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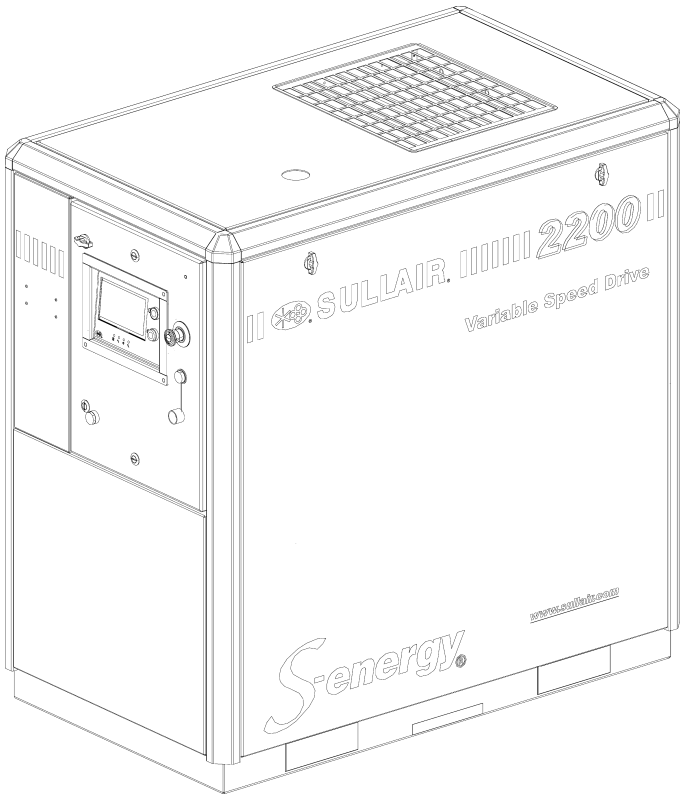
SULLAIR®

USER MANUAL

Industrial Air Compressor
1800, 2200, 3000, 1800v, 2200v, 3000v

18, 22 & 30kw/25 & 30 & 40HP



PART NUMBER:
02250176-180 R06

SAFETY WARNING

Users are required to read the entire User Manual before moving or using the product.

WARRANTY NOTICE

Failure to follow the instructions and procedures in this manual, or misuse of this equipment, will **void** its warranty.

The information in this manual is current as of its publication date and applies to compressors with **serial number**:
US0123070001
and all subsequent serial numbers.

Publication date: 07/01/2023

Hitachi Global Air Power US, LLC

Subject to EAR, ECCN EAR99 and related export control restrictions.

Reading a Sullair Compressor Number

From 2006 through March 31st, 2022, serial numbers used on Sullair compressors have the following format:

- **Yr** is the 4-digit year of the date the machine was serialized
- **Mth** is the 2-digit month of the date the machine was serialized
- **Day** is the 2-digit day of the date the machine was serialized
- **Seq** is a 4-digit sequence number for the machines serialized that day

Beginning April 1st, 2022, serial numbers used on Sullair compressors have the following format:

- **Loc** is a 2-letter+2-number code for the plant and product line where the machine was built
- **Yr** is the 2-digit year of the date the machine was serialized
- **Mth** is the 2-digit month of the date the machine was serialized
- **Seq** is a 4-digit sequence number for the machines serialized that month

Service Training Courses

Sullair training courses provide hands-on and classroom instruction for the proper operation, maintenance, and servicing of Sullair products. Individual courses on Stationary compressors, variable speed drives, compressor electrical systems, and dryers are offered at regular intervals throughout the year at Sullair's training facility located in Michigan City, Indiana.

Instruction includes training on the function and installation of Sullair service parts, troubleshooting common faults and malfunctions, and actual equipment operation. These courses are recommended for distributor service personnel. There is also a basic Stationary compressor course available for end-users.

For details on course offerings, outlines, schedules, and cost information contact:

Sullair Training Department

1-888-SULLAIR or
219-879-5451 (ext. 5623)
training@sullair.com
www.SullairTraining.com

- Or Write -

Sullair
1 Sullair Way
Michigan City, IN 46360
Attn: Training Department

Table of Contents

Section 1
Safety

NOTE

Operator is required to read entire instruction manual.

1.1 General

Sullair 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

A. 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 ½″ (13 mm) 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 ½″ (13 mm) inside diameter that is to be connected to the manifold to reduce pressure in case of hose failure.

C. Provide an appropriate flow-limiting valve at the beginning of each additional 75 feet (23 m) of hose in runs of air hose exceeding ½″ (13 mm) 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 pressure 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 receiver tank 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. **DO NOT** use air at pressures higher 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 clothing away from couplings, belts, pulleys, 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.

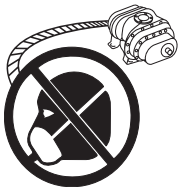
C. Wear personal protective equipment including gloves and head covering when working in, on or around the compressor.

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



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.

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 anti-freeze 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.

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.

1.11 Implementation of lockout/tagout

The energy control procedure defines actions necessary to lockout a power source of any machine to be repaired,

serviced or set-up, where unexpected motion, or an electrical or other energy source, would cause personal injury or equipment damage. The power source on any machine shall be locked out by each employee doing the work except when motion is necessary during setup, adjustment or trouble-shooting.

A. The established procedures for the application of energy control shall cover the following elements and actions and shall be initiated only by Authorized Persons and done in the following sequence:

1. Review the equipment or machine to be locked and tagged out.
2. Alert operator and supervisor of which machine is to be worked on, and that power and utilities will be turned off.
3. Check to make certain no one is operating the machine before turning off the power.
4. Turn off the equipment using normal shutdown procedure.
5. Disconnect the energy sources:
   a. Air and hydraulic lines should be bled, drained and cleaned out. There should be no pressure in these lines or in the reservoir tanks. Lockout or tag lines or valves.
   b. Any mechanism under tension or pressure, such as springs, should be released and locked out or tagged.
   c. Block any load or machine part prior to working under it.
   d. Electrical circuits should be checked with calibrated electrical testing equipment and stored energy and electrical capacitors should be safely discharged.
6. Lockout and/or Tagout each energy source using the proper energy isolating devices and tags. Place lockout hasp and padlock or tag at the point of power disconnect where lockout is required by each person performing work. Each person shall be provided with their own padlock and have possession of the only key. If more than one person is working on a machine *each* person *shall* affix personal lock and tag using a multi-lock device.
7. Tagout devices shall be used only when power sources are not capable of being locked out by use of padlocks and lockout hasp devices. The name of the person affixing tag to power source must be on tag along with date tag was placed on power source.
8. Release stored energy and bring the equipment to a “zero mechanical state”.
9. Verify Isolation: Before work is started, test equipment to ensure power is disconnected.

B. General Security

1. The lock shall be removed by the “Authorized” person who put the lock on the energy-isolating device. No one other than the person/persons placing padlocks and lockout hasps on power shall remove padlock and lockout hasps and restore power. However, when the authorized person who applied the lock is unavailable to remove it his/her Supervisor may remove padlock/padlocks and lockout hasps and restore power only if it is first:
   a. verified that no person will be exposed to danger.
   b. verified that the “Authorized” person who applied the device is not in the facility.
   c. noted that all reasonable efforts to contact the “Authorized” person have been made to inform him or her that the lockout or tagout device has been removed.
   d. ensured that the “Authorized” person is notified of lock removal before returning to work.
2. Tagout System—Tags are warning devices affixed at points of power disconnect and are not to be removed by anyone other that the person placing tag on power lockout. Tags shall never be by-passed, ignored, or otherwise defeated.

1.12 Safety warnings

The following special instructions apply to VSD packages provided with electronic adjustable speed motor drives. These cautions that apply to VSD operation.

WARNING

Ground the unit following the instructions in this manual. Ungrounded units may cause electric shock and/or fire. The variable speed drive has a large capacitive leakage current during operation, which can cause enclosure parts to be above ground potential. Proper grounding, as described in this manual, is required. Failure to observe this precaution could result in death or severe injury.

WARNING

Before applying power to the variable speed drive, make sure that the front and cable covers are closed and fastened to prevent exposure to potential electrical fault conditions. Failure to observe this precaution could result in death or severe injury.

WARNING

Refer all drive service to trained technicians. This equipment should be installed, adjusted, and serviced by qualified electrical maintenance personnel familiar with the construction and operation of this type of equipment and the hazards involved and in accordance with published service manuals. Failure to observe this precaution could result in death or severe injury.

WARNING

Line terminals (L1, L2, L3), motor terminals (U, V, W) and the DC link/brake resistor terminals (-/+) are live when the drive is connected to power, even if the motor is not running. Contact with this voltage is extremely dangerous and may cause death or severe injury.

WARNING

Before opening the variable speed drive covers:

- Disconnect all power to the variable speed drive.
- Wait a minimum of 5 (five) minutes after all the lights on the keypad are off. This allows time for the DC bus capacitors to discharge.
- A hazard voltage may still remain in the DC bus capacitors even if the power has been turned off. Confirm that the capacitors have fully discharged by measuring their voltage using a multimeter set to measure DC voltage. Failure to follow the above precautions may cause death or severe injury.

CAUTION

Do not perform any megger or voltage withstand tests on any part of the variable speed drive or its components. Improper testing may result in damage. Prior to any tests or measurements of the motor or the motor cable, disconnect the motor cable at the variable speed drive output terminals (U, V, W) to avoid damaging the variable speed drive during motor or cable testing.

CAUTION

Do not touch any components on the circuit boards. Static voltage discharge may damage the components.

CAUTION

Install the variable speed drive in a well ventilated room that is not subject to temperature extremes, high humidity, or condensation, and avoid locations that are directly exposed to sunlight, or have high concentrations of dust, corrosive gas, explosive gas, inflammable gas, grinding fluid mist, etc. Improper installation may result in a fire hazard.

CAUTION

Make sure that no power correction capacitors are connected to the variable speed drive output or the motor terminals to prevent variable speed drive malfunction and potential damage.

CAUTION

Make sure that the variable speed drive output terminals (U, V, W) are not connected to the utility line power as severe damage to the VSD may occur.

NOTE

Interior electrical wiring is performed at the factory. Required customer wiring is minimal, but 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. Sullair provides a wiring diagram for use by the installer.

NOTE

Customer must provide electrical supply power disconnect within sight of machine.

1.13 Auto start hazard

WARNING

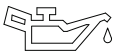
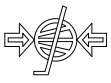
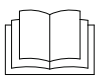
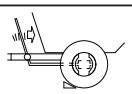
Auto start hazard

This machine is equipped with an auto start sequence that will start the unit when power is restored after a power failure or as part of automatic operation, which can result in serious injury or death.

Do not attempt to make any adjustments or perform any maintenance on this machine without disconnecting both main line and control circuit electrical power and follow all of your company's prescribed safety practices for electrical equipment.

1.14 Symbols and references

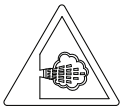
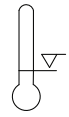
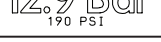
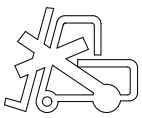
The symbols below may or may not be used. Please refer to the decals set forth on the machine for applicable symbols.

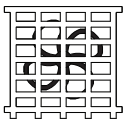
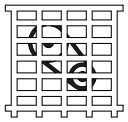
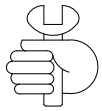
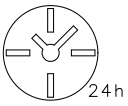
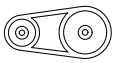
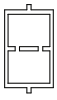
	DIESEL FUEL
	ROTARY COMPRESSOR
	TEST RUN
	DRAIN
	HIGH PRESSURE
	SHUT-OFF VALVE W/ SAFETY
	NO
	ENGINE
	COMPRESSOR
	ENGINE OIL
	ENGINE COOLANT
	WATER
	OIL
	DO NOT ..... ABNORMAL SHUTDOWN
	CLOSED MECHANICAL
	FUSE
	LOW PRESSURE
	READ MANUAL
	BRAKES

	HEARING PROTECTION
	HARD HAT
	SAFETY GLASSES
	HOOK HERE
	DO NOT REMOVE MANUAL
	DO NOT BREATHE COMPRESSED AIR
	DO NOT STAND ON SERV. VALVE
	DO NOT OPERATE W/ DOORS OPEN
	DO NOT OPEN
	DO NOT STACK
	ELECTRICAL SHOCK
	AIR FLOW
	HOT SURFACE
	PRESSURIZED VESSEL
	PRESSURIZED COMPONENT

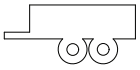
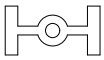
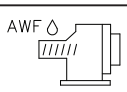
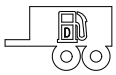
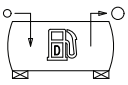
SAFETY SYMBOLS 1

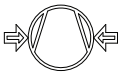
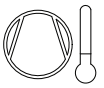
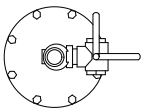
02250176-180 R06

	DANGEROUS OUTLET
	REMOTELY CONTROLLED
	CORROSIVE
	WARNING
	DO NOT MAINTENANCE
	BELOW TEMPERATURE
	DO NOT TOW
	BAR/PSI
	BATTERY
	BATTERY DISCONNECT
	OFF
	ON
	RESET
	NO FORKLIFT
	FORK LIFT HERE
	DIRECTION OF ROTATION

	ENGINE START
	ENGINE ECM
	READ/WRITE DATA
	INTAKE AIR
	EXHAUST GAS
	FAN GUARD
	BELT GUARD
	SERVICE POINT
	LOW TEMPERATURE
	STD AIR
	A/C AIR
	24 HOURS
	BELTS
	FILTER
	STRAINER

SAFETY SYMBOLS 2

	RADIATOR
	AIR-CIRCULATING FAN
	AIR-COOLED OIL COOLER
	LIQUID-COOLED OIL COOLER
	LUBRICATION
	TRAILER TOWING MODE
	AXLE
	LUBRICANT GREASE
	EXAMINE, CHECK
	CRUSH/PINCH POINT
	FUNCTIONAL ARROW
	ENGINE INTAKE AIR FILTER
	PRESSURE CONTROL
	INLET VALVE SPRING
	INTERNAL FUEL
	EXTERNAL FUEL
	SIDE DOOR T-LATCH

	HOUR METER
	COMPRESSOR AIR PRESSURE
	START
	CONTROL
	ENGINE PREHEAT LOW TEMP AID
	ENGINE WARNING
	FUEL LEVEL
	ENGINE RPM
	ENGINE OIL PRESSURE
	ENGINE COOLANT TEMPERATURE
	COMPRESSOR TEMPERATURE
	DO NOT MIX COOLANTS
	AFTERCOOLER BYPASS VALVE
	DRAIN HEATER
	BATTERY HEATER
	COMPRESSOR OIL HEAT
	STACKING LIMIT BY NUMBER

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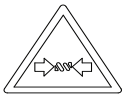
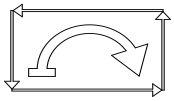
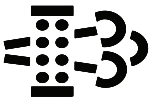
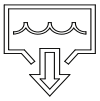
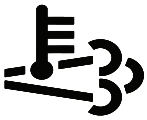
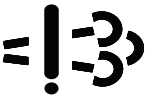
	DO NOT OPERATE WHILE STACKED
	PRESSURIZED SPRING
	DO NOT MIX FLUIDS
	AUTO START/STOP
	FLUID DRAIN
	DPF: DIESEL PARTICULATE FILTER
	DPF REGEN. INHIBIT
	ENGINE NOT ALLOWED TO CRANK AIR SHUTOFF ACTIVE
	CONTROLLER AUTO MODE

	WATER DRAIN
	SEVER (FAN)
	DEF FLUID ONLY
	RUN
	LOW FUEL
	HEST: HIGH EMISSIONS SYSTEM TEMPERATURE
	EMISSIONS MALFUNCTION INDICATION
	ENGINE STOP

SAFETY SYMBOLS 4

Notes:

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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* on page 63 to see how surprisingly easy it is to keep your air compressor in top operating condition.

