OceanAire

PROVIDING A BETTER CLIMATE ANYWHERE.

2OAC(H)36-60 SERIES

3-5 Ton Portable Spot Cooler and Heat Pump

ENGINEERING, INSTALLATION AND SERVICE MANUAL

Heating & Cooling

PROUDLY MADE IN THE USA

C ETL US LISTED Intertek

OCEANAIRE-INC.COM

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FORWARD

This manual provides the user with basic details for the installation and operation of OceanAire 2OAC(H)36-60 air cooled, and air-cooled heat pump units. It is recommended to read and fully understand the instructions outlined within this manual, before operating the 2OAC(H) unit.

As with all commercial air conditioning equipment, it is recommended to have the 2OAC(H) sized and installed by a licensed specifying engineer and contractor, in accordance with all local and state codes. The length of service received can be extended by following the installation and preventive maintenance instructions.

In our ongoing process of continuous improvement, the items and procedures described in this manual are subject to change without notice. Please note model and serial number of the 2OAC(H) unit before contacting the factory.

GENERAL INFORMATION

The OceanAire 2OAC(H) is a portable, air-cooled heat pump designed for permanent or temporary spot cooling or heating applications. The entire unit has been built in a premium sheet metal cabinet, equipped with heavy-duty casters for mobility. All 2OAC(H) models come standard with a power cord for electrical connection and added mobility in service. These units direct heated/cooled air to specific areas or objects through a discharge grille located on the upper-front of the unit, while rejecting cooled/heated air from the top of the unit. The 2OAC(H) models outlined in this manual have a capacity ranging from 36,000 BTU/HR to 60,000 BTU/HR to satisfy most space cooling or heating requirements.

The 2OAC(H) is a self-contained unit with the entire system (evaporator and condenser blower assemblies, electrical and refrigeration components), neatly arranged in a gray and blue polyester powder coated metal cabinet. When connected to the proper source of electrical power, the 2OAC(H) is controlled by a deluxe electronic controller, with numerous options of temperature and airflow controls that will provide the desired level of comfort when cooling or heating.

A wide variety of accessories and factory-installed options are available for 2OAC(H) units allowing for improved performance and added versatility.

WARRANTY

ALL OCEANAIRE PRODUCTS ARE COVERED BY THE OCEANAIRE LIMITED WARRANTY 1 YEAR ON THE FULL PRODUCT PLUS 4 ADDITIONAL YEARS FOR THE COMPRESSOR (RESTRICTIONS APPLY).

WARRANTY CARD

It is important that the warranty card be filled out completely and returned to the factory within fourteen (14) days of installation of the unit in order to receive the benefits of the warranty.

NOTICE

NOT APPROVED FOR OUTDOOR USE

Unit will not operate at full capacity when run outdoors, and exposure to elements may result in immediate or premature component failure.

NOMENCLATURE

2 O AC H 60 1 2

- 2nd GENERATION
- DELUXE PORTABLE
- PORTABLE AIR-COOLED
- HEAT PUMP
- NOMINAL CAPACITY
- PHASE (1 – Single Phase; 3 – Three Phase)
- VOLTAGE (2 — 230v; 4 — 460v)

CAPACITY RATING

36.....36,000 BTU/HR

60.....60,000 BTU/HR

COOLING AMBIENT OPERATING RANGE 60° to 105°

HEATING AMBIENT OPERATING RANGE 40° to 85°

MODEL 2OAC(H)	3612	3632	3634	6012	6032	6034
COOLING CAPACITY BTUH	36,000	36,000	36,000	60,000	60,000	60,000
VOLTAGE (V/PHASE) AT 60Hz	208-230/1	208-230/3	460/3	208-230/1	208-230/3	460/3
AMPS	19.6	17.2	8.7	32	20.4	14.8
TOTAL WATTS	3620	3620	3620	6000	6000	6000
IN-RUSH CURRENT	113	93	60	178	162	87
PLUG TYPE	6-30P LCDI	L15-30P	L16-20P	6-50P	L15-30P	L16-20P
EER	10	10	10	10	10	10
COMPRESSOR	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL	SCROLL
COMPRESSOR LRA	109	102.8	50	155	155	58.1
EVAPORATOR CFM - HIGH	1200	1200	1200	1950	1950	1950
EVAPORATOR MOTOR AMPS	3.1	3.1	3.1	3.1	3.1	3.1
CONDENSER CFM	1390	1390	1390	2200	2200	2200
CONDENSER MOTOR AMPS	3.1	3.1	3.1	3.1	3.1	3.1
CONDENSATE PUMP	STANDARD	STANDARD	STANDARD	STANDARD	STANDARD	STANDARD
R-454b CHARGE (oz)	56	56	56	68	68	68
HEIGHT (INCH)	55	55	55	55	55	55
WIDTH (INCH)	28	28	28	28	28	28
DEPTH (INCH)	39	39	39	39	39	39
NET WEIGHT (lb)	485	485	520	485	485	520

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Cooling Capacity is total BTUH at 80°DB/67°WB return air at high fan speed

Time delay fuses/circuit breakers are recommended

EER is determined at High fan speed

CFM with free discharge

Amps and Watts at 208/460 Volts.

Heating & Cooling

PROUDLY MADE IN THE USA

STANDARD FEATURES

CABINET: The 2OAC(H) Series has a cabinet constructed of 18 gauge steel with a polyester, powder-coated finish that will compliment any decor. The entire cabinet is equipped with sound-absorbing insulation for quiet comfort. All units come equipped with handles and premium swivel casters for portability and convenient set-up.

DELUXE ELECTRONIC CONTROLLER: The 2OAC(H) is equipped with a deluxe electronic controller. When proper power is connected to the unit, the thermostat will control the unit to cool or heat a space to the desired temperature. The thermostat is also capable of controlling the fan to operate automatically (when needed) or continuously. To protect the compressor from short-cycling, there is a built-in time delay in the thermostat.

FAN SPEED CONTROL: With The Deluxe Electronic controller, you can set fan speed for manual or automatic. In manual mode setting, the fan speed can be set to any of the six fan speed levels, from 1 (Low) to 6 (High). When set to Automatic, the controller will determine the best fan speed based on the inside temperature and selected SETPOINT. In the manual select fan speed mode, the fan speed may change automatically under certain conditions to protect the compressor. With the unit plugged in and powered off you can set the evaporator fan to continuous run or auto cycle run, press and hold the fan icon button, display CON press up arrow to advance to CYL press gear icon to accept desired running mode.

CONDITION ALARM / ERROR: The deluxe electronic controller is constantly checking unit operation and component function. If the controller detects a fault in operation or with a component, the display will show "ERR" and type of error. See Alarm / Error table (pg. 23) for a list of error codes, system responses, and corrective action.

CONDENSATE PUMP: These 2OAC(H) units are equipped with an Automatic Condensate Pump that removes condensate. The pump discharges through a check valve located on top of the condensate pump assembly. 20 feet of 3/8" ID tubing exits through a water-tight seal at the rear of the unit. The pump has capabilities up to a 20' lift, to handle almost any installation requirement. If a failure occurs with the operation of the pump circuit, the controller will display "FULL" + "TANK", illuminating the alarm icon and sounding an alarm. When the failure has been corrected, or the condensate line blockage/kink has been resolved, the fault will clear, and the unit will resume operation.

HIGH PRESSURE SAFETY SWITCH: Located on the back of the 2OAC(H) unit is a manual reset high pressure switch, used for the protection of the compressor. If the condensing pressure exceeds the limit setting, the switch will cycle the compressor off, while the evaporator fan remains running. The display will error code "ERR" - "HP-1" and sound an alarm. The compressor can be restarted once the condensing pressure has equalized and the high pressure switch has been reset. RESET THE RED BUTTON by pushing down on the red rubber boot, listen for a "click," and restart the unit.

LOW PRESSURE SAFETY SWITCH: Located in the refrigerant circuit, this AUTO RESET switch is an added feature for the protection of the compressor.

FILTERS: All 2OAC(H) units are equipped with washable filters at the air intakes. Electrostatic mesh air filters located behind the evaporator return air grille serve to filter the air before it is cooled/heated, and behind the condenser return grille to prevent dust build-up. Both filters can be easily removed and cleaned.

POWER CORD: All 2OAC(H) units come standard with a power cord for convenient connection. All 3 phase models are equipped with a twist-lock plug for added safety.

APPLICATIONS (COOLING)

COOLING MODE-SPOT COOLER

The 2OAC(H) can be used in an open environment to cool specific objects or "spots". Spot Cooling is a convenient and economical way to provide air conditioning, where Cooling the entire space is impractical. Cool air is discharged from the unit and is directed where it is needed. Nozzle kits can be used for directional cooling.

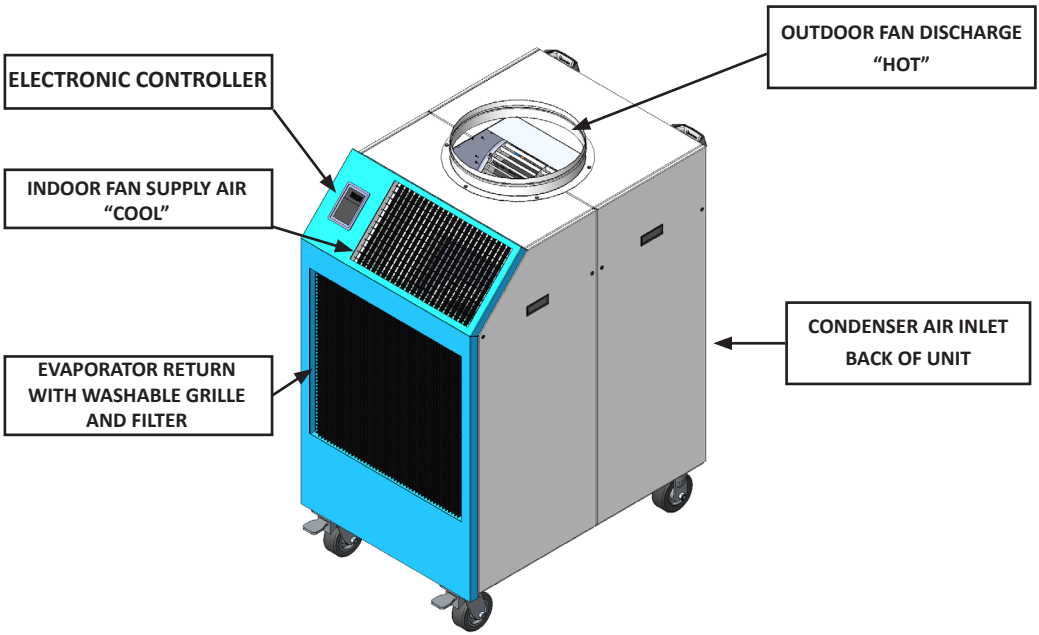
AREA COOLER

When the 2OAC(H) is installed in an open area, the condenser exhaust duct directs the warm air away from the space, allowing the evaporator air to cool the specific area.

ROOM AIR CONDITIONER

When ducted properly, the 2OAC(H) can be used as a room air conditioner to cool an enclosed space. Using the condenser return air plenum, additional ceiling kit, and other accessories, the 2OAC(H) can then operate as a room air conditioner with the condenser air isolated from the conditioned space.

2OAC(H) — COOLING MODE OPERATION / DESCRIPTION



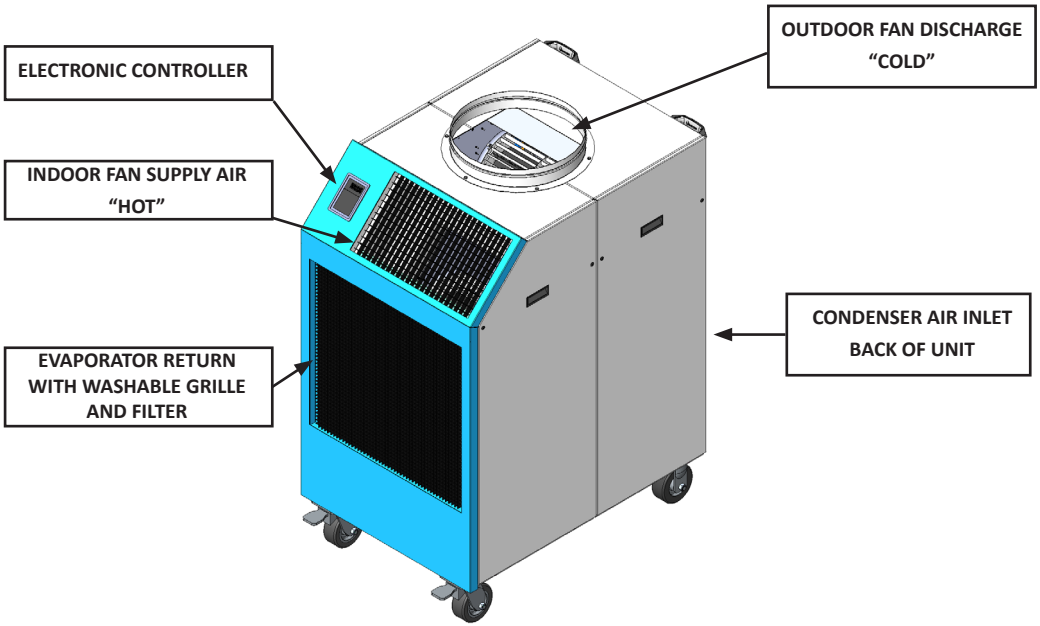
2OACH — COOLING MODE

APPLICATIONS (HEATING)

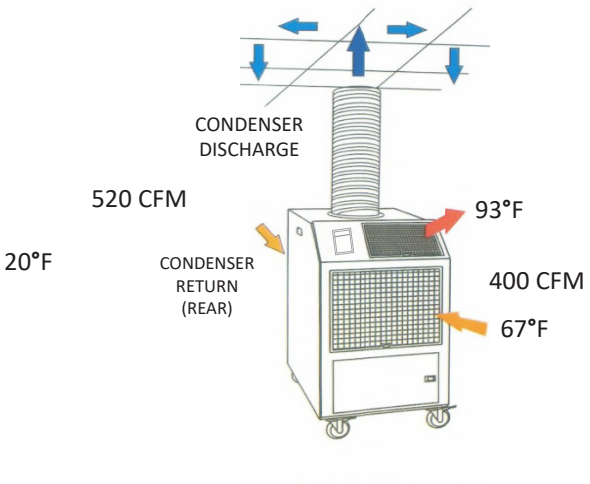
HEATING MODE-HEAT PUMP

In HEAT mode, the 2OACH can be used in an open environment to provide heat to a specific area or "spot". The 2OACH is a heat pump, and the supply air will feel warm, but not extremely hot to the touch. Nozzle kits can be used for directional heating.

