SULLAIR®

SULLAIR

Refrigerated Air Dryer SRD
Models 125, 190 and 300
R–22

OPERATOR'S MANUAL AND PARTS LIST

Part Number 02250055–220

Effective 6/94

AIR CARE
SEMINAR TRAINING

Sullair Air Care Seminars are 2–day courses that provide hands–on instruction in the proper operation, maintenance and service of Sullair Dryers and Filters. Seminars are presented at regular intervals throughout the year at a dedicated training facility at Sullair's corporate headquarters in Michigan City, Indiana.

Instruction includes discussion of the function and installation of Sullair service parts, troubleshooting of the most common problems, and actual equipment operation. The seminars are recommended for maintenance and service personnel.

For detailed course outlines, schedule and cost information contact:

Sullair Corporate Training Department
1–800–SULLAIR or 219–879–5451 (ext. 1816)

– Or Write –

Sullair Corporation
3700 E. Michigan Blvd.
Michigan City, IN 46360
Attn: Service Training Department

KEEP YOUR MACHINE IN TOP

OPERATING CONDITION

USE

GENUINE

SULLAIR®

SERVICE PARTS

CONTACT YOUR NEAREST SULLAIR

DISTRIBUTOR OR CALL 1-800-348-2722

TABLE OF CONTENTS

TABLE OF CONTENTS
(CONTINUED)

Section 6
MAINTENANCE

Section 7
ILLUSTRATIONS AND PARTS LIST

Section 1
SAFETY

1.1 GENERAL

Sullair Corporation designs and manufactures all of its products so they can be operated safely. However, the responsibility for safe operation rests with those who use and maintain these products. The following safety precautions are offered as a guide which, if conscientiously followed, will minimize the possibility of accidents throughout the useful life of this equipment.

The dryer should be operated only by those who have been trained and delegated to do so, and who have read and understood this Operator's Manual. Failure to follow the instructions, procedures and safety precautions in this manual may result in accidents and injuries.

NEVER start the dryer unless it is safe to do so. **DO NOT** attempt to operate the dryer with a known unsafe condition. Tag the dryer and render it inoperative by disconnecting and locking out all power at the source or otherwise disabling its prime mover so others, who may not know of the unsafe condition, will not attempt to operate it until the condition is corrected.

Install, use and operate the dryer only in full compliance with all pertinent OSHA regulations and all applicable Federal, State, and Local codes, standards and regulations.

DO NOT modify the dryer and/or controls in any way except with written factory approval.

While not specifically applicable to all types of dryers with all types of prime movers, most of the precautionary statements contained herein are applicable to most dryers and the concepts behind these statements are generally applicable to all dryers.

1.2 PERSONAL PROTECTIVE EQUIPMENT

Prior to installing or operating the dryer, owners, employers, and users should become familiar with, and comply with, all applicable OSHA regulations and any applicable Federal, State and Local codes, standards, and regulations relative to personal protective equipment, such as eye and face protective equipment, respiratory protective equipment, equipment intended to protect the extremities, protective clothing, protective shields and barriers and electrical protective equipment, as well as noise exposure administrative and/or engineering controls and/or personal hearing protective equipment.

1.3 PRESSURE

⚠ WARNING

DO NOT remove caps, plugs, and/or other components when dryer is running or pressurized. Stop dryer and relieve all internal pressure before doing so.

A. Secure all connections by wire, chain or other suitable retaining device to prevent tools or hose ends from being accidentally disconnected and expelled.

B. DO NOT overpressure the unit.

C. Vent all internal pressure prior to opening any air line, fitting, hose, valve, drain plug, connection or other component, such as filters and line oilers.

D. Keep personnel out of line with and away from the discharge opening of hoses or tools or other points of compressed air discharge.

E. Use air at pressures less than 30 psig (2.1 bar) for cleaning purposes, and then only with effective chip guarding and personal protective equipment per OSHA Standard 29 CFR 1910.242(b).

F. DO NOT engage in horseplay with air hose as serious injury or death may result.

G. DO NOT pass air through the dryer while the dryer is in the **OFF** position.

H. DO NOT pass air through the dryer until the dryer has been stabilized. This condition exists when the refrigeration suction and discharge gauges read normal.

I. DO NOT operate a dryer at abnormal conditions. Consult the manual for normal operating conditions.

J. Only qualified personnel should attempt to repair leaks or problems with the refrigerant system of the dryer.

K. For potential hazards of fluorocarbon refrigerants, see the following tables in this section.

1.4 FIRE AND EXPLOSION

A. Clean up spills of lubricant or other combustible substances immediately, if such spills occur.

B. Shut off the dryer and allow it to cool. Then keep sparks, flames and other sources of ignition away.

C. DO NOT permit fluids, including air line de–icer system antifreeze compound or fluid film to accumulate on under or around acoustical material, or on any external surfaces of the air dryer or on internal surfaces of the enclosure. Wipe down using an aqueous industrial cleaner or steam clean as required. If necessary, remove acoustical mater–ial, clean all surfaces and then replace acoustical material. Any acoustical material with a protective covering that has been torn or punctured should be replaced immediately to prevent accumulation of liquids or fluid film within the material. **DO NOT** use flammable solvents for cleaning purposes.

Section 1
SAFETY

POTENTIAL HAZARDS OF FLUOROCARBON REFRIGERANTS

⚠ WARNING Dryers contain HCFC. This substance harms the public health and environment by destroying the ozone in the upper atmosphere.

CONDITION	POTENTIAL HAZARD	SAFEGUARD
VAPORS MAY DECOMPOSE IN FLAMES OR IN CONTACT WITH HOT SURFACES	Inhalation Of Toxic Decomposition Products	Good ventilation. Toxic decomposition products serve as warning agents. Avoid misuse. Vent refrigerant outdoors.
VAPORS ARE 4 TO 5 TIMES HEAVIER THAN AIR. HIGH CONCENTRATIONS MAY TEND TO ACCUMULATE IN LOW PLACES	Inhalation Of Concentrated Vapors Can Be Fatal	Avoid misuse. Vent refrigerant outdoors. Forced–air ventilation at the level of vapor concentration. Individual breathing devices with air supply. Lifelines when entering tanks or other confined areas. **DO NOT** administer epinephrine or other similar drugs.
DELIBERATE INHALATION TO PRODUCE INTOXICATION	Can Be Fatal	Avoid misuse. Vent refrigerant outdoors. Forced–air ventilation at the level of vapor concentration. Individual breathing devices with air supply. Lifelines when entering tanks or other confined areas. **DO NOT** administer epinephrine or other similar drugs.
SOME FLUOROCARBON LIQUIDS TEND TO REMOVE NATURAL OILS FROM THE SKIN	Irritation Of Dry, Sensitive Skin	Gloves and protective clothing.
LOWER BOILING LIQUIDS MAY BE SPLASHED ON SKIN	Freezing Of Skin	Gloves and protective clothing.
LIQUIDS MAY BE SPLASHED INTO EYES	Lower Boiling Liquids May Cause Freezing. Higher Boiling Liquids May Cause Temporary Irritation And If Other Chemicals Are Dissolved, May Cause Damage	Wear eye protection. Get medical attention. Flush eyes for several minutes with running water.
CONTACT WITH HIGHLY REACTIVE METALS	Violent Explosion May Occur	Test the proposed system and take appropriate safety precautions.

CRITICAL PROPERTIES OF REFRIGERANTS

REFRIGERANT	CRITICAL TEMPERATURE		CRITICAL PRESSURE	
	°F	°C	Psia	kg/cm^2
"Freon" 12	234	112	597	42.0
"Freon" 22	205	96	722	50.8

D. Disconnect and lock out all power at source prior to attempting any repairs or cleaning of the dryer or of the inside of the enclosure, if any.

E. Keep electrical wiring, including all terminals and pressure connectors in good condition. Replace any wiring that has cracked, cut, abraded or otherwise degraded insulation, or terminals that are worn, discolored or corroded. Keep all terminals and pressure connectors clean and tight.

F. Keep grounded and/or conductive objects such as tools away from exposed live electrical parts such as terminals to avoid arcing which might serve as a source of ignition.

G. Remove any acoustical material or other material that may be damaged by heat or that may support combustion and is in close proximity, prior to attempting weld repairs.

H. Keep suitable fully charged Class BC or ABC fire extinguisher or extinguishers nearby when servicing and operating the dryer.

I. Keep oily rags, trash, leaves, litter or other combustibles out of and away from the dryer.

J. DO NOT operate the dryer without proper flow of cooling air or water or with inadequate flow of lubricant or with degraded lubricant.

K. DO NOT attempt to operate the compressor and dryer in any classification of hazardous environment unless the compressor and dryer has been specifically designed and manufactured for that duty.

1.5 MOVING PARTS

A. Keep hands, arms and other parts of the body and also clothing away from couplings, fans and other moving parts.

B. DO NOT attempt to operate the dryer with the fan, coupling or other guards removed.

C. Wear snug fitting clothing and confine long hair when working around this dryer, especially when exposed to hot or moving parts.

D. Keep access doors, if any, closed except when making repairs or adjustments.

E. Make sure all personnel are out of and/or clear of the dryer prior to attempting to start or operate it.

F. Disconnect and lock out all power at source and verify at the dryer that all circuits are de–energized to minimize the possibility of accidental start–up or operation, prior to attempting repairs or adjustments. This is especially important when compressors and dryers are remotely controlled.

G. Keep hands, feet, floors, controls and walking surfaces clean and free of fluid, water or other liquids to minimize the possibility of slips and falls.

1.6 HOT SURFACES, SHARP EDGES AND SHARP CORNERS

A. Avoid bodily contact with hot fluid, hot coolant, hot surfaces and sharp edges and corners.

B. Keep all parts of the body away from all points of air discharge.

C. Wear personal protective equipment including gloves and head covering when working in, on or around the dryer.

D. Keep a first aid kit handy. Seek medical assistance promptly in case of injury. **DO NOT** ignore small cuts and burns as they may lead to infection.

1.7 TOXIC AND IRRITATING SUBSTANCES

A. DO NOT use air from this dryer for respiration (breathing) except in full compliance with OSHA Standards 29 CFR 1910 and any other Federal, State or Local codes or regulations.

B. DO NOT use air line anti–icer systems in air lines supplying respirators or other breathing air utilization equipment and **DO NOT** discharge air from these systems in unventilated or other confined areas.

C. Operate the dryer only in open or adequately ventilated areas.

⚠ DANGER

Death or serious injury may result from inhaling compressed air without using proper safety equipment. See OSHA standards on safety equipment.

1.8 ELECTRICAL SHOCK

A. This dryer should be installed and maintained in full compliance with all applicable Federal, State and Local codes, standards and regulations, including those of the National Electrical Code, and also including those relative to equipment grounding conductors, and only by personnel who are trained, qualified and delegated to do so.

B. Keep all parts of the body and any hand–held tools or other conductive objects away from exposed live parts of electrical system. Maintain dry footing, stand on insulating surfaces and **DO NOT** contact any other portion of the dryer when making adjustments or repairs to exposed live parts of the electrical system. Make all such adjustments or repairs with one hand only, so as to minimize the possibility of creating a current path through the heart.

C. Attempt repairs in clean, dry and well lighted and ventilated areas only.

D. DO NOT leave the dryer unattended with open electrical enclosures. If necessary to do so, then disconnect, lock out and tag all power at source so others will not inadvertently restore power.

E. Disconnect, lock out, and tag all power at the source prior to attempting repairs or adjustments to rotating machinery and prior to handling any ungrounded conductors.

1.9 LIFTING

A. Dryers to be lifted by helicopter must be supported by slings. In any event, lift and/or handle only in full compliance with OSHA standards 29 CFR 1910 subpart N.

B. Inspect points of attachment for cracked welds and for cracked, bent, corroded or otherwise degraded members and for loose bolts or nuts prior to lifting.

C. Make sure entire lifting, rigging and supporting structure has been inspected, is in good condition and has a rated capacity of at least the weight of the dryer. If you are unsure of the weight, then weigh dryer before lifting.

D. Make sure lifting hook has a functional safety latch or equivalent, and is fully engaged and latched on the bail or slings.

E. Use guide ropes or equivalent to prevent twisting or swinging of the dryer once it has been lifted clear of the ground.

F. DO NOT attempt to lift in high winds.

G. DO NOT lift dryer by motor–lifting eye.

H. Keep all personnel out from under and away from the dryer whenever it is suspended.

I. Lift dryer no higher than necessary.

J. Keep lift operator in constant attendance whenever dryer is suspended.

K. Set dryer down only on a level surface capable of safely supporting at least its weight and unit loading.

L. When moving dryers by forklift truck, utilize fork pockets if provided. Otherwise, utilize pallet if provided. If neither fork pockets or pallet are provided, then make sure dryer is secure and well balanced on forks before attempting to raise or transport it any significant distance.

M. Make sure forklift truck forks are fully engaged and tipped back prior to lifting or transporting the dryer.

N. Forklift no higher than necessary to clear obstacles at floor level and transport and corner at minimum practical speeds.

O. Make sure pallet–mounted dryers are firmly bolted or otherwise secured to the pallet prior to attempting to forklift or transport them. **NEVER** attempt to forklift a dryer that is not secured to its pallet, as uneven floors or sudden stops may cause the dryer to tumble off, possibly causing serious injury or property damage in the process.

1.10 ENTRAPMENT

A. If the dryer enclosure, if any, is large enough to hold a man and if it is necessary to enter it to perform service adjustments, inform other personnel before doing so, or else secure and tag the access door in the open position to avoid the possibility of others closing and possibly latching the door with personnel inside.

B. Make sure all personnel are out of dryer before closing and latching enclosure doors.

2.1 INTRODUCTION

This manual provides information and recommendations for installing, operating and servicing the Sullair Refrigerated Air Dryer (SRD). The unit is designed and manufactured to the highest quality standards. All self–contained units have been fully tested and inspected by the manufacturer before shipment from the factory.

The information, specifications and illustrations in this manual are in accordance with information in effect at the time of printing. The manufacturer reserves the right to change design and specifications without notice and without incurring obligations.

It is extremely important to analyze completely every system and understand the intended function of each component before attempting to determine the cause of a malfunction or failure.

The refrigerant (R–22) and air circuit can be easily followed by referring to the table in Section 3 Specifications.

A refrigerant suction pressure and head pressure gauge are provided as standard equipment for analyzing the system operation and performance.

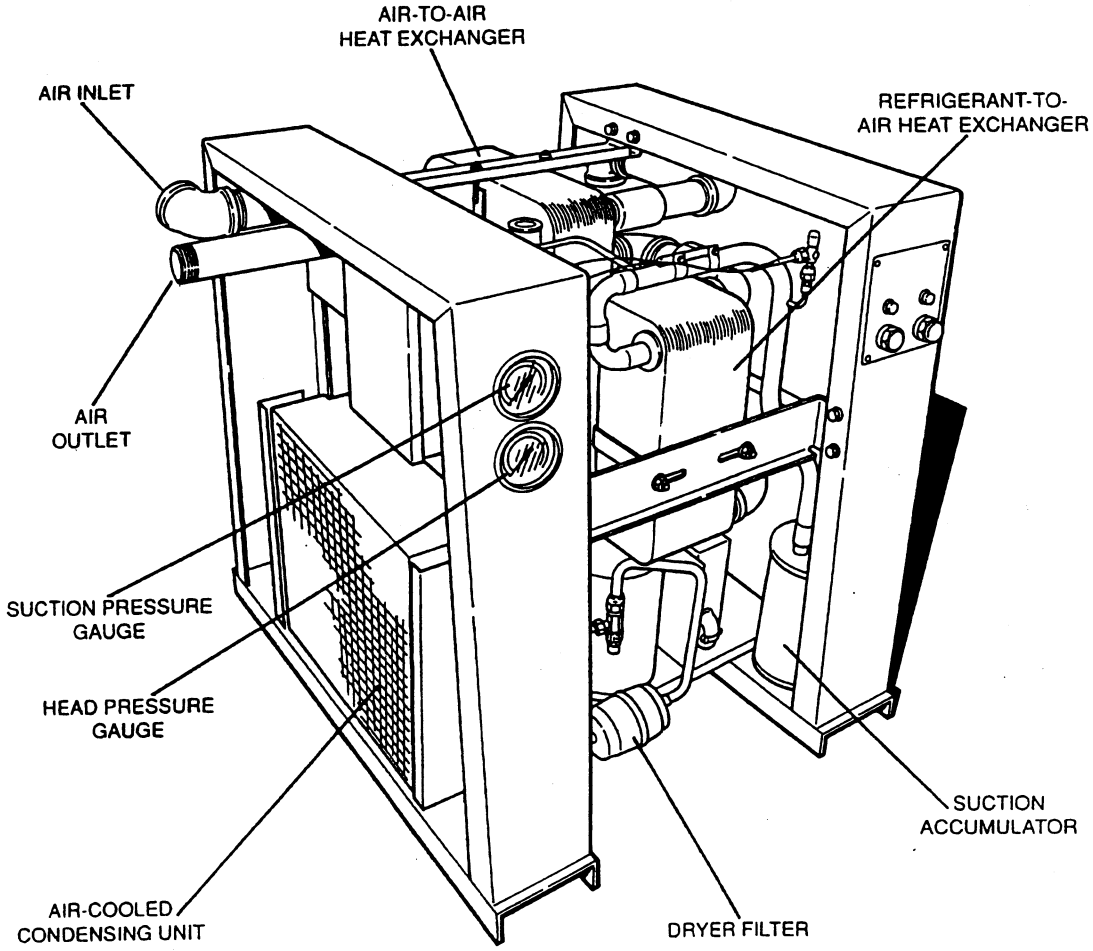
Any question or problem not covered herein can be directed to the nearest Sullair representative. Always specify the model and serial number of the dryer on all correspondence regarding service and parts.

2.2 IDENTIFICATION OF COMPONENTS

Refer to Figure 2–1. Parts can be ordered from the nearest Sullair representative. If for any reason parts cannot be obtained in this manner, contact the factory. Authorization and shipping instructions must be obtained from the factory before returning the parts to the factory. The manufacturer will not be responsible for parts returned without proper authorization or identification.

The Sullair Refrigerated Air Dryer (SRD) is designed for the purpose of removing moisture from compressed air by cooling it to a temperature of 35°F to 39°F (2°C to 4°C).

Figure 2–1 Identification of Components (SRD 300)



Section 2
DESCRIPTION

2.3 REFRIGERANT CIRCUIT, FUNCTIONAL DESCRIPTION

The SRD dryer cools the process air by the use of a closed–loop vapor compression refrigeration cycle. Refer to Figures 2–2, 2–3 and 2–4 for the flow schematics.

Dry R–22 vapor enters the compressor inlet and its pressure and temperature are raised at discharge. The vapor continues through a condenser, where it is cooled to its liquid state at near constant pressure. A filter dryer then removes any water and impurities that may be carried by the refrigerant. A further reduction of temperature and pressure takes place as the liquid R–22 is throttled through a capillary tube (SRD125, 190), or a thermoexpansion valve (SRD300). The resulting mixture of vapor and liquid picks up heat (does cooling) as it moves through the evaporator, where it turns back to its vapor state and routes back to the compressor inlet port.

