5002735 5/06

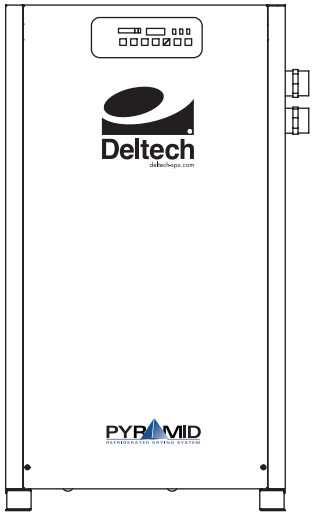
Internal Use Only
5002730/060519

Deltech
deltech-spx.com

INSTRUCTION MANUAL

PYRAMID SERIES

Models: PYR100, PYR125, PYR150, PYR200, PYR250, PYR300, PYR400, PYR500, PYR600, PYR750



CONTENTS

REFRIGERATED

TYPE

COMPRESSED

AIR DRYERS

SERVICE DEPARTMENT: (724) 746-1100

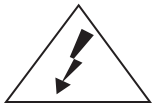
GENERAL SAFETY INFORMATION

1. PRESSURIZED DEVICES:

This equipment is a pressure containing device.

- Do not exceed maximum operating pressure as shown on equipment serial number tag.
- Make sure equipment is depressurized before working on or disassembling it for service.

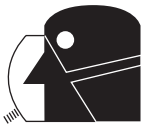
2. ELECTRICAL:



This equipment requires electricity to operate.

- Install equipment in compliance with all applicable electrical codes.
- Standard equipment is supplied with electrical enclosures not intended for installation in hazardous environments.
- Disconnect power supply to equipment when performing any electrical service work.

3. BREATHING AIR:



- Air treated by this equipment may not be suitable for breathing without further purification.

  Refer to applicable standards and specifications for the requirements for breathing quality air.

RECEIVING, MOVING, AND UNPACKING

A. RECEIVING

This shipment has been thoroughly checked, packed and inspected before leaving our plant. It was received in good condition by the carrier and was so acknowledged.

Check for Visible Loss or Damage. If this shipment shows evidence of loss or damage at time of delivery to you, insist that a notation of this loss or damage be made on the delivery receipt by the carrier's agent.

B. UNPACKING

Check for Concealed Loss or Damage. When a shipment has been delivered to you in apparent good order, but concealed damage is found upon unpacking, notify the carrier immediately and insist on his agent inspecting the shipment. Concealed damage claims are not our responsibility as our terms are F.O.B. point of shipment.

C. MOVING

In moving or transporting dryer, do not tip dryer onto its side.

D. STORAGE/SHUT DOWN

⚠ CAUTION Dryer should not be stored outside (either packed or unpacked) or exposed to the weather. Damage to electrical and control components may result.

IMPORTANT: WATER-COOLED UNITS - If unit is shut down below freezing temperatures, the water-cooled condenser may freeze and cause permanent damage. Condenser must be drained when the unit is shut down.

IMPORTANT: Do not store dryer in temperatures above 130°F, 54.4°C.

1.0 INSTALLATION

1.1 Location

A. For typical placement in a compressed air system, see drawing.

B. Air compressor intake – Locate air compressor so that contaminants potentially harmful to the dryer (e.g. ammonia) are not drawn into the air system.

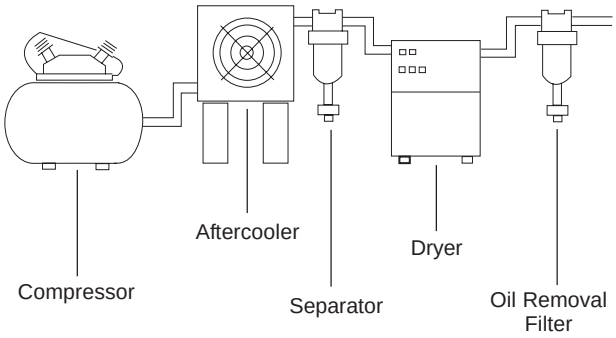
C. Clearances Free air flow
Front 36 inches (914 mm)
Back 6 inches (152 mm)
Sides 36 inches (914 mm)
Service - To facilitate maintenance leave 36 inches (914 mm) of clearance in front of dryer.

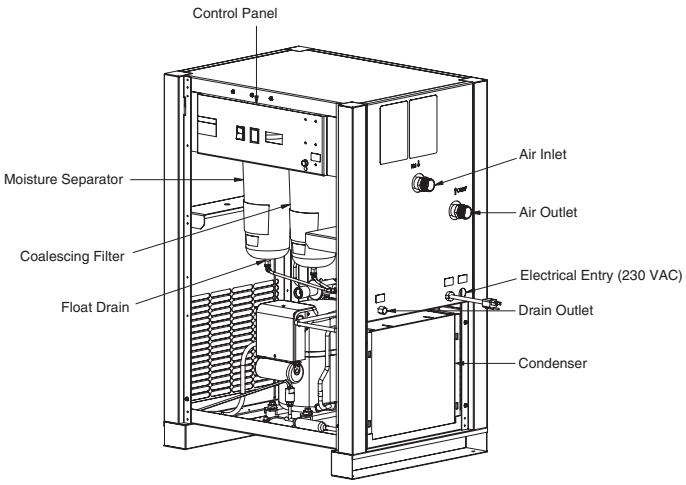
D. Standard units are designed to operate in ambients:
Air-cooled: 45 to 110°F (7 to 43°C).
Water-cooled: 45 to 130°F (7 to 54°C).

E. Installations in altitudes above 4500 feet (1370 meters) – Dryer is adjusted to operate in altitudes up to 4500 feet (1370 meters). If dryer is installed in an altitude above this, and has not been preset at the factory for this altitude, contact manufacturer's Service Department.

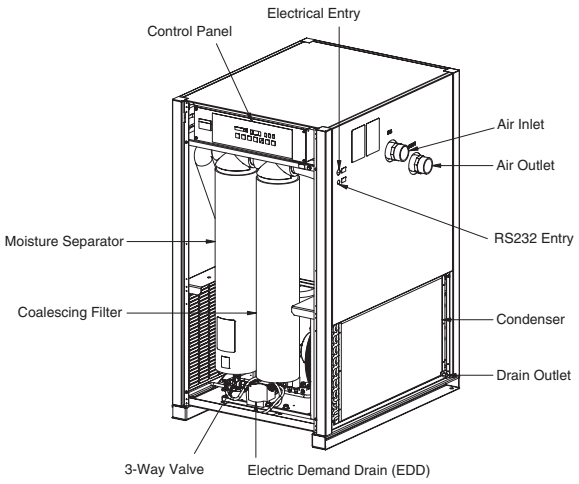
F. The installation of a flexible connection prior to the dryer is recommended to prevent possible damage from vibration.

NOTE: Outdoor installation – Standard units are designed for indoor installation. Contact manufacturer if installing outdoors.





Models 100, 125, & 150



Models 200, 250, 300, 400, 500, 600, & 750

1.2 Mounting

Mount the dryer on a level solid surface. Holes are provided in the dryer base to permanently mount the dryer to the floor.

1.3 Piping connections

A. Air Inlet - Connect compressed air line from air source to air inlet. (Reference markings on dryer or see callout drawing on page 14 for air inlet/outlet connection locations.)

⚠WARNING Refer to Serial Number Tag for maximum working pressure. Do not exceed dryer's Maximum Working Pressure.

NOTE: Install dryer in air system at highest pressure possible (e.g. before pressure reducing valves).

NOTE: Install dryer at coolest compressed air temperature possible. Maximum inlet compressed air temperature: 120°F (49°C). If inlet air exceeds this temperature, precool the air with an aftercooler.

B. Air Outlet – Connect air outlet to downstream air lines.

C. Bypass piping – If servicing the dryer without interrupting the air supply is desired, piping should include inlet and outlet valves and an air bypass valve.

D. Water cooled models – cooling water inlet and outlet
   1. Connect cooling water supply to cooling water inlet.
   2. Connect cooling water return line to cooling water outlet connection.

NOTE: Strainer and water regulating valve are supplied on water cooled models.

1.4 Electrical connections

IMPORTANT: Use copper supply wires only.

A. Dryer is designed to operate on the voltage, phase, and frequency listed on the serial number tag.

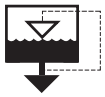
B. If dryer is supplied with a cord and plug, install in a receptacle of proper voltage.

C. Electrical entry on larger dryers is through a hole in the cabinet. It is located on the right side panel when facing the front of the unit. Connect power source to terminal strip in electrical enclosure as shown on the wiring diagram included with the dryer.

NOTE: Refrigeration condensing unit is designed to run continuously and should NOT be wired to cycle on/off with the air compressor.

1.5 Moisture separator

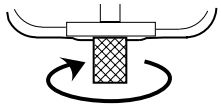
A. Models 100-150:
Separator and Oil Removal Filter has an internal drain which automatically discharges condensate.



Models 200-750:
Separator and Oil Removal Filter has an electronic demand drain (EDD) which automatically discharges condensate.

NOTE: It may be desirable to pipe the condensate from the Automatic Drain outlet to a suitable drain.

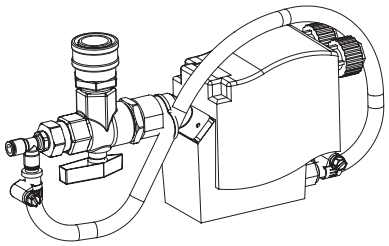
B. Models 100-150:
Separator has a knurled fitting with flexible drain tubing attached. Be sure knurled fitting is tightened by turning counter-clockwise before operating dryer.



TO CLOSE
TURN COUNTERCLOCKWISE

C. Models 200-750
For manual draining, convenient dryer depressurization, and EDD service, a three-way valve assembly has been installed at the bottom of the moisture separator (and cold coalescing filter where applicable). Review the following for proper drain function:

- Automatic Draining - Valve handle should be positioned parallel to the valve body (as shown), with the arrow on the handle pointing toward the EDD. In this position, condensate will flow from the bowl to the EDD.
- Drain Isolation (Shutdown) - Valve handle shall be turned perpendicular to the valve body (rotate 90°). In this position, condensate flow is shutoff.



