SPXFLOW

INSTRUCTION MANUAL

HPR*plus* Series

Refrigerated Type Compressed Air Dryers

Models: HPRP1000, HPRP1250, HPRP1500, HPRP1750, HPRP2000, HPRP2500, HPRP3000

FORM NO.: 5001321 REVISION: 02/2017

READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT.

Hankison

CONTENTS

GENERAL SAFETY INFORMATION

1. PRESSURIZED DEVICES:

This equipment is a pressure containing device.

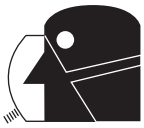
- Do not exceed maximum operating pressure as shown on equipment serial number tag.
- Make sure equipment is depressurized before working on or disassembling it for service.

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°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. Dryer should be installed in a moderately heated, well ventilated area. Avoid locations immediately adjacent to cold exterior windows or walls, or adjacent to high temperature ovens or boilers.

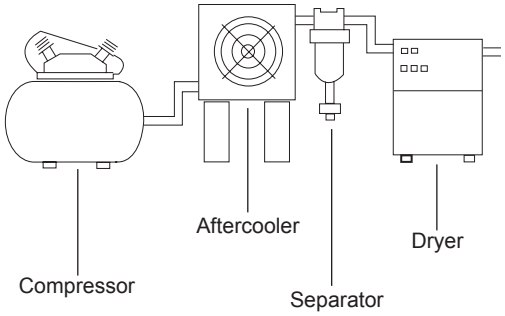
D. Clearances: Free air flow
Front 37.3/8 inches (950 mm)
Back 37.3/8 inches (950 mm)
Left Side 37.3/8 inches (950 mm)
Right Side 6 inches (153 mm)
Top 25.5/8 inches (650 mm)
Service - To facilitate maintenance leave 37.3/8 inches (950 mm) of clearance in front of dryer.

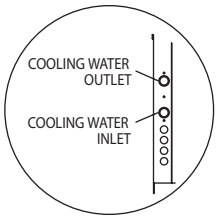
E. Standard units are designed to operate in ambients:
Air-cooled: 40 to 110°F (4 to 43°C).
Water-cooled: 40 to 130°F (4 to 54°C).

F. Dryer is designed to operate at all altitudes - no adjustment for altitude is required.

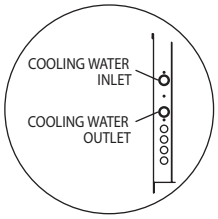
G. The installation of a flexible connection prior to the dryer is recommended to prevent possible damage from vibration.

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

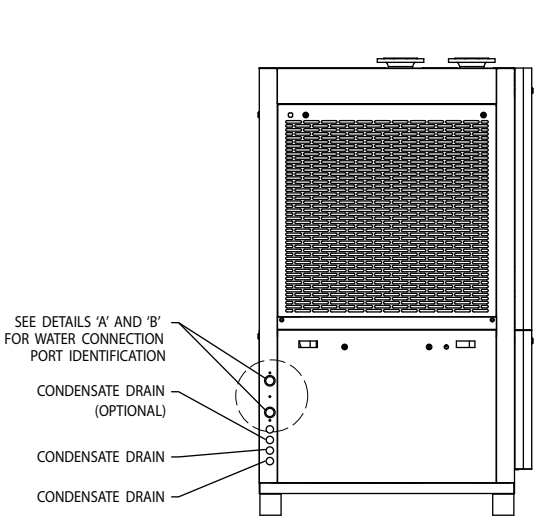




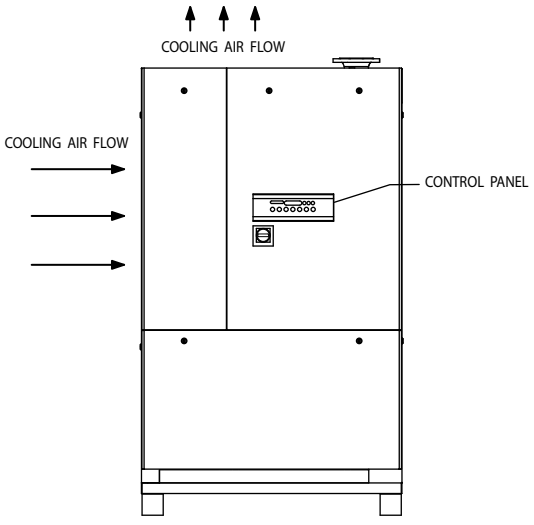
DETAIL 'A'
Cooling Water Connection Ports for Models 1000, 1250, 1500



DETAIL 'B'
Cooling Water Connection Ports for Models 1750, 2000, 2500, 3000



LEFT SIDE VIEW



FRONT SIDE VIEW

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.

⚠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

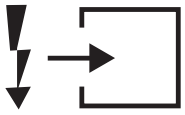
1. Connect cooling water supply to cooling water inlet.
2. Connect cooling water return line to cooling water outlet connection.

NOTE: Strainer and water regulating valve are supplied on water-cooled models. Also, it is recommended to add water inlet/outlet temperature and pressure gauges to the water piping.

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.

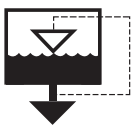


B. Electrical entry is through a hole in the top of the cabinet. Route wires through the bottom of the electrical enclosure. Connect power source to the terminal strip in the electrical enclosure as shown on the electrical schematic included with the dryer.

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

1.5 Electronic Demand Drain

A. An automatic electric demand drain (EDD) discharges condensate removed by the separator.



B. All dryer models are supplied with one EDD. Models with the additional (optional) oil removal filter are supplied with a second EDD.

C. The drains are piped to fittings in the leg of the unit. Condensate should be piped from this fitting to an open vented floor drain or sump.

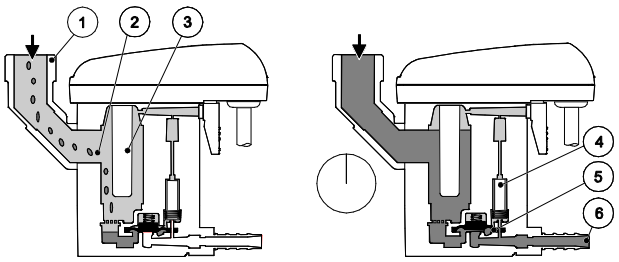
NOTE: Discharge is at system pressure. Drain line should be anchored.

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

D. 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 80 seconds for 60 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.

E. **Description of Operation:** The condensate flows through the feed line **(1)** into the condensate drain and accumulates in the housing **(2)**. A capacitive sensor **(3)** continuously registers the liquid level. As soon as the container is filled, a fixed waiting period begins during which more condensate accumulates. After the waiting time has expired the pilot valve (4) is then activated and the diaphragm **(5)** opens the outlet line **(6)** for discharging the condensate.

When the condensate drain has been emptied, the outlet line is closed again quickly and tightly without wasting compressed air.



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 barg)

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: 40°F (4°C)

2.2 Start-up

A. **Energize dryer.** Green power on light will illuminate.

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

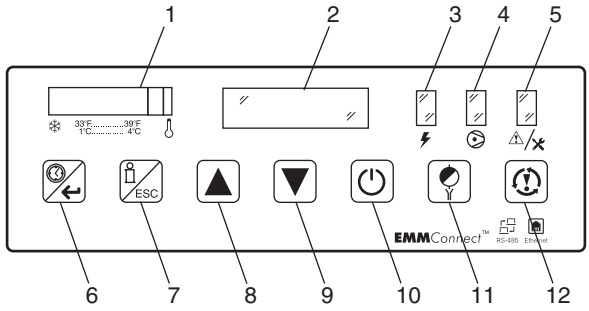
B. **Program Monitor**

Press and hold Program Mode button until Main Menu screen appears. Use the Up and Down arrow buttons to scroll through the list of sub-menu choices. Press Enter button to view the sub-menu 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 13 available: English, Spanish, French, German, Portuguese, Italian, Polish, Danish, Dutch, Norwegian, Finnish, Swedish and Czech).
   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. Press 'Enter' to edit value.
   b. Use the 'Up' and 'Down' arrow buttons to set year (00 to 99 representing 2000 to 2099). Press 'Enter' to accept new value.
   c. Use the 'Up' and 'Down' arrow buttons to set month (1-12). Press 'Enter' to accept new value.
   d. 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.
   e. Use the 'Up' and 'Down' arrow buttons to set hours (00 to 23). Press 'Enter' to accept new value.
   f. Use the 'Up' and 'Down' arrow buttons to set minutes (00 to 59). Press 'Enter' to accept new value.
   g. Press 'Enter' to accept new value. Push 'ESC' at any time to return to the Main Menu.

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 SCHEDULED MODE and MANUAL MODE.
   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: Press to cycle to next Display screen
   b. In Program Mode:
      i. Press to view the next item in a list or to increment a variable to a higher value.
      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: Press to cycle to previous Display screen
   b. In program mode:
      i. Press to view the previous item in a list or to decrement a variable to a lower value.
      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 open the drains.
12. Reset: Press at any time to clear the alarm/service message (if shown) and the alarm LED.

3. Setting Schedule
    a. Use the 'Up' and 'Down' arrow buttons to select desired "Day of week + on/off". Press 'Enter' to adjust time.
    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 '--:--', Press 'Enter' again to move the cursor under the "Day of week + on/off".
    c. Use the 'Up' and 'Down' arrow buttons to set minutes (00, 10, 20, 30, 40, 50; not shown if hour setting is '--:--'). 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.
4. Hours To Service
    a. Use the 'Up' and 'Down' arrow buttons to scroll through the range of permissible values (0 to 9999) before service reminder is initiated. Press 'Enter' to move to next field. (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.

        NOTE: All 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. Alarm History
    a. Use the 'Up' and 'Down' arrow buttons to scroll through the last twenty (20) alarms beginning with the most recent alarm.
    b. Press 'ESC' at any time to return to the Main Menu.
    c. To clear the alarm history, press and hold the 'Enter' button then press the 'Up' arrow button. Release both buttons.
6. Push ESC button to exit program mode.

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 and before starting dryer, 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.

    a. 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 MODE will appear on interface panel.
    b. Schedule Mode - push 'Schedule On/Off and Enter' button. SCHEDULED MODE will appear on the interface panel. The compressor will then turn on or off as programmed.

NOTE: Dryer may be returned to the Manual Mode at any time using the 'Schedule On/Off and Enter' button or by pressing On/Off button. MANUAL MODE 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 MODE, refrigeration compressor, off when power is restored after power interruption.

7. To reinstitute SCHEDULED MODE: push 'Schedule On/Off and Enter' button.

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

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 MODE - 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.

        SCHEDULED MODE - 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.4.).

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 EVAPORATOR 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, none of the LED's 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.

2.3 Using the RS-485 Port Connector (J8)

This connector provides RS-485 compatible signals from the internal master microprocessor. Using jumpers on the headers supplied near the connector (J12), 120 ohm termination resistors can be connected and the system can be connected for either two-wire or four-wire operation (half or full duplex). To connect the termination resistors, install jumpers on J12 in the direction shown by the white bars printed above the connector.

If the jumpers are removed no termination of the RS-485 bus is in effect. Usually, these jumpers must be in position for proper operation of the bus.

J10 contains the two-wire/four-wire jumper. If the jumper is set in W2 place, the circuit is set up for two-wire operation. If the jumper is set in W4 place, the circuit is set up for four-wire operation. Selection of jumper settings must be determined by the customer's system. The jumpers are supplied as standard and are installed as shown at the factory. Be sure to set the jumpers properly for your system.

RS-485 Pinout

Following is the pinout for J8, the RS-485 communications connector.

1 A
2 B
3 Z
4 Y

When connected in two-wire mode, the bus wires may be connected to pins 1 & 2. Also note that when in two-wire mode, one termination resistor jumper should be removed to prevent the termination from being too low in value. It may be stored on the top set of pins on J12. Those pins are not connected. Please make sure that your connections are properly made. This connector is a 4-pin terminal block. Mating connectors are not supplied. The electrical signals supplied by this connector are TIA/EIA-485A compliant. A good cable should be used to transmit signals such as Belden 3109A or equivalent.

Communication Parameters:

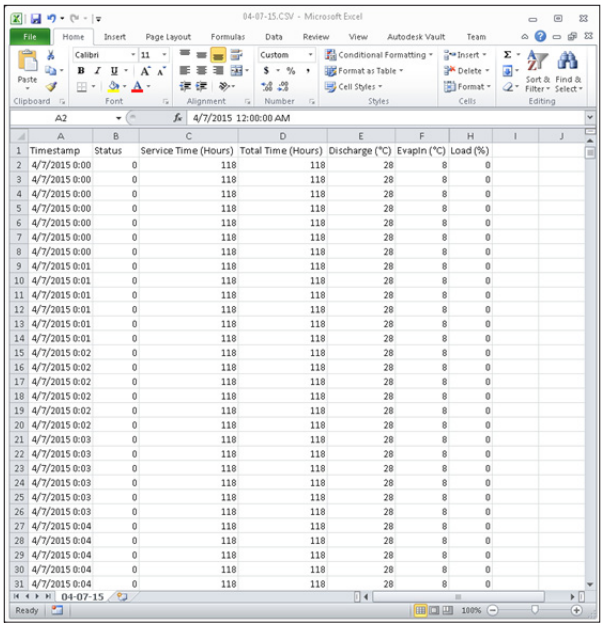
RS-485 Parameters	
Baud Rate	19200
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None
Modbus Drop I/O	Factory Default = 1 (user adjustable 1 - 247)

2.4 Using the USB Host Feature (J7)

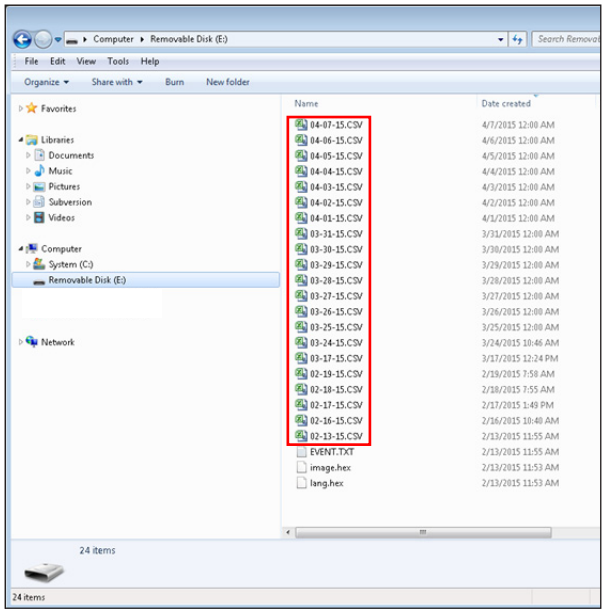
The EMM connect is equipped with a USB Host port located at J7 on the control board which allows for the connection of a USB flash drive. The USB flash drive can be used for data logging, event history, and installing software updates.

1. USB Data Logging

When a USB flash drive is installed in the controller it will begin to automatically record key dryer operating parameters: timestamp, dryer status, service timer, total compressor run timer, discharge temperature, evaporator inlet temperature, evaporator outlet temperature, and dryer % load.

