1/98
7610.726.15

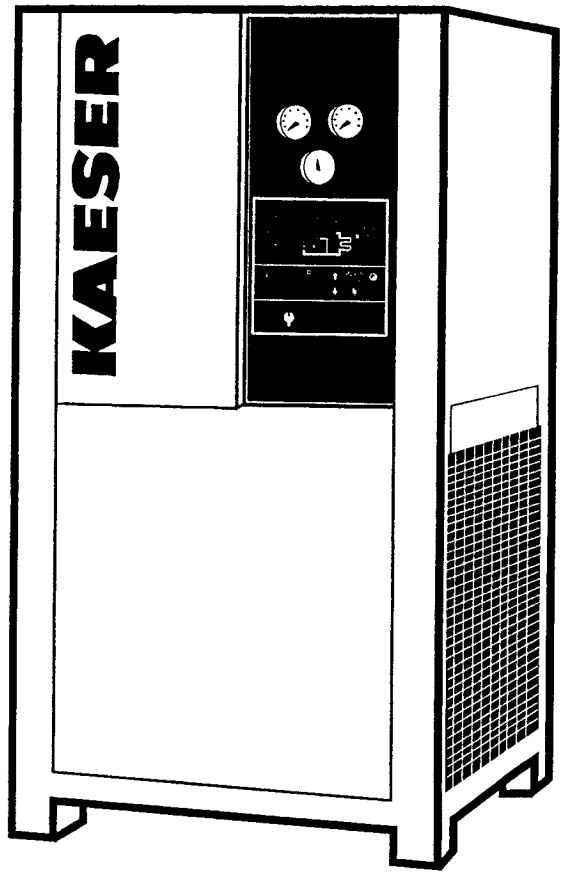
KAESER COMPRESSORS

KRD Series

Refrigerated Type Compressed Air Dryers
Models: 500, 600, 700, 800, 1000, 1200, 1600, 2000, 2300

INSTRUCTION MANUAL

CONTENTS



IMPORTANT -

380-420V/3ph/50Hz models - control transformer is wired to operate on a voltage range of 391 to 418. For voltages outside this range rewire transformer as shown on page 12.

SERVICE DEPARTMENT: (724) 745-3038

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.

All dryers are shipped to accommodate a fork lift truck.
When installing this unit, move it by means of a fork lift or other suitable means.
NEVER lift unit by hooking on to the air inlet and outlet connections. Serious damage may result.

D. STORAGE/SHUT-DOWN

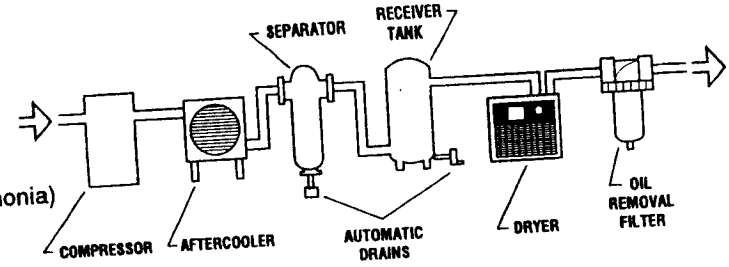
IMPORTANT - WATER-COOLED UNITS
If unit is shut down in below freezing temperatures, the water-cooled condenser may freeze and cause permanent damage.
Condenser must be drained using drain cocks located on the condenser when unit is shut down.

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

IMPORTANT
READ PRIOR TO STARTING THIS EQUIPMENT

1.0 INSTALLATION

1.1 Location



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

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.

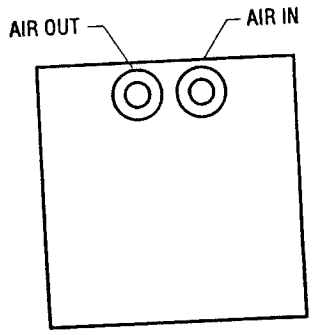
C. Air-cooled units - Free air flow - Ambient air should be free to flow across the refrigeration condenser. Do not block either side of the cabinet. Leave at least 36 inches (915 mm) clearance for free air flow.

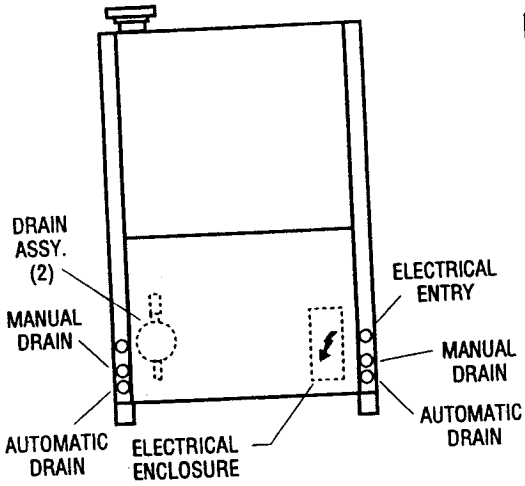
1.2 Mounting

A. Mount dryer on firm level surface.

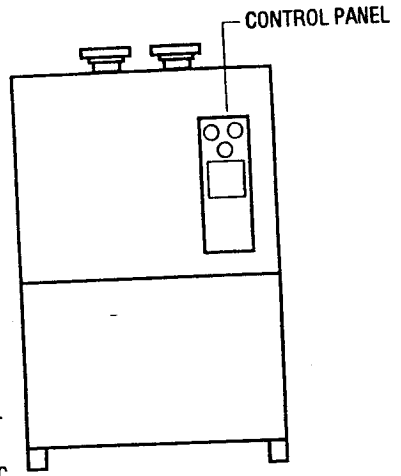
B. Dryers are furnished with removable shipping pads. Remove prior to installation if desired.
Dryers may be bolted to the floor if desired.

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

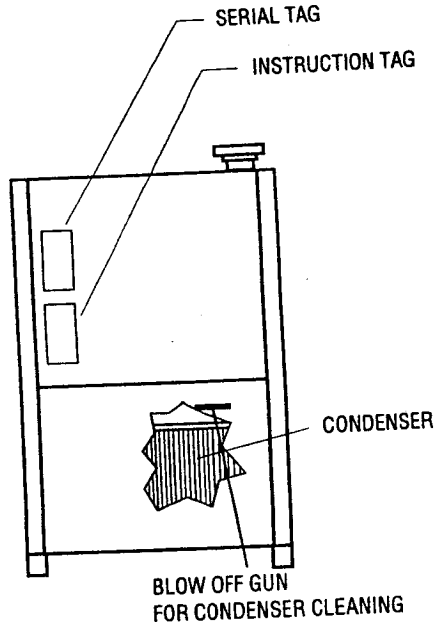




LEFT SIDE VIEW



FRONT VIEW



RIGHT SIDE VIEW

1.3 Piping connections

WARNING

If welding above unit make certain that sparks are kept from contacting insulation around inlet and outlet piping.

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° (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. By-pass piping - If servicing the dryer without interrupting the air supply is desired, piping should include inlet and outlet valves and an air by-pass valve.

D. Condensate Drain

1) Manual Drains

Petcocks (2) for manual draining are attached to the manual drain lines in the cabinet. Remove petcocks and install into manual drain couplings. Make sure petcocks are closed.

2) Automatic Drain

Drain lines can be run from Automatic Drain outlets (2) to the plant drainage system.

NOTE

Discharge is at system pressure. Anchor drain line.

NOTE

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

E. Water cooled models - cooling water inlet and outlet

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

NOTE

Strainer and water regulating valve are supplied on water cooled models

1.4 Electrical connections

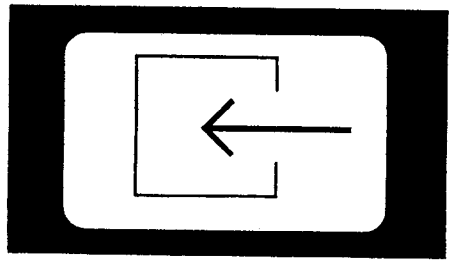
IMPORTANT - Use copper supply wires only.

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

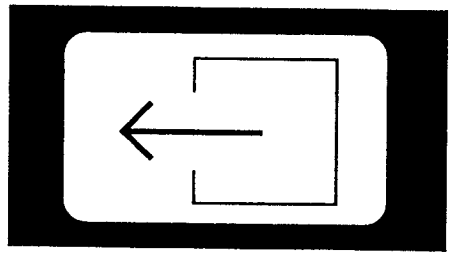
B. Electrical entry is through hole in cabinet and into electrical enclosure. Connect power source to terminal strip in electrical enclosure as shown on Electrical Schematic attached to dryer.

NOTE

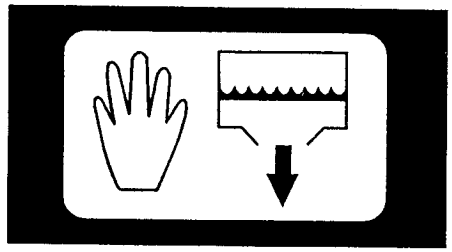
Refrigeration condensing unit is designed to run continuously and should NOT be wired to cycle on/off with the air compressor.