2OACH — HEATING MODE OPERATION/DESCRIPTION



HARD-Stack Configuration



- **Room Air Only**
- **Infiltration Low**
- **Stratification**

ELECTRICAL CONFIGURATION

⚠ CAUTION

DO NOT USE THE LCDI AS AN ON/OFF SWITCH FOR THE UNIT. USING CORD AS ON/OFF SWITCH MAY RESULT IN DAMAGE TO THE UNIT/COMPONENTS OR MINOR PERSONAL INJURY.

All 3-phase models are equipped with locking plugs for added connection reliability. Refer to the chart below for plug and receptacle details for all 2OAC(H) models

⚠ WARNING

A DAMAGED LCDI POWER SUPPLY CORD MUST BE REPLACED WITH A NEW POWER SUPPLY CORD AND NOT REPAIRED. FAILURE TO REPLACE THE CORD MAY RESULT IN ELECTRICAL SHOCK LEADING TO INJURY OR DEATH.

PLUG CONFIGURATIONS

UNIT/MODEL	PLUG CONFIGURATION	RECEPTACLE
115 VOLT 2OACH1211	 15A-125 VOLT NEMA 5-15P	NEMA 5-15R
115 VOLT 2OACH1811	 20A-125 VOLT NEMA 5-20P	NEMA 5-20R
208-230 VOLT SINGLE PHASE 2OACH2412	 20A-250 VOLT NEMA 6-20P	NEMA 6-20R
208-230 VOLT SINGLE PHASE 2OACH3612	 30A-250 VOLT NEMA 6-30P	NEMA 6-30R
208-230 VOLT SINGLE PHASE 2OACH6012	 50A-250 VOLT NEMA 6-50P	NEMA 6-50R
208-230 VOLT 3-PHASE 2OACH3632 2OACH6032	 30A-250 VOLT NEMA L15-30P	NEMA L15-30R
460 VOLT 3-PHASE 2OACH3634 2OACH6034	 20A-460 VOLT NEMA L16-20P	NEMA L16-20R

USE OF EXTENSION CORDS

⚠ CAUTION

USE OF EXTENSION CORDS

FOR MODEL 2OAC(H)1211 AN EXTENSION CORD CAN BE USED, PROVIDED IT IS RATED AT LEAST 15 AMPS @ 115 VOLTS WITH GROUNDING-TYPE ATTACHMENT PLUG AND GROUNDING TYPE CONNECTOR (LOAD FITTING)

FOR MODEL 2OAC(H)1811 AN EXTENSION CORD CAN BE USED, PROVIDED IT IS RATED AT LEAST 20 AMPS @ 115 VOLTS WITH GROUNDING-TYPE ATTACHMENT PLUG AND GROUNDING TYPE CONNECTOR (LOAD FITTING)

FOR MODEL 2OAC(H)2412 AN EXTENSION CORD CAN BE USED, PROVIDED IT IS RATED AT LEAST 20 AMPS @ 250 VOLTS WITH GROUNDING-TYPE ATTACHMENT PLUG AND GROUNDING TYPE CONNECTOR (LOAD FITTING)

FOR MODEL 2OAC(H)3612 AN EXTENSION CORD CAN BE USED, PROVIDED IT IS RATED AT LEAST 30 AMPS @ 250 VOLTS WITH GROUNDING-TYPE ATTACHMENT PLUG AND GROUNDING TYPE CONNECTOR (LOAD FITTING)

FOR MODEL 2OAC(H)6012 AN EXTENSION CORD CAN BE USED, PROVIDED IT IS RATED AT LEAST 50 AMPS @ 250 VOLTS WITH GROUNDING-TYPE ATTACHMENT PLUG AND GROUNDING TYPE CONNECTOR (LOAD FITTING)

FOR MODEL 2OAC(H)3632 AND 2OAC(H)6032 AN EXTENSION CORD CAN BE USED, PROVIDED IT IS RATED AT LEAST 30 AMPS @ 250 VOLTS, 3 PHASE

FOR MODEL 2OAC(H)3634 AND 2OAC(H)6034 AN EXTENSION CORD CAN BE USED, PROVIDED IT IS RATED AT LEAST 20 AMPS @ 600 VOLTS, 3 PHASE

SPECIAL NOTICE—THREE PHASE OPERATION

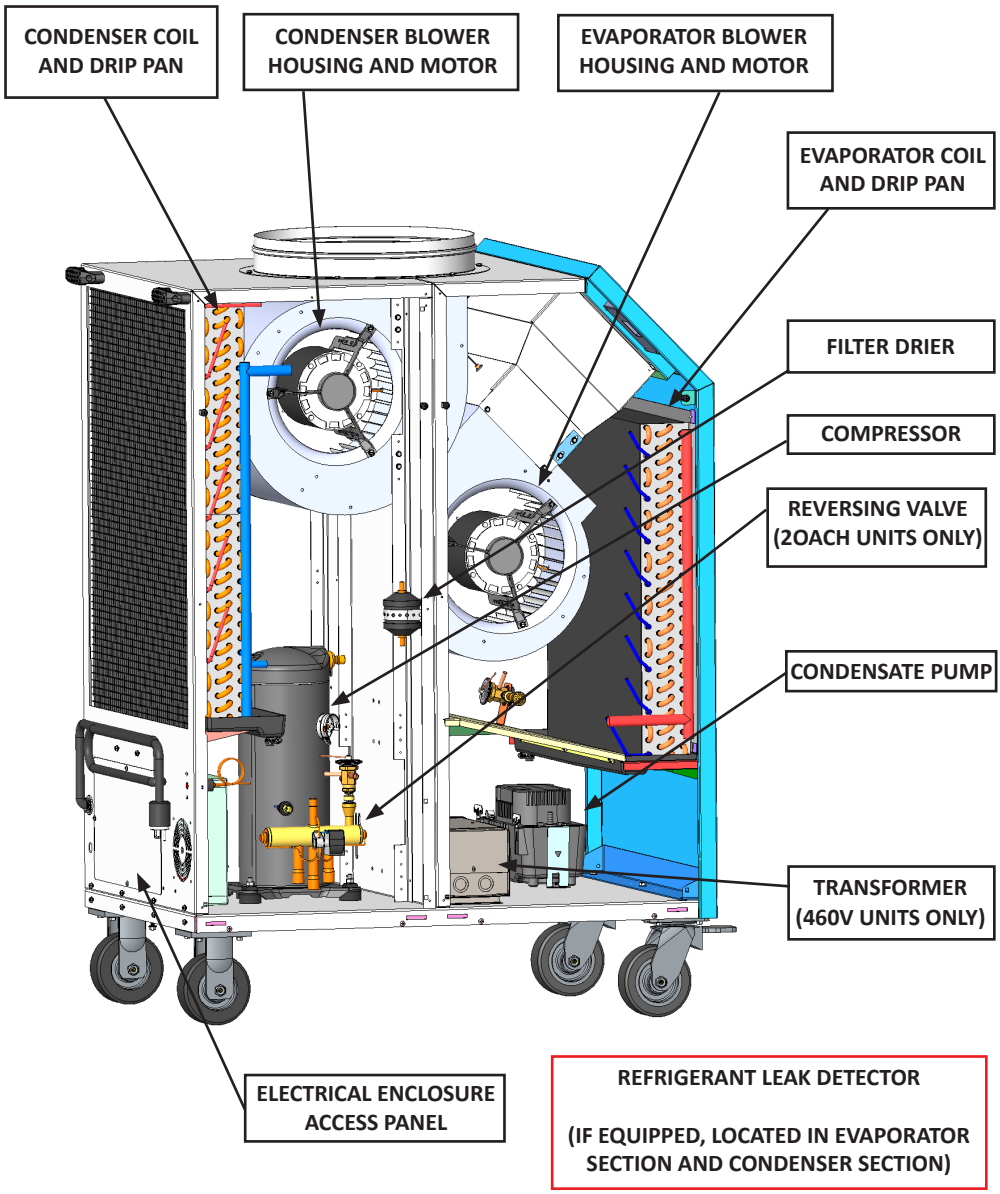
Models 2OAC(H)3632, 2OAC(H)3634, 2OAC(H)6032 and 2OAC(H)6034

All three-phase 2OAC(H) models are equipped with a three-phase monitor for added compressor protection. The phase monitor, located in the control box, has a multi-color LED that reports status. The monitor protects the compressor from reverse operation, phase loss, and low voltage situations. Further description of the three-phase monitor is located in the electrical section of this manual (pg. 24).

⚠ CAUTION

DO NOT OPERATE ANY THREE-PHASE UNIT WHILE BY-PASSING THE MONITOR. THIS WILL VOID THE WARRANTY

2OAC(H) INTERIOR



INSTALLATION INSTRUCTIONS

RECEIVING INSPECTION

Upon receiving your 2OAC(H) unit, inspect the packaging for any damage. All units are shipped on a skid, and packaged in a double-wall carton for added protection.

BEFORE INSTALLING

Check the unit for any damage. All OceanAire products are thoroughly inspected at the factory and carefully packaged. If any damage is evident, contact OceanAire IMMEDIATELY.

START-UP

Install the unit in accordance with all local and state building codes, and install all accessories. Allow for clearance around the unit for future maintenance and/or service. Level unit and lock casters. Connect power cord. Power up unit via controller, and check for proper operation. Refer to Controller Operation (pg. 20-23) for more details.

ELECTRICAL REQUIREMENTS

Check the nameplate data located on the back of the unit to confirm the proper power is available for the unit. Refer to "SPECIFICATIONS" (pg. 4) section for voltage and amperage requirements. For proper NEMA receptacles, refer to "ELECTRONIC SERVICE PLUG CONFIGURATION" (pg. 8). When using an extension cord, use the proper gauge cord, and check voltage to the unit.

NOTICE

TIME DELAY FUSES/CIRCUIT BREAKERS ARE RECOMMENDED TO AVOID DAMAGE TO THE UNIT

⚠ CAUTION

OPERATING THE UNIT ON IMPROPER VOLTAGE MAY RESULT IN PERSONAL OR UNIT DAMAGE, AND WILL VOID THE WARRANTY.

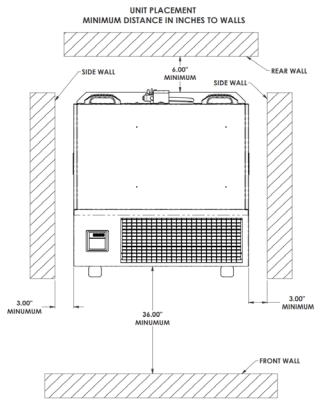
ACCESSORIES

Verify that all accessories are correct for the model, and are installed in accordance with all instructions.

Minimum room area at higher installation heights, use formula:

0.25 x 0.296 x (room height in meters) = X

Refrigerant charge in kg divided by X = minimum room size in square meters

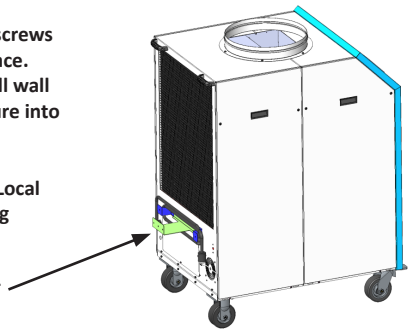


Attach wall mount bracket

Remove the two outer screws holding cord wrap in place. Leaving cord wrap install wall mount bracket and secure into place with two screws.

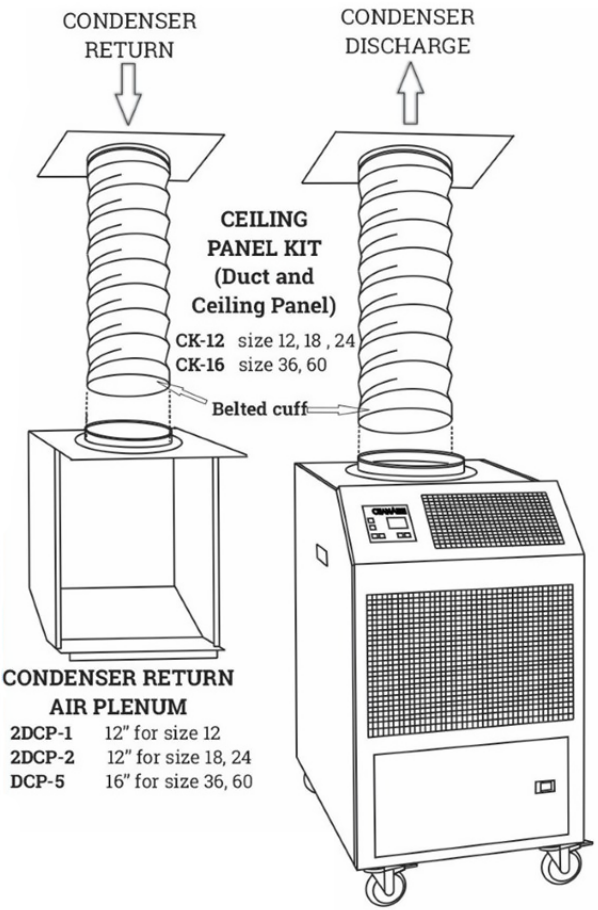
Consult your State and Local requirements for affixing equipment.