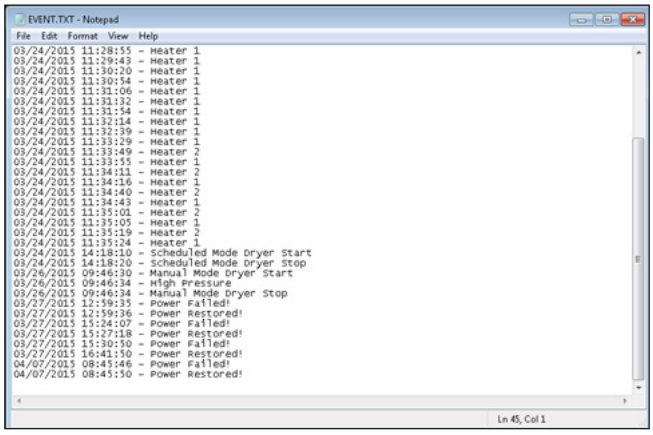


These values will be written every 10 seconds to a comma separated value file stored in the root folder of the USB flash drive. Each day a new comma separated value file will be created for storing the samples for that day. Comma separated value files older than 60 days will be automatically deleted.

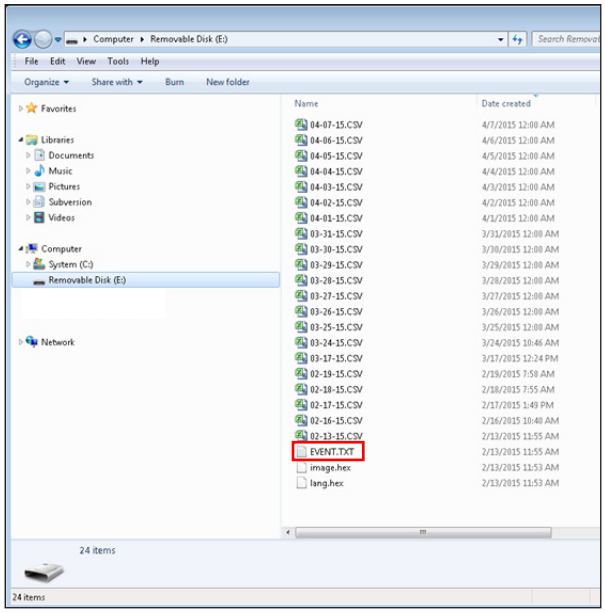


2. USB Event History

When a USB flash drive is installed in the controller it will begin to automatically log all dryer events: power loss, power recovery, alarms, state (standby/running), and mode (manual/scheduled/remote).

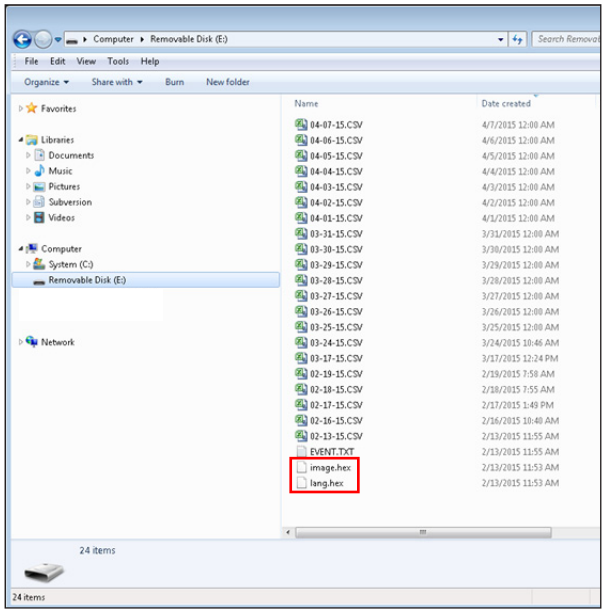


Events are timestamped and recorded in the EVENT.TXT file stored in the root folder of the USB flash drive.



3. USB Bootloader

Firmware updates for the EMM connect can be performed via the USB flash drive. In order to perform a firmware update; place the image.hex and lang.hex files provided by SPX in the root folder of a USB thumb drive.



With the dryer controller powered off install the USB flash drive in the USB host port on the EMM connect. Then while holding the enter button on the front panel apply power to the controller. Once the power LED begins blinking rapidly you can release the enter button. The controller will reboot when the update is complete. On startup the current firmware version will be shown on the text display.

2.5 Using the Ethernet Feature (J3)

The EMM connect is equipped with an Ethernet port located at J3 on the control board which allows the customer to connect the dryer to a local area network. The customer can then monitor the dryer status and performance via Web Interface or ModbusTCP.

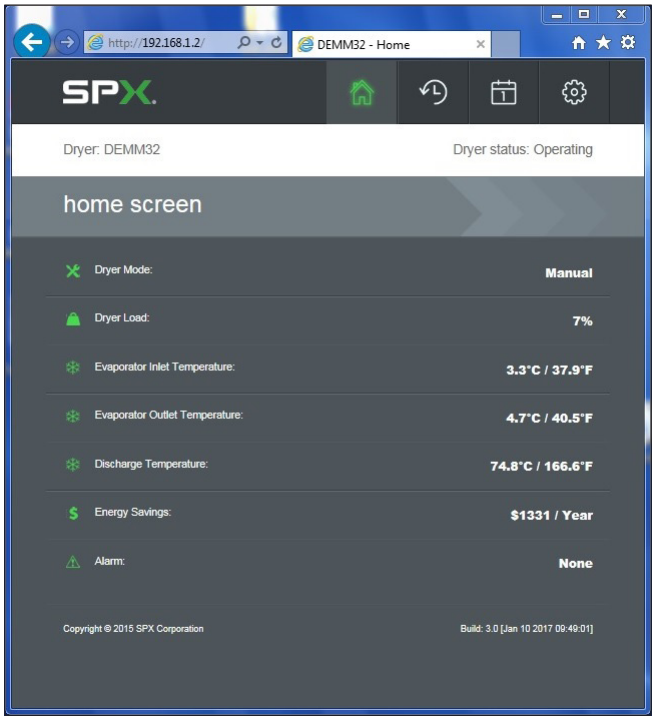
1. Web Interface

After assigning an IP address to the dryer the IP address can be entered into the address bar of any web browser to connect to the web interface.

The first page displayed is the home screen. Displayed on this page are the dryers operating status, operating mode, current dryer load, evaporator inlet temperature, evaporator outlet temperature, discharge temperature, energy savings, and any active alarms. The navigation bar at the top of this page can be used to view event history, dryer scheduler, and dryer settings.

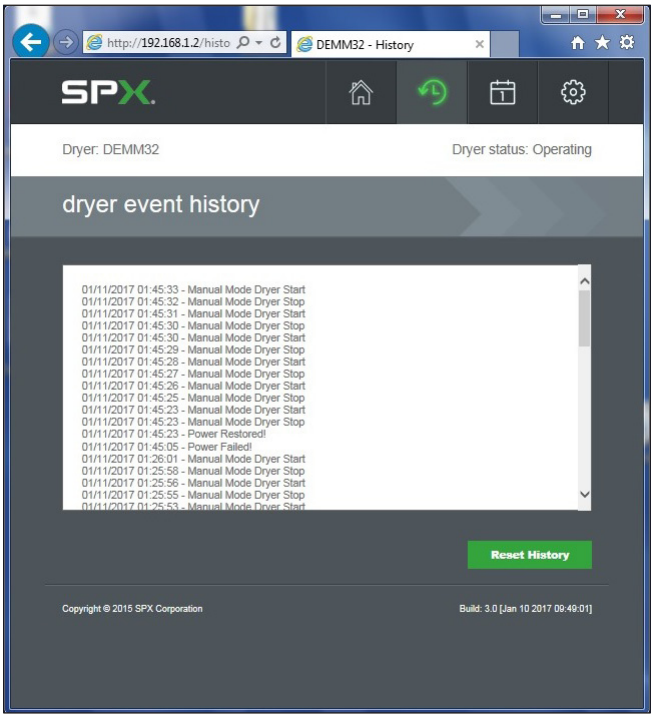
Energy savings is shown as the estimated annual energy savings based on the actual energy cost (entered on the settings page) and the average dryer load over the last 30 days.

Figure 1: Home Screen



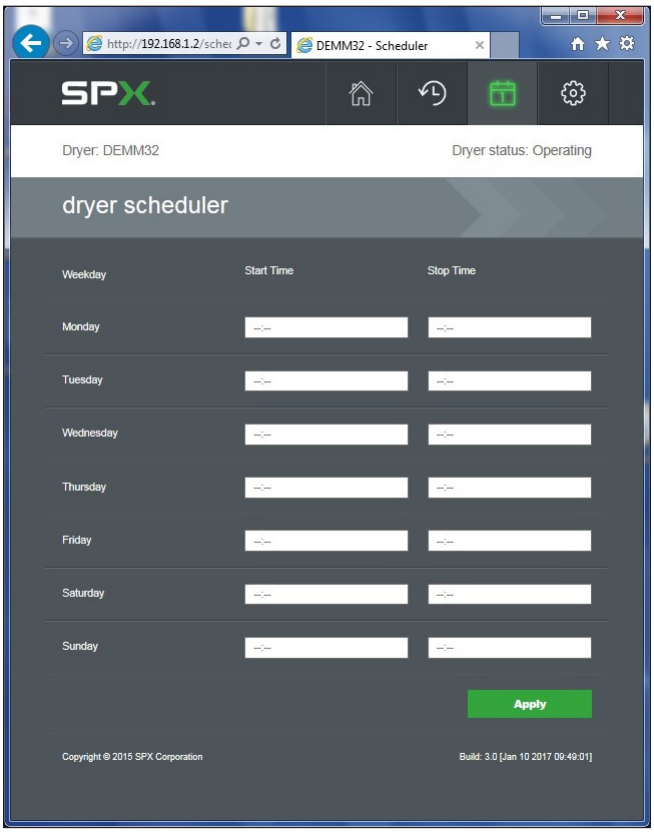
The event history page shows the last 64 timestamped events that have occurred on the dryer. These events include power failure/ recovery, dryer mode changes, dryer status changes, and alarms.

Figure 2: Event History



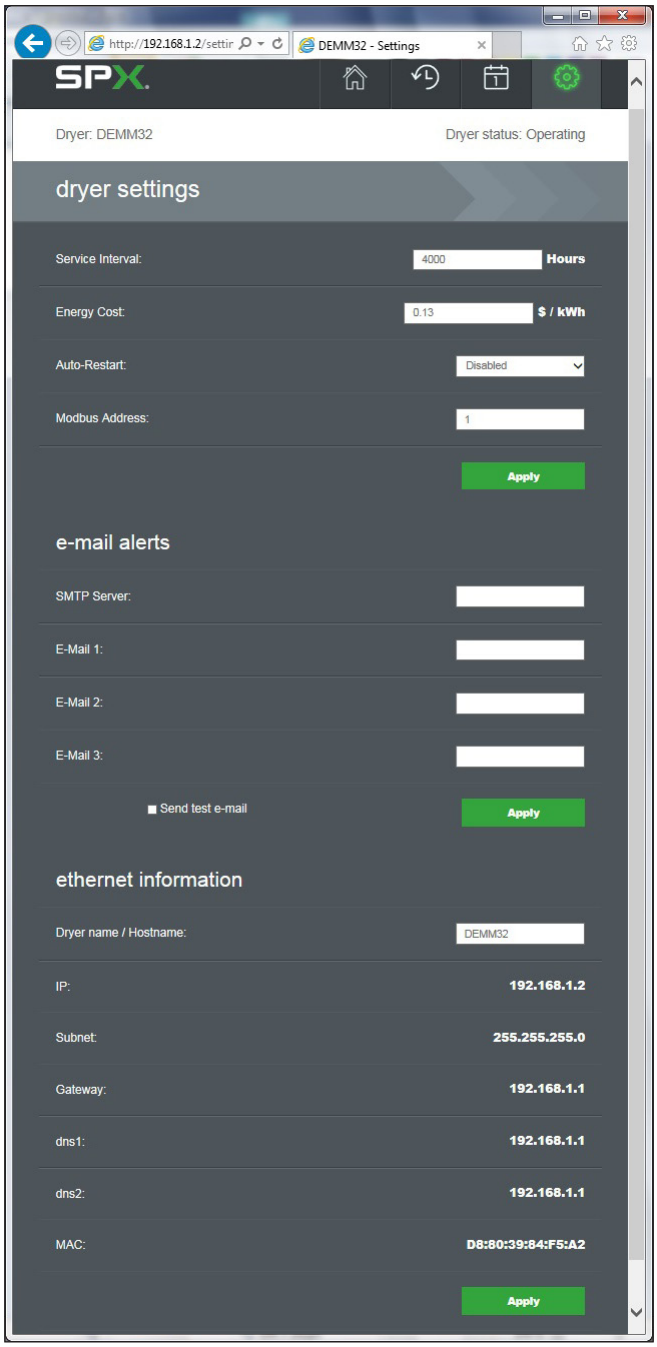
The dryer scheduler page allows the customer to view/edit the daily start/stop times that will be used when operating the dryer in scheduled mode.

Figure 3: Schedule



The dryer settings screen allows the customer to view/edit various dryer set points and setup E-mail alerts that will send an e-mail to up to 3 different e-mail addresses whenever an alarm or warning occurs on the dryer.

Figure 4: Settings



2. Modbus TCP

The Modbus TCP connection allows you to continuously monitor the dryer from a DCS system which implements a Modbus TCP master. The dryer controller implements a ModbusTCP server on port 502. The following Modbus register table provides a list of data that is available.