To prevent feeding the compressor with liquid R–22 and evaporator icing during low heat rejection operation (i.e., partial process air flow), a pressure operated valve bypasses hot R–22 vapor to the evaporator inlet, thus assuring thorough evaporation of the refrigerant.

To insure that adequate head pressure is maintained during periods of low ambient temperatures or partial loads, a switch located at the compressor discharge cycles the condensor fan. If the head pressure is too low to insure adequate flow through the hot gas bypass valve, the condenser fan is shut off.

Figure 2–2 Dryer Flow Schematic Model SRD 125

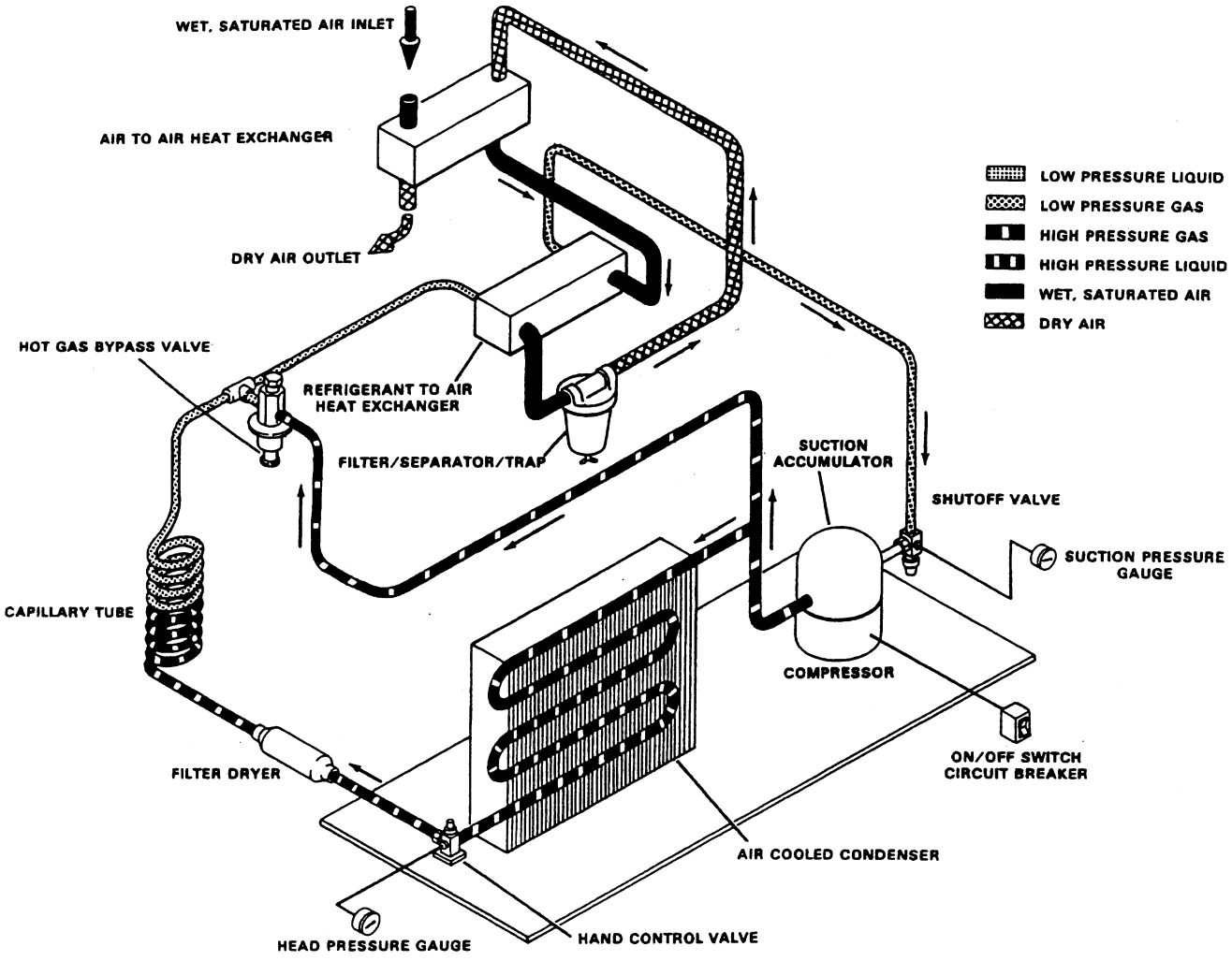


Figure 2–3 Dryer Flow Schematic Model SRD 190

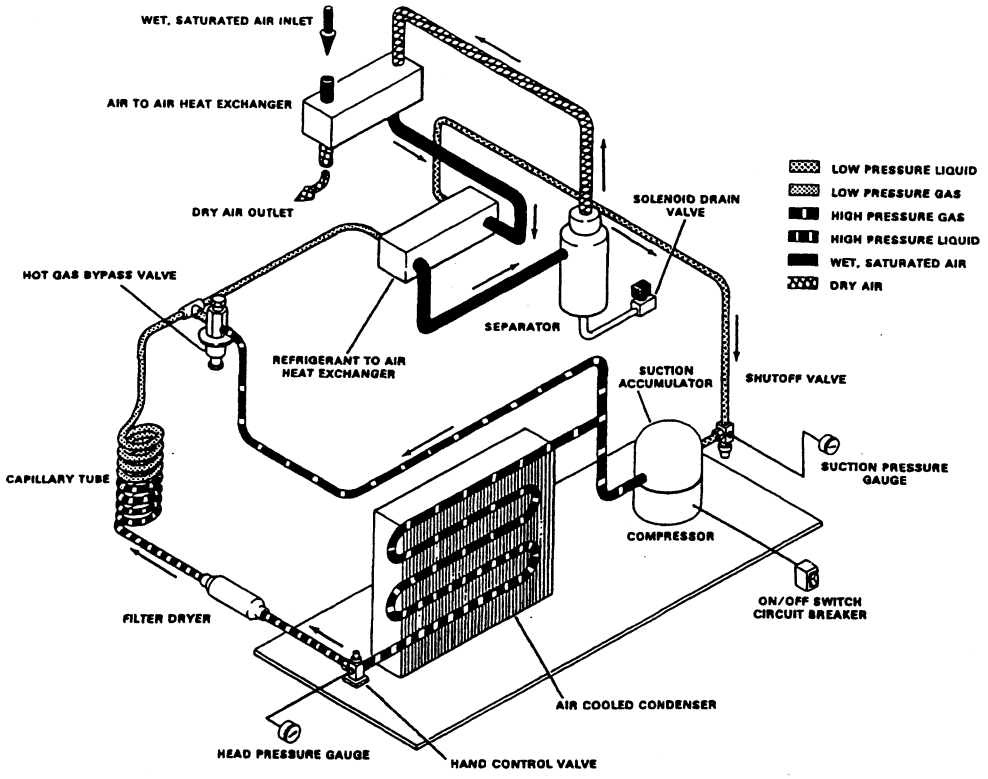
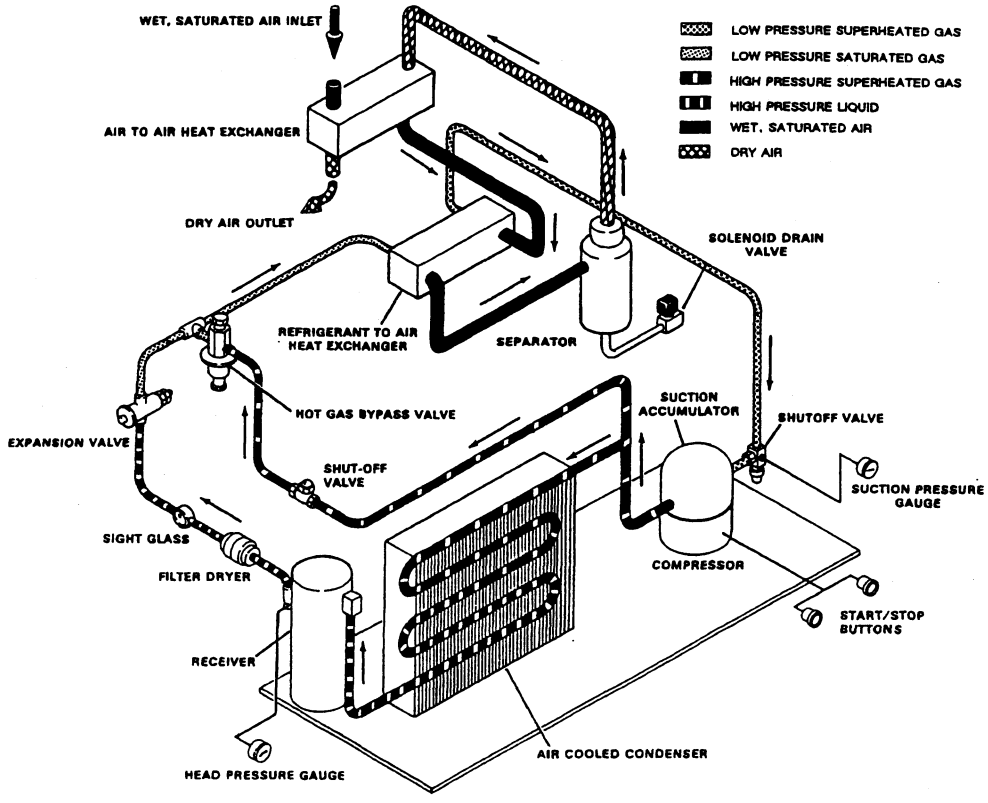


Figure 2–4 Dryer Flow Schematic Model SRD 300



Section 2
DESCRIPTION

2.4 COMPRESSED AIR CIRCUIT, FUNCTIONAL DESCRIPTION

The compressed air drying circuit uses an air–to–air heat exchanger which acts as a pre–cooler/re–heater, and an air–to–refrigerant heat exchanger (evaporator).

Warm, saturated compressed air first enters the air–to–air heat exchanger, where it is precooled. By precooling the incoming air, energy is saved through the reduction of the heat load imposed on the refrigerant compressor and condenser. From the precooler, the air will enter the evaporator further reducing its temperature to 35°F to 39°F (2°C to 4°C). Moisture is condensed and is separated by a cyclone separator and discharged through an automatic float–type drain trap (SRD125) or solenoid type drain valve (SRD190, 300).

The chilled air then re–enters the air–to–air heat exchanger, where is it re–heated. Re–heating of the air does not affect the air's dewpoint. It prevents condensation of moisture on the outside of the air–distribution piping. The cold air flow through the air–to–air heat exchanger is in a direction opposite to the flow of the warm, saturated incoming air. This counterflow assures high temperature differential throughout the heat exchanger, resulting in a more effective heat transfer.

2.5 REFRIGERANT SYSTEM COMPONENT, FUNCTIONAL DESCRIPTION

The refrigerant **compressor** compresses low pressure refrigerant gas into high pressure refrigerant gas.

The air–cooled **condenser** changes high pressure refrigerant gas from compressor discharge into high pressure liquid as the gas flows through.

The **filter/dryer** removes any contaminant and moisture that may be in the system.

The **capillary tube** is a non–adjustable metering device which separates the high pressure side of the system from the low pressure side. The capillary tube controls the flow of refrigerant to the evaporator in order to maintain a non–adjustable temperature difference (superheat) between the evaporator refrigerant inlet and outlet (see Figures 2–2 and 2–3).

The **thermostatic expansion valve** (TXV) is an adjustable metering device which separates the high pressure side of the system from the low pressure side. The TXV regulates the flow of refrigerant to the evaporator in order to maintain an adjustable temperature difference (superheat) between the evaporator refrigerant inlet and outlet. As the temperature of the gas leaving the evaporator varies, the TXV power element bulb senses the refrigerant temperature and signals the TXV to meter the flow of refrigerant as required (see Figure 2–4).

The **hot gas bypass valve** (HGBV) is used to artificially load the evaporator during part–load conditions. The HGBV accomplishes this task by diverting high pressure gas from the compressor discharge to the inlet of the evaporator. The HGBV separates the high pressure side of the system from the low pressure side. The HGBV will modulate from fully open to fully closed in response to its outlet pressure setting. The HGBV is set to maintain the minimum allowable suction line pressure.

The **refrigerant–to–air heat exchanger** chills the compressed air to achieve a 35°F to 39°F (2°C to 4°C) temperature. A low pressure liquid/gas mixture enters the refrigerant side of the heat exchanger and removes heat from the warm compressed air. The refrigerant changes phases as it passes through the heat exchanger and exits as a low pressure superheated gas.

Figure 3–1 SRD Specifications – Models 125–300

MODEL		SRD 125	SRD 190	SRD 300
Flow Capacity (I)	SCFM at 39°F (4°C) Evaporator Outlet Air Temperature	125	190	300
	M^3/hr. at 4°C Evaporator Outlet Air Temperature	213	323	510
Power Input (KW)		1.19	1.47	1.98
Air Inlet/Outlet Connection (MPT)		1"	1 1/4"	1 1/2"
Drain Connection (FPT)		1/4	1/4	1/4
Refrigerant Compressor HP Rating		3/4	1	1 1/2
Maximum Heat of Rejection (BTU/hr.)		10,620	13,620	19,740
R–22 Cooling Air Flow (CFM)		800	800	1125
Refrigerant/Charge (lbs.)		1.8	2.2	6
Standard Voltage (Optional) (II)		A (B)	B	D (C)
Total Power Input – Amps		15.1	8.4	4.2
Height	(inches)	31.81	31.81	31.81
	(mm)	808	808	808
Width	(inches)	32.0	32.0	32.0
	(mm)	813	813	813
Length	(inches)	28.12	28.12	28.12
	(mm)	714	714	714
Weight	(lbs.)	250	310	370
	(kgs.)	114	141	168

(I) Flow Capacity rating is based on 100°F (38°C) air inlet temperature, 100 psig (6.9 bar) air inlet pressure and 100°F (38°C) ambient temperature.

