08TC
Channels	4-CH	8-CH
Data size	8-byte	16-byte
Sensor type	K (default), J, E, T, B, R, S, N, C / W5, G / W, L, U, PLII	
Sensor connection method	2-wire	
Resolution	16-bit	
Accuracy	±0.2% F.S (at room temperature: 23 °C ±5 °C)	
Temperature range	-200 to 2300 °C	
Sampling rate	50 msec/CH	
Power consump. (ABUS)	≤ 180 mA @ 5 VDC≡ (≤ 0.9 W)	≤ 140 mA @ 5 VDC≡ (≤ 0.7 W)
Power consump. (Field)	≤ 15 mA @ 24 VDC≡ (≤ 0.36 W)	≤ 20 mA @ 24 VDC≡ (≤ 0.48 W)

[Resistance thermometer (RTD) input modules]

Model	ARIO-S-AI04RTD	ARIO-S1-AI08RTD
Channels	4-CH	8-CH
Data size	8-byte	16-byte
Sensor type	Pt50, Pt100 (default), Pt1000 / JPt50, JPt100, JPt1000 / Ni100, Ni120, Ni1000 / Cu50, Cu100	
Sensor connection method	3-wire	2-wire
Resolution	16-bit	
Accuracy	Pt, JPt: ±0.2% F.S / Ni: ±0.3% F.S / Cu: ±0.5% F.S (at room temperature: 23 °C ±5°C)	
Temperature range	-200 to 650 °C	
Sampling rate	50 msec/CH	
Power consump. (ABUS)	≤ 180 mA @ 5 VDC≡ (≤ 0.9 W)	≤ 120 mA @ 5 VDC≡ (≤ 0.6 W)
Power consump. (Field)	≤ 15 mA @ 24 VDC≡ (≤ 0.36 W)	≤ 20 mA @ 24 VDC≡ (≤ 0.48 W)

[Specifications: Environmental Conditions]

Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)
Dielectric strength	Between the charging part and the case : 1000 VAC~ 50 / 60 Hz for 1 min
Noise immunity	±500 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator
Vibration	0.7 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunction)	0.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 55 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP20 (IEC standard)
Certification	                        

01) Certification attainment may vary depending on the model. Check the certification on the Autonics website.

DeviceNet

Remote I/O

(Standard Terminal Block Type)

ARD-D Series



Features

- Automatic communication speed recognition:
Enables to recognize communication speed automatically when connecting with master
- Network voltage monitoring:
If PV is lower than SV, enables to receive error flag for network power monitoring as Explicit message.
- Connect up to 3 expansion units
(expandable I/O points up to max. 64 points)
- Reading the number of expansion units:
Reads the number of connected expansion units
- Reading the unit specifications:
Reads the specifications of connected units

Specifications

Model		ARD-DI16□□	ARD-DO16□□	ARD-DX16□□
I/O points		NPN or PNP input 16-point	NPN or PNP output 16-point	NPN or PNP I/O each 8-point (total 16 -point)
Control I/O	Voltage	10-28 VDC≡	10-28 VDC≡ (voltage drop: ≤ 0.5 VDC≡)	
	Current	10 mA/point	0.5 A/point (leakage current: ≤ 0.5 mA)	Input: 10 mA/point Output: 0.5 A/point (leakage current: ≤ 0.5 mA)
	COMMON method	8-point, common		
Protection circuit		Surge, short-circuit and overheat protection, reverse power protection circuit, overcurrent protection circuit (NPN type: operate at ≥ 1.9 A, PNP type: operate at ≥ 0.7 A)		
Certification		CE UK ENEC DeviceNet		
Unit weight		≈ 140 g		

Model		ARD-DI08A□	ARD-DO08S□	ARD-DO08R□
I/O points		AC input 8-point	SSR output 8-point	Relay output 8-point
Control I/O	Voltage	75-250 VAC~	30-250 VAC~	N.O. (Normally Open) 250 VAC~ 2A, 1a
	Current	13 mA/point	1 A/point	
	COMMON method	8-point, common		1 point, 1 COM
Protection circuit		Surge, reverse power protection circuit		
Certification		EAC DeviceNet		
Unit weight		≈ 150 g	≈ 170 g	≈ 160 g
Power supply		Rated voltage: 24 VDC≡, voltage range: 12-28 VDC≡		
Power consumption		≤ 3 W		
Number of connected expansion unit		8-point type: ≤ 7 units, 16-point type: ≤ 3 units		
I/O points		≤ 64-point		
Communication spec.		I/O Slave messaging (group 2 only slave) : supporting Poll command, BitStrobe command, Cyclic command, COS command		
Communication speed (comm. distance)		125 kbps (≤ 500 m), 250 kbps (≤ 250 m), 500 kbps (≤ 100 m)		
Protocol		DeviceNet		
Approval		ODVA Conformance tested		
Insulation method		I/O and internal circuit: photocoupler insulation, DeviceNet and internal circuit: non-insulation, DeviceNet power: non-insulation		
Insulation resistance		≥ 200 MΩ (500 VDC≡ megger)		
Noise immunity		±240 VDC≡ the square wave noise (pulse width: 1 μs) by the noise simulator		
Dielectric strength		Between the charging part and the case: 1,000 VAC~ at 50/60 Hz for 1 min		
Vibration		1.5 mm amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours		
Shock		500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times		
Ambient temperature		-10 to 55 °C, storage: -25 to 75 °C (no freezing or condensation)		
Ambient humidity		35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)		
Protection rating		IP20 (IEC standard)		
Indicator		Network status (NS) and unit status (MS) indicator (green, red LED), I/O status indicator (input: green LED, output: red LED)		
Material		Front and body case: PC, rubber cap: NBR		
Mounting method		DIN rail or panel mounting		



View product detail

DeviceNet

Remote I/O

(Sensor Connector Type)

ARD-D Series



Features

- Automatic communication speed recognition:
Enables to recognize communication speed automatically when connecting with master
 - Network voltage monitoring:
If PV is lower than SV, enables to receive error flag for network power monitoring as Explicit message.
 - Connect up to 7 expansion units
(expandable I/O points up to max. 64 points)
 - Reading the number of expansion units:
Reads the number of connected expansion units
 - Reading model name:
Reads the connected model name of connected units
 - Reading the unit specifications:
Reads the specifications of connected units
- * Sold Separately
- Sensor connector: CNE Series

Specifications

Model	AR□-DI08□-4S	AR□-DO08□-4S
Power supply	Rated voltage: 24 VDC \equiv , voltage range: 12-28 VDC \equiv	
Power consumption	≤ 3 W	
I/O points	NPN or PNP input 8-point	NPN or PNP output 8-point
Control I/O	Voltage	10-28 VDC \equiv input
	Current	10 mA/point (sensor current: 150 mA/point)
	COMMON method	8-point, common
Number of connected expansion unit	≤ 7 units	
I/O points	≤ 64 -point	
Communication spec.	I/O Slave messaging (group 2 only slave) : supporting Poll command, Bit_strobe command, Cyclic command, COS command	
Communication speed (comm. distance)	125 kbps (≤ 500 m), 250 kbps (≤ 250 m), 500 kbps (≤ 100 m)	
Protocol	DeviceNet	
Approval	ODVA Conformance tested	
Insulation method	I/O and internal circuit: photocoupler insulation, DeviceNet and internal circuit: non-insulation, DeviceNet power: non-insulation	
Insulation resistance	≥ 200 M Ω (500 VDC \equiv megger)	
Noise immunity	± 240 VDC \equiv the square wave noise (pulse width: 1 μ s) by the noise simulator	
Dielectric strength	Between the charging part and the case: 1,000 VAC \sim at 50/60 Hz for 1 min	
Vibration	1.5 mm amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Shock	500 m/s 2 (≈ 50 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-10 to 55 $^{\circ}$ C, storage: -25 to 75 $^{\circ}$ C (a non freezing or condensation environment)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (a non freezing or condensation environment)	
Protection structure	IP20 (IEC standard)	
Protection circuit	Overcurrent protection circuit (operation : ≥ 0.17 A)	Overcurrent protection circuit (operation : ≥ 0.7 A)
Indicator	Network status (NS) and unit status (MS) indicator (green, red LED), I/O status indicator (input: green LED, output: red LED)	
Material	Front and body case: PC	
Mounting method	DIN rail or panel mounting	
Certification	CE ENEC DeviceNet	
Unit weight	Basic unit	≈ 64 g
	Expansion unit	NPN type: ≈ 65 g PNP type: ≈ 67 g
		NPN type: ≈ 58 g PNP type: ≈ 59 g



View product detail

DeviceNet

Remote I/O

(Analog, Terminal Block Type)



ARD-A Series



Features

- Adopts DeviceNet, standard open Network
 - : Communicates other DeviceNet devices without additional installation
 - : Configurable power and communication system only with communication cables
 - : Connectible max. 63 units per 1 master unit
- Strong against noise and high accuracy (0.3 %) measurement with differential input method (measuring difference between +, - input signal)
- Various I/O range:
0-5 VDC \rightleftharpoons , 1-5 VDC \rightleftharpoons , 0-10 VDC \rightleftharpoons ,
-5-5 VDC \rightleftharpoons , -10-10 VDC \rightleftharpoons , DC 4-20 mA,
DC 0-20 mA
- Scale function:
Settable high / low limit scale value for analog I/O range
(setting range: -28,000 to 28,000)
- Various functions:
Automatic communication speed recognition,
Network voltage monitoring, Input digital filter,
Peak / Bottom Hold, hysteresis, reading model
name and number of units, I/O and status flag
monitoring
- Built-in surge, ESD protection, reverse polarity
protection circuit
- Mounting DIN rail and panel method

Specifications

Model		ARD-AI04	ARD-AO04
Power supply		Rated voltage: 24 VDC \rightleftharpoons , voltage range: 12-28 VDC \rightleftharpoons	
Power consumption		≤ 3 W	
Output points		Input 4-point (switchable voltage/current)	Output 4-point (voltage 2 CH, current 2 CH)
Control I/O	Voltage	0-10 VDC \rightleftharpoons , -10-10 VDC \rightleftharpoons , 0-5 VDC \rightleftharpoons , 1-5 VDC \rightleftharpoons , -5-5 VDC \rightleftharpoons (input impedance: ≥ 1 M Ω)	0-10 VDC \rightleftharpoons , -10-10 VDC \rightleftharpoons , 0-5 VDC \rightleftharpoons , 1-5 VDC \rightleftharpoons , -5-5 VDC \rightleftharpoons (load resistance: ≥ 1 k Ω)
	Current	DC 4-20 mA, DC 0-20 mA (input impedance: 250 Ω)	DC 4-20 mA, DC 0-20 mA (load resistance: ≤ 600 Ω)
	Max. allowable I/O	± 5 % F.S. of I/O range	
	Resolution	14 bits, 1/16,000	
	Accuracy	At room temperature (25 $^{\circ}$ C ± 5 $^{\circ}$ C) range: ± 0.3 % F.S. Out of room temperature range: ± 0.6 % F.S.	
Communication spec.		I/O Slave messaging (group 2 only slave) : supporting Poll command, Bit_strobe command, Cyclic command, COS command	
Communication speed (comm. distance)		125 kbps (≤ 500 m), 250 kbps (≤ 250 m), 500 kbps (≤ 100 m)	
Protocol		DeviceNet	
Insulation method		I/O and internal circuit: non-insulation, DeviceNet and internal circuit: insulation, DeviceNet power: insulation	
Insulation resistance		≥ 200 M Ω (500 VDC \rightleftharpoons megger)	
Noise immunity		± 500 VDC \rightleftharpoons the square wave noise (pulse width: 1 μ s) by the noise simulator	
Dielectric strength		Between the charging part and the case: 500 VAC \sim at 50/60 Hz for 1 min	
Vibration		1.5 mm amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Shock		500 m/s 2 (≈ 50 G) in each X, Y, Z direction for 3 times	
Ambient temperature		-10 to 50 $^{\circ}$ C, storage: -25 to 75 $^{\circ}$ C (no freezing or condensation)	
Ambient humidity		35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating		IP20 (IEC standard)	
Protection circuit		Surge and ESD protection, reverse power protection circuit	
Indicator		Network status (NS) and unit status (MS) indicator (green, red LED)	
Material		Front and body case: PC	
Mounting method		DIN rail or panel mounting	
Certification		CE  ENEC DeviceNet	CE  ENEC DeviceNet compatible
Unit weight (packaged)		≈ 145 g (≈ 210 g)	≈ 145 g (≈ 210 g)



View product detail

Modbus

Remote I/O

ARM Series



Features

- Modbus RTU standard protocol
- Saving work time for wiring with sensor connector (CNE series, sold separately)
- Compact size
 - : Small size with W 26 × L 76 × H 54 mm to install at narrow space
 - : Available DIN Rail mounting and panel mounting method
- Real-time monitoring by various functions
 - : Communication speed auto-recognition
 - : Reading number of expansion units and specifications, Reading model name of basic and expansion units
 - : Monitoring Single byte input / output, Multi byte input / output and status Flag
- Easy expansion
 - : Available to connect up to 63 basic units per 1 master unit
 - : Available to connect up to 7 expansion units per 1 basic units (controllable input / output for max. 64 points)
 - : Combines the desired specifications of input / output by various input / output units
 - : Organizes power and communication system by only communication cable lines

* Sold Separately

- Sensor connector: CNE Series



View product detail

Specifications

Model	AR□-DI08□-4S	AR□-DO08□-4S
Power supply	Rated voltage: 24 VDC≒, voltage range: 12-28 VDC≒	
Power consumption	≤ 3 W	
I/O points	NPN or PNP input 8-point	NPN or PNP output 8-point
Control I/O	Voltage	10-28 VDC≒ input
	Current	10 mA/point (sensor current: 150 mA/point)
	COMMON method	8-point, common
Number of connected expansion unit	≤ 7 units	
I/O points	≤ 64-point	
Counter function ⁰¹⁾	16 bits low-speed counter (30 CPS)	-
Insulation method	I/O and internal circuit: photocoupler insulation, Modbus to internal bus and internal circuit: insulation, unit power: non-insulation	
Insulation resistance	≥ 200 MΩ (500 VDC≒ megger)	
Noise immunity	±240 VDC≒ the square wave noise (pulse width: 1 μs) by the noise simulator	
Dielectric strength	Between the charging part and the case: 1,000 VAC~ at 50 / 60 Hz for 1 min	
Vibration	1.5 mm amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-10 to 55 °C, storage: -25 to 75 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection rating	IP20 (IEC standard)	
Protection circuit	Surge, short-circuit, overheat and ESD protection, reverse power protection circuit	
Indicator	Overcurrent protection circuit (operation: ≥ 0.17 A)	Overcurrent protection circuit (operation: ≥ 0.7 A)
	Network status (NS) and unit status (MS) indicator (green, red LED), I/O status indicator (input: green LED, output: red LED)	
Material	Front and body case: PC	
Mounting method	DIN rail or panel mounting	
Certification	CE ENEC	
Unit weight (packaged)	Basic unit	≈ 61.8 g (≈ 123.3 g)
	Expansion unit	NPN type: ≈ 56 g (≈ 117.5 g) PNP type: ≈ 57 g (≈ 118.5 g)
Comm. protocol	Modbus RTU	

01) CPS (counter per second): Specification of accepting external signals per second
The digital output type is available to use the counter when using with digital input type.



H3. Signal Conditioners

Converters are devices which convert voltage, current, RTD, and TC input into assigned voltage, current or alarm outputs.

Isolated Converters

CN-6000 Series



Features

- Multi-input
 - CN-610□-□: Thermocouple 12 types, RTD 5 types, Analog (mV, V, mA) 6 types
 - CN-640□-□: 0 to 50.00kHz
- Improved visibility with negative LCD:
 - 12 segment, 3 colors
 - (selectable red, green, yellow)
- Displays input type and unit on display part
- Various outputs
 - Alarm output: 1 EA / 2 EA / 4 EA
 - 0 - 20 mA transmission output (adjustable insulation, output range),
 - 0 - 10 VDC \rightleftharpoons voltage output (adjustable insulation, output range)
- Various functions
 - High / Low peak input monitoring
 - Alarm output (upper / lower, sensor break)
 - Transmission output / display scale
 - Digital input key (DI), etc.
- Built-in power supply for sensor / transmitter (24 VDC \rightleftharpoons)

Specifications

Model	CN-610□-□	CN-640□-□
Input type ⁰¹⁾	Universal - Temperature sensor : RTD, thermocouple - Analog: voltage, current	Pulse
Display method	12-segment (selectable red, green, yellow) LCD (character size: 6.4 × 11.0 mm), Graphic bar and input type / unit display part (red) LCD (character size: 1.4 × 2.75 mm)	
Display accuracy ⁰²⁾	Dependent on the ambient temperature	
25 ± 5°C	± 0.2 % F.S. ± 1 digit	
-10 to 20°C, 30 to 50°C	± 0.3 % F.S. ± 1 digit	
Display cycle ⁰³⁾	-	Same with pulse input cycle
Sampling cycle	Temperature sensor input: 250 ms Analog input: 100 ms	-
Unit weight (packaged)	≈ 160 g (≈ 301 g)	≈ 200 g (≈ 340 g)
Certification	CE UK	

01) For details, refer to the input type and range.

02) Thermocouple, below -100 °C: ± 0.4 % F.S. ± 1 digit
Thermocouple T, U: min. ± 2.0 °C

03) When pulse input cycle is over 10 sec, it is updated by every 10 sec.

Output	Transmission (DC 0 - 20 mA)	Transmission (0 - 10 VDC \rightleftharpoons)	Alarm
Load resistance	≤ 600Ω	≥ 10 kΩ	-
Accuracy	± 0.3 F.S.		-
Resolution	8,000		-
Contact capacity	-		250 VAC \sim
Contact composition	-		5 A, 1a: 1 / 3 A, 1c: 2 / 5 A, 1a: 4 model

Power supply	100 - 240 VAC \sim 50 / 60 Hz	24 VDC \rightleftharpoons
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	≤ 8 VA	≤ 3 W
Insulation resistance	≥ 100 MΩ (500 VDC \rightleftharpoons megger)	
Dielectric strength	Between input terminal and power terminal: 2,000 VAC \sim 50 / 60 Hz for 1 min	
Vibration	0.75 mm double amplitude at frequency of 5 to 55 Hz in each X, Y, Z direction for 2 hours	
Noise immunity	± 2 kV the square wave noise (pulse width: 1 μs) by the noise simulator	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	

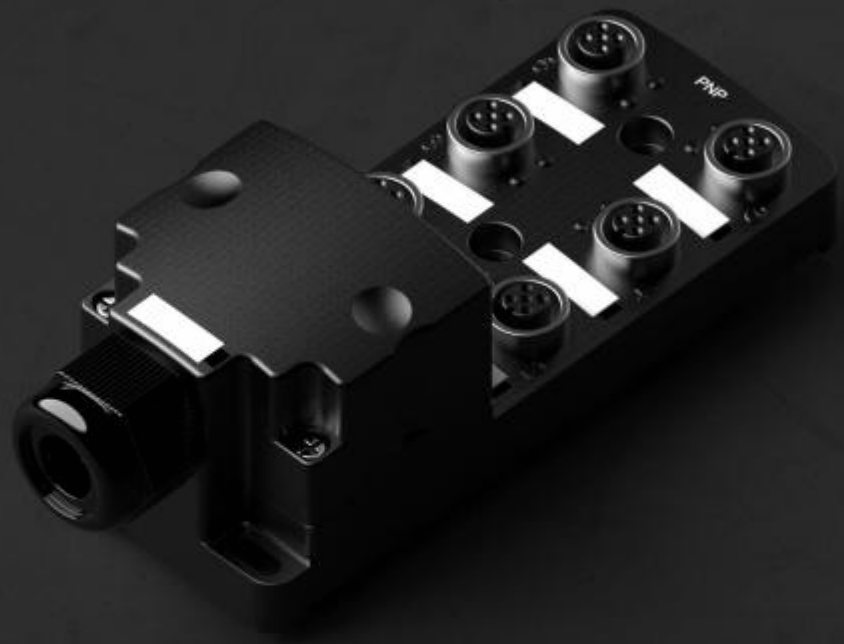


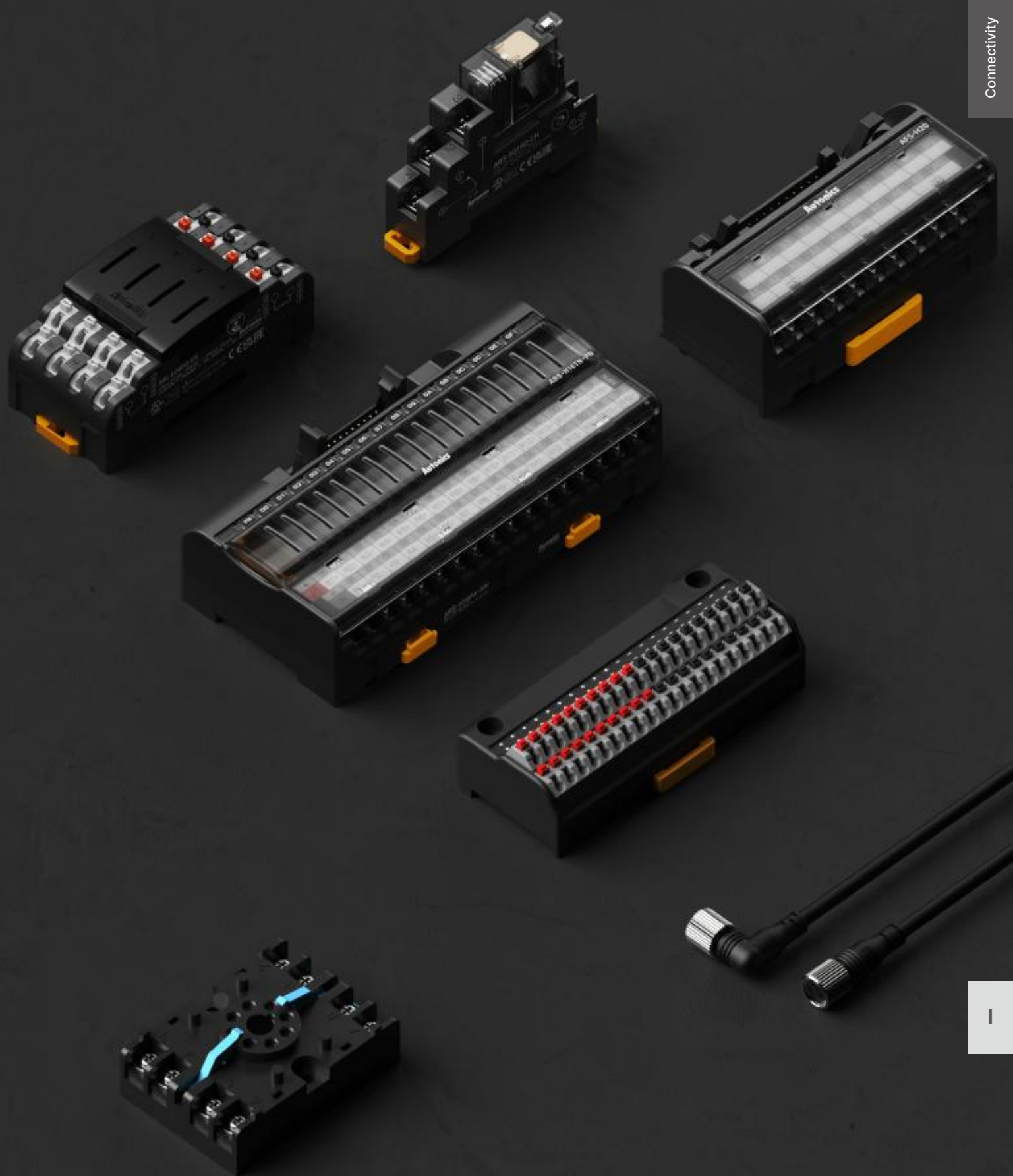
View product detail

I. Connectivity

Connectivity devices are communication devices used to send and receive signals or data between the environment and information processing systems.