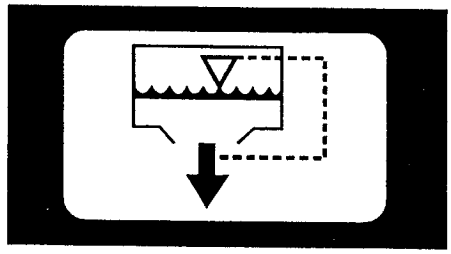
IN



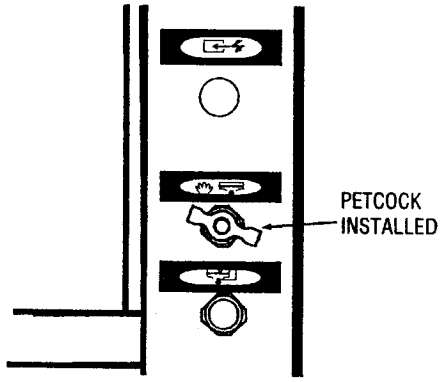
OUT

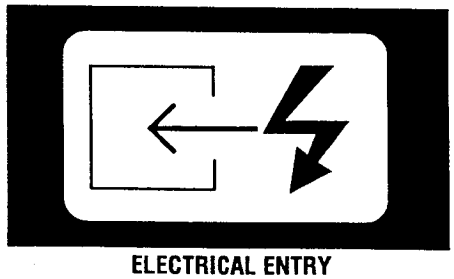


MANUAL DRAIN



AUTOMATIC DRAIN





ELECTRICAL ENTRY

1.5 Automatic condensate drains

1.5.1 Models with electric drains

A. Verify that isolation valves are open.

B. Verify time settings.

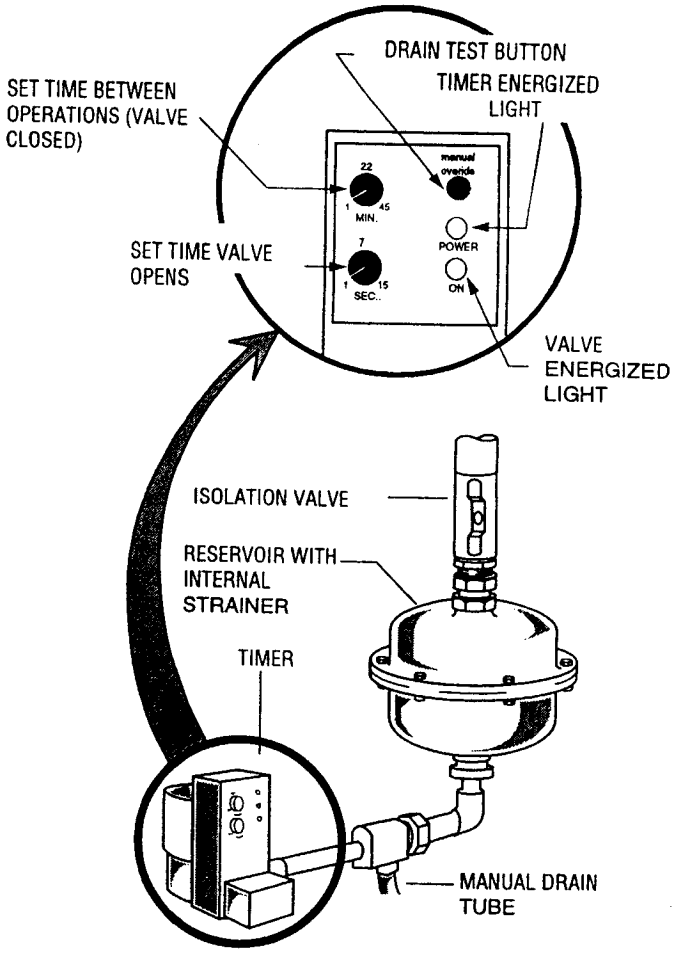
After dryer is operating, verify that valve remains open long enough for all condensate to be ejected from the system. If all condensate is not ejected during valve open time, shorten time between operations.

1) MODELS WITH STANDARD CONTROL PANEL AND ELECTRIC DRAIN -
Drain timers (2) are factory set for 5 minutes between operations (valve closed) and 5 seconds valve open time

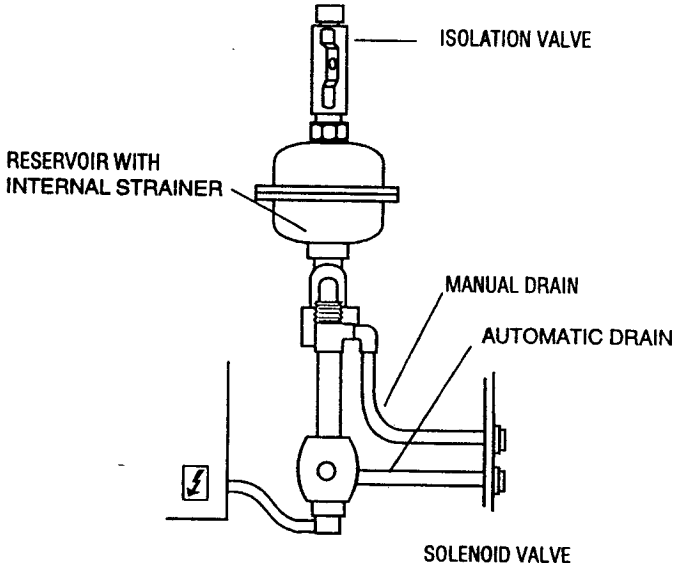
2) MODELS WITH DIGITAL CONTROL PANEL -
TIME BETWEEN OPERATIONS (valve closed) is factory set for 2.5 minutes, valve open time is not adjustable. See instructions under 2.3 to adjust time.

1.5.2 Models with mechanical drains

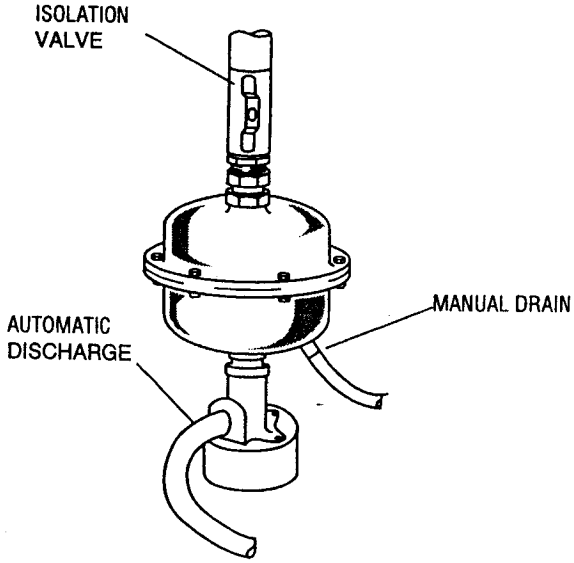
A. Verify that isolation valves are open.



ELECTRIC DRAIN
(Optional with Three Light Control Panel)



ELECTRIC DRAIN
(Supplied with digital control panel)



MECHANICAL DRAIN

2.0 OPERATION

2.1 Minimum/maximum operating conditions

NOTE:
High refrigerant pressure switch has a manual reset. After correcting fault, manually reset switch to resume operation.

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

B. Minimum inlet air pressure: 20 psig (1.4 kgf/cm^2)

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

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

E. Minimum ambient temperature: 35°F (2°C)

2.2 Start-up

NOTE
DRYER MUST BE ENERGIZED 24 HOURS BEFORE STARTING REFRIGERATION COMPRESSOR

NOTE
Start unit before introducing air flow. High pressure switch has a manual reset. If refrigerant pressure cut-out (compressor off light) illuminates during start-up, reset switch.

A. MODELS 500 TO 1200

1. After making sure that on/off switch is off ("O"), energize dryer. Green power-on light will glow.
2. On water-cooled units - after 24 hours start flow of water through condenser.
3. After 24 hours, energize compressor by positioning the on/off switch in the on ("I") position. Green compressor-on light will glow.

NOTE - COMPRESSOR ROTATION
Model 1200 only - ensuring proper compressor rotation
Dryer contains a scroll compressor which must rotate in the proper direction. If after starting dryer an unusual noise is heard and the suction pressure fails to drop into the normal (green) range, stop dryer, reverse two power leads, restart, and verify that suction pressure is in the green range.

B. MODELS 1600 TO 2300

1. With switch in off position, energize dryer.
2. Water-cooled models: after 24 hours, begin cooling water flow.
3. After 24 hours, open refrigeration service valves (use refrigeration service wrench only)

NOTE: We strongly recommend that this procedure be performed by a qualified refrigeration mechanic.

a. Open (back seat) by-pass system shut off valve (A) by turning counter-clockwise as far as possible.

b. Open (back seat) liquid line shut off valve (B) by turning counter-clockwise as far as possible, then turn valve clockwise two complete turns.

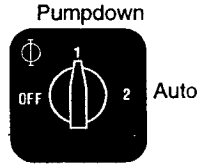
c. Open (back seat) suction service valve (C) by turning counter-clockwise as far as possible.

