Operator's Manual

SULLAIR®
COMPRESSOR

Series 10B 50HP Standard
Industrial Rotary Screw Air Compressor

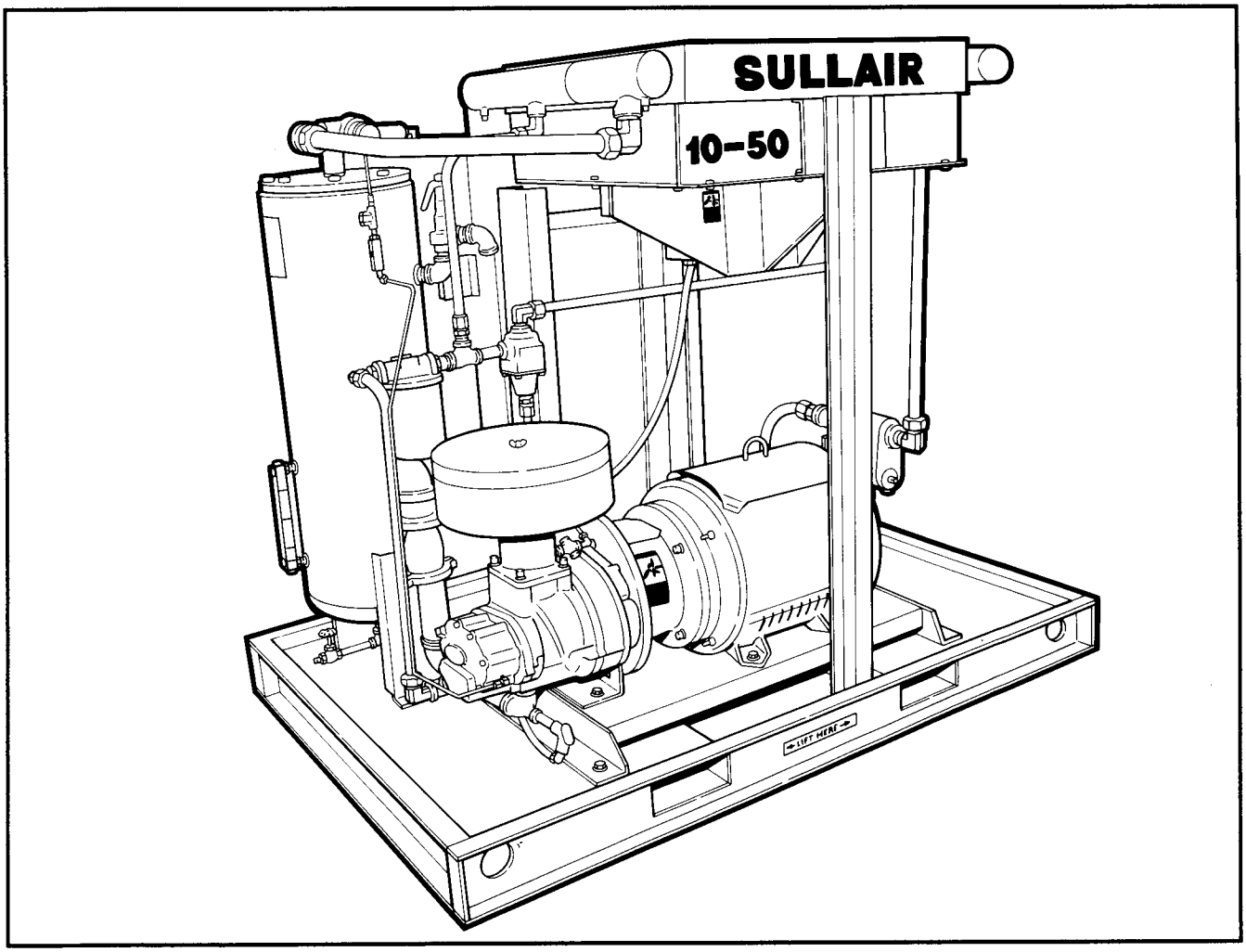

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TABLE OF CONTENTS

TABLE OF CONTENTS
(CONTINUED)

Section 1
SAFETY

1.1 GENERAL

Sullair® Corporation and its subsidiaries design and manufacture 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 compressor should be operated only by those who have been trained and delegated to do so, and who have read and understand this Operators Manual. Failure to follow the instructions, procedures and safety precautions in this manual can result in accidents and injuries.

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

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

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

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

1.2 PERSONAL PROTECTIVE EQUIPMENT

Prior to installing or operating the compressor, 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 RELEASE

A. Install an appropriate flow limiting valve between the service air outlet and the shut-off (throttle) valve, either at the compressor or at any other point along the air line, when an air hose exceeding ½" inside diameter is to be connected to the shut-off (throttle) valve, to reduce pressure in case of hose failure, per OSHA Standard 29 CFR 1926.302(b)(7).

B. When the hose is to be used to supply a manifold, install an additional appropriate flow limiting valve between the manifold and each air hose exceeding ½" inside diameter that is to be connected to the manifold to reduce pressure in case of hose failure.

C. Provide an appropriate flow limiting valve at the beginning of each additional 75 feet of hose in runs of air hose exceeding ½" inside diameter to reduce pressure in case of hose failure.

D. Flow limiting valves are listed by pipe size and rated CFM. Select appropriate valves accordingly, in accordance with their manufacturer's recommendations.

E. **DO NOT** use air tools that are rated below the maximum rating of the compressor. Select air tools, air hoses, pipes, valves, filters, and other fittings accordingly. DO NOT exceed manufacturer's rated safe operating pressures for these items.

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

G. Open fluid filter cap only when compressor **is not running and is not pressurized.** Shut down the compressor and bleed the sump (receiver) to zero internal pressure before removing the cap.

H. Vent all internal pressure prior to opening any line, fitting, hose, valve, drain plug, connection or other component, such as filters and line oilers, and before attempting to refill optional air line anti-icer systems with antifreeze compound.

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

J. Use air at pressures less than 30 PSIG (207kPa) for cleaning purposes, and then only with effective chip guarding and personal protective equipment per OSHA Standard 29 CFR 1910.242 (b).

K. **DO NOT** engage in horseplay with air hoses as death or serious injury may result.

1.4 FIRE AND EXPLOSION

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

B. Shut off the compressor and allow it to cool. Then keep sparks, flames and other sources of ignition away and **DO NOT** permit smoking in the vicinity when checking or adding lubricant or when refilling air line anti-icer systems with antifreeze compound.

C. **DO NOT** permit fluids, including air line anti-icer system antifreeze compound or fluid film to accumulate on under or around acoustical material, or on any external surfaces of the air compressor or on internal surfaces of the enclosure. Wipe down using an aqueous industrial cleaner or steam clean as required. If necessary, remove acoustical material, 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.

D. Disconnect and lock out all power at source prior to attempting any repairs or cleaning of the compressor 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 compressor.

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

J. **DO NOT** operate the compressor 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 in any classification of hazardous environment unless the compressor has been specially 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 compressor with the fan, coupling or other guards removed.

C. Wear snug fitting clothing and confine long hair when working around this compressor, 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 compressor prior to attempting to start or operate it.

F. Disconnect and lock out all power at source and verify at the compressor 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 compressors 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 compressor.

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 compressor for respiration (breathing) except in full compliance with OSHA Standards 29 CFR 1910 and any other Federal, State or Local Codes or regulations.

⚠ DANGER

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

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 compressor only in open or adequately ventilated areas.

D. Locate the compressor or provide a remote inlet so that it is not likely to ingest exhaust fumes or other toxic, noxious or corrosive fumes or substances.

E. Coolants and lubricants used in this compressor are typical of the industry. Care should be taken to avoid accidental ingestion and/or skin contact. In the event of ingestion, seek medical treatment promptly. Wash with soap and water in the event of skin contact.

F. Wear goggles or a full face shield when adding antifreeze compound to air line anti-icer systems.

G. If air line anti-icer system antifreeze compound enters the eyes or if fumes irritate the eyes, they should be washed with large quantities of clean water for 15 minutes. A physician, preferably an eye specialist, should be contacted immediately.

H. **DO NOT** store air line anti-icer system antifreeze compound in confined areas.

I. The antifreeze compound used in air line antifreeze systems contains methanol and is toxic, harmful, or fatal if swallowed. Avoid contact with the skin or eyes and avoid breathing the fumes. If swallowed, induce vomiting by administrating a tablespoon of salt, in each glass of clean, warm water until vomit is clear, then administer two teaspoons of baking soda in a glass of clean water. Have patient lay down and cover eyes to exclude light. Call a physician immediately.

1.8 ELECTRICAL SHOCK

A. This compressor 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 that 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 compressor 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 compressor 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 source prior to attempting repairs or adjustments to rotating machinery and prior to handling any ungrounded conductors.

1.9 LIFTING

A. If the compressor is provided with a lifting bail, then lift by the bail provided. If no bail is provided, then lift by sling. Compressors to be air lifted by helicopter must not be supported by the lifting bail but by slings instead. 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 conditions and has a rated capacity of at least the weight of the compressor. If you are unsure of the weight, then weigh compressor 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 compressor once it has been lifted clear of the ground.

F. **DO NOT** attempt to lift in high winds.

G. Keep all personnel out from under and away from the compressor whenever it is suspended.

H. Lift compressor no higher than necessary.

I. Keep lift operator in constant attendance whenever compressor is suspended.

J. Set compressor down only on level surfaces capable of safely supporting at least its weight and unit loading.

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

L. Make sure forklift truck forks are full engaged and tipped back prior to lifting or transporting the compressor.

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

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

Section 1
SAFETY

1.10 ENTRAPMENT

A. If the compressor 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 compressor before closing and latching enclosure doors.

2.1 INTRODUCTION

Your new Sullair® flood-lubricated rotary screw air compressor will provide you with a unique experience in improved reliability and greatly reduced maintenance.

Compared to other types of compressors, the Sullair rotary screw is unique in mechanical reliability, with "no wear" and "no inspection" required of the working parts within the compressor unit.

Read Section 5 (Maintenance) to see how surprisingly easy it is to keep your air compressor in top operating condition.

2.2 DESCRIPTION OF COMPONENTS

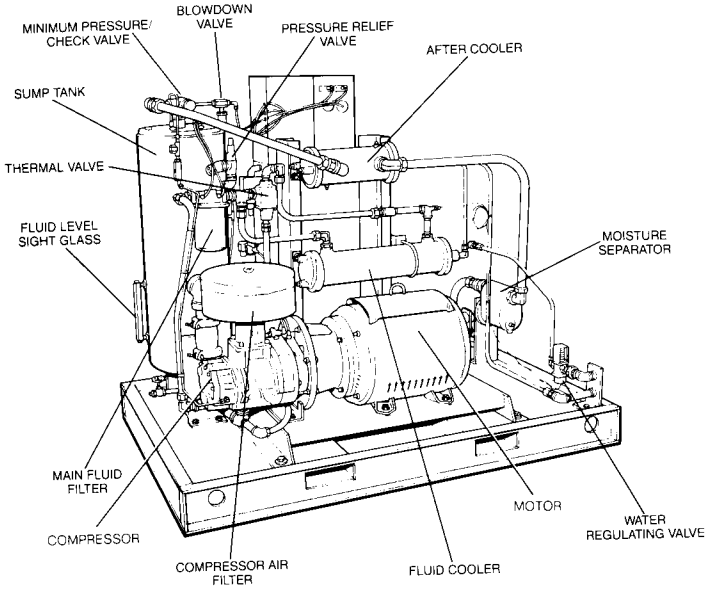
Refer to Figure 2-1. The components and assemblies of the air compressor are clearly shown. The complete package includes compressor, electric motor, starter, compressor inlet system, compressor discharge system, compressor lubrication and cooling system, capacity control system, instrument panel, aftercooler and combination separator and trap all mounted on a heavy gauge steel frame.

On air-cooled models, a fan draws air over the motor and forces it out through the combined aftercooler and oil cooler thereby removing the compression heat from the compressed air and the cooling oil.

On water-cooled models, a shell and tube heat exchanger is mounted on the compressor frame. Oil is piped into the heat exchanger where compression heat is removed from the oil. Another similar heat exchanger cools the compressed air.

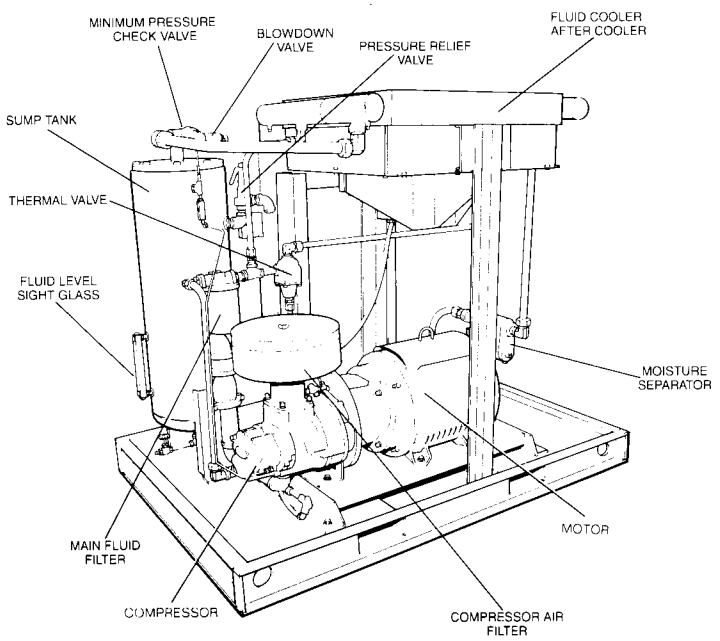
Both air-cooled and water-cooled versions have easily accessible items such as the oil filters and control valves. The inlet air filter is also easily accessible for servicing.

