

Indoor Air Conditioners
Or outdoor with no low ambient
temperature needs or requirement



Features

- Cooling capacities from 1,200 BTU/Hr up to 14,300 BTU/Hr
- Micro channel condenser allows a significant reduction of refrigerant charge, resulting in a lower CO2 footprint
- Built in electrical condensate evaporation
- UL Type 12 (type 3R and 4 optional)
- Extended temperature range +50°F - +140°F
- Suitable for US enclosures 10", 12", 16"
- Built in ModBus for remote monitoring and optional ethernet communication





Recessed

- Fast and easy installation, simplified cut outs.
- A single family suitable for external and recess installation.
- Slim design, narrow profile avoiding big protrusions from enclosure or taking excessive space inside the enclosure.
- Worldwide compatibility with certifications and approvals to be shipped / installed to most of the industrial areas globally.
- Limited models with multiple cooling capacities per size to facilitate cut-out standardization

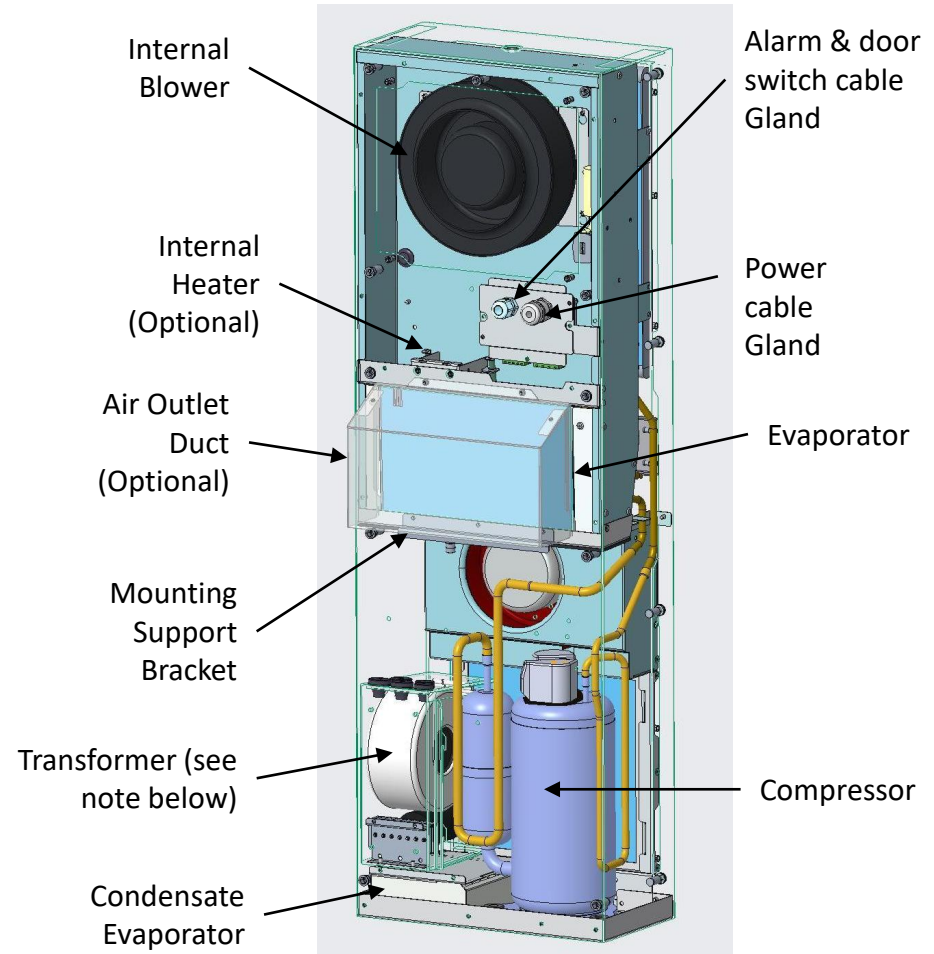
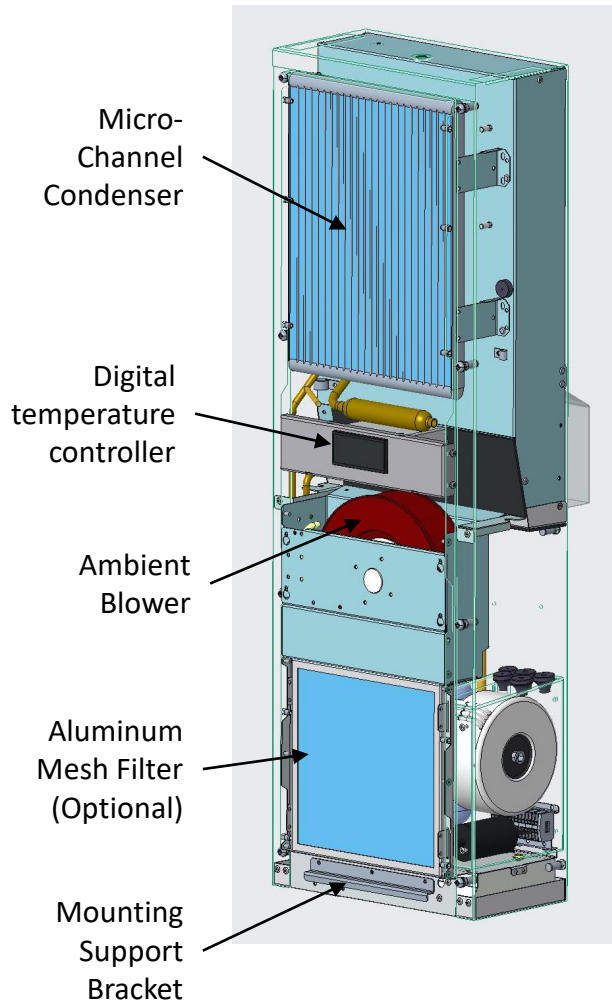


External

ENVIRO-THERM®

Components location

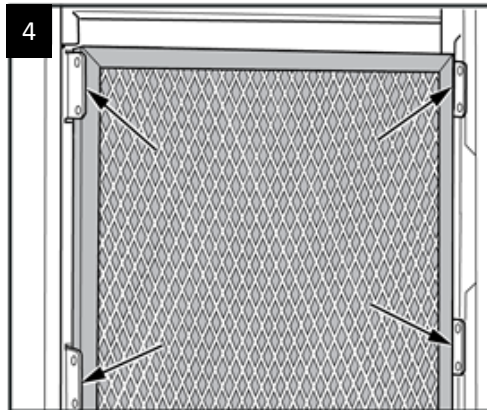
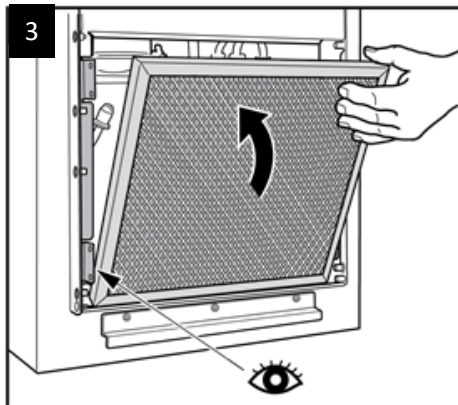
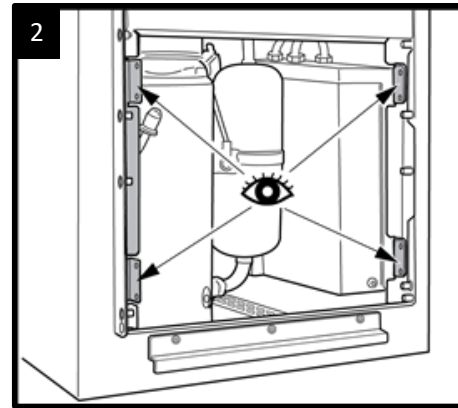
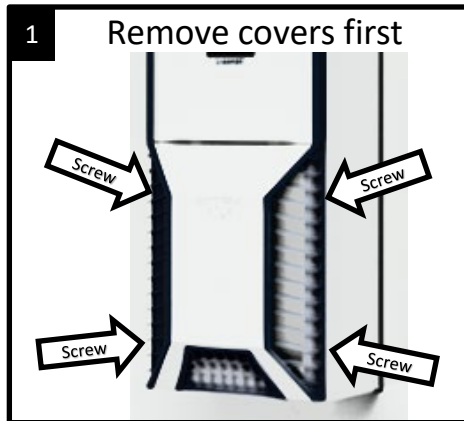
NEXTGEN



Note: Transformers are used on 120 V and 400/460 V single phase units with cooling capacities of 2700 BTU/hr and above, in these units all components operate at 230 VAC.