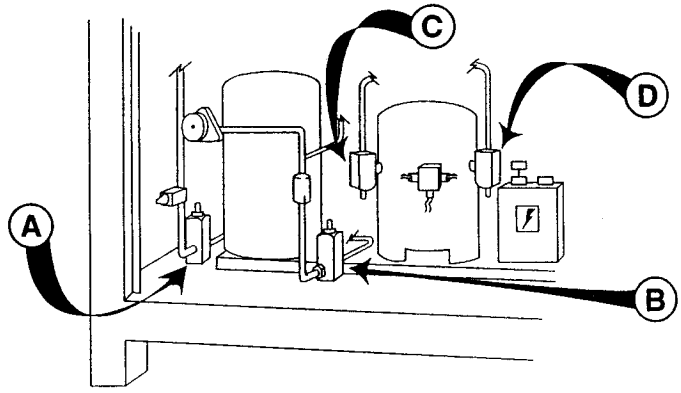
d. Open (back seat) compressor discharge service valve (D) by turning counter-clockwise as far as possible, then turn valve clockwise two complete turns.

4. Check for refrigerant leaks and proper electrical voltage.
5. Turn switch to Pump-down/1 position. Allow dryer to run until it stops.
6. Turn switch to Auto/2 position.

NOTE: Air-cooled models:
- Check fan rotation (air must be pulled through condenser). To reverse fan direction switch two incoming power leads.
- Fans may not start immediately or may cycle on and off.

7. Slowly pressurize unit by opening inlet isolation valve. Check for air leaks.
8. After 15 minutes, open outlet isolation valve slowly.
9. Close air by-pass valve.





Start-up
Models 1600-2300

2.3 Using the Digital Panel

A. Function Lights

1. Power-on light - indicates power to dryer

2. Compressor-on light - indicates power to control circuit, refrigeration compressor should be running

3. Drain energized light - indicates power to solenoid valve, drain should be open

B. Numeric Display

When the on/off switch is placed in the ON position, the Numeric Display indicates Lowest Air Temperature. Additional temperatures, alarm setpoints, and electric drain adjustment are available by pressing the mode selector button in the following sequence:

1. Display indicates Outlet Air Temperature. Outlet temperature light glows.

2. Display indicates Ambient Temperature. Ambient temperature light glows.

3. Display indicates Inlet Temperature Alarm set point. Green light glows in Temperature Alarm box. Set point may be changed by pushing up and down arrows.

4. Display indicates Lowest Air Temperature Alarm set point. Green light glows in Temperature Alarm box. Set point may be changed by pushing up and down arrows.
5. Used on models with Electric Drains (if dryer is not equipped with electric drain sequence through this step) Display indicates Electric Drain Closed time in minutes and tenths of a minute. Green light in drain time box glows. Time between valve openings may be changed by pushing up and down arrows.
6. Display indicates Inlet Air Temperature. Inlet temperature light glows.

NOTE: Once display is returned to one of the monitor modes, the selected settings are retained in memory. Set points are retained in memory even if power to the dryer is interrupted.

NOTE: If display is left in an alarm set or drain set mode, display will automatically return to lowest air temperature after 7 seconds.

NOTE: Position 1 on dip switch on back of panel allows choice of °F or °C on readout. Place in ON position for °C and OFF position for °F.

C. Alarms

1. High temperature alarm - If either Inlet Temperature or Lowest Air Temperature exceed the alarm set point, the red light in the temperature alarm box flashes. The Inlet Temperature or Lowest Air Temperature light will also blink to indicate which alarm is active.

2. Refrigerant pressure cut out alarm - If compressor on light changes from green to red, high or low refrigerant pressure switch has cut out.

3. Optional high water level alarm - red light in time box flashes to indicate that insufficient condensate is being discharged.

D. Drain Test Button

For models with electric drains, push to manually activate drain valve. Drain energized light will glow.

2.4 Shutdown and Restart

A. Shutdown

1. Models 500-1200 - Turn on/off switch to off "O". Leave dryer energized unless servicing.
2. Models 1600-2300
   a. Shutdown - Turn switch to Pumpdown/1 and leave in this mode until normal operation resumes. Refrigeration unit may occasionally cycle.
   b. For service - turn switch to Pump-down/1, allow dryer to cycle until it stops, turn switch to Off.

B. Restart

NOTE: Dryer should be energized 24 hours prior to start-up.

1. Make certain air inlet and oulet isolation valves are closed.

2. Models 500-1200 - turn on/off switch to on "I"

3. Models 1600-2300
   a. If switch is in the off position turn to Pump-down/1 position. Allow dryer to run until it stops.
   b. Turn switch to Auto/2 position.

4. After 15 minutes, slowly open isolation valves and close by-pass valve.

2.5 Operating check points

Check the following on a periodic basis:

A. Power-on light glows indicating power to the dryer.

B. Compressor-on light (green) glows indicating control circuit is energized.

C. Standard Panels

1. High air temperature warning light is out. The high air temperature warning light will illuminate when unit is energized. Light should go out approximately 15 minutes after start-up. If light remains lit after 30 minutes or lights again after going out, refer to Troubleshooting Guide.

2. Refrigerant pressure cut out light is out.

D. Digital panels

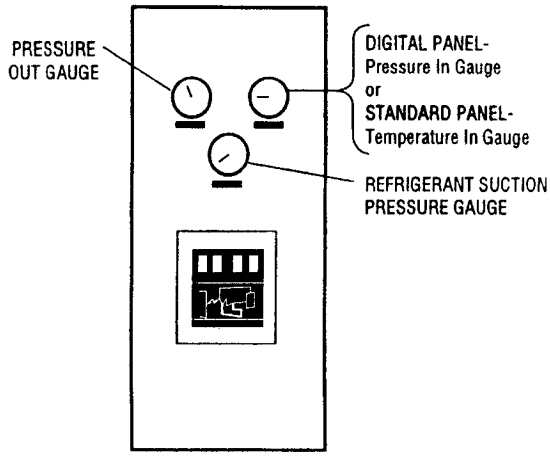
Check for alarms - compressor on light - red indicating compressor off because of refrigerant pressure cut out. High temperature alarm. High level alarm (optional).

E. Suction pressure gauge reads in green area.

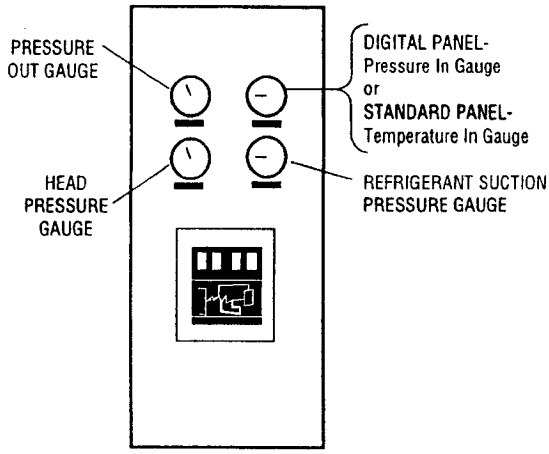
F. Outlet pressure gauge - Compare with pressure at inlet to dryer to determine if a higher than normal pressure drop exists.

G. Inlet temperature gauge (supplied on models with Standard Control Board) - inlet temperature should read below 120°F (49°C).

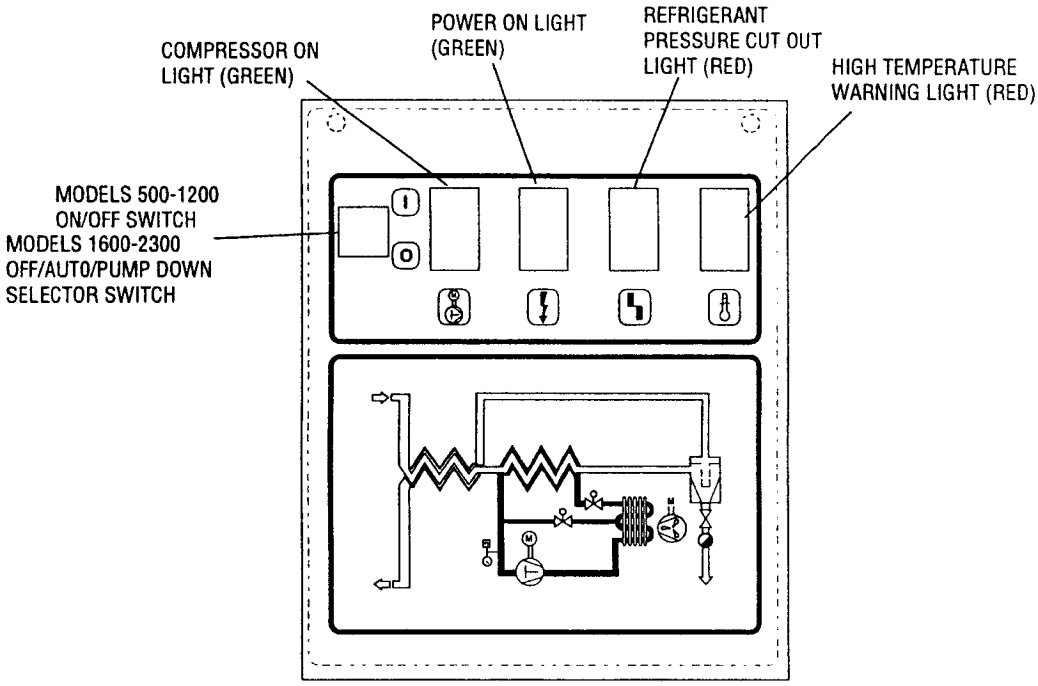
H. Condensate is discharging from drain.