Figure 2-1 Sullair Rotary Screw Compressor



WATERCOOLED

AIRCOOLED



Section 2
DESCRIPTION

2.3 SULLISCREW® COMPRESSOR UNIT, FUNCTIONAL DESCRIPTION

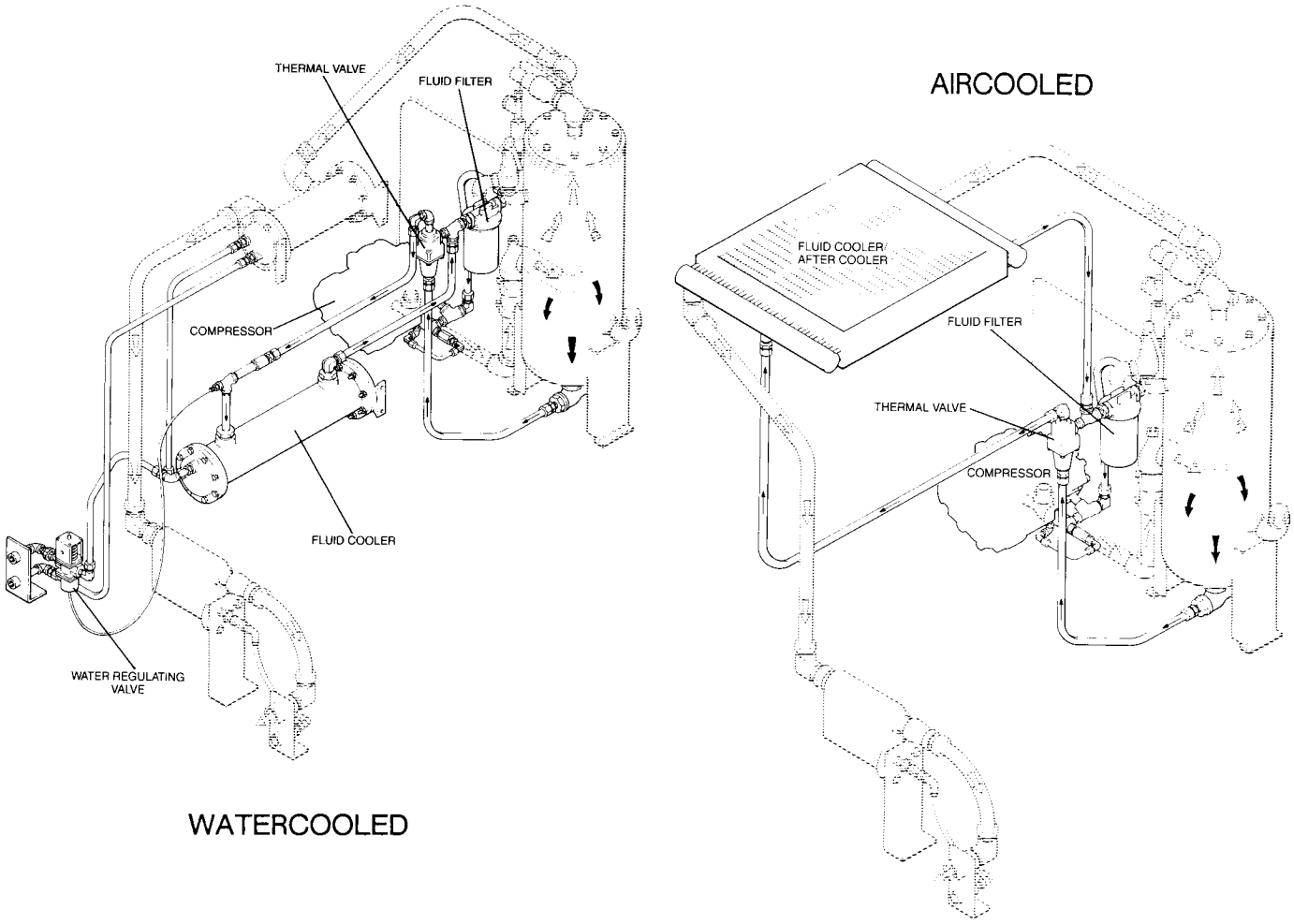
Sullair air compressors feature the Sulliscrew® compressor unit, a single-stage, positive displacement, flood lubricated-type compressor. This unit provides continuous pulse-free compression to meet your needs. With a Sullair compressor, there is no maintenance or inspection of the internal parts of the compressor unit permitted in accordance with the terms of the warranty.

Fluid is injected into the compressor unit in large quantities and mixes directly with the air as the rotors turn compressing the air. The fluid flow has three primary functions:

- As coolant, it controls the rise of air temperature normally associated with the heat of compression.
- Seals the leakage paths between the rotors and the stator and also between the rotors themselves.
- Acts as a lubricating film between the rotors allowing one rotor to directly drive the other, which is an idler.

After the air/fluid mixture is discharged from the compressor unit, it enters the separator/sump tank. There the larger droplets of fluid drop out of the air stream and are collected in the sump. The finer fluid mist is then removed from the air by a coalescing element, located in the upper part of the tank. The air then flows through an aftercooler and water separator to the service line. The fluid from the sump flows through a thermal valve, cooler and fluid filter prior to being reinjected into the compressor unit.

Figure 2-2 Compressor Fluid Cooling and Lubrication System



2.4 COMPRESSOR COOLING AND LUBRICATION SYSTEM, FUNCTIONAL DESCRIPTION

Refer to Figure 2-2. The cooling system (air-cooled version) consists of a fan, fan motor, radiator-type aftercooler/oil cooler, full flow fluid filter, thermal valve, and interconnecting piping and tubing. For water-cooled models, two shell and tube heat exchangers and a water-flow regulating valve are substituted for the radiator-type cooler listed above.

The pressure in the receiver/sump causes fluid flow by forcing the fluid from the high pressure area of the sump to an area of lower pressure in the compressor unit.

Fluid flows from the bottom of the receiver/sump to the thermal valve. The thermal valve is fully open when the fluid temperature is below 170°F (76.7°C). The fluid passes through the thermal valve, the main filter and directly to the compressor unit where it lubricates, cools and seals the rotors and the compression chamber.

As the discharge temperature rises above 170°F (77°C), due to the heat of compression, the thermal valve begins to close and a portion of the fluid then flows through the cooler. From the cooler the fluid flows to the main filter and on to the compressor unit.

A portion of the fluid flowing to the compressor is routed to the anti-friction bearings which support the rotors inside the compressor unit.

The fluid filter has a replacement element and an integral pressure bypass valve. A gauge on the instrument panel indicates when the filter needs servicing. After the initial 50 hour filter change, the gauge should rarely show red under normal operating conditions.

Water-cooled versions of the compressor have a water-flow regulating valve which operates to conserve water during periods of varying load on the compressor. This same valve automatically shuts off the water supply when the compressor is shut down. In addition, water-cooled models have a water pressure switch to prevent operation with inadequate water pressure.

2.5 COMPRESSOR DISCHARGE SYSTEM, FUNCTIONAL DESCRIPTION

Refer to Figure 2-3. The compressor unit discharges the compressed air/fluid mixture into the combination receiver/sump. The receiver has three functions:

- It acts as a primary fluid separator.
- Serves as the compressor fluid sump.
- Houses the final fluid separator.

The compressed air/fluid mixture enters the separator and is directed toward the bottom of the separator element. The direction of movement is changed and its velocity significantly reduced, thus causing the large droplets of fluid to fall to the bottom of the receiver/sump. The fractional percentage of fluid remaining in the compressed air collects on the surface of the separator element as the compressed air flows through the separator. A return line (or scavenge tube) leads from the bottom of the separator element to the inlet region of the compressor unit. Fluid collecting on the bottom of the separator is returned to the compressor by a pressure differential between the receiver and the compressor inlet. A visual sight glass is located in the return line to observe this fluid flow. There is also an orifice in this return line (protected by a strainer) to assure proper flow. A gauge, located on the instrument panel, indicates if abnormal pressure drop through the separator develops. At this time, separator element replacement is necessary.

The receiver is ASME code rated at 175 PSIG (1206kPa) working pressure. A minimum pressure/check valve, located downstream from the separator, assures a minimum receiver pressure of 55 PSIG (379kPa) during all conditions except during blowdown. This pressure is necessary for proper air/fluid separation and proper fluid circulation.

A terminal check valve is incorporated into the minimum pressure/check valve to prevent compressed air in the service line from bleeding back into the receiver on shutdown and during operation of the compressor in an unloaded condition.

A pressure relief valve (located on the wet side of the separator) is set to open if the sump pressure exceeds 175 PSIG (1206kPa). A temperature switch will shut down the compressor if the discharge temperature reaches 240°F (115°C).

All compressor models are equipped with a high pressure shutdown switch to shut down the compressor at 135 PSIG (931kPa). This prevents the pressure relief valve from opening under routine conditions, thereby preventing fluid loss through the pressure relief valve.

⚠WARNING

DO NOT remove caps, plugs, or other components when compressor is running or pressurized.

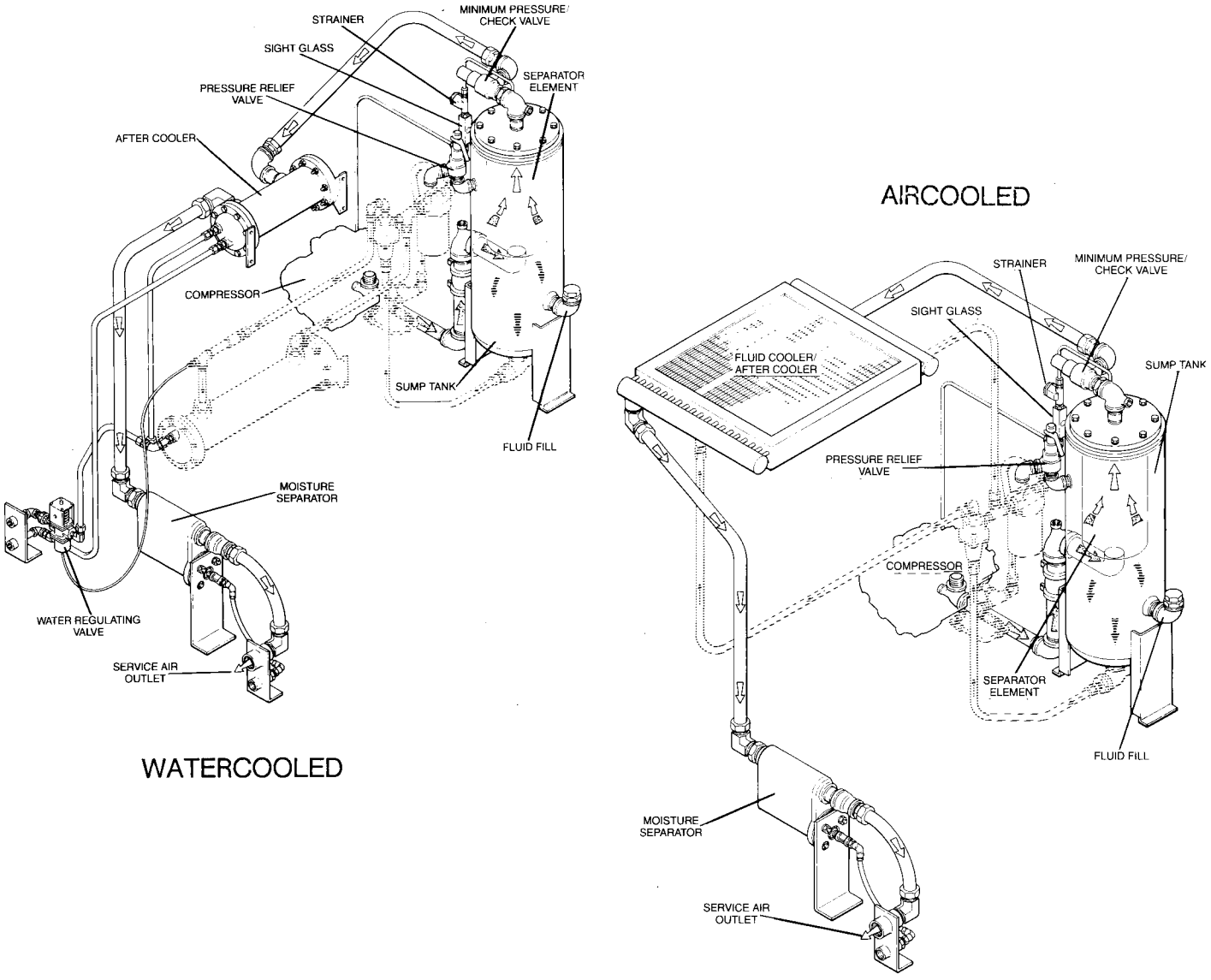
Stop compressor and relieve all internal pressure before doing so.