Filter Installation

- The aluminum mesh filter is easily replaced or removed by removing the air inlet cover located on the front of the unit



Controller function

Functions of the Controller

Temperature Control

The electronic controller insures a stable operation of the cabinet air conditioner:

- Internal temperature of the enclosure
- Run time of the compressor
- Downtime of the compressor
- Hysteresis of temperature:
 - ✓ to control the accuracy of the temperature setting at a tolerance of 3°F

Settings

The cooling unit is intended to be used as a complementary accessory to larger industrial equipment. The unit is used where heat needs to be dissipated from electrical control cabinets or similar enclosures in order to protect heat sensitive components. It is not intended for household use. The unit has two completely separate air circuits which ensure that the clean cabinet air does not come into contact with the ambient air which may well be dirty or polluted. Enclosure cooling units can dissipate large quantities of heat from sealed enclosures such as electrical enclosures into the ambient air and at the same time reduce the cabinet internal temperature to below that of the ambient air.

The unit can function without problems in extreme ambient conditions (e.g. dusty and oily air) with a standard operating temperature ranging between +10°C (50°F) and +60°C (131°F). Units can be ordered with an additional electrical cabinet heater. For the cooling capacities and environmental ratings please refer to the type plate data.

Controller function



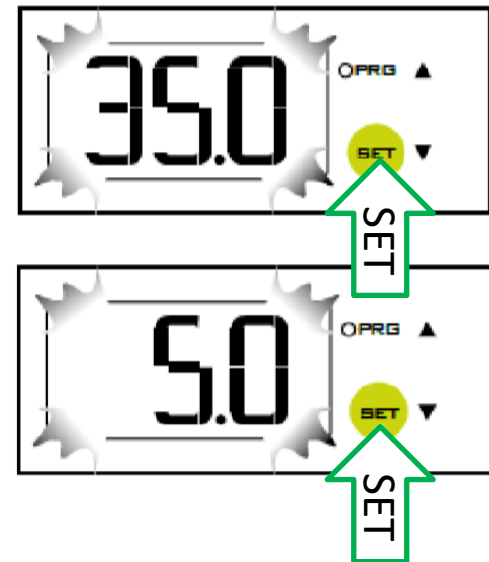
Display icons

Icon	Function	Description
1	Compressor relay active	Flashes when activation is delayed or inhibited by protection times, external disabling or other procedures in progress
2	Alarm relay active	
3	Heater relay active	
4	Ambient blower relay active	
!	Alarm	Flashes when alarms are active
↑R↓	Heating mode	Signals operation of unit in heating mode
↓D↑	Cooling mode	Signals operation of unit in cooling mode
TEST	Text mode in progress	Activated only by manual procedure

Controller function

Under normal working conditions the display shows the temperature inside the enclosure.

The controller “set point” for the interior of the enclosure is pre-set at 95°F and can be adjusted between 68°F and 122°F.

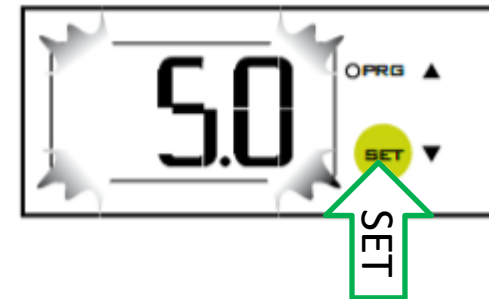
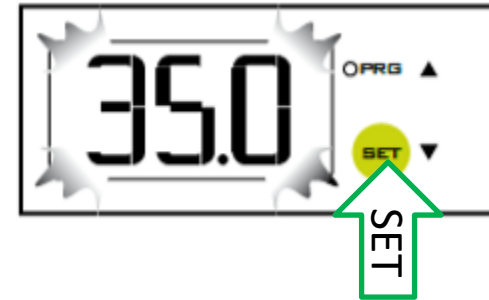


The High temperature alarm (parameter AH) is preset at 131°F. The High Temperature Alarm relay is delivered as “normally closed” (H1=1). If you need to change it to “normally open”, please modify value of parameter H1 (H1=2).

Controller function

Setting cooling set point, St1:

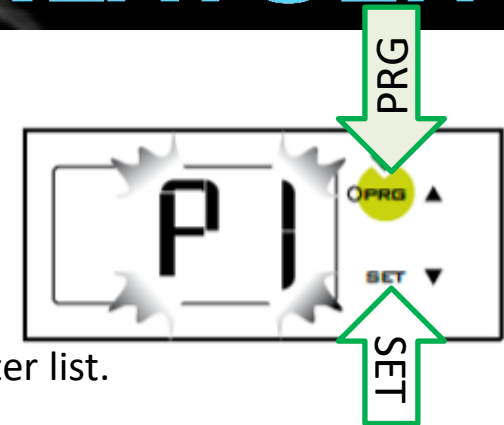
1. Press “SET” and display should show St1 and then the pre-set value of St1. (default: +35°C / +95°F)
2. Reach the desired value by using ▲ or ▼.
3. Press “SET” again to save the new value of St1.



Controller function

Setting temperature units (°C / °F), low temperature alarm and high temperature alarm:

1. Press “PRG” button for 5 seconds to reach the modifiable parameter list.
2. Use ▲ or ▼ to reach the desired parameter:
 - C18 for temperature unit of measure
 - °C = 0
 - °F = 1
 - P25 for low temperature alarm threshold (default -10°C / +14°F)
 - P26 for high temperature alarm threshold (default +55°C / +131°F)
 - c68 for door contact NO/NC logic change (0=ON if closed, 1=ON if open)
 - Controller firmware rev. 1.2 or higher.
3. Press “SET” on the desired parameter to display the current value.
4. Use ▲ or ▼ to reach the desired value.
5. Pressing “SET” temporarily saves the new value and returns to the parameters list.
6. Repeat steps 2-5 to set other parameters.
7. Press “PRG” for 5 seconds to permanently save the new values.



Controller function

Test function

Different test functions can be used depending on the combination of keys pressed. Such tests run for the duration of 4 minutes.

- “SET+▲” tests Compressor and Ambient Blower relays.
- “SET+▼” tests Alarms and Heater relays

Alarm Relay Operation

Both normally closed (NC) and normally open (NO) alarm contacts are provided. Under normal conditions, the NC contact is closed and the NO contact is open. When an alarm condition is present, the NC contact will open and the NO contact will close.

1. System power OFF



2. System powered ON
-NO ALARM
-Door Contact Closed



3. System Powered ON



4. System powered ON
-ALARM STATE



Failure table:

The display shows either “OFF” or “EXX” with an icon flashing (triangle), alternating with the standard display. If more than one error occurs, these are shown in sequence on the display.



Failure Code	Description	
OFF	Door open	Close the enclosure door and check the door contact switch. If no door contact switch is used and c68=0, bridge terminals on power connector.
	Incorrect phase sequence (3-phase units)	Displayed on power-up. Check phase sequence.
E01	Failure internal temperature sensor	Check probe connections.
E02	Failure ambient temperature sensor	Check probe connections.
E04	High temperature alarm	The measured temperature has exceeded the threshold P26. Check rating of the cooling unit. Clean air filters, condenser; check fans' and compressor's correct operation. Contact your service partner.
E05	Low temperature alarm	The measured temperature has fallen below the threshold P25.
E07 / E08	Controller error	Contact your service partner.

Controller function

Important Notes

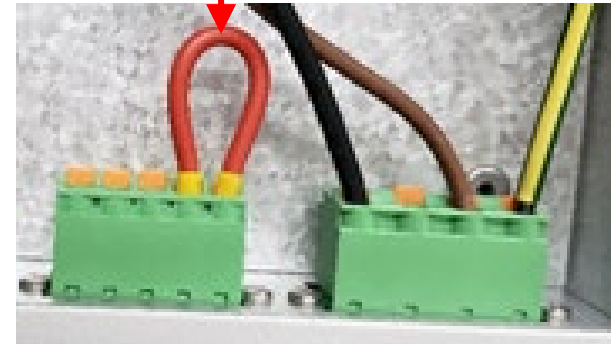
- Whilst programming, if no button is pressed for 10 seconds, the display starts flashing, and after 1 minute returns to the main display without saving changes.
- To increase scrolling speed, press and hold the ▲ or ▼ button for at least 5 seconds.
- When pressing “PRG” for 3 seconds, the firmware revision code is displayed for 2 seconds.
- When cleaning the controller panel, do not use ethanol, hydrocarbons, ammonia or their by-products. Use neutral detergents and water.
- In order to protect the unit’s components, minimum relay output on (3 or 7 minutes) and off (4 minutes) times and minimum time (7 or 11 minutes) between activation of the same relay output are applied.
- In case of digital inputs not configured, probes not fitted or configured, or St2 not enabled on the controller the display shows ‘nO’

Controller function

Door Switch

The unit can be turned on and off via a door contact switch. When a new unit is delivered the door contact terminals are bridged on the female connector. In order to connect the door contact switch remove the bridge and connect the door contact switch. The contact must be closed when the cabinet door is closed.