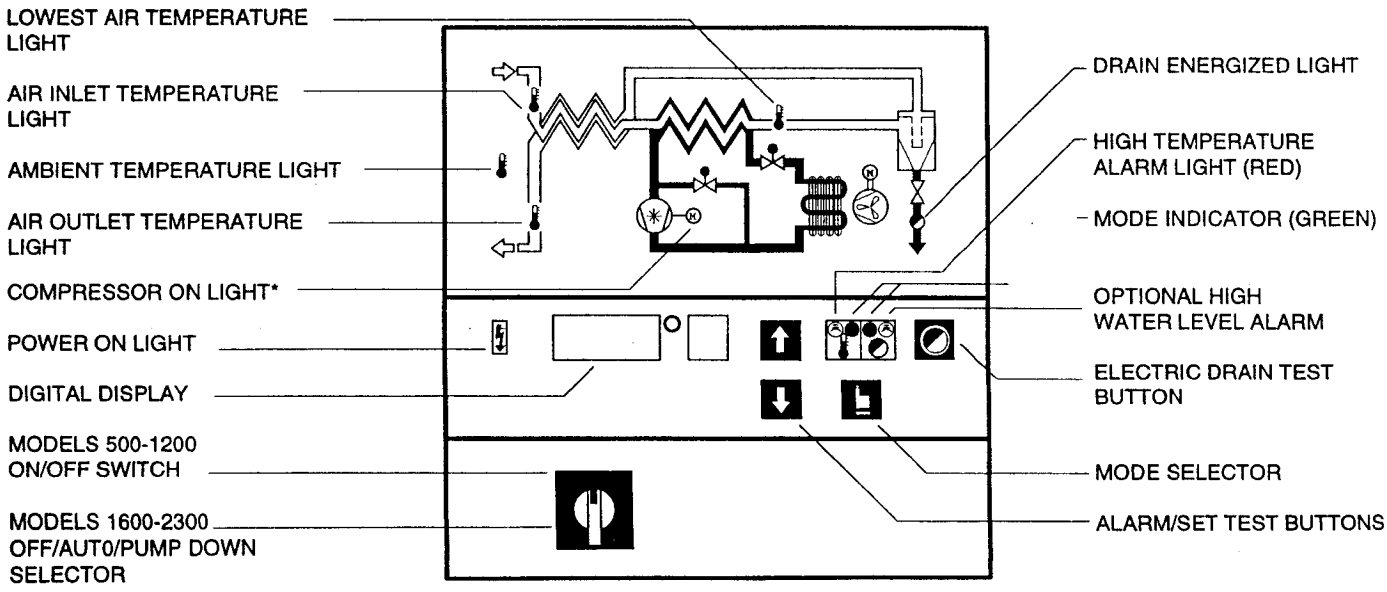
CONTROL PANEL FOR MODELS 500 TO 1200



CONTROL PANEL FOR MODELS 1600 , 2000, 2300



STANDARD CONTROL PANEL



DIGITAL CONTROL PANEL

* Green - compressor on
Red - compressor off because of refrigerant pressure cut out

3.0 MAINTENANCE

3.1 Air-cooled models -

Condenser coil - Clean off accumulated dust and dirt monthly.

NOTE: A blow-gun is supplied with dryer for this purpose. Remove condenser screen to access blow gun.

3.2 Water-cooled models -

Strainer - Clean strainer periodically to prevent restriction of water flow

3.3 Automatic condensate drains

3.3.1 Check daily to be sure automatic drain is discharging.

3.3.2 Manually drain separator weekly by opening manual drain.

3.3.3 Electric drains - periodically clean strainer in drain reservoirs.

3.3.4 Mechanical drains - Rebuild drain mechanisms annually. Use repair parts kit - 05.7501-03.

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 1000 handle when the compressed air to be dried is at 80 psig and 90°F; ambient air temperature is 80°F; and a 38°F dew point temperature is desired?
ANSWER: 1000 x 1.17 x 1.12 x 1.0 = 1310 scfm.

Pressure Drop

To determine pressure drop at increased flows, multiply the pressure drop at rated conditions from Table 1 by the multiplier shown in Table 3 for the appropriate air flow rate and operating pressure.
EXAMPLE: What is the pressure drop across a model 1000 when flowing 1500 scfm at 200 psig ?
ANSWER: 1500/1000 = 1.5; multiplier below at 1.5 and 200 psi = 1.1; 1.1 x 4.2 psi = 4.6 psi.

TABLE 1
Rated capacity and Pressure @ 100 psig inlet pressure, 100°F inlet temperature, and 100°F ambient temperature

MODEL		500 scfm	600 scfm	700 scfm	800 scfm	1000 scfm	1200 scfm	1600 scfm	2000 scfm	2300 scfm
Rated Capacity of Air-Cooled Models (scfm)	60 Hz	500	600	700	800	1000	1200	1600	2000	2300
	50 Hz	500	560	580	745	830	1000	1330	1660	1910
Pressure Drop (psi)	60 Hz	3.2	3.6	4.0	3.6	4.2	4.1	3.9	4.7	5.0
	50 Hz	3.2	3.2	2.9	3.2	3.0	2.9	2.8	3.4	3.6

scfm x 0.0286 = m^3/min

TABLE 2
Air capacity correction factors (multipliers)

INLET COMPRESSED AIR CONDITIONS						
INLET PRESSURES		INLET TEMPERATURES				
psig	kg/cm²	80°F 27°C	90°F 32°C	100°F 38°C	110°F 43°C	120°F 49°C
50	3.5	1.35	1.05	0.84	0.69	0.56
80	5.6	1.50	1.17	0.95	0.79	0.66
100	7.0	1.55	1.23	1.00	0.82	0.70
125	8.8	1.63	1.31	1.07	0.91	0.74
150	10.5	1.70	1.37	1.13	0.95	0.80
175	12.3	1.75	1.42	1.18	0.99	0.84
200	14.0	1.80	1.47	1.22	1.03	0.89

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

OUTLET DEWPOINT		
DEW POINT TEMPERATURE °F	DEW POINT TEMPERATURE °C	MULTIPLIER
38	3	1.0
40	4	1.1
45	7	1.2
50	10	1.3

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

TABLE 3
Pressure drop correction factors (multipliers)

AIR FLOW	OPERATING PRESSURE psig / kg/cm²			
	60 / 4.2	100 / 7	180 / 12.6	200 / 14.0
2.0 x rated flow	5.4	3.5	2.1	1.9
1.5 x rated flow	3.2	2.1	1.2	1.1
1.2 x rated flow	2.1	1.4	0.8	0.7