Fluid is added to the sump via a capped fluid filler opening, placed low on the tank to prevent overfilling of the sump. A sight glass enables the operator to visually monitor the sump fluid level

2.6 CONTROL SYSTEM, FUNCTIONAL DESCRIPTION

Refer to Figure 2-4. The purpose of the control system is to regulate the amount of air intake in

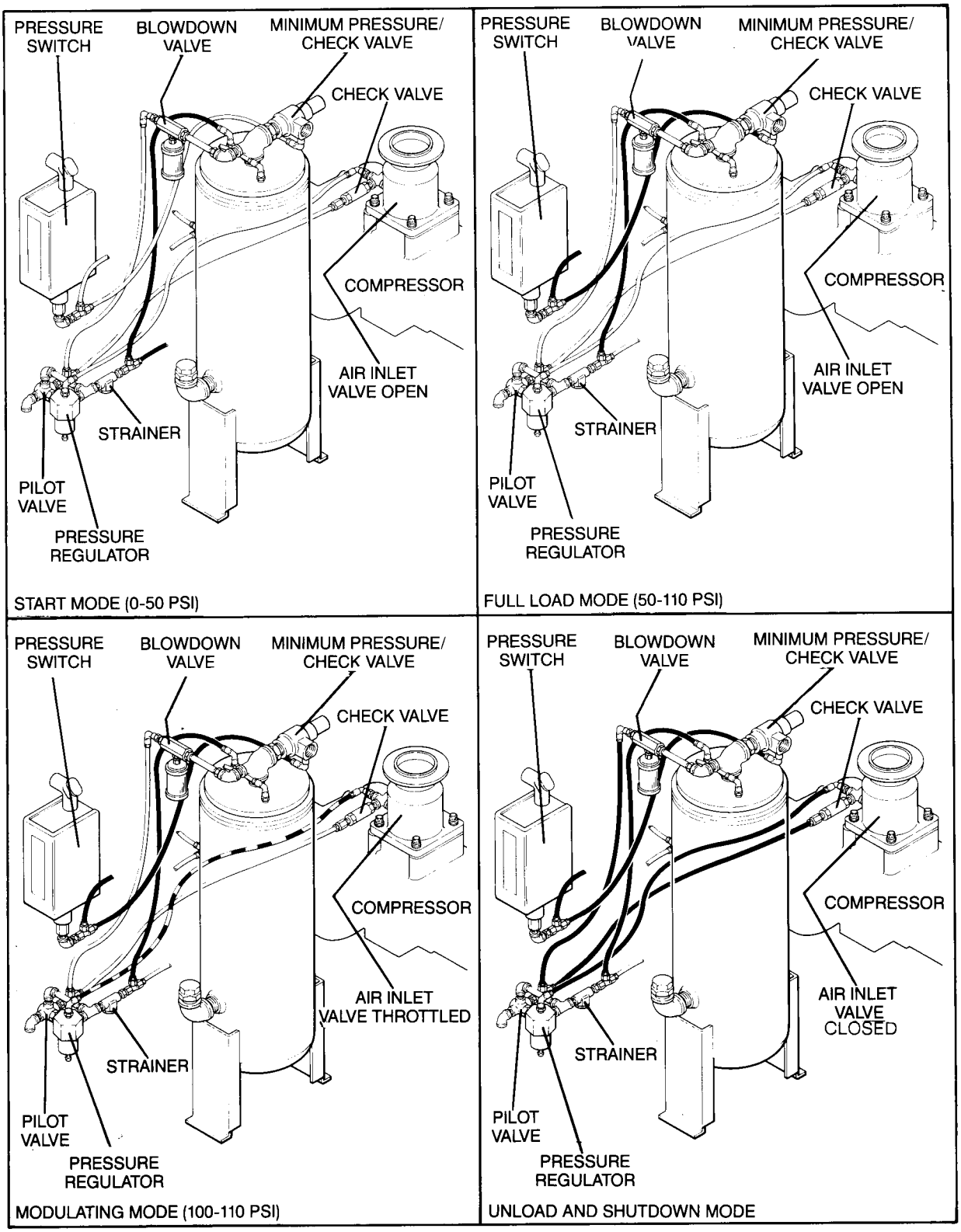
Figure 2-3 Compressor Discharge System



accordance with the amount of compressed air being used. The control system consists of an inlet valve, pressure regulating valve, blowdown valve, pressure switch and pilot valve. The functional description of the control system is described below in 4 distinct phases of operation. This description will apply to all control systems with the exception of the stated pressures which may vary depending on your pressure requirements. The pressures stated will be in accordance with a compressor having an operating pressure range of 100 to 110 PSIG (690 to 760 kPa).

START - 0 TO 55 PSIG (0 TO 380kPa)
When the compressor start button is depressed, the pressure will quickly rise from 0 to 55 PSIG (0 to 380kPa). During this period the pressure

Figure 2-4 Control System, Sequence of Operation



regulator valve is inoperative. The inlet valve is fully open due to inlet air flow, and the compressor pumps at full rated capacity.

NORMAL OPERATION - 55 TO 100 PSIG (380 TO 690kPa)
When the compressed air rises above 55 PSIG (380kPa), the minimum pressure valve opens and delivers compressed air to the service line. At this time, the inlet valve remains fully open for maximum air output.

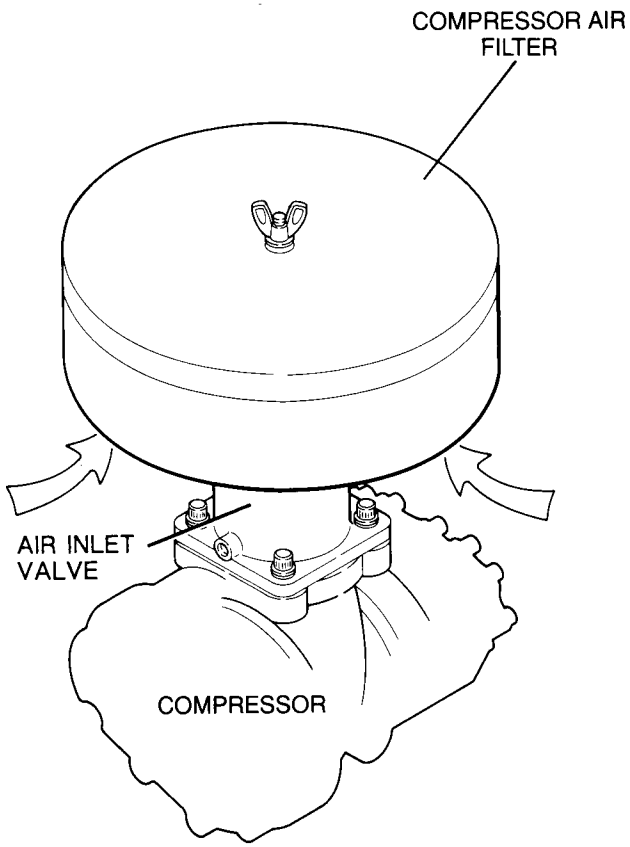
MODULATION - 100 TO 110 PSIG (690 TO 760kPa)
Should less than the rated capacity of air be used, the service line pressure will rise above 100 PSIG (690kPa). The pressure regulating valve gradually opens, applying pressure to the inlet valve piston. This causes the inlet valve to partially close reducing the amount of air entering the compressor until it matches the amount of air being used. The control system functions continually in this manner, between the limits of 100 to 110 PSIG (689 to 758kPa), in response to varying demands from the service line.

UNLOAD - IN EXCESS OF 110 PSIG (758kPa) LINE PRESSURE
When no air is being used, the service line pressure rises to the setting (cut-out pressure) of the pressure switch, the pressure switch opens, interrupting the electrical power to the solenoid-type pilot valve. At this time, the pilot valve allows dry sump tank air pressure to be applied directly to the inlet valve piston, keeping it closed. Simultaneously, the pilot valve sends a pneumatic signal to the blowdown valve. The blowdown valve opens the sump to atmosphere, reducing the sump pressure to approximately 20 to 30 PSIG (138 to 207kPa). The check valve in the service air line prevents line pressure from returning to the sump.

When the line pressure drops to the low setting (cut-in pressure) of the pressure switch (usually 100 PSIG [689kPa]), the pressure switch closes, re-engergizing the 3-way pilot valve and allowing the blowdown valve to close. The re-energized pilot valve again prevents line pressure from reaching the inlet valve. Should the pressure begin to rise, the pressure regulator will resume its normal function as previously described.

For a compressor with varied periods of time when there are no air requirements, a "Dual-Control" option is available. This option allows you to set the compressor in an automatic mode whereby the compressor will shut down when no compressed air requirement is present and restart as compressed air is needed.

Figure 2-5 Compressor Air Inlet System



SHUTDOWN
The blowdown valve is normally closed. Upon shutdown, a pressure signal is applied to the blowdown valve which opens, venting compressed air pressure to the atmosphere.

2.7 AIR INLET SYSTEM, FUNCTIONAL DESCRIPTION

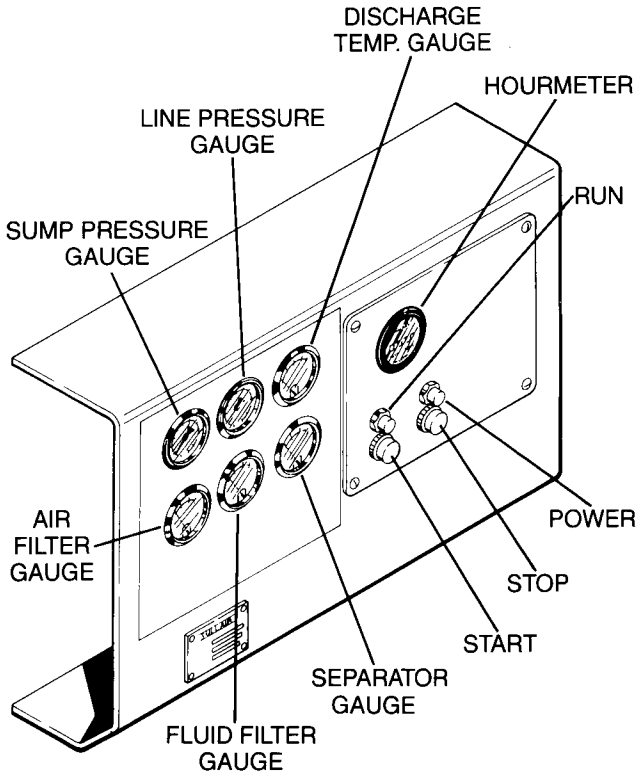
Refer to Figure 2-5. The air inlet systems consists of an air filter, and a compressor air inlet valve.

NOTE

The standard air filter is a single stage dry type filter. An optional heavy duty 2-stage dry type filter is available for areas where the air is extremely dirty.

See Section 5 for Air Filter Maintenance Procedures. The air filter gauge should be checked daily after start-up under normal conditions.

Figure 2–6 Instrument Panel Group



2.8 INSTRUMENT PANEL GROUP, FUNCTIONAL DESCRIPTION

Refer to Figure 2–6 for specific location of parts described. The instrument panel group consists of a panel containing the following gauges: line pressure, sump pressure, discharge temperature, air filter restriction separator restriction and fluid filter restriction. Also located on the panel are the hourmeter, START and STOP pushbuttons, a power on light and a compressor running light.

Refer to Figure 2–6 for locations of the following indicators and controls:

- The line (terminal) pressure gauge is connected to the dry side of the receiver downstream from the check valve and continually monitors the air pressure.
- The sump pressure gauge continually monitors the sump pressure at the various load and/or unload conditions.
- The discharge temperature gauge monitors the temperature of the air leaving the compressor unit. For both air–cooled and water–cooled compressors the normal reading is approximately 180°F to 205°F (82 °C to 96°C).
- The air filter restriction gauge monitors the condition of the air intake filter and shows in the red zone (20 to 30" water [51 to 76 cm]) when filter service is required (see Figure 2–5).
- The separator maintenance gauge monitors the condition of the separator element and shows in the red zone when the element restriction is excessive and should be replaced.
- The fluid filter maintenance gauge monitors the condition of the compressor fluid filter element and shows in the red zone when the element should be changed.
- The START pushbutton turns the compressor on.
- The STOP pushbutton turns the compressor off.
- The hourmeter records cumulative hours of operation for the compressor and is useful for planning and logging service operations.
- The red light on the instrument panel indicates when power to the compressor is supplied.
- The green light indicates when the compressor is running.
- The optional dual control package is supplied with an amber auto mode indicator light to indicate that the unit is running in the automatic mode. A two position selector switch provides selection between hand operation and automatic control.

Section 3
SPECIFICATIONS

SULLAIR SERIES 10B SPECIFICATIONS

Model Series	Length		Width		Height		Weight*	
	in	mm	in	mm	in	mm	lb	kg
10B-50HP (STD)	**72**	1829	**48**	1219	**60**	1524	**1850**	839
ENCLOSURE (Optional)	**72**	1829	**48**	1219	**63**	1600	**500**	227
EES PACKAGE (Optional)	**89**	2261	**48**	1219	**103**	2616	**600**	272

COMPRESSOR:	**STANDARD MODELS**
Type	Rotary Screw
Standard Operating Pressure	100 PSI (689kPa) (L) 115 PSI (792kPa) (H)
Bearing Type	Anti-Friction
Ambient Temperature (Max.)**	105°F (40°C)
Cooling	Pressurized Fluid
Compressor Fluid	SRF 1/4000 Fluid or Equal
Sump Capacity	8.0 U.S. Gallons (30.25 Liters)
Control	Electro-Pneumatic

MOTOR: (60 Cycle Compressors)

	STANDARD MODELS
Size	50 HP
Type	C-Flanged, Open Dripproof, 460V, A.C., Three Phase, 60 Cycles 40°C Maximum Ambient Temperature Options Available: 200V 230V and 575V T.E.F.C. Also Available
Starter	460V Full Voltage Magnetic Options Available 200V, 230V and 575V
Speed	3550 RPM

MOTOR: (50 Cycle Compressors)

	STANDARD MODELS
Size	50 HP
Type	C-Flanged, Open Dripproof, 380/415V, A.C., Three Phase, 50 Cycles 40°C Maximum Ambient Temperature
Starter	460V Full Voltage Magnetic
Speed	2950 RPM

* The weights shown for the Enclosure and EES packages does not include the weight of the compressor package.