Door contact bridge

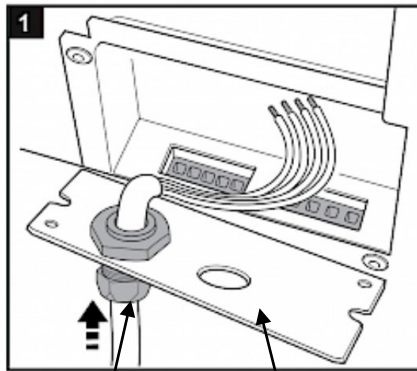


Assembling of cables assemblies

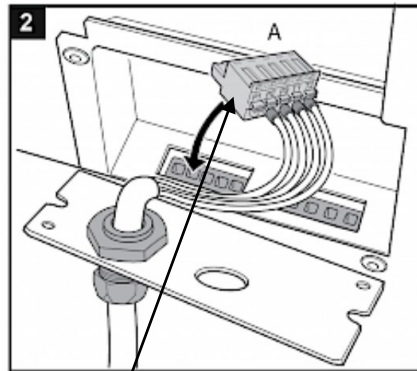
Connect the cooling device according to the instructions below

Connector A: alarm and door switch signals

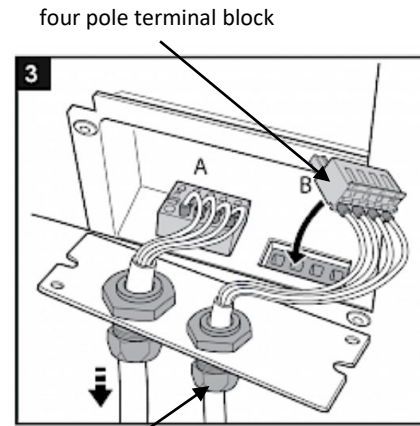
Connector B: Power supply



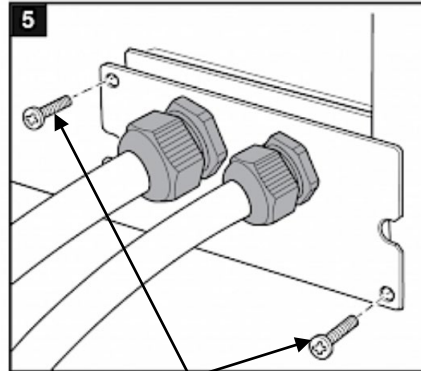
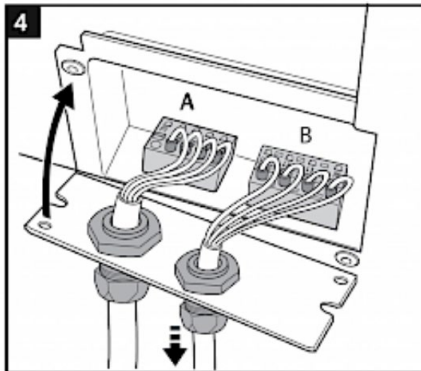
M16 cable gland with lock nut
Supply plate



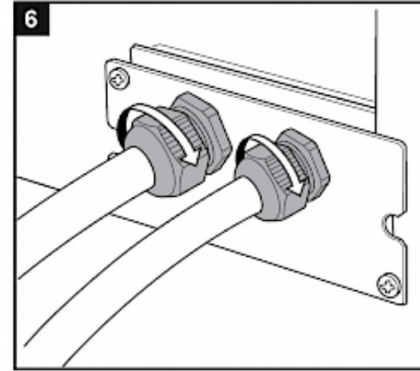
Five pole terminal block



M20 cable gland with lock nut



M4x12 screws



ENVIRO-THERM® NEXTGEN

Single phase wiring

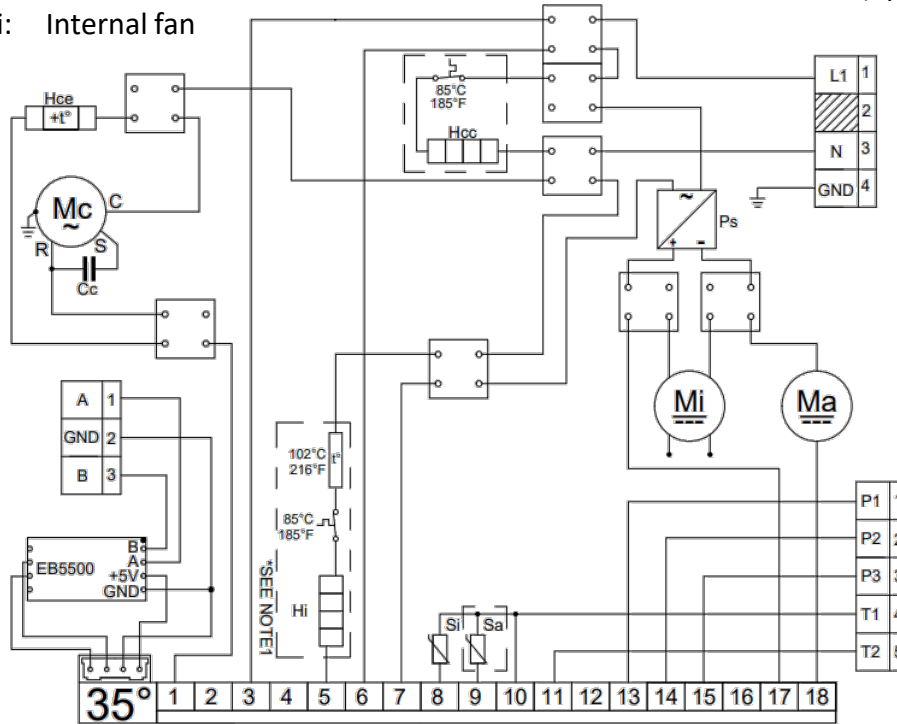
Parts List

- Sa: Ambient Temperature Sensor (Optional)
- Si: Internal temperature Sensor
- Hcc: Compressor c/case heater (Optional)
- Hce: Condensate evaporator heater
- Hi: Internal heater
- Cc: Compressor capacitor
- Ps: DC power supply
- Mc: Compressor
- Ma: Ambient fan
- Mi: Internal fan

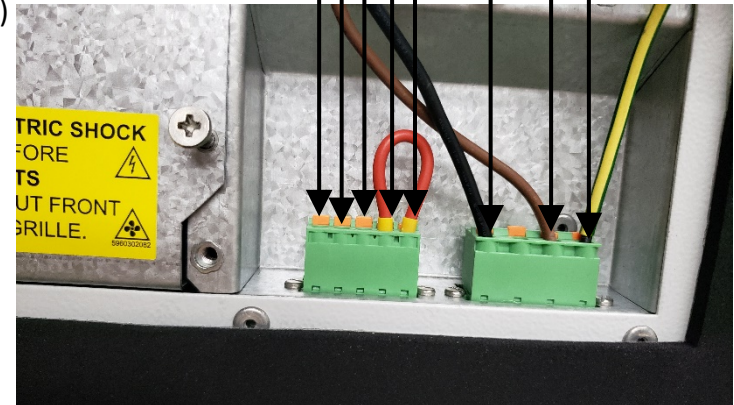
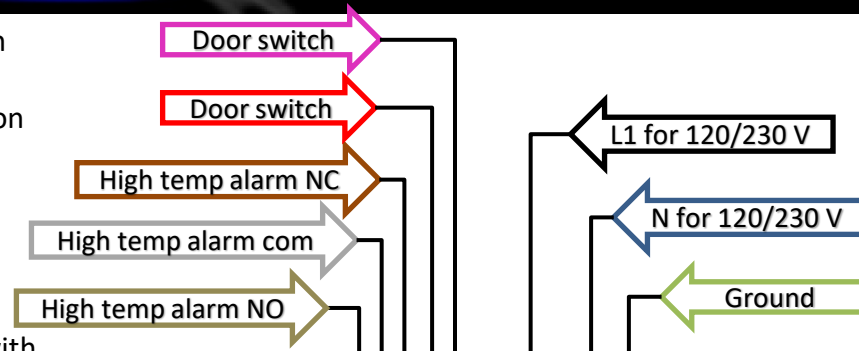
- A RS495 – connection
- GND GND connection
- B RS485 - B connection

