



TECHNICAL MANUAL

HeatSink™

True-Cycling Refrigerated
Compressed Air Dryers

HSF Models
500-800 SCFM



Patent No.: 6,186,223



NOTICE

Those operating the machine or performing maintenance should read and understand the decals positioned on the machine and contents of this Technical Manual.

Ensure that this Technical Manual is not removed permanently from the machine.

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**HSF Models
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1. INTRODUCTION

ZEKS HeatSink™ refrigerated air dryers remove moisture, oil vapor, and other contaminants from compressed air. These contaminants are detrimental to pneumatically operated appliances, controls, instruments, machinery and tools. This removal is accomplished by cooling the air with a refrigeration unit to a temperature at which moisture in the air is condensed and separated from the air stream. The temperature the air is cooled to, normally between 34°F and 38°F (1°C - 3°C), is known as dew point. This dryer can be easily installed into various pneumatic systems in which dry air is required or desired. Please refer to Principles of Operation for complete operating details.

- For Warning Label information with French translations, refer to pages 5 and 6.
- Pour obtenir l'information des étiquettes dangereuses avec la traduction en français, s'il vous plaît consulter les pages 5 and 6.

2. ABBREVIATED WARRANTY

ZEKS refrigerated dryers are warranted to be free from defects in material and workmanship for a period of 12 months from the original date of shipment from the factory. To allow the warranty to be in effect for 12 months from the date of equipment start-up, the Warranty Registration Card must be completed and returned to ZEKs. Alternately, the Warranty Registration Card may be completed online at www.zeks.com. The total warranty period cannot exceed 18 months from the original date of shipment from the factory.

Equipment must be installed and operated in accordance with ZEKs' recommendations. ZEKs liability is limited to repair of, refund of purchase price paid for, or replacement in kind at ZEKs' sole option, during the warranty time period stated above. IN NO EVENT SHALL ZEKs BE LIABLE OR RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, even if the possibility of such incidental or consequential damages has been made known to ZEKs Compressed Air Solutions. In addition, the usual maintenance and replacement type products are not covered by this warranty.

REFRIGERANT COMPRESSORS

A prorated warranty for the replacement of the refrigerant compressor will be extended to a maximum of 60 months (5 years) from the original date of shipment from the factory. Following the standard warranty terms, the available prorated compressor warranty is as stated below. This prorated warranty applies to replacement compressor only and does not cover any labor expenses.

Prorated coverage of price from date of shipment from the factory:

19 to 24 months	70%
25 to 36 months	50%
37 to 48 months	30%
49 to 60 months	10%

HEAT EXCHANGERS

Dryers that utilize CFX heat exchanger technology are covered for a total of 10 years from the original date of shipment from the factory. Following the standard warranty terms the available warranty is as stated below. The exchanger warranty applies to the replacement exchanger only and does not cover any labor expenses.

Prorated coverage of prices from date of shipment from the factory:

12 to 36 months	100%
37 to 48 months	70%
49 to 60 months	50%
61 to 84 months	30%
85 to 96 months	20%
97 to 120 months	10%

Freight and labor coverage varies internationally. Refer to Distributor Warranty Guidelines for limitations and detailed explanation of warranty coverage.

The warranties expressed above are in lieu of and exclusive of all other warranties. There are no other warranties, expressed or implied, except as stated herein. There are no implied warranties of merchantability or fitness for a particular purpose, which are specifically disclaimed.

3. REFRIGERATED DRYER NOMENCLATURE

NOMINAL*

FLOW SCFM	TYPE	DESIGN SERIES	CONDENSER TYPE	POWER	OPTIONS
500, 600, 700, 800	HS= HeatSink	F	A = Air Cooled W = Water Cooled	4 = 460-3-60 5 = 230-3-60 6 = 575-3-60 7 = 330-3-50 8 = 220-3-50 9 = 500-3-50	

O = STANDARD
G = ANALOG GAUGES
H = NEMA 4/12
K = G + H
L = G + W
W = WEATHERPROOF
Z = NO DRAIN OPTION

O = STANDARD
F = COLD MIST ELIMINATOR
Z = SPECIAL
8 = DPC™ Plus

* Nominal Flows indicated are for 100°F inlet temperature, 100°F ambient temperature and 100 psig compressed air pressure.

4. RECEIVING AND INSPECTION

4.1 INSPECTION

Upon receiving your ZEKS air dryer, please inspect the unit closely. If rough handling is detected, please note it on your delivery receipt, especially if the dryer will not be uncrated immediately. Obtaining the delivery person's signed agreement to any noted damages will facilitate insurance claims.

4.2 UNPACKING AND HANDLING

WARNING

Under no circumstances should any person attempt to lift heavy objects without proper lifting equipment (i.e., crane, hoist, slings or fork truck). Lifting any unit without proper lifting equipment, may cause serious injury.

To facilitate handling during shipment, all dryer packages have been mounted on a base that provides for forklifting between two base channels. Forks should extend all the way through forklift channels to reduce unnecessary forces to the dryer during moving. Slings can be used to lift the crates, but spreader bars must be used to prevent the slings from exerting force against the sides of the crates or the dryer.

5. SAFETY AND OPERATION PRECAUTIONS

Because an air dryer is pressurized and contains rotating parts, the same precautions should be observed as with any piece of machinery of this type where carelessness in operation or maintenance could be hazardous to personnel. In addition to obvious safety rules that should be followed with this type of machinery, safety precautions as listed below must be observed:

1. Only qualified personnel shall be permitted to adjust, perform maintenance or repair this air dryer.
2. Read all instructions completely before operating unit.
3. Pull main electrical disconnect switch and disconnect any separate control lines, if used, before attempting to work or perform maintenance on the unit.
4. Do not attempt to service any part while machine is in an operational mode.
5. Do not attempt to remove any parts without first relieving the entire air system of pressure.
6. Do not attempt to remove any part of the refrigeration system without removing and containing refrigerant in accordance with the EPA and local regulations.
7. Do not operate the dryer at pressures in excess of its rating.
8. Do not operate the dryer without guards, shields and screen in place.
9. Inspect unit daily to observe and correct any unsafe operating conditions.

OSHA Heading Descriptions

WARNING

"Warning" is used to indicate a hazardous situation which has some probability of death or severe injury. Warning should not be considered for property damage accidents unless personal injury risk is present.

CAUTION

"Caution" is used to indicate a hazardous situation which may result in minor or moderate injury.

NOTICE

"Notice" is used to indicate a statement of company policy as the message relates directly or indirectly to the safety of personnel or protection of property. Notice should not be associated directly with a hazard or hazardous situation and must not be used in place of "Danger," "Warning," or "Caution."

NOTICE

The user of any air dryer manufactured by ZEKS Compressed Air Solutions, is hereby warned that failure to follow the above Safety and Operation Precautions may result in personal injury or equipment damage. However, ZEKS Compressed Air Solutions does not state as fact, nor does it mean to imply, that the preceding list of Safety and Operating Precautions is all inclusive, and further, that the observance of this list will prevent all personal injury or equipment damage.



L'air sous pression causera des blessures graves, des dégâts matériels et peut même entraîner la mort

Ne pas excéder le taux de pression

Relâcher la pression avant la mise en service de l'appareil

Ne pas modifier/réparer ou retravailler

Le taux de pression des vaisseaux est conforme aux recommandations de l'ASME (American Society of Mechanical Engineers) et peut être vérifié lors d'un contrôle.

LIRE LE MANUEL D'INSTRUCTIONS!

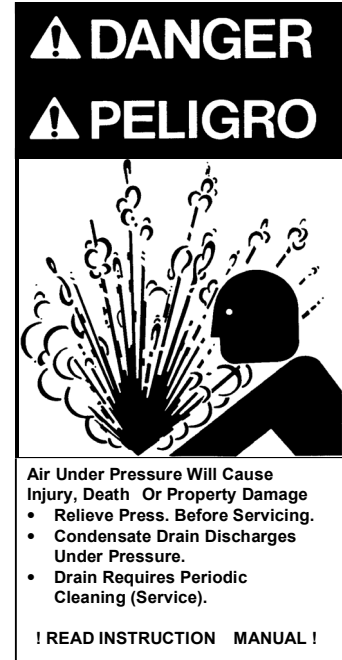


La haute tension peut entraîner des blessures graves ou même la mort

· Certains circuits peuvent être chargés lorsque l'interrupteur est en position "fermé" (off)

· Déconnecter et verrouiller TOUTES les sources d'électricité avant la mise en service de l'appareil

LIRE LE MANUEL D'INSTRUCTIONS!



L'air sous pression causera des blessures graves, des dégâts matériels ou même la mort

Relâcher la pression avant la mise en service de l'appareil

Condenser les tuyaux de décharges sous pression

Les tuyaux doivent être nettoyés régulièrement (service)

LIRE LE MANUEL D'INSTRUCTIONS

WARNING

Removing fuses will not disconnect power from dryer. Always disconnect power from ALL sources before performing service.