- Manual Draining - Drain valve handle shall be rotated slightly past the drain isolation position to allow throttling through the valve for manual discharge and depressurization.
- Note: The quick disconnect fitting allows removal of the entire drain assembly. **However, the unit must be depressurized prior to disassembly or serious injury may occur.**

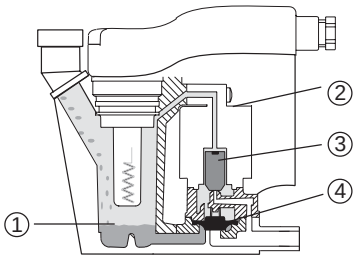
NOTE*:* Discharge is at system pressure. Drain line should be anchored.

NOTE*:* Condensate may contain oil. Comply with applicable laws concerning proper disposal.

1.6 Operation

A. Verify that isolation valves are open. If the drain fails to discharge after the valve is energized, the electronic control circuit will repeatedly energize the valve in an attempt to clear the discharge port. If, after 60 seconds, the drain still fails to discharge, the control circuit then switches to the alarm mode. In this mode the valve is de-energized and the red alarm light is activated on the drain and the dryer controller. The valve is then automatically energized every 4 minutes for 5 seconds. Check the drain operation. Push drain (push-to-test) button on the Energy Management Monitor control board to energize drain. A flow of condensate and/or air should be present at the drain outlet. The alarm mode automatically clears after the drain returns to normal operation.

B. Condensate enters the reservoir **(1)** through the inlet port. When the condensate level in the reservoir covers the capacitance sensor, an electronic signal is sent to the solid state countdown processor. The processor delays the opening of the solenoid valve for a given period of time. Once the time has elapsed, the solid state processor transmits information to energize the coil in the solenoid valve **(2)**. The magnetic force of the coil causes the solenoid core **(3)** to move, closing the pilot air supply line and opening the pilot air exhaust line. After the pilot air above the diaphragm **(4)** is vented, pressure in the reservoir opens the discharge port and forces the condensate through the discharge port and outlet piping.



2.0 OPERATION

2.1 Minimum/Maximum operating conditions

A. Maximum inlet air pressure: refer to dryer serial number tag

B. Minimum inlet air pressure: 30 psig (2.1 kgf/cm^2)

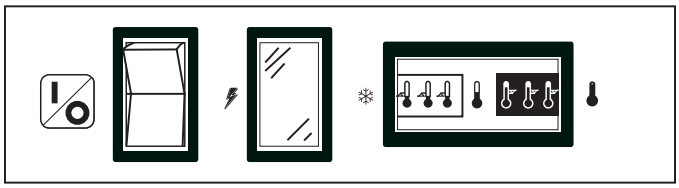
C. Maximum inlet air temperature: 120°F (49°C)

D. Maximum ambient temperature:
Air-cooled models: 110°F (43°C)
Water-cooled models: 130°F (54°C)

E. Minimum ambient temperature: 45°F (7°C)

2.2 Start-up

A. Models 100-150:
Energize compressor by positioning the on/off switch in the on (I) position. Compressor on light will illuminate.



On/Off Switch Power-On Light Dewpoint Indicator (Green)

B. Models 200-750:
Energize dryer. Green power on light will illuminate.

IMPORTANT: Energize dryer disconnect switch (provided by others, see NEC) 24 hours before refrigeration compressor is started! Never use the disconnect switch to shutdown the dryer for a extended period of time (except for repair). Failure to follow these instructions may result in a non-warrantable compressor failure.

NOTE: If there is no power to the control board for a period of two weeks or more, it may return to the default mode.

C. Program Monitor

Press and hold Program Mode button until Main Menu screen appears. Use the Up and Down arrow buttons to scroll through the list of submenu choices. Press Enter button to view the submenu that is displayed. Press ESC to exit the Main Menu and return to Display mode.

1. Language selection
   a. Use the 'Up' and 'Down' arrow buttons to scroll through the list of languages (choice of 10 available: English, Deutsch, Francais, Espanol, Italiano, Polski, Dansk, Dutch, Norsk and Suomi).
   b. Press 'Enter' button to select the language that is displayed.
   c. Push 'ESC' at any time to return to the Main Menu.

2. Setting Date & Time
   a. Use the 'Up' and 'Down' arrow buttons to set minutes (00 to 59). Press 'Enter' to accept new value.
   b. Use the 'Up' and 'Down' arrow buttons to set hours (00 to 23). Press 'Enter' to accept new value.
   c. Use the 'Up' and 'Down' arrow buttons to set year (00 to 99 representing 2000 to 2099). Press 'Enter' to accept new value.
   d. Use the 'Up' and 'Down' arrow buttons to set month (three letter abbreviation). Press 'Enter' to accept new value.
   e. Use the 'Up' and 'Down' arrow buttons to set day (01 to maximum for the month and year selected). Press 'Enter' to accept new value.
   f. Push 'ESC' at any time to return to the Main Menu.

3. Setting Schedule
   a. Use the 'Up' and 'Down' arrow buttons to select desired "Day of week + on/off". Press 'Enter' to accept new value
   b. Use the 'Up' and 'Down' arrow buttons to set hour (00 to 23). Press 'Enter' to accept new value

      Note: If the hour setting is 'IGNORE', Press 'Enter' again to move the cursor under the "Day of week + on/off". Repeat steps a through b (or c) as needed.
   c. Use the Up and Down arrow buttons to set minutes (00, 10, 20, 30, 40, 50; not shown if hour setting is 'IGNORE'). Press 'Enter' to accept new value and return to "Day of week + on/off". Repeat steps a through c as needed.
   d. Push 'ESC' at any time to return to the Main Menu.

      NOTE: Scheduler will ignore programmed commands for 10 minutes after exiting program mode.

4. Hours To Service
   a. Use the 'Up' and 'Down' arrow buttons to scroll through the range of permissible values (0 to 8760) before service reminder is initiated. Press 'Enter' to accept new value. (Only hours that refrigeration compressor is operating are counted).
   b. Press 'ESC' at any time to return to the Main Menu.

      NOTE: On dryers with air-cooled condensers, regular condenser cleaning is recommended. Dirtiness of ambient air at installation site will determine frequency of service. Typically once a month is recommended. Dryers contain an integral 3 micron filter. As the filter element accumulates solid contaminants, differential

pressure increases. Solid particulate load in the compressed air supply will determine frequency of service. Typically element changeout is recommended at least annually.

5. Push ESC button to exit program mode

   NOTE: If after 60 seconds no button is pressed while in Program Mode, the audible alarm sounds for five (5) seconds. Dryer will resume previous operating mode.

6. Manual Operation

   a. To manually turn the refrigeration system on or off use 'On/Off' button; Push 'Schedule On/Off and Enter' button to return to schedule.

      NOTE: After power interruption dryer will reenergize in Manual override, refrigeration system off. To restart Schedule: Push 'Schedule On/Off and Enter' button.

C. Starting dryer

IMPORTANT: Dryer must be energized 24 hours before starting refrigeration compressor.

NOTE: It is recommended that dryer be started 15 minutes before compressed air flow begins.

1. On water-cooled models: after 24 hours, begin cooling water flow.
2. Check for proper electrical voltage.
3. Slowly pressurize unit air side by opening inlet isolation valve. Check for leaks.
4. After 15 minutes, open outlet isolation valve slowly.
5. Close air bypass valve.
6. Dryer may be operated in Manual or scheduled modes.

NOTE: Check for correct phasing of unit. On air-cooled models: check fan rotation (air must be pulled through the condenser). Fans may not start immediately or may cycle on and off. If rotation is in the wrong direction follow the procedure below. On water-cooled models: After starting dryer if an unusual noise is heard and the discharge line does not get hot, stop the dryer, reverse two power leads, restart, and verify discharge line gets hot.

Manual mode - push On/Off button - refrigeration compressor will start and run, green Compressor-on light will illuminate. In this mode compressor will run continuously and will not be turned on and off by the monitor. MANUAL OVERRIDE will appear on interface panel.

Schedule mode - push Schedule On/Off and Enter button. SCHEDULE RUNNING will appear on the interface panel. The refrigeration compressor will continue to be on or off (as selected in the Manual Override Mode) until the next scheduled event. The compressor will then turn on or off as programmed.

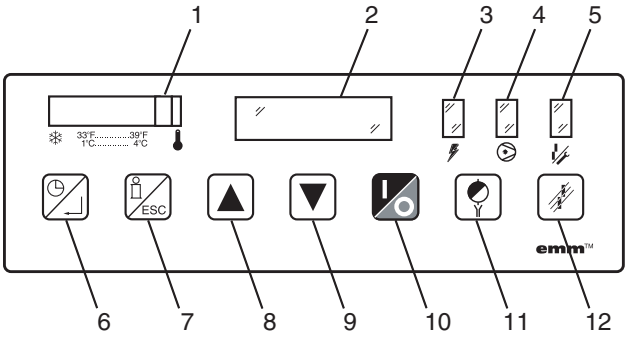
NOTE: Schedule may be returned to the manual mode at any time using the 'Schedule On/Off and Enter' button. MANUAL OVERRIDE will appear on interface panel. To reinstitute Schedule, push the 'Schedule On/Off and Enter' button again.

NOTE: Restart after the power interruption. Unit will be in MANUAL OVERRIDE mode, refrigeration compressor, off when power is restored after power interruption.

