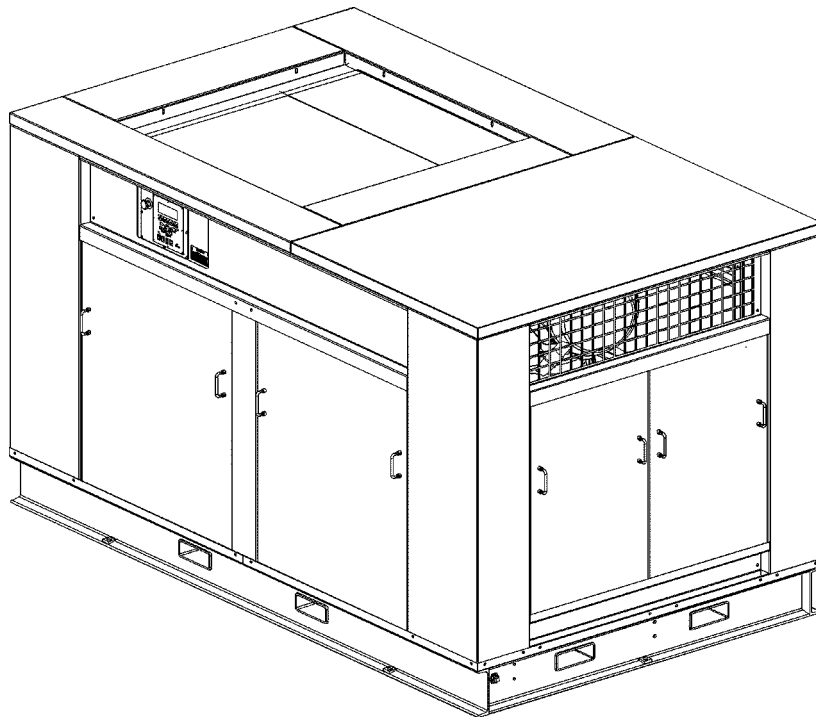




USER MANUAL

INDUSTRIAL AIR COMPRESSOR TS20C/V200TSv



WARRANTY NOTICE

Failure to follow the instructions
and procedures in this manual or,
misuse of this equipment will
VOID its warranty!

PART NUMBER:
02250184-783 R00

**KEEP FOR
FUTURE
REFERENCE**

©SULLAIR CORPORATION

The information in this manual is current
as of its publication date, and applies to
compressor **serial number:**

200910010000

and all subsequent serial numbers.



AIR CARE SEMINAR TRAINING

Sullair Air Care Seminars are courses that provide hands-on instruction for the proper operation, maintenance, and servicing of Sullair products. Individual seminars on Industrial compressors and compressor electrical systems are offered at regular intervals throughout the year at Sullair's corporate headquarters training facility located at 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 seminars are recommended for maintenance, contractor maintenance, and service personnel.

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



TABLE OF CONTENTS

SECTION 1—SAFETY

5	1.1	GENERAL
5	1.2	PERSONAL PROTECTIVE EQUIPMENT
5	1.3	PRESSURE RELEASE
6	1.4	FIRE AND EXPLOSION
6	1.5	MOVING PARTS
7	1.6	HOT SURFACES, SHARP EDGES AND SHARP CORNERS
7	1.7	TOXIC AND IRRITATING SUBSTANCES
8	1.8	ELECTRICAL SHOCK
8	1.9	LIFTING
9	1.10	ENTRAPMENT

SECTION 2—DESCRIPTION

11	2.1	INTRODUCTION
11	2.2	COMPRESSOR COMPONENT DESCRIPTION
17	2.3	COMPRESSOR COOLING AND LUBRICATION SYSTEM—FUNCTIONAL DESCRIPTION
17	2.4	COMPRESSOR DISCHARGE SYSTEM—FUNCTIONAL DESCRIPTION
18	2.5	CONTROL SYSTEM— FUNCTIONAL DESCRIPTION FOR TS20C
19	2.6	CONTROL SYSTEM— FUNCTIONAL DESCRIPTION V200TS
22	2.7	AIR INLET SYSTEM— FUNCTIONAL DESCRIPTION

SECTION 3—SPECIFICATIONS

73	3.1	TABLE OF SPECIFICATIONS—TS-20C
73	3.2	TABLE OF SPECIFICATIONS—V200TS
73	3.3	COMPRESSOR SPECIFICATIONS
74	3.4	MOTOR SPECIFICATIONS
74	3.5	MOTOR SPECIFICATIONS
74	3.6	LUBRICATION GUIDE
75	3.7	APPLICATION GUIDE
75	3.8	LUBRICATION CHANGE RECOMMENDATIONS AND MAINTENANCE, FLUID FILTER AND SEPARATOR

TABLE OF CONTENTS

SECTION 4—INSTALLATION

101	4.1	COMPRESSOR MOUNTING— SUPPORT AND LOCATION
101	4.2	VENTILATION AND COOLING
105	4.3	SERVICE AIR PIPING
105	4.4	COUPLING ALIGNMENT CHECK
105	4.5	FLUID LEVEL CHECK
106	4.6	ELECTRICAL PREPARATION
106	4.7	MOTOR ROTATION DIRECTION CHECK

SECTION 5—SUPERVISOR CONTROLLER

SECTION 6—MAINTENANCE

111	6.1	GENERAL
111	6.2	DAILY OPERATION
111	6.3	MAINTENANCE AFTER INITIAL 50 HOURS OF OPERATION
111	6.4	MAINTENANCE EVERY 2000 HOURS
111	6.5	FLUID MAINTENANCE
112	6.6	FLUID FILTER MAINTENANCE
113	6.7	AIR FILTER MAINTENANCE
114	6.8	SEPARATOR MAINTENANCE
116	6.9	FLUID RETURN/SIGHT GLASS MAINTENANCE
117	6.10	PRESSURE REGULATOR ADJUSTMENT
118	6.11	WATER CONDENSATE DRAIN MAINTENANCE
118	6.12	CONTROL LINE FILTER
118	6.13	SHAFT COUPLING MAINTENANCE

SECTION 7—TROUBLESHOOTING

119	7.1	TROUBLESHOOTING— INTRODUCTION
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Section 1

SAFETY

NOTE



**OPERATOR IS REQUIRED TO READ
ENTIRE INSTRUCTION MANUAL.**

1.1 GENERAL

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

The compressor should be operated only by those who have been trained and delegated to do so, and who have read and understood this Operator's Manual. Failure to follow the instructions, procedures and safety precautions in this manual may result in accidents and injuries. **NEVER** start the compressor unless it is safe to do so. **DO NOT** attempt to operate the compressor with a known unsafe condition. Tag the compressor and render it inoperative by disconnecting and locking out all power at source or otherwise disabling its prime mover so others who may not know of the unsafe condition cannot attempt to operate it until the condition is corrected.

Install, use and operate the compressor only in full compliance with all pertinent OSHA regulations and/or any applicable Federal, State, and Local codes, standards and regulations. **DO NOT** modify the compressor and/or controls in any way except with written factory approval.

While not specifically applicable to all types of compressors with all types of prime movers, most of

the precautionary statements contained herein are applicable to most compressors and the concepts behind these statements are generally applicable to all compressors.

1.2 PERSONAL PROTECTIVE EQUIPMENT

- 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 1/2" (13mm) inside diameter is to be connected to the shut-off (throttle) valve, to reduce pressure in case of hose failure, per OSHA Standard 29 CFR 1926.302(b)(7) and/or any applicable Federal, State and Local codes, standards and regulations.
- B. When the hose is to be used to supply a manifold, install an additional appropriate flow-limiting valve between the manifold and each air hose exceeding 1/2" (13mm) inside diameter that is to be connected to the manifold to reduce pressure in case of hose failure.
- C. Provide an appropriate flow-limiting valve at the beginning of each additional 75 feet (23m) of hose in runs of air hose exceeding 1/2" (13mm)

inside diameter to reduce pressure in case of hose failure.

- D. Flow-limiting valves are listed by pipe size and flow-rated. Select appropriate valves accordingly, in accordance with their manufacturer's recommendations.
- E. **DO NOT** use air tools that are rated below the maximum rating of the compressor. Select air tools, air hoses, pipes, valves, filters and other fittings accordingly. **DO NOT** exceed manufacturer's rated safe operating pressures for these items.
- F. Secure all hose connections by wire, chain or other suitable retaining device to prevent tools or hose ends from being accidentally disconnected and expelled.
- G. Open fluid filler cap only when compressor is not running and is not pressurized. Shut down the compressor and bleed the 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 anti-freeze 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.

SECTION 1

- 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.

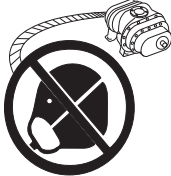
1.6 HOT SURFACES, SHARP EDGES AND SHARP CORNERS

- 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 antifreeze compound to air line anti-icer systems.
- G. If air line anti-icer system antifreeze compound enters the eyes or if fumes irritate the eyes, they should be washed with large quantities of clean water for fifteen minutes. A physician, preferably an eye specialist, should be contacted immediately.
- H. **DO NOT** store air line anti-icer system antifreeze compound in confined areas.
- I. The antifreeze compound used in air line anti-freeze 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.

SECTION 1

- 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.

NOTES

Section 2

DESCRIPTION

2.1 INTRODUCTION

The design of the Sullair TS20C/V200TS compressor unit is a two stage, positive displacement, flood lubricated one. A complete package includes the:

- Compressor unit
- Electric motor
- MFV STR/Variable speed drive
- Compressor inlet and discharge systems
- Compressor lubrication and cooling system
- Capacity control system
- Supervisor™ Controller
- Aftercooler
- Moisture separator
- Moisture Trap
- Heavy gauge steel mounting frame

CAUTION

Use only one type of a recommended compressor lubricant. Adding a different one, or mixing lubricants can cause damage and/or malfunctions, and will void the compressor's warranty.

NOTE

The compressor requires no internal inspections or maintenance actions. Opening the compressor's housing may void its warranty. (This does not apply to the shaft seal which is replaceable.)

Although the compressor requires no inspection of the unit's internal components, external piping, connectors, and the enclosure should be inspected and maintained in accordance with the procedures and recommendations in this manual.

2.2 COMPRESSOR COMPONENT DESCRIPTION

The components and assemblies of the air compressors are clearly shown. The complete package includes compressor, electric motor, variable speed drive, Supervisor Controller, compressor inlet system, compressor discharge system, compressor lubrication and cooling system, capacity control system, instrument panel, aftercooler and combination separator and trap, all mounted on a heavy gauge steel frame.

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

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

After the fluid is cooled, it is injected into the compressor, and mixes directly with the air as the rotors turn which compresses the air. The fluid flow has three basic functions:

1. As a coolant, it controls the air temperature rise normally associated with the heat of compression.
2. Seals the clearance paths between the rotors and the stator, and also between the two rotors.
3. Provides a lubricating film between the rotors allowing one rotor to directly drive the other, which is an idler.

After the air/fluid mixture is discharged from the compressor unit, the fluid is separated from the air. At this time, the air flows through an aftercooler and separator, and then to the service line while the fluid is cooled and filtered in preparation for reinjection.

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

Figure 2-1: Sullair Rotary Screw Air Compressor- Air-Cooled 100/150HP

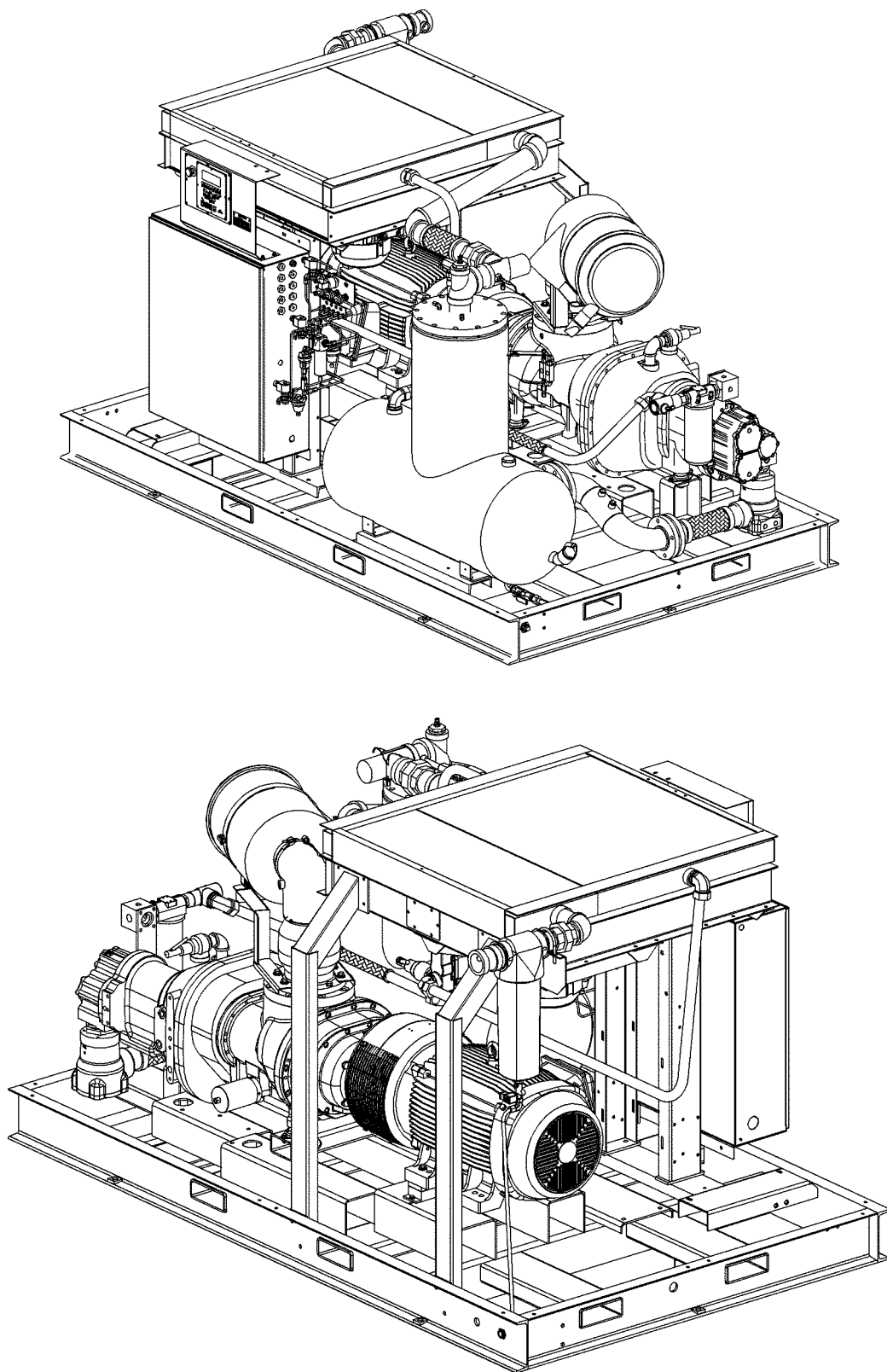


Figure 2-2: Sullair Rotary Screw Air Compressor- Air-Cooled 200HP

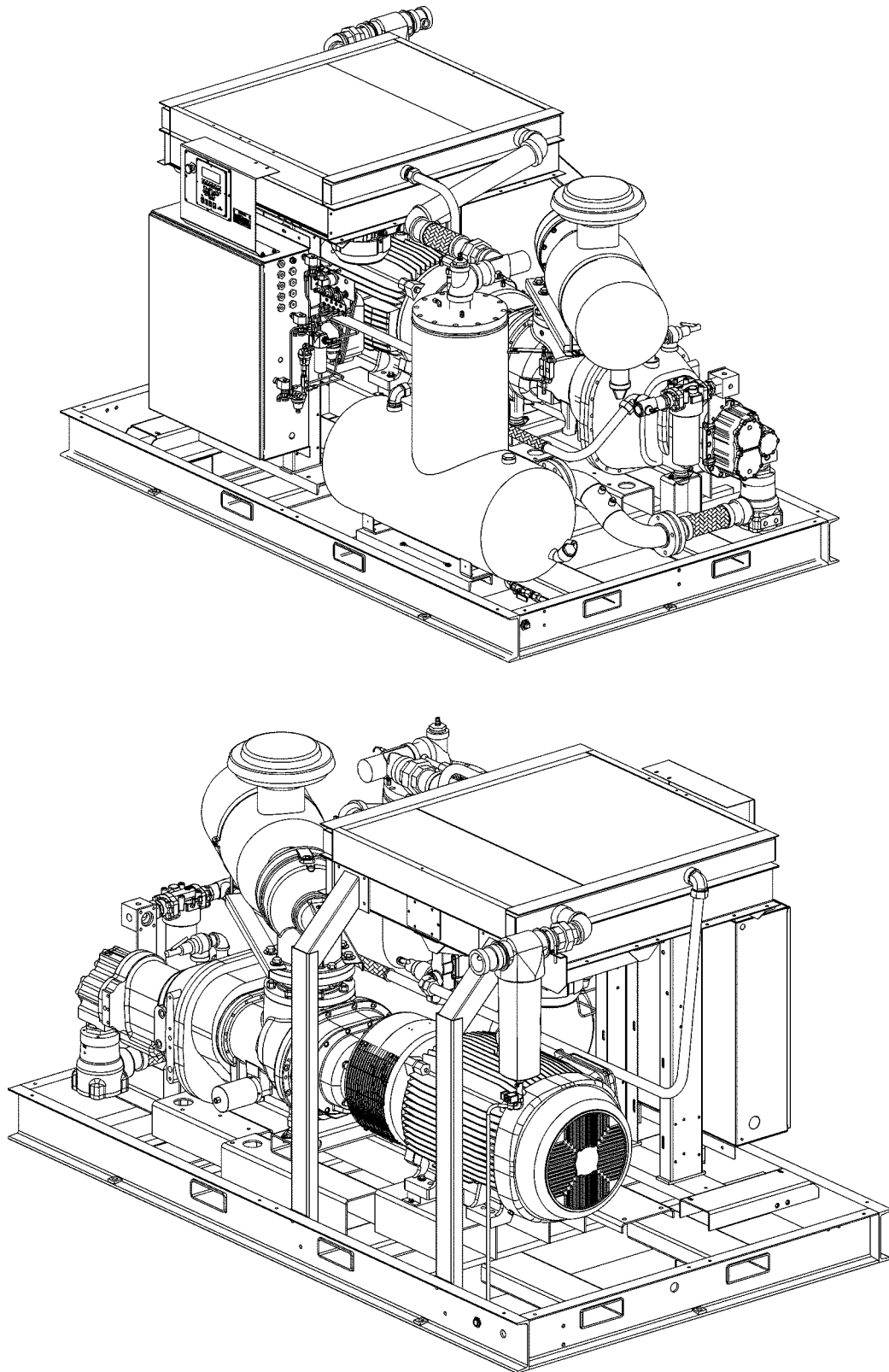


Figure 2-3: Sullair Rotary Screw Air Compressor- Air-Cooled 250HP

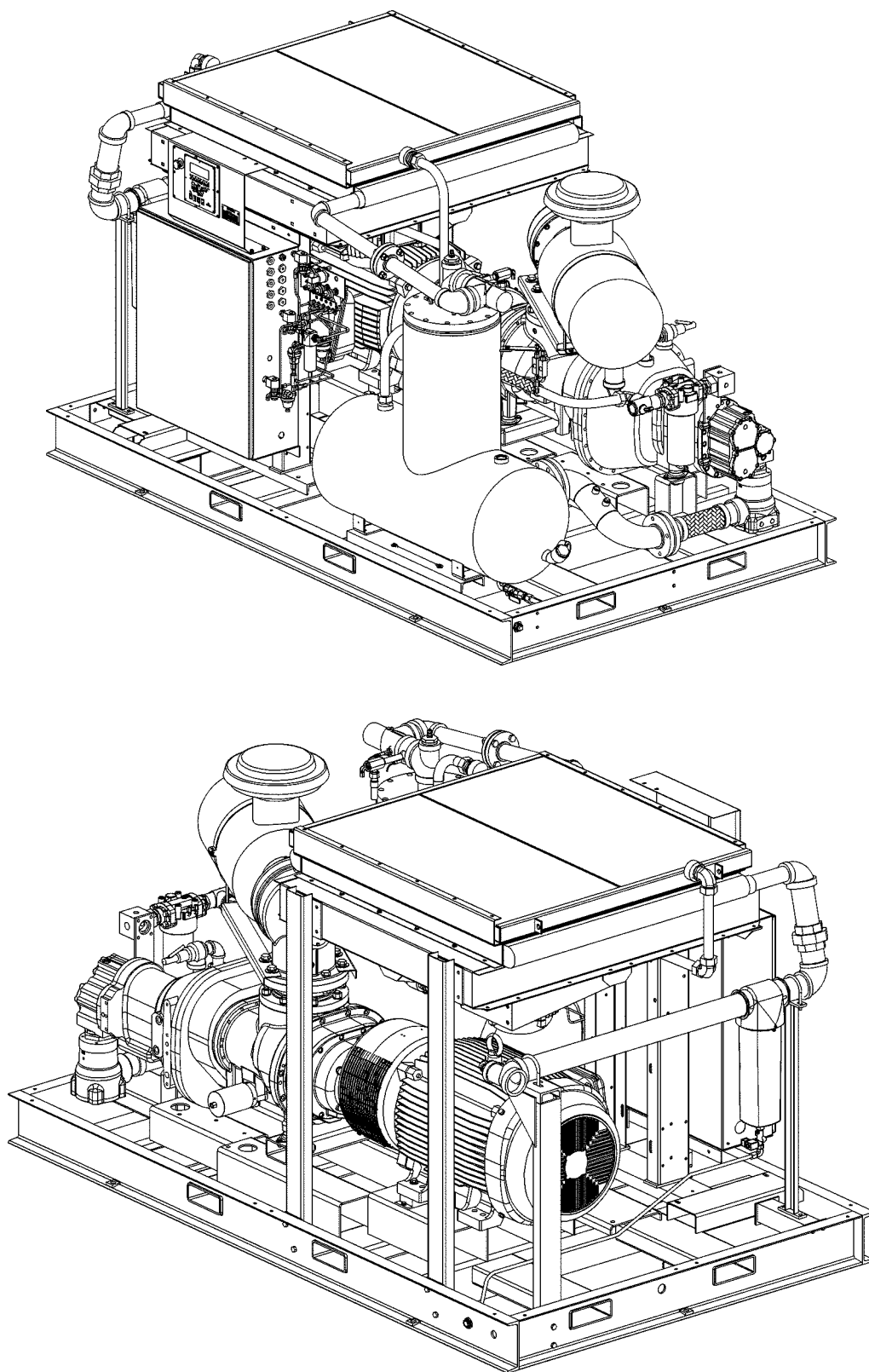
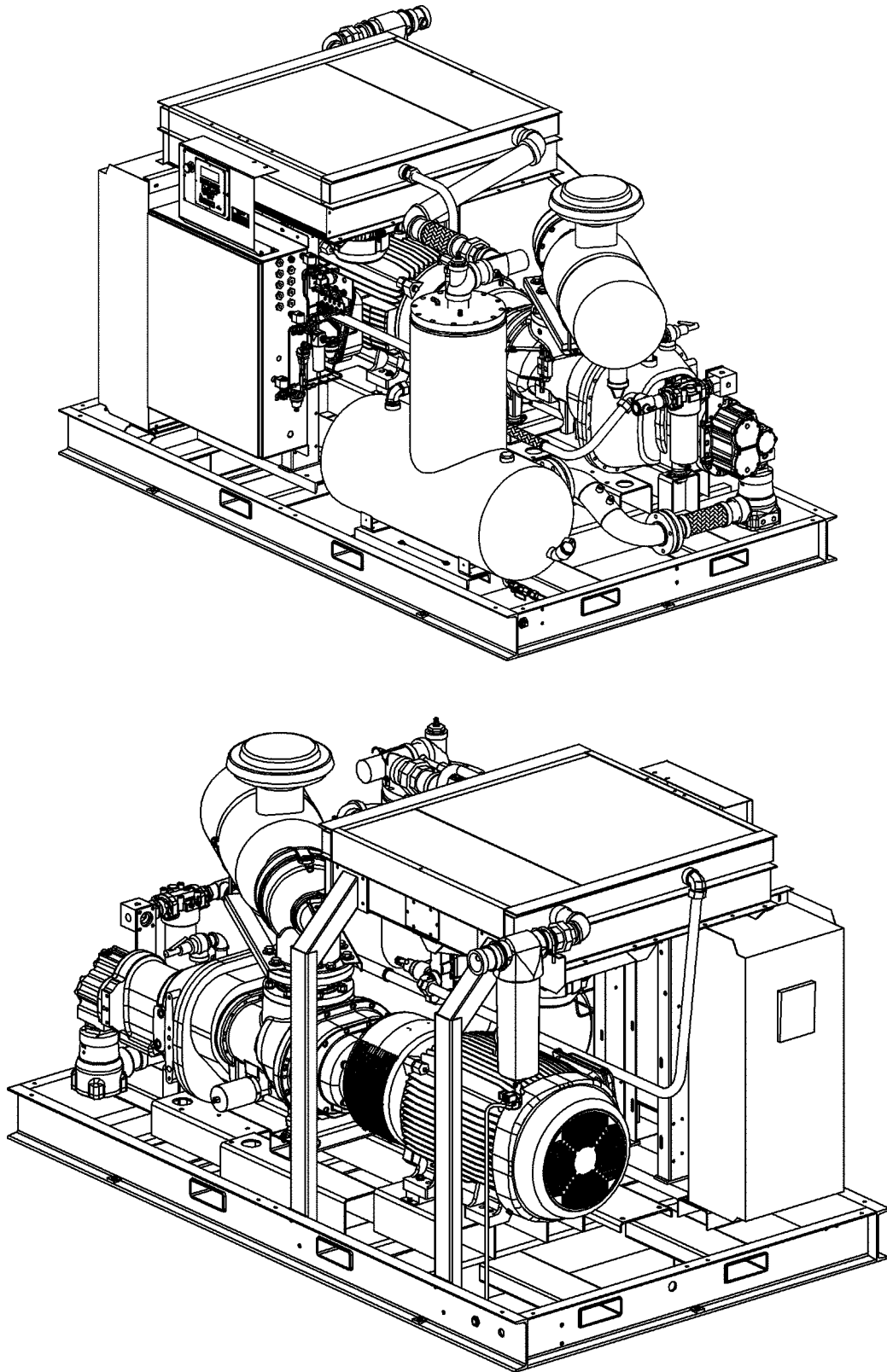


Figure 2-4: Sullair Rotary Screw Air Compressor- Air-Cooled 200HP with Mounted VSD



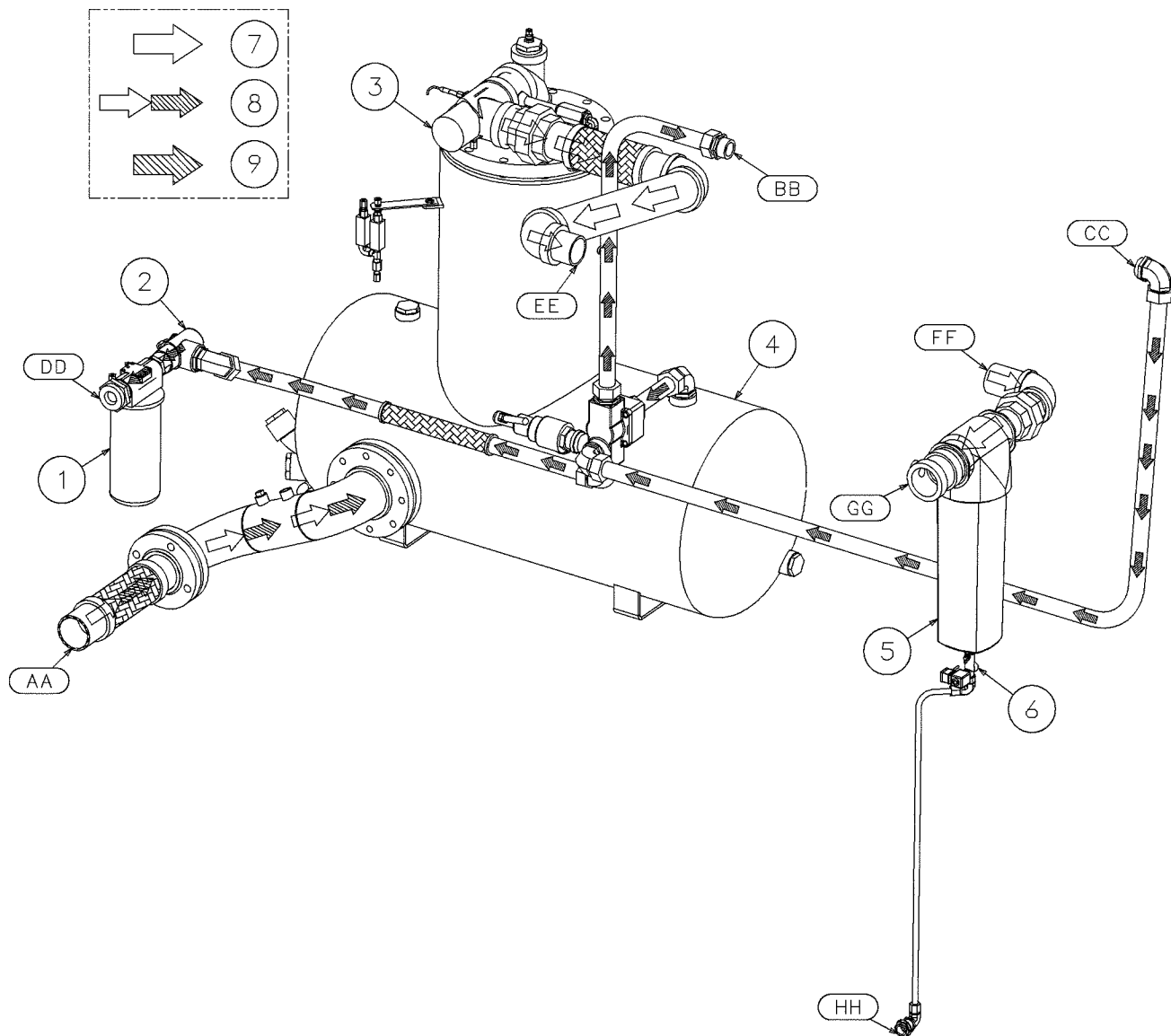


Figure 2-5: Air-Cooled, Cooling/Lubrication and Discharge System

AA: FROM UNIT DISCHARGE CHECK VALVE
 BB: TO FLUID COOLER
 CC: FROM FLUID COOLER
 DD: TO UNIT INJECTION
 EE: TO AFTERCOOLER
 FF: FROM AFTERCOOLER
 GG: PACKAGE AIR OUTLET
 HH: MOISTURE DRAIN OUTLET

1. FLUID FILTER
 2. FLUID STOP VALVE
 3. MINIMUM PRESSURE CHECK VALVE
 4. AIR/FLUID SUMP/SEPARATOR TANK
 5. MOISTURE SEPARATOR
 6. MOISTURE DRAIN/TRAP
 7. AIR
 8. AIR/FLUID MIX
 9. FLUID

2.3 COMPRESSOR COOLING AND LUBRICATION SYSTEM—FUNCTIONAL DESCRIPTION

Refer to *Figure 2-5*. For air-cooled models, the cooling and lubrication system consists of a fan, fan motor, aftercooler/fluid cooler, full flow fluid filter, thermal valve, and interconnecting tubes. For water-cooled models, a shell and tube fluid cooler, aftercooler and water-flow regulating valve are substituted for the radiator-type cooler on air-cooled compressors.

The pressure in the sump tank starts the fluid flow by forcing the fluid from the high pressure area of the tank to an area of lower pressure in the compressor. Fluid flows from the sump tank to the thermal valve that is fully open when the fluid temperature is below 170°F (77°C). The fluid passes through the thermal valve, the main filter, and directly to the compressor where it lubricates, cools and seals the rotors, and the compression chamber.

As the discharge temperature rises above 170°F (77°C), due to the heat of compression, the thermal valve begins to close and a portion of the fluid then flows through the cooler. From the cooler the fluid flows to the fluid filter and on to the compressor. A portion of the fluid flow to the compressor is routed to the anti-friction bearings which support the compressor rotors. Water-cooled versions of the compressor that have an optional water-flow regulating valve, it operates to conserve water during periods of varying load on the compressor. The same valve automatically shuts off the water supply when the compressor is shut down. In addition, water-cooled models have a water pressure switch to prevent operation with inadequate water pressure.