2.2 Description of Components

Refer to *Figure 2-1*. The components and assemblies of the air compressor are clearly shown. The complete package includes compressor, electric motor, starter, compressor inlet system, compressor discharge system, compressor lubrication and cooling system, capacity control system, STS 2.0 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.

This compressor model has easily accessible items such as the fluid filter air/oil separator and control valves. The inlet air filter is also easily accessible for servicing.

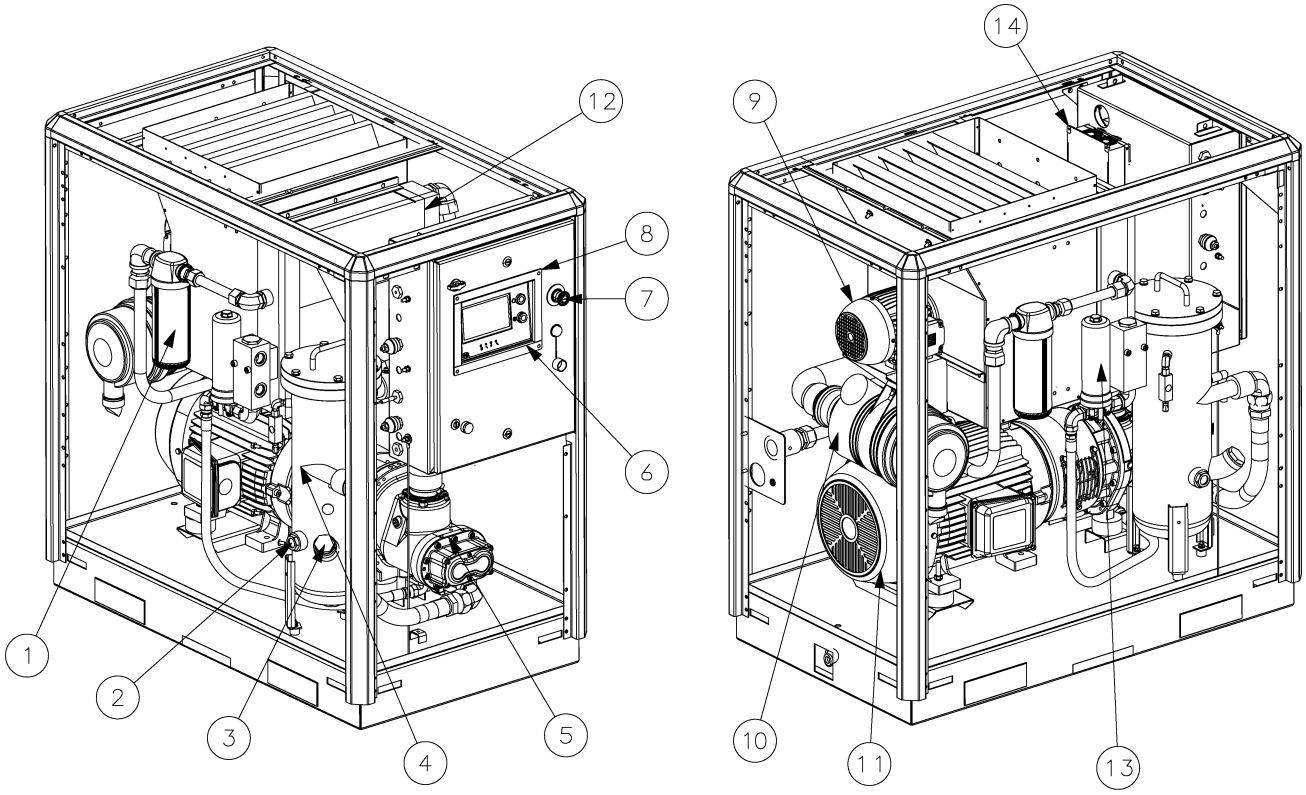

Figure 2-1: Main Component Location

1. Moisture Separator	8. Starter Box
2. Sight Glass	9. Fan Motor
3. Fluid Port Fill	10. Air Filter
4. Separator/Sump Tank	11. Motor
5. Compressor Unit	12. Cooler
6. STS 2.0 Controller	13. Fluid Filter
7. E-Stop	14. Variable Speed Drive (where equipped)

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.

The 1800, 2200 & 3000 Series compressors are factory-filled with Sullube lubricant. For more information on fluid fill, refer to *Section 3: Lubrication Change Recommendations and Maintenance—Fluid Filter and Separator* on page 34.

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.

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, and also lubricates the bearings.

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.

2.4 Compressor Cooling And Lubrication System, Functional Description

Refer to *Figure 2-2*. The Cooling and Lubrication System consists of a fan, fan motor, radiator-type aftercooler/fluid cooler, full flow fluid filter, thermal valve, and interconnecting hoses. The pressure in the separator/sump tank causes fluid flow by forcing the fluid from the high pressure area of the separator/sump tank to an area of lower pressure in the compressor unit.

Fluid flows from the bottom of the separator/sump tank 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 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 adjust 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 STS 2.0 Controller indicates when the fluid filter needs to be changed.

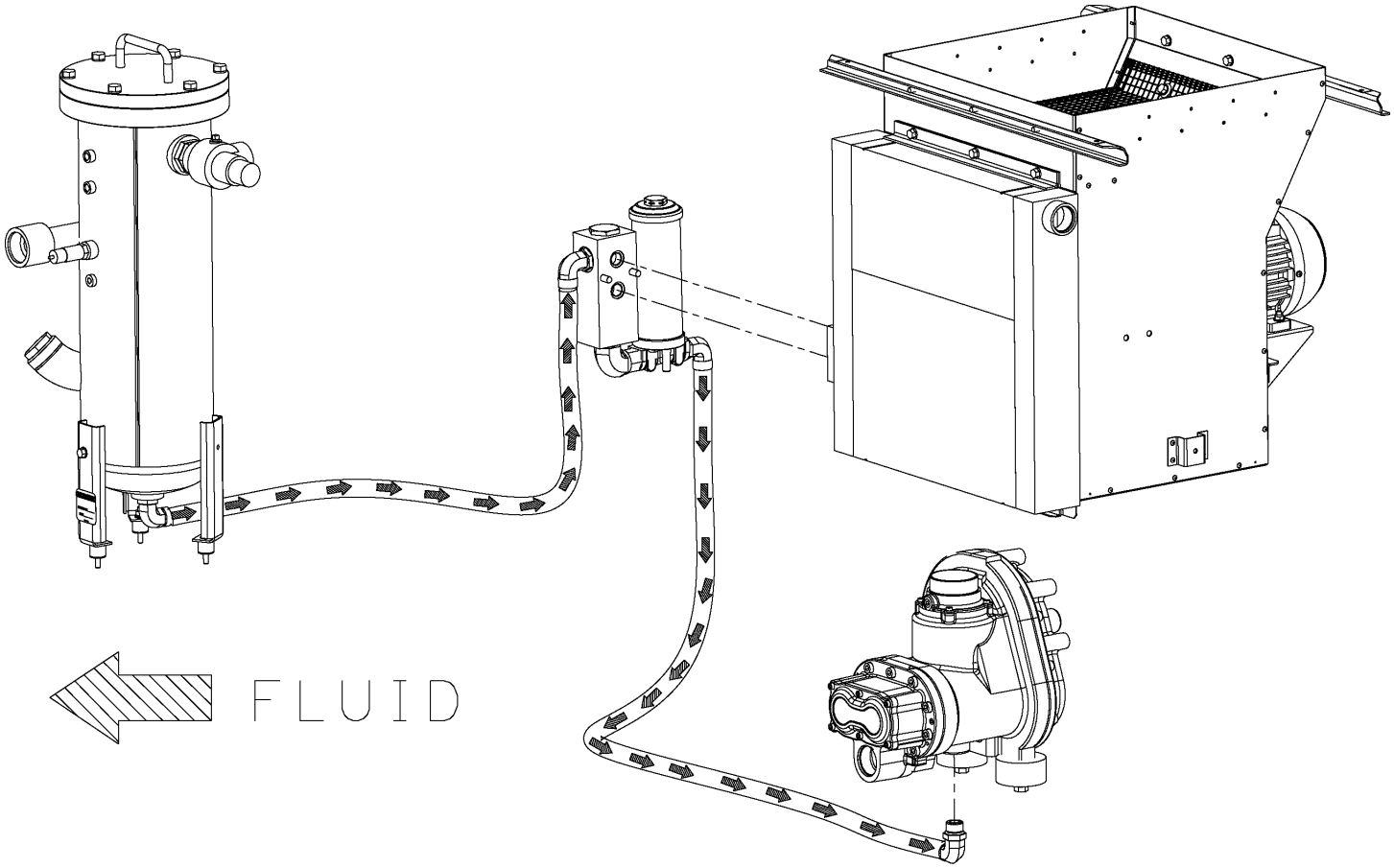

Figure 2-2: Cooling and Lubrication System

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2.5 Compressor Discharge System, Functional Description

Refer to *Figure 2-3*. The compressor unit discharges the compressed air/fluid mixture into the combination separator/sump tank.

The separator/sump tank 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 separator/sump tank 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 separator/sump tank. 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 dry side of the separator/sump 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 separator/sump tank 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) for Sullube, or 2 ppm for 24KT at nominal rated pressures. 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 separator/sump tank 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 separator/sump tank 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 separator/sump tank pressure exceeds the separator/sump tank rating. The STS 2.0 Controller 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.

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

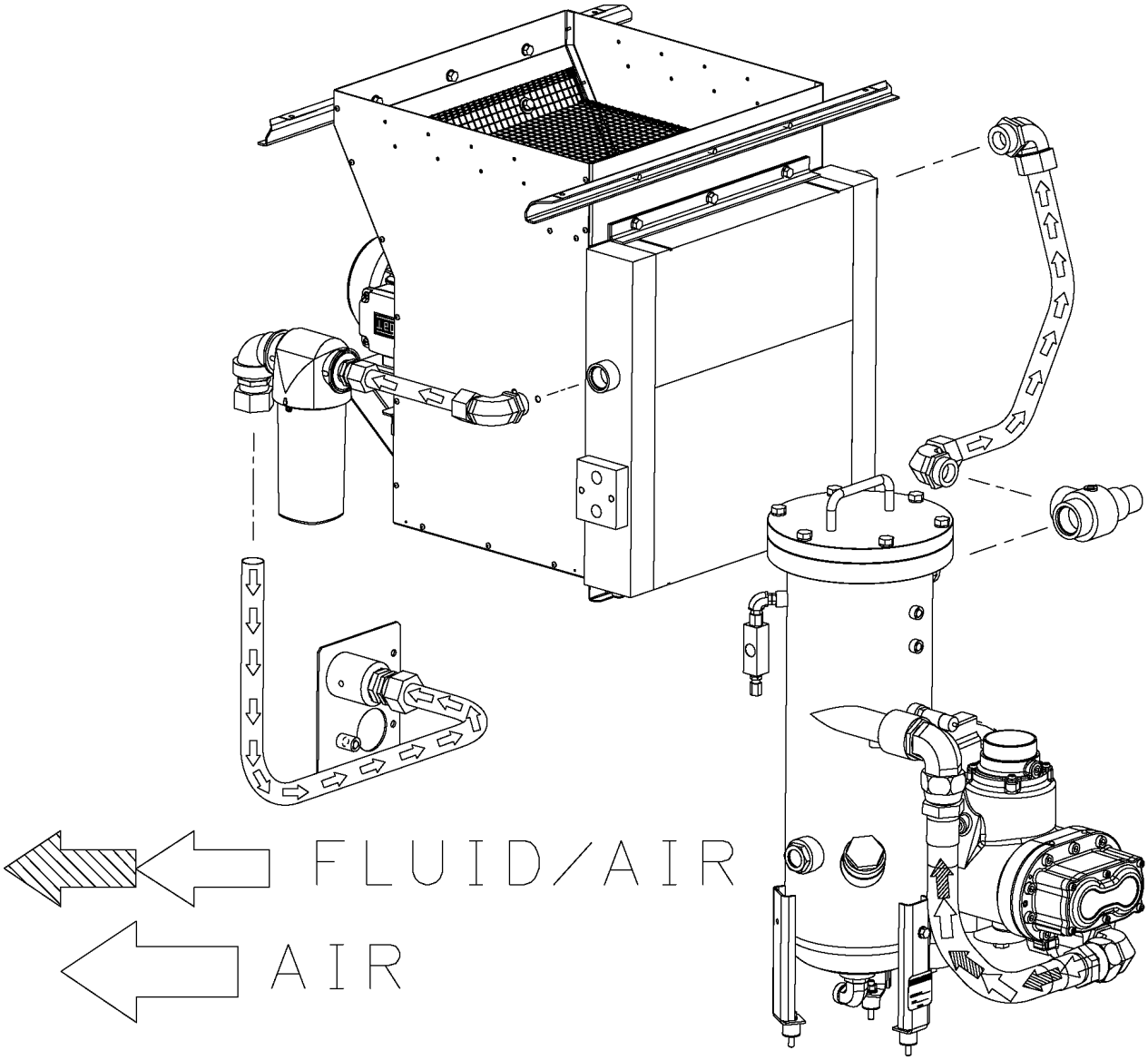

Figure 2-3: Discharge System

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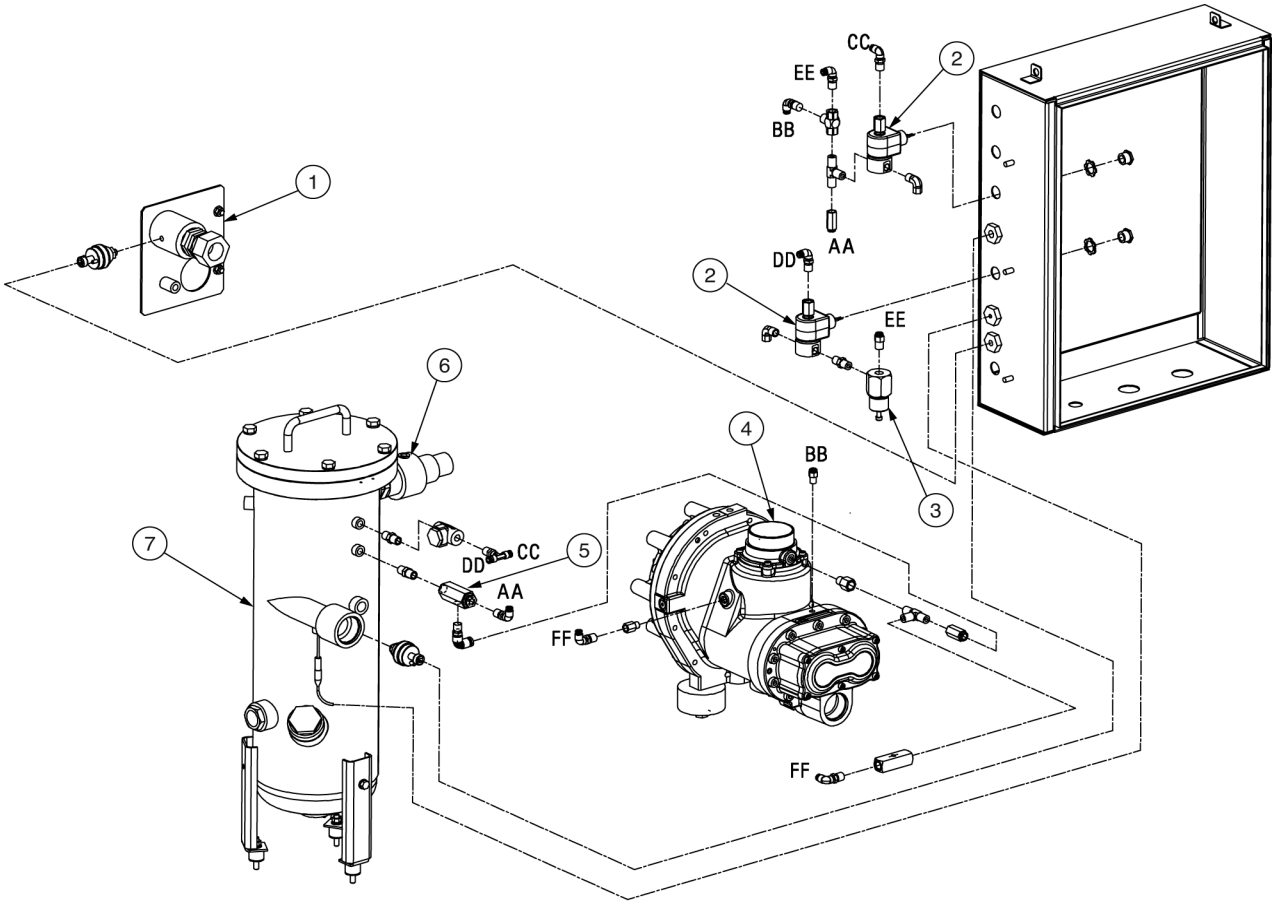
2.6 Control System, Functional Description