Notes

1. Connector for units with internal heater (optional)



SCE-NG1195B120/230V, SCE-NG2320B120/230V



Notes

High temp alarm can be wired NC or NO

When wires:

P1 P2 – NO

When wires:

P2 P3 - NC

Power connector

1 L1

2 /

3 N

4 PE

Signal connector

1 Alarm (NC)

2 Alarm (COM)

3 Alarm (NO)

4 Door contact

5 Door contact

ENVIRO-THERM®

Single phase wiring

NEXTGEN

SCE-NG2970B120/230/400/460V

SCE-NG4095B120/230V

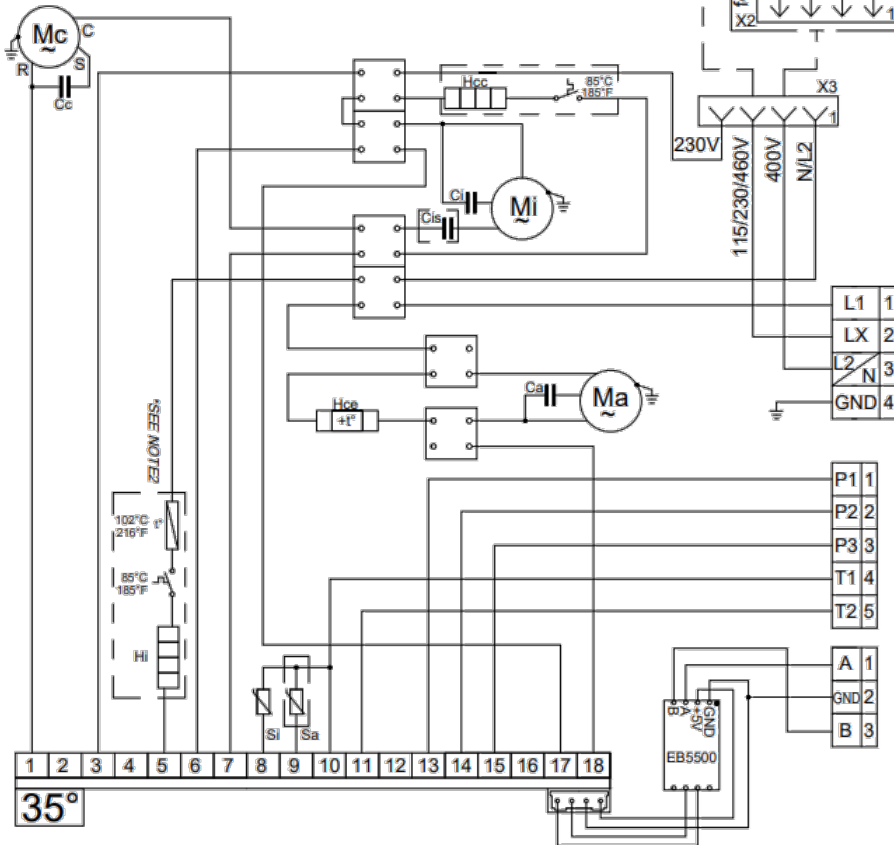
SCE-NG5100B120/230V

SCE-NG5290B120V

SCE-NG6800B120/230V

SCE-NG8500B120/230V

SCE-NG4095B120/230V



NOTES:

See unit typeplate for correct voltage and frequency. Suitable protection devices should be installed on supply line. Use copper conductors only. Use supply wires suitable for 75 °C (167 °F).

1. X1 uses for 230 V units, X2 used for 115/400-460 V units (Plugged into X3)
2. Connected for units with internal heater

PARTS LIST:

- Mc Compressor
- Mi Internal fan
- Ca Ambient fan capacitor
- Hi Internal heater
- Hcc Compressor crank case heater (Optional)
- Si Internal temperature sensor
- Ma Ambient fan
- Cc Compressor capacitor
- Ci Internal fab capacitor
- Hce Condensate evaporator heater
- Sa Ambient temperature sensor (Optional)
- A RS495 – connection
- GND GND connection
- B RS485 - B connection

X4 ELECTRICAL SUPPLY CONNECTION

(see unit type plate for unit voltage)

230 V - 1:L1 (230V), 3:N

115 V - 1:L1 (115V), 3:N

400 V - 2: LX(400V), 3:L2(400 V)

460 V - 1:L1(460V), 3:L2(460 V)

Power connector

1 L1

2 /

3 N

4 PE

Signal connector

1 Alarm (NC)

2 Alarm (COM)

3 Alarm (NO)

4 Door contact

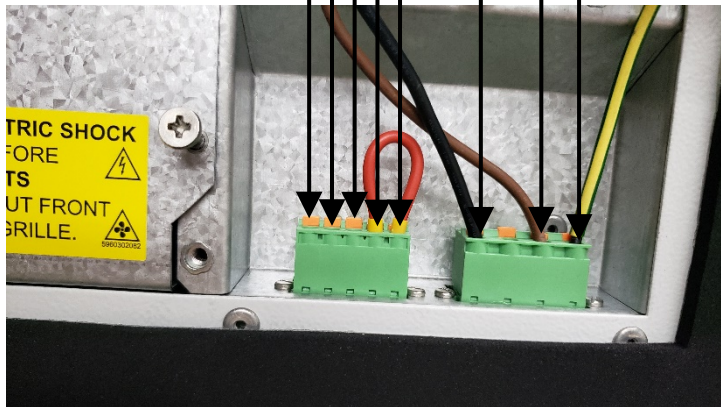
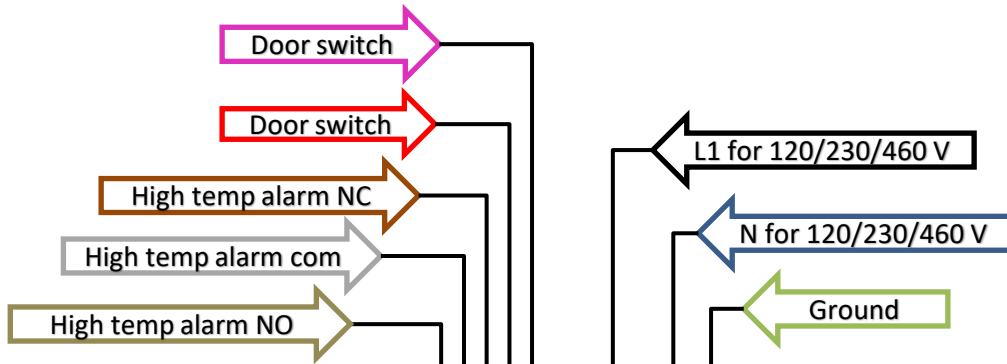
5 Door contact

RS485 connector

1 A

2 GND

3 B



120/230/460 Volts

- SCE-NG2970B120/230/460V
- SCE-NG4095B120V
- SCE-NG5100B120/230V
- SCE-NG6800B120/230V
- SCE-NG8500B120/230V
- SCE-NG5290B120V

Notes

High temp alarm can be wired NC or NO

When wires:

P1 P2 – NO

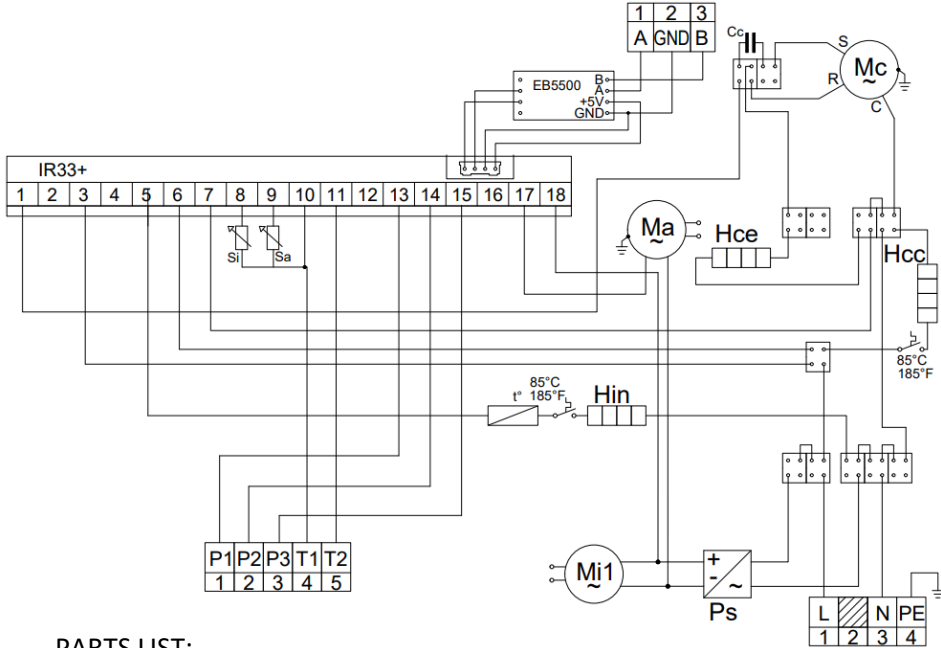
When wires:

P2 P3 - NC

ENVIRO-THERM®

Single phase wiring

NEXTGEN



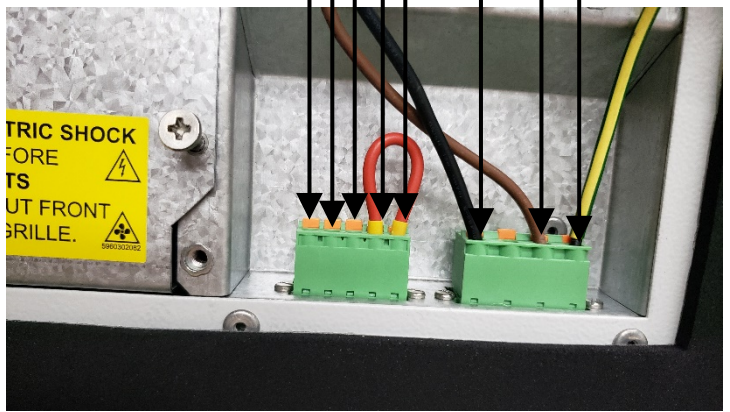
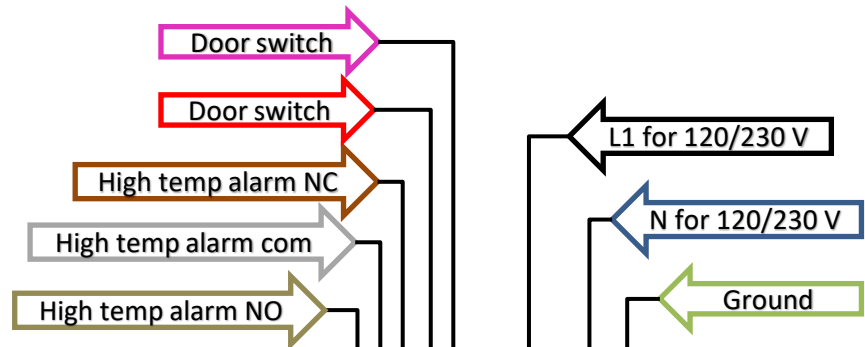
SCE-NG1870B120/230V

PARTS LIST:

- Mc Compressor
- Ma Ambient fan
- Mi1 Internal fan 1
- Cc Compressor capacitor
- Hce Condensate evaporator heater
- Hin Internal heater (Optional)
- Hcc Heater, compressor crankcase (Optional)
- Si Internal temperature sensor
- Sa Ambient temperature sensor (Option)
- Ps DC Power supply
- A RS495 – connection
- GND GND connection
- B RS485 - B connection

Notes:

See Unit typeplate for correct operating voltage and frequency.
 Suitable protective devices should be installed on the supply line.
 Use copper conductors only.
 Use supply wires suitable for 75 °C (167 °F).



Notes

High temp alarm can be wired NC or NO
 When wires:
 P1 P2 – NO
 When wires:
 P2 P3 - NC

ENVIRO-THERM®

Single phase wiring

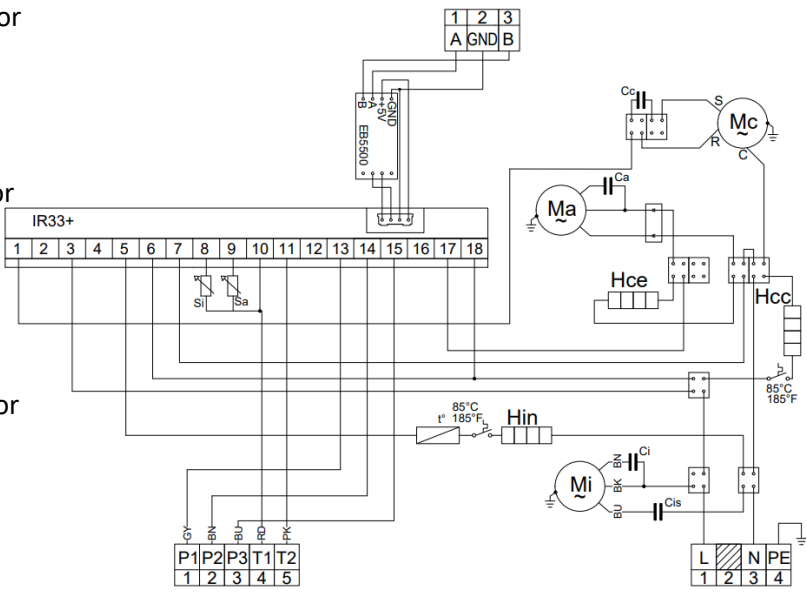
NEXTGEN

Power connector

- 1 L1
- 2 /
- 3 N
- 4 PE

Signal connector

- 1 Alarm (NC)
 - 2 Alarm (COM)
 - 3 Alarm (NO)
 - 4 Door contact
 - 5 Door contact
- RS485 connector**
- 1 A
 - 2 GND
 - 3 B



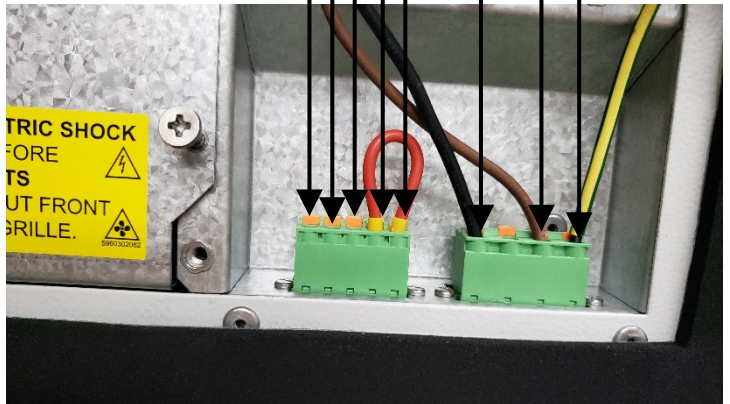
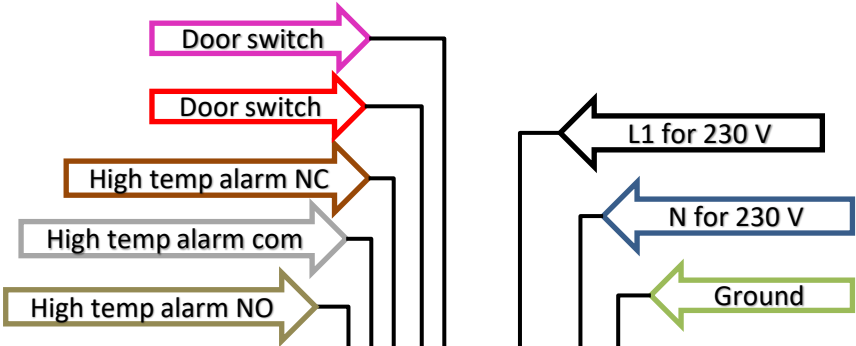
PARTS LIST:

- Mc Compressor
- Ma Ambient fan
- Mi Internal fan 1
- Cc Compressor capacitor
- Ca Ambient Fan Capacitor
- Hi Internal Slow-down Capacitor (optional)
- Ca Ambient Fan Capacitor
- Hce Condensate evaporator heater
- Hin Internal heater (Optional)
- Hcc Heater, compressor crankcase (Optional)
- Si Internal temperature sensor
- Sa Ambient temperature sensor (Optional)
- A RS495 – connection
- GND GND connection
- B RS485 - B connection

SCE-NG5290B230V
SCE-NG14300B230V

NOTES:

- Use copper conductors only.
- Use supply wires suitable for 75 °C (167 °F).
- See Unit typeplate for correct operating voltage and frequency.
- Suitable protective devices should be installed on the supply line.