The fluid filter has a replacement element and an integral bypass valve. Refer to *Section 6.6* on page 112.

2.4 COMPRESSOR DISCHARGE SYSTEM—FUNCTIONAL DESCRIPTION

Refer to *Figure 2-5*. The compressor discharges the compressed air/fluid mixture into the combination sump tank. The sump tank has three basic functions:

1. It acts as an air/fluid separator.
2. Serves as the compressor fluid sump.

3. Houses the air/fluid separator elements.

The compressed air/fluid mixture enters the sump tank and flows through an internal baffle system that changes the flow's direction and velocity, which causes most of the fluid to fall to the bottom of the sump tank. A small amount of fluid remaining in the compressed air collects on the surface of the separator elements as the air flows through the separators.

Two return lines (or scavenge tube) lead from the bottom of the separators dry side to a medium pressure region in the compressor. Scavenged fluid is returned by a pressure differential between the sump tank and compressor.

Visual sight glasses are located on the return line to observe this flow. This return line also has an orifice (protected by a strainer) to ensure an unobstructed flow.

The Supervisor™ Controller will show an abnormal pressure drop through the separator if the element becomes dirty or plugged. (Refer to *Section 6.8* on page 114.) It will also shut down the compressor if the discharge temperature reaches 235°F (113°C).

A minimum pressure/check valve located downstream from the separator maintains the sump tank pressure at approximately 50 psig (3.4 bar) during load conditions. This pressure level is necessary for proper air/fluid separation and sufficient fluid circulation.

A terminal check valve is a sub-component of the minimum pressure/check valve that prevents compressed air in the service line from back-flowing into the sump tank on shutdown or when the compressor is operating in an unload condition. Also, a pressure relief valve on the compressor's wet side opens if the sump tank pressure exceeds its rating.



WARNING

Stop the compressor and relieve all internal pressure before removing caps, plugs, and/or other components when the compressor is running or pressurized.

Add fluid to the sump tank through the capped fluid filter port. There is also a sight glass that enables the user to check the sump tank fluid level. See *Section 4.5: Fluid Level Check* on page 105.

2.5 CONTROL SYSTEM— FUNCTIONAL DESCRIPTION FOR TS20C

Refer to *Figure 2-9*. The purpose of the compressor control system is to regulate the amount of the air being compressed to match the amount of compressed air being used. The Capacity Control System consists of a pneumatic inlet valve, solenoid valve, pressure regulator valve and a pressure transducer. The functional description of the Control System is described below in four distinct phases of operation. The following description text applies to all series compressors with the Supervisor Controller. 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.

NOTE

Always refer to the machine nameplate for designed operating pressure.

START MODE—0-50 PSIG (0 TO 3.5 BAR)

When the compressor (I) (**START**) button is depressed, the sump pressure will quickly rise from 0 to 50 psig (0-3.4 bar). During this period both the pressure regulator and the solenoid valve are closed, the inlet valve is fully open and the compressor pumps at full rated capacity. The rising compressor air pressure is isolated from the service line in this phase by the minimum pressure valve set at approximately 50 psig (3.4 bar).

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

When the compressed air pressure rises over 50 psig (3.4 bar) the minimum pressure valve is opened allowing compressed air to flow into the service line. From this point on the line pressure is continually monitored by the Supervisor™ Controller, which controls the variable speed drive. 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 WITH SPIRAL VALVE—100 TO 110 PSIG (6.9 TO 7.6 BAR)

As air demand drops below the rated capacity of the compressor, the line pressure will rise above 100 psig (6.9 bar). As a result, the differential pressure regulator for the spiral valve gradually opens, applying air pressure to the spiral valve actuator. Air pressure at the actuator expands the diaphragm. The rack, in turn, engages with the pinion mounted on the spiral valve shaft assembly. This results in a rotary motion. As the spiral valve rotates, it starts opening the bypass ports gradually. Excess air is then being returned back internally to the suction end of the compressor unit. Now the compressor is fully compressing only that amount of air, which is being used. As air demand keeps dropping further, the spiral valve keeps opening more and more until all the bypass ports are fully open. At this point, the spiral valve has moved into the unload (minimum) position.

The spiral valve provides a modulation range from 100 to 50%. During this period, the pressure rises approximately from 100 to 105 psig (6.9 to 7.2 bar). As the air pressure exceeds 105 psig (7.2 bar), the differential pressure regulator controlling the inlet poppet valve starts opening and forcing the poppet closed, thus throttling inlet air flow to the compressor. The inlet poppet valve provides a modulation range from 50 to 40%. During this period, the pressure rises approximately from 106 to 110 psig (7.3 to 7.6 bar). During this range, the spiral valve remains in the unload position.

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 Supervisor™ control system de-energizes the solenoid valve allowing line air pressure to be supplied directly to close the inlet valve. Simultaneously, the solenoid valve sends a pneumatic signal to the blow down valve. The blow-down valve opens to the atmosphere, reducing sump pressure to approximately 25 to 30 psig (1.7 to 2.1 bar). The check valve in the air service line prevents line pressure from returning to the sump.

When the line pressure drops to the low setting cut-in pressure; usually 100 psig (6.9 bar) on low pressure ["L"] compressors; 125 psig (8.6 bar) on high pressure ["H"] compressors; 150 psig (10.3 bar) on ["HH"] compressors; and 175 psig (12.0 bar) ["XH"]. Supervisor 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.

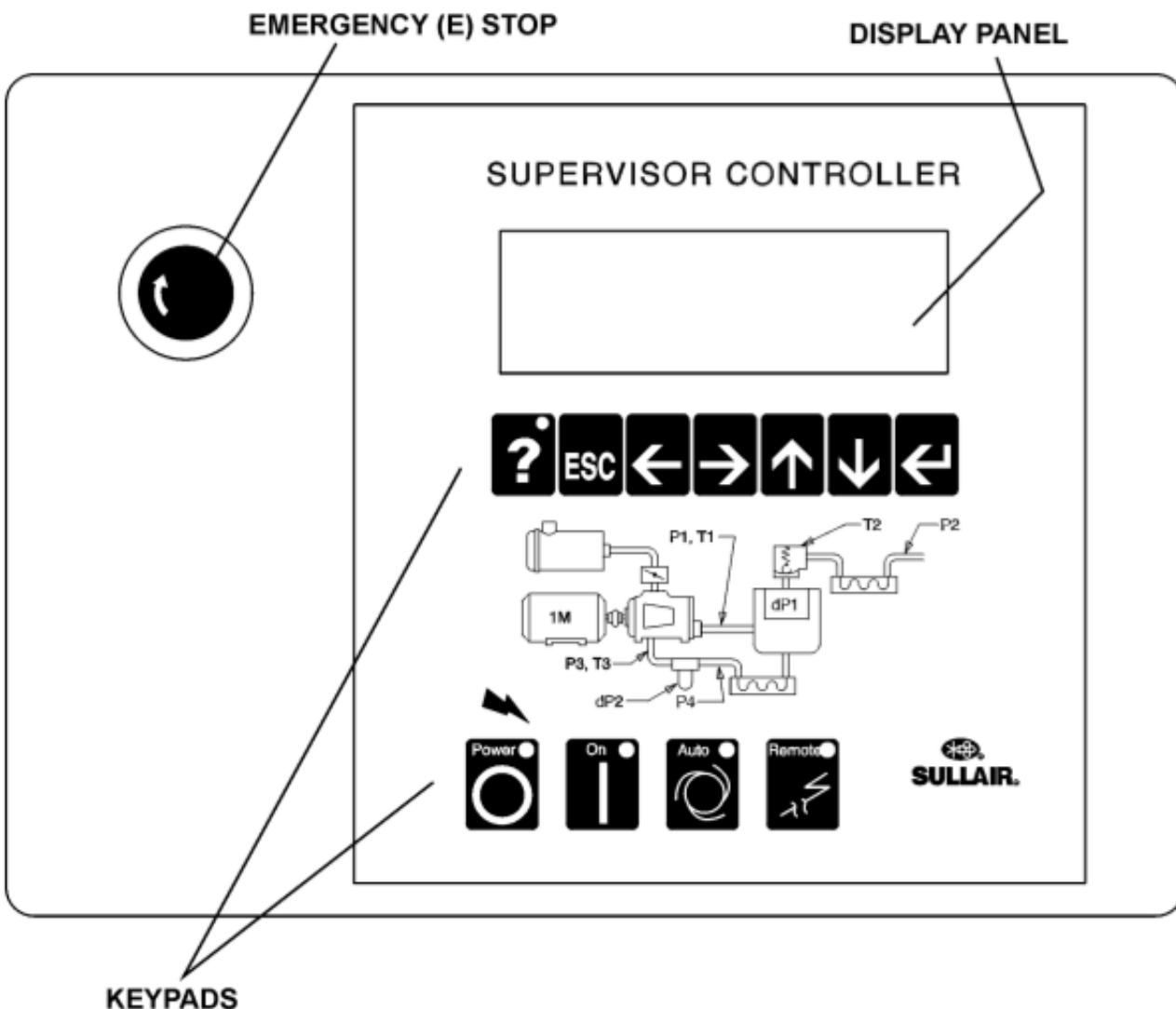
NOTE

For information concerning all aspects of the Supervisor Controller, consult the Supervisor Controller Manual.

2.6 CONTROL SYSTEM— FUNCTIONAL DESCRIPTION V200TS

The purpose of the compressor control system is to regulate the amount of the air being compressed to match the amount of compressed air being used. The Capacity Control system consist of variable speed drive, solenoid valve, regulating valve, and the inlet valve. The functional description of the control system is described below in six distinct phases of operation. The following description text applies to V-200 series variable speed drive compressors with Supervisor Controller. Depending on the model, the compressor can be operated at a setpoint pressure from 60 to 175 psig (4.1 to 12.1 bar). Refer to the nameplate for operating pressure range. The

Figure 2-6: Supervisor™ Controller Panel



Supervisor Controller will automatically set the frequency range based on the selected pressure. For explanatory purposes, this description will apply to a compressor with an operating pressure of 100 psig (6.9 bar). A compressor with any other pressure range would operate in the same manner except stated pressures.

START MODE—0 – 50 PSIG (0 TO 3.5 BAR)

When the Supervisor™ Controller (START) button is depressed, the VSD ramps the motor to full speed and the sump pressure will quickly rise from 0 to 50 psig (0-3.4 bar). During this period, the solenoid valve is closed, the inlet valve is fully open and the air-end delivers full capacity to the sump tank. 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).

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

When the compressed air pressure rises over 50 psig (3.4 bar) the minimum pressure valve is opened allowing compressed air to flow into the service line. From this point on the line pressure is continually monitored by the Supervisor™ Controller, which controls the variable speed drive. The solenoid valve remains closed with the inlet valve fully open running at 100 psig (6.9 bar) or below.

VARIABLE SPEED DRIVE PART LOAD CONTROL

If less than rated capacity of compressed air is being used, the service line pressure will rise above 100 psig (6.9 bar). Consequently, the Variable Speed Drive will begin to decelerate the motor, thereby reducing the output capacity to match demand. The drive will continuously adjust the motor speed (accelerate or decelerate) to maintain a line pressure of 100 psig (6.9 bar). In this mode the VSD will operate within the appropriate frequency range determined by the Supervisor™ Controller.

MODULATING MODE WITH SPIRAL VALVE:

NOTE

This operation does not have inlet modulation.)

As demand decreases, the variable speed drive reduces motor speed to maintain the set point pressure. When the speed approaches the minimum setting, a solenoid valve opens feeding air pressure

to the spiral valve actuator. This in turn expands the diaphragm and engages the pinion mounted on the spiral valve shaft assembly, resulting in a rotary motion and full opening of the spiral valve, effectively reducing the rotor length by 50%. Excess air will be returned back internally to the suction side of the compressor unit. In this mode, the VSD will modulate the motor speed within a specified range to maintain the set point pressure as follows:

Increasing demand condition:

If demand increases, the VSD increases the motor speed until the set point pressure is achieved. If set point pressure is not achieved while at maximum speed, the controller will close the spiral valve, thereby eliminating internal air bypass. Consequently, the VSD will regulate the motor speed to achieve the set point pressure.

Decreasing demand condition:

While the spiral valve is open, if demand continues to decrease the VSD will reduce the motor speed until the set point pressure is achieved. This action will continue until the minimum speed is reached. When the system pressure reaches 106 psig (7.3 bar), or alternatively set unload pressure, the compressor unloads, or turns off.

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

When a relatively small amount or no air is being used, the service line pressure continues to rise. When it exceeds 106 psig (7.3 bar), or alternatively set unload pressure, the Supervisor™ control system de-energizes the solenoid valve allowing sump air pressure to be supplied directly to close the inlet valve. Simultaneously, the solenoid valve sends a pneumatic signal to the blow down valve. The blow-down valve opens to the atmosphere, reducing sump pressure. The check valve in the air service line prevents line pressure from returning to the sump. The compressor will shut down after the unload time setting expires if programmed (the default setting is zero [0] seconds for an immediate shutdown upon unload).

When the line pressure drops to the low setting pressure of 100 psig (6.9 bar) The Supervisor™ Controller starts the motor and energizes the solenoid valve which closes the blow down valve. The re-energized solenoid valve prevents line pressure from reaching the inlet control valve, thereby allowing it to fully open.

Automatic Operation

For applications with varied periods of time when

there are no air requirements, Supervisor'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 2-9*. The compressor inlet system consists of a dry-type air filter and an air inlet valve. A poppet-type modulating air inlet valve directly controls the amount of air intake to the compressor in response to the operation of the pressure regulator (see *MODULATING MODE WITH SPIRAL VALVE—100 TO 110 PSIG (6.9 TO 7.6 BAR)* on page 18).



CAUTION

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

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

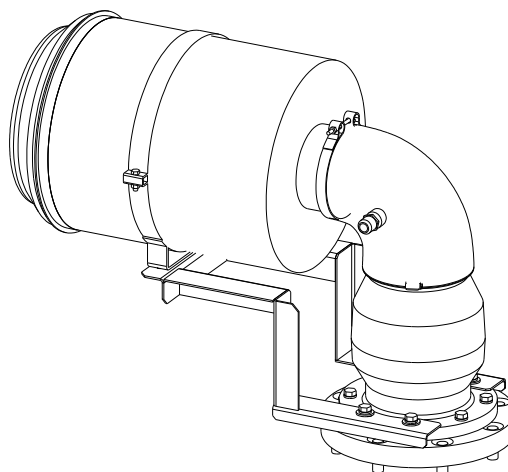


**Figure 2-7: Compressed Air Inlet System
100/150HP**

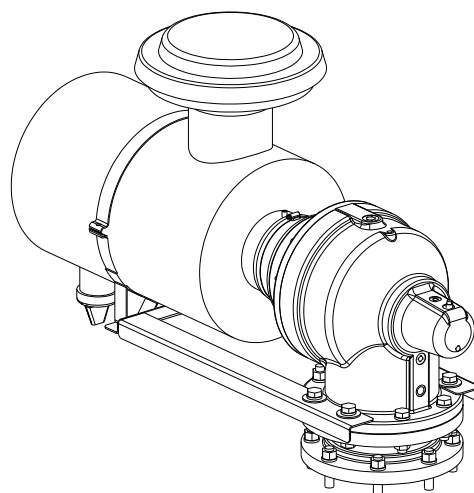
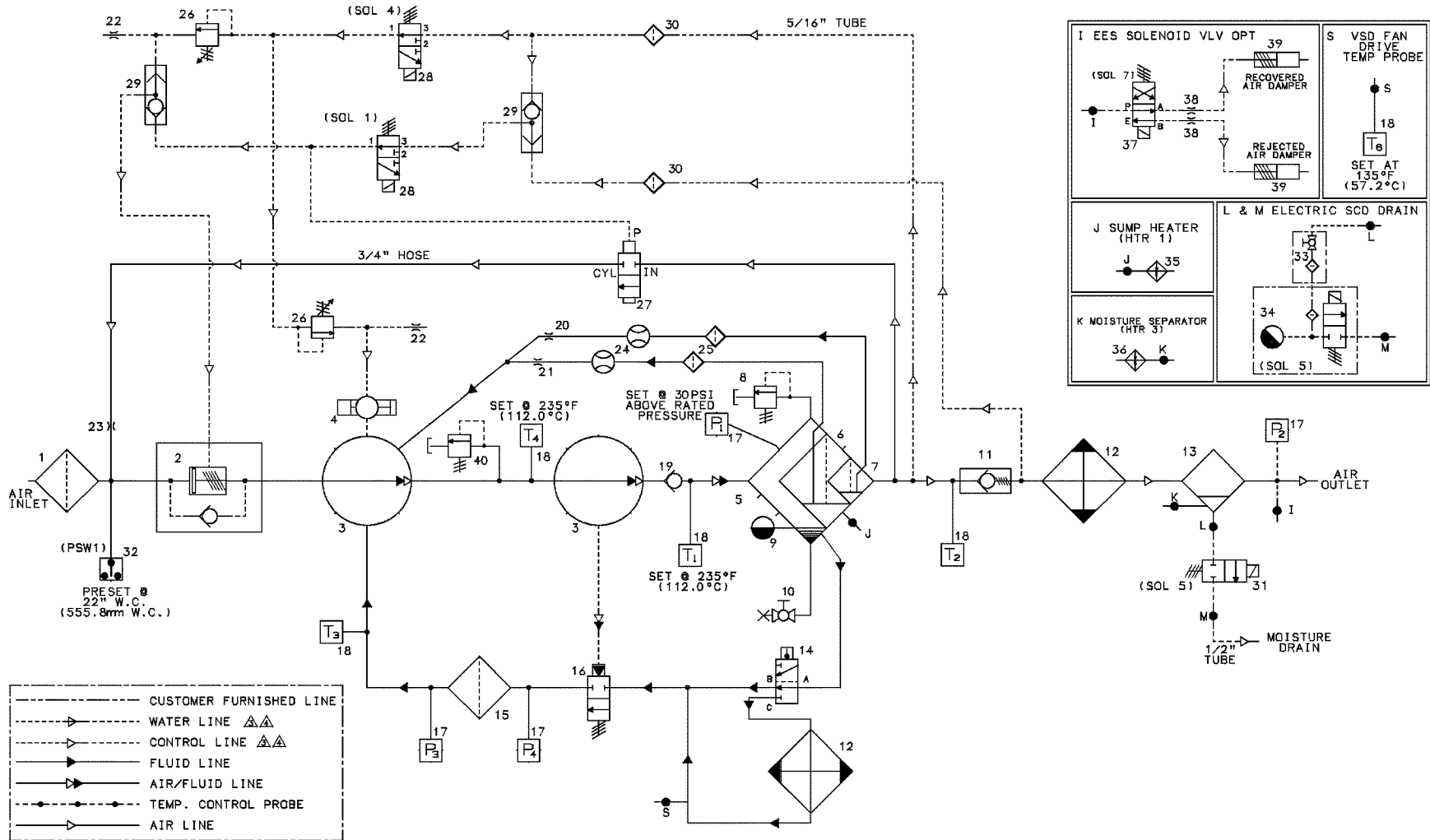


**Figure 2-8: Compressed Air Inlet System
200/250HP**

Figure 2-9: TS20C Piping and Instrumentation 100/150HP



02250177-307 R02

Figure 2-9: TS20C Piping and Instrumentation 100/150HP

KEY NO.	PART NO.	QTY	DESCRIPTION
1	02250135-154	1	FILTER,AIR 15" DIA.
2	02250145-632	1	VALVE,INLET 6" W/BYPASS
3	-	1	COMPRESSOR,UNIT TS20C
4	-	1	VALVE, SPIRAL
5	TNK,SEP	1	TANK,FLUID/AIR SEPARATOR (SEE TAB & NOTE #5)
6	250034-121	1	ELEMENT,PRIMARY
7	250034-133	1	ELEMENT,SECONDARY
8	VLV,RLF	1	VALVE,RELIEF (SEE TAB & NOTE #5)
9	02250097-611	1	PLUG,SIGHT GLASS 1-7/8" SAE
10	02250179-296	1	VALVE,BALL 1-1/16" SAE x 3/4" NPT
11	250033-821	1	VALVE,MIN. PRESSURE CHECK 3" NPT
12	02250173-053	1	COOLER,COMBO FLUID/AIR W/SAE FLUID PORTS
13	SEP,MOIST	1	SEPARATOR,MOISTURE (SEE TAB & NOTE #5)
14	02250127-119	1	HSG,THRMVLV 1-7/8" SAE 4 PORT
15	02250054-605	1	FILTER.FLUID 1-5/8" SAE STR THRD
16	02250113-668	1	VALVE,FLUID STOP 1-5/8" SAE PORTS
17	02250155-174	4	XDCR,PRESS 0-250# RATIOMETRIC
18	02250175-087	5	P,THERMISTER 3000 OHM NTC 12'L
19	02250177-841	1	SA,DISCH CHK VLV TS20C
20	02250125-774	1	ORIFICE .031" (.79mm)
21	02250125-775	1	ORIFICE, .062" (1.58mm)
22	02250132-934	2	ORIFICE,CAP 1/4" NPT .031" DIA. (.79mm)
23	234125-313	1	ORIFICE, 1/2M X 1/2F X .313
24	02250126-129	2	GLASS,SIGHT 1/4"
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

KEY NO.	PART NO.	QTY	DESCRIPTION
25	02250117-782	2	STRAINER,V-TYPE 1/4" 300PSI (2.1 BAR)
26	250017-280	2	VALVE, PRESSURE REGULATOR
27	02250100-042	1	VLV, 1/2 BLDWN 1.8:1 250 PSIG
28	02250125-657	2	VALVE,SOLENOID 1/4" NPT 3WNO 115VAC
29	408893	2	VALVE, SHUTTLE 1/4" (DBL CHK)
30	02250168-917	2	FLTR,SCF-20N 1/4" NPT
31	02250170-782	1	VLV,DR COMBO 115 VAC
32	02250078-249	1	SWITCH,VAC 22" W.C. N4 (555.8mm W.C.)
33	02250182-548	1	VLV,BALL/STNR COMBO-1/2"NPT
34	02250182-545	1	DRAIN,ELEC. CONDS. SCD-2400 115VAC
35	02250043-014	1	HTR,SUMP 1800W 120V PAD 29X19
36	02250087-631	1	HEATER,MOIST SEPARATOR 120VAC 70W
37	02250125-673	1	VALVE,SOLENOID 1/4" NPT 4-WAY EES
38	02250118-585	2	ORIFICE, .062" .25" FNPT x .25" MNPT
39	241906	2	CYLINDER,PNEU 7/8" DIA x 4" STROKE
40	02250051-913	1	VLV,RLF INTERSTAGE 65#
			<i>Continued on page 27</i>
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

02250177-307 R02

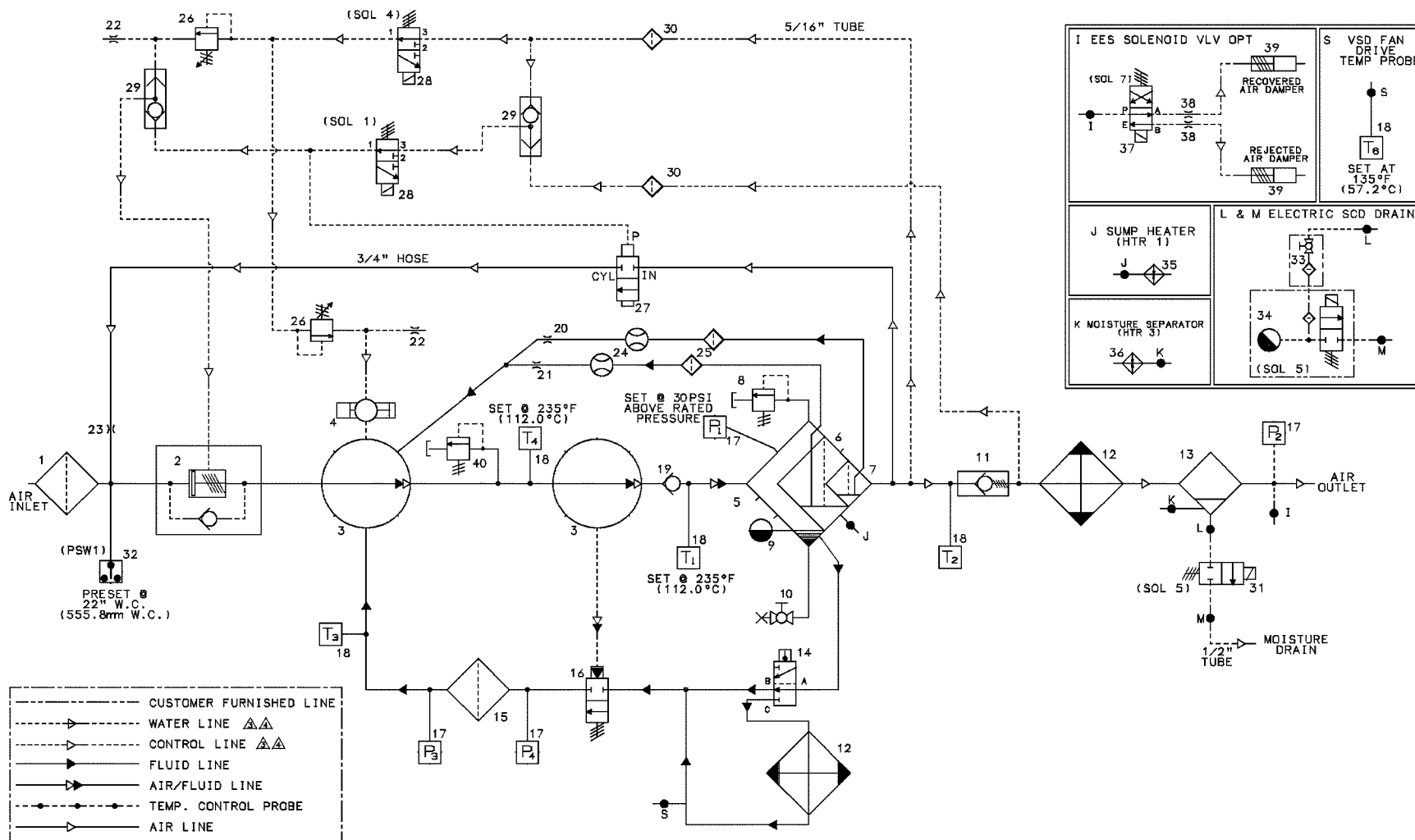


Figure 2-9: TS20C Piping and Instrumentation 100/150HP

NOTES:	
1.	PART NUMBERS ARE FOR REFERENCE ONLY. REFER TO BILL OF MATERIAL AND OR FACE OF ORDER FOR ACTUAL PARTS.
2.	SECTION BETWEEN LETTERED POINTS ARE TO BE REPLACED WITH CORRESPONDING OPTION PICTURED BELOW, AS REQUIRED BY FACE OF ORDER.
3.	CONTROL/MOISTURE DRAIN LINES ARE 1/4" TUBING EXCEPT AS NOTED.
4.	OPTIONAL HEAT TRACE IS APPLIED ONLY TO CONTROL AND MOISTURE DRAIN LINES AND USED ONLY WITH STAINLESS STEEL TUBING. REFER TO FACE OF ORDER FOR HEAT TRACE REQUIREMENTS.
5.	PART VARIES BY MODEL.
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR	

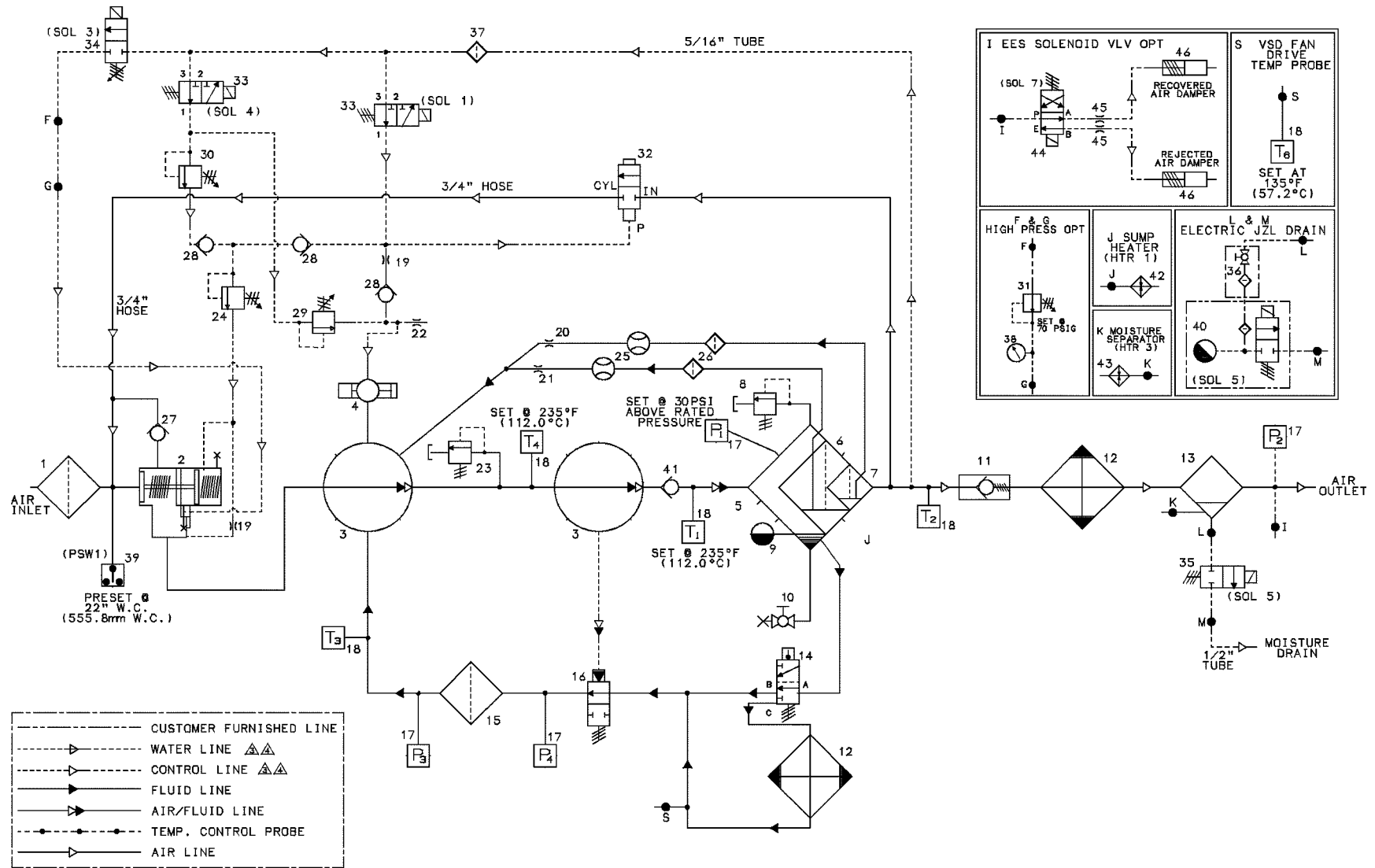
MOISTURE SEPARATORS		
PACKAGE HP	PART #	DESCRIPTION
100/125	02250166-742	SEP,WTR SCWS-740N 2" L/AD
150	02250166-743	SEP,WTR SCWS-1700N 2-1/2" L/AD

RELIEF VALVES	
PART #	DESCRIPTION
410103	VALVE,RELIEF 1-1/4" NPT 175#
02250049-001	VALVE,RELIEF 1" NPT 210#

FLUID/AIR SEPARATOR TANKS	
PART #	DESCRIPTION
02250174-146	TNK,FLUID/AIR 20" DIA. SAE PORTS 175# ASME
02250174-147	TNK,FLUID/AIR 20" DIA. SAE PORTS 210# ASME

COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
P3	INJECTION FLUID PRESSURE
P4	HIGH PRESSURE SIDE OF FILTER
PSW1	INLET FILTER VACUUM SWITCH
T1	WET DISCHARGE TEMPERATURE
T2	DRY DISCHARGE TEMPERATURE
T3	INJECTION FLUID TEMPERATURE
T4	INTERSTAGE AIR/FLUID TEMPERATURE
T6	FLUID COOLER OUT TEMPERATURE (VSD FAN)
SOL 1	LOAD/UNLOAD SOLENOID VALVE
SOL 4	SEQ/SPIRAL CONTROL SOLENOID VALVE
SOL 5	ELECTRIC DRAIN/SCD DRAIN SOLENOID VALVE
SOL 7	EES SOLENOID VALVE