- I1. I/O Terminal Blocks
- I2. Distribution Boxes
- I3. Sockets
- I4. Connectors
- I5. Cables







I/O Terminal Blocks

I/O terminal blocks are widely used to connect various devices in a industrial environments and accomplish ideal system configurations.

I1-1	Interface	AFL Series	Screwless Interface Terminal Blocks
		AFR Series	Rising Clamp Interface Terminal Blocks
		AFS Series	Screw Interface Terminal Blocks
I1-2	Common	ACL Series	Screwless Common Terminal Blocks
		ACR Series	Rising Clamp Common Terminal Blocks
		ACS Series	Screw Common Terminal Blocks
I1-3	Relay	ABL Series	Screwless Relay Terminal Blocks (Comprehensive Connection, 16 / 32-Point)
			Screwless Relay Terminal Blocks (16-Point)
			Screwless Relay Terminal Blocks (4-Point)
			Screwless Relay Terminal Blocks (1-Point)
		ABS Series	Screw Relay Terminal Blocks (Comprehensive Connection, 16 / 32-Point)
			Screw Relay Terminal Blocks (4 / 16-Point)
			Screw Relay Terminal Blocks (1-Point)
I1-4	Solid State Relay	ASL Series	Screwless SSR Terminal Blocks (Comprehensive Connection, 16 / 32-Point)
			Screwless SSR Terminal Blocks (16-Point)
			Screwless SSR Terminal Blocks (4-Point)
			Screwless SSR Terminal Blocks (1-Point)
		ASS Series	Screw SSR Terminal Blocks (Comprehensive Connection, 16 / 32-Point)
I1-5	Sensor Connector	AFE Series	Sensor Connector Terminal Blocks

Screwless Interface Terminal Blocks

AFL Series



Features

- Screwless push-in type connection for simple and easy connection
- Compact, space-saving design
- Ideal for PLCs and motion device I/O
- DIN rail mount and screw mount installation

* Sold Separately

- I/O cable CH / CO Series

Specifications

Model	AFL-H20	AFL-H26	AFL-H40	AFL-H50	AFL-H50B
No. of connector pins	20	26	40	50	50
No. of terminal points	20	26	40	50	50
Terminal type	Screwless	Screwless	Screwless	Screwless	Screwless
Terminal pitch	5.0 mm	5.0 mm	5.0 mm	5.0 mm	5.0 mm
Connector for controller side	20-pin Omron (XG4A-2031)	26-pin Omron (XG4A-2631)	40-pin Hirose (HIF3BA-40PA-54DSA)	50-pin Hirose (HIF3BA-50PA-2.54DSA)	50-pin Hirose (HIF3BB-50PA-2.54DSA)
Material	Case, Base: PC				
Certification	  				
Unit weight (packaged)	≈ 48.5 g (≈ 86.2 g)	≈ 60 g (≈ 89 g)	≈ 89 g (≈ 156 g)	≈ 110 g (≈ 177 g)	≈ 110 g (≈ 177 g)

Model	AFL-H20-LN, AFL-H20-LP	AFL-H40-LN, AFL-H40-LP
No. of connector pins	20	40
No. of terminal points	16 ⁰¹⁾	32 ⁰²⁾
Terminal type	Screwless	Screwless
Terminal pitch	5.0 mm	5.0 mm
Connector for controller side	20-pin Omron (XG4A-2031)	40-pin Hirose (HIF3BA-40PA-2.54DSA)
Input logic	NPN / PNP model	
Indicator	Power indicator: red, operation indicator: blue	
Material	Case, Base: PC	
Certification	  	  
Unit weight (packaged)	≈ 48.6 g (≈ 86.3 g)	≈ 91 g (≈ 158 g)

01) Four terminals among twenty terminals are used for LED power.

02) Eight terminals among forty terminals are used for LED power or N.C (Not Connected) terminals.

Rated voltage ⁰¹⁾	Basic model: ≤ 125 VDC≡, 125 VAC~ 50/60 Hz Indicator equipped model: ≤ 24 VDC≡ ± 10%
Rated current	≤ 1 A
Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)
Dielectric strength	2,700 VAC~ 50/60 Hz for 1 minute
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes
Shock	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection structure	IP20 (IEC standard)

Applicable wire- solid ⁰¹⁾	Ø 0.6 to 1.25 mm
Applicable wire - stranded ^{01) 02)}	AWG 22-18 (0.30 to 0.80 mm ²)
Wire ferrule connection tensile strength	≥ 30 N
Stripped length	8 to 10 mm

01) Use the cable of copper conductor in 60 °C temperature class.

02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Rising Clamp Interface Terminal Blocks

AFR Series



Features

- Rising clamp type connection method offers easy and durable connection
- Space-saving design with 5 mm terminal pitch (compact size)
- Ideal for PLCs and motion device I/O
- DIN rail mount and screw mount installation

* Sold Separately

- I/O cable CH / CO Series

Specifications

Model	AFR-H20	AFR-H26	AFR-H40	AFR-H50	AFR-H50B
No. of connector pins	20	26	40	50	50
No. of terminal points	20	26	40	50	50
Terminal type	Rising Clamp	Rising Clamp	Rising Clamp	Rising Clamp	Rising Clamp
Terminal pitch	5.0 mm	5.0 mm	5.0 mm	5.0 mm	5.0 mm
Connector for controller side	20-pin Omron (XG4A-2031)	26-pin Omron (XG4A-2631)	40-pin Hirose (HIF3BA-40PA-54DSA)	50-pin Hirose (HIF3BA-50PA-2.54DSA)	50-pin Hirose (HIF3BB-50PA-2.54DSA)
Material	Case, Base: PC				
Certification					
Unit weight (packaged)	≈ 61 g (≈ 98.7 g)	≈ 78 g (≈ 107 g)	≈ 116 g (≈ 183 g)	≈ 143 g (≈ 210 g)	≈ 143 g (≈ 210 g)

Model	AFR-H20-LN, AFR-H20-LP	AFR-H40-LN, AFR-H40-LP
No. of connector pins	20	40
No. of terminal points	16 ⁰¹⁾	32 ⁰²⁾
Terminal type	Rising Clamp	Rising Clamp
Terminal pitch	5.0 mm	5.0 mm
Connector for controller side	20-pin Omron (XG4A-2031)	40-pin Hirose (HIF3BA-40PA-2.54DSA)
Input logic	NPN / PNP model	
Indicator	Power indicator: red, operation indicator: blue	
Material	Case, Base: PC	
Certification		
Unit weight (packaged)	≈ 61.1 g (≈ 98.8 g)	≈ 118 g (≈ 188 g)

01) Four terminals among twenty terminals are used for LED power.

02) Eight terminals among forty terminals are used for LED power or N.C (Not Connected) terminals.

Rated voltage ⁰¹⁾	Basic model: ≤ 125 VDC=, 125 VAC~ 50/60 Hz Indicator equipped model: ≤ 24 VDC= ± 10%
Rated current	≤ 1 A
Insulation resistance	≥ 1,000 MΩ (500 VDC= megger)
Dielectric strength	2,700 VAC~ 50/60 Hz for 1 minute
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz (for 1 minute) in each X, Y, Z direction for 10 minutes
Shock	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection structure	IP20 (IEC standard)

01) When connecting loads to output part, connect loads of same power type. Connecting loads of different power type may cause safety issues.

Applicable wire - solid ⁰¹⁾	Ø 0.3 to 1.2 mm
Applicable wire - stranded ^{01) 02)}	AWG 22-16 (0.30 to 1.25 mm ²)
Wire ferrule connection tensile strength	≥ 30 N
Stripped length	6 to 8 mm

01) Use the cable of copper conductor in 60 °C temperature class.

02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Screw Interface Terminal Blocks

AFS Series




















Features

- Screw type connection for stable and reliable connection
- Ideal for PLCs and motion device I/O
- Compact, space-saving design
- Excellent environment resistance against dust and debris by hinged cover
- DIN rail mount and screw mount installation

* Sold Separately

- 7 mm jumper bar (4-pin: JB-7-04, 10-pin: JB-7-10)
- I/O cable CH / CO Series

Specifications

Model	AFS-H20	AFS-H26	AFS-H40	AFS-HB40	AFS-H50
No. of connector pins	20	26	40	40	50
No. of terminal points	20	26	40	40	50
Terminal type	Screw	Screw	Screw	Screw	Screw
Terminal block arrangement	Single line	Single line	Single line	Double line	Single line
Terminal pitch	7.0 mm	7.1 mm	7.0 mm	7.2 mm	7.0 mm
Connector for controller side	20-pin Hirose (HIF3BA-20PA-2.54DSA)	26-pin Omron (XG4A-2631)	40-pin Hirose (HIF3BA-40PA-2.54DSA)	40-pin Omron (XG4A-4031)	50-pin Hirose (HIF3BA-50PA-2.54DSA)
Material	Case, Base: MPPO, terminal: brass	Case, Base: PC, terminal: brass	Case, Base: MPPO, terminal: brass	Case, Base: PC, terminal: brass	Case, Base: MPPO, terminal: brass
Certification	    ENEC	   	   ENEC	  	   ENEC
Unit weight (packaged)	≈ 71 g (≈ 103 g)	≈ 93 g (≈ 133 g)	≈ 133 g (≈ 175 g)	≈ 142 g (≈ 194 g)	≈ 163 g (≈ 211 g)
Rated voltage ⁰¹⁾	≤ 125 VDC≡, 125 VAC~ 50/60 Hz				
Rated current	≤ 1 A				
Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)				
Dielectric strength	2,700 VAC~ 50/60 Hz for 1 minute				
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours				
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes				
Shock	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times				
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times				
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)				
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)				
Protection structure	IP20 (IEC standard)				
01) When connecting loads to output part, connect loads of same power type. Connecting loads of different power type may cause safety issues.					
Applicable wire - solid	Ø 0.3 to 1.2 mm				
Applicable wire - stranded	AWG 22-16 (0.30 to 1.25 mm ²)				
Crimp terminal connection tensile strength	≥ 30 N				
Tightening torque	0.5 to 0.6 N·m				



View product detail

Screwless

Common

Terminal Blocks

ACL Series



Features

- Screwless push-in type connection for simple and easy connection
- Common wiring on PCB, jumper bar not required
- Space-saving design with 5 mm terminal pitch and 2-line arrangement
- DIN rail mount and screw mount installation

Specifications

Model	ACL-20□	ACL-40□	ACL-B40□	ACL-50□
No. of terminals	20	40	40	50
Terminal type	Screwless	Screwless	Screwless	Screwless
Terminal block arrangement	Single line	Single line	Double line	Single line
Terminal pitch	5.0 mm	5.0 mm	5.0 mm	5.0 mm
Material	Case, Base: PC	Case, Base: PC	Case, Base: PC	Case, Base: PC
Certification	CE UK ENEC EAC	CE UK ENEC EAC	CE UK ENEC EAC	CE UK ENEC EAC
Unit weight (packaged)	≈ 42 g (≈ 71 g)	≈ 79 g (≈ 146 g)	≈ 67 g (≈ 96 g)	≈ 97 g (≈ 164 g)
Rated voltage	≤ 250 VDC≡, 250 VAC~ 50/60 Hz			
Rated current	≤ 10 A			
Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)			
Dielectric strength	3,000 VAC~ 50/60 Hz for 1 minute			
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes			
Shock	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times			
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times			
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)			
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)			
Protection structure	IP20 (IEC standard)			
Applicable wire - solid ⁰¹⁾	Ø 0.6 to 1.25 mm			
Applicable wire - stranded ^{01) 02)}	AWG 22-18 (0.30 to 0.80 mm ²)			
Wire ferrule connection tensile strength	≥ 30 N			
Stripped length	8 to 10 mm			

01) Use the cable of copper conductor in 60 °C temperature class.

02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Rising Clamp

Common

Terminal Blocks

ACR Series



Features

- Rising clamp type connection method offers easy and durable connection
- Common wiring on PCB, jumper bar not required
- Space-saving design with 5 mm terminal pitch and 2-line arrangement
- DIN rail mount and screw mount installation

Specifications

Model	ACR-20□	ACR-40□	ACR-B40□	ACR-50□
No. of terminals	20	40	40	50
Terminal type	Rising Clamp	Rising Clamp	Rising Clamp	Rising Clamp
Terminal block arrangement	Single line	Single line	Double line	Single line
Terminal pitch	5.0 mm	5.0 mm	5.0 mm	5.0 mm
Material	Case, Base: PC	Case, Base: PC	Case, Base: PC	Case, Base: PC
Certification	CE  ENEC (ACR-20T)	CE  ENEC (ACR-40T)	CE 	CE  ENEC (ACR-50T)
Unit weight (packaged)	≈ 55 g (≈ 84 g)	≈ 105 g (≈ 172 g)	≈ 92 g (≈ 121 g)	≈ 130 g (≈ 197 g)
Rated voltage ⁰¹⁾	≤ 250 VDC≡, 250 VAC~ 50/60 Hz			
Rated current	≤ 10 A			
Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)			
Dielectric strength	3,000 VAC~ 50/60 Hz for 1 minute			
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes			
Shock	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times			
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times			
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)			
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)			
Protection structure	IP20 (IEC standard)			
Applicable wire - solid ⁰¹⁾	Ø 0.6 to 1.25 mm			
Applicable wire - stranded ^{01) 02)}	AWG 22-16 (0.30 to 1.25 mm ²)			
Wire ferrule connection tensile strength	≥ 30 N			
Stripped length	8 to 10 mm			

01) Use the cable of copper conductor in 60 °C temperature class.

02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Screw

Common

Terminal Blocks

ACS Series



Features

- Screw type connection for stable and reliable connection
- Excellent environment resistance against dust and debris by hinged cover
- Common wiring on PCB, jumper bar not required
- Compact, space-saving design
- DIN rail mount and screw mount installation

Specifications

Model	ACS-20□	ACS-40□	ACS-B40□	ACS-50□
No. of terminals	20	40	40	50
Terminal type	Screw	Screw	Screw	Screw
Terminal block arrangement	Single line	Single line	Double line	Single line
Terminal pitch	7.0 mm	7.0 mm	7.2 mm	7.0 mm
Material	Case, Base: MPPO, terminal: brass	Case, Base: MPPO, terminal: brass	Case, Base: PC, terminal: brass	Case, Base: MPPO, terminal: brass
Certification	CE UK ENEC EAC	CE UK ENEC EAC	CE UK ENEC EAC	CE UK ENEC EAC
Unit weight (packaged)	≈ 61 g (≈ 92 g)	≈ 115 g (≈ 157 g)	≈ 120 g (≈ 149 g)	≈ 141 g (≈ 189 g)
Rated voltage	≤ 125 VDC≡, 125 VAC~ 50/60 Hz			
Rated current	≤ 10 A			
Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)			
Dielectric strength	2,700 VAC~ 50/60 Hz for 1 minute			
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours			
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes			
Shock	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times			
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times			
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)			
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)			
Protection structure	IP20 (IEC standard)			
Applicable wire - solid	Ø 0.3 to 1.2 mm			
Applicable wire v- stranded	AWG 22-16 (0.30 to 1.25 mm ²)			
Crimp terminal connection tensile strength	≥ 30 N			
Tightening torque	0.5 to 0.6 N·m			



View product detail

Screwless

Relay Terminal Blocks

(Common Type, 16 / 32-point)

ABL Series



Features

- Screwless push-in type connection for simple and easy connection
- Ideal for operating various loads using output signals from PLCs
- Space-saving design with 5 mm terminal pitch and 2-line relay arrangement
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Convenient relay removal with ejector clip and release lever
- Relay protection cover

* Sold Separately

- I/O cable CH / CO Series

Specifications

Model	ABL-HC16□-□N	ABL-HC32□-□N
Applied relay ⁰¹⁾	PA: APAN3124 [MATSUSHITA (Panasonic)] / TN: NYP24W-K [TAKAMISAWA (Fujitsu)]	
Output method	1a	1a
Power supply	≤ 24 VDC≒ ±10 %	≤ 24 VDC≒ ±10 %
Current consumption	PA: ≤ 7.4 mA ⁰²⁾ or ≤ 10.1 mA ⁰³⁾ TN: ≤ 7.8 mA ⁰²⁾ or ≤ 10.5 mA ⁰³⁾	PA: ≤ 7.4 mA ⁰²⁾ or ≤ 10.1 mA ⁰³⁾ TN: ≤ 7.8 mA ⁰²⁾ or ≤ 10.5 mA ⁰³⁾
Relay output rated spec.	250 VAC~ 50/60 Hz 2A (2A / 1-point, 8A / 1COM), 24 VDC≒ 2A (2A / 1-point, 8A / 1COM)	250 VAC~ 50/60 Hz 2A (2A / 1-point, 8A / 1COM), 24 VDC≒ 2A (2A / 1-point, 8A / 1COM)
No. of connector pins	20	40
Connector for controller side	20-pin Omron (XG4A-2031)	40-pin Omron (XG4A-4031)
No. of relay points	16	32
Output connection	8-point/1COM	8-point/1COM
Terminal type	Screwless	Screwless
Terminal pitch	≥ 5 mm	≥ 5 mm
Indicator	Power indicator: red, operating indicator: blue	Power indicator: red, operating indicator: blue
Varistor	None	None
Input logic	NPN / PNP model	NPN / PNP model
Material	CASE, BASE, COVER: PC, terminal pin: copper+PA66	CASE, BASE, COVER: PC, terminal pin: copper+PA66
Certification	CE, ENEC, UL, VDE	CE, ENEC, UL, VDE
Unit weight (packaged)	PA: ≈ 173 g (≈ 220 g), TN: ≈ 185 g (≈ 232 g)	PA: ≈ 345 g (≈ 438 g), TN: ≈ 370 g (≈ 463 g)

01) For the detailed information about each relay, please refer to 'Power Relay' or data sheet from the manufacturer.

02) It is current consumption per a relay including LED current.

03) It is current consumption including LED current for power part to 02).

Insulation resistance	≥ 1,000 MΩ (500 VDC≒ megger)
Dielectric strength (coil-contact)	3,000 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact)	PA: 1,000 VAC~ 50/60 Hz for 1 minute TN: 750 VAC~ 50/60 Hz for 1 minute
Vibration	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Applicable wire - solid ⁰¹⁾	Ø 0.6 to 1.25 mm
Applicable wire - stranded ^{01) 02)}	AWG 22-18 (0.30 to 0.80 mm ²)
Stripped length	8 to 10 mm

01) Use the cable of copper conductor in 60 °C temperature class.