Modbus Registers

Holding Register		Name	Units	Description
Reference	Address			
40001	0x0000	DRYER_STATUS	Status ID	Status ID for the dryer
40002	0x0001	ALARM_STATUS	Flag Bits	Alarm flag bits
40003	0x0002	WARNING_STATUS	Flag Bits	Warning flag bits
40004	0x0003	RESERVED	N/A	Reserved
40005	0x0004	SERVICE_TIMER	Hours	Timer to service
40006	0x0005	TOTAL_TIMER	Hours	Total operating hours
40007	0x0006	EVAPORATOR_INLET_TEMP	1/10 Degree Celsius	Evaporator inlet temperature
40008	0x0007	DISCHARGE_TEMP	1/10 Degree Celsius	Discharge temperature
40009	0x0008	DRYER_LOAD	%	Dryer load
40010	0x0009	SAVINGS	Dollars / Euros	Energy savings
40011	0x000A	EVAPORATOR_OUTLET_TEMP	1/10 Degree Celsius	Evaporator outlet temperature
40012	0x000B			
40013	0x000C			
40014	0x000D			
40015	0x000E			
40016	0x000F			
40017	0x0010	DRYER_MODEL	Model_ID	Dryer model
40018	0x0011	DRYER_MODE	Mode_ID	Dryer mode
40019	0x0012	SERVICE_INTERVAL	Hours	Service interval
40020	0x0013	AUTO_RESTART	Boolean	Auto-restart (0=Disabled, 1=Enabled)
40021	0x0014	UI_LANGUAGE	Language_ID	User interface language
40022	0x0015	RESERVED	N/A	Reserved
40023	0x0016	RESERVED	N/A	Reserved
40024	0x0017	ENERGY_COST	Integer	Energy cost (Cost / kWh)
40025	0x0018	AUDIBLE_ALARM	Boolean	Audible Alarm (0=Disabled, 1=Enabled)
40026	0x0019	MODBUS_ADDRESS	Integer	Modebus Address
40027	0x001A	FULL_POWER	Watts	Full load power
40028	0x001B			
40029	0x001C			
40030	0x001D			
40031	0x001E			
40032	0x001F			
40033	0x0020	ALARM_MSG_1	Integer	Alarm message #1 phrase id
40034	0x0021	ALARM_MSG_2	Integer	Alarm message #2 phrase id
40035	0x0022			
40036	0x0023			
40037	0x0024			
40038	0x0025			
40039	0x0026			
40040	0x0027			
40041	0x0028	INPUT_STATUS	Flag Bits	Digital Input Status
40042	0x0029	OUTPUT_STATUS	Flag Bits	Digital Output Status
40043	0x002A	ANALOG[0]	1/10 Degree Celsius	Analog Input [0]
40044	0x002B	ANALOG[1]	1/10 Degree Celsius	Analog Input [1]
40045	0x002C	ANALOG[2]	1/10 Degree Celsius	Analog Input [2]
40046	0x002D	PV	1/10 Degree Celsius	Process value
40047	0x002E	P	Integer	P Term
40048	0x002F	I	Integer	I Term
40049	0x0030	D	Integer	D Term
40050	0x0031	FIXED_LOAD	Seconds	Fixed cycle load period
40051	0x0032	FIXED_UNLOAD	Seconds	Fixed cycle unload period
40052	0x0033	FIXED_TIME	Seconds	Fixed mode timeout period
40053	0x0034	DELTA_PID_CALC	1/10 Degree Celsius	PID calculation set point
40054	0x0035	DELTA_PID_CTRL	1/10 Degree Celsius	PID control set point

Modbus Register Details

Dryer Status	
Register	40001

Decimal	Hex	Description
0	0x0000	Standby
1	0x0001	Fixed
2	0x0002	PID
3	0x0003	Reserved
4	0x0004	Reserved
5	0x0005	Reserved
6	0x0006	Reserved
7	0x0007	Reserved

Dryer Alarm Flags	
Register	40002

Bit	Mask	Description
0	0x0001	High Discharge Temperature
1	0x0002	High Refrigerant Pressure
2	0x0004	Low Refrigerant Pressure
3	0x0008	Compressor #1
4	0x0010	Compressor #2
5	0x0020	Oil Protection #1
6	0x0040	Oil Protection #2
7	0x0080	Phase Reversal
8	0x0100	Phase Loss
9	0x0200	Evaporator Temperature Sensor Failure
10	0x0400	Glycol Temperature Sensor Failure
11	0x0800	Evaporator Outlet Temperature Sensor Failure
12	0x1000	Discharge Temperature Sensor failure
13	0x2000	High Super Heat
14	0x4000	Reserved
15	0x8000	Reserved

Dryer Warning Flags	
Register	40003

Bit	Mask	Description
0	0x0001	High Evaporator Temperature
1	0x0002	High Glycol Temperature
2	0x0004	Heater #1
3	0x0008	Heater #2
4	0x0010	Drain #1
5	0x0020	Drain #2
6	0x0040	Filter #1
7	0x0080	Filter #2
8	0x0100	Reserved
9	0x0200	Reserved
10	0x0400	Reserved
11	0x0800	Reserved
12	0x1000	Reserved
13	0x2000	Reserved
14	0x4000	Reserved
15	0x8000	Reserved

Modbus Register Details

Dryer Model		
Register	40017	
Decimal	Hex	Description
0	0x0000	Non-Cycling MRD
1	0x0001	Non-Cycling LRD
2	0x0002	ES-MRD 90
3	0x0003	ES-MRD 120
4	0x0004	ES-MRD 140
5	0x0005	ES-MRD 190
6	0x0006	ES-MRD 245
7	0x0007	ES-MRD 280
8	0x0008	ES-MRD 360
9	0x0009	ES-MRD 450
10	0x000A	ES-MRD 540
11	0x000B	ES-MRD 675
12	0x000C	DEMM 800
13	0x000D	DEMM 1000
14	0x000E	DEMM 1250
15	0x000F	DEMM 1500
16	0x0010	DEMM 1750
17	0x0011	DEMM 2000
18	0x0012	DEMM 2500
19	0x0013	DEMM 3000
20	0x0014	Reserved
21	0x0015	Reserved
22	0x0016	Reserved
23	0x0017	Reserved
24	0x0018	Reserved
25	0x0019	Reserved
26	0x001A	Reserved
27	0x001B	Reserved
28	0x001C	Reserved
29	0x001D	Reserved
30	0x001E	Reserved
31	0x001F	Reserved

Dryer Mode		
Register(s)	40018	
Decimal	Hex	Description
0	0x0000	Manual Mode
1	0x0001	Scheduled Mode
2	0x0002	Remote Mode
3	0x0003	Reserved
4	0x0004	Reserved
5	0x0005	Reserved
6	0x0006	Reserved
7	0x0007	Reserved

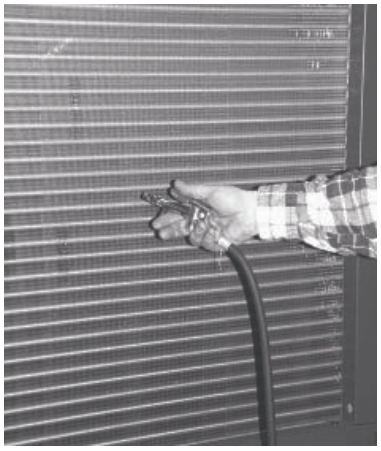
Modbus Register Details

UI Language		
Register(s)	40021	
Decimal	Mask	Description
0	0x0000	English
1	0x0001	Spanish
2	0x0002	French
3	0x0003	German
4	0x0004	Portuguese
5	0x0005	Italian
6	0x0006	Polish
7	0x0007	Danish
8	0x0008	Dutch
9	0x0009	Norwegian
10	0x000A	Finnish
11	0x000B	Swedish
12	0x000C	Czech
13	0x000D	Reserved
14	0x000E	Reserved
15	0x000F	Reserved

3.0 MAINTENANCE

3.1 Monthly Maintenance

A. Air-Cooled: Clean refrigerant condenser. Blow the fins of the condenser clean with compressed air, if necessary, remove heavier soiling with a suitable cleansing agent.



B. Water-cooled - clean strainer monthly, more often if required. Shut off water, remove small plug to relieve pressure, then remove large plug to remove strainer. Clean strainer and replace.

C. Check the condensate drains by pressing the Drain Test button on the control panel (see page 5 for description and location). Visually check to assess whether condensate is separated and discharged.

D. Check the dew point temperature on the control panel.

E. Check the inlet compressed air temperature and the ambient temperature (or inlet cooling water temperature) to assure they are within the operational limits.

3.2 Annual Maintenance

A. Check all terminals in the switchgear cabinet and tighten them up if necessary.

⚠ CAUTION Check to be sure the unit is de-energized.

B. Maintenance/Cleaning of the condensate drain.

1. To facilitate service, maintenance kits are available.

C. Replace the filter cartridges in the filter. (All necessary service parts can be ordered in a service kit – See Parts List.)

1. When to replace the Separator/Filters.

   Replace filter element when pressure drop across dryer is excessive or annually.

   When removing liquids at rated flow conditions, the pressure drop will be 5 psi (0.35 bar), or less, across the entire dryer. An increase in pressure drop will occur only as the separator/filter elements become loaded with solid particles. It is recommended, for maximum filtration efficiency, the separator/filter elements be replaced when the pressure drop across the dryer exceeds 10 psi (0.7 bar), or every 12 months, whichever occurs first.

2. Replacement of the Separator/Filters

   ⚠ CAUTION Depressurize the unit before servicing. Failure to do this may result in injury.

   a. Open the bypass between compressed air inlet and outlet. (if equipped)

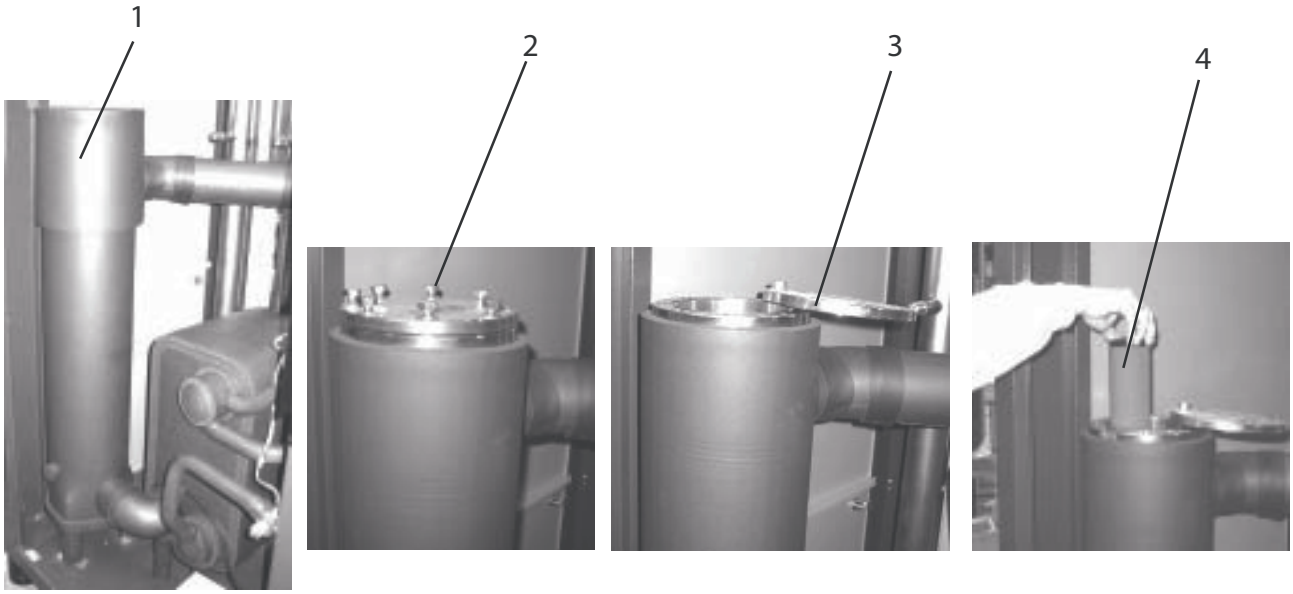
   b. Close the shut-off devices at the compressed air inlet and outlet.

   c. Press the Drain Test button on the control panel (see page 5 for description and location) until the system is depressurized.

   d. Switch off the dryer.

   e. Remove the insulation [1].

Ref: 3.2, C, 2, e through h



f. Loosen the screws [2] of the filter housing. Caution is necessary as the system may still be under slight residual pressure.

g. Remove all screws except one and swing flange [3] to the side.

h. Pull out the old cartridges [4].

i. Push new cartridges on to the mounting posts in the bottom of the separator vessel.

   NOTE: Do not touch the foam sleeves of the cartridges with your fingers.

j. Close housing in reverse order.

k. Put on insulation.

l. Switch on the dryer.

m. Repressurize the dryer by slowly opening the compressed air inlet valve.

n. Slowly open the compressed air outlet valve.

o. Slowly close the compressed air bypass valve (if equipped).

4.0 TROUBLESHOOTING GUIDE

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	1. Power failure; open circuit.	1. Check for power to dryer.
2. Compressor on light off	1. Compressor commanded off by manual switch or programmed schedule.	1. Check current command status.
	2. Open circuit.	2. Check power to compressor.
	3. Control circuit open on high or low pressure cutout.	3. Check display for fault.
3. Alarm/Service alert light on -check Display for active conditions		
SERVICE DRYER	1. Service interval specified has elapsed.	1. Perform scheduled service.
LOW PRESSURE	1. Hot gas bypass valve requires adjustment	1. Contact qualified technician or manufacturer's service department.
	2. Low on refrigerant/refrigerant leak.	
HIGH PRESSURE NOTE: If high refrigerant pressure occurs, switch must be manually reset	1. Lack of condenser cooling. Air-cooled - Ambient temperature too high, clogged condenser fins, obstructed flow across condenser, faulty fan motor or fan control switch.	1. Check air temperature 6" in front of condenser; Clean condenser and check for free air flow; Check fan and switch operation.
	2. Water-cooled - Cooling temperature too high, flow too low, clogged strainer, faulty water regulating valve.	2. Check cooling medium temperature and flow, clean strainer, check valve operation.
HIGH EVAPORATOR TEMPERATURE (also observed as high reading on temperature indicator)	1. Dryer overloaded.	1. Check compressed air inlet flow, temperature, and pressure.
	2. Refrigeration system off or not cooling sufficiently.	2. Check power to unit, power to compressor, Low or High pressure faults. Have qualified technician evaluate system.
DRAIN	1. Drain line restricted or frozen.	1. Open drain line.
	2. Drain mechanism faulty.	2. Check drain by pressing "Push to Test" button on control panel. If faulty, isolate drain. Rebuild automatic drain.
COMPRESSOR	1. Faulty compressor contactor.	1. Check wiring and operation of contactor.
	2. Faulty N.O. auxiliary contact on compressor contactor.	2. Check wiring and operation of auxiliary contact.
HEATER	1. Faulty compressor contactor.	1. Check wiring and operation of contactor.
	2. Faulty N.C. auxiliary contact on compressor contactor.	2. Check wiring and operation of auxiliary contact.
	3. Faulty heater.	3. Check heater element for continuity.
TEMP SENSOR	1. Temperature sensor or wiring to sensor is open (none of the LED's in the temperature display will be illuminated).	1. Replace sensor or repair wiring.
	2. Temperature sensor or wiring to sensor is shorted (all of the LEDs in the temperature display will be illuminated).	2. Replace sensor or repair wiring.

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

5.0 REFERENCE

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 a 60 Hz air-cooled model 1000 handle when compressed air to be dried is at 200 psig and 100°F; ambient air temperature is 80°F?

Answer: 1,000 x 1.22 x 1.12 = 1,366 scfm.