** Special machines are available for operation in higher ambient temperature.

LUBRICATION GUIDE-STANDARD COMPRESSORS

Sullair standard compressors are filled with SRF 1/4000 fluid factory fill. MIXING OF OTHER FLUIDS WITHIN THE COMPRESSOR WILL VOID ALL WARRANTIES.

SRF 1/4000 fluid should be changed every 4000 hours or once a year, whichever comes first. The fluid should be changed more frequently under severe operating conditions, such as high ambient temperatures coupled with high humidity, or when high particulate level, corrosive gases or strong oxidizing gases are present in the air.

For extended life synthetic lubricants contact the nearest Sullair representative.

Maintenance of all other components is still recommended as indicated in the Operators Manual.

APPLICATION GUIDE

Sullair encourages the user to participate in an oil analysis program with the oil suppliers. This could result in an oil change interval differing from that stated in the manual. Contact your Sullair dealer for details.

Section 4
INSTALLATION

4.1 MOUNTING OF COMPRESSOR

A foundation or mounting capable of supporting the weight of the compressor, and rigid enough to maintain the compressor frame level and the compressor in alignment is required. The compressor frame must be leveled and secured with foundation bolts, and full uniform contact must be maintained between the frame and foundation. No piping loads shall be transmitted to the compressor at the external connections.

4.2 VENTILATION AND COOLING

For air-cooled compressors, select a location to permit sufficient unobstructed air flow in and out to the compressor to keep the operating temperature stable. The minimum distance that the compressor should be from surrounding walls is three (3) feet (914mm). To prevent excessive ambient temperature rise, it is imperative to provide adequate ventilation.

For water-cooled compressors, it is necessary to check the cooling water supply. The water system must be capable of supplying the following flows:

WATER TEMP. (0°F)	WATER FLOW (GPM)
70	7.0
80	9.5

(Water pressure should be between 25 and 75 PSIG (170 to 520kPa).

For water-cooled compressors, it is necessary to check cooling water supply. The proper water flow as indicated in the table above, must be maintained at all times. These figures apply to a compressor running at full load with an aftercooler. For cooler water or a partially loaded compressor, slightly less water is required. However, for hotter water the flow requirements are significantly greater.

The table below indicates the ventilation requirements necessary to keep the compressor running at a normal operating temperature. The fan air requirement is the volume of air which must flow through the compressor for proper ventilation. The specified heat rejection requirement is the amount of heat that is radiated by the compressor. This heat must be removed to assure a normal operating temperature. With air-cooled compressors it is possible to use this heat for space heating, providing no additional pressure drop is created across the fan. Consult your Sullair representative for assistance in utilizing this heat.

DO NOT install a water-cooled or an air-cooled/aftercooled compressor where it will be exposed to temperature less than 32°F(0°C) without providing freeze protection.

4.3 SERVICE AIR PIPING

Service air piping should be installed as shown in Figure 4-1. A shut-off valve should be installed to isolate a compressor from the service line if required. Also notice that the service line should be equipped with water legs and condensate drains throughout the system.

4.4 COUPLING ALIGNMENT CHECK

No coupling alignment is required.

4.5 FLUID LEVEL CHECK

The air compressor is also supplied with the proper amount of fluid. However, it is necessary to check the fluid level at installation. The level is checked by looking at the sight glass located near the sump. If the sump is properly filled, the fluid level should be visible in the sight glass.

4.6 ELECTRICAL PREPARATION

Electrical wiring of the compressor package has been performed at the factory. The customer is required performed to do a minimal amount of wiring, primarily power to the starter. This should be done be a qualified electrician in compliance with OSHA, National Electric Code, and any other applicable local electrical code concerning isolation switches, fuse disconnects, etc. Sullair provides a wiring diagram for use by the installer.

⚠DANGER

Lethal shock hazard inside.

Disconnect all power at source, before opening or servicing.

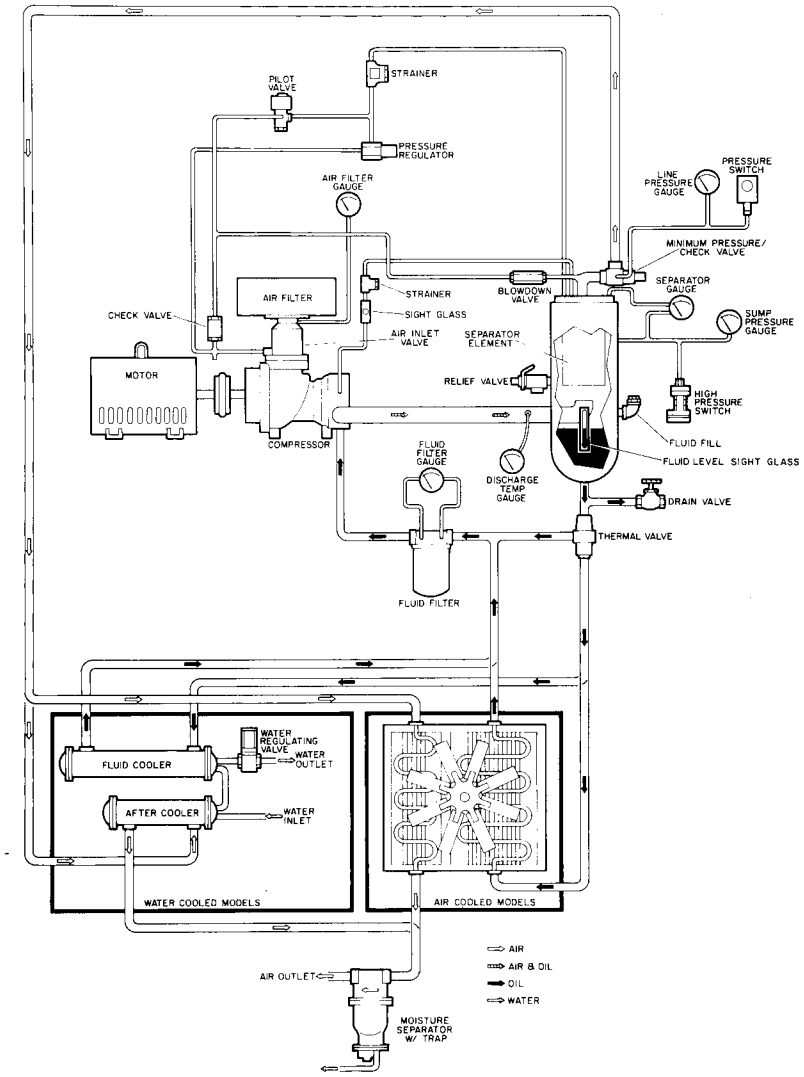
1. Check incoming voltage. Be sure that the incoming voltage is the same voltage that the compressor was wired for.
2. Check starter and overload heater sizes (see electrical parts in Parts Manual).

VENTILATION REQUIREMENTS

Cooling Type	Air-Cooled w/Aftercooler	Water-Cooled
Motor HP	50	50
Fan Air CFM*	6,000	1,440
Heat Rejection BTU/Hour	153,360	13,300

* Applies to machines with canopy only (vent fan).

Figure 4-1 Piping and Instrument Diagram



3. Check all electrical connections for tightness.
4. "DRY RUN" the electrical controls by disconnecting the three (3) motor leads from the starter. Energize the control circuits by pushing the START button and check all protective devices to be sure that they will de-energize the starter coil when activated.
5. Reconnect the three (3) motor leads and jog the motor for a direction of rotation check, as explained in Section 4.6.

4.7 MOTOR ROTATION DIRECTION CHECK

After the electrical wiring has been done, it is necessary to check the direction of the motor rotation. This can be done by jogging the START and STOP buttons on the instrument panel. When looking at the motor form the end opposite the compressor unit, the shaft should be turning clockwise. If the motor shaft is not turning clockwise, disconnect the power to the starter and exchange any two of the three power input leads, then re-check rotation. A "Direction of Rotation" decal is located on the motor to show proper motor/compressor rotation.

Section 5
OPERATION

5.1 GENERAL

While Sullair® has built into this compressor a comprehensive array of controls and instrumentation to help assure you that it is operating properly, you will want to recognize and interpret the reading which will call for service or indicate the beginning of a malfunction. Before starting your Sullair compressor, read this section thoroughly and familiarize yourself with the controls and instrumentation – their purpose, location and use.

5.2 PURPOSE OF CONTROLS

Control or Indicator	*Purpose*
START PUSHBUTTON	Depress to turn the compressor ON.
STOP PUSHBUTTON	Depress to turn the compressor OFF.
HOURMETER	Records cumulative hours of compressor operation; useful for planning and logging service schedules.
LINE PRESSURE GAUGE	Continually monitors service line air pressure. Located on dry side of receiver downstream from check valve.
SUMP PRESSURE GAUGE	Continually monitors receiver/sump pressure at various load and/or unloaded conditions.
DISCHARGE TEMPERATURE GAUGE	Monitors temperature of the air/fluid mixture leaving the compressor unit. For both air and water-cooled compressors, the normal reading should be approximately 180°F to 205°F (82°C to 96°C).
AIR FILTER RESTRICTION GAUGE	Indicates when air filter element change is required. The gauge shows the red zone when drop through the filter is excessive.
FLUID FILTER MAINTENANCE GAUGE	Indicates when a fluid filter element change is required. Shows red when the pressure drop through the filter is excessive.
SEPARATOR MAINTENANCE GAUGE	Indicates when separator element change is required. Shows red when the pressure drop through the separator is excessive.
"POWER ON" LIGHT (RED)	Indicates when the starter is receiving power.
"RUNNING" LIGHT (GREEN)	Indicates when machine is in operation.
FLUID LEVEL SIGHT GLASS	Monitors fluid level in the sump. The fluid must be visible between the indicated portion of the glass. Check the level when the machine is shut done. **DO NOT OVERFILL.**
SEPARATOR RETURN LINE SIGHT GLASS	Used to indicate fluid flow in the return line. When the compressor is running at full load, fluid flow should be visible in this sight glass. There may be little or no flow when the compressor is running unloaded, but a sluggish flow at full load indicates a need to clean the return line strainer.
THERMAL VALVE	Regulates flow of fluid to and around the cooler. Designed to maintain a minimum operating temperature of 180°F (82°C); use for fast warm-up on start-up.

5.2 PURPOSE OF CONTROLS (continued)

Control or Indicator	*Purpose*
MINIMUM PRESSURE/CHECK VALVE	Maintains a minimum of 55 PSIG (379kPa) in the compressor sump tank during loaded conditions. Valve piston restricts receiver air discharge from receiver/sump when pressure falls to 55 PSIG (379kPa). Also prevents backflow into the sump during unload conditions and after shutdown.
COMPRESSOR DISCHARGE TEMPERATURE SWITCH	Designed to shut the machine down when the discharge temperature reaches 240°F (115°C).
HIGH PRESSURE SHUTDOWN SWITCH	An added protective device designed to shut down the machine when the pressure becomes too high. This switch is set for shutdown at approximately 135 PSI (931kPa).
WATER PRESSURE SWITCH (water-cooled machines only)	Prevents operation when water pressure of machine is inadequate.
PRESSURE RELIEF VALVE	Opens sump pressure to the atmosphere should pressure inside the sump become too high (175 PSI [1206kPa]). Operation of this valve indicates that the high pressure switch is either faulty or out of adjustment.
AIR INLET VALVE	Regulates the amount of air allowed to enter the compressor inlet. This regulation is determined by pressure signal from the pressure regulator.
PRESSURE REGULATOR	Opens a pressure line between the sump and the inlet control valve, to regulate air delivery according to the air demand.
PILOT VALVE	Bypasses the pressure regulator valve causing the inlet control valve to close and the blowdown valve to open when the machine reaches maximum operating pressure.
PRESSURE SWITCH	Senses service line pressure. When line pressure reaches the maximum setting the pressure switch signals the pilot valve to unload the machine.
BLOWDOWN VALVE	Vents sump pressure to the atmosphere during unload conditions and shutdown.
WATER REGULATING VALVE (water-cooled only)	Regulates the amount of cooling water used in the cooler to keep the machine running at a normal operating temperature.

5.3 INITIAL START-UP PROCEDURE

The following procedure should be used to make the initial start-up of the compressor:

1. Read the preceding pages of this manual thoroughly.
2. Be sure that all preparations and checks described in the INSTALLATION section have been made.
3. Crack open the shut off valve to the service line.
4. Start the machine by pushing the START button.
5. Check for possible leaks in piping.
6. Slowly close the shut-off valve and check that the setting on the pressure switch in set correctly. If set correctly, the machine will unload at the desired unload pressure. If adjustments are necessary, see Control System Adjustments in the Maintenance Section of the manual.
7. Observe the operating temperature. If the operating temperature exceeds 200°F (93°C), the cooling system or installation environment should be checked.

8. Observe return line sight glass and maintenance indicators.
9. Open shut-off valve to service line.
10. Reinspect the machine for temperature and leaks the following day.

5.4 SUBSEQUENT START-UP PROCEDURE

On subsequent start-ups, check that the proper level is visible in the fluid sight glass and simply press the START button. When the machine is running, observe the instrument panel and maintenance gauges.

5.5 SHUTDOWN PROCEDURE

To shut the machine down, simply press the STOP button.

Section 6
MAINTENANCE

6.1 GENERAL
As you proceed in reading this section, it will be easy to see that the Maintenance Program for the air compressor is quite minimal. The use of the service gauges provided for the fluid filter, air filter and fluid separator, will alert you when service maintenance is required. When the maintenance gauge shows red, maintenance for that specific item is required. See instructions for each item in Section 6.7, Parts Replacement and Adjustment procedures.