02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Screwless

Relay Terminal Blocks

(16-Point)

ABL Series



Features

- Screwless push-in type connection for simple and easy connection
- Ideal for operating various loads using output signals from PLCs
- Switch between independent and load common output with jumper bar
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Convenient relay removal with ejector clip and release lever
- Relay protection cover

* Sold Separately

- 8-pin 10.2 mm pitch jumper bar (JB-10.2-08L)
- I/O cable CH / CO Series

Specifications

Model	ABL-H16R6-□
Applied relay ⁰¹⁾	G6B-1174P-FD-US [OMRON]
Output method	1a
Power supply	24 VDC± 10 %
Current consumption ⁰²⁾	≤ 20 mA
Relay output rated spec. ^{03) 04)}	250 VAC~50/60 Hz 3A, 30 VDC± 3A
No. of connector pin	20
Connector for controller side	20-pin Hirose (HIF3BA-20PA-2.54DSA)
Terminal type	Screwless
Terminal pitch	≥ 7.8 mm
Indicator	Power indicator: red, operation indicator: blue
Varistor	None
Input logic	NPN / PNP model
Material	CASE, BASE: MPPO, terminal block, cover: PC
Certification	CE, ENEC, ETL, ENEC
Unit weight (packaged)	≈ 348 g (≈ 446 g)
Insulation resistance	≥ 1,000 MΩ (500 VDC± megger)
Dielectric strength (coil-contact)	3,000 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact)	1,000 VAC~ 50/60 Hz for 1 minute
Vibration	1.5 mm amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 10 minutes
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection structure	IP20 (IEC standard)
Applicable wire - solid ⁰¹⁾	Ø 0.6 to 1.25 mm
Applicable wire - stranded ^{01) 02)}	AWG 22-18 (0.30 to 0.80 mm ²)
Stripped length	8 to 10 mm

01) Use the cable of copper conductor in 60 °C temperature class.

02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Screwless

Relay Terminal Blocks

(4-Point)

ABL Series



Features

- Screwless push-in type connection for simple and easy connection
- Ideal for operating various loads using output signals from PLCs
- Switch between independent and load common output with jumper bar
- Switch between NPN and PNP input with jumper bar
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Convenient relay removal with ejector clip and release lever
- Relay protection cover

* Sold Separately

- PA, TN: 6.0 mm pitch jumper bar (JB-6.0-04L)
- PQ, R6: 10.2 mm pitch jumper bar (JB-10.2-04L)

Specifications

Model	ABL-L04PA-□	ABL-L04TN-□	ABL-L04PQ-□	ABL-L04R6-□
Applied relay ⁰¹⁾	APAN3124 [MATSUSHITA (Panasonic)]	NYP24W-K [TAKAMISAWA (Fujitsu)]	PQ1a-24V [MATSUSHITA (Panasonic)]	G6B-1174P-FD-US [OMRON]
Output method	1a	1a	1a	1a
Power supply	≤ 24 VDC≡ ± 10 %	≤ 24 VDC≡ ± 10 %	≤ 24 VDC≡ ± 10 %	≤ 24 VDC≡ ± 10 %
Current consumption ⁰²⁾	≤ 8 mA	≤ 8 mA	≤ 20 mA	≤ 20 mA
Relay output rated spec. ^{03) 04)}	250 VAC~ 50/60 Hz 3A, 30 VDC≡ 3 A		250 VAC~ 50/60 Hz 3A, 30 VDC≡ 5 A	
Terminal type	Screwless		Screwless	
Terminal pitch	5.0 mm		10.2 mm	
Indicator	Operation indicator: blue		Operation indicator: blue	
Varistor	Equipped ⁰⁵⁾ / not equipped model		Equipped ⁰⁵⁾ / not equipped model	
Input logic	NPN / PNP selectable with jumper bar		NPN / PNP selectable with jumper bar	
Material	Terminal block: PA66, CASE, BASE: PPS, conducting plate: brass		Terminal block: PA66, CASE, BASE: MPPO, conducting plate: brass	
Certification	CE ENEC EAC		CE ENEC EAC	
Unit weight (packaged)	≈ 72 g (≈ 125 g)	≈ 75 g (≈ 128 g)	≈ 94 g (≈ 150 g)	≈ 88 g (≈ 144 g)

01) For the detailed information about each relay, please refer to 'Power Relay' or data sheet from the manufacturer.

02) It is current consumption for a relay including LED current.

03) This value is rated with resistive load.

04) When connecting loads to output part, please connect loads of same power type.

Connecting loads of different power type may cause safety issues.

05) Since the varistor type is for protecting the contact, it is recommended to use with an inductive load.

Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)
Dielectric strength (coil-contact)	PA, TN, R6: 3,000 VAC~ 50/60 Hz for 1 minute PQ: 4,000 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact) ⁰¹⁾	PA, PQ, R6: 1,000 VAC~ 50/60 Hz for 1 minute TN: 750 VAC~ 50/60 Hz for 1 minute
Vibration	PA, TN: 0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours PQ, R6: 1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	PA, TN: 0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes PQ, R6: 1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (a non freezing or condensation environment)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (a non freezing or condensation environment)
Protection structure	IP20 (IEC standard)

01) Varistor type is 300 VAC~.

Applicable wire - solid ⁰¹⁾	Ø 0.6 to 1.25 mm
Applicable wire - stranded ^{01) 02)}	AWG 22-18 (0.30 to 0.80 mm ²)
Stripped length	8 to 10 mm

01) Use the cable of copper conductor in 60 °C temperature class.

02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Screwless

Relay Terminal Blocks

(1-Point)

ABL Series



Features

- Screwless push-in type connection for simple and easy connection
- Ideal for operating various loads using output signals from PLCs
- Switch between independent and load common output with jumper bar
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Relay protection cover

* Sold Separately

- 9.0 mm pitch jumper bar (JB-9.0-04L)

Specifications

Model	ABL-L01PA-□	ABL-L01TN-□
Applied relay ⁰¹⁾	APAN3124 [MATSUSHITA(Panasonic)]	NYP24W-K [TAKAMISAWA(Fujitsu)]
Output method	1a	
Power supply	≤ 24 VDC ≒ ± 10 %	
Current consumption ⁰²⁾	≤ 8 mA	
Relay output rated spec. ^{03) 04)}	250 VAC ~ 50/60 Hz 3A, 30 VDC ≒ 3A	
Terminal type	Screwless	
Terminal pitch	9.0 mm (arranging over 2 units)	
Indicator	Operation indicator: blue	
Varistor	Equipped / not equipped model	
Input logic	NPN / PNP model	
Material	Terminal block: PA66, CASE, BASE: PPS, conducting plate: brass	
Certification	CE, RoHS, ENEC, ETL	
Unit weight (packaged) ⁰⁵⁾	≈ 21 g (≈ 138 g)	≈ 21 g (≈ 135 g)

01) For the detailed information about each relay, please refer to 'Power Relay' or data sheet from the manufacturer.

02) It is current consumption for a relay including LED current.

03) This value is rated with resistive load.

04) When connecting loads to output part, please connect loads of same power type.

Connecting loads of different power type may cause safety issues.

05) It is weight per product. The weight in parentheses is for 4 packing units including packing materials.

Insulation resistance	≥ 1,000 MΩ (500 VDC ≒ megger)
Dielectric strength (coil-contact)	3,000 VAC ~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact) ⁰¹⁾	PA: 1,000 VAC ~ 50/60 Hz for 1 minute TN: 750 VAC ~ 50/60 Hz for 1 minute
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection structure	IP20 (IEC standard)

01) Varistor type is 300 VAC ~.

Applicable wire - solid ⁰¹⁾	Ø 0.6 to 1.25 mm
Applicable wire - stranded ^{01) 02)}	AWG 22-18 (0.30 to 0.80 mm ²)
Stripped length	8 to 10 mm

01) Use the cable of copper conductor in 60 °C temperature class.

02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Screw

Relay Terminal Blocks

(16 / 32-Point)

ABS Series









Features

- Screw type connection for stable and reliable connection
- Compact, space-saving design
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Convenient relay removal with ejector clip and release lever
- Relay protection cover

* Sold Separately

- I/O cable CH / CO Series

Specifications

Model	ABS-HC16□-□N	ABS-HC32□-□N
Applied relay ⁰¹⁾	PA: APAN3124 [MATSUSHITA (Panasonic)] / TN: NYP24W-K [TAKAMISAWA (Fujitsu)]	
Output method	1a	1a
Power supply	≤ 24 VDC≒ ±10 %	≤ 24 VDC≒ ±10 %
Current consumption	PA: ≤ 7.4 mA ⁰²⁾ or ≤ 10.1 mA ⁰³⁾ TN: ≤ 7.8 mA ⁰²⁾ or ≤ 10.5 mA ⁰³⁾	PA: ≤ 8.0 mA ⁰²⁾ or ≤ 13.0 mA ⁰³⁾ TN: ≤ 8.5 mA ⁰²⁾ or ≤ 13.5 mA ⁰³⁾
Relay output rated spec.	250 VAC~ 50/60 Hz 2A (2 A /1 point, 8 A /1COM), 24 VDC≒ 2A (2 A / 1-point, 8 A / 1COM)	250 VAC~ 50/60 Hz 2A (2 A /1 point, 8 A /1COM), 24 VDC≒ 2A (2 A /1-point, 8 A / 1COM)
No. of connector pins	20	40
Connector for controller side	20-pin Omron (XG4A-2031)	40-pin Hirose (HIF3BA-40PA-2.54DSA)
No. of relay points	16	32
Output connection	8-point/1COM	8-point/1COM
Terminal type	Screw	Screw
Terminal pitch	7.62 mm	7.62 mm
Indicator	Power indicator: red, operating indicator: blue	Power indicator: red, operating indicator: blue
Varistor	None	None
Input logic	NPN / PNP model	NPN / PNP model
Material	CASE, BASE, COVER: PC, terminal pin: brass, Ni-plating	CASE: MPPO, BASE: PA66 (G25 %), COVER: PC, terminal pin: brass, Ni-plating
Certification	  	  
Unit weight (packaged)	PA: ≈ 173 g (≈ 220 g) TN: ≈ 185 g (≈ 232 g)	PA: ≈ 345 g (≈ 438 g) TN: ≈ 370 g (≈ 463 g)

01) For the detailed information about each relay, please refer to 'Power Relay' or data sheet from the manufacturer.

02) It is current consumption per a relay including LED current.

03) It is current consumption including LED current for power part to 02).

Insulation resistance	≥ 1,000 MΩ (500 VDC≒ megger)
Dielectric strength (coil-contact)	3,000 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact)	PA: 1,000 VAC~ 50/60 Hz for 1 minute TN: 750 VAC~ 50/60 Hz for 1 minute
Vibration	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Applicable wire - solid	Ø 0.3 to Ø 1.2 mm
Applicable wire - stranded	AWG 22-16 (0.30 to 1.25 mm ²)
Tightening torque	0.5 to 0.6 N·m



View product detail

Screw

Relay Terminal Blocks

(4 / 16-Point)

ABS Series



Features

- Screw type connection for stable and reliable connection
- Compact, space-saving design
- Switch between independent and load common output with jumper bar
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Convenient relay removal with ejector clip and release lever
- Relay protection cover

* Sold Separately

- 7.62 mm pitch jumper bar
(4-pin: JB-7.62-04, 8-pin: JB-7.62-08)
- I/O cable CH / CO Series

Specifications

Model	ABS-S04□-CN	ABS-H16□-□
Applied relay ⁰¹⁾	PA: APAN3124 [MATSUSHITA (Panasonic)] / TN: NYP24W-K [TAKAMISAWA (Fujitsu)]	
Output method	1a	1a
Power supply	≤ 24 VDC ≒ ±10 %	≤ 24 VDC ≒ ±10 %
Current consumption	PA: ≤ 8 mA ⁰²⁾ TN: ≤ 8.5 mA ⁰²⁾	PA: ≤ 8 mA ⁰²⁾ or ≤ 13 mA ⁰³⁾ TN: ≤ 8.5 mA ⁰²⁾ or ≤ 13.5 mA ⁰³⁾
Relay output rated spec. ^{04) 05)}	250 VAC~ 50/60 Hz 3A, 30 VDC ≒ 3A	250 VAC~ 50/60 Hz 3A, 30 VDC ≒ 3A
No. of connector pins	-	20
Connector for controller side	-	20-pin Hirose (HIF3BA-20PA-2.54DSA)
No. of relay points	4	16
Terminal type	Screw	Screw
Terminal pitch	7.62 mm	7.62 mm
Indicator	Operation indicator: blue	Power indicator: red, operating and disconnection indicator: blue
Varistor	None	None
Input logic	-	NPN / PNP model
Material	CASE, BASE: MPPO, terminal pin: brass	CASE: MPPO, BASE: PA66 (G25%), terminal pin: brass
Certification	CE ENEC ⁰⁶⁾	CE ENEC ⁰⁶⁾
Unit weight (packaged)	PA: ≈ 68 g (≈ 104 g) TN: ≈ 71 g (≈ 107 g)	PA: ≈ 224 g (≈ 307 g) TN: ≈ 235 g (≈ 318 g)

01) For the detailed information about each relay, please refer to 'Power Relay' or data sheet from the manufacturer.

02) It is current consumption for a relay including LED current.

03) It is current consumption including LED current for power part to 2).

04) This value is rated with resistive load.

05) When connecting loads to output part, please connect loads of same power type.

Connecting loads of different power type may cause safety issues.

06) 30 VDC ≒ of rated load voltage is not subjected to UL Listed.

Insulation resistance	≥ 1,000 MΩ (500 VDC ≒ megger)
Dielectric strength (coil-contact)	3,000 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact)	PA: 1,000 VAC~ 50/60 Hz for 1 minute TN: 750 VAC~ 50/60 Hz for 1 minute
Vibration	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 min
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	147 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Applicable wire - stranded	AWG 22-16 (0.30 to 1.25 mm ²)
Tightening torque	0.5 to 0.6 N-m



View product detail

Screw

Relay Terminal Blocks

(1-Point)






ABS Series



Features

- Screw type connection for stable and reliable connection
- Clip connection between terminals allow compact and easy expansion
- Max. rated load: 250 VAC 10A, 30 VDC 10A
- Compact, space-saving design
- Operation status indicator(blue LED)
- DIN Rail mount and screw mount installation
- Relay protection cover

Specifications

Model	3 A model	5 A model	10 A model		
	ABS-S01□-CN	ABS-S01□-CN	ABS-S01R2-CN	ABS-S01R26-CN	ABS-S01R25-CN
Applied relay ⁰¹⁾	PA: APAN3124 [MAT-SUSHITA (Panasonic)] TN: NYP24W-K [TAKA-MISAWA (Fujitsu)]	PQ: PQ1a-24V [MAT-SUSHITA (Panasonic)] R6: G6B-1174P- FD-US [OMRON]	G2R-1-S24VDC [OMRON]	G2R-1-S100/ (110)VAC [OMRON]	G2R-1-S200/ (220)VAC [OMRON]
Output method	1a	1a	1c	1c	1c
Power supply	≤ 24 VDC≡ ±10 %	≤ 24 VDC≡ ±10 %	≤ 24 VDC≡ ±10 %	100/110 VAC~	200/220 VAC~
Current consumption	PA: ≤ 8 mA TN: ≤ 8.5 mA	≤ 20 mA	≤ 25 mA	≤ 15 mA	≤ 10 mA
Relay output rated spec. ^{02) 03)}	250 VAC~ 50/60 Hz 3A, 30 VDC≡ 3A	250 VAC~ 50/60 Hz 5A, 30 VDC≡ 5A	250 VAC~ 50/60 Hz 10A, 30 VDC≡ 10A	250 VAC~ 50/60 Hz 10A, 30 VDC≡ 10A	250 VAC~ 50/60 Hz 10A, 30 VDC≡ 10A
Terminal type	Screw	Screw	Screw	Screw	Screw
Indicator	Operation indicator: blue	Operation indicator: blue	Operation indicator: blue	Operation indicator: blue	Operation indicator: blue
Varistor	None	None	None	None	None
Material	CASE, BASE: PA6, terminal pin: brass	CASE, BASE: PBT, terminal pin: brass	CASE, BASE: PBT, terminal pin: brass, phosphor bronze	CASE, BASE: PBT, terminal pin: brass, phosphor bronze	CASE, BASE: PBT, terminal pin: brass, phosphor bronze
Certification					
Unit weight (packaged) ⁰⁵⁾	PA: ≈ 21.5 g (≈ 314.5 g) TN: ≈ 22.2 g (≈ 324.5 g)	PQ: ≈ 31 g (≈ 430 g) R6: ≈ 30 g (≈ 416 g)	≈ 53 g (≈ 719 g)	≈ 52 g (≈ 711 g)	≈ 52 g (≈ 712 g)

01) For the detailed information about each relay, please refer to 'Power Relay' or data sheet from the manufacturer.

02) This value is rated with resistive load.

03) When connecting loads to output part, please connect loads of same power type.

Connecting loads of different power type may cause safety issues.

04) 30 VDC≡: of rated load voltage is not subjected to UL Listed.

05) It is weight per product. The weight in parentheses is for 10 packing units (PA, TN: 14) including packing materials.

Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)
Dielectric strength (coil-contact)	PA, TN: 3,000 VAC~ 50/60 Hz for 1 minute PQ, R6: 4,000 VAC~ 50/60 Hz for 1 minute R2 (5, 6): 5,000 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact)	PA: 1,000 VAC~ 50/60 Hz for 1 minute, TN: 750 VAC~ 50/60 Hz for 1 minute PQ: 1,000 VAC~ 50/60 Hz for 1 minute, R6: 3,000 VAC~ 50/60 Hz for 1 minute R2 (5, 6): 1,000 VAC~ 50/60 Hz for 1 minute
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 10 min
Shock	PA, TN: 500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times PQ, R6, R2 (5, 6): 1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	PA, TN: 147 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times PQ, R6, R2 (5, 6): 100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)



View product detail

Applicable wire - stranded	PA, TN: AWG 22-16 (0.30 to 1.25 mm ²) PQ, R6: AWG 19-14 (0.65 to 2.0 mm ²) R2 (5, 6): AWG 17-14 (1.0 to 2.0 mm ²)
Tightening torque	PA, TN: 0.5 to 0.6 N·m PQ, R6: 0.7 to 0.8 N·m R2 (5, 6): 0.7 to 0.8 N·m

Screwless

SSR Terminal Blocks

(Common Type, 16 / 32-point)

ASL Series



Features

- Screwless push-in type connection for simple and easy connection
- Contactless relay suitable for systems requiring long life-cycle and high-speed response
- Space-saving design with 5 mm terminal pitch and 2-line SSR arrangement
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Convenient SSR removal with ejector clip
- SSR protection cover

* Sold Separately

- I/O cable CH / CO Series

Specifications

Model	ASL-HC16□-□N	ASL-HC32□-□N
Applied SSR ⁰¹⁾	AQZ202D [Panasonic]	
Output method	1a	1a
Power supply	≤ 24 VDC≒ ±10 %	≤ 24 VDC≒ ±10 %
Current consumption	≤ 10.4 mA ⁰²⁾ or ≤ 13.1 mA ⁰³⁾	≤ 10.4 mA ⁰²⁾ or ≤ 13.1 mA ⁰³⁾
SSR output rated spec.	24 VAC~ 50/60 Hz 1.6A, VDC≒ 1.6A (1.6 A / 1-point, 8 A / 1COM)	24 VAC~ 50/60 Hz 1.6A, VDC≒ 1.6A (1.6 A / 1-point, 8 A / 1COM)
No. of connector pins	20	40
Connector for controller side	20-pin Omron (XG4A-2031)	40-pin Omron (XG4A-4031)
No. of SSR points	16	32
Output connection	8-point/1COM	8-point/1COM
Terminal type	Screwless	Screwless
Terminal pitch	≥ 5 mm	≥ 5 mm
Indicator	Power indicator: red, operating indicator: blue	Power indicator: red, operating indicator: blue
Varistor	None	None
Input logic	NPN / PNP model	NPN / PNP model
Material	CASE, BASE, COVER: PC, terminal pin: copper+PA66	CASE, BASE, COVER: PC, terminal pin: copper+PA66
Certification	CE UK RoHS	CE UK RoHS
Unit weight (packaged)	≈ 185 g (≈ 232 g)	≈ 370 g (≈ 463 g)
⁰¹⁾ For the detailed information about each SSR, please refer to 'SSR' or data sheet from the manufacturer. ⁰²⁾ It is current consumption per a SSR including LED current. ⁰³⁾ It is current consumption including LED current for power part to ⁰²⁾ .		
Insulation resistance	≥ 1,000 MΩ (500 VDC≒ megger)	
Dielectric strength (coil-contact)	2,500 VAC~ 50/60 Hz for 1 minute	
Dielectric strength (same polarity contact)	1,000 VAC~ 50/60 Hz for 1 minute	
Vibration	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 min	
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Applicable wire- solid ⁰¹⁾	Ø 0.6 to 1.25 mm	
Applicable wire-stranded ^{01) 02)}	AWG 22-18 (0.30 to 0.80 mm ²)	
Stripped length	8 to 10 mm	

⁰¹⁾ Use the cable of copper conductor in 60 °C temperature class.