(II) Voltage Code: A – 115/1/60 B – 230/1/60
C – 230/3/60 D – 460/3/60

Section 3
SPECIFICATIONS

Figure 3–2 Dimensions – Model SRD 125

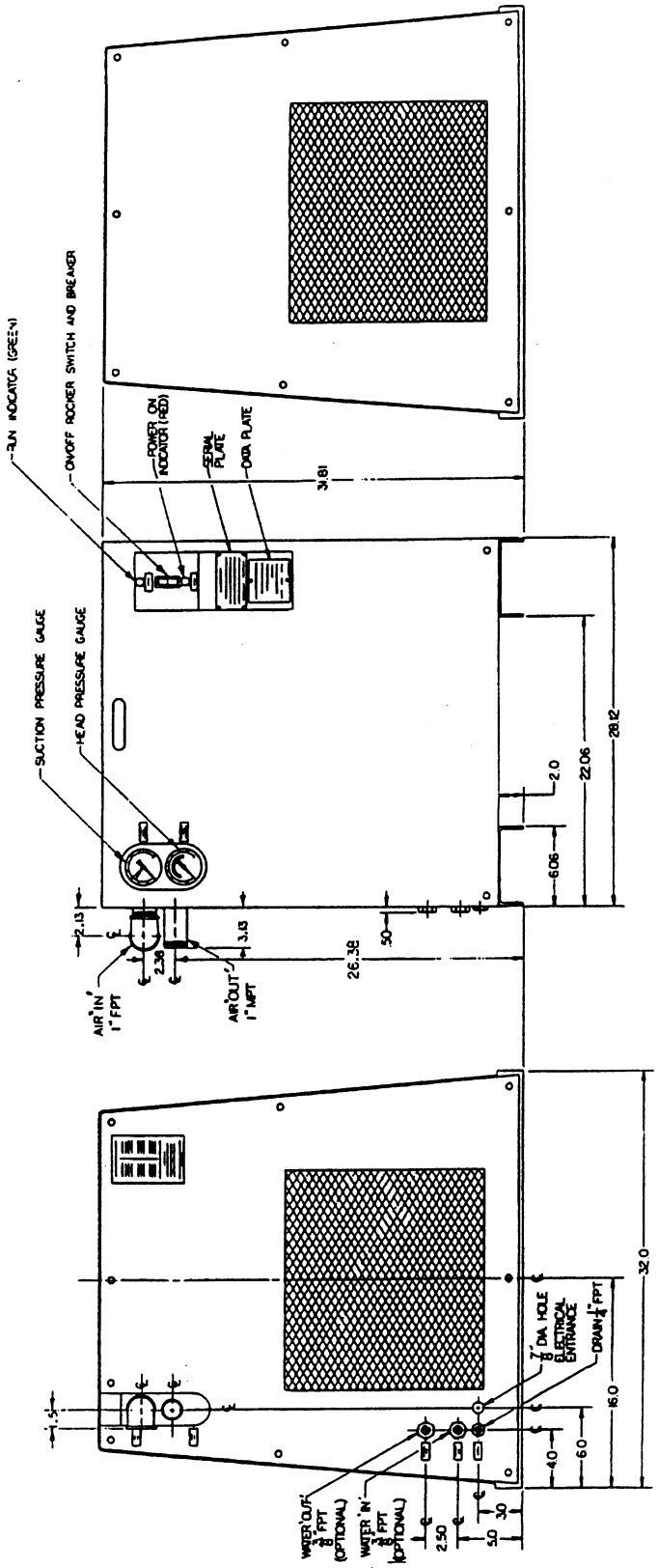
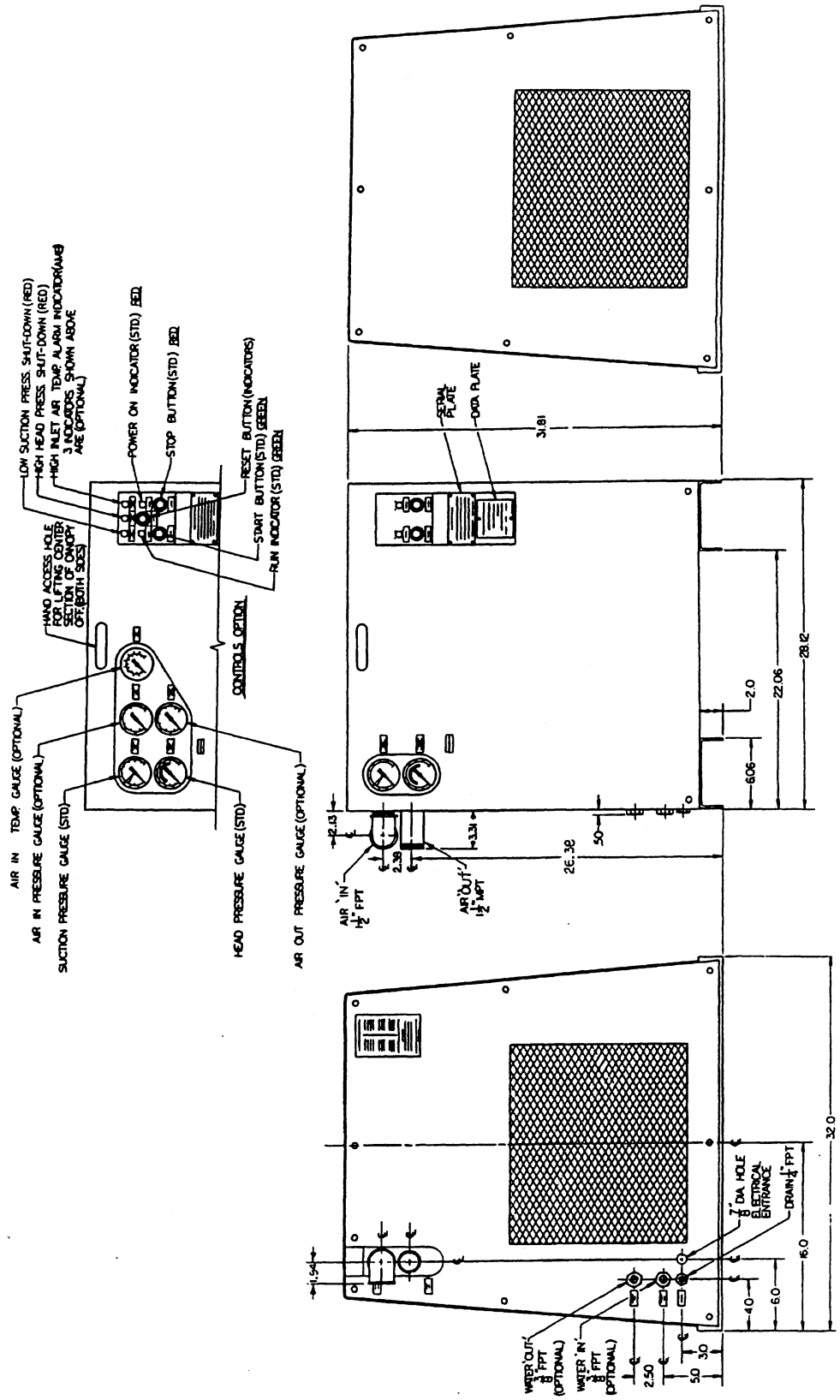
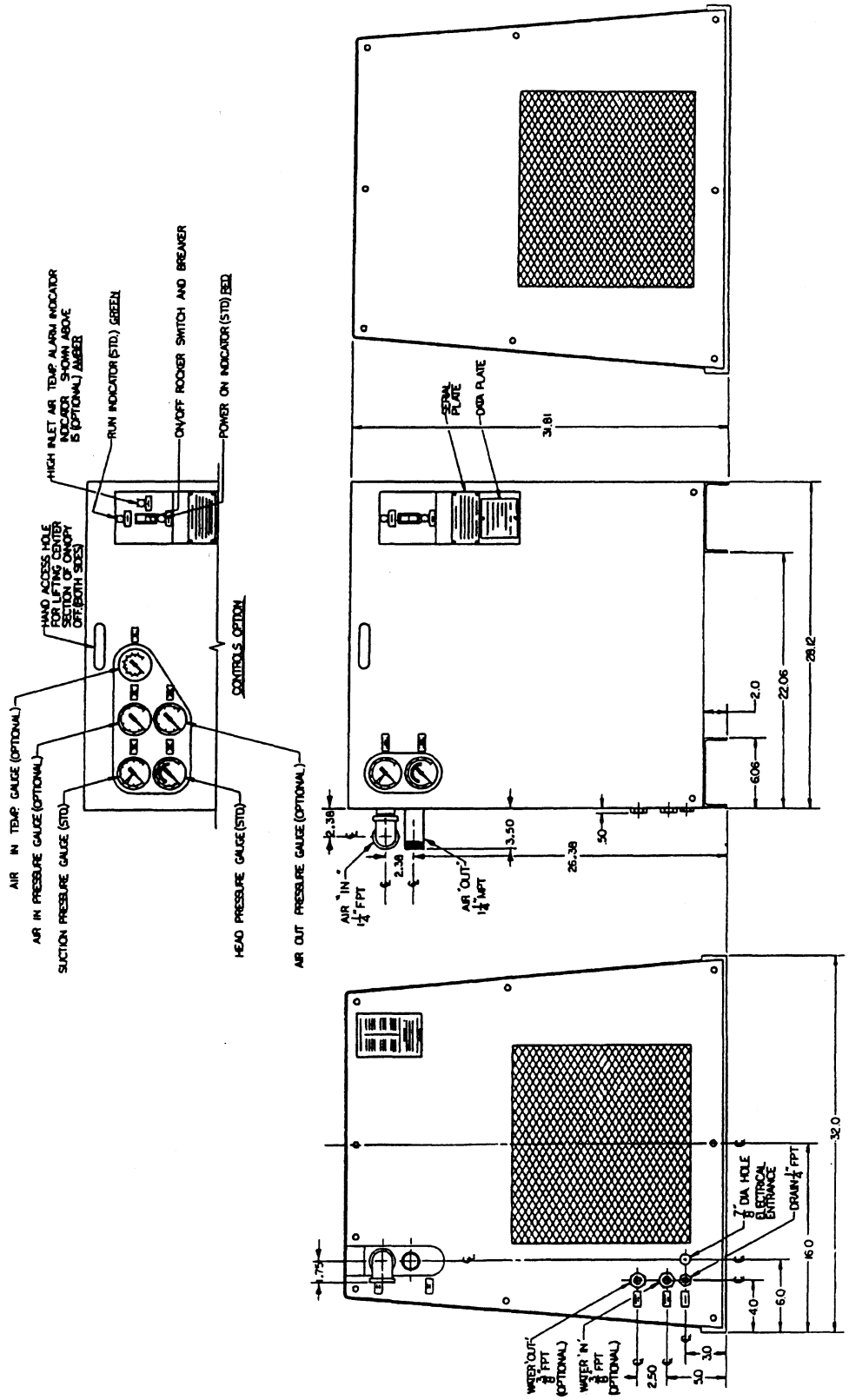


Figure 3–3 Dimensions – Model SRD 190



Section 3
SPECIFICATIONS

Figure 3–4 Dimensions – Model SRD 300



4.1 GENERAL

Each dryer is test run at the factory before shipment. Immediately upon receipt of the equipment, remove the cabinet and check the unit carefully for any physical damage that may have occurred in transit.

If there is any physical damage or a refrigerant leak, please file a claim with the shipper immediately and notify your Sullair representative or the factory of the nature of the damage. The carrier is legally responsible for any damages, since the unit is shipped F.O.B. Michigan City, Indiana. Your Sullair representative or Sullair Corporation will assist in any way possible to rectify problems.

After you are assured that the unit has sustained no shipping damage, the dryer is ready for installation.

4.2 MOUNTING OF DRYER

The dryer should be installed in an area that is clean and dry, allowing sufficient space on all sides for routine maintenance and service. The unit should be shielded from the weather elements, with ambient temperature above 65°F (18°C) and not more than 100°F (38°C). Occasional operation at ambient temperature up to120°F (49°C) will not damage the dryer, but will affect the capacity and dewpoint. Temperatures below 35°F (2°C) can cause freeze–ups of the condensate drains. If prolonged periods below 35°F (2°C) are expected, a heat source for these areas will have to be provided.

NOTE

If ambients are expected to fall below 65°F (18°C), a compressor crankcase heater and head pressure control valve should be installed. This will allow dryer operation in ambient temperatures as low as 40°F (5°C).

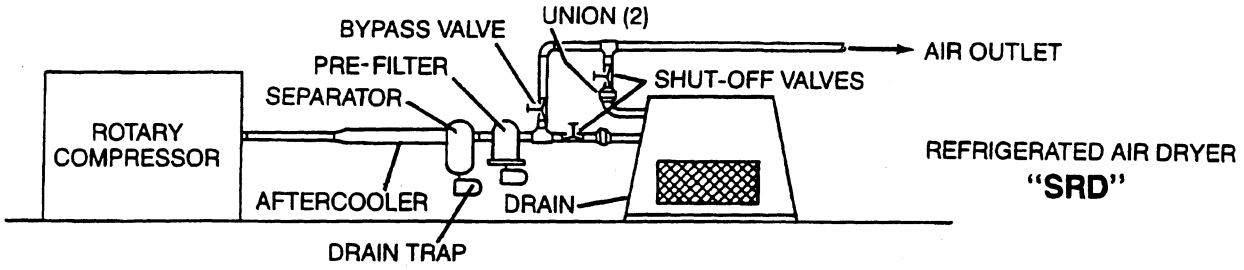
Sufficient ventilation must be provided to maintain acceptable ambient temperature for efficient operation.

SRD Refrigerated Air Dryers are designed to operate with saturated air at the inlet. They should be installed downstream of a functioning aftercooler/ separator combination to prevent slugging the dryer with liquid water. It is also highly recommended to install a Sullair PF or MPF pre–filter upstream of the SRD.

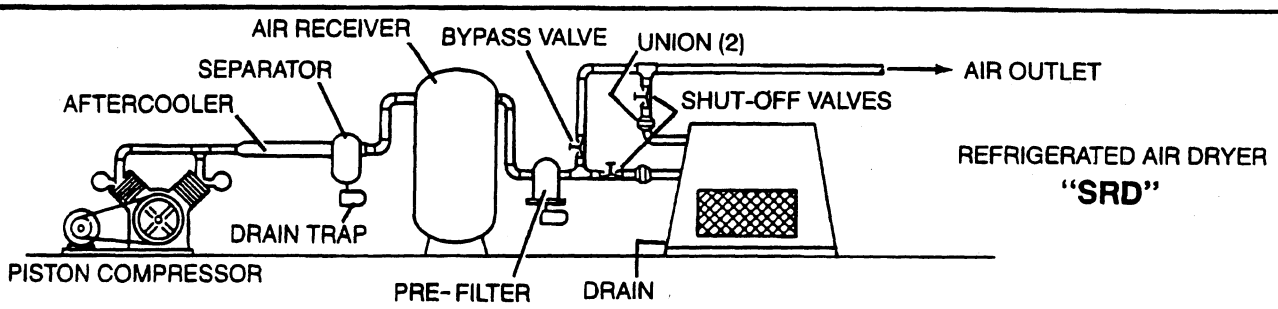
⚠ CAUTION

A Sullair PF or MPF prefilter should be installed upstream of the SRD dryer to prevent contamination of the plate heat exchangers.

Figure 4–1 Typical Rotary and Piston Compressor Air System



TYPICAL ROTARY COMPRESSOR AIR SYSTEM



TYPICAL PISTON COMPRESSOR AIR SYSTEM

Section 4
INSTALLATION

NOTE

A foundation or mounting capable of supporting the weight of the machine, and rigid enough to maintain the frame level is required.

⚠ WARNING

All piping between compressor outlet and dryer inlet must be clean of all particulate by flushing or comparable cleaning method before initial air run through dryer.

4.3 DRYER PIPING

Refer to Figure 4–1. Compressed air piping should be at least of equal size to that furnished on the inlet and outlet of the dryer. Larger pipes reduced to the inlet/outlet pipe size may be used. It is recommended that shut–off valves with unions be installed at each port, with a valved bypass to permit isolation of the unit for servicing to eliminate the need of shutting down the plant air system.

Make sure, when piping is connected, that undue stress is not applied on the dryer fittings.

Drain lines should be sloped adequately to drain by gravity any water accumulated after separation. Drains must be connected directly to a proper disposal system.

4.4 ELECTRICAL PREPARATION

Refer to Figures 4–2 and 4–3. The nameplate on the instrument panel of each unit identifies the power supply requirements. A suitably fused disconnect switch in compliance with the National and Local Electrical Code requirements is recommended.

The wiring of all functional electrical components has been designed and manufactured in accordance with the following electrical codes/practices:

NEC – National Electrical Codes

NEMA – National Electrical Manufacturers Association

UL – Underwriters Laboratories – Recognized Components

Figure 4–2 Wiring Schematic SRD 125

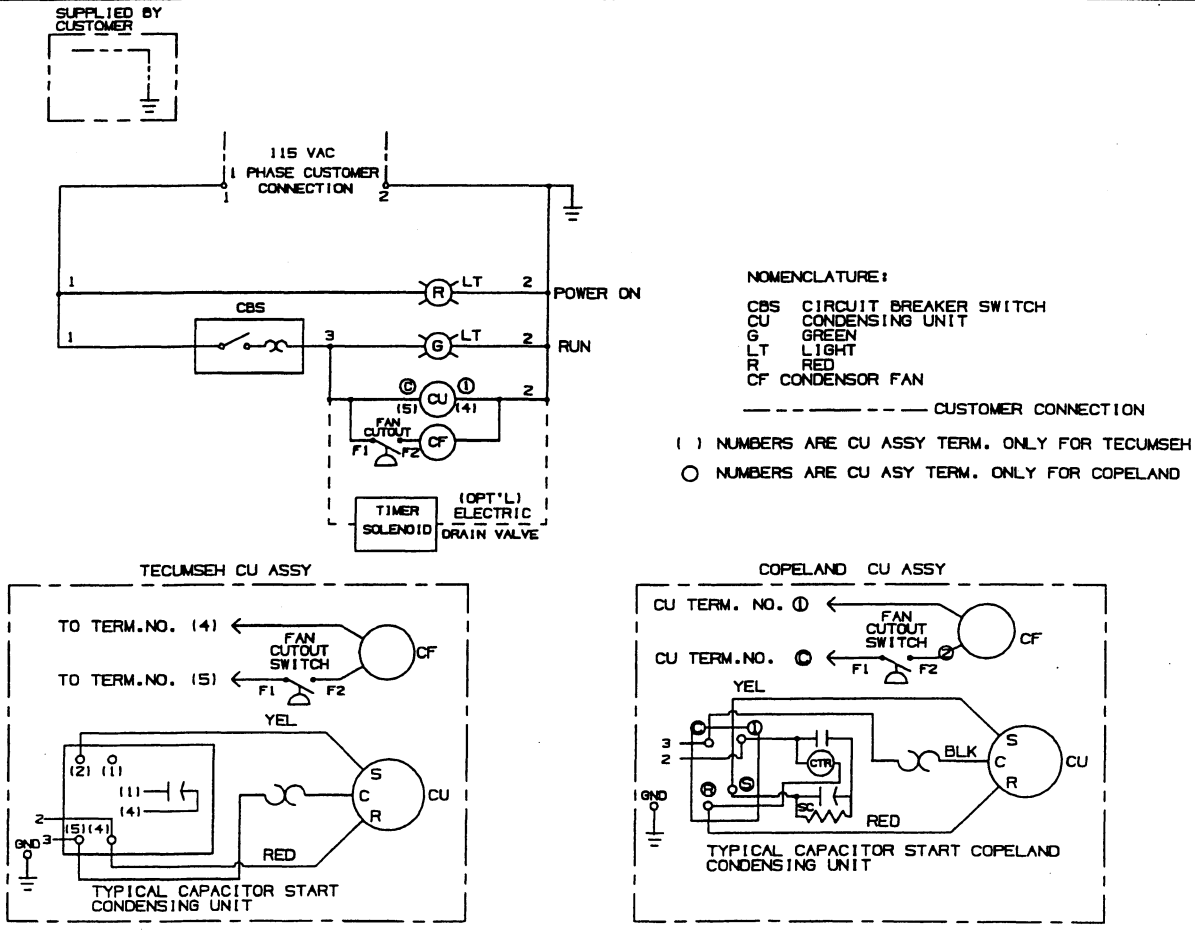


Figure 4–3 Wiring Schematic SRD 190

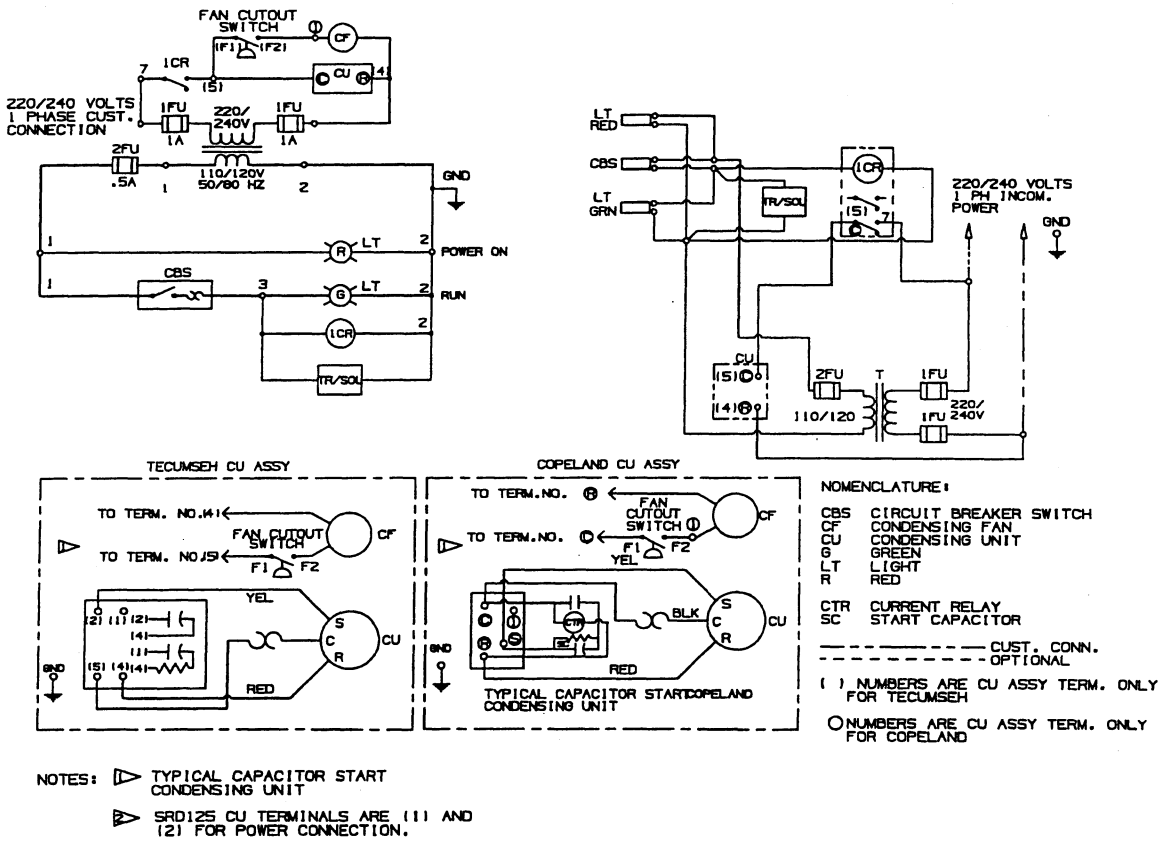
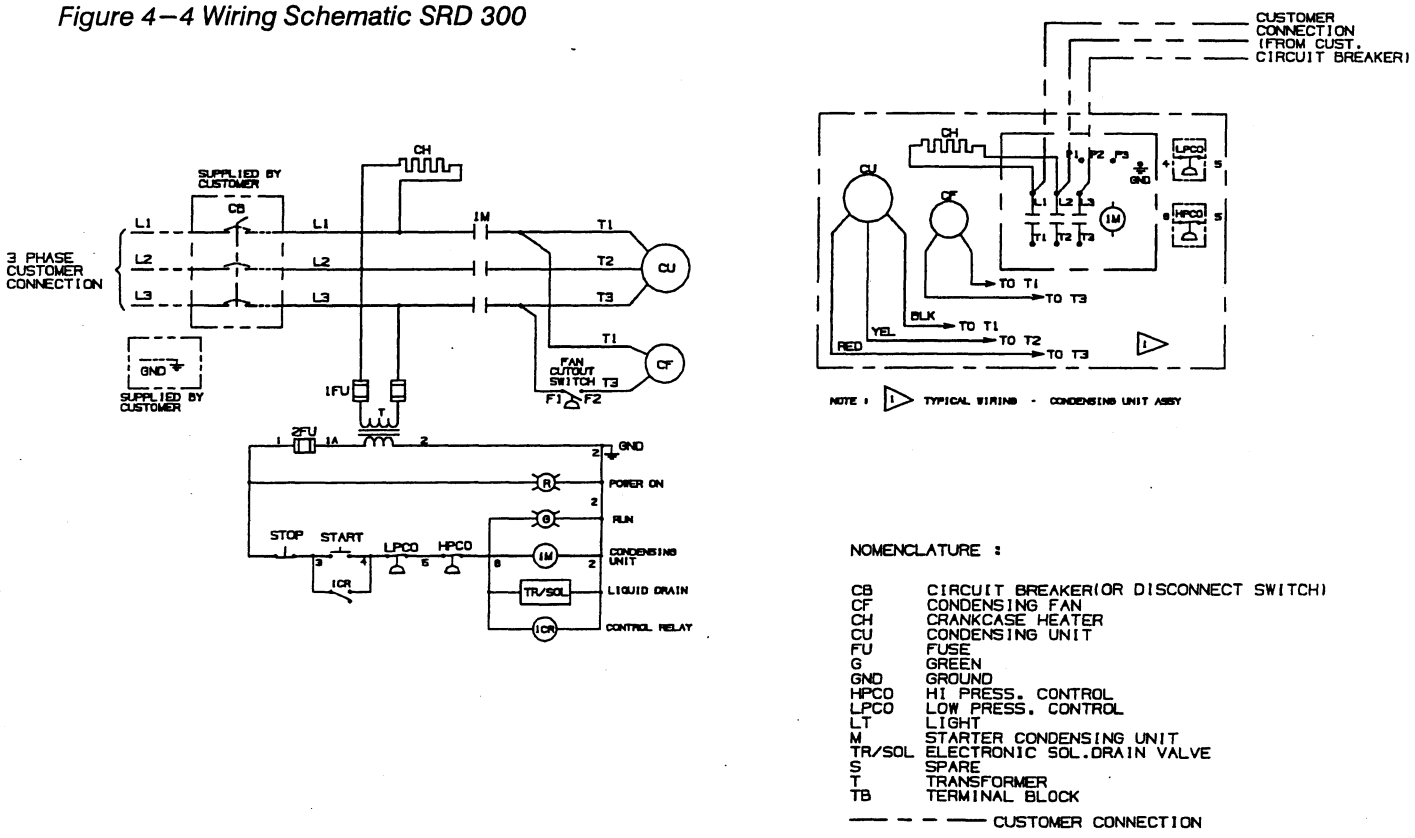