Refer to *Figure 2-4*. 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 START pad is depressed, the separator/sump tank pressure will quickly rise from 0 to 50 psig (0 - 3.4 bar). The compressor initially starts unloaded with the solenoid valve open and the 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 are 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	5. Blowdown Valve
2. Solenoid Valve	6. Minimum Pressure/Check Valve
3. Regulator	7. Separator/Sump Tank
4. Air Inlet	

Figure 2-4: Standard 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 STS 2.0 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 to the compressor 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 STS 2.0 Controller control system de-energizes the solenoid valve allowing separator/sump tank 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 separator/sump tank pressure to approximately 17 psig (1.2 bar). The check valve in the air service line prevents line pressure from returning to the separator/sump tank.

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) on (12 bar) compressors), the STS 2.0 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 STS 2.0 Controller 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 STS 2.0 Controller 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 STS 2.0 Controller 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 to 100 psig (6.3 to 6.9 bar).

Automatic Operation

For applications with varied periods of time when there are no air requirements, the STS 2.0 Controller'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 air 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. Refer to *Modulating Mode —100 to 110 PSIG (6.9 to 7.6 BAR)* on page 26. 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.

2.8 Variable Speed Drive (VSD) Components

The VSD, located in the machine's electrical enclosure, works in concert with the STS Controller to allow the compressor to match its output to the current demand on the system. The drive's heat sink extends through the back of the enclosure, and is cooled by air flowing through the compressor enclosure.

2.9 VSD Control System — Functional Description

Refer to *Figure 2-4*. The controls consist of:

- a VSD
- a solenoid valve
- a regulating valve
- and an inlet valve.

Depending on the model, a compressor can be operated at a setpoint pressure from 60 to 175 psig (4.1 to 12.1 bar). The STS 2.0 Controller automatically sets the frequency range based on the selected pressure. (The compressor's operating range is on its nameplate.)

The following paragraphs apply to a compressor with a 100 psig (6.9) operating pressure and a 6 psi (0.4 bar) load delta setting.

NOTE

The load delta default setting is 10 psi (0.7 bar). Sullair recommends a setting of 6 psi (0.4) for the most efficient operation.

Compressors with different pressure operating ranges perform in the same manner.

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

Pressing the STS 2.0 Controller START button (1) signals the VSD to accelerate the motor to full speed, causing the separator/sump tank pressure to rise from 0 to 50 psig (0 to 3.4 bar). At this time both the pressure regulator and solenoid valves are closed; the inlet valve is fully open and the air-end provides a full flow to the separator/sump tank. A minimum pressure valve set at approximately 50 psig (3.4 bar) isolates the rising compressor air pressure from the service line.

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 to the service line. From this point on the STS 2.0 Controller monitors the line pressure which controls the VSD. The pressure regulator and solenoid valves remain closed with the inlet valve fully open, running at 100 psig (6.9 bar) or lower.

VSD PART LOAD CONTROL—

The service line pressure increases to a value above 100 psig (6.9) if the demand is less than the compressor's rated capacity. In this condition, the VSD slows the motor's rpm which reduces the output to match the demand. The drive continuously adjusts the motor's rpm to maintain a 100 psig (6.9 bar) line pressure.The STS 2.0 Controller maintains the correct frequency when the VSD is operating in this mode.

MODULATING MODE- 100 TO 106 PSIG (7.3 TO

6.9 BAR)

During low demand periods and with the VSD running at minimum speed, the line pressure can continue to rise. When the line pressure reaches 101-102 psig (approximately 7 bar), the regulator valve (*Figure 2-4*) gradually opens, directing air pressure to the inlet control valve piston. This action causes the inlet valve to partially close, thereby reducing the air flow entering the compressor until it matches the demand. The control system functions continuously in this manner between less than 101 psig (7.0 bar) to 106 psig (7.3 bar), in response to varying system demand. The pressure regulator has an orifice which vents a small amount of air to the atmosphere when the pressure regulator controls the inlet valve. The orifice also bleeds off any accumulated moisture from the control line. When the discharge pressure rises above 106 psig (7.3 bar), or to a preset unload pressure, the compressor unloads.

UNLOAD MODE- IN EXCESS OF 106 PSIG (7.3 BAR)

When there is no demand or it is at a minimal level, the service line pressure continues to rise. When it exceeds 106 psig (7.3 bar), or reaches a preset unload pressure value, the STS 2.0 control system de-energizes the solenoid valve allowing separator/sump tank air pressure to be supplied directly which closes the inlet valve. The solenoid valve simultaneously sends a pneumatic signal to the blow down valve which opens to the atmosphere, and reduces the separator/sump tank pressure. The check valve in the air service line prevents line pressure from back-flowing to the separator/sump tank. The compressor will shut down after the programmed unload time setting expires (the default setting is zero [0] minutes for an immediate shutdown upon unload). When the line pressure drops to the low pressure setting of 100 psig (6.9 bar) the STS 2.0 Controller starts the motor and energizes the solenoid valve which closes the blowdown valve. The re-energized solenoid valve prevents line pressure from reaching the inlet control valve, thereby allowing it to fully open, and the compressor supplies compressed air to the system.

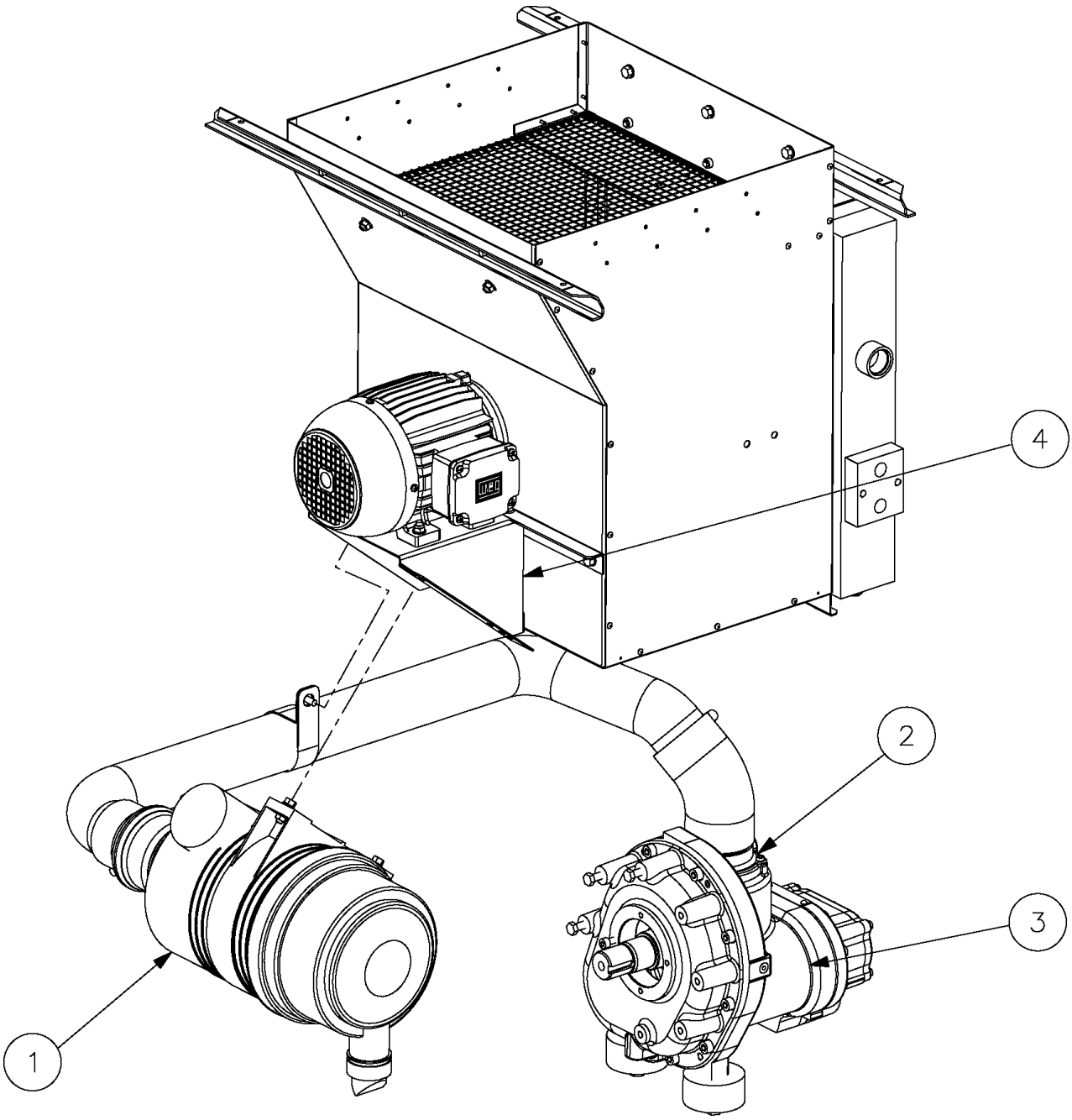


Figure 2-5: Air Inlet System

1. Air FIlter
2. Inlet Valve
3. Compressor Unit
4. Fan Motor/Air Filter Mount

Notes:

Section 3
Specifications

3.1 Table of Specifications

TABLE 1:

		DIMENSIONS							
		Length		Width		Height		Weight	
MODEL	HP	in	mm	in	mm	in	mm	lbs	kg
1800 Series									
1807	25	53.2	1351	31.5	800	53.2	1351	1420	644
1809	25	53.2	1351	31.5	800	53.2	1351	1420	644
1810	25	53.2	1351	31.5	800	53.2	1351	1420	644
1812	25	53.2	1351	31.5	800	53.2	1351	1420	644
2200 Series									
2207	30	53.2	1351	31.5	800	53.2	1351	1450	658
2209	30	53.2	1351	31.5	800	53.2	1351	1450	658
2210	30	53.2	1351	31.5	800	53.2	1351	1450	658
2212	30	53.2	1351	31.5	800	53.2	1351	1450	658
3000 Series									
3009	40	53.2	1351	31.5	800	53.2	1351	1613	732
3010	40	53.2	1351	31.5	800	53.2	1351	1613	732
3012	40	53.2	1351	31.5	800	53.2	1351	1613	732

TABLE 2:

		DIMENSIONS							
		Length		Width		Height		Weight	
MODEL	HP	in	mm	in	mm	in	mm	lbs	kg
1800 Series with Integral Dryer									
1807	25	63.1	1603	31.5	800	53.2	1351	1621	735
1809	25	63.1	1603	31.5	800	53.2	1351	1621	735
1810	25	63.1	1603	31.5	800	53.2	1351	1621	735
1812	25	63.1	1603	31.5	800	53.2	1351	1621	735
2200 Series with Integral Dryer									
2207	30	63.1	1603	31.5	800	53.2	1351	1651	749
2209	30	63.1	1603	31.5	800	53.2	1351	1651	749
2210	30	63.1	1603	31.5	800	53.2	1351	1651	749
2212	30	63.1	1603	31.5	800	53.2	1351	1651	749
3000 Series with Integral Dryer									
3009	40	53.2	1351	31.5	800	53.2	1351	1814	823
3010	40	53.2	1351	31.5	800	53.2	1351	1814	823
3012	40	53.2	1351	31.5	800	53.2	1351	1814	823

Table 3-1: Compressor Specifications

COMPRESSOR:	STANDARD MODELS:	
Type:	Rotary Screw	
Standard Speed Operating Pressure (II):	100 psi (7 bar) 125 psig (9 bar)	150 psig (10 bar) 175 psig (12 bar)
Bearing Type:	Anti-friction	
Ambient Temperature (Max.) (III):	104°(40°C)	
Cooling:	Pressurized Fluid	
Compressor Fluid:	Sullair Sullube	
Separator/Sump Tank Capacity:	2.5 Gallons (9.5 liters)	
Control:	STS 2.0 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:	25,30,40HP / 18,22,30KW
Type:	C-Flanged, Open Drip proof, Epact Efficiency, Three Phase, 230/460 Hz, 380-515 (400) 50Hz
Maximum Ambient Temperature	104°(40°C)
Options Available:	200V and 575V 60 Hz, 220 50 Hz TEFC also available: CE Approved
Starter:	Full Voltage Magnetic, Wye-Delta
Options Available:	VSD Optional, 460V, 575V, 400V 50 Hz
Speed—25, 30 HP:	1765 RPM (60 Hz) or 1475 RPM (50 Hz)
(IV) Multi-frequency and voltage motors are used. The compressors msust be used only with the specified electrical frequency and voltage.	

NOTE

For latest sound test data, consult Sullair factory.

3.2 Lubrication Guide

Refer to *Figure 3-1* for location of fluid fill port. For best value and longest uninterrupted service, the 1800, 2200 & 3000 Series compressors are factory filled and tested with Sullube lubricant.

CAUTION

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

If fluid change is required, follow *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.* on page 34.

To drain fluid, disconnect lubricant hose from the thermal valve and divert the open end into a suitable container below the separator/sump tank fluid level.

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.

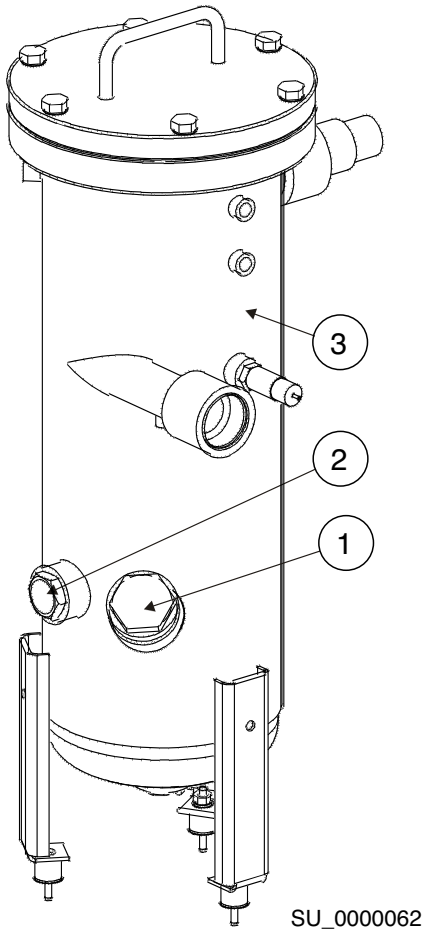
DO NOT MIX DIFFERENT TYPES OF FLUIDS.