⁰²⁾ When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Screwless

SSR Terminal Blocks

(16-Point)

ASL Series



Features

- Screwless push-in type connection for simple and easy connection
- Contactless relay suitable for systems requiring long life-cycle and high-speed response
- Switch between independent and load common output with jumper bar
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Convenient SSR removal with ejector clip
- SSR protection cover

* Sold Separately

- 10.2 mm pitch jumper bar (JB-10.2-08L)
- I/O cable CH / CO Series

Specifications

Model	ASL-H16MP0-□N
Applied SSR ⁰¹⁾	AQZ202D [Panasonic]
Output method	1a
Power supply	≤ 24 VDC ± 10 %
Current consumption ⁰²⁾	≤ 4 mA
SSR output rated spec. ^{03) 04)}	24 VAC~ / VDC 50/60 Hz
No. of connector pin	20
Connector for controller side	20-pin Omron (XG4A-2031)
Terminal type	Screwless
Terminal pitch	≥ 7.8 mm
Indicator	Power indicator: red, operation indicator: blue
Varistor	None
Input logic	NPN / PNP model
Material	Terminal block: PC, CASE, BASE: MPPO
Certification	CE, RoHS, ENEC, ENEC
Unit weight (packaged)	≈ 278 g (≈ 377 g)
Insulation resistance	≥ 1,000 MΩ (500 VDC ≒ megger)
Dielectric strength (coil-contact)	2,500 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact)	1,000 VAC~ 50/60 Hz for 1 minute
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 10 minutes
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection structure	IP20 (IEC standard)
Applicable wire - solid ⁰¹⁾	Ø 0.6 to 1.25 mm
Applicable wire - stranded ^{01) 02)}	AWG 22-18 (0.30 to 0.80 mm ²)
Stripped length	8 to 10 mm

01) Use the cable of copper conductor in 60 °C temperature class.
 02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Screwless

SSR Terminal Blocks

(4-Point)

ASL Series



Features

- Screwless push-in type connection for simple and easy connection
- Contactless relay suitable for systems requiring long life-cycle and high-speed response
- Switch between independent and load common output with jumper bar
- Switch between NPN and PNP input with jumper bar
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Convenient SSR removal with ejector clip
- SSR protection cover

* Sold Separately

- 6.0 mm pitch jumper bar (JB-6.0-04L)
- DIN Rail Stopper

Specifications

Model	ASL-L04MP0-U□	ASL-L04SP0-U□	ASL-L04ST0-U□
Applied SSR ⁰¹⁾	AQZ202D [Panasonic]	AQG12124 [Panasonic]	SN-24A01C [Fujitsu]
Output method	1a	1a	1a
Power supply	≤ 24 VDC≡ ±10 %	≤ 24 VDC≡ ±10 %	≤ 24 VDC≡ ±10 %
Current consumption ⁰²⁾	≤ 3 mA	≤ 18 mA	≤ 10 mA
SSR output rated spec. ^{03) 04)}	24 VAC~ 50/60 Hz 2.7A, 24 VDC≡ 2.7A	75-240 VAC~ 50/60 Hz 1A	24-240 VAC~ 50/60 Hz 1A
Terminal type	Screwless		
Terminal pitch	5.0 mm		
Indicator	Operation indicator: blue		
Varistor	Equipped ⁰⁵⁾ / not equipped model		
Input logic	NPN / PNP selectable with jumper bar		
Material	Terminal block: PA66, CASE, BASE: PPS, conducting plate: brass		
Certification	CE ENEC ENEC ENEC	CE ENEC ENEC ENEC	CE ENEC ENEC
Unit weight (packaged)	≈ 65 g (≈ 118 g)	≈ 69 g (≈ 122 g)	≈ 172 g (≈ 126 g)

01) For the detailed information about each SSR, please refer to 'SSR' or data sheet from the manufacturer.

02) It is current consumption for a SSR including LED current.

03) This value is rated with resistive load, when the conditions of the temperature characteristic graph are satisfied.

04) When connecting loads to output part, please connect loads of same power type. Connecting loads of different power type may cause safety issues.

05) Since the varistor type is for protecting the contact, it is recommended to use with an inductive load.

Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)
Dielectric strength (coil-contact)	2,500 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact) ⁰¹⁾	1,000 VAC~ 50/60 Hz for 1 minute
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection structure	IP20 (IEC standard)

01) Varistor type is 300 VAC~.

Applicable wire - solid ⁰¹⁾	Ø 0.6 to 1.25 mm
Applicable wire - stranded ^{01) 02)}	AWG 22-18 (0.30 to 0.80 mm ²)
Stripped length	8 to 10 mm

01) Use the cable of copper conductor in 60 °C temperature class.

02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Screwless

SSR Terminal Blocks

(1-Point)

ASL Series



Features

- Screwless push-in type connection for simple and easy connection
- Contactless relay suitable for systems requiring long life-cycle and high-speed response
- Switch between independent and load common output with jumper bar
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- SSR protection cover

* Sold Separately

- 9.0 mm pitch jumper bar (JB-9.0-04L)

Specifications

Model	ASL-L01MP0-□	ASL-L01SP0-□	ASL-L01SP1-□	ASL-L01SR0-□	ASL-L01ST0-□
Applied SSR ⁰¹⁾	AQZ202D [Panasonic]	AQG12124 [Panasonic]	AQG22124 [Panasonic]	G3MC-202P [Omron]	SN-24A01C [Fujitsu]
Output method	1a	1a	1a	1a	1a
Power supply	≤ 24 VDC≡ ±10 %	≤ 24 VDC≡ ±10 %	≤ 24 VDC≡ ±10 %	≤ 24 VDC≡ ±10 %	≤ 24 VDC≡ ±10 %
Current consumption ⁰²⁾	≤ 3 mA	≤ 18 mA	≤ 18 mA	≤ 18 mA	≤ 10 mA
SSR output rated spec. ^{03) 04)}	24 VAC~ 50/60 Hz, 2.7A 24 VDC≡ 2.7A	75-240 VAC~ 50/60 Hz 1A	75-240 VAC~ 50/60 Hz 2A	24-240 VAC~ 50/60 Hz 2A	24-240 VAC~ 50/60 Hz 1A
Terminal type	Screwless				
Terminal pitch	9.0 mm (arranging over 2 units)				
Indicator	Operation indicator: blue				
Varistor	Equipped ⁰⁵⁾ / not equipped model				
Input logic	NPN / PNP model				
Material	Terminal block: PA66, CASE, BASE: PPS, conducting plate: brass				
Certification					
Unit weight (packaged) ⁰⁶⁾	≈ 19 g (≈ 130 g)	≈ 20 g (≈ 134 g)	≈ 22 g (≈ 140 g)	≈ 24 g (≈ 148 g)	≈ 21 g (≈ 136 g)

01) For the detailed information about each SSR, please refer to 'SSR' or data sheet from the manufacturer.

02) It is current consumption for a SSR including LED current.

03) This value is rated with resistive load, when the conditions of the temperature characteristic graph are satisfied.

04) When connecting loads to output part, please connect loads of same power type.

Connecting loads of different power type may cause safety issues.

05) Since the varistor type is for protecting the contact, it is recommended to use with an inductive load.

06) It is weight per product. The weight in parentheses is for 4 packing units including packing materials.

Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)
Dielectric strength (coil-contact)	2,500 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact) ⁰¹⁾	1,000 VAC~ 50/60 Hz for 1 minute
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection structure	IP20 (IEC standard)

01) Varistor type is 300 VAC~.

Applicable wire - solid ⁰¹⁾	Ø 0.6 to 1.25 mm
Applicable wire - stranded ^{01) 02)}	AWG 22-18 (0.30 to 0.80 mm ²)
Stripped length	8 to 10 mm

01) Use the cable of copper conductor in 60 °C temperature class.

02) When using the stranded wire, use End Sleeve (wire ferrule).



View product detail

Screw

SSR Terminal Blocks

(Common Type, 16 / 32-point)

ASS Series



Features

- Screw type connection for stable and reliable connection
- Contactless relay ideal for systems requiring long life-cycle and high-speed response
- Compact, space-saving design
- Comprehensive connection type for use without jumper bar
- Operation status indicator (blue LED)
- DIN rail mount and screw mount installation
- Convenient SSR removal with ejector clip
- SSR protection cover

* Sold Separately

- I/O cable CH / CO Series

Specifications

Model	ASS-HC16MP0-□N	ASS-HC32MP0-□N
Applied SSR ⁰¹⁾	AQZ202D [Panasonic]	
Output method	1a	1a
Power supply	≤ 24 VDC≐ ±10 %	≤ 24 VDC≐ ±10 %
Current consumption	≤ 10.4 mA ⁰²⁾ or ≤ 13.1 mA ⁰³⁾	≤ 11.5 mA ⁰²⁾ or ≤ 15.3 mA ⁰³⁾
SSR output rated spec.	24 VAC~ 50/60 Hz 1.6A, 24 VDC≐ 1.6A (1.6 A / 1-point, 8 A / 1COM)	24 VAC~ 50/60 Hz 1.6A, 24 VDC≐ 1.6A (1.6 A / 1-point, 8 A / 1COM)
No. of connector pins	20	40
Connector for controller side	20-pin Omron (XG4A-2031)	40-pin Hirose (HIF3BA-40PA-2.54DSA)
No. of SSR points	16	32
Output connection	8-point/1COM	8-point/1COM
Terminal type	Screw	Screw
Terminal pitch	7.62 mm	7.62 mm
Indicator	Power indicator: red, operating indicator: blue	Power indicator: red, operating indicator: blue
Varistor	None	None
Input logic	NPN / PNP model	NPN / PNP model
Material	CASE, BASE, COVER: PC, terminal pin: brass, Ni-plating	CASE: MPPO, BASE: PA66 (G25%), COVER: PC, terminal pin: brass, Ni-plating
Certification	CE, ENEC, UL, VDE	CE, ENEC, UL, VDE
Unit weight (packaged)	≈ 185 g (≈ 232 g)	≈ 370 g (≈ 463 g)

01) For the detailed information about the SSR, please refer to 'SSR' or data sheet from the manufacturer.
02) It is current consumption per a SSR including LED current.
03) It is current consumption including LED current for power part to 02).

Insulation resistance	≥ 1,000 MΩ (500 VDC≐ megger)
Dielectric strength (coil-contact)	2,500 VAC~ 50/60 Hz for 1 minute
Dielectric strength (same polarity contact)	1,000 VAC~ 50/60 Hz for 1 minute
Vibration	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 min
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)

Applicable wire - solid	Ø 0.3 to Ø 1.2 mm
Applicable wire - stranded	AWG 22-16 (0.30 to 1.25 mm ²)
Tightening torque	0.5 to 0.6 N·m



View product detail

Sensor Connector Terminal Blocks

AFE Series



Features

- Save installation time and work with Autonics CNE series sensor connectors
- Wire stripping and tools not required
- Compact, space-saving design
- LED Operation status indicator
- DIN rail mount and screw mount installation
- Switch between NPN and PNP input with switch

* Sold Separately

- Sensor connector wire mount plug (CNE-P04-□)
- I/O cable CH / CO Series

Specifications

Model	AFE4-H20-16LF	AFE4-H40-32LF
No. of connector pins	20	40
No. of sensor connectors	16	32
Connector for controller side	20-pin Hirose (HIF3BA-20PA-2.54DSA)	40-pin Hirose (HIF3BA-40PA-2.54DSA)
Indicator	Power indicator: red, operation and disconnection indicator: blue	
Material	CASE, BASE: PC	
Certification	CE, UKCA, RoHS, ENEC	
Unit weight (Packaged)	≈ 69 g (≈ 121 g)	≈ 119 g (≈ 203 g)
Voltage	12-24 VDC≒ ±10%	
Current	≤ 1 A ⁰¹⁾	
Insulation resistance	≥ 1,000 MΩ (500 VDC≒ megger)	
Input logic	NPN/PNP switch	
Dielectric strength	600 VAC~ 50/60 Hz for 1 minute	
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes	
Shock	150 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Tightening torque	0.7 to 0.8 N·m	

01) It includes LED current of terminal block.



View product detail



I2. Distribution Boxes

Distribution boxes can simplify sensor connection work and provide installation flexibility in applications requiring multiple sensors.

I2-1 Distribution Boxes

PT Series

M12 5-Pin Connector Distribution Boxes

M12 4-Pin Connector Distribution Boxes

M12 5-Pin Connector Distribution Boxes

PT Series



Features

- 5-pin M12 connector type sensor distribution boxes
- Supply power to multiple sensors using a single power supply
- Simplify complicated wiring and maintenance work
- Various connection methods
: cable / connector / spring terminal / plug-in terminal type
- Check operation status with LED indicators (green, red LED)
- Supports 1-signal, 2-signal (DC 3-wire, 4-wire type)
- Protection structure:
IP67 (with waterproofcover, sold separately)
IP52 (with protection cover, sold separately)

* Sold Separately

- Protection cover (CAP-PT)
- Waterproof cover (P96-M12-1)
- M23 cable connector

Specifications

[Cable type]

Model	PT4-3D□5-□	PT4-4D□5-□	PT6-3D□5-□	PT6-4D□5-□	PT8-3D□5-□	PT8-4D□5-□
No. of port	4	4	6	6	8	8
Output type ⁰¹⁾	3-wire (1 signal)	4-wire (2 signal)	3-wire (1 signal)	4-wire (2 signal)	3-wire (1 signal)	4-wire (2 signal)
Output logic ⁰¹⁾	NPN/PNP model					
Material	Case: PBT (G15 %), name plate: PC, general cable (black): PVC					
Unit weight (packaged) ⁰²⁾	≈ 900 g (≈ 1100 g)	≈ 1200 g (≈ 1400 g)	≈ 930 g (≈ 1130 g)	≈ 1230 g (≈ 1430 g)	≈ 960 g (≈ 1160 g)	≈ 1260 g (≈ 1460 g)

01) Connect the sensor to the proper output type and logic.

02) It is based on 5 m cable.

[Connector type]

Model	PT4-C3D□5	PT4-C4D□5	PT6-C3D□5	PT6-C4D□5	PT8-C3D□5	PT8-C4D□5
No. of port	4	4	6	6	8	8
Output type ⁰¹⁾	3-wire (1 signal)	4-wire (2 signal)	3-wire (1 signal)	4-wire (2 signal)	3-wire (1 signal)	4-wire (2 signal)
Output logic ⁰¹⁾	NPN/PNP model					
Material	Case: PBT (G15 %), name plate: PC, general cable (black): PVC					
Unit weight (packaged)	≈ 120 g (≈ 230 g)	≈ 125 g (≈ 235 g)	≈ 150 g (≈ 260 g)	≈ 155 g (≈ 265 g)	≈ 180 g (≈ 290 g)	≈ 185 g (≈ 295 g)

01) Connect the sensor to the proper output type and logic.

[Spring terminal type]

Model	PT4-S3D□	PT6-S3D□	PT8-S3D□
No. of port	4	6	8
Output type ⁰¹⁾	3-wire (1 signal)		
Output logic ⁰¹⁾	NPN/PNP model		
Material	Case: PBT (G15 %), name plate: PC, cover: PBT (G15 %), cover bolt: PA6 (G15 %)		
Applicable cable out diameter	10.5 mm ± 0.3		
Unit weight (packaged)	≈ 140 g (≈ 270 g)	≈ 165 g (≈ 292 g)	≈ 190 g (≈ 314 g)

01) Connect the sensor to the proper output type and logic.



View product detail

[Pluggable screw terminal type]

Model	PT4- 3D □-□	PT4- 4D □-□	PT6- 3D □-□	PT6- 4D □-□	PT8- 3D □-□	PT8- 4D □-□
No. of port	4	4	6	6	8	8
Output type ⁰¹⁾	3-wire (1 signal)	4-wire (2 signal)	3-wire (1 signal)	4-wire (2 signal)	3-wire (1 signal)	4-wire (2 signal)
Output logic ⁰¹⁾	NPN/PNP model					
Material	Case: PBT (G15 %), name plate: PC, cover: PBT (G15 %), cover bolt: PA6 (G15 %)					
Applicable cable out diameter	10.5 mm ± 0.3					
Unit weight (packaged)	≈ 150 g (≈ 280 g)	≈ 154 g (≈ 284 g)	≈ 175 g (≈ 302 g)	≈ 181 g (≈ 306 g)	≈ 210 g (≈ 334 g)	≈ 218 g (≈ 342 g)

⁰¹⁾ Connect the sensor to the proper output type and logic.

[Common]

Power supply	12-24 VDC=
Rated current	<ul style="list-style-type: none"> Cable type / connector type: 2 A (per signal), 4 A (per port), 10 A (body) Spring / pluggable screw terminal type: 2 A (per signal), 2 A (per port), 7 A (body)
Leakage current	≤ 0.5 mA (only applicable for the cable type / connector type)
Current consumption	≤ 5 mA
Connection life cycle	≥ 200 operations
Insulation resistance	≥ 100 MΩ (500 VDC= megger)
Dielectric strength	500 VAC~ 50/60 Hz for 1 minute
Vibration	3 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) X, Y, Z in each X, Y, Z direction for 3 times
Indicator	Power indicator: red / operation indicator: green
Ambient temperature	-25 to 75 °C, storage: -30 to 80 °C (no freezing or condensation)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (no freezing or condensation)
Certification	CE ENEC
Protection structure ⁰¹⁾	<ul style="list-style-type: none"> With connector / waterproof cover: IP67 (IEC standard) With protection cover: IP52 (IEC standard)

⁰¹⁾ This is not applicable when connectors and protection/waterproof covers are not mounted.

M12 4-Pin Connector Distribution Boxes

PT Series



Features

- 4-pin M12 connector type sensor distribution boxes
- Supply power to multiple sensors using a single power supply
- Simplify complicated wiring and maintenance work
- Check operation status with LED indicators (green, red LED)
- Supports 1-signal (DC 2-wire, 3-wire type)
- Protection structure:
IP67 (with waterproof cover, sold separately)
IP52 (with protection cover, sold separately)

* Sold Separately

- Protection cover (CAP-PT)
- Waterproof cover (P96-M12-1)

Specifications

Model	PT4-2D	PT4-3D□	PT6-2D	PT6-3D□	PT8-2D	PT8-3D□
No. of port	4	4	6	6	8	8
Output type ⁰¹⁾	2-wire (1 signal)	3-wire (1 signal)	2-wire (1 signal)	3-wire (1 signal)	2-wire (1 signal)	3-wire (1 signal)
Output logic ⁰¹⁾	-	NPN/PNP model	-	NPN/PNP model	-	NPN/PNP model
Material	Case: PC, general cable (gray): PVC					
Certification	CE UK					
Unit weight (packaged) ⁰²⁾	≈ 660 g (≈ 700 g)		≈ 680 g (≈ 720 g)		≈ 780 g (≈ 820 g)	

01) Connect the sensor to the proper output type and logic.

02) It is based on 5 m cable.

Power supply	12-24 VDC≒
Using power supply	10-30 VDC≒
Rated current	2 A (per signal), 4 A (per port), 10 A (body)
Leakage current	≤ 0.5 mA
Connection life cycle	≥ 200 operations
Insulation resistance	≥ 50 MΩ (500 VDC≒ megger)
Dielectric strength	1500 VAC~ 50/60 Hz for 1 minute
Vibration	1.0 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) X, Y, Z in each X, Y, Z direction for 3 times
Indicator	Power indicator: green / operation indicator: red
Cable specification	Ø 9, 8-wire (conductor cross section: 0.3 mm ² , insulator diameter: Ø 1.67)
Ambient temperature	-25 to 75 °C, storage: -30 to 80 °C (a non freezing or condensation environment)
Ambient humidity	35 to 95 %RH, storage: 35 to 95 %RH (a non freezing or condensation environment)
Protection structure ⁰¹⁾	With connector / waterproof cover: IP67 (IEC standard) With protection cover: IP52 (IEC standard)

01) This is not applicable when connectors and protection/waterproof covers are not mounted.



View product detail



I3. Sockets

Sockets are used with Autonics plug-in type devices and offer easier installation along with high durability and electrical conductivity.

