INDUSTRIAL AIR COMPRESSOR
3000, 3700, 4500, 3000V, 3700V, 4500V 30, 37 & 45 KW/40, 50 & 60HP

Air-Cooled Standard & 24 KT

OPERATOR'S MANUAL AND PARTS LIST

PART NUMBER:
02250155-601

KEEP FOR FUTURE REFERENCE

Starting Serial Number:
003-139556

AIR CARE
SEMINAR TRAINING

Sullair Air Care Seminars are courses that provide hands-on instruction in the proper operation, maintenance and service of Sullair equipment. Individual seminars on Industrial compressors and compressor electrical systems 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

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219-879-5451 (ext. 5363)
www.sullair.com

- Or Write -

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

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Section 1

SAFETY

NOTE

OPERATOR IS REQUIRED TO READ ENTIRE INSTRUCTION MANUAL.

SU_0000005

1.1 GENERAL

Sullair Corporation and its subsidiaries design and manufacture all of their 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 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 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 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/or any 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/or 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 13mm 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) and/or any applicable Federal, State and Local codes, standards and regulations.

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 13mm 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 23m of hose in runs of air hose exceeding 13mm inside diameter to reduce pressure in case of hose failure.

D. Flow-limiting valves are listed by pipe size and flow-rated. 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 device to prevent tools or hose ends from being accidentally disconnected and expelled.

G. Open fluid filler 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 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) and/or any applicable Federal, State, and Local codes, standards and regulations.

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, if 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. 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, litter 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 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/or any applicable Federal, State or Local codes or regulations.

DANGER

INHALATION HAZARD!

Death or serious injury can result from inhaling compressed air without using proper safety equipment. See OSHA standards and/or any applicable Federal, State, and Local codes, standards and regulations on safety equipment.

SU_0000006

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 into 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. Consult Material Safety Data Sheet for information pertaining to fluid of fill.

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 fifteen 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 administering 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.

⚠ DANGER

All field equipment must be tested for electrostatic fields prior to servicing or making contact with the machine using the following or equivalent test equipment:

- **90-600 VAC: Volt detector such as Fluke Model 1AC-A**
- **600-7000 VAC: Voltage detector such as Fluke Networks Model C9970**

It is the responsibility of each organization to provide/arrange training for all their associates expected to test for electrostatic fields.

SU_0000020

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 and/or any applicable Federal, State, and Local codes, standards and regulations.

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 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 a level surface capable of safely supporting at least its weight and its loading unit.

K. When moving the compressor 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 fully 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.

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.

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Section 2

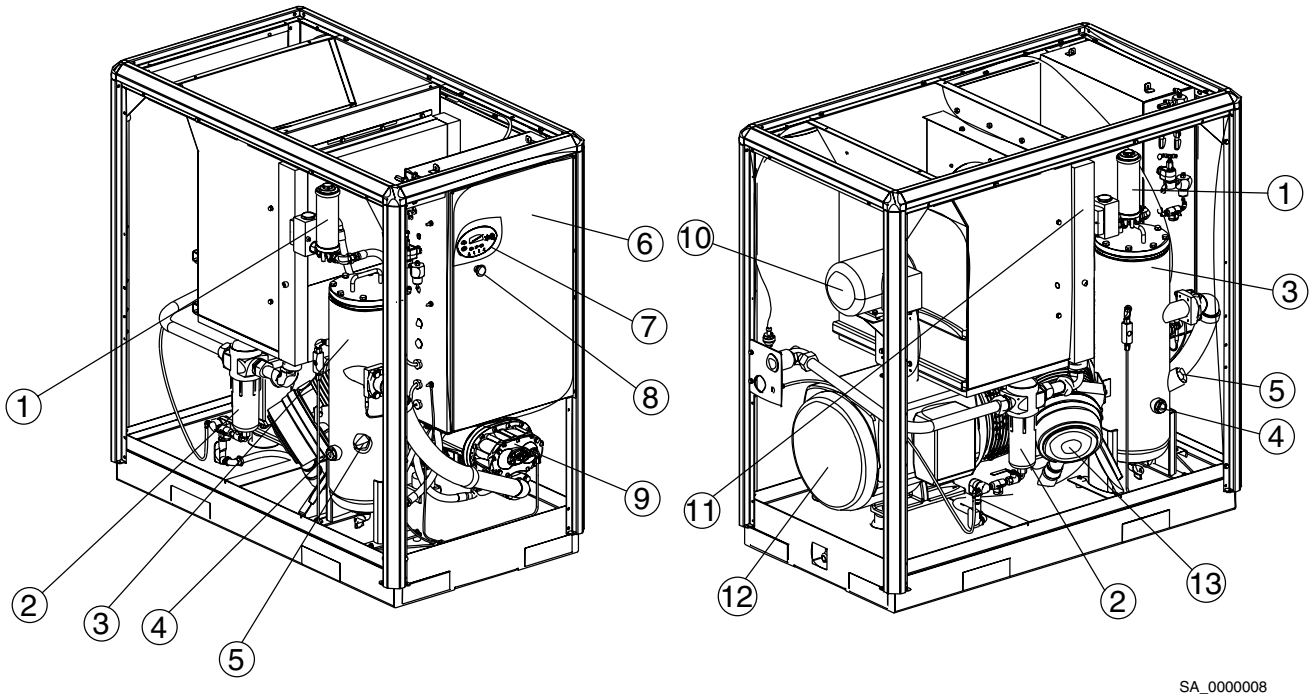
DESCRIPTION

2.1 INTRODUCTION

Your new Sullair flood-lubricated rotary screw air compressor will provide you with a unique experience in improved reliability and simplified 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 6, MAINTENANCE* to see how surprisingly easy it is to keep your air compressor in top operating condition.



1. Fluid Filter
2. Moisture Separator
3. Sump Tank
4. Fluid Fill Sight Glass
5. Fluid Fill
6. Starter Box
7. Controller
8. E-Stop Button
9. Compressor Unit
10. Cooler Fan Motor
11. Cooler
12. Motor
13. Air Inlet Filter

Figure 2-1
Overall Component Layout - Air-Cooled Model

2.2 DESCRIPTION OF COMPONENTS

Refer to **Figure 2-1** and **Figure 2-2**. 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**, **microprocessor controller**, **aftercooler**, a **combination separator and trap**, all mounted on a **heavy gauge steel frame**.

On air-cooled models, a fan draws air into the enclosure over the fan and main motors through the combined aftercooler and fluid cooler thereby removing the compression heat from the compressed air and the cooling fluid, and forces it out the top of the machine.

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

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

2.3 SULLAIR COMPRESSOR UNIT, FUNCTIONAL DESCRIPTION

Sullair air compressors feature the **Sullair compressor unit**, a **single-stage, positive displacement, flood lubricated-type compressor**. This unit provides continuous compression to meet your needs.

NOTE

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.

SU_0000021

The 3700 Series compressors are factory-filled with Sullube lubricant. For more information on fluid fill, consult *Section 3, SPECIFICATIONS*.

Sullair 24KT compressors are filled with a fluid that rarely needs to be changed. Use only Sullair 24KT fluid in the event that a fluid change is required.

CAUTION

Mixing of other lubricants within the compressor unit will void all warranties.

SU-0000022

Sullair recommends that a 24KT sample be taken at the first filter change and sent to the factory for analysis. This is a free service. The sample kit with instructions and self-addressed container is to be supplied by your Sullair dealer at start-up. The user will receive an analysis report with recommendations.

Fluid is injected into the compressor unit hoses and mixes directly with the air as the rotors turn, compressing the air. The fluid flow has three basic functions:

1. As coolant, it controls the rise of air temperature normally associated with the heat of compression.
2. Seals the clearance paths between the rotors and the stator and also between the rotors themselves.
3. 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, the fluid is separated from the air. At this time, the air flows through an aftercooler and separator then to your service line while the fluid is being cooled in preparation for reinjection.

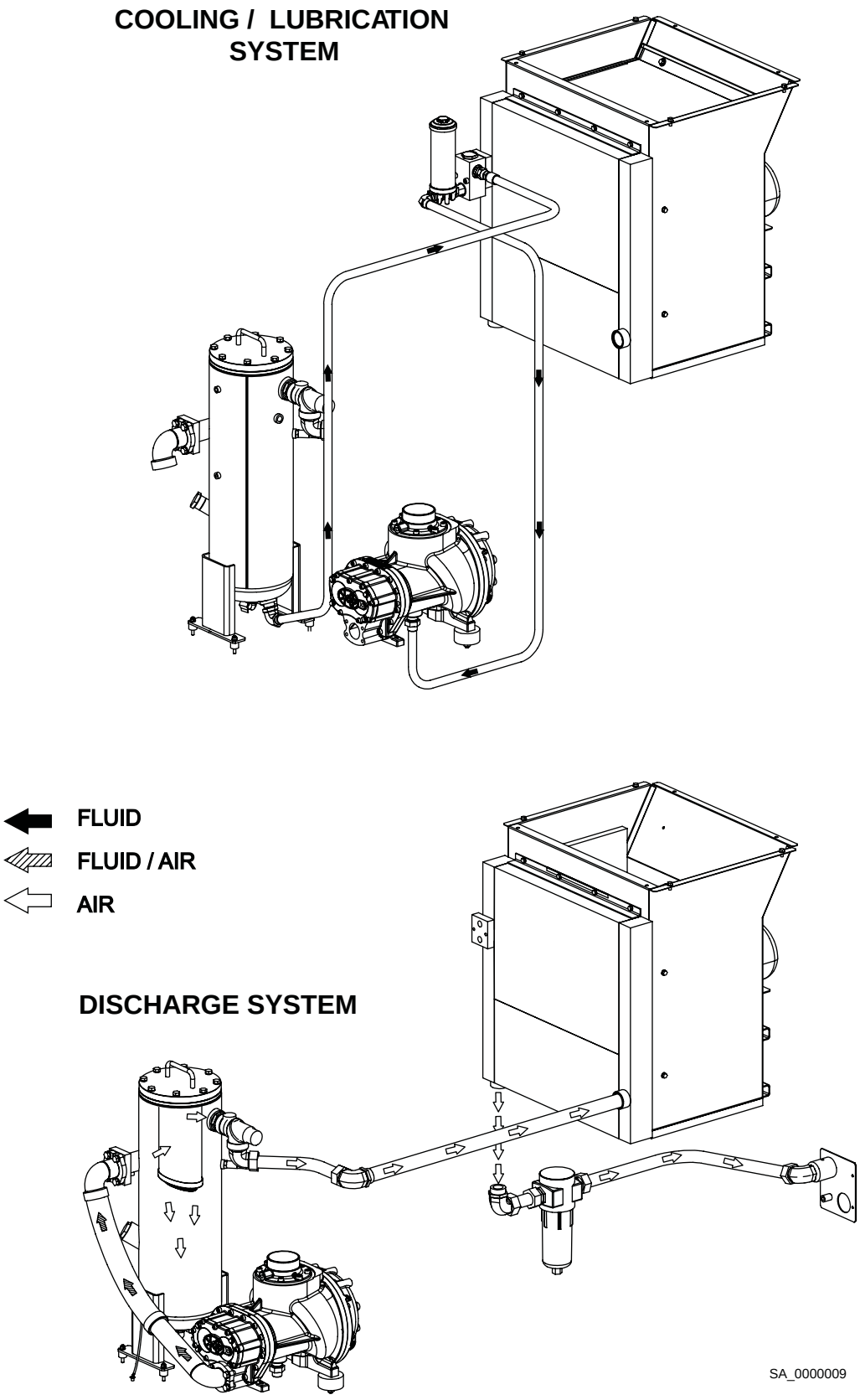


Figure 2-2
Air-Cooled Cooling/Lubrication and Discharge System

2.4 COMPRESSOR COOLING AND LUBRICATION SYSTEM, FUNCTIONAL DESCRIPTION

Refer to **Figure 2-2**. The **Cooling and Lubrication System** (air-cooled version) consists of a **fan, fan motor, radiator-type aftercooler/fluid cooler, full flow fluid filter, thermal valve**, and **interconnecting hoses**. 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 185°F (85°C) [200°F (93°C) for 24KT] and pressures are rated at or above 150 psig. 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 185°F (85°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 fluid filter and then 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 message on the controller indicates when the fluid filter needs to be changed.

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 2-2**. The compressor unit discharges the compressed air/fluid mixture into the combination receiver/sump.

The receiver has three basic functions:

1. It acts as a primary fluid separator.
2. Serves as the compressor fluid sump.
3. Houses the final fluid separator.

The compressed air/fluid mixture enters the receiver and flows through an internal baffle system. The direction of movement is changed and its velocity significantly reduced, thus causing large droplets of fluid to form and 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 a medium pressure 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. A visual sight glass is located on 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. The separator system reduces the fluid carry-over to less than 1 ppm (parts per million) or 2 ppm for 24KT. A message on the controller indicates if abnormal pressure drop through the separator develops. At this time, separator element replacement is necessary.

A minimum pressure/check valve, located downstream from the separator, assures a minimum receiver pressure of 50 psig (3.4 bar) during loaded conditions. 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 the sump tank rating. A temperature switch will shut down the compressor if the discharge temperature reaches 235°F (113°C).

⚠ WARNING

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

Stop compressor and relieve all internal pressure before doing so.

SU_0000023

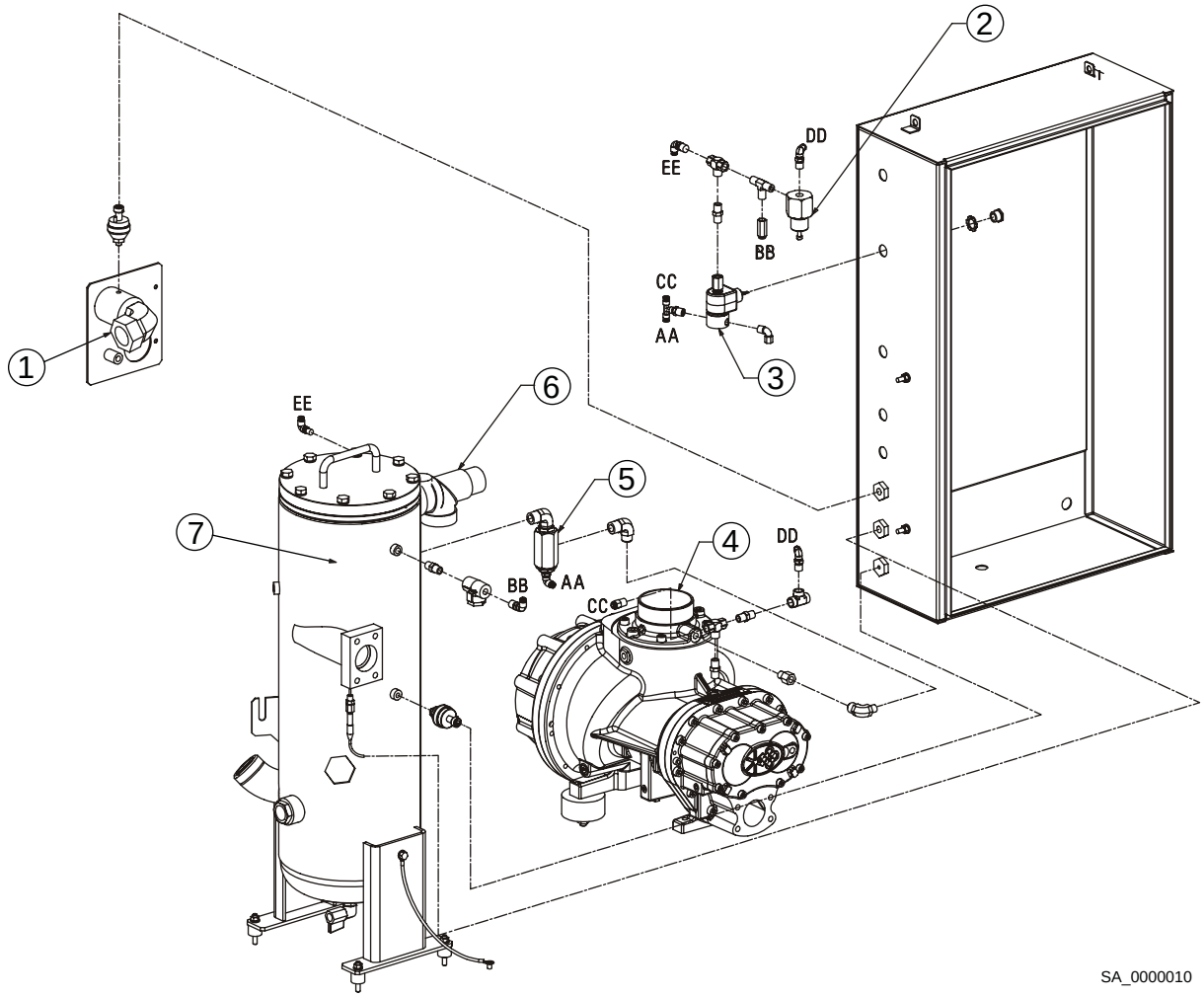
Fluid is added to the sump via a capped fluid filler opening, placed low on the tank to prevent overfilling of the sump. A sight glass enables the operator to visually monitor the sump fluid level.

2.6 CONTROL SYSTEM, FUNCTIONAL DESCRIPTION

Refer to **Figure 2-3**. The purpose of the compressor Control System is to regulate the amount of air being compressed to match the amount of compressed air being used. The Capacity Control System consists of a solenoid valve, regulator valve and an inlet valve. The functional description of the Control System is described below in four distinct phases of operation. For explanatory purposes, this description will apply to a compressor with an operating range of 100 to 110 psig (6.9 to 7.6 bar). A compressor with any other pressure range would operate in the same manner except stated pressures.

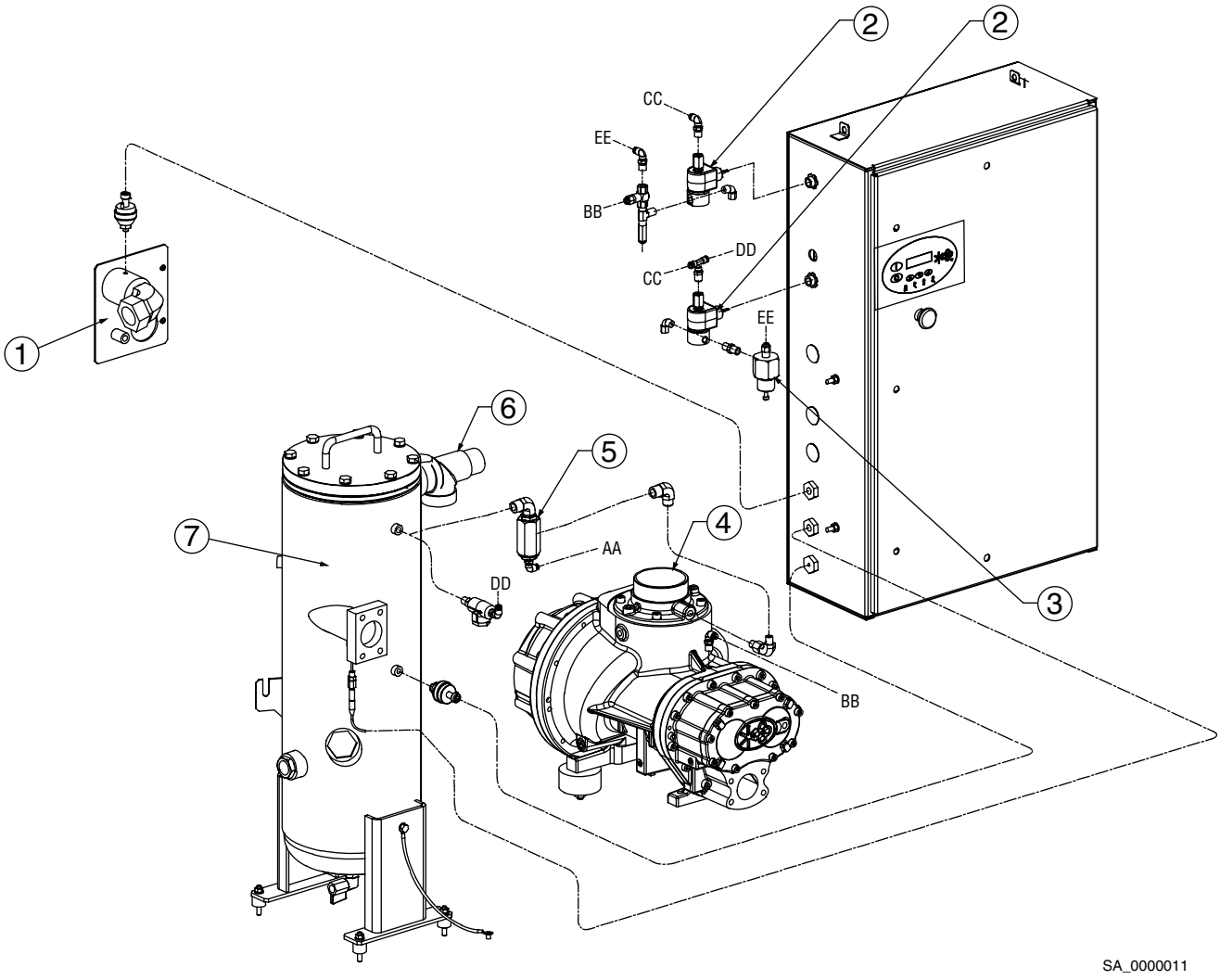
START MODE - 0 TO 50 PSIG (0 TO 3.5 BAR)

When the compressor "I" (START) pad is depressed, the sump pressure will quickly rise from 0 to 50 psig (0 - 3.4 bar). The compressor initially starts unloaded with solenoid valve open and inlet valve closed. It then switches to full load when full rpm has been achieved. During this period, both the pressure regulator and the solenoid valve are closed, the inlet valve is fully open and the compressor pumps at full rated capacity. The rising compressor air pressure is isolated from the service line in this phase by the minimum pressure valve set at approximately 50 psig (3.4 bar).



