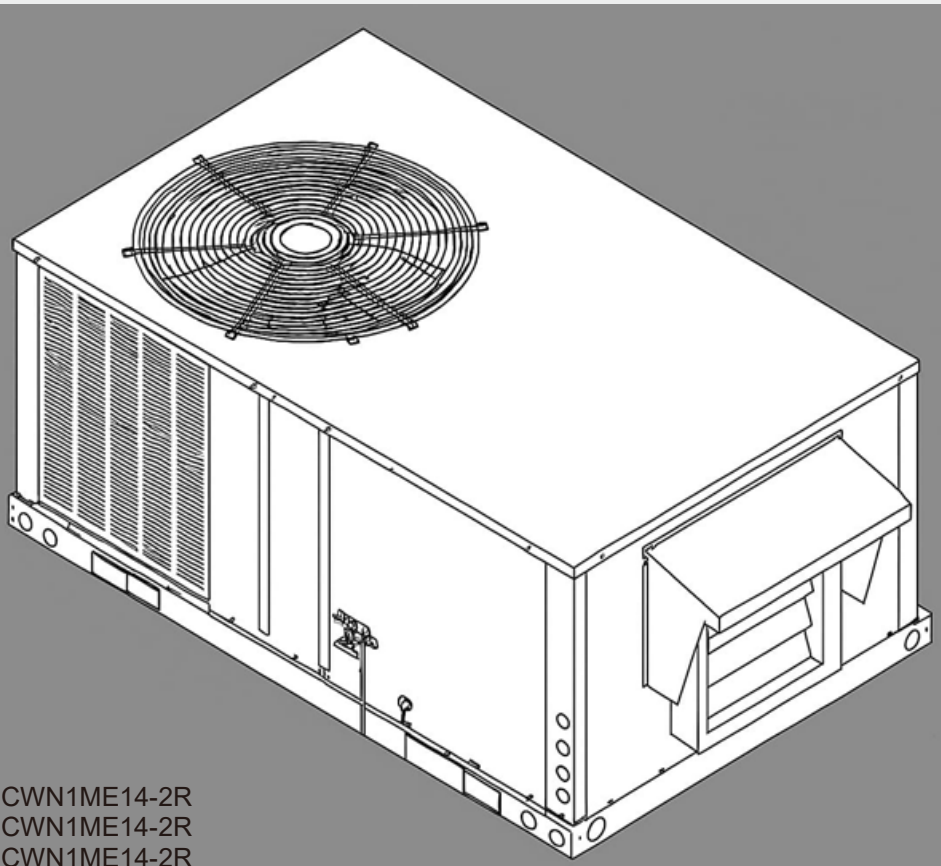
NŌRDEN®

INSTALLATION INSTRUCTIONS

SELF-CONTAINED
FEATURING R-410A
14 SEER
3-5 TR



NAC-24CWN1ME14-2R
NAC-36CWN1ME14-2R
NAC-48CWN1ME14-2R

Thank you very much for purchasing our product,
Before using your unit , please read this manual carefully and keep it for future reference.
The figure shown in this manual is for reference only and may be slightly different from the actual product.

ETL Intertek

NORDEN

RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION

⚠ WARNING

These instructions are intended as an aid to qualified, licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.

CONTENTS

This document is customer property and is to remain with this unit.

These instructions do not cover all the different variations of systems nor does it provide for every possible contingency to be met in connection with installation.

All phases of this installation must comply with NATIONAL, STATE and LOCAL CODES. If additional information is required please contact your local distributor.

1 SAFETY

When you see the symbols below on the labels or in the manuals, be alert to the potential or immediate hazards of personal injury, property and/or product damage. It is the owner's or installer's responsibility to comply with all safety instructions and information accompanying these symbols.

WARNING: This is a safety alert symbol indicating a potential hazardous situation, which could result in personal injury, property and/or product damage or death.

CAUTION: This is a safety alert symbol indicating a potential hazardous situation, which could result in moderate personal injury, property and/or product damage.

⚠ WARNING

These instructions are intended as an aid to qualified, licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation.

Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.

⚠ WARNING

The manufacturer's warranty does not cover any damage or defect to the heat pump caused by the attachment or use of any components, accessories or devices (other than those authorized by the manufacturer) into, onto or in conjunction with the heat pump. You should be aware that the use of unauthorized components, accessories or devices may adversely affect the operation of the heat pump and may also endanger life and property. The manufacturer disclaimer any responsibility for such loss or injury resulting from the use of such unauthorized components, accessories or devices.

⚠ WARNING

Disconnect all power to the unit before starting maintenance. Failure to do so can result in severe electrical shock or death.

⚠ WARNING

Do not, under any circumstances, connect return ductwork to any other heat producing device such as a fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, property damage, severe personal injury or death.

⚠ WARNING

The unit must be permanently grounded. A grounding lug is provided. Failure to ground this unit can result in fire or electrical shock causing property damage, severe personal injury or death.

⚠ WARNING

Only electric heater kits supplied by this manufacturer as described in this publication have been designed, tested, and evaluated by a nationally recognized safety testing agency for use with this unit. Use of any other manufactured electric heaters installed within this unit may cause hazardous conditions resulting in property damage, fire, body injury or death.

⚠ WARNING

Proposition 65: This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to the state of California to cause cancer.

⚠ CAUTION

Only use this unit in well-ventilated spaces and ensure that there are no obstructions that could impede the airflow into and out of the unit.
Do not use this unit in the following locations:

- Locations with mineral oil.
- Locations with saline atmospheres, such as seaside locations.
- Locations with sulphurous atmospheres, such as near natural hot springs.
- Where high voltage electricity is present, such as in certain industrial locations.
- On vehicles or vessels, such as trucks or ferry boats.
- Where exposure to oily or very humid air may occur, such as kitchens.
- In proximity to sources of electromagnetic radiation, such as high-frequency transmitters or other high strength radiation devices.

⚠ CAUTION

A manufactured (mobile) home installation must conform with the Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280, or when this Standard is not applicable, the Standard for Manufactured Home Installations (Manufactured Home Sites, Communities and Set-Ups), ANSI/NCS A225.1, and/or MH Series Mobile Homes, CAN/CSA Z240.

⚠ CAUTION

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge,unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

1.1 Inspection

As soon as unit is received, it should be inspected and noted for possible shipping damage during transportation. It is carrier's responsibility to cover the cost of shipping damage. Manufacturer or distributor will not accept the claims from dealer for any transportation damage.

1.2 Nomenclature

NAC-24CWN1ME14-2R

N	A	C	24	C	W	N1	M	E	14	2R
1	2	3	4	5	6	7	8	9	10	11

1	N	Norden Brand
2	A	Self-contained
3	C	Single discharge
4	24	Capacity
5	C	Cooling
	H	Heat pump
6	W	Wired controller
7	N1	Refrigerant R-410A
8	M	1 - Phase
	X	3 - Phase
9	E	Economizer
	S	Non-economizer
10	14	SEER Efficiency
11	2R	Compressor scroll

1.3 Limitations

Refer to Fig. 2-2, 2-3 , 2-4, 2-5 for unit physical data and to Table 6-1 & 6-2 for electrical data.If components are to be added to a unit they must meet local codes, they are to be installed at the dealer's and /or the customer's expense.

Size of unit for proposed installation should be based on heat loss / heat gain calculations made in accordance with industry recognized procedures identified by the Air Conditioning Contractors of America.

Units may be moved or lifted with a forklift. Slotted openings in the base rails are provided for this purpose.

2 INSTALLATION

2.1 Pre-Installation

Before installation, carefully check the following:

1. Unit should be installed in accordance with national and local safety codes, including but not limit to ANSI/NFPS No. 70 or Canadian Electrical Code Part 1, C22.1, local plumbing and wastewater codes and any other applicable codes.
2. For wall mounting, ensure that you install a structure strong enough to support the unit's weight. The unit must be installed on a properly leveled metal base.
3. For ground level installation, a level slab should be used.
4. Condenser airflow should not be restricted.
5. On applications when a roof curb is used, the unit must be positioned on the curb so the front of the unit is tight against the curb.

2.2 Clearance

All units require certain clearance for proper operation and service. Refer to Table 2-1 for the clearances required for construction, servicing and proper unit operation.

2.3 Rigging and Handing

Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation. Rig the unit by attaching chain or cable slings to the lifting holes provided in the base rails. Spreader bars, whose length exceeds the largest dimension across the unit, MUST be used across the top of the unit.

⚠ CAUTION

Before lifting, make sure the unit weight is distributed equally on the rigging cables so it will lift evenly.

⚠ CAUTION

All panels must be secured in place when the unit is lifted.
The condenser coils should be protected form rigging cable damage with plywood or other suitable material.

⚠ WARNING

Check the electric wire, water and gas pipeline layout inside the wall, floor and ceiling before installation. Do not implement drilling unless confirm safety with the user, especially for the hidden power wire. An electroprobe can be used to test whether a wire is passing by at the drilling location, to prevent physical injury or death caused by insulation broken cords.

⚠ WARNING

Check the power supply before installation. Ensure that the power supply must be reliably grounded following local, state and National Electrical Codes. If not, for example, if the ground wire is detected charged, installation is prohibited before it is rectified. Otherwise, there is a risk of fire and electric shock, causing physical injury or death.