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.

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



1.	Fluid Fill Port
2.	Sight Glass
3.	Separator/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.

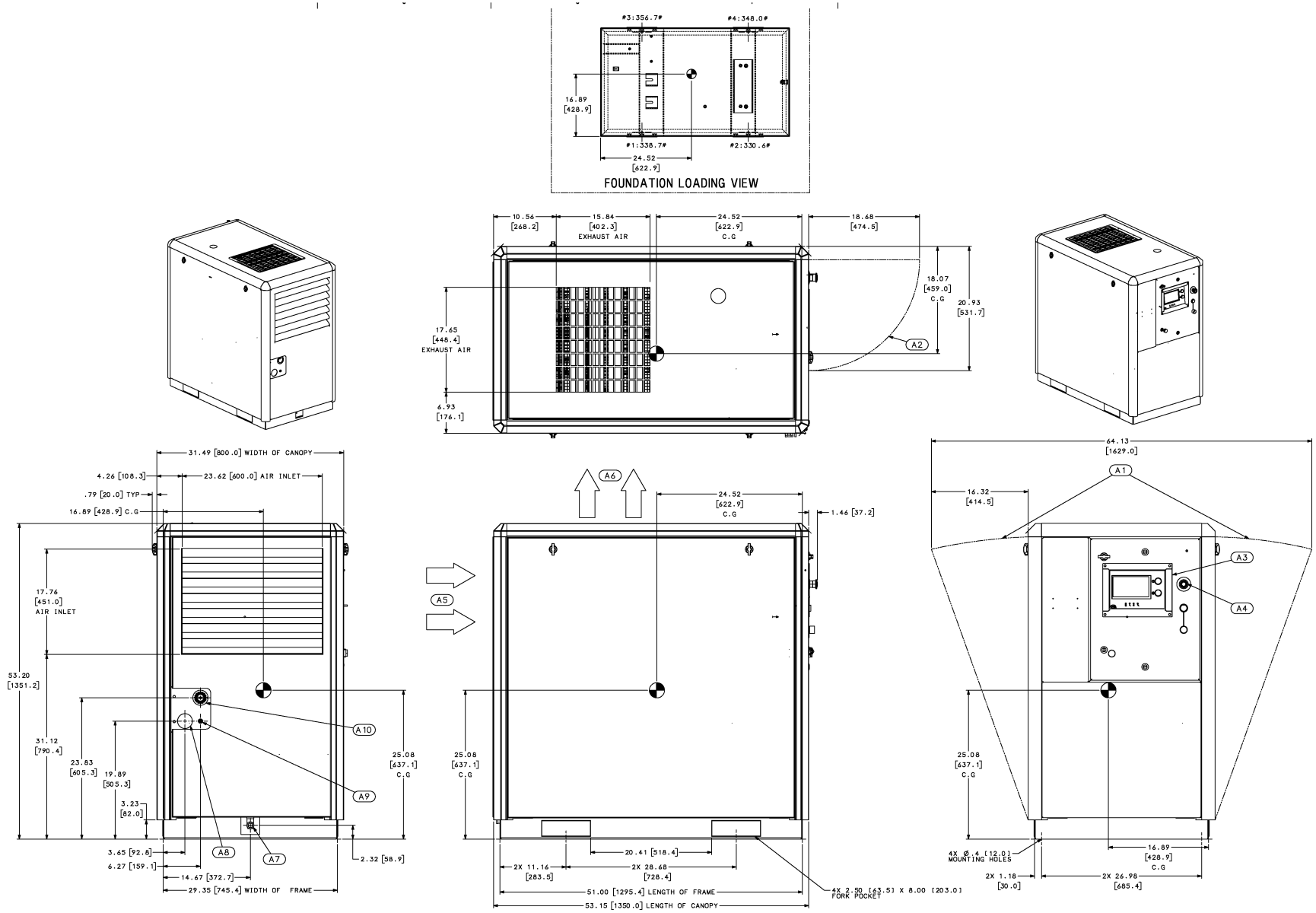
3.4 Lubrication Change Recommendations and Maintenance—Fluid Filter and Separator

LUBRICANT	FLUID CHANGE	FLUID FILTER CHANGE	SEPARATOR CHANGE
Sullube (2.5 gal)	A, E	G, C	A, D
SRF 1/4000 (2.5 gal)	B, E	G, C	B, D
24KT (2.5 gal)	F, E	G, C	A, D
CP-4600-32-F (2.5 gal)	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:

3.5 ID, 1800/2200 air-cooled with standard enclosure



SULLAIR

3.5 ID, 1800/2200 air-cooled with standard enclosure

Main Motor HP	Motor Type	Weight	CFM Cooling Air
25	ODP	1374 LBS/623 KG	2000 CFM
25	TEFC	1420 LBS/644 KG	2000 CFM
30	ODP	1383 LBS/627 KG	2000 CFM
30	TEFC	1450 LBS/658 KG	2000 CFM

NOTES:

1. ALLOW 4.00 FT. [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.
3. ALL DIMENSIONS ARE ±1/2" [12.7MM].
4. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY IS SHOWN ON DRAWING.
5. ALL DIMENSIONS SHOWN IN INCHES WITH MILLIMETER DIMENSIONS IN PARENTHESES.

A1: SPACE REQUIRED TO OPEN DOORS

A2: SPACE REQUIRED TO OPEN STARTER PANEL

A3: CONTROLLER

A4: E-STOP

A5: AIR INLET

A6: EXHAUST AIR OUT

A7: CONTAINMENT PAN DRAIN

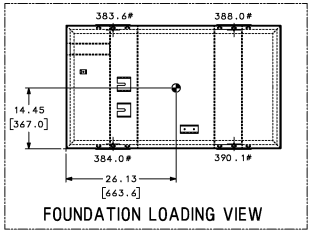
A8: INCOMING CUSTOMER POWER SUPPLY

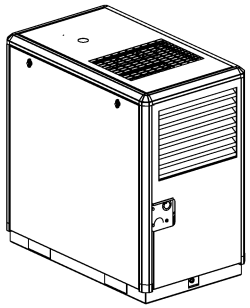
Ø2.50[63.5]

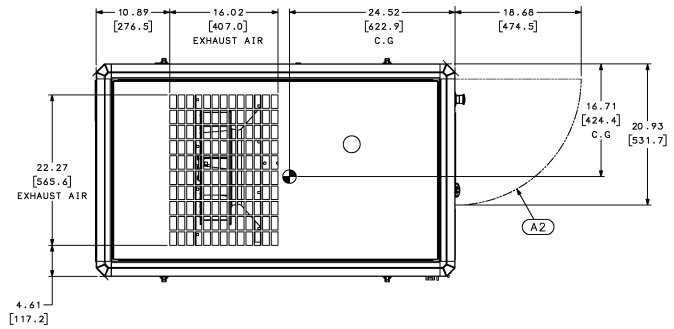
A9: MOISTURE DRAIN CONNECTION 1/4"-18 NPT

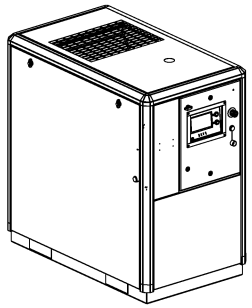
A10: AIR OUT CONNECTION 1-1/2" NPT

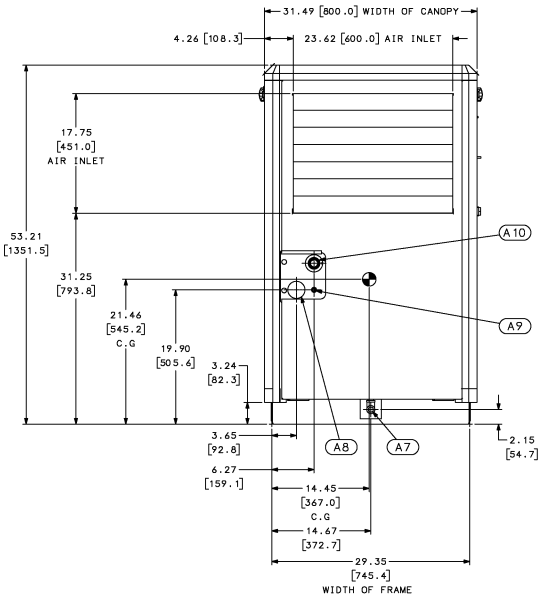
3.6 ID, 3000 air-cooled with standard enclosure

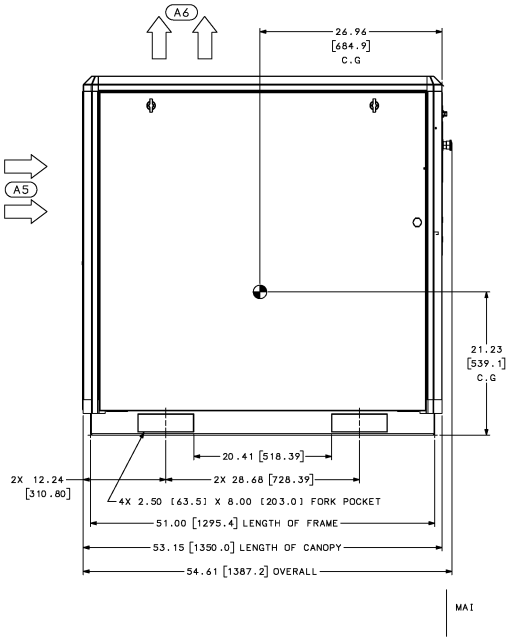


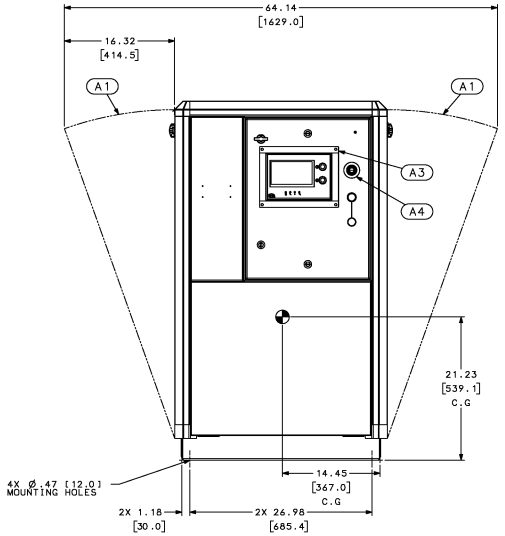












1002-4883 R00

3.6 ID, 3000 air-cooled with standard enclosure

Main Motor HP	Motor Type	Weight	CFM Cooling Air
40	ODP	1556 LBS/706 KG	2900 CFM
40	TEFC	1613 LBS/732 KG	2900 CFM

NOTES:

1. ALLOW 4.00 FT. [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.
3. ALL DIMENSIONS ARE ±1/2" [12.7MM].
4. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY IS SHOWN ON DRAWING.
5. ALL DIMENSIONS SHOWN IN INCHES WITH MILLIMETER DIMENSIONS IN PARENTHESES.

A1: SPACE REQUIRED TO OPEN DOORS

A2: SPACE REQUIRED TO OPEN STARTER PANEL

A3: CONTROLLER

A4: E-STOP

A5: AIR INLET

A6: EXHAUST AIR OUT

A7: CONTAINMENT PAN DRAIN

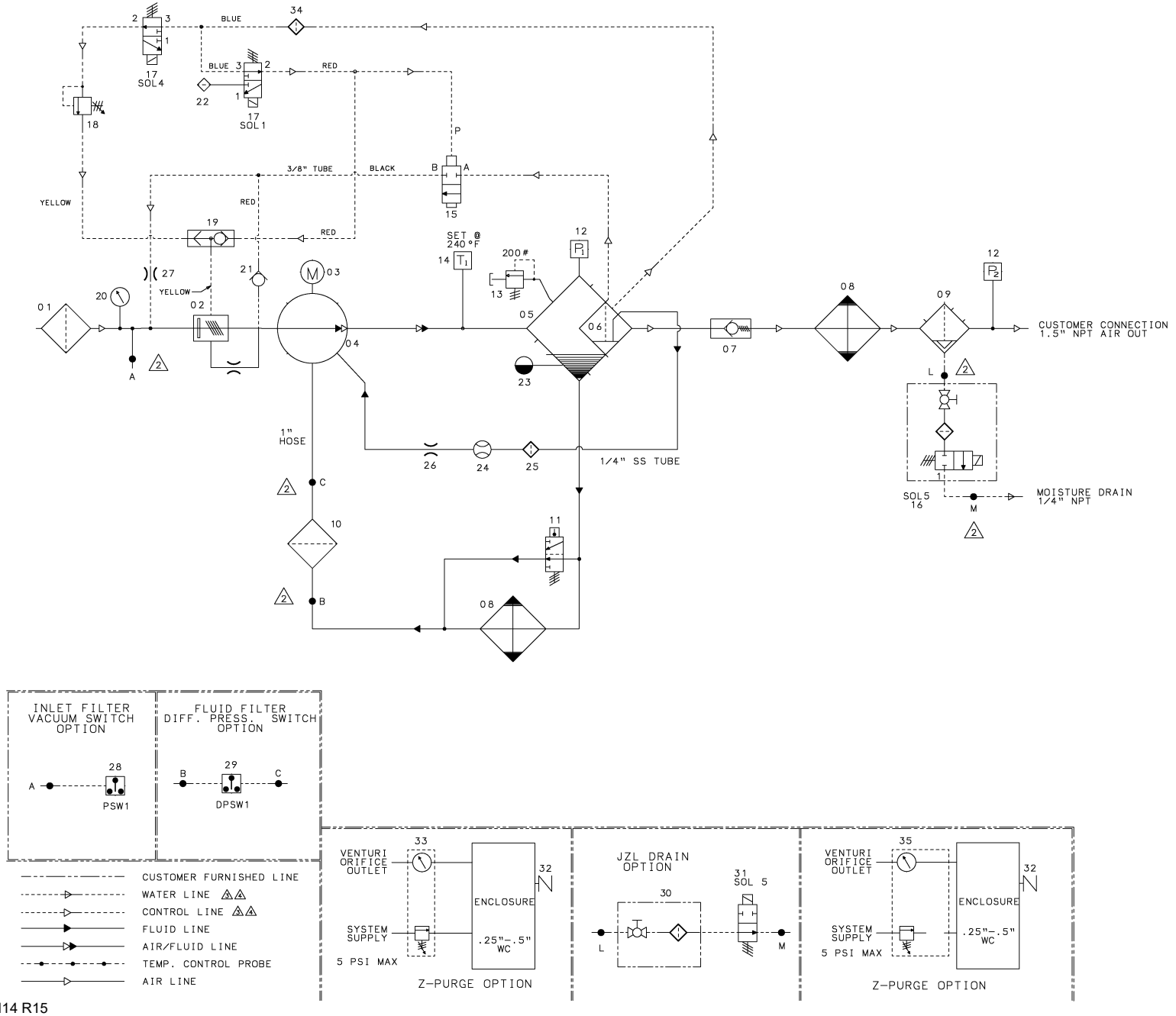
A8: INCOMING CUSTOMER POWER SUPPLY

Ø2.50[63.5]