1. Air Outlet
2. Pressure Regulator
3. Solenoid Valve
4. Air Inlet
5. Blowdown Valve
6. Minimum Pressure / Check Valve
7. Sump Tank

Figure 2-3
Standard Control System



1. Air Outlet
2. Pressure Regulator
3. Solenoid Valve
4. Air Inlet
5. Blowdown Valve
6. Minimum Pressure / Check Valve
7. Sump Tank

Figure 2-4
Sequencing Control System

FULL LOAD MODE - 50 TO 100 PSIG (3.4 TO 6.9 BAR)

When the compressed air pressure rises above 50 psig (3.4 bar), the minimum pressure valve opens allowing compressed air to flow into the service line. From this point on, the line air pressure is continually monitored by the microprocessor controller. The pressure regulator and the solenoid valve remain closed during this phase. The inlet valve is in the fully open position as long as the compressor is running at 100 psig (6.9 bar) or below.

MODULATING MODE - 100 TO 110 PSIG (6.9 TO 7.6 BAR)

If less than the rated capacity of compressed air is being used, the service line pressure will rise above 100 psig (6.9 bar). The pressure regulator valve gradually opens, directing air pressure to the inlet control valve, reducing 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 (6.9 to 7.6 bar) in response to varying demands from the service line.

The integrated inlet valve has an orifice which vents a small amount of air inlet when the pressure regulator controls the inlet control valve. The orifice also bleeds any accumulated moisture from the control lines.

UNLOAD MODE - IN EXCESS OF 110 PSIG (7.6 BAR)

When a relatively small amount or no air is being used, the service line pressure continues to rise. When it exceeds 110 psig (7.6 bar), the microprocessor control system de-energizes the solenoid valve allowing sump air pressure to be supplied directly to close the inlet valve. Simultaneously, the solenoid valve sends a pneumatic signal to the blowdown valve. The blowdown valve opens to the atmosphere, located in the compressor intake, reducing the sump pressure to approximately 17 psig (1.2 bar). The check valve in the air service line prevents line pressure from returning to the sump.

When the line pressure drops to the low setting (cut-in pressure; usually 100 psig (6.9 bar) on low pressure (7 bar) compressors and 125 psig (8.6 bar) on high pressure (9 bar) compressors, 150 psig (10.3 bar) on (10 bar) compressors, 175 psig (12.0 bar) (12 bar), the microprocessor controller energizes the solenoid valve and allows the blowdown valve to close. The re-energized solenoid valve again prevents line pressure from reaching the inlet control valve. Should the pressure begin to rise, the pressure regulator will resume its normal function as previously described.

LOAD/NO LOAD CONTROL

If desired by the customer, the compressor can be set to operate load/no load without modulating control. This control mode is often selected when a large amount of compressed air storage (air tank) is available. Using the microprocessor keypad, select “load/no load control” from the menu. On a machine rated for 100 psig (7 bar) the compressor will run in the full load mode up to 100 psig (7 bar). If less than the rated capacity is required, pressure will rise above 100 psig and the microprocessor will de-energize the solenoid valve, causing the compressor to run in the unload mode. When the system pressure falls to 90 psig (6.3 bar), the microprocessor energizes the solenoid valve, causing the compressor to return to the full load mode. The compressor will thus operate to keep the system pressure in the range of 90-100 psig (6.3 - 6.9 bar).

AUTOMATIC OPERATION

For applications with varied periods of time when there are no air requirements, the microprocessor’s AUTOMATIC mode allows the compressor to shutdown (time delayed) when no compressed air requirement is present and restart as compressed air is needed.

2.7 AIR INLET SYSTEM, FUNCTIONAL DESCRIPTION

Refer to **Figure 2-5**. The **Compressor Inlet System** consists of a **dry-type air filter**, a **restriction gauge** and an **air inlet valve**.

The restriction gauge (located on the air filter) indicates the condition of the air filter by showing red when filter maintenance is required.

The poppet-type modulating air inlet valve directly controls the amount of air intake to the compressor in response to the operation of the pressure regulator *(see MODULATING MODE - 100 TO 110 PSIG (6.9 TO 7.6 BAR) on page 12)*. The inlet valve also acts as a check valve, thus preventing reverse rotation when the compressor is shut down.

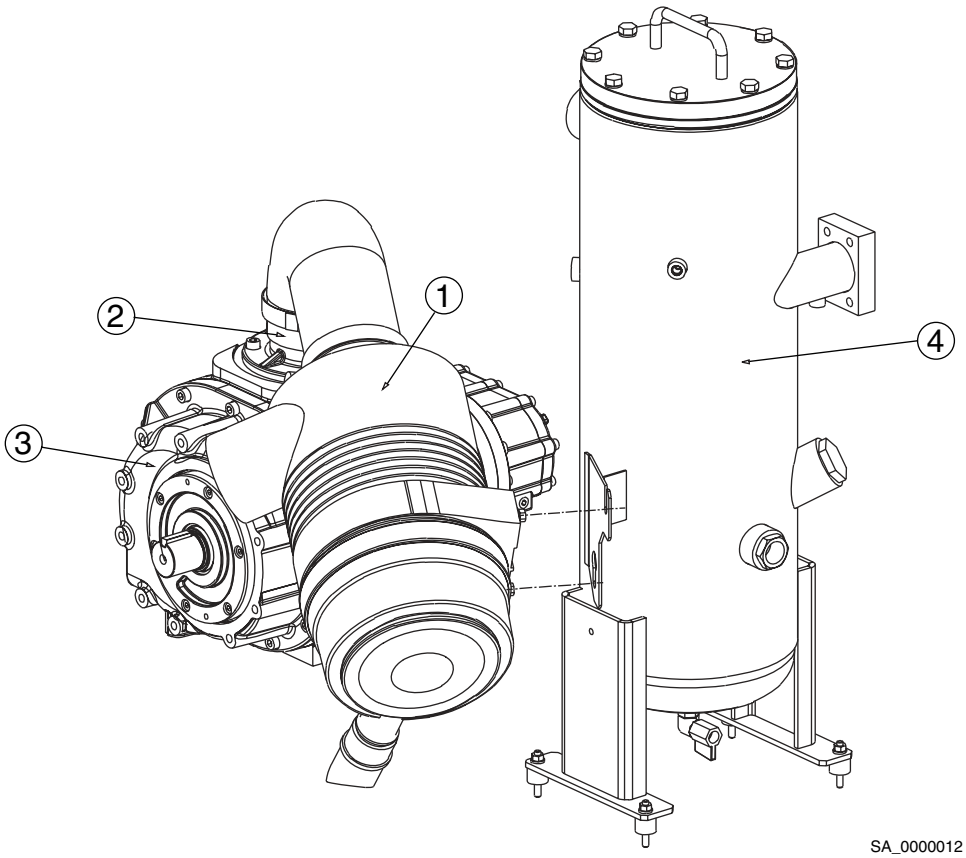
⚠ WARNING

“The Plastic Pipe Institute recommends against the use of thermoplastic pipe to transport compressed air or other compressed gases in exposed above ground locations, e.g. in exposed plant piping.” (I)

Sullube should not be used with PVC piping systems. It may affect the bond at cemented joints. Certain other plastic materials may also be affected.

(I) Plastic Pipe Institute, Recommendation B, Adopted January 19, 1972.

SU_0000024



1. Air Inlet Filter
2. Air Inlet
3. Compressor Unit
4. Sump Tank (Mounting)

Figure 2-5
Air Inlet System

Section 3

SPECIFICATIONS

3.1 TABLE OF SPECIFICATIONS

3000 SERIES									
MODEL (I)	**HP**	**DIMENSIONS**							
		Length		**Width**		**Height**		**Weight**	
		in	**mm**	**in**	**mm**	**in**	**mm**	**lbs**	**kg**
3007	40	62	1575	34.5	876	61.5	1562	1990	903
3009	40	62	1575	34.5	876	61.5	1562	1990	903
3010	40	62	1575	34.5	876	61.5	1562	1990	903
3700 SERIES									
3707	50	62	1575	34.5	876	61.5	1562	2040	925
3709	50	62	1575	34.5	876	61.5	1562	2040	925
3710	50	62	1575	34.5	876	61.5	1562	2040	925
3712	50	62	1575	34.5	876	61.5	1562	2040	925
4500 SERIES									
4509	60	62	1575	34.5	876	61.5	1562	2190	993
4510	60	62	1575	34.5	876	61.5	1562	2190	993
4512	60	62	1575	34.5	876	61.5	1562	2190	993
(I) Includes standard and 24KT. Rated pressure designations appearing after model number are as follows:									
07 - 100 psig (6.9 bar)					**10** - 150 psig (10.3 bar)				
09 - 125 psig (8.6 bar)					**12** - 175 psig (12 bar)				
Maximum pressure is rated pressure plus 10 psig (0.7 bar).									

NOTE

For latest sound test data, consult Sullair Factory.

SU_0000040

COMPRESSOR:	STANDARD MODELS:
Type:	Rotary Screw
Standard Operating Pressure **(II)**:	100 psig (07 bar) 150 psig (10 bar) 125 psig (09 bar) 175 psig (12 bar)
Bearing Type:	Anti-friction
Ambient Temperature (Max.) **(III)**:	104°F (40°C)
Cooling:	Pressurized fluid
Compressor Fluid:	Sullair Sullube
Sump Capacity:	3.0 gallons (11.4 liters)
Control:	Microprocessor controller
(II) Special compressors are available for operation at higher pressures.	
(III) Special compressors are available for operation in higher ambient temperature.	

MOTOR (IV):	STANDARD MODELS:
Size:	40, 50, 60 HP / 30, 37, 45 KW
Type:	C-Flanged, Open Dripproof, Epact Efficiency, Three Phase, 230/460 Hz, 380-415 (400) 50 Hz
Maximum Ambient Temperature	104°F (40°C)
Options Available:	200V and 575V 60 Hz, 220 50 Hz TEFC also available: CE Approved
Starter:	Full Voltage Magnetic, Wye-Delta or Solid State
Options Available:	VSD Optional, 460V, 575V, 400V 50 Hz
Speed - 40, 50, 60 HP:	1765 RPM (60 Hz) or 1475 RPM (50 Hz)
(IV) Multi-frequency and voltage motors are used. The compressors must be used only with the specified electrical frequency and voltage.	

NOTE

For latest sound test data, consult Sullair Factory.

SU_0000040

3.2 LUBRICATION GUIDE

Refer to **Figure 3-1** for location of fluid fill port. For best value and longest uninterrupted service, the 3700 Series compressors are factory filled and tested with Sullube lubricant.

CAUTION

Mixing of other lubricants within the compressor unit will void all warranties.

SU-0000022

If fluid change is required, follow **Lubrication Change Recommendations, Section 3.4**.

⚠ WARNING

"The Plastic Pipe Institute recommends against the use of thermoplastic pipe to transport compressed air or other compressed gases in exposed above ground locations, e.g. in exposed plant piping." (l)

Sullube should not be used with PVC piping systems. It may affect the bond at cemented joints. Certain other plastic materials may also be affected.

(l) Plastic Pipe Institute, Recommendation B, Adopted January 19, 1972.

SU_0000024

Maintenance of all other components is still recommended as indicated in the Operator's Manual.

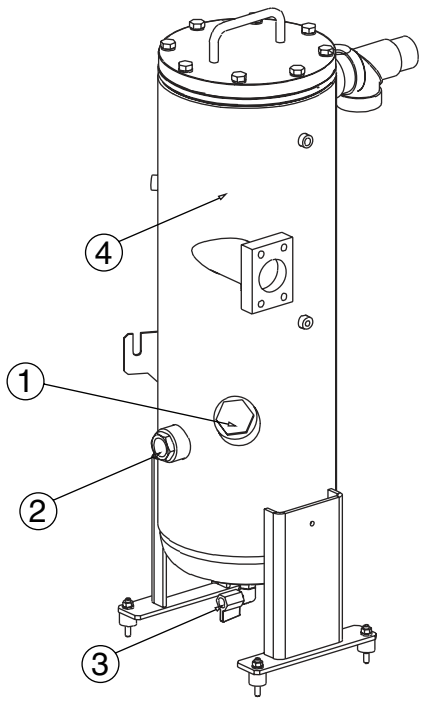
DO NOT MIX DIFFERENT TYPES OF FLUIDS. Contamination of non-detergent mineral fluids with traces of detergent motor fluids may lead to operational problems such as foaming, filter plugging, orifice or line plugging.

NOTE

Flush system when switching lubricant brands.

SU_0000025

When ambient conditions exceed those noted or if conditions warrant use of "extended" life lubricants contact Sullair for recommendation.



SA_0000013

1. Fluid Fill Port
2. Sight Glass
3. Fluid Drain Valve
4. Sump Tank

Figure 3-1
Fluid Fill Location

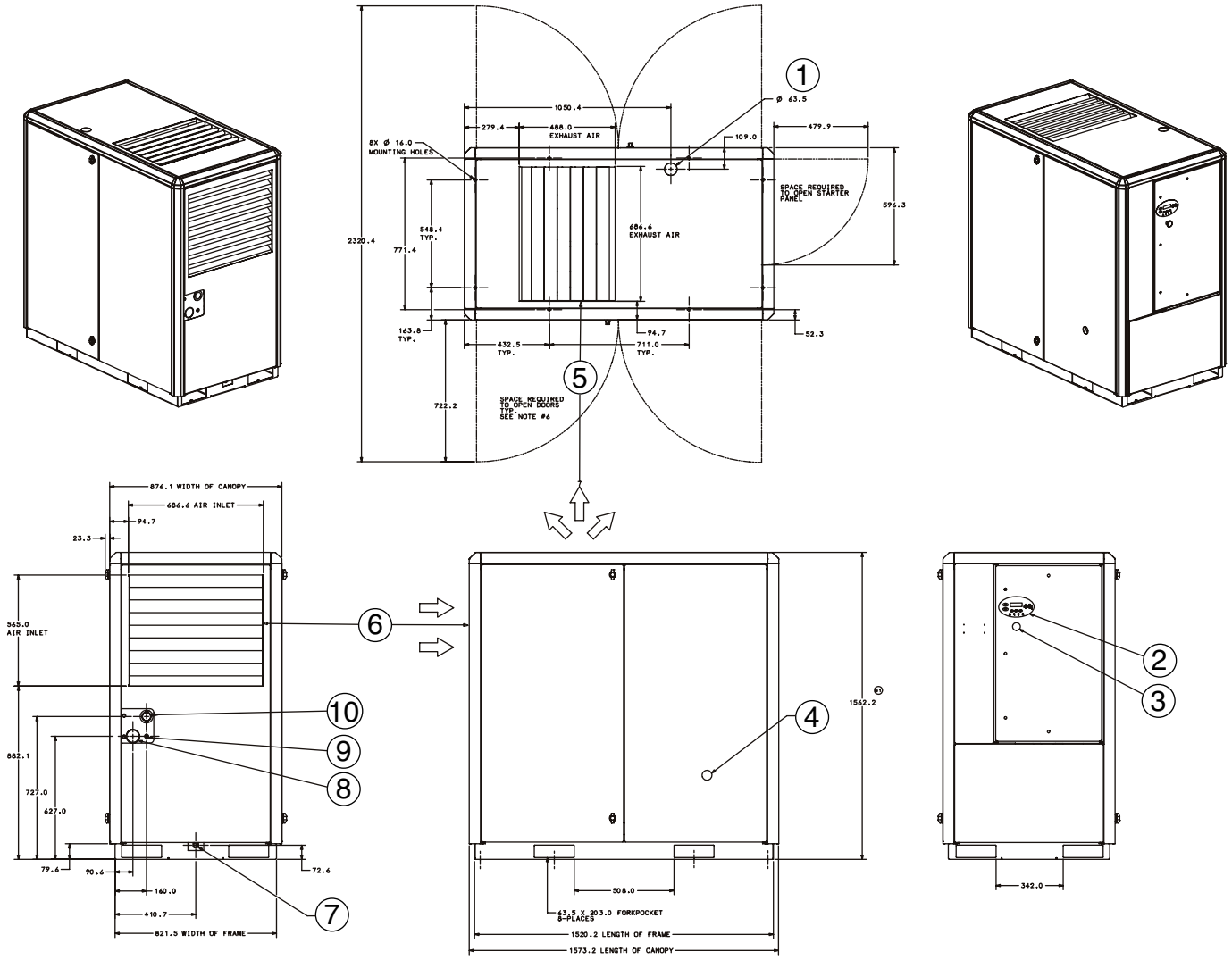
3.3 APPLICATION GUIDE

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

3.4 LUBRICATION CHANGE RECOMMENDATIONS AND MAINTENANCE - FLUID FILTER AND SEPARATOR

LUBRICANT	FLUID CHANGE	FLUID FILTER CHANGE	SEPARATOR CHANGE
Sullube	A, E	G, C	A, D
SFR 1/4000	B, E	G, C	B, D
24KT	F, E	G, C	A, D
CP-4600-32-F	B, E	G, C	B, D

A - 8,000 hours or once a year.
B - 4,000 hours or more frequently if conditions so require.
C - When measured pressure loss exceeds 20 psig (1.3 bar).
D - When measured pressure loss exceeds 10 psig (0.7 bar).
E - When required by fluid analysis or known contamination.
F - Does not require replacement during normal service conditions.
G - Every 2,000 hours.



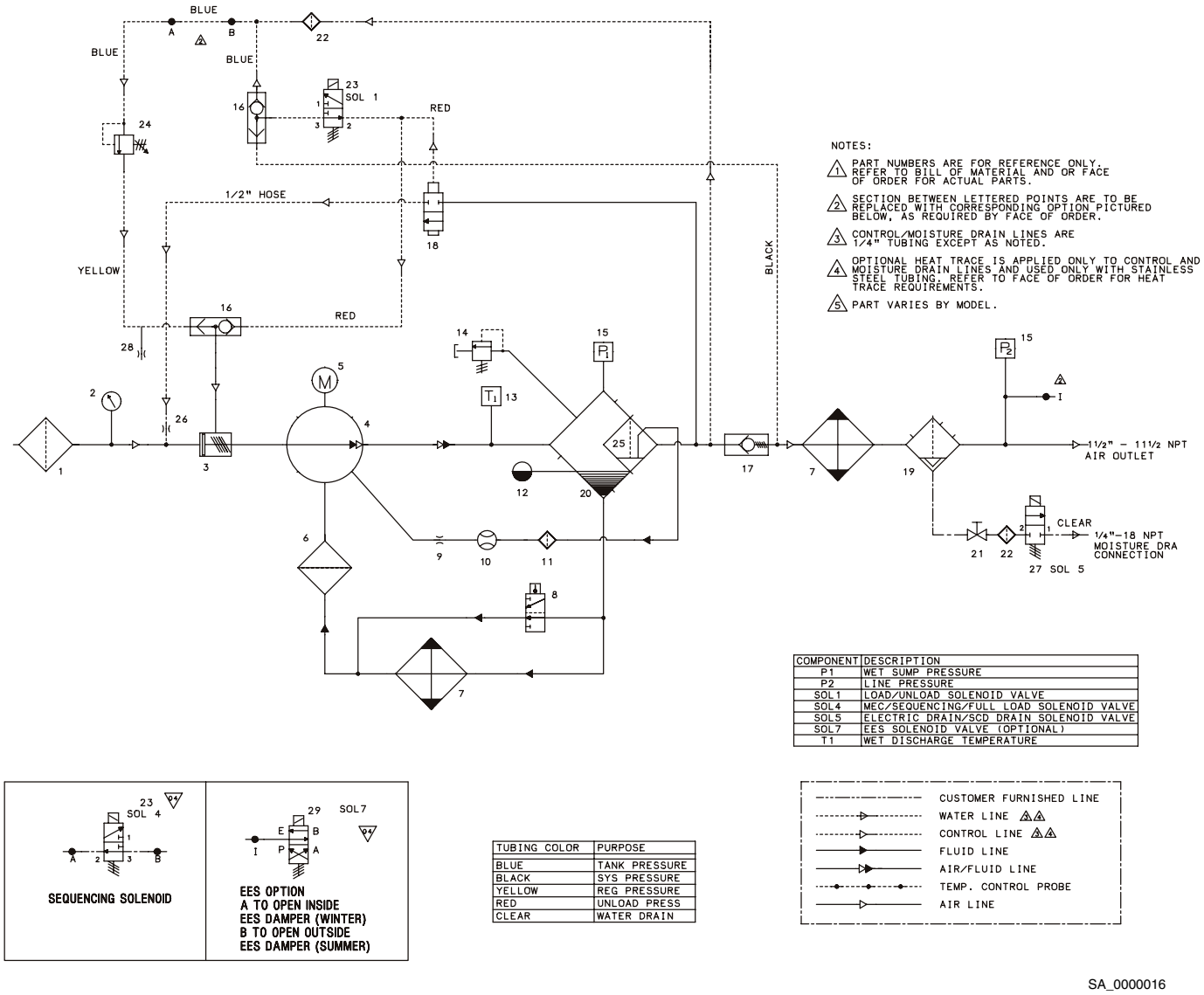
NOTES:
1. ALLOW 1.25 METERS MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF PACKAGE, AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELLED AND SECURED BETWEEN THE FRAME AND THE FOUNDATION. NO PIPING LOADS ARE PERMITTED AT EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE ±12.7MM.
4. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY IS SHOWN ON DRAWING.
5. IF DUCTWORK IS TO BE INSTALLED FOR COOLING AIR, HIGH STATIC FAN MUST BE SELECTED. MAX ALLOWABLE ADDITIONAL STATIC PRESSURE 0.4 IN H_2O WITH HIGH STATIC FAN.
6. DOORS ARE REMOVABLE USING LIFT-OFF HINGE PINS.