ENGINEERING DATA

MINIMUM - MAXIMUM OPERATING CONDITIONS		500	600	700	800	1000	1200	1600	2000	2300
Max. Inlet Air Pressure (compressed air at inlet to dryer)										
Standard		200 psig (14 bar)								
Optional		300 psig (21 bar)								
Max. Inlet Air Temperature (compressed air at inlet to dryer)		120°F (49°C)								
Min.- Max. Ambient Temperature										
Air-cooled		35°F (1.7°C) - 110°F (43°C)								
Water-cooled		35°F (1.7°C) - 130°F (54°C)								
REFRIGERATION SYSTEM DATA		**500**	**600**	**700**	**800**	**1000**	**1200**	**1600**	**2000**	**2300**
Condensing Unit Mfg.		Tecumseh			Copeland			Copeland		Copeland
Compressor Type		Hermetic - Non-Cycling								
Refrigeration Compressor Horsepower		3	3	3	4	4	6	7.5	10	12
BTU/HR - Refrigeration Only										
@ 35°F Evaporator & 100°F Ambient	60 Hz	30,875	30,875	30,875	42,720	42,720	60,744	70,175	94,775	107,160
	50 Hz	25,730	25,730	25,730	35,600	35,600	50,620	58,479	78,979	89,300
Outlet Air Temperature (nominal at rated conditions)		85°F (29°C)								
Refrigerant Type		R-22								
Refrigerant Charge		See dryer serial number tag								
Suction Pressure Setting (controlled by hot gas by-pass valve)		62	62	62	62	62	62	62	62	62
Compressor Control Ranges (psig) (out-in)										
High		405-284	405-284	405-284	405-284	405-284	405-284	405-284	405-284	405-284
Low		52-67	52-67	52-67	52-67	52-67	52-67	24-56	24-56	24-56
Condenser Fan Switch Setting (in-out)(psig)	Fan 1	250-190	250-190	250-190	250-190	250-190	250-190	250-190	250-190	250-190
(air-cooled models)	Fan 2	275-195	275-195	275-195	****	****	275-195	275-195	275-195	275-195
Air Flow Across Condenser (cfm) (air-cooled models)	60 / 50 Hz	2100/1750	2100/1750	2100/1750	2725/2271	2725/2271	4237/3531	5300/4416	4900/4083	4900/4083
Condenser Cooling Water Requirements (water-cooled models)										
Recommended Water Pressure (psig)		40 Min. - 120 Max*								
Gallons Per Minute Of Flow Required With 85°F Cooling Water	60 / 50 Hz	6 / 5	7 / 6	8 / 7	9 / 8	12 / 10	14 / 12	21 / 18	27 / 23	35 / 30
ELECTRICAL DATA		**500**	**600**	**700**	**800**	**1000**	**1200**	**1600**	**2000**	**2300**
Nominal Voltage		**208-230/3/60**	**208-230/3/60**	**208-230/3/60**	**208-230/3/60**	**208-230/3/60**	**208-230/3/60**	**200-230/3/60**	**200-230/3/60**	**208-230/3/60**
Max.- Min. voltage		253-187	253-187	253-187	253-187	253-187	253-187	253-180	253-180	253-187
Amperage Draw	Total Full Load***	15.1	15.1	15.1	22.0	22.0	23.7	34.2	43.2	50.4
	Compressor Full Load	12.5	12.5	12.5	17.9	17.9	20.7	26.6	35.6	42.0
	Total Locked Rotor Amps***	74.6	74.6	74.6	90	90	156	189.8	208	267
	Compressor Locked Rotor	72.0	72.0	72.0	90	90	156	189.8	208	267
Unit Protection Fuse Size (amps)**		17.5	17.5	17.5	25	25	25	35	45	50
Branch Circuit Fuse Size (amps)		20	20	20	30	30	40	50	60	60
kW @ 35°F Evaporator & 100°F Ambient		5.3	5.3	5.3	5.0	5.0	5.1	9.4	11.8	14.7
Resistance (Ohms) Compressor	Three phase (total)	1.17	1.17	1.17	0.84	0.84	1.517	.200-.400	.200-.400	0.433
Nominal Voltage		**460/3/60**	**460/3/60**	**460/3/60**	**460/3/60**	**460/3/60**	**460/3/60**	**460/3/60**	**460/3/60**	**460/3/60**
Max. - Min. Voltage		506-414	506-414	506-414	506-414	506-414	506-414	506-414	506-414	506-414
Amperage Draw	Total Full Load***	6.8	6.8	6.8	10.7	10.7	12.0	15.3	21.6	31.4
	Compressor Full Load	5.8	5.8	5.8	8.6	8.6	10.2	13.3	17.8	27.6
	Total Locked Rotor ***	36.0	36.0	36.0	45.0	45.0	70	93.1	107.8	138.8
	Compressor Locked Rotor	35.0	35.0	35.0	45.0	45.0	70	91.1	104.0	135.0
Unit Protection Fuse Size (amps)**		8	8	8	12	12	15	17.5	25	35
Branch Circuit Fuse Size (amps)		15	15	15	15	15	20	30	35	45
kW @ 35°F Evaporator & 100°F Ambient		4.3	4.3	4.3	5.1	5.1	5.3	8.7	11.1	14.5
Resistance (ohms) Compressor	Three phase (total)	3.53	3.53	3.53	2.71	2.71	2.310	.200-.400	.200-.400	.91-1.04
Nominal Voltage		**200-240/3/50**	**200-240/3/50**	**200-240/3/50**	**200-220/3/50**	**200-220/3/50**	**200-220/3/50**	**200-220/3/50**	**200-220/3/50**	**200-220/3/50**
Max.- Min. voltage		262-180	262-180	262-180	242-180	242-180	242-180	242-180	242-180	242-180
Amperage Draw	Total Full Load***	15.1	15.1	15.1	22.0	22.0	23.7	34.2	43.2	50.4
	Compressor Full Load	12.5	12.5	12.5	17.9	17.9	20.7	26.6	35.6	42.0
	Total Locked Rotor Amps***	74.6	74.6	74.6	90	90	156	189.8	208	267
	Compressor Locked Rotor	72.0	72.0	72.0	90	90	156	189.8	208	267
Unit Protection Fuse Size (amps)**		17.5	17.5	17.5	25	25	25	35	45	50
Branch Circuit Fuse Size (amps)		20	20	20	30	30	40	50	60	60
kW @ 35°F Evaporator & 100°F Ambient		5.3	5.3	5.3	5.0	5.0	5.1	9.4	11.8	14.7
Resistance (Ohms) Compressor	Three phase (total)	1.17	1.17	1.17	0.84	0.84	1.517	.200-.400	.200-.400	0.433
Nominal Voltage		**380-420/3/50**	**380-420/3/50**	**380-420/3/50**	**380-420/3/50**	**380-420/3/50**	**380-420/3/50**	**380-420/3/50**	**380-420/3/50**	**380-420/3/50**
Max. - Min. Voltage		462-342	462-342	462-342	462-342	462-342	462-342	462-342	462-342	462-342
Amperage Draw	Total Full Load***	6.8	6.8	6.8	10.7	10.7	12.0	15.3	21.6	31.4
	Compressor Full Load	5.8	5.8	5.8	8.6	8.6	10.2	13.3	17.8	27.6
	Total Locked Rotor ***	36.0	36.0	36.0	45.0	45.0	70	93.1	107.8	138.8
	Compressor Locked Rotor	35.0	35.0	35.0	45.0	45.0	70	91.1	104.0	135.0
Unit Protection Fuse Size (amps)**		8	8	8	12	12	15	17.5	25	35
Branch Circuit Fuse Size (amps)		15	15	15	15	15	20	30	35	45
kW @ 35°F Evaporator & 100°F Ambient		3.6	3.6	3.6	4.3	4.3	4.4	7.3	9.3	12.1
Resistance (ohms) Compressor	Three phase (total)	3.53	3.53	3.53	2.71	2.71	2.310	.200-.400	.200-.400	.91-1.04

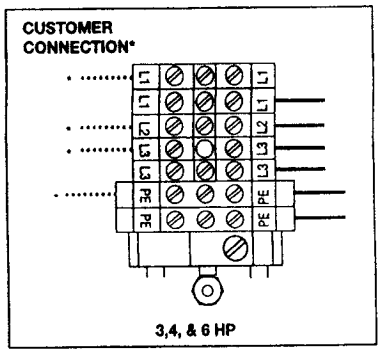
* Allows continued operation with some restriction in the water strainer

** Amp rating is for dual element fuse

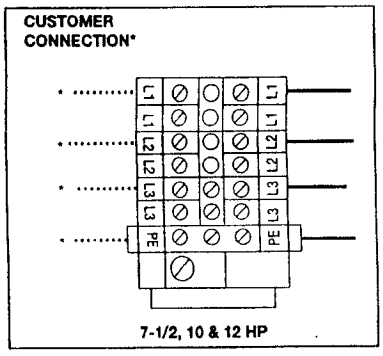
*** Air-cooled models only

**** These units have only one fan

ELECTRICAL CONNECTIONS

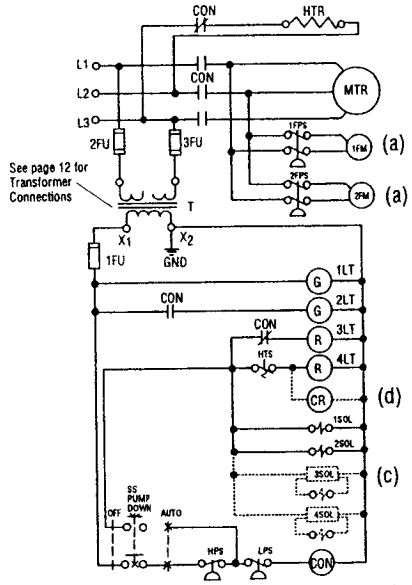


3,4, & 6 HP

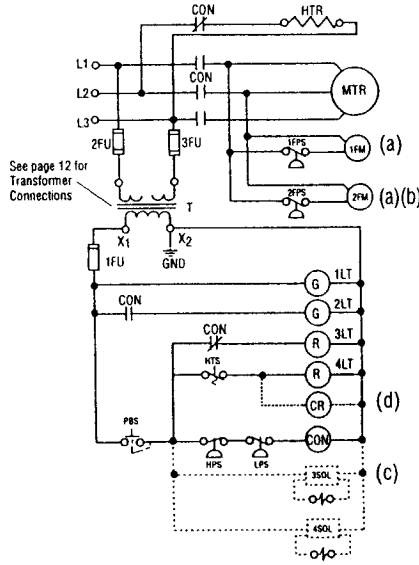


7-1/2, 10 & 12 HP

STANDARD CONTROL PANEL



Models 1600, 2000, & 2300 (7-1/2, 10 & 12 HP)
All Voltages



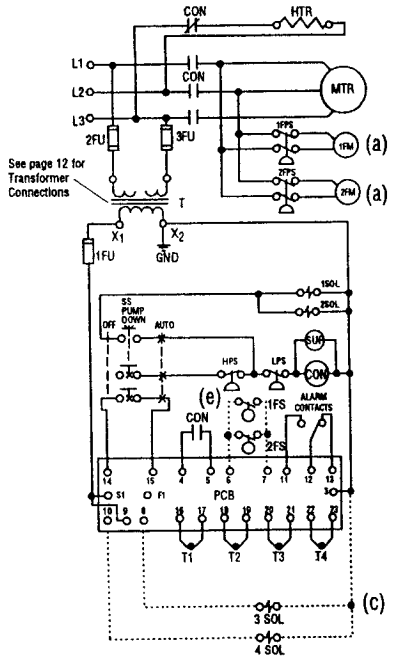
Models 500-1200 (3,4, & 6 HP)
All Voltages