A9: MOISTURE DRAIN CONNECTION 1/4"-18 NPT

A10: AIR OUT CONNECTION 1-1/2" NPT

3.7 Piping and instrumentation, air-cooled



02250156-114 R15

SULLAIR

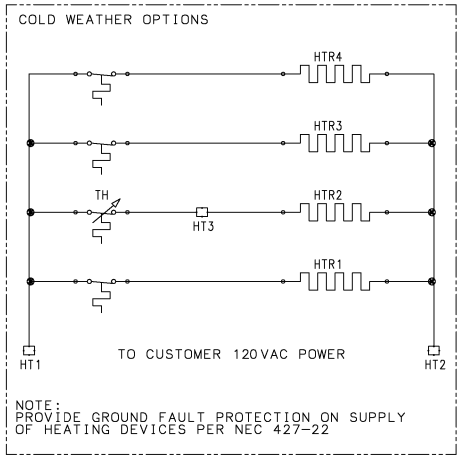
3.7 PIPING AND INSTRUMENTATION, AIR-COOLED

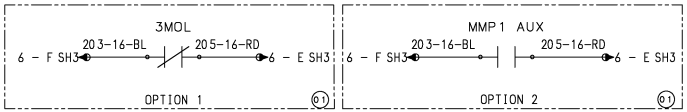
KEY NO.	PART NO.	QTY	DESCRIPTION
1	02250125-369	1	FILTER, AIR 8”(PLASTIC) W/MTG BAND
2	-	1	VALVE, GROUP INLET DXX102E
3	MTR_VAR	1	MOTOR
4	-	1	COMPRESSOR
5	02250155-599	1	TANK, SEP 2200
6	02250160-773	1	ELEM,OIL SEP 1800/2200
7	02250097-609	1	VALVE, 1-5/8 SAE MIN PRESS CHK
8	02250156-137	1	COOLER, AIR/OIL 2200
9	02250208-566	1	SEP,WTR CS-200 1-1/2” W/O DR
	02250208-567	1	SEP,WTR CS-200 1” W/O DR
10	02250155-708		FLTR,CORELESS M27 6”L W/ BYPASS
11	02250092-081	1	VLV,THERMAL 195 DEG
	02250148-796	1	VLV,THERMAL 210 DEG
12	02250155-174	2	XDCR,PRESS 0-250PSI 1-5VDC N4
13	250006-938	1	VALVE, RELIEF 1/2” 200#
14	02250155-175	1	PROBE,THERMISTER 3000 OHM NTC 6’L
15	02250049-634	1	VLV,BLWDN 1/4 NPT HI PRS
16	02250170-783	2	VLV,DR COMBO 24 VDC
17	02250155-714	2	VALVE,SOL 3WNO 1/4 235# N4
18	250017-280	1	VALVE, PRESSURE REGULATOR
19	408893	1	VALVE, SHUTTLE 1/4” (DBL CHK)
20	250003-869	1	INDICATOR, RESTRICTION 20”H20
21	02250115-272	1	VLV,CHK 1/4”-NPT
22	02250173-972	1	FLTR,PNEUMATIC 1/8”NPT 5MICRON
23	02250097-610	1	PLUG,SIGHT GLASS 1 5/16” SAE
24	02250126-129	1	GLASS,SIGHT SIGHT/ORIFICE BLK SAE
25	02250117-782	1	FILTER,ASSY GENESIS
26	02250125-774	1	ORIFICE,PLUG BRASS 1/8NPT X 1/32”
27	02250118-586	1	ORF, .078” .25FNPT X.25MNPT
28	02250078-249	1	SW,VAC 22”WC N4 6FT CABLE 5A
29	02250100-363	1	SW,DIFF PRESS 20 PSID
30	02250144-841	1	VLV,BALL/STNR COMB 1/2M X 1/2M
	02250182-548	1	VLV,BALL/STNR COMBO-1/2”NPT
31	02250209-760	1	DRN,ZERO LOSS 115VAC A1 ALARM
32	02250168-837	1	VENT,ENCL PROT 1/2” TOP
33	02250169-612	1	GA,DIFF PRESS Z-PRG ASY BTM
34	241771	1	STRAINER, V-TYPE 300PSIX1/4
35	02250201-184	1	GA,DIFF PRESS Z-PURGE ASY REGU

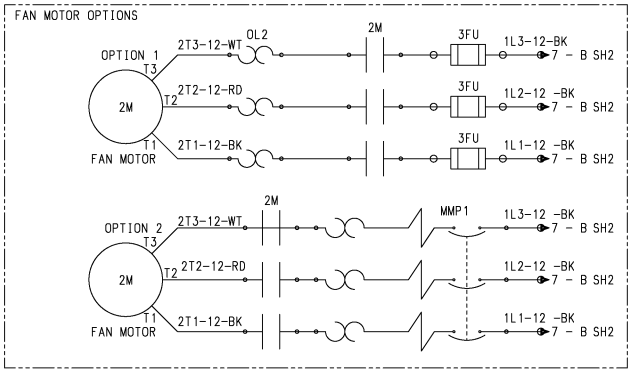
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR

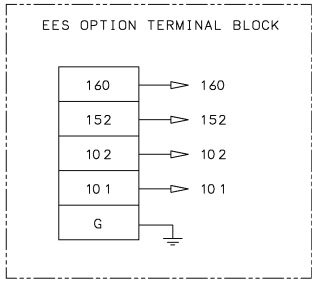
COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
DPSW1	FLUID FILTER DIFFERENTIAL SWITCH
PSW1	INLET AIR FILTER SWITCH 22"WC (558.9mm WC)
SOL1	LOAD/UNLOAD SOLENOID VALVE
SOL4	MEC/SEQUENCING/FULL LOAD SOLENOID VALVE
SOL5	COMBO DRAIN/JZL DRAIN SOLENOID VALVE
T1	WET DISCHARGE TEMPERATURE

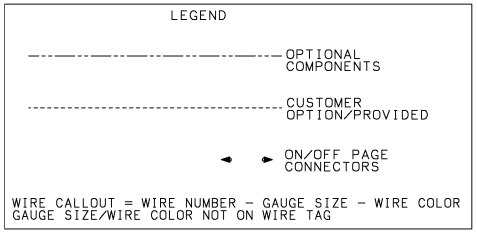
3.8 Wiring Diagram—VSD, AC P8/P10



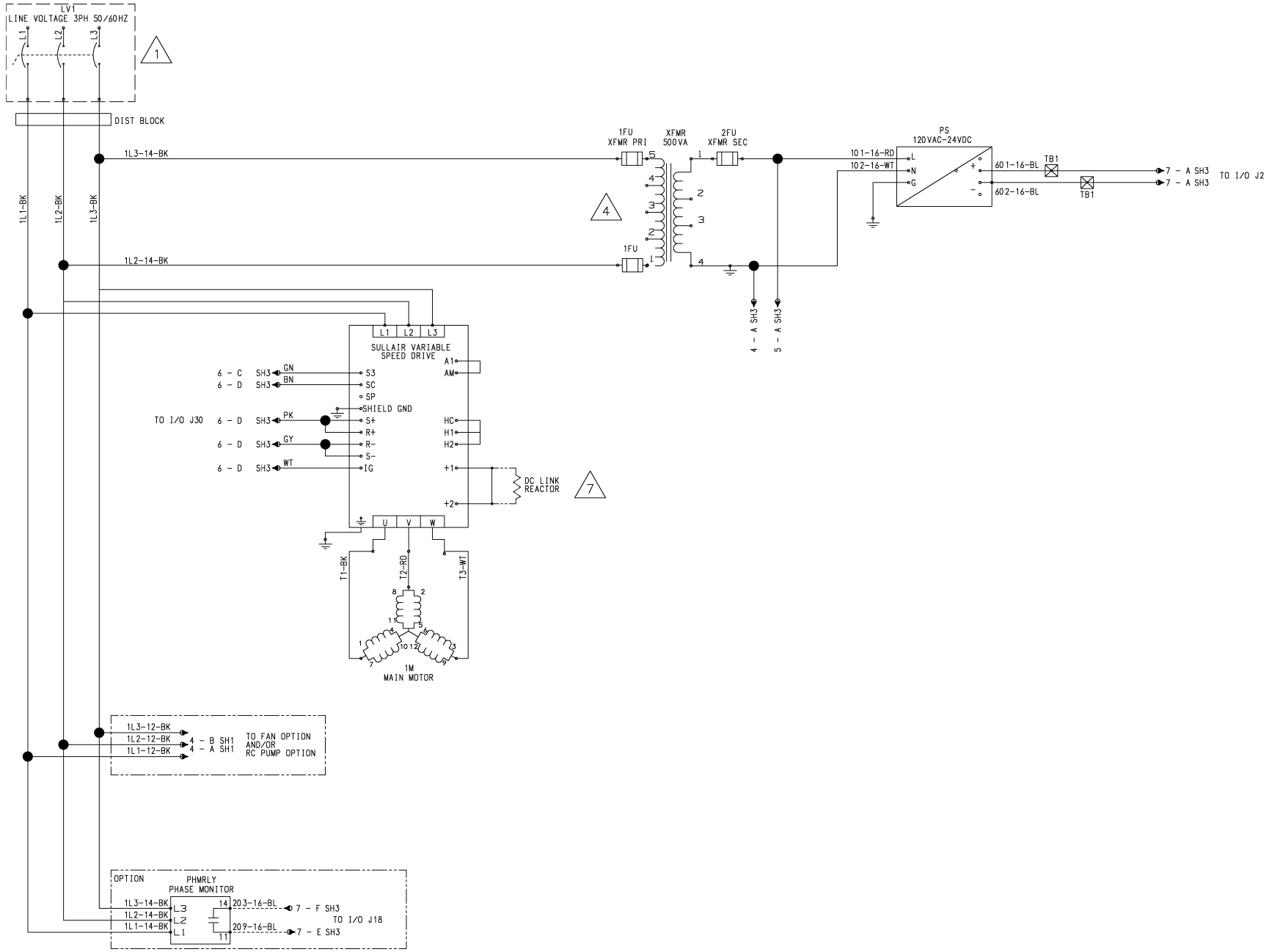






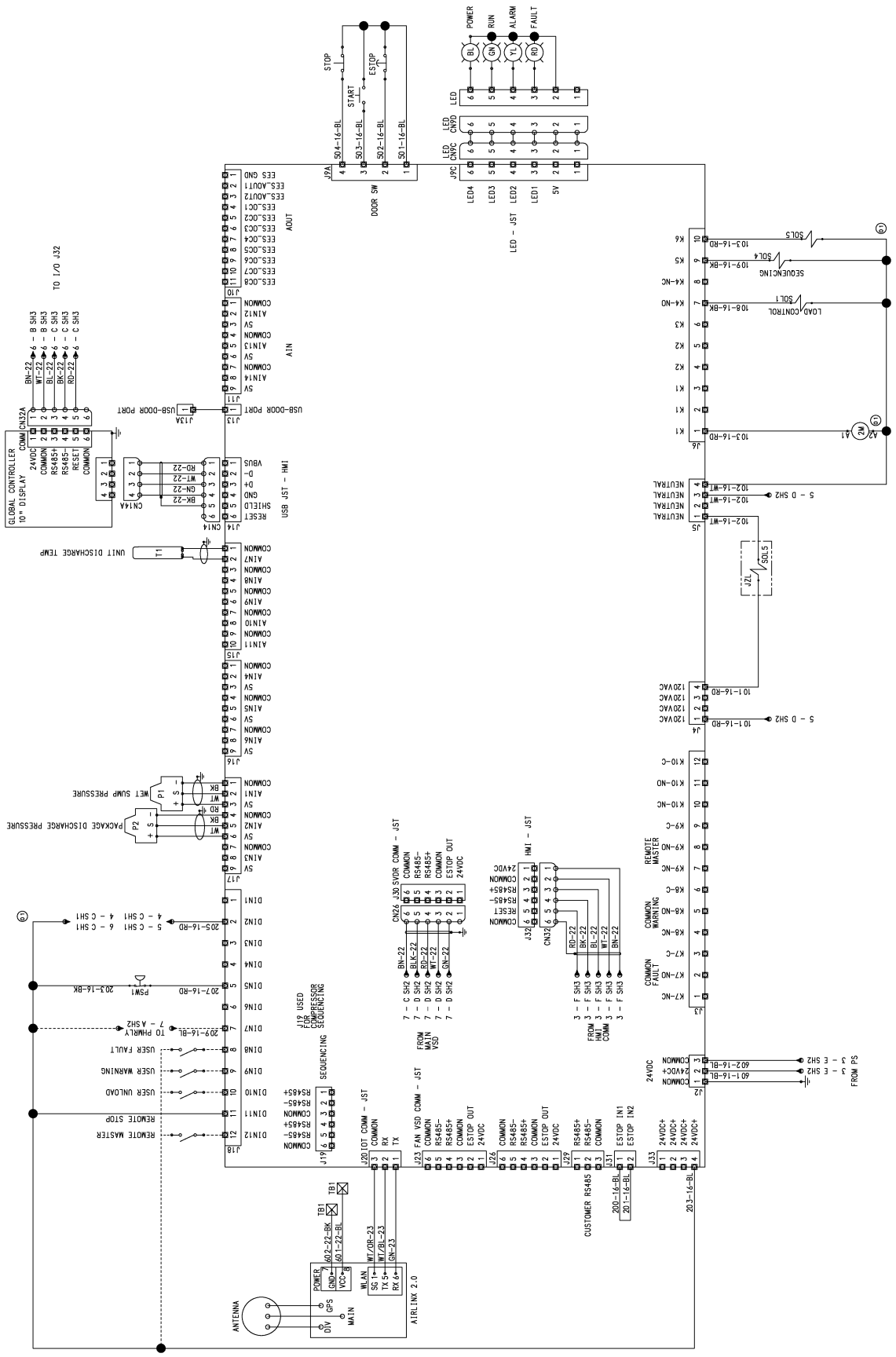


3.8 Wiring Diagram—VSD, AC P8/P10



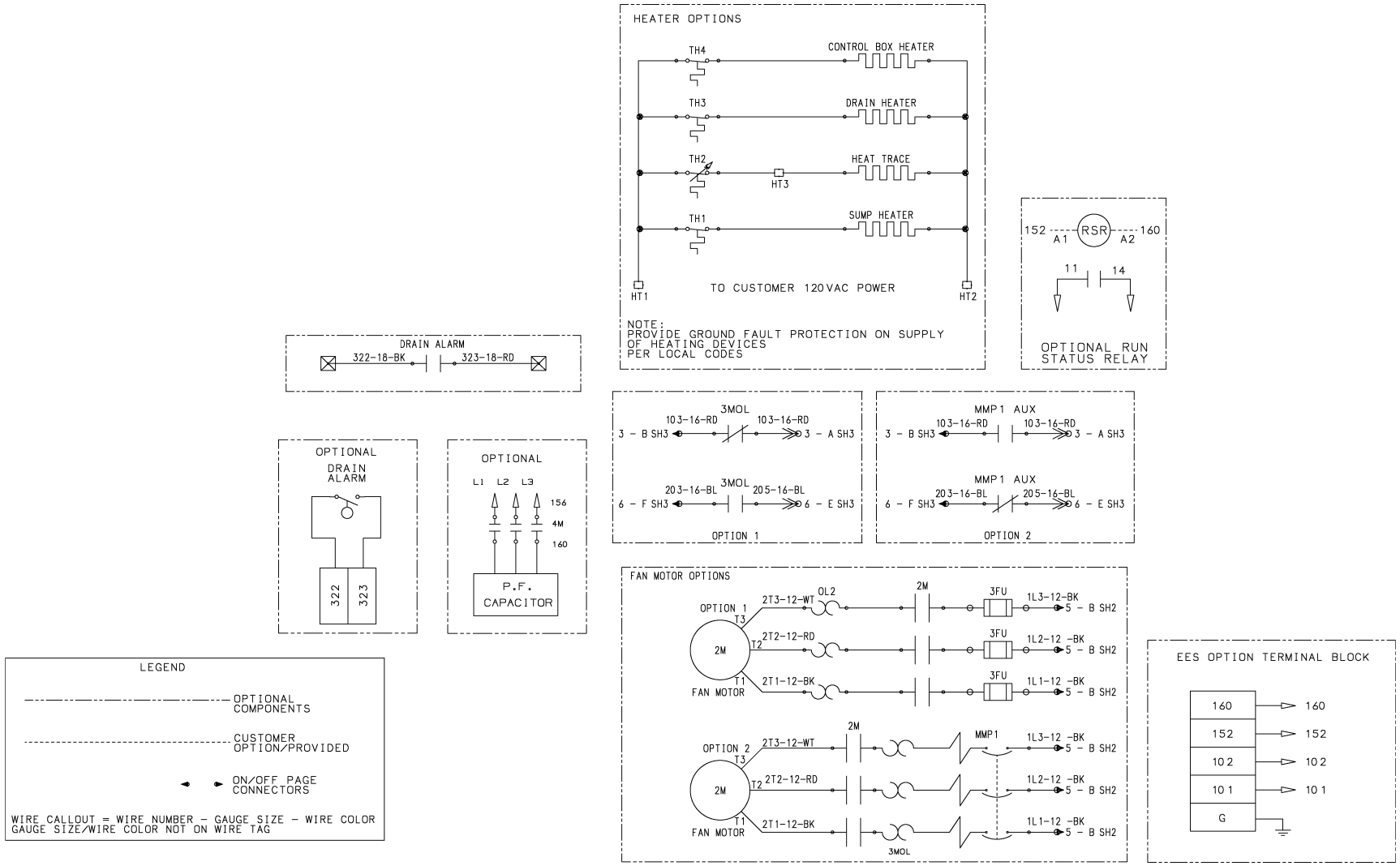
1003-1988 R01 (sh2)

