



TB420 4-20mA Smart Gas Sensor Module —— Manual ——

Easy Gas Sensor Module Solutions Easy to Use



General Information

This manual applies to TB420-ES1, TB420-ES4, TB420-EC4 Smart Gas Sensor Modules.

Safety

Be sure to read and understand this instruction manual before power on and operation of this product. Use it in accordance with the relevant industry standards. In the event of an unrecoverable malfunction, the instrument must be taken out of service and prevented from accidental commissioning.

Failure to follow these instructions may result in equipment damage to the instrument, abnormal detection, or system failure.

The product is used under most environmental conditions. However, during storage, assembly and operation, due to the principles and characteristics of solid-state polymer electrochemical sensors, users should strictly follow this article and the general type of PCB circuit board application to ensure normal use. Illegal application will not be covered under warranty. Although our products are very reliable, we recommend checking the module's response to the target gas before use to ensure field use.

- Before undertaking any work, be sure to follow local regulations and procedures.
- Do not disassemble any circuit components or disassemble the sensor in any way.
- Do not expose the sensor to temperatures outside the recommended range.
- To prevent the sensor's air inlet from being blocked by dust in the environment, keep the air inlet downward during installation.
- At the end of the product's useful life, do not dispose of any product components in household waste, but in accordance with local government e-waste recycling regulations. Electrochemical sensors should not be incinerated, as this action may cause the battery to release toxic substances and smoke.



Introduction

The TB420 Gas Sensor Module is an intelligent two wire 4-20 mA digital gas sensor module, which utilizes a smart microprocessor with highreliability solid polymer electrochemical gas sensing technology and intelligent algorithm calculation. The TB420 is designed to comply with the relevant standards for gas safety monitoring in the industrial application.

The intelligent Gas Sensor Module provides a self-test which evaluates the sensor performance without a gas measurement. Therefore, it is the perfect solution for smart home and IoT applications. The data is put out through the output signal, which makes it easy and convenient to determine the right time to perform maintenance and replacement.

Each TB420 Sensor Module has been professionally calibrated with the gas. It can be instantly used without prior warm-up time and the calibration information is stored in the flash chip. There is a calibration software from EC Sense in case a recalibration is required or the 4-20 mA output signal-needs to be corrected.

The TB420 Gas Sensor Module effectively shortens gas instrument development time, reduces costs and risks in new product development, saves production time, avoids complex gas calibration steps and ensures high reliability and accuracy. The standard 4-20 mA two-wire module allows for quick instrument and system setup or connection to display, DCS, PLC and other systems.

Features

- 4-20 mA standard two-wire output, 24V DC power supply
- Detects single gas
- Pre-calibration, with sensor performance and lifetime self-test output Fast signal stability time at power on
- Suitable for indoor and outdoor environments, sensor can work in-40 °C to +55 °C Fast response time and stable zero point without drift, anti-electromagnetic interference ability
- Long lifetime, anti-poisoning
- Integrated safety protection enables use in potentially explosive environments Electronic circuit boards have a dust and corrosion resistant coating
- Small size
- Intrinsic safety, RoHS approved

Principle

The TB420 Sensor Module is a durable product. It converts the original small current signals of the gas sensors into standard 4-20 mA outputs through a digital circuit. It is also possible to convert an external resistor to a 40-200 mV voltage output.

The Sensor Module uses the Solid Polymer Electrochemical sensing technology. It employs a three-electrode arrangement- the working, the counter and the reference electrodes- in which concentration measurements can be performed continuously and the sensor operates at a fixed potential. The gas of interest (target gas) diffuses through a diffusion barrier, like a capillary, into the cell to the working electrode, where an electrochemical reaction takes place. There are oxidation and reduction reactions. The current flowing through the cell is direct proportional to the concentration of the target gas. A reference electrode keeps the potential constant together with a potentiostat.





Technical Specifications

Gas Sensor Specifications

Principle	TB420-ES1/ES4: Solid Polymer Electrochemical Sensing Technology				
	TB420-EC4: Electrochemical Sensing Technology				
Accuracy	± 5 % (Measurement Value)				
Repeatability	< 2 %				
Linearity	Linear				
Long-Term Drift	< 5 %/years				
Expected Lifetime	TB420-ES1/ES4: > 5 years TB420-EC4: > 2 years				