WALL MOUNT BRACKET



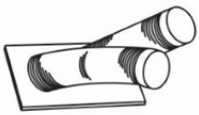
2OAC(H) Optional ACCESSORIES

NOTE - IT IS IMPORTANT TO SPECIFY MODEL NUMBER AND SERIAL NUMBER WHEN ORDERING ACCESSORIES



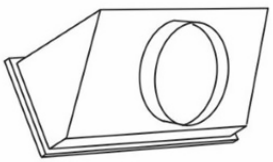
CONDENSER RETURN AIR PLENUM

2DCP-1	12" for size 12
2DCP-2	12" for size 18, 24
DCP-5	16" for size 36, 60



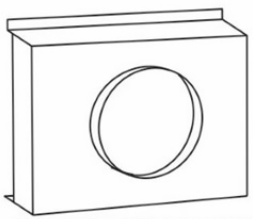
NOZZLE KIT
for Directional Cooling/Heating

2NK-1	2 x 4" for size 12
2NK-2	2 X 6" for size 18, 24
2NK-3	2 X 8" for size 36, 60



DISCHARGE DUCT ADAPTER
for Extended Single Duct Length

2DDA-6	6" for size 12
2DDA-10	10" for size 18, 24
2DDA-16	16" for size 36, 60



EVAPORATOR RETURN AIR PLENUM

DEP-10	10" for size 12
2DEP-12	12" for size 18, 24
DEP-16	16" for size 36, 60

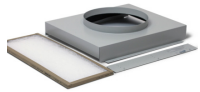
2OAC(H) Optional ACCESSORIES

NOZZLE KIT

2NK-1	(2 X 4-Inch)	2OACH12
2NK-2	(2 X 6-Inch)	2OACH18, 24
2NK-3	(2 X 8-Inch)	2OACH36, 60

EVAPORATOR RETURN AIR PLENUM

DEP-10	(10-Inch Round)	2OACH12
2DEP-12	(12-Inch Round)	2OACH18, 24
DEP-16	(16-Inch Round)	2OACH36, 60



DISCHARGE DUCT ADAPTER

2DDA-6	(6-Inch Round)	2OACH12
2DDA-10	(10-Inch Round)	2OACH18, 24
2DDA-16	(16-Inch Round)	2OACH36, 60

CONDENSER RETURN AIR PLENUM

2DCP-1	(12-Inch Round)	2OACH12
2DCP-2	(12-Inch Round)	2OACH18, 24

DCP-5	(16-Inch Round)	2OACH36, 60

ACCESSORIES

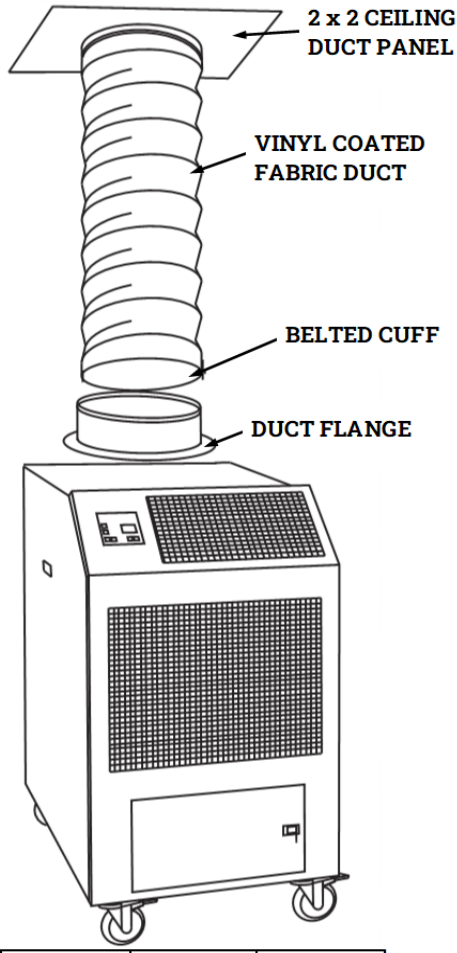
CEILING PANEL DUCT KIT

A ceiling panel kit is available for discharging the condenser air above a drop ceiling. The ceiling panel duct kits are furnished with a white vinyl coated flexible duct that allows for convenient installation. A 2ft X 2ft ceiling duct-panel is included to replace a 2ft X 2ft drop-ceiling panel where the connection is desired.

The **CK-12** is available for 20ACH12, 18, and 24. The ceiling panel kit consists of 8 feet of flexible duct, and a 2' X 2' lay in ceiling panel that attaches to the condenser air discharge opening on the top of the unit. The **CK-16** (for 3 and 5-ton units) consists of a ceiling duct-panel, and a 16 inch flexible duct.

***Note**—Drop ceiling spaces should be vented or large enough to handle the warm condenser air. Check local codes to insure compliance*.

If longer runs of duct are required, table below lists maximum duct run with no bends. For every 90° elbow, subtract 6 feet from the run.



Ceiling Kit Model	Flexible Duct Diameter X Length	Fits 20ACH12	Fits 20ACH18	Fits 20ACH24	Fits 20ACH36	Fits 20ACH60
CK-12	12 inch X 8 feet	✓	✓	✓	No	No
CK-16	16 Inch X 8 feet	No	No	No	✓	✓
Maximum Equivalent Feet (approx) (ESP)		25 (.20)	50 (.25)	60 (.25)	70 (.25)	80 (.50)

ACCESSORIES

DISCHARGE AIR NOZZLE KIT ASSEMBLY

The optional discharge nozzle kits are used to direct the conditioned air to a specific target area. By concentrating the airflow, the nozzles increase the air velocity towards production lines to cool personnel and/or equipment. In server rooms, the nozzles can be used to direct the airflow through the rack to remove the hot air from the area of the equipment.

Nozzle Kit

2NK-1 for model 2OACH12, (2) 4-inch diameter nozzles with an approximate compressed length of 15 inches. The Approximate extended length is 21".

2NK-2 for models 2OACH18, 2OACH24 (2) 6-inch diameter nozzles with an approximate compressed length of 22 inches. The approximate extended length is 32 inches.

2NK-3 for models 2OACH36 and 2OACH60, (2) 8-inch diameter nozzles with an approximate compressed length of 20 inches. The extended length is approximately 29 inches.

The nozzle kits come pre-assembled with the nozzles secured to a mounting plate and with edge guards. By removing the discharge grille, you can insert the nozzle kit into the opening without the use of tools.

CONDENSATE PUMP

The condensate pump provides for the automatic removal of condensate water during the cooling process. The pump is capable of pumping to a 20 foot height, allowing for the routing of the drain line above the drop ceiling to a nearby drain. The pump is controlled by an internal float-switch/check valve, which turns the pump on and off automatically. The pump is also equipped with a condensate over-flow safety switch that will shut down the unit compressor when the pump is not working properly.

Replacement Pump Only
057-021R

ACCESSORIES

CONDENSER RETURN AIR PLENUM

Condenser return air plenums are available for installations where it is required to duct air to the inlet of the condenser. The plenum easily fits into place on the back of the unit, and is provided with a flange for connecting 12-inch or 16-inch flexible ducting. A condenser return air plenum can substantially reduce air noise and allow the unit to operate without drawing condenser air from the conditioned space. Refer to the table below for configuration and application information.

NOTE — When installing the condenser return air plenum with a ceiling panel kit, allow for a minimum separation distance of 2 feet between the unit discharge duct and the return air duct. It is also recommended to direct the condenser discharge air away from the condenser return air duct.

DCP-5

To estimate the "equivalent feet" of condenser duct, add the length of the condenser intake duct run and the length of the condenser discharge duct run, and add 6 equivalent feet per bend in the duct. Make sure that you do not exceed the rated E.S.P. to avoid shut down due to the high pressure switch cut-out.

Plenum Kit	Duct Flange	2OACH12	2OACH18	2OACH24	2OACH36	2OACH60
2DCP-1	12-inch	✓				
2DCP-2	12-inch		✓	✓		
DCP-5	16-Inch				✓	✓
Maximum Approximate Equivalent Feet		25	50	60	70	80
Estimated External Static Pressure		(.20)	(.25)	(.25)	(.25)	(.50)

ACCESSORIES

EVAPORATOR RETURN AIR PLENUM

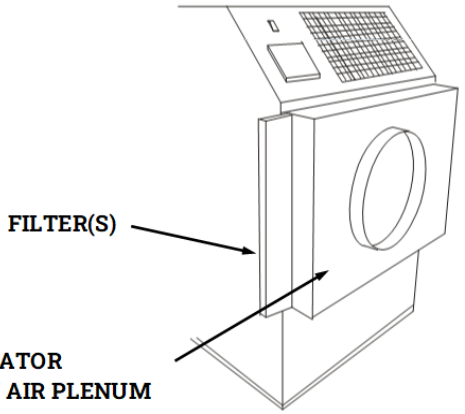
Evaporator return air plenums are available for installations where it is required to duct air to the inlet of the evaporator. The evaporator return air plenum allows the user to connect round duct (flexible or rigid) to the return air intake to reduce air noise and increase the number of options for solving difficult application problems. The plenum attaches to the front of the unit, replacing the return air grille. Refer to the table below for configuration and application information.

DEP-10 for 2OACH12 transitions the return air opening to a 10-inch round duct.

2DEP-12 for 2OACH18 & 2OACH24 transitions the return opening to a 12-inch round duct.

DEP-16 for 2OACH36, 60 transitions the return opening to a 16-inch round duct.

NOTE—When an evaporator return air plenum is installed, it is recommended to set the evaporator blower speed to high, to avoid coil freeze-up.



Plenum Kit Duct/Flange	2OACH12	2OACH18	2OACH24	2OACH36	2OACH60	FILTERS
DEP-10 10 inch	✓					(1) 10" x 20" x 1"
2DEP-12 12 inch		✓	✓			(1) 16" x 24" x 1"
DEP-16 16 inch				✓	✓	(1) 22" x 30" x 1"
Maximum Equivalent Feet	25	50	60	70	80	
Est. External Static Pressure	(.20)	(.25)	(.25)	(.25)	(.50)	

ACCESSORIES

DISCHARGE DUCT ADAPTER

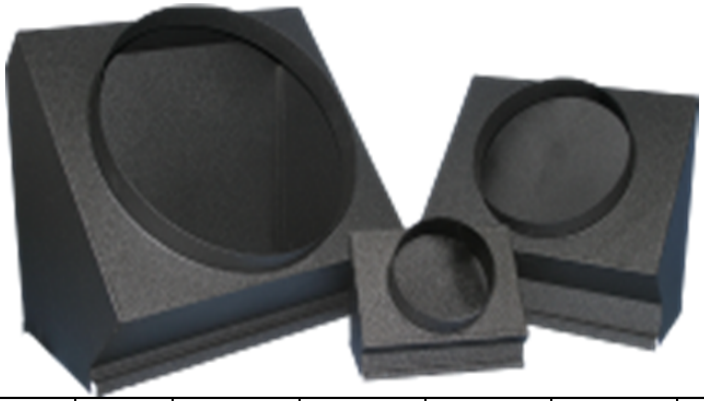
Discharge duct adapters are available for applications where ducted evaporator discharge is required. The adapters can be easily installed on the unit without fasteners, and can be used for either vertical or horizontal ducting. The standard discharge grille is removed and the 2DDA is attached in the grille opening.

2DDA-6 for model 2OACH12, converts the evaporator discharge to a 6-inch diameter round duct.

2DDA-10 for models 2OACH18 and 2OACH24, converts the evaporator discharge to a 10-inch diameter round duct.

2DDA-16 for models 2OACH36 AND 2OACH60, converts the evaporator discharge to a 16-inch round duct.

When used in conjunction with the evaporator return air plenum, the unit can provide a closed-loop cooling solution for a given space without the influence of any outside air.



Adapter Model	Round Duct Size	2OACH12	2OACH18	2OACH24	2OACH36	2OACH60
2DDA-6	6-inch	✓				
2DDA-10	10-inch		✓	✓		
2DDA-16	16-inch				✓	✓
Maximum Approx. Equivalent Feet		25	50	60	70	80
Maximum E.S.P		.15	.25	.25	.25	.50

PREVENTIVE MAINTENANCE

2OACH Heat Pumps are designed to last a long time and to give maximum performance and reliability with minimum maintenance. To prolong the life of the unit, regular maintenance must be performed as specified below:

BLOWER MOTORS

The motors on all units have permanently lubricated bearings. No oiling is necessary.

FILTERS

A clogged filter will cause the unit to operate at greatly reduced efficiency. We recommend that the filter be inspected on a regular basis **every six weeks or less,** depending on the environment. The evaporator filter is located behind the return air grille and can be easily removed and cleaned. The condenser filter is located at the backside of the unit. The filters must be washed periodically as needed by placing them in a dishwasher or soaking them in a solution of warm water and detergent for 10 minutes. Then rinsing them clean with hot water and shaking excess moisture from filter.

CONDENSATE PUMP - MAINTENANCE

When servicing pump, follow these steps:

1. Make certain that the unit is disconnected from the power source before attempting to service or remove any component.

2. Be sure the float moves freely. Clean as necessary.

3. Remove the pump housing and check for obstructions.

4. Clean the housing with warm water and mild soap when mineral deposits are visible.

5. Check the inlet and outlet piping. Clean as necessary. Be sure there are no kinks in the lines that would restrict flow.