3.8 Wiring Diagram—VSD, AC P8/P10

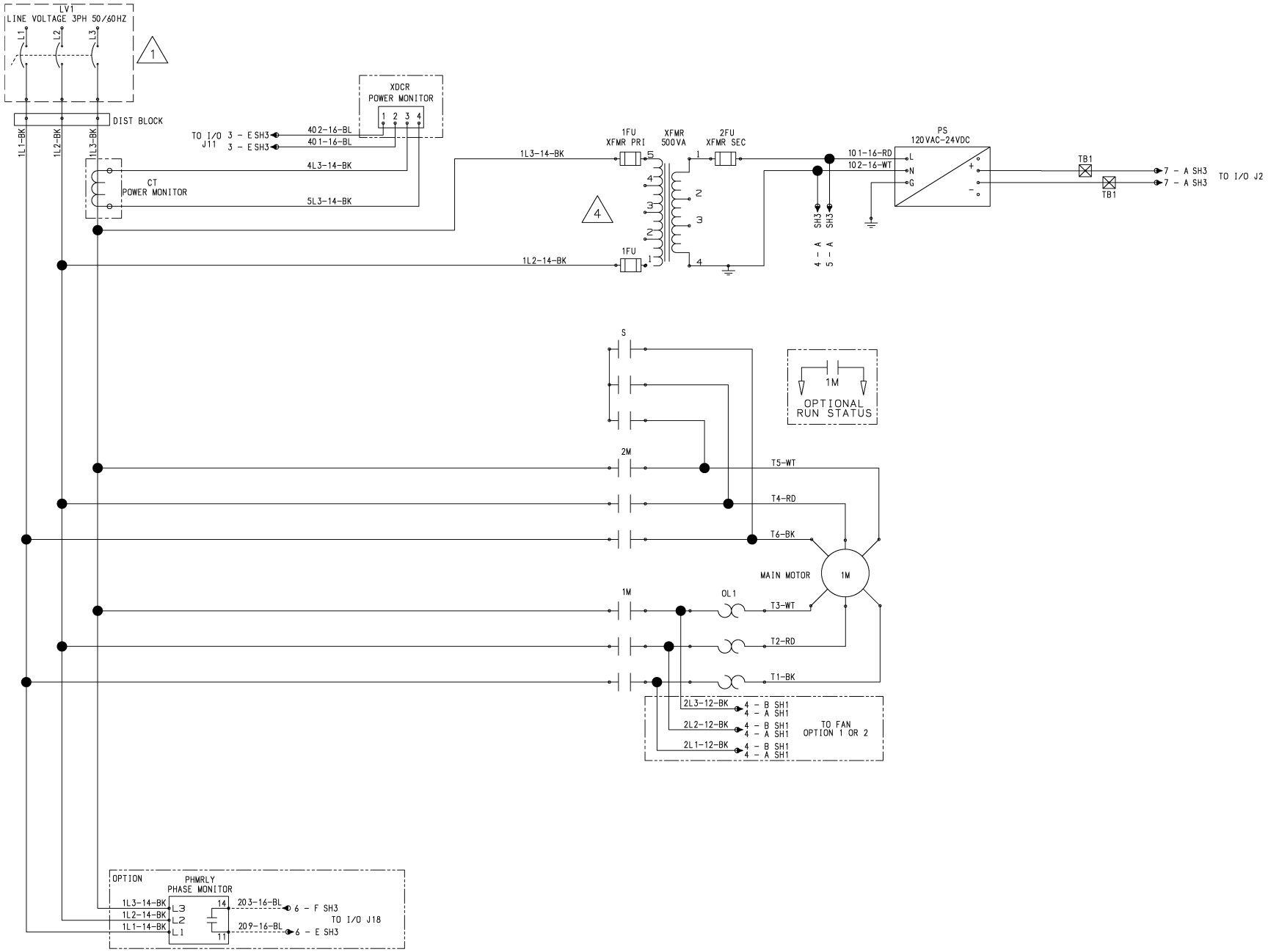


Notes:

3.9 Wiring Diagram—YD, AC P8/P10

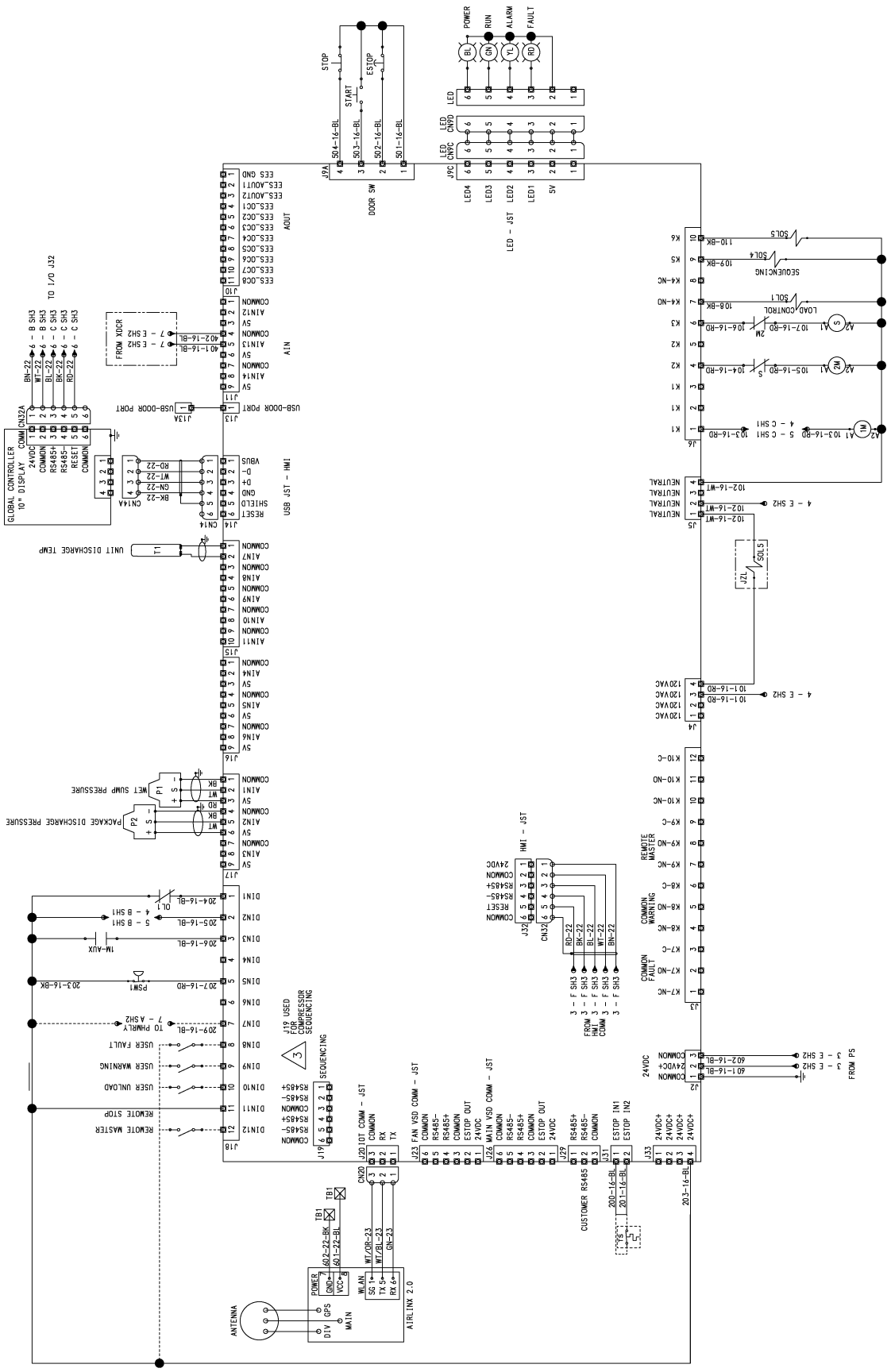


3.9 Wiring Diagram—YD, AC P8/P10



1003-1987 R02 (sh2)

3.9 Wiring Diagram—YD, AC P8/P10



1003-1987 R02 (sh3)

SULLAIR

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.

NOTE

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

4.2 Ventilation & 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 4 feet (1.25 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 reintroduction 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.
- If discharge/inlet ductwork is added to the compressor package, then remove the louvers from the compressor package.

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.

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.

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 NEMA 4 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.

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)

.

NOTE

Compressors with integral dryers can be damaged by ambient temperatures below freezing. The dryer electrical system is Nema 12 rated and should not be installed outdoors or in an unheated space, subject to freezing temperatures.

For installation in a below freezing climate, a low ambient option with heat tracing and a separator/sump tank 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 tank. 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. See *Figure 4-1*.

NOTE

Compressors with integral dryers can be damaged by ambient temperatures below freezing. The dryer electrical system is NEMA 12 rated and should not be installed outdoors or in an unheated space, subject to freezing temperatures.

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. Downstream filters (available from Sullair) can remove any liquid carryover.

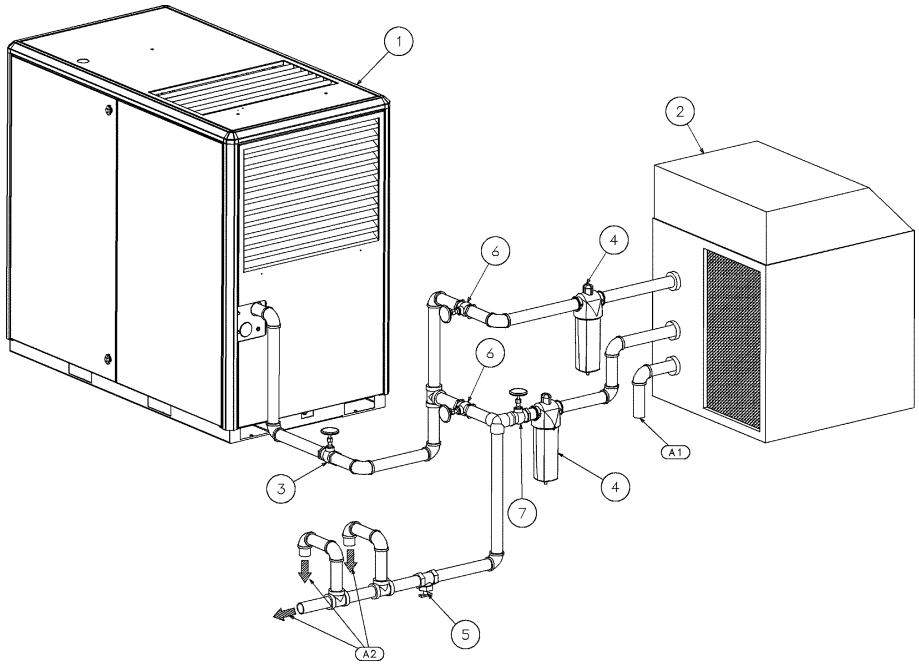


Figure 4-1: Service Air Piping, Typical Installation

1. Sullair Compressor
2. Sullair Dryer
3. Shut-Off Gate Valve
4. Sullair Filter
5. Water Leg Drain Valve
6. By-Pass Gate Valve
7. Standard Gate Valve

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 Tank

An auxiliary receiver tank 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 compressor outlet connections, 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 tank.

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." (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.

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 fluid level is to be checked when the compressor is in the SHUT DOWN MODE (fluid level may not be visible when operating), and by looking at the sight glass on the separator/sump tank. To be able to see the fluid level it may be necessary to start the machine and build the separator/sump tank pressure up to 10/20 psi and then shut down. If no fluid level is seen in the sight glass add fluid to the center of the glass. Do not overfill in any case. When a complete fluid change is performed, fill the separator/sump tank 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 inside the starter enclosure.

- 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 8 ga. to 3/0 ga. 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.

1. Check incoming voltage. Be sure that the 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 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 startup. See *Figure 4-2* and *Figure 4-3*. 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 **START** and **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 STS 2.0 Controller to display P1 separator/sump tank pressure. Pull out the **EMERGENCY STOP** button and press once, quickly and in succession, the **START** and **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.