! READ INSTRUCTION MANUAL !

ATTENTION !

Retirer les fusibles ne déconnectera pas l'électricité de l'appareil
TOUJOURS déconnecter toutes les sources d'électricité avant la mise en marche de l'appareil

LIRE LE MANUEL D'INSTRUCTIONS!

6. PRINCIPLES OF OPERATION

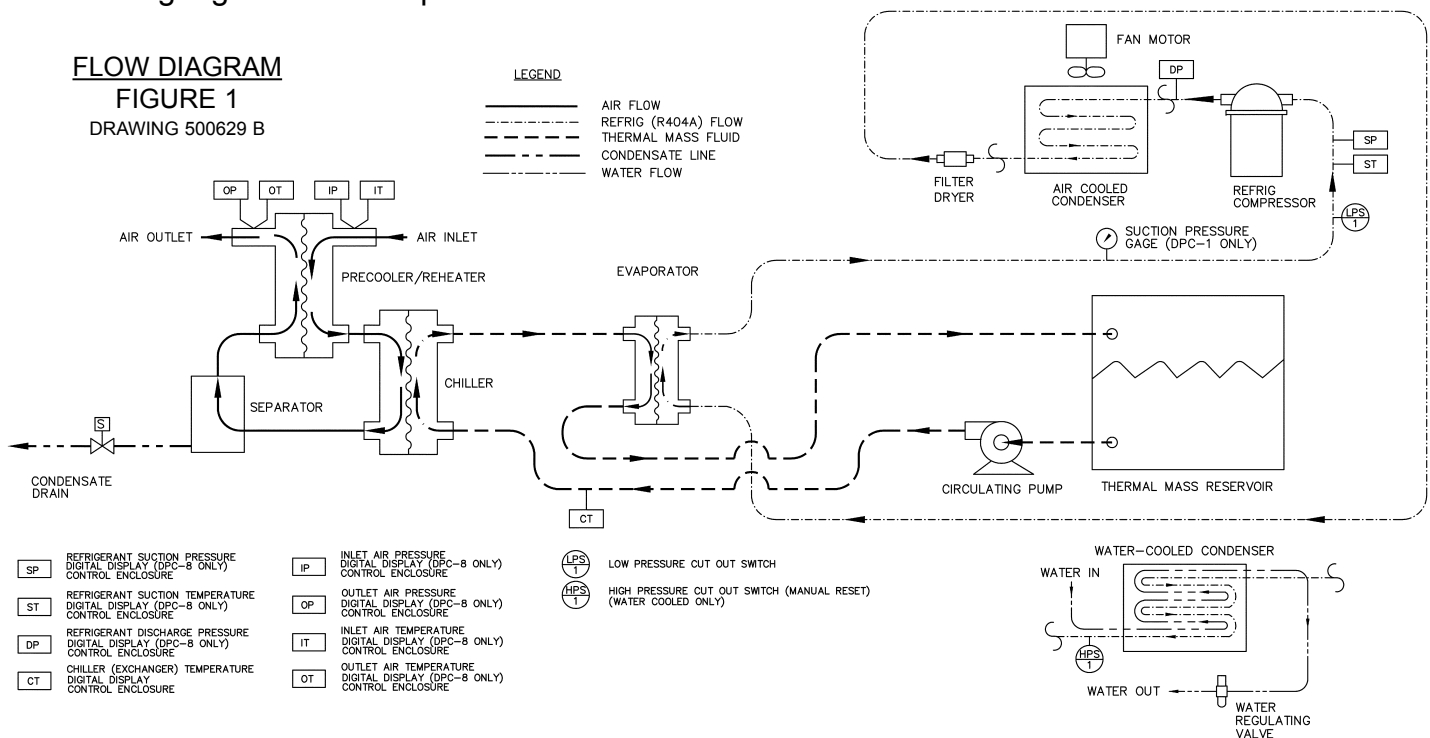
6.1 INTRODUCTION

ZEKS' HeatSink™ dryers remove moisture from compressed air by cooling the air temperature to between 34°F and 38°F (1°C - 3°C). This causes vapors to condense into liquid droplets which can then be easily removed from the air. The major systems of the dryer which contribute to its operation are the Air System, the Moisture Removal System, the Refrigeration System, the Thermal Mass Circulating System and the Controls. The following paragraphs describe each of the systems in greater detail.

6.2 AIR SYSTEM

The air system consists of the dryer components which are in contact with the compressed air. Referring to Figure 1 and following the bold "AIR FLOW," hot saturated air from the compressor enters the precooler/reheater where the air temperature is reduced prior to entering the chiller by the cool air exiting the air/moisture separator. This precooling allows for the use of a smaller refrigeration system. The air then goes into the chiller section where it is further cooled to the desired dew point by a thermal mass fluid. The temperature of the thermal mass fluid is maintained by the refrigeration circuit and controls. The air continues to the separator where moisture is removed, thereby, allowing the cool, dry air to return back to the precooler/reheater to be heated by the incoming moist hot air. The air exiting the "reheater" portion of the dryer should be approximately 15°F - 20°F lower than the inlet air temperature based on standard conditions at full rated flow.

ZEKS offers a Cold Mist Eliminator option on all 500-800 F Series dryers. This filter which is mounted externally after the dryer's separator coalesces moisture at the coldest point in the system for maximum efficiency. A pressure differential gauge, visible from the side of the dryer, indicates the pressure drop through the element. ZEKS recommends changing the element in the Cold Mist Eliminator when the gauge indicates 6 psid.



6.3 MOISTURE REMOVAL SYSTEM

Liquid droplets are removed from the air stream in the separator. As the air and liquid mixture passes through the separator it spins, slows down and then changes direction. This causes the condensate to fall out of the air stream and collect in the bottom of the separator. The collected liquid is removed from the separator by a solenoid drain valve. This valve is controlled by the microprocessor controller as described in Section 6.6. For adjustment, note the following:

- To obtain the optimum time values for operation of the solenoid drain valve, access the drain adjustment controls through the microprocessor controller to set the OFF time to 5 minutes and the ON time to 5 seconds.
- After running the unit under full rated flow for approximately 30 minutes, verify that when the solenoid drain opens, all of the accumulated liquid is discharged followed by a short burst of air.
- If a small amount of liquid and a large volume of air is discharged, decrease the ON time setting or increase the OFF time setting. If only liquid and no air discharges, increase the ON time setting or decrease the OFF time setting.
- The ON/OFF time settings will vary according to seasonal operating conditions. During warm summer months when more moisture is present in the air system a longer ON time may be needed to discharge all the liquid, or a shorter OFF time may be required to increase the valve opening frequency. A longer valve OFF time may be sufficient during winter months when moisture levels are lower.

Units equipped with the optional Cold Mist Eliminator have a timed electric drain to remove liquid droplets from the Cold Mist Eliminator. For adjustment, note the following:

- To determine the optimum time values for drain operation, set the OFF time adjustment knob to 5 minutes and the ON time adjustment knob to 10 seconds.
- After running the unit under full rated flow for approximately 30 minutes, verify that when the drain opens, all accumulated liquid is discharged, followed by a short burst of air.
- If a small amount of liquid and a large volume of air is discharged, decrease the ON time setting or increase the OFF time setting. If only liquid and no air is discharged, increase the ON time setting or decrease the OFF time setting.

6.4 REFRIGERATION SYSTEM

The Refrigeration System consists of all the components which handle R-404A. This is a hermetically sealed closed-loop system. Referring to Figure 1 and following the phantom “REFRIG(R-404A) FLOW,” refrigerant is shown leaving the evaporator section where, in the process of removing heat, it is changed from a low pressure liquid into a low pressure gas. This gas enters the suction side of the compressor where it is compressed into a high pressure gas. The high pressure gas is cooled in the condenser section until it becomes a high pressure liquid. It then goes through a permanent filter dryer that ensures the refrigeration system is free of contaminants.

A small diameter capillary tube (expansion valve on water-cooled dryers) meters the refrigerant for introduction into the evaporator. The refrigerant pressure is reduced upon entering the evaporator where as it evaporates, heat is removed from the thermal mass fluid.

6.5 THERMAL MASS CIRCULATING SYSTEM

The thermal mass fluid in a ZEKS' HeatSink™ dryer is continuously circulated in a closed pump loop system. Referring to Figure 1 and following the dashed "THERMAL FLUID" line, the heat is removed from the fluid in the evaporator by the refrigeration system. The thermal mass reservoir is sized to minimize refrigeration cycles during reduced air load periods. The thermal mass fluid is pulled from the bottom of the reservoir and pumped through the chiller, removing heat from the air, and is then returned to the evaporator. The pump utilized on ZEKS' HeatSink™ dryer is a maintenance-free, quiet cartridge circulator pump similar to those used in residential water systems. While the refrigeration system cycles on and off based on loading conditions, the circulating pump runs continuously to maintain flow through the chiller at all times.