Electrical Specifications

Output Signal	4-20 mA two-wires
Sensor Lifetime Self-Test	The TB420 module starts the self-test after being switched on for 30 seconds, the test lasts 20 seconds and the module continuously emits a signal of 3.8 mA. Once the test is complete, the module returns to the normal measuring state.
Fault Output	3.5 mA Fault Signal: Sensor signal weak
	3 mA Fault Signal: Sensor failure or sensor disconnection
Supply Voltage	9 to 24V DC, 24V DC recommended
Supply Current	3 to 22 mA
Power Consumption	< 0.6 W
Maximum Loop Resistance	< 500 R @ 24V DC
Protection	Reverse polarity protection

Environment Specifications

Operating Temperature	-40 °C to +55 °C
Operating Humidity	15-95 % RH. non-condensing
Operating Pressure	Atmospheric pressure ± 10 %
Storage Temperature	0 °C to 20 °C

Mechanical Specifications

Size (Including Gas Sensor)	TB420-ES1: 45 x 35 x 11.9 mm	TB420-ES4: 45 x 35 x 21.7 mm	TB420-EC4: 45 x 35 x 21.7 mm
Size (Without Gas Sensor)	45 x 35 x 11.9 mm		
Weight (Including Gas Sensor)	TB420-ES1: 7.8 g	TB420-ES4: 11.8 g	TB420-EC4: 11.0 g
Weight (Without Gas Sensor)	7.1 g		
Warranty	12 months		
Package	ESDBAG Size: 120 x 150 mm		

Certification

Ex ia IIC Ga Intrinsic safety (certificated Temperature T6-40 °C to + 55 °C)
RoHS Directive 2011/65/EU with amendment (EU)2015/863



Mechanical Diagram

TB420 Smart Gas Sensor Module adopts a compact integrated structure design, and the sensor has its own plug-and-play-method. The sensor is inserted into the sensor socket on the circuit board for signal transmission, avoiding the interference of external factors on the sensor's small signal. As a result, the stability of the signal is ensured.

11 9+0 2

TB420-ES1 Mechanical Diagram Unit: mm







TB420-ES4 Mechanical Diagram Unit: mm



25.3±0.1 20±0.1 16.6±0.1 Sensor 21.7+0.2 민만대 _ 1.6±0.1 7 4.9 45±0.2

Side View



Top View

Product Schematic

TB420-EC4 Mechanical Diagram Unit: mm



20±0.1 25.3±0.1 16.6±0.1 Sensor 21.7±0.2 1<u>.6±</u>0.1 4.9 45±0.2

Side View



Top View

Product Schematic

Connector Mechanical Diagram Unit: mm The maximum wire diameter is: 1.5mm²



Product Schematic



Side View

Product Schematic



Electrical Connections

WARNINGS

TB420 is designed for installation and use in many hazardous areas.

- To reduce the risk of ignition of a hazardous atmosphere, please disconnect the device from the power supply circuit before opening the sensor module housing. Keep the instrument housing tightly closed during operation.
- The sensor module must be grounded for electrical safety and to limit the effects of radio frequency interference. Possible grounding points are provided inside and outside the instrument.
- Refer to the local or national regulations regarding installation and device location.

The TB420 Smart Sensor Module has two-wire loop, power supply of 9-24V DC (24V DC is recommended), and the output and power supply use the same wires. Since the magnitude of the power supply voltage influences the total loop resistance of the external circuit, the voltage drop caused by the power supply voltage should be considered when selecting the power supply voltage. Make sure that at least 9V DC is measured at the TB420 Smart Sensor Module.

The two wires of the smart sensor module do not distinguish between positive and negative.



Cabling

The use of industrial grade, suitably armoured field cable is recommended.

Output Current Value Calculation

When using the current mA file of the multimeter to measure the output current value directly, place the red pin of the multimeter on the terminal "V-" and connect the black pin of the multimeter to the signal line to measure the 4-20 mA output signal current value. The current calculation formula is:

 $A = 4 + (20-4) \times (Cx \div Cf) mA$

Note:

V: The theoretical current value corresponds to the currently detected gas

Cx: Is the current gas concentration

Cf: Full-scale gas concentration

4: Indicates 4 mA (4 mA = 0ppm of detection concentration)

20: Indicates 20 mA (20 mA = full-scale value of detected concentration)

For example:

The range of the gas sensor module is 0-100 ppm, the standard gas concentration of 10ppm is passed in and the output current value is: 5.6mA = 4 + (20- 4) x (10 ÷ 100) mA

If the detection signal output is abnormal, please check whether the electrical wiring is correct, and if the error cannot be eliminated, please contact us for support.



First Power On

Re-checking power and output signal

Re-checking power

Check that all electrical connections are terminated correctly.

Switch on the external power supply to the sensor module in the safe area of the gas measurement.

Controller/PLC. Check the supply voltage with a digital multimeter, if it is 24V DC. It should be a minimum supply voltage of 9V DC.