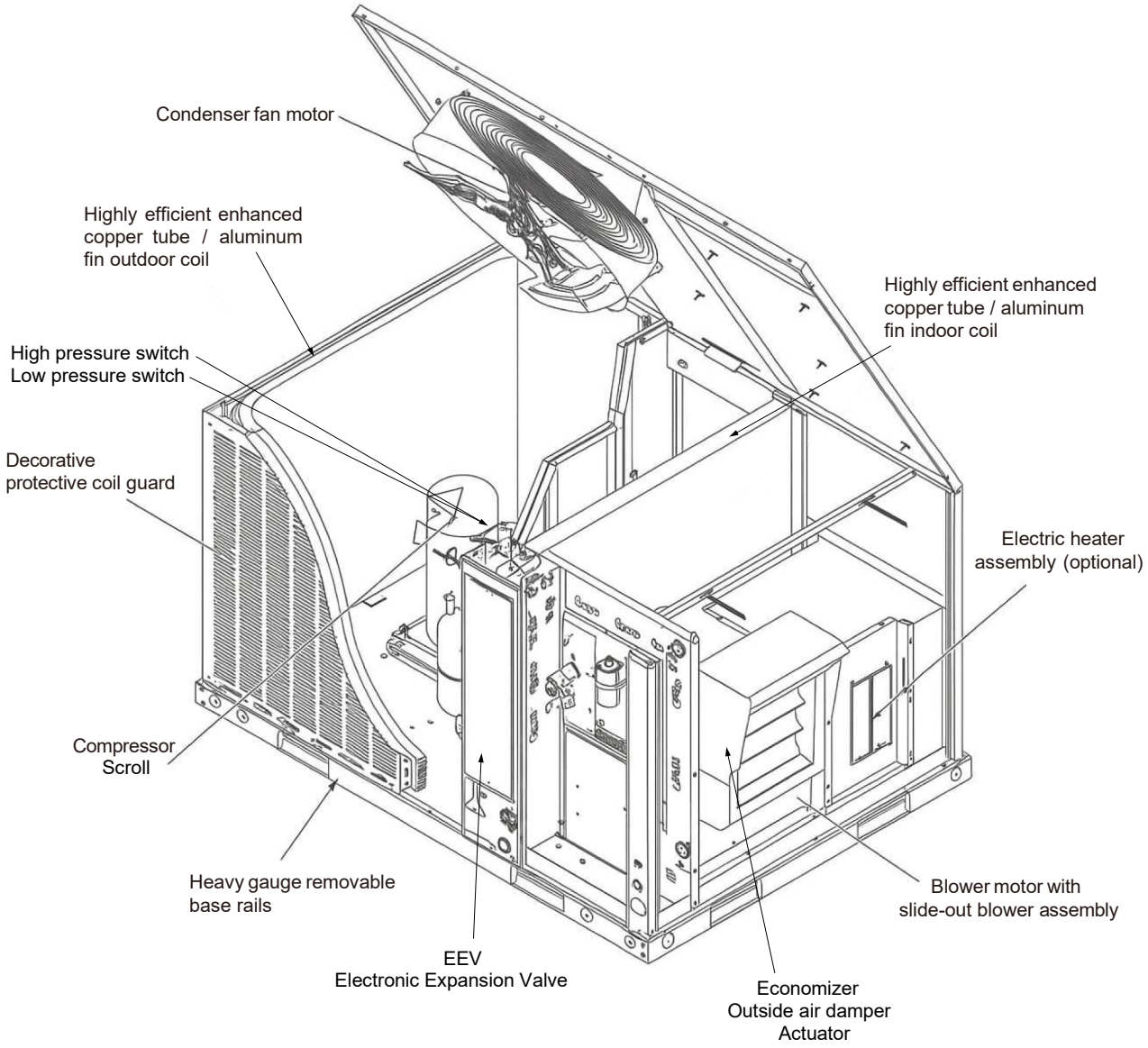


Fig. 2-1 Component Location

* The above figure for reference purpose only.

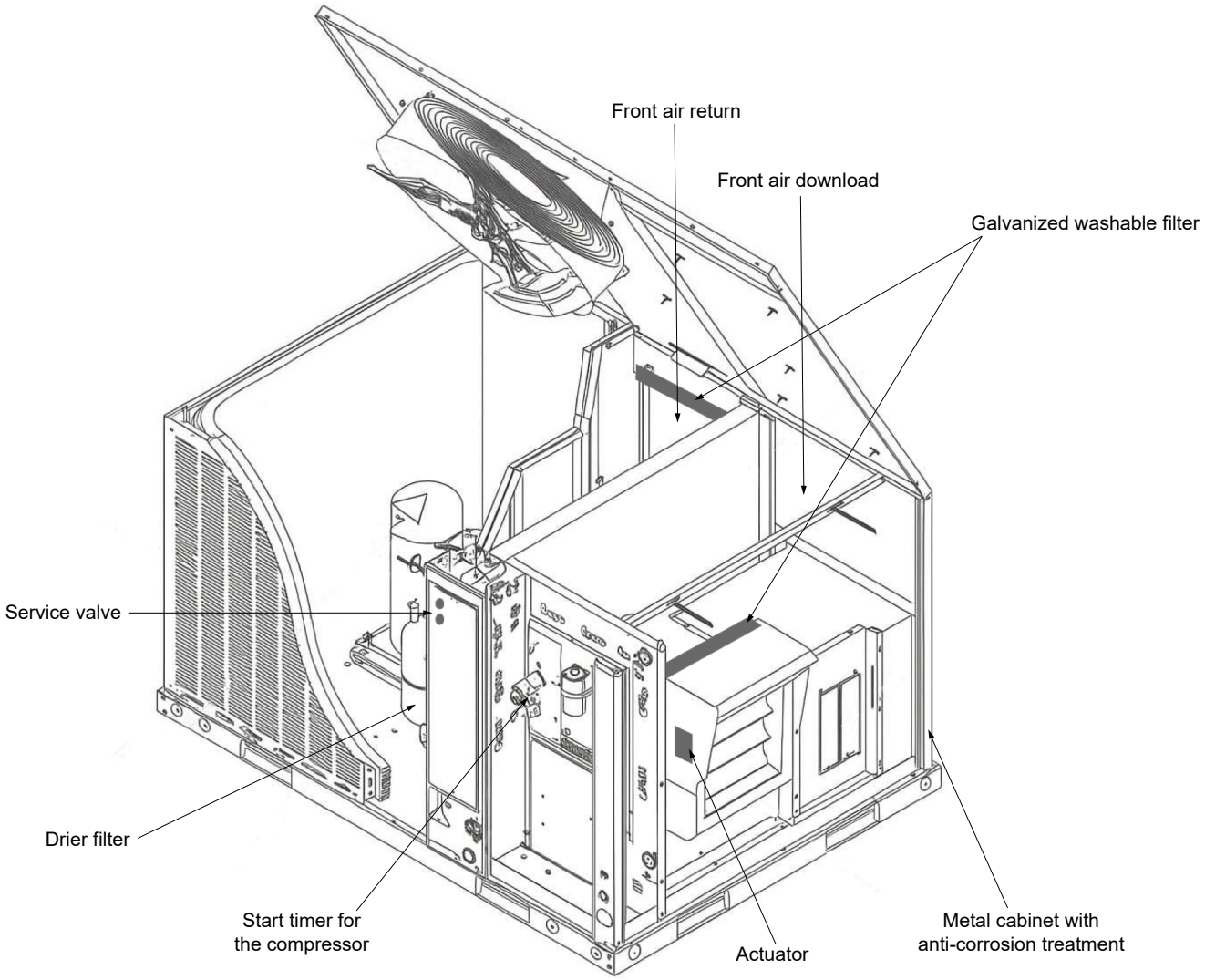


Fig. 2-1 Component Location

* The above figure for reference purpose only.