6.2 DAILY OPERATION
Prior to starting the compressor, it is necessary to check the fluid level in the sump. Should the level be low, simply add the necessary amount. If the addition of fluid becomes too frequent, a simple problem has developed which is causing this excessive loss. See the Troubleshooting Section (6.8) under Excessive Fluid Consumption for a probable cause and remedy.

⚠WARNING

DO NOT remove caps, plugs, or other components when compressor is running or pressurized.

Stop compressor and relieve all internal pressure before doing so.

6.3 MAINTENANCE AFTER INITIAL 50 HOURS OF OPERATION
After the initial 50 hours of operation, a few maintenance requirements are needed to cleanse the system of any foreign materials. Perform the following maintenance operations to prevent unnecessary problems.

1. Clean the return line strainer.
2. Clean the return line orifice.
3. Change fluid filter.

6.4 MAINTENANCE EVERY 1000 HOURS
After 1000 hours of operation, or when the maintenance gauge is in the red zone, it will be necessary to perform the following:

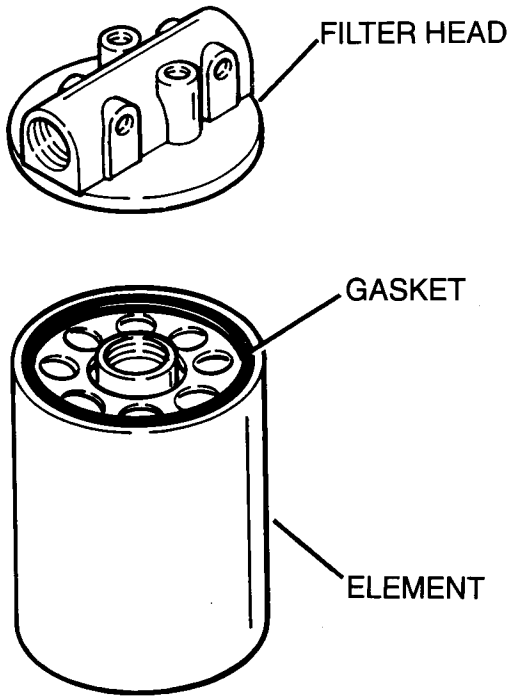
1. Clean the return line strainer.
2. Replace the fluid filter element and gasket.

6.5 FLUID CHANGE
1. Standard models (SRF 1/4000). Change fluid every 4000 hours.
2. Standard models filled with long life lubricants (LLL-4-32 or Sullube).

Fluid should be changed under following conditions whichever occurs first:

A. Every 8000 hours.
B. Once a year.
C. As indicated by fluid analysis.

Figure 6-1 Fluid Filter (P/N 250025-521)



Repair Kit P/N 250025-525

A fluid sample at every 4000 hours is recommended. Return fluid to Sullair Corporation in Michigan City, IN for free analysis. To facilitate this, a sample bottle is included with the compressor.

6.6 SEPARATOR MAINTENANCE
Replace the separator element when your separator maintenance gauge shows red or after one (1) year, whichever comes first. The separator element must be replaced. **DO NOT** attempt to clean the separator element.

6.7 PARTS REPLACEMENT AND ADJUSTMENT PROCEDURES

FLUID FILTER ELEMENT REPLACEMENT
Refer to Figure 6-1.

1. Using a strap wrench, remove the old element and gasket.
2. Clean gasket seating surface.
3. Apply a light film of fluid to the new gasket.
4. Hand tighten new element until gasket makes full contact with head. Avoid any nicks, cuts or pinches to the gasket.
5. Continue tightening element by hand an additional ½ to ¾ turn.
6. Restart compressor and check for leaks.

Section 6
MAINTENANCE

⚠CAUTION

To minimize the possibility of filter element rupture, it is important that ONLY replacement elements identified with the Sullair name, logo and appropriate part number be used and that substituted elements NOT be used, due to the fact that such filters may have inadequate or questionable working pressure ratings.

AIR FILTER MAINTENANCE

Refer to Figure 6-2. Air filter maintenance should be performed when the maintenance gauge shows red or once a year, whichever comes first. The air filter (P/N 250030-092) supplied with your compressor has a cleanable-type element. If the filter needs to be replaced, order element No. 040899. Below you will find procedures on how to replace and how to clean the air filter element.

AIR FILTER ELEMENT REPLACEMENT

1. Clean exterior of air filter housing.
2. Remove the air filter cover by loosening the wing nut securing the cover.
3. Remove element and clean interior of housing using a damp cloth. **DO NOT** blow dirt out with compressed air.
4. At this time clean or replace the element.
5. Reassemble in the reverse order of the disassembly.

AIR FILTER ELEMENT CLEANING

The air filter element is cleanable by using compressed air. The maximum amount of times that an element should be cleaned is six (6) times however, the element should be used no longer than a period of one (1) year without changing.

Prior to, cleaning an element, check the element for damage. Damaged elements must be replaced. Compressed air shall be used for cleaning except in full compliance with OSHA Std. 29 CFR 1910.242(b).

DO NOT strike the element against any hard surface to dislodge dust. This will damage the sealing surfaces and possibly rupture the element.

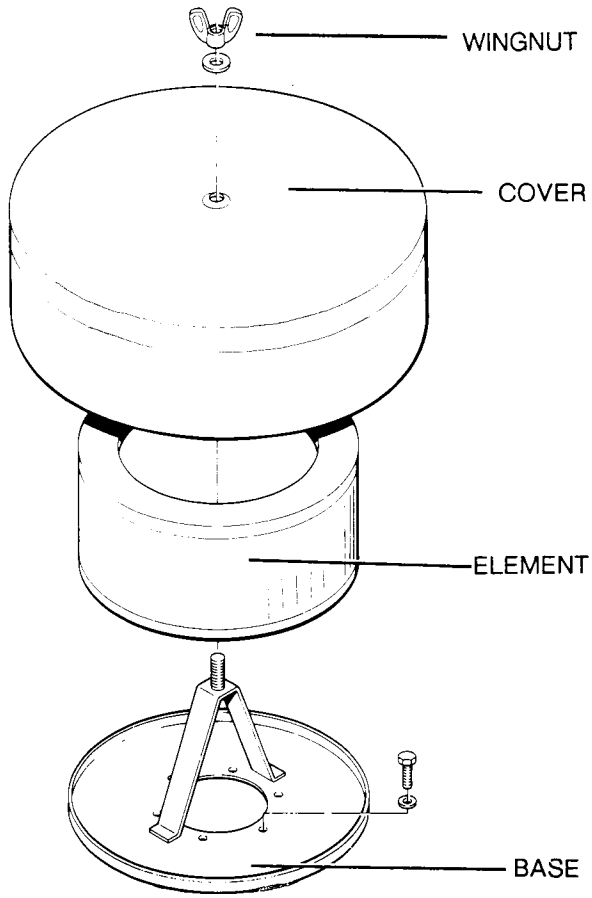
DO NOT blow dirt out of the interior of the filter housing. This may introduce dust downstream of the filter. Instead, use a clean damp cloth.

DO NOT oil the element.

CLEANING THE ELEMENT WITH COMPRESSOR AIR

When cleaning the element with compressed air, never let the air pressure exceed 30 PSI (207kPa). Reverse flush the element by directing the compressed air up and down the pleats in the filter media from the "clean side" of the element. Continue reverse flushing until all dust is removed. Should any fluid or greasy dirt remain on the filter surface, the element should then be replaced. When the element is satisfactorily cleaned, inspect thoroughly prior to installation (see Element Inspection).

Figure 6-2 Air Filter Replacement (P/N 250030-092)

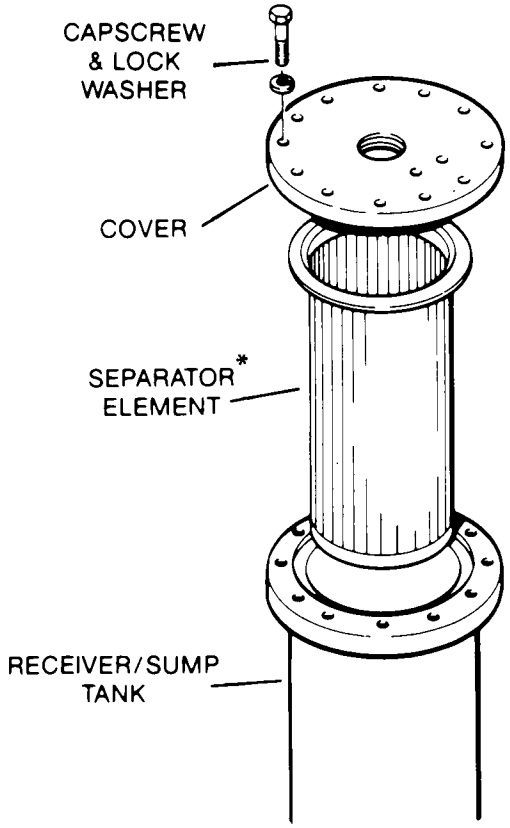


Replacement Element P/N 040899

ELEMENT INSPECTION

1. Place a bright light inside the element to inspect for damage or leak holes. Concentrated light will shine through the element and disclose any holes.
2. Inspect all gaskets and gasket contact surfaces of the housing. Should faulty gaskets be evident, correct the condition immediately.
3. If the clean element is to be stored for later use, it must be stored in a clean container.
4. After the element has been installed, inspect and tighten all air inlet connections prior to resuming operation.

Figure 6-3 Separator Element Replacement



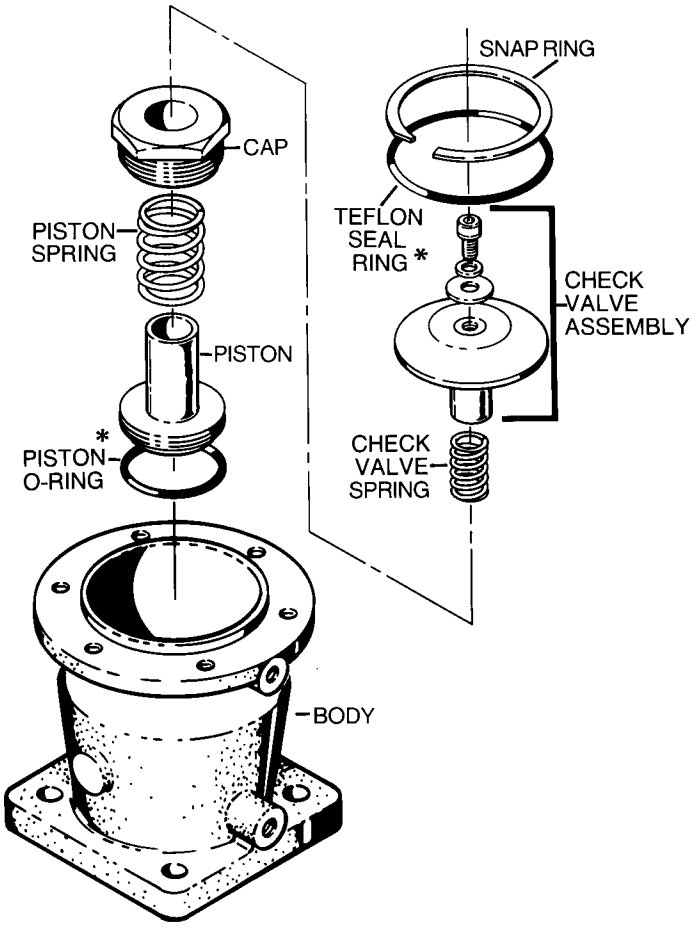
*Repair Kit P/N 408167-005

SEPARATOR ELEMENT REPLACEMENT
Refer to Figure 6-3. The separator element must be changed when the maintenance gauge shows red, or once a year whichever occurs first. Order separator element, No. 408167-005. Follow the procedure explained below for separator element replacement.

1. Shut off service valve and relieve all pressure from the sump tank and all compressor lines.
2. Disconnect all piping connected to the sump cover to allow removal (return lines, service lines, etc.).
3. Loosen and remove the eight (8) hex head capscrews (⅝" x 2") from the cover plate.
4. Lift the cover plate from the sump.
5. Remove the separator element (P/N 408167-005).
6. Inspect the receiver/sump tank for rust, dirt, etc.
7. Scrape the old gasket material from the cover and flange on the sump tank. Be careful not to let the scraps fall in the sump tank.
8. Insert new separator element (P/N 408167-005) into the sump tank taking care not to dent it against the tank opening. **DO NOT** remove grounding staples in the gaskets.
9. Clean the underside of the receiver/sump tank cover and remove any rust. Paint surface with an epoxy paint if rust is evident.
10. Replace the cover plate, washers and capscrews. Torque to 55 ft./lbs. Check for continuity between separator element flange and cover if possible.
11. Reconnect all piping making sure return line tubes extend to the bottom or ¼" above the bottom of the separator element. This will assure proper fluid return flow to the compressor. Reopen service valve.

INLET VALVE MAINTENANCE
Refer to Figure 6-4. The inlet valve (P/N 250030-612) maintenance usually requires the

Figure 6-4 Inlet Valve (P/N 250030-612)



*Repair Kit P/N 250031-438

replacement of the piston spring, piston O-ring, seal ring, and check valve spring. Use repair kit No. 250031-438 and follow the procedure below for proper installation.