Figure 2-10: TS20C Piping and Instrumentation 200-250HP



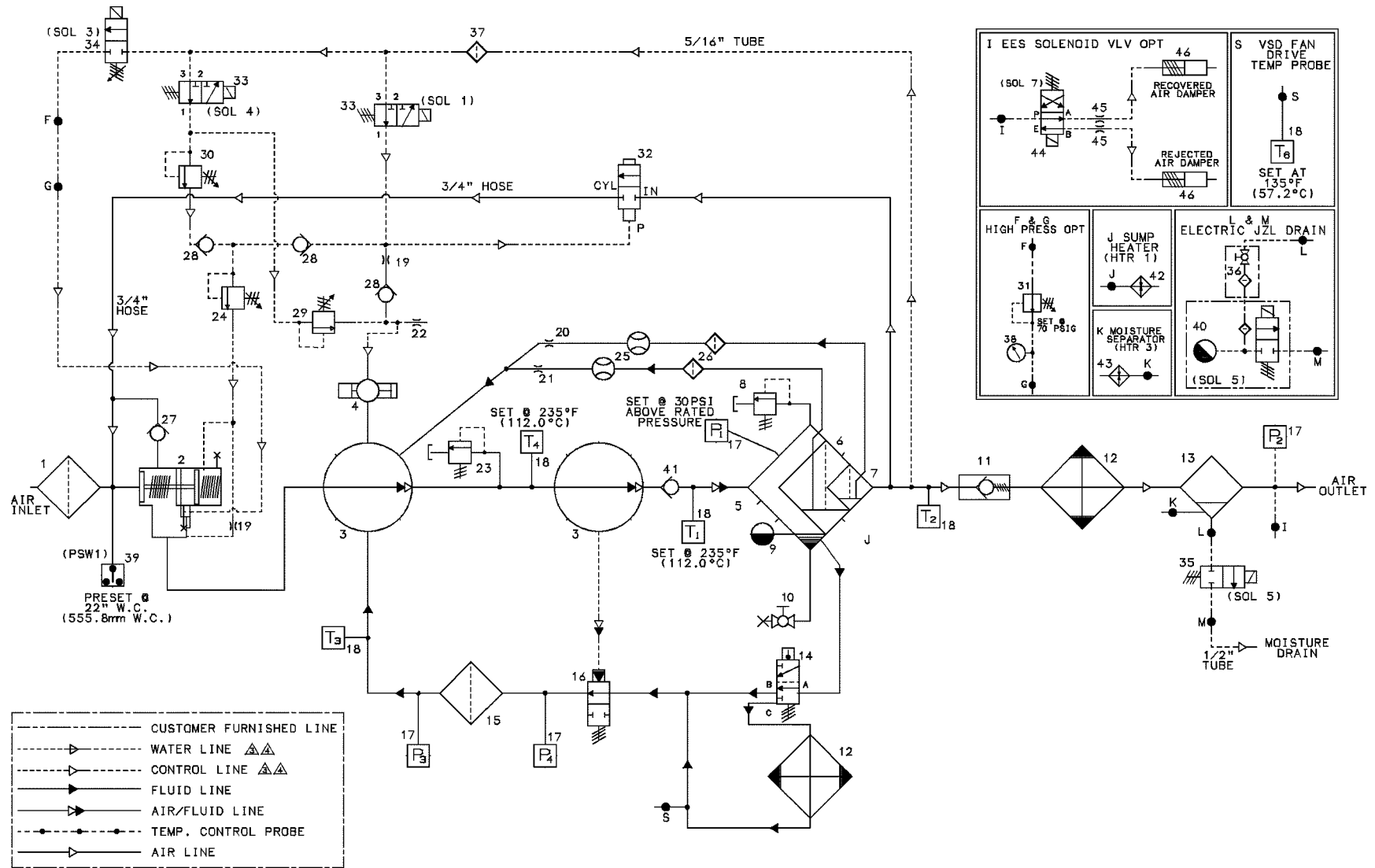
02250177-308 R02

Figure 2-10: TS20C Piping and Instrumentation 200-250HP

KEY NO.	PART NO.	QTY	DESCRIPTION
1	02250140-798	1	FILTER,INL OPTIMALAIR 16" DIA.
2	02250161-157	1	VALVE,INLET 8" W/ALUM SLV
3	-	1	COMPRESSOR,UNIT TS20C
4	-	1	VALVE, SPIRAL
5	TNK,SEP	1	TANK,FLUID/AIR SEPARATOR (SEE TAB)
6	250034-121	1	ELEMENT,PRIMARY
7	250034-133	1	ELEMENT,SECONDARY
8	VLV,RLF	1	VALVE,RELIEF (SEE TAB)
9	02250097-611	1	PLUG,SIGHT GLASS 1-7/8" SAE
10	02250179-296	1	VALVE,BALL 1-1/16" SAE x 3/4" NPT
11	250033-821	1	VALVE,MIN. PRESSURE CHECK 3" NPT
12	02250173-053	1	COOLER,COMBO FLUID/AIR W/SAE FLUID PORTS
13	02250166-743	1	SEP,WTR SCWS-1700N 2-1/2" L/AD
14	02250127-119	1	HSG,THRMVLV 1-7/8" SAE 4 PORT
15	02250121-656	1	FILTER.FLUID SAE 2" FLG CORELESS
16	02250113-668	1	VALVE,FLUID STOP 1-5/8" SAE PORTS
17	02250155-174	4	XDCR,PRESS 0-250# RATIOMETRIC
18	02250175-087	5	P,THERMISTER 3000 OHM NTC 12'L
19	02250101-191	2	ORIFICE, .03" (.76mm)
20	02250125-774	1	ORIFICE .031" (.79mm)
21	02250125-775	1	ORIFICE, .062" (1.58mm)
22	02250132-934	1	ORIFICE,CAP 1/4" NPT .031" DIA. (.79mm)
23	02250051-913	1	VLV,RLF INTERSTAGE 65#
24	02250186-328	1	VLV,PRESSURE REG 65PSI
25	02250126-129	2	GLASS,SIGHT 1/4"
26	02250117-782	2	STRAINER,V-TYPE 1/4" 300PSI (2.1 BAR)
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

KEY NO.	PART NO.	QTY	DESCRIPTION
27	42694	1	VALVE,CHECK 1/2"
28	02250110-557	3	VALVE,CHECK 1/4"
29	02250148-608	1	VALVE,PRESSURE REG. 1/4" NPT 70-25-#
30	02250052-358	1	VALVE,REGULATOR BACKPRESSURE CTL 1/4"
31	02250046-568	1	VALVE,REGULATOR REDUCING 1/4" NPT
32	02250100-042	1	VLV, 1/2 BLDWN 1.8:1 250 PSIG
33	02250125-657	2	VALVE,SOLENOID 1/4" NPT 3WNO 115VAC
34	02250125-665	1	VLV,SOL 3WNC 1/4 210# N4
35	02250170-782	1	VLV,DR COMBO 115 VAC
36	02250182-548	1	VLV,BALL/STNR COMBO-1/2"NPT
37	02250153-023	1	FLTR,SCF-20N 1/4" NPT
38	02250117-009	1	GAGE,PRESSURE 1/4" NPT 0-200PSI
39	02250078-249	1	SWITCH,VAC 22" W.C. N4 (555.8mm W.C.)
40	02250182-545	1	DRN,ZERO LOSS 110V 1/2"NPT
41	02250177-841	1	SA,DISCH CHK VLV TS20C
42	02250043-014	1	HTR,SUMP 1800W 120V PAD 29X19
43	02250087-631	1	HEATER,MOIST SEPARATOR 120VAC 70W
44	02250125-673	1	VALVE,SOLENOID 1/4" NPT 4-WAY EES
45	02250118-585	2	ORIFICE, .062" .25" FNPT x .25" MNPT
46	241906	2	CYLINDER,PNEU 7/8" DIA x 4" STROKE
			Continued on page 31
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

Figure 2-10: TS20C Piping and Instrumentation 200-250HP (continued)



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Figure 2-10: TS20C Piping and Instrumentation 200-250HP

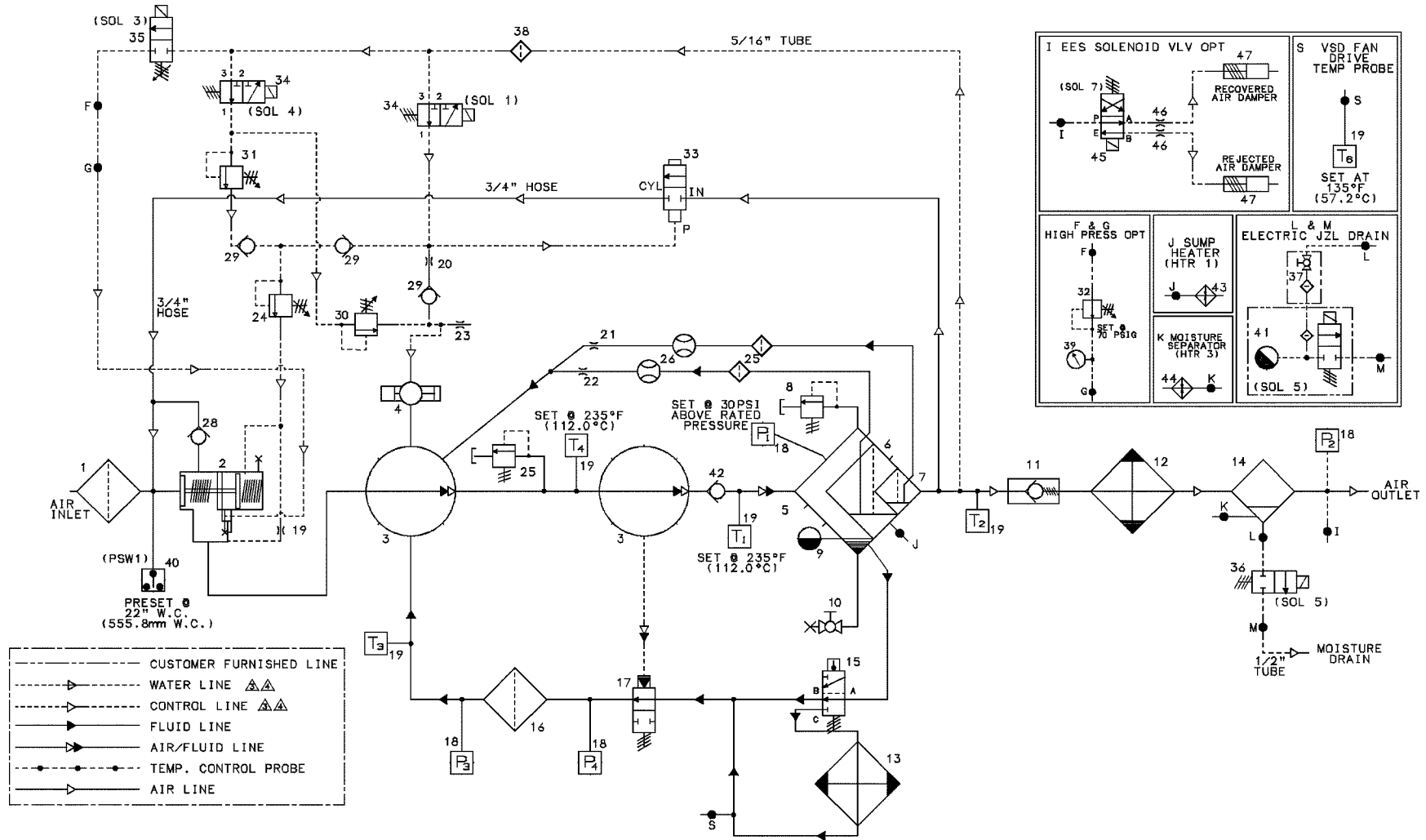
NOTES:	
1.	PART NUMBERS ARE FOR REFERENCE ONLY. REFER TO BILL OF MATERIAL AND OR FACE OF ORDER FOR ACTUAL PARTS.
2.	SECTION BETWEEN LETTERED POINTS ARE TO BE REPLACED WITH CORRESPONDING OPTION PICTURED BELOW, AS REQUIRED BY FACE OF ORDER.
3.	CONTROL/MOISTURE DRAIN LINES ARE 1/4" TUBING EXCEPT AS NOTED.
4.	OPTIONAL HEAT TRACE IS APPLIED ONLY TO CONTROL AND MOISTURE DRAIN LINES AND USED ONLY WITH STAINLESS STEEL TUBING. REFER TO FACE OF ORDER FOR HEAT TRACE REQUIREMENTS.
5.	PART VARIES BY MODEL.
6.	REQUIRED FOR 150# & 175# APPLICATIONS ONLY.
7.	TO BE DISCONNECTED FOR DRY PRESSURE TESTING.
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR	

RELIEF VALVES	
PART #	DESCRIPTION
410103	VALVE,RELIEF 1-1/4" NPT 175#
02250049-001	VALVE,RELIEF 1" NPT 210#

FLUID/AIR SEPARATOR TANKS	
PART #	DESCRIPTION
02250174-146	TNK,FLUID/AIR 20" DIA. SAE PORTS 175# ASME
02250174-147	TNK,FLUID/AIR 20" DIA. SAE PORTS 210# ASME

COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
P3	INJECTION FLUID PRESSURE
P4	HIGH PRESSURE SIDE OF FILTER
PSW1	INLET FILTER VACUUM SWITCH
T1	WET DISCHARGE TEMPERATURE
T2	DRY DISCHARGE TEMPERATURE
T3	INJECTION FLUID TEMPERATURE
T4	INTERSTAGE AIR/FLUID TEMPERATURE
T6	FLUID COOLER OUT TEMPERATURE (VSD FAN)
SOL 1	LOAD/UNLOAD SOLENOID VALVE
SOL 3	START CONTROL SOLENOID VALVE
SOL 4	SEQ/SPIRAL CONTROL SOLENOID VALVE
SOL 5	ELECTRIC DRAIN/JZL DRAIN SOLENOID VALVE
SOL 7	EES SOLENOID VALVE

Figure 2-11: TS20C Piping & Instrumentation 250HP INTAC



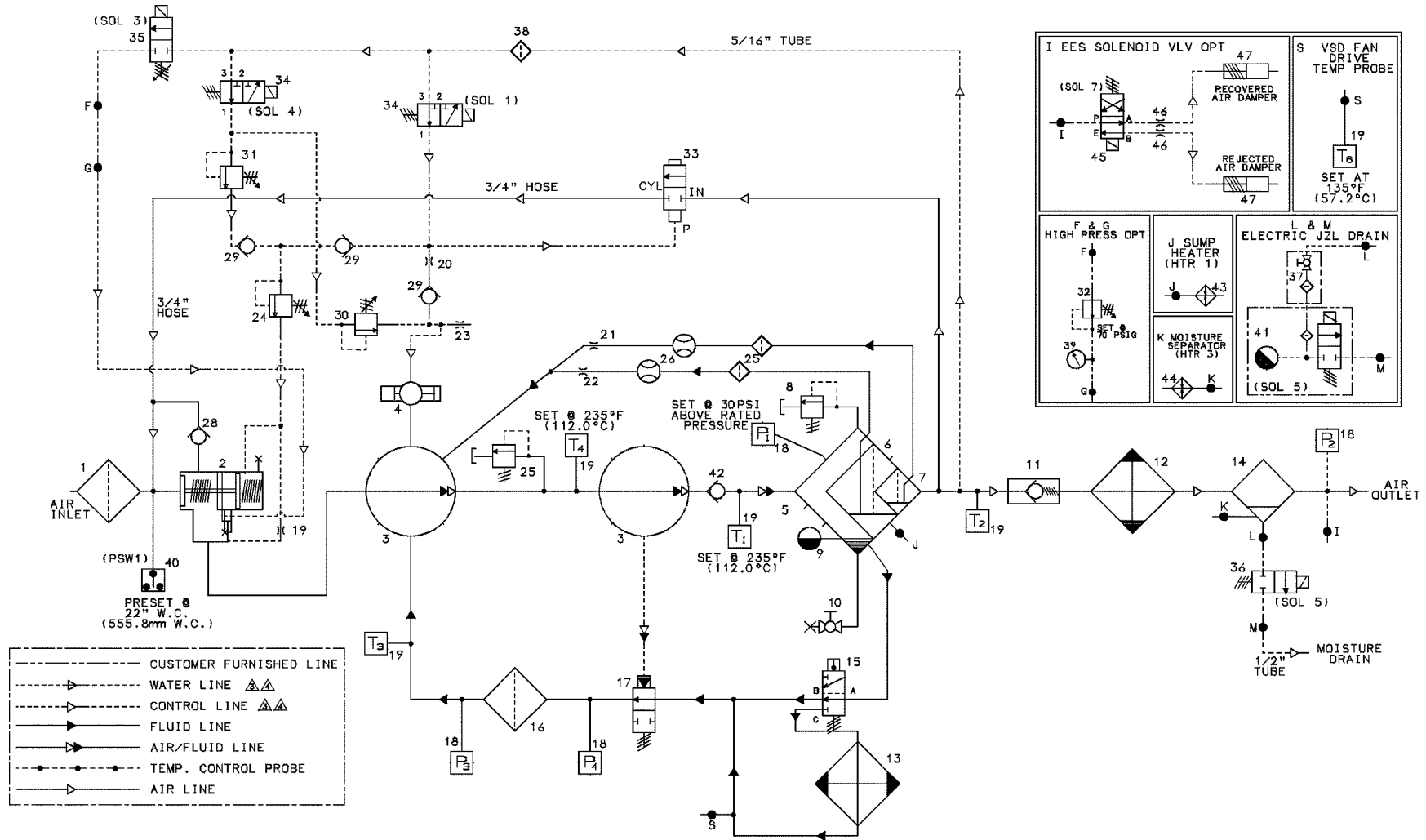
02250177-313- R03

Figure 2-11: TS20C Piping & Instrumentation 250HP INTAC

KEY NO.	PART NO.	QTY	DESCRIPTION
1	02250140-798	1	FILTER,INL OPTIMALAIR 16" DIA.
2	02250161-157	1	VALVE,INLET 8" W/ALUM SLV
3	-	1	COMPRESSOR,UNIT TS20C
4	-	1	VALVE, SPIRAL
5	TNK,SEP	1	TANK,FLUID/AIR SEPARATOR (SEE TAB)
6	250034-121	1	ELEMENT,PRIMARY
7	250034-133	1	ELEMENT,SECONDARY
8	VLV,RLF	1	VALVE,RELIEF (SEE TAB)
9	02250097-611	1	PLUG,SIGHT GLASS 1-7/8" SAE
10	02250179-296	1	VALVE,BALL 1-1/16" SAE x 3/4" NPT
11	250033-821	1	VALVE,MIN. PRESSURE CHECK 3" NPT
12	02250086-247	1	CLR,AFTCLR 1100 CFM AC
13	02250086-248	1	CLR,OIL 250HP AC
14	02250166-743	1	SEP,WTR SCWS-1700N 2-1/2" L/AD
15	02250127-119	1	HSG,THRMVLV 1-7/8" SAE 4 PORT
16	02250121-656	1	FILTER.FLUID SAE 2" FLG CORELESS
17	02250113-668	1	VALVE,FLUID STOP 1-5/8" SAE PORTS
18	02250155-174	4	XDCR,PRESS 0-250# RATIOMETRIC
19	02250175-087	5	P,THERMISTER 3000 OHM NTC 12'L
20	02250101-191	2	ORIFICE, .03" (.76mm)
21	02250125-774	1	ORIFICE .031" (.79mm)
22	02250125-775	1	ORIFICE, .062" (1.58mm)
23	02250132-934	1	ORIFICE,CAP 1/4" NPT .031" DIA. (.79mm)
24	02250186-328	1	VLV,PRESSURE REG 65PSI
25	02250051-913	1	VLV,RLF INTERSTAGE 65#
26	02250126-129	2	GLASS,SIGHT 1/4"
27	02250117-782	2	STRAINER,V-TYPE 1/4" 300PSI (2.1 BAR)
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

KEY NO.	PART NO.	QTY	DESCRIPTION
28	42694	1	VALVE,CHECK 1/2"
29	02250110-557	3	VALVE,CHECK 1/4"
30	02250148-608	1	VALVE,PRESSURE REG. 1/4" NPT 70-25-#
31	02250052-358	1	VALVE,REGULATOR BACKPRESSURE CTL 1/4"
32	02250046-568	1	VALVE,REGULATOR REDUCING 1/4" NPT
33	02250100-042	1	VLV, 1/2 BLDWN 1.8:1 250 PSIG
34	02250125-657	2	VALVE,SOLENOID 1/4" NPT 3WNO 115VAC
35	02250125-665	1	VLV,SOL 3WNC 1/4 210# N4
36	02250170-782	1	VLV,DR COMBO 115 VAC
37	02250182-548	1	VLV,BALL/STNR COMBO-1/2"NPT
38	02250168-917	1	FLTR,SCF-20N 1/4" NPT
39	02250117-009	1	GAGE,PRESSURE 1/4" NPT 0-200PSI
40	02250078-249	1	SWITCH,VAC 22" W.C. N4 (555.8mm W.C.)
41	02250182-545	1	DRN,ZERO LOSS 110V 1/2"NPT
42	02250177-841	1	SA,DISCH CHK VLV TS20C
43	02250043-014	1	HTR,SUMP 1800W 120V PAD 29X19
44	02250087-631	1	HEATER,MOIST SEPARATOR 120VAC 70W
45	02250125-673	1	VALVE,SOLENOID 1/4" NPT 4-WAY EES
46	02250118-585	2	ORIFICE, .062" .25" FNPT x .25" MNPT
47	241906	2	CYLINDER,PNEU 7/8" DIA x 4" STROKE
			Continued on page 35
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

Figure 2-11: TS20C Piping & Instrumentation 250HP INTAC (continued)



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Figure 2-11: TS20C Piping & Instrumentation 250HP INTAC

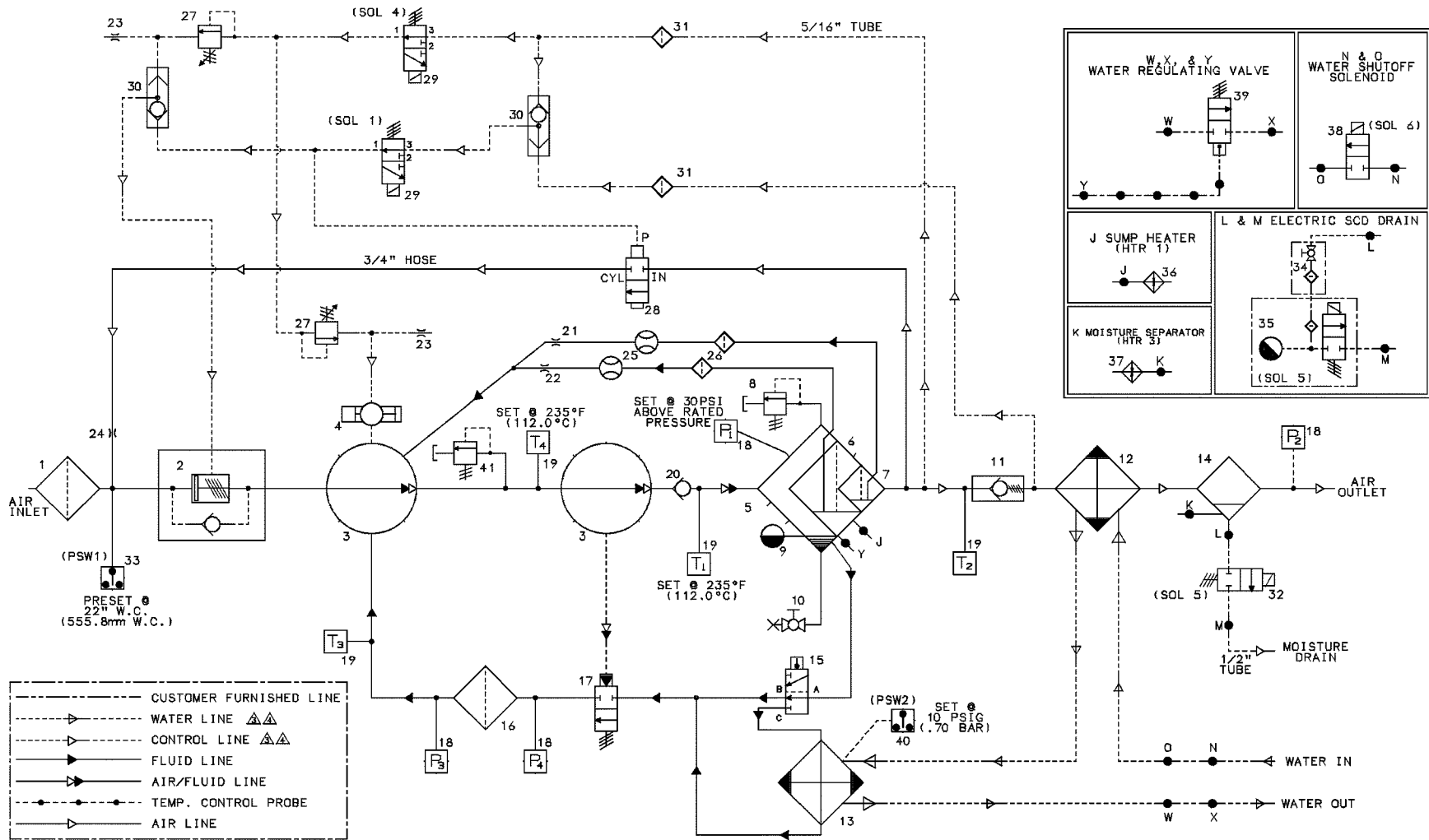
NOTES:	
1.	PART NUMBERS ARE FOR REFERENCE ONLY. REFER TO BILL OF MATERIAL AND OR FACE OF ORDER FOR ACTUAL PARTS.
2.	SECTION BETWEEN LETTERED POINTS ARE TO BE REPLACED WITH CORRESPONDING OPTION PICTURED BELOW, AS REQUIRED BY FACE OF ORDER.
3.	CONTROL/MOISTURE DRAIN LINES ARE 1/4" TUBING EXCEPT AS NOTED.
4.	OPTIONAL HEAT TRACE IS APPLIED ONLY TO CONTROL AND MOISTURE DRAIN LINES AND USED ONLY WITH STAINLESS STEEL TUBING. REFER TO FACE OF ORDER FOR HEAT TRACE REQUIREMENTS.
5.	PART VARIES BY MODEL.
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR	

RELIEF VALVES	
PART #	DESCRIPTION
410103	VALVE,RELIEF 1-1/4" NPT 175#
02250049-001	VALVE,RELIEF 1" NPT 210#

FLUID/AIR SEPARATOR TANKS	
PART #	DESCRIPTION
02250174-146	TNK,FLUID/AIR 20" DIA. SAE PORTS 175# ASME
02250174-147	TNK,FLUID/AIR 20" DIA. SAE PORTS 210# ASME

COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
P3	INJECTION FLUID PRESSURE
P4	HIGH PRESSURE SIDE OF FILTER
PSW1	INLET FILTER VACUUM SWITCH
T1	WET DISCHARGE TEMPERATURE
T2	DRY DISCHARGE TEMPERATURE
T3	INJECTION FLUID TEMPERATURE
T4	INTERSTAGE AIR/FLUID TEMPERATURE
T6	FLUID COOLER OUT TEMPERATURE (VSD FAN)
SOL 1	LOAD/UNLOAD SOLENOID VALVE
SOL 3	START CONTROL SOLENOID VALVE
SOL 4	SEQ/SPIRAL CONTROL SOLENOID VALVE
SOL 5	ELECTRIC DRAIN/JZL DRAIN SOLENOID VALVE
SOL 7	EES SOLENOID VALVE

Figure 2-12: TS20C Piping and Instrumentation 100/150HP WCAC



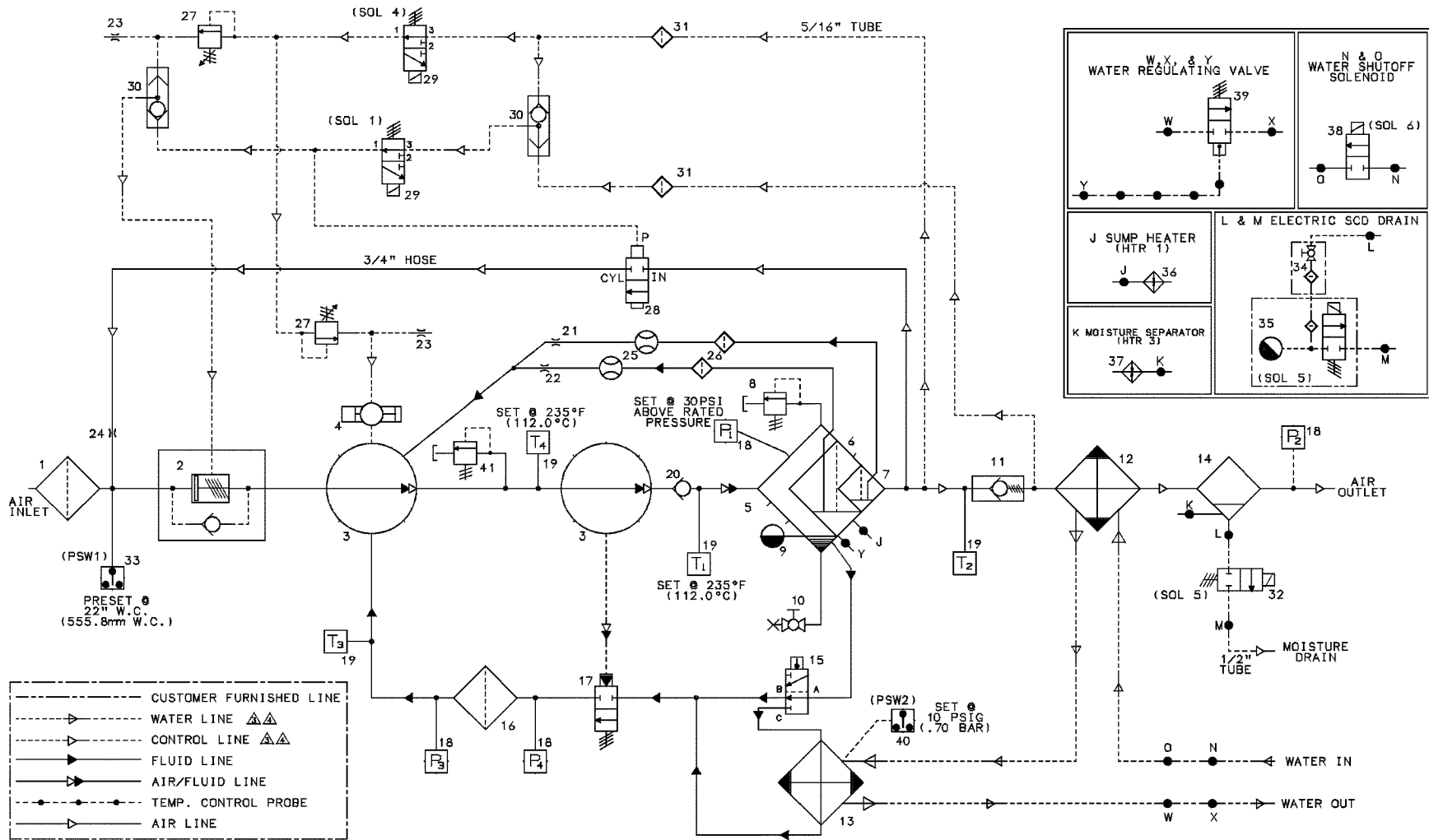
02250177-309 R02

Figure 2-12: TS20C Piping and Instrumentation 100/150HP WCAC

KEY NO.	PART NO.	QTY	DESCRIPTION
1	02250135-154	1	FILTER,AIR 15" DIA.
2	02250145-632	1	VALVE,INLET 6" W/BYPASS
3	-	1	COMPRESSOR,UNIT TS20C
4	-	1	VALVE, SPIRAL
5	TNK,SEP	1	TANK,FLUID/AIR SEPARATOR (SEE TAB & NOTE #5)
6	250034-121	1	ELEMENT,PRIMARY
7	250034-133	1	ELEMENT,SECONDARY
8	VLV,RLF	1	VALVE,RELIEF (SEE TAB & NOTE #5)
9	02250097-611	1	PLUG,SIGHT GLASS 1-7/8" SAE
10	02250179-296	1	VALVE,BALL 1-1/16" SAE x 3/4" NPT
11	250033-821	1	VALVE,MIN. PRESSURE CHECK 3" NPT
12	043009	1	AFTERCOOLER, 6" x 48"
13	02250113-281	1	CLR,OIL 8 X 48 W/SAE PORTS
14	SEP,MOIST	1	SEPARATOR,MOISTURE (SEE TAB & NOTE #5)
15	02250127-119	1	HSG,THRMVLV 1-7/8" SAE 4 PORT
16	02250054-605	1	FILTER.FLUID 1-5/8" SAE STR THRD
17	02250113-668	1	VALVE,FLUID STOP 1-5/8" SAE PORTS
18	02250155-174	4	XDCR,PRESS 0-250# RATIOMETRIC
19	02250175-087	4	P,THERMISTER 3000 OHM NTC 12'L
20	02250177-841	1	SA,DISCH CHK VLV TS20C
21	02250125-774	1	ORIFICE .031" (.79mm)
22	02250125-775	1	ORIFICE, .062" (1.58mm)
23	02250132-934	2	ORIFICE,CAP 1/4" NPT .031" DIA. (.79mm)
24	234125-313	1	ORIFICE, 1/2M X 1/2F X .313
25	02250126-129	2	GLASS,SIGHT 1/4"
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