Figure 4–4 Wiring Schematic SRD 300



Section 4
INSTALLATION

CSA – Canadian Standards Association – Recognized Components

As stated in Section 1, Safety, use a qualified electrician for all electrical wiring. Connect the power supply lines to the terminals indicated on the wiring diagram corresponding to your unit. All units are supplied with control circuit protection and a "red" power indicating light (On SRD units, with the control circuit transformer provided, a fuse is connected on the primary side of the control circuit transformer to protect the unit from overcurrent and short circuit.)

Connect ground wire to provided ground lug.

The compressor can rotate in either direction. The fans are single phase and will turn only in the correct direction (fan must pull air across the condenser).

NOTE

Grounding of the frame is required.

5.1 GENERAL

While Sullair has built into this dryer controls and indicators to assist you in determining if it is operating properly, it will be necessary to recognize and interpret the condition which will call for service or indicate the beginning of a malfunction. Before starting the Sullair dryer, read this section thoroughly and familiarize yourself with the controls and indicators – their purpose, location and use.

5.2 PURPOSE OF CONTROLS

CONTROL OR INDICATOR	PURPOSE
REFRIGERANT SUCTION PRESSURE GAUGE	Indicates the refrigerant pressure as it enters the compressor. Before start–up, it is equivalent to the ambient temperature converted to pressure e.g. at 70°F (21°C) ambient temperature, R–22 suction pressure is 121 psig (8.3 bar) (see Figure 5–1, Temperature Pressure Chart).
REFRIGERANT HEAD PRESSURE GAUGE	Indicates the refrigerant pressure as it leaves the compressor. Before start–up, it will be the same pressure reading as the suction pressure.
SIGHT GLASS AND MOISTURE INDICATOR	Indicates the condition of the refrigerant in the system (full, wet or dry).

5.3 INITIAL START–UP PROCEDURE

After the installation has been completed, the following items should be checked.

1. Check main electrical supply for proper input voltage. On units supplied with a control circuit transformer, a fuse is provided on the primary side.
2. Check proper connection and support of compressed air lines to the dryer (complete with bypass valving system).
3. Check that inlet air temperature and pressure to the dryer meet the specification requirements.

⚠ CAUTION

Make certain that all shut–off valves in the refrigerant circuit are open. Starting the dryer with a valve closed could burn up the compressor. Rotate valve clockwise to open.

4. For SRD 125, 190, turn on the main disconnect and power switch to the dryer. The power indcating light will be on.

For SRD 300, turn on the main disconnect switch to the dryer. The dryer must be in this mode for at least twelve (12) hours to allow the compressor crankcase heater to energize. After twelve (12) hours, turn on the power switch of the dryer. The power indicating light will be on.

⚠ CAUTION

SRD 125, SRD 190 are not equipped with crankcase heater. Installation of these dryers in areas with ambient temperatures below 65°F (18°C) can result in compressor damage.

5. Check that the bypass valve in the main air line is open and the shutoff valve to the dryer is closed.
6. Check the refrigerant suction pressure. This should be checked with no air flowing through the dryer, with a head pressure of 150 psig (10.3 bar), and without the condenser fan cycling.
   a) The suction pressure should be 58–60 psig (4.0 to 4.1 bar). It is normal for the dryer to cycle between these pressures. During this cycling the suction pressure should not fall below 58 psig (4 bar).
   b) If the fan cycles during the checking of the suction pressure, a jumper wire may be installed around the fan cycling switch to temporarily prevent cycling.
   c) To achieve the proper head pressure for checking the suction pressure, the following should be done. To increase the head pressure increase the ambient air temperature or temporarily restrict the air flow to the condenser. To reduce the head pressure, the ambient temperature must be reduced.
   d) Allow the dryer to run at least 15 minutes for stabilization when checking and adjusting the suction pressure.
   e) If necessary, adjust the hot gas bypass valve (HGBV) to change the suction pressure. Turn clockwise to increase the suction pressure and counterclockwise to decrease the suction pressure.
   f) Remove the jumper wire which was installed around the fan cycling switch in Step "b" above.

NOTE

If the suction pressure was set or checked at a head pressure greater than 150 psig (10.3 bar), a suction pressure lower than 58 psig (4.0 bar) may result, which could result in evaporator icing.

7. Open the dryer shutoff valve slowly and close the bypass valve. Apply full rated air flow to the dryer at its rating conditions. Rating conditions are 100°F (38°C) entering air temperature, 100 psig (6.9 bar) entering air pressure and 100°F (38°C) ambient air temperature.
8. Check the refrigerant suction pressure, refrigerant head pressure, sight glass and moisture indicator for normal operating conditions. See Section 5.5.
   a) If necessary, take corrective action as described in the Troubleshooting Section of this manual (See 6.3 Troubleshooting).

NOTE

Expansion and hot gas bypass valves are preset at the factory. However, they may require readjustment at initial installation and periodically to help assure the suction pressure remains in the specified range, as stated in this Operator's Manual. If the suction pressure is too low, icing of the evaporator is possible.

5.4 SUBSEQUENT START–UP PROCEDURE

1. If the main disconnect switch is open, close the switch and apply power to the dryer for a minimum of 12 hours before starting the dryer.
2. Turn on the power switch on the dryer.
3. With the air shutoff valve closed, check the suction pressure for a normal operating condition. If it is not within the normal unload range of 58 – 60 psig (4.0 to 4.1 bar), immediately take corrective action utilizing the Troubleshooting section of this manual.
4. Open the air shutoff valve slowly and apply load to the dryer. Check the suction pressure, head pressure, sight glass and moisture indicator for normal operating conditions as shown in Section 5.5 of this manual.

5.5 NORMAL OPERATING CONDITIONS

After the dryer has been started under rated load, let the dryer run for at least 15 minutes to allow stabilization of the system.

The gauge readings should be as follows:

REFRIGERANT SUCTION PRESSURE

R–22 fully loaded is 65 psig (4.5 bar) and unloaded is 58 psig (4.0 bar).

NOTE

Add 1 psig (0.7 bar) to the minimum allowable suction pressures referred to in manual for each 2,000 ft (610m) elevation above sea level.

REFRIGERANT HEAD PRESSURE

To the ambient temperature add 25°F to 30°F (15°C to 18°C) then convert to pressure using the Temperature Pressure Chart (Figure 5–1). For proper dryer operation, the minimum discharge head pressure required is 150 psig (10.3 bar).

SIGHT GLASS AND MOISTURE INDICATOR

It may take up to twelve (12) hours of running before indicator becomes proper color indicating a dry system. Green color indicates a dry system. Yellow indicates a wet system. There should be no bubbles showing during full load operation.

Sight glass may appear half (½) full or less during no load or part load operation. Sight glass will appear full only during full load operation. If sight glass is not full during full load operation, repair refrigerant leak where required and re–charge.

Figure 5–1 Temperature Pressure Chart

Temperature (°F/°C)	(psig/bar) R–22	Temperature (°F/°C)	(psig/bar) R–22
20/–7	43/3.0	70/21	121/8.3
22/–6	45/3.1	75/24	132/9.1
24/–4	48/3.3	80/27	144/9.9
26/–3	50/3.5	85/29	156/10.8
28/–2	52/3.6	90/32	168/11.6
30/–1	55/3.8	95/35	182/12.6
32/0	58/4.0	100/38	195/13.4
34/1	60/4.1	105/41	211/14.6
36/2	63/4.4	110/43	226/15.6
38/3	66/4.6	115/46	243/16.8
40/4	69/4.8	120/49	260/17.9
45/7	76/5.2	125/52	278/19.1
50/10	84/5.8	130/54	297/20.5
55/13	93/6.4	140/60	337/23.2
60/16	102/7.0	150/66	381/26.3
65/18	111/7.7	160/71	430/29.7

6.1 GENERAL

As you proceed in reading this section, it will be easy to see that the Maintenance Program for the dryer is quite minimal. The use of the service indicators will alert you when service maintenance is required. Checks on a regular basis on the dryer will help insure that all items are functioning properly.

6.2 ROUTINE MAINTENANCE

Check automatic condensate trap (in SRD 125) on a regular basis to insure that it is operating properly or the emulsion will back up into the compressed air system. On SRD 190 and SRD 300 check drain valve to insure proper operation. Proper drain trap and valve maintenance is the owner's responsibility and is not covered by the warranty.

The condenser fins may need to be periodically cleaned to remove dust, lint, etc, to assure efficient heat transfer. High head pressure or a visual check will determine the need for cleaning.

Check the gauge readings periodically for good system operation.

For SRD 300, inspect sight glass and moisture indicator; a continuous stream of bubbles indicates loss of refrigerant or a color change from green to yellow indicates moisture contamination of the refrigerant. Before working on the refrigerant system, read the Safety Section 1.3 pertaining to pressure.

6.3 TROUBLESHOOTING

The dryer consists of three basic systems: Air, Refrigerant and Electrical. An air leak at 100 psig (6.9 bar) will provide an audible signal indicating where there is a problem; R–22 has no color or odor, therefore a small refrigerant leak is difficult to find. However, it can be detected by a bubble test, halide torch (with a flame which changes from red–orange to blue on contact with refrigerant) or an electronic detector.

The electrical system consists of transformers, starter, switches, relays, etc. The use of a volt–ohm meter or similar equipment is required for checking continuity, amperage and voltage.

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	REMEDY
UNIT DOES NOT RUN	No Line Voltage	Follow wiring diagram and check voltage from compressor terminal to the power source to find where the circuit was interrupted.
		Inspect electrical components such as switches, controls, motors, transformers, etc.
		The supply power voltage, frequency and phase must coincide with unit's nameplate.
	Improperly Wired	Check wiring against wiring diagram and tighten any loose connection.
	Blown Fuse Or Tripped Circuit Breaker	Check for amperage draw of unit.
	Safety Controls Open (SRD 300).	Inspect the controls such as low and high pressure switches, and fan cut–out switch and etc, to see if the contact points are closed.
		The low pressure switch can shut down the unit due to loss of refrigerant or hot gas bypass valve being out of adjustment or low ambient temperature.
		The high pressure switch can shut down the unit due to high ambient air temperature, condenser not receiving proper cooling, hot gas bypass valve out of adjustment, or over–charge of refrigerant or wrong refrigerant.
HEAD PRESSURE TOO HIGH	Refrigerant Overcharge	Excess refrigerant; check unit's nameplate for total system refrigerant charge.
		Refrigerant overcharge may cause system not to perform properly and efficiently.
	Condenser Fouled And Dirty	Dismantle and clean condenser.
		Clogged fins in air–cooled condenser will reduce heat transfer efficiently. Fins should be periodically checked and cleaned.

Section 6
MAINTENANCE

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	REMEDY
HEAD PRESSURE TOO HIGH (cont'd.)	Defective Fan Control Switch	Replace. Fan controls cut in at 230 psig (15.9 bar) and cut out at 150 psig (10.3 bar).
	Defective Fan Motor	Replace.
	Dryer Location Too Hot (high ambient)	Cool ambient or relocate the unit (see Section 4, Installation; Location of Dryer).
	Compressed Air Leaks To Refrigerant System.	Evacuate, repair leak and recharge with refrigerant. Repair or replace evaporator. Can be detected by checking the color indicator or bubbles in the glass (SRD 300).
	Fan Operating In Wrong Direction	Reverse any two wires at disconnect (three phase fans). Single phase fan will rotate only in correct direction. For three phase fans, check for proper rotation (see Wiring Schematics in Section 4). Fans must pull air through condenser.
HEAD PRESSURE TOO LOW	Low Ambient Temperature	Increase ambient temperature. If ambient temperature is too low, dryer freeze up can take place. Add some type of head pressure control.
	Refrigerant Shortage	Check for leaks in the system and repair and recharge until bubbles disappear (SRD 300). Turn off the unit for five (5) minutes. Restart, watching sight glass (SRD 300). Bubbles should appear at first, due to the modulating action of the expansion and hot gas bypass valve. If no bubbles appear at full load, system has correct charge. See unit's nameplate for total system charge (SRD 300). It is common to observe a half full sight glass during no load or part load operation. Check sight glass during full load.
	Defective Fan Control Switch	Replace. Fan should cut out at 150 psig (10.3 bar).
SUCTION PRESSURE TOO LOW	Hot Gas Bypass Valve Out Of Adjustment Or Defective	Adjust or replace. Turn clockwise to increase suction pressure; See Section 5.5 for normal operating conditions.
	Refrigerant Shortage	Add enough refrigerant to maintain desired suction pressure. Can be detected in the sight glass (SRD 300). Also check amperage draw.
	Thermostatic Expansion Valve Does Not Feed Enough Refrigerant To Evaporator.	Adjust TXV by turning stem counterclockwise (SRD 300). When adjusting the valve, **DO NOT** make more than one turn at a time. As much as 30 minutes may be required for the new balance to take place after adjustment.

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	REMEDY
SUCTION PRESSURE TOO LOW (cont'd.)	Excessive Pressure Drop In High Side	Check for any restriction (plugged filter drier or receiver hand valve partially closed [SRD 300]). Suction pressure should be steady and vary only 1 to 3 psig (0.1 to 0.2 bar) from high to low at this condition.
	Head Pressure Too Low Due To Defective Fan Control Switch	Replace.
SUCTION PRESSURE TOO HIGH	Hot Gas Bypass Valve Out Of Adjustment Or Defective	Turn counterclockwise to lower suction pressure to desired reading. Compressed air dewpoint will rise as the suction pressure increases.
	Superheat Too High Or TXV Is Out Of Adjustment (SRD 300)	Turn TXV clockwise (SRD 300). Make sure that adjustment is made one full turn at a time and wait for about 30 minutes to stabilize.
	TXV Bulb Location (SRD 300)	Relocate bulb making sure it is parallel to the direction of flow, is at the four o'clock position, and has good thermal contact (SRD 300), and is adequately insulated.
WATER IN THE COMPRESSED AIR SYSTEM	Drain Traps Clogged	Disassemble and clean traps to restore free flow of drainage. Check drain lines. Automatic drain traps are ballfloat type and do not need priming. It should be disassembled and cleaned after two weeks of operation.
	Clogged Strainer	Check strainer and clean if required.
	Air Bypass System Open	Close air bypass valve (see Section 5.3 Operation; Initial Start–up Procedure).
	Malfunctioning Or Clogged Electric Drain Valve	Check solenoid for proper operation. Clean or repair valve.
	Electric Drain Valve Does Not Open Long Enough	Reset drain valve timer.
	Improperly Set Or Malfunctioning Hot Gas Bypass Valve, Thermostatic Expansion Valve Or Fan Cycling Switch	Will be indicated by suction pressure being too high. Adjust or Replace.
	Ambient Temperature Is Too High	Remove ambient or improve ventilation.

NOTES

7.1 PROCEDURE FOR ORDERING PARTS

Parts should be ordered from the nearest Sullair Representative or the Representative from whom the dryer was purchased. If for any reason parts cannot be obtained in this manner, contact the factory directly at the addresses or phone numbers below.

When ordering parts always indicate the **Serial Number** of the dryer. This can be obtained from the Bill of Lading for the dryer or from the Serial Number Plate located on the dryer.

Standard fasteners (capscrews, nut, washers, etc.), tubing and fittings plus other standard hardware have been included in the Parts List. Standard pipe is Schedule 40, and fittings are 150# malleable. These are items which can be obtained quicker and more economically from local sources.