TABLE 1

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

MODEL		1000	1250	1500	1750	2000	2500	3000
Rated capacity of air-cooled models (scfm)	60 Hz	1000	1250	1500	1750	2000	2500	3000
	50 Hz	830	1050	1250	1460	1670	2080	2500

TABLE 2

Air capacity correction factors (Multipliers)

INLET COMPRESSED AIR CONDITIONS						
INLET PRESSURES		INLET TEMPERATURES				
		80°F	90°F	100°F	110°F	120°F
psig	barg	27°C	32°C	38°C	43°C	49°C
50	3.4	1.35	1.05	0.84	0.69	0.56
80	5.5	1.50	1.17	0.95	0.79	0.66
100	6.9	1.55	1.23	1.00	0.82	0.70
125	8.6	1.63	1.31	1.07	0.91	0.74
150	10.3	1.70	1.37	1.13	0.95	0.80
175	12.1	1.75	1.42	1.18	0.99	0.84
200	13.8	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 95°F (35°C).*

ENGINEERING DATA TABLE

Sheet 1 of 2

Model		1000	1250	1500	1750	2000	2500	3000
Air System Data								
Rated Air Flow at 100°F & 100 psig Inlet, 100°F Ambient (scfm)	60 Hz, a-c	1000	1250	1500	1750	2000	2500	3000
	60 Hz, w-c	1150	1438	1725	2013	2300	2875	3450
Rated Air Flow at 95°F & 100 psig Inlet, 77°F Ambient (scfm)	50 Hz, a-c	1060	1325	1590	1855	2120	2650	3180
	50 Hz, w-c	1070	1338	1605	1873	2140	2675	3210
Minimum / Maximum Inlet Compressed Air Pressure		30 / 232 psig (2.1 / 16.0 barg)						
Minimum / Maximum Inlet Compressed Air Temperature		40° / 120°F (4° / 49°C)						
Minimum / Maximum Ambient Temperature	a-c	40° / 110°F (4° / 43°C)						
	w-c	40° / 130°F (4° / 54°C)						
Outlet Air Temperature (nominal at rated conditions)		85°F (29°C)						
Refrigeration System Data								
Compressor Type		Hermetic Reciprocating						
Refrigeration Compressor Horsepower		4	5	7	8	8	10	13
Refrigeration Capacity @ Rated Flow (BTU/hr)*	60 Hz, a-c	42,300	52,700	65,700	78,400	78,400	98,800	125,700
	50 Hz, a-c	46,500	58,100	73,400	87,600	87,600	112,900	140,200
Refrigerant Type		R-404A						
Refrigerant Charge		See Data Tag on Dryer						
Suction Pressure Setting - Hot Gas Bypass Valve		78 psig (5.4 barg)						
Compressor Pressure Switch Setting (cut out / cut in)	High, a-c	450 / 350 psig (31.0 / 24.1 barg)						
	High, w-c	320 / 250 psig (22.1 / 17.2 barg)						
	Low	47 / 64 psig (3.2 / 4.4 barg)						
Air-Cooled Condensers								
Air Flow Across Condenser (cfm)	60 Hz	4,200	4,200	7,300	7,300	7,300	7,300	14,600
	50 Hz	3,500	3,500	6,100	6,100	6,100	6,100	12,200
Condenser Fan Switch Setting (in-out)	Fan 1	300 / 230 psig (20.7 / 15.9 barg)						
	Fan 2	N/A		325 / 255 psig (22.4 / 17.6 barg)				
Water-Cooled Condensers								
Water Regulating Valve Setting		255 psig (17.6 barg)						
Minimum Water Pressure Differential		40 psig (2.8 barg)						
Cooling Water Flow with 85°F (gpm)*	60 Hz	8.3	10.3	12	14	16	20	24
	50 Hz	7.7	9.6	11	13	15	19	22

NOTES

* 60 Hz: 35°F Evaporator & 100°F Ambient; 50 Hz: 35°F Evaporator & 77°F Ambient

ENGINEERING DATA TABLE

Sheet 2 of 2

Model	1000	1250	1500	1750	2000	2500	3000
Electrical Data							
Nominal Voltage	**230/3/60 ****						
Voltage Range	207 - 253						
Input Power @ Rated Flow (watts) *	6,130	7,290	9,470	11,360	11,360	15,030	19,670
Minimum Circuit Ampacity	25	31	39	46	46	55	79
Maximum Overcurrent Protector (amps)	40	50	60	75	75	90	125
Compressor Rated Load Amps	8.6	10.7	12.9	15.7	15.7	19.3	25.7
Compressor Locked Rotor Amps	42	67	80	90	90	105	140
Compressor Winding Resistance (ohms)	3.80	2.41	1.90	1.85	1.85	1.57	1.10
Nominal Voltage	**460/3/60**						
Voltage Range	414 - 506						
Input Power @ Rated Flow (watts) *	6,130	7,290	9,470	11,360	11,360	15,030	19,670
Minimum Circuit Ampacity	13	15	20	23	23	28	39
Maximum Overcurrent Protector (amps)	20	25	30	35	35	45	60
Compressor Rated Load Amps	8.6	10.7	12.9	15.7	15.7	19.3	25.7
Compressor Locked Rotor Amps	42	67	80	90	90	105	140
Compressor Winding Resistance (ohms)	3.80	2.41	1.90	1.85	1.85	1.57	1.10
Nominal Voltage	**575/3/60 ****						
Voltage Range	518 - 633						
Input Power @ Rated Flow (watts) *	6,130	7,290	9,470	11,360	11,360	15,030	19,670
Minimum Circuit Ampacity	10	12	16	19	19	22	31
Maximum Overcurrent Protector (amps)	15	20	25	30	30	35	50
Compressor Rated Load Amps	8.6	10.7	12.9	15.7	15.7	19.3	25.7
Compressor Locked Rotor Amps	42	67	80	90	90	105	140
Compressor Winding Resistance (ohms)	3.80	2.41	1.90	1.85	1.85	1.57	1.10
Nominal Voltage	**380-420/3/50**						
Voltage Range	342 - 462						
Input Power @ Rated Flow (watts) *	4,180	4,970	6,450	7,740	7,740	10,240	13,410
Minimum Circuit Ampacity	13	15	20	23	23	28	39
Maximum Overcurrent Protector (amps)	20	25	30	35	35	45	60
Compressor Rated Load Amps	8.6	10.7	12.9	15.7	15.7	19.3	25.7
Compressor Locked Rotor Amps	42	67	80	90	90	105	140
Compressor Winding Resistance (ohms)	3.80	2.41	1.90	1.85	1.85	1.57	1.10

NOTES

* 60 Hz: 35°F Evaporator & 100°F Ambient; 50 Hz: 35°F Evaporator & 77°F Ambient

** 230/3/60 and 575/3/60 units use equipment transformers on incoming power. Compressor and fan voltage is 460/3/60.

DRYER SET POINT TABLE

DIP Switch Settings

DIP Switch	Description	On	Off
1	Evaporator Outlet Temperature Sensor	Disabled	Enabled
2	Status Menu Scrolling	Disabled	Enabled
3	Reserved	N/A	N/A
4	Reserved	N/A	N/A

Dryer Configuration

Description	Units	Lower	Upper	Increment	Default
Service Interval	Hours	0	9999	1	4000
Energy Cost	Decimal	0.00	0.99	0.01	0.13
Total Hours	Hours	0	999999	1	0
Modbus Device Address	Integer	1	247	1	1

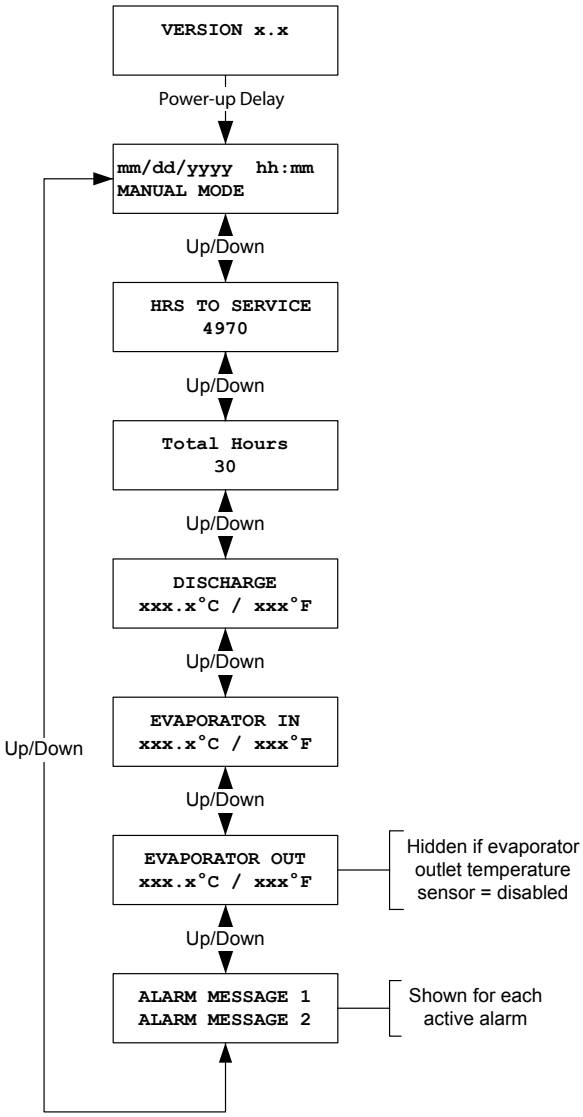
DRYER ALARM TABLE

Alarm Conditions

Alarm Text	Alarm Trigger	Delay	Monitored	Exit Condition	Alarm Action
DISCHARGE HIGH TEMPERATURE	Discharge temperature > high discharge temperature set point	1 Second	Always	Alarm reset button pressed	Halt compressors De-energize alarm relay #1
HIGH PRESSURE	High pressure switch open	1 Second	Always	Alarm reset button pressed	Halt compressors De-energize alarm relay #1
LOW PRESSURE	Low pressure switch open	3 Minutes	Always	Alarm reset button pressed	Halt compressors De-energize alarm relay #1
COMPRESSOR	Motor protection switch open	1 Second	Primary Compressor On	Alarm reset button pressed	Halt compressors De-energize alarm relay #1
PHASE REVERSAL	Phase Detection Enabled AND isPhaseReversed()	1 Second	Standby	Alarm reset button pressed	Halt compressors De-energize alarm relay #1
PHASE LOSS	Phase Detection Enabled and isPhaseLoss()	1 Second	Standby	Alarm reset button pressed	Halt compressors De-energize alarm relay #1
EVAPORATOR HIGH TEMPERATURE	Evaporator temperature > High evaporator temperature set point	1 Second	Dryer On > 10 minutes	Alarm reset button pressed	De-energize alarm relay #2
HEATER	Heater switch open	1 Second	Standby	Alarm reset button pressed	De-energize alarm relay #2
DRAIN 1	Drain #1 switch open	1 Second	Dryer On	Alarm reset button pressed	De-energize alarm relay #2
DRAIN 2	Drain #2 switch open	1 Second	Dryer On	Alarm reset button pressed	De-energize alarm relay #2
SERVICE DRYER	Dryer service interval > 0 AND Dryer service timer > Dryer service interval	None	Always	Alarm reset button pressed	De-energize alarm relay #2
EVAPORATOR TEMP SENSOR	Evaporator temperature sensor out of range	1 Second	Always	Alarm reset button pressed	Halt compressors De-energize alarm relay #1
EVAPORATOR OUT. TEMP SENSOR	Evaporator outlet temperature sensor out of range AND evaporator outlet temperature sensor installed	1 Second	Always	Alarm reset button pressed	Halt compressors De-energize alarm relay #1
DISCHARGE TEMP SENSOR	Discharge temperature sensor out of range	1 Second	Always	Alarm reset button pressed	Halt compressors De-energize alarm relay #1
SUPERHEAT ALARM	(Evaporator outlet temperature – Evaporator inlet temperature) > Super heat alarm set point AND evaporator outlet temperature sensor installed	7 Minutes	Dryer On	Alarm reset button pressed	Halt compressors De-energize alarm relay #1

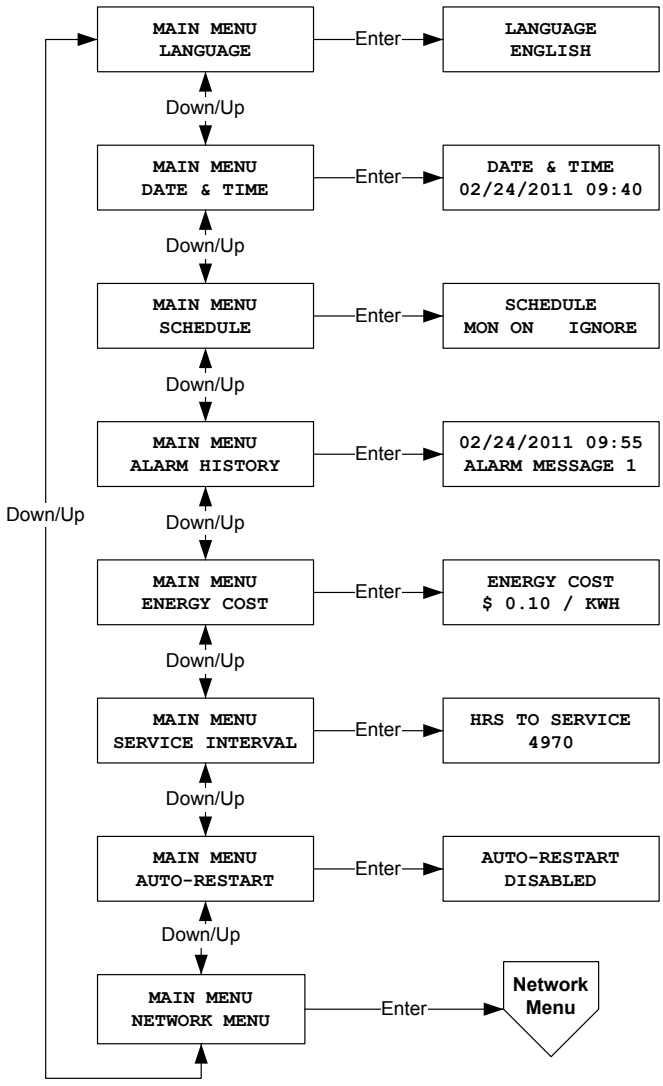
CONTROLLER SCREEN SHOTS

Status Menu Screens



CONTROLLER SCREEN SHOTS

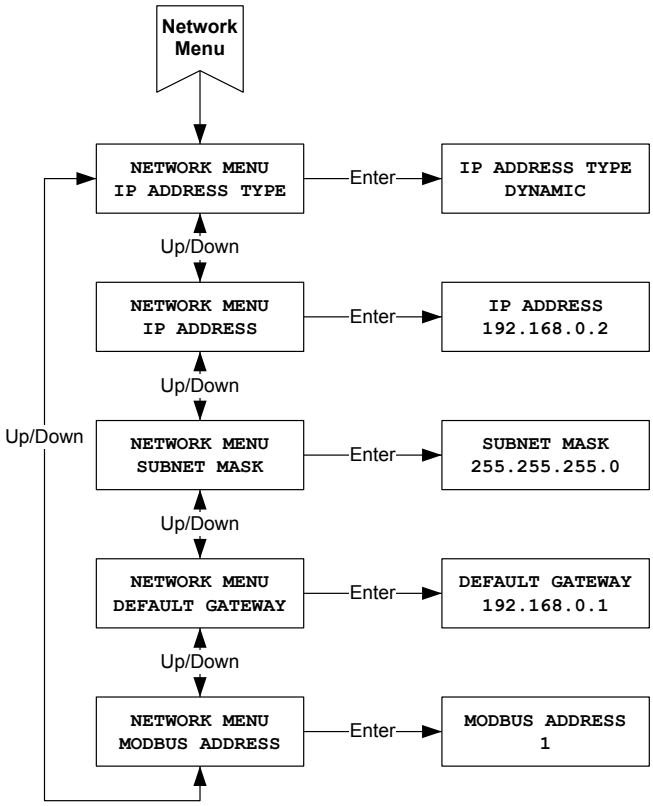
Setup Menu Screens



NOTE: Press & hold ESC button for 3 seconds to enter setup menu.