LEGEND

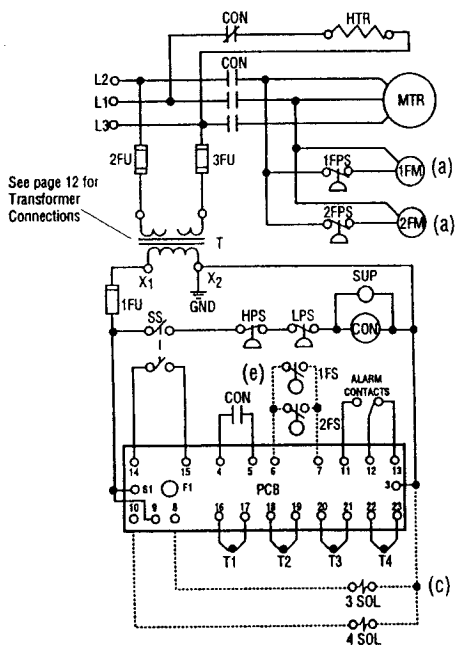
SS - Selector Switch
PBS - Dryer - On/Off Switch
HPS - High Pressure Switch
LPS - Low Pressure Switch
HTR - Crankcase Heater
T1 - Inlet Temperature Sensor
T2 - Evaporator Temperature Sensor
T3 - Ambient Temperature Sensor
T4 - Outlet Temperature Sensor
1LT - Power On Light
2LT - Compressor On Light
3LT - High Temperature Light
PCB - Printed Circuit Board
FPS - Fan Pressure Switch
HTS - High Temperature Switch
SSMP - Solid State Motor Protection
1SOL - Hot Gas Solenoid Valve
2SOL - Liquid Solenoid Valve
3SOL - Drain Solenoid Valve
4SOL - Drain Solenoid Valve
T - Control Transformer
CON - Contactor
1FU - Fuse - Littlefuse FLM
500-1200 use 6/10, 250V
1600-2300 use 1.25, 250V
2FU - Fuse - Littlefuse KLDR 1/2, 600V
3 FU - Fuse - Littlefuse KLDR 1/2, 600V
F1 - Fuse - Wickmann TR5 250MA, 250V
MTR - Compressor
FM - Fan Motor
GND - Ground
1FS - Float Switch
2FS - Float Switch
SUP - Surge Suppressor
CR - Control Relay

(a) Not supplied on water-cooled models
(b) 4 HP has one FPS and FM only
(c) Electric drain valves (optional)
(d) Control Relay & Alarm Contacts (optional-on standard control panel)
(e) Float switches (optional)

DIGITAL CONTROL PANEL



Models 1600, 2000, & 2300
(7-1/2, 10 & 12 HP)
All Voltages

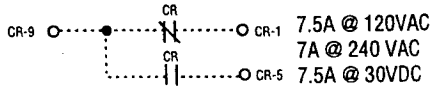


Models 500-1200 (3,4, & 6 HP)
All Voltages

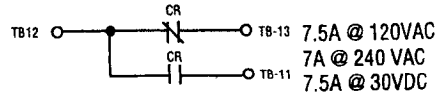
Alarm Contacts

Standard Control Panel
(Optional Control Relay)

Ratings



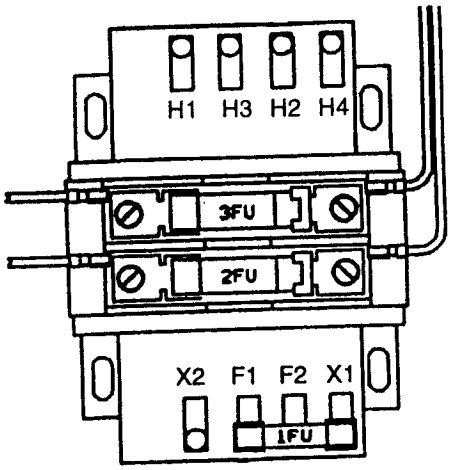
Digital Control Panel



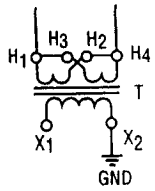
CONTROL TRANSFORMER CONNECTIONS

1. Four Lead Transformer

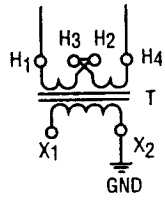
230 & 460V/3ph/60Hz



180-253V

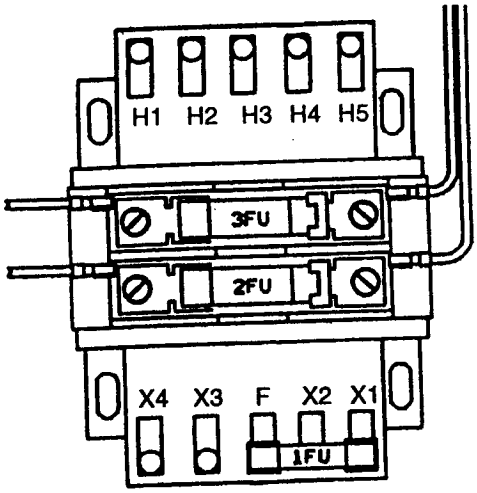


414-506V



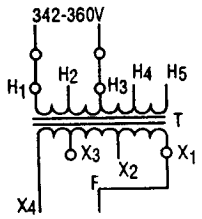
2. Five Lead Transformer

380-420V/3ph/50Hz
460V/3ph/60Hz

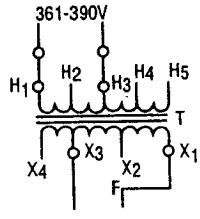


50 Hz

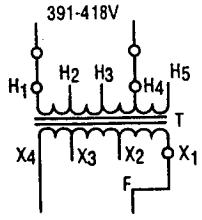
342-360V



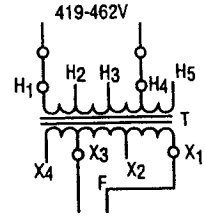
361-390V



391-418V



419-462V



Connection Table

50 Hz

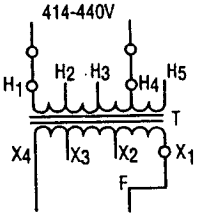
Line Voltage Range	Primary Taps	Secondary Taps
342 - 360V	H1/H3	X1/X4
361 - 390V	H1/H3	X1/X3
391 - 418V	H1/H4	X1/X4
419 - 462V	H1/H4	X1/X3

60 Hz

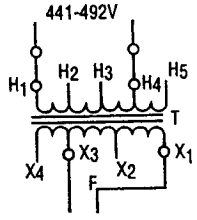
Line Voltage Range	Primary Taps	Secondary Taps
414 - 440V	H1/H4	X1/X4
441 - 492V	H1/H4	X1/X3
493 - 506V	H1/H5	X1/X4