6.6 CONTROLS

The ZEKS HeatSink™ dryer incorporates automatic controls for proper operation. The standard microprocessor is the Compustat Controller.

NOTE: For dryers equipped with the optional DPC Plus Controller, refer to the DPC Supplement that accompanies this Technical Manual for specific instruction on operating the HeatSink™ dryer with the DPC Plus Controller.

The thermal mass fluid temperature is maintained by the microprocessor that monitors the temperature and cycles the refrigeration system in response to varying air flow and temperature. Upon an increase in the temperature of the thermal mass fluid, the compressor is cycled on. When the fluid is cooled to its control set point, the compressor is cycled off. The thermal mass fluid functions as a thermal storage mass in the HeatSink™ dryer.

A low pressure cut out switch (LPCO) is provided for all HSF series dryers. This switch is factory set to open at 30 psig. If the refrigerant suction pressure draws below 30 psig, the LPCO opens to shut off the refrigerant compressor. Once the switch has opened, it will prevent the compressor from running until the suction pressure rises above 60 psig and the LPCO has been manually reset.

When the optional gauge package is included, inlet air temperature, outlet air pressure, refrigerant suction and discharge pressure gauges are supplied.

- 1) Refrigerant discharge gauge monitors the pressure of the refrigerant gas exiting the compressor. This reading will vary dependent upon condenser type as indicated below:
- Air Cooled condensers with ambient temperatures between 80°F and 100°F: the refrigerant discharge gauge should read between 275 - 350 psig.
 - Water cooled condensers utilize a water regulating valve (See Figure 2): the water regulating valve comes pre-adjusted from the factory at 250 psig discharge pressure.
 - When the refrigeration system is running, the suction pressure will pull down between 50 and 60 psig, depending on load and ambient conditions. After the thermal mass fluid has been cooled and the refrigeration system is cycled off, the system pressure will equalize with a gauge reading typically between 80 and 150 psig - depending on ambient temperature.

All water cooled units come with a high pressure cut out switch (HPCO). This switch is set to open at 320 psig and close at 270 psig.

To compensate for variation in water temperature, it may be necessary to adjust the water regulating valve to maintain a 250 psig discharge pressure. Adjustment can be done by rotating the adjusting screw counterclockwise for an increase in discharge pressure. For conditions where low water temperature and/or high water pressure are expected it is advisable to install a water pressure regulator ahead of the condenser.

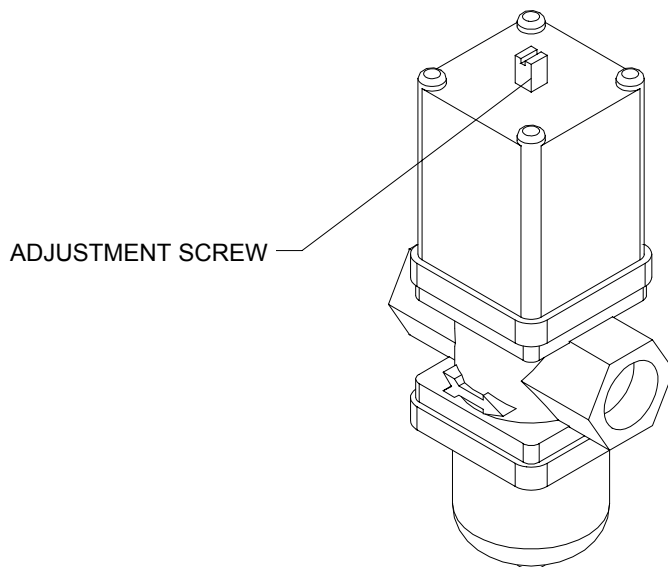
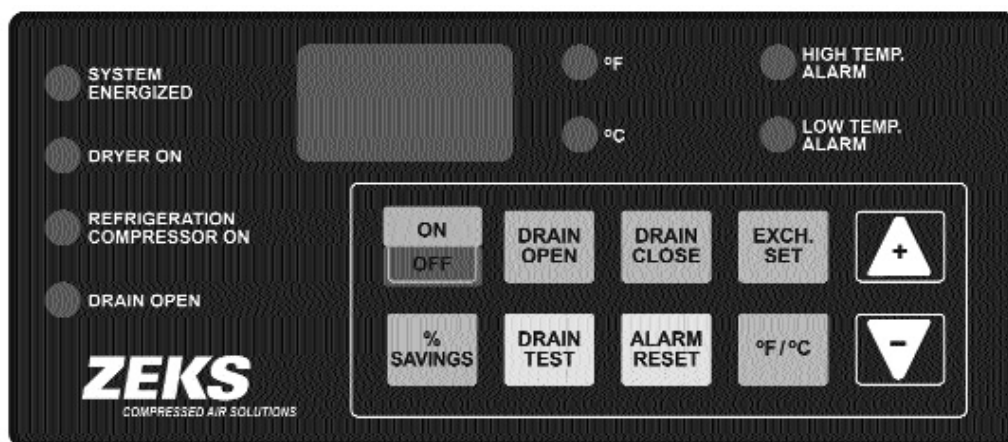


FIGURE 2
WATER REGULATING VALVE
Drawing 600562

- 2) Outlet air pressure gauge monitors the exiting compressed air pressure. During normal operation, the outlet air pressure should be within 3 psig of the compressed air entering the dryer.
- 3) Inlet air temperature gauge monitors the compressed air temperature entering the dryer. During normal dryer operation, the temperature reading should be 100°F or lower.



COMPUSTAT CONTROLLER BUTTONS

- **ON/OFF**
Pressing this button will start or stop the unit. It toggles the unit between on and off.
- **EXCHANGER SET**
Press this button to adjust the exchanger temperature control set point. The refrigeration system will cycle on 1.5°F above the set point and cycle off 1.5°F below the set point.
- **DRAIN OPEN**
This button controls the length of time, in seconds, the drain will stay open.
- **% SAVINGS**
Press this button to review how much time the compressor has been running while the unit has been energized in the DRYER ON condition. This may be reset by holding down the button for ten seconds.
- **ALARM RESET**
Press this button to open the optional relay for the remote alarm. This does not correct the alarm condition which is indicated by the flashing alarm light.
- **DRAIN TEST**
Press this button to verify drain operation.
- **°F/°C**
This button selects Fahrenheit or Celsius temperature scale for the display.
- **UP/DOWN ARROWS**
These buttons raise or lower the exchanger temperature and increase or decrease the drain open and drain close settings.

COMPUSTAT CONTROLLER LIGHTS

- **SYSTEM ENERGIZED**
Indicates when power is applied to unit.
- **DRYER ON**
Illuminated when the ON/OFF switch has been pressed to place the unit in operation. The refrigerant system may start at any time when the light is on.
- **REFRIGERATION COMPRESSOR ON**
This light comes on when the refrigeration compressor is operating.
- **DRAIN OPEN**
This light comes on when power is applied to open the timed solenoid drain.
- **DEG. F**
Illuminated when readings are in degrees Fahrenheit.
- **DEG. C**
Illuminated when readings are in degrees Celsius.
- **HIGH TEMP. ALARM**
When this light is on, it indicates that the exchanger temperature has risen to 12°F or 7°C above the exchanger temperature set point.
- **LOW TEMP. ALARM**
When this light is on, it indicates that the exchanger temperature has dropped below 29°F or -2°C. This condition stops the compressor and it will not restart until the temperature has risen two degrees above exchanger set point.

COMPUSTAT CONTROLLER DISPLAY

The display is composed of two 3/4" letters. These are used to display temperatures in the 15°F to 99°F range. Temperatures outside this range will be displayed as "EE". The display also informs you of fault or delay conditions.

- **PF** indicates a probe failure. This is usually caused by a probe being unplugged, damage to the probe lead or a defective probe.
- **cd** indicates that the refrigerant compressor will not start until the end of a three (3) minute safety delay. The display of "cd" is immediately followed by the number of minutes left in the delay.

WEATHERPROOF PACKAGE (OPTIONAL)

Dryers equipped with the optional Weatherproof Package are designed to operate in ambient conditions as low as 35°F. This package incorporates a fan cycling switch that operates the refrigeration system at optimal condensing temperatures. The fan switch controls the condensing temperature by cycling the fan based on refrigerant discharge pressure. When the unit reaches 275 psig, the fan cycling switch will run the fan until the discharge pressure is reduced to 195 psig.

NOTICE

Dryers equipped with the weatherproof package are not intended for use below 35°F.