CONTROLLER SCREEN SHOTS

Network Menu Screens

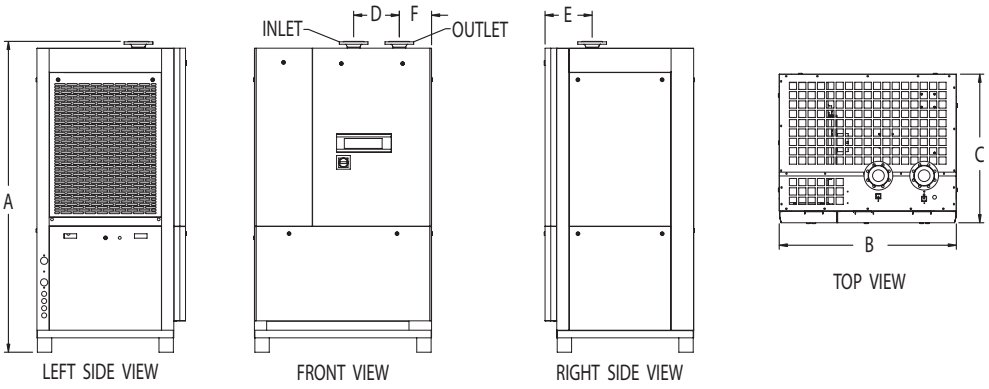


6.0 DIMENSIONS / WEIGHTS

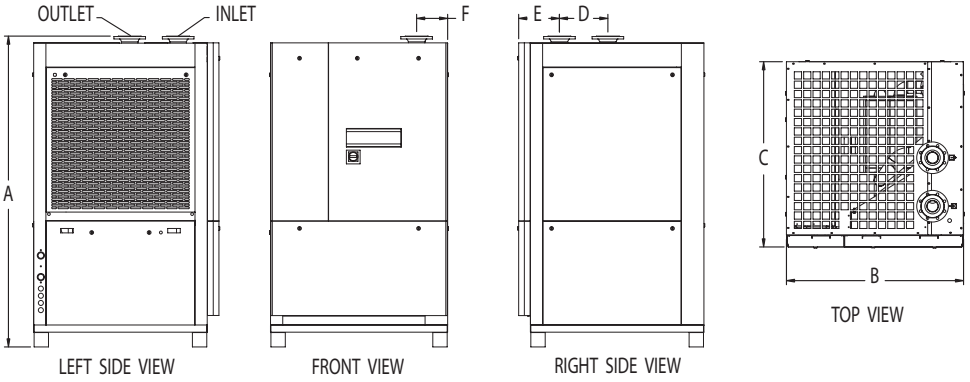
Model	Dimensions in (mm)						Weight Lb. (kg)	Inlet/Outlet Connections
	Height (A)	Width (B)	Depth (C)	(D)	(E)	(F)		
1000	85.1/8 (2162)	48.1/2 (1232)	40.3/4 (1035)	12.1/2 (318)	12.7/8 (327)	8.3/4 (222)	1146 (520)	3" ANSI Flg.
1250	85.1/8 (2162)	48.1/2 (1232)	50.3/4 (1289)	13.1/4 (337)	11.1/4 (286)	8.1/2 (216)	1521 (690)	4" ANSI Flg.
1500	85.1/8 (2162)	48.1/2 (1232)	50.3/4 (1289)	13.1/4 (337)	11.1/4 (286)	8.1/2 (216)	1547 (702)	4" ANSI Flg.
1750	85.1/8 (2162)	55.1/8 (1400)	59.3/8 (1508)	13.1/4 (337)	31.1/4 (794)	9.1/8 (232)	1940 (880)	6" ANSI Flg.
2000	85.1/8 (2162)	55.1/8 (1400)	59.3/8 (1508)	13.1/4 (337)	31.1/4 (794)	9.1/8 (232)	1986 (901)	6" ANSI Flg.
2500	85.1/8 (2162)	55.1/8 (1400)	59.3/8 (1508)	13.1/4 (337)	31.1/4 (794)	9.1/8 (232)	2315 (1050)	6" ANSI Flg.
3000	85.1/8 (2162)	55.1/8 (1400)	59.3/8 (1508)	13.1/4 (337)	31.1/4 (794)	9.1/8 (232)	2646 (1200)	6" ANSI Flg.