1. Remove air filter assembly and remove all piping connected to inlet valve assembly.
2. Remove the four (4) capscrews and lockwashers that attach the valve body to the compressor unit and remove from compressor.
3. Remove snap ring and Teflon O-ring inside valve body.
4. Lift and remove check valve assembly and spring from valve body.
5. Remove piston cap, piston spring, and piston.
6. Clean valve body as needed, making sure all air passages are clear and old seal ring is removed from the inlet body flange.
7. The next step is to reassemble the inlet valve using the new parts supplied in the repair kit.
8. Install O-ring on piston, lightly oil piston, and install in valve body.
9. Install new piston spring and replace piston cap and tighten.
10. Place new check valve spring into piston and install check valve assembly
11. Position new Teflon O-ring in valve body and install snap ring.
12. Clean compressor/inlet valve flanges before installing new flange seal ring.
13. Reinstall valve in reverse order.
14. Reinstall air filter assembly.

CONTROL SYSTEM ADJUSTMENT

Refer to Figure 6-5. Prior to adjusting the control system, it is necessary to determine the desired operating pressure range and also the maximum pressure at which your compressor is to operate. The pressure must not exceed the maximum operating pressure which is stamped on the compressor serial number nameplate. The following explanation applies to a typical installation with a desired operating range of 100 to 110 PSI (689 to 758kPa). This information will apply to a compressor with any other operating range excepting the stated pressures.

With the shut-off valve closed (or slightly cracked open) start the compressor. Observe the line pressure gauge and pressure switch contacts. When the line pressure reaches the desired pressure, the pressure switch contacts should open. If the pressure switch contacts do not open or they open prior to the desired pressure, the pressure switch setting will require adjustment (refer to Figure 6-5).

⚠ DANGER

DO NOT touch the electrical contacts, terminal or leads with any metallic object. Severe electrical shock may occur.

FOR PRESSURE RANGE ADJUSTMENT:

1. Remove the cover of the pressure switch.
2. Turn the range adjusting screw to adjust the high pressure setting. Turning the screw counterclockwise lowers both the high and low pressure equally.

FOR DIFFERENTIAL ADJUSTMENT:

Differential is the difference between the high and low pressure settings 10 PSI (7kPa) typical.

1. Turn the differential adjusting screw to the lower (reset) setting. Turning the screw counterclockwise widens the differential by lowering the reset (lower) setting only.

When the pressure switch adjustment is complete, the pressure regulator should be adjusted for the pressure at which modulation of air delivery should begin. In this case, that pressure will be 100 PSI (689kPa). The regulator is adjusted by loosening the jam nut on the end of the cover of the pressure regulator (refer to Figure 6-11 for the location). With the jam nut loose, turn the adjusting screw clockwise to increase

Figure 6-5 Pressure Switch (P/N 040694)

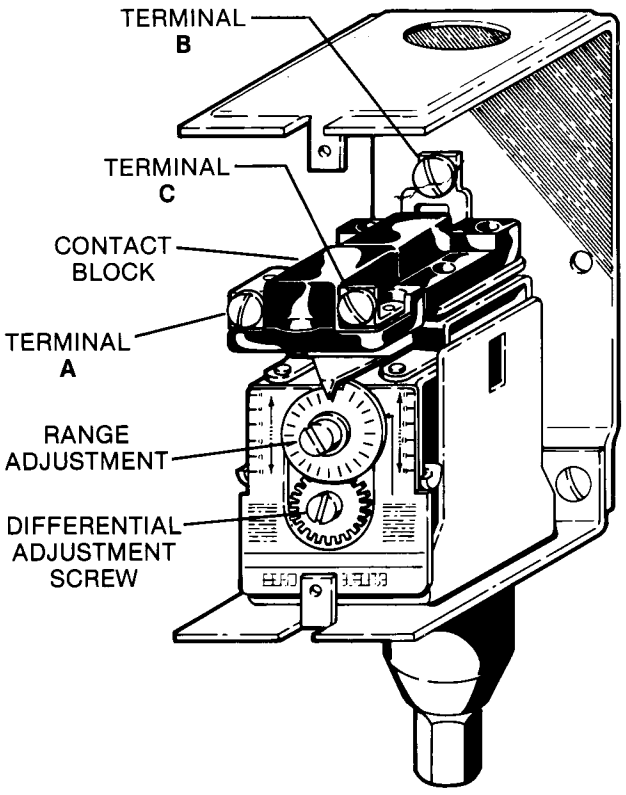
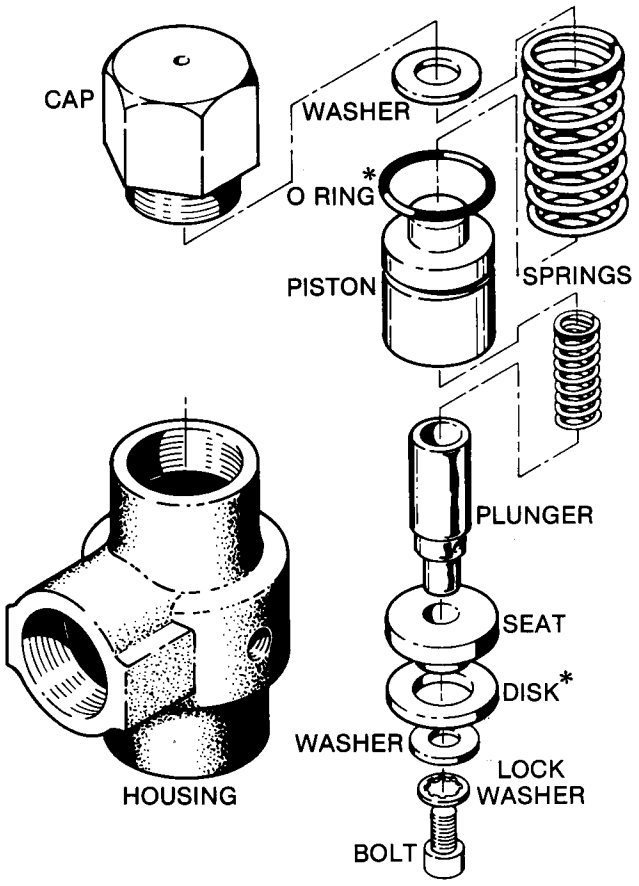


Figure 6-6 Minimum Pressure / Check Valve (P/N 241581)



*Repair Kit P/N 250020-344

or counterclockwise to decrease the pressure setting.

Cycle the control system several times and re-check all pressure settings.

MINIMUM PRESSURE/CHECK VALVE MAINTENANCE

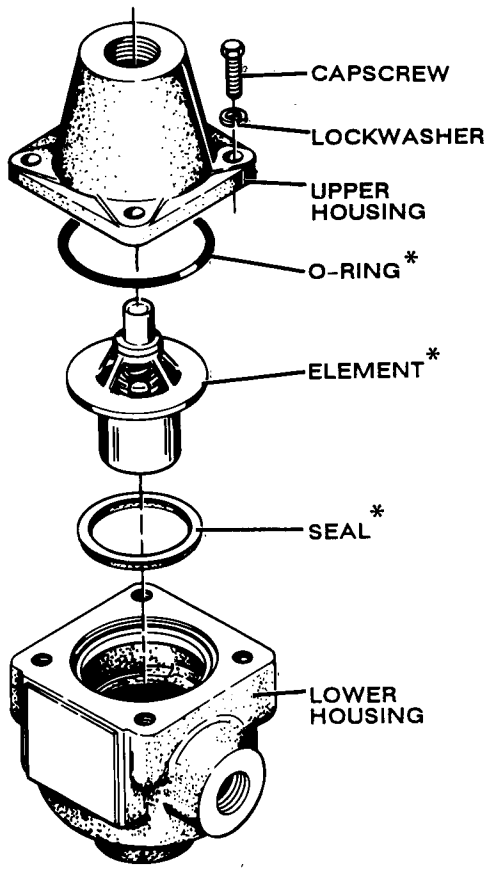
Refer to Figure 6-6. Minimum pressure/check valve (P/N 241581) maintenance is quite minimal. The only part which normally requires replacement is the O-ring on the piston. To replace this ring, order seal repair kit No. 250020-344. and follow the procedure explained below.

⚠WARNING

Before performing maintenance on the valve, be sure that all pressure has been relieved in the compressor sump, and all downstream pressure has been vented to the atmosphere. Also be sure that the components of the compressor are cool to the touch.

1. Close service valve and relieve pressure from the sump tank.
2. Unscrew the minimum pressure/check valve (P/N 241581) from the receiver cover.
3. Remove the hexagonal retaining cap from the main body.
4. Remove the flat washer and heavy spring from the main body.
5. Tap the piston assembly (with a screwdriver) from the bottom of the main body and remove. The O-ring will now be seen easily.
6. Remove the O-ring and discard.

Figure 6-7 Thermal Valve (P/N 250025-620)



*Repair Kit P/N 250025-621

7. Clean piston assembly and valve thoroughly.
8. Replace seal ring and coat the piston and seal with Parker Super "O" Ring Seal or an equivalent quality grease.

⚠WARNING

Extreme caution should be used when removing the cap from the body because there is spring tension on the cap.

9. Reset piston assembly into the main body and reposition spring and flat washer.
10. Replace retaining cap.
11. Reattach valve to receiver cover and reconnect all piping.
12. Reopen service valve.

THERMAL VALVE MAINTENANCE

Refer to Figure 6-7. For thermal valve (P/N 250025-620) maintenance, order repair kit No. 250025-621 and follow the procedure explained below for installation.

DISASSEMBLY

1. Remove the appropriate piping from the thermal valve before starting disassembly.
2. Remove the four (4) capscrews holding the housing together and separate the upper housing from the lower housing.
3. Remove the O-ring from between the housings.
4. Pull firmly on the thermal element and remove.

NOTE

There will be a slight resistance from the seal ring centered in the lower housing.

5. Remove the seal ring from the lower housing and discard.

REASSEMBLY

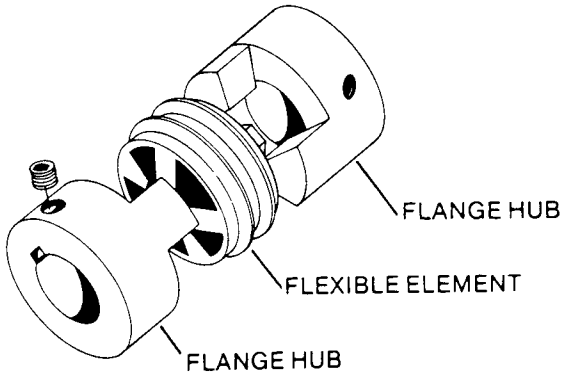
1. Grease and replace the seal ring in the center of the lower housing.
2. Reinsert the thermal element pushing down until the brass ring is flush with the surface of the lower housing.
3. Position a new O-ring on the lower housing.
4. Place the upper housing on the lower housing and retighten the capscrews.
5. Replace all piping connected to the thermal valve.

DRIVE COUPLING INSTALLATION AND MAINTENANCE

Refer to Figure 6-8. For coupling installation the tools required will be one set of standard Allen wrenches. All 10B compressors are flange mounted to the motor, making them self-aligning eliminating the need for alignment proce-

Figure 6-8 Drive Coupling "Hub" Gap Check

HUB SEPARATION



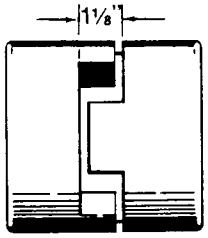
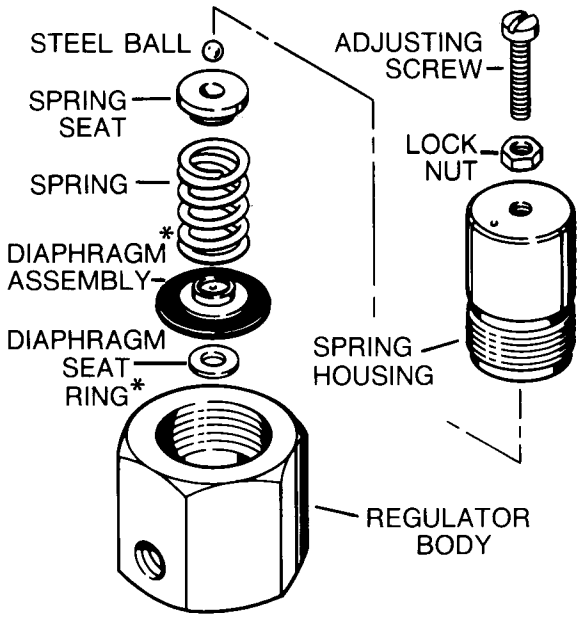


Figure 6-9 Pressure Regulator (P/N 250017-280)



* Repair Kit P/N 250019-453

dures. Proper hub separation is shown in Figure 6-8.

PRESSURE REGULATOR VALVE MAINTENANCE

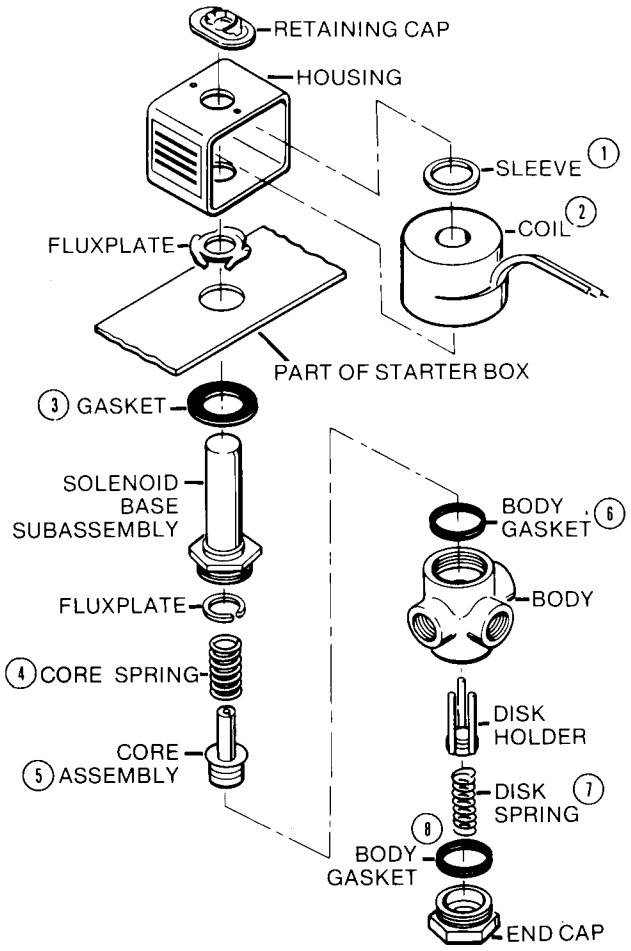
Refer to Figure 6-9. Pressure control regulator (P/N 250017-280) maintenance normally requires the replacement of the internal diaphragm. Use repair kit No. 250019-453 and follow the procedure below for proper installation.