MACHINE WEIGHTS				
	MAIN MOTOR HP	MOTOR TYPE	WEIGHT	CFM COOLING AIR
3000X	40	ODP	825 kg	4800
02 3000X	40	TEFC	855 kg	4800
3000	40	ODP	904 kg	4800
3000	40	TEFC	934 kg	4800
3700	50	ODP	927 kg	4800
3700	50	TEFC	965 kg	4800
4500	60	ODP	995 kg	5600
4500	60	TEFC	1,030 kg	5600

SA_0000014

1. Alternate Incoming Power Supply Location
2. Controller
3. E-Stop
4. Oil Level Sight Glass
5. Air Exhaust
6. Air Inlet
7. Containment Pan Drain
8. Incoming Customer Power Supply Location
9. Moisture Drain Connection
10. Air Outlet Connection

Figure 3-2
Identification, Air-Cooled



COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
SOL1	LOAD/UNLOAD SOLENOID VALVE
SOL4	MEC/SEQUENCING/FULL LOAD SOLENOID VALVE
SOL5	ELECTRIC DRAIN/SCD DRAIN SOLENOID VALVE
SOL7	EES SOLENOID VALVE (OPTIONAL)
T1	WET DISCHARGE TEMPERATURE

TUBING COLOR	PURPOSE
BLUE	TANK PRESSURE
BLACK	SYS PRESSURE
YELLOW	REG PRESSURE
RED	UNLOAD PRESS
CLEAR	WATER DRAIN

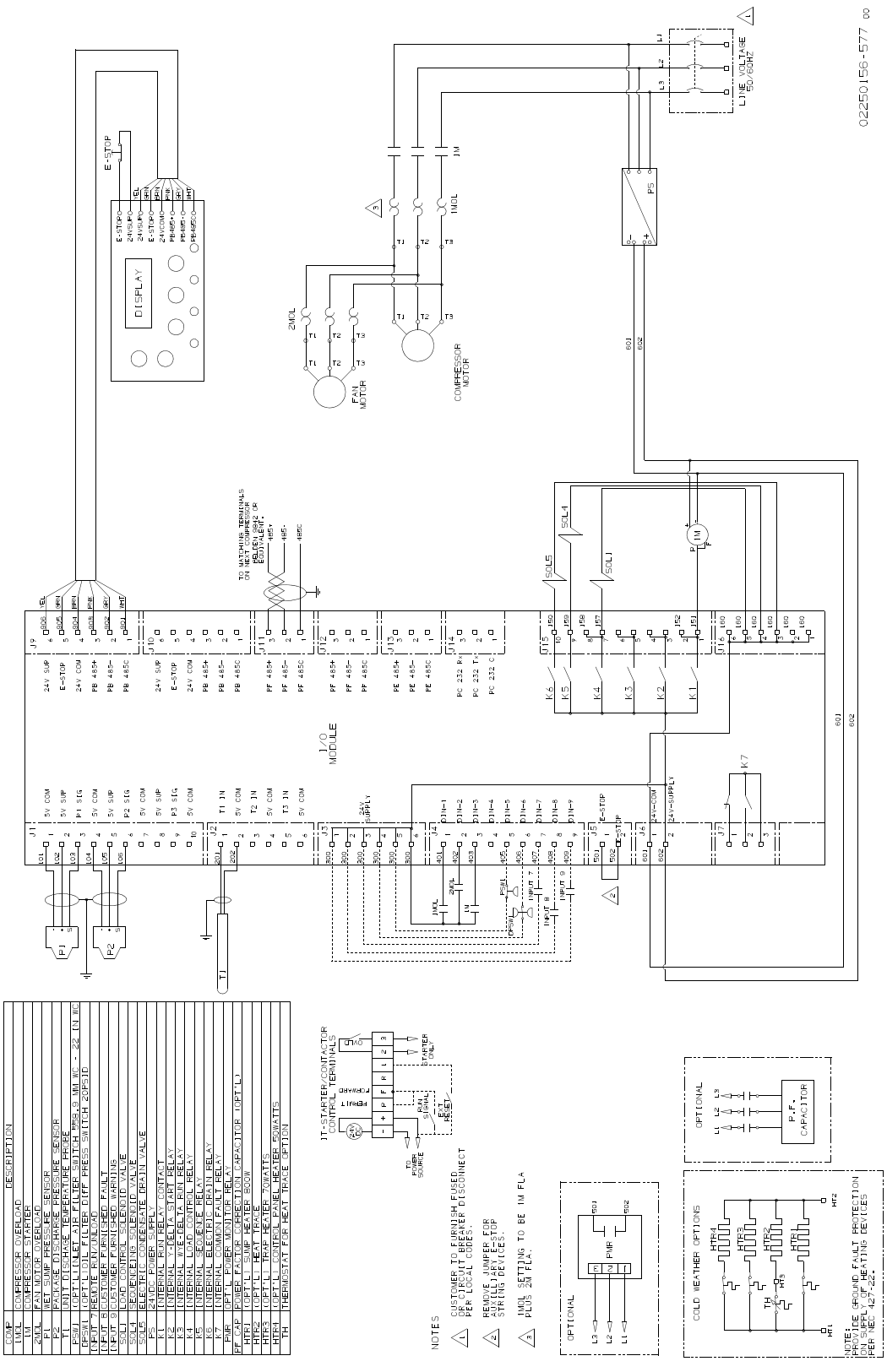
Figure 3-3
Piping and Instrumentation, Air-Cooled

Piping and Instrumentation, Air-Cooled

Key Number	Description	Part Number	Quantity
1	filter, air 9" plastic	02250127-683	1
2	indicator, restriction	250003-869	1
3	inlet	-	1
4	compressor unit	-	1
5	motor	-	1
6	filter, coreless 1-1/16 sae	02250155-708	1
7	cooler, air/oil 60hp	02250152-862	1
	• cooler, air/oil 50hp	02250151-493	1
8	valve, thermal 210deg 1-1/2"-18	02250148-796	1
	• valve, thermal 195deg 1-1/2"-18	02250092-081	1
9	orifice, 1/8 x 1/32	02250125-774	1
10	gls, sight/orf sae	02250126-129	1
11	filter, assy genensis	02250117-782	1
12	plug, sightglass 1-5/16" sae	02250097-610	1
13	probe, thermister 3000 ohm	02250155-175	1
14	valve, relief 1/2"	250006-938	1
15	xducr, 1-250# radiometric	02250155-174	2
16	valve, shuttle 1/4" double chk	408893	1
17	vlv, min pressure 1-7/8 sae	02250097-598	1
18	valve, blowdown 1/2" 1.8:1	02250100-042	1
19	sep, water d-h 1-1/2" fnpt 1/4" drn	02250144-635	1
20	elem, sep round 5.5d x 14.3lng	02250160-774	1
21	valve, ball 1/4"	47115	1
22	strainer, v-type 300psi x 1/4	241771	2
23	vlv, sol 3wno 1/4 250# 24vdc	02250155-714	1
23A	vlv, sol 3wno 1/4 250# 24vdc **(I)**	02250155-714	1
24	valve, pressure reg	250017-280	1
25	tank, separator	02250149-624	1
26	orifice, .140 x 1/4m x 1/4f	02250161-433	1
27	vlv, sol 2wnc 1/4 200# 24vdc	02250155-715	1
28	vlv, chk 1/4"nptf brass viton	02250115-272	1
29	valve, solenoid ees **(II)**	125-673	1

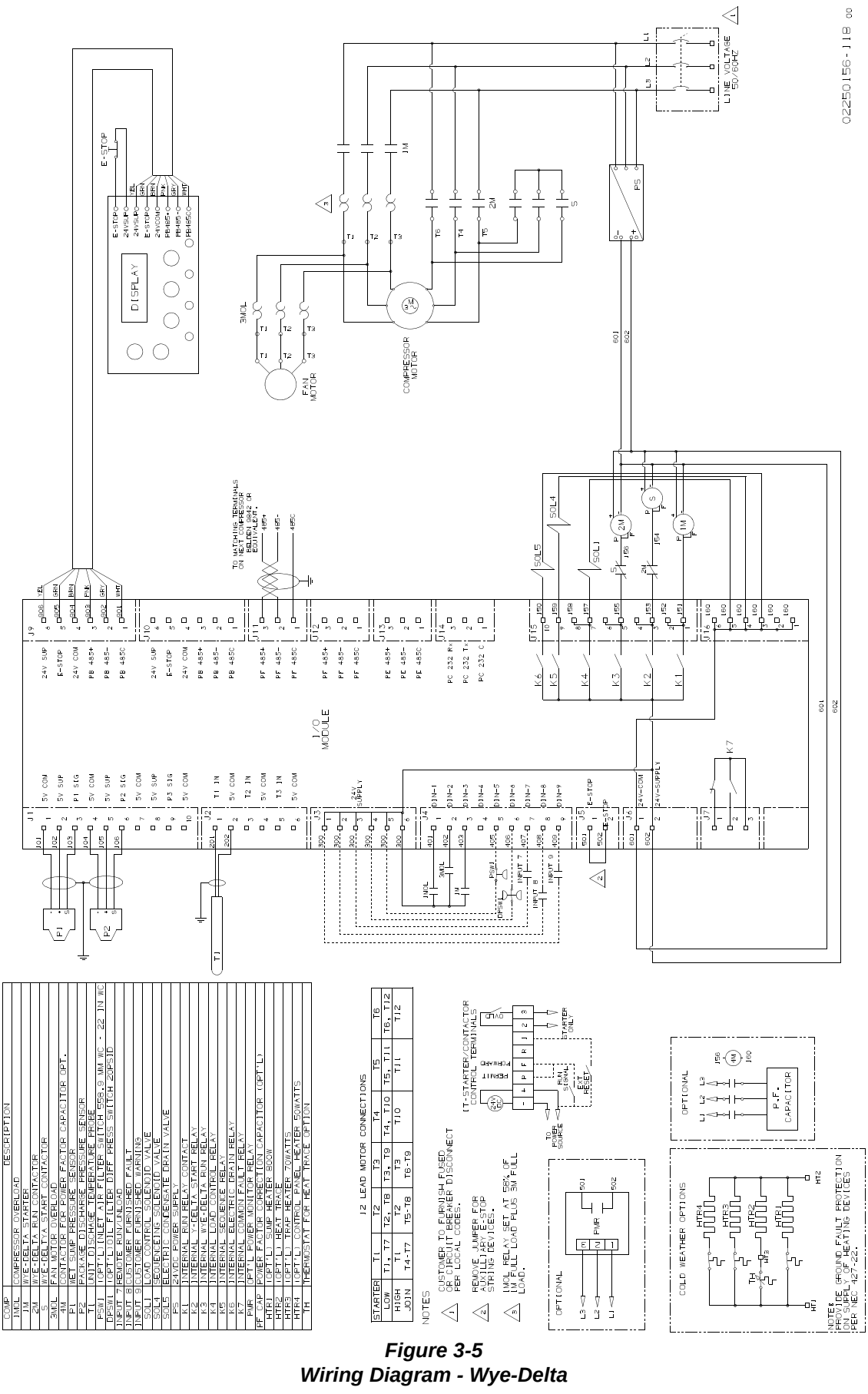
(I) Part varies by model. Consult factory with serial number.

(II) Part used for EES option only.



COMP	DESCRIPTION
1MOL	COMPRESSOR OVERLOAD
1M	COMPRESSOR STARTER
2MOL	FAN MOTOR OVERLOAD
2M	FAN MOTOR STARTER
P1	PERFORMANCE PRESSURE SENSOR
P2	PERFORMANCE PRESSURE SENSOR
T1	UNIT DISCHARGE TEMPERATURE PROBE
PSW1	(OPTIONAL) INLET AIR FILTER SWITCH P/S-9 MM WC - 22 IN WC
DPSW1	(OPTIONAL) OIL FILTER DIFF PRESS SWITCH 20PSID
INPUT 7	CUSTOMER FURNISHED WARNING
INPUT 8	CUSTOMER FURNISHED FAULT
INPUT 9	CUSTOMER FURNISHED WARNING
SOL1	LOAD CONTROL SOLENOID VALVE
SOL4	SEQUENCING SOLENOID VALVE
SOL5	ELECTRONIC CONDENSATE DRAIN VALVE
K1	INTERNAL MAIN RELAY CONTACT
K2	INTERNAL Y-DELTA START RELAY
K3	INTERNAL WYE-DELTA RUN RELAY
K4	INTERNAL LOAD CONTROL RELAY
K5	INTERNAL ELECTRIC DRAIN RELAY
K6	INTERNAL COMMON FAULT RELAY
K7	(OPTIONAL) POWER MONITOR RELAY
PWR	POWER FACTOR CORRECTION CAPACITOR (OPTIONAL)
HTR1	(OPTIONAL) HEAT TRACE 250W
HTR2	(OPTIONAL) HEAT TRACE
HTR3	(OPTIONAL) TRAP HEATER 70WATTS
HTR4	(OPTIONAL) CONTROL PANEL HEATER 80WATTS
TH	THERMOSTAT FOR HEAT TRACE OPTION

Figure 3-4
Wiring Diagram - MFV



COMP	DESCRIPTION
1MOL	COMPRESSOR OVERLOAD
1M	WYE-DELTA STARTER CONTACTOR
2M	WYE-DELTA RUN CONTACTOR
S	WYE-DELTA START CONTACTOR
3MOL	FAN MOTOR OVERLOAD
4M	CONTACTOR FOR POWER FACTOR CAPACITOR OPT.
F1	WET SUMP PRESSURE SENSOR
F2	PACKAGE DISCHARGE PRESSURE SENSOR
F3	UNIT DISCHARGE TEMPERATURE PROBE
PSW1	UNIT INLET AIR FILTER DIFF PRESS SWITCH 20"WC - 22 IN WC
PSW2	(OPT'L) INLET AIR FILTER DIFF PRESS SWITCH 20"WC
INPUT 7	REMOTE RUN/UNLOAD
INPUT 8	CUSTOMER FURNISHED FAULT
INPUT 9	CUSTOMER FURNISHED WARNING
SOL1	LOAD CONTROL SOLENOID VALVE
SOL4	SEQUENCING SOLENOID VALVE
SOL5	ELECTRONIC CONDENSATE DRAIN VALVE
K1	INTERNAL RUN RELAY CONTACT
K2	INTERNAL Y-DELTA START RELAY
K3	INTERNAL WYE-DELTA RUN RELAY
K4	INTERNAL LOAD CONTROL RELAY
K5	INTERNAL SEQUENCE RELAY
K6	INTERNAL ELECTRIC DRAIN RELAY
PWR	OPTIONAL POWER SWITCH MODULE
PF CAP	POWER FACTOR CORRECTION CAPACITOR (OPT'L)
HTR1	(OPT'L) SUMP HEATER BOOM
HTR2	(OPT'L) HEAT TRACE
HTR3	(OPT'L) TRAP HEATER 70WATTS
HTR4	(OPT'L) CONTROL PANEL HEATER 50WATTS
TH	THERMOSTAT FOR HEAT TRACE OPTION

STARTER	T1	T2	T4	T5	T6
LOW	T1, T7	T2, T8	T3, T9	T4, T10	T5, T11	T6, T12
HIGH	T1	T2	T3	T10	T11	T12
JOIN	T4-T7	T5-T8	T6-T9			

Figure 3-5
Wiring Diagram - Wye-Delta

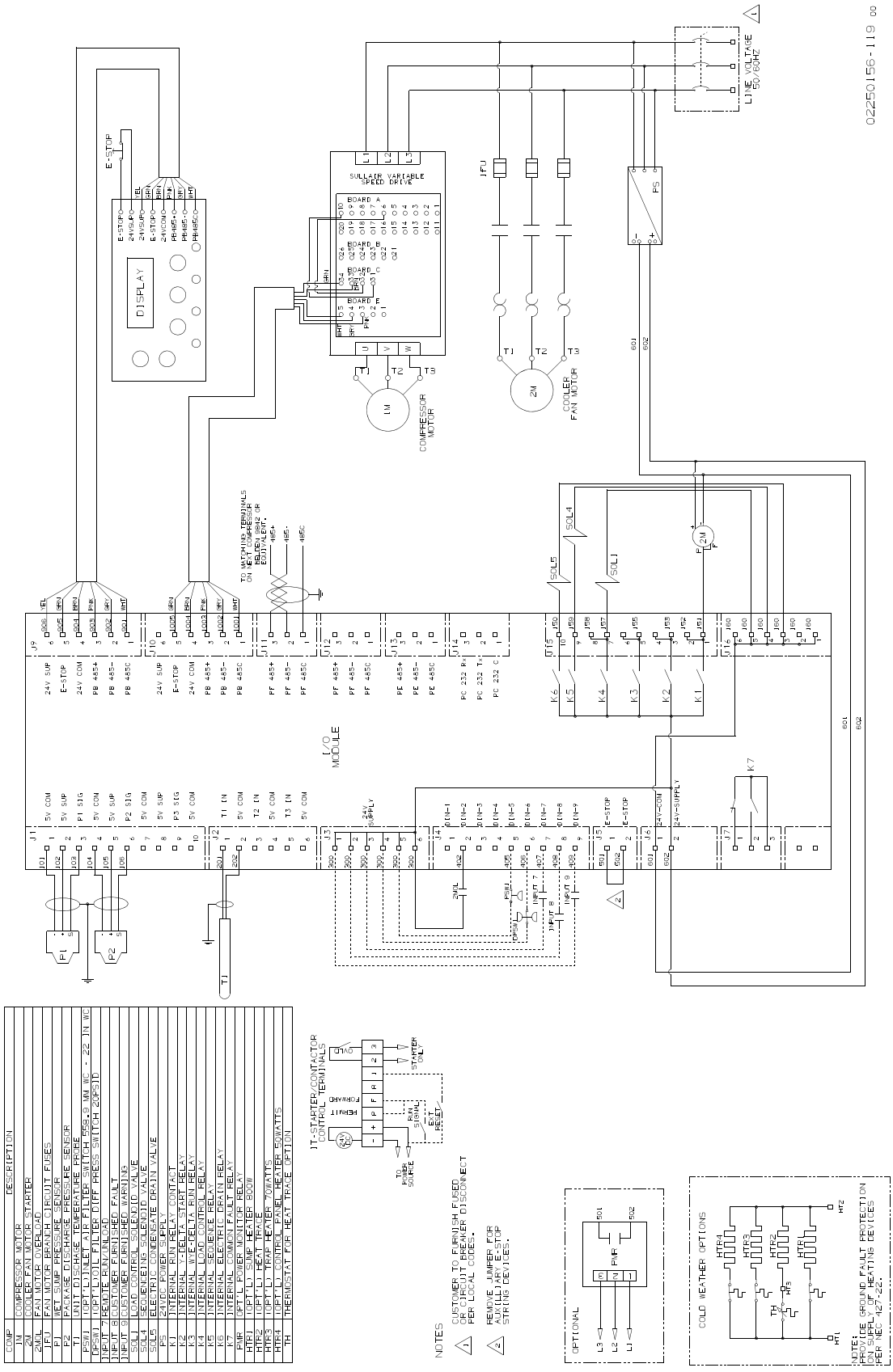


Figure 3-6
Wiring Diagram - VSD

Section 4

INSTALLATION

4.1 MOUNTING OF COMPRESSOR

A suitable foundation or fabricated support must be established to support the compressor. It should be rigid enough to keep the compressor frame level and maintain alignment of the compressor and motor. Tie-down bolts of sufficient size must be used to provide uniform contact between the foundation and the compressor frame. Materials such as rubber or cork can be used to provide uniform contact between the foundation and compressor frame.

- Piping loads must be eliminated through the use of flex connectors or other systems which prevent piping loads from being transmitted to the compressor.
- Special consideration should be made to meet national and local electrical codes for the required space around and in front of the electrical panel. Lighting should be provided for future service requirements.
- Accessibility for fork lift trucks, overhead cranes and maintenance vehicles should be given careful consideration in order to provide any maintenance that may be required. Adequate space around the unit should be provided for access to all components of the compressor.
- Softer surfaces in walls or ceilings will absorb sound and minimize ambient noise levels. Harder, reflective surfaces will increase ambient noise levels.
- Water-cooled compressors must have provisions for cooling water supply and drainage available.

NOTE

Ambient temperatures above 104°F (40°C) require that the high ambient option is specified for the compressor.

SU_0000026

4.2 VENTILATION AND COOLING

AIR-COOLED COMPRESSORS

- An area with adequate space must be provided for the compressor and its components. Air-cooled compressors require a minimum of 3 feet (1 meter) around the perimeter of the compressor.
- The location should be free from standing water and allow access to clean air that is free from exhaust and paint fumes, dust, metal filings or caustic chemicals.
- Cooling air should be removed from the area in order to prevent the re-introduction of heated exhaust air back into the compressor's cooling system.
- Reduced headroom above the compressor will require that cooling air be either ducted or in some way deflected away from the compressor. Inadequate ventilation will result in higher ambient operating temperatures.

NOTE

Systems that employ both a conventional reciprocating compressor and a screw-type axial compressor must be isolated from each other by use of a common receiver tank. Individual airlines from each compressor should be piped to the common receiver tank.

SU_0000027

NOTE

Shipping straps are painted red in order to help identify them for removal. Be sure to remove them prior to operation of the drive assembly.

SU_0000028

OUTDOOR INSTALLATION (SHELTERED)

Many times a compressor must be installed outside due to available space or other jobsite conditions. When this is necessary, there are certain items that should be incorporated into the system to help ensure trouble-free operation. *The unit must be purchased with a TEFC motor.* The standard machine has NEMA4 rated controls, which are watertight.

NOTE

Variable speed drive compressors are NEMA 12 rated and must not be installed outside or exposed to the elements.

SU_0000041

The compressor should be on a concrete pad, which is designed to drain water away from it. If the concrete pad is sloped, then the compressor must be mounted so that it is level. The base or skid must be sealed where it contacts the concrete pad.