GENERAL

When necessary maintenance steps outlined above are followed, the air conditioner will provide long and reliable service. The refrigeration and electrical circuits of the system should only be serviced by a fully qualified service technician.

DELUXE ELECTRONIC CONTROLLER

The 2OAC(H) deluxe controller is equipped with many features for a more precise level of cooling, heating and dehumidification operation. With the addition of a remote sensor, the controller can sense temperatures in another space or in ductwork. Sensing temperature overrides the temperature sensing bulb located behind the evaporator grille.

OceanAire DELUXE ELECTRONIC CONTROLLER

When the unit is plugged in, the Green Plug icon will illuminate indicating the unit is receiving power. Pressing the Power Button on the controller will display your unit Type, Refrigerant and Model. Example: "ACH" for HEAT PUMP, "454" for 454b refrigerant, then "3612" for Model number. When powered on, the controller will automatically check for correct power phase on a 3-phase unit, and correct line voltage on non 3-phase units. If power is out of phase, the controller will display "ERR" + "PWR". If line voltage is out of operational range, the controller will also display "ERR" + "PWR". If a 3-phase or line voltage error occurs, have a certified electrician check the building's power receptacles. If 3-phase power is OK and line voltage is in range, no error will be displayed and you are OK to operate your unit.

The system controls temperature within +/-2°F

CONTROLLER BUTTON AND ICON TABLE

CONTROLLER BUTTONS	
	POWER BUTTON
	MODE BUTTON
	THERMOMETER BUTTON
	ALARM/BEEPER BUTTON
	UP / DOWN ARROW BUTTON
	FAN SPEED BUTTON
	GEAR BUTTON

CONTROLLER ICONS	
	POWER = Indicates unit is plugged in
	HEAT MODE = Indicates unit is in heat mode
	AUTO MODE = Indicates unit is in AUTO cool/heat mode
	COOL MODE = Indicates unit is in cooling mode
	DEHUMIDIFY MODE = Indicates unit is in dehumidification mode
	WARNING = Indicates unit is in alarm or error mode
	FAN SPEED = Indicates level of fan speed in manual mode
	AUTO FAN MODE = Indicates unit is in auto adjust fan speed
	MANUAL FAN MODE = indicates unit is in manual select fan speed
	FAHRENHEIT MODE = Indicates unit temperature is set to F
	CELSIUS MODE = Indicates unit temperature is set to C
	TEMPERATURE DISPLAY = Controller will display Ambient temperature
	TEMPERATURE DISPLAY = Controller will display Evaporator discharge air temperature
	TEMPERATURE DISPLAY = Controller will display user setpoint temperature
	TEMPERATURE DISPLAY = Controller will display Ambient temperature at remote probe if installed

CONTROLLER BUTTON GUIDE

POWER – Turns the unit on/off when power is supplied

MODE – Selects the mode of operation between Cooling, Heating, Auto and Moisture Control.

MODE SELECT – Options Cooling, Heating, Auto or dehumidify modes. With the unit plugged in and powered on press the MODE button to toggle between modes: COOL mode indicated by an illuminated snowflake, HEAT mode indicated by three illuminated/wavy red lines, AUTO mode indicated by the word "AUTO" illuminated, and DEHUMIDIFY mode indicated by an illuminated water-drop. When the desired mode is illuminated, press the gear button to accept.

COOL MODE - 2OAC(H) unit will cycle the cooling system +/- 2 degrees to maintain set-point temperature.

HEAT MODE - 2OACH unit will cycle the heating system +/- 2 degrees to maintain set-point temperature.

AUTO MODE - 2OAC(H) unit will cycle between cooling and heating systems to maintain set-point temperature.

DEHUMIDIFICATION MODE – 2OAC(H) unit operates the cooling system to reduce humidity within the conditioned space. The controller constantly checks ambient room temperature; if temperature drops 2 degrees below setpoint, the compressor will turn off and the fan will remain on circulating air. Your 2OAC(H) unit will continue to monitor ambient temperature and cycle Moisture Control as needed.

FAHRENHEIT / CELSIUS SELECT – Press the THERMOMETER Button and MODE Button simultaneously to toggle between "F" and "C". Controller display will illuminate "F" or "C". When desired Temperature mode is illuminated, press the GEAR Button to accept

SETPOINT TEMPERATURE – 2OAC(H) unit can be set to operate between 60°F(16°C) and 85°F(29°C)

SETPOINT TEMPERATURE ADJUST – Press the UP-ARROW Button to increase the setpoint temperature in 1-degree increments. Press the DOWN-ARROW Button to decrease the setpoint temperature in 1-degree increments. The controller display will show setpoint temperature change with each button press, when desired setpoint is shown no further button press required controller will automatically accept the new setpoint temperature

FAN SPEED – You can set your 2OACH unit to operate in AUTO fan speed mode or MANUAL fan speed mode. Manual fan speed mode has six fan speed selections. Note: When in MANUAL fan speed mode your 2OAC(H) may change fan speed to protect the unit's compressor.

FAN SPEED MODE SELECT – Press the FAN Button to toggle between AUTO fan speed and Manual fan speed levels. For AUTO, press the FAN Button until AUTO illuminates next to the fan speed indicator bar; press the GEAR Button to accept. For MANUAL fan speed, press the FAN Button until MANUAL illuminates next to the fan speed indicator bar. The first bar on the speed indicator will illuminate. This is fan speed 1. Fan speed will advance through all 6 speeds with each FAN Button press. When desired fan speed is reached, press the GEAR Button to accept. With the unit plugged in and powered off you can set the evaporator fan to continuous or auto cycle run, press and hold the fan icon button, display CON, press the up arrow to advance to CYL press the gear icon to accept the desired running mode.

ALARM / ERROR – In the event of a system ALARM or ERROR, the controller will display an ERROR message and the ALARM beeper will sound. To silence the alarm, press the ALARM Button. See ERROR CODE TABLE for list of error codes, system responses and required action.

TEMPERATURE DISPLAY PROBE SELECT— Press the Thermometer Button to cycle through the four temperature display modes. The controller will cycle through the four options and the icon at the top of the controller will illuminate. "INSIDE" will display Ambient temperature, "DISCHARGE" will display discharge air temperature, "SETPOINT" will display unit setpoint temperature and "EXTERNAL" will display remote ambient temperature if probe is installed. When the desired mode of temperature display is illuminated, press the GEAR Button to accept.

ALARM / ERROR CODES

ERROR CODE	ERROR TITLE	ERROR CONDITION	SYSTEM RESPONSE	CORRECTIVE ACTION
ERR + MC	MACHINE CONTROL CIRCUIT	MC DETECTS AN INTERNAL CIRCUIT FAILURE THAT PREVENTS IT FROM OPERATING PROPERLY	DISPLAY ERR + MC, SOUND ALARM, UNIT WILL NOT OPERATE	CONTACT OCEANAIRE TECH SUPPORT
ERR + UI	USER INTERFACE CIRCUIT	UI DETECTS AN INTERNAL CIRCUIT FAILURE THAT PREVENTS IT FROM OPERATING PROPERLY	DISPLAY ERR + UI, SOUND ALARM, UNIT WILL NOT OPERATE	CONTACT OCEANAIRE TECH SUPPORT
ERR + COMM	UI/MC COMMUNICATIONS ERROR	UI IS UNSUCCESSFUL AT COMMUNICATING WITH THE MC	DISPLAY ERR + COMM, SOUND ALARM, UNIT WILL NOT OPERATE	CONTACT OCEANAIRE TECH SUPPORT
ERR + USB	UNIVERSAL SERIAL BUS	USB DOWNLOAD UNSUCCESSFUL	DISPLAY ERR + USB, SOUND ALARM, UNIT WILL NOT OPERATE	CONTACT OCEANAIRE TECH SUPPORT
ERR + PWR	LINE VOLTAGE OUT OF RANGE	NON-3-PHASE POWER VOLTAGE AT END USER RECEPTACLE IS OUT OF RANGE	DISPLAY ERR + PWR, SOUND ALARM, UNIT WILL NOT OPERATE	CONTACT OCEANAIRE TECH SUPPORT. HAVE CERTIFIED ELECTRICIAN CHECK BUILDING POWER / RECEPTACLE(S)
ERR + PWR	POWER CONNECTION OUT OF PHASE	3-PHASE POWER AT END USER RECEPTACLE IS OUT OF PHASE	DISPLAY ERR + PWR, SOUND ALARM, UNIT WILL NOT OPERATE	CONTACT OCEANAIRE TECH SUPPORT. HAVE CERTIFIED ELECTRICIAN CHECK BUILDING POWER / RECEPTACLE(S)
ERR + TP1	TEMPERATURE SENSOR #1	CONTROLLER IS NOT RECEIVING SENSOR SIGNAL	DISPLAY ERR + TP-1, SOUND ALARM, UNIT WILL CONTINUE TO OPERATE	CONTACT OCEANAIRE TECH SUPPORT, REPLACE TP-1
ERR + TP2	TEMPERATURE SENSOR #2	CONTROLLER IS NOT RECEIVING SENSOR SIGNAL	DISPLAY ERR + TP-2, SOUND ALARM, UNIT WILL CONTINUE TO OPERATE	CONTACT OCEANAIRE TECH SUPPORT, REPLACE TP-2
ERR + TP3	TEMPERATURE SENSOR #3	CONTROLLER IS NOT RECEIVING SENSOR SIGNAL	DISPLAY ERR + TP-3, SOUND ALARM, UNIT WILL CONTINUE TO OPERATE	CONTACT OCEANAIRE TECH SUPPORT, REPLACE TP-3
ERR + TP4	TEMPERATURE SENSOR #4	CONTROLLER IS NOT RECEIVING SENSOR SIGNAL	DISPLAY ERR + TP-4, SOUND ALARM, UNIT WILL CONTINUE TO OPERATE	CONTACT OCEANAIRE TECH SUPPORT, REPLACE TP-4
ERR + TP5	TEMPERATURE SENSOR #5	CONTROLLER IS NOT RECEIVING SENSOR SIGNAL	IF EQUIPPED, DISPLAY ERR + TP-5, SOUND ALARM, UNIT WILL CONTINUE TO OPERATE	CONTACT OCEANAIRE TECH SUPPORT, REPLACE TP-5
ERR + HP-1	HIGH PRESSURE SWITCH	HIGH PRESSURE SWITCH READS PRESSURE THAT EXCEEDS MAXIMUM ALLOWED	DISPLAY ERR + HP-1, SOUND ALARM, UNIT WILL NOT RUN UNTIL PRESSURE IS IN OPERATING RANGE	MANUALLY RESET HIGH PRESSURE SWITCH, CONTACT OCEANAIRE TECH SUPPORT IF ERROR PERSISTS
ERR + LP-1	LOW PRESSURE SWITCH	LOW PRESSURE SWITCH READS PRESSURE BELOW MINIMUM ALLOWED	DISPLAY ERR + LP-1, SOUND ALARM, UNIT WILL NOT RUN UNTIL PRESSURE IS IN OPERATING RANGE	CONTACT OCEANAIRE TECH SUPPORT
ERR + LDET	REFRIGERANT LEAK	LEAK IN REFRIGERATION SYSTEM	IF EQUIPPED, DISPLAY ERR + LDET, SOUND ALARM, SHUT DOWN REFRIGERATION SYSTEM, TURN ON ALL FANS	CONTACT OCEANAIRE TECH SUPPORT
FULL - TANK	CONDENSATE TANK	CONDENSATE TANK PUMP RESERVOIR IS FULL	DISPLAY FULL + TANK, SOUND ALARM, UNIT WILL CONTINUE TO OPERATE	POWER OFF UNIT AND UNPLUG, REMOVE CONDENSATE TANK AND EMPTY, REPLACE EMPTY TANK, PLUG IN UNIT AND POWER ON

NOTICE

DO NOT REMOVE ANY UNIT PANELS OR ATTEMPT ANY SELF REPAIR. CONTACT OCEANAIRE TECH SUPPORT.

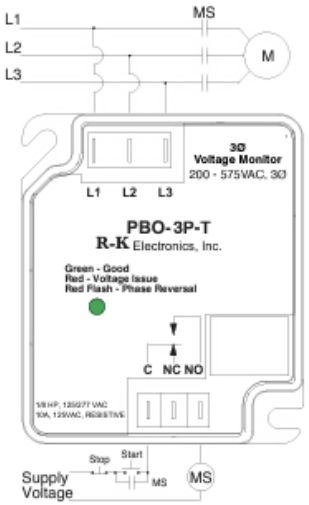
ALL REPAIRS SHOULD BE MADE BY A CERTIFIED/ LICENSED ELECTRICIAN/HVAC SERVICE TECH

THREE-PHASE MONITOR

OceanAire Three-Phase units are equipped with phase monitors for compressor motor protection. The Three-Phase Monitor safeguards the compressor against phase reversal, phase imbalance and/or phase loss. The monitor is installed in the control box and is equipped with LED's for diagnosis of electrical conditions. The 2OACH Three-Phase unit(s) controller is also equipped with phase detection.

⚠WARNING

When power is connected and unit is turned on the 2OACH controller will first check phase before sending power to any component. If power is out of phase, the display will show "ERR" + "PWR" and sound and alarm. If the phase alarm has sounded, remove the control box access to observe the LED's on the Phase Monitor.