Unit size: NAC-24 / 36

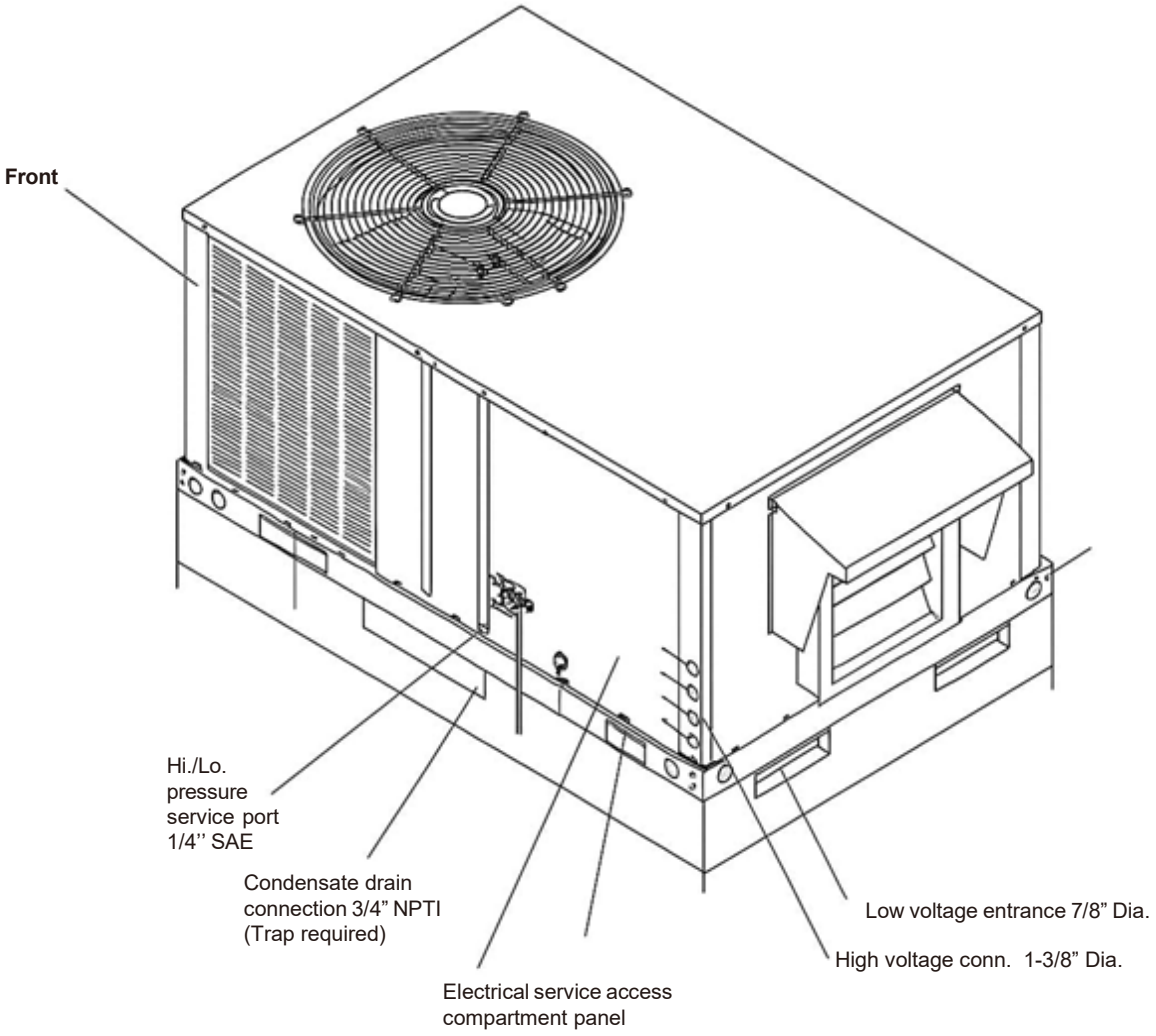
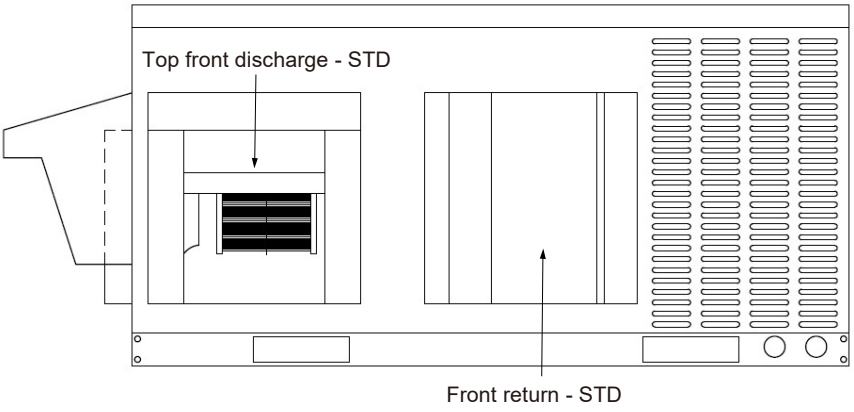
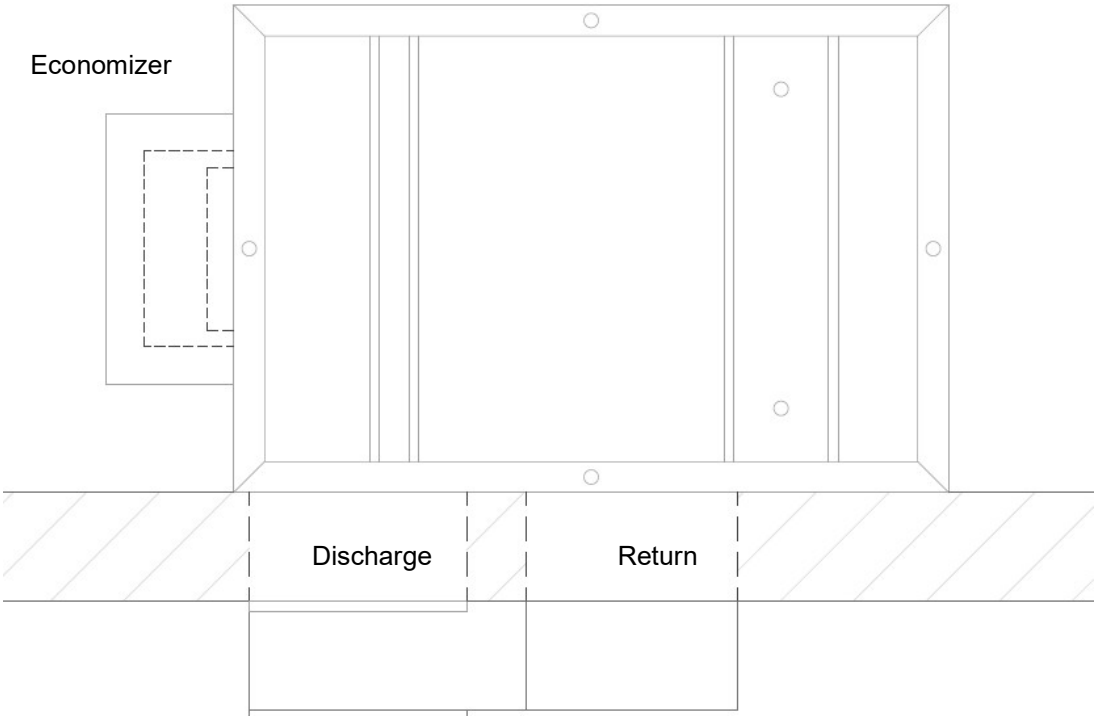


Fig. 2-2 Unit NAC - 24/36

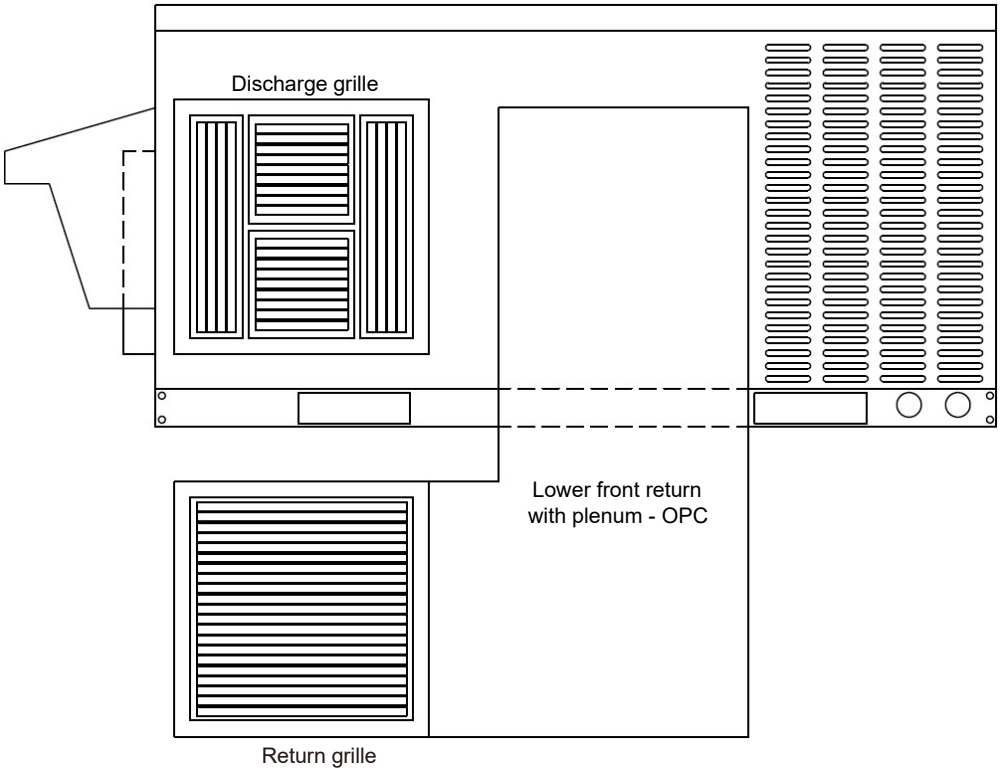


* The above figure for reference purpose only.

Unit size: NAC-24 / 36



Return Configuration



* The above figure for reference purpose only.