7. INSTALLATION AND INITIAL START-UP

7.1 LOCATION AND MOUNTING

The dryer should not be located in an area where ambient temperature is likely to exceed 113°F (45°C) or be less than 50°F (10°C). The dryer must be located in an area that provides sufficient clearance from walls and other adjoining equipment to allow easy access for servicing and maintenance requirements. A minimum of 30 inches is required to allow free flow of air to the condenser inlet and clearance for servicing the dryer.

On installations with a relatively steady flow rate, the dryer is normally connected after the air receiver. If loads fluctuate widely, the dryer should be positioned ahead of the receiver and sufficient storage capacity downstream is necessary to prevent excessive air flow through the dryer.

When installed after any compressor that causes significant vibration or air pulsation, such as reciprocating compressors, proper vibration isolation and pulsation dampening devices should be added to protect the dryer.

NOTICE

Failure to comply to the above instructions may result in equipment malfunction and will void warranty.

NOTICE

Always use a backup wrench when making any threaded connection to the dryer. Failure to use a backup wrench may result in damaged tubing and components internal to the cabinet.

7.2 PIPING AND VALVES

Install piping, fittings and accessories as required for specific site conditions and requirements. Figure 3 indicates a typical piping arrangement for a refrigerated dryer, including dryer and filter bypasses. This figure can be used as a guide for valve and accessory placement in the system.

ZEKS 500 - 800 HSF models come with a drain isolation valve (D) factory installed. The isolation valve permits maintenance of the automatic drain without isolating air flow to the dryer. To operate dryer, all valves shown in Figure 3 are to be closed except valves (B), (C) and (D). Valve (A) is used for bypass purposes and valve (E) is for test and manual drain purposes.

7.3 FILTRATION

To protect the air dryer from gross contamination associated with compressor oil and debris and ensure maximum dryer performance, a prefilter is recommended. Prefilters and afterfilters sized to your drying application can be provided by ZEKs and are available factory installed. Call your local distributor to select the filter that best suits your filtration requirements. In addition to air filtration, condensate discharge oil/water separators are also available to address stringent EPA regulations.

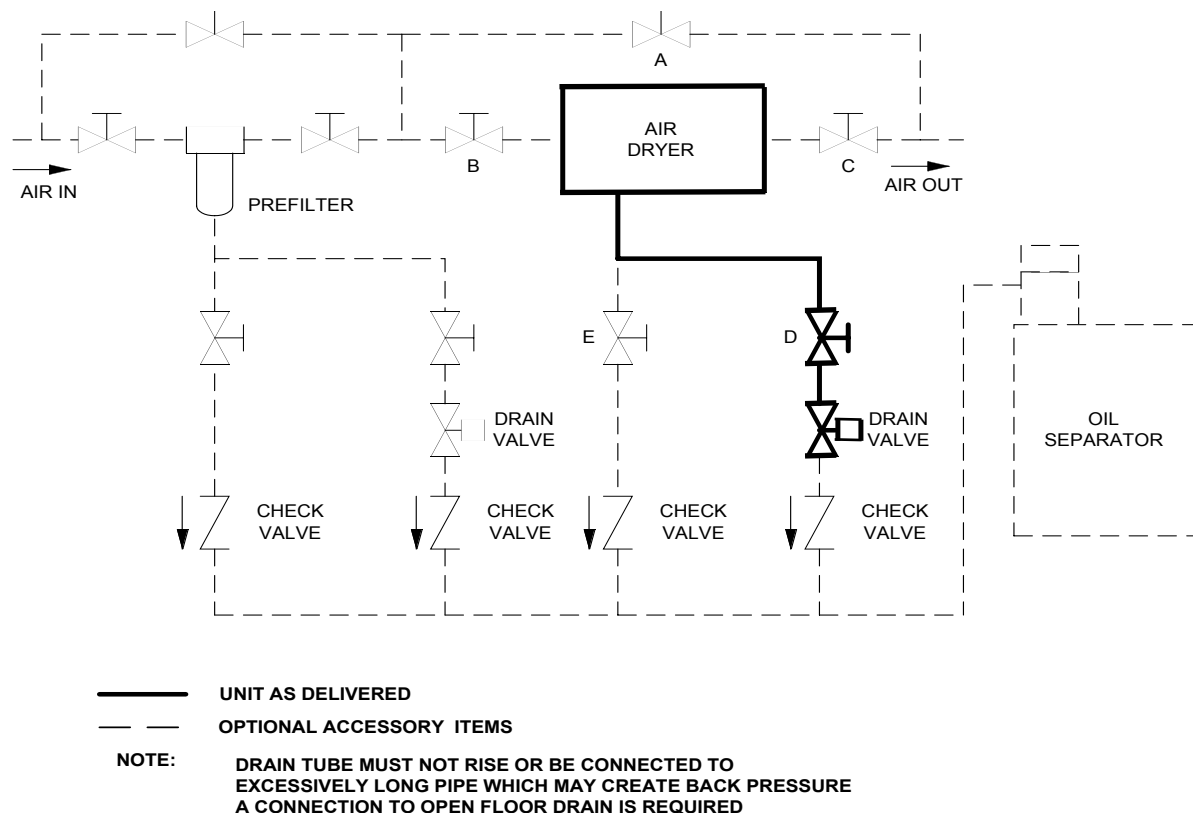


FIGURE 3
TYPICAL PIPING ARRANGEMENT

7.4 ELECTRICAL CONNECTION

Equipment is available in various electrical configurations. All customer power connections can be made at the terminal connections located in the Customer Electrical Connection Box on the rear of the dryer. (Refer to General Arrangement and appropriate Wiring Diagrams.)

A suitable fused disconnect switch or circuit breaker, in accordance with national and local code requirements, is recommended for all ZEKs equipment. Refer to Section 13 for voltage requirements and load.

CAUTION

Never wire directly, or connect any additional wires, to the compressor junction box. This will cause severe system malfunction.

7.5 INITIAL START-UP

NOTICE

For water cooled models, the water valve must be manually opened to ensure that the condenser is full of water prior to start-up.

NOTICE

Exchanger temperature should never be set lower than 35° as system malfunction could occur.

- Turn customer fused disconnect to the “ON” position. The dryer “SYSTEM ENERGIZED” light will illuminate.
- After the 3 minute safety delay, depress the dryer “ON/OFF” button.
- The “DRYER ON” light will illuminate.
- Provided the chiller temperature is above the Chiller Temperature Set Point, the “REFRIG ON” light will illuminate and refrigeration system will operate.
- The “HIGH TEMP ALARM” light will illuminate upon start-up and remain that way until the thermal mass fluid in the chiller reaches 50°F. After the temperature is reduced below 50°F, the “HIGH TEMP ALARM” light will go out.
- After the refrigeration system shuts off, air flow may be introduced to the dryer.
- Drain settings should be checked as described in Section 6.3.

CAUTION

Slowly pressurize dryer after start-up

NOTICE

After installation or a prolonged shutdown, start the dryer with no air load (no air flow). This enables the dryer to reach its proper operating temperature in the shortest time possible (typically within 30 minutes).

8.0 SCHEDULED MAINTENANCE

8.1 INTRODUCTION

ZEKS HeatSink™ refrigerated air dryers require little maintenance. These dryers utilize hermetically sealed compressors which do not require any lubrication. Fan motors require lubrication at both oil ports every six months. ZEKs recommends component inspection and service at regular intervals to obtain maximum performance from your dryer.

8.2 REFRIGERATION CONDENSER

ZEKS dryers can be equipped with an optional ambient air filter that is designed to protect the condenser from the accumulation of dirt and debris. For proper operation, it is imperative that this filter be inspected and cleaned on a regular basis. For applications where excessive dirt, dust or debris is encountered, frequent inspection and cleaning may be required. Annual replacement of the filter is recommended.

8.3 CONDENSATE DISCHARGE SYSTEM

On a minimum of a monthly basis, operation of the automatic drain should be checked. The drain should be removed and cleaned as well to ensure no debris from the system is trapped inside the strainer. Figure 4 illustrates the drain assembly. To clean the drain, turn the Isolation Valve to the off position. Be sure the valve is depressurized. Carefully remove the Strainer End Cap and remove the Strainer. Clean the Strainer and remove any debris that is evident in the valve. Replace the Strainer and reinstall the Strainer End Cap. Carefully open the isolation valve and inspect the Strainer End Cap for leaks. Tighten as required.

WARNING

If your dryer is installed without a drain isolation valve (filter stop), failure to depressurize the dryer may result in serious injury. Do not remove the drain valve without depressurizing the unit.