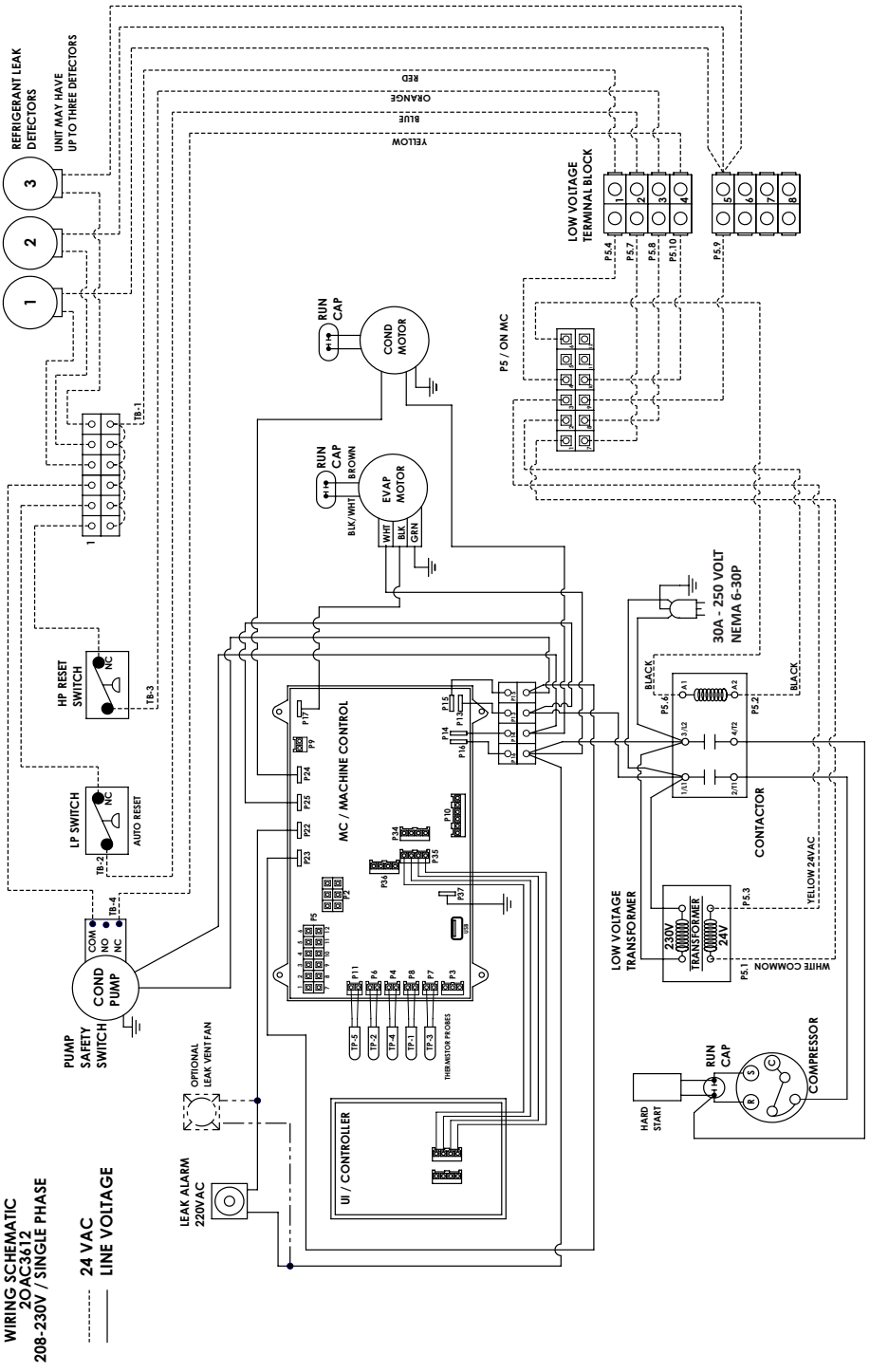
Three Phase Monitor — PBO-3P-T LED's

The PBO-3P-T monitors 5 three phase voltages with the tolerances pre-programmed into the PBO. Each time the PBO is powered up, the compressor evaluates the line voltage and compares it to the pre-programmed line voltages and tolerances. If the line voltage matches one of the programmed voltages and is within the tolerances, the output relay will be energized and the LED will be GREEN. The PBO will indicate what voltage it is set for by flashing the LED GREEN in a sequence corresponding to the selected voltage. If a voltage fault is detected, the LED will be RED and if the Phases are reversed, the LED will FLASH RED.

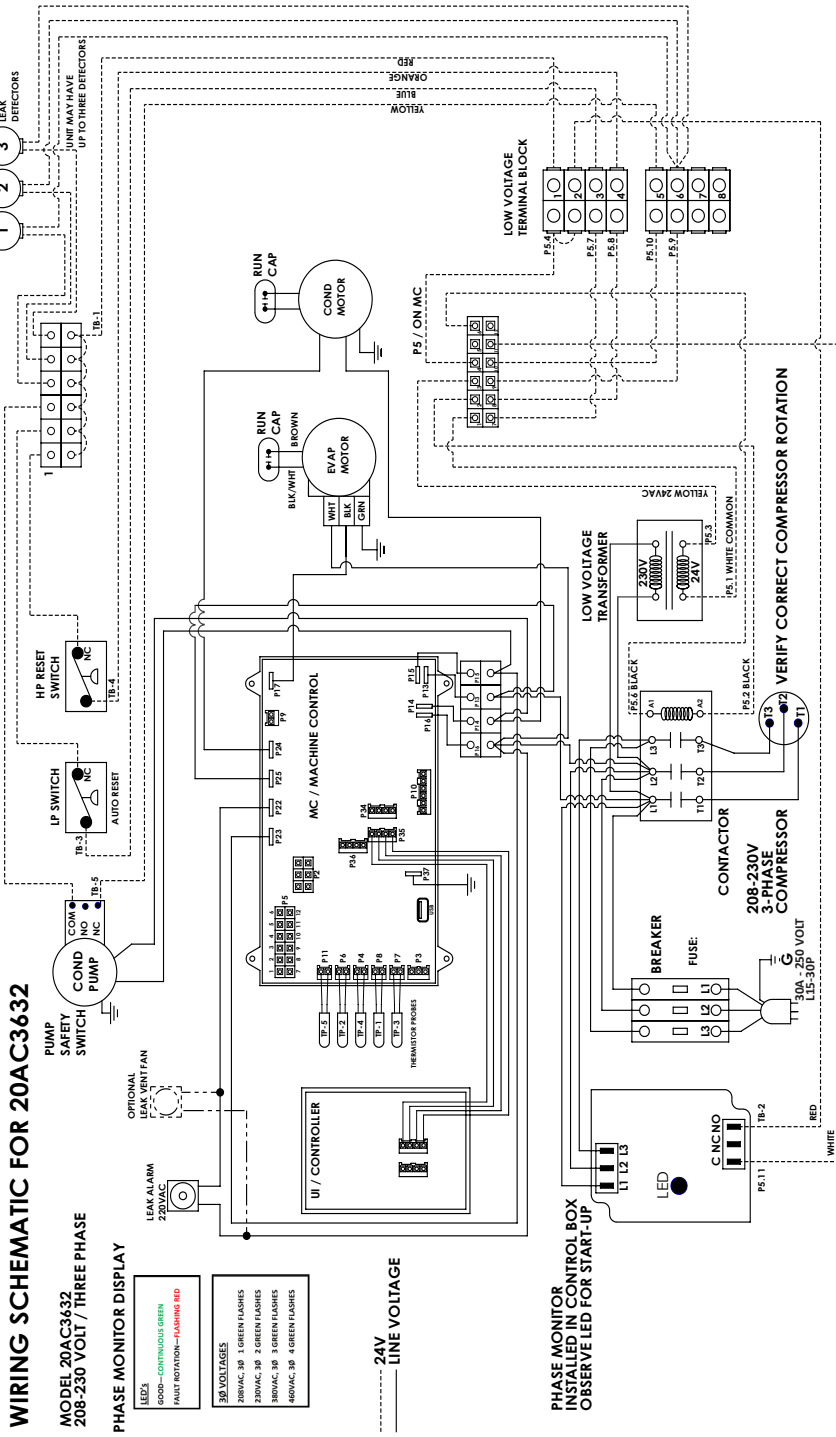
3Ø VOLTAGES	
208VAC, 3Ø	1 GREEN FLASH
230VAC, 3Ø	2 GREEN FLASHES
380VAC, 3Ø	3 GREEN FLASHES
460VAC, 3Ø	4 GREEN FLASHES
575VAC, 3Ø	5 GREEN FLASHES