Unit size: NAC-48

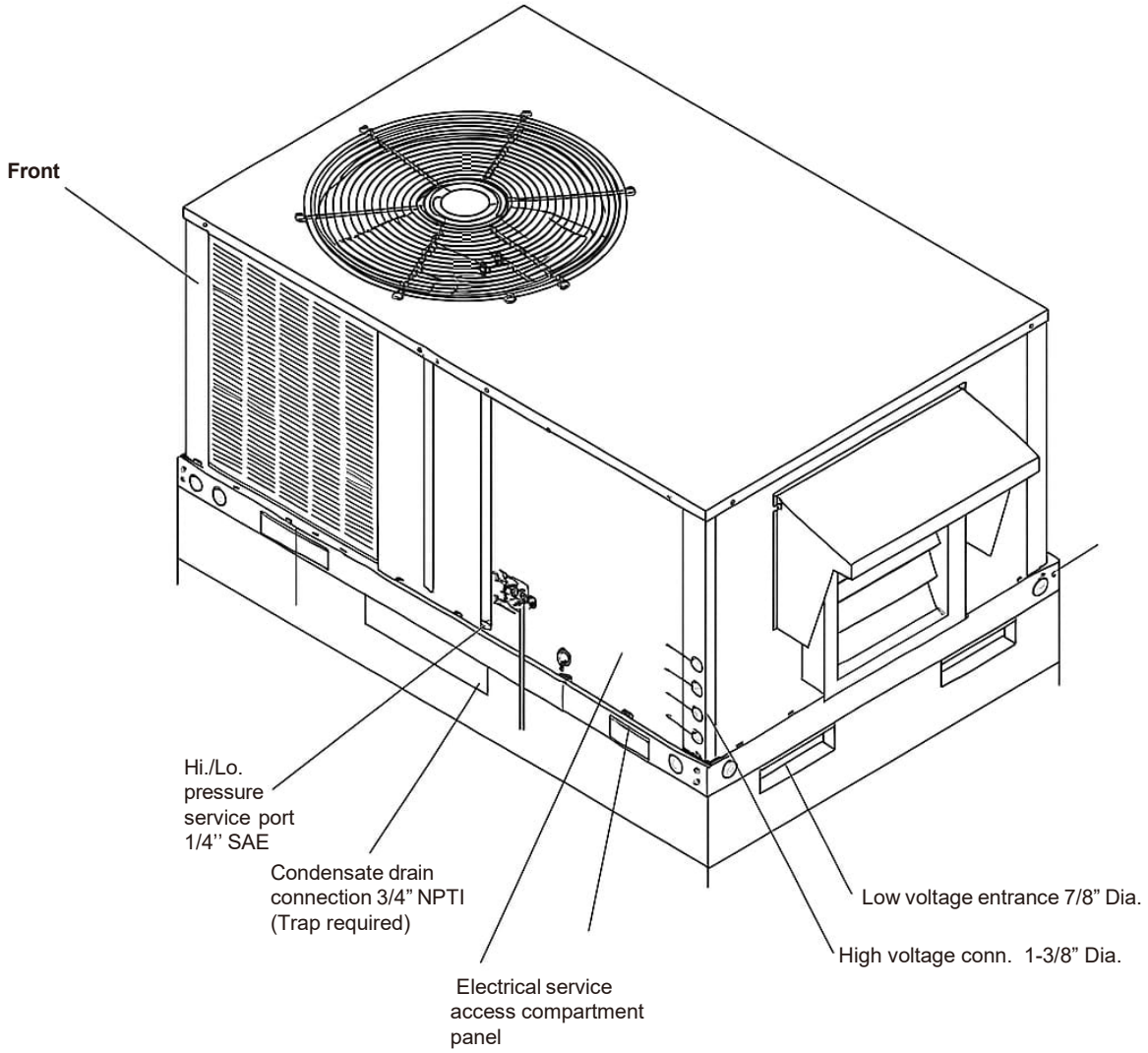
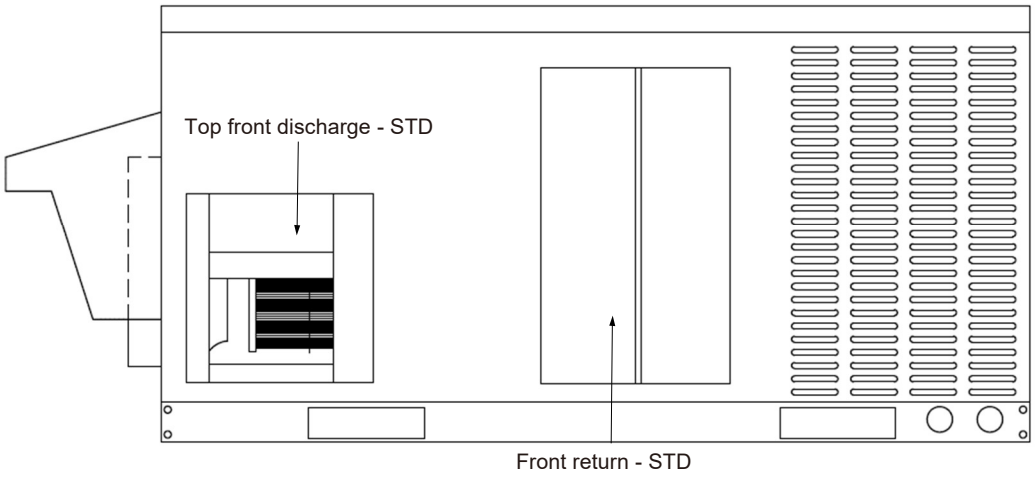
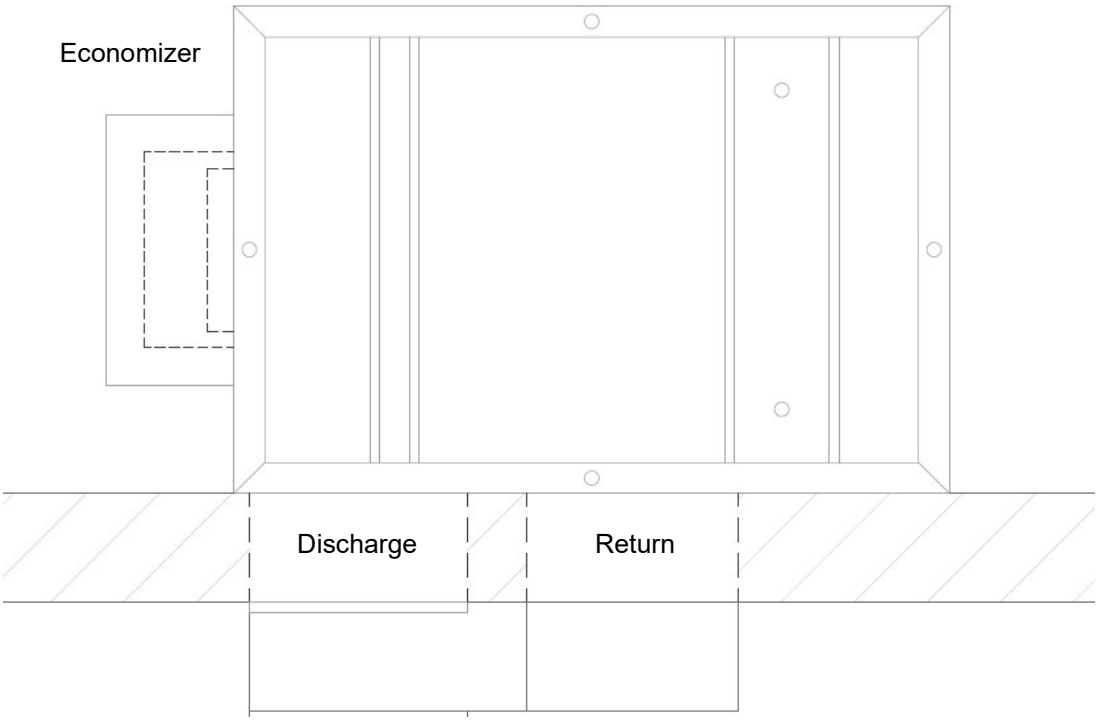


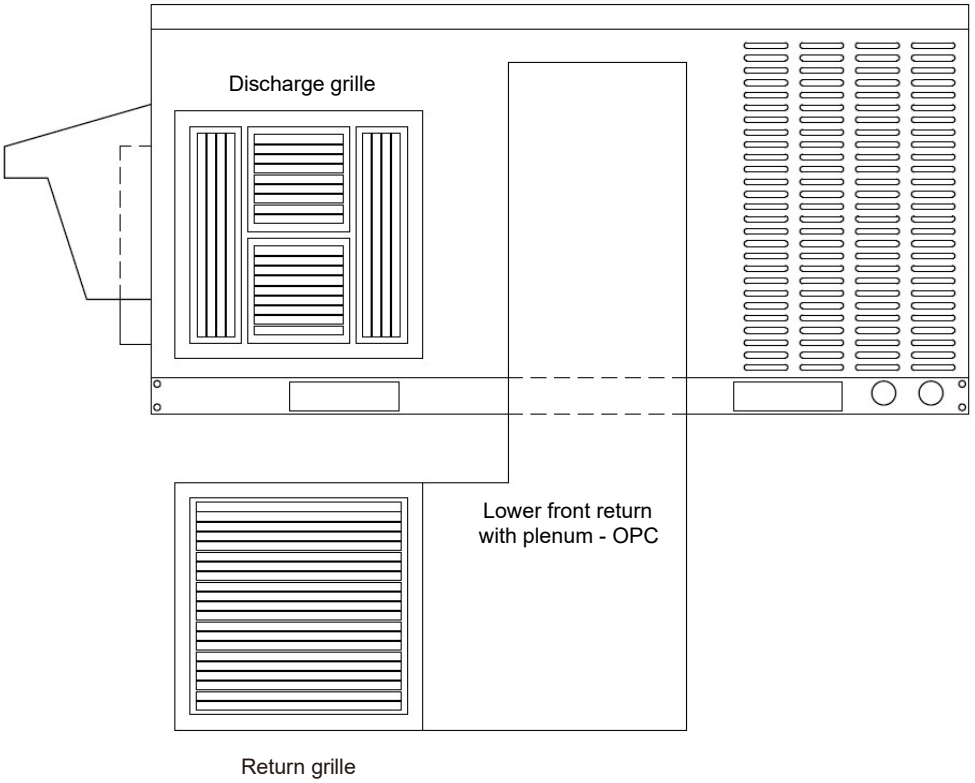
Fig. 2-4 Unit NAC-48



* The above figure for reference purpose only.

Unit size: NAC-48





* The above figure for reference purpose only.

2.4 Download and return

Air will be discharged through the bidirectional vents of a room air conditioner.

The (cold) air flow will exit through the system's diffusers to climatize the space. Vents, also called diffusers, are strategic components in air conditioning and ventilation (HVAC) systems that allow for uniform and targeted airflow, ensuring efficient distribution throughout the space and preventing uneven dispersion.

A closed return system will be used. This will not prevent the use of economizers or ventilation air intakes.

NOTE

For units applied with a roof curb, the minimum clearance may be reduced from 1 inch to 1/2 inch between combustible roof curb material and this supply air duct.

NOTE

A unit with electric heaters with an inlet or outlet duct that penetrates the building structure supporting the unit shall be provided with a mounting base of noncombustible material so designed that, after the unit is installed, there will be no open passages through the supporting structure that would permit flame or hot gases from a fire originating in the space below the supporting structure to travel to the space above that structure. If the unit is intended to be installed on a supporting structure of combustible material, the base shall be so designed that the required clearance will be maintained between the supporting structure and the unit, plenum, and attached duct. Spacers necessary to provide required clearances shall be attached to the unit mounting base, and shall extend not less than 76 mm (3 in.) below the upper surface of the supporting structure, except that, in a unit designed for use only in a mobile home, the distance shall be not less than 19 mm (3/4 in.).

NOTE

On ductwork exposed to outside air space, use at least 2" of insulation and a vapor barrier. Flexible joint may be used to reduce noise.

⚠ CAUTION

When fastening duct work to the side duct flanges on the unit, insert the screws through the duct flanges only. DO NOT insert the screws through the casing. Outdoor duct work must be insulated and waterproofed.

Refer to Fig. 2-3 and 2-5 for information concerning supply and return air duct openings.

3 CONDENSATE DRAIN CONNECTION

Consult local codes for special requirements.
To provide extra protection from water damage, install an additional drain pan, provided by installer, under the entire unit with a separate drain line.
Manufacturer will not be responsible for any damages due to the failure to follow these requirements.

3.1 Install Drain Pipe

1. Use the provided female NPT threaded fitting for outside connection and make sure that drain holes are not blocked.
2. Insulation may be needed for drain line to prevent sweating.
3. Drain pan has two drain connections on each side to provide flexibility of connection and drainage. Make sure proper pitch and plugging if second connection is not used.
4. Use a sealing compound on male pipe threads. Install the condensate drain line (NPT) to spill into an open drain.
5. Ensure a trap is included in the condensate drain line.

4 FILTERS

Units are shipped without a filter or filter racks. It is the responsibility of the installer to secure a filter in the return air ductwork or install a filter/frame Kit.