1. Loosen the locknut and turn the adjusting screw counterclockwise until the inner spring tension is relieved. The adjusting screw should turn freely when the spring tension is relieved.
2. Remove the spring housing from the body to allow access to internal parts.
3. Remove steel ball, spring seat, and spring.
4. At this time, remove the diaphragm assembly and diaphragm seat ring.
5. Clean regulator parts as needed.
6. The next step is to reassemble the regulator using the new parts provided in your repair kit.
7. Install the new seat ring in the regulator body. Position the new diaphragm assembly in regulator body. Replace spring,new spring seat and steel ball.
8. Apply a thin coating of Locktite® on the spring housing threads and tighten.
9. Tighten the adjusting screw until tension is realized.
10. At this time, refer to Control System Adjustment procedure and readjust.

PILOT VALVE MAINTENANCE

Refer to Figure 6-10. Pilot valve (P/N 250017-993) maintenance is quite minimal but a periodic cleaning is desirable. The time between cleanings will vary depending on operating conditions. In general, if the voltage to the coils is correct, Sluggish valve operation or excessive leakage will indicate that cleaning is required. If parts replacement is required, order repair kit No. 250018-970 or 250018-971 and follow the procedure explained below:

Figure 6-10 Pilot Valve (P/N 250017-993)



Replacement Coil Kit P/N 250018-970 (1 and 2)
Valve Coil Kit P/N 250018-971 (3 thru 8)

Section 6
MAINTENANCE

Figure 6-11 Flexmaster Coupling

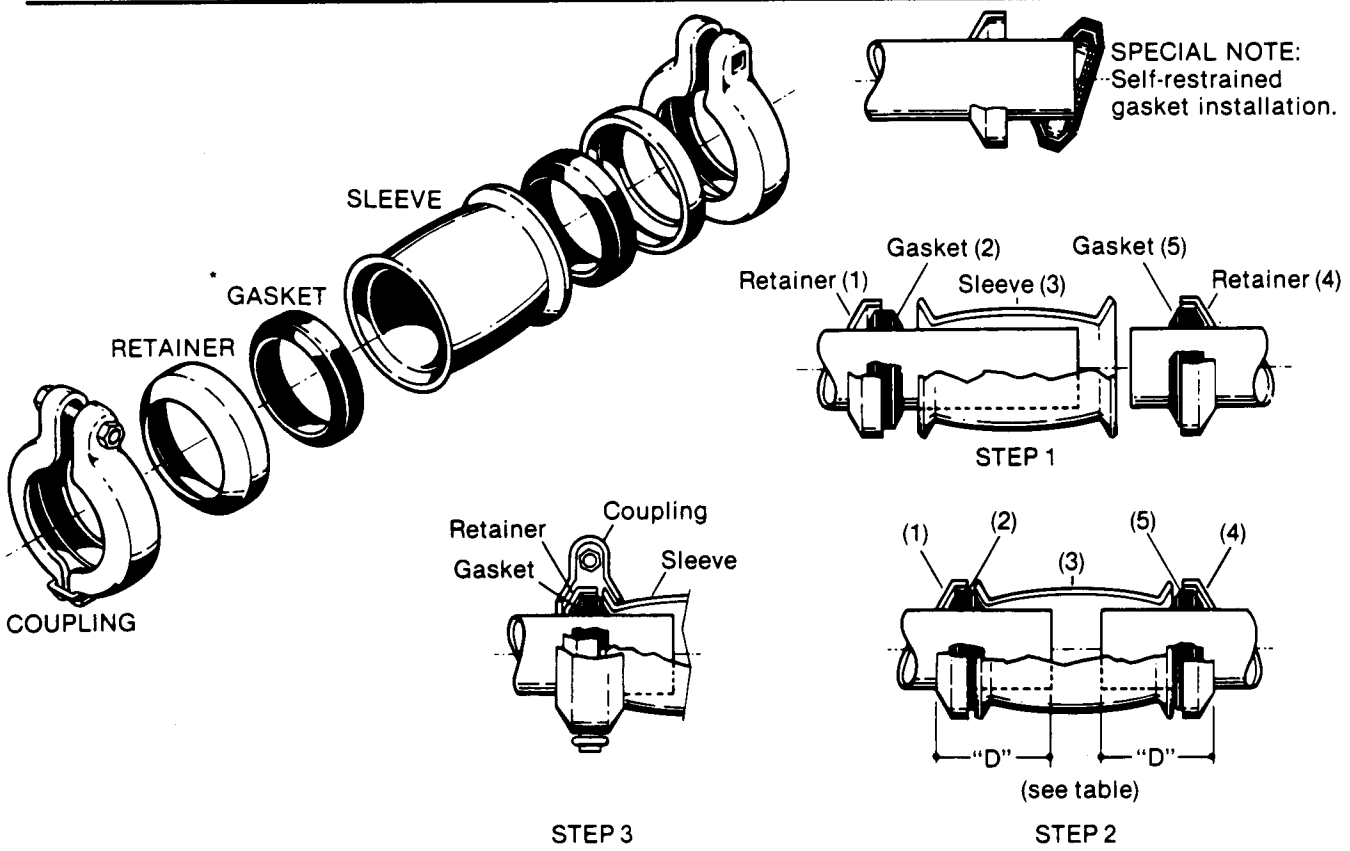


TABLE 1 INSERTION DEPTH

Pipe Size	"D" Min.	"D" Max.
2½" (63.5mm)	1.68" (42.7mm)	2.38" 62.5mm)

TABLE 2 ASSEMBLY TORQUE*

Size	Standard
2½" (63.5mm)	180 to 200 in./lbs. (20.3 to 22.6Nm)

*Tighten as shown in chart or a minimum of 1/16" (1.5mm) clearance between coupling lubs, whichever comes first.

TABLE 3 GASKET RING SELECTION

Size	Part Number
	(Buna N)
2½"	040649

⚠WARNING

Turn off all power, relieve line pressure, and disconnect coil lead wires to the valve before making repairs.

It is not necessary to remove the valve from the pipe line for repairs.

DISASSEMBLY AND REASSEMBLY
1. Remove the retaining cap and slip the entire solenoid off the solenoid base subassembly.
2. Unscrew the solenoid base assembly. Remove the core assembly, core spring and body gasket.
3. Next, remove the end cap, body gasket, disc spring, and disc holder assembly.
4. All parts are now accessible for cleaning or replacement. Replace worn or damaged parts with repair kit No. 250018-970 for best results.
5. Reassemble in reverse order of disassembly.

COIL REPLACEMENT KIT (P/N 250018-971)
1. Remove the retaining clip.
2. Slip the yoke containing the coil and sleeves off the solenoid base sub-assembly.
3. Reassemble in reverse order of disassembly.

FLEXMASTER® COUPLING MAINTENANCE
Refer to Figure 6-11. Flexmaster® coupling maintenance normally requires the replacement of the 2 gasket rings on the coupling. Select appropriate gasket rings from Table 3 and follow the procedure below for proper installation.

PIPE END PREPARATION
1. Deburr and clean the pipe ends.
2. The pipe ends should be free of all deep scratches, gouges, dents, etc. A special finish is not required.

JOINT INSTALLATION
1. Install the retainer (1), gasket (2), and sleeve on one side of the pipe as shown in Step 1.
2. Install the remaining retainer (4) and gasket (5) on the other pipe end.
3. Position the retainer (4) and gasket to proper pipe insertion depth ("D") as show in Table 1.
4. Slide the sleeve (3) to the gasket (5) and move gasket (2) and retainer (1) into position as show in Step 2.. The pipe MUST be inserted to the proper depth ("D") into both gaskets.

COUPLER INSTALLATION
1. Install both V couplings as shown in Step 3, encompassing the retainer, gasket and sleeve, **DO NOT** tighten either coupling until the entire joint has been assembled.
2. Tighten the nuts to the torque valve shown in Table 2. RECOMMENDED ASSEMBLY TORQUE MUST BE MAINTAINED. Retightening of the coupler will be necessary if leakage occurs.

SPECIAL NOTES
1. Assembly of the gaskets can be made easier by dipping the gaskets in water or the oil to be sealed **DO NOT** USE THE RUBBER LUBRICANTS.
2. Flexmaster® joints are not intended to support end loads caused by internal pressure or other forces causing pipe separation.

6.8 TROUBLESHOOTING

The information contained in the Troubleshooting chart has been compiled from field report data and factory experience. It contains symptoms and usual causes for the described problems, however **DO NOT** assume that these are the only problems that may occur. All available data concerning the trouble should be systematically analyzed before undertaking any repairs or component replacement procedures.

A detailed visual inspection is worth performing for almost all problems and may avoid unnecessary additional damage to the compressor.

a. Check for loose wiring.
b. Check for damaged piping.
c. Check for parts damaged by heat or an electrical short circuit, usually apparent by discoloration or a burnt order.

Should your problem persist after making the recommended check, consult you nearest Sullair representative or the Sullair Corporation factory toll free at 1-800-348-2722.

Figure 5-15 Piping and Instrumentation Diagram (Water-cooled)

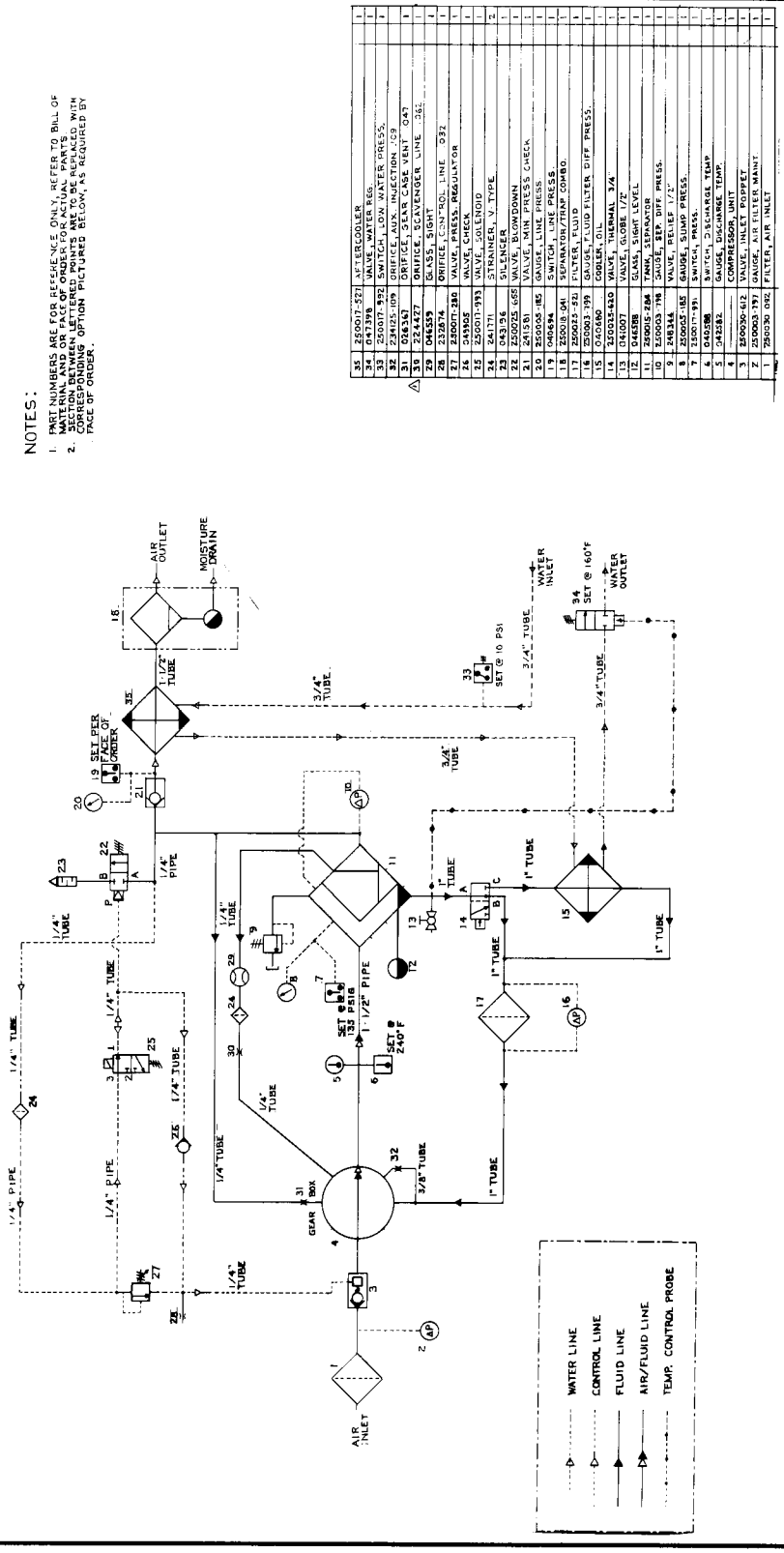


Figure 5-16 Piping and Instrumentation Diagram ((Air-cooled)