KEY NO.	PART NO.	QTY	DESCRIPTION
26	02250117-782	2	STRAINER,V-TYPE 1/4" 300PSI (2.1 BAR)
27	250017-280	2	VALVE, PRESSURE REGULATOR
28	02250100-042	1	VLV, 1/2 BLDWN 1.8:1 250 PSIG
29	02250125-657	2	VALVE,SOLENOID 1/4" NPT 3WNO 115VAC
30	408893	2	VALVE, SHUTTLE 1/4" (DBL CHK)
31	02250168-917	2	FLTR,SCF-20N 1/4" NPT
32	02250170-782	1	VLV,DR COMBO 115 VAC
33	02250078-249	1	SWITCH,VAC 22" W.C. N4 (555.8mm W.C.)
34	02250182-548	1	VLV,BALL/STNR COMBO-1/2"NPT
35	02250182-545	1	DRAIN,ELEC. CONDS. SCD-2400 115VAC
36	02250043-014	1	HTR,SUMP 1800W 120V PAD 29X19
37	02250087-631	1	HEATER,MOIST SEPARATOR 120VAC 70W
38	250035-291	1	VALVE,SOLENOID WATER SHUT OFF
39	049474	2	VALVE,WATER REGULATING 1-1/4" NPT
40	250017-992	2	SWITCH,LOW WATER PRESSURE
41	02250051-913	1	VLV,RLF INTERSTAGE 65#
			Continued on page 39
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

Figure 2-12: TS20C Piping and Instrumentation 100/150HP WCAC (continued)



02250177-309 R02

Figure 2-12: TS20C Piping and Instrumentation 100/150HP WCAC

NOTES:	
1.	PART NUMBERS ARE FOR REFERENCE ONLY. REFER TO BILL OF MATERIAL AND OR FACE OF ORDER FOR ACTUAL PARTS.
2.	SECTION BETWEEN LETTERED POINTS ARE TO BE REPLACED WITH CORRESPONDING OPTION PICTURED BELOW, AS REQUIRED BY FACE OF ORDER.
3.	CONTROL/MOISTURE DRAIN LINES ARE 1/4" TUBING EXCEPT AS NOTED.
4.	OPTIONAL HEAT TRACE IS APPLIED ONLY TO CONTROL AND MOISTURE DRAIN LINES AND USED ONLY WITH STAINLESS STEEL TUBING. REFER TO FACE OF ORDER FOR HEAT TRACE REQUIREMENTS.
5.	PART VARIES BY MODEL.
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR	

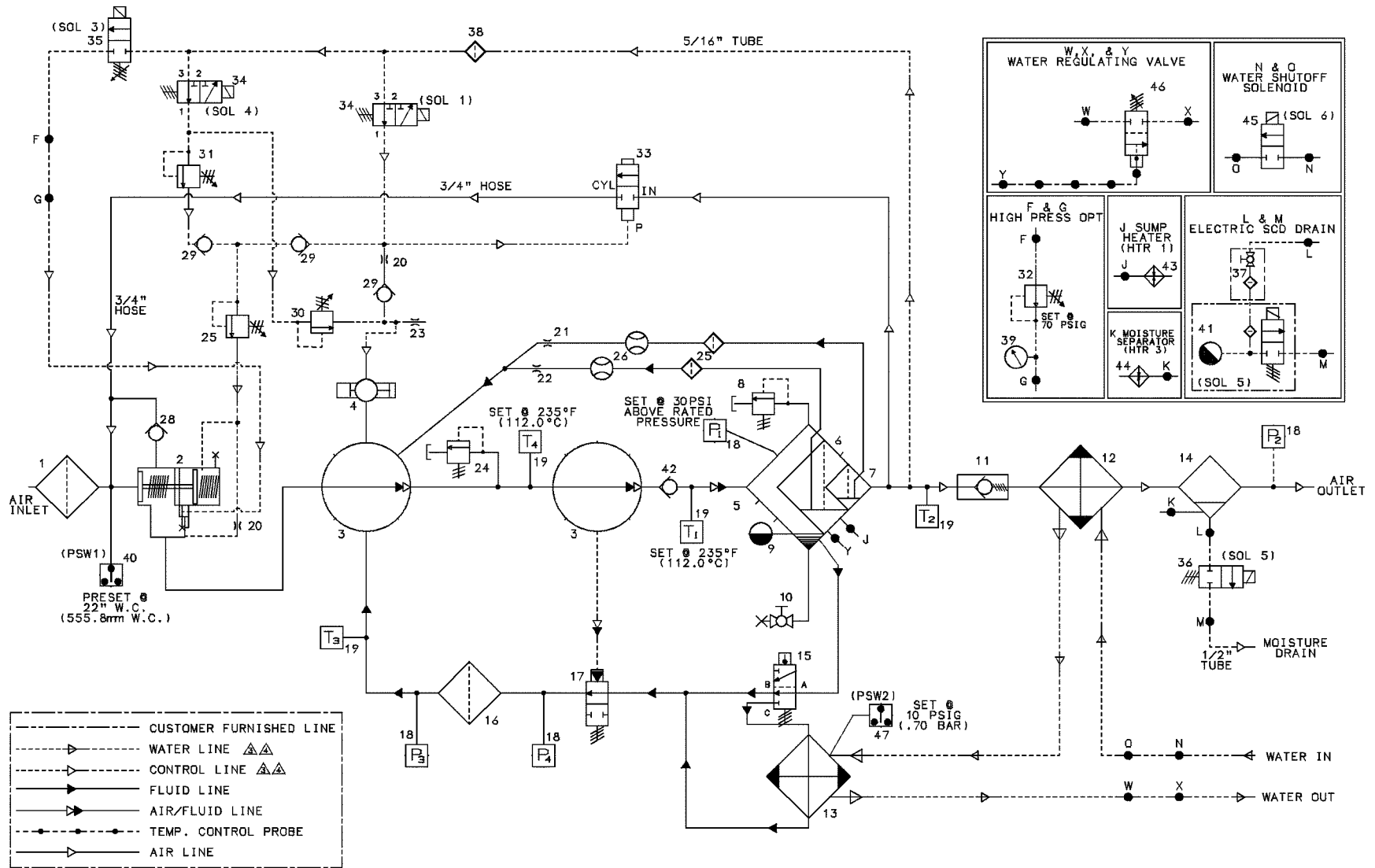
FLUID/AIR SEPARATOR TANKS	
PART #	DESCRIPTION
02250174-146	TNK,FLUID/AIR 20" DIA. SAE PORTS 175# ASME
02250174-147	TNK,FLUID/AIR 20" DIA. SAE PORTS 210# ASME

RELIEF VALVES	
PART #	DESCRIPTION
410103	VALVE,RELIEF 1-1/4" NPT 175#
02250049-001	VALVE,RELIEF 1" NPT 210#

MOISTURE SEPARATORS		
PACKAGE	PART #	DESCRIPTION
H.P.		
100/125	02250166-742	SEP,WTR SCWS-740N 2" L/AD
150	02250166-743	SEP,WTR SCWS-1700N 2-1/2" L/AD

COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
P3	INJECTION FLUID PRESSURE
P4	HIGH PRESSURE SIDE OF FILTER
PSW1	INLET FILTER VACUUM SWITCH
PSW2	LOW WATER PRESSURE SWITCH
T1	WET DISCHARGE TEMPERATURE
T2	DRY DISCHARGE TEMPERATURE
T3	INJECTION FLUID TEMPERATURE
T4	INTERSTAGE AIR/FLUID TEMPERATURE
SOL 1	LOAD/UNLOAD SOLENOID VALVE
SOL 4	SEQ/SPIRAL CONTROL SOLENOID VALVE
SOL 5	ELECTRIC DRAIN/SCD DRAIN SOLENOID VALVE
SOL 6	WATER SHUTOFF VALVE

Figure 2-13: TS20C Piping and Instrumentation 200-250HP WCAC



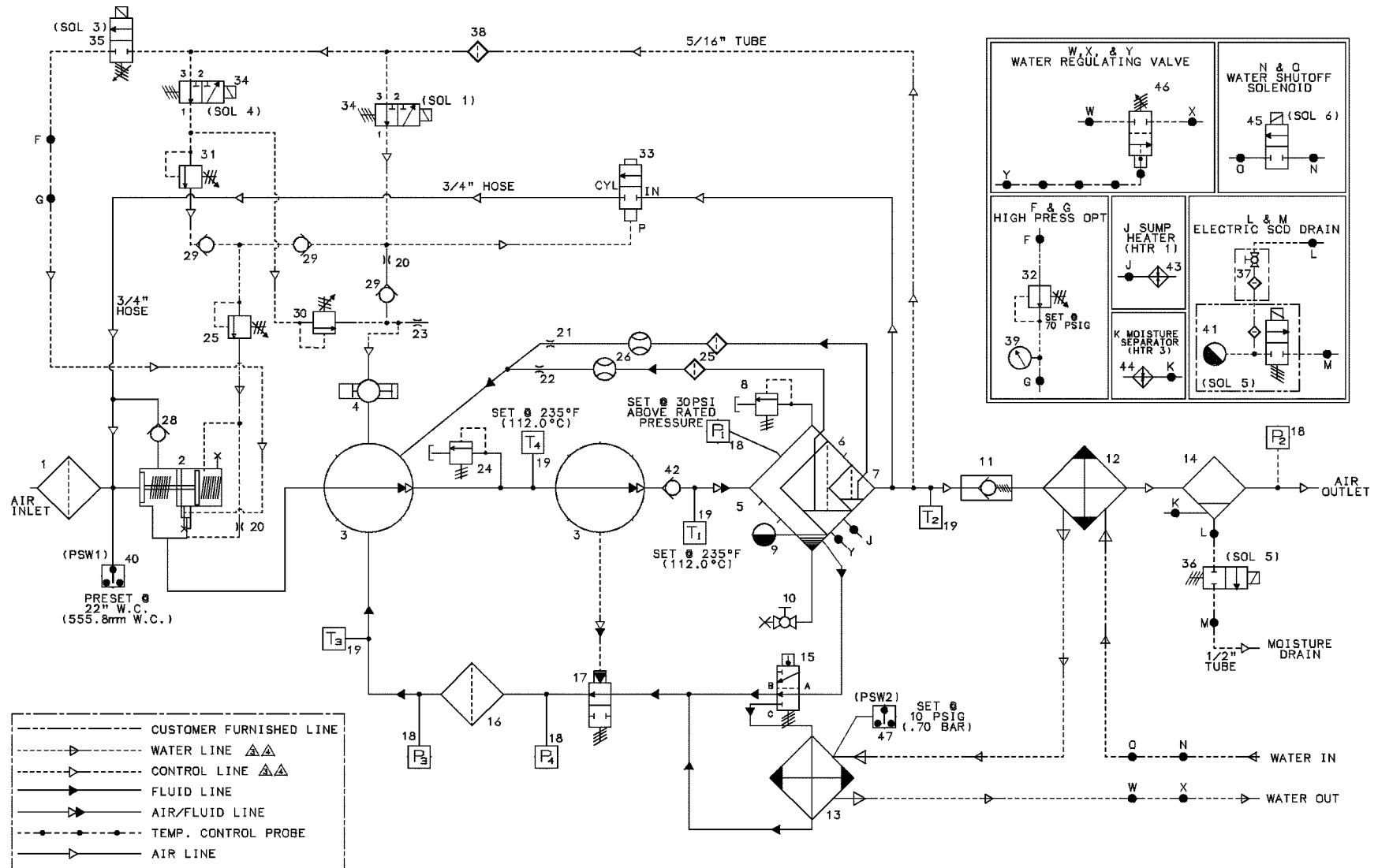
02250177-310 R03

Figure 2-13: TS20C Piping and Instrumentation 200-250HP WCAC

KEY NO.	PART NO.	QTY	DESCRIPTION
1	02250140-798	1	FILTER,INL OPTIMALAIR 16" DIA.
2	02250161-157	1	VALVE,INLET 8" W/ALUM SLV
3	-	1	COMPRESSOR,UNIT TS20C
4	-	1	VALVE, SPIRAL
5	TNK,SEP	1	TANK,FLUID/AIR SEPARATOR (SEE TAB)
6	250034-121	1	ELEMENT,PRIMARY
7	250034-133	1	ELEMENT,SECONDARY
8	VLV,RLF	1	VALVE,RELIEF (SEE TAB)
9	02250097-611	1	PLUG,SIGHT GLASS 1-7/8" SAE
10	02250179-296	1	VALVE,BALL 1-1/16" SAE x 3/4" NPT
11	250033-821	1	VALVE,MIN. PRESSURE CHECK 3" NPT
12	42541	1	AFTERCOOLER, 8" x 36"
13	02250126-003	1	CLR,OIL 8 X 60 W/SAE PORTS
14	02250166-743	1	SEP,WTR SCWS-1700N 2-1/2" L/AD
15	02250127-119	1	HSG,THRMVLV 1-7/8" SAE 4 PORT
16	02250121-656	1	FILTER.FLUID SAE 2" FLG CORELESS
17	02250113-668	1	VALVE,FLUID STOP 1-5/8" SAE PORTS
18	02250155-174	4	XDCR,PRESS 0-250# RATIOMETRIC
19	02250175-087	4	P,THERMISTER 3000 OHM NTC 12'L
20	02250101-191	2	ORIFICE, .03" (.76mm)
21	02250125-774	1	ORIFICE .031" (.79mm)
22	02250125-775	1	ORIFICE, .062" (1.58mm)
23	02250132-934	1	ORIFICE,CAP 1/4" NPT .031" DIA. (.79mm)
24	02250051-913	1	VLV,RLF INTERSTAGE 65#
25	02250186-328	1	VLV,PRESSURE REG 65#
26	02250126-129	2	GLASS,SIGHT 1/4"
27	02250117-782	2	STRAINER,V-TYPE 1/4" 300PSI (2.1 BAR)
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

KEY NO.	PART NO.	QTY	DESCRIPTION
28	42694	1	VALVE,CHECK 1/2"
29	02250110-557	3	VALVE,CHECK 1/4"
30	02250148-608	1	VALVE,PRESSURE REG. 1/4" NPT 70-25-#
31	02250052-358	1	VALVE,REGULATOR BACKPRESSURE CTL 1/4"
32	02250046-568	1	VALVE,REGULATOR REDUCING 1/4" NPT
33	02250100-042	1	VLV, 1/2 BLDWN 1.8:1 250 PSIG
34	02250125-657	2	VALVE,SOLENOID 1/4" NPT 3WNO 115VAC
35	02250125-665	1	VALVE,SOLENOID N.C. 1/4" NPT
36	02250170-782	1	VLV,DR COMBO 115 VAC
37	02250182-548	1	VLV,BALL/STNR COMBO-1/2"NPT
38	02250168-917	1	FLTR,SCF-20N 1/4" NPT
39	02250117-009	1	GAGE,PRESSURE 1/4" NPT 0-200PSI
40	02250078-249	1	SWITCH,VAC 22" W.C. N4 (555.8mm W.C.)
41	02250182-545	1	DRN,ZERO LOSS 110V 1/2"NPT
42	02250177-841	1	SA,DISCH CHK VLV TS20C
43	02250043-014	1	HTR,SUMP 1800W 120V PAD 29X19
44	02250087-631	1	HEATER,MOIST SEPARATOR 120VAC 70W
45	250035-291	1	VALVE,SOLENOID WATER SHUTOFF
46	49474	1	VALVE,WATER REGULATING 1-1/4" NPT
47	250017-992	1	SWITCH,LOW WATER PRESSURE
Continued on page 43			
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

Figure 2-13: TS20C Piping and Instrumentation 200-250HP WCAC (continued)



02250177-310 R03

Figure 2-13: TS20C Piping and Instrumentation 200-250HP WCAC

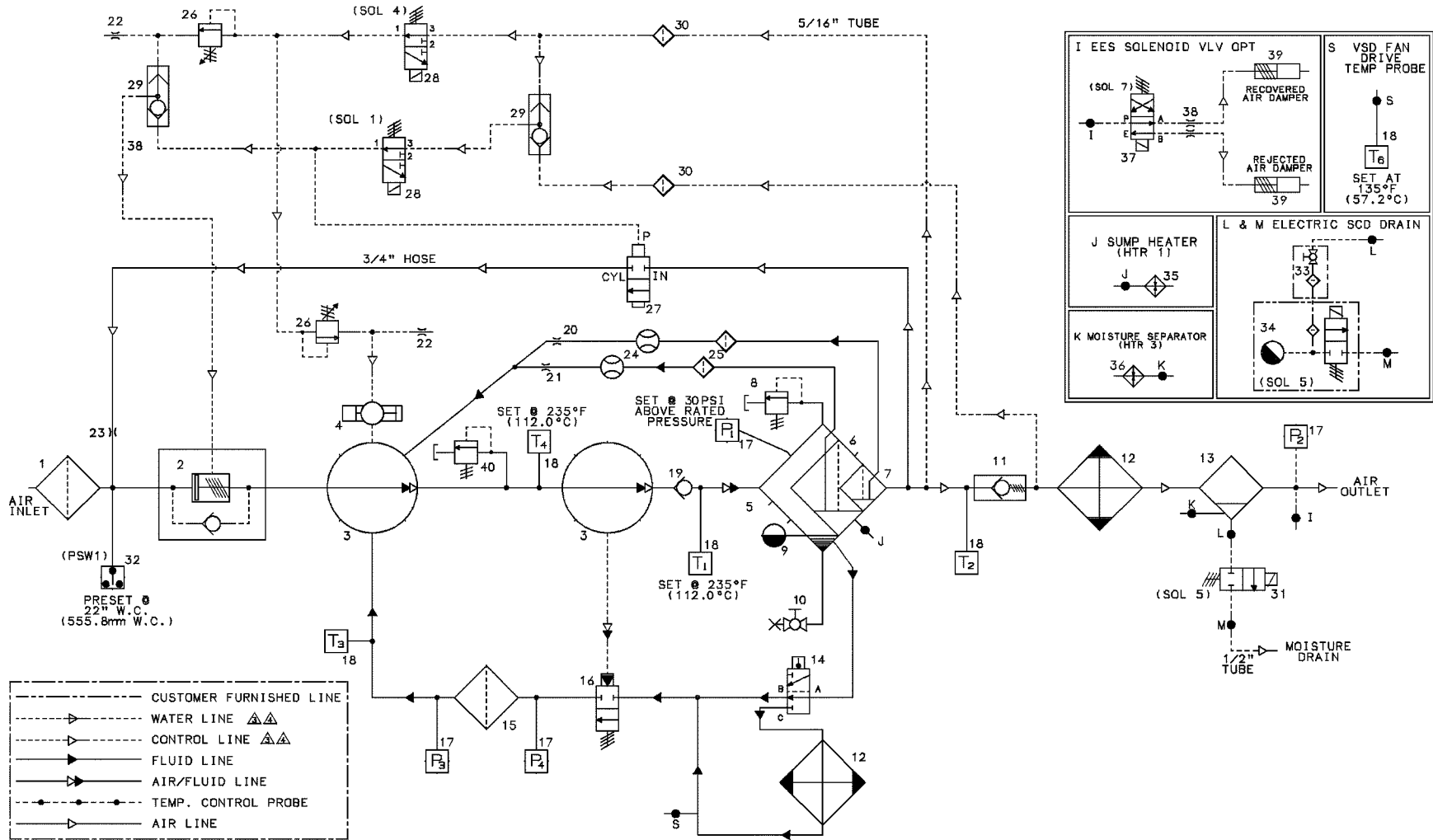
NOTES:	
1.	PART NUMBERS ARE FOR REFERENCE ONLY. REFER TO BILL OF MATERIAL AND OR FACE OF ORDER FOR ACTUAL PARTS.
2.	SECTION BETWEEN LETTERED POINTS ARE TO BE REPLACED WITH CORRESPONDING OPTION PICTURED BELOW, AS REQUIRED BY FACE OF ORDER.
3.	CONTROL/MOISTURE DRAIN LINES ARE 1/4" TUBING EXCEPT AS NOTED.
4.	OPTIONAL HEAT TRACE IS APPLIED ONLY TO CONTROL AND MOISTURE DRAIN LINES AND USED ONLY WITH STAINLESS STEEL TUBING. REFER TO FACE OF ORDER FOR HEAT TRACE REQUIREMENTS.
5.	PART VARIES BY MODEL.
6.	REQUIRED FOR 150# & 175# APPLICATIONS ONLY.
7.	TO BE DISCONNECTED FOR DRY PRESSURE TESTING.
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR	

FLUID/AIR SEPARATOR TANKS	
PART #	DESCRIPTION
02250174-146	TNK,FLUID/AIR 20" DIA. SAE PORTS 175# ASME
02250174-147	TNK,FLUID/AIR 20" DIA. SAE PORTS 210# ASME

RELIEF VALVES	
PART #	DESCRIPTION
410103	VALVE,RELIEF 1-1/4" NPT 175#
02250049-001	VALVE,RELIEF 1" NPT 210#

COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
P3	INJECTION FLUID PRESSURE
P4	HIGH PRESSURE SIDE OF FILTER
PSW1	INLET FILTER VACUUM SWITCH
PSW2	LOW WATER PRESSURE SWITCH
T1	WET DISCHARGE TEMPERATURE
T2	DRY DISCHARGE TEMPERATURE
T3	INJECTION FLUID TEMPERATURE
T4	INTERSTAGE AIR/FLUID TEMPERATURE
SOL 1	LOAD/UNLOAD SOLENOID VALVE
SOL 3	START CONTROL SOLENOID VALVE
SOL 4	SEQ/SPIRAL CONTROL SOLENOID VALVE
SOL 5	ELECTRIC DRAIN/JZL DRAIN SOLENOID VALVE
SOL 6	WATER SHUTOFF SOLENOID

Figure 2-14: V200TS Piping and Instrumentation 100/150 INTAC



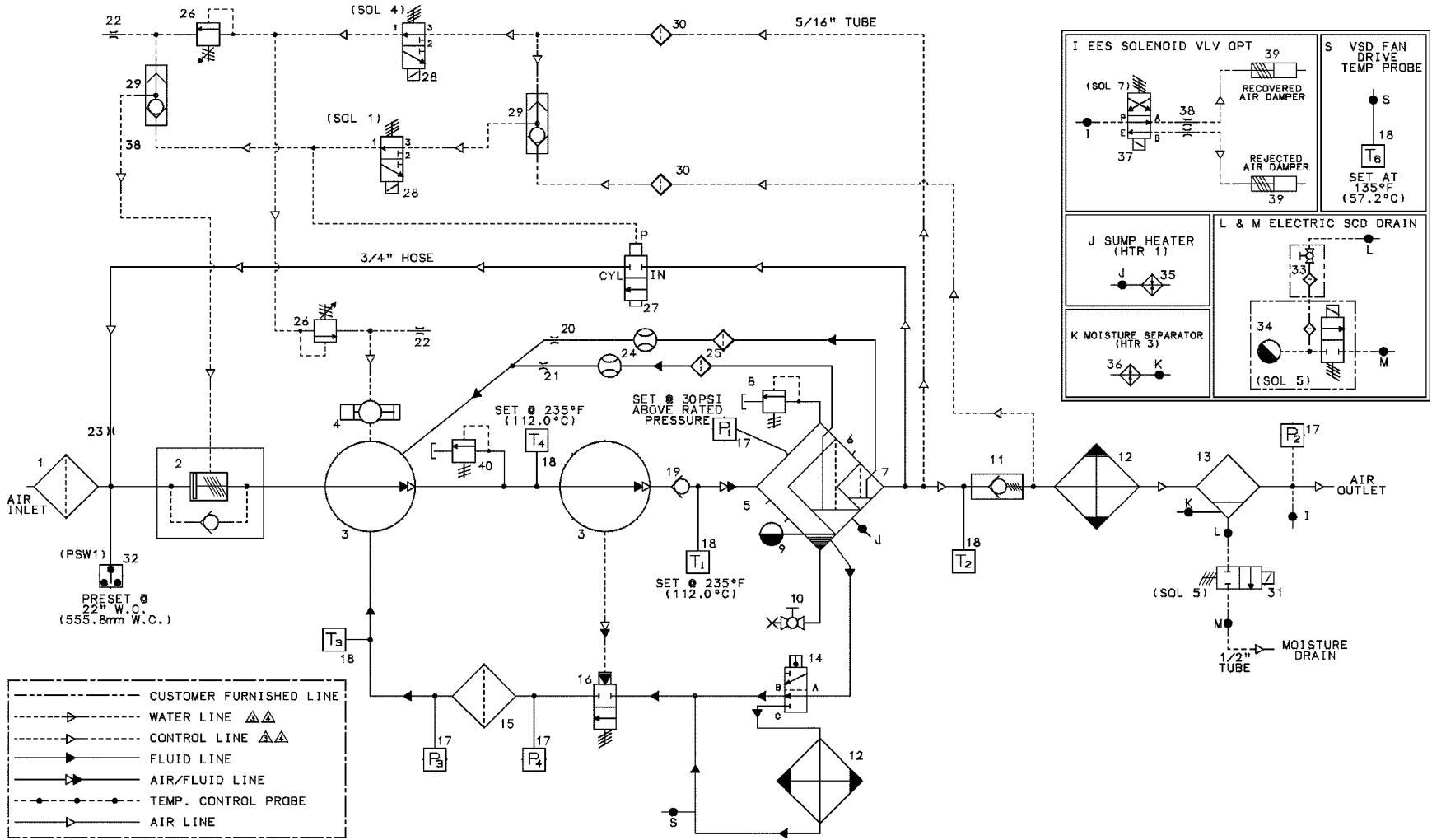
02250183-513 R01

Figure 2-14: V200TS Piping and Instrumentation 100/150HP

KEY NO.	PART NO.	QTY	DESCRIPTION
1	02250135-154	1	FILTER,AIR 15" DIA.
2	02250145-632	1	VALVE,INLET 6" W/BYPASS
3	-	1	COMPRESSOR,UNIT TS20C
4	-	1	VALVE, SPIRAL
5	TNK,SEP	1	TANK,FLUID/AIR SEPARATOR (SEE TAB & NOTE #5)
6	250034-121	1	ELEMENT,PRIMARY
7	250034-133	1	ELEMENT,SECONDARY
8	VLV,RLF	1	VALVE,RELIEF (SEE TAB & NOTE #5)
9	02250097-611	1	PLUG,SIGHT GLASS 1-7/8" SAE
10	02250179-296	1	VALVE,BALL 1-1/16" SAE x 3/4" NPT
11	250033-821	1	VALVE,MIN. PRESSURE CHECK 3" NPT
12	02250173-053	1	COOLER,COMBO FLUID/AIR W/SAE FLUID PORTS
13	SEP,MOIST	1	SEPARATOR,MOISTURE (SEE TAB & NOTE #5)
14	02250127-119	1	HSG,THRMVLV 1-7/8" SAE 4 PORT
15	02250054-605	1	FILTER.FLUID 1-5/8" SAE STR THRD
16	02250113-668	1	VALVE,FLUID STOP 1-5/8" SAE PORTS
17	02250155-174	4	XDCR,PRESS 0-250# RATIOMETRIC
18	02250175-087	5	P,THERMISTER 3000 OHM NTC 12'L
19	02250177-841	1	SA,DISCH CHK VLV TS20C
20	02250125-774	1	ORIFICE .031" (.79mm)
21	02250125-775	1	ORIFICE, .062" (1.58mm)
22	02250132-934	2	ORIFICE,CAP 1/4" NPT .031" DIA. (.79mm)
23	234125-313	1	ORIFICE, 1/2M X 1/2F X .313
24	02250126-129	2	GLASS,SIGHT 1/4"
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

KEY NO.	PART NO.	QTY	DESCRIPTION
25	02250117-782	2	STRAINER,V-TYPE 1/4" 300PSI (2.1 BAR)
26	250017-280	2	VALVE, PRESSURE REGULATOR
27	02250100-042	1	VLV, 1/2 BLDWN 1.8:1 250 PSIG
28	02250125-657	2	VALVE,SOLENOID 1/4" NPT 3WNO 115VAC
29	408893	2	VALVE, SHUTTLE 1/4" (DBL CHK)
30	02250168-917	2	FLTR,SCF-20N 1/4" NPT
31	02250170-782	1	VLV,DR COMBO 115 VAC
32	02250078-249	1	SWITCH,VAC 22" W.C. N4 (555.8mm W.C.)
33	02250182-548	1	VLV,BALL/STNR COMBO-1/2"NPT
34	02250182-545	1	DRAIN,ELEC. CONDS. SCD-2400 115VAC
35	02250043-014	1	HTR,SUMP 1800W 120V PAD 29X19
36	02250087-631	1	HEATER,MOIST SEPARATOR 120VAC 70W
37	02250125-673	1	VALVE,SOLENOID 1/4" NPT 4-WAY EES
38	02250118-585	2	ORIFICE, .062" .25" FNPT x .25" MNPT
39	241906	2	CYLINDER,PNEU 7/8" DIA x 4" STROKE
40	02250051-913	1	VLV,RLF INTERSTAGE 65#
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

Figure 2-14: V200TS Piping and Instrumentation 100/150 INTAC (continued)



02250183-513 R01

V200TS Piping and Instrumentation 100/150HP

NOTES:

- PART NUMBERS ARE FOR REFERENCE ONLY. REFER TO BILL OF MATERIAL AND OR FACE OF ORDER FOR ACTUAL PARTS.
- SECTION BETWEEN LETTERED POINTS ARE TO BE REPLACED WITH CORRESPONDING OPTION PICTURED BELOW, AS REQUIRED BY FACE OF ORDER.
- CONTROL/MOISTURE DRAIN LINES ARE 1/4" TUBING EXCEPT AS NOTED.
- OPTIONAL HEAT TRACE IS APPLIED ONLY TO CONTROL AND MOISTURE DRAIN LINES AND USED ONLY WITH STAINLESS STEEL TUBING. REFER TO FACE OF ORDER FOR HEAT TRACE REQUIREMENTS.
- PART VARIES BY MODEL.