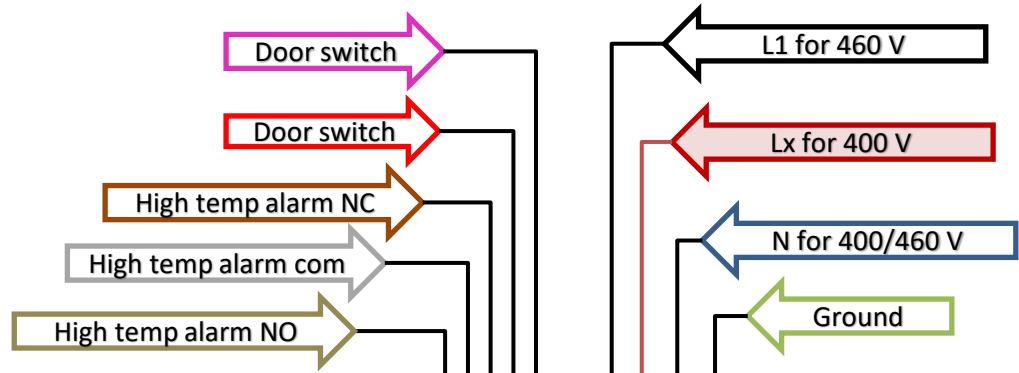
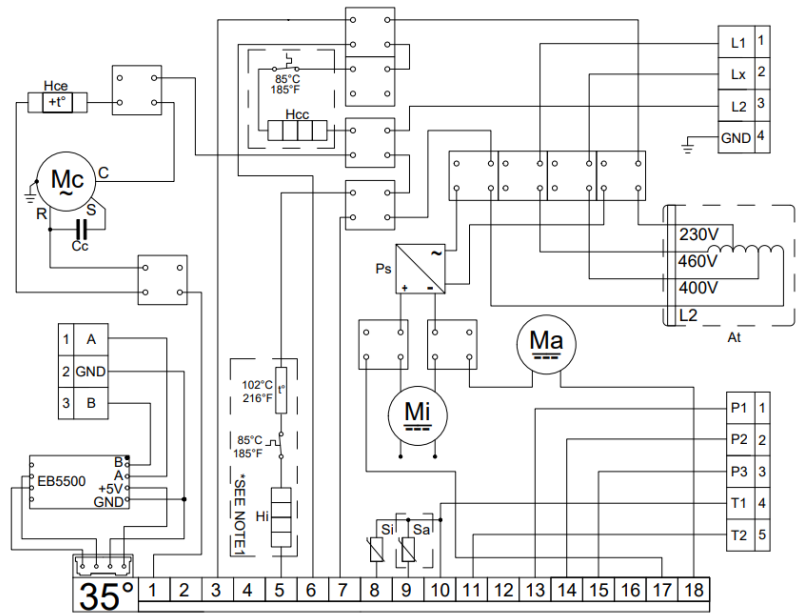
Notes

- High temp alarm can be wired NC or NO**
- When wires: P1 P2 – NO
- When wires: P2 P3 - NC

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Single phase wiring

NEXTGEN



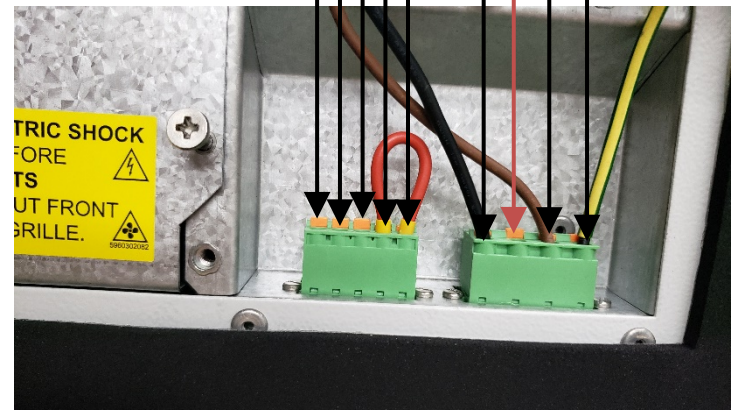
PARTS LIST:

- Sa Ambient Temperature Sensor (Optional)
- Si Internal Temperature Sensor
- Hcc Compressor c/case heater (Optional)
- Hce Condensate evaporator heater
- Hi Internal heater (Optional)
- Cc Compressor capacitor
- Ps DC Power Supply
- Mc Compressor
- Ma Ambient fan
- Mi Internal fan
- At Autotransformer
- A RS495 – connection
- GND GND connection
- B RS485 - B connection

- SCE-NG1195B460V,
- SCE-NG2320B460V,
- SCE-NG1870B460V

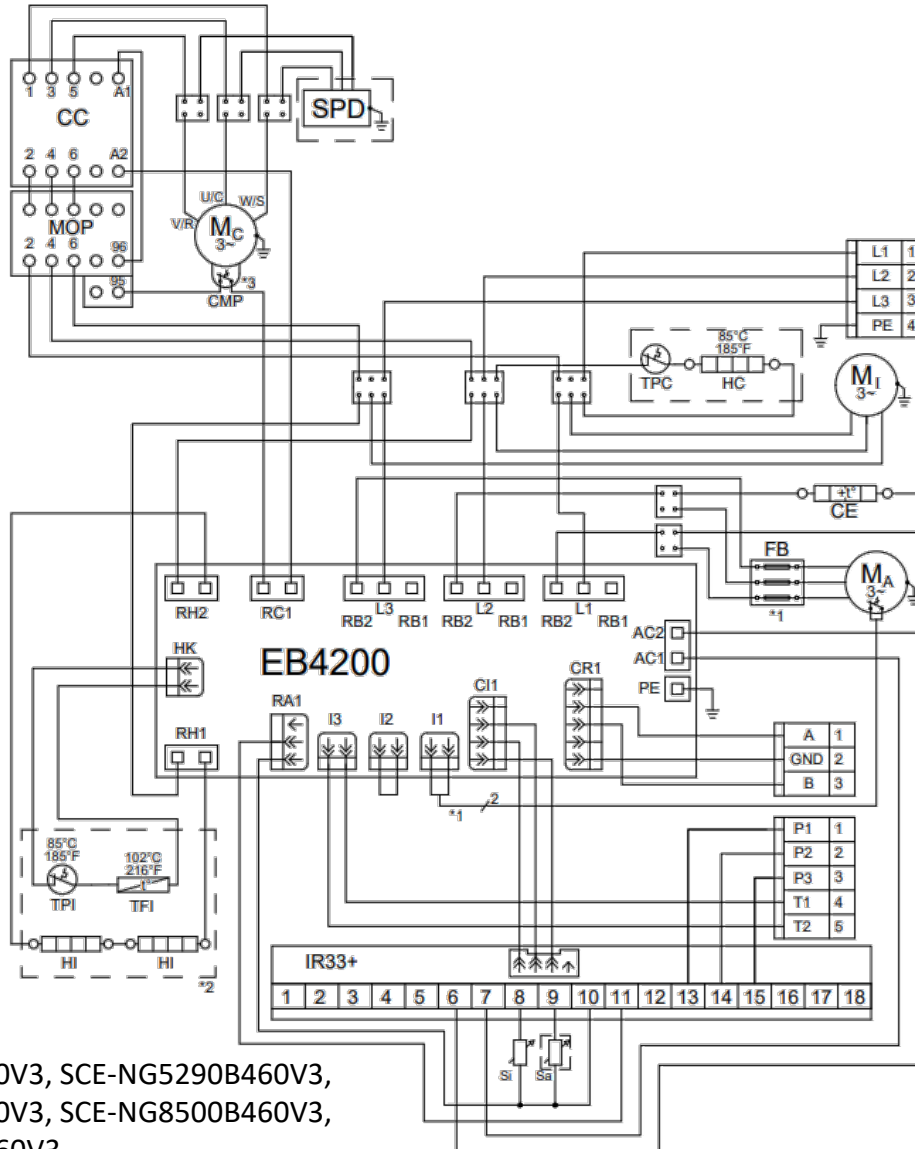
NOTES

See Unit typeplate for correct operating voltage and frequency.
 Suitable protective devices should be installed on the supply line.
 Use copper conductors only.
 Use supply wires suitable for 75°C (167 °F).
ELECTRICAL SUPPLY CONNECTION (see typeplate for correct voltage)
400V: 2-Lx(400V) 3-L2(400V) 460V: 1-L1(460V) 3-L2(460V)



Notes

High temp alarm can be wired NC or NO
 When wires:
 P1 P2 – NO
 When wires:
 P2 P3 - NC



Parts list:

- L1 Live Phase 1
- L2 Live Phase 2
- L3 Live Phase 3
- PE Protective Earth
- P1 High Temperature Alarm NC
- P3 High Temperature Alarm COM
- P3 High Temperature Alarm NO
- T1-T2 Door contact
- A RS495 – connection
- GND GND connection
- B RS485 - B connection
- Si Internal Temperature Sensor
- HI Internal Heater (Option)
- FB Fuse Board
- TFI Thermal Fuse f/ HI
- MI Internal Blower
- MA Ambient Blower
- MC Compressor
- CE Condensate Evaporator
- HC Crankcase Heater (Optional)
- TPC Thermal Cutout f/ HC
- CC Contactor
- MOP Overload Protector
- SPD Surge Arrestor (Optional)
- CMP Compressor Motor Protector
- Sa Ambient Temperature Sensor (Optional)
- TPI Thermal Protector f/ HI

NOTES: Use copper conductors only. Use supply wires suitable for 75 °C (167 °F). *1: Used only for units with cooling capacity higher than 4 kW (13,600 BTU/hr). *2: Connected for units with internal heater (optional). *3: Compressor with internal TOP used for units with cooling capacity higher than 6 kW (20,000 BTU/hr).