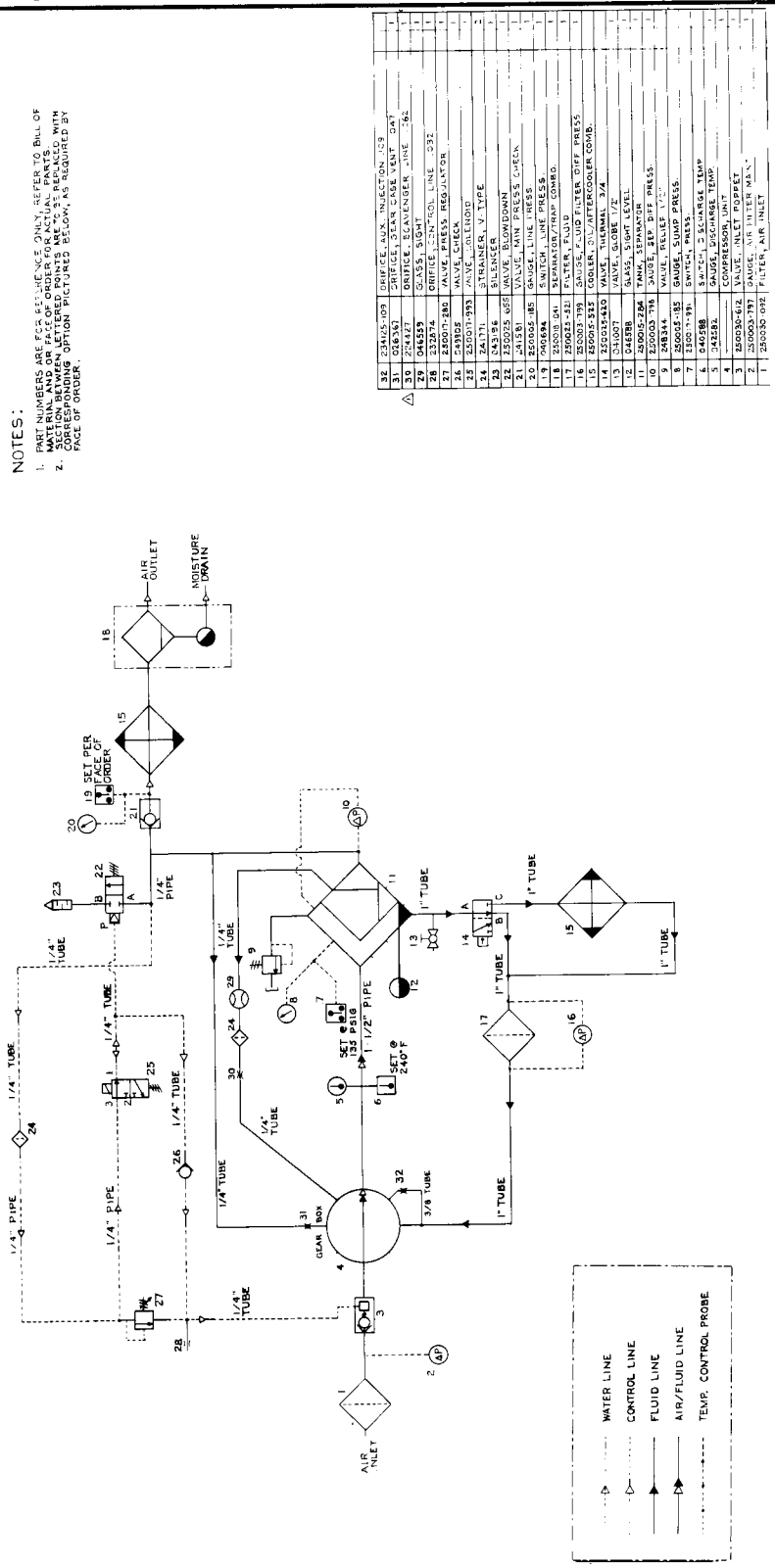


Figure 5-17 Wiring Diagram (Standard)

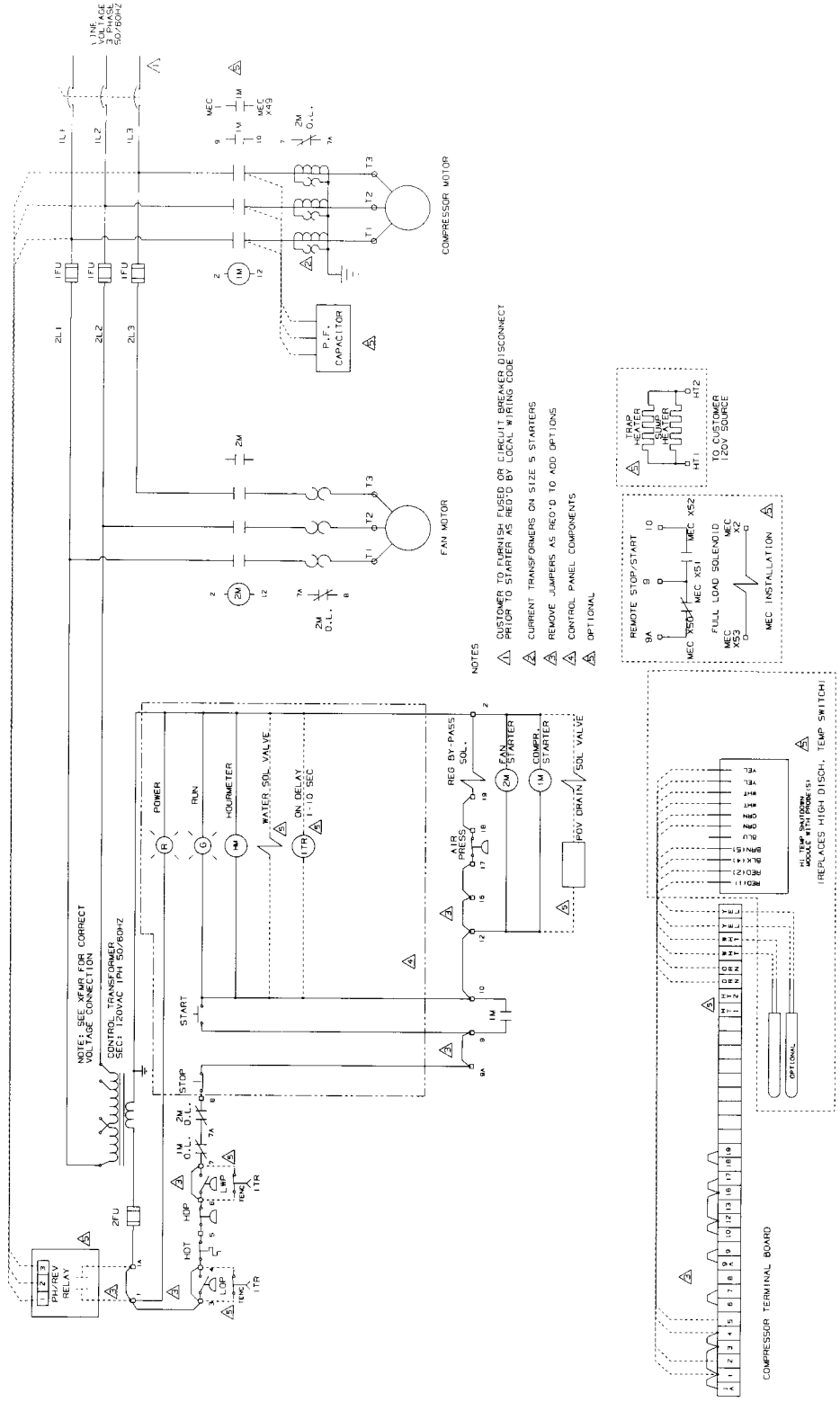
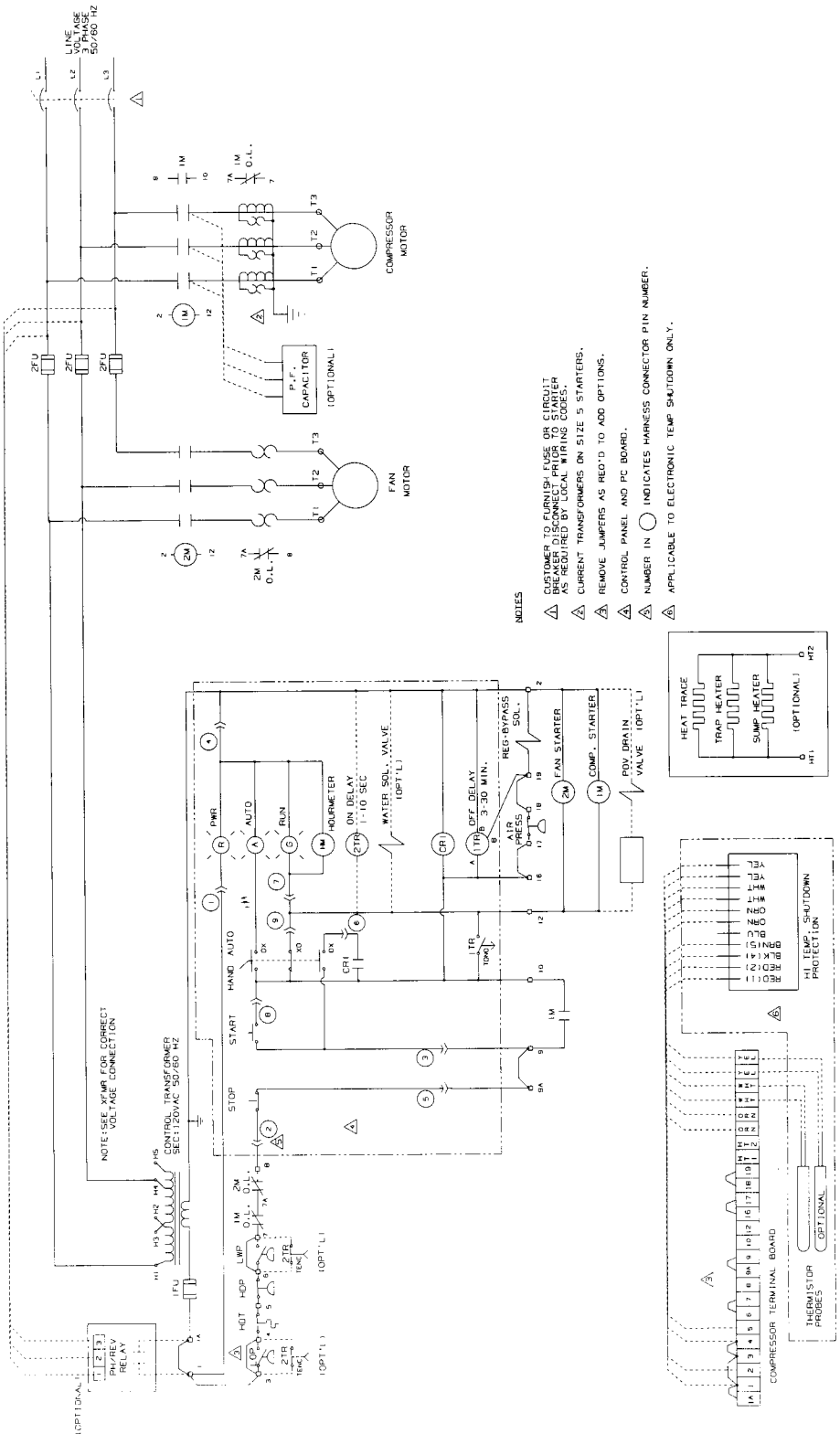


Figure 5-18 Wiring Diagram (Dual Control)



NOTES

Section 7
ILLUSTRATONS AND PARTS LIST

7.1 PROCEDURE FOR ORDERING PARTS

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

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

Standard fasteners (capscrews, nuts, washers, etc.) tubing and fittings plus other standard hardware have not been included in the Parts List. Standard Pipe is 150# malleable. These are items which can be obtained quicker and more economically from local sources.

SULLAIR CORPORATION

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3700 East Michigan Boulevard
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SULLAIR CORPORATION

Parts Distribution Division
1625 E. Second Street
Michigan City, Indiana 46360

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1-800-348-2722 (U.S. except Indiana)
1-800-225-6226 (Indiana)
1-800-525-5506 (Canada)
Telex: 4320147
FAX: 1-219-874-1835

7.2 RECOMMENDED SPARE PARTS LIST

Description	*Assembly Part Number**	*Kit Number*	*Quantity*
element, compressor fluid filter	250025-521	**250025-525**	1
element, air filter	250030-092	**040899**	1
element, separator (primary)	250015-284	**408167-005**	1
repair kit, minimum pressure/check valve	241581	**250020-344**	1
repair kit, thermal valve	250025-620	**250025-621**	1
gasket, thermal valve	250025-620	**250025-621**	1
repair kit, pressure regulator	250017-280	**250019-453**	1
repair kit, pilot valve	250017-993	**250018-970**	1
replacement kit, pilot valve coil	250017-993	**250018-971**	1
repair kit, Flexmaster gasket	040648	**040649**	1
repair kit, v-type strainer	241771	**241772**	1
repair kit, shaft seal (10 series)		**001836-007**	1
valve, poppet inlet (3")	250030-612	**250031-438**	1

* Sullair complete assembly part number needs indicated repair kit number.

WHEN ORDERING PARTS, ALWAYS INDICATE SERIAL NUMBER OF MACHINE

WORLDWIDE SALES AND SERVICE

SULLAIR CORPORATION

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