Re-checking output signal

A multimeter can be used to input the 4-20 mA signal output. The output value of the sensor module signal should be kept at 4 mA in the absence of the to be measured gas. The current output signal will be higher than 4mA when there is a gas to be measured in the environment.



Make sure that the wiring is correct and the grounding is reliable before turning on the TB420 Smart Sensor Module for the first time. When the sensor is switched on for the first time, the stable output of the sensor is usually very short. Because the sensor is designed with a plug-and-play function, the internal circuit always keeps the sensor in the working state, which avoids the problem of long stabilization time of the gas sensor based on the traditional electrochemical principle. However, the sensors and electronics still require a short startup and equilibration time.

If the concentration of the contaminated gas is high during storage, transportation or in the working area, the stabilization time will increase, and the higher the contamination concentration, the longer the stabilization time is required.

If the ambient air convection on site is large, the data fluctuation will also change from time to time, especially when detecting low concentrations in ppb range. Please pay close attention to the ambient status on site. When the environmental conditions are stable, there is no strong convection and air exchange, such as by: Open windows, doors, fans, air conditioners, air purification systems, etc. After the output signal is stable, the sign will enter normal detection.

Oxygen has a longer settling time than other gases, about 5-10 minutes, mainly due to the sensor's-500 mV bias voltage and the time required for the sensor and electronics to equalize.



Warning Output

3.5mA Warning Solution: Prepare to replace the new sensor or check the usage environment.

Cause of issue:

- When the sensor signal is 20 % \sim 10% of the new sensor.
- When the humidity in the operating environment is continuously below 30%RH for an extended period of time.

3mA Warning Solution: Replace it with a new sensor.

- Cause of issue:
- When the sensor fails, the signal is less than 10% of the new sensor.
- The sensor falls off.
- The sensor pins have no good contact with the circuit board.

Response Check

It is recommended to use a gas response check on the sensor module. The gas concentration should be below the sensor module range. For example, if the range is 0-100ppm, the gas can use 20% to 80% of range concentration. ES1 and 4S Sensor FlowCap adjust the gas testing.

Calibration

The TB420 smart sensor module has been factory calibrated for ventilation and can be recalibrated as needed via the calibration software provided by EC Sense.

When using software for calibration, users need to purchase a calibration evaluation kit (including calibration software, U ART (TTL) to USB module).

See "TB420 User Calibration Software User's Manual " for details.

Maintenance and Care

- Do not bump the circuit board or sensor during installation.
- Users are not allowed to replace and repair the internal electrical components of the circuit board without authorization.
- Avoid blocking the temperature and humidity sensor, resulting in measurement deviation caused by inaccurate temperature data and the actual environment.
- It is strictly forbidden to install on the heat or vibration source.
- Users are advised to check the sensor for zero point and measurement accuracy every 6 months.
- Do not store the transmitter board in dusty areas.
- Do not drop, knock or shake the unit to avoid possible internal damage.
- Do not use harsh chemicals, cleaning agents or strong detergents to clean the transmission circuit board.
- At regular intervals, and after exposure to high concentrations of gas, calibrate, test, and inspect the transmitter circuit board.
- Keep a log of all maintenance and calibration operations.
- Use a soft damp cloth to clean the surface of the transmitter circuit board.
- Do not use solvents, soaps, alcohol or polishes to clean the sensor and circuitry.
- Do not immerse the transmitter circuit board in liquid.