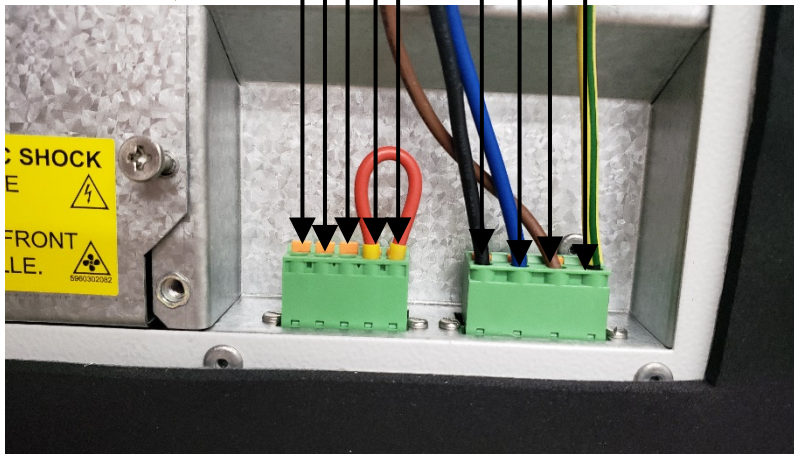
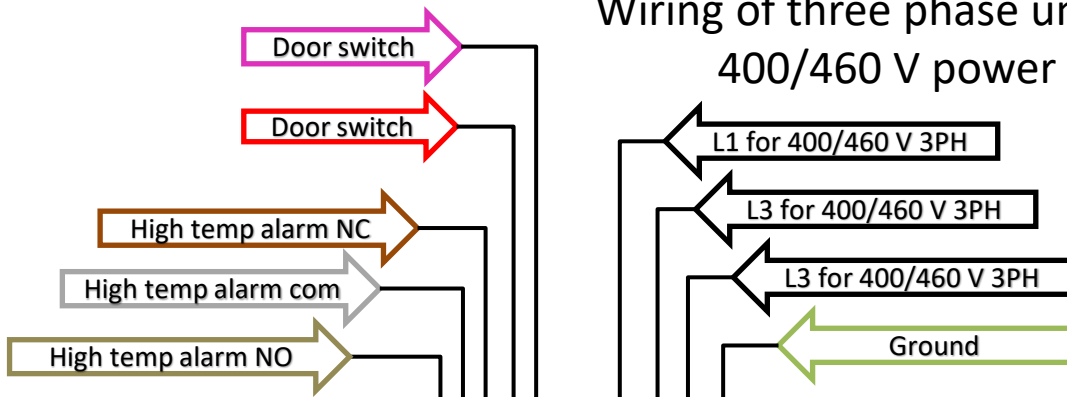
SCE-NG4095B460V3, SCE-NG5290B460V3,
 SCE-NG6800B460V3, SCE-NG8500B460V3,
 SCE-NG14300B460V3

ENVIRO-THERM®

Three phase wiring

NEXTGEN

Wiring of three phase units to 400/460 V power



Notes

High temp alarm can be wired NC or NO

When wires:

P1 P2 – NO

When wires:

P2 P3 - NC

3 Phase 400/460 V units are available with cooling capacities of 4,300, 5,100, 5,800, 8,500 and 14,300BTU/hr

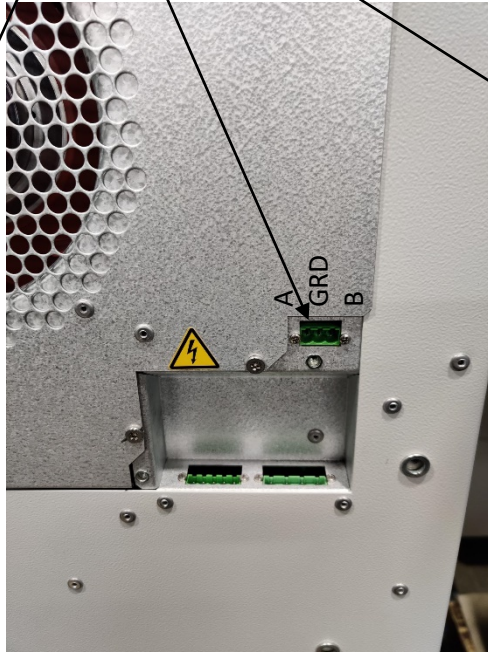
MODBUS connection

Three pole Modbus connector

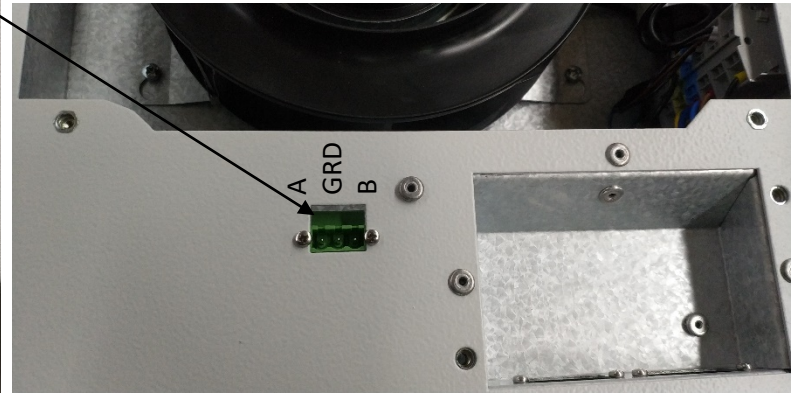
All Enviro-therm units are offered standard with a Modbus connection



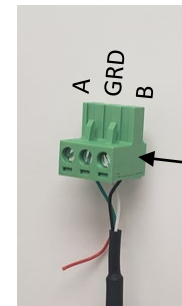
SCE-NG1195B / SCE-NG2320



SCE-NG5100B / SCE-NG6800B /
SCE-NG8500B / SCE-NG14300B



KG4808/KG-KG8412



Modbus connector included

Installation and storage instructions

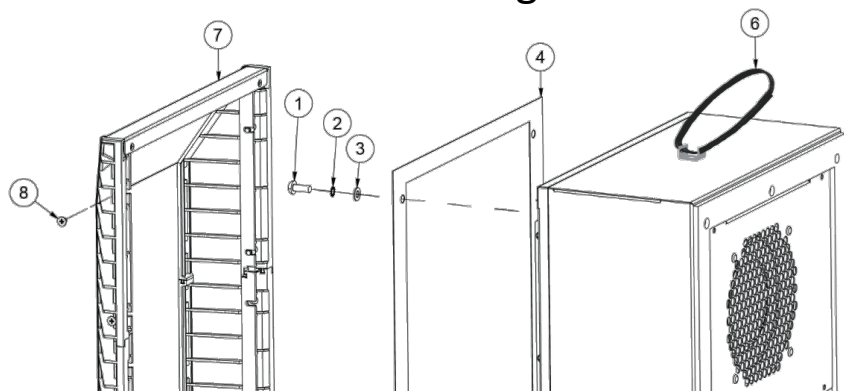
Attention!