I3-1	Sockets	PG Series	8-Pin / 11-Pin Controller Sockets
		PS Series	8-Pin / 11-Pin Controller Sockets (DIN Rail / Panel)

8-Pin / 11-Pin Controller Sockets

PG Series



Features

- Excellent heat resistance
- Copper alloy contacts for excellent electrical conductivity and high durability
- Isolated contacts

Specifications

Model	PG-08	PG-11
Pins	8-pin	11-pin
Rated voltage	250 VAC~	
Rated current	7 A (resistance load)	
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)	
Dielectric strength	2000 VAC~ 50 / 60 Hz for 1 min	
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Shock	980 m/s ² (≈ 98 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH (no freezing or condensation)	
Tightening torque	0.8 N.m	
Applied screw	M3.5	
Material	BODY: PBT, BOLT: Steel (Ni plated), NUT: Steel (Ni plated), terminal: Phosphor bronze(Ni plated)	
Certification	CE UK RoHS REACH	
Unit weight	≈ 37.5 g	≈ 47 g



View product detail

8-Pin / 11-Pin Controller Sockets

(DIN Rail / Panel)

PS Series



Features

- Excellent heat resistance
- Copper alloy contacts for excellent electrical conductivity and high durability
- Easy one-touch mount installation

Specifications

Model	PS-08(N)	PS-11(N)	PS-M8 ⁰¹⁾
Pins	8-pin	11-pin	8-pin
Rated voltage	250 VAC~		
Rated current	7 A (resistance load)		
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)		
Dielectric strength	2000 VAC~ 50 / 60 Hz for 1 min		
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour		
Shock	980 m/s ² (≈ 98 G) in each X, Y, Z direction for 3 times		300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)		
Ambient humidity	35 to 85%RH (no freezing or condensation)		
Tightening torque	0.8 N m		0.75 to 0.95 N m
Applied screw	M4		
Material	BODY: PBT, BOLT: Steel (Ni plated), NUT: Steel (Ni plated), terminal: Phosphor bronze(Ni plated)		
Certification	CE, RoHS, REACH		
Unit weight	≈ 62 g	≈ 85 g	≈ 43 g

01) Only for timer ATS Series



View product detail



I4. Connectors

Sensor connectors provide convenient installation and maintenance in addition to strong and stable connections.

Sensor Connectors

CNE Series



Features

[Common Features]

- Significantly reduce installation work and time
- Wide range of connectors compatible with diverse cables and wires
- High density connection with contact pitch of 2 mm
- Compatible with e-CON connectors
- 3 A current capacity for each pin

[Wire Mount Plug / Socket]

- Compact and secure one-touch connection type sensor connectors
- Wire mount plug / sockets allow relay connection of wires
- 9 different color covers for identifying wire thickness
- Visually inspect connection status with translucent covers

[Board Mount Socket]

- Contacts positioned within mold to prevent electric shock or short-circuit
- Connect up to 4 wire mount plugs (1 / 2 / 4)
- Closely-packed connection possible

Specifications

Type		Wire mount plug	Wire mount Socket	Board mount socket
Model		CNE-P	CNE-S	CNE-B
Application	Connector	Board mount socket / Wire mount Socket		Wire mount plug
	Cable	AWG30 - 20 (insulator outside diameter Ø 0.6 to 2.0)		-
	PCB	-		Fender plated-through hole, hole dia.: 1.0 mm PCB thickness: 1.0 to 2.2 mm
Power supply		≤ 32 VAC~ / VDC=		
Rated current		≤ 3.0 A		
Ambient temperature		Applying 1 A: -20 to 85 °C Applying 2 A: -20 to 75 °C Applying 3 A: -20 to 60 °C (rated at no freezing or condensation)		
Ambient humidity		40 to 80%RH (rated at no freezing or condensation)		
Terminal retention		≥ 1.4 kgf		
Pressure strength		AWG30: ≥ 0.5 kgf AWG24: ≥ 0.8 kgf AWG20: ≥ 1.0 kgf		
Extraction		≥ 0.49N (50 gf) / pin		
Insertion		≤ 1.96 N (200 gf) / pin		
Dielectric strength		1,000 VAC~ for 1 min (between terminals)		
Insulation resistance		≥ 1,000 MΩ (between terminals)		
Contact resistance		≤ 0.05 Ω (short current: 1 mA, max. open voltage: 20 mV)		
Certification		CE ㇏		
Material		Body: PC/ABS (UL94V-0), terminal: C5210 (Gold 0.2μm), case: PC (UL94-V0)		Body: PC/ABS (UL94-V0), terminal: C5210 (Gold 0.2μm)



View product detail



I5. Cables

I/O cables allow reliable signal transmission between devices including various PLCs, servo, and controllers.

I5-1	Connector Cables	M8 / M12 Series	Connector Cables
		M17 Series	Connector Cables
		M23 Series	Connector Cables
I5-2	I/O Cables	CH Series	I/O Cables
		CO Series	I/O Cables
I5-3	Communication Cables	D-SUB Series	D-SUB Connector Communication Cables
		M12 Series	M12 Connector Communication Cables
I5-4	Valve Plug Cables	CV Series	Valve Plug Cables

Connector Cables

M8 / M12 Series



Features

- M8 Connector type 4-pin models available
- M12 Connector type 4-pin / 5-pin / 8-pin / 12-pin models available
- M8 to M12 Connector cable available
- Various cable length
- Available in I-type connector, L-type connector, cable type
- Autonics application
 - M8 4-pin: Photoelectric Sensors, Linear Positioning Sensor
 - M12 4-pin: Photoelectric / Proximity Sensors, Safety Door Switches, Area Sensors, Linear Positioning Sensor
 - M12 5-pin: Safety Non-Contact Door Switches, Ultrasonic Sensors
 - M12 8-pin: Smart Camera, Safety Light Curtain
 - M12 12-pin: Vision Sensor, LiDAR Sensor(LSC)

Specifications

M8 Connector 4-Pin


Power	Connector 1	Connector 2	Length	Feature	Application	Model	
DC	M8 (Socket-Female)	4-wire	2 m	PVC	Photoelectric sensors / Proximity sensors	CID408-2	
			5 m			CID408-5	
			2 m	Oil resistant PVC		CIDH408-2	
			5 m			CIDH408-5	
		M8 (Socket-Female), L type	2 m	PVC		CLD408-2	
			5 m			CLD408-5	
			2 m	Oil resistant PVC		CLDH408-2	
			5 m			CLDH408-5	
	M8 (Socket-Female)	M12 (Plug-Male)	2 m	PVC	Linear positioning sensors	C1D4-2EB	
			5 m			C1D4-5EB	
	M8 (Socket-Female), L type	M12 (Plug-Male), L type	2 m			C2D4-2EB	
			5 m			C2D4-5EB	
	M8 (Socket-Female)	M12 (Plug-Male), L type	2 m			C3D4-2EB	
			5 m			C3D4-5EB	
	M8 (Socket-Female), L type	M12 (Plug-Male)	2 m			C4D4-2EB	
			5 m			C4D4-5EB	
	M8 (Socket-Female)	M12 (Plug-Male)	2 m			Oil resistant PVC	C1DH4-2EB
			5 m				C1DH4-5EB
	M8 (Socket-Female), L type	M12 (Plug-Male), L type	2 m				C2DH4-2EB
			5 m				C2DH4-5EB
	M8 (Socket-Female)	M12 (Plug-Male), L type	2 m				C3DH4-2EB
			5 m				C3DH4-5EB
	M8 (Socket-Female), L type	M12 (Plug-Male)	2 m				C4DH4-2EB
			5 m				C4DH4-5EB

M12 Connector 4-Pin


Power	Connector 1	Connector 2	Length	Feature	Application	Model	
AC	M12 (Socket-Female)	2-wire	2 m	PVC	Photoelectric sensors / Proximity sensors / Safety door switches	CIA2-2	
			5 m			CIA2-5	
			2 m	Oil resistant PVC		CIAH2-2	
			5 m			CIAH2-5	
	M12 (Socket-Female), L type		2 m	PVC		CLA2-2	
			3 m			CLA2-3	
			5 m			CLA2-5	
			2 m	Oil resistant PVC		CLAH2-2	
			5 m			CLAH2-5	



View product detail

Power	Connector 1	Connector 2	Length	Feature	Application	Model		
AC	M12 (Plug-Male)	2-wire	2 m	PVC	Photoelectric sensors / Proximity sensors / Safety door switches	CIA2-2P		
			5 m	Oil resistant PVC		CIA2-5P		
			2 m			CIAH2-2P		
			5 m			CIAH2-5P		
	M12 (Plug-Male), L type		2 m	PVC		CLA2-2P		
			5 m	Oil resistant PVC		CLA2-5P		
			2 m			CLAH2-2P		
			5 m			CLAH2-5P		
	M12 (Socket-Female)	M12 (Plug-Male)	2 m	PVC	Photoelectric sensors / Proximity sensors / Safety door switches	C1A4-2		
			5 m			C1A4-5		
	M12 (Socket-Female), L type	M12 (Plug-Male), L type	2 m			C2A4-2		
			5 m			C2A4-5		
	M12 (Socket-Female)	M12 (Plug-Male), L type	2 m			C3A4-2		
			5 m			C3A4-5		
	M12 (Socket-Female), L type	M12 (Plug-Male)	2 m			C4A4-2		
			5 m			C4A4-5		
	M12 (Plug-Male)	M12 (Plug-Male)	2 m			C1A4-2P		
			5 m			C1A4-5P		
DC	M12 (Socket-Female)	2-wire	2 m			PVC	Photoelectric sensors / Proximity sensors / Safety door switches	CID2-2
			5 m			Oil resistant PVC		CID2-5
			2 m					CIDH2-2
			5 m					CIDH2-5
	M12 (Socket-Female), L type		2 m			PVC		CLD2-2
			5 m			Oil resistant PVC		CLD2-5
			2 m	CLDH2-2				
			5 m	CLDH2-5				
	M12 (Socket-Female)	2-wire	2 m	PVC	CID2-2-I			
			5 m	Oil resistant PVC	CID2-5-I			
			2 m		CIDH2-2-I			
			5 m		CIDH2-5-I			
	M12 (Socket-Female), L type		2 m	PVC	CLD2-2-I			
			5 m	Oil resistant PVC	CLD2-5-I			
			2 m		CLDH2-2-I			
			5 m		CLDH2-5-I			
	M12 (Plug-Male)	2-wire	2 m	PVC	CID2-2P			
			5 m	Oil resistant PVC	CID2-5P			
			2 m		CIDH2-2P			
			5 m		CIDH2-5P			
	M12 (Plug-Male), L type		2 m	PVC	CLD2-2P			
			5 m	Oil resistant PVC	CLD2-5P			
			2 m		CLDH2-2P			
			5 m		CLDH2-5P			
	M12 (Socket-Female)	3-wire	2 m	PVC	CID3-2			
			5 m	Oil resistant PVC	CID3-5			
			2 m		CIDH3-2			
			5 m		CIDH3-5			
	M12 (Socket-Female), L type		2 m	PVC	CLD3-2			
			5 m	Oil resistant PVC	CLD3-5			
			2 m		CLDH3-2			
			5 m		CLDH3-5			
	M12 (Plug-Male)	3-wire	2 m	PVC	CID3-2P			
			5 m	Oil resistant PVC	CID3-5P			
			2 m		CIDH3-2P			
			5 m		CIDH3-5P			
	M12 (Plug-Male), L type		2 m	PVC	CLD3-2P			
			5 m	Oil resistant PVC	CLD3-5P			
			2 m		CLDH3-2P			
			5 m		CLDH3-5P			
	M12 (Socket-Female)	4-wire	2 m	Oil resistant PVC	CIDH4-2			
			3 m		CIDH4-3			
			5 m		CIDH4-5			
			7 m		CIDH4-7			
			2 m	Oil resistant PVC 	CIDH4-2-A			
			3 m		CIDH4-3-A			
			5 m		CIDH4-5-A			
			7 m		CIDH4-7-A			


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Power	Connector 1	Connector 2	Length	Feature	Application	Model		
DC	M12 (Socket-Female), L type	4-wire	2 m	Oil resistant PVC	Photoelectric sensors / Proximity sensors / Safety door switches	CLDH4-2		
			3 m			CLDH4-3		
			5 m			CLDH4-5		
			7 m			CLDH4-7		
			2 m	Oil resistant PVC 		CLDH4-2-A		
			3 m			CLDH4-3-A		
			5 m			CLDH4-5-A		
			7 m			CLDH4-7-A		
		M12 (Plug-Male)	4-wire	2 m		Oil resistant PVC	CIDH4-2P	
				3 m			CIDH4-3P	
				5 m			CIDH4-5P	
				7 m			CIDH4-7P	
	M12 (Plug-Male), L type		2 m	Oil resistant PVC		CLDH4-2P		
			3 m			CLDH4-3P		
		5 m	CLDH4-5P					
		7 m	CLDH4-7P					
	M12 (Socket-Female)	4-wire	3 m	Black (transmitter)		Area sensors BW Series / BWC Series	CID4-3T	
				Gray (receiver)			CID4-3R	
			5 m	Black (transmitter)			CID4-5T	
				Gray (receiver)			CID4-5R	
			7 m	Black (transmitter)	CID4-7T			
				Gray (receiver)	CID4-7R			
			10 m	Black (transmitter)	CID4-10T			
				Gray (receiver)	CID4-10R			
		15 m	Black (transmitter)	CID4-15T				
			Gray (receiver)	CID4-15R				
		M12 (Socket-Female)	M12 (Plug-Male)	2 m	PVC		Photoelectric sensors / Proximity sensors / Safety door switches	C1D4-2
				5 m				C1D4-5
			M12 (Socket-Female), L type	2 m				C2D4-2
				5 m				C2D4-5
		M12 (Socket-Female)	M12 (Plug-Male), L type	2 m				C3D4-2
				5 m				C3D4-5
	M12 (Socket-Female), L type	M12 (Plug-Male)	2 m	C4D4-2				
			5 m	C4D4-5				
	M12 (Socket-Female)	M12 (Plug-Male)	1 m	Oil resistant PVC	C1DH4-1			
			3 m		C1DH4-3			
			5 m		C1DH4-5			
			7 m		C1DH4-7			
	M12 (Socket-Female), L type	M12 (Plug-Male), L type	1 m		C2DH4-1			
			3 m		C2DH4-3			
			5 m		C2DH4-5			
			7 m		C2DH4-7			
	M12 (Socket-Female)	M12 (Plug-Male), L type	1 m		C3DH4-1			
			3 m		C3DH4-3			
			5 m		C3DH4-5			
			7 m		C3DH4-7			
	M12 (Socket-Female), L type	M12 (Plug-Male)	1 m	PVC	C4DH4-1			
			3 m		C4DH4-3			
			5 m		C4DH4-5			
			7 m		C4DH4-7			
	M12 (Plug-Male)	M12 (Plug-Male)	2 m	PVC	C1D4-2P			
			5 m		C1D4-5P			

M12 Connector 5-Pin

Power	Connector 1	Connector 2	Length	Feature	Application	Model
DC	M12 (Socket-Female)	5-wire	1 m	PVC	Safety non-contact door switches	CID5-1
			2 m			CID5-2
			3 m			CID5-3
			5 m			CID5-5
			7 m			CID5-7
			1 m			CID5-1P
			2 m			CID5-2P
	M12 (Plug-Male)	5-wire	3 m			CID5-3P
			5 m			CID5-5P
			7 m			CID5-7P
	M12 (Socket-Female)	M12 (Plug-Male)	1 m	PVC	Safety non-contact door switches	C1D5-1
			2 m			C1D5-2
			3 m			C1D5-3
			5 m			C1D5-5
			7 m			C1D5-7

M12 Connector 8-Pin

Power	Connector 1	Connector 2	Length	Feature	Application	Model
DC	M12 (Socket-Female)	8-wire	2 m	Drag chain type 	Smart cameras	CIDM8-2-A
			5 m			CIDM8-5-A
			10 m			CIDM8-10-A
			2 m			CLDM8-2-A
			5 m			CLDM8-5-A
			10 m			CLDM8-10-A
	M12 (Socket-Female)	8-wire	3 m	Transmitter	Safety light curtains ⁰¹⁾	CID8-3T
				Receiver		CID8-3R
			5 m	Transmitter		CID8-5T
				Receiver		CID8-5R
			7 m	Transmitter		CID8-7T
				Receiver		CID8-7R
			10 m	Transmitter		CID8-10T
				Receiver		CID8-10R
		M12 (Plug-Male)	3 m	Transmitter		C1D8-3T
				Receiver		C1D8-3R
			5 m	Transmitter		C1D8-5T
				Receiver		C1D8-5R
			7 m	Transmitter		C1D8-7T
				Receiver		C1D8-7R
		12-wire	10 m	Transmitter		C1D8-10T
				Receiver		C1D8-10R
			15 m	Transmitter		C1D8-15T
				Receiver		C1D8-15R
		20 m		Transmitter		C1D8-20T
				Receiver		C1D8-20R

01) To ordering the cable for safety light curtains, select the material specification.

M12 Connector 12-Pin

Power	Connector 1	Connector 2	Length	Application	Model
DC	M12 (Socket-Female)	12-wire	2 m	LIDAR LSC Series / Vision sensors	CID-2-VG
			5 m		CID-5-VG
			10 m		CID-10-VG
	M12 (Socket-Female), L type		2 m		CLD-2-VG
			5 m		CLD-5-VG
			10 m		CLD-10-VG
	M12 (Socket-Female)	12-wire	2 m		CID12-2
			5 m		CID12-5
			10 m		CID12-10
	M12 (Socket-Female), L type		2 m		CLD12-2
			5 m		CLD12-5
			10 m		CLD12-10

Connector Cables

M17 Series



Features

- M17 Connector type 6-pin / 9-pin / 13-pin models available
- Various cable length (2m, 5m, 10m)
- Available in I-type connector
- Autonics application: Rotary Encoders

Specifications

M17 Connector 6-Pin

Connector 1	Connector 2	Length	Application	Model
M17 (Socket-Female)	6-wire	2 m	Incremental rotary encoders (Totem pole output / NPN open collector output / Voltage output)	CID6S-2
		5 m		CID6S-5
		10 m		CID6S-10
		15 m		CID6S-15

M17 Connector 9-Pin

Connector 1	Connector 2	Length	Application	Model
M17 (Socket-Female)	9 -wire	2 m	Incremental rotary encoders (Line driver output)	CID9S-2
		5 m		CID9S-5
		10 m		CID9S-10

M17 Connector 13-Pin

Connector 1	Connector 2	Length	Application	Model
M17 (Socket-Female)	13-wire	2 m	-	CID13S-2
		5 m		CID13S-5
		10 m		CID13S-10
M17 (Socket-Female)	M17 (Plug-Male)	2 m	-	CID13P-2-SI
		5 m		CID13P-5-SI
		10 m		CID13P-10-SI



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Connector Cables

M23 Series



Features

- M23 Connector type 12-pin / 19-pin models available
- Various cable length (4m, 6m, 7m, 8m)
- Available in L-type connector
- Autonics application: Distribution box

Specifications

M23 Connector 12-Pin

Connector 1	Connector 2	Length	Feature	Application	Model
M23 (Socket-Female)	11 -wire	4 m	Oil resistant PVC	Distribution boxes	CLDH12C-040
		6 m			CLDH12C-060
		7 m			CLDH12C-070
		8 m			CLDH12C-080

M23 Connector 19-Pin

Connector 1	Connector 2	Length	Feature	Application	Model
M23 (Socket-Female)	19-wire	4 m	Oil resistant PVC	Distribution boxes	CLDH19C-040
		6 m			CLDH19C-060
		7 m			CLDH19C-070
		8 m			CLDH19C-080



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I/O

Cables

CH Series



Features

- Diverse cables available for connection to various PLCs and controllers
- Customizable cable arrangement
- Diverse cable lengths for various user requirements
- Customizable branching cable types

Specifications

Model	CH Series
Cable connector	PLC / SERVO side - Terminal block side
PLC / SERVO side	Hirose 20-pin / 40-pin socket, Fujitsu 40-pin socket, D-Sub 37-pin socket / plug MDR (latch) 20-pin / 26-pin / 50-pin socket, MDR (bolt) 26-pin / 50-pin socket
Terminal block side	Hirose 20-pin / 26-pin / 40-pin / 50-pin socket
Wire ⁰¹⁾	UL 20276 TWIST 20C / 40C / 26C / 50C
Conductor characteristics	7 / 0.127 mm (AWG 28) × 20P, 7 / 0.127 mm (AWG 28) × 13P, 7 / 0.127 mm (AWG 28) × 10P, 7 / 0.127 mm (AWG 28) × 25P
Insulation diameter	0.12 mm ²
Cable diameter	Ø 6.3 mm (26C) / Ø 7.2 mm (40C) / Ø 8.9 mm (50C)
Rated current	≤ 1 A
Conductor resistance ⁰²⁾	≤ 0.223 Ω/m
Insulation voltage	500 VAC~ 50/60Hz for 1 min
Insulation resistance	≥ 15 MΩ/km
Ambient temperature	-15 to 55°C, storage: -25 to 65°C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)

01) Color is black.

02) Conductor resistance value is rated at 20 °C.

[Unit weight : PLC cable]

• It excludes the package weight (+ 5 g). Unit weight is different depending on the cable length.

Type	No. of pin	Branching	Model	Weight
Hirose plug	20-pin	Non-branching	CH20-HP□-□	≈ 37 to 298 g
	40-pin	Non-branching	CH40-HP□-□	≈ 58 to 391 g
		2-branching	CH40-HP□-□-2S	≈ 55 to 388 g
		2-branching	CH40-HP□-□-2L	≈ 55 to 388 g
		2-branching	CH40-HP□-□-YS	≈ 58 to 391 g
		2-branching	CH40-HP□-□-FS	≈ 58 to 391 g
Fujitsu plug	40-pin	Non-branching	CH40-FP□-□	≈ 85 to 418 g
		2-branching	CH40-FP□-□-2S	≈ 88 to 421 g
		2-branching	CH40-FP□-□-2L	≈ 88 to 421 g
D-Sub plug	37-pin	Non-branching	CH37-DP□-□	≈ 90 to 423 g
		2-branching	CH37-DP□-□-2S	≈ 84 to 417 g
		2-branching	CH37-DP□-□-2L	≈ 84 to 417 g
D-Sub Socket	37-pin	Non-branching	CH37-DS□-□	≈ 90 to 423 g
		2-branching	CH37-DS□-□-2S	≈ 84 to 417 g
		2-branching	CH37-DS□-□-2L	≈ 84 to 417 g

[Unit weight : SERVO cable]

• It excludes the package weight (+ 5 g). Unit weight is different depending on the cable length.