A weatherhood option should be selected to prevent direct rain and snow from falling on the unit. If local weather conditions can be extreme such that direct rain or snow may fall on the unit, it should be in a fully enclosed room or building.

If installed under a shelter, air-cooled machines must be positioned in a way that prevents air recirculation (i.e., hot exhaust being allowed back to the system air inlet).

In installations that include more than one compressor, hot air exhaust should not be directed toward the fresh air intake of the second unit or an air dryer.

A standard machine installed outside must not be started or run if the ambient temperature in and around the compressor drops or may drop below 35°F (1.7°C).

For installation in a below freezing climate, a low ambient option with heat tracing and a sump heater must be installed.

4.3 SERVICE AIR PIPING

Review carefully the total air system before installing a new compressor. Items to consider for the total air system include liquid carryover, pipe sizing, and the use of an auxiliary receiver. The installation of a drip leg or multiple drip legs, installation of a line filter(s) and the installation of isolation valve or valves. These considerations are important to ensure a safe and effective system.

NOTE

Discharged air contains a very small amount of compressor lubricating oil, and care should be taken to ensure that this oil would not interfere with downstream equipment. An air dryer can remove any liquid carryover.

SU_0000030

PIPE SIZING

Pipe should be sized at least as large as the discharge connection of the compressor. Piping and fittings should all be suitably rated for the discharge pressure.

USE OF AUXILIARY RECEIVER / SUMP

An auxiliary receiver/sump should be used in cases where large demand swings are expected. This is not necessary with a variable speed design.

ISOLATION VALVE(S)

If isolation of the compressor from the service lines is required, isolation valves should be installed close to the discharge of the compressor. They should be installed with drip legs that drain sloping downward from the base in order to drain properly. Install a vent to the piping downstream of the minimum pressure check valve on the separator tank, and upstream of the first isolation valve.

When two compressors are operated in parallel, provide an isolation valve and a drain trap for each compressor before the common receiver.

A built-in after-cooler reduces the discharge air temperature below the dew point. For most ambient conditions, considerable water vapor is condensed. To remove the condensation, each compressor with built-in after-cooler is supplied with a combination condensate separator/trap. A drain line should be installed on the condensate drain.

FLUID CONTAINMENT

Compressors are equipped with a fluid containment pan to catch any fluid in the event of a leak or spill. The drain for the pan is located on the air intake end of the machine. For indoor installations, the drain should be plugged to contain fluids. For outdoor applications, the drain must be connected to a separate, customer supplied system to allow rainwater or any accumulated compressor fluid to drain out.

⚠ CAUTION

The use of plastic bowls on line filters and other plastic airline components without metal guards can be hazardous. Synthetic coolants or the additives used in mineral oils can alter their structural integrity and create hazardous conditions. Metal bowls should be used on any pressurized system for safety concerns.

"The Plastic Pipe Institute recommends against the use of thermoplastic pipe to transport compressed air or other compressed gases in exposed above ground locations, e.g. in exposed plant piping." (l)

Sullube should not be used with PVC piping systems. It may affect the bond at cemented joints. Certain other plastic materials may also be affected.

(l) Plastic Pipe Institute, Recommendation B, Adopted January 19, 1972.

SU_0000032

4.4 COUPLING ALIGNMENT CHECK

No coupling alignment is required.

4.5 FLUID LEVEL CHECK

The air compressor is shipped with the proper amount of fluid installed. However, it is necessary to check the fluid level at the time of installation and during continued operation of the compressor. The oil level is to be checked when the compressor is in the **SHUT DOWN MODE (oil level may not be visible when operating)**, and by looking at the sight glass on the sump. **To be able to see the oil level it may be necessary to start the machine and build the sump pressure up to 10/20 psi and then shut down.** If no oil level is seen in the sight glass add oil to the center of the glass. Do not overfill in any case. When a complete oil change is performed, fill the sump to the maximum allowable fluid level (up to the fill plug.)

4.6 ELECTRICAL PREPARATION

Interior electrical wiring is performed at the factory. Required customer wiring should be done by a qualified electrician in compliance with OSHA, National Electrical Code, and/or any other applicable state, federal and local electrical codes concerning isolation switches, fused disconnects, etc.

NOTE

Customer must provide electrical supply power disconnect within sight of machine. The fuse protecting the circuit and the compressor must be selected in accordance with the data provided in the general information section.

SU_0000033

- The compressor and drive should be provided with a proper grounding conductor/earthed in accordance with both local and National Electrical Code (NEC) requirements.
- Installation of this compressor must be in accordance with recognized electrical codes and any local Health and Safety Codes.
- Feeder cables should be sized by the customer/electrical contractor to ensure that the electrical circuit the system is connected to is balanced and not overloaded by any other electrical equipment. The length of wiring from a suitable electrical feed point is critical as voltage drop may impair the performance of the compressor. Cable sizes may vary so the mains terminals will accept from 50 mm^2 (1 awg) (37/4 Sk & 50/60 H) to 90 mm^2 (3/0 awg) (55/75 k & 75/100 H) cable.
- Feeder cable connections to incoming terminals L1-L2-L3 should be tight and clean.

The applied voltage must be compatible with the motor and compressor data plate ratings.

- A starter hole is provided for incoming power connection. If it is necessary to make a hole in the control box in a different location, care should be taken to not allow metal shavings to enter the starter and other electrical components. If another hole is used, the original hole must be blocked off with a suitable knockout seal.
- A few electrical checks should be made to help assure that the first start-up will be trouble-free.

DANGER

Lethal shock hazards exist inside. Disconnect all power at source and lock out before opening or servicing.

SU_0000034

1. Check incoming voltage. Be sure that compressor is wired for the correct incoming voltage.
2. Check the motor starter for correct size, properly sized overload relay, and correct heaters for the load.
3. Check all electrical connections for tightness. Check all grounding connection for bond.
4. “DRY RUN” the electrical controls by disconnecting the three (3) motor leads from the starter. Energize the control circuits by pressing the “I” (START) pad, and check all protective devices to be sure that they will de-energize the starter coil when tripped.
5. Reconnect the motor leads and jog the motor for a direction of rotation check as explained in *Section 4.7*. Wiring diagram for standard compressors is supplied with the machine.

4.7 MOTOR ROTATION DIRECTION CHECK

Motor rotation check must be made at compressor start-up. The compressor will not operate correctly if it runs in the wrong direction. Open the compressor door to view the motor rotation. After the electrical wiring has been done, it is necessary to check the direction of the motor rotation. Pull out the EMERGENCY STOP button and press once, quickly and in succession, the “I” (START) and “O” (STOP) pads. This action will bump start the motor for a very short time. When looking at the motor from the end opposite the compressor unit, the shaft should be turning clockwise. If the reversed rotation is noted, 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. An alternative to this procedure is to set the Microprocessor to display P1 sump pressure. Pull out the EMERGENCY STOP button and press once, quickly and in succession, the “I” (START) and “O” (STOP) pads. This action will bump start the motor for a very short time. If motor rotation is correct there will be immediate pressure shown. If no pressure is present, reverse rotation is occurring. Disconnect the power to the starter and exchange any two of the three power input leads. Recheck rotation as outlined above.

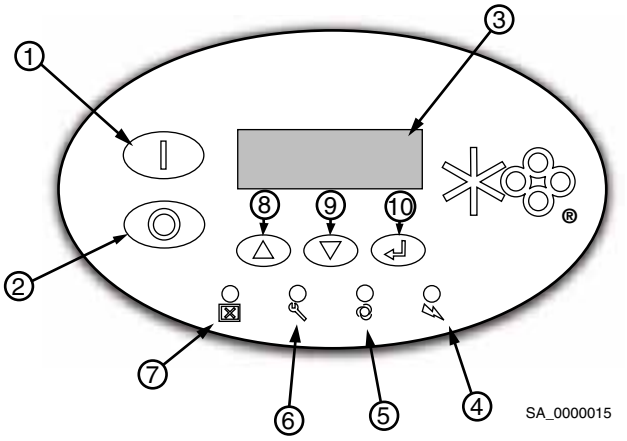
4.8 FAN MOTOR ROTATION CHECK

On initial start-up check that the fan is rotating in the proper direction. The correct rotation is counterclockwise when viewing the fan motor from the driveshaft end.

Section 5

WS CONTROLLER

5.1 CONTROLLER LAYOUT



1. ON
2. OFF
3. LED Display
4. Power Indicator
5. Auto Mode
6. Maintenance Indicator
7. Fault Indicator
8. Up Key
9. Down Key
10. Return Key

Figure 5-1
WS Controller

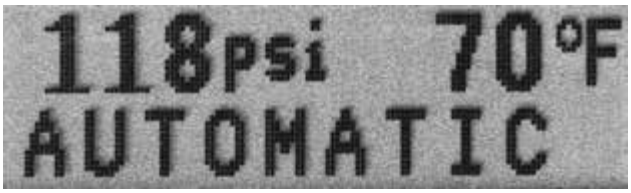
5.2 CONTROLLER KEYPAD

The WS controller keypad has two main pads for compressor control.

- To start the compressor operation, press the green Start pad "I".
- To stop compressor operation, press the red Stop pad "O".
- The Auto mode indicator "⟲" lights up whenever the control is in an operating mode.

5.3 LED DISPLAY

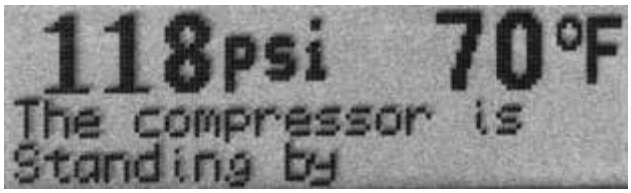
The display's normal view shows the compressor package's discharge pressure, internal temperature, and the operating mode. The modes are MANUAL, OFF, AUTOMATIC, or FAULTED.



SA_0000005

Figure 5-2

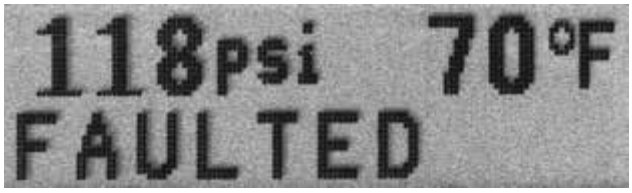
(Figures 5-2 and 5-3) The lower line is occasionally interrupted to descibe the compressor package's operating state.



SA_0000004

Figure 5-3

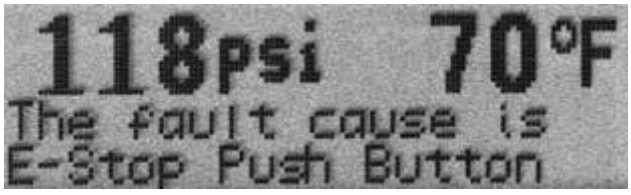
(Figure 5-4) If a machine fault occurs, the red fault "⊠" indicator will light up, and the display will indicate that a fault has occurred.



SA_0000001

Figure 5-4

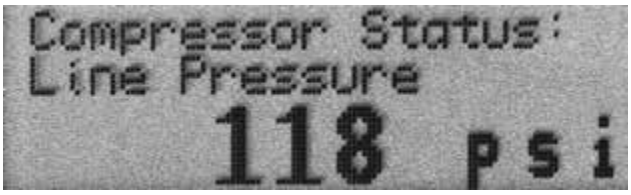
(Figure 5-5) The lower line periodically will display the cause of the fault. Refer to service instructions to correct the cause. Press the Stop pad "O" to reset the controller.



SA_0000002

Figure 5-5

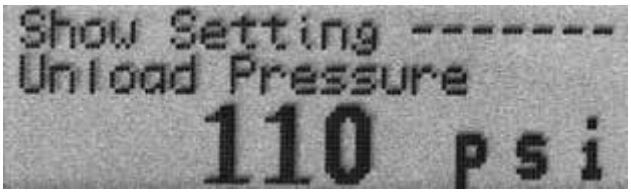
(Figure 5-6) Press the Down arrow "▼" to display additional information about the compressor. The upper line will indicate "Compressor Status" and the name of the temperature, pressure, or other measurement. The lower line indicates the present reading.



SA_0000003

Figure 5-6

(Figure 5-7) When you continue beyond the status information, the display will show a list of control settings. The upper line will indicate "Show Setting" and the name of the setting. The lower line shows the present value.



SA_0000006

Figure 5-7

(Figure 5-8) To change the setting, press the Enter pad "↵". The display indicates that you are in a change mode with reverse characters. Use the Up "▲" or Down "▼" arrow keys to change the setting, and press Enter again to save the new setting.

SA_0000007

Figure 5-8

(Figure 5-8) If there is no keypad activity, the display will return to normal view in about one minute. If the Start or Stop buttons are pressed, the display also returns to normal view. If either of these occur, the setting will not be altered.

If there are any warnings or recommended service instructions, these will be periodically displayed on the normal view.

The list of displays may be navigated from either direction by using the Up "  " or Down "  " arrow keys. For example, to change language from normal view, press the Up arrow pad once, press the Enter key "  ", select your language, and press Enter again. The number of displays varies with compressor model, but will follow the pattern shown on the next page.

The large Emergency Stop button located near the controller overrides all electronic funtions to turn off control devices. The controller senses this, and will display the fault as demonstrated above. To reset, pull out the Emergency Stop button, then press the Stop pad to reset the WS controller.

5.4 LED LIGHTS

The four LED lights indicate the general condition of the machine.

The green Power indicator "  " simply indicates that power is applied to the controller. If will blink very slowly if the WS controller is set up to automatically restart after power failure.

The green Auto mode indicator "  " indicates compressor operation is enabled. It lights steadily if the motor is running. If the motor stops while in Automatic mode, this LED will blink to indicate that the motor may restart.

The yellow Maintenance indicator "  " comes on whenever there is recommended maintenance or a warning. The text display will periodically indicate the recommended actions or the cause of the warning.

The red Fault indicator "  " indicates that a compressor fault has occurred and needs to be repaired before further operation. The text display will indicate the cause of the fault.

The PC support program for the WS controller provides additional information about compressor operation and advanced setup adjustments to optimize operation.

Software part numbers are shown following a power interruption or other interruption of communication with the controller. This remains on the display until satisfactory communications are established with the Input/Output module.

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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 simple. The use of the service indicators provided for the fluid filter, air filter and fluid separator, will alert you when service maintenance is required. When the microprocessor display indicates service, maintenance for that specific item is required. See instructions for each item in *Section 6.6*, *Filter Maintenance*.

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 Guide* Section under EXCESSIVE COMPRESSOR FLUID CONSUMPTION for a probable cause and remedy.

⚠ WARNING

HIGH-PRESSURE HAZARD!

- **DO NOT remove caps, plugs, and/or other components when compressor is running or pressurized. Stop compressor and relieve all internal pressure before doing so.**
- **Failure to comply could result in death or serious injury.**

SU_0000037

After a routine start has been made, observe the controller display and be sure it monitors the correct readings for their particular phase of operation. After the compressor has warmed up, it is recommended that a general check on the overall compressor be made to assure that the compressor is running properly.

6.3 MAINTENANCE AFTER INITIAL 50 HOURS OF OPERATION

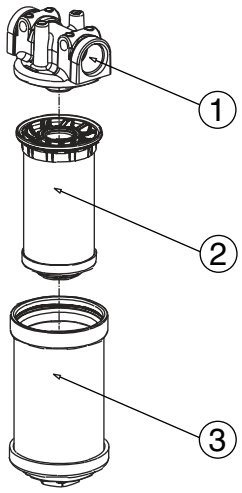
After the initial 50 hours of operation, a few maintenance requirements are needed to clean the system of any foreign materials. Perform the following maintenance operations to prevent unnecessary problems.

1. Clean the return line strainer (refer to *6.4,* for location).
2. Clean the return line orifice.

6.4 MAINTENANCE EVERY 2000 HOURS

After 2000 hours of operation, it will be necessary to perform the following:

1. Clean the return line strainer (refer to*8.10,* for location).
2. Replace the fluid filter element.



1. Filter Head
2. Element*
3. Body*

* Repair Kit P/N 02250155-709

Figure 6-1
Fluid Filter (P/N 02250155-708)

6.5 FLUID MAINTENANCE

Drain the sump and change the compressor fluid using instructions shown in *Sections 3.2, 3.3 and 3.4*.

6.6 FILTER MAINTENANCE

Replace your fluid filter element under any of the following conditions, whichever occurs first:

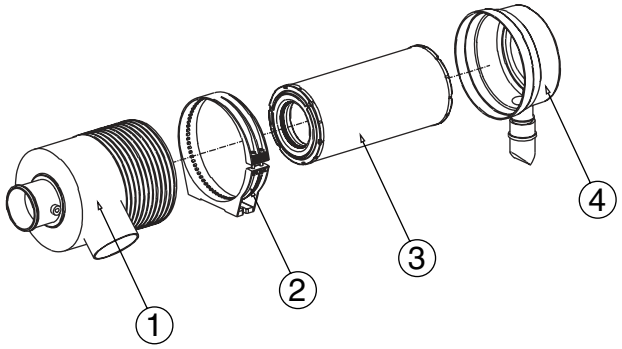
1. As indicated by the microprocessor.
2. Every fluid change.

Refer to **Figure 6-1**.

FLUID FILTER ELEMENT REPLACEMENT

Refer to **Figure 6-1**.

1. Using a wrench, remove the filter canister.
2. Remove and dispose of filter element. Observe all laws and regulations for filter disposal.
3. Clean gasket seating surface.
4. Apply a light film of fluid to the element seal.
5. Install the element into the filter canister.
6. Screw the canister to the filter head. Tighten to 10-12 ft•lb.
7. Restart compressor and check for leaks.



1. Housing
2. Clamp
3. Element
4. Cover

* Replacement Element P/N 02250127-683

Figure 6-2
Air Filter (P/N 02250127-684)

6.7 AIR FILTER MAINTENANCE

Refer to **Figure 6-2**. Air filter maintenance should be performed when the maintenance gauge shows red with the compressor running full load, or once a year, whichever comes first. If the filter needs to be replaced, order a replacement element. Below you will find procedures on how to replace the air filter element.

AIR FILTER ELEMENT REPLACEMENT

1. Clean exterior of air filter housing.
2. Rotate end cover counterclockwise and remove
3. Remove air filter element by pulling it out of the housing.
4. Clean interior of housing using a damp cloth. **DO NOT** blow dirt out with compressed air.
5. At this time replace the element.
6. Reassemble in the reverse order of the disassembly.

6.8 SEPARATOR MAINTENANCE

Replace the separator element when indicated by the microprocessor or after one (1) year, whichever comes first. The separator element must be replaced. **DO NOT** attempt to clean the separator element.

SEPARATOR ELEMENT REPLACEMENT

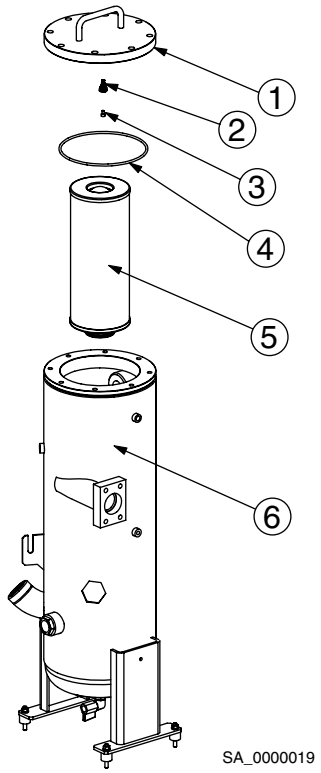
Refer to **Figure 6-3**. The separator element must be changed when indicated by the microprocessor, or once a year, whichever occurs first. Follow the procedure explained below for separator element replacement.

NOTE

Relieve all pressure from the sump tank and all compressor lines.

SU_0000038

1. Loosen and remove the eight (8) hex head capscrews (5/8 x 2") from the cover plate.
2. Lift the cover plate from the sump.
3. Remove the separator element.
4. Inspect the receiver/sump tank for rust, dirt, etc.
5. Reinsert the separator element into the sump taking care not to dent the element against the tank opening.
6. Install a new O-ring in the O-ring groove on the underside of the receiver/sump tank cover.
7. Replace the cover plate, washers and capscrews. Torque to 55 ft•lbs. (75 Nm).
8. Clean the return line strainer before restarting the compressor.



1. Cover
2. Ground Spring*
3. Spring Fastener*
4. Cover Gasket*
5. Element*
6. Sump Tank

* Replacement Kit P/N 02250160-774

Figure 6-3
Separator Element (P/N 02250160-776)

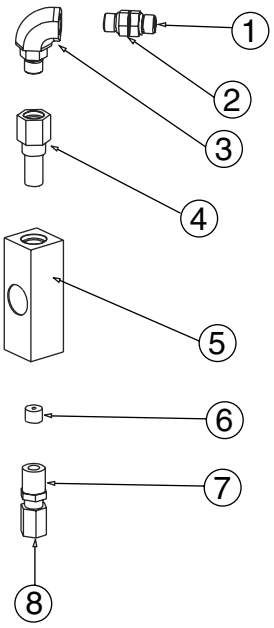
OIL RETURN/SIGHT GLASS MAINTENANCE

Refer to **Figure 6-4**. The oil return/sight glass subassembly is attached to the side of the separator tank. Oil return/sight glass maintenance should be performed on a routine basis parallel to that of the fluid filter, or as indicated in the troubleshooting section of this manual. The maintenance on an oil return/sight glass is mainly concerned with the condition of the filter assembly. Order filter assembly No. 02250117-782, and use the following instructions as a guide.

NOTE

Always perform maintenance on both oil return/sight glasses at the same time.