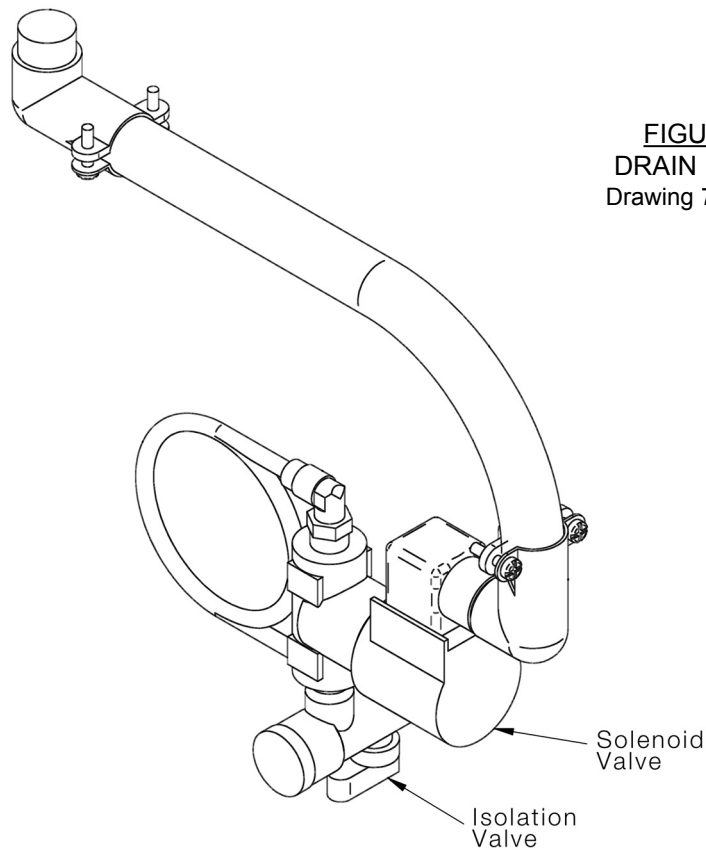
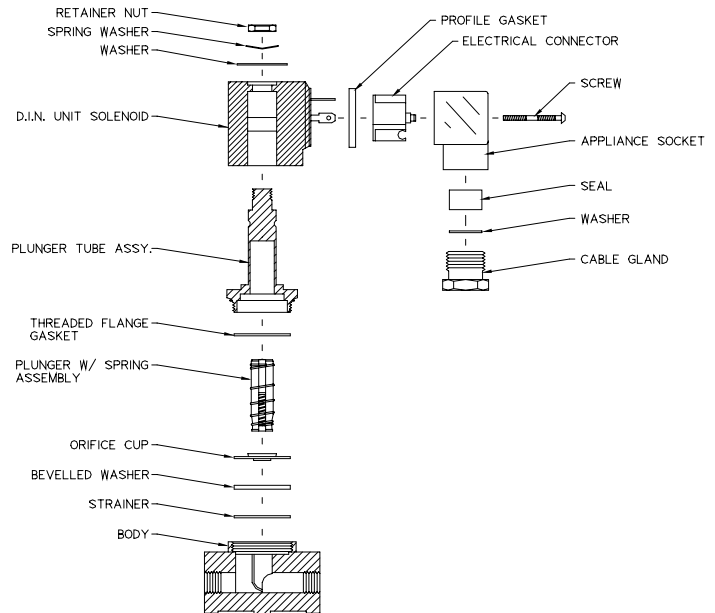


FIGURE 4
DRAIN DETAIL
Drawing 737486 B

CLEANING INSTRUCTIONS - SOLENOID DRAIN VALVE

- Be sure dryer is depressurized or isolation valve is closed.
- Disconnect drain body from filter stop.
- Loosen connector screw to allow the electrical connector assembly to be removed from the D.I.N. unit solenoid.
- Remove retainer nut and separate the valve body from the D.I.N. unit solenoid.
- Unthread the plunger tube assembly in a counter-clockwise direction until plunger separates from valve body.
- Clean beveled washer, thread gasket, spring assembly and strainer with soap and water. Do **NOT** use solvents of any kind, as failure to the seals will occur. Be especially careful to clean the center brass orifice and the rubber gasket orifice on the orifice cup with a straight pin.
- Reassemble all drain components after the drain has been cleaned and inspected. Reposition the orifice hole on the rubber gasket of the orifice cup in the line and closest to the arrow indicated on the valve body.
- Reassemble valve and install in reverse order as described above.



SOLENOID VALVE DETAIL

9. TROUBLESHOOTING

9.1 INTRODUCTION

ZEKS HeatSink™ dryers are designed for reliable, trouble-free operation. In the event of any dryer malfunction, the guide below has been developed to facilitate problem identification and corrective actions.

WARNING

An air dryer always operates under pressure. Any maintenance procedure that involves disassembly of pipe fittings, valves or any other components requires the dryer be isolated from the compressed air stream and fully depressurized.

WARNING

Prior to working on the unit, make sure that all circuit breakers or disconnected switches are tagged "Out of Service."

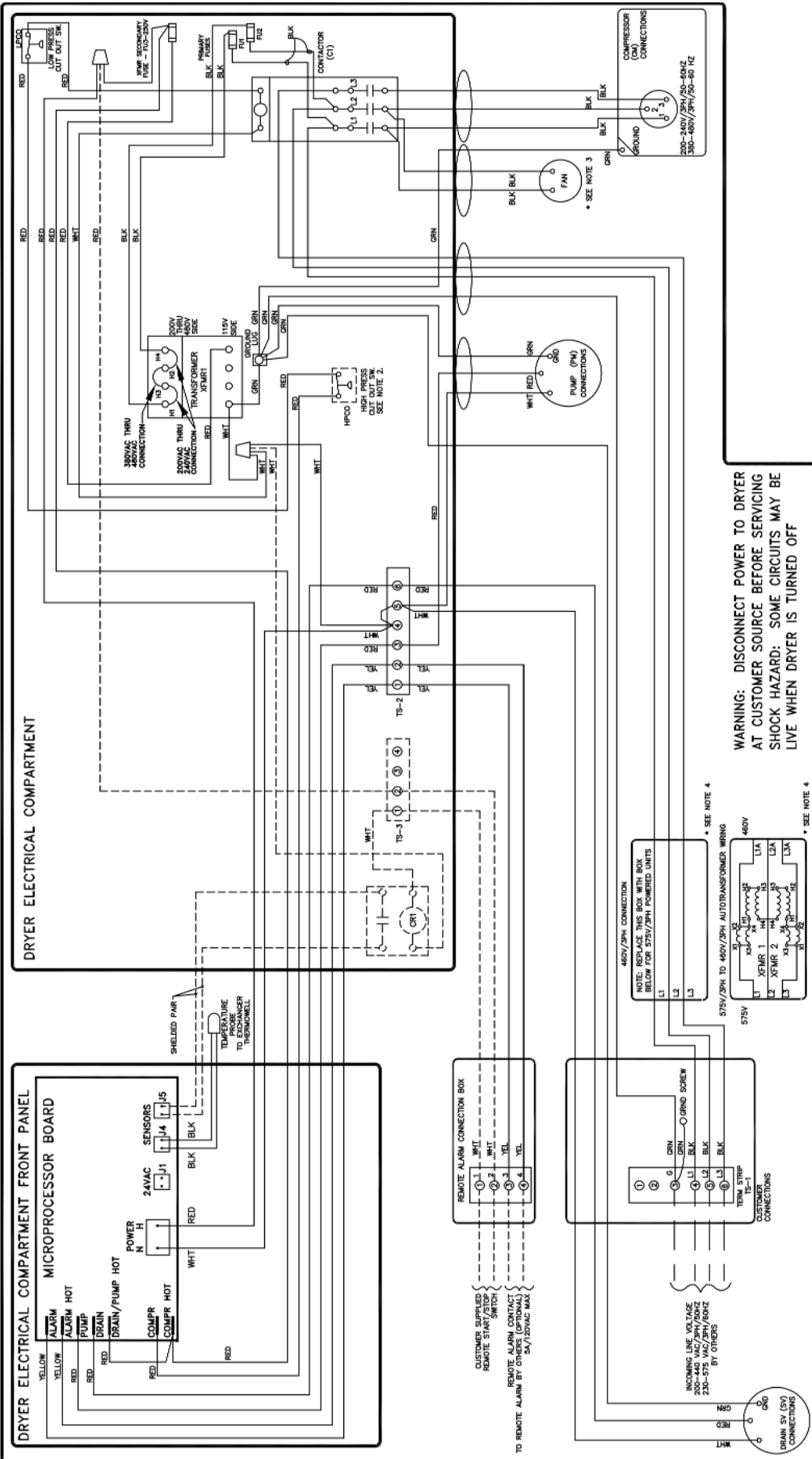
9.2 PROBLEM / ACTION GUIDE

PROBLEM	SYMPTOM(S)	POSSIBLE CAUSE	CORRECTIVE ACTION
Moisture down stream	Dryer is properly cooling air stream (Check Exch. Temp on controller)	Drain failure or timer adjustment is required	Depress "Drain Test" button - if drain valve operates, then adjust timing (See Section 6.3)
			Depress "Drain Test" button - if "Drain Open Light" comes on but valve does not open, ensure wiring connections are secure and power is being applied to the solenoid coil. If valve continues not to open, clean as described in Section 8.3.
			Depress "Drain Test" button - if "Drain Open Light" does not come on, contact distributor.
		Excessive flow	Check inlet and outlet pressures and system design capacity.
		Dryer by-pass valve not closed	Correct cause of excessive flow. Close by-pass valve
	Inlet and outlet temperatures are the same.	No power to the dryer	Check power supply and fuses/circuit breakers