Type	No. of pin	Model	Weigh
3M plug (latch)	20-pin	CH20-MP□-□	≈ 46 to 301 g
	26-pin	CH26-MP□-□	≈ 72 to 267 g
	50-pin	CH50-MP□-□	≈ 95 to 587 g
3M plug (bolt)	26-pin	CH26-MQ□-□	≈ 74 to 269 g
	50-pin	CH50-MQ□-□	≈ 98 to 590 g



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I/O Cables

CO Series



Features

- Diverse cables available for connection to various PLCs and controller
- Diverse cable lengths for various user requirements

Specifications

Model	CO Series
Cable connector	Hirose 20-pin / 40-pin socket, Fujitsu 40-pin socket, D-sub 37-pin socket / plug, MDR (latch) 20-pin / 26-pin / 50-pin socket, MDR (bolt) 26-pin socket
Wire ⁰¹⁾	UL 20276 TWIST 20C / 26C / 40C / 50C
Conductor characteristics	7 / 0.127 mm (AWG 28) × 20P, 7 / 0.127 mm (AWG 28) × 13P, 7 / 0.127 mm (AWG 28) × 10P, 7 / 0.127 mm (AWG 28) × 25P
Insulation diameter	0.12 mm ²
Cable diameter	Ø 6.3 mm (26C) / Ø 7.2 mm (40C) / Ø 8.9 mm (50C)
Rated current	≤ 1 A
Conductor resistance ⁰²⁾	≤ 0.223 Ω/m
Insulation voltage	500 VAC ~ 50/60Hz for 1 min
Insulation resistance	≥ 15 MΩ/km
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)

01) Color is black.

02) Conductor resistance value is rated at 20 °C.

[Unit weight : PLC cable]

• It excludes the package weight (+ 5 g). Unit weight is different depending on the cable length.

Type	No. of pin	Model	Weight
Hirose plug	20-pin	CO20-HP□-□	≈ 33 to 294 g
	40-pin	CO40-HP□-□	≈ 33 to 324 g
	50-pin	CO50-HP□-□	≈ 102 to 414 g
Fujitsu plug	40-pin	CO40-FP□-□	≈ 83 to 360 g
D-Sub plug	37-pin	CO37-DP□-□	≈ 88 to 365 g
D-Sub socket	37-pin	CO37-DS□-□	≈ 88 to 365 g

[Unit weight : SERVO cable]

• It excludes the package weight (+ 5 g). Unit weight is different depending on the cable length.

Type	No. of pin	Model	Weight ⁰¹⁾
3M plug (latch)	20-pin	CO20-MP□-□	≈ 50 to 311 g
	26-pin	CO26-MP□-□	≈ 62 to 279 g
	50-pin	CO26-MQ□-□	≈ 64 to 281 g
3M plug (screw)	26-pin	CO50-MP□-□	≈ 110 to 422 g

01) It excludes the package weight (+ 5 g). Unit weight is different depending on the cable length.



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D-SUB Connector

Communication Cables

D-SUB Series



Features

- D-Sub 9-pin Connector type available
- Available in various wire connection
- Autonics application: HMIs



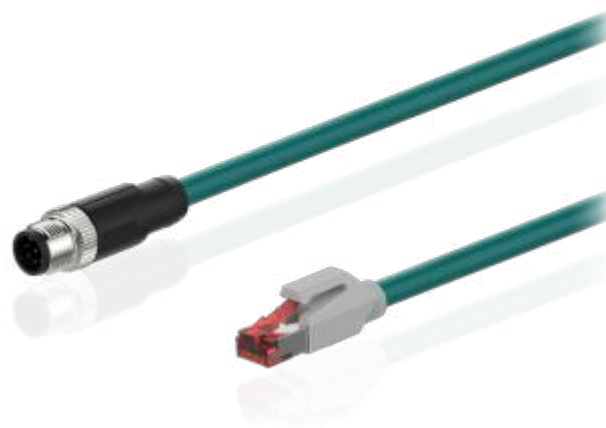
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M12 Connector

Communication

Cables

M12 Series








Features

- M12 Connector type 4-pin / 5-pin / 8-pin / 12-pin models available
- Various cable length (2m, 5m, 10m)
- Available in I-type connector, L-type connector, cable type
- Standard and moving type cables available
- Protection structure: IP67
- Autonics application: Smart cameras, Vision sensors, LiDAR sensors (LSC)

Specifications

M12 Connector 8-Pin

Connector 1	Connector 2	Length	Feature	Application	Model
M12 (Plug-Male)		2 m	<ul style="list-style-type: none"> • IP65 / IP67 • PUR 	Vision sensors	CIR-2-VG
		5 m			CIR-5-VG
		10 m			CIR-10-VG
M12 (Plug-Male), L type		2 m			CLR-2-VG
		5 m			CLR-5-VG
		10 m			CLR-10-VG
M12 (Plug-Male)		2 m	<ul style="list-style-type: none"> • Drag chain type (16 million) • TPE 	Vision sensors / Smart cameras	C1M8-2PR
		5 m			C1M8-5PR
		10 m			C1M8-10PR
M12 (Plug-Male), L type		2 m			C4M8-2PR
		5 m			C4M8-5PR
		10 m			C4M8-10PR
M12 (Plug-Male)		2 m	<ul style="list-style-type: none"> • PVC 	Vision sensors / Smart cameras	C18-2PR
		5 m			C18-5PR
		10 m			C18-10PR
M12 (Plug-Male), L type		2 m			C48-2PR
		5 m			C48-5PR
		10 m			C48-10PR
M12 (Plug-Male)		2 m	<ul style="list-style-type: none"> • Drag chain type (5 million) • IP65 / IP67 • PUR •  EAC 	Smart cameras	C1M8-2PR-A
		5 m			C1M8-5PR-A
		10 m			C1M8-10PR-A
M12 (Plug-Male), L type		2 m			C4M8-2PR-A
		5 m			C4M8-5PR-A
		10 m			C4M8-10PR-A
M12 (Plug-Male)		2 m	<ul style="list-style-type: none"> • IP65 / IP67 • PUR •  EAC 		C18-2PR-A
		5 m			C18-5PR-A
		10 m			C18-10PR-A
M12 (Plug-Male), L type		2 m			C48-2PR-A
		5 m			C48-5PR-A
		10 m			C48-10PR-A
Connector 1	Connector 2	Length	Feature	Application	Model
M12 (Socket-Female)		2 m		LiDAR LSC Series	C18-2R-A
		5 m			C18-5R-A
		10 m			C18-10R-A
M12 (Socket-Female), L type		2 m			C48-2R-A
		5 m			C48-5R-A
		10 m			C48-10R-A



View product detail

Valve Plug

Cables

CV Series



Features

- Available in I-type connector, L-type connector, cable type
- Screw mount connection for strong connectivity
- Excellent oil-resistance, abrasion resistance

Specifications

Model	CVA / CVC Series	
Removable durability	Max. 200 operations	
Cable tension	10 kgf (100 N)	
Tightening	M3 × 0.5	
Tightening torque	0.4 to 0.6 N.m M12 nut: 0.6 to 0.7 N.m	
Connections	Cable connector / cable type model	
Cable diameter	Ø 5 ± 0.2 mm	
Wire	3C × 0.3 mm ² (AWG22 - 0.08 × 60)	
Flexion	Over 1,000 operations	
Protection structure	IP67	
Plug material	Jacket: TPU Socket: MPPO Name plate: PC Bolt: SWCH 10A Pin: BRASS / NIKEL-PLATED	
Connector material	Jacket: TPU Socket: PA6 Pin: BRASS / NIKEL-PLATED	
Cable material	PVC	
Unit weight (packaged) ⁰¹⁾	CVA: ≈ 68g (≈ 73.1 g) CVC: ≈ 55g (≈ 60.1g)	

01) Based on CVA/CVC-□□□-3010-I. Add ≈ 35 g by cable 1 m.

Power supply	24 VAC~ 50 / 60 Hz, 24 VDC≡	24 VDC≡
Rated current	≤ 2 A	
Conductor resistance	≤ 60.12 Ω/km (AWG22)	
Insulation resistance	≥ 1000 MΩ (500 VDC≡ megger)	
Dielectric strength	2000 VAC~ 50 / 60 Hz for 1 min	
Vibration	1 mm amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 1 hour	
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-25 to 70 °C, storage: -30 to 80 °C (no freezing or condensation)	
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	



View product detail

J. Switches / Signals

An extensive range of control switches and signals, including push buttons, selector switches, emergency switches, pilot lights, buzzers, and more, are available to provide visual and audio status indication of control processes and applications.

J1. Control Switches

J2. Buzzers







J1. Control Switches

Control switches maximize device control efficiency with fluid operation mechanics and high durability.

J1-1	Ø 16 mm Switches / Pilot Light	S16PR Series	Ø 16 mm Push Button Switches
		S16SR Series	Ø 16 mm Selector Switches
		S16KR Series	Ø 16 mm Key Selector Switches
		S16BR Series	Ø 16 mm Mushroom-Head Push Button Switches
		S16ER Series	Ø 16 mm Emergency Switches
		L16RR Series	Ø 16 mm Pilot Lights
J1-2	Ø 22 / 25 mm Switches / Pilot Light	S2PR Series	Ø 22 / 25 mm Push Button Switches
		S2SR Series	Ø 22 / 25 mm Selector Switches
		S2KR Series	Ø 22 / 25 mm Key Selector Switches
		S2TR Series	Ø 22 / 25 mm I/O Push Button Switches
		S2BR Series	Ø 22 / 25 mm Mushroom-Head Push Button Switches
		S2ER Series	Ø 22 / 25 mm Emergency Switches
		L2RR Series	Ø 22 / 25 mm Pilot Lights
J1-3	Ø 30 mm Switches / Pilot Light	S3PR / S3PF Series	Ø 30 mm Push Button Switches
		S3SF Series	Ø 30 mm Selector Switches
		S3KF Series	Ø 30 mm Key Selector Switches
		L3RF Series	Ø 30 mm Pilot Lights
J1-4	□ 30 mm Switches / Pilot Light	SQ3PF Series	□ 30 mm Push Button Switches
		LQ3RF Series	□ 30 mm Pilot Lights
J1-5	Magnetic Switches	MN Series	Magnetic Non-Contact Switches

Ø 16 mm

Push Button

Switches

S16PR Series



Features

- Compact, space-saving 16 mm installation diameter
- Short rear-length size of only 29.5 mm
- Independent detachable contacts

* Sold Separately

- Contact blocks (SA□-C□□)
- LED blocks (SA□-L□□□)
- Locking handle (SA□-LH)

Specifications

Model	S16PR Series
Actuation distance	3 mm
Actuation force	0.2 to 0.35 kgf (2 to 3.5 N)
Installation	Extended
Shock	500 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	Returned: ≥ 1 million operations (20 operations/min) Maintained: ≥ 200,000 operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP65 (IEC standard)
Certification	CE 011 UK ENEC ENEC ENEC
Control unit weight	Round: ≈ 3.8 g, Square: ≈ 4.4 g, Rectangular: ≈ 5.1 g
Housing weight	≈ 1.4 g

01) IEC-60947-5-1

Contact blocks					
Power supply/current	250 VAC~ / 3 A				
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute				
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)				
Contact resistance	≤ 50 mΩ (initial)				
Electrical life cycle	≥ 100,000 operations (20 operations/min)				
Contact material	AgNi10				
Terminal tensile force	≤ 30 N				
Terminal soldering time	At the end of tips within 3 sec with 350 °C (30 W-soldering machine)				
Certification	CE UK ENEC ENEC ENEC				
Weight	≈ 1.6 g				
LED blocks					
Rated voltage	5 / 12 / 24 VDC≡ model				
Current consumption	Refer to the below Current consumption table.				
Certification	CE UK ENEC ENEC ENEC				
Weight	≈ 1.9 g				
Current consumption	Red	Blue	Green	Yellow	White
SA16-L5□ (5 VDC≡)	6 to 9 mA	10 to 14 mA	5 to 7 mA	12 to 16 mA	10 to 14 mA
SA16-L12□ (12 VDC≡)	9 to 14 mA	10 to 15 mA	5 to 9 mA	10 to 16 mA	9 to 14 mA
SA16-L24□ (24 VDC≡)	15 to 20 mA	20 to 26 mA	16 to 22 mA	27 to 35 mA	23 to 30 mA



View product detail

Ø 16 mm

Selector Switches

S16SR Series



Features

- Compact, space-saving 16 mm installation diameter
- Short rear-length size of only 29.5 mm
- Independent detachable contacts

* Sold Separately

- Contact blocks (SA□-C□□)
- LED blocks (SA□-L□□□)
- Locking handle (SA□-LH)

Specifications

Model	S16SR Series
Actuation angle	2-position: 90°±5°, 3-position: 45°±5°
Actuation force	20 to 120 N·mm
Installation	Extended
Shock	500 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 250,000 operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP65 (IEC standard)
Certification	CE 01) UK ENEC ENEC ENEC
Control unit weight	Round: ≈ 6.6 g, Square: ≈ 6.8 g, Rectangular: ≈ 7.7 g
Housing weight	≈ 1.4 g

01) IEC-60947-5-1

Contact blocks	
Power supply/current	250 VAC~ / 3 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)
Contact resistance	≤ 50 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Terminal tensile force	≤ 30 N
Terminal soldering time	At the end of tips within 3 sec with 350 °C (30 W-soldering machine)
Certification	CE UK ENEC ENEC ENEC
Weight	≈ 1.6 g

LED blocks	
Rated voltage	5 / 12 / 24 VDC≡ model
Current consumption	Refer to the below Current consumption table.
Certification	CE UK ENEC ENEC ENEC
Weight	≈ 1.9 g

Current consumption	Red	Blue	Green	Yellow	White
SA16-L5□ (5 VDC≡)	6 to 9 mA	10 to 14 mA	5 to 7 mA	12 to 16 mA	10 to 14 mA
SA16-L12□ (12 VDC≡)	9 to 14 mA	10 to 15 mA	5 to 9 mA	10 to 16 mA	9 to 14 mA
SA16-L24□ (24 VDC≡)	15 to 20 mA	20 to 26 mA	16 to 22 mA	27 to 35 mA	23 to 30 mA



View product detail

Ø 16 mm

Key Selector

Switches

S16KR Series



Features

- Compact, space-saving 16 mm installation diameter
- Short rear-length size of only 29.5 mm
- Independent detachable contacts

- * Sold Separately
- Contact blocks (SA□-C□□)
 - LED blocks (SA□-L□□□)
 - Locking handle (SA□-LH)

Specifications

Model	S16KR Series
Actuation angle	2-position: 90°±5°, 3-position: 45°±5°
Actuation force	20 to 120 N·mm
Installation	Extended
Shock	500 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 250,000 operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP65 (IEC standard)
Certification	CE 011 UK ENEC ENEC ENEC
Control unit weight	Round: ≈ 16 g, Square: ≈ 16.2 g, Rectangular: ≈ 17.1 g
Housing weight	≈ 1.4 g

01) IEC-60947-5-1

Contact blocks					
Power supply/current	250 VAC~ / 3 A				
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute				
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)				
Contact resistance	≤ 50 mΩ (initial)				
Electrical life cycle	≥ 100,000 operations (20 operations/min)				
Contact material	AgNi10				
Terminal tensile force	≤ 30 N				
Terminal soldering time	At the end of tips within 3 sec with 350 °C (30 W-soldering machine)				
Certification	CE UK ENEC ENEC ENEC				
Weight	≈ 1.6 g				
LED blocks					
Rated voltage	5 / 12 / 24 VDC≡ model				
Current consumption	Refer to the below Current consumption table.				
Certification	CE UK ENEC ENEC ENEC				
Weight	≈ 1.9 g				
Current consumption	Red	Blue	Green	Yellow	White
SA16-L5□ (5 VDC≡)	6 to 9 mA	10 to 14 mA	5 to 7 mA	12 to 16 mA	10 to 14 mA
SA16-L12□ (12 VDC≡)	9 to 14 mA	10 to 15 mA	5 to 9 mA	10 to 16 mA	9 to 14 mA
SA16-L24□ (24 VDC≡)	15 to 20 mA	20 to 26 mA	16 to 22 mA	27 to 35 mA	23 to 30 mA



View product detail

Ø 16 mm

Mushroom-Head

Push Button

Switches

S16BR Series



Features

- Compact, space-saving 16 mm installation diameter
- Short rear-length size of only 29.5 mm
- Independent detachable contacts

* Sold Separately

- Contact blocks (SA□-C□□)
- LED blocks (SA□-L□□□)
- Locking handle (SA□-LH)

Specifications

Model	S16BR Series
Actuation distance	3 mm
Actuation force	0.2 to 0.35 kgf (2 to 3.5 N)
Installation	Extended
Shock	500 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 1 million operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP65 (IEC standard)
Certification	CE 01) UK ENEC ENEC ENEC
Control unit weight	≈ 4.1 g
Housing weight	≈ 1.4 g

01) IEC-60947-5-1

Contact blocks	
Power supply/current	250 VAC~ / 3 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 100 MΩ (500 VDC≡ megger)
Contact resistance	≤ 50 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Terminal tensile force	≤ 30 N
Terminal soldering time	At the end of tips within 3 sec with 350 °C (30 W-soldering machine)
Certification	CE UK ENEC ENEC ENEC
Weight	≈ 1.6 g

LED blocks	
Rated voltage	5 / 12 / 24 VDC≡ model
Current consumption	Refer to the below Current consumption table.
Certification	CE UK ENEC ENEC ENEC
Weight	≈ 1.9 g

Current consumption	Red	Blue	Green	Yellow	White
SA16-L5□ (5 VDC≡)	6 to 9 mA	10 to 14 mA	5 to 7 mA	12 to 16 mA	10 to 14 mA
SA16-L12□ (12 VDC≡)	9 to 14 mA	10 to 15 mA	5 to 9 mA	10 to 16 mA	9 to 14 mA
SA16-L24□ (24 VDC≡)	15 to 20 mA	20 to 26 mA	16 to 22 mA	27 to 35 mA	23 to 30 mA



View product detail

Ø 16 mm

Emergency Switches

S16ER Series



Features

- Compact, space-saving 16 mm installation diameter
- Short rear-length size of only 29.5 mm
- Independent detachable contacts

- * Sold Separately
- Contact blocks (SA□-C□□)
 - LED blocks (SA□-L□□□)
 - Locking handle (SA□-LH)

Specifications

Model	S16ER Series
Actuation distance	2 to 4 mm
Actuation angle	35° ± 7°
Actuation force	1.7 to 4.7 kgf (17 to 47 N)
Installation	Extended
Shock	500 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 100,000 operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP65 (IEC standard)
Certification	CE 01 UK ENEC ENEC EAC
Control unit weight	≈ 11.5 g
Housing weight	≈ 1.4 g

01) IEC-60947-5-1

Contact blocks	
Power supply/current	250 VAC~ / 3 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 100 MΩ (500 VDC== megger)
Contact resistance	≤ 50 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Terminal tensile force	≤ 30 N
Terminal soldering time	At the end of tips within 3 sec with 350 °C (30 W-soldering machine)
Certification	CE 01 UK ENEC ENEC EAC
Weight	≈ 1.6 g

LED blocks	
Rated voltage	5 / 12 / 24 VDC== model
Current consumption	Refer to the below Current consumption table.
Certification	CE 01 UK ENEC ENEC EAC
Weight	≈ 1.9 g

Current consumption	Red	Blue	Green	Yellow	White
SA16-L5□ (5 VDC==)	6 to 9 mA	10 to 14 mA	5 to 7 mA	12 to 16 mA	10 to 14 mA
SA16-L12□ (12 VDC==)	9 to 14 mA	10 to 15 mA	5 to 9 mA	10 to 16 mA	9 to 14 mA
SA16-L24□ (24 VDC==)	15 to 20 mA	20 to 26 mA	16 to 22 mA	27 to 35 mA	23 to 30 mA



View product detail

Ø 16 mm

Pilot Lights

L16RR Series



Features

- Compact, space-saving 16 mm installation diameter
- Short rear-length size of only 29.5 mm

* Sold Separately

- LED blocks (SA□-L□□□□)
- Locking handle (SA□-LH)

Specifications

Model	L16RR Series
Installation	Extended
Shock	500 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Light unit: IP65 (IEC standard)
Certification	CE ⁰¹⁾
Light unit weight	≈ 11.5 g
Housing weight	≈ 1.4 g