SU_0000039



SA_0000020

1. To Sump Tank
2. Male Tube Connector
3. 90° Pipe Elbow
4. Filter Assembly*
5. Sight Glass/Orifice Block
6. Brass Plug Orifice
7. Female Tube Connector
8. To Unit

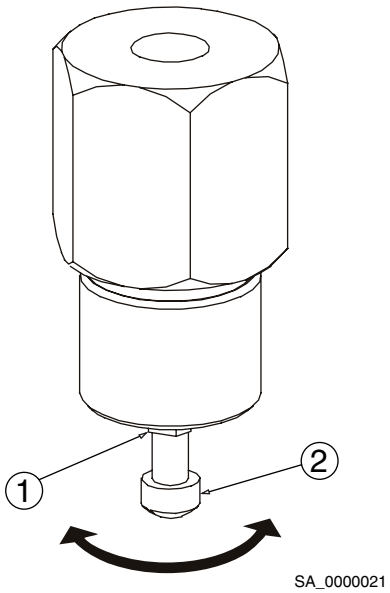
* Repair Kit P/N 02250117-782

Figure 6-4
Oil Return/Sight Glass

1. Disconnect the tube at bottom of sight glass.
2. Unscrew the sight glass assembly where the ell fitting joins the strainer/filter.
3. Remove used filter assembly, and replace with new assembly.
4. Inspect and clean the orifice inside the sight glass blocks. The orifice must be removed with an allen wrench.
5. Coat/lubricate the o-rings with silicone grease.
6. Reattach the connectors to the sight glass/orifice blocks.

PRESSURE REGULATOR ADJUSTMENT

Start the compressor and adjust the service valve to maintain service air pressure approximately at 5 psi over rated pressure. Turn the inlet valve regulator adjusting screw until air just begins to escape from the control air orifice (located at the bottom of the regulator; refer to **Figure 6-5**). Lock the adjusting screw in place with the locknut. The regulator is now properly set.



SA_0000021

1. Locking Nut
2. Adjustment Screw

Figure 6-5
Regulator Adjustment

WATER CONDENSATE DRAIN MAINTENANCE

If your compressor is fitted with the standard solenoid condensate drain valve, it is necessary to periodically clean the strainer. Remove the hex cap from the strainer and remove the strainer screen. Clean the screen and reinstall. If the screen is damaged, the strainer assembly must be replaced (P/N 241772).

CONTROL LINE STRAINER

The regulator and solenoid valve(s), which control the compressor, are protected by a strainer. Every 12 months it is necessary to clean the strainer. Remove the hex cap from the strainer and remove the strainer screen. Clean the screen and reinstall. If the screen is damaged, the strainer assembly must be replaced (P/N 241772).

SHAFT COUPLING MAINTENANCE

The compressor unit and motor are rigidly connected via a mounting adapter housing. This arrangement makes coupling alignment unnecessary. The coupling is a jaw type in shear. If the elastomeric element requires replacement due to wear or breakage, order replacement element no. 02250152-670, and follow the following steps:

1. Remove the protective grill from the adapter housing.
2. Loosen the retaining screw located on the outer sleeve. Slide the sleeve to one side, exposing the coupling element.
3. Unwrap the coupling element from the coupling jaws.
4. Install the new element by wrapping it around the jaws, engaging the cogs on the element into the jaws.
5. Reinstall the outer sleeve and the protective grill.

6.9 TROUBLESHOOTING - INTRODUCTION

The information contained in the Troubleshooting Guide 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 a problem 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. Always remember to:

1. Check for loose wiring.
2. Check for damaged piping.
3. Check for parts damaged by heat or an electrical short circuit, usually apparent by discoloration or a burnt odor.

Should your problem persist after making the recommended check, consult your nearest Sullair representative.

6.10 TROUBLESHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	REMEDY
COMPRESSOR WILL NOT START	Main Disconnect Switch Open	Close switch.
	Line Fuse Blown	Replace fuse.
	Motor Starter Overload Tripped	Reset. Should trouble persist, check whether motor starter contacts are functioning properly.
	Low Incoming Line Voltage	Check voltage. Should voltage check low, consult power company.
COMPRESSOR SHUTS DOWN WITH AIR DEMAND PRESENT	Loss of Control Voltage	Reset. If trouble persists, check that line pressure does not exceed maximum operating pressure of the compressor (specified on nameplate).
	Low Incoming Voltage	Consult power company.
	Excessive Operating Pressure	Separator requires maintenance; check maintenance indicator under full load conditions.
		High pressure setting in microprocessor set wrong; reset.
		Defective valve; regulator valve should cause inlet valve to close when the pressure switch contacts open. Repair if defective.
		Defective blowdown valve; blowdown valve should exhaust sump pressure to 25 psig (1.7 bar) when maximum operating pressure is reached. Repair if defective.
	Discharge Temperature Switch Open	Cooling water temperature too high; increase water flow (water-cooled only).
		Cooling water flow insufficient; check water lines and valves (water-cooled only).
		Cooler plugged; clean tubes. If plugging persists, install water conditioner (water-cooled only).
		Cooling air flow restricted; clean cooler and check for proper ventilation.
		Ambient temperature is too high; provide sufficient ventilation.
		Low fluid level; add fluid.
		Clogged filter; change the fluid filter element.
		Thermal valve not functioning properly; replace element.
		Water flow regulating valve not functioning properly; change (water-cooled only).

(Continued)

SYMPTOM	PROBABLE CAUSE	REMEDY
COMPRESSOR WILL NOT BUILD FULL DISCHARGE PRESSURE	Air Demand is Too Great	Check service lines for leaks or open valves up.
	Dirty Air Filter	Check the filter indicator and inspect and/or change element if required.
	Inlet Valve Bleed Orifice Plugged	Insure control line bleed orifice located in assembly on top of air end is not plugged.
	Pressure Regulator Out of Adjustment	Adjust regulator according to control adjustment instructions in the Maintenance section.
	Defective Pressure Regulator	Check diaphragm and replace if necessary (kit available).
	Defective Unload Solenoid Valve	Check that the valve closes when energized. Replace the coil or the complete valve if defective.
LINE PRESSURE RISES ABOVE UNLOAD PRESSURE SET-POINT	Leak in Control System Causing Loss of Pressure Signals	Check for leaks.
	Inlet Valve Stuck Open	Remove the intake hose and check for inlet valve operation.
	Defective Unload Solenoid Valve	Check that the valve is open when de-energized. Replace if necessary.
	Plugged Control Line Strainer	Clean strainer (screen and o-ring replacement kit available).
	Defective Blowdown Valve	Check that sump pressure is exhausted to the atmosphere when the solenoid valve opens. Repair or replace if necessary (kit available).
EXCESSIVE COMPRESSOR FLUID CONSUMPTION	Clogged Return Line or Orifice	Clean strainer (screen and o-ring replacement kit available).
		Clean orifice.
	Separator Element Damaged or Not Functioning Properly	Change separator.
	Leak in the Lubrication System	Check all pipes, connections and components.
	Excess Fluid Foaming	Drain and change.
	Fluid Level Too High	Drain and change.
PRESSURE RELIEF VALVE OPENS REPEATEDLY	Defective Pressure Relief Valve	Replace.
	Plugged Separator	Check separator differential.

(Continued)

SYMPTOM	PROBABLE CAUSE	REMEDY
LIQUID WATER IN COMPRESSED AIR LINES	Plugged Strainer in Moisture Drain Line	Clean and service strainer located in the line off the bottom of the water separator.
	Water Vapor Condensation from Cooling and Compression Occurs Naturally	Remove the water vapor from compressed air prior to distribution through the air system. Check operation of aftercooler and moisture separator. Install a compressed air dryer sized for the flow and dryness level required. (Note: Filters may also be required to remove particulates, liquid oil aerosols or for oil vapor removal. Change cartridges as recommended by the filter manufacturer). Check all drain traps routinely to insure their proper operation. Maintain them regularly.
	Defective Drain Solenoid Valve	Insure valve opens and closes as signaled by the microprocessor controller.
	Inadequate Drain Timer Settings	Check microprocessor control drain interval and drain time, and adjust accordingly. High humidity conditions require longer drain times or more frequent openings.

Section 7

PARTS LISTS

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 addresses, phone or fax numbers listed 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.

SULLAIR ASIA, LTD.
Sullair Road, No. 1
Chiwan, Shekou
Shenzhen, Guangdong PRV.
PRC POST CODE 518068
Telephone: 755-6851686
Fax: 755-6853473
www.sullair-asia.com

SULLAIR CORPORATION
3700 East Michigan Boulevard
Michigan City, Indiana 46360 U.S.A.
www.sullair.com
Telephone: 1-800-SULLAIR (U.S.A. Only)
or 1-219-879-5451
Fax: (219) 874-1273

CUSTOMER CARE
for PARTS and SERVICE
1-888-SULLAIR (7855247)
219-874-1835

SULLAIR EUROPE, S.A.
Zone Des Granges BP 82
42602 Montbrison Cedex, France
Telephone: 33-477968470
Fax: 33-477968499
www.sullaireurope.com

CHAMPION COMPRESSORS, LTD.
Princess Highway
Hallam, Victoria 3803
Austrailia
Telephone: 61-3-9796-4000
Fax: 61-3-9703-8053
www.championcompressors.com.au

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7.2 RECOMMENDED SPARE PARTS LIST

List No.	Description	Part Number	Quantity
ELEMENTS			
1	element, compressor fluid filter 02250155-708	**02250155-709**	**1**
2	element, heavy duty air filter 02250127-683	**02250127-684**	**1**
3	element, heavy duty air filter 02250091-634	**02250131-499**	**1**
4	element, replacement for separator 02250160-774	**02250160-776**	**1**
KITS			
5	kit, repair for minimum pressurelcheck valve 02250097-598	**02250110-727**	**1**
6*	kit, cap for minimum pressurelcheck valve 02250097-598	**02250046-396**	**1**
7*	kit, o-ring for minimum pressurelcheck valve 02250097-598	**02250048-363**	**1**
8*	kit, piston for minimum pressurelcheck valve 02250097-598	**02250051-337**	**1**
9	kit, repair for thermal valve 02250092-081	**02250092-081**	**1**
10	kit, repair for thermal valve 02250148-796	**02250148-796**	**1**
11	kit, repair for pressure regulator 250017-280	**250019-453**	**1**
12	kit, repair for blowdown valve 02250100-042	**02250100-142**	**1**
13	kit, repair for control solenoid valve 02250155-714	**02250157-500**	**1**
14*	kit, coil replacement for control solenoid valve coil 02250155-714	**02250157-502**	**1**
15	kit, repair for condensate drain solenoid valve coil 02250155-715	**02250157-501**	**1**
16*	kit, coil replacement for condensate drain solenoid valve coil 02250155-715	**02250157-502**	**1**
17	kit, repair inlet valve (integrated with compressor unit)	**02250155-971**	**1**
18	kit, rebuild inlet valve	**02250155-970**	**1**
19	kit, repair for v-type strainer 241771	**241772**	**1**
20	kit, repair for shaft seal	**02250050-363**	**1**
21	kit, repair for shaft seal installation	**602542-001**	**1**
22	filter, scavenge line 02250117-782	**02250117-782**	**2**
23	kit, seal replacement for separatorltrap 02250144-635	**02250144-735**	**1**
LUBRICATION			
24	fluid, SRF 1/4000 (5 gal/19 liter)	**250019-662**	**(I)**
25	lubricant, Sullube (Std.) (5 gal/19 liter)	**250022-669**	**(I)**
26	lubricant, 24 KT (5 gal/19 liter)	**02250051-053**	**(I)**
27	lubricant, Food Grade (5 gal/19 liter)	**250029-008**	**(I)**

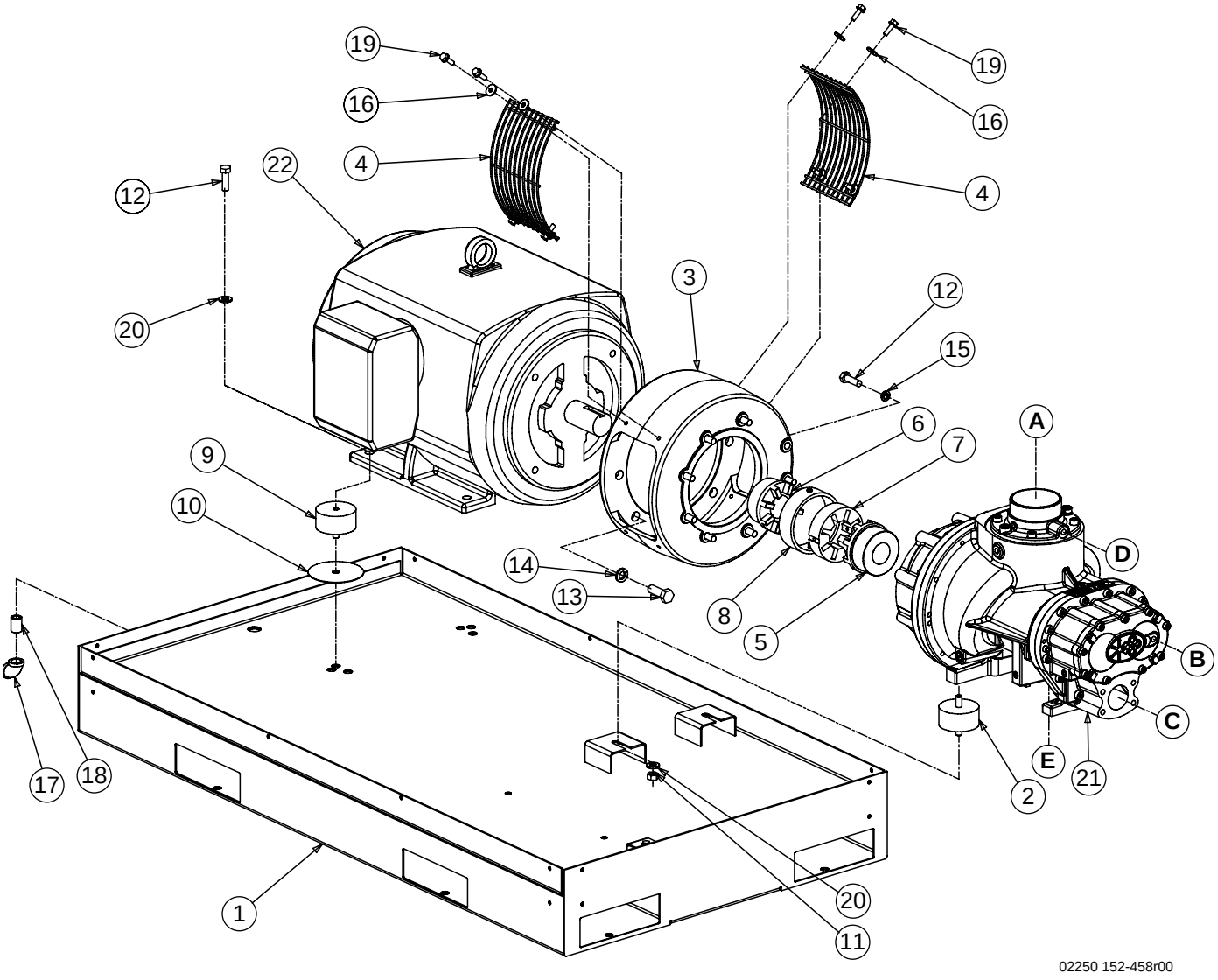
(I) For proper amount of fluid fill, please consult Lubrication Guide in Section 3, Specifications.

CAUTION

Mixing of other lubricants within the compressor unit will void all warranties.

SU_0000042

7.3 COMPRESSOR, FRAME AND DRIVE - 3000 AND 3700 MODELS



A. From Air Inlet Filter
B. Oil Return From Sightglass on Receiver Tank
C. To Receiver Tank
D. From Blowdown Valve
E. Main Oil Connection

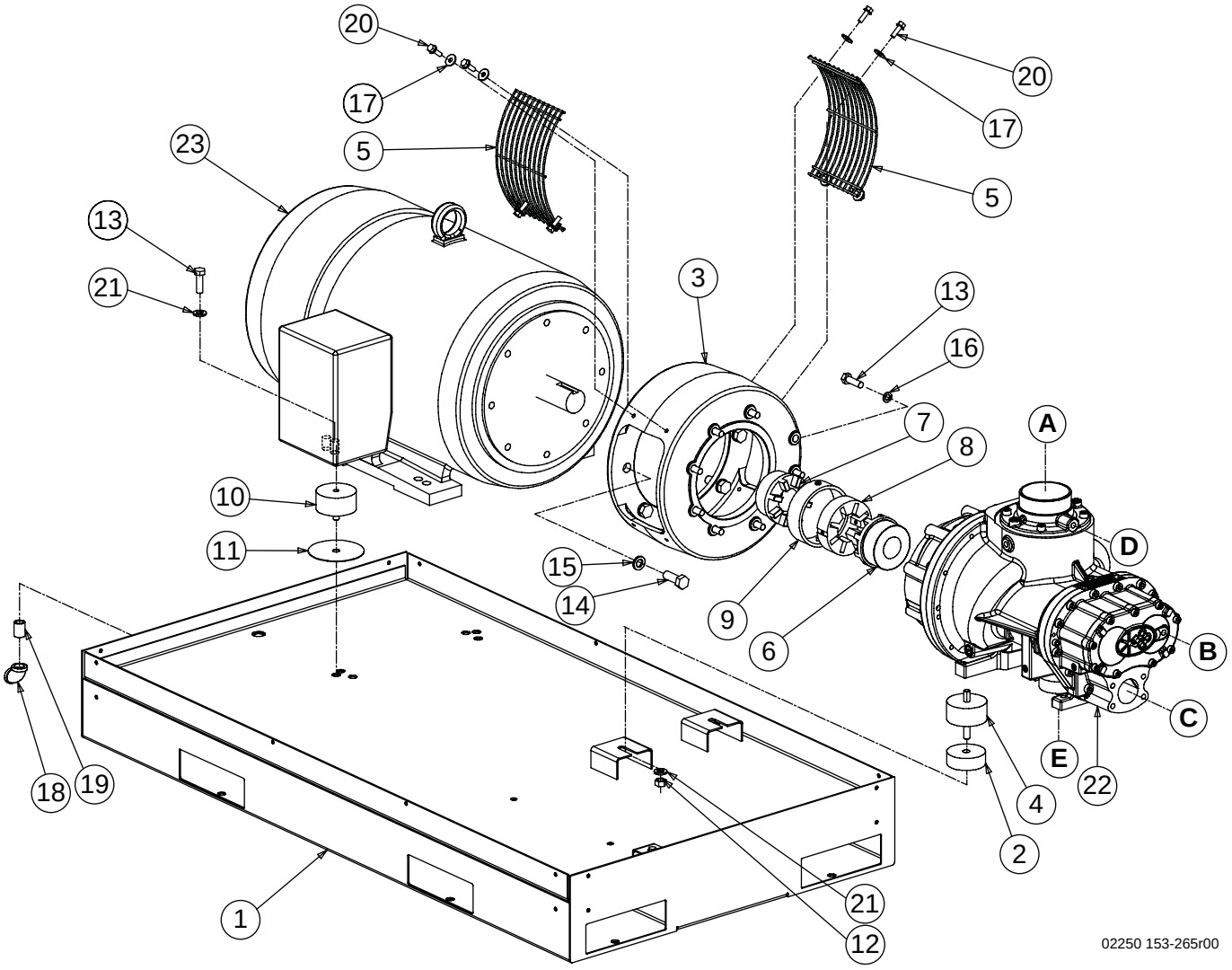
Compressor, Frame and Drive - 3000 and 3700 Models (Continued)

Key Number	Description	Part Number	Quantity
1	frame, 37KW	02250151-176	1
2	isolator, vibration air end 50HP	02250151-500	2
3	adapter, compr/motor 50HP ma	02250151-630	1
4	grille, coupling guard 50HP	02250152-346	2
5	hub, coupling 1.75 bore 20r	02250152-624	1
6	hub, coupling 1.875 bore 20r	02250152-625	1
7	element, cplg 20r	02250152-670	1
8	cover, cplg element 20r	02250152-678	1
9	isolator, vibration motor 37KW	02250155-285	2
10	plate, motor 40HP ws30/37/45 seal	02250156-393	2
11	nut, hex metric m12 x 1.75	825912-175	2
12	capscrew, hex 8.8 m12 x 40mm	828012-040	10
13	capscrew, hex gr5 5/8-11 x 1 3/4	829110-175	4
14	washer, spr lock reg pltd 5/8	837810-156	4
15	washer, spr lock-metric pltd m12	838812-250	8
16	washer, iso 7093-8-140hv	865708-240	8
17	elbow, pipe 90 deg plt 1/2	866215-020	1
18	nipple, pipe-xs plt 1/2 x cl	866408-000	1
19	screw, hex serr washer m8 x 25	882608-025	8
20	washer, nord-lock pl m12 sp	883212-254	4
21	unit, compressor with inlet valve (I)	–	1
22	motor (I)	–	1

(I) Sullair offers an exchange program whereby a remanufactured compressor unit can be obtained from Sullair distributors or the factory at a lower cost than it would cost for the owner to repair the unit. For information regarding the unit exchange program, contact your nearest Sullair representative or the Sullair Corporation.

The shaft seal is not considered part of the compressor unit in regard to the two year warranty, but the normal Sullair parts warranty does apply. For shaft seal repairs, order repair kit No. 02250050-363 and installation kit No. 602542-001.