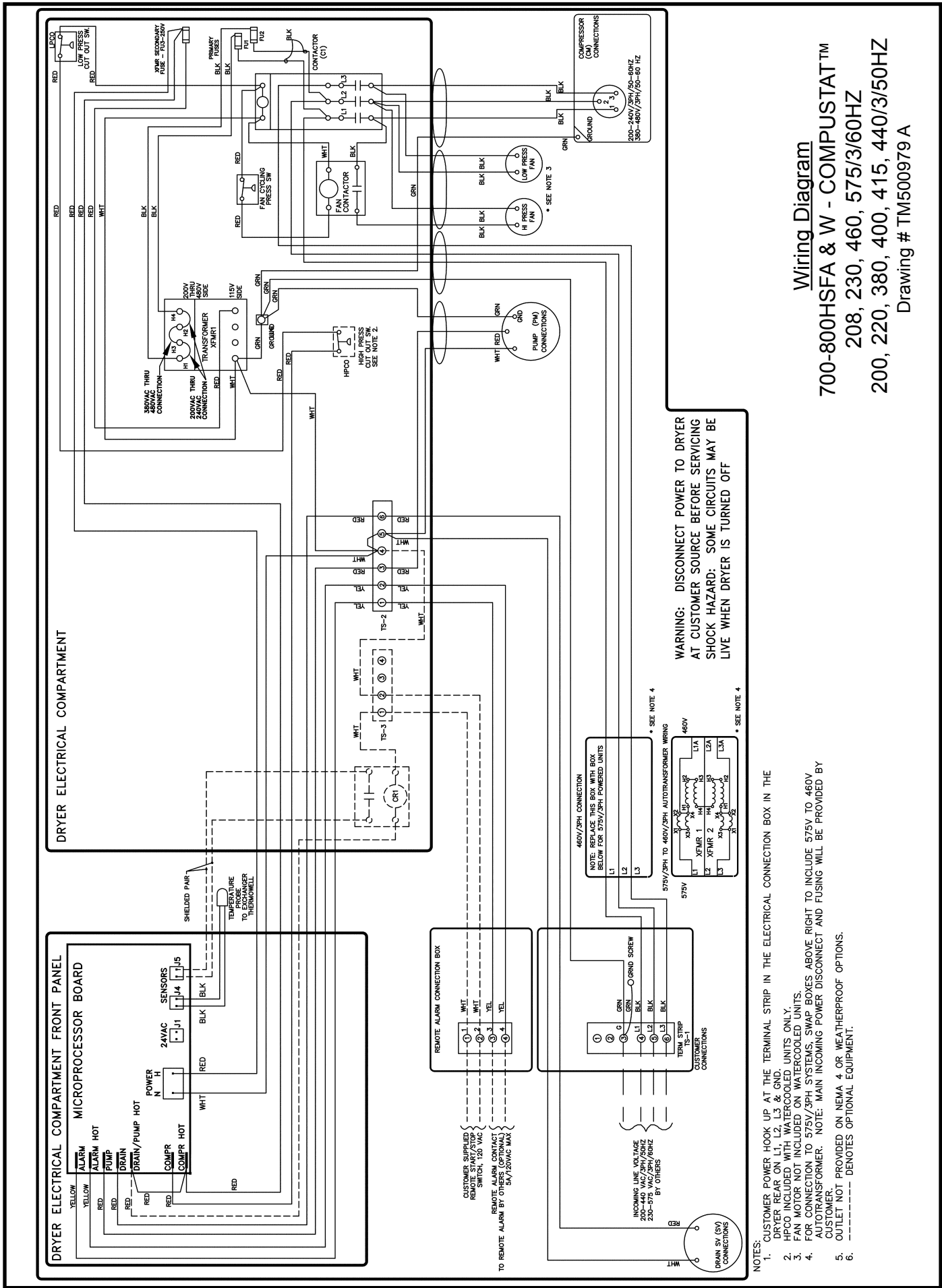
PROBLEM	SYMPTOM(S)	POSSIBLE CAUSE	CORRECTIVE ACTION
Moisture down stream	Inlet and outlet temperatures are the same.	Compressor <u>not</u> running and fan is running	Check and clean ambient air filter.
			Check ambient temperature and reduce below 120°F
		Compressor and fan <u>not</u> running (Refrig On light is off)	Controller adjustment required. Disconnect power source and reinitiate start up procedures
			Compressor relay may be bad, replace relay
			Check for loose wire connections at contactor or loss of power at control board
			Defective control board - replace as necessary
High pressure drop across dryer	Outlet pressure substantially lower than inlet pressure	Inlet and outlet valves not completely open	Open valves
			Change filter elements
		Heat exchanger has become clogged	Flush air system as required, check with your local distributor
		System operating temperature is below 32°F	Turn dryer off and consult your local distributor for further assistance

10. WIRING DIAGRAMS

DRYER ELECTRICAL COMPONENTS

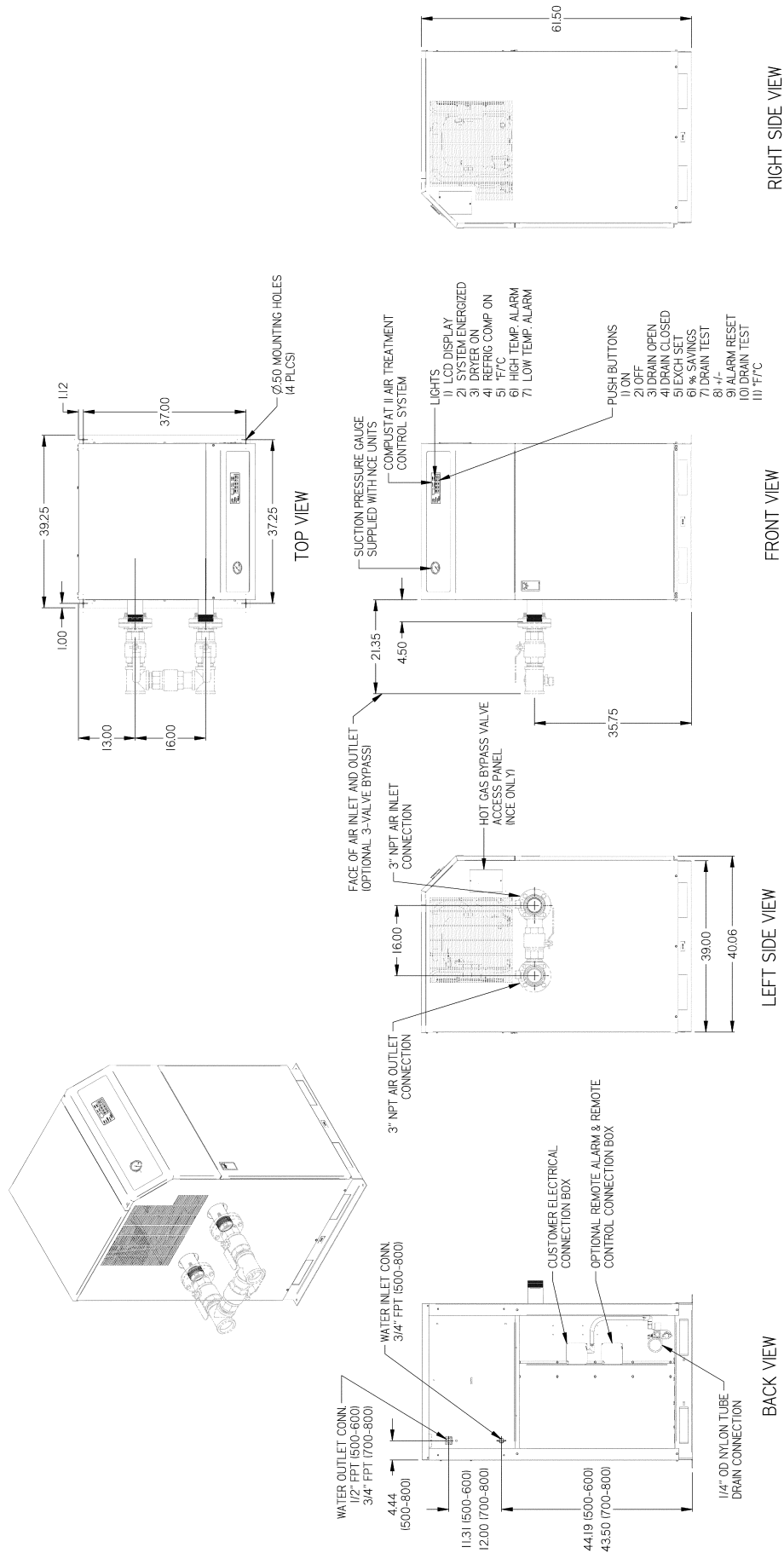


Wiring Diagram
500-600HSFA & W - COMPUSTAT™
 208, 230, 460, 575/3/60HZ
 200,220, 380, 400, 415, 440/3/50HZ
 Drawing # TM500978 C