01) IEC-60947-5-1

LED blocks					
Rated voltage	5 / 12 / 24 VDC= model				
Current consumption	Refer to the below Current consumption table.				
Certification	CE ⁰¹⁾				
Weight	≈ 1.9 g				
Current consumption	Red	Blue	Green	Yellow	White
SA16-L5□ (5 VDC=)	6 to 9 mA	10 to 14 mA	5 to 7 mA	12 to 16 mA	10 to 14 mA
SA16-L12□ (12 VDC=)	9 to 14 mA	10 to 15 mA	5 to 9 mA	10 to 16 mA	9 to 14 mA
SA16-L24□ (24 VDC=)	15 to 20 mA	20 to 26 mA	16 to 22 mA	27 to 35 mA	23 to 30 mA



View product detail

Ø 22 / 25 mm

Push Button

Switches

S2PR Series



Features

- Smooth operation
 - High electrical conductivity
 - Long-lasting durability
- * Sold Separately
- Contact blocks (SA□-C□□)
 - LED blocks (SA□-L□□□)
 - Switch enclosures (SA-□B□)
 - Locking handle (SA□-LH)
 - Switch washer (SA-SW□)
 - Switch waterproof cap (SA-W□)

Specifications

Series	S2PR Series
Actuation distance	5.0 to 5.5 mm
Actuation force	0.5 kgf (4.9 N) (per 1 contact)
Installation	Extended
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	Returned: ≥ 1 million operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP52 (IEC standard)
Certification	CE UK ENEC ENEC PS
Control unit weight	Round : ≈ 14.5 g, Square: ≈ 15.5 g
Housing weight	≈ 7 g
Contact blocks	
Power supply / current	110 VAC~ / 10 A, 250 VAC~ / 6 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 1,000 MΩ (500 VDC= megger)
Contact resistance	≤ 20 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Certification	CE UK ENEC ENEC PS
Weight	Modular type: ≈ 10 g, Singular type: ≈ 11 g
LED blocks	
Rated voltage	AC/DC voltage type: 12-24 VAC~ 50/60 Hz, 12-24 VDC=
	AC voltage type: 110-220 VAC~ 50/60 Hz
Current consumption	≤ 20 mA
Certification	CE UK ENEC ENEC
Weight	AC/DC voltage type: ≈ 11 g, AC voltage type: ≈ 12 g



View product detail

Ø 22 / 25 mm

Selector Switches

S2SR Series



Features

- Smooth operation
- High electrical conductivity
- Long-lasting durability

* Sold Separately

- Contact blocks (SA□-C□□)
- LED blocks (SA□-L□□□)
- Switch enclosures (SA-□B□)
- Locking handle (SA□-LH)
- Switch washer (SA-SW□)

Specifications

Model	S2SR Series
Actuation angle	2-position: [Spring return] 60° ±5°, 90° ±5° [Maintained] 90° ±5° 3-position: [Spring return] 60° ±5°, 45° ±5° [Maintained] 90° ±5°, 45° ±5°
Actuation force	0.5 kgf (4.9 N) (per 1 contact)
Installation	Extended
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 100,000 operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP52 (IEC standard)
Certification	CE UK ENEC EAC
Control unit weight	Standard head type: ≈ 19 g Shark-head type: ≈ 16 g
Housing weight	≈ 7 g
Contact blocks	
Power supply / current	110 VAC~ / 10 A, 250 VAC~ / 6 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 1,000 MΩ (500 VDC= megger)
Contact resistance	≤ 20 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Certification	CE UK ENEC EAC
Weight	Modular type: ≈ 10 g, Singular type: ≈ 11 g
LED blocks	
Rated voltage	AC/DC voltage type: 12-24 VAC~ 50/60 Hz, 12-24 VDC= AC voltage type: 110-220 VAC~ 50/60 Hz
Current consumption	≤ 20 mA
Certification	CE UK ENEC EAC
Weight	AC/DC voltage type: ≈ 11 g, AC voltage type: ≈ 12 g



View product detail

Ø 22 / 25 mm

Key Selector
Switches

S2KR Series



Features

- Smooth operation
- High electrical conductivity
- Long-lasting durability

- * Sold Separately
- Contact blocks (SA□-C□□)
 - Switch enclosures (SA-□B□)
 - Locking handle (SA□-LH)
 - Switch washer (SA-SW□)

Specifications

Model	S2KR Series
Actuation angle	2-position: [Spring return] 60° ±5° [Maintained] 90° ±5° 3-position: [Spring return] 60° ±5° [Maintained] 90° ±5°
Actuation force	0.5 kgf (4.9 N) (per 1 contact)
Installation	Extended
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 100,000 operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP52 (IEC standard)
Certification	CE UK ENEC EAC PS
Control unit weight	≈ 37 g
Housing weight	≈ 7 g
Contact blocks	
Power supply / current	110 VAC~ / 10 A, 250 VAC~ / 6 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)
Contact resistance	≤ 20 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Certification	CE UK ENEC EAC PS
Weight	Modular type: ≈ 10 g, Singular type: ≈ 11 g



View product detail

Ø 22 / 25 mm

I/O Push Button

Switches

S2TR Series



Features

- Smooth operation
- High electrical conductivity
- Long-lasting durability

* Sold Separately

- Contact blocks (SA□-C□□)
- LED blocks (SA□-L□□□)
- Switch enclosures (SA-□B□)
- Locking handle (SA□-LH)
- Switch washer (SA-SW□)

Specifications

Model	S2TR Series
Actuation distance	5.0 to 5.5 mm
Actuation force	0.5 kgf (4.9 N) (per 1 contact)
Installation	Extended
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 1 million operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP50 (IEC standard)
Certification	CE UK ENEC ENEC ENEC ENEC
Control unit weight	≈ 14.5 g
Housing weight	≈ 7 g
Contact blocks	
Power supply / current	110 VAC~ / 10 A, 250 VAC~ / 6 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 1,000 MΩ (500 VDC= megger)
Contact resistance	≤ 20 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Certification	CE UK ENEC ENEC ENEC
Weight	Modular type: ≈ 10 g, Singular type: ≈ 11 g
LED blocks	
Rated voltage	AC/DC voltage type: 12-24 VAC~ 50/60 Hz, 12-24 VDC=
	AC voltage type: 110-220 VAC~ 50/60 Hz
Current consumption	≤ 20 mA
Certification	CE UK ENEC ENEC
Weight	AC/DC voltage type: ≈ 11 g, AC voltage type: ≈ 12 g



View product detail

Ø 22 / 25 mm
Mushroom-Head
Push Button
Switches

S2BR Series



Features

- Smooth operation
 - High electrical conductivity
 - Long-lasting durability
- * Sold Separately
- Contact blocks (SA□-C□□)
 - Switch enclosures (SA-□B□)
 - Locking handle (SA□-LH)
 - Switch washer (SA-SW□)

Specifications

Model	S2BR Series
Actuation distance	5.0 to 5.5 mm
Actuation force	0.5 kgf (4.9 N) (per 1 contact)
Installation	Extended
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 1 million operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP52 (IEC standard)
Certification	CE UK ENEC EAC PS
Control unit weight	≈ 21 g
Housing weight	≈ 7 g
Contact blocks	
Power supply / current	110 VAC~ / 10 A, 250 VAC~ / 6 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 1,000 MΩ (500 VDC= megger)
Contact resistance	≤ 20 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Certification	CE UK ENEC EAC PS
Weight	Modular type: ≈ 10 g, Singular type: ≈ 11 g



View product detail

Ø 22 / 25 mm

Emergency Switches

S2ER Series



Features

- Smooth operation
- High electrical conductivity
- Long-lasting durability
- Sold Separately
 - Contact blocks (SA□-C□□)
 - LED blocks (SA□-L□□□)
 - Switch enclosures (SA-□B□)
 - Locking handle (SA□-LH)
 - Switch washer (SA-SW□)
 - Emergency switch nameplates (SA-N□)
 - Emergency switch protective shrouds (SA-EG□)

Specifications

Model	S2ER Series
Actuation distance	5.0 to 5.5 mm
Actuation angle	40° ± 7°
Actuation force	0.5 kgf (4.9 N) (per 1 contact)
Installation	Extended
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 100,000 operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP52 (IEC standard)
Certification	CE ENEC EAC  
Control unit weight	D30: ≈ 22.5 g D40: ≈ 22.5 g D60: ≈ 27 g
Housing weight	≈ 7 g
Contact blocks	
Power supply / current	110 VAC~ / 10 A, 250 VAC~ / 6 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 1,000 MΩ (500 VDC= megger)
Contact resistance	≤ 20 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Certification	CE ENEC EAC  
Weight	Modular type: ≈ 10 g, Singular type: ≈ 11 g
LED blocks	
Rated voltage	AC/DC voltage type: 12-24 VAC~ 50/60 Hz, 12-24 VDC=
Current consumption	≤ 20 mA
Certification	CE ENEC EAC
Weight	AC/DC voltage type: ≈ 11 g, AC voltage type: ≈ 12 g



View product detail

Ø 22 / 25 mm

Pilot Lights

L2RR Series



Features

- High luminance LED
 - Available in various colors
 - Long-lasting durability
- * Sold Separately
- LED blocks (SA□-L□□□)
 - Switch enclosures (SA-□B□)
 - Locking handle (SA□-LH)
 - Switch washer (SA-SW□)

Specifications

Model	L2RR Series
Installation	Extended
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Light unit: IP52 (IEC standard)
Certification	CE UK ENEC EAC
Light unit weight	≈ 15.5 g
Housing weight	≈ 7 g
LED blocks	
Rated voltage	AC/DC voltage type: 12-24 VAC~ 50/60 Hz, 12-24 VDC=
	AC voltage type: 110-220 VAC~ 50/60 Hz
Current consumption	≤ 20 mA
Certification	CE UK ENEC EAC
Weight	AC/DC voltage type: ≈ 11 g, AC voltage type: ≈ 12 g



View product detail

Ø 30 mm

Push Button

Switches

S3PR / S3PF Series



Features

- Smooth operation
- High electrical conductivity
- Long-lasting durability

* Sold Separately

- Contact blocks (SA□-C□□)
- LED blocks (SA□-L□□□)
- Locking handle (SA□-LH)
- Switch washer (SA-SW□)

Specifications

Model	S3PR Series	S3PF Series
Actuation distance	5.0 to 5.5 mm	
Actuation force	0.5 kgf (4.9 N) (per 1 contact)	
Installation	Extended	Flush
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times	
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes	
Mechanical life cycle (control unit life cycle)	Returned: ≥ 1 million operations (20 operations/min)	
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)	
Protection structure	Control unit: IP52 (IEC standard)	
Certification	CE UKCA VDE ENEC EAC  	
Control unit weight	21.5 g	
Housing weight	≈ 7 g	
Contact blocks		
Power supply / current	110 VAC~ / 10 A, 250 VAC~ / 6 A	
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute	
Insulation resistance	≥ 1,000 MΩ (500 VDC== megger)	
Contact resistance	≤ 20 mΩ (initial)	
Electrical life cycle	≥ 100,000 operations (20 operations/min)	
Contact material	AgNi10	
Certification	CE UKCA VDE ENEC EAC  	
Weight	Modular type: ≈ 10 g, Singular type: ≈ 11 g	
LED blocks		
Rated voltage	AC/DC voltage type: 12-24 VAC~ 50/60 Hz, 12-24 VDC== AC voltage type: 110-220 VAC~ 50/60 Hz	
Current consumption	≤ 20 mA	
Certification	CE UKCA VDE ENEC EAC	
Weight	AC/DC voltage type: ≈ 11 g, AC voltage type: ≈ 12 g	

View product detail



S3PR Series



S3PF Series

Ø 30 mm

Selector Switches



S3SF Series



Features

- Smooth operation
- High electrical conductivity
- Long-lasting durability
-
- * Sold Separately
 - Contact blocks (SA□-C□□)
 - LED blocks (SA□-L□□□)
 - Locking handle (SA□-LH)
 - Switch washer (SA-SW□)

Specifications

Model	S3SF Series
Actuation angle	2-position: [Spring return] 60° ±5° , 90° ±5° [Maintained] 90° ±5° 3-position: [Spring return] 60° ±5° , 45° ±5° [Maintained] 90° ±5° , 45° ±5°
Actuation force	0.5 kgf (4.9 N) (per 1 contact)
Installation	Flush
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 100,000 operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP52 (IEC standard)
Certification	CE UK ENEC EAC  
Control unit weight	Standard head type: ≈ 23.5 g Shark-head type: ≈ 21 g
Housing weight	≈ 7 g
Contact blocks	
Power supply / current	110 VAC~ / 10 A, 250 VAC~ / 6 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 1,000 MΩ (500 VDC= megger)
Contact resistance	≤ 20 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Certification	CE UK ENEC EAC  
Weight	Modular type: ≈ 10 g, Singular type: ≈ 11 g
LED blocks	
Rated voltage	AC/DC voltage type: 12-24 VAC~ 50/60 Hz, 12-24 VDC= AC voltage type: 110-220 VAC~ 50/60 Hz
Current consumption	≤ 20 mA
Certification	CE UK ENEC EAC
Weight	AC/DC voltage type: ≈ 11 g, AC voltage type: ≈ 12 g



View product detail

Ø 30 mm

Key Selector

Switches

S3KF Series



Features

- Smooth operation
- High electrical conductivity
- Long-lasting durability

* Sold Separately

- Contact blocks (SA□-C□□)
- Locking handle (SA□-LH)
- Switch washer (SA-SW□)

Specifications

Model	S3KF Series
Actuation angle	2-position: [Spring return] 60° ±5° [Maintained] 90° ±5° 3-position: [Spring return] 60° ±5° [Maintained] 90° ±5°
Actuation force	0.5 kgf (4.9 N) (per 1 contact)
Installation	Flush
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	≥ 100,000 operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP52 (IEC standard)
Certification	CE UK ENEC ENEC ENEC ENEC
Control unit weight	≈ 41 g
Housing weight	≈ 7 g
Contact blocks	
Power supply / current	110 VAC~ / 10 A, 250 VAC~ / 6 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 1,000 MΩ (500 VDC≡ megger)
Contact resistance	≤ 20 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Certification	CE UK ENEC ENEC ENEC
Weight	Modular type: ≈ 10 g, Singular type: ≈ 11 g



View product detail

Ø 30 mm

Pilot Lights

L3RF Series



Features

- High luminance LED
 - Available in various colors
 - Long-lasting durability
- * Sold Separately
- LED blocks (SA□-L□□□)
 - Locking handle (SA□-LH)
 - Switch washer (SA-SW□)

Specifications

Model	L3RF Series
Installation	Flush
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Light unit: IP52 (IEC standard)
Certification	CE UK ENEC EAC
Light unit weight	≈ 22 g
Housing weight	≈ 7 g
LED blocks	
Rated voltage	AC/DC voltage type: 12-24 VAC~ 50/60 Hz, 12-24 VDC=
	AC voltage type: 110-220 VAC~ 50/60 Hz
Current consumption	≤ 20 mA
Certification	CE UK ENEC EAC
Weight	AC/DC voltage type: ≈ 11 g, AC voltage type: ≈ 12 g



View product detail

□ 30 mm

Push Button

Switches

SQ3PF Series



Features

- Smooth operation
- High electrical conductivity
- Long-lasting durability

* Sold Separately

- Contact blocks (SA□-C□□)
- LED blocks (SA□-L□□□)
- Locking handle (SA□-LH)

Specifications

Model	SQ3PF Series
Actuation distance	5.0 to 5.5 mm
Actuation force	0.5 kgf (4.9 N) (per 1 contact)
Installation	Flush
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Mechanical life cycle (control unit life cycle)	Returned: ≥ 1 million operations (20 operations/min)
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Control unit: IP52 (IEC standard)
Certification	CE ENEC UL ENEC ENEC PS
Control unit weight	≈ 22 g
Housing weight	≈ 7 g
Contact blocks	
Power supply / current	110 VAC~ / 10 A, 250 VAC~ / 6 A
Dielectric strength	Between the charging part and the case : 3,000 VAC~ 50/60 Hz for 1 minute
Insulation resistance	≥ 1,000 MΩ (500 VDC= megger)
Contact resistance	≤ 20 mΩ (initial)
Electrical life cycle	≥ 100,000 operations (20 operations/min)
Contact material	AgNi10
Certification	CE ENEC UL ENEC ENEC PS
Weight	Modular type: ≈ 10 g, Singular type: ≈ 11 g
LED blocks	
Rated voltage	AC/DC voltage type: 12-24 VAC~ 50/60 Hz, 12-24 VDC=
	AC voltage type: 110-220 VAC~ 50/60 Hz
Current consumption	≤ 20 mA
Certification	CE ENEC UL ENEC
Weight	AC/DC voltage type: ≈ 11 g, AC voltage type: ≈ 12 g



View product detail

☐ 30mm

Pilot Lights

LQ3RF Series



Features

- High luminance LED
 - Available in various colors
 - Long-lasting durability
- * Sold Separately
- LED blocks (SA□-L□□□)
 - Locking handle (SA□-LH)

Specifications

Model	LQ3RF Series
Installation	Flush
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 10 minutes
Ambient temperature	-15 to 55 °C, storage : -25 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (no freezing or condensation)
Protection structure	Light unit: IP52 (IEC standard)
Certification	CE UK ENEC EAC
Light unit weight	≈ 22 g
Housing weight	≈ 7 g
LED blocks	
Rated voltage	AC/DC voltage type: 12-24 VAC~ 50/60 Hz, 12-24 VDC=
Current consumption	≤ 20 mA
Certification	CE UK ENEC EAC
Weight	AC/DC voltage type: ≈ 11 g, AC voltage type: ≈ 12 g



View product detail

Magnetic Non-Contact Switches

MN Series




Features

- Non-powered magnetic detection method
- Two wiring specifications of cable / cable connector type
- Available to install at back-forth / right-left moving door
- Protection structure: IP67

* Sold Separately

- M12 Connector cable: CIDH4-□, CLDH4-□

Specifications

Model	MN-AB-□		MN-2A-□
Contact	1 × N.O. + 1 × N.C.		2 × N.O.
Operating distance ⁰¹⁾	OFF→ON	≥ 5 mm	
	ON→OFF	≤ 15 mm	
Certification	CE UK  ENEC ETL		
Unit weight (package)	Cable type: ≈ 92.6 g (≈ 106.5 g)		
	Cable connector type: ≈ 47.2g (≈ 61.0g)		

01) Rated at the ambient temperature of 23 °C. It can be differ up to ±20 % according to the ambient temperature.

Switching voltage	≤ 24 VDC≡
Switching current	≤ 400 mA
Life expectancy	≥ 1 billion times (with low load)
Vibration	1.0 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Vibration (malfunction)	1.0 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunction)	300m/s ² (≈ 30 G) in each X, Y, Z direction in output ON/OFF status for 3 times
Ambient temperature	-10 to 55 °C, storage: -20 to 60 °C (a non freezing or condensation environment)
Ambient humidity	35 to 85 %RH, storage : 35 to 85 %RH (a non freezing or condensation environment)
Protection structure	IP67 (IEC standard)
Connection	Cable type / Cable connector type
Cable	Ø 5 mm, 4-wire cable type: 2 m, cable connector type: 0.3 m
Wire	AWG24 (0.08 mm), 40-core, core diameter: Ø 1.11 mm
Connector	M12 connector
Material	Body/CAP: PC



View product detail



J2. Buzzers

The buzzer informs the situation by making a sound. There are magnetic buzzers and piezo buzzers depending on the structure that making a sound.

J2-1	Buzzers	B7VA Series	Voice Buzzers
		B2PB Series	Piezo Buzzers
		B6MA Series	Melody Buzzers
		B2NB Series	Magnetic Buzzers

Voice Buzzers

B7VA Series



Features

- Sound pressure level: up to 90dB±10% (at 1 m)
- Mounting hole : Ø72 mm, panel thickness: ≤6mm
- Check operation status with operation indicator (LED indicator)
- 8 different alarms
- Switch between single or repeat play (internal memory type)
- Inserting voice or melody available (external memory type)
- Switch between NPN/PNP
- Protection structure: IP65

* Sold Separately

- Micro SD card: BSD-16G

Specifications

Type	Internal memory		External memory
Model	B7VA-8KD		B7VA-8KD-E
Sound pressure	≤ 90 ±10% dB (distance at 1 m)		
Signal input method	Compatible with NPN and PNP inputs		
Audio sources ⁰¹⁾	Alarm: 8 types		Alarm: 8 types (factory settings)
Alarms	Sound 1	Police siren sound	Police siren sound
	Sound 2	Fire alarm	Fire alarm
	Sound 3	Ambulance sound	Ambulance sound
	Sound 4	Warning sound	Warning sound
	Sound 5	Alarm sound	Alarm sound
	Sound 6	Doorbell ring	Doorbell ring
	Sound 7	Ringtone 1	Ringtone 1
	Sound 8	Ringtone 2	Ringtone 2
Audio file format	-		MPEG-1 Audio Layer III (MP3), Waveform Audio Format (WAV) ⁰²⁾
Memory card	-		micro SD (SDHC) ⁰³⁾
SD card format type	-		FAT32
Indicator	Status indicator: Green / Orange LED		
Certification	CE, RoHS, REACH		CE, RoHS, REACH
Unit weight (packaged)	≈ 255 g (≈ 323 g)		≈ 255 g (≈ 325 g)

01) You can download the 8 types of alarm sounds from our website. For external memory type, changing the audio sources will delete the provided built-in sounds.