SULLAIR CORPORATION
Subsidiary of Sundstrand Corporation
3700 East Michigan Boulevard
Michigan City, Indiana 46360 U.S.A.
Telephone: 1–800–SULLAIR or
1–219–879–5451
FAX: (219) 874–1273

SULLAIR ASIA, LTD.
ROOM 2304A
Shartex Plaza Ctr.
No. 88 Zun Yi Nan Rd.
Shanghai, P.R.C.
Telephone: 21–2192066
FAX: 21–2196568

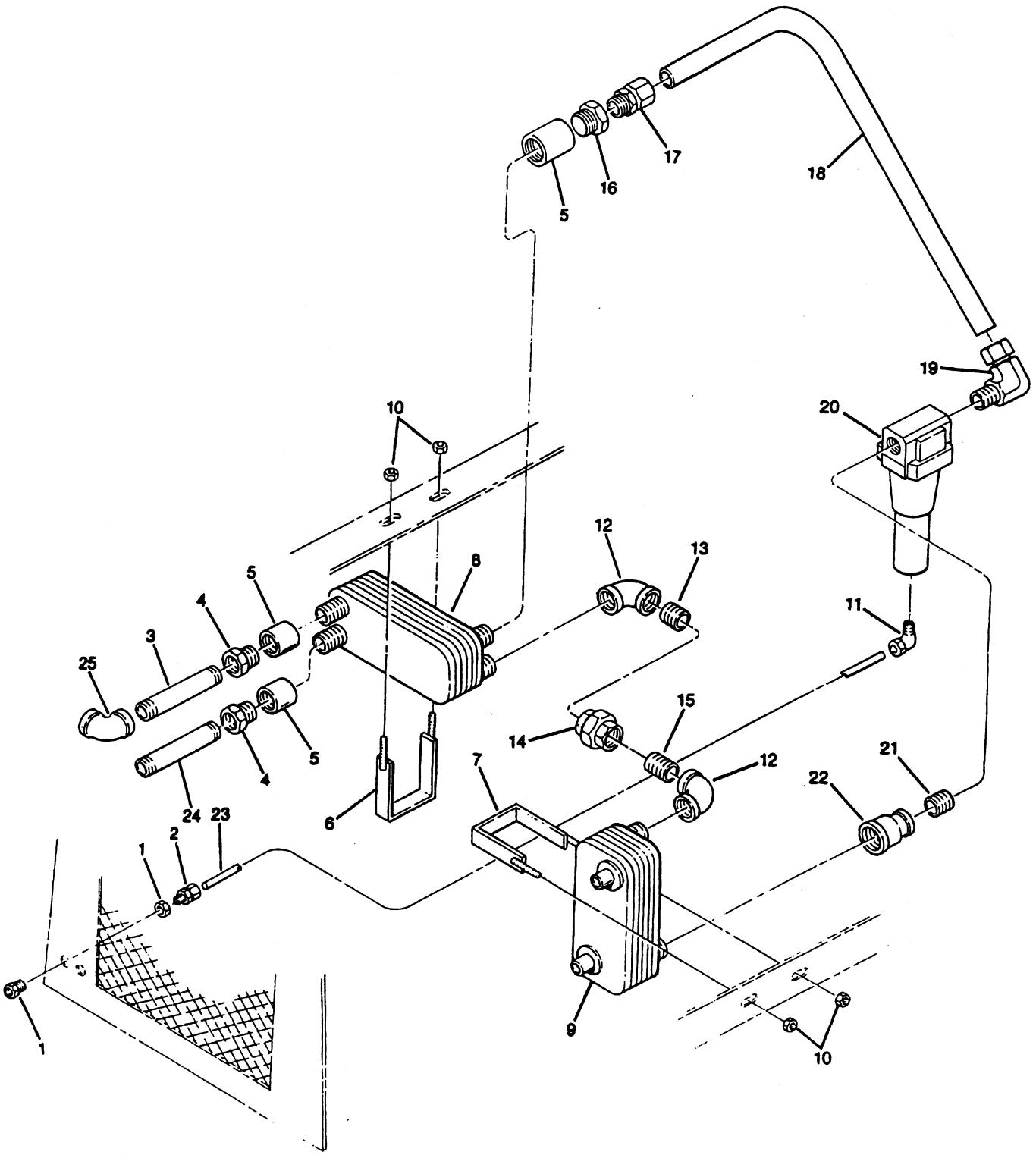
SULLAIR EUROPE, S.A.
Chemin de Genas BP 639
69800 Saint Priest, France
Telephone: 33–72232425
FAX: 33–78907168

7.2 RECOMMENDED SPARE PARTS LIST

Description	Kit Number	Quantity
kits, repair for sep/trap filter 02250056–834 (SRD 125)	**02250056–839 (element/o–ring)**	**1**
	02250056–838 (baffle/reflector)	**1**
	02250056–842 (bowl/auto drain)	**1**
kit, repair for strainer 241771	**241772**	**1**
replacement, solenoid for valve 250038–163 (drain solenoid valve 250031–278)	**250031–322**	**1**

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER UNIT.

7.3 AIR SYSTEM – SRD 125



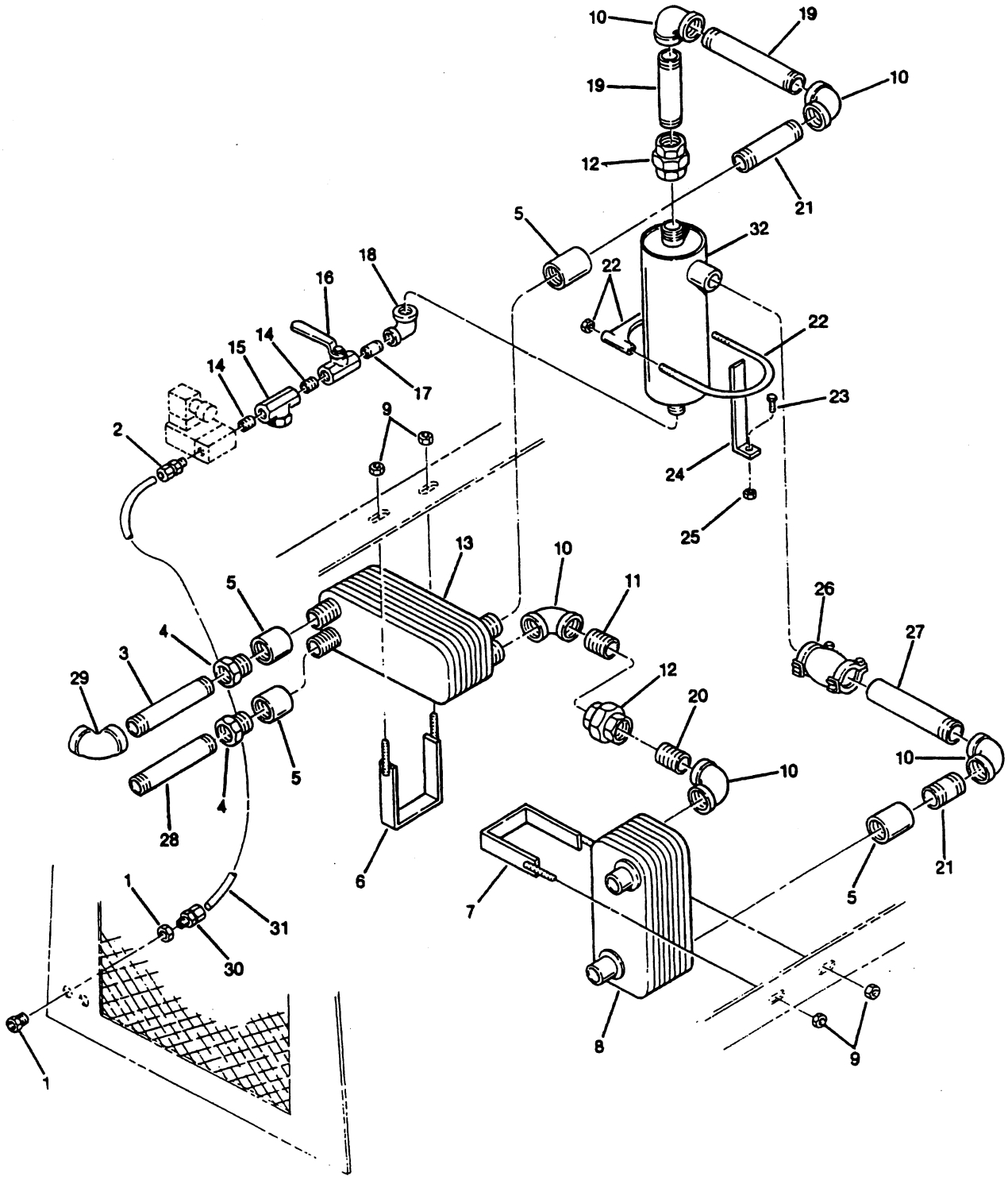
7.3 AIR SYSTEM – SRD 125

key number	*description*	*part number*	*quantity*
1	bulkhead, pipe 1/4"	841500–004	1
2	connector, tube–straight 1/4" mnpt x 1/4"t	250024–685	1
3	nipple, pipe galv 1" x 9 1/2"	823116–095	1
4	bushing, red galv 1 1/2" x 1"	804106–040	2
5	coupling, pipe 1 1/2" galv	02250055–007	3
6	u–bolt, cooler mtg a x a	250040–329	1
7	u–bolt, cooler mtg f x a	250040–330	1
8	heat exchanger, a x a	250027–255	1
9	evaporator, f x a	250027–267	1
10	nut, hex 3/8"–16	825306–347	4
11	elbow, tube–m 1/4" x 1/4"	813704–250	1
12	elbow, pipe 1 1/2"	801515–060	2
13	nipple, pipe xs 1 1/2" x close	822224–000	1
14	union, pipe 1 1/2"	802515–060	1
15	nipple, pipe 1 1/2" x 2"	822124–020	1
16	bushing, red 1 1/2" x 1"	802106–040	1
17	connector, tube–m 1" x 1"	810216–100	1
18	tubing, steel 1"	841115–016	1 ft.
19	elbow, tube 90° 1" x 1"	810516–100	1
20	filter, air sep/trap (I)	02250056–834	1
21	nipple, pipe 1" x 3 1/2"	822116–035	1
22	coupling, red 1 1/2" x 1"	801012–008	1
23	tubing, thermoplastic 1/4" od	250024–745	3 1/2 ft.
24	nipple, pipe galv 1" x 11"	823116–115	1
25	elbow, pipe galv 90°	803515–060	1

(I) For maintenance on air separator/trap filter no. 0250056–834, order bowl/auto drain repair kit no. 02250056–842; and/or baffle/reflector repair kit no. 02250056–838; and/or element/o–ring repair kit no. 02250056–839.

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

7.4 AIR SYSTEM – SRD 190



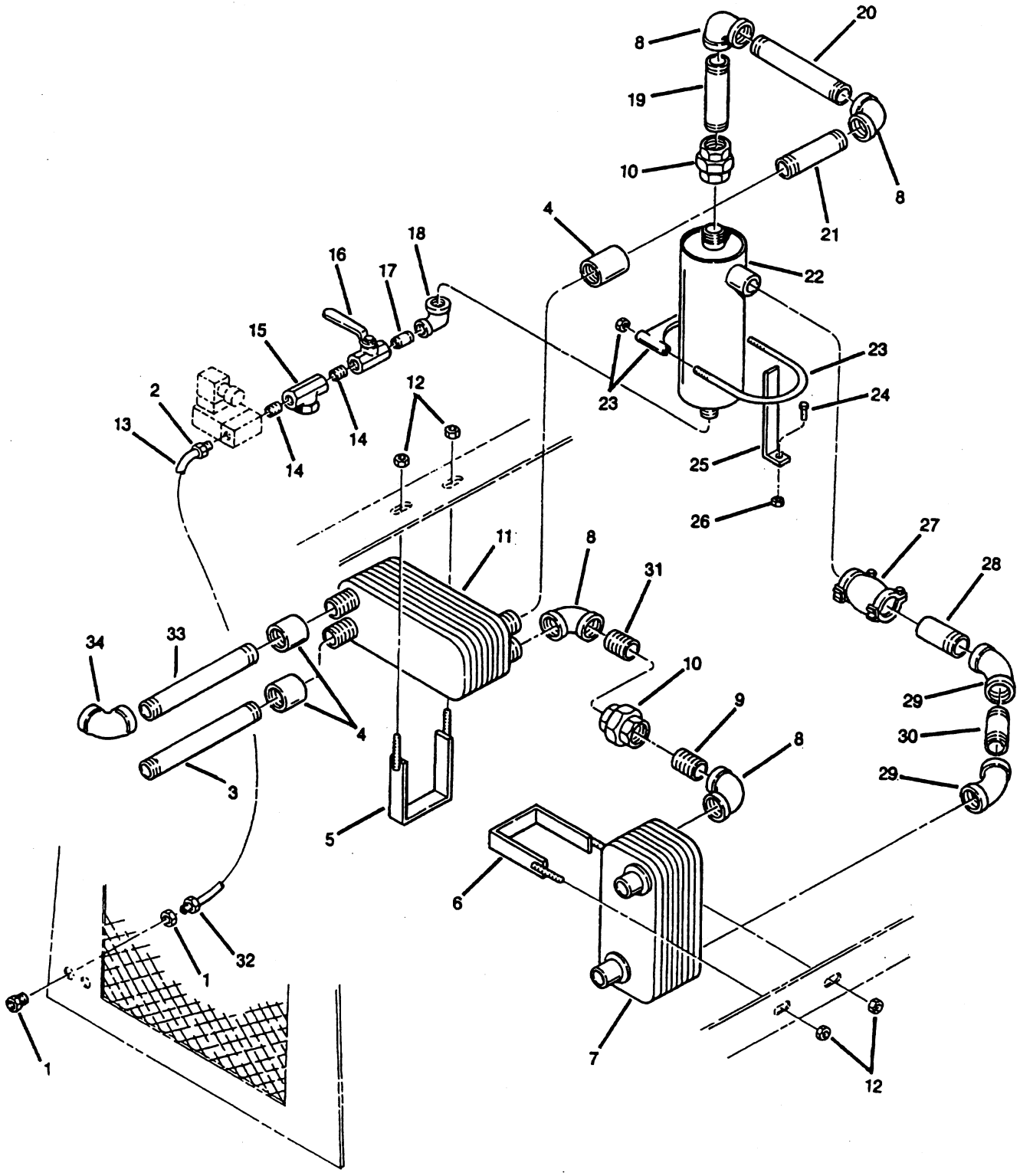
7.4 AIR SYSTEM – SRD 190

key number	*description*	*part number*	*quantity*
1	bulkhead, pipe 1/4"	841500–004	1
2	connector, tube–m 1/4" x 1/4"	813604–250	1
3	nipple, pipe 1 1/4" x 9"	823120–090	1
4	bushing, red hex 1 1/2" x 1 1/4"	803106–050	2
5	coupling, pipe 1 1/2" galv	02250055–007	4
6	u–bolt, cooler mtg a x a	250040–330	1
7	u–bolt, cooler mtg f x a	250040–331	1
8	evaporator, f x a	250027–268	1
9	nut, 3/8"–16	825306–347	4
10	elbow, pipe 90° 1 1/2"	801515–060	5
11	nipple, pipe 1 1/2" x close	822124–000	1
12	union, pipe 1 1/2"	802515–060	2
13	heat exchanger, a x a	250027–256	1
14	nipple, 1/4" x close	823204–000	2
15	strainer, 1/4"(I)	241771	1
16	valve, 1/4"	047115	1
17	nipple, 1/4" x 2 1/2"	823104–025	1
18	elbow, red 1/2" x 1/4" galv	803602–010	1
19	nipple, pipe 1 1/2" x 6 1/2"	822124–065	1
20	nipple, pipe 1 1/2" x 2"	822124–020	1
21	nipple, pipe 1 1/2" x 5 1/2"	822124–055	2
22	clamp, muffler 4.5 id x 3/8"	250031–227	1
23	screw, hex 5/16" x 3/4"	829705–075	1
24	bracket, separator support	250031–228	1
25	nut, hex 5/16"–18	825305–283	1
26	coupling, flexible 1 1/2"	405669–002	1
27	nipple, half 1 1/2" x 12 1/2"	822824–125	1
28	nipple, pipe galv 1 1/4" x 11 1/2"	823120–115	1
29	elbow, pipe 90° galv 1 1/4"	803515–050	1
30	connector, tube–straight 1/4" mnpt x 1/4" t	250024–685	1
31	tubing, thermoplastic 1/4" od	250024–745	3 1/2 ft.
32	separator	250023–098	1

(I) For maintenance on strainer no. 241771, order repair kit no. 241772.

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

7.5 AIR SYSTEM – SRD 300



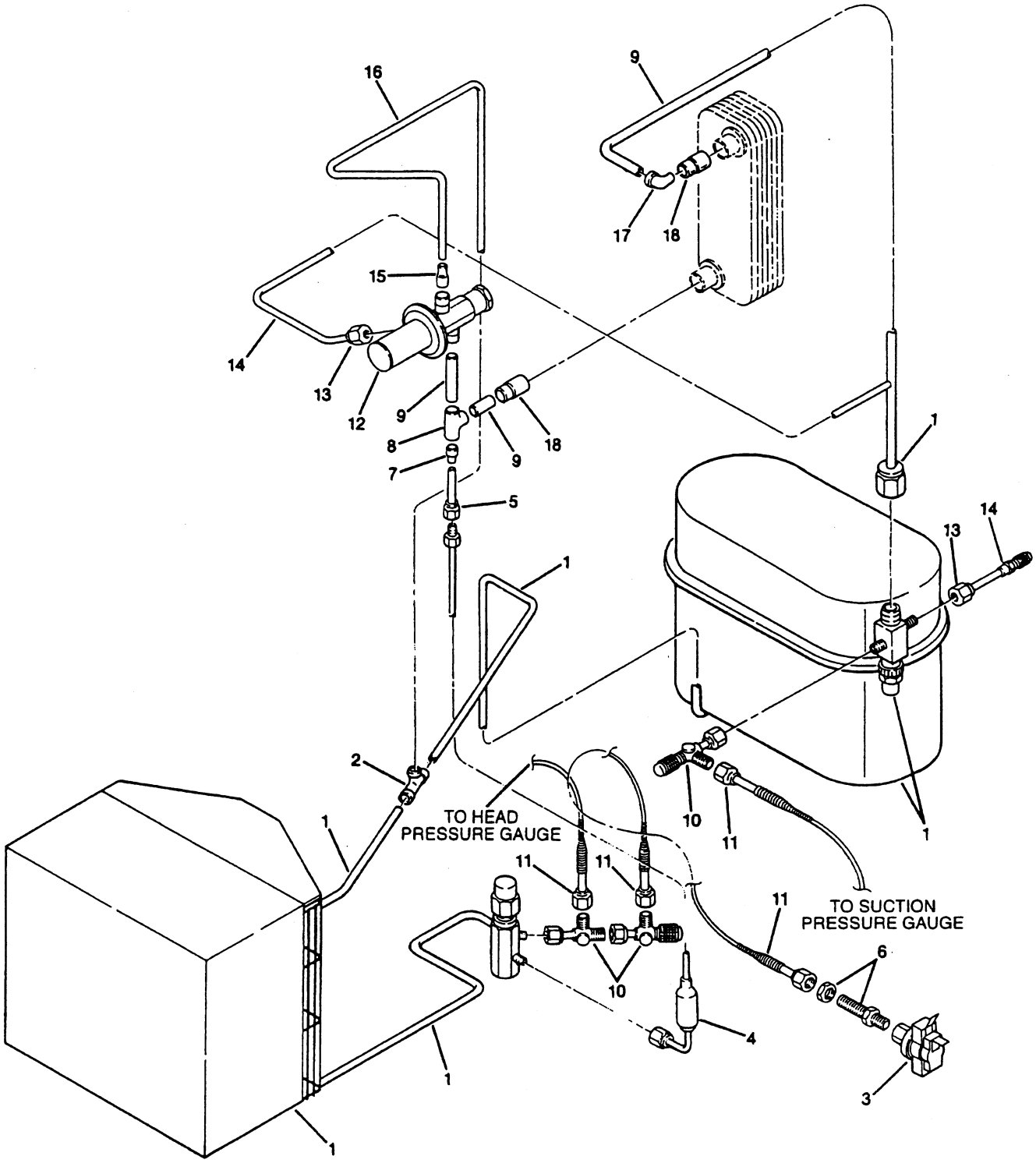
7.5 AIR SYSTEM – SRD 300

key number	*description*	*part number*	*quantity*
1	bulkhead, pipe 1/4"	841500–004	1
2	connector, tube–m 1/4" x 1/4"	813600–250	1
3	nipple, pipe galv 1 1/2" x 12 1/2"	823124–125	1
4	coupling, pipe 1 1/2"	250040–353	3
5	u–bolt, heat exchanger a x a	250040–331	1
6	u–bolt, heat exchanger f x a	250040–332	1
7	evaporator, f x a	250027–269	1
8	elbow, pipe 90° 1 1/2"	801515–060	4
9	nipple, pipe 1 1/2" x close	822224–000	1
10	union, pipe 1 1/2"	802515–060	1
11	heat exchanger, a x a	250027–257	1
12	nut, hex 3/8"	825306–347	4
13	tubing, thermoplastic 1/4"	250024–745	1 1/2 ft.
14	nipple, pipe 1/4" x close	823204–000	2
15	strainer (I)	241771	1
16	valve, ball 1/4"	047115	1
17	nipple, 1/4" x 2"	823204–020	1
18	elbow, red 1/2" x 1/4"	801602–010	1
19	nipple, pipe 1 1/2" x 6 1/2"	822124–065	1
20	nipple, pipe 1 1/2" x 8"	822124–080	1
21	nipple, pipe 1 1/2" x 4 1/2"	822124–045	1
22	separator	250023–098	1
23	clamp, muffler	250031–227	1
24	screw, hex 5/16" x 3/4"	829705–075	1
25	bracket, separator support	250031–228	1
26	nut, hex 5/16"–18	825305–283	1
27	coupling, flex 1 1/2"	405669–002	1
28	nipple, half 1 1/2" x 8"	822824–080	1
29	elbow, pipe 45° 1 1/2"	801415–060	2
30	nipple, pipe 1 1/2" x 7 1/2"	822124–075	1
31	nipple, pipe 1 1/2" x 2"	822124–020	1
32	connector, tube–strt 1/4" mnpt x 1/4"t	250024–685	1
33	nipple, pipe galv 1 1/2" x 10"	823124–100	1
34	elbow, pipe galv 1 1/2"	803515–060	1

(I) For maintenance on strainer no. 241771, order repair kit no. 241772.