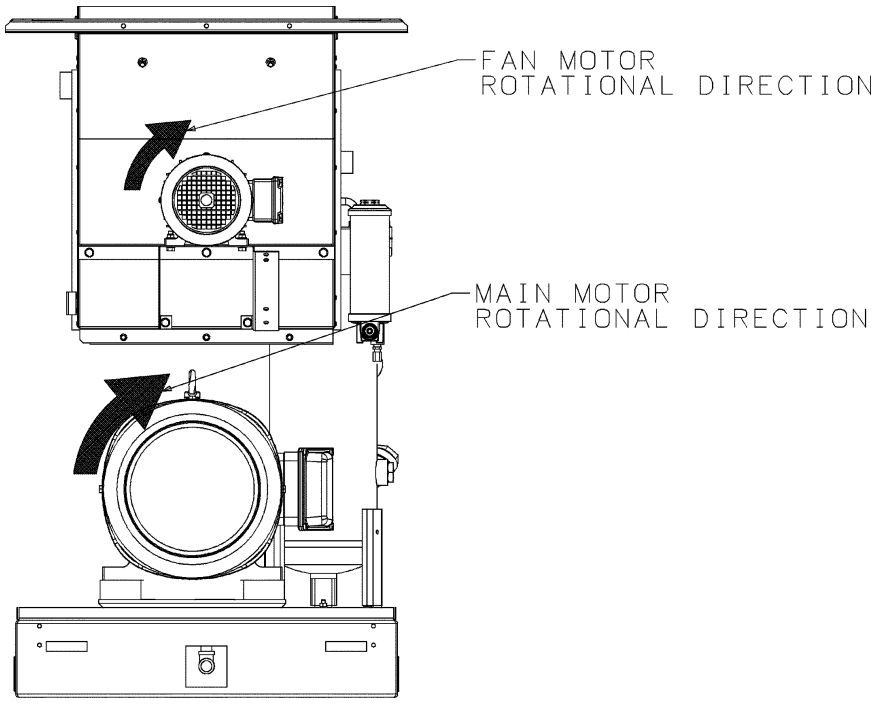


Figure 4-2: Fan motor/main motor rotational direction
50Hz 25HP/18kw, 50Hz or 60Hz 30HP/22kw

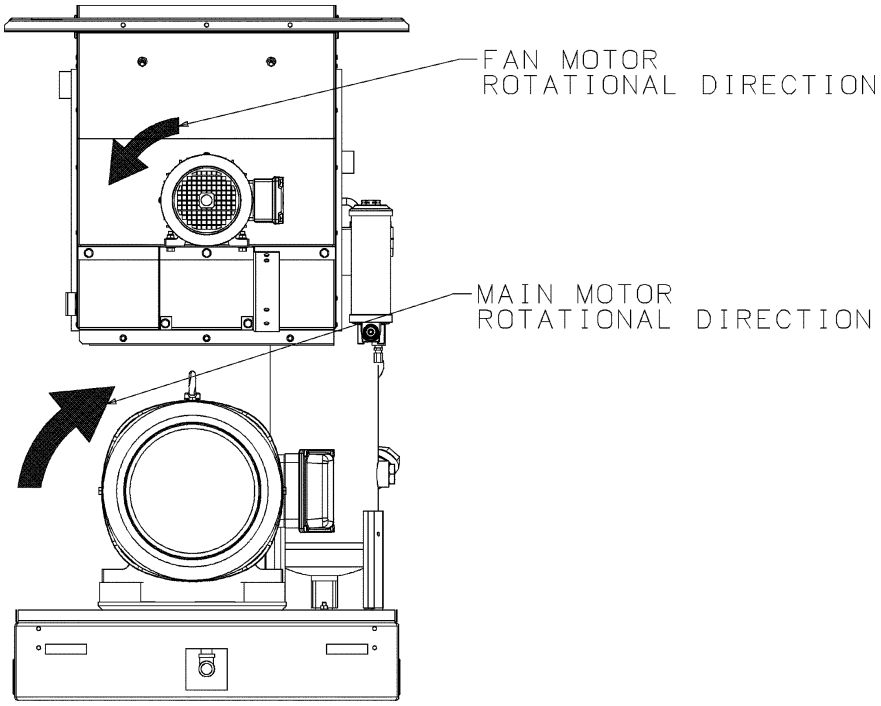
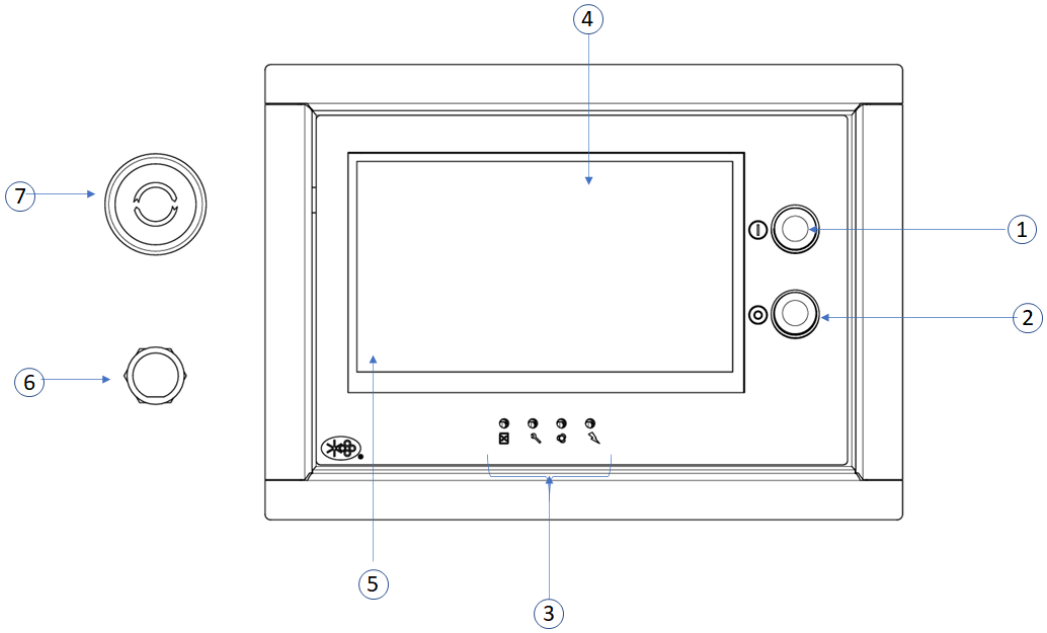


Figure 4-3: Fan motor/main motor rotational direction
60Hz 25HP/18kw, 50Hz or 60Hz 40HP/30kw

Section 5
Controller

5.1 Controller layout



1.	**Start button**	5.	**Menu button**
2.	**Stop button**	6.	**USB Port**
3.	**Indicator LEDs**	7.	**E-stop button**
4.	**Touch screen display**		

Figure 5-1: STS Controller

Key	Description	Function
1	**Start button**	Push to start the compressor. Can also be used to reset maintenance and warning messages while the compressor is running.

2	**Stop button**	Push to stop the compressor. Can also be used to clear fault messages when the compressor is stopped. Oil free compressors will enter an Unload Stop state upon the first press of the Stop Button. The machine will run unloaded for 5 minutes to clear the compressor of condensate. This timer should be allowed to expire but if it is required to stop the machine prior to completion of the unload stop time, press the Stop button a second time.
3	**Indicator LEDs**	There are four status indicators that identify the current operational status of the machine: • Power-On Indicator (Blue) – Lights when power is applied to the controller. It will blink slowly to indicate that Automatic Restart After Power Failure is enabled. • Automatic or Manual Run Mode Indicator (Green) – Lights whenever the compressor is set to start and run automatically. The light is constant whenever the motor is running. The light will blink slowly if the compressor motor is stopped while in Automatic Mode as a warning that the machine may restart at any time. The light may blink rapidly if a machine start is imminent. • Maintenance or Warning Indicator (Amber) - Lights when recommended maintenance or service warning is issued. In most cases, the machine will continue to operate normally. • Fault Indicator (Red) - Lights when a compressor fault has occurred. The light remains steady and the compressor remains inoperative until the fault condition is corrected.
4	**Touch screen display**	Displays operating parameters and compressor information. Provides interface between the user and the compressor controller.
5	**Menu button** 	Returns to the main menu screen.
6	**USB Port**	Use this port to upload information to the STS controller using a flash drive.
7	**Emergency Stop (E-stop) button**	Used to stop the compressor immediately. The E-stop button is logged as a fault and should only be used when essential.

5.2 Home page

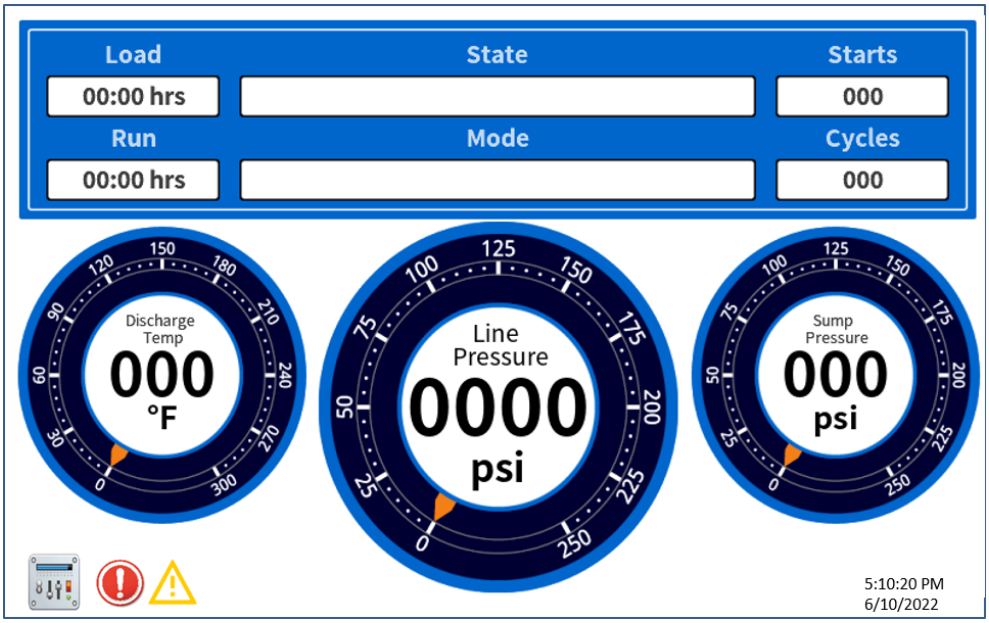


Figure 5-2: Home page—Analog/Digital Panel screen (default)

For a complete overview of the controller, see the ***Sullair Touch Screen Controller 2.0 User Manual*** (P/N 1002-6712 R02) for more information.

NOTE

Consult your local Sullair service representative for installation guidance.

NOTE

Do not use tools or any other instrument to operate touch screen. Use only finger or stylus to operate display while only using moderate force.

The **Analog/Digital Panel** screen is the default screen for the home page. This screen is divided into two main sections:

- The status area at the top shows the load and run times, starts and cycles, and message related to the current status (state and mode).
- The gauge area below shows discharge temperature, discharge pressure, and sump pressure as analog gauges.

You can change the units of measure for pressure and temperature on the **User Preferences** page (see *Section 5.4* on page 59).

You can access the **User Preferences** page by pressing the main menu button in the lower left corner of the screen, then selecting **System Information**, and then selecting **User Preferences**. (See *Section 5.5: Menu hierarchy* on page 60 for the complete menu structure.)

NOTE

- Do not expose machine to temperatures outside of design specifications.
- Do not expose machine or control panel to direct, uninterrupted UV/sunlight.
- Do not install machine in areas with high continuous moisture content.

5.3 Main Menu page

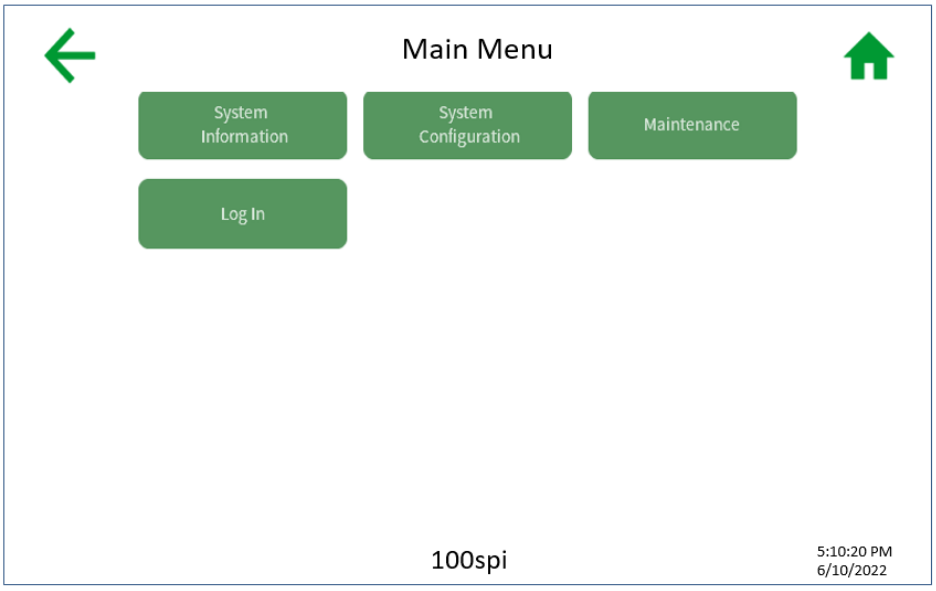


Figure 5-3: Main menu page

From the main menu, you can navigate to other pages that allow you to:

- View and change configuration settings
- View reports, charts, and graphs
- View fault and warning history
- View maintenance information
- Login in as an administrator
- And perform other administrative functions

To view the complete menu hierarchy, see *Section 5.5* on page 60.

You can reach the main menu by pressing the main menu (home) button on the home page, or by pressing the back arrow from other menus until you return to the main menu.

- The back arrow always takes you back one page.
  - If you're on the main menu page, the back arrow will return you to the home page.
- The main menu (home) button always takes you back to the home page.

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5.4 User Preferences page

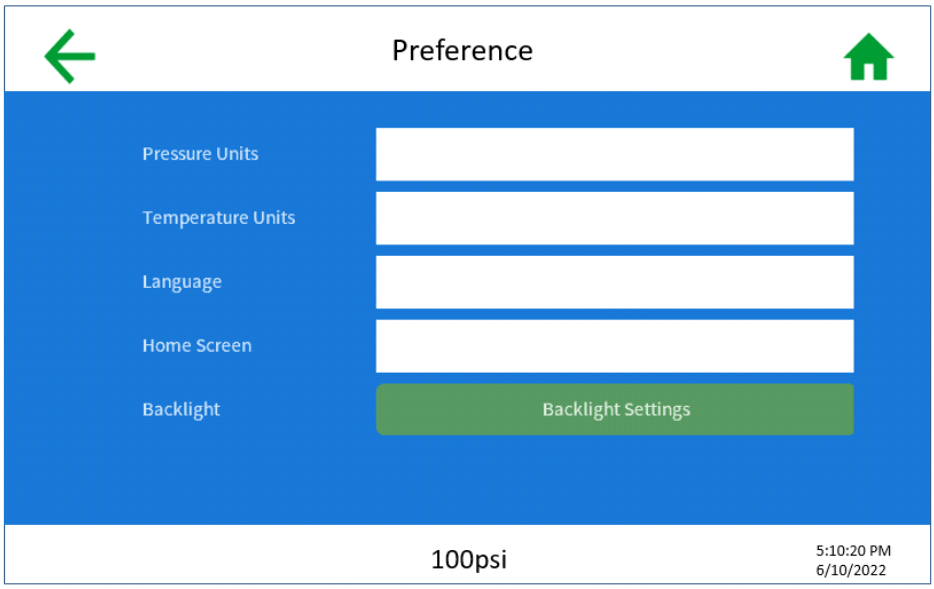

Figure 5-4: User preferences page

The following user interface options are available under **User Preferences**:

- **Pressure Units**. The user can choose between **PSI**, **BAR**, and **k/Pa** as the unit of measure for pressure.
- **Temperature Units**. The user can choose between Fahrenheit (**F**) and Celsius (**C)** as the unit of measure for temperature.
- **Language**. The user can choose between English, Spanish, French, Portuguese, Russian and Chinese for the display language.
  - **Note:** The display language changes immediately upon selection.
- **Home Screen**. The user can choose between **Analog/Digital Panel**, **Mimic Panel**, or **Multi Gauge** for the home page screen. See the ***Sullair Touch Screen Controller 2.0 User Manual*** (P/N 1002-6712 R02) for more information.

You can access the **User Preferences** page by selecting **System Information** from the main menu and then selecting **User Preferences**.