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

FLUID/AIR SEPARATOR TANKS

PART #	DESCRIPTION
02250174-146	TNK,FLUID/AIR 20" DIA. SAE PORTS 175# ASME
02250174-147	TNK,FLUID/AIR 20" DIA. SAE PORTS 210# ASME

RELIEF VALVES

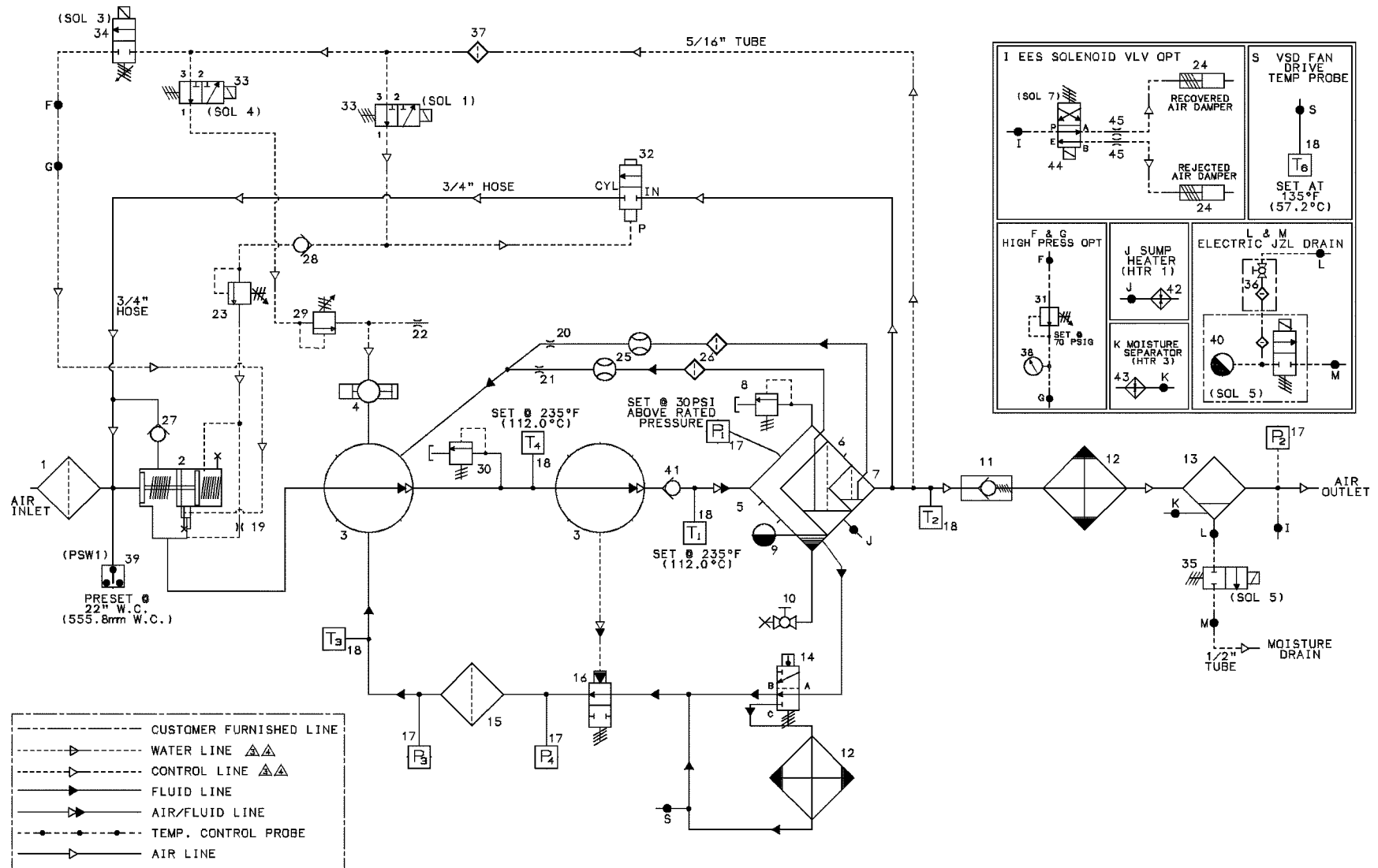
PART #	DESCRIPTION
410103	VALVE,RELIEF 1-1/4" NPT 175#
02250049-001	VALVE,RELIEF 1" NPT 210#

MOISTURE SEPARATORS

PACKAGE	PART #	DESCRIPTION
H.P.		
100/125	02250166-742	SEP,WTR SCWS-740N 2" L/AD
150	02250166-743	SEP,WTR SCWS-1700N 2-1/2" L/AD

COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
P3	INJECTION FLUID PRESSURE
P4	HIGH PRESSURE SIDE OF FILTER
PSW1	INLET FILTER VACUUM SWITCH
T1	WET DISCHARGE TEMPERATURE
T2	DRY DISCHARGE TEMPERATURE
T3	INJECTION FLUID TEMPERATURE
T4	INTERSTAGE AIR/FLUID TEMPERATURE
T6	FLUID COOLER OUT TEMPERATURE (VSD FAN)
SOL 1	LOAD/UNLOAD SOLENOID VALVE
SOL 4	SEQ/SPIRAL CONTROL SOLENOID VALVE
SOL 5	ELECTRIC DRAIN/SCD DRAIN SOLENOID VALVE
SOL 7	EES SOLENOID VALVE

Figure 2-15: V200TS Piping & Instrumentation 200HP INTAC



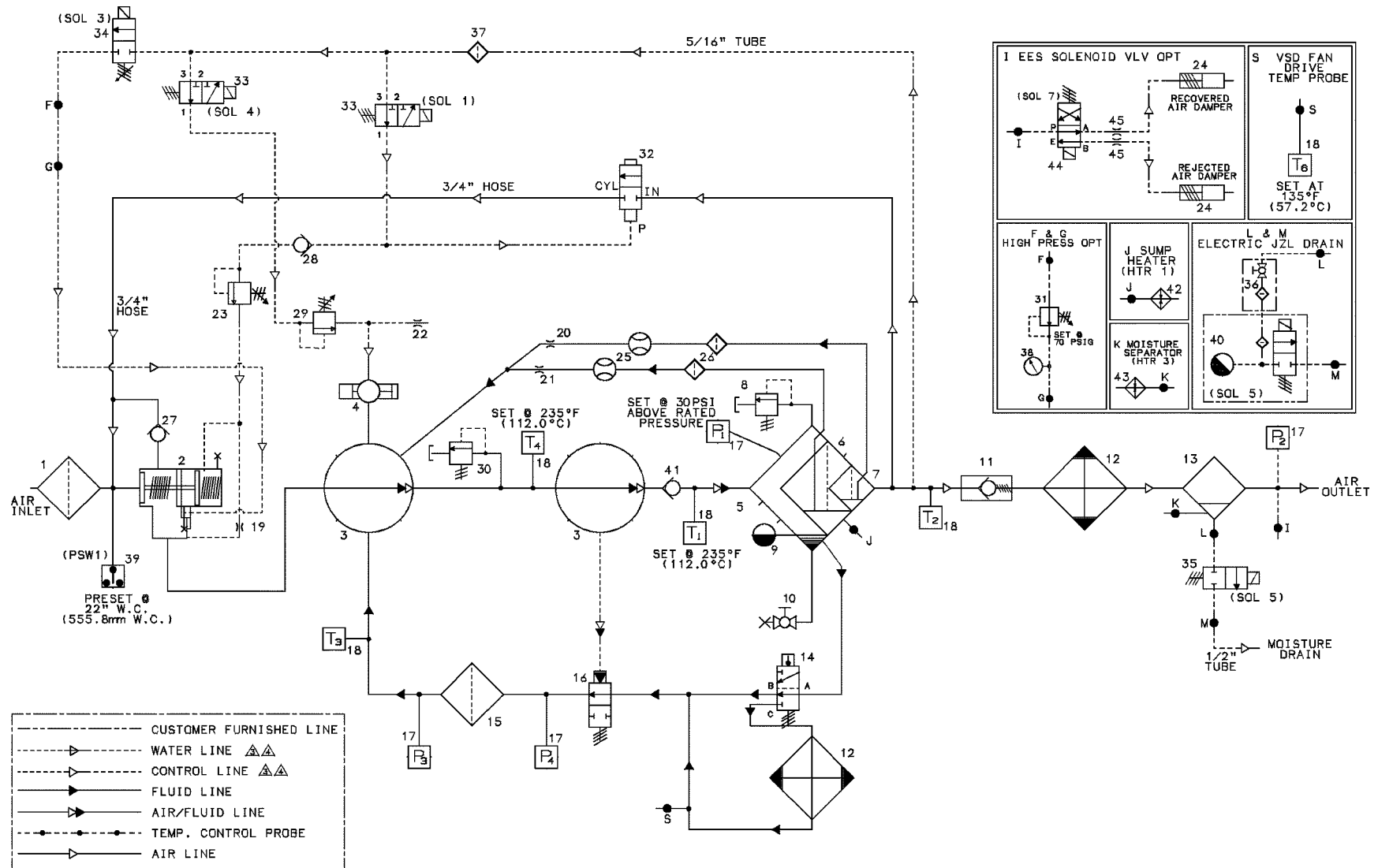
02250183-443 R01

Figure 2-15: V200TS Piping & Instrumentation 200HP INTAC

KEY NO.	PART NO.	QTY	DESCRIPTION
1	02250140-798	1	FILTER,INL OPTIMALAIR 16" DIA.
2	02250161-157	1	VALVE,INLET 8" W/ALUM SLV
3	-	1	COMPRESSOR,UNIT TS20C
4	-	1	VALVE, SPIRAL
5	TNK,SEP	1	TANK,FLUID/AIR SEPARATOR (SEE TAB)
6	250034-121	1	ELEMENT,PRIMARY
7	250034-133	1	ELEMENT,SECONDARY
8	VLV,RLF	1	VALVE,RELIEF (SEE TAB)
9	02250097-611	1	PLUG,SIGHT GLASS 1-7/8" SAE
10	02250179-296	1	VALVE,BALL 1-1/16" SAE x 3/4" NPT
11	250033-821	1	VALVE,MIN. PRESSURE CHECK 3" NPT
12	02250173-053	1	COOLER,COMBO FLUID/AIR W/SAE FLUID PORTS
13	02250166-743	1	SEP,WTR SCWS-1700N 2-1/2" L/AD
14	02250127-119	1	HSG,THRMVLV 1-7/8" SAE 4 PORT
15	02250121-656	1	FILTER.FLUID SAE 2" FLG CORELESS
16	02250113-668	1	VALVE,FLUID STOP 1-5/8" SAE PORTS
17	02250155-174	4	XDCR,PRESS 0-250# RATIOMETRIC
18	02250175-087	5	P,THERMISTER 3000 OHM NTC 12'L
19	02250101-191	1	ORIFICE, .03" (.76mm)
20	02250125-774	1	ORIFICE .031" (.79mm)
21	02250125-775	1	ORIFICE, .062" (1.58mm)
22	02250132-934	1	ORIFICE,CAP 1/4" NPT .031" DIA. (.79mm)
23	02250186-328	1	VLV,PRESSURE REG 65PSI
24	241906	2	CYLINDER,PNEU 7/8" DIA x 4" STROKE
25	02250126-129	2	GLASS,SIGHT 1/4"
26	02250117-782	2	STRAINER,V-TYPE 1/4" 300PSI (2.1 BAR)
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

KEY NO.	PART NO.	QTY	DESCRIPTION
27	42694	1	VALVE,CHECK 1/2"
28	02250110-557	1	VALVE,CHECK 1/4"
29	02250148-608	1	VALVE,PRESSURE REG. 1/4" NPT 70-25-#
30	02250051-913	1	VLV,RLF INTERSTAGE 65#
31	02250046-568	1	VALVE,REGULATOR REDUCING 1/4" NPT
32	02250100-042	1	VLV, 1/2 BLDWN 1.8:1 250 PSIG
33	02250125-657	2	VALVE,SOLENOID 1/4" NPT 3WNO 115VAC
34	02250125-665	1	VLV,SOL 3WNC 1/4 210# N4
35	02250170-782	1	VLV,DR COMBO 115 VAC
36	02250182-548	1	VLV,BALL/STNR COMBO-1/2"NPT
37	02250168-917	1	FLTR,SCF-20N 1/4" NPT
38	02250117-009	1	GAGE,PRESSURE 1/4" NPT 0-200PSI
39	02250078-249	1	SWITCH,VAC 22" W.C. N4 (555.8mm W.C.)
40	02250182-545	1	DRN,ZERO LOSS 110V 1/2"NPT
41	02250177-841	1	SA,DISCH CHK VLV TS20C
42	02250043-014	1	HTR,SUMP 1800W 120V PAD 29X19
43	02250087-631	1	HEATER,MOIST SEPARATOR 120VAC 70W
44	02250125-673	1	VALVE,SOLENOID 1/4" NPT 4-WAY EES
45	02250118-585	2	ORIFICE, .062" .25" FNPT x .25" MNPT
Continued on page 51			
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

Figure 2-16: V200TS Piping & Instrumentation 200HP INTAC (continued)



02250183-443 R01

Figure 2-16: V200TS Piping & Instrumentation 200HP INTAC

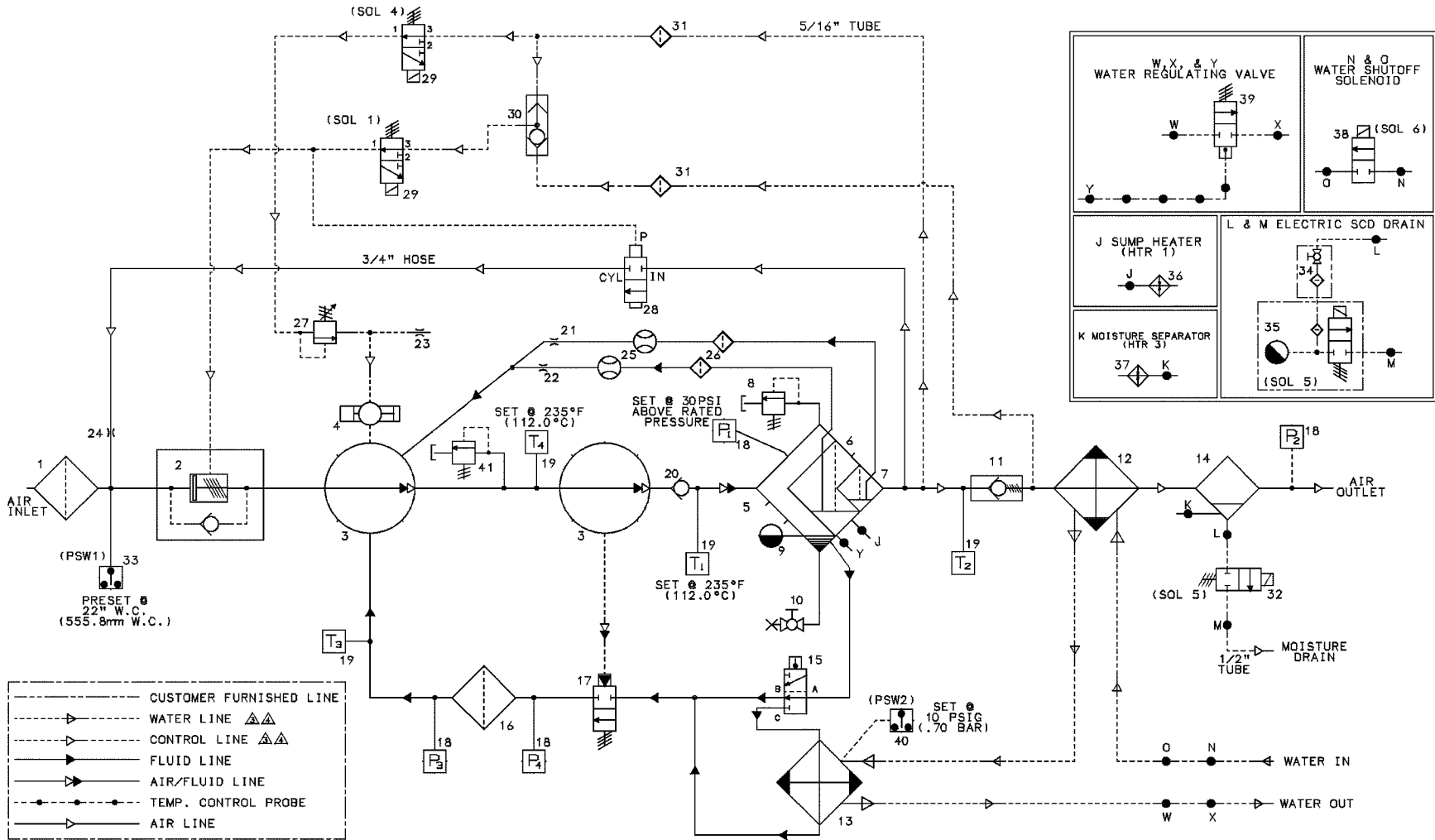
NOTES:	
1.	PART NUMBERS ARE FOR REFERENCE ONLY. REFER TO BILL OF MATERIAL AND OR FACE OF ORDER FOR ACTUAL PARTS.
2.	SECTION BETWEEN LETTERED POINTS ARE TO BE REPLACED WITH CORRESPONDING OPTION PICTURED BELOW, AS REQUIRED BY FACE OF ORDER.
3.	CONTROL/MOISTURE DRAIN LINES ARE 1/4" TUBING EXCEPT AS NOTED.
4.	OPTIONAL HEAT TRACE IS APPLIED ONLY TO CONTROL AND MOISTURE DRAIN LINES AND USED ONLY WITH STAINLESS STEEL TUBING. REFER TO FACE OF ORDER FOR HEAT TRACE REQUIREMENTS.
5.	PART VARIES BY MODEL.
6.	REQUIRED FOR 150# & 175# APPLICATIONS ONLY.
7.	TO BE DISCONNECTED FOR DRY PRESSURE TESTING.
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR	

FLUID/AIR SEPARATOR TANKS	
PART #	DESCRIPTION
02250174-146	TNK,FLUID/AIR 20" DIA. SAE PORTS 175# ASME
02250174-147	TNK,FLUID/AIR 20" DIA. SAE PORTS 210# ASME

RELIEF VALVES	
PART #	DESCRIPTION
410103	VALVE,RELIEF 1-1/4" NPT 175#
02250049-001	VALVE,RELIEF 1" NPT 210#

COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
P3	INJECTION FLUID PRESSURE
P4	HIGH PRESSURE SIDE OF FILTER
PSW1	INLET FILTER VACUUM SWITCH
T1	WET DISCHARGE TEMPERATURE
T2	DRY DISCHARGE TEMPERATURE
T3	INJECTION FLUID TEMPERATURE
T4	INTERSTAGE AIR/FLUID TEMPERATURE
T6	FLUID COOLER OUT TEMPERATURE (VSD FAN)
SOL 1	LOAD/UNLOAD SOLENOID VALVE
SOL 3	START CONTROL SOLENOID VALVE
SOL 4	SEQ/SPIRAL CONTROL SOLENOID VALVE
SOL 5	ELECTRIC DRAIN/JZL DRAIN SOLENOID VALVE
SOL 7	EES SOLENOID VALVE

Figure 2-17: V200TS Piping & Instrumentation 100/150HP WCAC



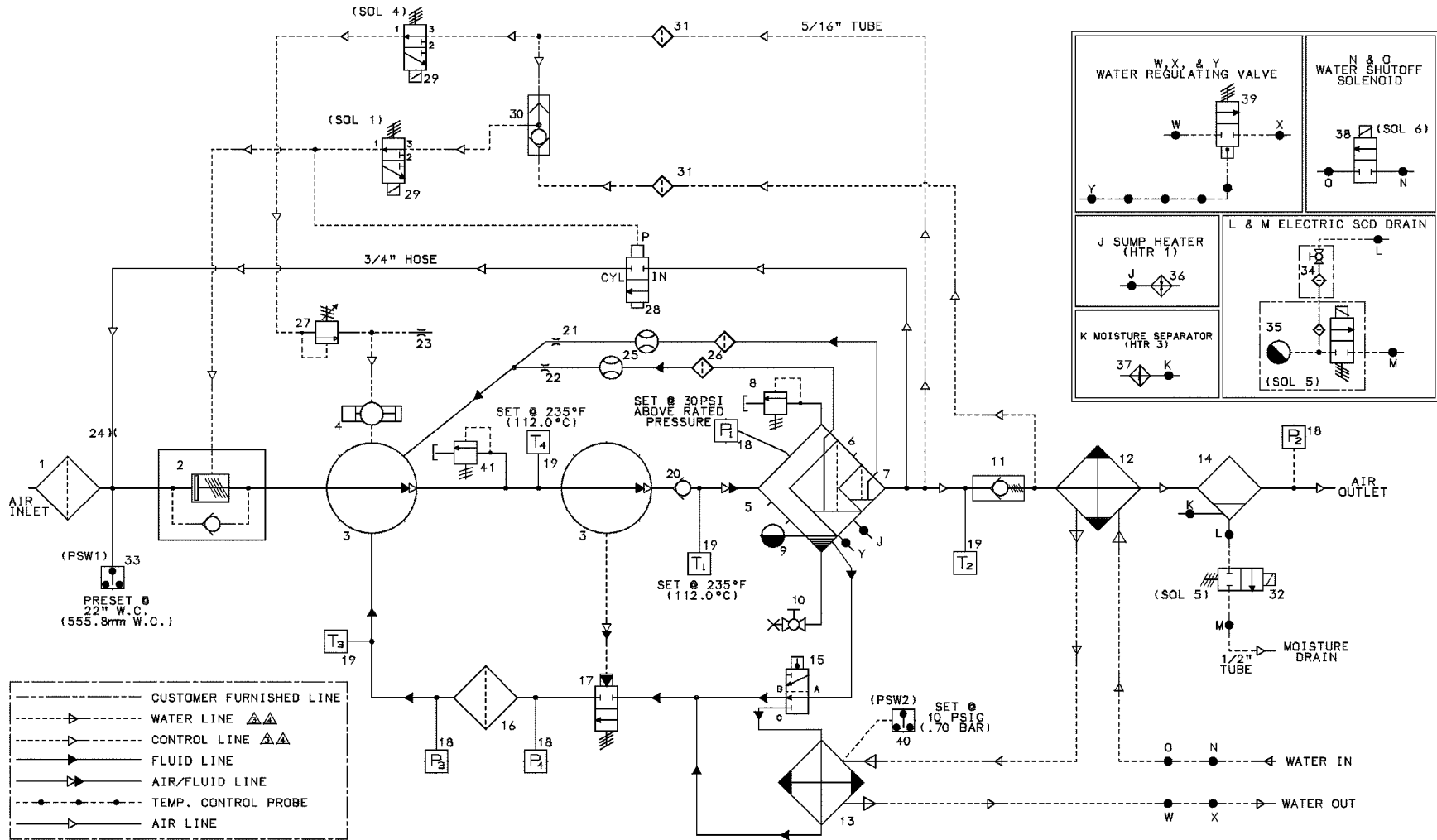
02250183-515 R01

Figure 2-17: V200TS Piping & Instrumentation 100/150HP WCAC

KEY NO.	PART NO.	QTY	DESCRIPTION
1	02250135-154	1	FILTER,AIR 15" DIA.
2	02250145-632	1	VALVE,INLET 6" W/BYPASS
3	-	1	COMPRESSOR,UNIT TS20C
4	-	1	VALVE, SPIRAL
5	TNK,SEP	1	TANK,FLUID/AIR SEPARATOR (SEE TAB)
6	250034-121	1	ELEMENT,PRIMARY
7	250034-133	1	ELEMENT,SECONDARY
8	VLV,RLF	1	VALVE,RELIEF (SEE TAB)
9	02250097-611	1	PLUG,SIGHT GLASS 1-7/8" SAE
10	02250179-296	1	VALVE,BALL 1-1/16" SAE x 3/4" NPT
11	250033-821	1	VALVE,MIN. PRESSURE CHECK 3" NPT
12	43009	1	AFTERCOOLER, 6" x 48"
13	02250113-281	1	CLR,OIL 8 X 48 W/SAE PORTS
14	SEP,MOIST	1	SEPARATOR,MOISTURE (SEE TAB)
15	02250127-119	1	HSG,THRMVLV 1-7/8" SAE 4 PORT
16	02250054-605	1	FILTER.FLUID 1-5/8" SAE STR THRD
17	02250113-668	1	VALVE,FLUID STOP 1-5/8" SAE PORTS
18	02250155-174	4	XDCR,PRESS 0-250# RATIOMETRIC
19	02250175-087	4	P,THERMISTER 3000 OHM NTC 12'L
20	02250177-841	1	SA,DISCH CHK VLV TS20C
21	02250125-774	1	ORIFICE .031" (.79mm)
22	02250125-775	1	ORIFICE, .062" (1.58mm)
23	02250132-934	1	ORIFICE,CAP 1/4" NPT .031" DIA. (.79mm)
24	234125-313	1	ORIFICE, 1/2M X 1/2F X .313
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

KEY NO.	PART NO.	QTY	DESCRIPTION
25	02250126-129	2	GLASS,SIGHT 1/4"
26	02250117-782	2	STRAINER,V-TYPE 1/4" 300PSI (2.1 BAR)
27	250017-280	1	VALVE, PRESSURE REGULATOR
28	02250100-042	1	VLV, 1/2 BLDWN 1.8:1 250 PSIG
29	02250125-657	2	VALVE,SOLENOID 1/4" NPT 3WNO 115VAC
30	408893	1	VALVE, SHUTTLE 1/4" (DBL CHK)
31	02250168-917	2	FLTR,SCF-20N 1/4" NPT
32	02250170-782	1	VLV,DR COMBO 115 VAC
33	02250078-249	1	SWITCH,VAC 22" W.C. N4 (555.8mm W.C.)
34	02250182-548	1	VLV,BALL/STNR COMBO-1/2"NPT
35	02250182-545	1	DRAIN,ELEC. CONDS. SCD-2400 115VAC
36	02250043-014	1	HTR,SUMP 1800W 120V PAD 29X19
37	02250087-631	1	HEATER,MOIST SEPARATOR 120VAC 70W
38	250035-291	1	VALVE,SOLENOID WATER SHUT OFF
39	49474	2	VALVE,WATER REGULATING 1-1/4" NPT
40	250017-992	2	SWITCH,LOW WATER PRESSURE
41	02250051-913	1	VLV,RLF INTERSTAGE 65#
Continued on page 51			
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

Figure 2-17: V200TS Piping & Instrumentation 100/150HP WCAC (continued)



02250183-515 R01

Figure 2-17: V200TS Piping & Instrumentation 100/150HP WCAC

NOTES:	
1.	PART NUMBERS ARE FOR REFERENCE ONLY. REFER TO BILL OF MATERIAL AND OR FACE OF ORDER FOR ACTUAL PARTS.
2.	SECTION BETWEEN LETTERED POINTS ARE TO BE REPLACED WITH CORRESPONDING OPTION PICTURED BELOW, AS REQUIRED BY FACE OF ORDER.
3.	CONTROL/MOISTURE DRAIN LINES ARE 1/4" TUBING EXCEPT AS NOTED.
4.	OPTIONAL HEAT TRACE IS APPLIED ONLY TO CONTROL AND MOISTURE DRAIN LINES AND USED ONLY WITH STAINLESS STEEL TUBING. REFER TO FACE OF ORDER FOR HEAT TRACE REQUIREMENTS.
5.	PART VARIES BY MODEL.
6.	REQUIRED FOR 150# & 175# APPLICATIONS ONLY.
7.	TO BE DISCONNECTED FOR DRY PRESSURE TESTING.
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR	

COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
P3	INJECTION FLUID PRESSURE
P4	HIGH PRESSURE SIDE OF FILTER
PSW1	INLET FILTER VACUUM SWITCH
PSW2	LOW WATER PRESSURE SWITCH
T1	WET DISCHARGE TEMPERATURE
T2	DRY DISCHARGE TEMPERATURE
T3	INJECTION FLUID TEMPERATURE
T4	INTERSTAGE AIR/FLUID TEMPERATURE
SOL 1	LOAD/UNLOAD SOLENOID VALVE
SOL 4	SEQ/SPIRAL CONTROL SOLENOID VALVE
SOL 5	ELECTRIC DRAIN/SCD DRAIN SOLENOID VALVE
SOL 6	WATER SHUTOFF VALVE

FLUID/AIR SEPARATOR TANKS	
PART #	DESCRIPTION
02250174-146	TNK,FLUID/AIR 20" DIA. SAE PORTS 175# ASME
02250174-147	TNK,FLUID/AIR 20" DIA. SAE PORTS 210# ASME

RELIEF VALVES	
PART #	DESCRIPTION
410103	VALVE,RELIEF 1-1/4" NPT 175#
02250049-001	VALVE,RELIEF 1" NPT 210#

MOISTURE SEPARATORS		
PACKAGE	PART #	DESCRIPTION
H.P.		
100/125	02250166-742	SEP,WTR SCWS-740N 2" L/AD
150	02250166-743	SEP,WTR SCWS-1700N 2-1/2" L/AD

Figure 2-18: V200TS Piping & Instrumentation 200HP WCAC

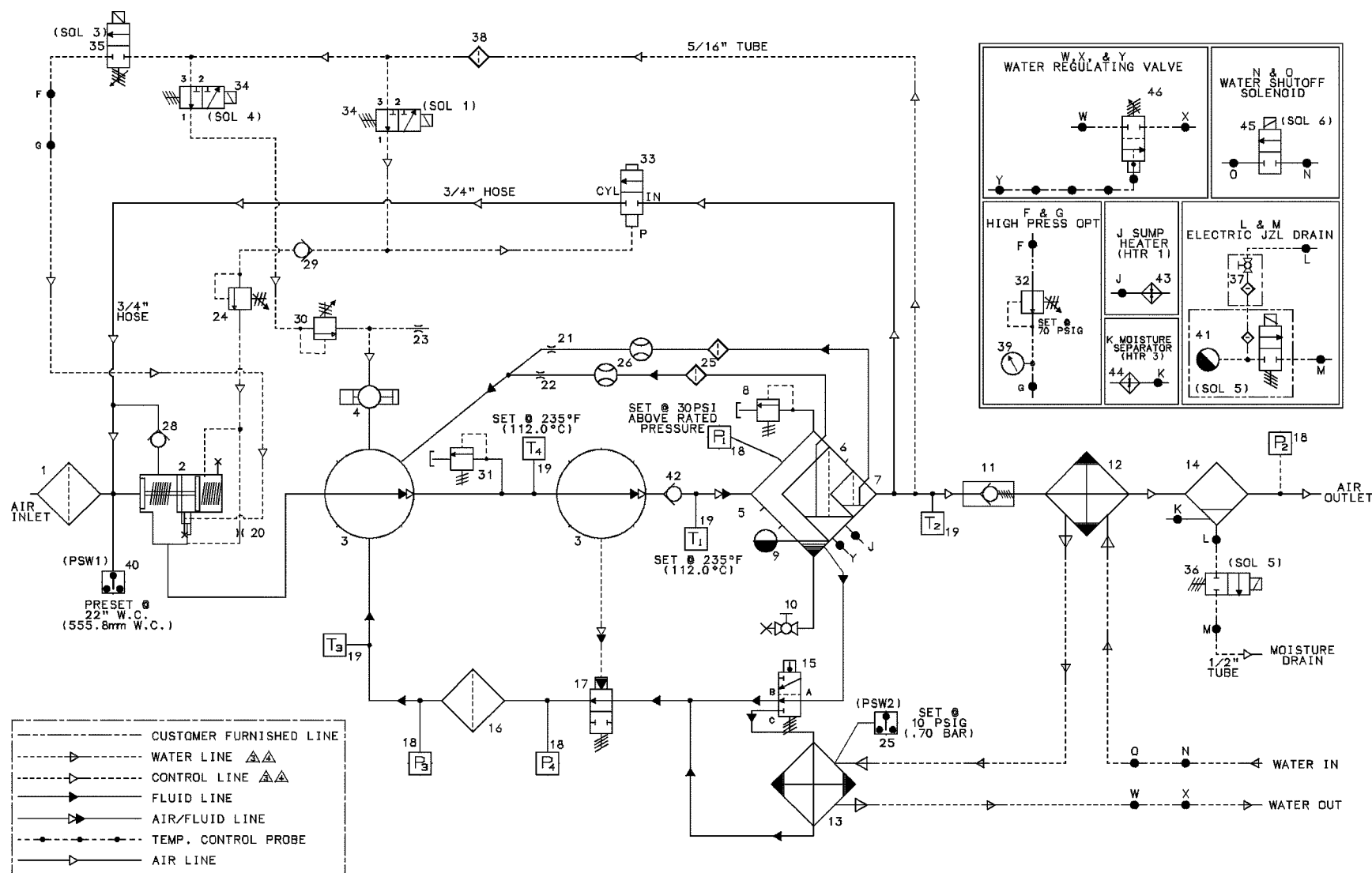
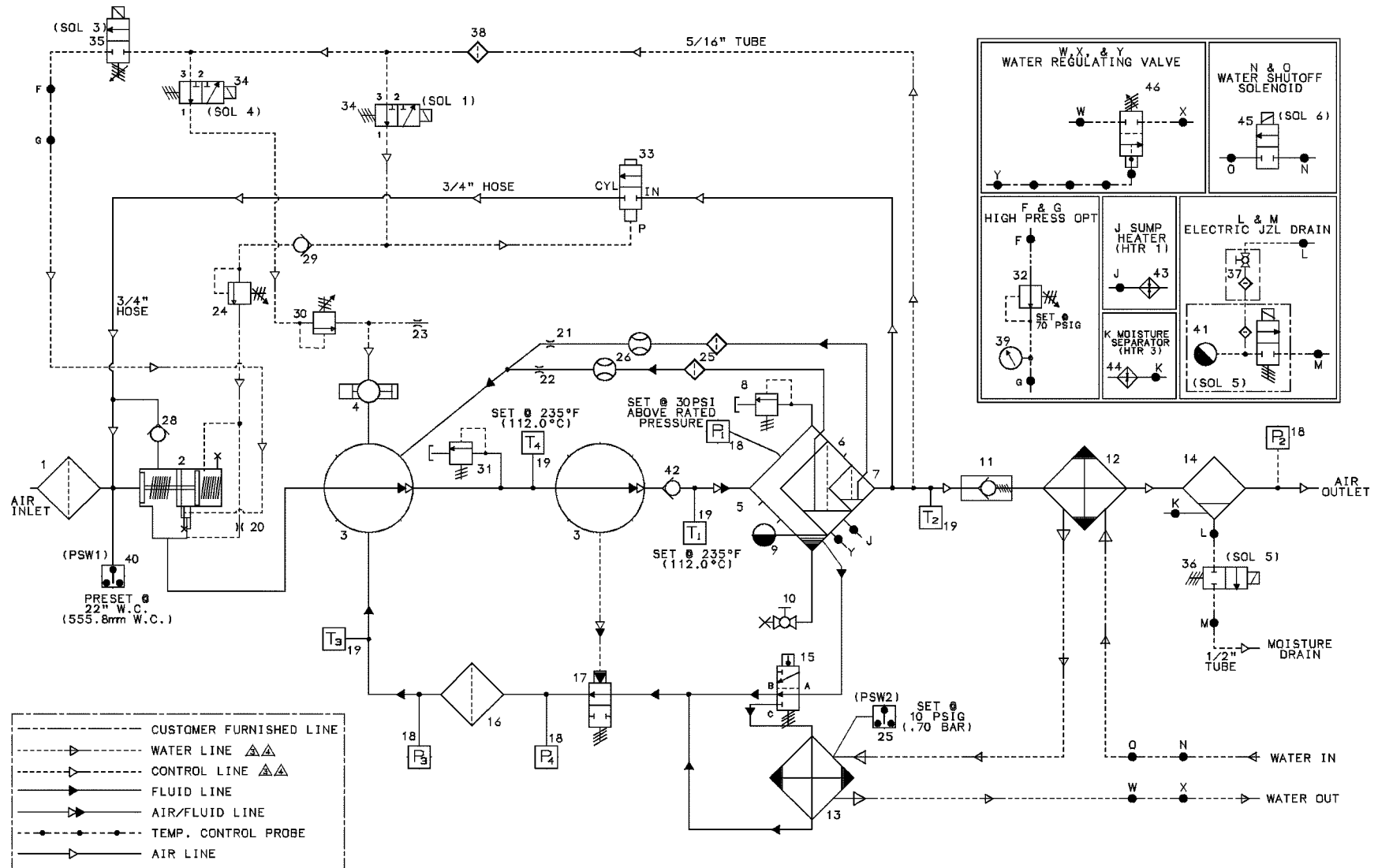