7.4 COMPRESSOR, FRAME AND DRIVE - 4500 MODEL



A. From Air Inlet Filter
B. Oil Return From Sightglass on Receiver Tank
C. To Receiver Tank
D. From Blowdown Valve
E. Main Oil Connection

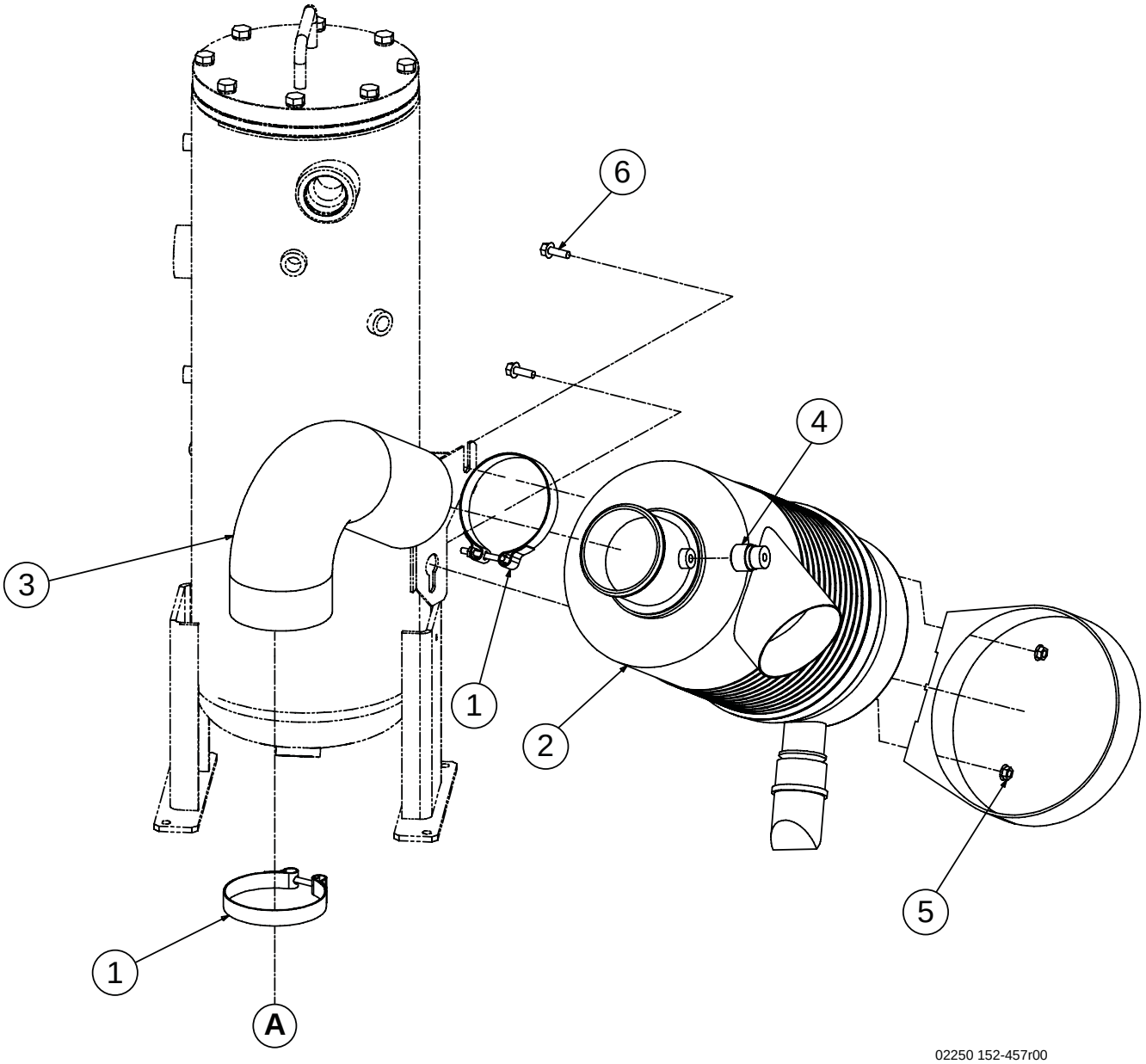
Compressor, Frame and Drive - 4500 Model (Continued)

Key Number	Description	Part Number	Quantity
1	frame, 37KW	02250151-176	1
2	spacer, air end shaft height 60HP	02250151-499	2
3	adapter, compr/motor 50HP ma	02250151-630	1
4	isolator, vibration motor/airend 50/60HP	02250151-941	2
5	grille, coupling guard 50HP	02250152-346	2
6	hub, coupling 1.75 bore 20r	02250152-624	1
7	hub, coupling 1.875 bore 20r	02250152-625	1
8	element, cplg 20r	02250152-670	1
9	cover, cplg element 20r	02250152-678	1
10	isolator, vibration motor 37kw	02250155-285	2
11	plate, motor 40HP ws30/37/45 seal	02250156-393	2
12	nut, hex metric m12 x 1.75	825912-175	2
13	capscrew, hex 8.8 m12 x 40mm	828012-040	10
14	capscrew, hex gr5 5/8-11 x 1 3/4	829110-175	8
15	washer, spr lock reg pltd 5/8	837810-156	8
16	washer, spr lock-metric pltd m12	838812-250	8
17	washer, iso 7093-8-140hv	865708-240	8
18	elbow, pipe 90 deg plt 1/2"	866215-020	1
19	nipple, pipe-xs plt 1/2 x cl	866408-000	1
20	screw, hex serr washer m8 x 25	882608-025	8
21	washer, nord-lock pl m12 sp	883212-254	4
21	unit, compressor with inlet valve (I)	–	1
22	motor (I)	–	1

(I) Sullair offers an exchange program whereby a remanufactured compressor unit can be obtained from Sullair distributors or the factory at a lower cost than it would cost for the owner to repair the unit. For information regarding the unit exchange program, contact your nearest Sullair representative or the Sullair Corporation.

The shaft seal is not considered part of the compressor unit in regard to the two year warranty, but the normal Sullair parts warranty does apply. For shaft seal repairs, order repair kit No. 02250050-363 and installation kit No. 602542-001.

7.5 AIR INLET SYSTEM



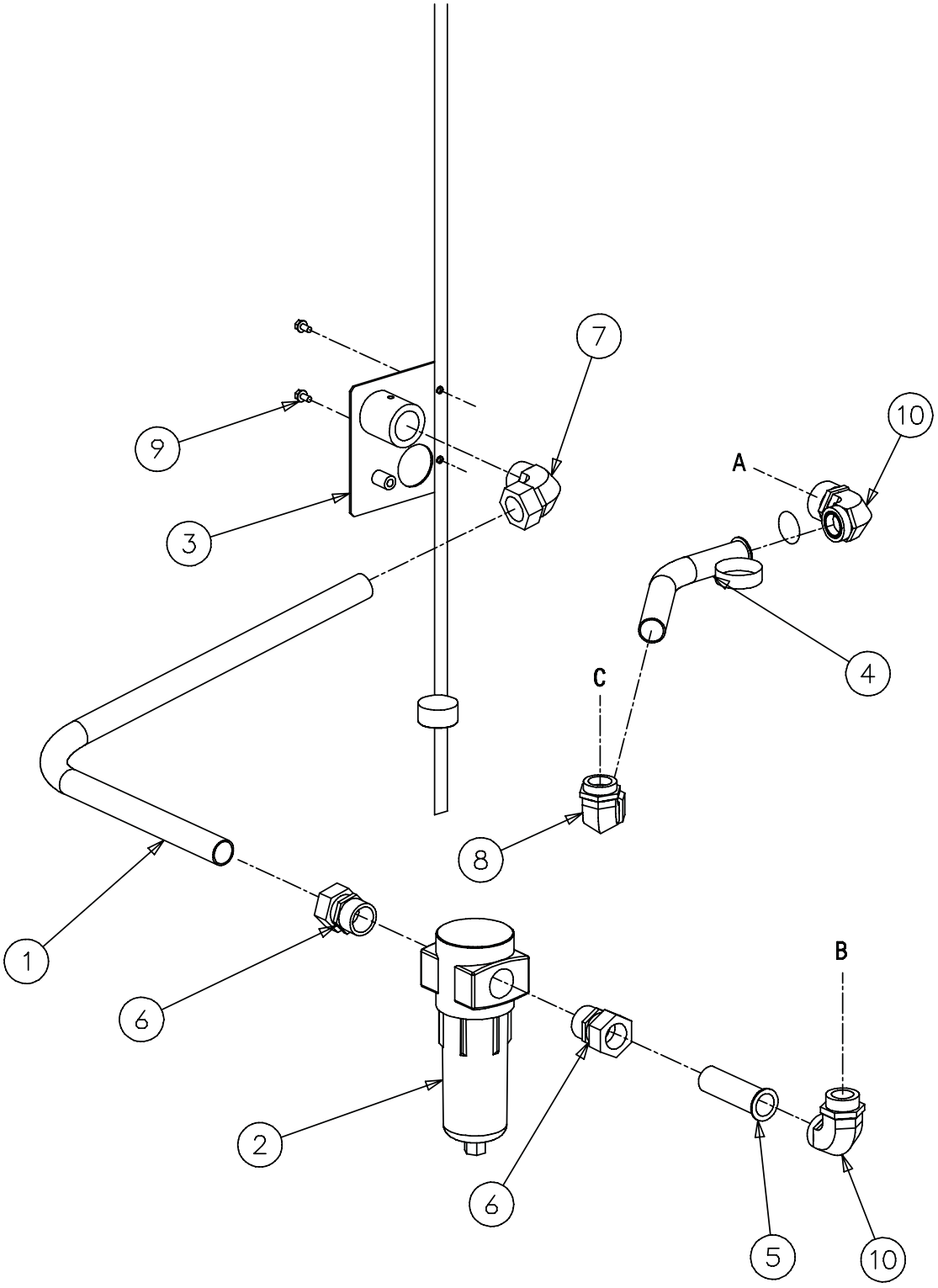
A. To Air Inlet on Compressor Unit

Air Inlet System (Continued)

Key Number	Description	Part Number	Quantity
1	clamp, t-bolt ss band 4.50" id	02250084-842	2
2	filter, air 9" (I)	02250127-683	1
3	hose, rubber el 120deg 4" inl ws37	02250156-927	1
4	indicator, restriction 20" h20	250003-869	1
5	nut, serr flng m8 x 1.25	882508-125	2
6	screw, hex serr washer m8 x 25	882608-025	2

(I) For maintenance on air filter No. 02250127-683, order replacement element No. 02250127-684.

7.6 AIR PIPING - AIR-COOLED



02250 152-474r00

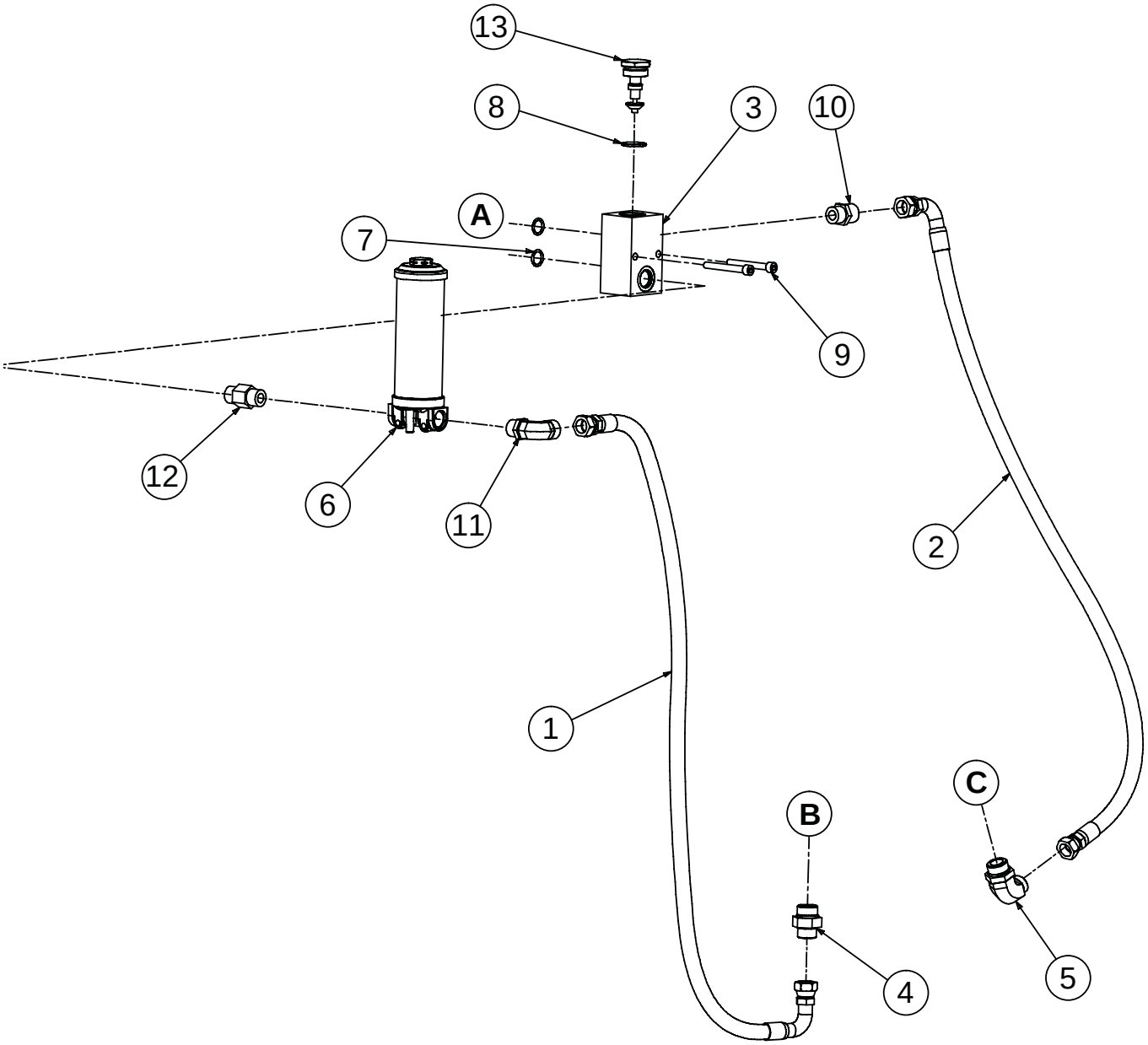
A. To After-Cooler
B. From After-Cooler
C. From Minimum Pressure Valve

Air Piping - Air-Cooled (Continued)

Key Number	Description	Part Number	Quantity
1	tube, mpv/clr/moist sep ls12	02250121-707	1
2	separator, water d-h 1-1/2" fnpt 1/4" drn (I)	02250144-635	1
3	support, outlet conn 1-1/2npt	02250152-215	1
4	tube, mpv to a/c 1.5" orfs 3700	02250157-836	1
5	tube, a/c to trap 1.5" orfs 3700	02250157-837	1
6	connector, tube-m 1 1/2 x 1 1/2	810224-150	2
7	elbow, tube 90 deg m 1 1/2 x 1 1/2	810524-150	1
8	elbow, tube str thrd 1 1/2 x 1 7/8	811624-188	1
9	screw, tf-hex m8 x 16 blk zinc	883008-016	2
10	elbow, met st thd/orfs m48 x 1 1/2	883648-024	2

(I) For maintenance on water separator No. 02250144-635, order seal replacement element No. 02250144-735.

7.7 FLUID PIPING - AIR-COOLED



02250152-488r00

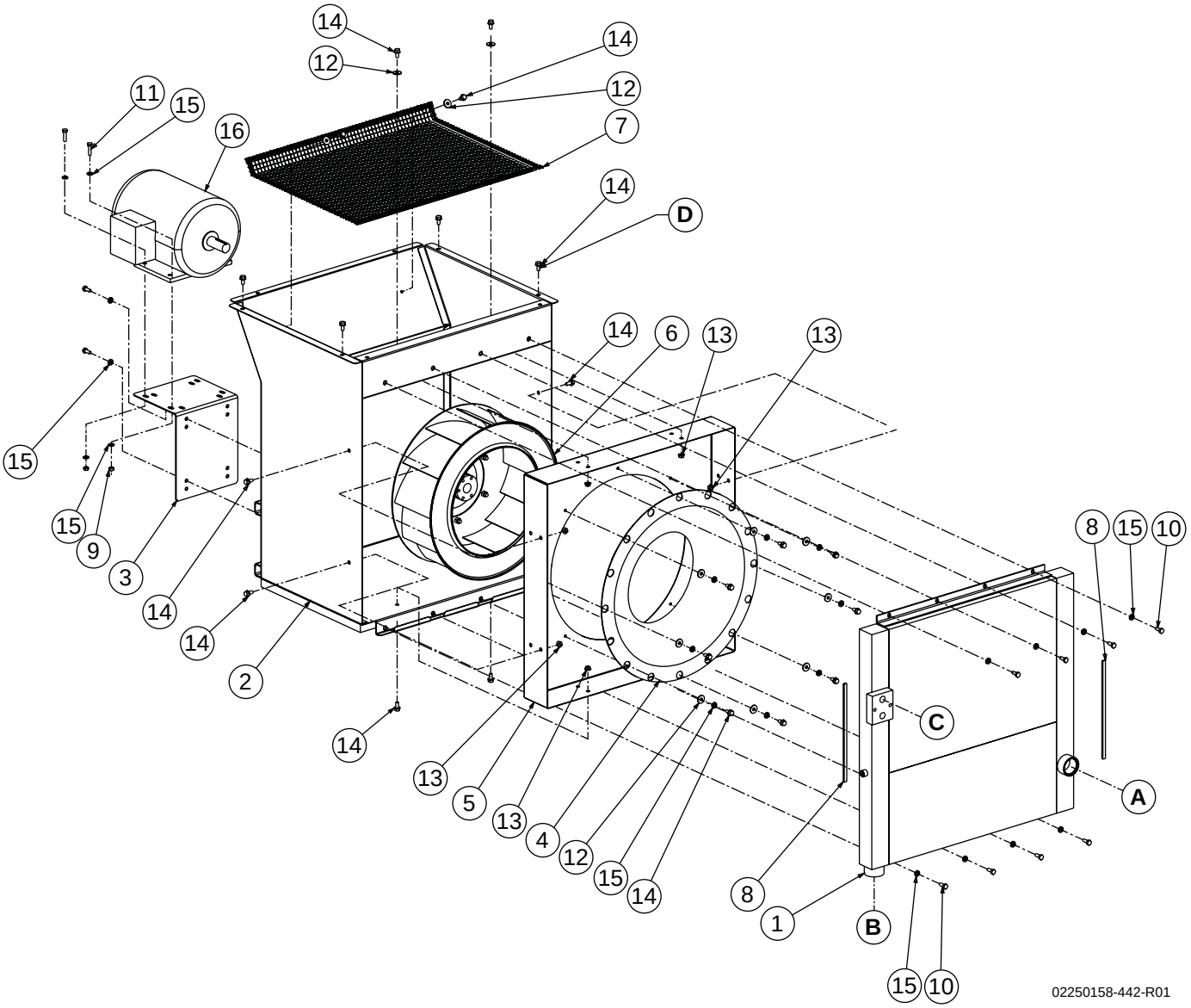
A. To Cooler
B. To Compressor Unit
C. To Receiver Tank

Fluid Piping - Air-Cooled (Continued)

Key Number	Description	Part Number	Quantity
1	hose, medium pressure orfs f-swvl 1" x 53”	02250141-104	1
2	hose, medium pressure orfs f-swvl 1" x 48”	02250143-476	1
3	block, thermal valve 50HP	02250151-498	1
4	connector, orfs x metr oring 3/4" 50HP	02250152-223	1
5	elbow, 90 1" sae x 3/4" orfs	02250152-544	1
6	filter, coreless m27 6" (I)	02250155-708	1
7	o-ring, viton 13/16 x 1/8	826502-211	2
8	o-ring, viton 1 5/16 x 1/8	826502-219	1
9	screw, socket iso m10 x 85mm pc 12.9	874510-085	2
10	connector, metr str thd/orfs m27 x 3/4	883527-012	1
11	elbow, met st thd/orfs m27 x 3/4	883627-012	1
12	union, str thd iso 6149 m27 x 2	883727-012	1
13	element, thermal valve (II)	–	1

(I) For maintenance on coreless filter No. 02250155-708, order replacement element No. 02250155-709.
(II) This part may vary per machine specification. Consult the Sullair factory for details.