7. To reinstitute SCHEDULE RUNNING, push 'Schedule On/Off and Enter' button.

IMPORTANT: Dryer must be energized 24 hours before refrigeration compressor is started

CONTROL PANEL



1. Temperature Indicator
2. Operator Interface Display
3. Power-on Light
4. Compressor-on Light
5. Alarm / Service Light
6. Schedule On/Off and Enter Button
   a. In display mode: Press to toggle between SCHEDULE RUNNING and MANUAL OVERRIDE.
   b. In program mode:
      i. Press to move to a lower level menu.
      ii. Press to accept a value that has been edited.
7. Program Mode (i) and Esc
   a. In display mode: Press and hold to enter program mode.
   b. In program mode: Press to move to a higher level menu.
8. Up Arrow
   a. In display mode: No function
   b. In program mode:
      i. Press to view the next item in a list or to increment a variable to a higher value. Press and hold for accelerated incrementing.
      ii. When the top of the list (or highest value) is displayed, pressing the up button will cause the display to wrap to the bottom of the list (or lowest value).
9. Down Arrow
   a. In display mode: No function
   b. In program mode:
      i. Press to view the previous item in a list or to increment a variable to a lower value. Press and hold for accelerated incrementing.
      ii. When the bottom of the list (or lowest value) is displayed, pressing the down button will cause the display to wrap to the top of the list (or highest value).
10. 1/0: Press at any time to turn the dryer on/off.
11. Drain test: Press at any time to momentarily the open drains (like the current emm).
12. Reset: Press at any time to clear the alarm/service message (if shown) and the alarm LED.

D. Operating check points

1. Check that green Power-on light is illuminated

2. Check that green Compressor-on light is illuminated if dryer is on in the manual mode or it is a scheduled on time

IMPORTANT: Refrigeration compressor must be restarted after power interruption.

3. Check interface panel

NOTE: Interface panel will scroll through three screens (Current Time/Operating Status, Hours to Service and Total Operating Hours).

a. Verify that current time is correct

b. Check HRS TO SERVICE: this indicates time remaining until service is required; allow time for required maintenance items to be ordered

c. Check operating status:

MANUAL OVERRIDE - Dryer is either running continuously (not being controlled by the scheduled on/off times) or the refrigeration compressor has been shut off using the 'On/Off' button.

SCHEDULE RUNNING - Refrigeration compressor is being turned on and off by the monitor per-programmed schedule (see B.3. to set schedule).

d. Check Temperature indicator - indicator should read in the green area.

e. Check Alarm/Service light If illuminated, check Interface panel.

1) If SERVICE DRYER appears, scheduled maintenance time has elapsed (HRS TO SERVICE is 0). Perform needed service and reset service interval (see B.3.).

2) If ALARM appears, a dryer fault is indicated; see Troubleshooting Guide for possible remedies. After fault correction push Reset button to turn Fault alarm off.

Type of FAULTS:

LOW PRESSURE - the refrigeration compressor control circuit has opened because of low suction pressure.

HIGH PRESSURE - the refrigeration compressor control circuit has opened because of high head pressure. The high pressure switch must be reset manually once the fault is corrected. Red reset button is located on pressure switch inside unit.

HIGH TEMPERATURE - compressed air temperature is above the set point.

COMPRESSOR - Normally open (NO) auxiliary contact on the compressor contactor is open when the dryer is on.

HEATER - Normally closed (NC) auxiliary contact on the compressor contactor is open when the dryer is off.

TEMP SENSOR - Occurs if the temperature sensor circuit is open or shorted. If open, the left-most LED in the temperature display will be illuminated. If shorted, all the LEDs in the temperature display will be illuminated.

DRAIN - electric drain contains a high water level alarm that activates if drain fails to discharge.

f. Check drain operation - push Drain (push-to-test) button to energize electric drain. A flow of condensate and/or air should be present at the drain outlet.

E. Using the RS-232 port

The RS-232 port is used to monitor dryer operation from a host computer. A (1 to 1) DB-9 cable is required to connect dryer and computer. For PC connections, data is transmitted on pin 2, received on pin 3, ground is pin 5, pins 7 and 8 are jumpered at dryer.

Operation is at fixed baud rate of 9,600; asynchronous format is 8 bit, no parity, 1 stop bit ("8,N,1"). No check sum or error correction values are provided. If required, request status string two (or more) times and compare for agreement.

Request data by sending ASCII ? character (3FH). Response may take up to two seconds as certain processing functions may require completion before serial port is acknowledged.

Dryer responds with line feed (0AH), carriage return (0DH), and character string:
(1), (2), (3), (4), (5), (6), (7), (8), (9)

(1) = STX (start-of-text character, may appear as a smiley face or some other character

(2) = 108, Control board ID

(3) = 0 or 1, Compressor running status (0=off, 1=on)

(4) = M or S, Operating Mode (M= MANUAL OVERRIDE, S = SCHEDULE RUNNING)

(5) = xxxx, HOURS TO SERVICE

(6) = xxxxxx, TOTAL HOURS

(7) = xx, Alarm or Service Code (0=no alarm, 30=LOW PRESSURE ALARM, 31=HIGH PRESSURE ALARM, 32=COMPRESSOR ALARM, 36=HIGH EVAP TEMP ALARM, 37=HEATER ALARM, 38=DRAIN ALARM, 39=SERVICE DRYER, 41=TEMP SENSOR ALARM)

(8) = xx.x, Evaporator temperature (°F)

(9) = ETX, (end-of-text character, may appear as a heart or some other character)

3.0 MAINTENANCE

3.1 Condenser coil – Clean off accumulated dust and dirt monthly.

3.2 Moisture separator – Replace filter element when pressure drop across dryer is excessive or annually.

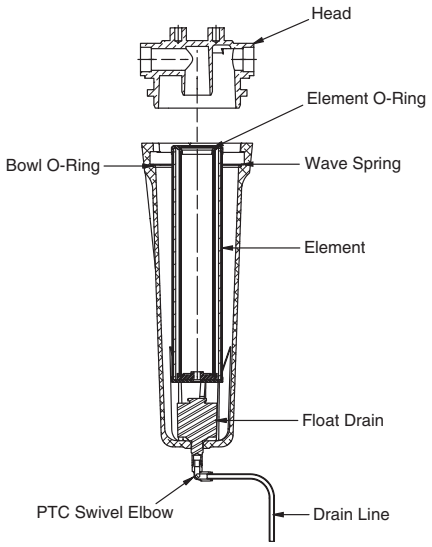
3.3 Check separator daily to be sure automatic drain is discharging.

3.4 Blow down separator weekly by pushing test button on control panel.

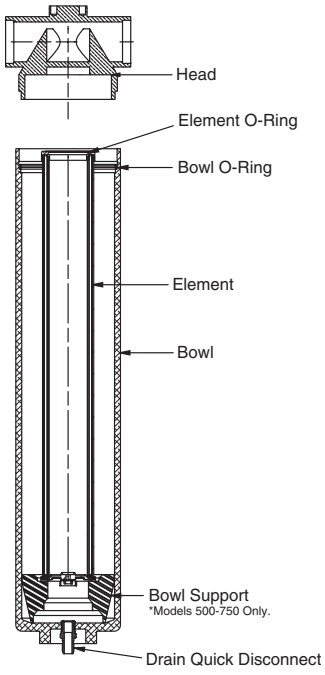
3.5 Rebuild drain mechanism annually.

To facilitate service, maintenance kits are available.

Models 100-150



Models 200-750



SIZING

Determining dryer capacity at actual operating conditions

To determine the maximum inlet flow capacity of a dryer at various operating conditions, multiply the rated capacity from Table 1 by the multipliers shown in Table 2.

Example: How many scfm can an air-cooled model 400 handle when compressed air to be dried is at 200 psig and 100°F; ambient air temperature is 80°F?

Answer: 400 x 1.22 x 1.12 = 547 scfm.

TABLE 1

Rated capacity (scfm) and pressure drop @ 100 psig inlet pressure, 100°F inlet temperature, and 100°F ambient temperature

MODEL		100	125	150	200	250
Rated capacity of air-cooled models (scfm)	60 Hz	100	125	150	200	250
	50 Hz	84	105	125	170	210

MODEL		300	400	500	600	750
Rated capacity of air-cooled models (scfm)	60 Hz	300	400	500	600	750
	50 Hz	250	340	420	540	630

TABLE 2

Air capacity correction factors (Multipliers)

INLET COMPRESSED AIR CONDITIONS						
INLET		INLET TEMPERATURES				
PRESSURES		80°F	90°F	100°F	110°F	120°F
psig	kgf/cm^2	27°C	32°C	38°C	43°C	49°C
50	3.5	1.35	1.05	0.84	0.69	0.56
80	5.6	1.50	1.17	0.95	0.79	0.66
100	7.0	1.55	1.23	1.00	0.82	0.70
125	8.8	1.63	1.31	1.07	0.91	0.74
150	10.5	1.70	1.37	1.13	0.95	0.80
175	12.3	1.75	1.42	1.18	0.99	0.84
200	14.0	1.80	1.47	1.22	1.03	0.89

COOLING MEDIUM*		
AMBIENT TEMPERATURE		MULTIPLIER
°F	°C	
80	27	1.12
90	32	1.06
100	38	1.00
110	43	0.94

**Air-cooled models; water-cooled models use 1.15 multiplier if cooling water is below 35°C, 95°F.*

ENGINEERING DATA (Models 100-250)