02) The WAV file is converted to the MP3 file in DAQMaster.

03) Be sure to use the included micro SD card (BSD-16G). Otherwise, we cannot guarantee the product's performance.

Power supply	12 ~ 24 VDC≡
Power consumption	7.2 W
Insulation resistance	≥ 1,000 MΩ (500VDC≡ megger)
Dielectric strength	Between the charging part and the case: 500 VAC~ 50 / 60 Hz for 1 min
Vibration	1.5 mm amplitude at frequency 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours
Shock	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Ambient temperature	-10 to 55 °C, Storage: -20 to 65 °C (no freezing or condensation)
Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH (no freezing or condensation)
Protection ratings	IP65 (Front part, IEC standard)
Material	Front cover: ABS, Body: PA6



View product detail

Piezo Buzzers

B2PB Series



Features

- Clear and loud sound:
up to 98 ± 8 dB (at 0.1 m)
- Select between continuous or intermittent sound settings
- Mounting hole: $\varnothing 22 / 25$ mm /
Panel thickness: 6 mm
- Protection structure: IP65 (front panel)

Specifications

Model	B2PB-B1D	B2PB-B1D-R
Power supply	12-24 VDC=	
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	≤ 0.6 W	
Current consumption	≤ 25 mA	
Sound pressure	98 ± 8 dB (distance: 0.1 m) ⁰¹⁾	
Sound frequency	≈ 2.5 kHz	
Sound type ⁰²⁾	Continuous sound, intermittent sound	
Mounting hole	$\varnothing 22/25$ mm compatible	
Operation indicator	Green	Red
Insulation resistance	$\geq 1,000$ M Ω (500 VDC= megger)	
Dielectric strength	Between the charging part and the case: 500 VAC~ 50/60 Hz for 1 min	
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 min	
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times	
Shock (malfunction)	147 m/s ² (≈ 15 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection structure	IP65 (front, IEC standard)	
Material	Cap: PC, Body: PA6 (G15%)	
Tightening torque	0.4 to 0.6 N m	
Certification	CE ENEC	
Unit weight (packaged)	≈ 18 g (≈ 305 g, 10 units)	

01) It is rated at power supply 24 VDC=. (sound pressure may be decreased when using 12 VDC=.)

02) Connect the power in the right direction: continuous sound (beep ---), Connect the power in the reverse direction: intermittent sound (beep- beep-)



View product detail

Melody

Buzzers

B6MA Series



Features

- 4 different melodies (ambulance, police siren, phone ring, Für Elise)
- Check operation status with operation indicator (red LED)
- End sleeves (ferrule terminal) provide simple wiring
- Power supply:
12 - 24 VDC, 110 - 220 VAC 50 / 60 Hz
- Max volume:
up to 95 dB (at 1 m), *105 dB (at 0.1 m)
- Installation diameter: Ø 66 mm
- Installation method: screw-on method
- Protection structure: IP65 (front panel)

Specifications

Model	B6MA-4GD□	B6MA-4GL□
Power supply	12 - 24 VDC≡	110 - 220 VAC~ 50/60 Hz
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	≤ 3 W	≤ 5 VA
Input	NPN open collector / PNP open collector model	
Sound pressure	Max. 105±10%dB (0.1 m), Max. 95±10%dB (1 m)	
Channels	4 channels	
Melody type	Terminal input: 4 types (ambulance, police, ringtone, for elise)	
Insulation resistance	≥ 1,000 MΩ (500VDC≡ megger, between all terminals and case)	
Dielectric strength	Between the charging part and the case: 500 VAC~ 50/60 Hz for 1 min	Between the charging part and the case: 2,000 VAC~ 50/60 Hz for 1 min
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours	
Shock	500 m/s ² (≈ 50 G) In each X, Y, Z direction for 3 times	
Ambient temperature	-10 to 55 °C, storage: -20 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection structure	IP65 (front, IEC standard)	
Material	PC	
Tightening torque for power input terminal	0.4 to 0.6 N m	
Tightening torque for nut on panel mounting	0.7 to 0.8 N m	
Certification	CE UK ENEC	
Unit weight (packaged)	≈ 130 g (≈ 170 g)	



View product detail

Magnetic Buzzers

B2NB Series



Features

- Clear and loud sound :
up to 87 ± 10 dB (at 0.1 m)
- Select between continuous or intermittent sound settings
- Mounting hole: $\varnothing 22 / 25$ mm /
Panel thickness: 6 mm
- Protection structure: IP30 (front panel)

Specifications

Model	B2NB-B1D	B2NB-B1D-R
Power supply	12 - 24 VDC=	
Permissible voltage range	90 to 110 % of rated voltage	
Power consumption	≤ 1.5 W	
Sound pressure	$\approx 87 \pm 10$ dB (distance: 0.1 m) ⁰¹⁾	
Sound type	Continuous sound, intermittent sound ⁰²⁾	
Mounting hole	$\varnothing 22/25$ mm compatible	
Operation indicator	Green	Red
Insulation resistance	≥ 50 M Ω (500 VDC= megger)	
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50/60 Hz for 1 min	
Vibration	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour	
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times	
Ambient temperature	-15 to 55 °C, storage: -25 to 65 °C (no freezing or condensation)	
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)	
Protection structure	IP30 (front)	
Material	Body: PA6, Cap: PC	
Tightening torque	0.4 to 0.6 N m	
Certification	CE UK ENEC	
Unit weight (packaged) ⁰³⁾	≈ 14 g (≈ 214 g)	

01) It is rated at power supply 24 VDC=, (sound pressure may be decreased when using 12 VDC=.)

02) Jumper pin attached: intermittent sound (beep - beep -), Jumper pin removed: continuous sound (beep ---)

03) It is weight per product. The weight in parentheses is for 10 packing units including packing materials.



View product detail

K. Software

Autonics software allows users to configure parameters, monitor status, program control processes with various Autonics devices.

K1. Software







K1. Software

Autonics software allows users to configure parameters, monitor status, program control processes with various Autonics devices.

K1-1	Comprehensive Management	DAQMaster	Comprehensive Device Management Software
K1-2	Machine Vision	atVision	Vision Software (for VC Series)
		Vision Master	Vision Software (for VG Series)
K1-3	IO-Link	atIOLink	IO-Link Software
K1-4	Light Curtain	atLightCurtain	Safety Light Curtain Software
K1-5	LIDAR	atLIDAR	Laser Scanner Software
K1-6	Distance Measurement	atDisplacement	Laser Displacement Sensors Software
		atDistance	Distance Measurement Software
K1-7	Motion Control	atMotion	Motion Control Software
K1-8	HMI	atLogic	HMI Logic Programming Software (for LP Series)
		atDesigner	HMI Screen Editor Software (for LP / GP Series)

Comprehensive Device Management Software

DAQMaster



Features

[DAQMaster Standard / Pro Version Common Features]

- Multiple device support
- Scan for devices
- Simple graphic user interface
- Project management
- Data analysis using grids or graphs
- Log monitoring data
- Real-time Logging (CSV)
- Edit tag formulas
- Print Modbus Map Table report
- Lua script support
- Multi-language support:
English, Korean, Japanese, Chinese (Simplified)

[DAQMaster Pro Version Features]

- Modbus device editor
- Trigger event, scheduler
- Action (SMS, e-mail, etc.)
- Database management
- TCP/IP server
- OPC DA server / client
- OPC UA client
- MQTT (publisher, subscriber)
- DDE server / client
- Modbus master / slave
- Virtual tag (tag combination)
- Manage user privileges

Installation Specification

[DAQMaster / DAQMaster Pro]

Download the installation program from the Autonics website.

Item	Recommended specifications
CPU	Quad Core (Clock Speed by Core \geq 2.0 GHz)
Operations	Microsoft Windows 7/10/11
Memory	8 GB or more
Storage space	\geq 10 GB
Resolution	1024 \times 768 or higher
Others	RS232C serial port(9-pin), USB port, RJ45 Ethernet port

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions. Download the manual from the Autonics website.

Supported Device

[Communication Supported Devices of Autonics]

Supported devices will be updated continuously. You can check the supported devices from the list of supported devices in the software. For more information, refer to the manual of the supported device.



View product detail

Vision

Software

(for VC Series)

atVision



Features

- Various inspection functions
- With 64 work group settings (32 inspection points per group), flexible coping with changes in work environment is possible
- Work group management and parameter setting
- Inspection result monitoring and output data setting
- Transfer the test result image to FTP server

Installation Specification

Download the installation program from the Autonics website.

Item	Recommended specifications
CPU	Intel i3 or higher or Ryzen 3 or higher
Operations	Microsoft Windows 7 (x64) or later
Memory	6 GB or more
Storage space	10 GB or more of free hard disk space
Resolution	1280 × 800 or higher (recommended: 1920 × 1080)
Other	RJ45 Ethernet port, GigE network interface card

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions. Download the manual from the Autonics website.

Supported Device

[Smart Camera VC Series]

For more information, refer to the manual of the supported device.



View product detail

Vision

Software

(for VG Series)

Vision Master



Features

- Various inspection functions
- Set up to 32 separate workgroups
- Manage parameters and workgroups
- Inspection results monitoring
- Inspection simulator function
- Send saved image data to FTP servers

Installation Specification

Download the installation program from the Autonics website.

Item	Recommended specifications
System	32bit (×86) or 64bit (×64) processor over 1GHz
Operations	Microsoft Windows 7 / 8 / 10
Memory	1GB or more
Storage space	400MB+ of available hard disk space
VGA	Resolution: 1024×768 or higher
Others	RJ45 Ethernet port

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions. Download the manual from the Autonics website.

Supported Device

[Ethernet VGA Mono / Color Camera VG Series]

For more information, refer to the manual of the supported device.



View product detail

IO-Link Software

atIOLink



Features

- Configuration of the ports on IO-Link Master
- Parameter setting of IO-Link device
- Real-time monitoring of IO-Link device
- Monitoring and controlling input / output process data of IO-Link device
- Simplified maintenance and repair of IO-Link device
 - : supports data storage
 - : supports restore to factory settings

Installation Specification

Download the installation program from the Autonics website.

Item	Minimum requirements
CPU	Intel i3, Ryzen 3 or above
Operations	Windows 7 (x64) or higher
Memory	6 GB or higher
Storage space	At least 10 GB of available HDD space
Resolution	1280 × 800 or higher (1920 × 1080 recommended)
Others	RJ45 Ethernet port, GigE network interface card

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions. Download the manual from the Autonics website

Supported Device

[Supported IO-Link devices of Autonics]

Supported devices will be updated continuously.
For more information, refer to the manual of the supported device.

[Iodd (IO Device Description)]

This file contains information such as manufacturer information, process data, diagnostic data, and parameter setting of a device using IO-Link communication. By uploading the Iodd file to PDCT Software, you can check the setting and communication data according to the user interface. Download the Iodd file from a manufacturer's website.



View product detail

Safety Light Curtain Software

atLightCurtain



Features

- Intuitive graphic user interface
- Light curtain operation status monitoring
 - Monitor amount of light received
 - Monitor connection and switches
 - Monitor errors and warnings
- Supports safe distance calculation function

Installation Specification

Download the installation program from the Autonics website.

Item	Minimum requirements
System	IBM PC compatible computer with over 1 GHz processor
Operations	≥ Windows 7
Memory	2GB or more
Storage space	≥ 1GB
Resolution	≥ 1024 X 760
Others	USB port

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions.
Download the manual from the Autonics website.

Supported Device

[Safety Cat. 4, Finger / Hand / Body Detection Safety Light Curtains SFL / SFLA Series]

For more information, refer to the manual of the supported device.

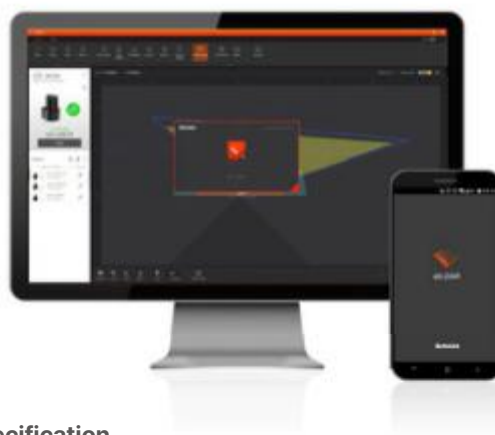
In case of SFL (Standard type), only monitoring function is supported, and in case of SFLA (advanced type), all functions such as parameter setting are available.



View product detail

Laser Scanner Software

atLiDAR



Features

- Intuitive UI design
- Parameter setting
 - Field setting related to input / output, filter, and teaching function
 - The various detection ranges such as rectangle, circle, polygon and teaching function are available for setting the surrounding environment.
- Data log monitoring
- Data analysis
- Mobile application support (Android)
- Multi-language support (Korean, English)

* Supported device functions for each version are different.

Installation Specification

Download the installation program from the Autonics website.

[atLiDAR (PC)]

Item	Minimum requirements
System	IBM PC compatible computer with over 1 GHz processor
Operations	Windows 7 or later
Memory	2 GB or more
Storage space	1 GB or more of free hard disk space
Resolution	1280×800 or higher (recommended: 1920×1080)
Other	RJ45 Ethernet port, GigE network interface card

[atLiDAR (Mobile)]

Search as below to download at operation system.

Android (Google Play Store): atLiDAR

Item	Minimum requirements
Supported version	Android 6.0 or higher
Content Rating	Ages 3+
Permissions	BLUETOOTH: Connect to a connected Bluetooth device BLUETOOTH_ADMIN: Search for and pair Bluetooth devices INTERNET: Network connection READ_EXTERNAL_STORAGE: Reading files from external storage WRITE_EXTERNAL_STORAGE: Write files to external storage
Current version	1.0.0
Connection method	Bluetooth, USB3.0-C to Ethernet adapter connection

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions.
Download the manual from the Autonics website.

Supported Device

atLiDAR (PC / mobile) is a management program for our LiDAR sensors. Supported devices will be updated continuously.

For more information, refer to the manual of the supported device.

Version \ Device	LSC Series	LSE2 Series	LSE3 Series
V2.3	○	○	○
V2.2	○	○	-
V2.0	○	-	-
V1.1	-	-	-



View product detail

Laser Displacement Sensors Software

atDisplacement



Features

- Dedicated software for use with BD-C series:
Graphic user interface, parameter settings
and data monitoring of BD amplifier units
- Check profiles of connected devices through
status window
- Monitor real-time data, graph, and wave
patter graphs

Installation Specification

Download the installation program from the Autonics website.

Item	Minimum requirements
System	IBM PC compatible computer with 1GHz + processor
Operations	Windows 98/NT/XP/Vista/7/8/10
Memory	2GB or more
Storage space	1GB+ of available hard disk space
VGA	Resolution: 1280×800 or higher
Others	RS232C serial port (9-pin), USB port

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions.
Download the manual from the Autonics website.

Supported Device

[Communication Converter for Laser Displacement Sensors BD-C Series]

For more information, refer to the manual of the supported device.



View product detail

Distance Measurement Software

atDistance



Features

- Dedicated software for UTR series ultrasonic sensors to monitor status and check product information in real-time
- Intuitive graphic user interface
- Various detection functions:
Various parameter configuration including output method switch, digital output operation mode switch, output mode switch and filter setting, and hysteresis setting
- Check previous data with saved logs

Installation Specification

Download the installation program from the Autonics website.

Item	Minimum requirements
System	IBM PC compatible computer with 1 GHz+ processor
Operations	Microsoft Windows 7+
Memory	2 GB or more
Storage space	Hard disk with 1 GB+
Resolution	Display with resolution of more than 1024 × 760
Others	USB 3.0 port (900 mA)

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions. Download the manual from the Autonics website.

Supported Device

[Ultrasonic Sensors UTR Series]

For more information, refer to the manual of the supported device.



View product detail

Motion Control Software

atMotion



Features

- Supports Multiple Devices
 - Monitor operation status of multiple devices and set parameters for each device
 - When multiple units with different addresses are connected, the address scan function provides
- Simple Graphic User Interface
 - Freely edit screen data to set parameters, monitor devices, and program control
 - Monitor operation status and history using DAQ Space (Line Graph, Grid)
- Multilingual Support
 - English and Korean are supported by default, and users can easily add other languages

Installation Specification

Download the installation program from the Autonics website.

Item	Minimum requirements
System	IBM PC compatible computer with 1 GHz+ processor
Memory	2 GB or more
Storage space	1GB+ of available hard disk space
VGA	Resolution: 1024×768 or higher
Others	RS232C serial port (9-pin), USB port, Ethernet port

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions. Download the manual from the Autonics website.

Supported Device

[Motion Controller Devices of Autonics]

Supported devices will be updated continuously. You can check the supported devices from the list of supported devices in the software. For more information, refer to the manual of the supported device.



View product detail

HMI Logic Programming Software (for LP Series)

atLogic



Features

- Supports multiple projects
 - Able to open up to 5 projects at the same time and write or edit programs.
- Convenient program edit
 - Able to edit by cell unit
 - Able to edit with multi window
 - Support several view functions such as viewing device name, variable name, or device name & comment, etc. to edit program easily.
 - Able to edit ladder program and mnemonic program at the same time.
- Several monitor function
 - Support several monitor function such as monitoring variable, device, system, or time chart, etc.
- Convenient user interface
 - Easy adaptation for atLogic by same basic function of Microsoft window.
- Various message window
 - Supports various message window for edit or check program easily.
- Real time switching ladder and mnemonic program
 - Switching ladder or mnemonic program in real time and it is available to write or edit at two editors simultaneously.

Installation Specification

Download the installation program from the Autonics website.

Item	Recommended requirements	Recommended spec.
Operating system	Windows 7/8.1/10	Windows 7/8.1/10
CPU	Pentium4	Over Pentium Dual Core
Memory	512 MB	Over 1 GB
Storage space	1 GB free space	Over 5 GB free space
Resolution	1024×768	Over 1280×1024

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions. Download the manual from the Autonics website.

Supported Device

[Color LCD Logic Panels LP-A Series]

For more information, refer to the manual of the supported device.



View product detail

HMI Screen Editor

Software

(for LP / GP Series)

atDesigner



Features

- Supporting for Windows true type font and other various bitmap font
- GP / LP-A Series firmware download function
- Project file converting function from project file of S Series to A Series
- Convenient user interface and display
 - : Title bar, Ribbon Menu, Project window, Tool-bar / Library / Undo List, Work space, Message
- Various editing functions for grouping, aligning, selecting, drawing
- Providing a selection of library and image
 - : Image library, Object library, Window library, Key window library
- Over-rop screen to enhance efficiently of user screen drawing and to save data
- Automatic validation test for the project file and data when downloading to GP / LP
- Simulator included for testing the project file before downloading

Installation Specification

Download the installation program from the Autonics website.

Item	Minimum spec	Recommended spec
CPU	Pentium4 1.6GHz or above	Inter Core i5-2nd generation 2500 or above
Memory	Min. 4GB	Min. 8GB
Storage space	Min. 4GB	Min. 8GB
Resolution	Min. 1280×1024	Min. 1920×1080

Manual

Please refer to the manual for correct use of the product and be sure to follow the precautions. Download the manual from the Autonics website.

Supported Device

[Color LCD Graphic Panels GP-A Series]

For more information, refer to the manual of the supported device.

[Color LCD Logic Panels LP-A Series]

For more information, refer to the manual of the supported device.



View product detail

Global Network

Korea

Autonics Corporation

T 82-2-2048-1577

F 82-2-2048-1995

E sales@autonics.com

Brazil

Autonics do Brasil Comercial
Importadora e Exportadora LTDA

T 55-11-2307-8480 / 3195-4610

F 55-11-2309-7784

E comercial@autonics.com.br

China

Autonics Electronic (Jiaxing)
Corporation

T 86-573-8216-1900

F 86-573-8216-1917

E china@autonics.com

Germany

Autonics Germany Office

T +49-6196-2048640

E germany@autonics.com

India

Autonics Automation India
Private Limited

T 91-22-2768-2570

E india@autonics.net.in

Indonesia

PT. Autonics Indonesia

T 62-21-8088-8814/5

E indonesia@autonics.co.id

Japan

Autonics Japan Tokyo Office

T 81-3-6435-8380

F 81-3-6435-8381

E ja@autonics.com

Malaysia

Mal-Autonics Sensor Sdn. Bhd.

T 60-3-7805-7190

F 60-3-7805-7193

E malaysia@autonics.com

Mexico

Autonics Mexico S.A. DE C.V

T 52-800-523-2131

E ventas05@autonics.com

Türkiye

Autonics Otomasyon Ticaret Ltd. Sti.

T 90-216-365-9117/3/4

F 90-216-365-9112

E turkiye@autonics.com

USA

Autonics USA, Inc.

T 1-847-680-8160

F 1-847-680-8155

E sales@autonicsusa.net

Vietnam

Autonics Vina Co.,Ltd

T 84-28-3771-2662

F 84-28-3771-2663

E vietnam@autonics.com



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