The unit must be stood up for at least **30 min** prior to operation

Recessed mounting

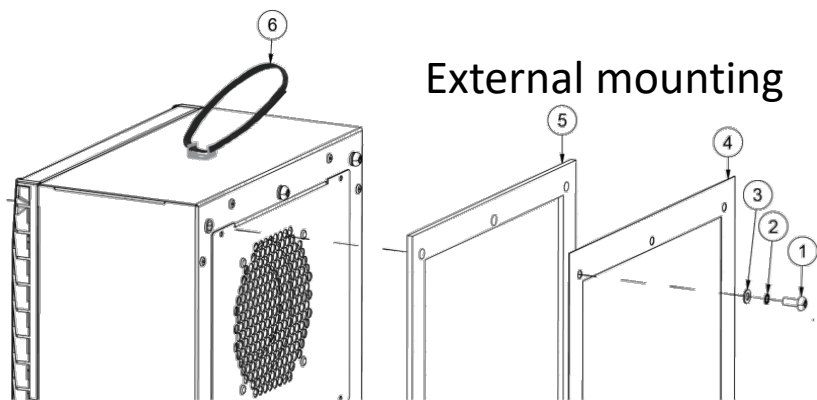


Symbol for
Transportation
and Handling
Position



1. M6 screws
2. M6 toothed washers
3. M6 flat washers
4. Enclosure
5. Mounting gasket
6. Lifting sling
7. Cover
8. M4 screws

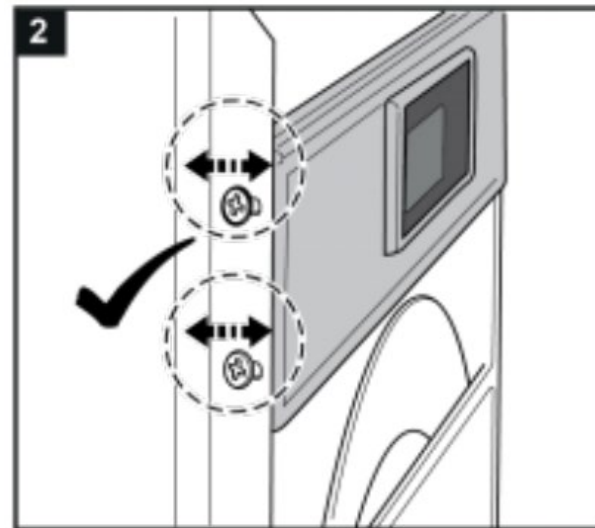
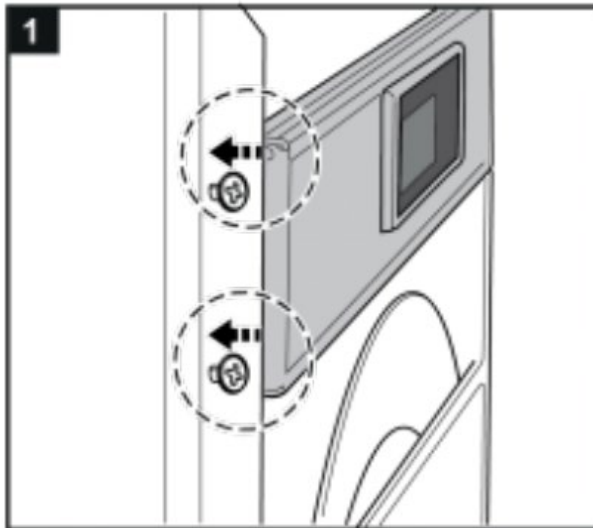
External mounting



During transport and storage the air conditioner unit must be kept in the position marked on the box and at a temperature between -40 °F and 158°F and a relative humidity of max. 95% (at 77 °F). Check the packaging has not been damaged during transport

Installation and storage instructions

If the unit is mounted in a recessed position, the controller bracket can be pulled according to the wall thickness of the enclosure outwards as per steps below.



Safety

Take care!



General danger

Indicates compulsory safety regulations which are not covered by a specific pictogram such as one of the following.



High electric voltage

Indicates electric shock danger.



Important safety instruction

Indicates instructions for safe maintenance and operation of the unit.



Attention

Indicates possible burns from hot components.



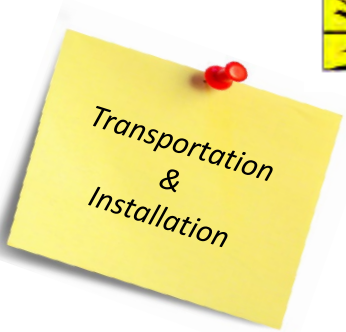
Attention

Indicates possible damage to the unit.



Instruction

Indicates possible danger to the environment.



Attention

The unit can be damaged by lack of lubricant. To ensure that the compressor is adequately lubricated the oil, which has been displaced during transport, must be allowed to flow back into it. The unit must therefore be allowed to stand for at least 30 min. before being connected to the mains and taken into operation.

The unit / system must be protected with a MCB Type D or K. Upon connection the internal fan will start working. If the temperature inside the enclosure is higher than the set value of the controller both the compressor and external air fan start working. The cooling cycle will either stop once the air inside the enclosure reaches the set temperature minus hysteresis or once the minimum On-time is reached.

The hysteresis is 3K, the minimum ON-time is 4 minutes, the minimum OFF-time is 3 minutes, for units with a cooling capacity of more than 1 kW is it usually 7 minutes.

The setpoint for the internal enclosure temperature is pre-set at 95°F.

What to do if air conditioner does NOT cool

Condition	Cause	Solution
Internal fan does not work	Power not connected.	Verify power supply
Internal fan works, external fan and compressor don't work	Enclosure temperature is below setting temperature (St1)	Verify values of parameter "St1"
	Door switch contact is open	Verify door switch
	Controller doesn't work	Replace controller
Internal fan works, external fan and compressor don't work. Display shows alternating OFF and temperature	The sequence of the phases inside the power supply connector is incorrect	Change phases inside power supply connector
External and internal fan work, compressor does not work	Compressor motor electrical failure	Have compressor replaced by qualified service technician
	Capacitor for compressor failed (single phase units)	Replace capacitor
Compressor works, external fan doesn't work	External fan needs to be replaced	Replace external fan

What to do in case of Overtemperature

Condition	Cause	Solution
Compressor and fans (external and internal) work all the time	Cooling unit undersized	Enclosure needs a cooling unit with higher capacity
Compressor and external fan work in alternating mode (ON / OFF)	Thermal compressor protector triggered	Verify if ambient temperature is too high, clean condenser
	Refrigerant leakage	Contact dealer/service center



What to do in case of excessive condensate

Condition	Cause	Solution
Enclosure door open	Ambient air gets into the enclosure	Seal all openings of the enclosure
Enclosure door closed	Enclosure IP protection class is below IP54	Seal all openings of the enclosure
	Damaged or misplaced sealing strip	Repair sealing strip accordingly

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AIR CONDITIONERS: Heat removed from the enclosure is discharged by circulating the ambient air through the condenser coil and returning the heated air to the ambient.

AMBIENT The environment surrounding the product. The word Ambient is typically used to describe the temperature, humidity, air cleanliness or quality including dust and possibly any other harsh weather condition.

CAPILLARY A copper tube with a very small inside diameter. Its function in the refrigerant system is to separate the High Pressure (condenser) side from the Low Pressure (evaporator) side, by providing a calibrated restriction and a resulting pressure drop.

EXPANSION VALVE A refrigerant metering device that provides the same function as a capillary tube (See Capillary), but can provide a variable flow rate to match different load conditions.

BLOWER An air moving device typically used to move air against medium to high static pressure systems. Blowers are designed to operate against higher static pressures than fans.

BTU/H British Thermal Unit per Hour is a unit of measure for heat. Heat is also commonly measured in watts: (1 BTU/H = .29 watts)

CLOSED LOOP COOLING An industry term used to describe a cooling process that reconditions (reuses) the air inside a chamber. The purpose of this system is to prevent contamination from entering the chamber.

COMPRESSOR is the main component in a refrigerant system. Inside compressors there is a motor and a pump that circulates the refrigerant through the rest of the system.

CONDENSATION The process in nature that causes water (condensate) to be removed from the air, and form on a cold surface. This is commonly seen on the outside of a glass of ice water, or dew on grass in the morning.

CONDENSER The hot section of the refrigerant system that removes the waste heat away from the refrigerant system. This is commonly accomplished with either air or water to carry away the heat. This component is called a condenser, because the refrigerant inside is changing state from a gas to a liquid (condensing).

CORROSIVE ATMOSPHERES Corrosive environments, such as those found in chemical plants and in industries where processes result in harsh chemical by-products, usually preclude the use of filtered ambient air for forced convection cooling.

DEW POINT The surface temperature at which condensate (water) will form as related to the air temperature and air humidity. (See Condensation)

HYSTERESIS A property of a system such that an output value is not a strict function of the corresponding input, but also incorporates some delay, or history dependence, and in particular when the response for a decrease in the input variable is different from the response for an increase. For example, a thermostat with a nominal setpoint of 95° F might switch the controlled cooling source on when the temperature rises above 99° F, and off when it drops below 92° F.

EVAPORATOR The section of a refrigerant system that operates colder than the ambient. This component is called an evaporator, because the refrigerant inside is changing state from a liquid to a gas (evaporating).

FILTERS Filters used with typical electronic equipment cooling devices are usually the viscous-impingement type. They utilize fibers that have been coated with a nondrying, tacky substance which traps particulates as air is drawn through. Usually constructed of aluminum foil, the filters can be cleaned, recoated and re-used indefinitely.

WATT A unit of measure for electrical power. Watts are also used to quantify the amount of heat in a system, because 1 watt will convert to 3.413 BTU's.