Wiring Diagram
700-800HSFA & W - COMPUSTAT™
 208, 230, 460, 575/3/60HZ
 200, 220, 380, 400, 415, 440/3/50HZ
 Drawing # TM500979 A

11. GENERAL ARRANGEMENT

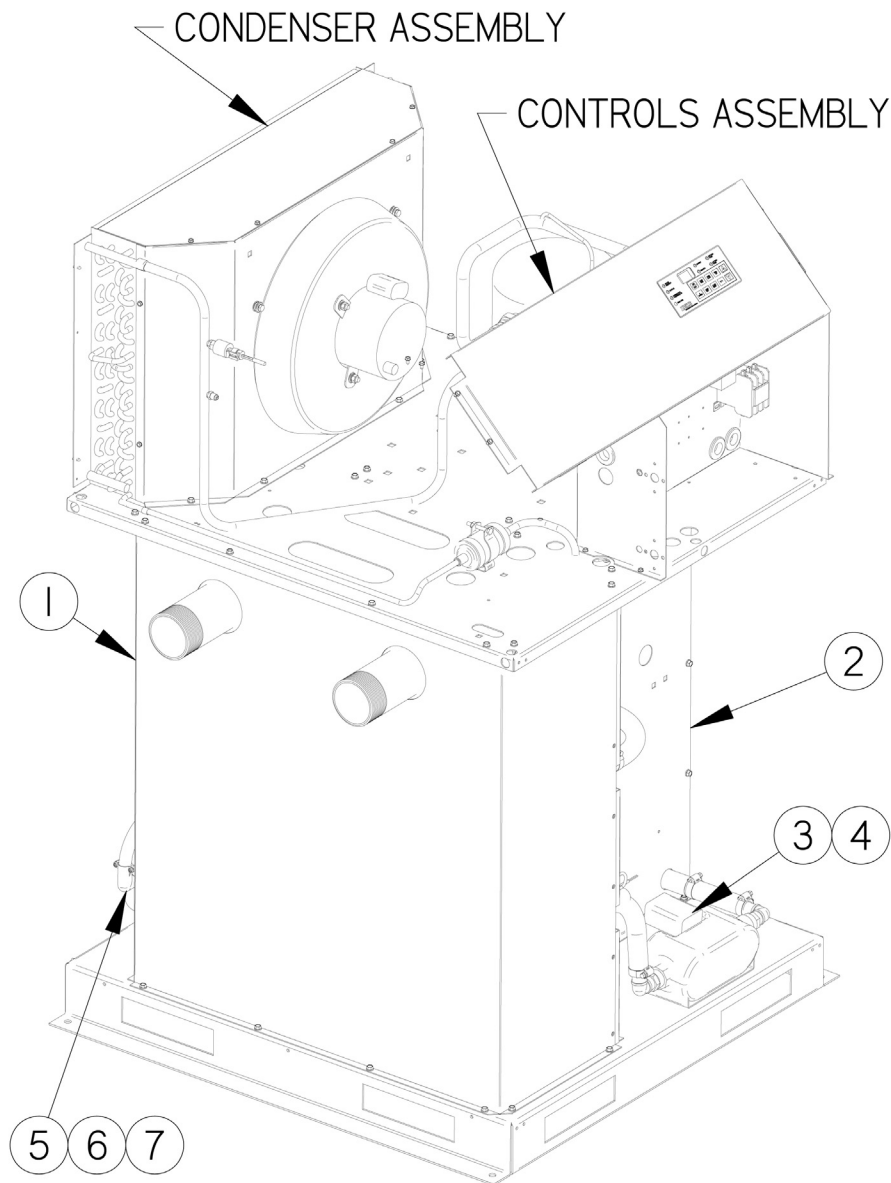


NOTE: Drawings and dimensions shown are for standard NEMA 1 dryers. Dimensions for dryers with optional NEMA 4 enclosures and / or 575V transformers differ from those shown above.

General Arrangement
Drawing # TM500983 B

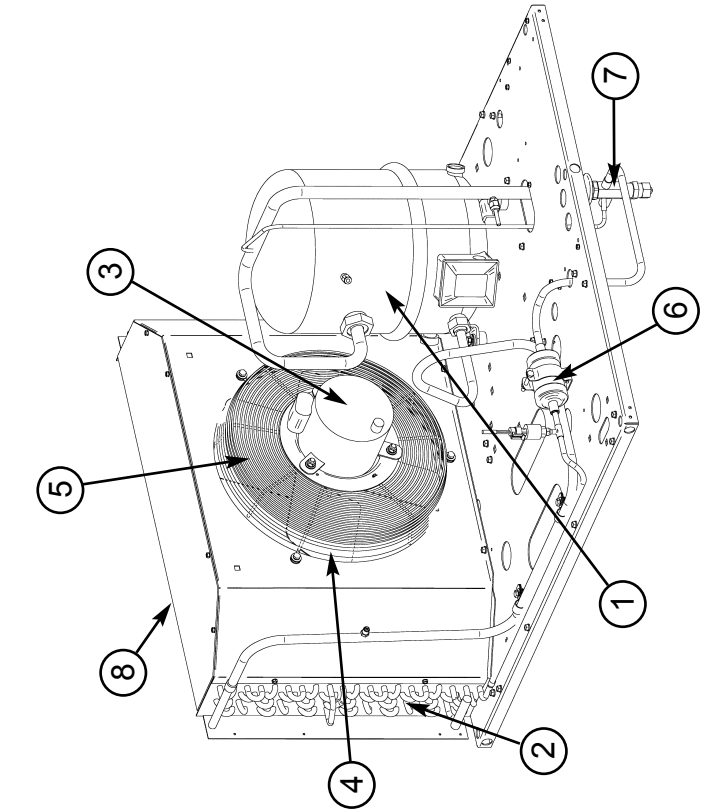
12. PARTS IDENTIFICATION

		500 HSF	600 HSF	700 HSF	800 HSF
1	Exchanger Assy	748064	748067	748023	748023
2	Evaporator Assy	748083	748083	748036	747990
3	Glycol Pump	38052262	38052262	38052262	38052262
5	Solenoid Drain Valve	682657SP	682657SP	682657SP	682657SP
6	Drain Valve Repair Kit	683006	683006	683006	683006
7	Filter Stop	683244	683244	683244	683244