Filter must always be used and must be kept clean. Dirty filters may cause insufficient air delivery, decreasing unit efficiency and increasing operation costs and wear-and tear on the unit and controls.

Filters should be checked monthly; this is especially important since this unit is used for both heating and cooling.

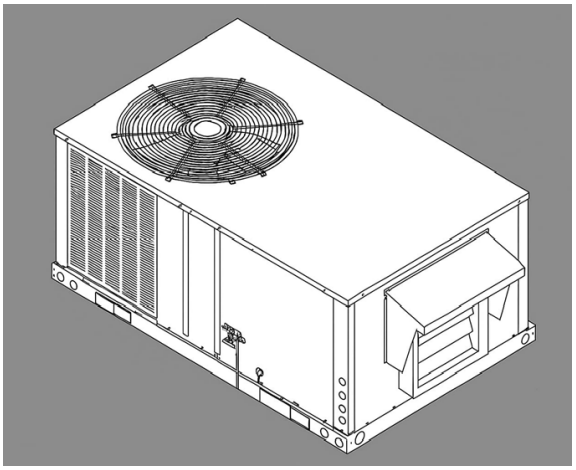
5 ELECTRICAL WIRING

Field wiring must comply with the National Electric Code (NEC) or Canadian Electrical Code (CEC) and any applicable local ordinance.

⚠ WARNING

Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment.

Hazardous voltage can cause severe personal injury or death.



When installing power cables (in the middle) and signal cables (in the top) of the whole device, first remove the cable running apron, install the bushing, and finally install the power cables.

5.1 Power Wiring

1. Proper electrical power should be available at unit. Voltage tolerance should not be over 10% from rating voltage.

2. If any of the wire must be replaced, replacement wire must be the same type as shown in nameplate, wiring diagram and electrical data sheet.

3. Install a branch circuit disconnect of adequate size to handle starting current, located within sight of, and readily accessible to the unit.

4. ELECTRIC HEATER - If the Electric Heater is installed, unit may be equipped with 30~60A. circuit breakers or fuse. These breaker(s) protect the internal wiring in the event of a short circuit and serve as a disconnect. Circuit breakers installed within the unit do not provide over-current protection of the supply wiring and therefore may be sized larger than the branch circuit protection.

- Supply circuit power wiring must be 221 °F minimum copper conductors only.

See Electrical Data in this section for ampacity, wire size and circuit protector requirements. Supply circuit protective devices may be either fuses or “HACR” type circuit breakers.

- Power wiring is connected to the power terminal block in unit electric cabinet.

See Electrical Heater Installation Instruction for details.

5.2 Grounding

⚠ WARNING

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

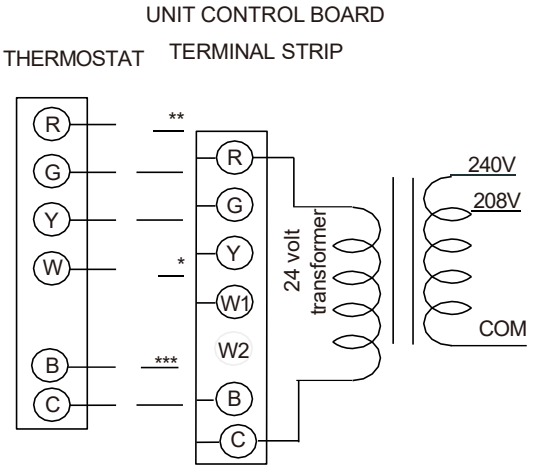
- The unit must be electrically grounded in accordance with local codes or the national electric code.
- Grounding may be accomplished by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.

5.3 Control Wiring

IMPORTANT: Class 2 low voltage control wiring should not be run in conduit with main power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used.

5.2.1	Low voltage control wiring should be 18 AWG color-coded. For lengths longer than 50 ft, 16 AWG wire should be used.
5.2.2	Two 7/8” holes can be used for control wires going into the unit, one on left side and one at the bottom.
5.2.3	Make sure, after installation, separation of control wiring and power wiring has been maintained.

Thermostat should be mounted on an inside wall about 58” from floor and will not be affected by unconditioned air, sun and/or heat exposure. Follow the instruction carefully because there are many wiring requirements. See Fig. 6-1 ~ 2, Table 6-1.



- 1-3/8” knockouts inside the cabinet are provided for connection of power wiring to electric heater.

Fig. 6-1 Typical Field Control Wiring Diagram

*** B wire be used with heat pump system only, reversing valve energizes at the heating mode, and cut off at the cooling mode.

** Minimum wire size of 18 AWG wire should be used for all field installed 24 volt wire.

* Only required on units with supplemental electric heat.

⚠ CAUTION

Label all wire prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

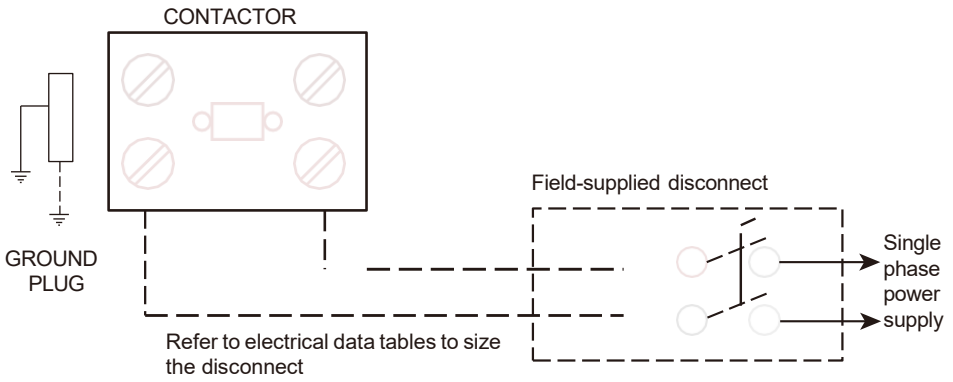


Fig. 6-2 Typical Field Power Wiring Diagram

Table 6-1: 14 SEER W/Without Electric Heat

Size (Tons)	Volt	Compressors		OD Fan Motors	ID Fan Motors	Heater Circuit (without units)					
		RLA	LRA	FLA	FLA	Model	kW	Stages	Amps	MCA (Amps)	Max Fuse Breaker Size (Amps)
NAC-24 NAC-36	208/240-1-60	13,0	83,0	2,0	4,3	None	-	None	-		
						JAYHTR1P08BKRA	5,6/7,5	1	27,1/31,3	34/40	25/30
						JAYHTR1P10BKRA	7,5/10	1	36,1/41,7	45/53	50/60
						JAYHTR1P15BKRA	11,3/15	2	54,2/62,5	68/79	70/80
NAC-48	208/240-1-60	21,5	140,0	2,0	6,0	None	-	None	-		
						JAYHTR1P05BKRA	3,8/5	1	18,1/20,8	23/26	25/30
						JAYHTR1P08BKRA	5,6/7,5	1	27,1/31,3	34/40	35/40
						JAYHTR1P10BKRA	9,5/10	1	36,1/41,7	46/53	50/60
						JAYHTR1P15BKRA	11,3/15	2	54,2/62,5	68/79	70/80
						JAYHTR1P20BKRA	15/20	2	72,3/83,4	91/105	100/110

NAC-24 / 36 / 48: Scroll compressor
1. Minimum Circuit Ampacity.
2. Maximum Over Current Protection per Standard UL 60335.
3. Fuse or HACR circuit breaker size installed at factory or field installed.

Table 6-2: 14 SEER Physical Data

SELF-CONTAINED			
BRAND	NORDEN®	NORDEN®	NORDEN®
MODEL	NAC-24CWN1ME14-2R	NAC-36CWN1ME14-2R	NAC-48CWN1ME14-2R
PARAMETER	ELECTRICAL SPECIFICATIONS		
Supply voltage	208 VAC - 240 VAC	208 VAC - 240 VAC	208 VAC - 240 VAC
Phases	1 PH	1 PH	1 PH
Operating frequency	60 Hz	60 Hz	60 Hz
Compressor type	Scroll	Scroll	Scroll
Quantity	1	1	1
RLA	14.3 A	20.0 A	29.3 A
Evaporator fan motor	Blower type	Blower type	Blower type
Quantity	1	1	1
Indoor blower	1/2 HP	1/2 HP	3/4 HP
FLA	4.3 A	4.3 A	5.2 A
Condenser fan motor	ECM motor with metal fins	ECM motor with metal fins	ECM motor with metal fins
Quantity	1	1	1
Outdoor fan	1/4 HP	1/4 HP	1/4 HP
FLA	2.3 A	2.3 A	2.3 A
Maximum Over Protector	30 A	40 A	50 A
Rated Current	20.9 A	26.6 A	36.8 A
EER	12	12	12
PARAMETER	MECHANICAL SPECIFICATIONS		
Type of Equipment	Self-contained	Self-contained	Self-contained
Capacity	2 TR (24,000 BTU/h)	3 TR (36,000 BTU/h)	4 TR (48,000 BTU/h)
Air flow	1200 CFM	1200 CFM	1700 CFM
Ecological refrigerant	R-410A	R-410A	R-410A
Factory charged	4 LBS. 2 OZ	5 LBS. 8 OZ	7 LBS. 4 OZ
Compressor protections	High and low pressure switch	High and low pressure switch	High and low pressure switch
Start timer	Delay Timer	Delay Timer	Delay Timer
Expansion valves	Electronic expansion valve (EEV)	Electronic expansion valve (EEV)	Electronic expansion valve (EEV)
Filter drier	Protection against system humidity	Protection against system humidity	Protection against system humidity
Service valves	For pressure measurement and refrigerant recharging	For pressure measurement and refrigerant recharging	For pressure measurement and refrigerant recharging
Air filtration	Washable filters	Washable filters	Washable filters
PARAMETER	GENERAL SPECIFICATIONS		
Field of operation	Telecommunications	Telecommunications	Telecommunications
Application	Vertical	Vertical	Vertical
Flow configuration	Top front discharge - STD	Top front discharge - STD	Top front discharge - STD
	Front return - STD	Front return - STD	Front return - STD
	Lower front return with plenum - OPC	Lower front return with plenum - OPC	Lower front return with plenum - OPC
Discharge grilles	Aluminum with movable leaves	Aluminum with movable leaves	Aluminum with movable leaves
Return grilles	Aluminum with fixed leaves	Aluminum with fixed leaves	Aluminum with fixed leaves
Economizer	Integrated energy saver for energy optimization	Integrated energy saver for energy optimization	Integrated energy saver for energy optimization
Metal cabinet	Anti-corrosion treatment, baked-on paint	Anti-corrosion treatment, baked-on paint	Anti-corrosion treatment, baked-on paint
Evaporator coil material	Copper tubing, aluminum fins	Copper tubing, aluminum fins	Copper tubing, aluminum fins
Condenser coil material	Copper tubing, aluminum fins	Copper tubing, aluminum fins	Copper tubing, aluminum fins

6 AIRFLOW PERFORMANCE

Airflow performance data is based on cooling performance with a coil and no filter in place. Use this performance table for appropriate unit size, external static applied to unit and allow operation within the minimum and maximum limits shown in table below for both cooling and electric heat operation.