Order Information

Product	Gas Formula	Partnumber	Range	Resolution	Response Time
Smart Arsine Sensor Module	AsH ₃	04-TB420-ES1-AsH ₃ -1-01	0-1 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-AsH ₃ -1-01	0-1 ppm	0.001 ppm	< 3 s (T90 < 80 s)
Smart Diborane Sensor Module		04-TB420-ES1-B ₂ H ₆ -1-01	0-1 ppm	0.001 ppm	< 3 s (T90 < 80 s)
	D ₂ H ₆	04-TB420-ES4-B ₂ H ₆ -1-01	0-1 ppm	0.001 ppm	< 3 s (T90 < 80 s)
Smart Bromine Sensor Module	Br ₂	04-TB420-EC4-Br ₂ -5-01	0-5 ppm	0.001 ppm	T90 < 60 s
		04-TB420-ES1-CH ₄ S-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES1-CH ₄ S-100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 80 s)
Smart Methyl Mercantan Sensor Module	CI I C	04-TB420-ES1-CH ₄ S-5000-01	0-5000 ppm	0.1 ppm	< 3 s (T90 < 80 s)
	CH45	04-TB420-ES4-CH ₄ S-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-CH ₄ S-100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-CH ₄ S-5000-01	0-5000 ppm	0.1 ppm	< 3 s (T90 < 80 s)
		04-TB420-EC4-Cl ₂ -5-01	0-5 ppm	0.001 ppm	T90 < 60 s
Smart Chlorine Sensor Module	CL	04-TB420-EC4-Cl ₂ -50-01	0-50 ppm	0.01 ppm	T90 < 60 s
Smart enforme Sensor Woulde		04-TB420-ES1-Cl ₂ -100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-Cl ₂ -100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
Smart Chlorine Dioxide Sensor Module	CIO ₂	04-TB420-EC4-ClO ₂ -5-01	0-5 ppm	0.001 ppm	T90 < 60 s
		04-TB420-ES1-CO-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES1-CO-100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-CO-1000-01	0-5000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
Smart Carbon Monovide Sensor Module	<u> </u>	04-TB420-ES1-CO-2%-01	0-2% vol.	0.001% vol.	< 3 s (T90 < 30 s)
	CO	04-TB420-ES4-CO-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-CO-100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-CO-1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-CO-2%-01	0-2% vol.	0.001% vol.	< 3 s (T90 < 30 s)
		04-TB420-ES1-ETO-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-ETO-200-01	0-200 ppm	0.1 ppm	< 3 s (T90 < 30 s)
Smart Ethylene Oxide Sensor Module	ETO (C ₂ H ₄ O)	04-TB420-ES1-ETO-1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-ETO-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-ETO-200-01	0-200 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-ETO-1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
Smart Fluoride Sensor Module	F ₂	04-TB420-EC4-F ₂ -5-01	0-5 ppm	0.001 ppm	T90 < 60 s
Smart Germane Gas Module	GeH₄	04-TB420-ES1-GeH ₄ -5-01	0-5 ppm	0.01 ppm	< 3 s (T90 < 80 s)
	4	04-TB420-ES4-GeH ₄ -5-01	0-5 ppm	0.01 ppm	< 3 s (T90 < 80 s)
	H ₂	04-TB420-ES1-H ₂ -1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-H ₂ -5000-01	0-5000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
Smart Hydrogen Sensor Module		04-TB420-ES1-H ₂ -5%-01	0-5% vol.	0.001% vol.	< 35 s (T90 < 90 s)
		04-TB420-ES4-H ₂ -1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-H ₂ -5000-01	0-5000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-H ₂ -5%-01	0-5% vol.	0.001% vol.	< 35 s (T90 < 90 s)



Order Information

Product	Gas Formula	Partnumber	Range	Resolution	Response Time
	H ₂ S	04-TB420-ES1-H ₂ S-5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-H ₂ S-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-H ₂ S-100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-H ₂ S-1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-H ₂ S-5000-01	0-5000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
Smart Hydrogen Sunde Sensor Module		04-TB420-ES4-H ₂ S-5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-H ₂ S-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-H ₂ S-100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-H ₂ S-1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-H ₂ S-5000-01	0-5000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-HCHO-5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 80 s)
Smart Formaldehyde Sensor Module	НСНО	04-TB420-ES1-HCHO-100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 60 s)
Smart Formaldenyde Sensor Woddle	neno	04-TB420-ES4-HCHO-5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-HCHO-100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 60 s)
Smart Hydrogen Chloride Sensor Module	HCI	04-TB420-EC4-HCl-30-01	0-30 ppm	0.001 ppm	T90 < 80 s
Smart Hydrogen Cyanide Sensor Module		04-TB420-ES1-HCN-50-01	0-50 ppm	0.01 ppm	< 3 s (T90 < 30 s)
	HEN	04-TB420-ES4-HCN-50-01	0-50 ppm	0.01 ppm	< 3 s (T90 < 30 s)
Smart Hydrogen Fluoride Sensor Module	HF	04-TB420-EC4-HF-30-01	0-30 ppm	0.001 ppm	T90 < 80 s
		04-TB420-EC4-NH ₃ -100-01	0-100 ppm	0.01 ppm	T90 < 60 s
		04-TB420-EC4-NH ₃ -500-01	0-500 ppm	0.1 ppm	T90 < 60 s
	NH ₃	04-TB420-EC4-NH ₃ -1000-01	0-1000 ppm	0.1 ppm	T90 < 60 s
Smart Ammonia Sensor Module		04-TB420-ES1-NH ₃ -10-01	0-10 ppm	0.001 ppm	< 3 s
		04-TB420-ES1-NH ₃ -100-01	0-100 ppm	0.01 ppm	< 3 s
		04-TB420-ES4-NH ₃ -10-01	0-10 ppm	0.001 ppm	< 3 s
		04-TB420-ES4-NH ₃ -100-01	0-100 ppm	0.01 ppm	< 3 s
		04-TB420-ES1-NO ₂ -5-02	0-5 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES1-NO ₂ -50-01	0-50 ppm	0.01 ppm	< 3 s (T90 < 30 s)
	NO ₂	04-TB420-ES1-NO ₂ -100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-NO ₂ -1000-01	0-1000 ppm	0.01 ppm	< 3 s (T90 < 30 s)
Smart Nitrogon Diovido Sonsor Modulo		04-TB420-ES1-NO ₂ -2000-01	0-2000 ppm	0.01 ppm	< 3 s (T90 < 30 s)
Smart Nitrogen Dioxide Sensor Module		04-TB420-ES4-NO ₂ -5-02	0-5 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-NO ₂ -50-01	0-50 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-NO ₂ -100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-NO ₂ -1000-01	0-1000 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-NO ₂ -2000-01	0-2000 ppm	0.01 ppm	< 3 s (T90 < 30 s)
Smart Ovygen Sensor Module	0	04-TB420-ES1-O ₂ -25%-01	0-25% vol.	0.01% vol.	< 3 s (T90 < 30 s)
	U ₂	04-TB420-ES4-O ₂ -25%-01	0-25% vol.	0.01% vol.	< 3 s (T90 < 30 s)
	O ₃ -	04-TB420-ES1-O ₃ -5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES1-O ₃ -50-01	0-50 ppm	0.01 ppm	< 3 s (T90 < 30 s)
Smart Ozone Sensor Module		04-TB420-ES1-O ₃ -100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
smart Ozone sensor Module		04-TB420-ES4-O ₃ -5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-O ₃ -50-01	0-50 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-O ₃ -100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)