60 Hz

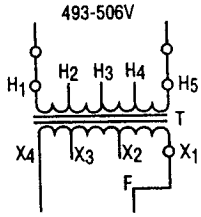
414-440V



441-492V

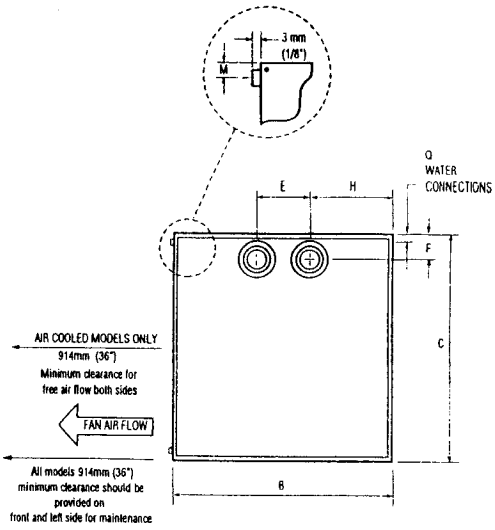


493-506V

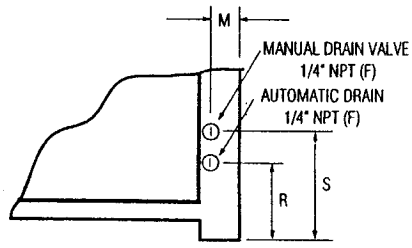


DIMENSIONS AND WEIGHTS

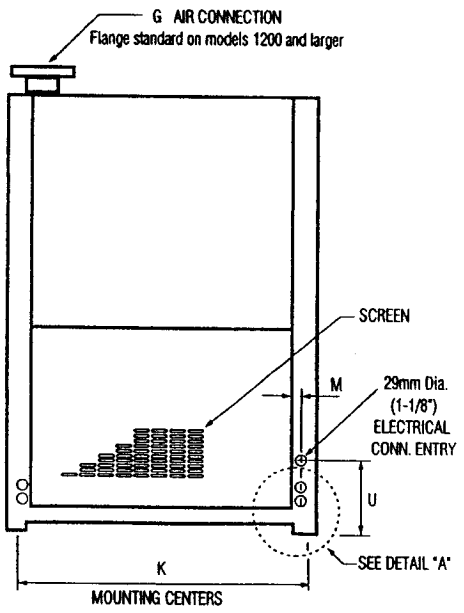
DIMENSIONS inches [mm]					
MODEL	**500-600-700**	**800-1000**	**1200**	**1600**	**2000/2300**
A	65-1/4 [1657]	75-3/4 [1924]	70-3/4 [1797]	85 [2159]	85 [2159]
B	38 [965]	38 [965]	48 [1219]	48 [1219]	48 [1219]
C	44 [1118]	44 [1118]	50 [1270]	50 [1270]	50 [1270]
D	68-1/2 [1740]	79 [2007]	74-1/4 [1886]	84-7/8 [2156]	84-7/8 [2156]
E	12-1/2 [318]	12-1/2 [318]	13-1/4 [337]	13-1/4 [337]	13-1/4 [337]
F	5-1/4 [133]	5-1/4 [133]	5-1/4 [133]	6-1/4 [159]	6-1/4 [159]
G	3" NPT [M]	3" NPT [M]	4" 150# CL FLG	6" 150# CL FLG	6" 150# CL FLG
H	12-3/4 [324]	12-3/4 [324]	17-3/8 [441]	17-3/8 [441]	17-3/8 [441]
J	35-3/8 [899]	35-3/8 [899]	44-3/4 [1137]	45-3/8 [1150]	45-3/8 [1150]
K	41-3/8 [1051]	41-3/8 [1051]	45-3/4 [1162]	47-3/8 [1203]	47-3/8 [1203]
L	5/8 [16]	5/8 [16]	5/8 [16]	5/8 [16]	5/8 [16]
M	2 [51]	2 [51]	2 [51]	2 [51]	2 [51]
N	10-3/4 [273]	10-3/4 [273]	9-1/2 [241]	10-1/4 [260]	10-1/4 [260]
P	16-3/4 [426]	16-3/4 [426]	15-1/2 [394]	16-3/4 [425]	16-3/4 [425]
Q	2 [51]	2 [51]	2 [51]	2 [51]	2 [51]
R	7 [178]	7 [178]	5-3/4 [146]	5-3/4 [146]	5-3/4 [146]
S	9 [229]	9 [229]	7-3/4 [197]	7-3/4 [197]	7-3/4 [197]
T	1/2"	3/4"	3/4"	3/4"	3/4"
U	13-1/2 [343]	19 [483]	12-1/4 [311]	12-1/4 [311]	12-1/4 [311]
WEIGHTS					
A/C	912 lbs [414 kg] 1024lbs [465 kg] 1066 lbs [484 kg]	1288 lbs [584 kg] 1365 lbs [619 kg]	1486 lbs [675 kg]	2173 lbs [986 kg]	2396 lbs. [1087 kg] 2715 lbs [1232 kg]
W/C	892 lbs [404 kg] 1004 lbs [455 kg] 1046 lbs [474 kg]	1230 lbs [558 kg] 1305 lbs [592 kg]	1466 lbs [666 kg]	2153 lbs [977 kg]	2376 lbs [1078 kg]



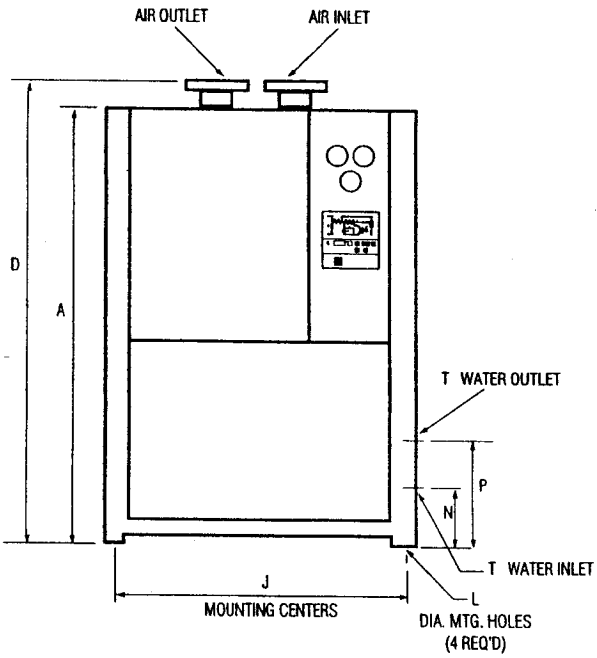
TOP VIEW



DETAIL "A"
Drain Location



LEFT SIDE VIEW



FRONT VIEW

TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSES	CORRECTIVE ACTION
A) Water downstream of dryer	1. Residual free moisture remaining in downstream pipelines	Blow out system with dry air
	2. Air by-pass system is open	Check valve positions
	3. Inlet and Outlet connections are reversed	Check for correct connection
	4. Temperatures surrounding air lines downstream of dryer have dropped below dryers dew point rating	Insulate or heat trace air lines exposed to low ambients or dry air to lower dew point
	5. Excessive free moisture (bulk liquid) at dryer inlet	Install separator ahead of dryer
	6. Condensate not being automatically drained	Rebuild drain mechanism if inoperative
	Drain mechanism is clogged or inoperative.	
	Drain line is restricted or frozen.	Open drain line
	Electric drains - timer not set to allow for sufficient condensate removal	Electric drains - reset time so that all liquid is discharged
	7. Dryer overloaded resulting in elevated dew point.	Check inlet air temperature and pressure, flow rate (compressor capacity) and ambient air or water temperature.
	8. Refrigeration system not functioning properly resulting in elevated dew point.	See D below
B) High pressure drop across dryer	1. Excessive air flow	Check flow rate
	2. Freezing of moisture in evaporator because of refrigeration system improperly functioning.	See D below
C) High Temperature Alarm	1. Dryer overloaded resulting in high air outlet temperature.	See A 7
	2. Refrigeration system not functioning properly resulting in high air outlet temperature.	See D below
	3. Unit functioning normally but thermostatic switch is malfunctioning or not securely mounted.	Contact qualified refrigeration repair-man or manufacturer's service depart-ment
D) Refrigeration system not functioning properly		
1. Power on light off	a. Power failure	Check power to unit
	b. Line disconnect switch open	Close disconnect switch
	c. Blown fuses, open breaker	Check for continuity
	d. Faulty wiring, loose terminals	Have electrician check electrical connections
2. Refrigerant Suction Pressure Gauge in red area	a. Refrigeration compressor not running	Contact qualified refrigeration repairman or manufacturer's service department.
	b.High inlet air temperature	Check temperature
	c. High ambient air temperature	Check temperature
	d. 1200 models - compressor rotation incorrect	See special instructions Section 2.2.
3. Refrigerant Suction Pressure Gauge in blue area	a. Hot gas by-pass valve improperly set	Contact qualified refrigeration repairman or manufacturer's service department.
	b. Low on refrigerant	
4. Refrigerant pressure cut out light on (with on/off switch in on position)	a. High or low ambient temperature	Check ambient temperature range
	b. Air-cooled models - Dirty, clogged condenser fins, obstructed air flow across condenser, or non functioning fan motor or fan control switch.	Clean condenser and check for free air flow, if problem persists contact qualified refrigeration repairman or manufacturer's service department.
	c. Water-cooled models - Cooling water temperature too high, or flow too low, faulty water regulating valve, clogged water strainer.	Clean strainer, check water flow and temperature, if problem persists contact qualified refrigeration repairman or manufacturer's service department.
	d. Start-up - high pressure switch may have tripped.	Manually reset and restart without load.