Air System Data						
Rated Flow Capacity at 100°F, 100 psig Inlet, 100°F Ambient Temperature		100	125	150	200	250
Maximum / Minimum Inlet Air Pressure (compressed air at inlet to dryer)		232 psig (16 barg) / 30 psig (2 barg)				
Maximum / Minimum Inlet Air Temperature (compressed air at inlet to dryer)		120°F (49°C) / 40°F (4°C)				
Maximum / Minimum Ambient Temperature		110°F (43°C) / 40°F (4°C)				
Outlet Air Temperature (nominal at rated conditions)		85°F (29°C)				
Refrigeration System Data						
Refrigeration Capacity @ 35°F Evaporator & 100°F Ambient (BTU/hr)	60 Hz	4820	6030		8900	15200
	50 Hz	4020	5690		7420	12700
Refrigerant Type		R-134A				
Refrigerant Charge		See Data Tag on Dryer				
Suction Pressure Setting - Hot Gas Bypass Valve (psig)		30.5 psig (2.1 barg)				
Compressor Control Ranges (out-in)	High	N/A			281 - 190 psig (19.4 - 13.1 barg)	
	Low	N/A			22 - 34 psig (1.5 - 2.3 barg)	
Air-Cooled Condensers						
Air Flow Across Condenser (cfm) (air-cooled models)	60 Hz	300	450		710	1070
	50 Hz	250	370		590	890
Condenser Fan Switch Setting (in-out)	Fan 1	110 - 70 psig (7.6 - 4.8 barg)			113 - 78 psig (7.8 - 5.4 barg)	
	Fan 2	N/A				
Water-Cooled Condensers						
Water Regulating Valve Setting		135 psig (9.3 barg)				
Required Available Water Pressure Differential		40 psig (2.8 barg) - minimum				
Flow Required with 85°F Cooling Water (gallons per minute)	60 Hz	N/A			1.1	2.0
	50 Hz	N/A			0.9	1.7
Electrical Data						
Nominal Voltage		**115/1/60**			**208-230/3/60**	
Min. - Max. Voltage		104 - 127			187 - 253	
Input Power @ Rated Flow (watts)		932	1280	1298	1255	1962
Rated Load Amps**		10.2	15.2		7.5	10.4
Locked Rotor Amps**		51.0	66.3		51.0	66.0
Minimum Circuit Ampacity		13.6	18.3		10.5	15.9
Branch Circuit Fuse Size (amps)		20	25		15	20
Resistance (ohms)		4.3 S / 0.7 R	3.2 S / 0.4 R		1.8	1.3
Nominal Voltage		**208-230/1/60**			**460/3/60**	
Min. - Max. Voltage		187 - 253			414 - 506	
Input Power @ Rated Flow (watts)		932	1280	1298	1255	1962
Rated Load Amps**		5.4	9.0		3.6	4.7
Locked Rotor Amps**		30.0	33.5		25.0	33.0
Minimum Circuit Ampacity		7.3	10.5		5.2	7.5
Branch Circuit Fuse Size (amps)		15	15		15	15
Resistance (ohms) Main/Start		9.0 S / 2.3 R	7.9 S / 1.6 R		7.4	5.0
Nominal Voltage		**100/1/50**			**575/3/60**	
Min. - Max. Voltage		90 - 110			518 - 633	
Input Power @ Rated Flow (watts)		680	1019	991	1255	1962
Rated Load Amps		10.2	15.2		3.6	4.7
Locked Rotor Amps		51.0	66.3		25.0	33.0
Minimum Circuit Ampacity		13.6	18.3		4.2	6.0
Branch Circuit Fuse Size (amps)		20	25		15	15
Resistance (ohms)		4.3 S / 0.7 R	3.2 S / 0.4 R		7.4	5.0
Nominal Voltage		**240/1/50**			**380-420/3/50**	
Min. - Max. Voltage		216 - 264			342 - 462	
Input Power @ Rated Flow (watts)		680	1019	991	1002	1613
Rated Load Amps**		4.5	8.3		3.6	4.7
Locked Rotor Amps**		21.0	53.0		25.0	33.0
Minimum Circuit Ampacity		6.2	9.9		5.2	7.5
Branch Circuit Fuse Size (amps)		15	15		15	15
Resistance (ohms)		19.5 S / 3.3 R	10.5 S / 1.8 R		7.4	5.0

* For 60 Hz, 35°F Evaporator, 100°F Ambient; for 50Hz, 35°F Evaporator, 77°F Ambient

** Compressor Only

ENGINEERING DATA (Models 300-750)

Air System Data						
Rated Flow Capacity at 100°F, 100 psig Inlet, 100°F Ambient Temperature		300	400	500	600	750
Maximum / Minimum Inlet Air Pressure (compressed air at inlet to dryer)		232 psig (16 barg) / 30 psig (2 barg)				
Maximum / Minimum Inlet Air Temperature (compressed air at inlet to dryer)		120°F (49°C) / 40°F (4°C)				
Maximum / Minimum Ambient Temperature		110°F (43°C) / 40°F (4°C)				
Outlet Air Temperature (nominal at rated conditions)		85°F (29°C)				
Refrigeration System Data						
Refrigeration Capacity @ 35°F Evaporator & 100°F Ambient (BTU/hr)	60 Hz	15200		19200	22000	30500
	50 Hz	12700		16000	18300	25400
Refrigerant Type		R-134A				
Refrigerant Charge		See Data Tag on Dryer				
Suction Pressure Setting - Hot Gas Bypass Valve (psig)		30.5 psig (2.1 barg)				
Compressor Control Ranges (out-in)	High	281 - 190 psig (19.4 - 13.1 barg)				
	Low	22 - 34 psig (1.5 - 2.3 barg)				
Air-Cooled Condensers						
Air Flow Across Condenser (cfm) (air-cooled models)	60 Hz	1070		2470	1680	2170
	50 Hz	890		2060	1400	1810
Condenser Fan Switch Setting (in-out)	Fan 1	113 - 78 psig (7.8 - 5.4 barg)				
	Fan 2	N/A		183 - 124 psig (12.6 - 8.6 barg)		
Water-Cooled Condensers						
Water Regulating Valve Setting		135 psig (9.3 barg)				
Required Available Water Pressure Differential		40 psig (2.8 barg) - minimum				
Flow Required with 85°F Cooling Water (gallons per minute)	60 Hz	2.0		2.1	4.9	6.8
	50 Hz	1.7		1.8	4.1	5.6
Electrical Data						
Nominal Voltage		**208-230/3/60**				
Min. - Max. Voltage		187 - 253				
Input Power @ Rated Flow (watts)		1999	2031	2680	2910	4120
Rated Load Amps**		10.4		11.4	13.9	22.1
Locked Rotor Amps**		66.0		75.0	88.0	115.0
Minimum Circuit Ampacity		15.9		20.0	19.7	30.4
Branch Circuit Fuse Size (amps)		20		25	30	45
Resistance (ohms)		1.3		1.1	1.0	0.7
Nominal Voltage		**460/3/60**				
Min. - Max. Voltage		414 - 506				
Input Power @ Rated Flow (watts)		1999	2031	2680	2910	4120
Rated Load Amps**		4.7		5.1	7.1	9.6
Locked Rotor Amps**		33.0		40.0	44.0	63.0
Minimum Circuit Ampacity		7.5		9.6	10.4	15.2
Branch Circuit Fuse Size (amps)		15		15	15	20
Resistance (ohms) Main/Start		5.0		4.1	4.0	2.7
Nominal Voltage		**575/3/60**				
Min. - Max. Voltage		518 - 633				
Input Power @ Rated Flow (watts)		1999	2031	2680	2910	4120
Rated Load Amps		4.7		5.1	7.1	9.6
Locked Rotor Amps		33.0		40.0	44.0	63.0
Minimum Circuit Ampacity		6.0		7.7	8.3	12.2
Branch Circuit Fuse Size (amps)		15		15	15	20
Resistance (ohms)		5.0		4.1	4.0	2.7
Nominal Voltage		**380-420/3/50**				
Min. - Max. Voltage		342 - 462				
Input Power @ Rated Flow (watts)		1622	1667	1992	2040	2860
Rated Load Amps**		4.7		5.1	7.1	9.6
Locked Rotor Amps**		33.0		40.0	44.0	63.0
Minimum Circuit Ampacity		7.5		8.1	10.4	15.2
Branch Circuit Fuse Size (amps)		15		15	15	20
Resistance (ohms)		5.0		4.1	4.0	2.7

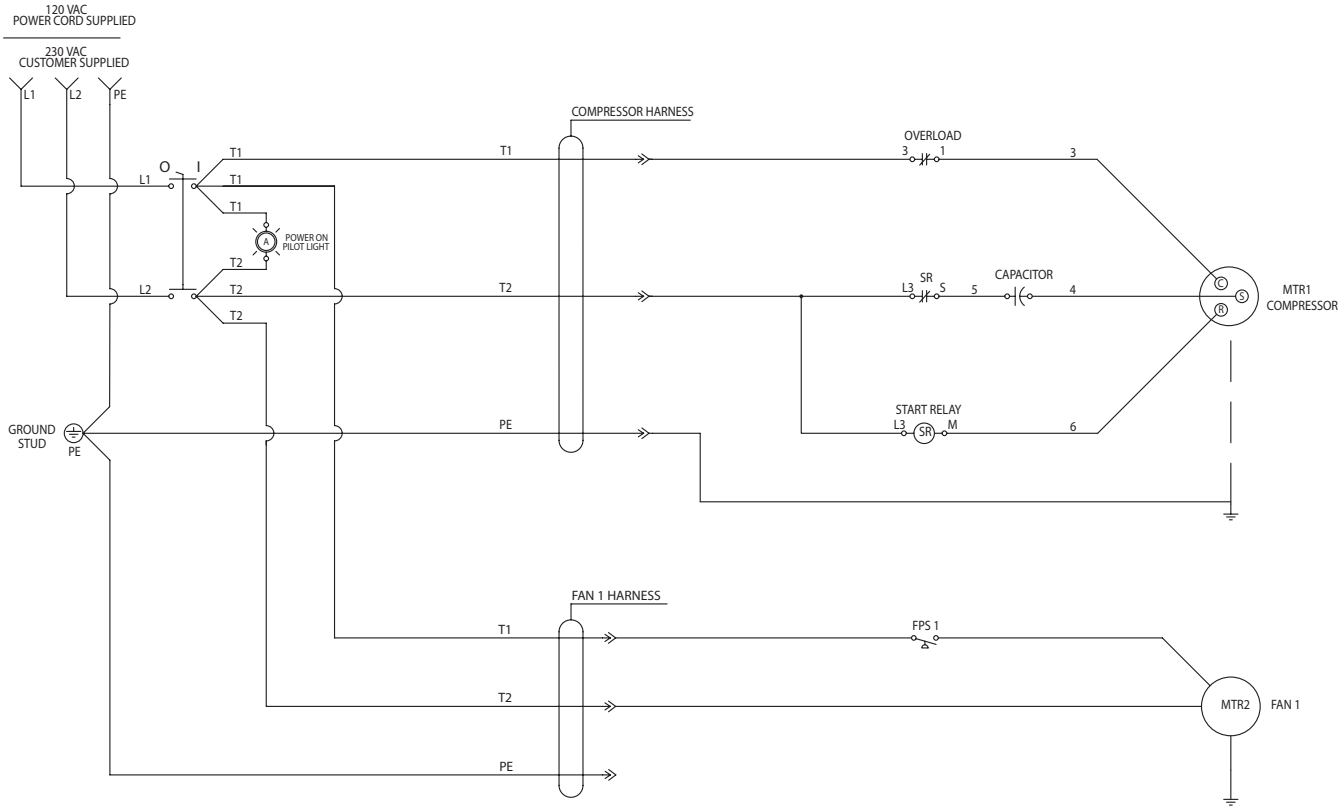
* For 60 Hz, 35°F Evaporator, 100°F Ambient; for 50Hz, 35°F Evaporator, 77°F Ambient