5.5 Menu hierarchy

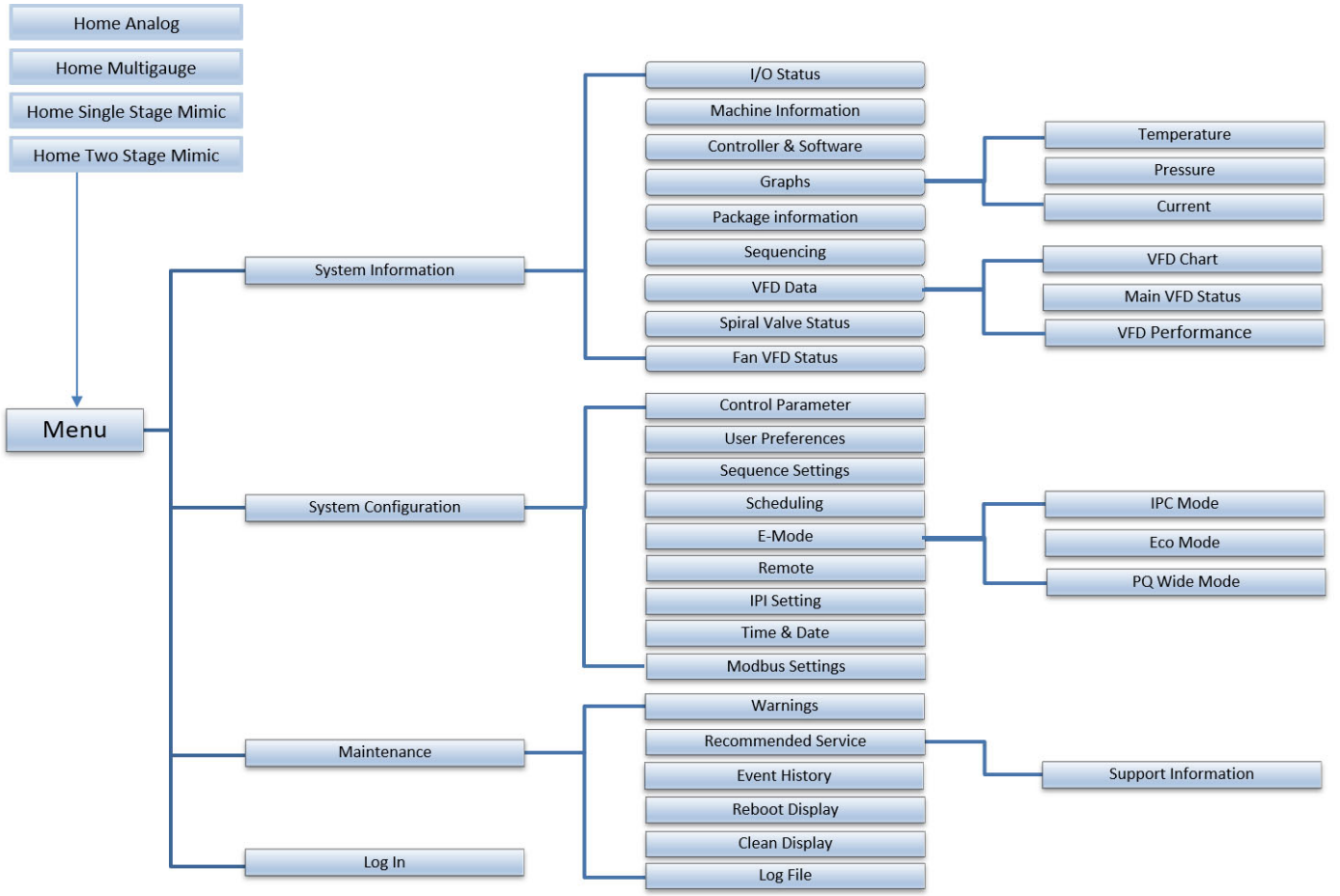

Figure 5-5: Sullair touch screen controller menu hierarchy

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5.6 AirLinx 2.0 remote monitoring

Sullair AirLinx 2.0 allows remote monitoring of your compressor. AirLinx 2.0 provides access to all monitored compressor readings—power, pressure, flow and more—24 hours a day, seven days a week, on any device that can load a browser.

To sign up for an AirLinx 2.0 account, please visit sullair.com or e-mail CRC@sullair.com for a digital sign-up form. If you need connection assistance, please call 888-320-8332 or send an e-mail to Support@opc247.com.

5.6.1 Troubleshooting AirLinx 2.0 communications

AirLinx 2.0 consists of an antenna installed on the outside of the compressor's enclosure and an CPTrans modem installed inside the compressor's control cabinet. The LED lights on the modem indicate the current status of the compressor. The definitions of these lights are shown in *Table 5-1*.

Table 5-1: LED Display

LED name	Color	Details
NET	Green	WAN connection status Offline: Off Online: Green light on
LAN1	Green-Red	LAN1 Ethernet1 port status Linkup (100M): Green light on Linkup (10M): Red light on
LAN2	Green-Red	LAN2 Ethernet2 port status Linkup (100M): Green light on Linkup (10M): Red light on
LED1	Green	Power status Power off: off Power on: Green light on
LED2	Green	Communication module status Communication module start up: off Communication module activated: Green light on
LED3	Green	Wireless LAN module status Wireless LAN module start up: off Wireless LAN module activated: Green light on
LED4	Green	LTE signal strength Signal (no connection -weak): off Signal (acceptable - strong): Green light on
LED5	Green	Serial communication status No serial communicaiton (Tx): off During serial communication (Tx): Green light on
LED6	Green	Reserved

Notes:

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Section 6
Maintenance

6.1 General

WARNING

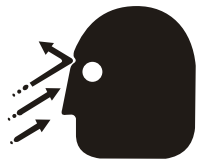
Before any repairs are attempted, refer to *Section 1: Safety* before proceeding.

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 STS 2.0 Controller display indicates service, maintenance for that specific item is required. Refer to *Filter Maintenance* on page 64.

6.2 Daily Operation

Prior to starting the compressor, it is necessary to check the fluid level in the separator/sump tank. 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 *Section 6.9: Troubleshooting— Introduction* on page 67 under EXCESSIVE COMPRESSOR FLUID CONSUMPTION for a probable cause and remedy.

WARNING



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.**

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 *Compressor Discharge System, Functional Description* on page 23 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 *Compressor Discharge System, Functional Description* on page 23 for location.
2. Replace the fluid filter element.

3. Pull oil sample for analysis
4. Check air filter. Change if necessary.

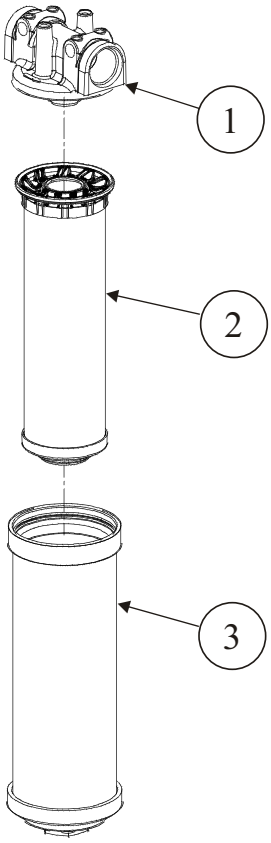


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Figure 6-1: Fluid Filter Assembly

1.	Filter Head
2.	Element*
3.	Body
* Fluid Filter Replacement Kit—P/N 02250155-709	

6.5 Fluid Maintenance

Drain the separator/sump tank and change the compressor fluid using instructions shown in *Application Guide* on page 34.

6.6 Filter Maintenance

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

1. As indicated by the STS 2.0 Controller.
2. Every fluid change.

Refer to *Figure 6-1*.

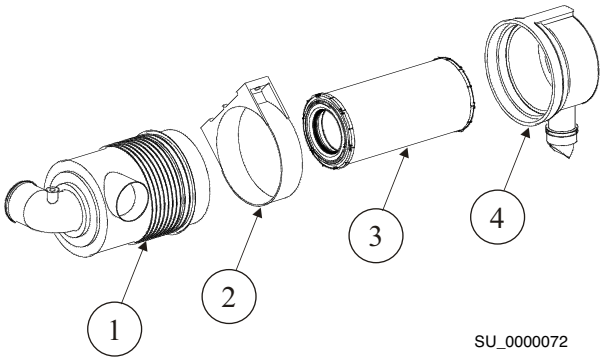
Fluid Filter Element Replacement

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 30 to 35 ft·lb (40.5 to 47.3 N·m).
7. Restart compressor and check for leaks. 6.7

6.7 Air Filter Maintenance

Refer to *Figure 6-2*. Air filter maintenance should be performed when the maintenance indicator 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.



SU_0000072

1.	Filter Head
2.	Element*
3.	Body
* Air Filter Replacement Kit—P/N 02250125-372	

Figure 6-2: Air Filter Assembly

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 STS 2.0 Controller or after one (1) year, whichever comes first. The separator element must be replaced. **DO NOT** attempt to clean the separator element.

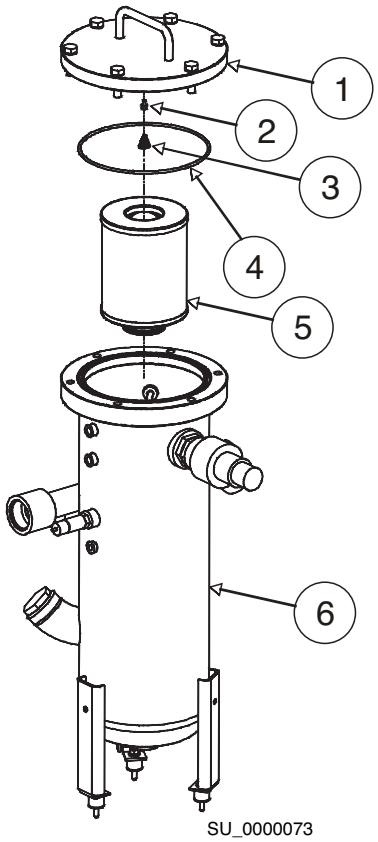
Separator Element Replacement

Refer to *Figure 6-3*. The separator element must be changed when indicated by the STS 2.0 Controller, or once a year, whichever occurs first. Follow the procedure explained below for separator element replacement.

NOTE

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

1. Loosen and remove the six (6) hex head cap screws (8.8 M12 x 40 mm) from the cover plate.
2. Lift the cover plate from the separator/sump tank.
3. Remove the separator element.
4. Inspect the separator/sump tank for rust, dirt, etc.
5. Reinsert the separator element into the separator/sump tank 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 separator/sump tank cover.
7. Replace the cover plate, washers and cap screws. Torque to 70 ft·lbs (95 N·m).
8. Clean the return line strainer before restarting the compressor.



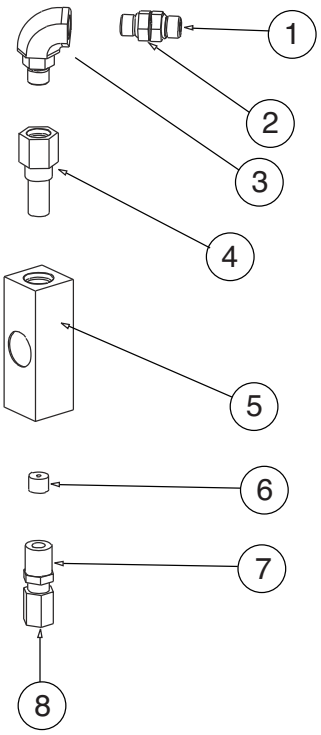
1.	Cover
2.	Ground Spring*
3.	Spring Fastener*
4.	Cover Gasket*
5.	Element*
6.	Separator/Sump Tank
Separator Element—P/N 02250185-533	
* (Included in) Separator Element Replacement Kit—P/N 02250185-532	

Figure 6-3: Separator Element Assembly

Fluid Return/Sight Glass Maintenance

Refer to *Figure 6-4*. The fluid return/sight glass subassembly is attached to the side of the separator tank. Fluid return/sight glass maintenance should be performed on a routine basis parallel to that of the fluid filter, or as indicated in *Section 6.9: Troubleshooting— Introduction* on page 67. The maintenance on a fluid return/sight glass is mainly concerned with the condition of the filter assem-

bly. Order filter assembly No. 02250117-782, and use the following instructions as a guide.



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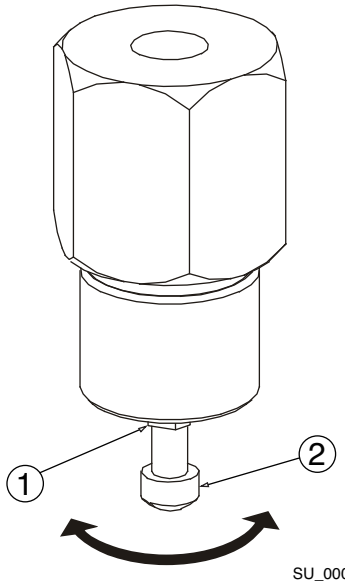
1.	To Separator/Sump Tank
2.	Male Tube Connector
3.	90° Pipe Elbow
4.	Filter Assembly*
5.	Sight Glass/Orifice Block
6.	Brass Plug Orifice
7.	Female Tube Connector
8.	To Unit
* Fluid Return Filter Replacement Kit—P/N 02250117-782	

Figure 6-4: Separator Element Assembly

1. Disconnect the tube at bottom of sight glass.
2. Unscrew the sight glass assembly where the elbow 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 1 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.



SU_0000033

1.	Locking Nut
2.	Adjustment Screw

Figure 6-5: Separator Element Assembly

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 knurled 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. 02250152-669, 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 torque the securing screws to 10 in·lb (1.13 N·m). Install 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.

SYMPTOM	PROBABLY 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.

SYMPTOM	PROBABLY CAUSE	REMEDY
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 STS 2.0 Controller Set Wrong	Reset.
	Defective Unload Solenoid Valve	STS 2.0 Controller will energize valve to close. Repair if defective.
	Defective Blowdown Valve	Blowdown valve should exhaust separator/sump tank pressure to 18 psig (1.2 bar) when maximum operating pressure is reached. Repair if defective.
	High Discharge Temperature	—
	Cooling Air Flow Restricted	Clean cooler and check for proper ventilation.
	Ambient Temperature Is Too High	Provide sufficient ventilation.
	Low Fluid Level	Add fluid.
	Thermal Valve Not Functioning Properly	Replace element.
Compressor Will Not Build Full Discharge Pressure	Air Demand Is Too Great	Check service lines for leaks or open valves.
	Dirty Air Filter	Check the filter indicator and inspect and/or change element if required.
	Inlet Valve Bleed Orifice Plugged	Ensure 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 .
	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.
	Sheared Coupling Element	Replace coupling element. Refer to *Shaft Coupling Maintenance* on page 67.

SYMPTOM	PROBABLY CAUSE	REMEDY
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. Repair Valve (kit available).
	Defective Unload Solenoid Valve	Check that the valve is open when deenergized. Replace if necessary.
	Plugged Control Line Strainer	Clean strainer (screen and O-ring replacement kit available).
	Defective Blowdown Valve	Check that separator/sump tank 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 hoses, 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.
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	Ensure valve opens and closes as signaled by the STS 2.0 Controller.
	Inadequate Drain Timer Settings	Check STS 2.0 Controller control drain interval and drain time, and adjust accordingly. High humidity conditions require longer drain times or more frequent openings.

Notes:

Hitachi Global Air Power US, LLC
1 Sullair Way
Michigan City, IN 46360 USA
www.sullair.com
1-800-SULLAIR (USA only)
1-219-879-5451 (non-USA)