7.8 COOLING AND LUBRICATION SYSTEM - AIR-COOLED 18"/60HZ FAN, STANDARD COOLER



A. In from MPV

B. Out to Water Separator

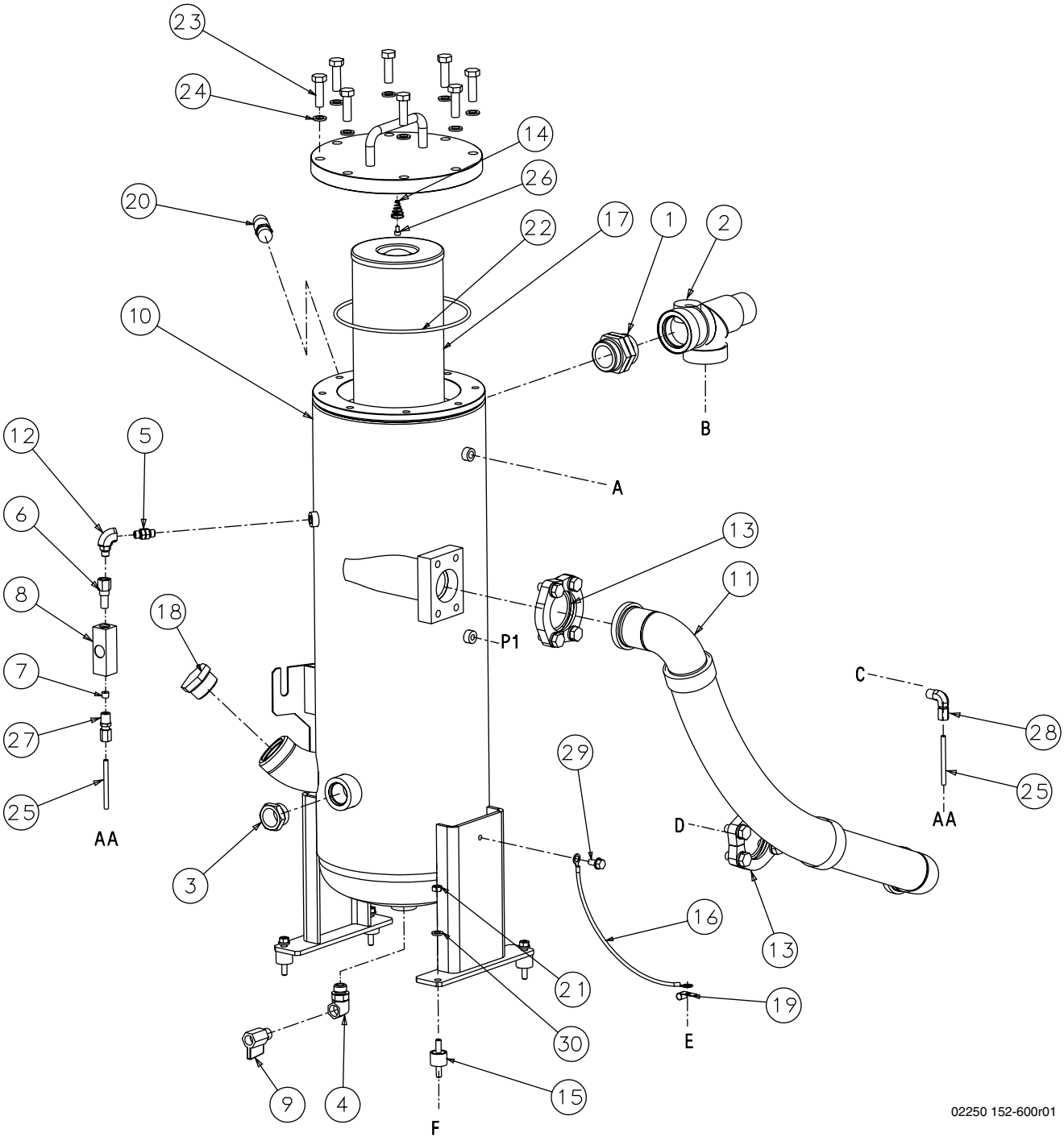
C. Thermal Bypass Valve

D. Cooler Pack Assembly Rests on Top Rails of Canopy. Thread Forming Screws Attach Cooler Pack to Rails.

Cooling and Lubrication System - Air-Cooled 18"/60Hz Fan, Standard Cooler (Continued)

Key Number	Description	Part Number	Quantity
1	cooler, air/oil 50hp	02250151-493	1
	• cooler, air oil high capacity/60HP	02250152-862	1
2	duct, centrifugal fan 50hp	02250151-496	1
3	support, fan motor 50hp	02250151-501	1
4	panel, venturi 50hp 18" fan	02250155-681	1
	• panel, venturi 50HP 20" fan	02250155-680	1
	• panel, venturi 50HP 18" fan	02250155-681	1
5	adapter, venturi 18" fan 37kw	02250155-682	1
6	fan, centrifugal hs 60hz 18" dia	02250155-684	1
	• fan, centrifugal 20" 50HP std	02250151-494	1
	• fan, centrifugal 18" 50HP hi static/60HP std	02250155-684	1
	• fan, centrifugal 20" 60HP hi static/50Hz	02250155-685	1
	• fan, centrifugal 18" 50HP 50Hz	02250151-495	1
7	guard, fan discharge 3700	02250158-544	1
8	weatherstrip, 3/16 x 3/8 ft	250022-436	6
9	nut, hex metric m8 x 1.25	825908-125	4
10	capscrew, hex 8.8 m8 x 20mm	828008-020	12
11	capscrew, hex 8.8 m8 x 30mm	828008-030	4
12	washer, iso 7093-8-140hv	865708-240	12
13	nut, serr flng m8 x 1.25	882508-125	8
14	screw, tf-hex m8 x 16 blk zinc	883008-016	22
15	washer, nord-lock pl m8 sp	883208-166	28
16	motor	–	1

7.9 DISCHARGE, SUMP AND PIPING SYSTEM



A. To Strainer on Solenoid Valve Assembly
B. To After-Cooler In
C. To Unit Oil Return Port
D. From Unit Discharge
E. To Grounding Location on Frame
F. To Frame

Discharge, Sump and Piping System (Continued)

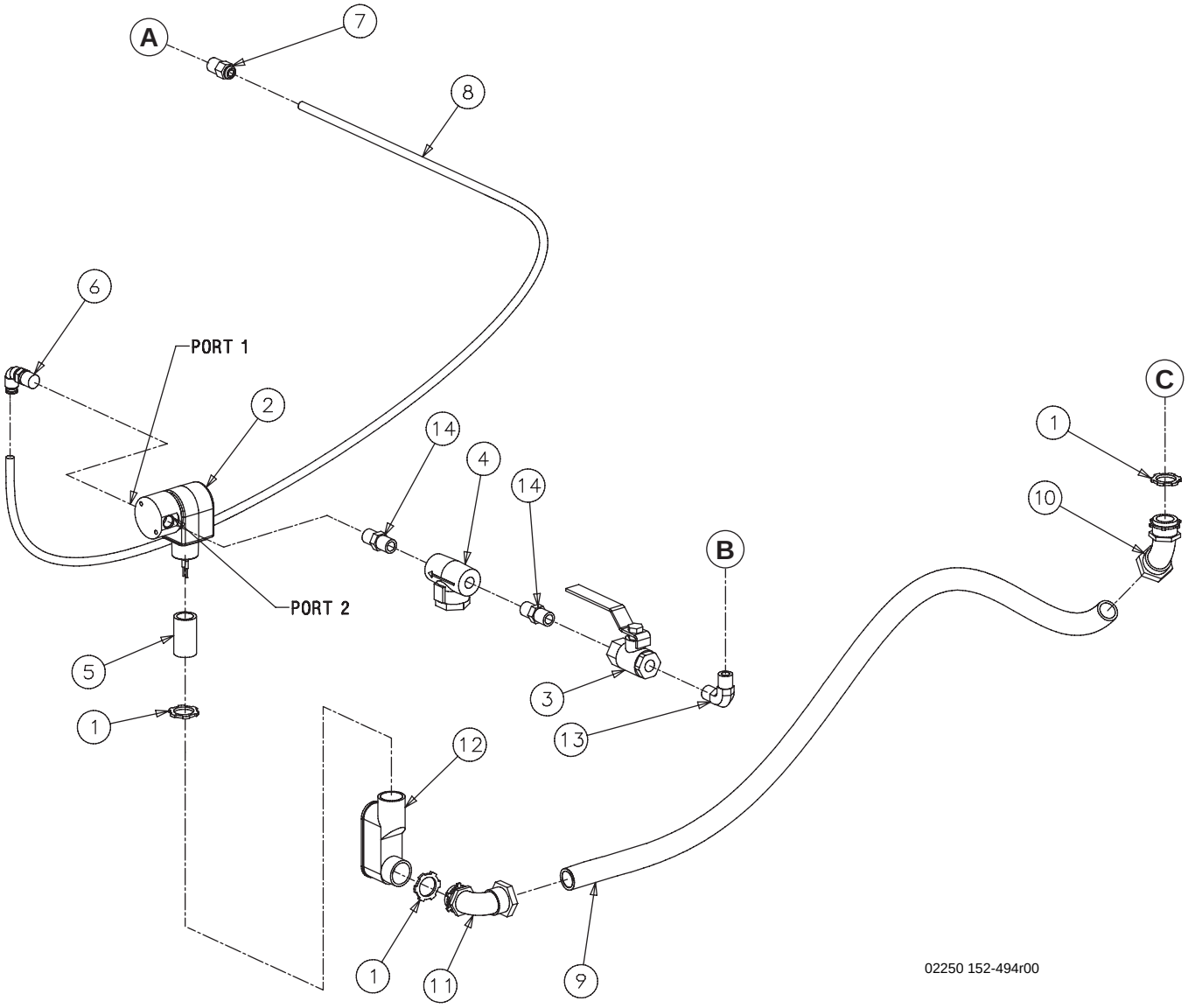
Key Number	Description	Part Number	Quantity
1	adapter, sae 1 7/8-12 x 1 7/8-12	02250055-014	1
2	vlv. min press chk 1-7/8 sae 0-ring por (I)	02250097-598	1
3	plug,sight glass 1 5/16" sae	02250097-610	1
4	elb, 90 deg 3/4 sae x 3/8 nptf	02250100-093	1
5	adapter, sae 7/16 x 7/16-20	02250101-783	1
6	filter, asembly genisis filter (II)	02250117-782	1
7	orifice, plug brass 1/8" npt x 1/32	02250125-774	1
8	sightglass, orf block sae	02250126-129	1
9	valve, ball mini m x f 3/8" viton	02250146-870	1
10	tank, separator ws37	02250149-624	1
11	joint, expansion airend-separator 50HP	02250151-492	1
12	elbow, sae 1/4" (7/16-20) m x f	02250152-798	1
13	flange, kit sae split 2" m12 bolt	02250152-810	2
14	element, oil sep ws37 (III)	02250155-254	1
15	spring, conical oil sep ground ws	02250155-720	1
16	isolator, vibration ws 30/37/45 rec tnk	02250156-379	4
17	wire, 10 gage ground bond 12" m8	02250157-450	1
18	plug, o-ring boss sae 1 1/4	040029	1
19	clamp, speed tube 1/4	043357	1
20	valve, pressure relief 200 psig	250006-938	1
21	nut, hex metric m8 x 1.25	825908-125	4
22	o-ring, viton 7 3/4 x 3/16	826502-368	1
23	capscrew, hex 8.8 m12 x 40mm	828012-040	8
24	washer, spr lock-metric pltd m12	838812-250	8
25	tubing, stnls stl 1/4 20ga ft	841215-004	2
26	screw, socket iso m5 x 8mm pc 12.9	874505-008	1
27	connector, tube-m 1/4 x 1/4 ss	876804-025	1
28	elbow, tube 90 deg m 1/4 x 1/4 ss	877004-025	1
29	screw, tf-hex m8 x 16 blk zinc	883008-016	1
30	washer, nord-lock pl m8 sp	883208-166	4

(I) For maintenance on minimum pressure/check valve No. 02250097-598, order:
kit, cap for minimum pressure/check valve 02250097-59802250046-396 1
kit, O-ring for minimum pressure/check valve 02250097-59802250048-3631
kit, piston for minimum pressure/check valve 02250097-59802250051-3371

(II) For maintenance on return line strainer, order replacement strainer No. 0220117-782 (qty. of 2 needed).

(III) For maintenance on separator element No. 02250155-254, order replacement element No. 02250155-255.

7.10 MOISTURE DRAIN



A. Condensate Drain To Air Out Bracket
B. To Water Separator at Bottom of Bowl
C. To Bottom of Starter Box

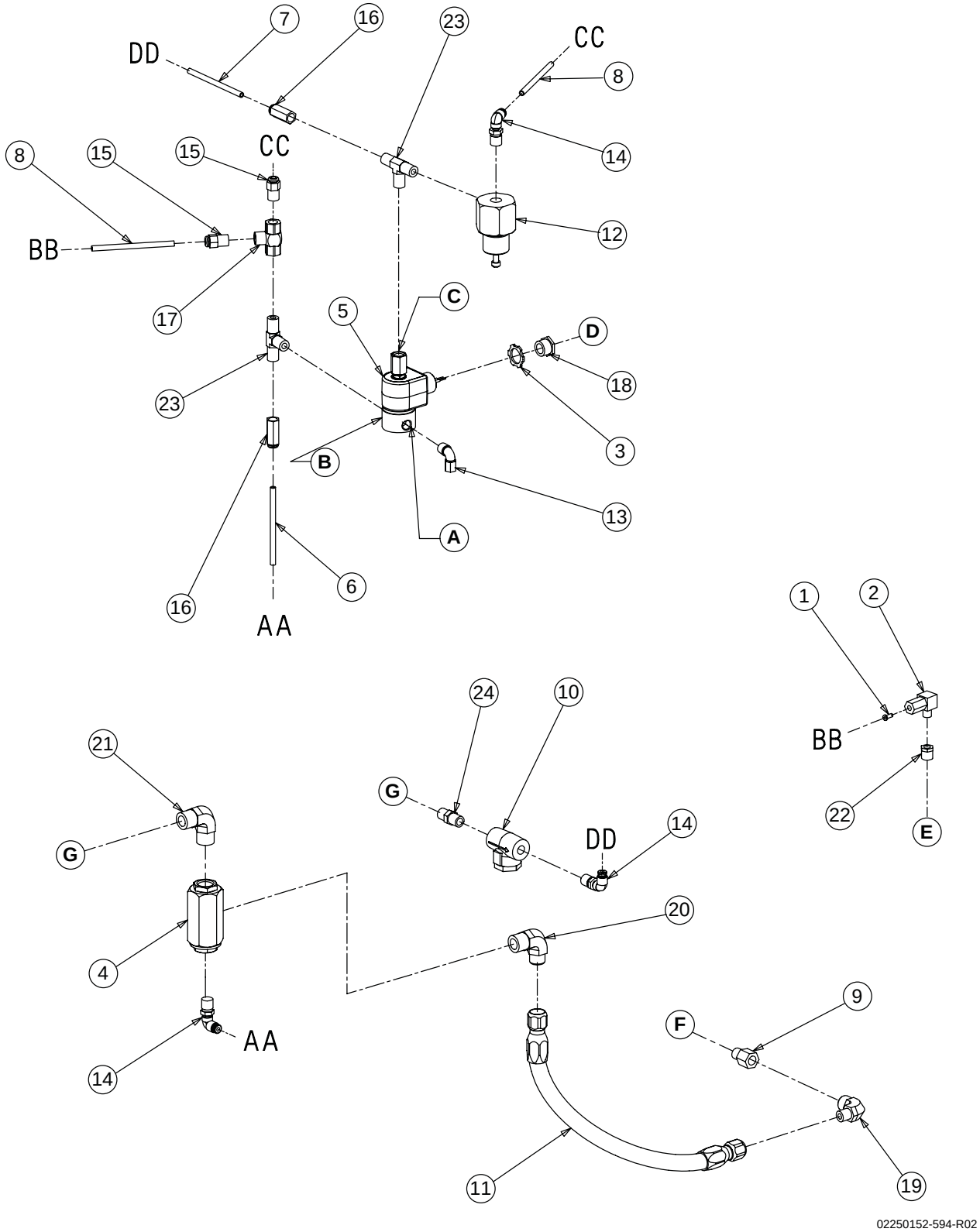
Moisture Drain (Continued)

Key Number	Description	Part Number	Quantity
1	locknut, n4 conduit sealing	02250071-362	3
2	valve, solenoid 2wnc 1/4 200# 24vdc (I)	02250155-715	1
3	valve, ball 1/4" npt	047115	1
4	strainer, v-type 300psix1/4 (II)	241771	1
5	nipple, conduit 1/2 x 1.5”	250007-169	1
6	elbow, 90deg m swvl 1/4t x 1/4 npt	250025-850	1
7	connector, male1/4tube x 1/4	250025-859	1
8	hose, nylon 1/4(ft)	842215-004	5
9	conduit	846315-050	3
10	elbow, 45deg lq-tite 1/2	846500-050	1
11	elbow, 90deg lq-tite 1/2	846600-050	1
12	elbow, entrance 1/2	847715-050	1
13	elbow, pipe-90m 1/4 x 1/4 brass	881004-025	1
14	nipple, pipe-hx brass 1/4 x 1/4	881304-025	2

(I) For maintenance on control solenoid valve No. 02250155-714, order repair part kit No. 02250157-500 and replacement coil No. 02250157-502.

(II) For maintenance on v-type strainer No. 241771, order repair kit No. 241772.

7.11 PNEUMATIC CONTROL SYSTEM - STANDARD

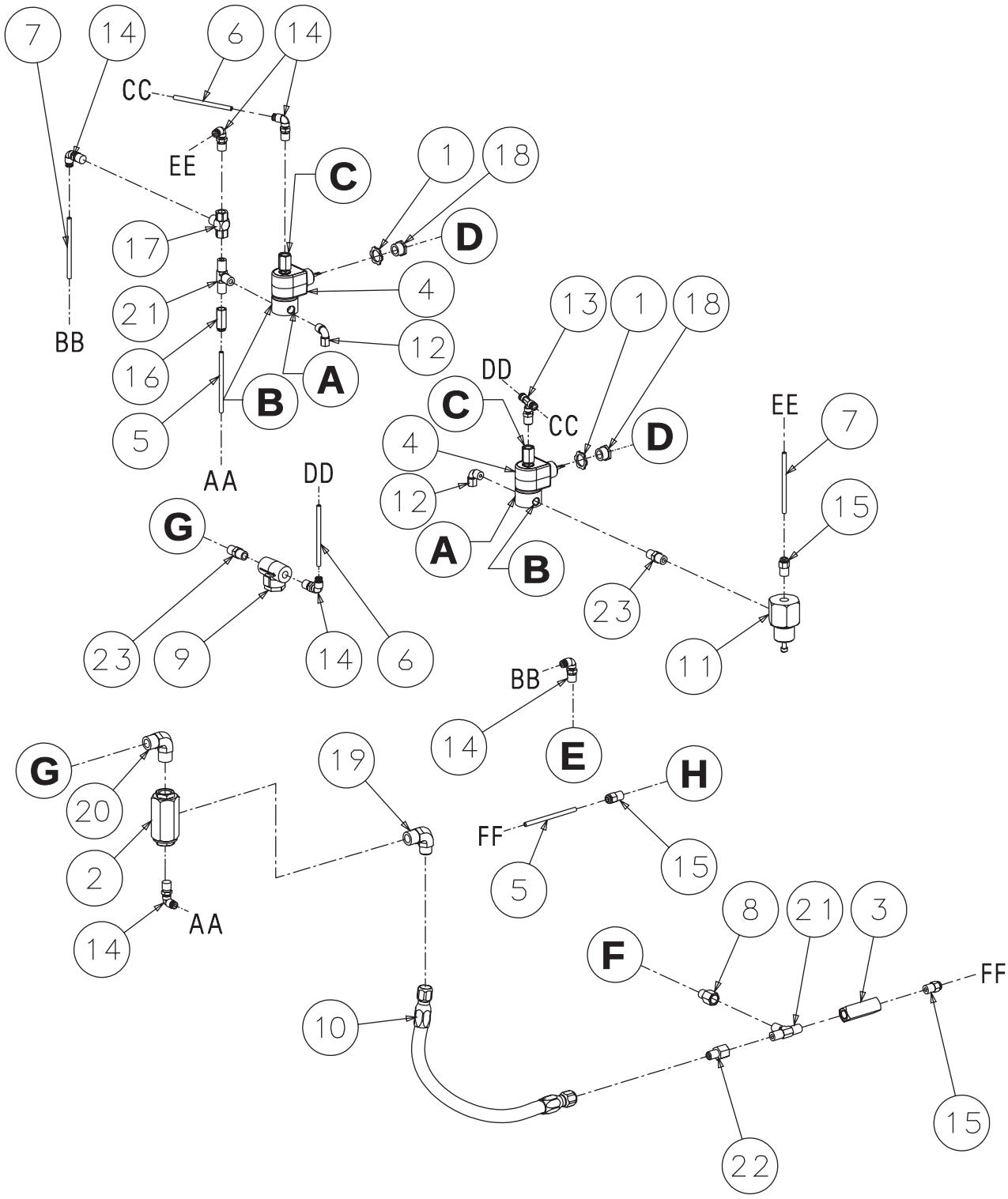


A. Port 1
B. Port 2
C. Port 3
D. To Starter Box
E. To Inlet Valve
F. To Inlet Adapter

G. To Receiver Tank

H. To Minimum Pressure Valve

7.12 PNEUMATIC CONTROL SYSTEM - WITH SEQUENCING



02250163-528R00

A. Port 1
B. Port 2
C. Port 3
D. To Starter Box
E. To Inlet Valve
F. To Inlet Adapter
G. To Receiver Tank
H. To Stator Below Inlet

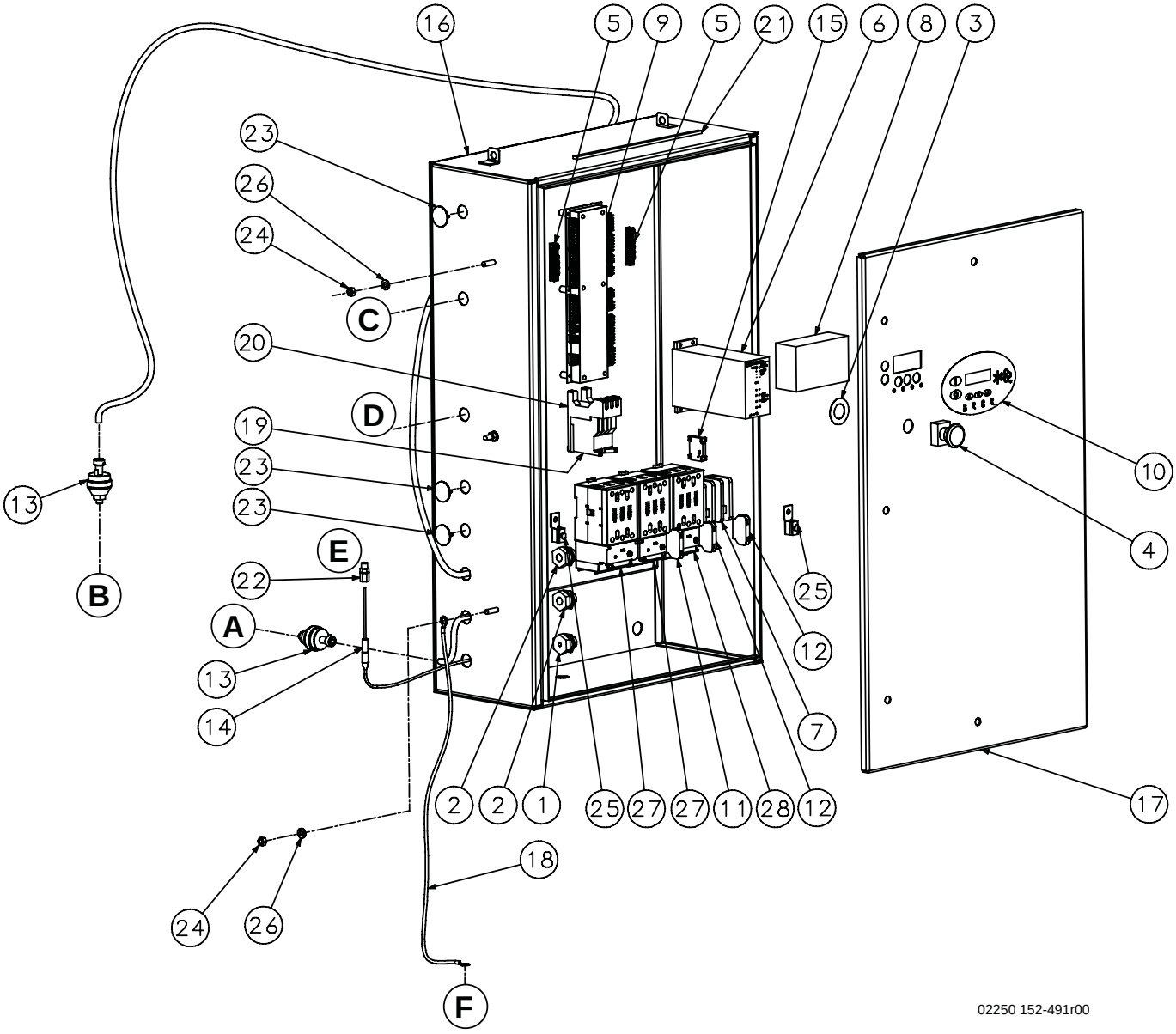
7.12 Pneumatic Control System - With Sequencing (Continued)