** Compressor Only

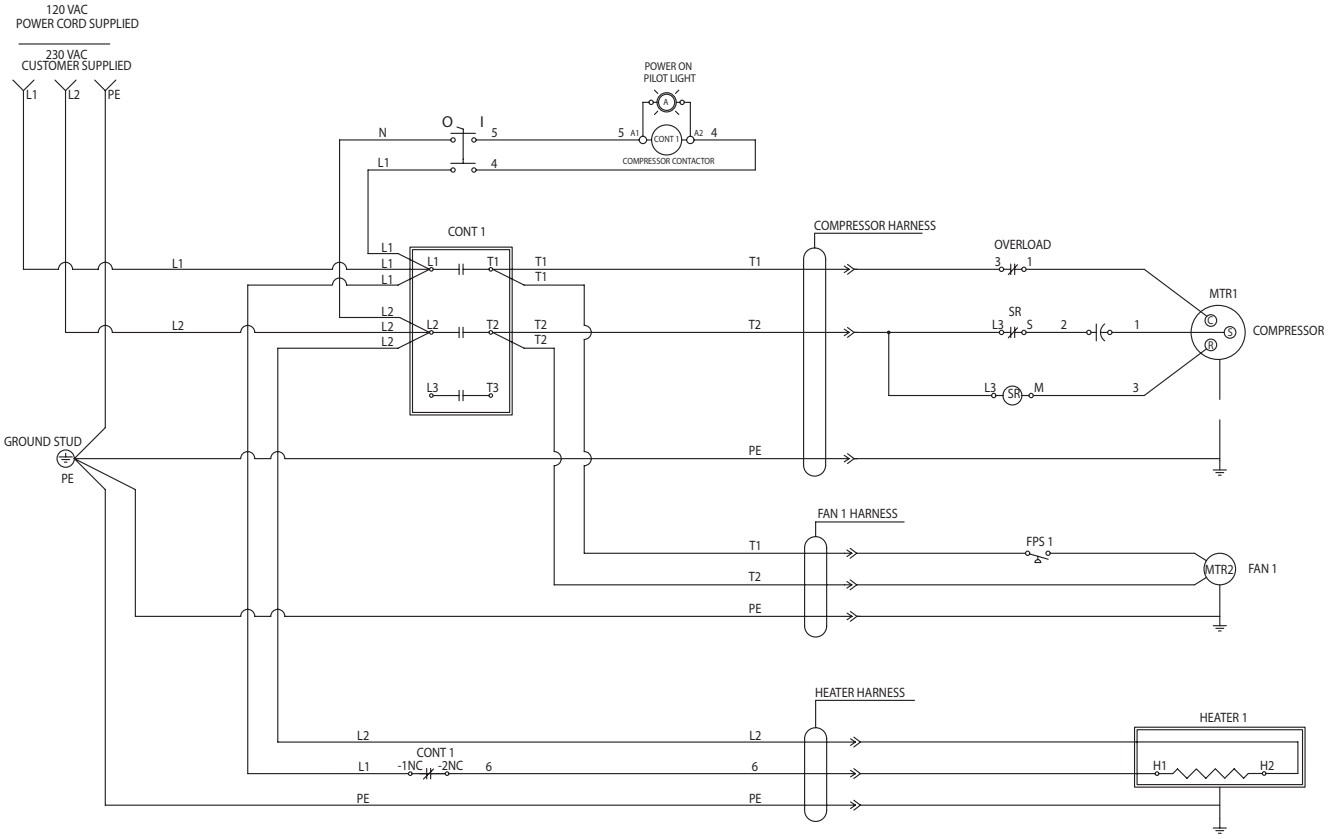
WIRING DIAGRAM

Models 100, 125 & 150

Model 100 - 120/230 VAC

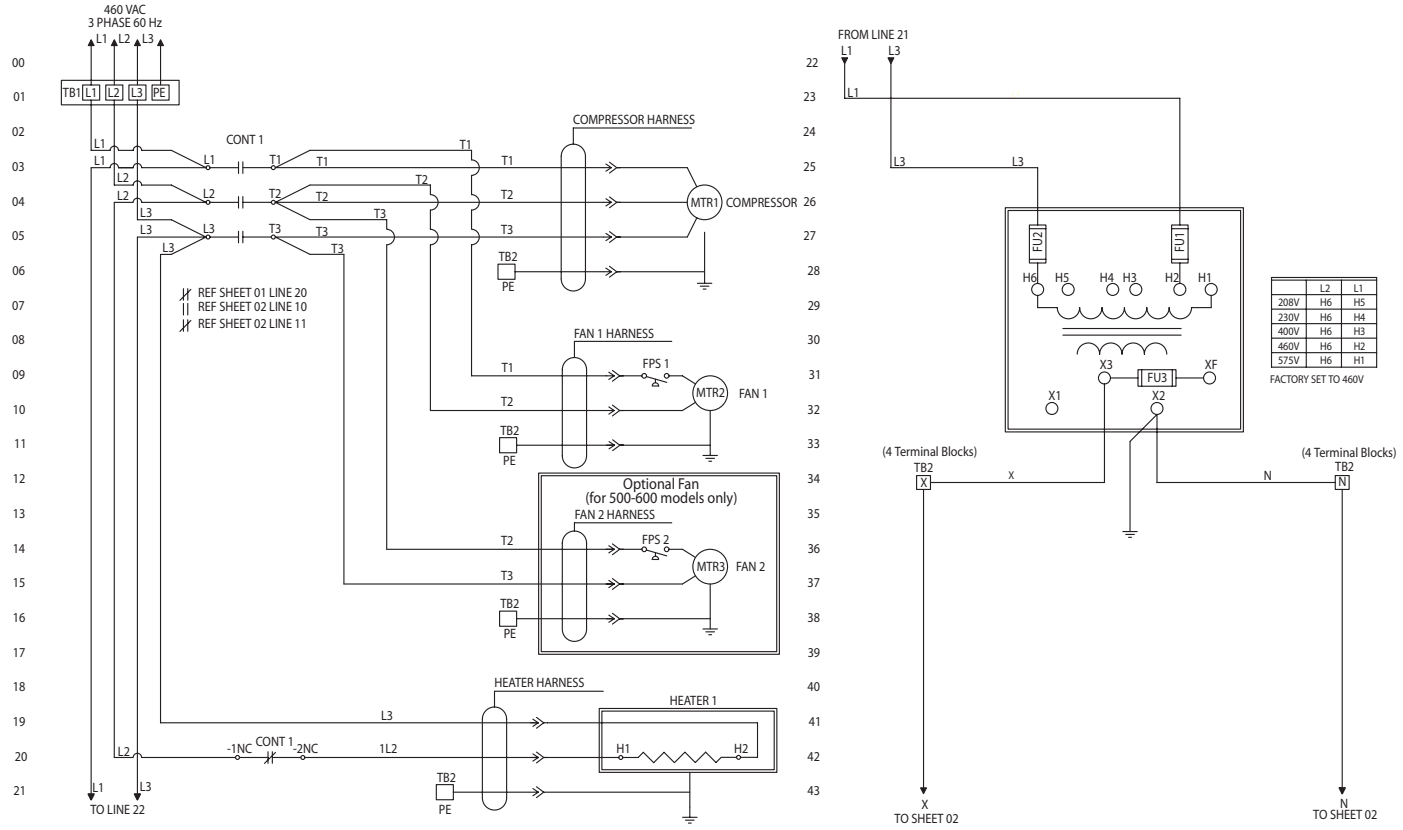


Models 125/150 - 120/230 VAC

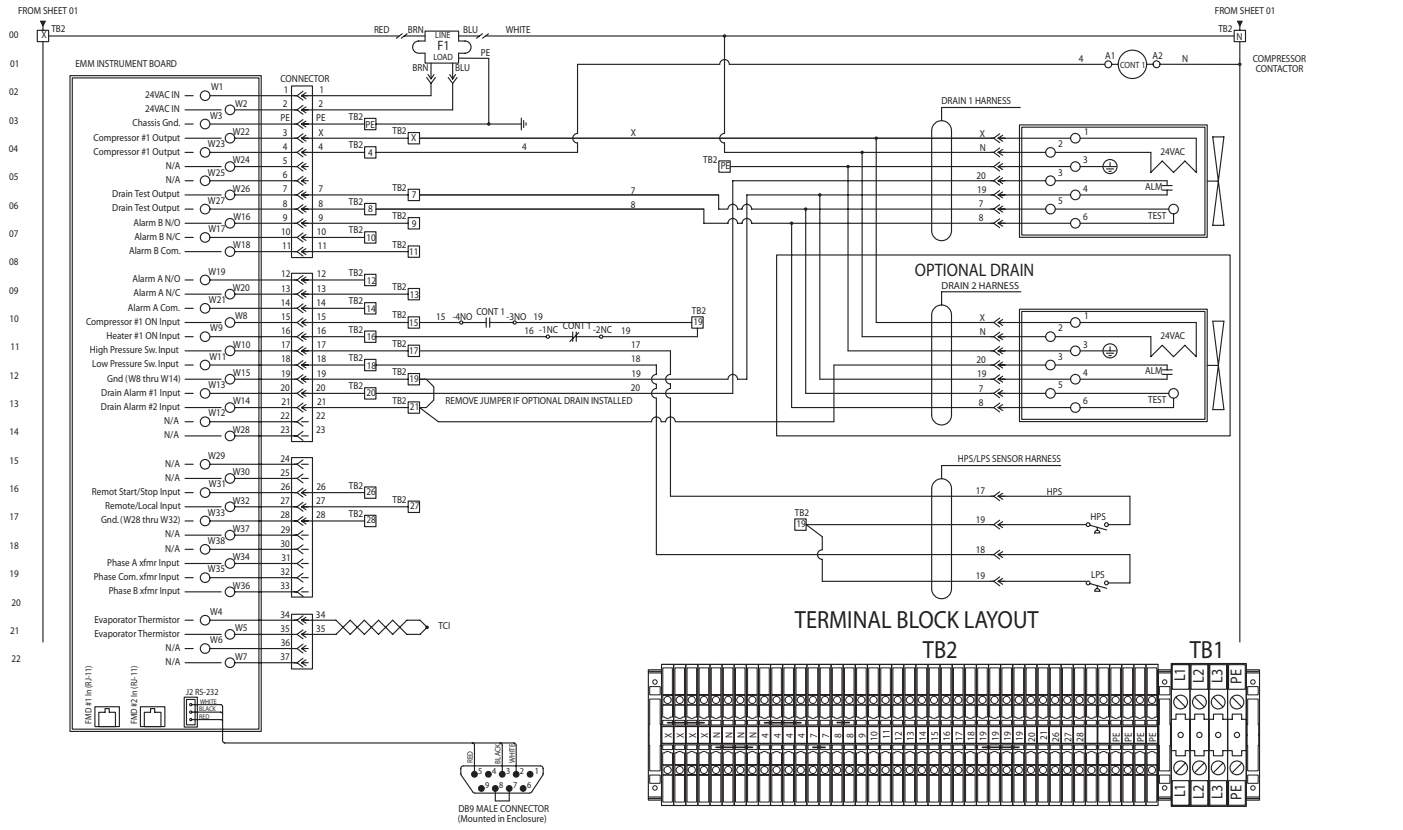


WIRING DIAGRAM

Models 200-600 - 460 VAC

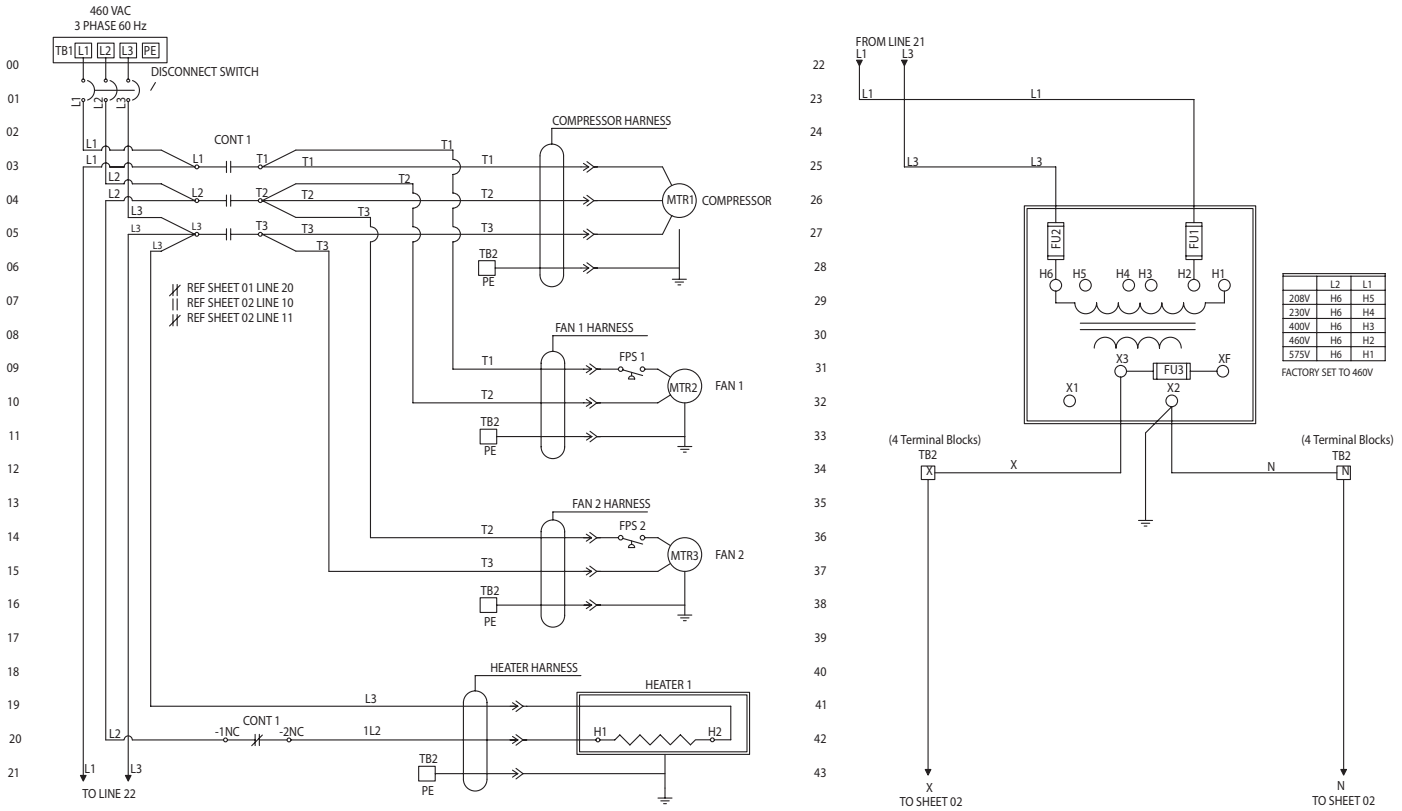


	L2	L1
208V	H6	H5
230V	H6	H4
400V	H6	H3
460V	H6	H2
575V	H6	H1

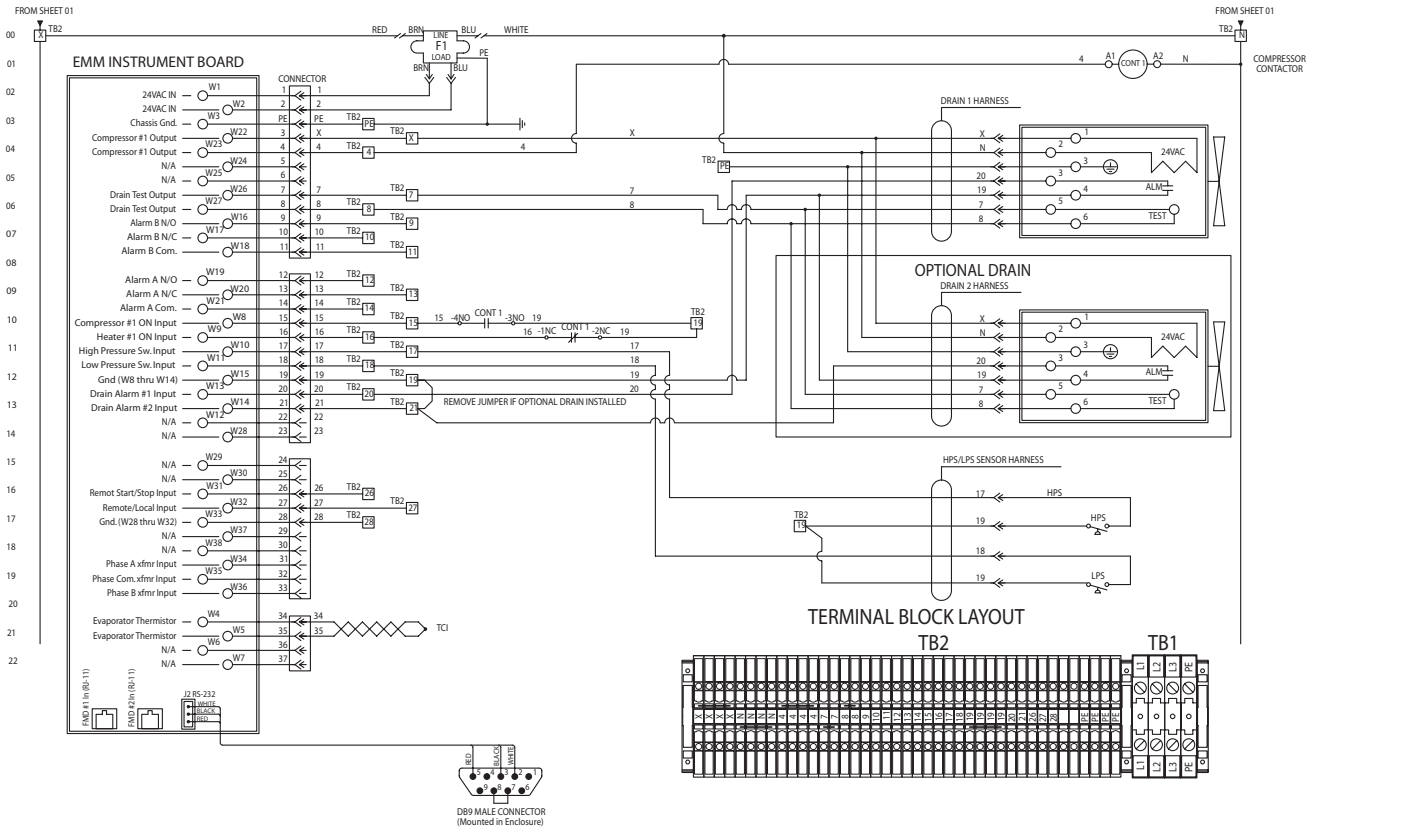


WIRING DIAGRAM

Model 750 - 460 VAC



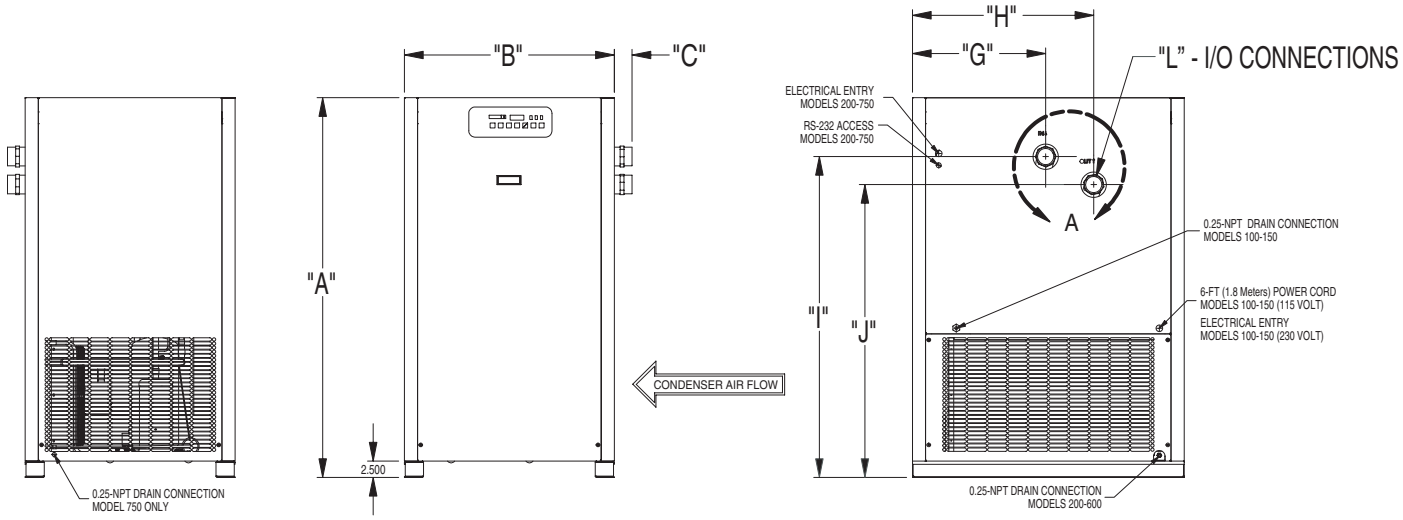
	L2	L1
208V	H6	H5
230V	H6	H4
400V	H6	H3
460V	H6	H2
575V	H6	H1



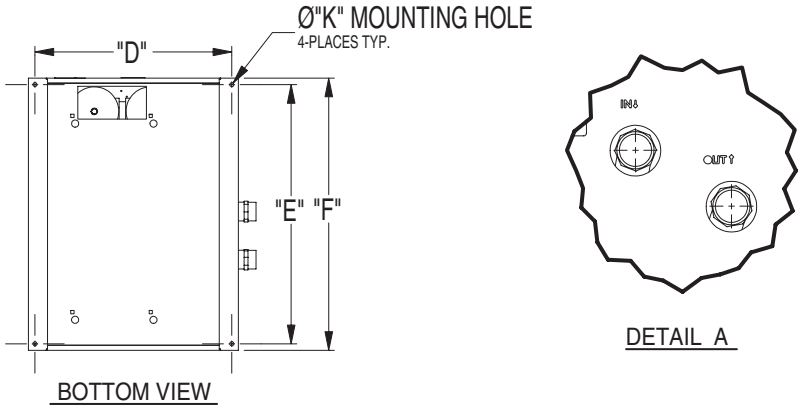
DIMENSIONS / WEIGHTS

	Dimensions (inches)									
Model	**100**	**125**	**150**	**200**	**250**	**300**	**400**	**500**	**600**	**750**
A	37.56	37.56	37.56	38.60	38.60	45.38	45.38	58.06	58.06	58.06
B	25.62	25.62	25.62	32.15	32.15	32.15	32.15	32.15	32.15	32.15
C	1.63	1.63	1.63	1.88	1.88	2.63	2.63	2.77	2.77	2.77
D	23.62	23.62	23.62	30.15	30.15	30.15	30.15	30.15	30.15	30.15
E	17.62	17.62	17.62	30.15	30.15	30.15	30.15	39.62	39.62	39.62
F	19.62	19.62	19.62	32.15	32.15	32.15	32.15	41.62	41.62	41.62
G	9.58	9.58	9.58	7.64	7.64	13.51	16.25	20.44	20.44	20.44
H	14.96	14.96	14.96	15.80	15.80	21.82	25.68	27.79	27.79	27.79
I	28.54	28.54	28.54	30.19	30.19	29.98	36.89	49.06	49.06	49.06
J	25.02	25.02	25.02	26.04	26.04	25.74	32.82	44.78	44.78	44.78
K	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.63	0.63	0.63
L Inlet/Outlet Connections	1	1	1	1-1/2	1-1/2	1-1/2	2	2-1/2	2-1/2	2-1/2
Weights (lbs)	251	273	279	425	463	527	571	684	691	734

NOTE: Dimensions and Weights are for reference only. Request certified drawings for construction purposes.



BACK VIEW FRONT VIEW RIGHT SIDE VIEW



BOTTOM VIEW

DETAIL A

TROUBLESHOOTING GUIDE (Models 100-150)

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
A) Water downstream of dryer	1. Residual free moisture remaining in downstream pipelines	Blow out system with dry air
	2. Air bypass system is open	Check valve positions
	3. Inlet and Outlet connections are reversed	Check for correct connection
	4. Air lines downstream of dryer are exposed to temperatures below the dew point.	Insulate or heat trace air lines exposed to low ambients or dry air to lower dew point
	5. Excessive free moisture (bulk liquid) at dryer inlet.	Install separator ahead of dryer
	6. Condensate not being drained Drain mechanism is clogged or inoperative. Drain line is restricted or frozen. Electric drains-timer not set to allow for sufficient condensate removal.	Replace drain mechanism if inoperative. Open drain line. Electric drains-reset time so that all liquid is discharged