PARTS LIST

	208-230/3/60 200-240/3/50	208-230/3/60 200-220/3/50		200-230/3/60 200-220/3/50		208-230/3/60 200-220/3/50	460/3/60 380-420/3/50					
PARTS DESCRIPTION	500/ 600/700	800/1000	1200	1600	2000	2300	500/ 600/700	800/1000	1200	1600	2000	2300
Condensing unit (air-cooled)	4130.132.3	4130.134.15	4130.134.17	4130.134.27	4130.134.30	4130.135.13	4130.132.2	4130.134.16	4130.134.18	4130.134.25	4130.134.28	4130.135.12
Compressor	4130.106.15	4130.109.34	4130.107.10	4130.134.39	4130.106.40	4130.106.31	4130.106.16	4130.109.35	4130.107.9	4130.106.37	4130.106.38	4130.106.30
Crankcase Heater	5920.328.8	5920.330.11	5920.330.15	5920.330.13	5920.330.13	5920.330.13	5920.328.9	5920.330.11	5920.330.14	5920.330.12	5920.330.12	5920.330.12
Contactor	5910.135.6	5910.135.6	5910.135.6	5910.135.10	5910.135.10	5910.135.12	5910.135.4	5910.135.4	5910.135.4	5910.135.6	5910.135.6	5910.135.10
Aux Contactor NO	6110.101.13	6110.101.13	6110.101.13	6110.101.13	6110.101.13	6110.101.13	6110.101.13	6110.101.13	6110.101.13	6110.101.13	6110.101.13	6110.101.13
Aux Contactor NC	6110.101.14	6110.101.14	6110.101.14	6110.101.14	6110.101.14	6110.101.14	6110.101.14	6110.101.14	6110.101.14	6110.101.14	6110.101.14	6110.101.14
Control Circuit Transformer	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Fuse, Control Circuit	5920.274.20	5920.274.20	5920.274.20	5920.274.20	5920.274.20	5920.274.20	5920.274.20	5920.274.20	5920.274.20	5920.274.20	5920.274.20	5920.274.20
Primary Fuse	5920.274.19	5920.274.19	5920.274.19	5920.274.19	5920.274.19	5920.274.19	5920.274.19	5920.274.19	5920.274.19	5920.274.19	5920.274.19	5920.274.19
High Refrigerant Pressure Switch	4130.138.15	4130.138.15	4130.138.15	4130.138.15	4130.138.15	4130.138.15	4130.138.15	4130.138.15	4130.138.15	4130.138.15	4130.138.15	4130.138.15
Low Refrigerant Pressure Switch	4130.138.14	4130.138.14	4130.138.14	4130.139.3	4130.139.3	4130.139.3	4130.138.14	4130.138.14	4130.138.14	4130.139.3	4130.139.3	4130.139.3
On/Off Switch	6110.706.9	6110.706.9	6110.706.9	---	---	---	6110.706.9	6110.706.9	6110.706.9	---	---	---
Selector Switch	---	---	---	6110.729.22	6110.729.22	6110.729.22	---	---	---	6110.729.22	6110.729.22	6110.729.22
Hot Gas By-pass Valve	4130.690.5	4130.690.5	4130.690.5	4130.690.7	4130.690.7	4130.690.7	4130.690.5	4130.690.5	4130.690.5	4130.690.7	4130.690.7	4130.690.7
By-pass Line Strainer	4130.701.5	4130.701.5	4130.701.5	4130.701.7	4130.701.7	4130.701.5	4130.701.5	4130.701.5	4130.701.5	4130.701.7	4130.701.7	4130.701.7
Hot Gas By-pass Line Manual Valve	4130.839.1	4130.839.1	4130.839.1	4130.839.2	4130.839.2	4130.839.1	4130.839.1	4130.839.1	4130.839.1	4130.839.2	4130.839.2	4130.839.1
Liquid Line Solenoid	---	---	---	4810.741.3	4810.741.3	4810.741.3	---	---	---	---	4810.741.3	4810.741.3
Thermal Expansion Valve	(2)	4130.828.6	4130.828.6	4130.830.2	4130.828.14	4130.829.12	(2)	4130.828.6	4130.828.6	4130.830.2	4130.828.14	4130.829.12
Filter Dryer (liquid line)	4130.166.2	4130.166.3	4130.166.3	4130.166.4	4130.166.4	4130.166.4	4130.166.2	4130.166.3	4130.166.3	4130.166.4	4130.166.4	4130.166.4
Sight Glass	4130.725.3	4130.725.2	4130.725.2	4130.725.4	4130.725.4	4130.725.4	4130.725.3	4130.725.2	4130.725.2	4130.725.4	4130.725.4	4130.725.4
De-Superheating Valve	---	---	---	4130.829.7	4130.829.7	4130.829.7	---	---	---	4130.829.7	4130.829.7	4130.829.7
Suction Filter	---	---	---	4130.246.1	4130.246.1	4130.246.1	---	---	---	4130.246.1	4130.246.1	4130.246.1
Condenser (Air-cooled)	4130.113.4	4130.113.11	4130.112.12	4130.111.16	4130.111.15	4130.111.15	4130.113.4	4130.113.11	4130.112.12	4130.111.16	4130.111.15	4130.111.15
Fan Motor	6105.238.7	6105.238.22	6105.237.15	6105.238.26	6105.238.26	6105.238.26	6105.238.8	6105.238.23	6105.237.14	6105.238.25	6105.238.25	6105.238.25
Fan Blade	4140.229.6	4140.227.14	4140.228.10	4140.227.15	4140.227.15	4140.227.15	4140.229.6	4140.227.14	4140.228.10	4140.227.15	4140.227.15	4140.227.15
Fan Cut-out Switch (Fan 1)	4130.138.19	4130.138.19	4130.138.19	4130.140.1	4130.140.1	4130.140.1	4130.138.19	4130.138.19	4130.138.19	4130.140.1	4130.140.1	4130.140.1
Fan Cut-out Switch (Fan 2)	4130.138.20	---	4130.138.20	4130.140.1	4130.140.1	4130.140.1	4130.138.20	---	4130.138.20	4130.140.1	4130.140.1	4130.140.1
Condenser (Water-cooled)	4130.115.1	4130.111.5	4130.115.11	4130.115.6	4130.115.6	4130.115.11(3)	4130.115.1	4130.111.5	4130.115.11	4130.115.6	4130.115.6	4130.115.11(3)
Cooling Water Regulating Valve	4130.145.1	4130.145.3	4130.145.3	4130.145.3	4130.145.5	4130.145.5	4130.145.1	4130.145.3	4130.145.3	4130.145.3	4130.145.5	4130.145.5
Cooling Water Strainer	4731.735.1	4731.735.2	4731.735.2	4731.735.2	4731.735.2	4731.735.3	4731.735.1	4731.735.2	4731.735.2	4731.735.2	4731.735.2	4731.735.3
Cooling Water Strainer Screen	4731.735.5	4731.735.7	4731.735.7	4731.735.7	4731.735.7	4731.735.8	4731.735.5	4731.735.7	4731.735.7	4731.735.7	4731.735.7	4731.735.8
Pressure Gauge	6685.279.1	6685.279.1	6685.279.1	6685.279.1	6685.279.1	6685.279.1	6685.279.1	6685.279.1	6685.279.1	6685.279.1	6685.279.1	6685.279.1
Temperature Gauge	6685.281.6	6685.281.6	6685.281.6	6685.281.6	6685.281.6	6685.281.6	6685.281.6	6685.281.6	6685.281.6	6685.281.6	6685.281.6	6685.281.6
Refrigerant Suction Pressure Gauge	6685.287.11	6685.287.11	6685.287.11	6685.287.11	6685.287.11	6685.287.11	6685.287.11	6685.287.11	6685.287.11	6685.287.11	6685.287.11	6685.287.11
Refrigerant Head Pressure Gauge	---	---	---	6685.279.2	6685.279.2	6685.279.2	---	---	---	6685.279.2	6685.279.2	6685.279.2
Light Assembly - Red	6350.457.12	6350.457.12	6350.457.12	6350.457.2	6350.457.2	6350.457.2	6350.457.12	6350.457.12	6350.457.12	6350.457.2	6350.457.2	6350.457.2
Light Assembly - Green	6350.457.11	6350.457.11	6350.457.11	6350.457.3	6350.457.3	6350.457.3	6350.457.11	6350.457.11	6350.457.11	6350.457.3	6350.457.3	6350.457.3
High Temperature Light Sensor	5930.189.1	5930.189.1	5930.189.1	5930.189.1	5930.189.1	5930.189.1	5930.189.1	5930.189.1	5930.189.1	5930.189.1	5930.189.1	5930.189.1
Digital Panel	03.5817-01	03.5817-01	03.5817-01	03.5817-02	03.5817-02	03.5817-02	03.5817-01	03.5817-01	03.5817-01	03.5817-02	03.5817-02	03.5817-02
Sensors (set of 4)	6625.471.3	6625.471.3	6625.471.3	6625.471.3	6625.471.3	6625.471.3	6625.471.3	6625.471.3	6625.471.3	6625.471.3	6625.471.3	6625.471.3
ELECTRIC DRAIN Coil and valve	4810.741.38	4810.741.38	4810.741.38	4810.741.38	4810.741.38	4810.741.38	4810.741.38	4810.741.38	4810.741.38	4810.741.38	4810.741.38	4810.741.38
Timer	5945.693.4	5945.693.4	5945.693.4	5945.693.4	5945.693.4	5945.693.4	5945.693.4	5945.693.4	5945.693.4	5945.693.4	5945.693.4	5945.693.4
MECHANICAL DRAIN (Repair parts kit)	05.7501-03	05.7501-03	05.7501-03	05.7501-03	05.7501-03	05.7501-03	05.7501-03	05.7501-03	05.7501-03	05.7501-03	05.7501-03	05.7501-03

(1) Models 500-1200 200-230/60, 200-220/50, and 460/60 6120.092.11
Models 1600-2300 200-230/60, 200-220/-50, and 460/60 6120.092.12
All Models 380-420/50 6120.093.6

(2) Model 500 - 4130.828.10
Model 600 - 4130.828.11
Model 700 - 4130.828.11

(3) (2 are required)

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 and workmanship for a period of one (1) year from the date of shipment to the buyer by the manufacturer or manufacturer's authorized distributor, or eighteen months from the date of shipment from the factory, whichever occurs first (refrigerated dryers, models 25 thru 2300 scfm inclusive, for a period of two years from the date of shipment from the factory), 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 occured in normal service and not as a result of misuse, abuse, neglect or accident. Normal maintenance items requiring routine replacement are not warranted. For refrigerated dryers model 25 thru 2300 scfm, the manufacturer will include parts and labor for 18 months from the date of shipment from the factory and parts only for an additional six (6) months. On all other products, the warranty covers parts and labor for the warranty period. 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 EXPRESSED IN LIEU OF THE IMPLIED WARRANTY OF MERCHANTIBILITY 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.

1/92

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

KAESER COMPRESSORS

SERVICE DEPARTMENT: (724) 745-3038

3517 Grande Allée • Boisbriand (Quebec) J7H 1H5
Tel: 450-971-1414 • Fax: 450-971-1415