Figure 2-18: V200TS Piping & Instrumentation 200HP WCAC

KEY NO.	PART NO.	QTY	DESCRIPTION
1	02250140-798	1	FILTER,INL OPTIMALAIR 16" DIA.
2	02250161-157	1	VALVE,INLET 8" W/ALUM SLV
3	-	1	COMPRESSOR,UNIT TS20C
4	-	1	VALVE, SPIRAL
5	TNK,SEP	1	TANK,FLUID/AIR SEPARATOR (SEE TAB)
6	250034-121	1	ELEMENT,PRIMARY
7	250034-133	1	ELEMENT,SECONDARY
8	VLV,RLF	1	VALVE,RELIEF (SEE TAB)
9	02250097-611	1	PLUG,SIGHT GLASS 1-7/8" SAE
10	02250179-296	1	VALVE,BALL 1-1/16" SAE x 3/4" NPT
11	250033-821	1	VALVE,MIN. PRESSURE CHECK 3" NPT
12	42541	1	AFTERCOOLER, 8" x 36"
13	02250126-003	1	CLR,OIL 8 X 60 W/SAE PORTS
14	02250166-743	1	SEP,WTR SCWS-1700N 2-1/2" L/AD
15	02250127-119	1	HSG,THRMVLV 1-7/8" SAE 4 PORT
16	02250121-656	1	FILTER.FLUID SAE 2" FLG CORELESS
17	02250113-668	1	VALVE,FLUID STOP 1-5/8" SAE PORTS
18	02250155-174	4	XDCR,PRESS 0-250# RATIOMETRIC
19	02250175-087	4	P,THERMISTER 3000 OHM NTC 12'L
20	02250101-191	1	ORIFICE, .03" (.76mm)
21	02250125-774	1	ORIFICE .031" (.79mm)
22	02250125-775	1	ORIFICE, .062" (1.58mm)
23	02250132-934	1	ORIFICE,CAP 1/4" NPT .031" DIA. (.79mm)
24	02250186-328	1	VLV,PRESSURE REG 65PSI
25	250017-992	1	SWITCH,LOW WATER PRESSURE
26	02250126-129	2	GLASS,SIGHT 1/4"
27	02250117-782	2	STRAINER,V-TYPE 1/4" 300PSI (2.1 BAR)
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

KEY NO.	PART NO.	QTY	DESCRIPTION
28	42694	1	VALVE,CHECK 1/2"
29	02250110-557	1	VALVE,CHECK 1/4"
30	02250148-608	1	VALVE,PRESSURE REG. 1/4" NPT 70-25-#
31	02250051-913	1	VLV,RLF INTERSTAGE 65#
32	02250046-568	1	VALVE,REGULATOR REDUCING 1/4" NPT
33	02250100-042	1	VLV, 1/2 BLDWN 1.8:1 250 PSIG
34	02250125-657	2	VALVE,SOLENOID 1/4" NPT 3WNO 115VAC
35	02250125-665	1	VLV,SOL 3WNC 1/4 210# N4
36	02250170-782	1	VLV,DR COMBO 115 VAC
37	02250182-548	1	VLV,BALL/STNR COMBO-1/2"NPT
38	02250168-917	1	FLTR,SCF-20N 1/4" NPT
39	02250117-009	1	GAGE,PRESSURE 1/4" NPT 0-200PSI
40	02250078-249	1	SWITCH,VAC 22" W.C. N4 (555.8mm W.C.)
41	02250182-545	1	DRN,ZERO LOSS 110V 1/2"NPT
42	02250177-841	1	SA,DISCH CHK VLV TS20C
43	02250043-014	1	HTR,SUMP 1800W 120V PAD 29X19
44	02250087-631	1	HEATER,MOIST SEPARATOR 120VAC 70W
45	250035-291	1	VALVE,SOLENOID WATER SHUTOFF
46	49474	1	VALVE,WATER REGULATING 1-1/4" NPT
			<i>Continued on page 59</i>
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR			

Figure 2-18: V200TS Piping & Instrumentation 200HP WCAC (continued)



02250183-444 R02

Figure 2-18: V200TS Piping & Instrumentation 200HP WCAC

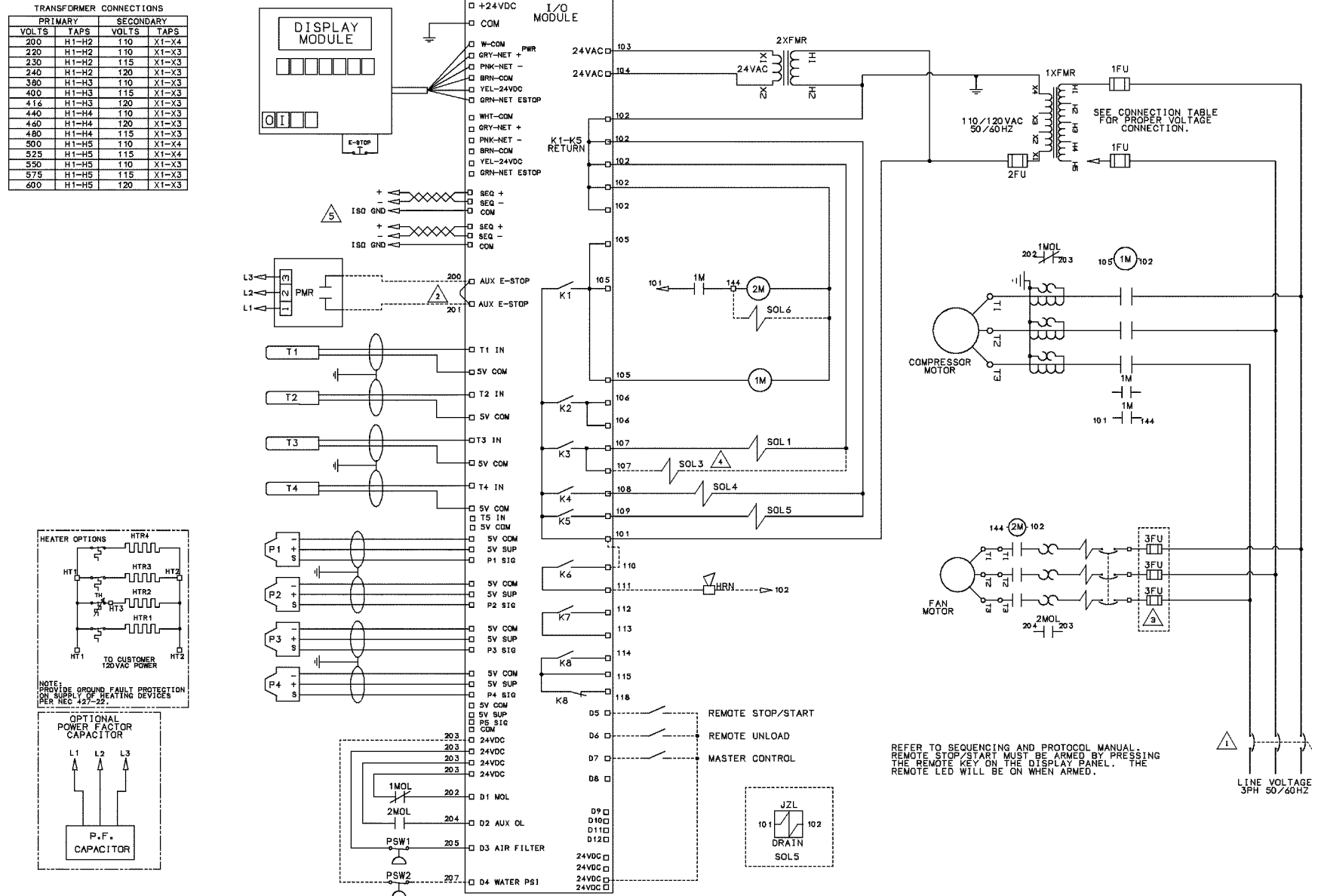
NOTES:	
1.	PART NUMBERS ARE FOR REFERENCE ONLY. REFER TO BILL OF MATERIAL AND OR FACE OF ORDER FOR ACTUAL PARTS.
2.	SECTION BETWEEN LETTERED POINTS ARE TO BE REPLACED WITH CORRESPONDING OPTION PICTURED BELOW, AS REQUIRED BY FACE OF ORDER.
3.	CONTROL/MOISTURE DRAIN LINES ARE 1/4" TUBING EXCEPT AS NOTED.
4.	OPTIONAL HEAT TRACE IS APPLIED ONLY TO CONTROL AND MOISTURE DRAIN LINES AND USED ONLY WITH STAINLESS STEEL TUBING. REFER TO FACE OF ORDER FOR HEAT TRACE REQUIREMENTS.
5.	PART VARIES BY MODEL.
6.	REQUIRED FOR 150# & 175# APPLICATIONS ONLY.
7.	TO BE DISCONNECTED FOR DRY PRESSURE TESTING.
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE SERIAL NUMBER OF COMPRESSOR	

FLUID/AIR SEPARATOR TANKS	
PART #	DESCRIPTION
02250174-146	TNK,FLUID/AIR 20" DIA. SAE PORTS 175# ASME
02250174-147	TNK,FLUID/AIR 20" DIA. SAE PORTS 210# ASME

RELIEF VALVES	
PART #	DESCRIPTION
410103	VALVE,RELIEF 1-1/4" NPT 175#
02250049-001	VALVE,RELIEF 1" NPT 210#

COMPONENT	DESCRIPTION
P1	WET SUMP PRESSURE
P2	LINE PRESSURE
P3	INJECTION FLUID PRESSURE
P4	HIGH PRESSURE SIDE OF FILTER
PSW1	INLET FILTER VACUUM SWITCH
PSW2	LOW WATER PRESSURE SWITCH
T1	WET DISCHARGE TEMPERATURE
T2	DRY DISCHARGE TEMPERATURE
T3	INJECTION FLUID TEMPERATURE
T4	INTERSTAGE AIR/FLUID TEMPERATURE
SOL 1	LOAD/UNLOAD SOLENOID VALVE
SOL 3	START CONTROL SOLENOID VALVE
SOL 4	SEQ/SPIRAL CONTROL SOLENOID VALVE
SOL 5	ELECTRIC DRAIN/JZL DRAIN SOLENOID VALVE
SOL 6	WATER SHUTOFF SOLENOID

Figure 2-19: TS20C Wiring Diagram MFV NC SUPV AC/WC



02250178-820 R02

Figure 2-20: TS20C Wiring Diagram MFV NC SUPV AC/WC

COMP	DESCRIPTION
1M	COMPRESSOR MOTOR
1MOL	COMPRESSOR OVERLOAD
2M	COOLER FAN STARTER/CANOPY FAN ON WATER COOLED
2MOL	COOLER/CANOPY FAN MOTOR OVERLOAD
1FU	TRANSFORMER PRIMARY FUSES
2FU	TRANSFORMER SECONDARY FUSE
3FU	AUXILLIARY MOTOR BRANCH FUSES
P1	WET SUMP PRESSURE SENSOR
P2	PACKAGE DISCHARGE PRESSURE SENSOR
P3	OIL FILTER DISCHARGE PRESSURE SENSOR
P4	OIL FILTER UPSTREAM PRESSURE SENSOR
T1	UNIT DISCHARGE TEMPERATURE PROBE
T2	DRY DISCHARGE TEMPERATURE PROBE
T3	INJECTION OIL TEMPERATURE PROBE
T4	INTERSTAGE TEMPERATURE PROBE
PSW1	INLET AIR FILTER SWITCH 558.9 MM WC - 22 IN WC
PSW2	WATER PRESSURE SWITCH 10PSI - WC ONLY
SOL1	LOAD CONTROL SOLENOID VALVE
SOL3	OPT'L START CONTROL SOLENOID VALVE 200HP ONLY
SOL4	SEQUENCE SOLENOID VALVE
SOL5	COMBO DRAIN/JZL DRAIN SOLENOID VALVE
SOL6	OPT'L WATER SHUTOFF SOLENOID VALVE - WC ONLY
1XFMR	CONTROL VOLTAGE TRANSFORMER
2XFMR	SUPERVISOR STEPDOWN TRANSFORMER 24VAC
K1	INTERNAL RUN RELAY CONTACT
K2	INTERNAL Y-DELTA RELAY CONTACT

COMP	DESCRIPTION
K3	INTERNAL LOAD CONTROL RELAY CONTACT
K4	INTERNAL SEQUENCE RELAY CONTACT
K5	INTERNAL ELECTRIC DRAIN RELAY CONTACT
K6	INTERNAL COMMON FAULT RELAY CONTACT
K7	INTERNAL COMMON WARNING RELAY CONTACT
K8	INTERNAL SPECIAL FUNCTION CONTACT
PMR	OPT'L POWER MONITOR RELAY
HRN	OPT'L AUDIBLE ALARM
HTR1	SUMP HEATER 2000 WATTS
HTR2	HEAT TRACE
HTR3	TRAP HEATER 50 WATTS
HTR4	CONTROL PANEL HEATER 50 WATTS
TH	THERMOSTAT FOR HEAT TRACE
NOTES: 1 CUSTOMER TO FURNISH FUSED OR CIRCUIT BREAKER DISCONNECT PER LOCAL CODES. 2 REMOVE JUMPER FOR AUXILIARY E-STOP STRING DEVICES. 3 FUSES FURNISHED FOR VOLTAGES GREATER THAN 480V 4 USED ONLY ON 200HP 5 BELDEN TYPE 9842 4 COND. 2 TWISTED PAIR W/SHIELD OR EQUIVALENT. TO MATCHING TERMINALS ON NEXT COMPRESSOR. REFER TO SUPERVISOR SEQUENCING PROTOCOL MANUAL	

Figure 2-21: TS20C Wiring Diagram YD NC SUPV AC/WC

PRIMARY		SECONDARY	
VOLTS	TAPS	VOLTS	TAPS
200	H1-H2	110	X1-X4
220	H1-H2	110	X1-X3
230	H1-H2	115	X1-X3
240	H1-H2	120	X1-X3
380	H1-H3	110	X1-X3
400	H1-H3	115	X1-X3
416	H1-H3	120	X1-X3
440	H1-H4	110	X1-X3
460	H1-H4	120	X1-X3
480	H1-H4	115	X1-X3
500	H1-H5	110	X1-X4
525	H1-H5	115	X1-X4
550	H1-H5	110	X1-X3
575	H1-H5	115	X1-X3
600	H1-H5	120	X1-X3

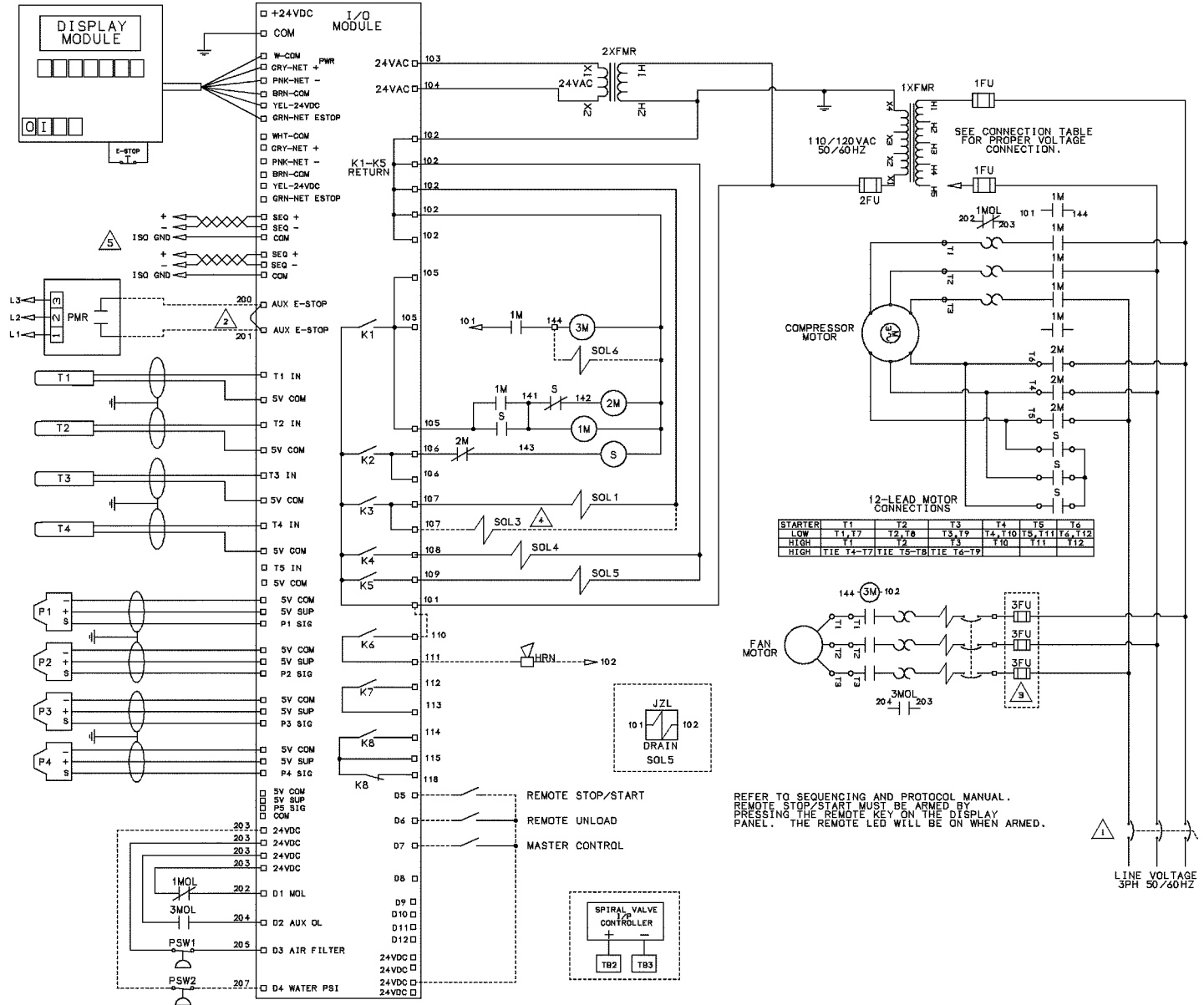
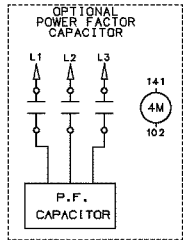
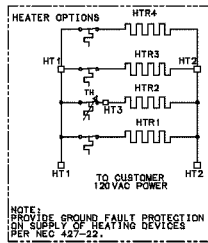


Figure 2-21: TS20C Wiring Diagram YD NC SUPV AC/WC

COMP	DESCRIPTION	COMP	DESCRIPTION
1M	COMPRESSOR MOTOR	K4	INTERNAL SEQUENCE RELAY CONTACT
1MOL	COMPRESSOR OVERLOAD	K5	INTERNAL ELECTRIC DRAIN RELAY CONTACT
2M	COMPRESSOR RUN CONTACTOR	K6	INTERNAL COMMON FAULT RELAY CONTACT
3M	COOLER FAN STARTER/CANOPY FAN ON WATER COOLED	K7	INTERNAL COMMON WARNING RELAY CONTACT
3MOL	COOLER/CANOPY FAN MOTOR OVERLOAD	K8	INTERNAL SPECIAL FUNCTION CONTACT
4M	OPT'L PF CAPACITOR CONTACTOR	PMR	OPT'L POWER MONITOR RELAY
S	COMPRESSOR START CONTACTOR	HRN	OPT'L AUDIBLE ALARM
1FU	TRANSFORMER PRIMARY FUSES	HTR1	SUMP HEATER 2000 WATTS
2FU	TRANSFORMER SECONDARY FUSE	HTR2	HEAT TRACE
3FU	AUXILLIARY MOTOR BRANCH FUSES	HTR3	TRAP HEATER 50 WATTS
P1	WET SUMP PRESSURE SENSOR	HTR4	CONTROL PANEL HEATER 50 WATTS
P2	PACKAGE DISCHARGE PRESSURE SENSOR	TH	THERMOSTAT FOR HEAT TRACE
P3	OIL FILTER DISCHARGE PRESSURE SENSOR	I/P	OPT'L SPIRAL VALVE CONTROLLER 4-20mA
P4	OIL FILTER UPSTREAM PRESSURE SENSOR		
T1	UNIT DISCHARGE TEMPERATURE PROBE	NOTES: 1 CUSTOMER TO FURNISH FUSED OR CIRCUIT BREAKER DISCONNECT PER LOCAL CODES. 2 REMOVE JUMPER FOR AUXILIARY E-STOP STRING DEVICES. 3 FUSES FURNISHED FOR VOLTAGES GREATER THAN 480V 4 USED ONLY ON 200HP 5 BELDEN TYPE 9842 4 COND. 2 TWISTED PAIR W/SHIELD OR EQUIVALENT. TO MATCHING TERMINALS ON NEXT COMPRESSOR. REFER TO SUPERVISOR SEQUENCING PROTOCOL MANUAL	
T2	DRY DISCHARGE TEMPERATURE PROBE		
T3	INJECTION OIL TEMPERATURE PROBE		
T4	INTERSTAGE TEMPERATURE PROBE		
PSW1	INLET AIR FILTER SWITCH 558.9 MM WC - 22 IN WC		
PSW2	WATER PRESSURE SWITCH 10PSI - WC ONLY		
SOL1	LOAD CONTROL SOLENOID VALVE		
SOL3	START CONTROL SOLENOID VALVE 200HP ONLY		
SOL4	SEQUENCE SOLENOID VALVE		
SOL5	COMBO DRAIN/JZL DRAIN SOLENOID VALVE		
SOL6	OPT'L WATER SHUTOFF SOLENOID VALVE - WC ONLY		
1XFMR	CONTROL VOLTAGE TRANSFORMER		
2XFMR	SUPERVISOR 3 STEPDOWN TRANSFORMER 24VAC		
K1	INTERNAL RUN RELAY CONTACT		
K2	INTERNAL Y-DELTA RELAY CONTACT		
K3	INTERNAL LOAD CONTROL RELAY CONTACT		

02250178-822 R02

Diagram illustrating the optional power factor capacitor connection. The circuit shows three line terminals (L1, L2, L3) connected to a common bus. A power factor capacitor (P.F. CAPACITOR) is connected across the bus. The capacitor is labeled with a value of 3M (3 Megafarads) and is connected between terminals 101 and 102. The capacitor is also connected to terminal 103, which is labeled IT-13, and terminal 104, which is labeled IT-14.

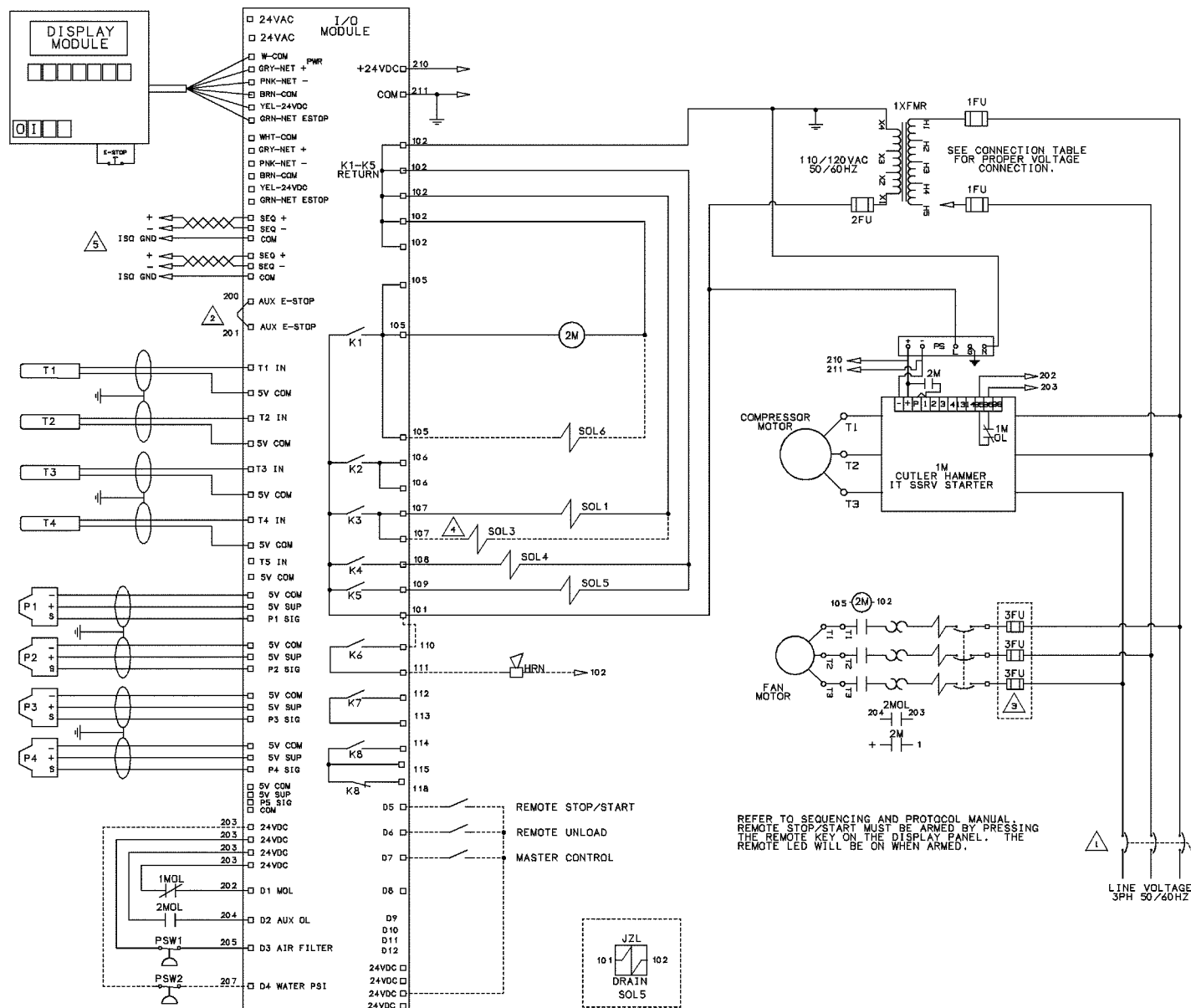


Figure 2-22: TS20C SSRV NC SUPV AC/WC

COMP	DESCRIPTION
1M	COMPRESSOR MOTOR
1MOL	COMPRESSOR OVERLOAD
2M	COOLER FAN STARTER/CANOPY FAN ON WATER COOLED
2MOL	COOLER/CANOPY FAN MOTOR OVERLOAD
3M	OPT'L POWER FACTOR CAPACITOR CONTACTOR
1FU	TRANSFORMER PRIMARY FUSES
2FU	TRANSFORMER SECONDARY FUSE
3FU	AUXILLIARY MOTOR BRANCH FUSES
P1	WET SUMP PRESSURE SENSOR
P2	PACKAGE DISCHARGE PRESSURE SENSOR
P3	OIL FILTER DISCHARGE PRESSURE SENSOR
P4	OIL FILTER UPSTREAM PRESSURE SENSOR
T1	UNIT DISCHARGE TEMPERATURE PROBE
T2	DRY DISCHARGE TEMPERATURE PROBE
T3	INJECTION OIL TEMPERATURE PROBE
T4	INTERSTAGE TEMPERATURE PROBE
PSW1	INLET AIR FILTER SWITCH 558.9 MM WC - 22 IN WC
PSW2	WATER PRESSURE SWITCH 10PSI - WC ONLY
SOL1	LOAD CONTROL SOLENOID VALVE
SOL3	START CONTROL SOLENOID VALVE 200 HP ONLY
SOL4	SEQUENCE SOLENOID VALVE
SOL5	COMBO DRAIN/JZL DRAIN SOLENOID VALVE
SOL6	OPT'L WATER SHUTOFF SOLENOID VALVE - WC ONLY
1XFMR	CONTROL VOLTAGE TRANSFORMER
K1	INTERNAL RUN RELAY CONTACT
K2	INTERNAL Y-DELTA RELAY CONTACT

COMP	DESCRIPTION
K3	INTERNAL LOAD CONTROL RELAY CONTACT
K4	INTERNAL SEQUENCE RELAY CONTACT
K5	INTERNAL ELECTRIC DRAIN RELAY CONTACT
K6	INTERNAL COMMON FAULT RELAY CONTACT
K7	INTERNAL COMMON WARNING RELAY CONTACT
K8	INTERNAL SPECIAL FUNCTION CONTACT
HRN	OPT'L AUDIBLE ALARM
HTR1	SUMP HEATER 2000 WATTS
HTR2	HEAT TRACE
HTR3	TRAP HEATER 50 WATTS
HTR4	CONTROL PANEL HEATER 50 WATTS
TH	THERMOSTAT FOR HEAT TRACE
NOTES: 1 CUSTOMER TO FURNISH FUSED OR CIRCUIT BREAKER DISCONNECT PER LOCAL CODES. 2 REMOVE JUMPER FOR AUXILIARY E-STOP STRING DEVICES. 3 FUSES FURNISHED FOR VOLTAGES GREATER THAN 480V 4 USED ONLY ON 200HP 5 BELDEN TYPE 9842 4 COND. 2 TWISTED PAIR W/SHIELD OR EQUIVALENT. TO MATCHING TERMINALS ON NEXT COMPRESSOR. REFER TO SUPERVISOR SEQUENCING PROTOCOL MANUAL	

Figure 2-23: TS20C CUST STR SUPV AC/WC

PRIMARY		SECONDARY	
VOLTS	TAPS	VOLTS	TAPS
200	H1-H2	110	X1-X4
220	H1-H2	110	X1-X3
230	H1-H2	115	X1-X3
240	H1-H2	120	X1-X3
380	H1-H3	110	X1-X3
400	H1-H3	115	X1-X3
416	H1-H3	120	X1-X3
440	H1-H4	110	X1-X3
460	H1-H4	120	X1-X3
480	H1-H4	115	X1-X3
500	H1-H5	110	X1-X4
525	H1-H5	115	X1-X4
550	H1-H5	110	X1-X3
575	H1-H5	115	X1-X3
600	H1-H5	120	X1-X3