Key Number	Description	Part Number	Quantity
1	locknut, n4 conduit sealing	02250071-362	2
2	valve, 1/2 bldwn 1.8:1 250 psig	02250100-042	1
3	valve, check 1/4" poppet style	02250115-272	1
4	valve, solenoid 3wno 1/4 250# 24vdc	02250155-714	2
5	tbg, nylon 1/4"-od red	02250155-961	3
6	tbg, nylon 1/4"-od blue	02250155-962	3
7	tbg, nylon 1/4"-od yellow	02250155-963	3
8	orifice, .140" .25 fnpt x .25	02250161-433	1
9	strainer, v-type 300psix1/4	241771	1
10	hose, med press 0.50 x 015"	249608-019	1
11	valve, pressure regulator	250017-280	1
12	elbow, 1/4" tube x 1/4" npt	250018-430	2
13	tee, male branch swiv 1/4 tube x 1/4 npt	250025-835	1
14	elbow, 90deg m swvl 1/4t x 1/4 npt	250025-850	6
15	connector, male1/4tube x 1/4	250025-859	3
16	connector, fem tube 1/4 x 1/4 nptf	250025-923	1
17	valve, shuttle 1/4" npt (dbl chk)	408893	1
18	nipple, chase cond 1/2	847815-050	2
19	elbow, 37fl 90m 1/2 x 1/2	860208-050	1
20	elbow, pipe-90m 1/2 x 1/2	860508-050	1
21	tee, male pipe brass 1/4	869825-025	2
22	connector, 37 fl 5/16 x 1/4" npt	873704-045	1
23	nipple, pipe-hx brass 1/4 x 1/4	881304-025	2

Pneumatic Control System - With Sequencing (Continued)

Key Number	Description	Part Number	Quantity
1	insert, nylon tubing 1/4" od	02250052-841	1
2	elbow, check valve 1/4t x 1/8p	02250058-275	1
3	locknut, n4 conduit sealing	02250071-362	2
4	valve, 1/2 bldwn 1.8:1 250 psig	02250100-042	1
5	valve, solenoid 3wno 1/4 250# 24vdc	02250155-714	2
6	tbg, nylon 1/4" od red	02250155-961	3
7	tbg, nylon 1/4" od blue	02250155-962	3
8	tbg, nylon 1/4" od yellow	02250155-963	3
9	orifice, .187 x 1/4m x 1/4f	02250160-103	1
10	strainer, v-type 300 psi x 1/4	241771	1
11	hose, med press 0.50 x 015	249608-019	1
12	valve, pressure regulator	250017-280	1
13	elbow, 1/4" tube x 1/4" npt	250018-430	2
14	tee, male branch swiv 1/4 tube x 1/4 npt	250025-835	1
15	elbow, 90 deg m swvl 1/4t x 1/4 npt	250025-850	4
16	connector, male 1/4 tube x 1/4	250025-859	2
17	connector, fem tube 1/4 x 1/4 nptf	250025-923	1
18	valve, shuttle 1/4" npt (dbl chk)	408893	1
19	nipple, chase cond 1/2	847815-050	2
20	elbow, 37fl 90m 1/2 x 1/4	860208-025	1
21	elbow, 37fl 90m 1/2 x 1/2	860208-050	1
22	elbow, pipe-90m 1/2 x 1/2	860508-050	1
23	bushing, red hex pltd 1/4 x 1/8	868900-005	1
24	tee, male pipe brass 1/4	869825-025	1
25	nipple, pipe-hx brass 1/4 x 1/4	881304-025	2

7.13 CONTROL SYSTEM AND ELECTRIC PARTS - 230/460 WYE-DELTA



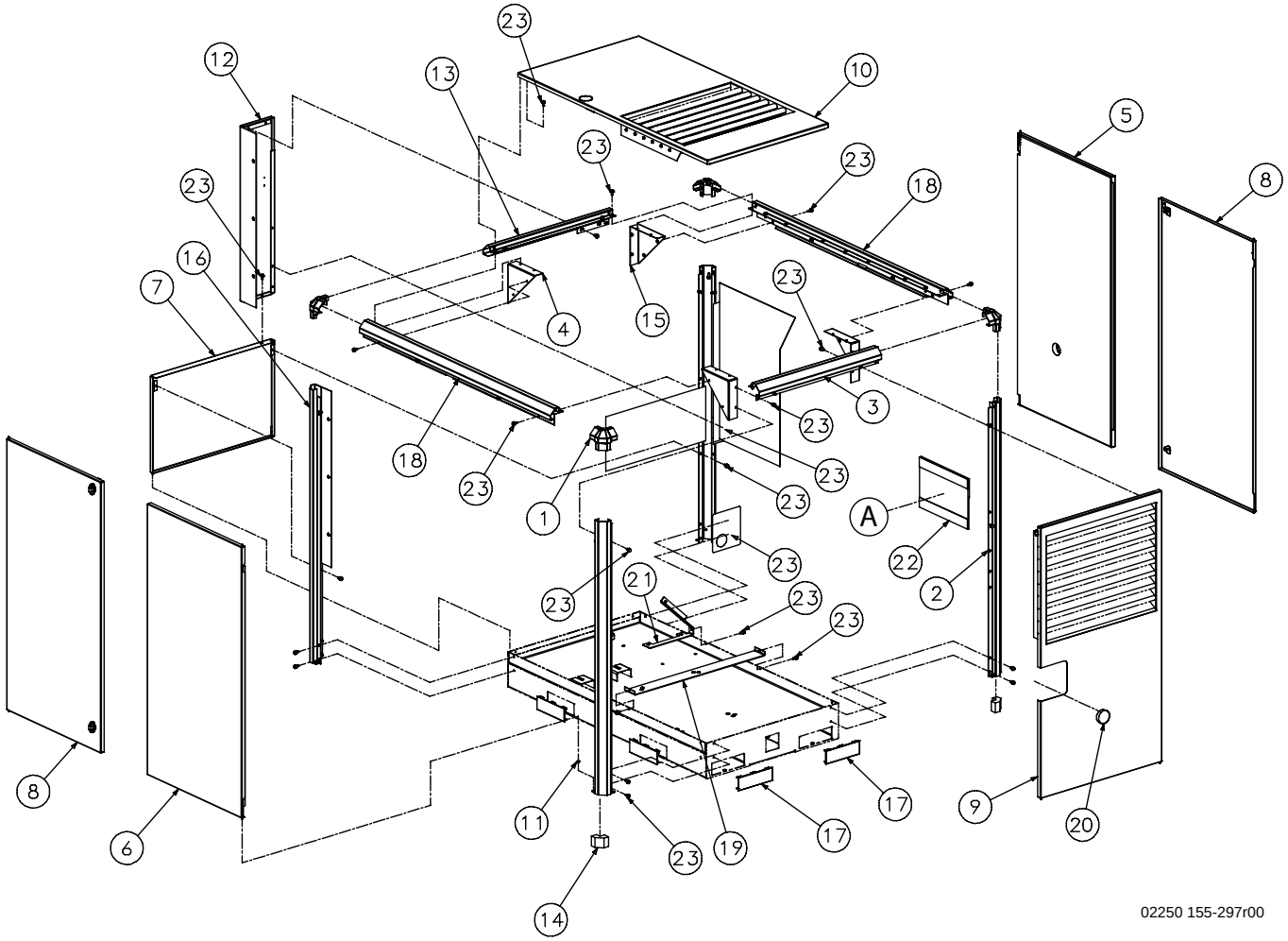
A. P1 - Wet Sump Pressure
B. P2 - Line Pressure
C. Solenoid 1
D. Solenoid 4
E. T1 - Wet Discharge Temp.

Control System and Electric Parts - 230/460 WYE-Delta (Continued)

Key Number	Description	Part Number	Quantity
1	grip, cord n4 .125-.187 x 1/2"	02250071-379	1
2	grip, cord n4 .250-.375 x 1/2"	02250071-381	2
3	nameplate, e-stop 45mm yellow	02250081-473	1
4	switch, push-button operator e-stop	02250085-504	1
5	bar, ground 5 post cutler hammer	02250101-721	2
6	supply, power 360-48ac/24dc ch-it strt	02250122-036	1
7	block, pwr distr 600a	02250145-195	1
8	control, display supv x	02250154-051	1
9	control, i/o mod supv x	02250154-052	1
10	decal, microprocessor overlay	02250154-359	1
11	block, contact aux 1no ch-it a-e	02250154-607	1
12	block, contact aux 1nc ch-it a-e	02250154-608	2
13	transducer, pressure 0-250# ratiometric	02250155-174	2
14	probe, rtd 100 ohm plat 3.5" x 6ft	02250155-175	1
15	link, mech intrlk ch it frm b-e	02250155-676	1
16	specification, encl ws37 22" x 36" x 10"	02250155-936	1
17	door, start encl ws37	02250155-938	1
18	wire, 10 gage ground bond 12" m8	02250157-449	1
19	relay, overload 32a	250021-692	1
20	adapter, o.l.r. base mnt ch1	250021-694	1
21	weatherstrip, 3/16 x 3/8 ft	250022-436	2
22	fitting, compress adj	250028-635	1
23	plug, hole n4 1/2" cond	409918-002	3
24	nut, hex metric m8 x 1.25	825908-125	6
25	lug, scrulug kpa-25 4-1/0	849215-025	2
26	washer, nord-lock pl m8 sp	883208-166	6
27	contactor (I)	–	2
28	Starter	–	1

(I) This part may vary per machine specification. Consult the Sullair factory for details.

7.14 ENCLOSURE - AIR-COOLED

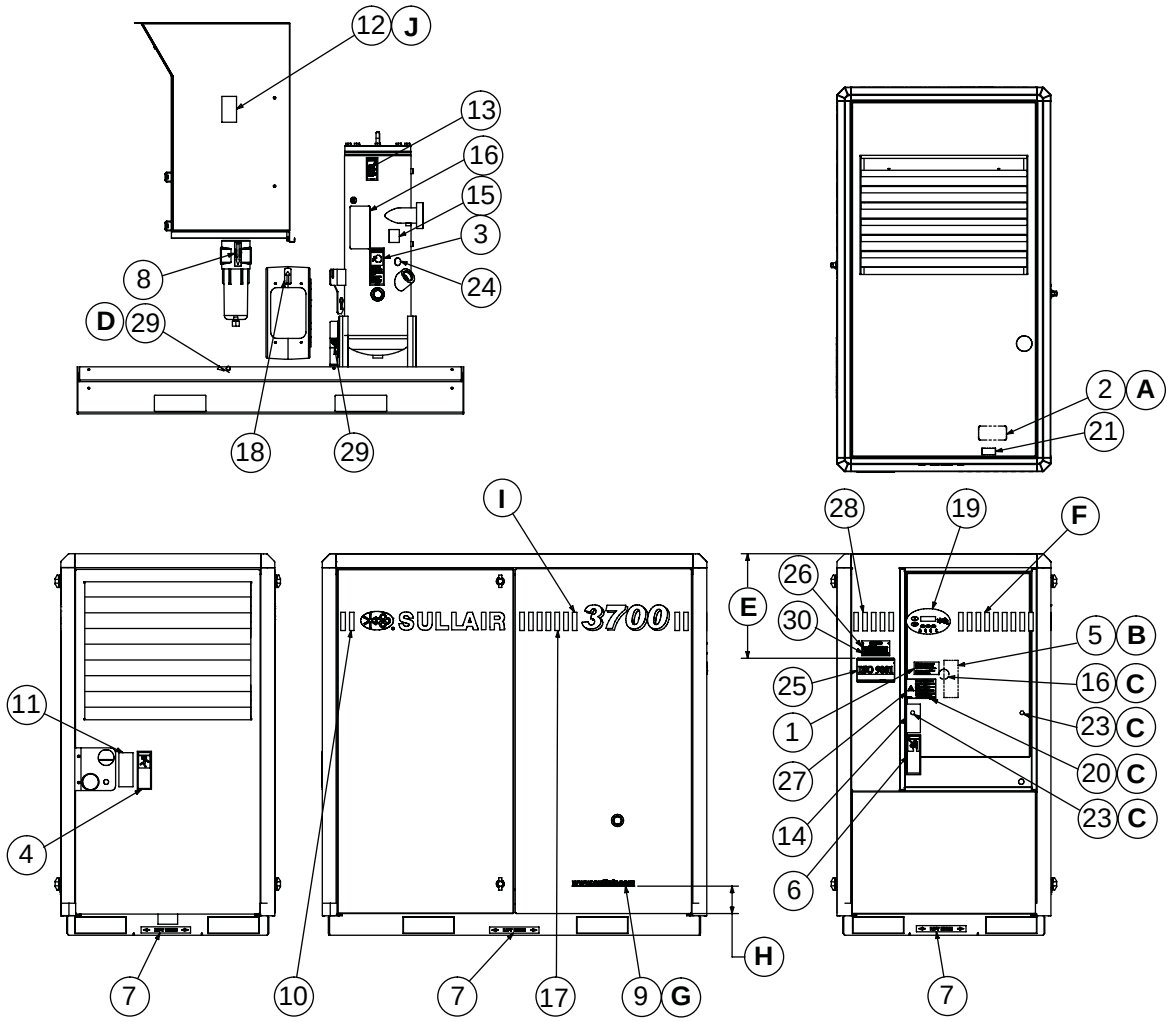


A. Fan Box

Enclosure - Air-Cooled (Continued)

Key Number	Description	Part Number	Quantity
1	cap, molded canopy corner 50HP	02250150-893	4
2	rail, vertical 37KW	02250150-910	3
3	rail, roof air out end 37KW	02250150-912	1
4	gusset, str crnr square 37KW	02250151-177	1
5	panel, canopy door flanged w/cutout	02250151-178	1
6	panel, canopy door flanged 37KW	02250151-179	1
7	panel, starter end bottom 37KW	02250151-180	1
8	panel, canopy door locking 37KW	02250151-181	2
9	panel, canopy assy intake end 37KW	02250151-182	1
10	panel, roof canopy 37KW	02250151-183	1
11	bearing, flanged 5mm 50HP	02250151-635	4
12	panel, starter end l/h 37KW	02250152-031	1
13	rail, roof starter end 37KW	02250152-040	1
14	insulation, foam 2" corner piece 50h	02250152-323	4
15	gusset, corner square 37KW	02250154-298	3
16	rail, vertical starter side 37KW	02250154-393	1
17	cover, forkpocket 37KW	02250154-405	8
18	rail, side assy rh/lh 37KW	02250154-992	2
19	support, shipping mtr/unit 37KW	02250155-191	1
20	plug, hole 2 1/2" nylon black	02250155-284	1
21	support, receiver ws30/37/45 shipping	02250157-383	1
22	pocket, drawing holder 3700	02250158-039	1
23	screw, tf-hex m8 x 16 blk zinc	883008-016	59

7.15 DECAL SECTION - AIR-COOLED



02250152-489

A. Attach to the Bottom on Inside of Starter Box

B. Attach to Inside of Starter Door

C. Attach to Sub-panel Inside Starter Box

D. Attach to Top of Shipping Strap

E. 428.0

F. Center Stripes Vertically Based on Location of Microprocessor Decal

G. Both Sides of Machine

H. 112.7

I. Locate Decals on Both Sides of Machine by Using Location of End Stripe and Microprocessor Location

J. Both Sides of Fan Box

Decal Section - Air-Cooled (Continued)

Key Number	Description	Part Number	Quantity
1	decal, caution auto start	041065	1
2	decal, danger hi voltage	042218	1
3	sign, warning-comp oil fil cap	049685	1
4	decal, warn "food grade" lube	250003-144	1
5	sign, warning ground fault	049852	1
6	decal, warning-autostart	250017-903	1
7	decal, fork lifting	241814	4
8	decal, water drain 3 3/4 x 1"	250022-810	1
9	decal, black www.sullair.com	02250155-495	2
10	decal, Sullair side graph 50HP	02250154-361	2
11	decal, danger inhaling comp air	250027-935	1
12	sign, warning-sever-fan-indus	049855	2
13	sign, warning-hot surfaces	407408	1
14	sign, danger electrocution	049850	1
15	decal, en-warning mixing fluids	02250110-891	1
16	decal, maint kit eng 3700	02250156-300	1
17	decal, 3000,3700 or 4500 (I)	–	2
18	decal, rotation 3.5" lg	250021-564	1
19	decal, microprocessor overlay	02250154-359	1
20	decal, pe designation	02250075-540	1
21	decal, voltages (I)	–	1
23	decal, protective earth ground	02250075-045	2
24	decal, various fluids (I)	–	1
25*	decal, iso 9001 blk 3.44x5.75	02250057-624	1
26*	nameplate, Sullair serial number	02250059-318	1
27*	decal, electrocution hazard international/globa	02250077-472	1
28*	decal, Sullair side graphic 50HP	02250154-360	1
29*	decal, remove before start-up	02250158-358	2
30*	rivet, pop 1/8 x 1/2	843102-050	4

(I) This decal may vary per machine specification. Consult the Sullair factory for details.

* Decal not shown.

Decal Section - Air-Cooled (Continued)

1

CAUTION: This machine is equipped with Automatic Stop / Start Control System.
DO NOT ATTEMPT to make any adjustment without disconnecting both main line and control circuit electrical power.
41065

41065

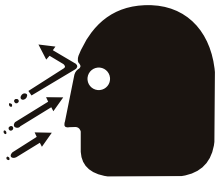
2

DANGER
HIGH VOLTAGE

042218

3

WARNING



Do not remove cap , plug , or other compo- nent when compre or i running or pre urized. Stop compre or and relieve all internal pre ure before doing o.

049685

4

WARNING

Do not permit air from this equip- ment to contact food stuff except in full compli- ance with FDA Standard 21CFR178.3570, and all other applicable federal, state and local, codes, standards and regulations.

250003-144

5

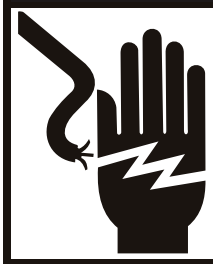
WARNING

Use equipment grounding connector in accordance with the National Electric Code, and all Federal, State, and Local Codes, to help avoid possible ground fault shock hazard.

049852

6

WARNING



This Unit is Equipped With An Auto Start Sequence That Will Start The Unit In The Event Of A Power Failure Automatically After The Sump Pressure Drops To 10 PSIG And The Power IS Restored.

When Performing Maintenance Follow Your Company's Prescribed Safety Practices for Electrical Equipment.

250017-903

7

LIFs HERE

241814

8

WATER
DRAIN

250022-810

9

www.sullair.com

02250155-495

10

SULLAIR.

02250154-361

Decal Section - Air-Cooled (Continued)

11

250027-935

12

049855

13

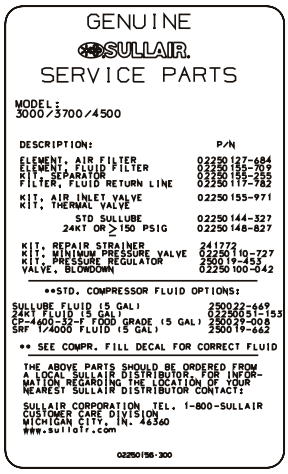
14

049850

15

02250110-891

16



02250156-300

17a

02250157-029

17b

02250157-030

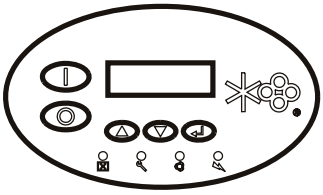
17c

02250157-031

18

250021-564

19

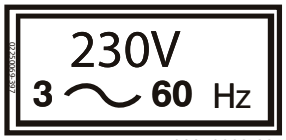


02250154-359

20

02250075-540

21a



02250069-397

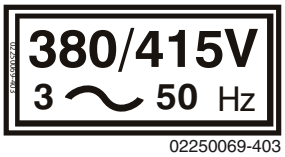
21b

02250069-399

21c

02250069-400

21d

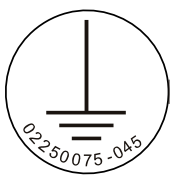


02250069-403

21e

02250069-406

23



02250075-045

24a

02250069-389

24b

02250069-394

24c

02250069-395

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E05
P2