LED's
GOOD - CONTINUOUS GREEN
FAULT - FLASHING RED
FAULT VOLTAGE - SOLID RED

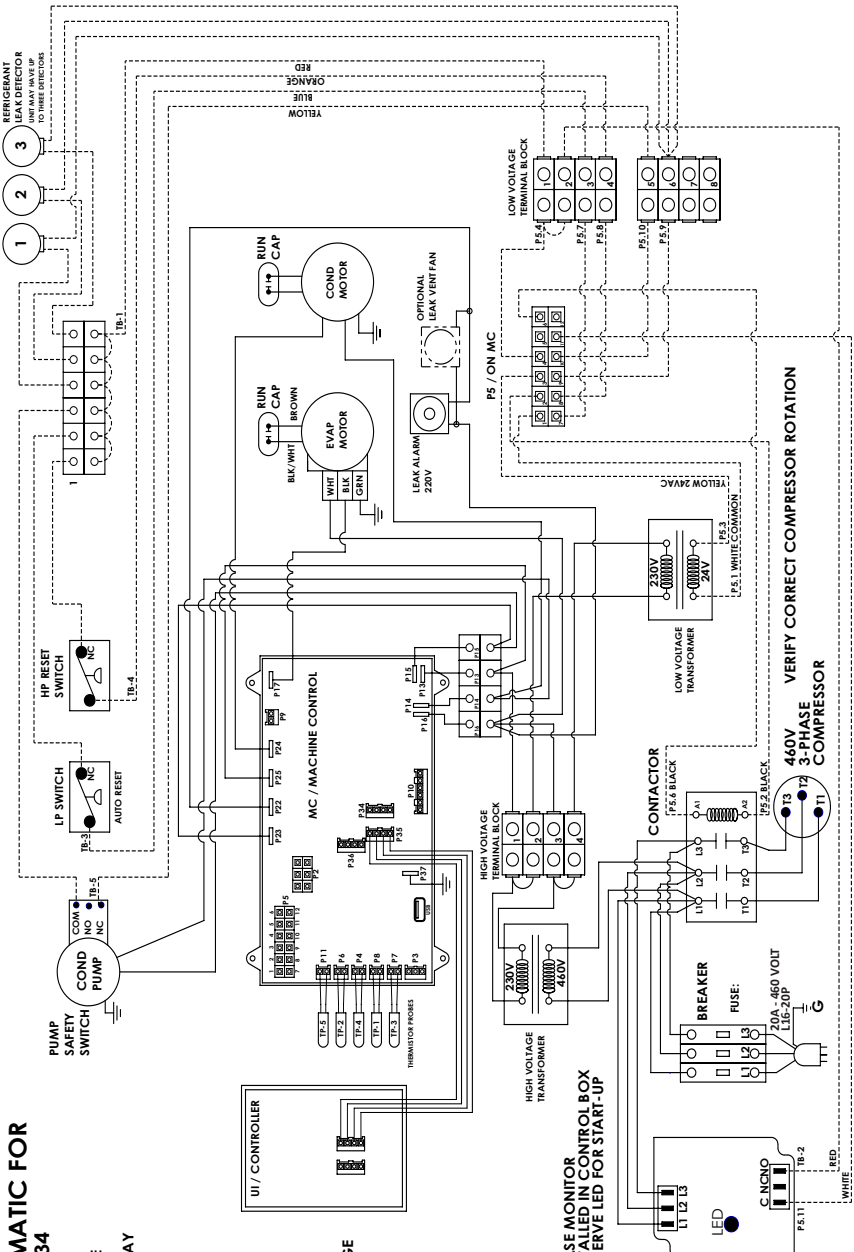
2OAC3612 WIRING DIAGRAM



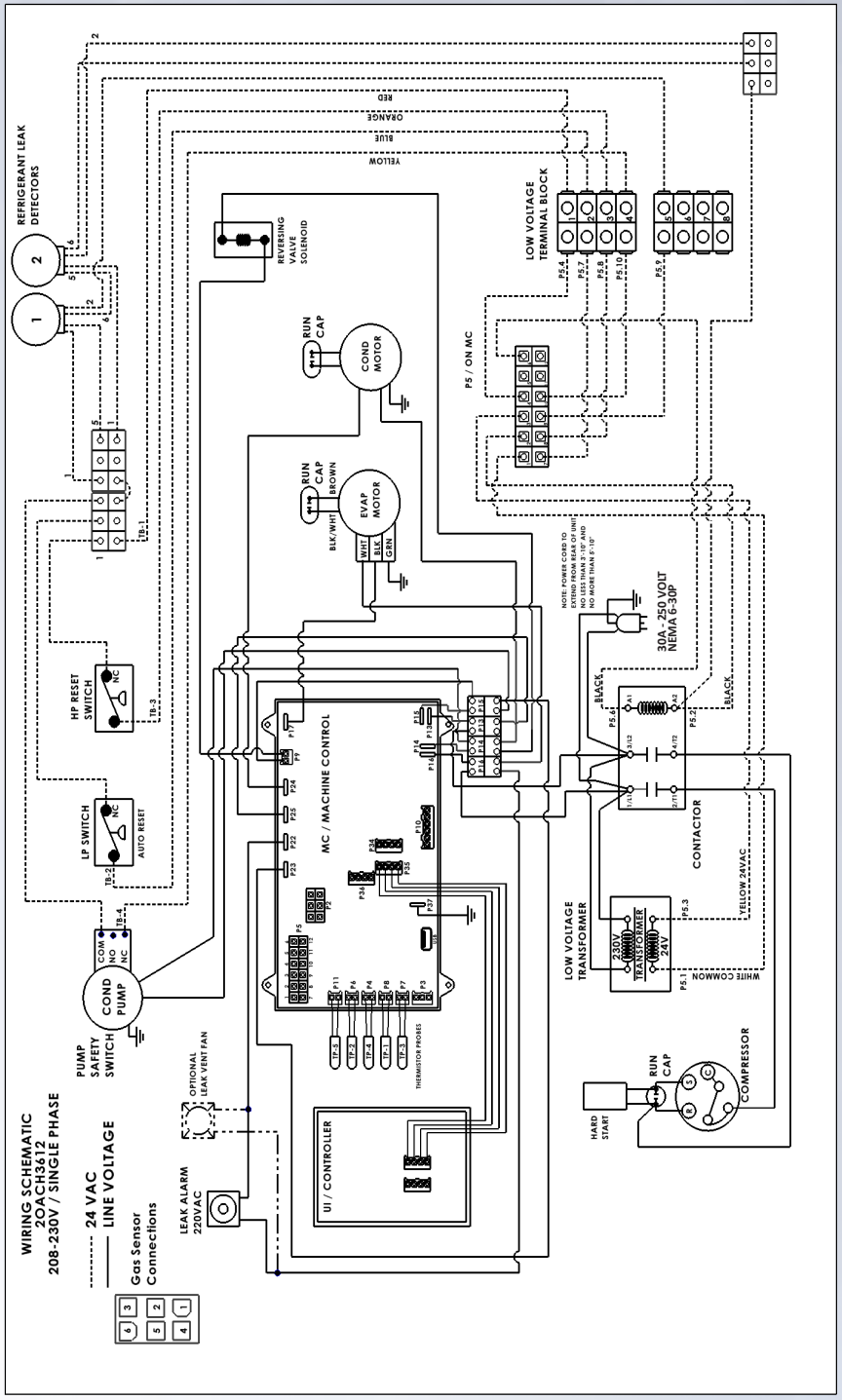
2OAC3632 WIRING DIAGRAM



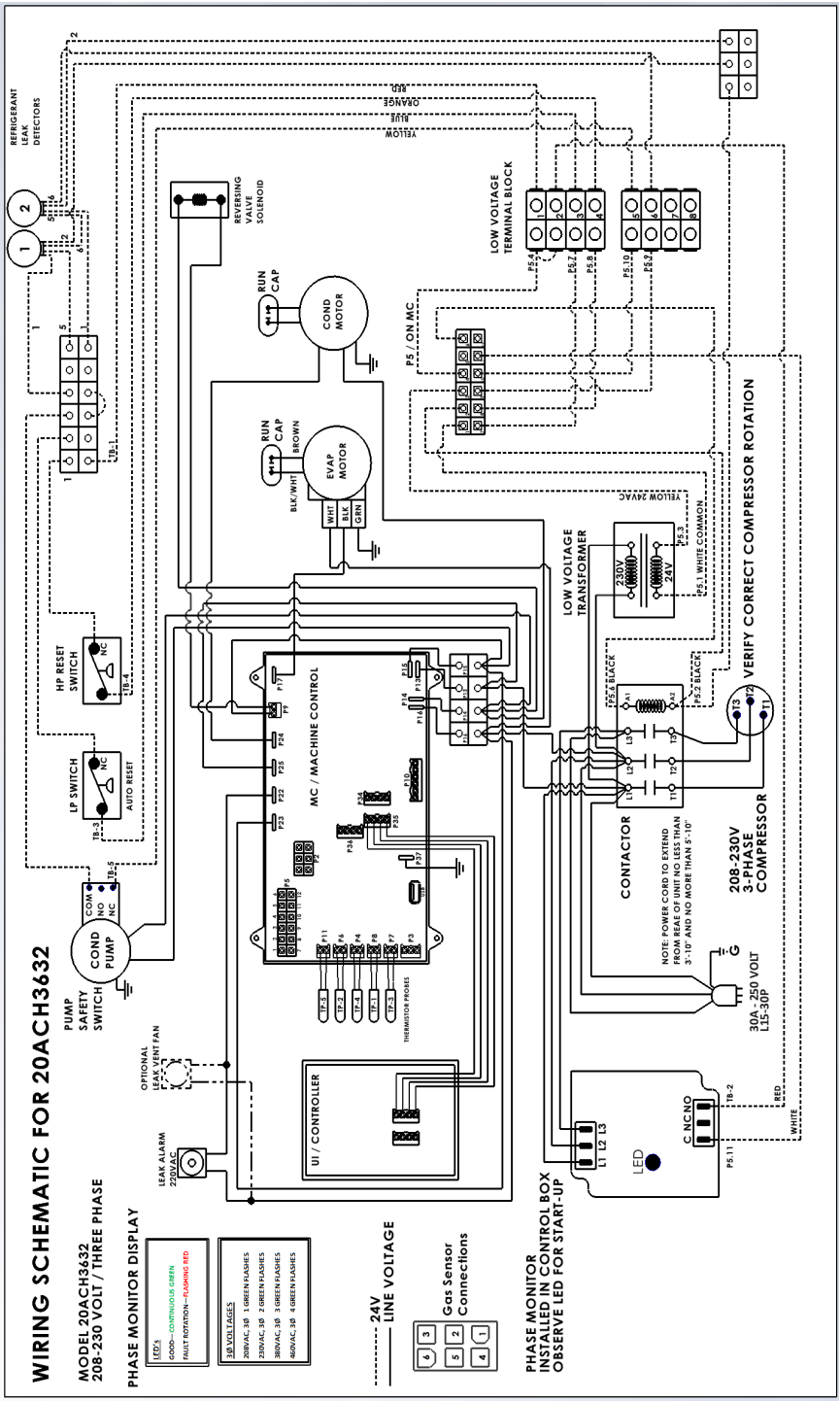
2OAC3634 WIRING DIAGRAM



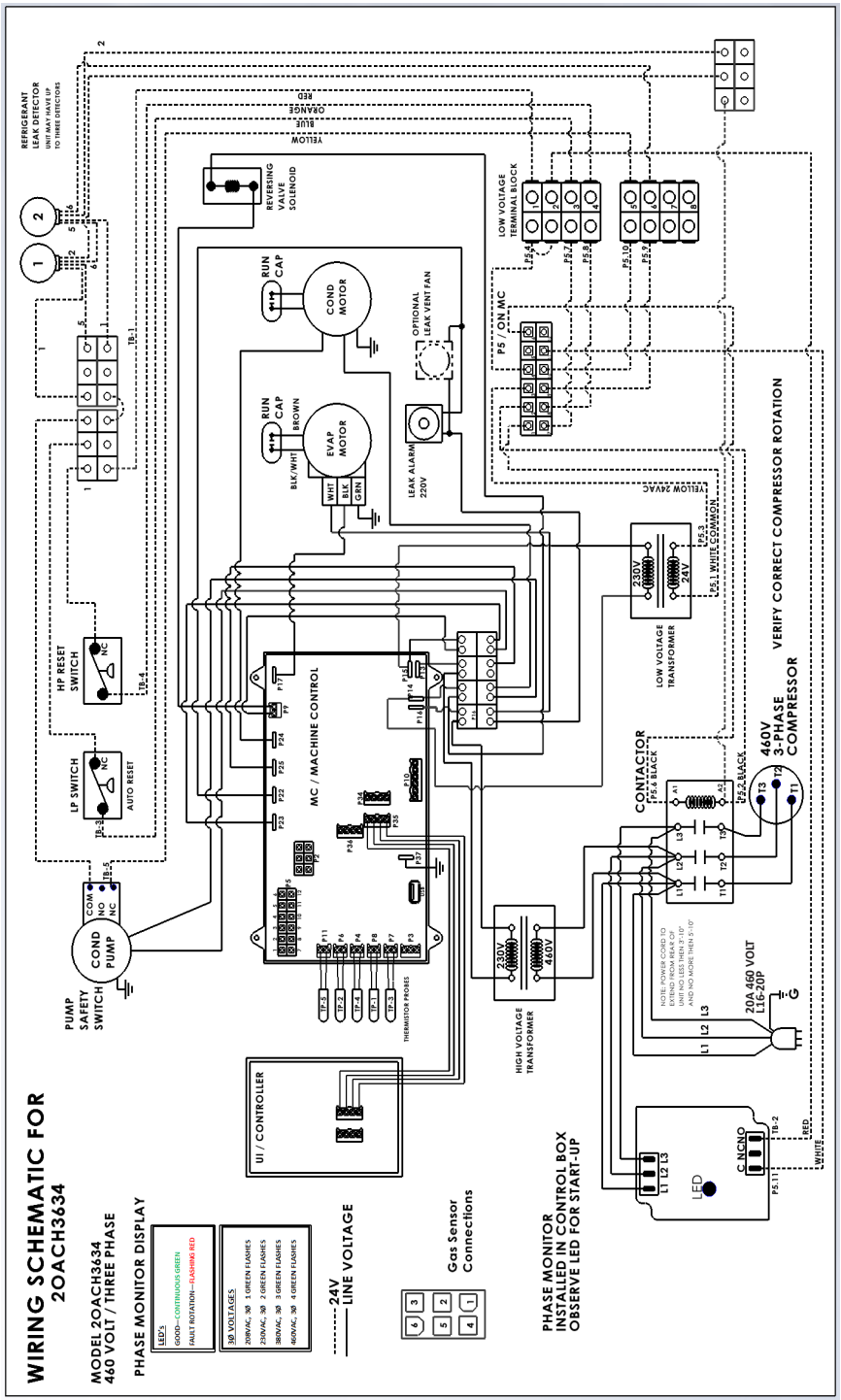
2OACH3612 WIRING DIAGRAM