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

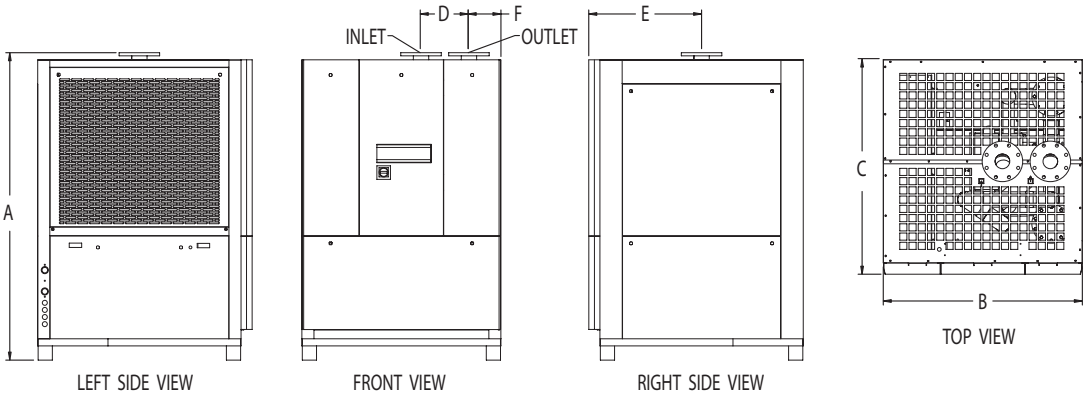
1000 scfm



1250-1500 scfm

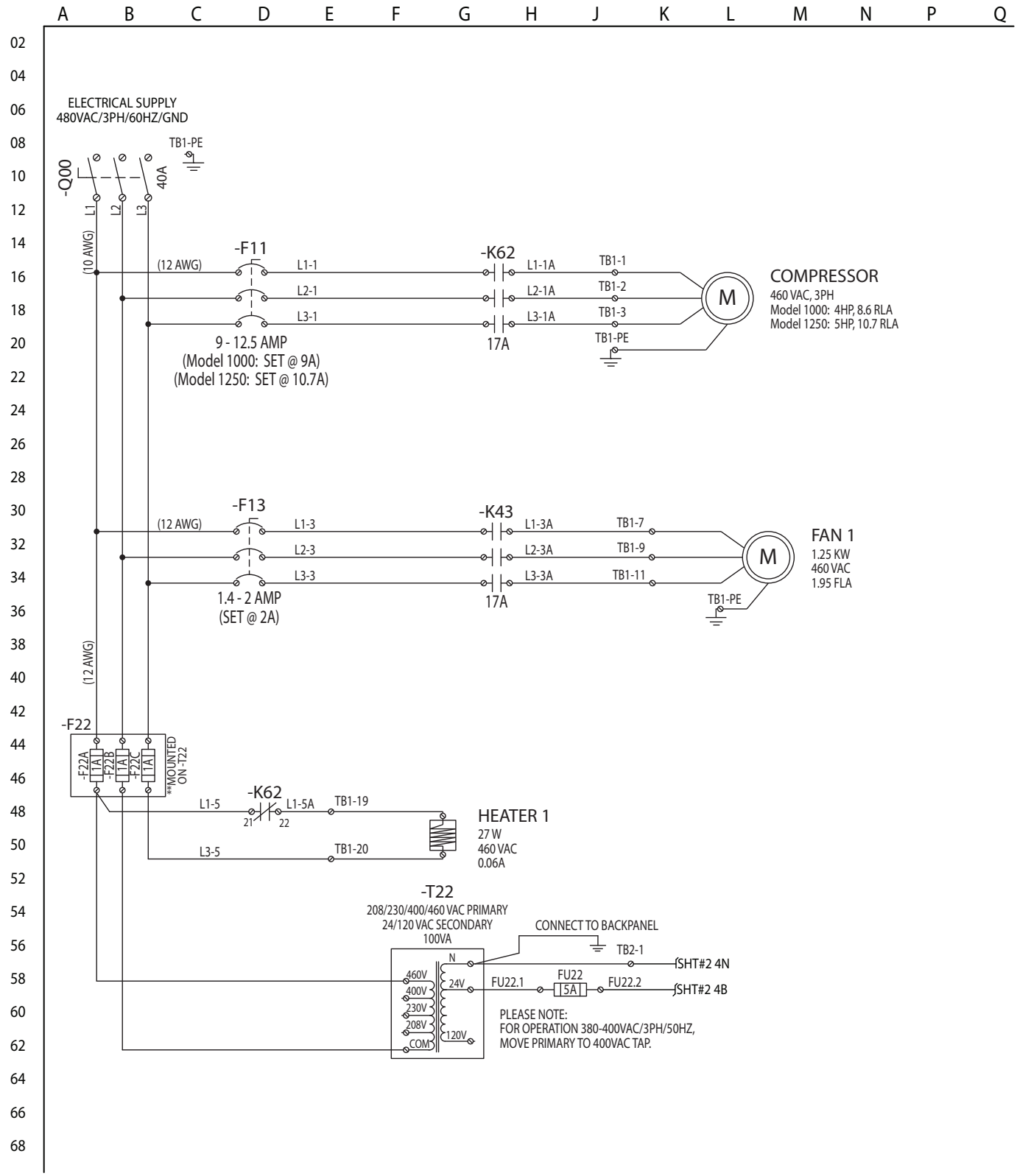


1750-3000 scfm



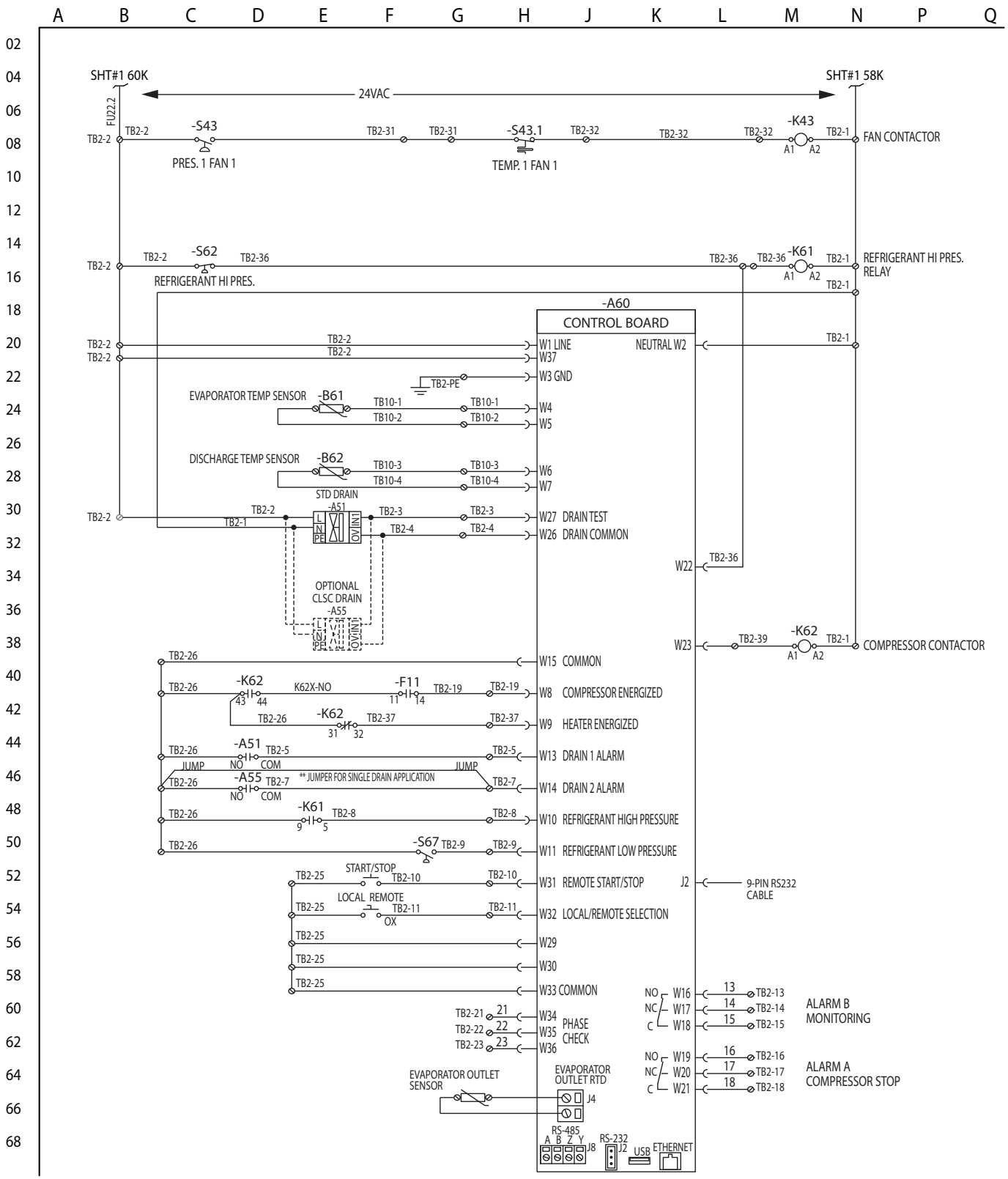
7.0 ELECTRICAL SCHEMATIC

Models 1000 and 1250
Sheet 1 of 2



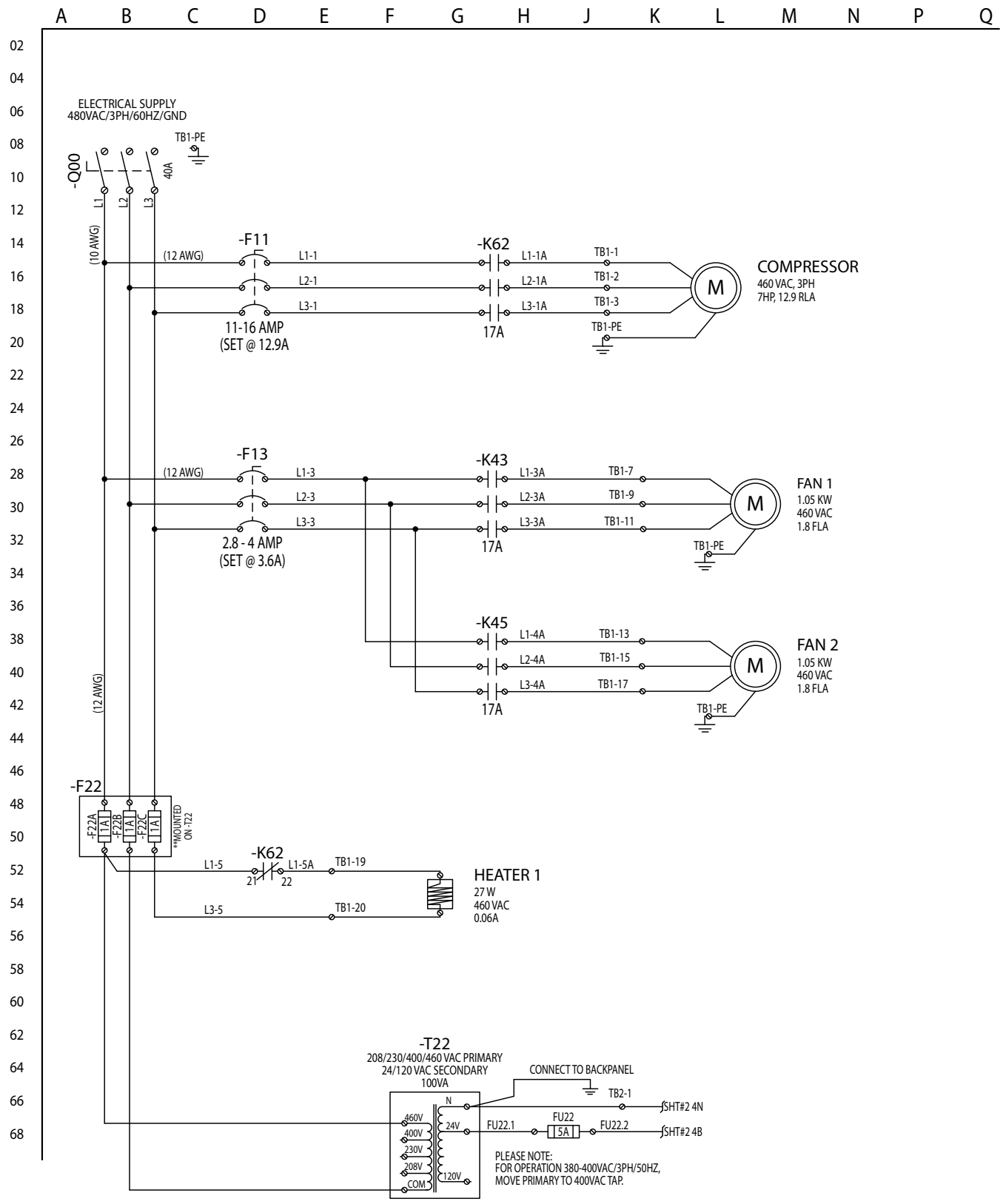
ELECTRICAL SCHEMATIC

Models 1000 and 1250
Sheet 2 of 2



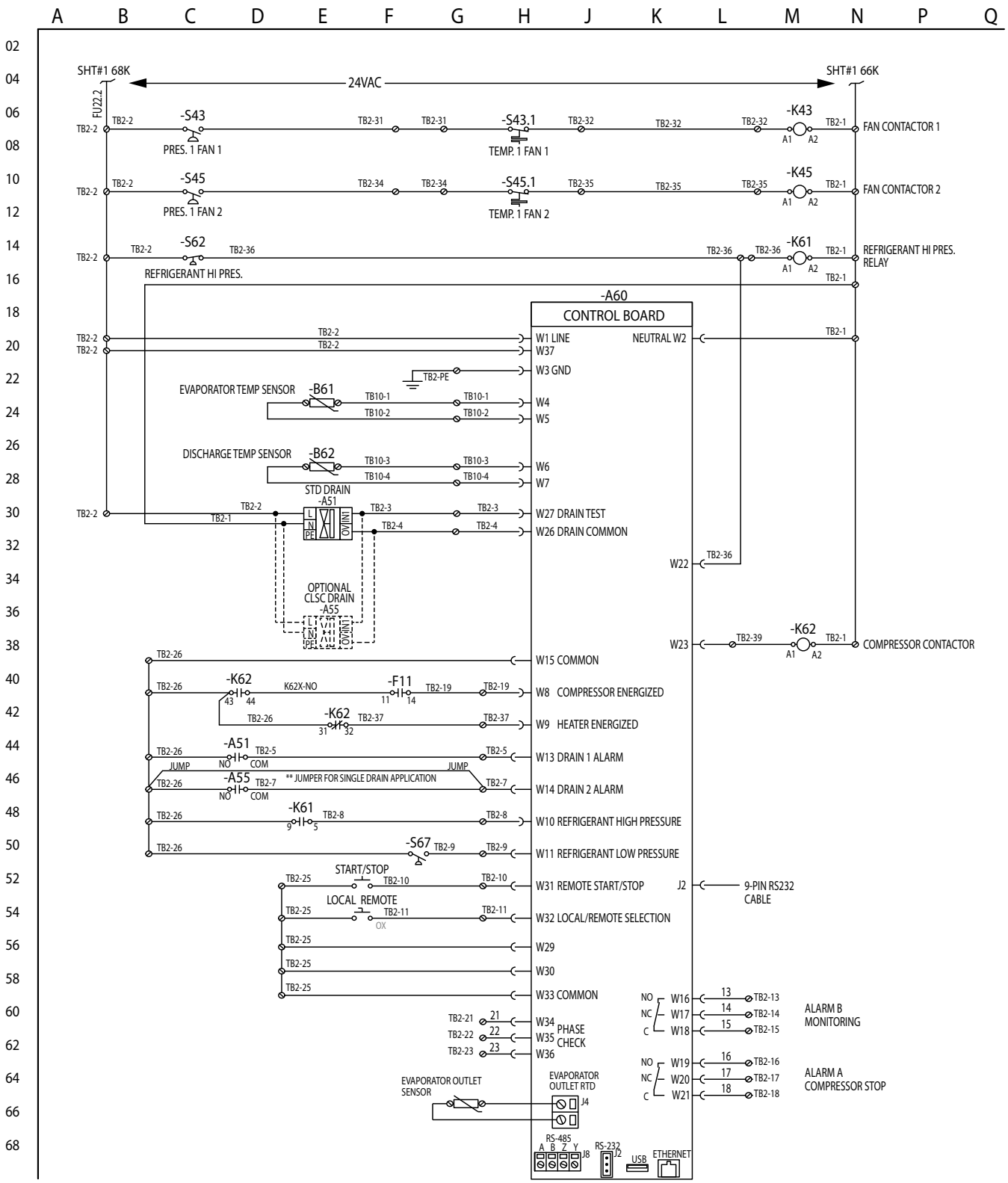
ELECTRICAL SCHEMATIC

Model 1500
Sheet 1 of 2



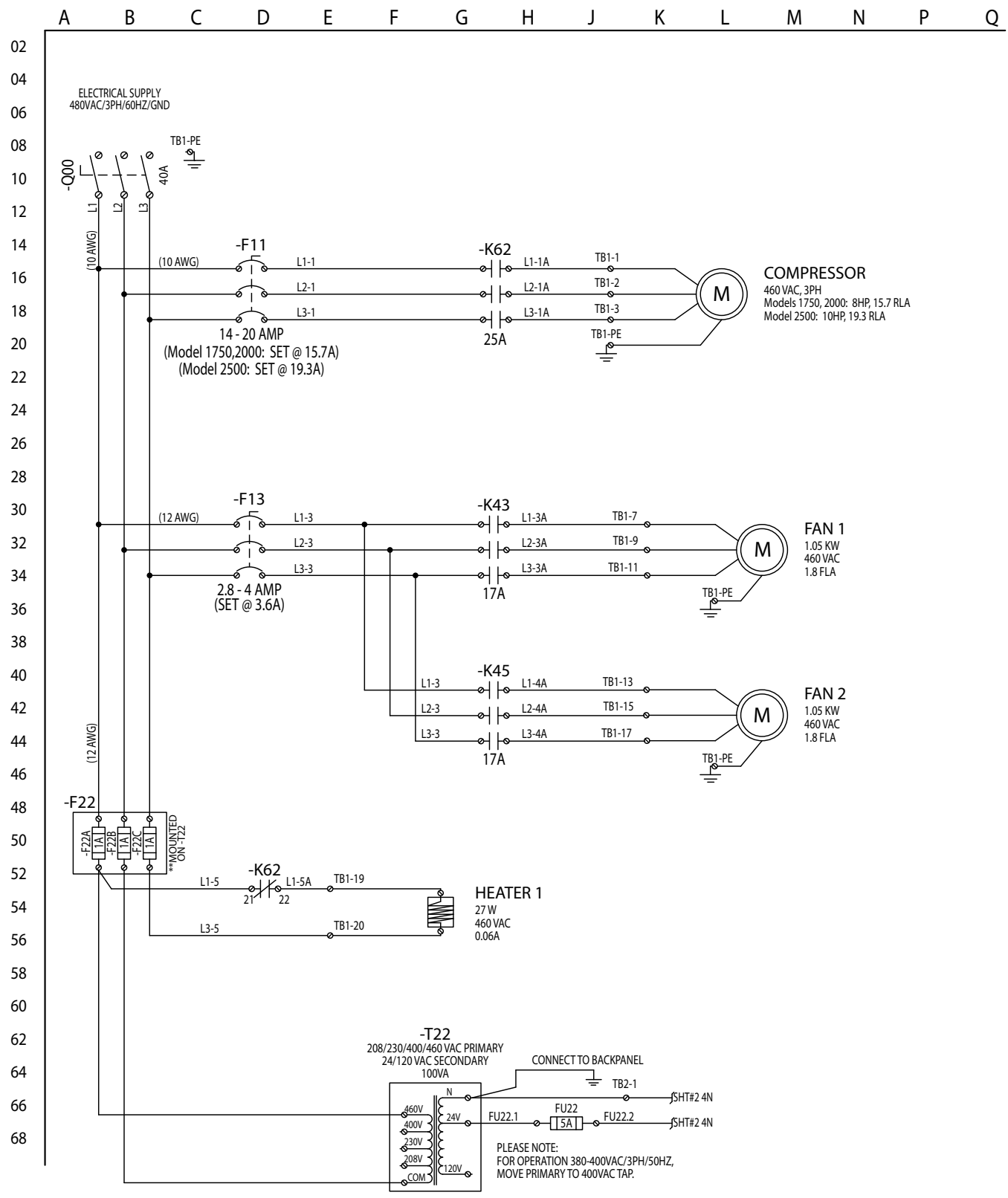
ELECTRICAL SCHEMATIC

Model 1500
Sheet 2 of 2



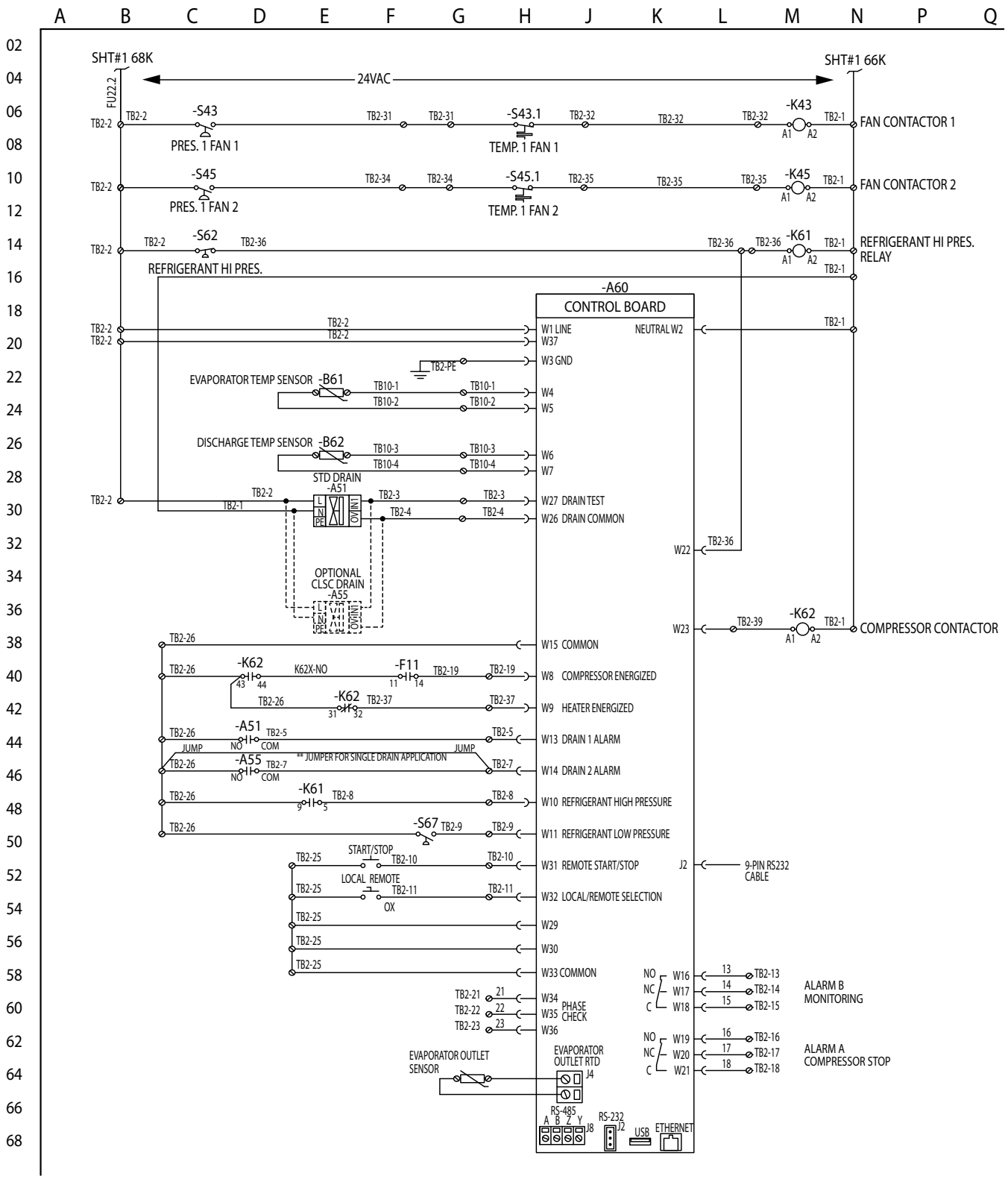
ELECTRICAL SCHEMATIC

Models 1750, 2000 and 2500
Sheet 1 of 2



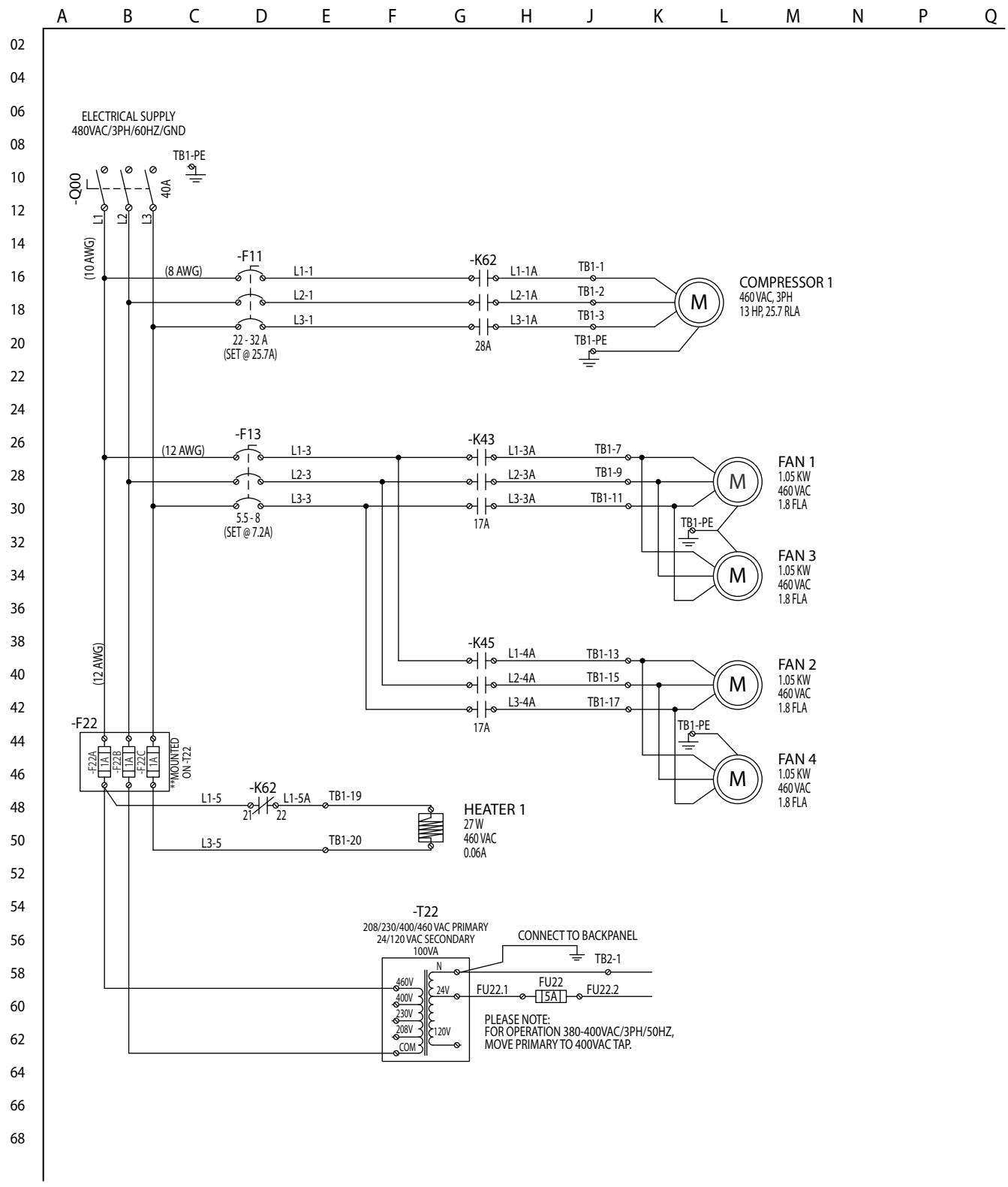
ELECTRICAL SCHEMATIC

Models 1750, 2000 and 2500
Sheet 2 of 2



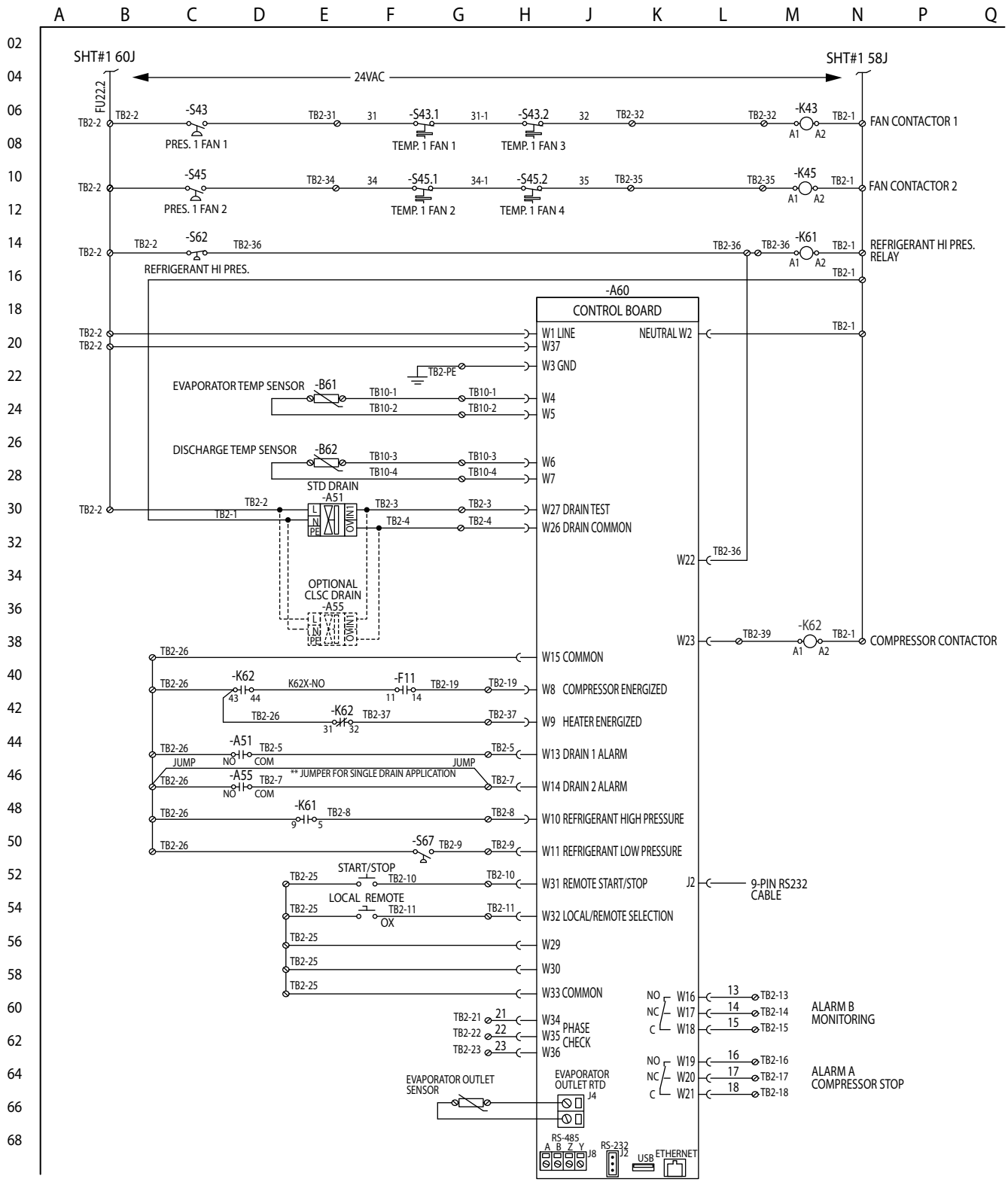
ELECTRICAL SCHEMATIC

Model 3000
Sheet 1 of 2



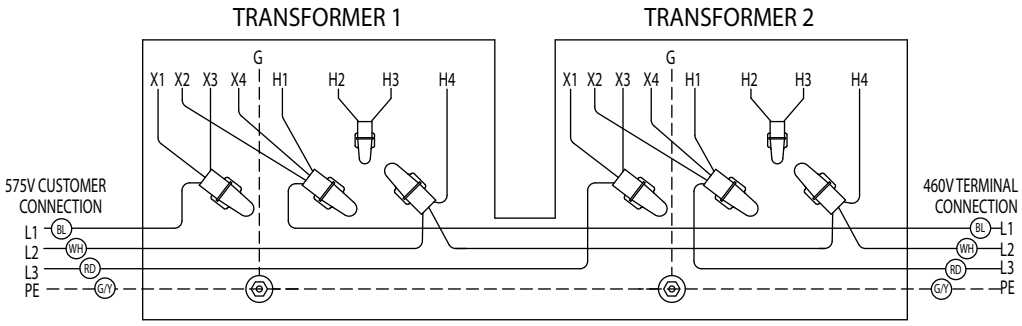
ELECTRICAL SCHEMATIC

Model 3000
Sheet 2 of 2

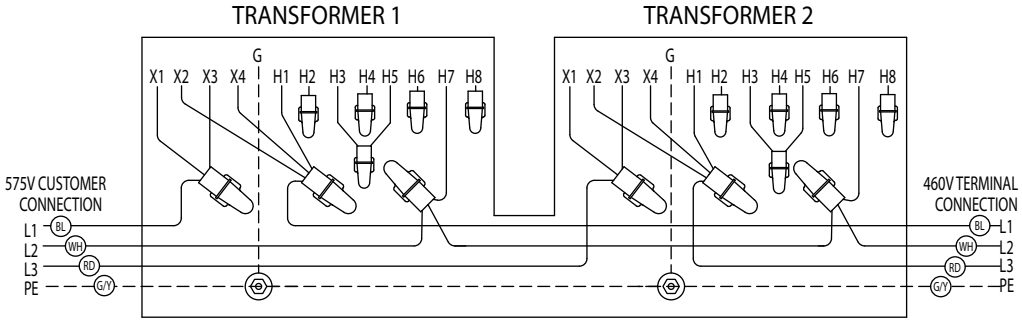


ELECTRICAL SCHEMATIC

575-460/3/60 Transformer Pack



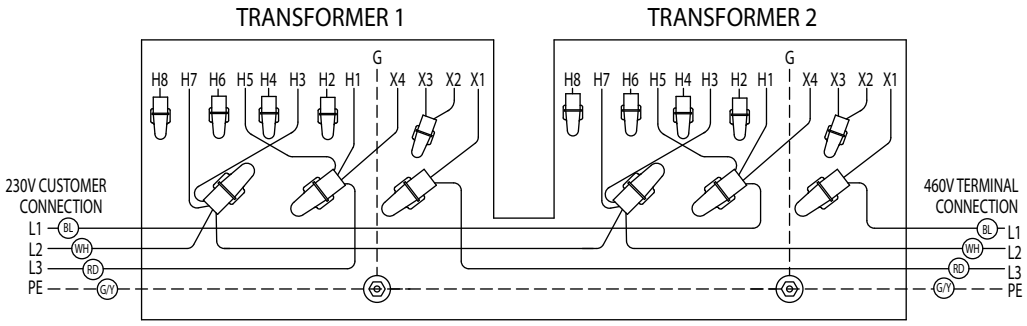
WIRING ASSEMBLY DETAIL
575V-460V
Models 1000-1500



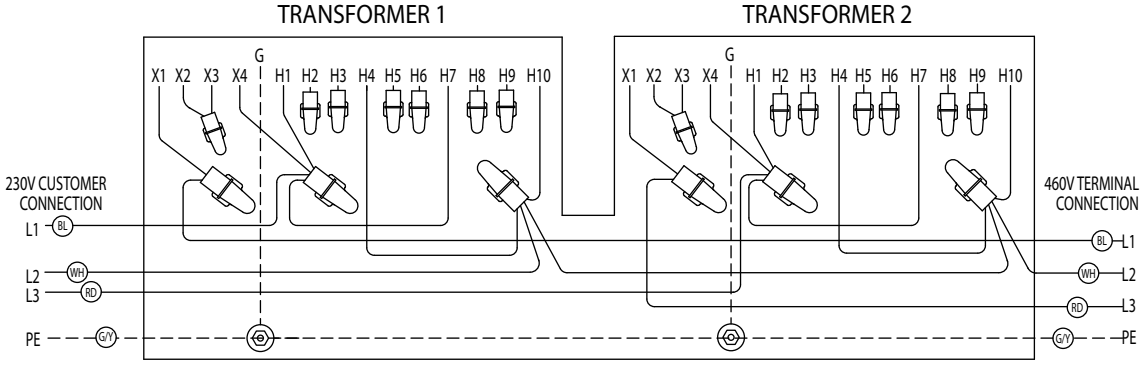