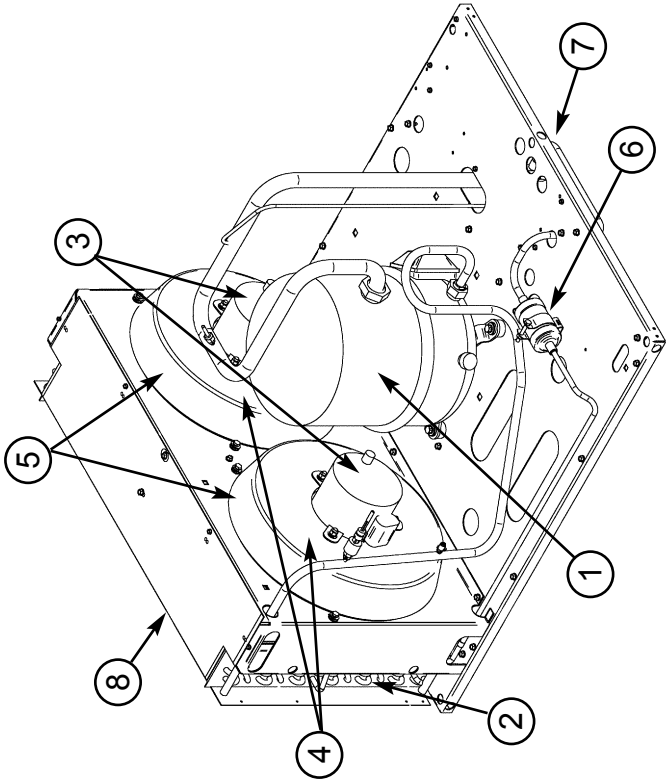


Parts Overview 500-800 HSF
Drawing # TM500HSFA400

	500HSF				600HSF				700HSF				800HSF			
	460/3/60	380/3/50	440/3/50	230/3/60	220/3/50	460/3/60	380/3/50	440/3/50	230/3/60	220/3/50	460/3/60	380/3/50	440/3/50	230/3/60	220/3/50	220/3/50
	575/3/60	682572	682571	682573	682575	682572	682575	682575	682571	683576	682575	682578	682574	682579	682578	682581
1 Compressor	682572	682571	682573	682575	682572	682575	682575	682571	683576	682575	682578	682574	682579	682578	682582	682581
2 Condenser	683100	683100	683100	683100	683100	683100	683100	683100	683100	683100	683100	683100	683100	683100	683100	683100
3 Fan Motor	698152	698151	698151	698151	698152	698152	698152	698151	698151	698151	698152	698152	698151	698152	698151	698151
4 Fan Blade	698156	698156	698156	698156	698156	698156	698156	698156	698156	698156	698156	698156	698156	698156	698156	698156
5 Fan Guard	682569	682569	682569	682569	682569	682569	682569	682569	682569	682569	682569	682569	682569	682569	682569	682569
6 Filter Dryer	600386	600386	600386	600386	600386	600386	600386	600386	600386	600386	600386	600386	600386	600386	600386	600386
7 Expansion Valve	683083	683083	683083	683083	683083	683083	683083	683083	683083	683083	683083	683083	683083	683083	683083	683083
8 Filter, Ambient Air	682951	682951	682951	682951	682951	682951	682951	682951	682951	682951	682951	682951	682951	682951	682951	682951

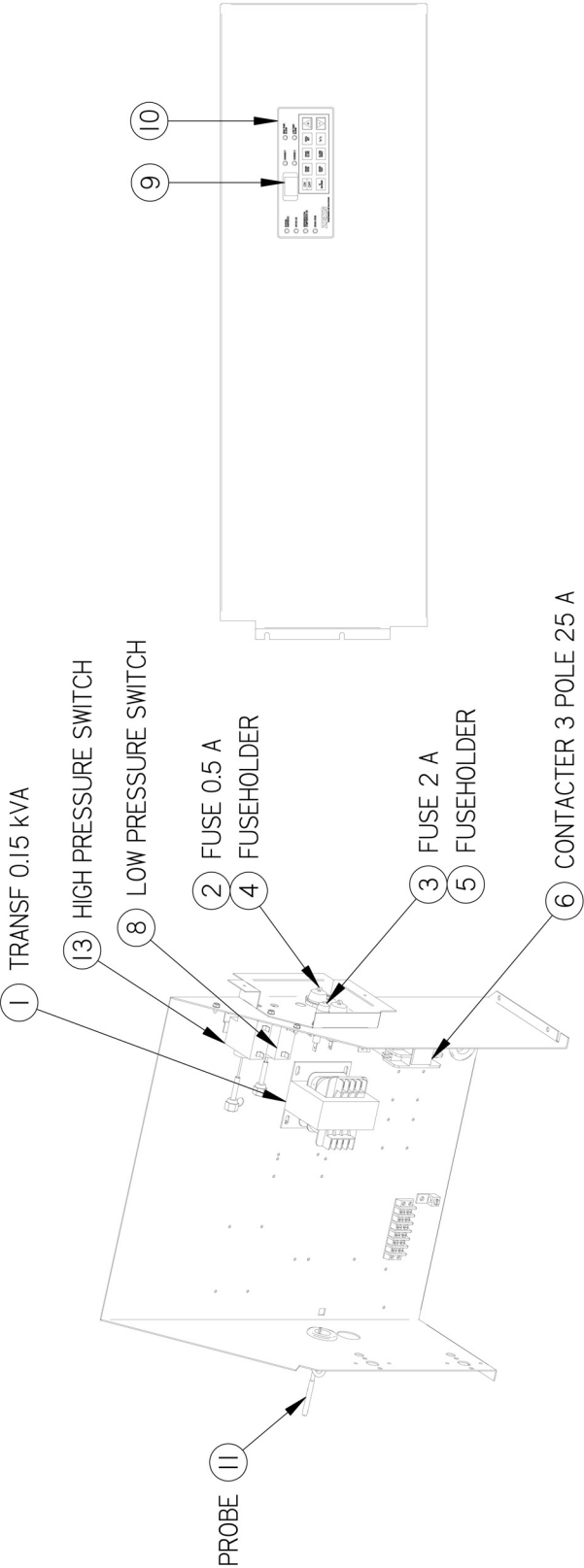


Condensing Assembly - 500-600 HSF
Drawing # TM747150 E



Condensing Assembly - 700-800 HSF
Drawing # TM747201 C

	500 & 600 HSF						700 & 800 HSF					
	460/3/60	575/3/60	380/3/50	440/3/50	230/3/60	220/3/50	460/3/60	575/3/60	380/3/50	440/3/50	230/3/60	
1 Control Transformer	600191	699808	682264	600191	600191	600191	600191	600191	682264	600191	600191	
2 Primary Control Fuse	699808	699809	682651	699391	699391	690680	699808	699808	699809	682651	699391	
3 Secondary Control Fuse	682646	683084	682647	682646	682646	682647	682646	682646	683084	682647	682646	
4 Ext Fuseholder (13/32")	688408	688408	688408	688408	688408	688408	688408	688408	688408	688408	688408	
5 Ext Fuseholder (1/4")	682552	682552	682552	682552	682552	682552	682552	682552	682552	682552	682552	
6 Contactor (3-Pole)	697290	697290	697290	697290	697290	697290	697290	697290	697290	697290	697290	
7 Contactor (1-Pole)	NA	NA	NA	NA	NA	NA	699621	699621	699621	699621	699621	
8 Switch, LPCO	681663	681663	681663	681663	681663	681663	681663	681663	681663	681663	681663	
9 Compustat Controller	681867	681867	681867	681867	681867	681867	681867	681867	681867	681867	681867	
10 Overlay	684464	684464	684464	684464	684464	684464	684464	684464	684464	684464	684464	
11 Temperature Probe	682955	682955	682955	682955	682955	682955	682955	682955	682955	682955	682955	
12 Fan Cycling Pressure Switch	NA	NA	NA	NA	NA	NA	682256	682256	682256	682256	682256	



Controls Assembly - 500-800 HSF
Drawing # TM771196

13. ENGINEERING SPECIFICATIONS

AIR-COOLED CONDENSERS															
MODEL NO.	VOLTS/PH/Hz		COMPRESSOR RATINGS			FAN RATINGS			REFRIGERANT		MAX. FUSE	MIN. CIRCUIT	WEIGHT		
			HP	RLA	LRA	QTY	HP	RLA	LRA	TYPE	LB-OZ	SIZE	AMPACITY	LBS.	KG.
500HSF	460/3/60	420/380/3/50	4	6.8	42.0	1	1/4	0.80	1.2	R-404	5-8	15	9.7	1105	499.7
	230/3/60	240/200/3/50	4	15.7	100.0	1	1/4	1.90	3.9	R-404	5-8	35	22.1	1105	499.7
	575/3/60	500/480/3/50	4	6.8	42.0	1	1/4	0.80	1.2	R-404	5-8	12	7.7	1105	499.7
600HSF	460/3/60	420/380/3/50	4	6.8	42.0	1	1/4	0.80	1.2	R-404	6-0	15	9.7	1275	579.7
	230/3/60	240/200/3/50	4	15.7	100.0	1	1/4	1.90	3.9	R-404	6-0	35	22.1	1275	579.7
	575/3/60	500/480/3/50	4	6.8	42.0	1	1/4	0.80	1.2	R-404	6-0	12	7.7	1275	579.7
700HSF	460/3/60	420/380/3/50	4.5	8.6	42.0	2	1/4	0.80	1.2	R-404	6-0	20	12.6	1320	599.0
	230/3/60	240/200/3/50	4.5	16.4	117.0	2	1/4	1.90	3.9	R-404	6-0	40	24.9	1320	599.0
	575/3/60	500/480/3/50	4.5	8.6	42.0	2	1/4	0.80	1.2	R-404	6-0	15	10.1	1320	599.0
800HSF	460/3/60	420/380/3/50	5	8.6	60.0	2	1/4	0.80	1.2	R-404	8-0	20	12.6	1415	642.0
	230/3/60	240/200/3/50	5	20.0	125.0	2	1/4	1.90	3.9	R-404	8-0	45	29.4	1415	642.0
	575/3/60	500/480/3/50	5	8.6	60.0	2	1/4	0.80	1.2	R-404	8-0	15	10.1	1415	642.0

NOTE: Electrical ratings based on 60HZ dryers.

NOTE: Maximum Allowable Working Pressure 300 psig

NOTICE

Specification information above accurate at time of publication. Refer to equipment serial label for actual refrigerant charges and specifications for units.