	7. Dryer overloaded resulting in elevated dew point.	Check inlet air temperature and pressure, flow rate (compressor capacity) and ambient air or water temperature.
	8. Refrigeration system not functioning	See D below
B) High pressure drop across dryer	1. Excessive air flow	Check flow rate
	2. Freezing of moisture in evaporator because of refrigeration system fault	See D below
	3. Separator filter element clogged	Replace filter element
C) Dew point indicator in red area	1. Dryer overloaded resulting in high air outlet temperature	See A 7
	2. Refrigeration system not functioning properly resulting in high air outlet temperature	See D below
D) Refrigeration system not functioning properly		
1. Power on light off	a. Power failure b. Line disconnect switch open c. Blown fuses, open breaker d. Faulty wiring, loose terminals	Check for power to unit Close disconnect switch Check for continuity Have electrician check electrical connections.
2. Refrigeration compressor cycles on and off	a. High or low ambient conditions	Check min./max. temperature ranges
	b. Air-cooled - Dirty, clogged condenser fins, obstructed flow across condenser, faulty fan motor or fan control switch.	Clean condenser and check for free air flow, if problem persists contact qualified refrigeration repairman or manufacturer's service department.

TROUBLESHOOTING GUIDE (Models 200-750)

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
A) Water downstream of dryer	1. Residual free moisture remaining in downstream pipelines	1. Blow out system with dry air
	2. Air bypass system is open	2. Check valve positions
	3. Inlet and Outlet connections are reversed	3. Check for correct connection
	4. Air lines downstream of dryer are exposed to temperatures below the dew point.	4. Insulate or heat trace air lines exposed to low ambients or dry air to lower dew point
	5. Excessive free moisture (bulk liquid) at dryer inlet.	5. Install separator ahead of dryer
	6. Condensate not being drained	6. See C below
	7. Dryer overloaded resulting in elevated dew point.	7. See C below
	8. Refrigeration system not functioning	8. See C below
B) High pressure drop across dryer	1. Excessive air flow	1. Check flow rate
	2. Freezing of moisture in evaporator because of refrigeration system fault	2. See C below
	3. Filter loaded with solid particulates	3. Replace filter element