Order Information

Product	Gas Formula	Partnumber	Range	Resolution	Response Time
		04-TB420-ES1-PH ₃ -5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES1-PH ₃ -20-01	0-20 ppm	0.01 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES1-PH ₃ -100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 80 s)
Smart Phosphine Sensor Module	PH.	04-TB420-ES1-PH ₃ -2000-01	0-2000 ppm	0.1 ppm	< 3 s (T90 < 80 s)
Smart mosphille Sensor Wodule	rn ₃	04-TB420-ES4-PH ₃ -5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-PH ₃ -20-01	0-20 ppm	0.01 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-PH ₃ -100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-PH ₃ -2000-01	0-2000 ppm	0.1 ppm	< 3 s (T90 < 80 s)
Smart Silana Sansar Madula	сіц	04-TB420-ES1-SiH ₄ -10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 80 s)
Smart share sensor module	SIH4	04-TB420-ES4-SiH ₄ -10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES1-SMELL-5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-SMELL-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-SMELL-200-01	0-200 ppm	0.1 ppm	< 3 s (T90 < 30 s)
Smart Odor Sensor Module	SMELL	04-TB420-ES1-SMELL-500-01	0-500 ppm	0.1 ppm	< 3 s (T90 < 30 s)
	JIVILLL	04-TB420-ES4-SMELL-5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-SMELL-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-SMELL-200-01	0-200 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-SMELL-500-01	0-500 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-SO ₂ -5-01	0-5 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES1-SO ₂ -50-01	0-50 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-SO ₂ -100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-SO ₂ -1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
Constant Culfure Discuids Company Marshula	SO ₂	04-TB420-ES1-SO ₂ -2000-01	0-2000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
Smart sulfur Dioxide Sensor Module		04-TB420-ES4-SO ₂ -5-02	0-5 ppm	0.001 ppm	< 3 s (T90 < 80 s)
		04-TB420-ES4-SO ₂ -50-01	0-50 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-SO ₂ -100-01	0-100 ppm	0.01 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-SO ₂ -1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-SO ₂ -2000-01	0-2000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-TVOC-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 30 s)
)r TVOC - -	04-TB420-ES1-TVOC-200-01	0-200 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES1-TVOC-1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
Smart Volatile Organic Compounds Sensor		04-TB420-ES1-TVOC-2000-01	0-2000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
Module		04-TB420-ES4-TVOC-10-01	0-10 ppm	0.001 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-TVOC-200-01	0-200 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-TVOC-1000-01	0-1000 ppm	0.1 ppm	< 3 s (T90 < 30 s)
		04-TB420-ES4-TVOC-2000-01	0-2000 ppm	0.1 ppm	< 3 s (T90 < 30 s)



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