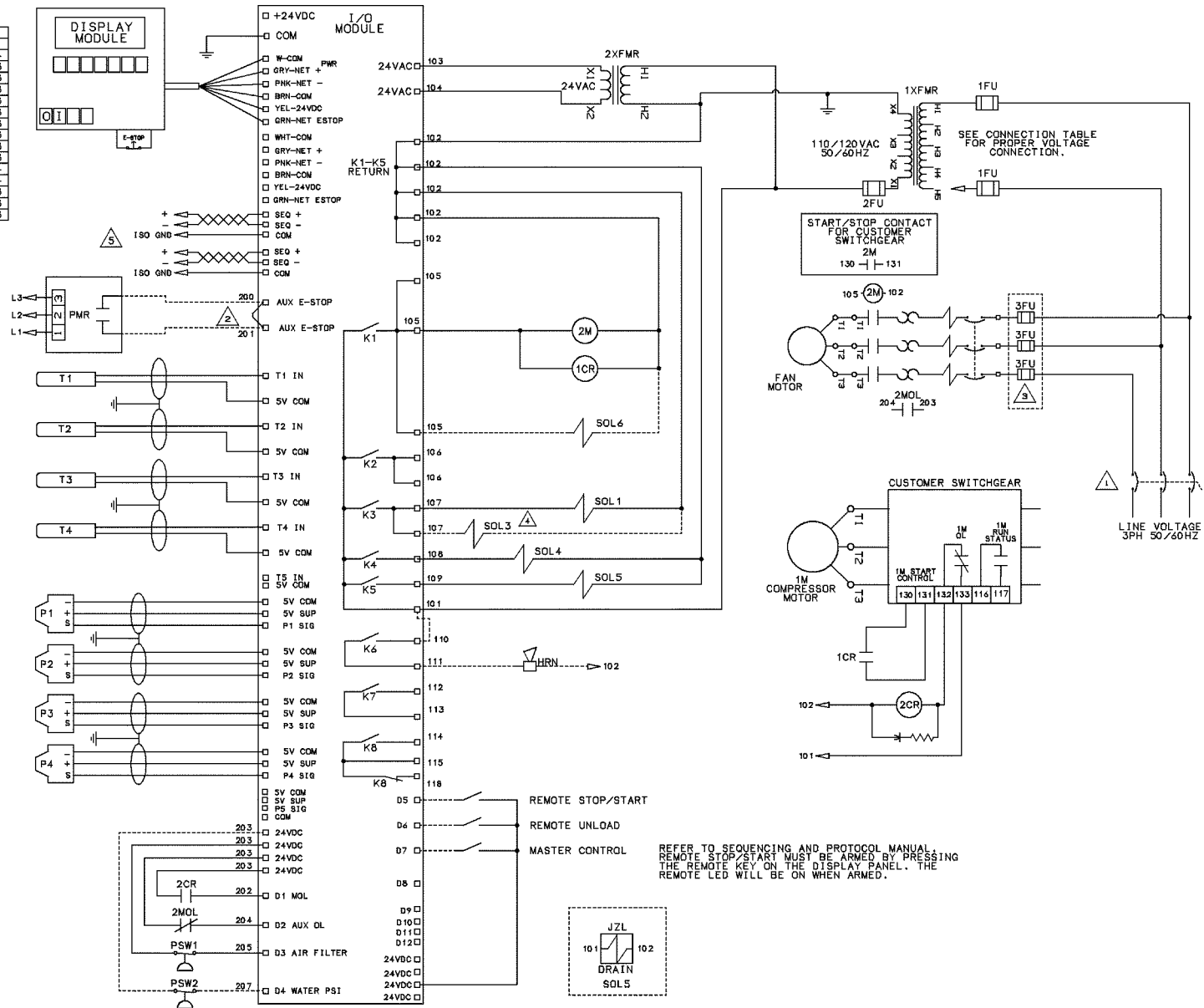
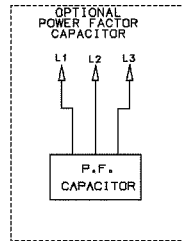
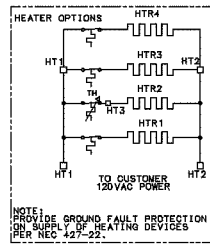


Figure 2-23: TS20C CUST STR SUPV AC/WC

COMP	DESCRIPTION
1M	COMPRESSOR MOTOR
1MOL	COMPRESSOR OVERLOAD
2M	COOLER FAN STARTER/CANOPY FAN ON WATER COOLED
2MOL	COOLER/CANOPY FAN MOTOR OVERLOAD
1FU	TRANSFORMER PRIMARY FUSES
2FU	TRANSFORMER SECONDARY FUSE
3FU	AUXILLIARY MOTOR BRANCH FUSES
P1	WET SUMP PRESSURE SENSOR
P2	PACKAGE DISCHARGE PRESSURE SENSOR
P3	OIL FILTER DISCHARGE PRESSURE SENSOR
P4	OIL FILTER UPSTREAM PRESSURE SENSOR
T1	UNIT DISCHARGE TEMPERATURE PROBE
T2	DRY DISCHARGE TEMPERATURE PROBE
T3	INJECTION OIL TEMPERATURE PROBE
T4	INTERSTAGE TEMPERATURE PROBE
PSW1	INLET AIR FILTER SWITCH 558.9 MM WC - 22 IN WC
PSW2	WATER PRESSURE SWITCH 10PSI - WC ONLY
SOL1	LOAD CONTROL SOLENOID VALVE
SOL3	OPT'L START CONTROL SOLENOID VALVE 200HP ONLY
SOL4	SEQUENCE SOLENOID VALVE
SOL5	COMBO DRAIN/JZL DRAIN SOLENOID VALVE
SOL6	OPT'L WATER SHUTOFF SOLENOID VALVE - WC ONLY
1XFMR	CONTROL VOLTAGE TRANSFORMER
2XFMR	SUPERVISOR STEPDOWN TRANSFORMER 24VAC
K1	INTERNAL RUN RELAY CONTACT
K2	INTERNAL Y-DELTA RELAY CONTACT

COMP	DESCRIPTION
K3	INTERNAL LOAD CONTROL RELAY CONTACT
K4	INTERNAL SEQUENCE RELAY CONTACT
K5	INTERNAL ELECTRIC DRAIN RELAY CONTACT
K6	INTERNAL COMMON FAULT RELAY CONTACT
K7	INTERNAL COMMON WARNING RELAY CONTACT
K8	INTERNAL SPECIAL FUNCTION CONTACT
PMR	OPT'L POWER MONITOR RELAY
HRN	OPT'L AUDIBLE ALARM
HTR1	SUMP HEATER 2000 WATTS
HTR2	HEAT TRACE
HTR3	TRAP HEATER 50 WATTS
HTR4	CONTROL PANEL HEATER 50 WATTS
1CR	1M STARTER RUN CONTROL RELAY
2CR	1M STARTER OVERLOAD INTERFACE RELAY
TH	THERMOSTAT FOR HEAT TRACE
NOTES: 1 CUSTOMER TO FURNISH FUSED OR CIRCUIT BREAKER DISCONNECT PER LOCAL CODES. 2 REMOVE JUMPER FOR AUXILIARY E-STOP STRING DEVICES. 3 FUSES FURNISHED FOR VOLTAGES GREATER THAN 480V 4 USED ONLY ON 200HP 5 BELDEN TYPE 9842 4 COND. 2 TWISTED PAIR W/SHIELD OR EQUIVALENT. TO MATCHING TERMINALS ON NEXT COMPRESSOR. REFER TO SUPERVISOR SEQUENCING PROTOCOL MANUAL	

Figure 2-24: TS20C MFV NC SUPV AC/RC

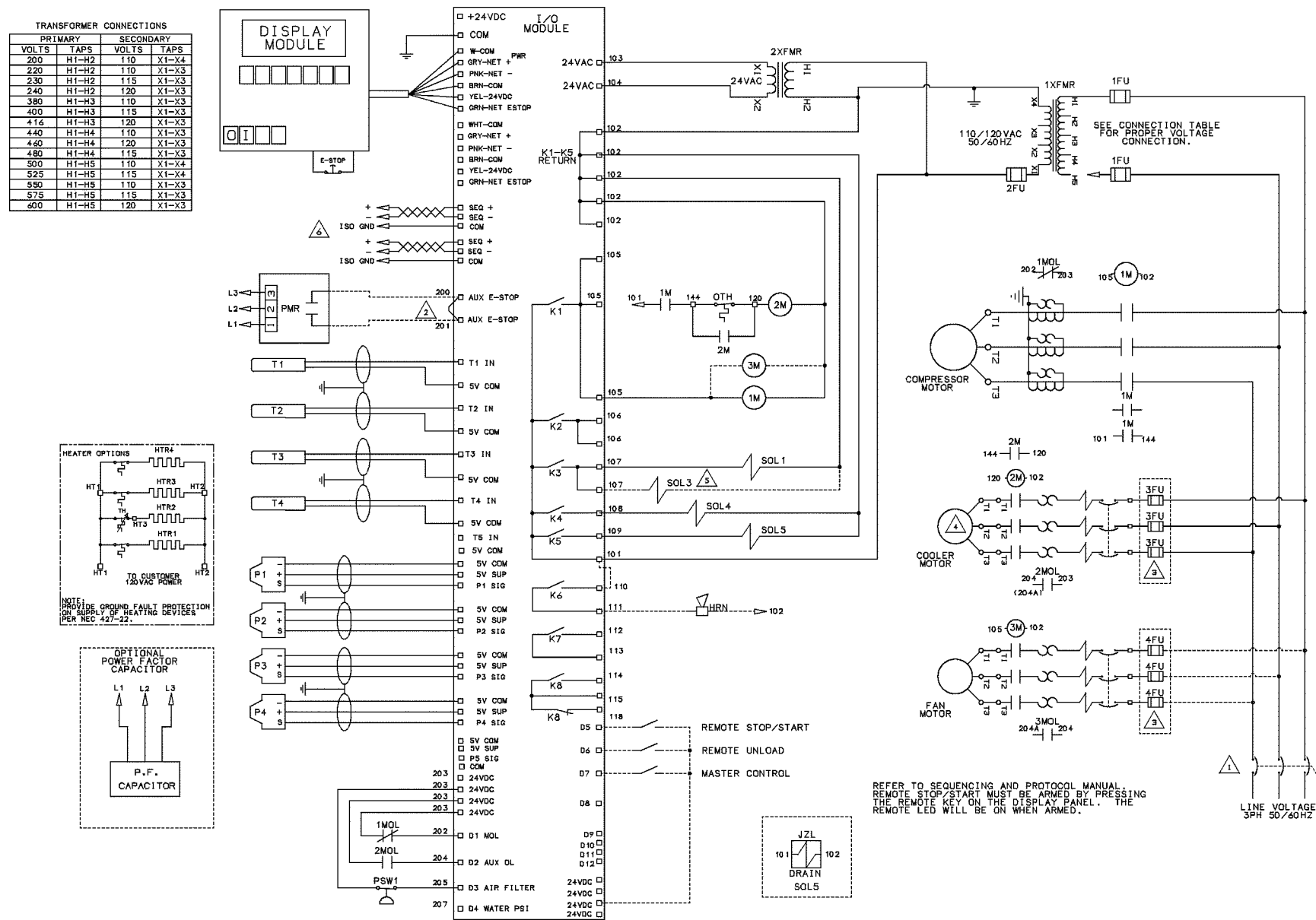


Figure 2-24: TS20C MFV NC SUPV AC/RC

COMP	DESCRIPTION
1M	COMPRESSOR MOTOR
1MOL	COMPRESSOR OVERLOAD
2M	COOLER FAN STARTER/CANOPY FAN ON WATER COOLED
2MOL	COOLER/CANOPY FAN MOTOR OVERLOAD
1FU	TRANSFORMER PRIMARY FUSES
2FU	TRANSFORMER SECONDARY FUSE
3FU	AUXILLIARY MOTOR BRANCH FUSES
P1	WET SUMP PRESSURE SENSOR
P2	PACKAGE DISCHARGE PRESSURE SENSOR
P3	OIL FILTER DISCHARGE PRESSURE SENSOR
P4	OIL FILTER UPSTREAM PRESSURE SENSOR
T1	UNIT DISCHARGE TEMPERATURE PROBE
T2	DRY DISCHARGE TEMPERATURE PROBE
T3	INJECTION OIL TEMPERATURE PROBE
T4	INTERSTAGE TEMPERATURE PROBE
PSW1	INLET AIR FILTER SWITCH 558.9 MM WC - 22 IN WC
PSW2	WATER PRESSURE SWITCH 10PSI - WC ONLY
SOL1	LOAD CONTROL SOLENOID VALVE
SOL3	OPT'L START CONTROL SOLENOID VALVE 200HP ONLY
SOL4	SEQUENCE SOLENOID VALVE
SOL5	COMBO DRAIN/JZL DRAIN SOLENOID VALVE
SOL6	OPT'L WATER SHUTOFF SOLENOID VALVE - WC ONLY
1XFMR	CONTROL VOLTAGE TRANSFORMER
2XFMR	SUPERVISOR STEPDOWN TRANSFORMER 24VAC
K1	INTERNAL RUN RELAY CONTACT
K2	INTERNAL Y-DELTA RELAY CONTACT
K3	INTERNAL LOAD CONTROL RELAY CONTACT
K4	INTERNAL SEQUENCE RELAY CONTACT

COMP	DESCRIPTION
K5	INTERNAL ELECTRIC DRAIN RELAY CONTACT
K6	INTERNAL COMMON FAULT RELAY CONTACT
K7	INTERNAL COMMON WARNING RELAY CONTACT
K8	INTERNAL SPECIAL FUNCTION CONTACT
PMR	OPT'L POWER MONITOR RELAY
HRN	OPT'L AUDIBLE ALARM
HTR1	SUMP HEATER 2000 WATTS
HTR2	HEAT TRACE
HTR3	TRAP HEATER 50 WATTS
HTR4	CONTROL PANEL HEATER 50 WATTS
1CR	1M STARTER RUN CONTROL RELAY
2CR	1M STARTER OVERLOAD INTERFACE RELAY
TH	THERMOSTAT FOR HEAT TRACE
NOTES: 1 CUSTOMER TO FURNISH FUSED OR CIRCUIT BREAKER DISCONNECT PER LOCAL CODES. 2 REMOVE JUMPER FOR AUXILIARY E-STOP STRING DEVICES. 3 FUSES FURNISHED FOR VOLTAGES GREATER THAN 480V 4 CUSTOMER WIRING REQ'D FROM COOLER MOTOR TO MACHINE MOUNTED STARTER 5 USED ONLY ON 200HP 6 BELDEN TYPE 9842 4 COND. 2 TWISTED PAIR W/SHIELD OR EQUIVALENT. TO MATCHING TERMINALS ON NEXT COMPRESSOR. REFER TO SUPERVISOR SEQUENCING PROTOCOL MANUAL	

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HEATER OPTIONS

HT1 HT2 HT3

HTR4 HTR3 HTR2 HTR1

TO CUSTOMER 120VAC POWER

NOTE: PROVIDE GROUND FAULT PROTECTION ON SUPPLY HEATING DEVICES PER NEC 427-22.

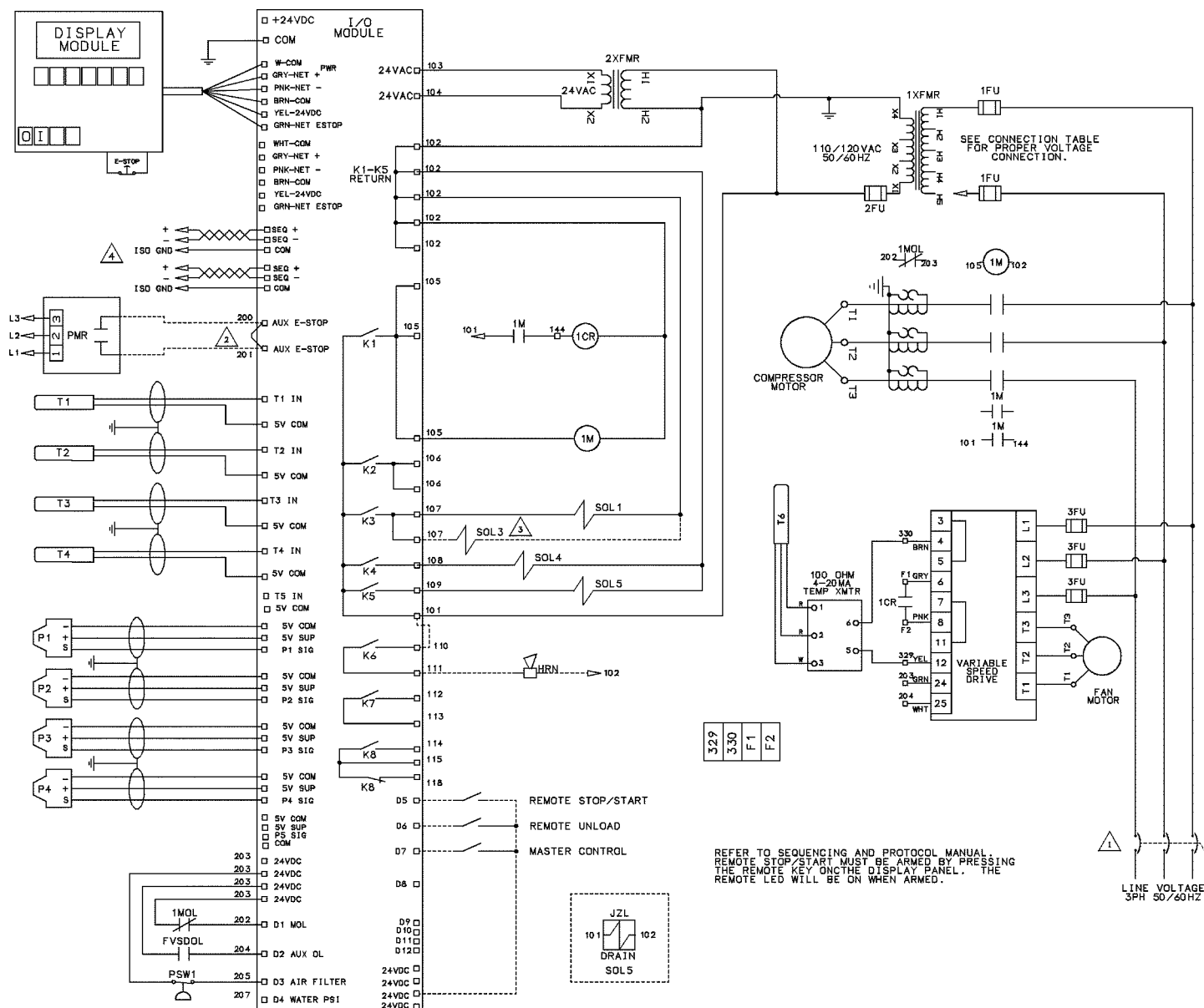
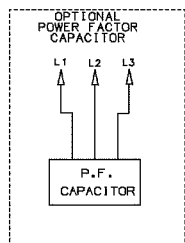


Figure 2-25: TS20C MFV NC SUPV AC VSD FAN

COMP	DESCRIPTION	COMP	DESCRIPTION
1M	COMPRESSOR MOTOR	HRN	OPT'L AUDIBLE ALARM
1MOL	COMPRESSOR OVERLOAD	HTR1	SUMP HEATER 2000 WATTS
1FU	TRANSFORMER PRIMARY FUSES	HTR2	HEAT TRACE
2FU	TRANSFORMER SECONDARY FUSE	HTR3	TRAP HEATER 50 WATTS
3FU	AUXILLIARY MOTOR BRANCH FUSES	HTR4	CONTROL PANEL HEATER 50 WATTS
P1	WET SUMP PRESSURE SENSOR	1CR	VSD FAN START RELAY
P2	PACKAGE DISCHARGE PRESSURE SENSOR	TH	THERMOSTAT FOR HEAT TRACE
P3	OIL FILTER DISCHARGE PRESSURE SENSOR	FVSDOL	FAN MOTOR VARIABLE SPEED DRIVE OVERLOAD
P4	OIL FILTER UPSTREAM PRESSURE SENSOR		
T1	UNIT DISCHARGE TEMPERATURE PROBE	NOTES: 1 CUSTOMER TO FURNISH FUSED OR CIRCUIT BREAKER DISCONNECT PER LOCAL CODES. 2 REMOVE JUMPER FOR AUXILIARY E-STOP STRING DEVICES. 3 USED ONLY ON 200HP 4 BELDEN TYPE 9842 4 COND. 2 TWISTED PAIR W/SHIELD OR EQUIVALENT. TO MATCHING TERMINALS ON NEXT COMPRESSOR. REFER TO SUPERVISOR SEQUENCING PROTOCOL MANUAL	
T2	DRY DISCHARGE TEMPERATURE PROBE		
T3	INJECTION OIL TEMPERATURE PROBE		
T4	INTERSTAGE TEMPERATURE PROBE		
T6	COOLER DISCHARGE TEMPERATURE PROBE		
PSW1	INLET AIR FILTER SWITCH 558.9 MM WC - 22 IN WC		
SOL1	LOAD CONTROL SOLENOID VALVE		
SOL3	OPT'L START CONTROL SOLENOID VALVE - 200HP ONLY		
SOL4	SEQUENCE SOLENOID VALVE		
SOL5	COMBO DRAIN/JZL DRAIN SOLENOID VALVE		
1XFMR	CONTROL VOLTAGE TRANSFORMER		
2XFMR	SUPERVISOR STEPDOWN TRANSFORMER 24VAC		
K1	INTERNAL RUN RELAY CONTACT		
K2	INTERNAL Y-DELTA RELAY CONTACT		
K3	INTERNAL LOAD CONTROL RELAY CONTACT		
K4	INTERNAL SEQUENCE RELAY CONTACT		
K5	INTERNAL ELECTRIC DRAIN RELAY CONTACT		
K6	INTERNAL COMMON FAULT RELAY CONTACT		
K7	INTERNAL COMMON WARNING RELAY CONTACT		
K8	INTERNAL SPECIAL FUNCTION CONTACT		
PMR	OPT'L POWER MONITOR RELAY		

Section 3

SPECIFICATIONS

3.1 TABLE OF SPECIFICATIONS—TS-20C

Model	HP	Hz	DIMENSIONS							
			Length		Width		Height (I)		Weight (II)	
			in	mm	in	mm	in	mm	lbs	kg
TS-20C	100	60	120	3048	72	1828.8	68	1727.2	7350	3333.9
TS-20C	125	60	120	3048	72	1828.8	68	1727.2	7600	3447.3
TS-20C	150	60	120	3048	72	1828.8	68	1727.2	7900	3583.4
TS-20C	200	60	120	3048	72	1828.8	68	1727.2	8100	3674.1
TS-20C	250	60	120	3048	72	1828.8	68	1727.2	8450	3832.9

(I) 78 in/198 cm required to service separator filter elements.

(II) With enclosure

3.2 TABLE OF SPECIFICATIONS—V200TS

Model	HP	Hz	DIMENSIONS							
			Length		Width		Height (I)		Weight (II)	
			in	mm	in	mm	in	mm	lbs	kg
V200TS	100	60	120	3048	72	1828.8	68	1727.2	7675	3333.9
V200TS	125	60	120	3048	72	1828.8	68	1727.2	7975	3447.3
V200TS	150	60	120	3048	72	1828.8	68	1727.2	8375	3583.4
V200TS	200	60	120	3048	72	1828.8	68	1727.2	8550	3674.1

(I) 78 in/198 cm required to service separator filter elements.

(II) With enclosure

3.3 COMPRESSOR SPECIFICATIONS

COMPRESSOR:	STANDARD MODELS:
Type:	Rotary Screw
Standard Operating Pressure (III):	see Specifications
Bearing Type:	Anti-friction
Ambient Temperature (Max.) (IV):	104°F (40°C)
Cooling:	Pressurized Fluid
Lubricant:	Sullube 32
Sump Capacity:	20 gallons
Control:	Supervisor
(III) Special compressors are available for operation at higher pressures.	
(IV) Special compressors are available for operating in higher ambient temperatures.	

3.4 MOTOR SPECIFICATIONS

MOTOR: (50 Hz Compressors)	STANDARD MODELS:
Size:	100-200 HP/75-150kW
Type:	Open Dripproof, Three Phase, 50 Cycles, A.C., 104°F (40°C) Maximum Ambient Temperature
Starter:	400V Full Voltage Magnetic
Speed:	1500 RPM

3.5 MOTOR SPECIFICATIONS

MOTOR: (60 Hz Compressors)	STANDARD MODELS:
Size:	100-250 HP/75-187kW
Type:	Open Dripproof, 460V, Three Phase, 60 Cycles, A.C., 104°F (40°C) Maximum Ambient Temperature, TEFC also available
Starter:	460V Full Voltage Magnetic Options Available: 200 to 230 and 575V
Speed:	1780 RPM

3.6 LUBRICATION GUIDE

Refer to *Figure 3-1* for the fluid fill port location. Sulliar's series compressors are filled and tested at the factory with **(20 GAL)** Sullube lubricant.



CAUTION

Contamination of compressor fluids with mineral oil or other fluids can cause foaming, filter plugging, or orifice line obstruction.



CAUTION

Do not mix different types of lubricants. Mixing lubricants can cause malfunctions or compressor damage: will void the compressor's warranty.

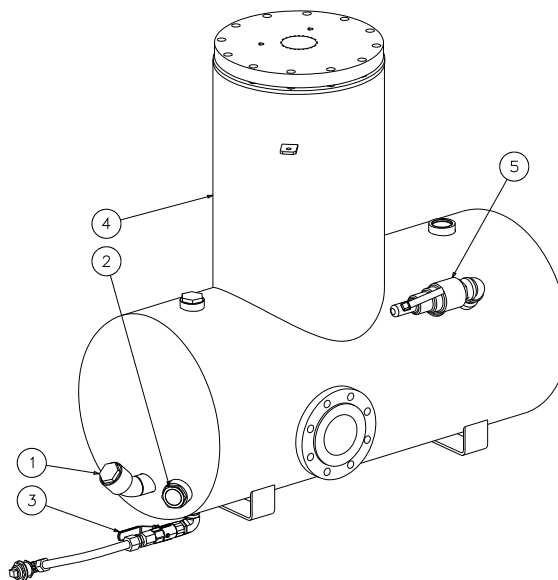


Figure 3-1: Fluid Fill Location

1. Fluid Fill Port
2. Fluid Level Sight Glass
3. Fluid Drain Valve
4. Air/Fluid Separator Tank
5. Relief Valve

NOTE

When performing a fluid change or topping off the fill, the proper level should be at half of the sight glass, with the machine off.

Mixing, changing or adding other lubricants within the compressor unit may void the air-end warranty.

3.7 APPLICATION GUIDE

Sulliar encourages its customers to participate in a fluid analysis program with the fluid suppliers. In some cases the analysis results suggest a fluid change interval which differs from the User Manual. Contact a Sulliar representative for details.

3.8 LUBRICATION CHANGE RECOMMENDATIONS AND MAINTENANCE, FLUID FILTER AND SEPARATOR

LUBRICANT	FLUID CHANGE	FLUID FILTER CHANGE	SEPARATOR CHANGE
Sullube	A,E	G,C	A,D
A - 8,000 hours or once per year, whichever comes first. 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 as the result of fluid analysis or known contamination. G - Every 2,000 hours.			

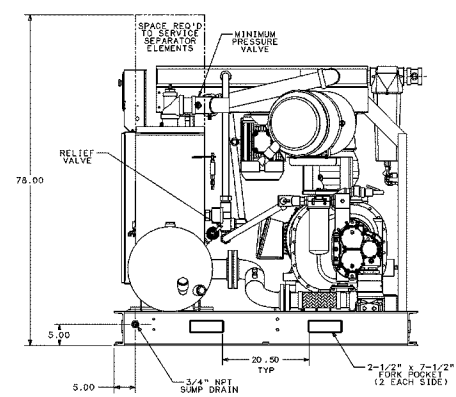
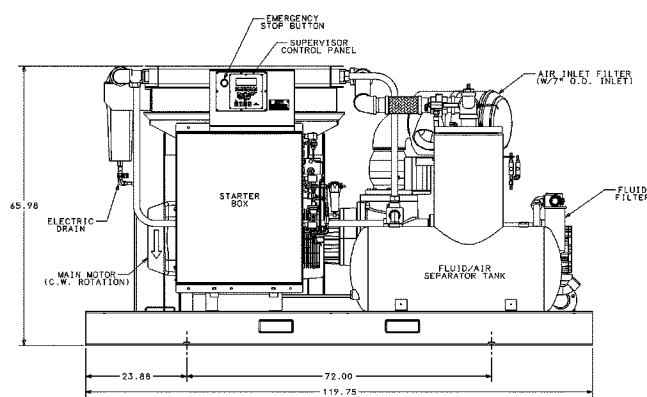
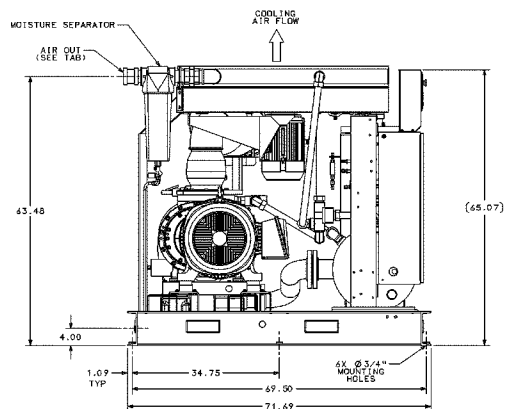
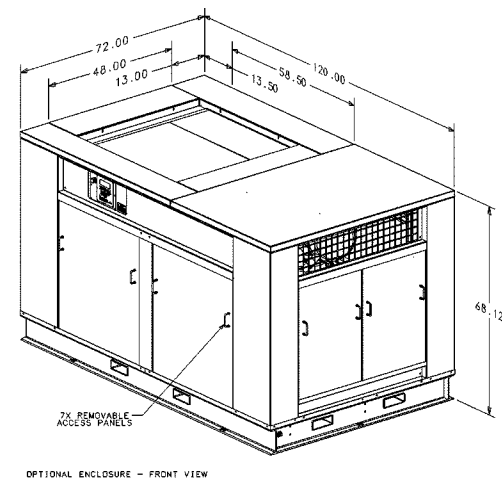
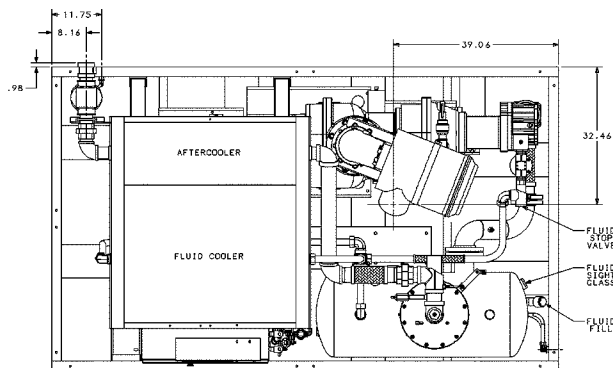
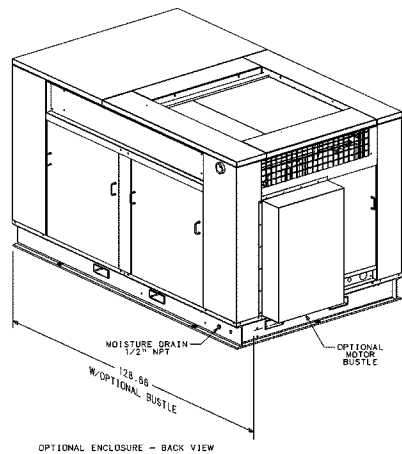
**CAUTION**

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 no 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.