6.1 Airflow Performance Data

Table 7-1 Duct Application(208-240V)

Model Number	Motor Speed		SCFM								
			External Static Pressure-Inches W.C.[kPa]								
			0[0]	0.1[.02]	0.2[.05]	0.3[.07]	0.4[.10]	0.5[.12]	0.6[.15]	0.7[.17]	0.8[.20]
NAC-24 NAC-36	Low-Tap(2)	SCFM	1082	1039	996	958	917	/	/	/	/
		Amps	1.54	1.63	1.73	1.82	1.92	/	/	/	/
		Watts	153	164	175	186	119	/	/	/	/
	Mid-Tap(3)	SCFM	1219	1179	1140	1102	1066	1031	998	964	916
		Amps	2.03	2.14	2.24	2.34	2.46	2.56	2.66	2.76	2.88
		Watts	211	223	235	248	261	274	286	297	312
	High-Tap(4) (Factory)	SCFM	1350	1321	1283	1248	1214	1181	1147	1115	1084
		Amps	2.63	2.75	2.86	2.97	3.09	3.2	3.32	3.43	3.53
		Watts	283	297	309	322	337	351	365	378	391
NAC-48	Low-Tap(3) (Factory)	SCFM	1777	1728	1680	1635	1592	1549	/	/	/
		Amps	2.8	2.9	3	3.1	3.2	3.3	/	/	/
		Watts	323	338	352	365	378	391	/	/	/
	Mid-Tap(4) (Factory)	SCFM	1937	1889	1842	1792	1758	1720	1678	1636	1593
		Amps	3.5	3.6	3.7	3.8	3.9	4	4.1	4.2	4.3
		Watts	412	428	444	457	471	486	499	513	527
	High-Tap(5)	SCFM	2235	2191	2144	2091	2050	2010	1971	1936	1892
		Amps	4.5	5.1	5.3	5.4	5.5	5.6	5.7	5.8	5.8
		Watts	623	642	660	673	689	704	719	734	744

Table 7-2 Duct Application(208-240V)

Model Number	Motor Speed		SCFM								
			External Static Pressure-Inches W.C.[kPa]								
			0[0]	0.1[.02]	0.2[.05]	0.3[.07]	0.4[.10]	0.5[.12]	0.6[.15]	0.7[.17]	0.8[.20]
NAC-24 NAC-36	Low-Tap(2)	SCFM	1082	1039	996	958	917	/	/	/	/
		Amps	1.54	1.63	1.73	1.82	1.92	/	/	/	/
		Watts	153	164	175	186	119	/	/	/	/
	Mid-Tap(3)	SCFM	1219	1179	1140	1102	1066	1031	998	964	916
		Amps	2.03	2.14	2.24	2.34	2.46	2.56	2.66	2.76	2.88
		Watts	211	223	235	248	261	274	286	297	312
	High-Tap(4) (Factory)	SCFM	1350	1321	1283	1248	1214	1181	1147	1115	1084
		Amps	2.63	2.75	2.86	2.97	3.09	3.2	3.32	3.43	3.53
		Watts	283	297	309	322	337	351	365	378	391
NAC-48	Low-Tap(3) (Factory)	SCFM	1777	1728	1680	1635	1592	1549	/	/	/
		Amps	2.8	2.9	3	3.1	3.2	3.3	/	/	/
		Watts	323	338	352	365	378	391	/	/	/
	Mid-Tap(4) (Factory)	SCFM	1937	1889	1842	1792	1758	1720	1678	1636	1593
		Amps	3.5	3.6	3.7	3.8	3.9	4	4.1	4.2	4.3
		Watts	412	428	444	457	471	486	499	513	527
	High-Tap(5)	SCFM	2235	2191	2144	2091	2050	2010	1971	1936	1892
		Amps	4.5	5.1	5.3	5.4	5.5	5.6	5.7	5.8	5.8
		Watts	623	642	660	673	689	704	719	734	744

* The above airflow data for reference only.

* In any stituation , the airflow of the unit should be in the range of 80% to 130% of 400CFM/Ton.

- The air distribution system has the greatest effect on airflow. The duct system is totally controlled by the contractor. For this reason, the contractor should use only industry-recognized procedures.
- Heat pump systems require a specified airflow. Each ton of cooling requires between 300 and 450 cubic feet of air per minute (CFM), or 400 CFM nominally.
- Duct design and construction should be carefully done. System performance can be lowered dramatically due to poor duct design.

- Air supply diffusers must be selected and located carefully. They must be sized and positoined to deliver treated air along the perimerter of the space. If they are too small for their intended airflow, they become noisy. If they are not located properly, they cause drafts. Return air grilles must be properly sized to carry air back to the blower. If they are too small, they also cause noise.
- The installers should balance the air distribution system to ensure proper quiet airflow to all rooms in the home. This ensures a comfortable living space.
- An air velocity meter or airflow hood can give a reading of system CFM.
- During installation, installer should select the air speed according to the actual setting static pressure. Please refer to the Table 7-1 AIRFLOW PERFORMANCE DATA

Table 7-3 Electric Heat Pressure Drop Tables(IN.W.C)

Small Cabinet: NAC-24/36

STATIC	STANDARD CFM (SCFM)					
	900	1000	1100	1200	1300	1400
5kW	0,05	0,05	0,05	0,05	0,05	0,1
7.5kW	0,05	0,05	0,05	0,05	0,05	0,1
10kW	0,05	0,05	0,05	0,05	0,05	0,1
15kW	/	/	0,1	0,1	0,1	0,1

Large Cabinet: NAC-48

STATIC	STANDARD CFM (SCFM)							
	1500	1600	1700	1800	1900	2000	2100	2200
5kW	0,1	0,1	0,1	0,1	0,15	0,15	0,15	0,15
7.5kW	0,1	0,1	0,1	0,1	0,15	0,15	0,15	0,15
10kW	0,1	0,1	0,15	0,15	0,15	0,15	0,15	0,15
15kW	/	/	0,2	0,2	0,2	0,2	0,2	0,2
20kW	/	/	0,2	0,2	0,2	0,2	0,2	0,25

Table 7-4 Refrigerant charge for H/P system

NAC-24/36 Cooling Mode Mode De Refroidissement		Cooling Charge Chart/Tableau De Charge de Refroidissement												
		Outdoor Ambient Temperature(oF)/Temperature Amdiante Exterieure(en oF)												
		55	60	65	70	75	80	85	90	95	100	105	110	115
		High Pressure Service Port (psig)/Vanne Détecté de Pression Haute(en psig)												
Low Pressure Service Port(psig)	Vanne Détectée de Pression Basse(en psig)													
	165			313	328	343	357	370	391	423	448	472	495	521
	161			309	324	339	353	366	387	419	444	468	491	516
	157			305	320	335	349	362	383	415	439	463	486	512
	153		286	301	316	331	345	358	379	411	435	459	482	508
	149		282	297	312	327	341	354	375	407	431	455	478	503
	145		278	293	308	323	337	350	372	404	428	451	474	500
	141	253	274	289	304	319	333	346	368	401	424	447	470	495
	137	246	268	283	298	313	328	342	363	397	421	444	471	501
	133	241	264	279	294	309	324	339	360	394	418	441	463	487
	129	236	260	275	290	305	321	337	358	391	415	438	461	486
	125	231	256	271	286	301	317	333	355	389	412	435	457	482
	121	226	252	267	282	297	313	329	351	386	409	432	454	478
	117	221	248	263	278	293	309	325	348	383	406	429	450	474
	113	216	244	259	274	289	305	321	344	380	403	426	447	470
	109	211	240	255	270	285	301	317	341	377	400	423	443	466
	105	206	236	251	266	281	297	313	337	374	397	420	440	462

Table 7-5 Refrigerant charge for H/P system

NAC-24/36 Heating Mode Mode De Chauffage			Heating Charge Chart/Tableau De Charge de Chauffage											
			Indoor Dry Bulb Temperature(oF)/Temperature Interieur au Themometre sec(en oF)											
			60	62	64	66	68	70	72	74	76	78	80	82
			High Pressure Service Port(psig)/Vanne Détecté de Pression Haute(en psig)											
Low Pressure Service Port(psig)	Vanne Détectée de Pression Basse(en psig)	135	344	352	360	368	376	384	392	400	408	416	424	431
		128	335	343	350	358	366	374	382	389	397	405	413	420
		121	326	333	341	348	356	364	371	379	386	394	402	409
		114	316	324	331	339	346	353	361	368	376	383	390	397
		107	307	314	322	329	336	343	350	358	365	372	379	386
		100	298	305	312	319	326	333	340	347	354	361	368	375
		93	287	293	300	307	314	321	328	335	342	349	356	363
		86	275	282	288	295	302	308	315	322	329	336	343	350
		79	264	270	277	283	289	296	303	310	317	324	331	338
		72	252	259	265	271	277	283	290	297	304	311	318	325
		65	241	247	253	259	265	271	278	285	292	299	306	313
		58					258	264	271	278	285	292	299	306
		51						257	264	271	278	285	292	299
		44							257	264	271	278	285	292
		37								257	264	271	278	285