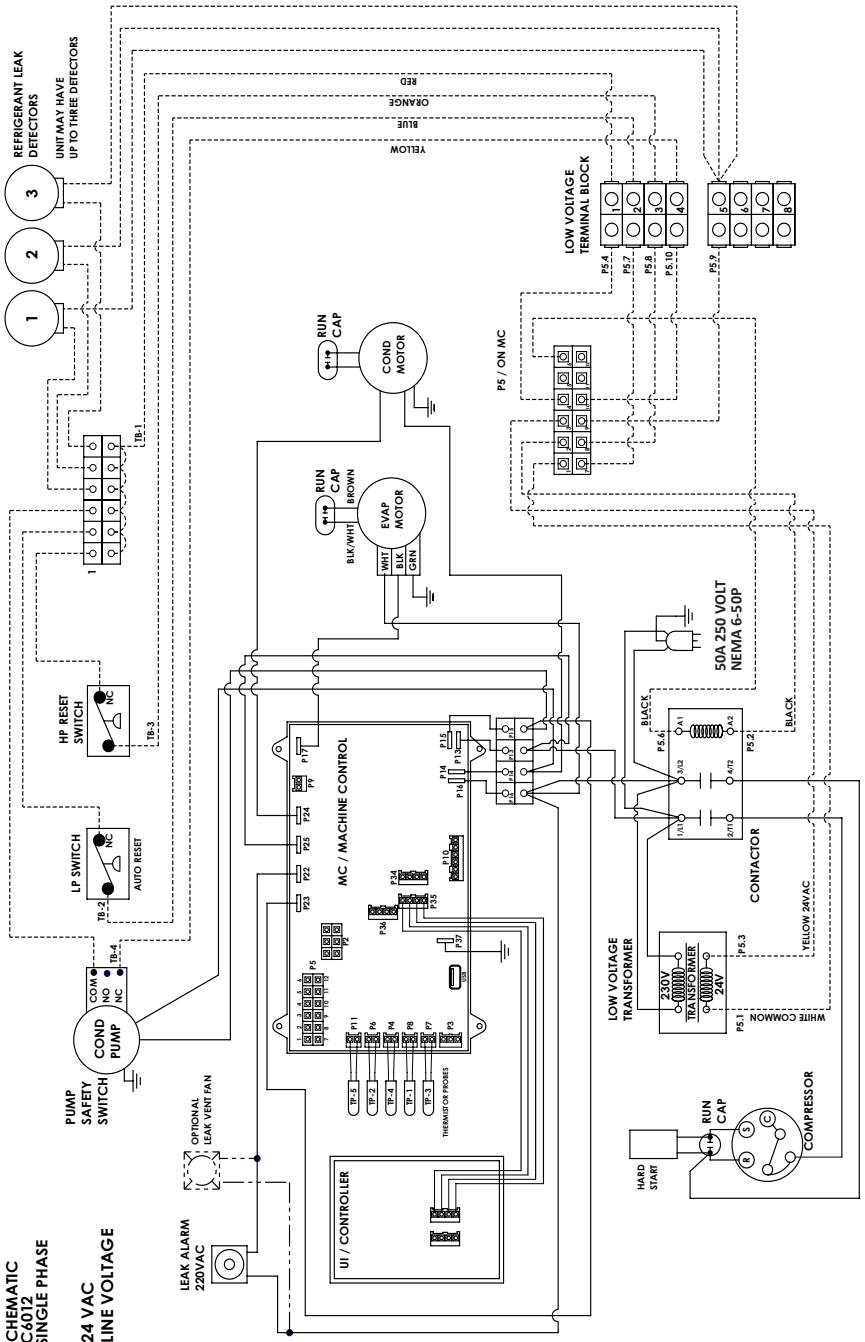
2OACH3632 WIRING DIAGRAM



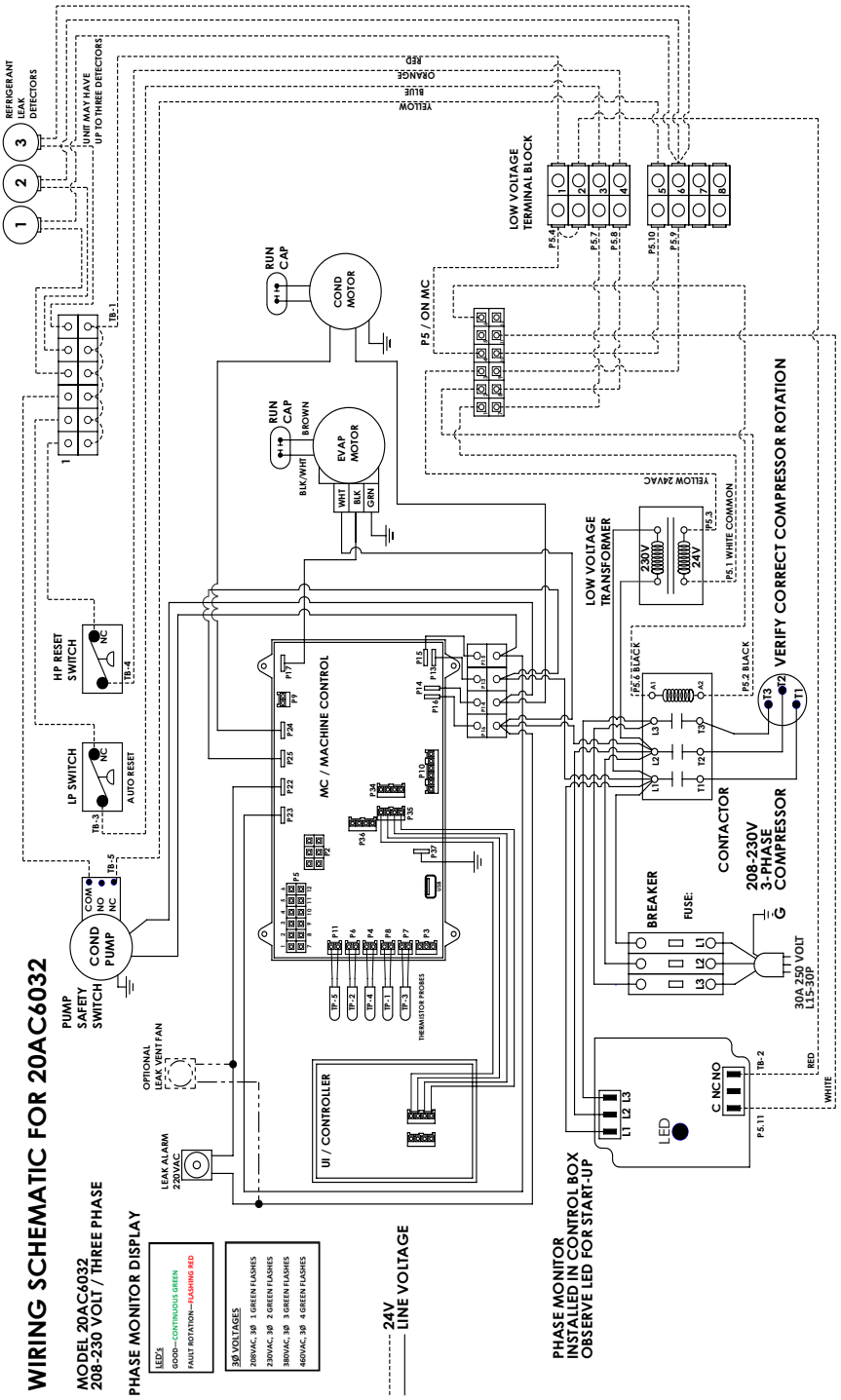
2OACH3634 WIRING DIAGRAM



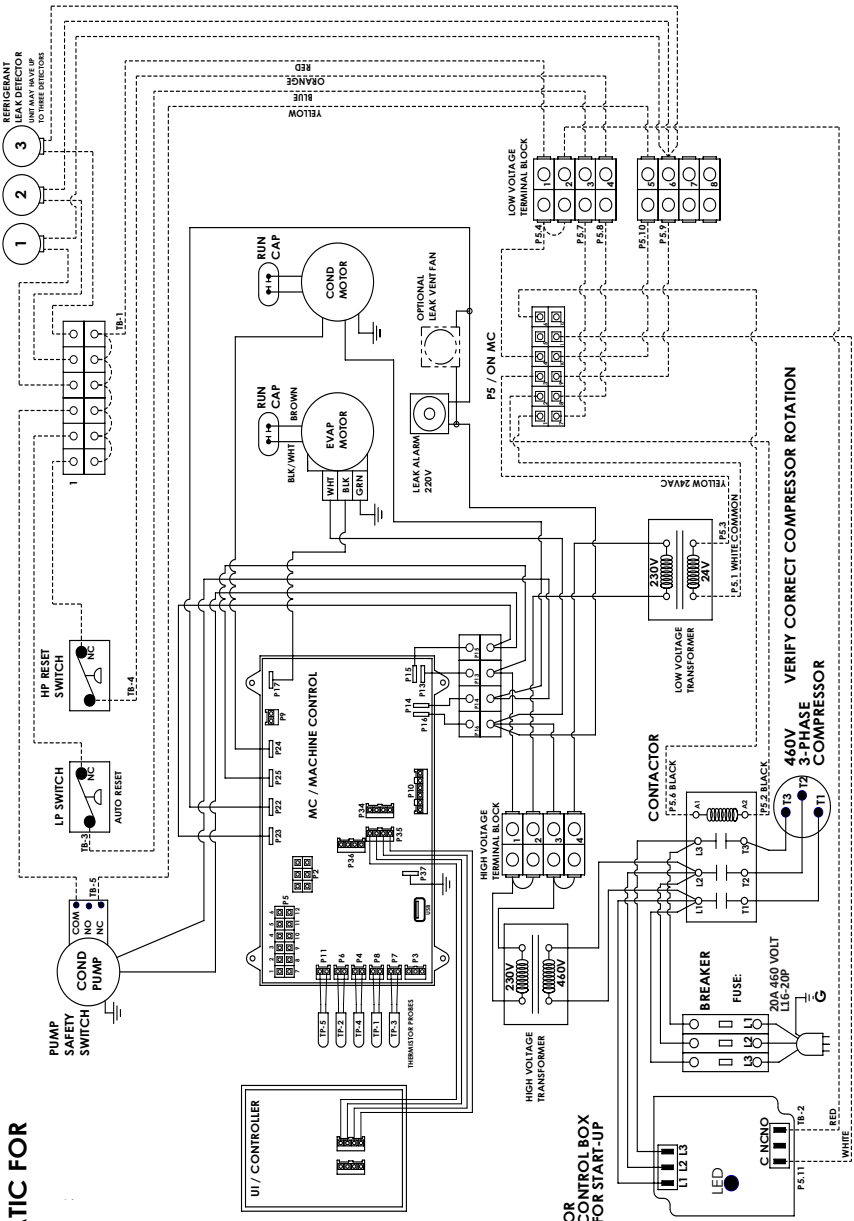
2OAC6012 WIRING DIAGRAM



2OAC6032 WIRING DIAGRAM



2OAC6034 WIRING DIAGRAM



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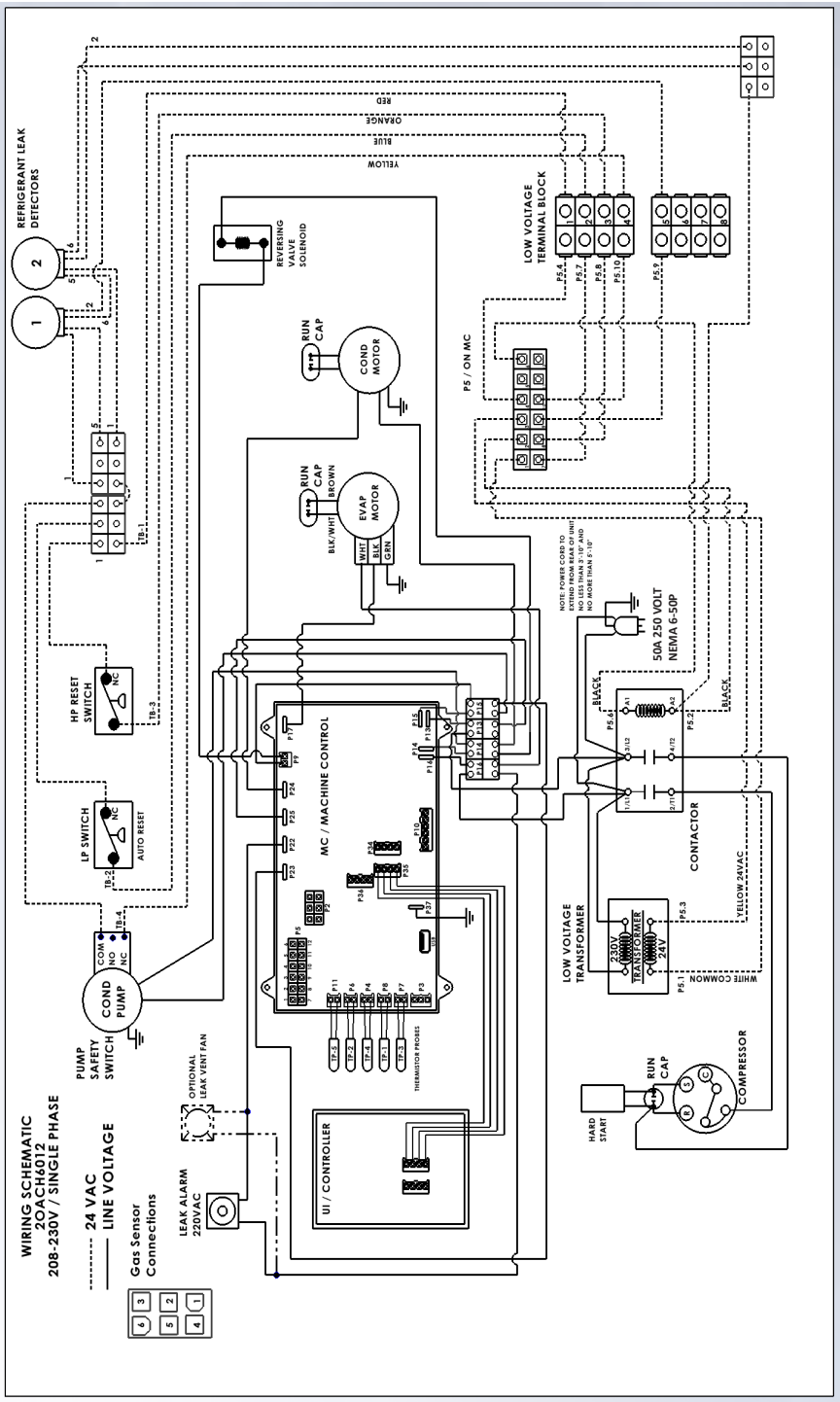