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

7.6 REFRIGERANT SYSTEM – SRD 125 AND 190



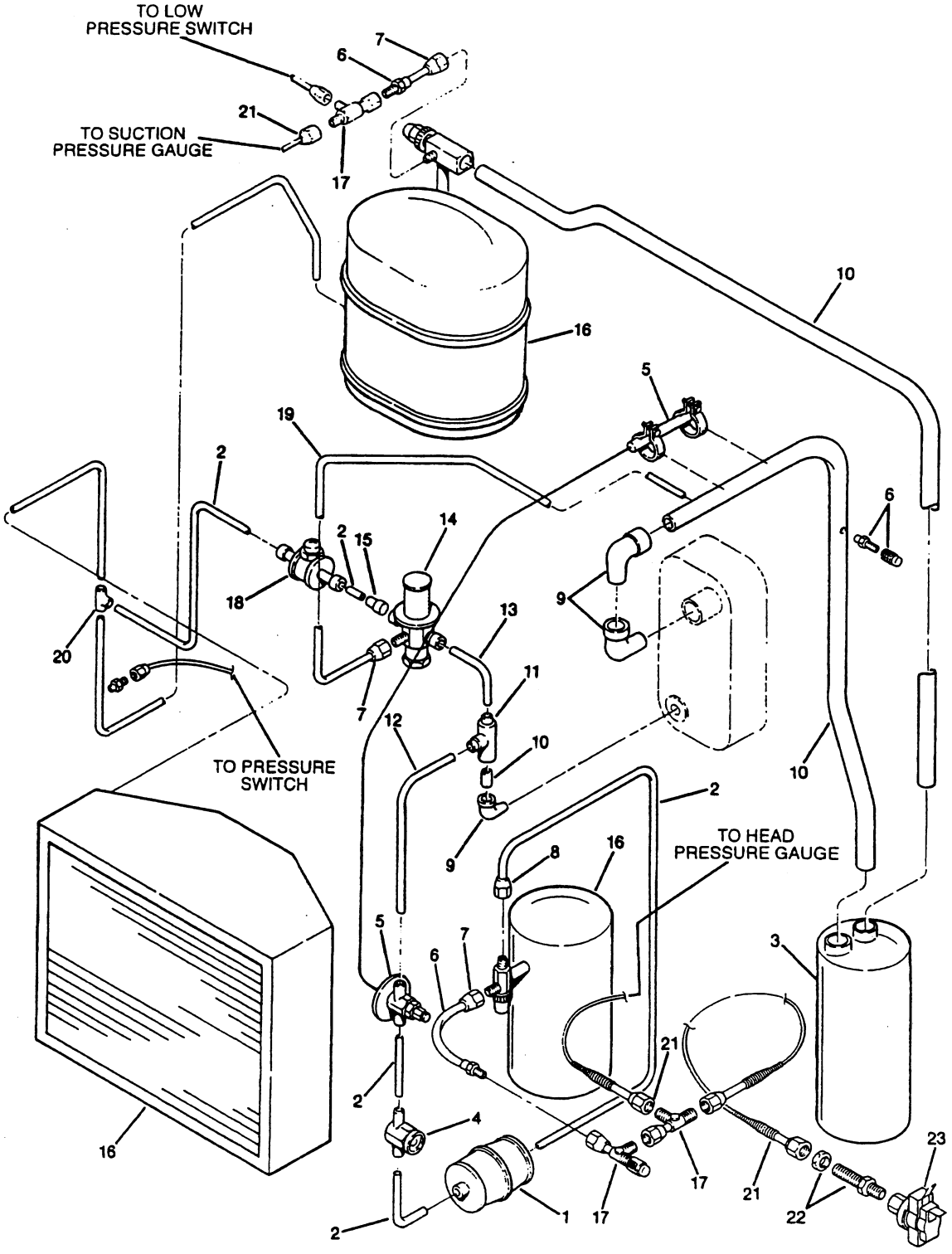
7.6 REFRIGERANT SYSTEM – SRD 125 AND 190

key number	*description*	*part number*	*quantity*
1	unit, condensing (125)	250040–293	1
	•unit, condensing (190)	250040–294	1
2	tee, solder 1/4" x 1/4" x 3/8" (125)	805504–046	1
	•tee, solder 3/8" (190)	805400–038	1
3	switch, fan–cut–out	02250055–160	1
4	dryer, filter (125)	02250055–008	1
	•dryer, filter (190)	250022–166	1
5	nut, access assembly	250033–737	1
6	bulkhead	232290	1
7	reducer, 1/2" x 1/4"	803808–025	1
8	tee, 5/8" x 1/2" x 5/8"	805510–080	1
9	tube, 5/8" copper	840215–010	3 ft.
10	valve, access tee 1/4"	250032–322	3
11	line, gauge 30"	250022–040	3
12	valve, hot gas bypass	406464–009	1
13	nut, short forged 1/4"	805604–260	2
14	tube, 1/4" copper	840215–004	2 ft.
15	reducer, 5/8" x 3/8"	803805–038	1
16	tube, 3/8" copper	840215–006	1 ft.
17	elbow, 90° street 5/8"	805200–062	1
18	reducer, 7/8" x 5/8"	803814–062	2

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

ILLUSTRATIONS AND PARTS LIST

7.7 REFRIGERANT SYSTEM – SRD 300



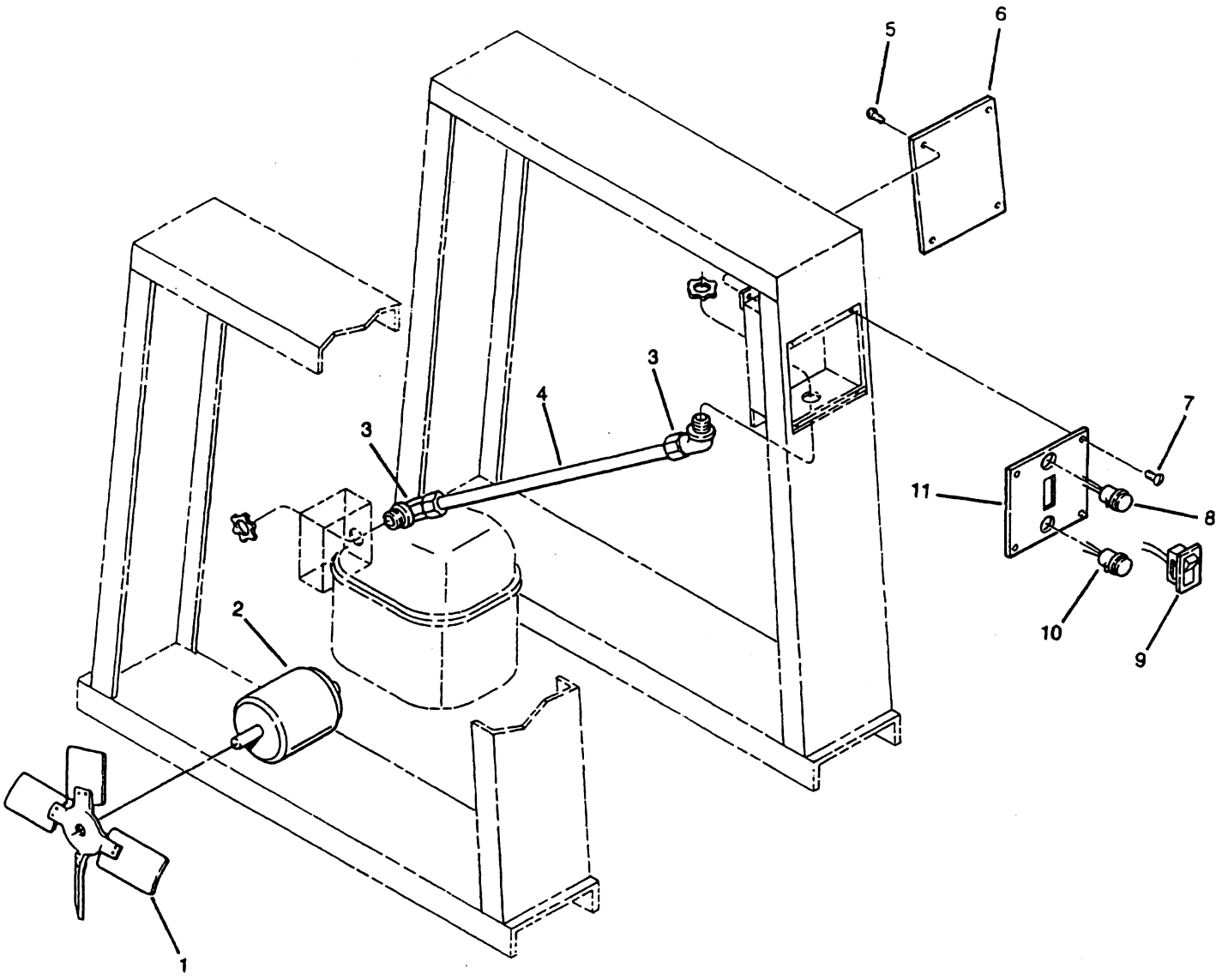
7.7 REFRIGERANT SYSTEM – SRD 300

key number	*description*	*part number*	*quantity*
1	filter, dryer	406227	1
2	tube, 3/8" copper	840215–006	5 ft.
3	accumulator, suction	406408–005	1
4	glass, sight	406482	1
5	valve, liquid expansion	250038–199	1
6	valve, access straight	250023–191	3
7	nut, short forged 45° fl 1/4"	805604–260	3
8	nut, short forged 45° fl 3/8"	805606–385	1
9	elbow, solder 90° st cr 7/8"	805200–088	3
10	tube, 7/8" copper	840215–014	3 ft.
11	tee, red 7/8" x 5/8" x 1/2"	805514–108	1
12	tube, 1/2" copper	840215–008	1 ft.
13	tube, 5/8" copper	840215–010	1 ft.
14	valve, hot gas	406464–006	1
15	reducer, 5/8" x 3/8"	803805–038	1
16	unit, condensing 1.5 hp ac	250040–295	1
17	valve, access tee	250032–322	1
18	valve, hand control 3/8"	406483–001	1
19	tube, 1/4" copper	840215–004	1 ft.
20	tee, solder 3/8"	805400–038	1
21	gauge, line 30"	250022–040	3
22	bulkhead	232290	1
23	switch, fan cut–out	02250055–160	1

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

ILLUSTRATIONS AND PARTS LIST

7.8 ELECTRICAL SYSTEM – SRD 125

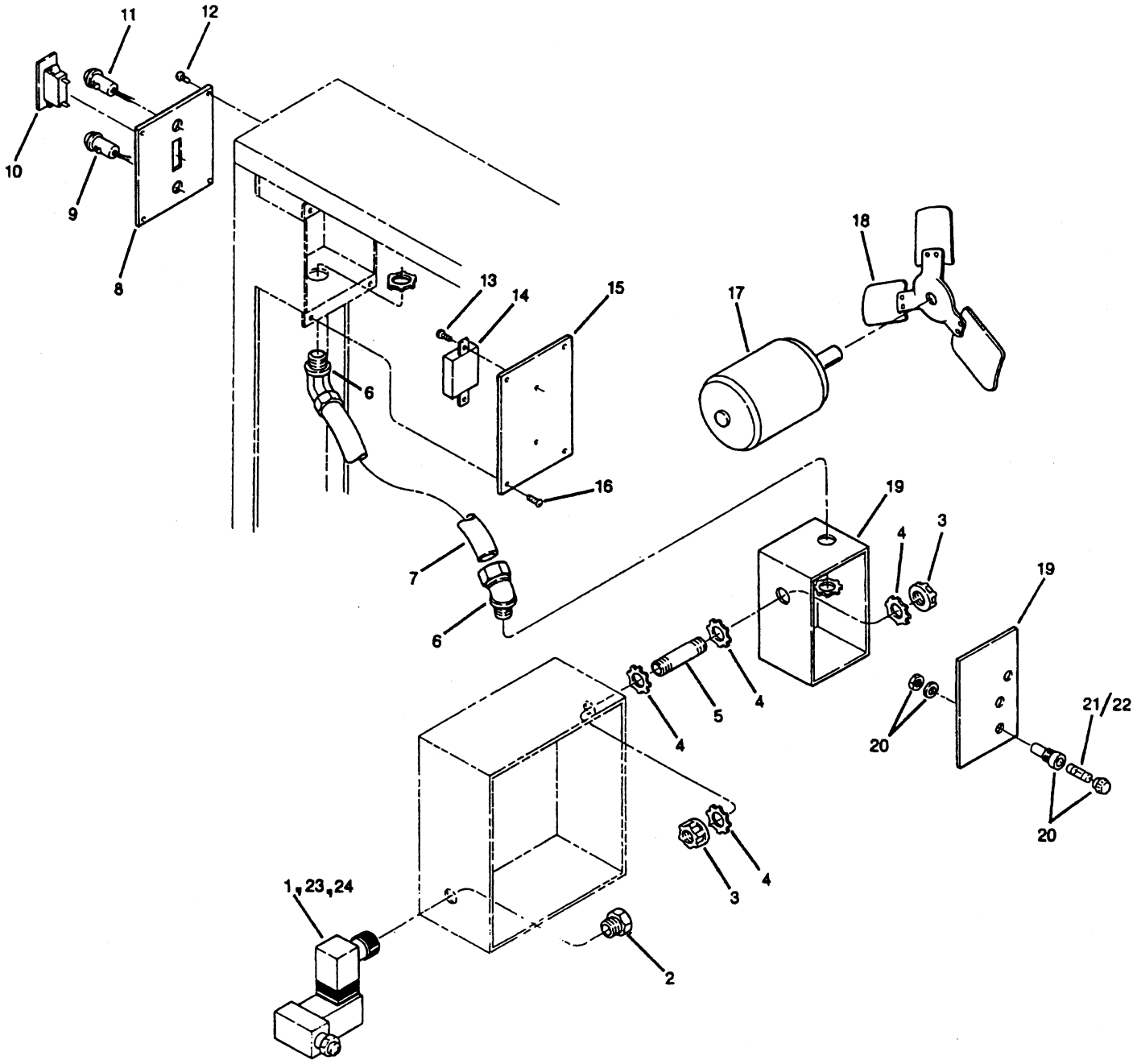


7.8 ELECTRICAL SYSTEM – SRD 125

key number	*description*	*part number*	*quantity*
1	blade, fan	406157	1
2	motor, fan 115V	250014–190	1
3	elbow, 45° lq–tite 1/2"	846500–050	2
4	conduit, CSA flex 1/2"	846315–050	2 ft.
5	screw, rod #8–32 x 1/2"	835701–050	4
6	cover, enclosure srd framd	250029–244	1
7	screw, machine flat #6–32 x 1/2"	831200–050	4
8	light, indicator neon 125V – green	406440–001	1
9	switch, on–off 20 amp	250024–589	1
10	light, indicator neon 125V – red	406440	1
11	panel, controls SRD 125–190	250030–748	1