C) Checkpoint faults		
1. Power on light off	a. Power failure; open circuit	a. Check for power to dryer
2. Compressor on light off	a. Compressor commanded off by manual switch or programmed schedule	a. Check current command status
	b. Open circuit	b. Check power to compressor
	c. Control circuit open on high or low pressure cutout	c. Check display for fault
3. Alarm/Service alert light on -check Display for active conditions		
SERVICE DRYER	a. Service interval specified has elapsed	a. Perform scheduled service
LOW PRESSURE	a. Hot gas bypass valve requires adjustment	a. Contact qualified technician or manufacturer's service department
	b. Low on refrigerant	
HIGH PRESSURE NOTE: If high refrigerant pressure occurs, switch must be manually reset	a. Lack of condenser cooling Air-cooled - Ambient temperature too high, clogged condenser fins, obstructed flow across condenser, faulty fan motor or fan control switch.	Check air temperature 6" in front of condenser; Clean condenser and check for free air flow; Check fan and switch operation
	Water-cooled - Cooling temperature too high, flow too low, clogged strainer, faulty water regulating valve	Check cooling medium temperature and flow, clean strainer, check valve operation
HIGH TEMPERATURE (also observed as high reading on temperature indicator)	a. Dryer overloaded	a. Check compressed air flow, temperature, and pressure
	b. Refrigeration system off or not cooling sufficiently	b. Check power to unit, power to compressor, Low or High pressure faults Have qualified technician evaluate system
DRAIN	a. Drain line restricted or frozen	a. Open drain line
	b. Drain mechanism faulty	b. Turn 3-way valve to horizontal position and open petcock for manual draining. Rebuild drain mechanism.
COMPRESSOR	a. Faulty compressor contactor.	a. Check wiring and operation of contactor.
	b. Faulty N.O. auxiliary contact on compressor contactor.	b. Check wiring and operation of auxiliary contact.
HEATER	a. Faulty compressor contactor.	a. Check wiring and operation of contactor.
	b. Faulty N.C. auxiliary contact on compressor contactor.	b. Check wiring and operation of auxiliary contact.
TEMP SENSOR	a. Temperature sensor or wiring to sensor is open (only the left-most LED in the temperature display will be illuminated).	a. Replace sensor or repair wiring.
	b. Temperature sensor or wiring to sensor is shorted (all of the LEDs in the temperature display will be illuminated).	b. Replace sensor or repair wiring.