WIRING ASSEMBLY DETAIL
575V-460V
Models 1750-3000

ELECTRICAL SCHEMATIC

230-460/3/60 Transformer Pack

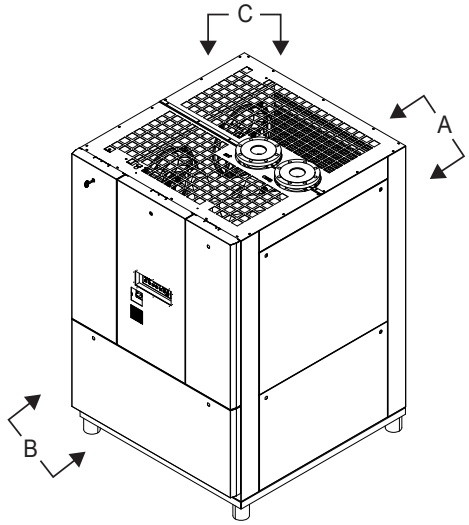


WIRING ASSEMBLY DETAIL
230V-460V
Models 1000-1500

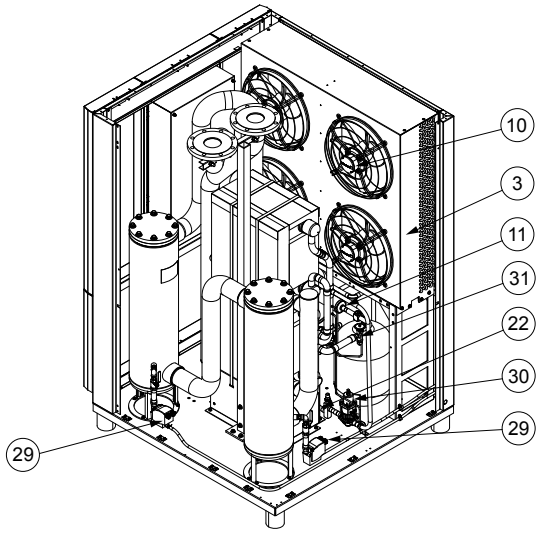


WIRING ASSEMBLY DETAIL
230V-460V
Models 1750-3000

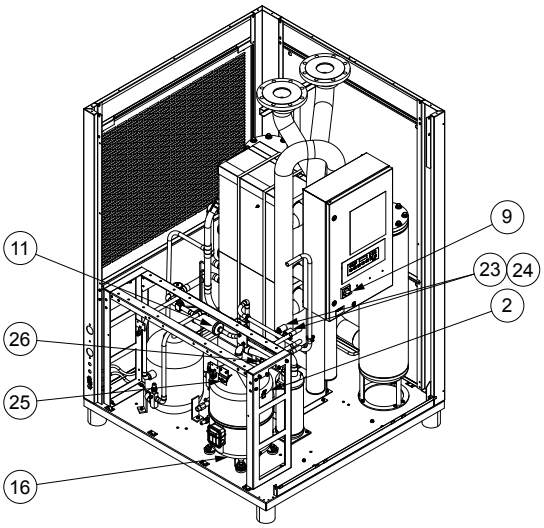
8.0 REPLACEMENT PARTS: AIR-COOLED UNITS



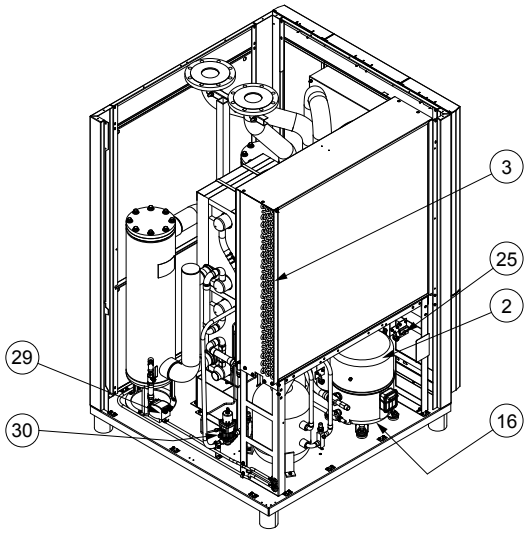
VIEW ORIENTATION REFERENCE



RIGHT REAR, VIEW-A
(covers and center support shelf removed for clarity)



RIGHT FRONT, VIEW-B
(covers and center support shelf removed for clarity)



LEFT REAR, VIEW-C
(covers and center support shelf removed for clarity)

REPLACEMENT PARTS: AIR-COOLED UNITS

MAINTENANCE KITS

Model	1000	1250	1500	1750	2000	2500	3000
Moisture Separator Filter (includes separator elements & drain rebuild kit)	HPRPMK27D2	HPRPMK27D2	HPRPMK27D2	HPRPMK28D2	HPRPMK28D2	HPRPMK28D2	HPRPMK28D2
Optional Oil Removal Filter (includes separator elements, oil removal elements & drain rebuild kit)	HPRPMK47D2	HPRPMK47D2	HPRPMK47D2	HPRPMK48D2	HPRPMK48D2	HPRPMK48D2	HPRPMK48D2
Rebuild Kit - Automatic Drain	7428278	7428278	7428278	7428278	7428278	7428278	7428278