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

7.9 ELECTRICAL SYSTEM – SRD 190



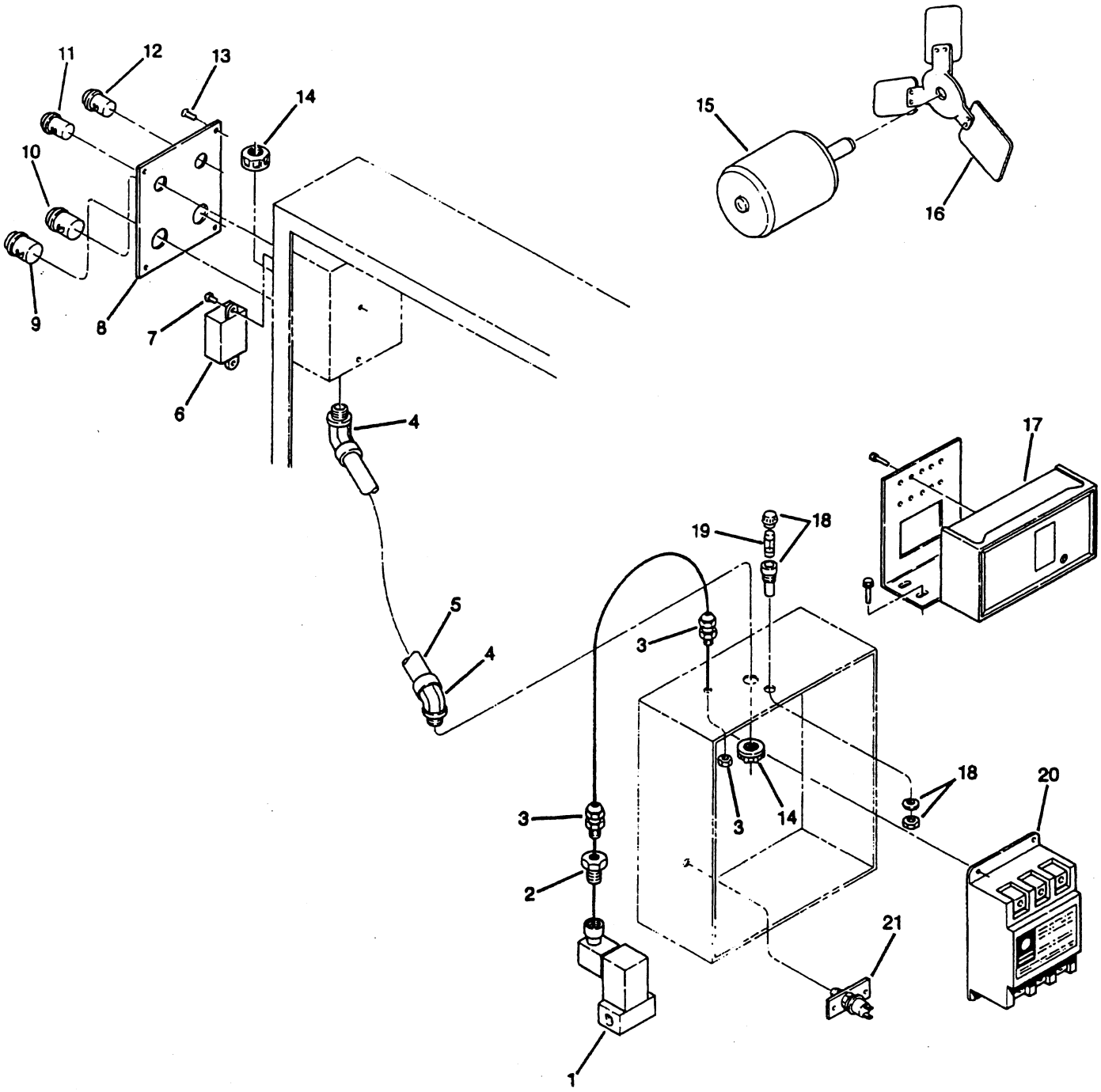
7.9 ELECTRICAL SYSTEM – SRD 190

key number	*description*	*part number*	*quantity*
1	valve, solenoid 1/4" w/timer 120V (I)	250038–163	1
2	nipple, chase conduit 1/2"	847815–050	1
3	bushing, conduit plastic1/2"	848815–050	2
4	locknut, conduit 1/2"	847200–050	4
5	nipple, conduit 1/2" x 1 1/8"	250007–168	1
6	elbow, 45° lq–tite 1/2"	846500–050	2
7	conduit, csa flex 1/2"	846315–050	2 ft.
8	panel, controls SRD 126/190	250030–748	1
9	light, indicating neon 125V – red	406440	1
10	switch, on–off 20 amp	250022–357	1
11	light, indicating neon 125V – green	406440–001	1
12	screw, machine flat #6–32 x 1/2"	831200–050	4
13	screw, tc–f pan #8–32 x 3/8"	835601–038	2
14	relay, gp dpdt 120V flange mount	250038–023	1
15	cover, enclosure srd frame	250029–244	1
16	screw, tc–f pan #8–32 x 1/2"	835601–050	4
17	motor, fan	406159	1
18	blade, fan	406160	1
19	transformer, 240 x 480/120 x 240	405589	1
20	holder, fuse 1/4" connector	250022–212	3
21	fuse, mdl 0.5 amp	250025–931	1
22	fuse, mdl 1.0 amp	250025–933	2
23	valve, drain solenoid 120V 1/4" (I)	250031–278	1
24	timer, solenoid valve 120V	250038–164	1

(I) For maintenance on solenoid valve no. 250038–163 (solenoid drain valve no. 250031–278), order replacement solenoid no. 250031–322.

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

7.10 ELECTRICAL SYSTEM – SRD 300



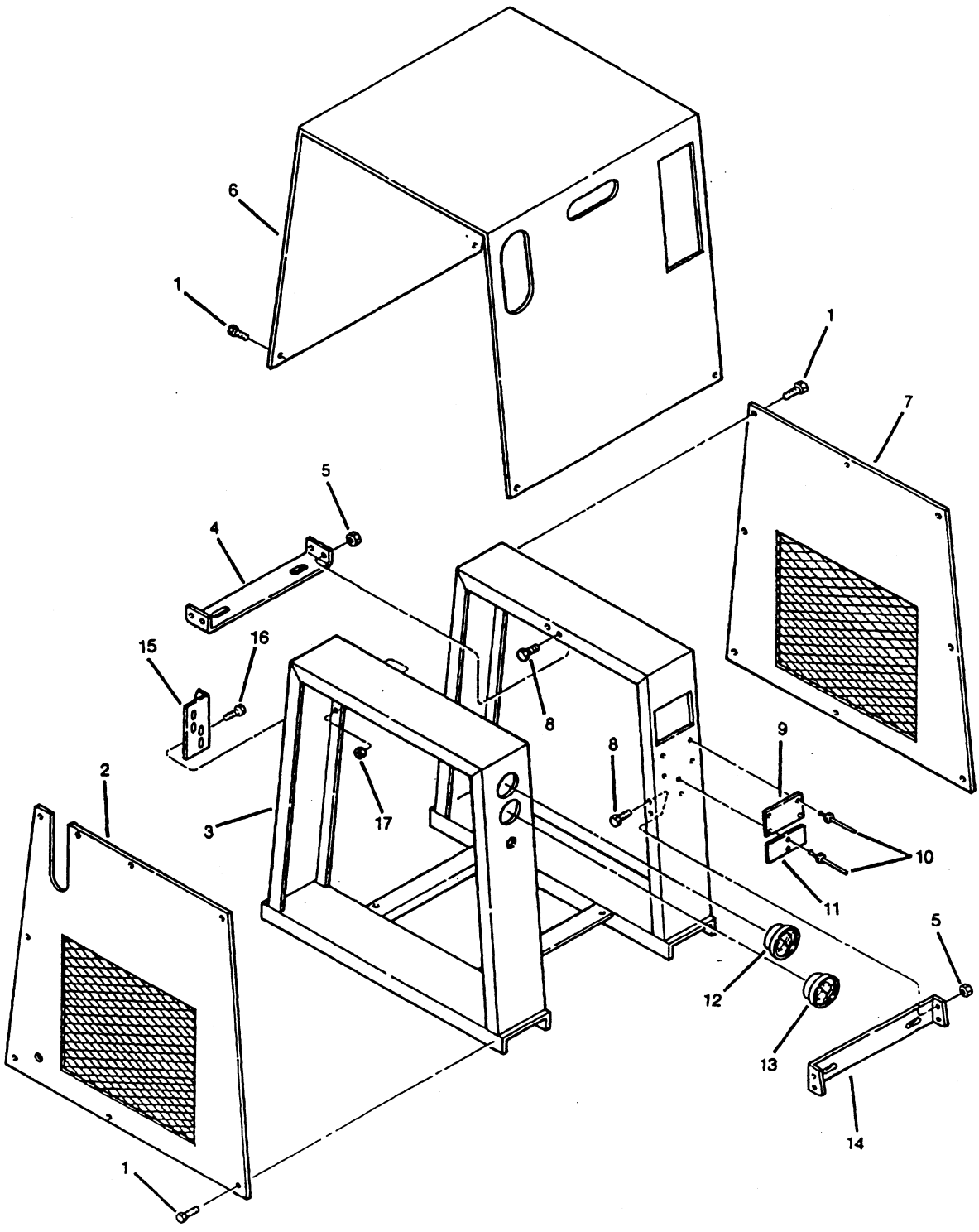
7.10 ELECTRICAL SYSTEM – SRD 300

key number	description	part number	quantity
1	valve, solenoid 1/4"w/ 1/4" timer (I)	250038–163	1
	•valve, drain solenoid 120v 1/4 " (I)	250031–278	1
	•timer, solenoid valve 120v	250038–164	1
2	bushing, reducing hex 1/2" x 1/4"	802102–010	1
3	connector, cord grip .09–0.26	250023–496	2
4	elbow, 45° lq–tite 1/2"	846500–050	2
5	conduit, csa flex 1/2"	846315–050	3 ft.
6	relay, gp dpdt 120V flange mt	250033–679	1
7	screw, tc–f rd #8–32 x 1/2"	835701–050	10
8	panel, controls SRD 300	250030–665	1
9	switch, pushbutton – red normally closed	250016–350	1
10	switch, pushbutton – green normally open	250016–351	1
11	light, indicator neon 125V – red	406440	1
12	light, indicator neon 125V – green	406440–001	1
13	screw, machine flat #6–32 x 1/2"	831200–050	4
14	bushing, conduit plastic 1/2"	848815–050	4
15	motor, fan	406120	1
16	blade, fan	406118	1
17	switch, hi/lo press cutout	250039–686	1
18	holder, fuse 1/4" qk connector	250022–212	1
19	fuse, .50 amp 250V	250022–211	1
20	starter, compressor motor	250035–099	1
21	switch, pressure – high pressure	02250044–767	1

(I) For maintenance on solenoid valve no. 250038–163 (solenoid drain valve no. 250031–278), order replacement solenoid no. 250031–322.

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

7.11 FRAME, COVER AND PARTS – SRD 125, 190, 300



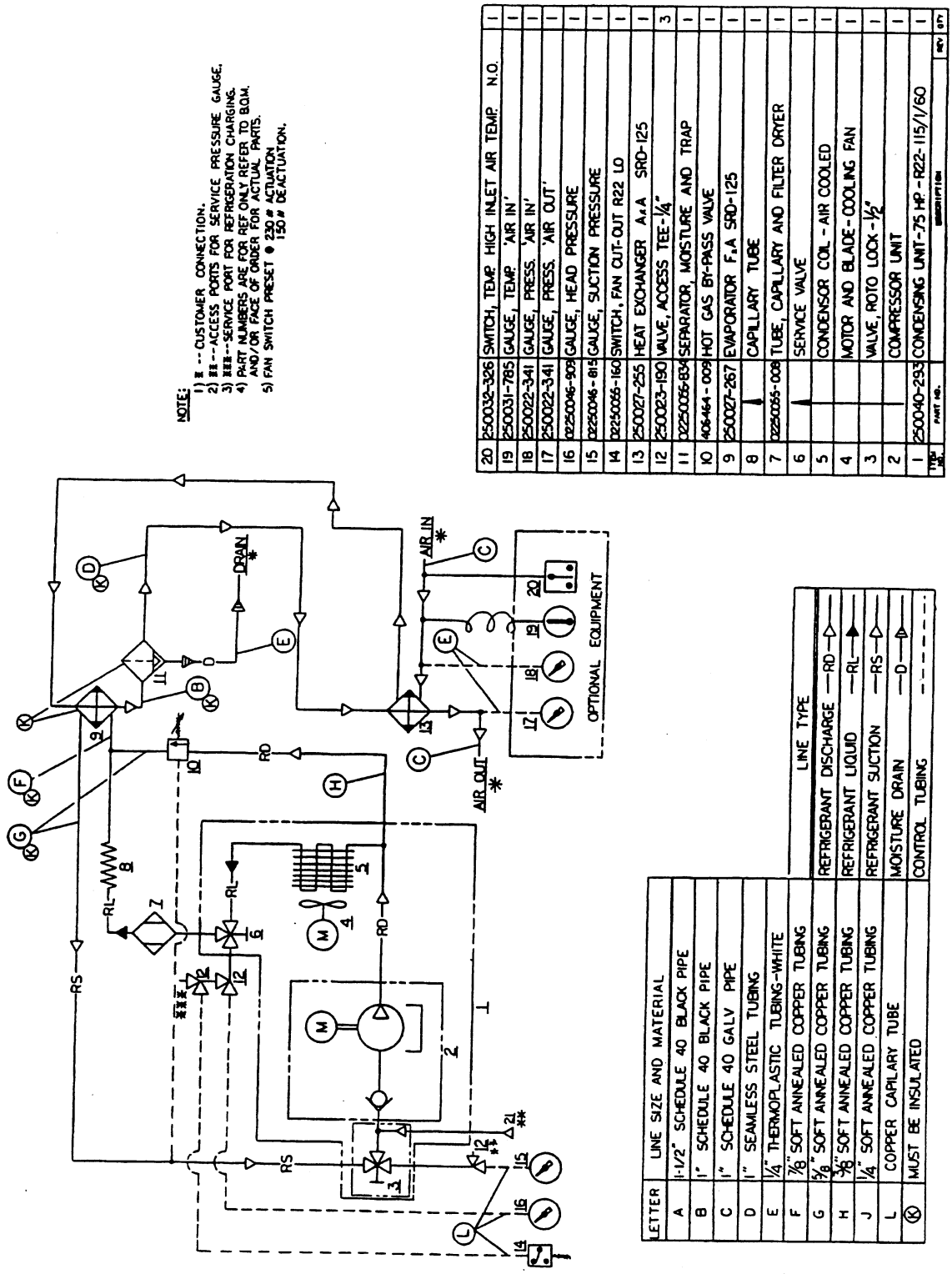
7.11 FRAME, COVER AND PARTS – SRD 125, 190, 300

key number	*description*	*part number*	*quantity*
1	screw, pan 1/4"–28 x 1/2"	835304–050	21
2	cover, end assembly	250031–202	1
3	frame, assembly	250038–398	1
4	bracket, cooler a x a mounting	250030–736	1
5	nut, hex 5/16"–18	825305–283	8
6	cover, enclosure center	250029–271	1
7	cover, end assembly	250029–270	1
8	screw, hex 5/16" x 3/4"	829705–075	8
9	nameplate, Sullair w/serial number	02250059–318	1
10	rivet, pop 1/8" x 1/2"	843102–050	6
11	dataplate, PSII and PDC refrigerated dryer	250022–022	1
12	gauge, pressure suction – freon	02250046–815	1
13	gauge, pressure head – freon	02250046–909	1
14	bracket, cooler f x a mounting	250030–725	1

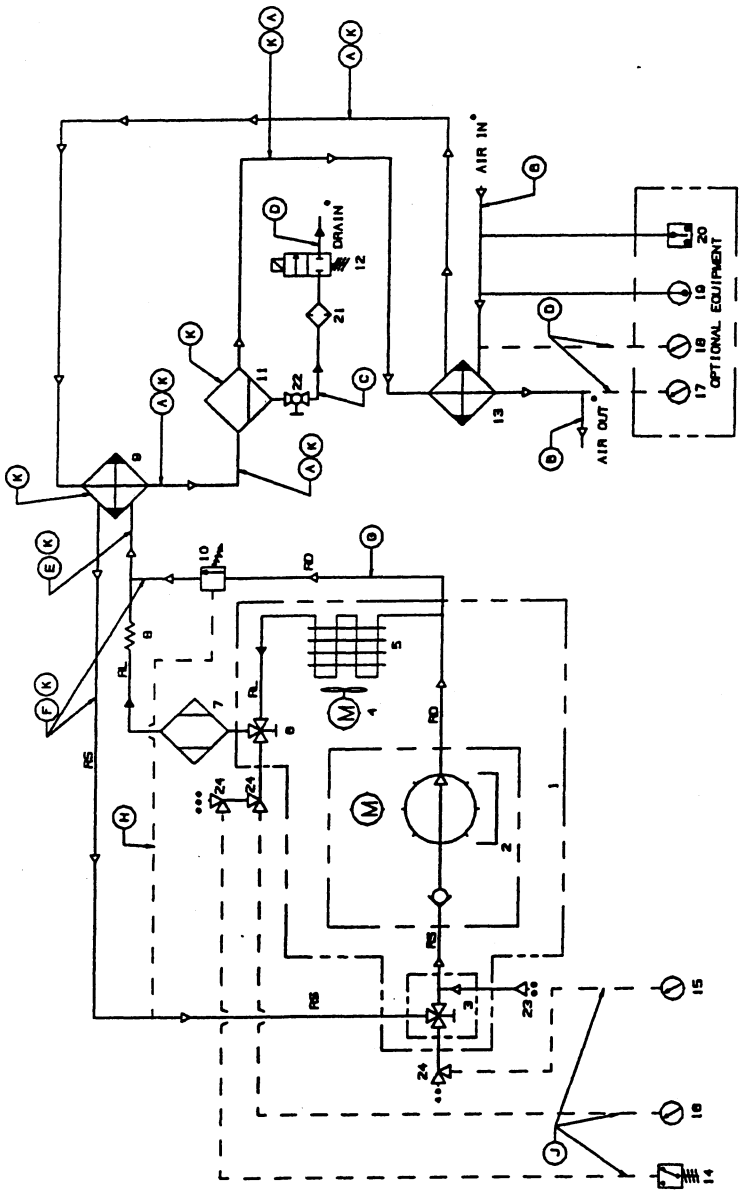
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

ILLUSTRATIONS AND PARTS LIST

7.12 PIPING AND INSTRUMENTATION – MODEL SRD 125



7.13 PIPING AND INSTRUMENTATION – MODEL SRD 190



LINE SIZE AND MATERIAL SCHEDULE	
LETTER	LINE SIZE AND MATERIAL
A	1 1/2" SCHEDULE 40 BLACK PIPE
B	1 1/4" SCHEDULE 40 GALV PIPE
C	1 1/4" GALV PIPE
D	1/4" THERMOPLASTIC TUBING
E	7/8" COPPER TUBING
F	5/8" COPPER TUBING
G	3/8" COPPER TUBING
H	1/4" COPPER CAPILLARY TUBE
J	COPPER CAPILLARY TUBE
K	MUST BE INSULATED