Table 7-6 Refrigerant charge for H/P system

NAC-48 Cooling Mode Mode De Refroidissement			Cooling Charge Chart/Tableau De Charge de Refroidissement												
			Outdoor Ambient Temperature(oF)/Temperature Amdiante Exterieure(en oF)												
			55	60	65	70	75	80	85	90	95	100	105	110	115
			High Pressure Service Port (psig)/Vanne Détecté de Pression Haute(en psig)												
Low Pressure Service Port(psig)	Vanne Détectée de Pression Basse(en psig)	165			297	318	339	360	379	399	418	442	466	490	514
		161			295	316	337	358	377	397	416	440	464	488	512
		157			293	314	335	356	375	395	414	438	462	486	510
		153		270	291	312	333	354	373	393	412	436	460	484	508
		149		268	289	310	331	352	371	391	410	434	458	482	506
		145		266	287	308	329	350	369	389	408	432	456	480	504
		141	243	264	285	306	327	348	367	387	406	430	454	478	502
		137	241	262	283	304	325	346	365	385	404	428	452	476	500
		133	239	260	281	302	323	344	363	383	402	426	450	474	498
		129	237	258	279	300	321	342	361	381	400	424	448	472	496
		125	235	256	277	298	319	340	359	379	398	422	446	470	494
		121	233	254	275	296	317	338	357	377	396	420	444	468	492
		117	231	252	273	294	315	336	355	375	394	418	442	466	490
		113	229	250	271	292	313	334	353	373	392	416	440	464	488
		109	227	248	269	290	311	332	351	371	390	414	438	462	486
		105	225	246	267	288	309	330	349	369	388	412	436	460	484

Table 7-7 Refrigerant charge for H/P system

NAC-48 Heating Mode Mode De Chauffage			Heating Charge Chart/Tableau De Charge de Chauffage											
			Indoor Dry Bulb Temperature(oF)/Temperature Interieur au Themometre sec(en oF)											
			60	62	64	66	68	70	72	74	76	78	80	82
			High Pressure Service Port(psig)/Vanne Détecté de Pression Haute(en psig)											
Low Pressure Service Port(psig)	Vanne Détectée de Pression Basse(en psig)	135	431	439	447	455	463	471	479	487	495	503	511	518
		128	405	413	421	429	436	444	452	460	468	475	483	490
		121	379	387	395	402	410	417	425	433	440	448	455	462
		114	354	361	368	376	383	391	398	405	413	420	428	435
		107	328	335	342	349	357	364	371	378	385	393	400	407
		100	302	309	316	323	330	337	344	351	358	365	372	379
		93	291	298	305	312	318	325	332	339	346	353	360	367
		86	280	287	294	300	307	313	320	327	334	341	348	355
		79	270	276	282	289	295	302	309	316	323	330	337	344
		72	259	265	271	277	284	290	297	304	311	318	325	332
		65	248	254	260	266	272	278	285	292	299	306	313	320
		58					265	271	278	285	292	299	306	313
		51						264	271	278	285	292	299	306
		44							264	271	278	285	292	299
		37								264	271	278	285	292

7 ECONOMIZER

In air conditioning systems: In cold climates, cold outside air can be used to cool the interior of the building in a process called "natural cooling."

This involves using a mechanical damper with an actuator.

The economizer damper is an essential device in a self-contained air conditioning system. Its main function is to regulate and redirect airflow, improving energy efficiency and adapting to the conditions of each space.

There are different types depending on their application: regulating, shut-off, volume control, inlet, variable (VIV), and fire and smoke safety.

Manual Operation: It can be operated manually with a push button, allowing the user to manually adjust the actuator when there is no power or no signal input.

Highly Reliable: Full-stroke overload protection, no limit switch, automatic stop at the end point.

Removable terminal cover design, convenient and easy to install and wire.

Long Service Life: Uses industrial design, stable and reliable operation, and long service life.

External Position Switch: The position set point can be freely adjusted and installed on-site. The wiring direction can be conveniently set to left or right.

The economizer will activate when the temperature differential between the room's interior and exterior temperatures is greater than 4°C. The actuator will open or close the damper when it receives the signal from the control board.

7.1 Specifications

Torque: 5 Nm
Rotation Direction: Adjustable via knob
Position Indicator: Mechanical
Manual Operation: Set via push-button
Rotation Angle: Max. 95°
Running Time: 120 s
Connection Shaft: Round Φ6-15 mm, Square 4.5-11 mm, Min. Length 43 mm
Control Signal: 0-10 VDC (input impedance 250 kΩ)
External Position Switch: 1 or 2, SPDT, 250 V/3 A, must be ordered separately; See External Position Switch
Electrical Connection: Screw Terminal
Operating Mode: Type 1 according to EN60730-1
Working Temperature: -30–50°C, 95% RH, non-condensing (EN60730-1)
Storage Temperature: -40–80°C
Noise Level: ≤ 35dB
Protection: IP54
Weight: 0.58 kg (24 V models)
Approval: CE

8 SYSTEM OPERATION

8.1 Compressor Crankcase Heater (Optional)

Refrigerant migration during the off cycle can result in a noisy start up. Add a crankcase heater to minimize refrigeration migration, and to help eliminate any start up noise or bearing “wash out”.

All heaters are located on the lower half of the compressor shell. Its purpose is to drive refrigerant from the compressor shell during long off cycles, thus preventing damage to the compressor during start-up.

At initial start-up or after extended shutdown periods, make sure the heater is energized for at least 12 hours before the compressor is started. (Disconnect switch on and wall thermostat off.)

The crankcase heater will start up or shut down according to the following logic:

The crankcase heater will start up when the compressor is off and T4<41°F.

The crankcase heater will shut down when T4 ≥ 45 °F

In any condition, the crankcase heater will shut down when the compressor is on

8.2 Protection

8.2.1 Protection for HP system

If sensors(T3&T4) become open-circuit or short-circuit, the compressor ,outdoor fan motor and reversing valve circuit will shut down.

Discharge temperature protection:

If discharge temp. is > 239°F, the compressor will shut down, If discharge temp. is < 167°F, the compressor will resume operation.

High pressure protection

If high pressure is ＞609PSIG,the compressor and the outdoor fan motor will stop running.

If high pressure is ＜464PSIG,the compressor and the outdoor fan motor will resume running(3 minutes delay necessary).

Low pressure protection

When low pressure is ＜21PSIG,the compressor and the outdoor fan motor will stop running.

When low pressure is ＞44PSIG,the compressor and the outdoor fan motor will resume running(3 minutes delay necessary).

In stand-by status, if low pressure protection was detected, the compressor will not start.

If protection cycles occur four times within 30 minutes, the compressor and outdoor fan will shut down. In this condition, the system needs to power on once more in order to keep on working.

T4 function:

When T4 is < 5 °F, the compressor will stop. If the electrical heater kit is installed in the indoor unit, the outdoor unit will send the operation signal to the indoor unit.

When T4 is > 10.4 °F, the compressor will restart .

8.3 Defrost Mode Introduction (Heat Pump Only)

Manual defrost mode

To manually cycle the defrost mode, set switch SW3-1 to the “ON” position (See Fig 8-1). The system will engage a defrost cycle, and automatically exit defrost mode once the Shut-down conditions of defrost mode described below are met.

Caution: Once the manual defrost mode is finished, please set switch SW3-1 back to “OFF”.

Start-up conditions of defrost mode

When SW3-1 switch is set to “ON”(See Fig 8-1), the system will perform a defrost cycle in any of the following conditions:

1. If the compressor is operating and T3 is < 32 °F, the system will perform a defrost cycle every 30 minutes of operation.

2. If the compressor is operating and T4 is < 37.4 °F, the system will perform a defrost cycle every 30 minutes of operation.

3. When T3 is < 28.4 °F and the compressor is operating for the first time after being connected power,the system will perform a defrost after 15 minutes for the first time.

4. When T3 is < 28.4 °F and the system has been in standby for two hours, the system will perform a defrost after 15 minutes for the first time.

Fig.8-1 SW3 Switch Location in the PCB Board
(For reference only)

SW3 	SW3-1	ON	MANUAL DEFROST
		OFF	AUTOMATIC DEFROST *
	SW3-2	ON	RESERVED
		OFF	NORMAL DEFROST *
	SW3-3	ON	DEFROSTING CYCLE:30MIN
		OFF	DEFROSTING CYCLE:60MIN *

When SW3-1 switch is set to “OFF”(See in Fig 11), the system will perform a defrost cycle in any of the following conditions:

1. If the compressor is operating and T3 is < 32 °F, the system will perform a defrost cycle every 60 minutes of operation.

2. If the compressor is operating and T4 is < 37.4 °F, the system will perform a defrost cycle every 60 minutes of operation.

3. When T3 is < 28.4 °F and the compressor is operating for the first time after being connected power,the system will perform a defrost after 15 minutes for the first time.

4. When T3 is < 28.4 °F and the system has been in standby for two hours ,the system will perform a defrost after 15 minutes for the first time.