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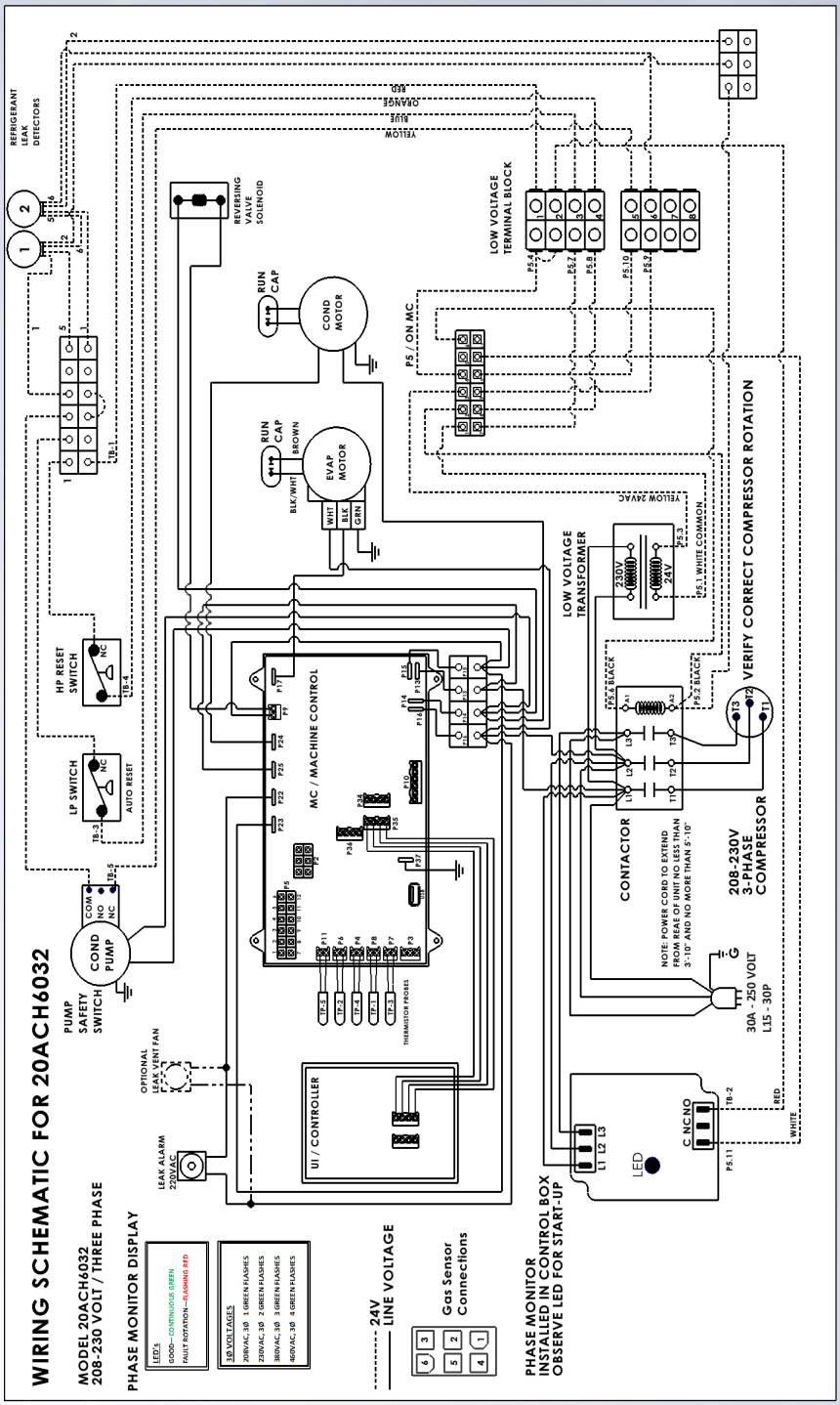
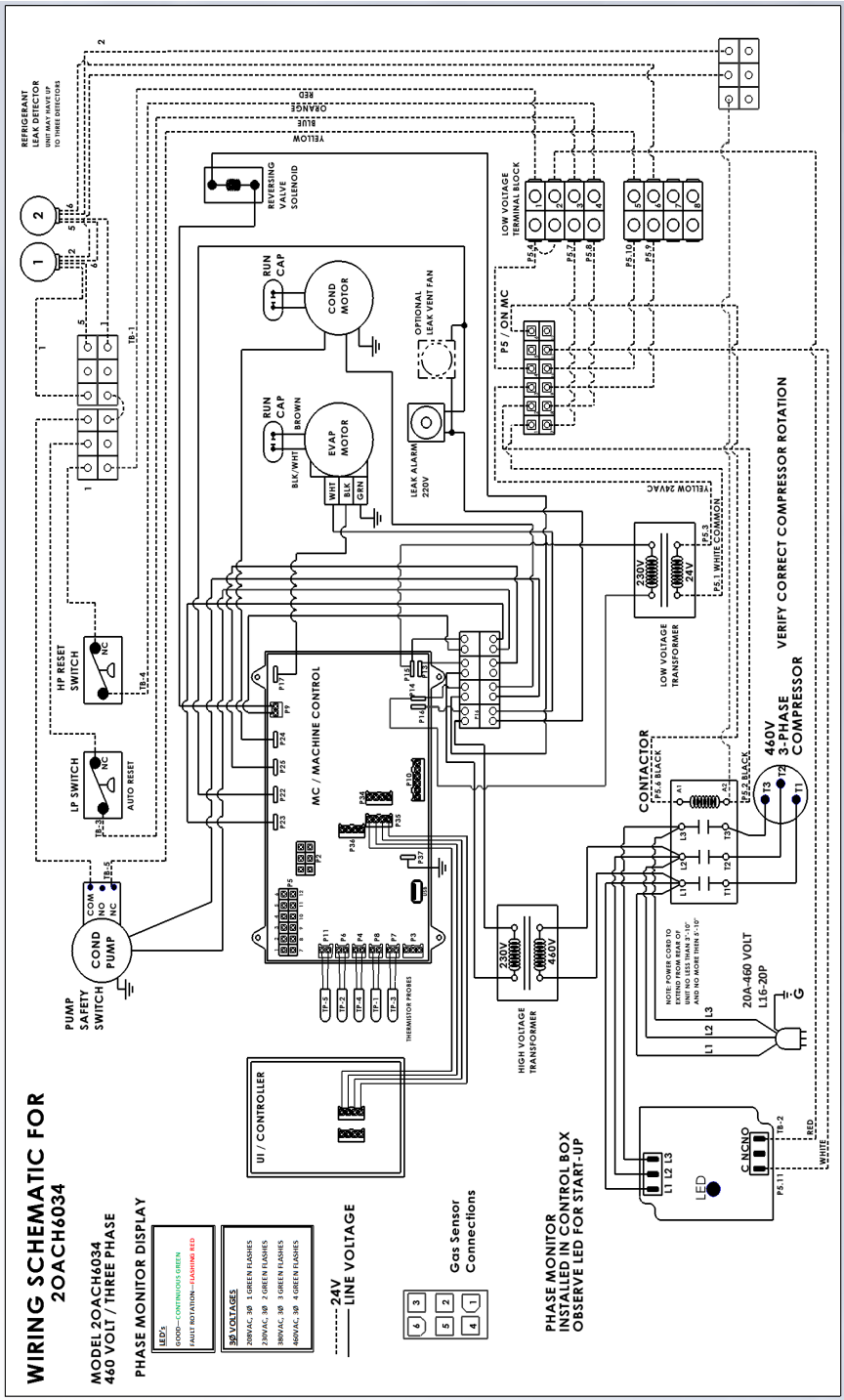


2OACH6034 WIRING DIAGRAM



LIMITED WARRANTY

The Manufacturer (OceanAire, Inc.) warrants to the original owner that the Product will be free from defects in material or workmanship for a period not to exceed one (1) year from date of installation. If upon examination by the Manufacturer, the Product is shown to have a defect in material or workmanship during the warranty period, the Manufacturer will repair or replace, at its option, that part of the Product which is shown to be defective.
The Manufacturer further warrants that the product's compressor-motor will be free from defects in material and workmanship for five (5) years from the date of installation.
If upon examination by the Manufacturer the Product is shown to have a defect in materials or workmanship during the warranty period, the Manufacturer will repair or replace, at its option, that Part of the Product which is shown to be defective.

Compressor warranty shall be pro-rated for years 2-5 at the sole discretion of OceanAire.

Electrical parts such as relays, overloads, capacitors, etc., and the sealed refrigeration system (condenser and evaporator) are included in the one year limited warranty, but not the five year limited warranty of the compressor.

This limited warranty does not apply to:

A) Product that has been subjected to misuse or neglect, has been accidentally or intentionally damaged, has not been installed, maintained or operated in accordance with the furnished written instructions, or has been altered or modified in any way.

B) Product that has been subjected to any abnormal power conditions such as loss of power surges, voltage irregularities such as brown-outs or phase loss on three-phase equipment.

C) Any expenses, including labor or material, incurred during removal or reinstallation of the product.

D) Any workmanship of the installer of the Product.

This limited warranty is conditional upon:

A) Return to the manufacturer, of the part of the Product thought to be defective. Goods can only be returned with prior approval from the Manufacturer. All returns must be freight prepaid.

B) Determination, in the reasonable opinion of the Manufacturer, that there exists a defect in material or workmanship.

Repair or replacement of any part under this Limited Warranty shall not extend the duration of the warranty with respect to such repaired or replaced part beyond the stated warranty period.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, AND ALL SUCH OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED AND EXCLUDED FROM THIS LIMITED WARRANTY. IN NO EVENT SHALL THE MANUFACTURER BE LIABLE IN ANY WAY FOR ANY CONSEQUENTIAL, SPECIAL, OR INCIDENTAL DAMAGES OF ANY NATURE WHATSOEVER, OR FOR ANY AMOUNTS OF IN EXCESS OF THE SELLING PRICE OF THE PRODUCT OR ANY PARTS THEREOF FOUND TO BE DEFECTIVE. THIS LIMITED WARRANTY GIVES THE ORIGINAL OWNER OF THE PRODUCT SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY BY JURISDICTION.

⚠WARNING
Failure to adhere to described instructions may result in serious injury or death.

NOTICE
Failure to adhere to instructions below may result in immediate or premature component failure.

ADDITIONAL SAFETY WARNINGS AND NOTICES

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

Keep any required ventilation openings clear of obstruction.

Servicing shall be preformed only as recommended by the manufacturer.

Ducts connected to an appliance shall not contain a POTENTIAL IGNITION SOURCE.

For appliances using A2L REFRIGERANTS connected via an air duct system to one or more rooms, the supply and return air shall be directly ducted to the space. Open areas such as false ceilings shall not be used as a return air duct.

The 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.

For unit operation, minimum permissible distance to adjacent structures, See figure on page 11 of this manual. Additional clearance may be required when using duct adapter kits.
It is not recommended to use the unit at elevations above 7,000 feet.

⚠ WARNING

Failure to adhere to described instructions may result in serious injury or death.

NOTICE

Failure to adhere to instructions below may result in immediate or premature component failure.

INFORMATION ON SERVICING

CHECKS TO THE AREA: Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized.

WORK PROCEDURE: Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

GENERAL WORK AREA: All maintenance staff and others working in the local area shall be instructed on the nature of the work being carried out. Work in confined spaces shall be avoided.

CHECKING FOR PRESENCE OF REFRIGERANT: The area shall be checked with an appropriate refrigerant detector prior to, and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

PRESENCE OF A FIRE EXTINGUISHER: If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available at hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

NO IGNITION SOURCES: No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of a fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. A “NO SMOKING” sign shall be displayed.

VENTILATED AREA: Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

CHECKS TO THE REFRIGERATING EQUIPMENT: Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer’s maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer’s technical department for assistance. The following checks shall be applied to installations using

FLAMMABLE REFRIGERANTS:

R-454B
A2L

-The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed
-The ventilation machinery and outlets are operating adequately and are not obstructed
-If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant
-Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected

Refrigerating pipe or components are to be installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

CHECKS TO ELECTRICAL DEVICES: Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties advised.

⚠WARNING
Failure to adhere to described instructions may result in serious injury or death.

NOTICE
Failure to adhere to instructions below may result in immediate or premature component failure.

INFORMATION ON SERVICING (CONTINUED)

Checks to Electrical devices (cont)

Initial safety checks shall include:

-The capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking

-That no live electrical components and wiring are exposed while charging, recovering or purging the system

-That there is continuity of earth bonding

REPAIRS TO SEALED COMPONENTS: During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. if it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point of a potentially hazardous situation. Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to the original specification, damage to seals, incorrect fitting of glands, etc. ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications. Sealed electrical components shall be replaced.

REPAIR TO INTRINSICALLY SAFE COMPONENTS: Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

CABLING: Check that the cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

DETECTION OF FLAMMABLE REFRIGERANTS: Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch, or any other detector using a naked flame, shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need recalibration. Detection equipment shall be calibrated in a refrigerant-free area. Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated by means of shut off valves in a part of the system remote from the leak.

REMOVAL AND EVACUATION: When breaking into the refrigerant circuit to make repairs—for any other purpose—conventional procedures shall be used. However, for FLAMMABLE REFRIGERANTS it is important that the best practice is followed since flammability is a consideration. The following procedure shall be adhered to: Remove refrigerant; Purge the circuit with inert gas (optional for A2L): Evacuate (optional for A2L): Continuously flush or purge with inert gas when using flame to open circuit and open the circuit

⚠WARNING

Failure to adhere to described instructions may result in serious injury or death.

NOTICE

Failure to adhere to instructions below may result in immediate or premature component failure.

INFORMATION ON SERVICING (CONTINUED)

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerant purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented to the atmospheric pressure to enable work to take place. The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

CHARGING PROCEDURES: In addition to conventional charging procedures, the following requirements shall be followed: Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them. Cylinders shall be kept in an appropriate position according to the instructions. Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant. Label the system when charging is complete. Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM. Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

DECOMMISSIONING: Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to reuse of recovered refrigerant. It is essential that the electrical power is available before the task is commenced. Become familiar with the equipment and its operation. Isolate system electrically. Before attempting the procedure, ensure that mechanical handling is available, if required, for handling refrigerant cylinders; all personal protective equipment is available and being used correctly; the recovery process is supervised at all times by a competent person; recovery equipment and cylinders conform to the appropriate standards.

Pump down the system, if possible. If a vacuum is not possible, make a manifold so that the refrigerant can be removed from various parts of the system. Make sure that the cylinder is situated on the scales before recovery takes place. Start the recovery machine and operate in accordance with instructions. Do not overfill cylinders, no more than 80% volume liquid charge. Do not exceed the maximum working pressure of the cylinder, even temporarily. When cylinders have been filled correctly and the process completed make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off. Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

LABELING DECOMMISSIONED EQUIPMENT: Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

RECOVERY: When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant, i.e. special cylinders for the recovery of refrigerant. Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs. The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders. If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that the flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from the system, it shall be carried out safely.

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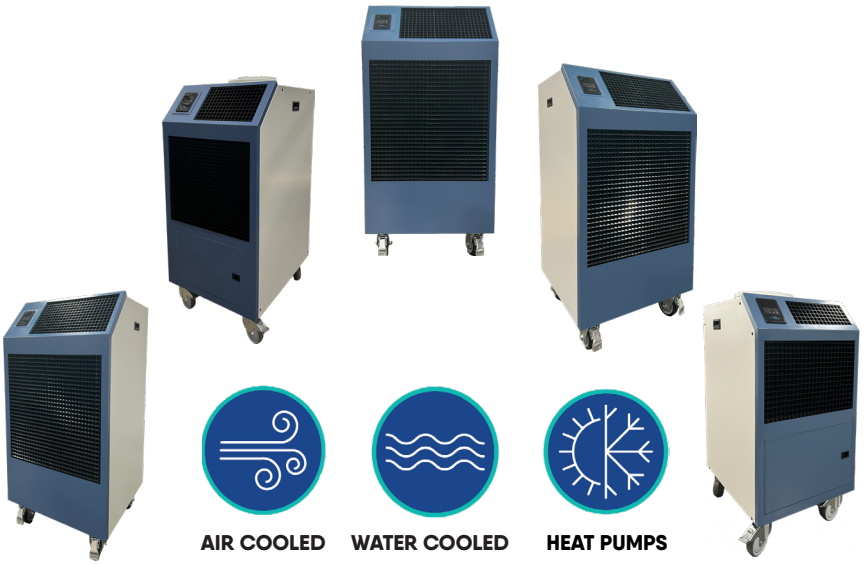

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