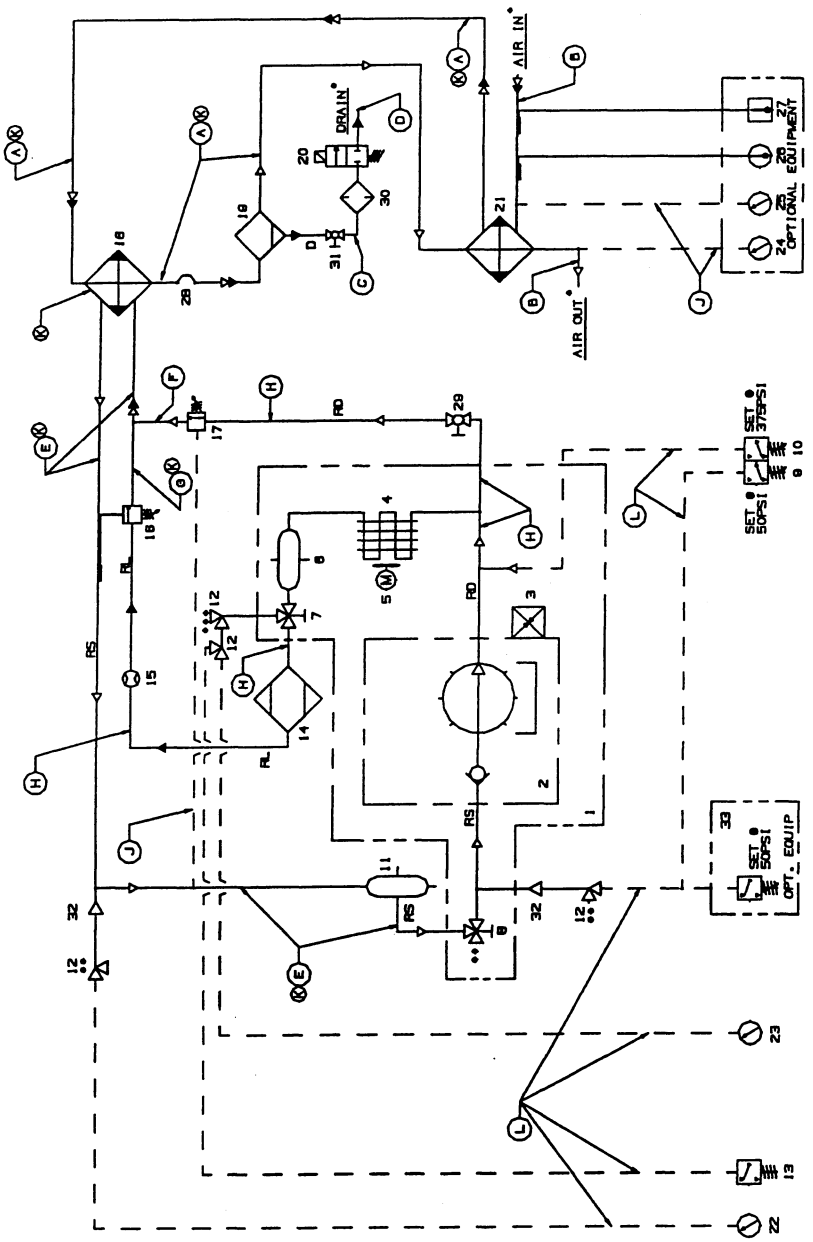
LEGEND	
	REFRIGERANT DISCHARGE - RD
	REFRIGERANT LIQUID - RL
	REFRIGERANT SUCTION - RS
	MOISTURE DRAIN - D
	CONTROL LINE

NOTE:
1) • CUSTOMER CONNECTION
2) •• ACCESS PORTS FOR SERVICE PRESSURE GAUGE
3) ••• SERVICE PORT FOR REFRIGERANT CHARGING
4) PART NUMBERS ARE FOR REFERENCE ONLY, REFER TO BOM AND/OR FACE OF ORDER FOR ACTUAL PARTS.
5) FAN SWITCH PRESET ● 230° ACTUATION
150° DEACTUATION

24	02250032-322	VALVE, ACCESS TEE 1/4"	-	3
23	250023-191	VALVE, ACCESS STRAIGHT 1/4"	-	1
22	047115	VALVE, BALL 1/4"	-	1
21	241771	STRAINER, "Y" 1/4"	-	1
20	250032-328	SWITCH, TEMP HIGH INLET AIR	-	1
19	250031-785	GAUGE, TEMP. "AIR IN"	-	1
18	250022-341	GAUGE, PRESS. "AIR IN"	-	1
17	250022-341	GAUGE, PRESS. "AIR OUT"	-	1
16	02250048-809	GAUGE, HEAD PRESSURE	-	1
15	02250048-815	GAUGE, SUCTION PRESSURE	-	1
14	02250055-180	SWITCH, FAN CUT-OUT R-22 LO	-	1
13	250027-258	HEAT EXCHANGER AxA SRD-180	-	1
12	250038-163	VALVE, SOLENOID-1/4" N.C.	-	1
11	250023-088	SEPARATOR, MOISTURE	-	1
10	406484-009	HOT GAS BYPASS VALVE	-	1
9	250027-288	EVAPORATOR FxA SRD-190	-	1
8	-	CAPILLARY TUBE	-	1
7	250022-188	TUBE, CAPILLARY & FILTER DRYER	-	1
6	-	SERVICE VALVE	-	1
5	-	CONDENSER COIL AIR COOLED	-	1
4	-	MOTOR AND BLADE COOLING FAN	-	1
3	-	VALVE, ROTO LOCK 5/8	-	1
2	-	COMPRESSOR UNIT	-	1
1	250040-294	CONDENSING UNIT 1HP R22	-	1

ILLUSTRATIONS AND PARTS LIST

7.14 PIPING AND INSTRUMENTATION – MODEL SRD 300



NOTES:
1) ● = CUSTOMER CONNECTIONS;
2) ●● = ACCESS FOR SERVICE PRESSURE GAUGE.
3) ●●● = SERVICE PORT FOR REFRIGERANT CHARGING.
4) PARTS ARE FOR REFERENCE ONLY, REFER TO BILL OF MATERIAL AND/OR FACE OF ORDER FOR ACTUAL PARTS.
5) FAN SWITCH #1 PRESET @ 230# ACTUATION, 150# DEACTUATION.
6) WITH CONTROLS OPTION, SUCTION CAPILLARY LINE TO ITEM #8 TO BE DISCONNECTED.

LINE SIZE AND MATERIAL SCHEDULE	
LETTER	LINE SIZE AND MATERIAL
A	1-1/2" BLACK PIPE
B	1-1/2" GALV PIPE
C	1/4" GALV PIPE
D	1/4" THERMOPLASTIC TUBING
E	7/8" COPPER TUBING
F	5/8" COPPER TUBING
G	1/2" COPPER TUBING
H	3/8" COPPER TUBING
J	1/4" COPPER TUBING
(K)	MUST BE INSULATED
L	COPPER CAPILLARY TUBE

LEGEND	
REFRIGERANT GAS/LIQUID	◁▶
REFRIGERANT DISCHARGE - RD	◁▶
REFRIGERANT LIQUID - RL	◁▶
REFRIGERANT SUCTION - RS	◁▶
WET AIR	◁▶
DRY AIR	◁▶
MOISTURE DRAIN - D	◁▶
CONTROL LINE	- -

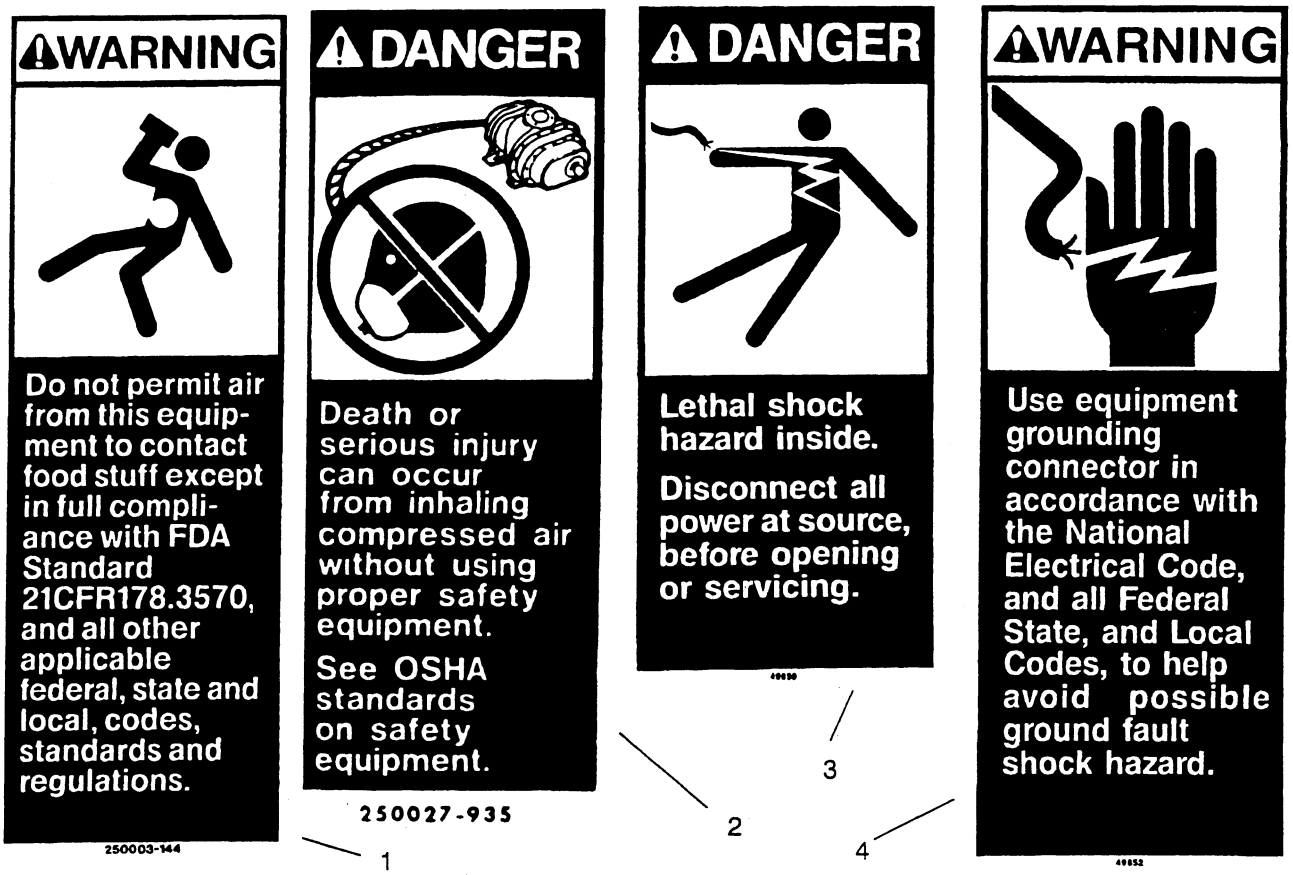
33	406454	LOW SUCTION/HIGH HEAD PRESS SWITCH	1
32	250023-191	VALVE, ACCESS STRAIGHT (SOLDER)	2
31	047115	VALVE, BALL 1/4" NPT	1
30	241771	STRAINER, DRAIN LINE-1/4"	1
29	406483-001	VALVE, SHUT-OFF HAND CONTROL-3/8"	1
28	406869-002	COUPLING, FLEXMASTER-1 1/2"	1
27	250032-328	SWITCH, TEMP HIGH INLET AIR TEMP-N.O.	1
26	250031-785	GAUGE, TEMP. 'AIR IN'	1
25	250022-341	GAUGE, PRESSURE 'AIR IN'	1
24	250022-341	GAUGE, PRESSURE 'AIR OUT'	1
23	0225048-808	GAUGE, HEAD PRESSURE	1
22	0225048-818	GAUGE, SUCTION PRESSURE	1
21	250027-257	HEAT EXCHANGER, AMA SRD-300	1
20	250038-163	VALVE, SOLENOID-1/4" N.C.	1
19	250023-098	MOISTURE, SEPARATOR	1
18	250027-268	EVAPORATOR, FMA SRD-300	1
17	406484-008	VALVE, HOT GAS BY-PASS	1
16	250038-188	VALVE, EXPANSION	1
15	406482	SIGHT GLASS, MOISTURE INDICATOR	1
14	406227	FILTER-DRYER	1
13	0225005-160	SWITCH, COND FAN CUTOUT	1
12	250023-190	VALVE, ACCESS TEE-1/4"	4
11	406408-005	ACCUMULATOR, SUCTION LINE	1
10		HIGH HEAD PRESSURE SWITCH	1
9		LOW SUCTION PRESSURE SWITCH	1
8		VALVE, ROTOLOCK-COMPRESSOR INLET	1
7		VALVE (PART OF RECEIVER TANK) PRESS. TAP	1
6		RECEIVER TANK	1
5		MOTOR AND BLADE - COOLING FAN	1
4		CONDENSING COIL - AIR COOLED	1
3		SUMP HEATER	1
2		COMPRESSOR UNIT	1
1	250040-295	UNIT, COND-1-1/2HP-R22 460/3/60	1

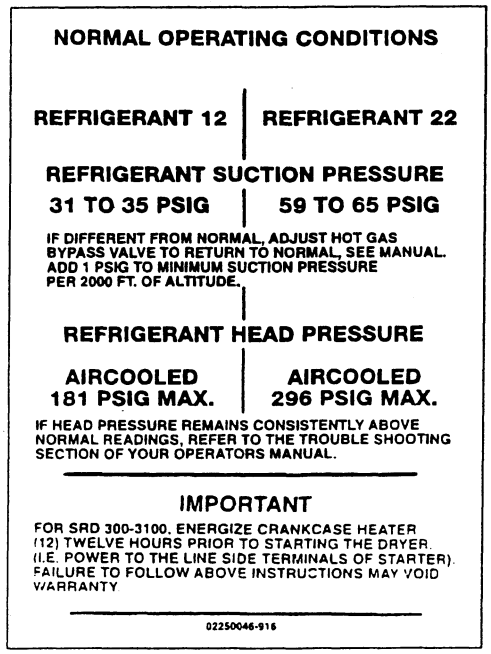
NOTES

Section 7

ILLUSTRATIONS AND PARTS LIST

7.15 DECAL GROUP

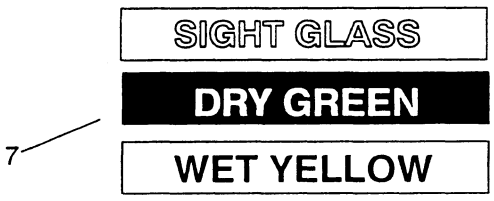




5

RUN	POWER	DRAIN	HOT GAS BYPASS VALVE
AIR INLET	AIR OUTLET	START	THERMAL EXPANSION VALVE
REFRIGERANT HEAD PRESSURE	REFRIGERANT SUCTION PRESSURE	STOP	250031-275

6



7

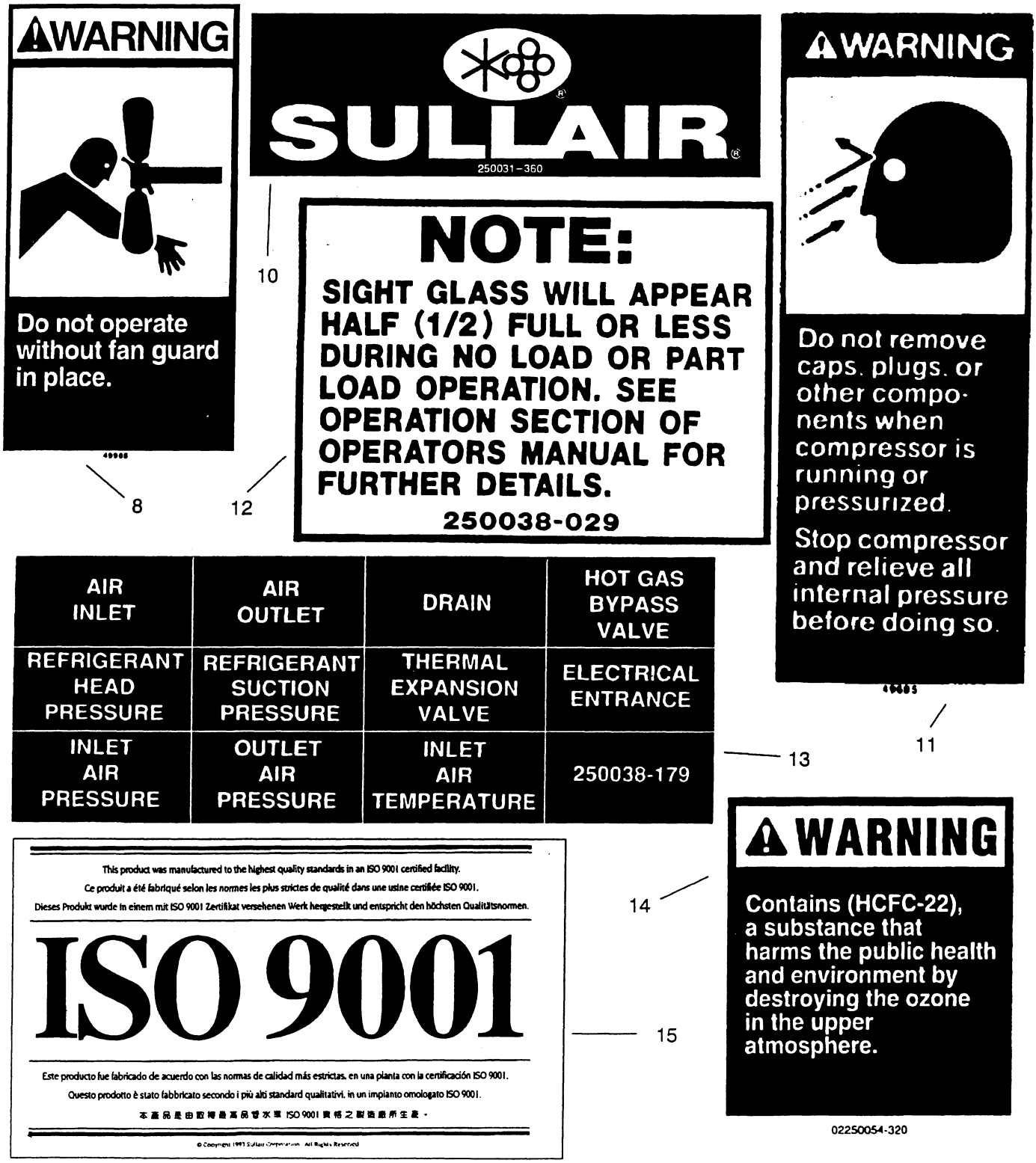
7.15 DECAL GROUP

key number	*description*	*part number*	*quantity*
1	sign, warning "food grade" lube	250003–144	1
2	decal, danger breathing	250027–935	1
3	sign, danger electrocution	049850	1
4	sign, warning ground fault	049852	1
5	decal, SRD normal open cond.	02250046–916	1
6	decal, controls kit SRD	250031–275	1
7	decal, sight glass PSII and PDC (SRD 300 only)	250024–165	1

(Continued on Page 49)

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

7.15 DECAL GROUP



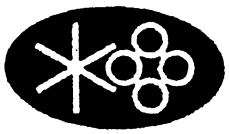
7.15 DECAL GROUP (Continued)

key number	*description*	*part number*	*quantity*
8	sign, warning sever fan port	049965	1
9	decal, SRD 125 (not shown)	250034–807	2
	decal, SRD 190 (not shown)	250034–808	2
	decal, SRD 300 (not shown)	250030–187	2
10	decal, Sullair with logo (not shown)	250031–360	2
11	sign, warning pressurized	049685	1
12	decal, SRD sightglass	250038–029	1
13	kit, decal standard controls	250038–179	1
14	decal, warning HCFC 22	02250054–320	1
15	decal, ISO 9001	Consult Factory	1
16	decal, controls (SRD 25, 190) (not shown)	250038–177	1
17	decal, controls (SRD 300) (not shown)	250038–175	1

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF DRYER

NOTES

WORLDWIDE SALES AND SERVICE



SULLAIR ASIA, LTD.
ROOM 2304A
Shartex Plaza Ctr.
No. 88 Zun Yi Nan Rd.
Shanghai, P.R.C.
Telephone: 21–2192066
FAX: 21–2196568

SULLAIR EUROPE, S.A.
Chemin de Genas BP 639
69800 Saint Priest, France
Telephone: 33–72232425
FAX: 33–78907168

SULLAIR CORPORATION
Subsidiary of Sundstrand Corporation
3700 East Michigan Boulevard
Michigan City, Indiana 46360 U.S.A.
Telephone: 1–800–SULLAIR or
1–219–879–5451
FAX: (219) 874–1273

AA120

Part Number

02250055-220

Printed in U.S.A.