Shut-down conditions of defrost mode:

No matter what defrost mode is selected, the defrost cycle will end in any of the following conditions:

1. The defrost cycle has been running for 10 minutes;

2. T3 is ≥ 77°F for more than 2s;

3. The compressor stops operating.

8.4 Thermostat Signals

Table 8-1: Thermostat Signals

Signal	State	Board Function
G	ON	Blower instant ON
	OFF	Blower 90 sec. delay OFF
G & W1	ON	Blower instant ON Heater bank 1 elec.onstant ON
	OFF	Heater bank 1 elec.instant OFF Blower 90 sec. delay OFF
G & W & W2	ON	Blower instant ON Heater 1 instant ON Heater 2 instant ON
	OFF	Blower 90 sec. delay OFF Heater 1 instant OFF Heater 2 instant OFF
G & Y	ON	Blower instant ON Compressor and outdoor fan instant ON
	OFF	Compressor and outdoor fan instant OFF Blower fan delay 90 sec. OFF
G & B & Y	ON	4-way valve instant ON Blower instant ON Compressor and outdoor fan instant ON
	OFF	Compressor and outdoor fan instant OFF Blower fan delay 90 sec. OFF 4-way valve instant OFF
G & B & Y & W1	ON	4-way valve instant ON Blower instant ON Compressor and outdoor fan instant ON Heater 1 instant ON
	OFF	4-way valve instant OFF Blower fan delay 90 sec. OFF Compressor and outdoor fan instant OFF Heater 1 instant OFF
G & B & Y & W1 & W2	ON	4-way valve instant ON Blower instant ON Compressor and outdoor fan instant ON Heater 1 instant ON Heater 2 instant ON
	OFF	4-way valve instant OFF Blower fan delay 90 sec. OFF Compressor and outdoor fan instant OFF Heater 1 instant OFF Heater 2 instant OFF

Table 8-2: Thermostat Wire Color

Thermostat Wire Color	Function
Red	Power wire
Black	Power wire
White	Heater signal 1
Green	Blower fan signal
Yellow	Compressor signal
Blue	Reversing valve signal
White/Black	Heater signal 2

9 OPERATION CHECK-UP

- **Cooling Startup**

1. Turn thermostat to OFF and turn power to ON
2. Turn ON thermostat and set as high as possible
3. Turn Fan switch ON and indoor blower should run
4. Turn fan switch to AUTO, system switch to COOL and thermostat tem perature setting below room temperature.
   Unit should run in COOLING mode.

- **Heating Startup**

After normal cooling run

1. Turn thermostat switch to HEAT. After unit stops, wait about 5 minutes.
2. Turn thermostat setting above room temperature.
   Unit should run in HEATING mode.

After unit has run for a while, check the following:

1. Are fans running properly?
2. Is compressor running correctly?
3. Check refrigerant charge.
4. Check duct connection for leaks.
5. Check for tubing and sheet metal rattles.

(See Wiring Diagram for electric connection detail.)

10 TROUBLE SHOOTING

⚠ WARNING

Component trouble shooting requires opening control box with power on.

Use extreme care while working on this condition. Check nameplate and this instruction when making wire connections.

10.1 Fault Code of Motor Driver Module

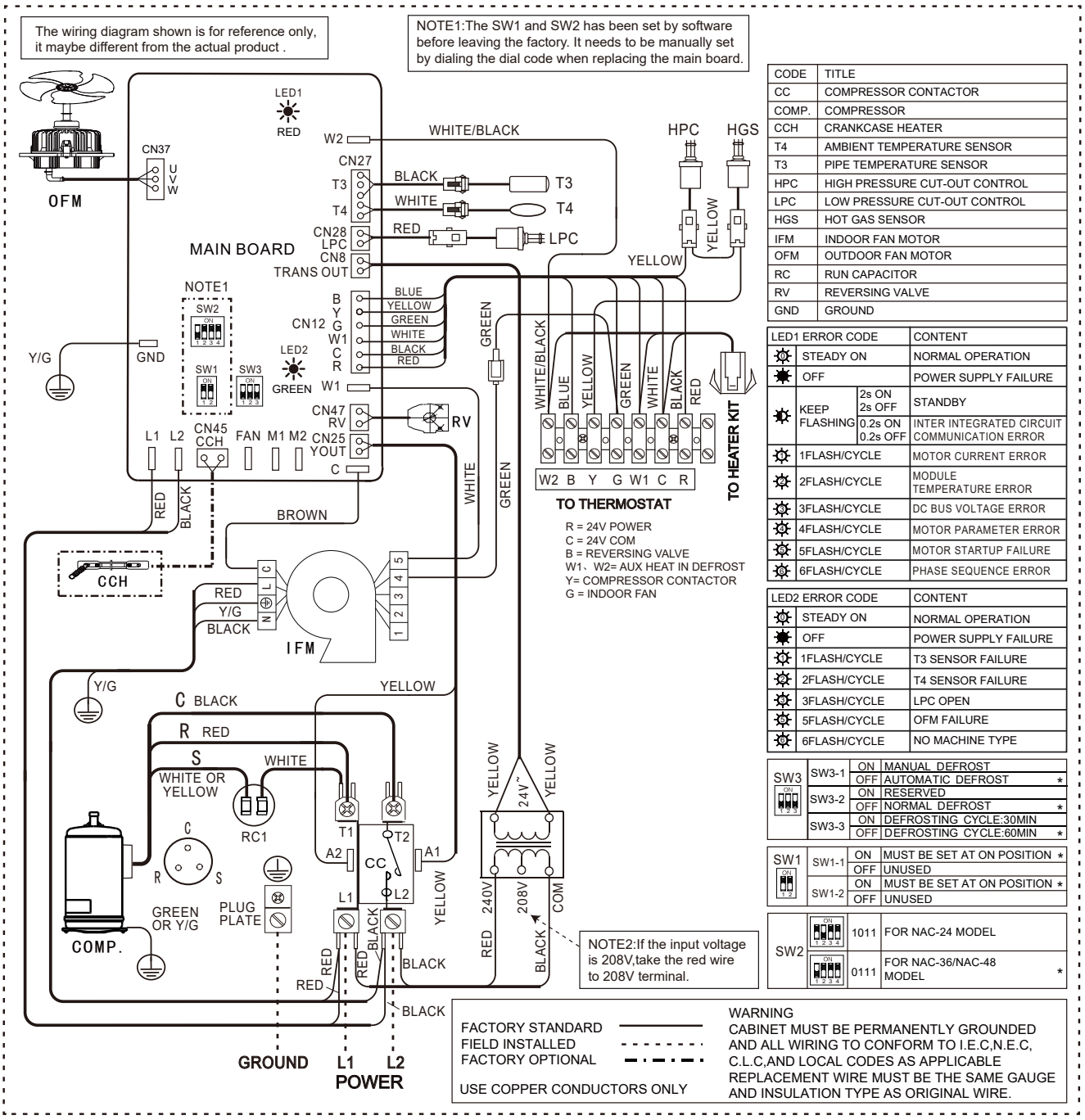
LED1 ERROR CODE			CONTENT
0	STEADY ON		NORMAL OPERATION
	OFF		POWER SUPPLY FAILURE
	KEEP FLASHING	2s ON 2s OFF	STANDBY
		0.2s ON 0.2s OFF	INTER INTEGRATED CIRCUIT COMMUNICATION ERROR
1	1FLASH/CYCLE		MOTOR CURRENT ERROR
2	2FLASH/CYCLE		MODULE TEMPERATURE ERROR
3	3FLASH/CYCLE		DC BUS VOLTAGE ERROR
4	4FLASH/CYCLE		MOTOR PARAMETER ERROR
5	5FLASH/CYCLE		MOTOR STARTUP FAILURE
6	6FLASH/CYCLE		PHASE SEQUENCE ERROR

10.2 Fault Code of Main Control Module

LED2 ERROR CODE		CONTENT
0	STEADY ON	NORMAL OPERATION
	OFF	POWER SUPPLY FAILURE
1	1FLASH/CYCLE	T3 SENSOR FAILURE
2	2FLASH/CYCLE	T4 SENSOR FAILURE
3	3FLASH/CYCLE	LPC OPEN
5	5FLASH/CYCLE	OFM FAILURE
6	6FLASH/CYCLE	NO MACHINE TYPE

NORDEN

HP System Wiring Diagram (NAC-24/36/48)



CODE	TITLE
CC	COMPRESSOR CONTACTOR
COMP.	COMPRESSOR
CCH	CRANKCASE HEATER
T4	AMBIENT TEMPERATURE SENSOR
T3	PIPE TEMPERATURE SENSOR
HPC	HIGH PRESSURE CUT-OUT CONTROL
LPC	LOW PRESSURE CUT-OUT CONTROL
HGS	HOT GAS SENSOR
IFM	INDOOR FAN MOTOR
OFM	OUTDOOR FAN MOTOR
RC	RUN CAPACITOR
RV	REVERSING VALVE
GND	GROUND

LED1 ERROR CODE			CONTENT
☼	STEADY ON		NORMAL OPERATION
✹	OFF		POWER SUPPLY FAILURE
☼	KEEP FLASHING	2s ON 2s OFF	STANDBY
		0.2s ON 0.2s OFF	INTER INTEGRATED CIRCUIT COMMUNICATION ERROR
☼	1FLASH/CYCLE		MOTOR CURRENT ERROR
☼	2FLASH/CYCLE		MODULE TEMPERATURE ERROR
☼	3FLASH/CYCLE		DC BUS VOLTAGE ERROR
☼	4FLASH/CYCLE		MOTOR PARAMETER ERROR
☼	5FLASH/CYCLE		MOTOR STARTUP FAILURE
☼	6FLASH/CYCLE		PHASE SEQUENCE ERROR

LED2 ERROR CODE		CONTENT
☼	STEADY ON	NORMAL OPERATION
✹	OFF	POWER SUPPLY FAILURE
☼	1FLASH/CYCLE	T3 SENSOR FAILURE
☼	2FLASH/CYCLE	T4 SENSOR FAILURE
☼	3FLASH/CYCLE	LPC OPEN
☼	5FLASH/CYCLE	OFM FAILURE
☼	6FLASH/CYCLE	NO MACHINE TYPE

SW3			
SW3-1	ON	MANUAL DEFROST	
	OFF	AUTOMATIC DEFROST	*
SW3-2	ON	RESERVED	
	OFF	NORMAL DEFROST	*
SW3-3	ON	DEFROSTING CYCLE:30MIN	
	OFF	DEFROSTING CYCLE:60MIN	*

SW1			
SW1-1	ON	MUST BE SET AT ON POSITION	*
	OFF	UNUSED	
SW1-2	ON	MUST BE SET AT ON POSITION	*
	OFF	UNUSED	

SW2		
1011	FOR NAC-24 MODEL	
0111	FOR NAC-36/NAC-48 MODEL	*

此页不做菲林，仅核对使用

印刷技术要求

材质	封面封底内页双胶纸80g
规格	A4规格
颜色	黑白
其他	

设计更改记录表（仅做说明用，不做菲林）

版本升级	更改人	更改日期	更改主要内容	涉及更改页面 （印刷页码）
A-B	颜昕	25.5.27	机器尺寸参数修改 18改为14-1/2	P5