NOTE: After fault correction, press reset button to clear display

PARTS LIST

PARTS DESCRIPTION	100			125			150		
	115/1/60 100/1/50	208-230/1/60	220-240/1/50	115/1/60 100/1/50	208-230/1/60	220-240/1/50	115/1/60 100/1/50	208-230/1/60	220-240/1/50
Condensing Unit Assembly	5002001	5002002	5002003	5002004	5002005	5002006	5002004	5002005	5002006
Compressor (Only)	5002243	5002250	5002256	4130.108.50	4130.108.51	4130.108.52	4130.108.50	4130.108.51	4130.108.52
Overload	5002244	5002251	5002257	5925.578.13	5925.578.14	5925.578.15	5925.578.13	5925.578.14	5925.578.15
Start Relay	5002245	5002252	5002258	5945.683.13	5945.683.14	5945.683.15	5945.683.13	5945.683.14	5945.683.15
Start Capacitor	5002246	5002253	5002253	5910.103.37	5910.103.38	5910.103.39	5910.103.37	5910.103.38	5910.103.39
Fan Motor	5002247	5002254	5002259	6105.238.35	6105.238.36	6105.238.36	6105.238.35	6105.238.36	6105.238.36
Fan Blade	5002248	5002255	5002255	4140.227.21	4140.227.21	4140.227.21	4140.227.21	4140.227.21	4140.227.21
Hot Gas By-Pass Valve	5002350	5002350	5002350	5002350	5002350	5002350	5002350	5002350	5002350
Condenser	5002249	5002249	5002249	4130.111.22	4130.111.22	4130.111.22	4130.111.22	4130.111.22	4130.111.22
Dryer	4130.165.12	4130.165.12	4130.165.12	4130.165.14	4130.165.14	4130.165.14	4130.165.14	4130.165.14	4130.165.14
Fan Pressure Switch	4130.138.13	4130.138.13	4130.138.13	4130.138.13	4130.138.13	4130.138.13	4130.138.13	4130.138.13	4130.138.13
Contactor	N/A	N/A	N/A	5002260	5002262	5002262	5002260	5002262	5002262
Auxiliary Contactor	N/A	N/A	N/A	5002261	5002263	5002263	5002261	5002263	5002263
Crankcase Heater	N/A	N/A	N/A	5920.327.18	5920.327.19	5920.327.19	5920.327.18	5920.327.19	5920.327.19
Light Assembly (Green)	N/A	N/A	N/A	6350.457.25	6350.457.23	6350.457.23	6350.457.25	6350.457.23	6350.457.23
Dew Point Indicator	6685.283.1	6685.283.1	6685.283.1	6685.283.1	6685.283.1	6685.283.1	6685.283.1	6685.283.1	6685.283.1
On-Off Switch	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13
Temperature Sensor	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2
Digital PC Board Fuse	5002943	5002943	5002943	5002943	5002943	5002943	5002943	5002943	5002943

PARTS DESCRIPTION	208-230/3/60					380-420/3/50, 460/3/60, and 575/3/60				
	200	250, 300, 400	500	600	750	200	250, 300, 400	500	600	750
Condensing Unit Assembly	5002007	5002009	5002011	5002013	5002015	5002008	5002010	5002012	5002014	5002016
Compressor (Only)	4130.108.53	4130.108.55	4130.108.57	5002921	4130.108.64	4130.108.54	4130.108.56	4130.108.58	5002930	4130.108.65
Fan Motor	6105.238.37	6105.238.39	6105.238.39	5002922	6105.238.39	6105.238.38	6105.238.40	6105.238.40	5002931	6105.238.40
Fan Blade	4140.227.22	4140.227.23	4140.227.24	5002923	4140.227.24	4140.227.22	4140.227.23	4140.227.24	5002923	4140.227.24
Crankcase Heater	5920.327.12	5920.327.12	5920.327.12	5920.327.12	5920.327.12	5920.327.13	5920.327.13	5920.327.13	5920.327.13	5920.327.13
Condenser	4130.111.23	4130.111.24	4130.111.25	5002924	4130.111.28	4130.111.23	4130.111.24	4130.111.25	5002924	4130.111.28
Low Refrigerant Pressure Switch	4130.138.22	4130.138.22	4130.138.22	4130.138.22	4130.138.22	4130.138.22	4130.138.22	4130.138.22	4130.138.22	4130.138.22
High Refrigerant Pressure Switch	4130.138.25	4130.138.25	4130.138.25	4130.138.25	4130.138.25	4130.138.25	4130.138.25	4130.138.25	4130.138.25	4130.138.25
Fan Cutout Switch 1	4130.138.23	4130.138.23	4130.138.23	4130.138.23	4130.138.23	4130.138.23	4130.138.23	4130.138.23	4130.138.23	4130.138.23
Fan Cutout Switch 2	N/A	N/A	4130.138.24	4130.138.24	4130.138.24	N/A	N/A	4130.138.24	4130.138.24	4130.138.24
Hot Gas By-Pass Valve (Air-Cooled)	5002350	5002350	5002350	5002351	5002351	5002350	5002350	5002350	5002351	5002351
Filter Dryer (Liquid Line)	5002925	5002925	5002925	5002925	5002925	5002925	5002925	5002925	5002925	5002925
Temperature Sensor	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2	6150.333.2
Contactor	5002926	5002926	5002926	5002926	5002928	5002926	5002926	5002926	5002926	5002928
Auxiliary Contacts	5002927	5002927	5002927	5002927	5002929	5002927	5002927	5002927	5002927	5002929
Transformer 230/400/460	6120.092.14	6120.092.14	6120.092.14	6120.092.14	6120.092.14	6120.092.14	6120.092.14	6120.092.14	6120.092.14	6120.092.14
Fuse Primary	5920.274.28	5920.274.28	5920.274.28	5920.274.28	5920.274.28	5920.274.27	5920.274.27	5920.274.27	5920.274.27	5920.274.27
Fuse Secondary	5920.274.26	5920.274.26	5920.274.26	5920.274.26	5920.274.26	5920.274.26	5920.274.26	5920.274.26	5920.274.26	5920.274.26
Board, Printed Circuit (EMM II)	5945.576.11	5945.576.11	5945.576.11	5945.576.11	5945.576.11	5945.576.11	5945.576.11	5945.576.11	5945.576.11	5945.576.11
Digital PC Board Fuse	5002943	5002943	5002943	5002943	5002943	5002943	5002943	5002943	5002943	5002943
Power Transformer (575V)	6120.277.1	6120.277.1	6120.277.1	6120.277.1	6120.277.1	6120.277.1	6120.277.1	6120.277.1	6120.277.1	6120.277.1
Refrigerant High Pressure Switch (H_2O)	4130.138.36	4130.138.36	4130.138.36	4130.138.36	4130.138.36	4130.138.36	4130.138.36	4130.138.36	4130.138.36	4130.138.36
On-Off Switch	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13	6110.706.13
Cooling Water Regulating Valve	4130.145.22	4130.145.22	4130.145.22	4130.145.22	4130.145.22	4130.145.22	4130.145.22	4130.145.22	4130.145.22	4130.145.22
Cooling Water Strainer Screen	4731.735.5	4731.735.5	4731.735.5	4731.735.5	4731.735.5	4731.735.5	4731.735.5	4731.735.5	4731.735.5	N/A

Maintenance Kits

MODEL	100	125	150	200	250	300	400	500	600	750
	RDMK40S	RDMK41S	RDMK41S	RDMK42S	RDMK42S	RDMK43S	RDMK44S	RDMK44S	RDMK45S	RDMK46S

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WARRANTY

The manufacturer warrants the product manufactured by it, when properly installed, operated, applied, and maintained in accordance with procedures and recommendations outlined in manufacturer's instruction manuals, to be free from defects in material or workmanship for a period as specified below, provided such defect is discovered and brought to the manufacturer's attention within the aforesaid warranty period.

The manufacturer will repair or replace any product or part determined to be defective by the manufacturer within the warranty period, provided such defect occurred in normal service and not as a result of misuse, abuse, neglect or accident. Normal maintenance items requiring routine replacement are not warranted. The warranty covers parts and labor for the warranty period unless otherwise specified. Repair or replacement shall be made at the factory or the installation site, at the sole option of the manufacturer. Any service performed on the product by anyone other than the manufacturer must first be authorized by the manufacturer.

Unauthorized service voids the warranty and any resulting charge or subsequent claim will not be paid. Products repaired or replaced under warranty shall be warranted for the unexpired portion of the warranty applying to the original product.

The foregoing is the exclusive remedy of any buyer of the manufacturer's product. The maximum damages liability of the manufacturer is the original purchase price of the product or part.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR STATUTORY, AND IS EXPRESSLY IN LIEU OF THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. THE MANUFACTURER SHALL NOT BE LIABLE FOR LOSS OR DAMAGE BY REASON OF STRICT LIABILITY IN TORT OR ITS NEGLIGENCE IN WHATEVER MANNER INCLUDING DESIGN, MANUFACTURE OR INSPECTION OF THE EQUIPMENT OR ITS FAILURE TO DISCOVER, REPORT, REPAIR, OR MODIFY LATENT DEFECTS INHERENT THEREIN.

THE MANUFACTURER, HIS REPRESENTATIVE OR DISTRIBUTOR SHALL NOT BE LIABLE FOR LOSS OF USE OF THE PRODUCT OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE BUYER, WHETHER ARISING FROM BREACH OF WARRANTY , NEGLIGENCE OR STRICT LIABILITY IN TORT.

The manufacturer does not warrant any product, part, material, component, or accessory manufactured by others and sold or supplied in connection with the sale of manufacturer's products.

Warranty Period

Parts and labor for two (2) years from the date of shipment from the factory; heat exchangers are covered (parts only) for an additional three (3) years (total of five [5]). On units that manufacturer requests be returned to the factory, a one time removal/reinstallation labor allowance as noted in the Service Warranty Policies and Procedures Handbook will apply. Freight to the factory from the installation site and to the installation site from the factory will be paid by the manufacturer; means of transportation to be specified by manufacturer.

AUTHORIZATION FROM THE SERVICE DEPARTMENT IS NECESSARY BEFORE MATERIAL IS RETURNED TO THE FACTORY OR IN-WARRANTY REPAIRS ARE MADE.

SERVICE DEPARTMENT: (724) 746-1100

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