REPLACEMENT PARTS

ID#	PARTS DESCRIPTION	1000	1250	1500	1750	2000	2500	3000
1	**Refrigerant Type** (see Serial Tag for charge amount)	R-404a	R-404a	R-404a	R-404a	R-404a	R-404a	R-404a
2	**Compressor**	3136250	3110640	5000012	3093647	3093647	3107110	5000420
3	**Condenser Assembly** (includes condenser and fans)	5000763	5000764	5000765	5000766	5000766	5000767	5000768
4	**Contactor** - Compressor [1]	5002926	5002926	5002926	5002928	5002928	5002928	5003511
5	**Contactor** - Fan Motor [1]	5002926	5002926	5002926	5002926	5002926	5002926	5002926
6	**Auxiliary Contacts** - Compressor [1]	7427939	7427939	7427939	7427939	7427939	7427939	7427939
8	**Control Board** [1, 2]	7426184	7426184	7426184	7426184	7426184	7426184	7426184
9	**Disconnect Switch**	3246083	3246083	3246083	3246083	3246083	3246083	3246084
10	**Fan Assembly** (includes motor, blade and guard)	3243804	3243804	3243805	3243805	3243805	3243805	3243805
11	**Filter/Dryer** - Liquid Line	3223812	3223812	3223812	3243615	3243615	3243616	3243616
12	**Fuse** - Control Board [1]	5002943	5002943	5002943	5002943	5002943	5002943	5002943
13	**Fuse** - Control Transformer - primary [1]	3246089	3246089	3246089	3246089	3246089	3246089	3246089
14	**Fuse** - Control Transformer - secondary [1]	3246090	3246090	3246090	3246090	3246090	3246090	3246090
15	**Fuse** - Crankcase Heater [1]	3246089	3246089	3246089	3246089	3246089	3246089	3246089
16	**Heater**, Crankcase	3076779	3076779	3076779	3076779	3076779	3076779	3076779
17	**Motor Starter Protector** - Compressor [1]	3246080	3246080	5003505	5003504	5003504	5003504	5006081
18	**Motor Starter Protector** - Fan [1]	3246077	3246077	3246078	3246078	3246078	3246078	3246079
19	**Relay** - High Pressure Cut-out [1]	3246088	3246088	3246088	3246088	3246088	3246088	3246088
20	**Sensor** - Temperature [1]	5007289	5007289	5007289	5007289	5007289	5007289	5007289
22	**Strainer** - Hot Gas Bypass Line	4006435	4006435	4006435	4006436	4006436	4006436	4006436
23	**Switch** - Fan Cut-out #1	3230765	3230765	3230765	3230765	3230765	3230765	3230765
24	**Switch** - Fan Cut-out #2	N/A	N/A	3230766	3230766	3230766	3230766	3230766
25	**Switch** - High Pressure Cut-out (air-cooled units)	3230770	3230770	3230770	3230770	3230770	3230770	3230770
26	**Switch** - Low Pressure Cut-out	3230769	3230769	3230769	3230769	3230769	3230769	3230769
28	**Transformer** - Control [1]	3246082	3246082	3246082	3246082	3246082	3246082	3246082
29	**Valve** - Automatic Drain (complete)	7428268	7428268	7428268	7428268	7428268	7428268	7428268
30	**Valve** - Hot Gas Bypass	3232527	3232527	3232527	3232548	3232548	3232548	3232548
31	**Valve** - Thermostatic Expansion (TXV)	3232550	3232550	3232550	3232532	3232532	3232533	3232533
	230/3/60 Units Only							
32	**Main Transformer** - 230/460 [1]	3230906	3230906	3230906	3230896	3230896	3230897	3230897
	575/3/60 Units Only							
33	**Main Transformer** - 575/460 [1]	3230907	3230895	3230895	3230908	3230908	3230908	3230908

[1] Items 4, 5, 6, 8, 12, 13, 14, 15, 17, 18, 19, 20, 28, 32, and 33 are located in the electrical enclosure located behind the control panel. Refer to the appropriate Electrical Schematic to identify part.
[2] NOTE: Consult factory with the dryer serial number when ordering Item 8, Control Board.

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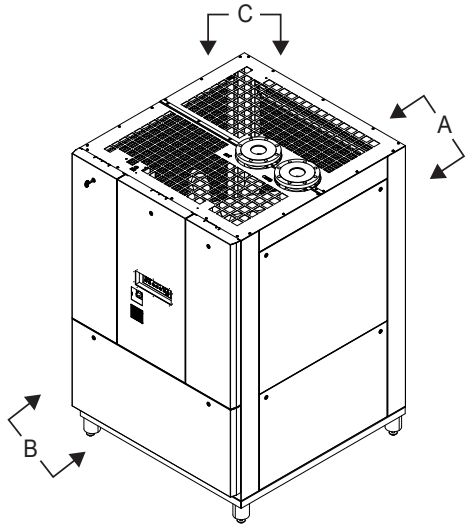
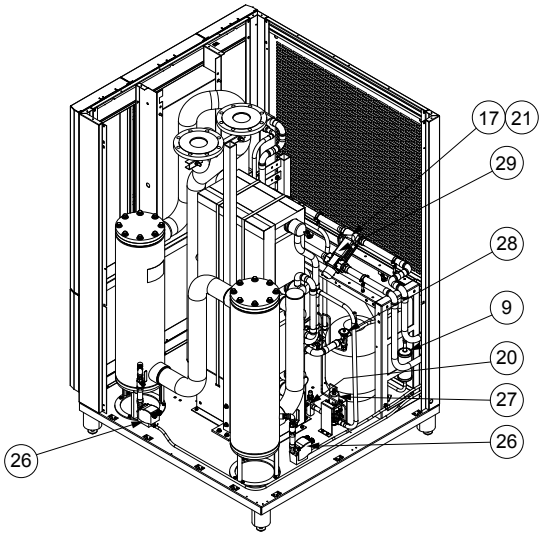
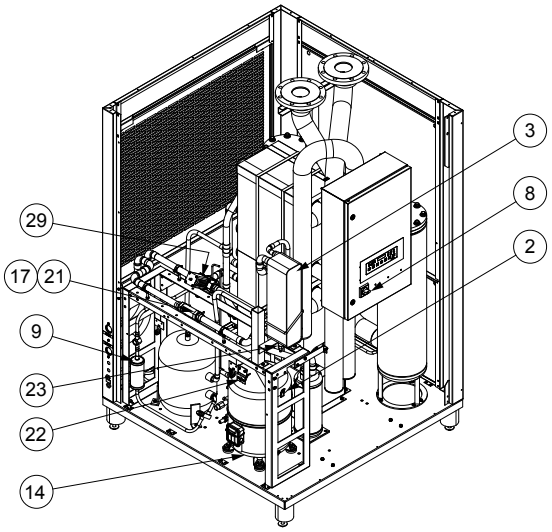
REPLACEMENT PARTS: WATER-COOLED UNITS



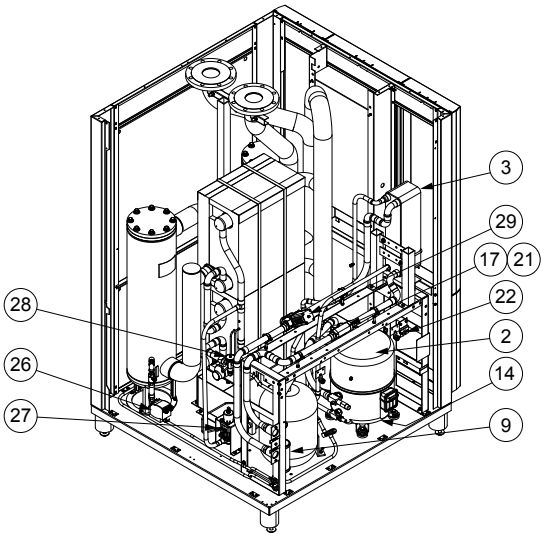
VIEW ORIENTATION REFERENCE



RIGHT REAR, VIEW-A
(covers and center support shelf removed for clarity)



RIGHT FRONT, VIEW-B
(covers and center support shelf removed for clarity)



LEFT REAR, VIEW-C
(covers and center support shelf removed for clarity)

REPLACEMENT PARTS: WATER-COOLED UNITS

MAINTENANCE KITS

Model	1000	1250	1500	1750	2000	2500	3000
Moisture Separator Filter (includes separator elements & drain rebuild kit)	HPRPMK27D2	HPRPMK27D2	HPRPMK27D2	HPRPMK28D2	HPRPMK28D2	HPRPMK28D2	HPRPMK28D2
Optional Oil Removal Filter (includes separator elements, oil removal elements & drain rebuild kit)	HPRPMK47D2	HPRPMK47D2	HPRPMK47D2	HPRPMK48D2	HPRPMK48D2	HPRPMK48D2	HPRPMK48D2
Rebuild Kit - Automatic Drain	7428278	7428278	7428278	7428278	7428278	7428278	7428278

REPLACEMENT PARTS

ID#	PARTS DESCRIPTION	1000	1250	1500	1750	2000	2500	3000
1	**Refrigerant Type** (see Serial Tag for charge amount)	R-404a	R-404a	R-404a	R-404a	R-404a	R-404a	R-404a
2	**Compressor**	3136250	3110640	5000012	3093647	3093647	3107110	5000420
3	**Condenser**	3223341	3223342	3223343	3223346	3223346	3223346	3223345
4	**Contactor** - Compressor [1]	5002926	5002926	5002926	5002928	5002928	5002928	5003511
5	**Auxiliary Contacts** - Compressor [1]	7427939	7427939	7427939	7427939	7427939	7427939	7427939
7	**Control Board** [1, 2]	7426184	7426184	7426184	7426184	7426184	7426184	7426184
8	**Disconnect Switch**	3246083	3246083	3246083	3246083	3246083	3246083	3246084
9	**Filter/Dryer** - Liquid Line	3223812	3223812	3223812	3243615	3243615	3243616	3243616
10	**Fuse** - Control Board [1]	5002943	5002943	5002943	5002943	5002943	5002943	5002943
11	**Fuse** - Control Transformer - primary [1]	3246089	3246089	3246089	3246089	3246089	3246089	3246089
12	**Fuse** - Control Transformer - secondary [1]	3246090	3246090	3246090	3246090	3246090	3246090	3246090
13	**Fuse** - Crankcase Heater [1]	3246089	3246089	3246089	3246089	3246089	3246089	3246089
14	**Heater**, Crankcase	3076779	3076779	3076779	3076779	3076779	3076779	3076779
15	**Motor Starter Protector** - Compressor [1]	3246080	3246080	5003505	5003504	5003504	5003504	5006081
16	**Relay** - High Pressure Cut-out [1]	3246088	3246088	3246088	3246088	3246088	3246088	3246088
17	**Replacement Screen** - Water Strainer	3230673	3230662	3230662	3230664	3230664	3230664	3230664
18	**Sensor** - Air Temperature [1]	5007289	5007289	5007289	5007289	5007289	5007289	5007289
20	**Strainer** - Hot Gas Bypass Line	4006435	4006435	4006435	4006436	4006436	4006436	4006436
21	**Strainer** - Water	4009635	4009636	4009636	4009637	4009637	4009637	4009637
22	**Switch** - High Pressure Cut-out	3230771	3230771	3230771	3230771	3230771	3230771	3230771
23	**Switch** - Low Pressure Cut-out	3230769	3230769	3230769	3230769	3230769	3230769	3230769
25	**Transformer** - Control [1]	3246082	3246082	3246082	3246082	3246082	3246082	3246082
26	**Valve** - Automatic Drain (complete)	7428268	7428268	7428268	7428268	7428268	7428268	7428268
27	**Valve** - Hot Gas Bypass	3232527	3232527	3232527	3232548	3232548	3232548	3232548
28	**Valve** - Thermostatic Expansion (TXV)	3232550	3232550	3232550	3232532	3232532	3232533	3232533
29	**Valve** - Water Regulating	4006391	4006392	4006392	4006393	4006393	4006393	4006393
	230/3/60 Units Only							
30	**Main Transformer** - 230/460 [1]	3230906	3230906	3230906	3230896	3230896	3230897	3230897
	575/3/60 Units Only							
31	**Main Transformer** - 575/460 [1]	3230907	3230895	3230895	3230908	3230908	3230908	3230908

[1] Items 4, 5, 7, 10, 11, 12, 13, 15, 16, 18, 25, 30, and 31 are located in the electrical enclosure located behind the control panel. Refer to the appropriate Electrical Schematic to identify part.
[2] NOTE: Consult factory with the dryer serial number when ordering Item 7, Control Board.

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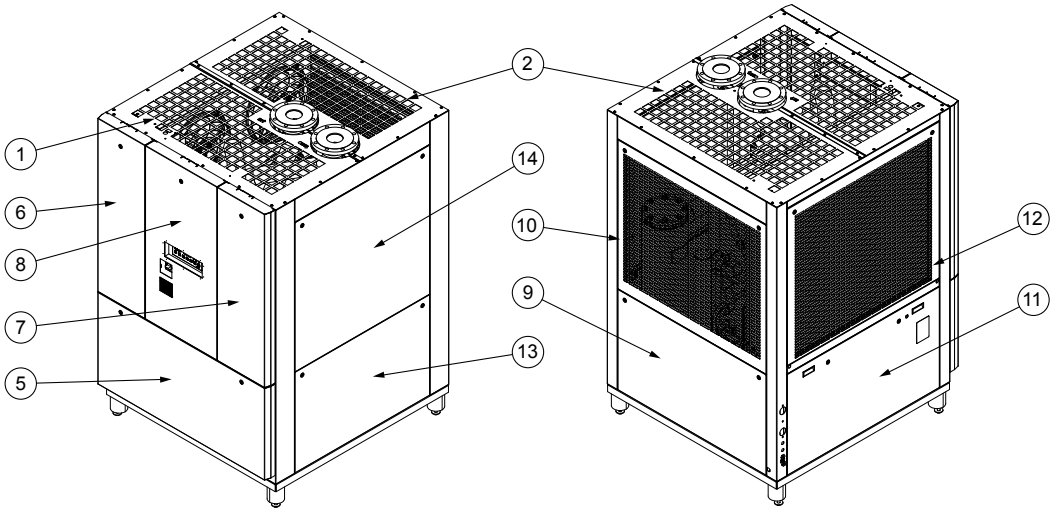
REPLACEMENT PARTS: CABINET PANELS



ID #	PARTS DESCRIPTION	1000	1250	1500	1750	2000	2500	3000
1	Cabinet Panel - Top Front	5000174	-	-	5000245	5000245	5000245	5000245
2	Cabinet Panel - Top Rear	5000176	-	-	5000242	5000242	5000242	5000242
3	Cabinet Panel - Top Left	-	5000117	5000117	-	-	-	-
4	Cabinet Panel - Top Right	-	5000120	5000120	-	-	-	-
5	Cabinet Panel - Front Bottom	5001525	5000091	5000091	5000257	5000257	5000257	5000257
6	Cabinet Panel - Front Top Left	5000094	5000094	5000094	5000094	5000094	5000094	5000094
7	Cabinet Panel - Front Top Right	5000182	5000097	5000097	5000302	5000302	5000302	5000302
8	Cabinet Panel - Front Top Center	-	-	-	5000260	5000260	5000260	5000260
9	Cabinet Panel - Rear Bottom	5000112	5000112	5000112	5000293	5000293	5000293	5000293
10	Cabinet Panel - Rear Top	5000125	5000125	5000125	5000296	5000296	5000296	5000296
11	Cabinet Panel - Left Bottom	5001504	5000100	5000100	5000284	5000284	5000284	5000284
12	Cabinet Panel - Left Top	5001499	5000109	5000109	5000769	5000769	5000769	5000769
13	Cabinet Panel - Right Bottom	5001494	5000103	5000103	5000287	5000287	5000287	5000287
14	Cabinet Panel - Right Top	5001530	7403106	7403106	5000290	5000290	5000290	5000290

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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

HPR*plus* Series

Refrigerated Type Compressed Air Dryers

Models: HPRP1000, HPRP1250, HPRP1500, HPRP1750, HPRP2000, HPRP2500, HPRP3000

SPXFLOW

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Improvements and research are continuous at SPX FLOW, Inc.
Specifications may change without notice.

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