Figure 3-2: Identification—TS20C (Typical)



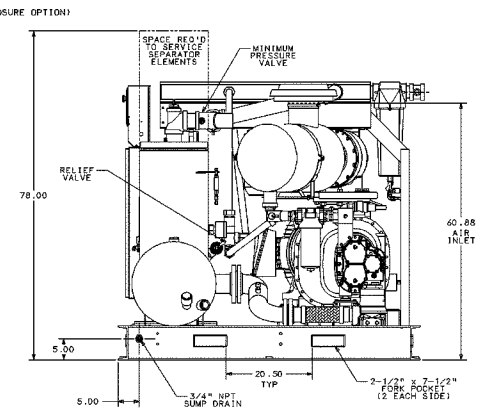
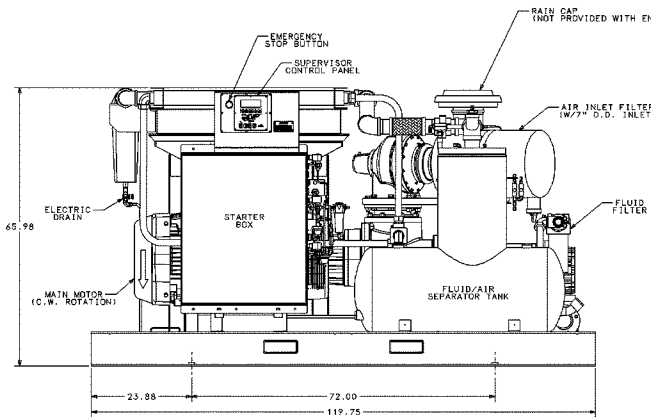
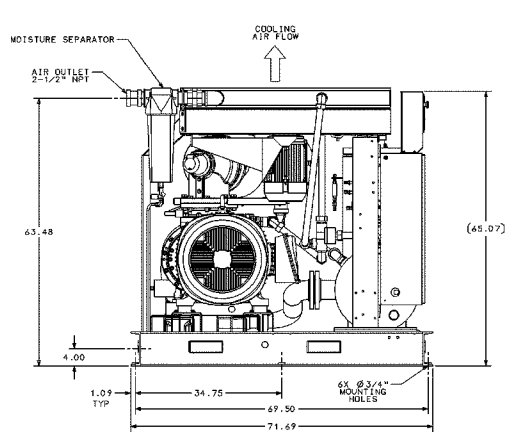
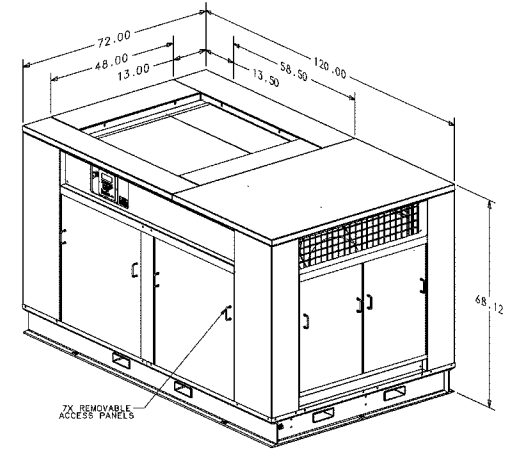
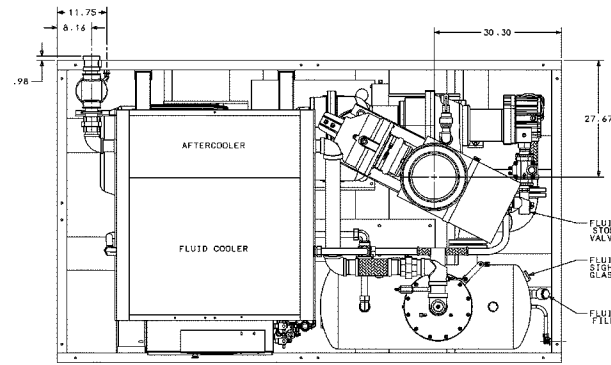
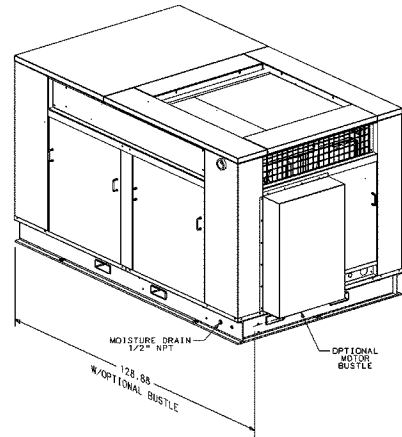
Identification—TS20C (Typical)

NOTES	
1.	ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2.	A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3.	ALL DIMENSIONS ARE +/- 1/2".
4.	APPROX. PACKAGE WEIGHT: SEE TABULATION
5.	RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

PACKAGE WEIGHTS			
PACKAGE HORSEPOWER	WEIGHT W/O ENCLOSURE	WEIGHT W/ ENCLOSURE	WEIGHT W/BUSTLED ENCLOSURE
100HP	6,400#	7,350#	7,400#
125HP	6,650#	7,600#	7,650#
150HP	6,950#	7,900#	7,950#

AIR OUTLET SIZE	
PACKAGE HORSEPOWER	AIR OUTLET PORT SIZE
100HP	2" NPT
125HP	2" NPT
150HP	2-1/2" NPT

Figure 3-3: Identification—TS2C0-200HP AC



Identification—TS2C0-200HP AC

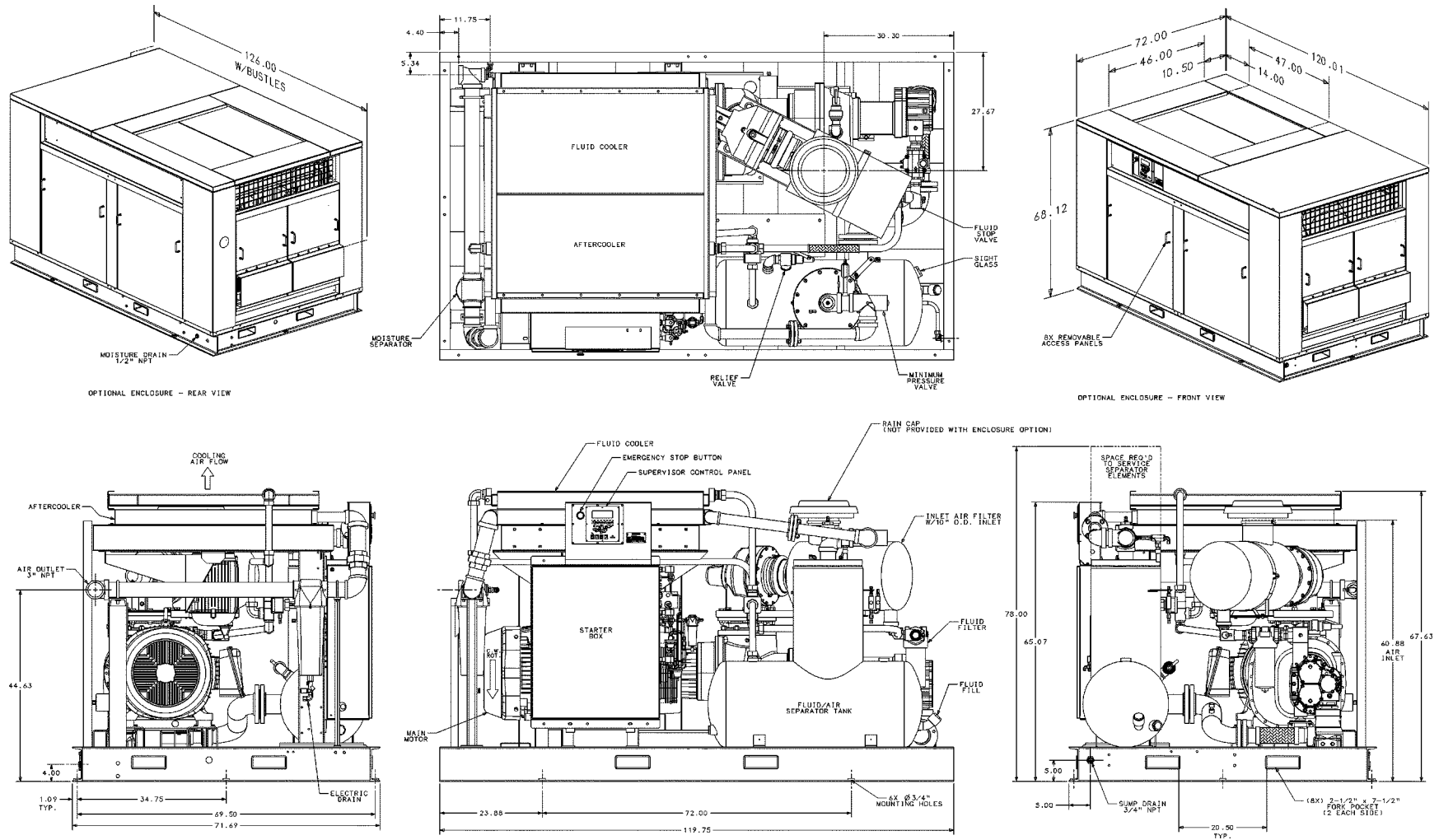
NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- 1/2".
4. APPROX. PACKAGE WEIGHT: SEE TABULATION
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

PACKAGE WEIGHTS

PACKAGE HORSEPOWER	WEIGHT W/O ENCLOSURE	WEIGHT W/ ENCLOSURE	WEIGHT W/ BUSTLED ENCLOSURE
200HP	7,150#	8,100#	8,150#

Figure 3-4: Identification—TS20C 250HP AC

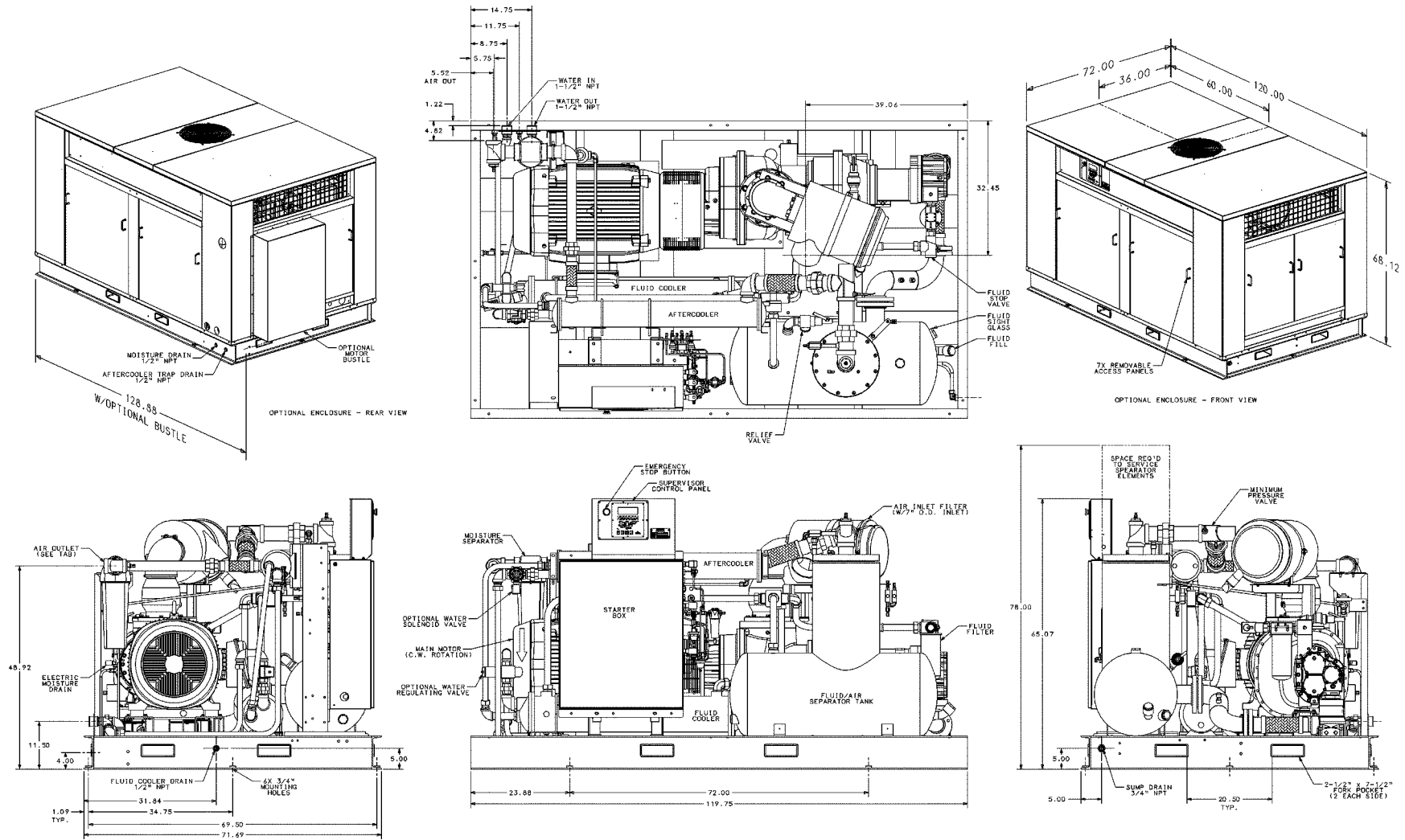


Identification—TS20C 250HP AC

NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- 1/2".
4. APPROX. PACKAGE WEIGHT:
7,500# W/O ENCLOSURE
8,450# W/ENCLOSURE
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

Figure 3-5: Identification—TS20C 100/150 WCAC SER



Identification—TS20C 100/150 WCAC SER
NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- 1/2".
4. APPROX. PACKAGE WEIGHT: SEE TABULATION
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

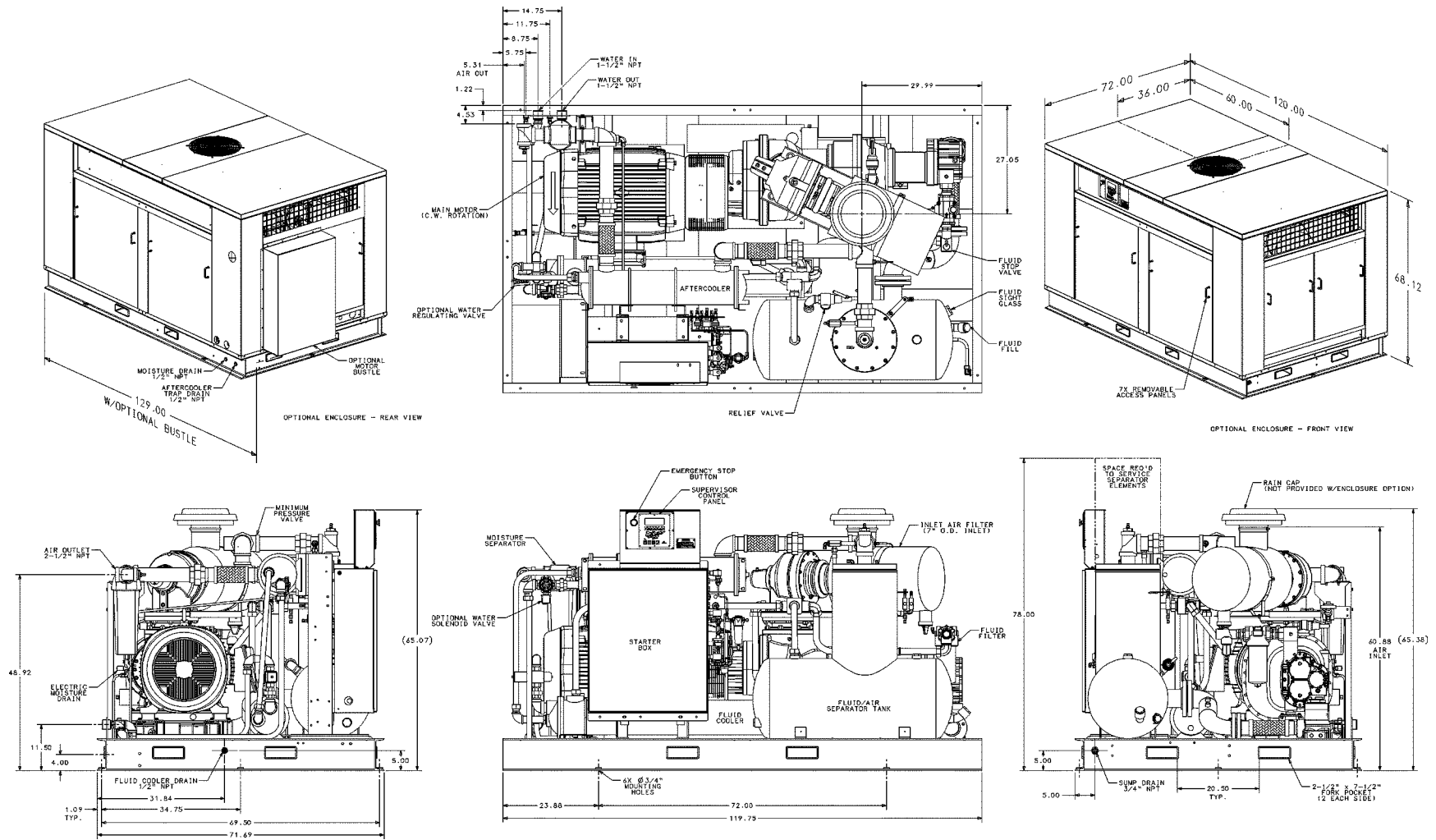
AIR OUTLET SIZE

PACKAGE HORSEPOWER	AIR OUTLET PORT SIZE
100HP	2" NPT
125HP	2" NPT
150HP	2-1/2" NPT

PACKAGE WEIGHTS

PACKAGE HORSEPOWER	WEIGHT W/O ENCLOSURE	WEIGHT W/ ENCLOSURE	WEIGHT W/ BUSTLED ENCLOSURE
100HP	6,150#	7,100#	7,150#
125HP	6,400#	7,350#	7,400#
150HP	6,700#	7,650#	7,700#

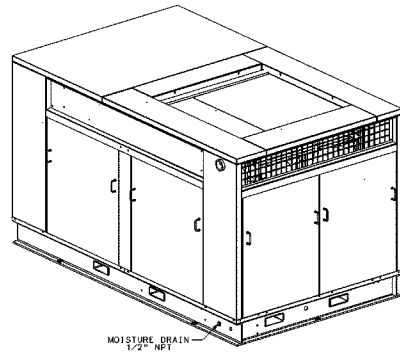
Figure 3-6: Identification—TS20C 200HP WCAC SER



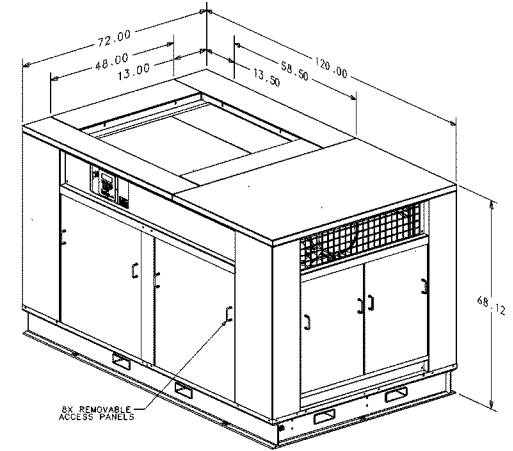
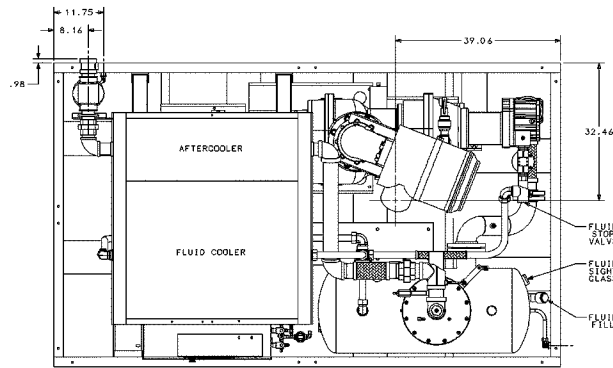
Identification—TS20C 200HP WCAC SER
NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- .1/2".
4. APPROX. PACKAGE WEIGHT: 6,900# W/O ENCLOSURE 7,850# W/ ENCLOSURE 7,900# W/BUSTLED ENCLOSURE
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

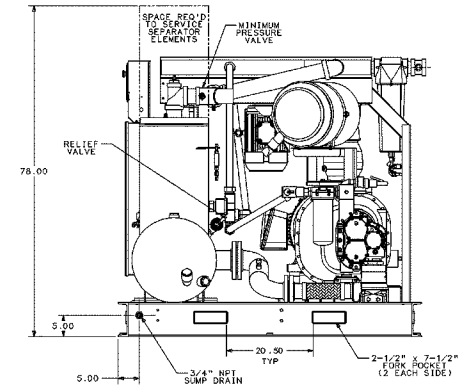
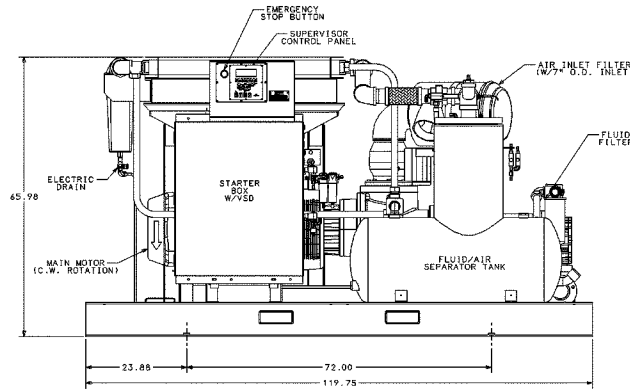
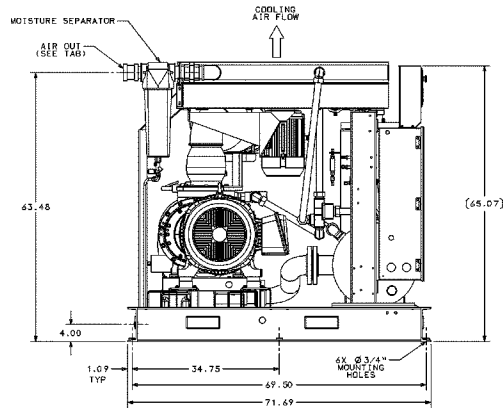
Figure 3-7: Identification—V200TS—100/150HP AC



OPTIONAL ENCLOSURE - BACK VIEW



OPTIONAL ENCLOSURE - FRONT VIEW



Identification—V200TS—100/150HP AC
NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- 1/2".
4. APPROX. PACKAGE WEIGHT: SEE TABULATION
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

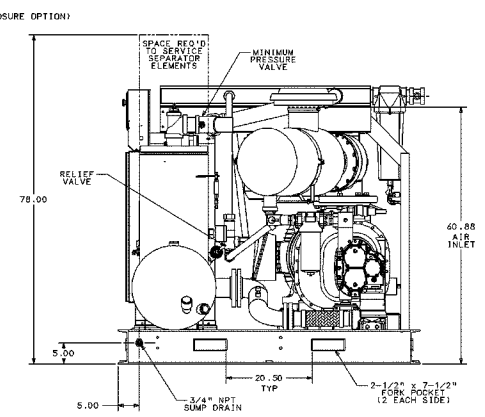
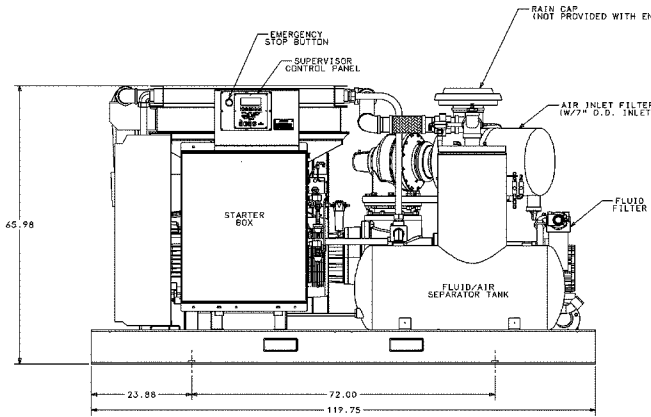
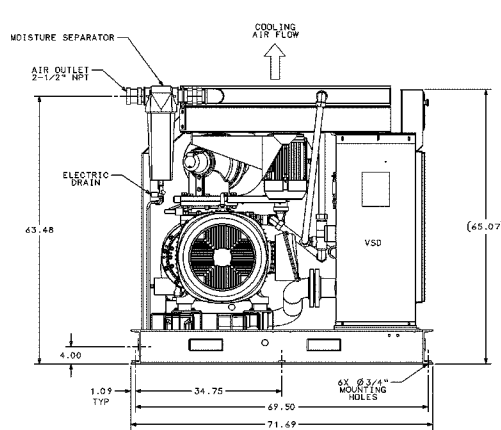
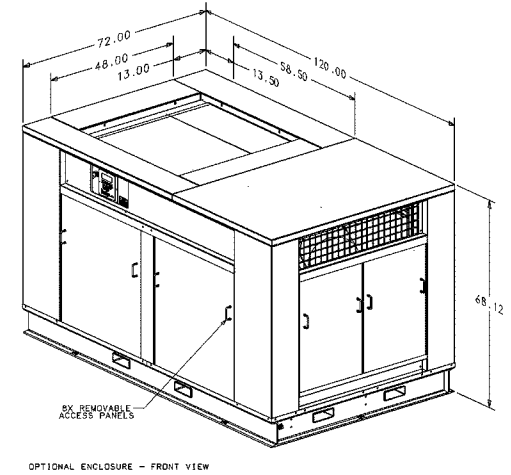
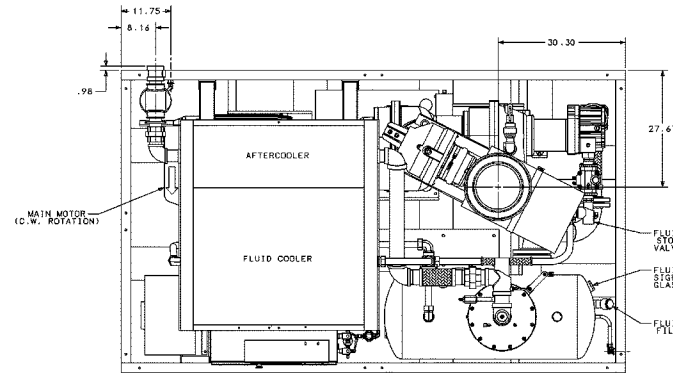
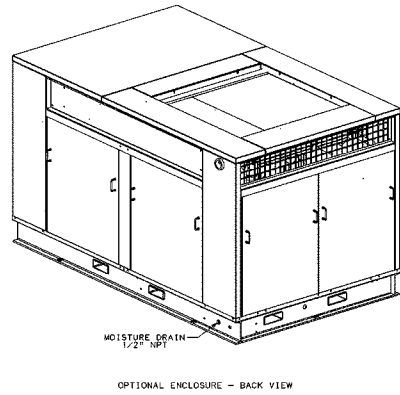
AIR OUTLET SIZE

PACKAGE HORSEPOWER	AIR OUTLET PORT SIZE
100HP	2" NPT
125HP	2" NPT
150HP	2-1/2" NPT

PACKAGE WEIGHTS

PACKAGE HORSEPOWER	WEIGHT W/O ENCLOSURE	WEIGHT W/ ENCLOSURE
100HP	6,700#	7,675#
125HP	7,000#	7,975#
150HP	7,400#	8,375#

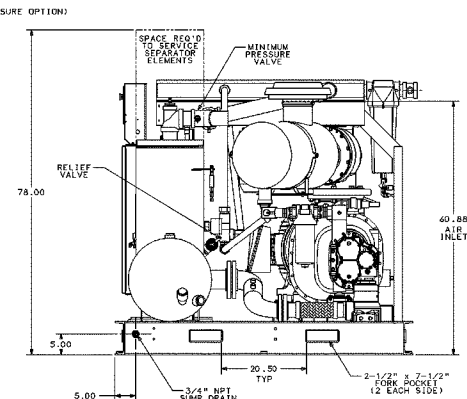
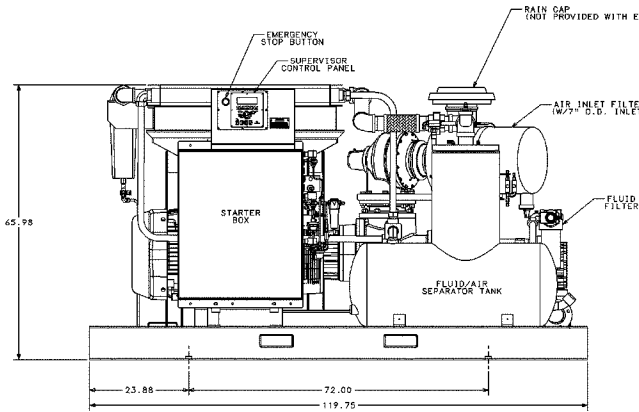
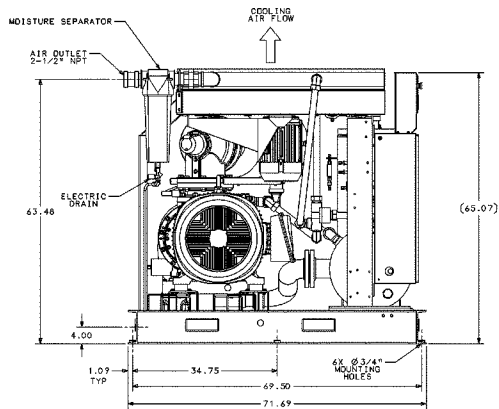
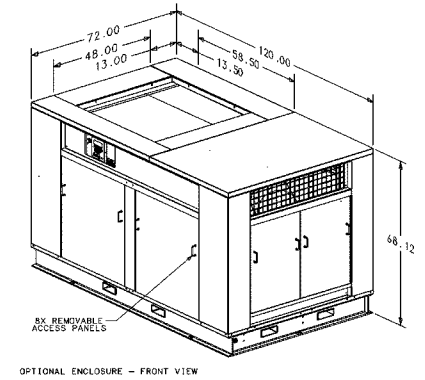
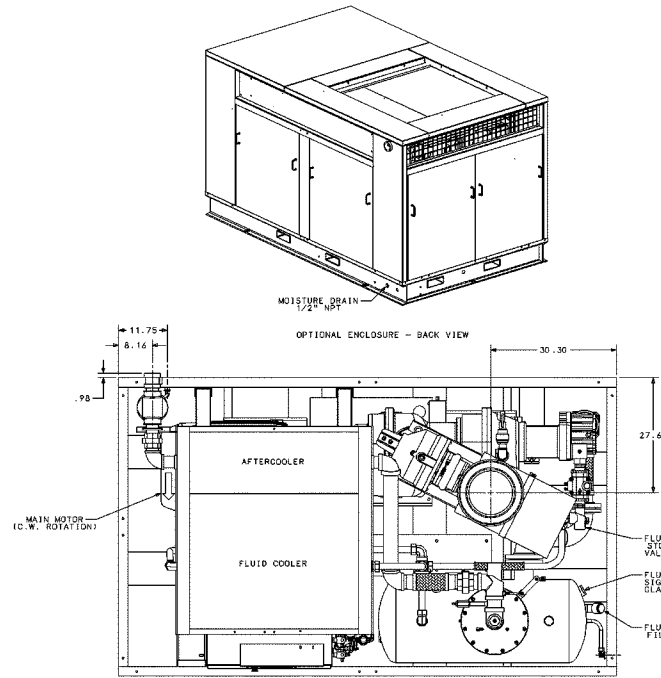
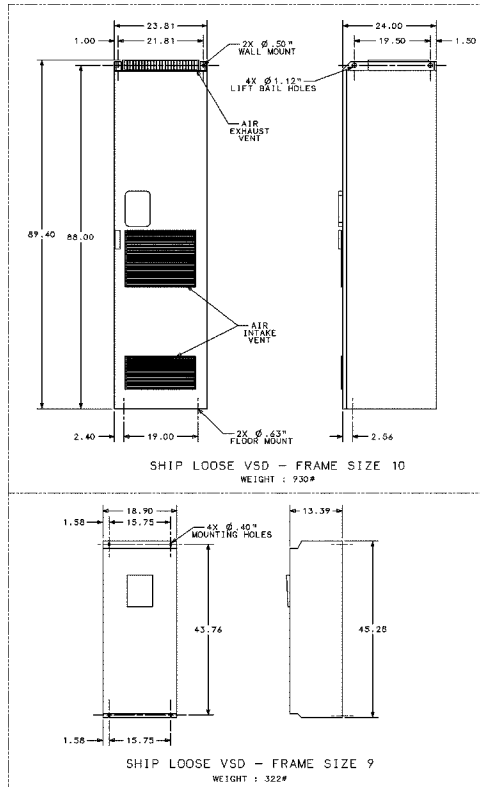
Figure 3-8: Identification—V200TS—200HP AC MTD VSD



NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- 1/2".
4. APPROX. PACKAGE WEIGHT:
7,575# W/O ENCLOSURE
8,550# W/ENCLOSURE
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

Figure 3-9: Identification—V200TS—150/200HP AC REM VSD



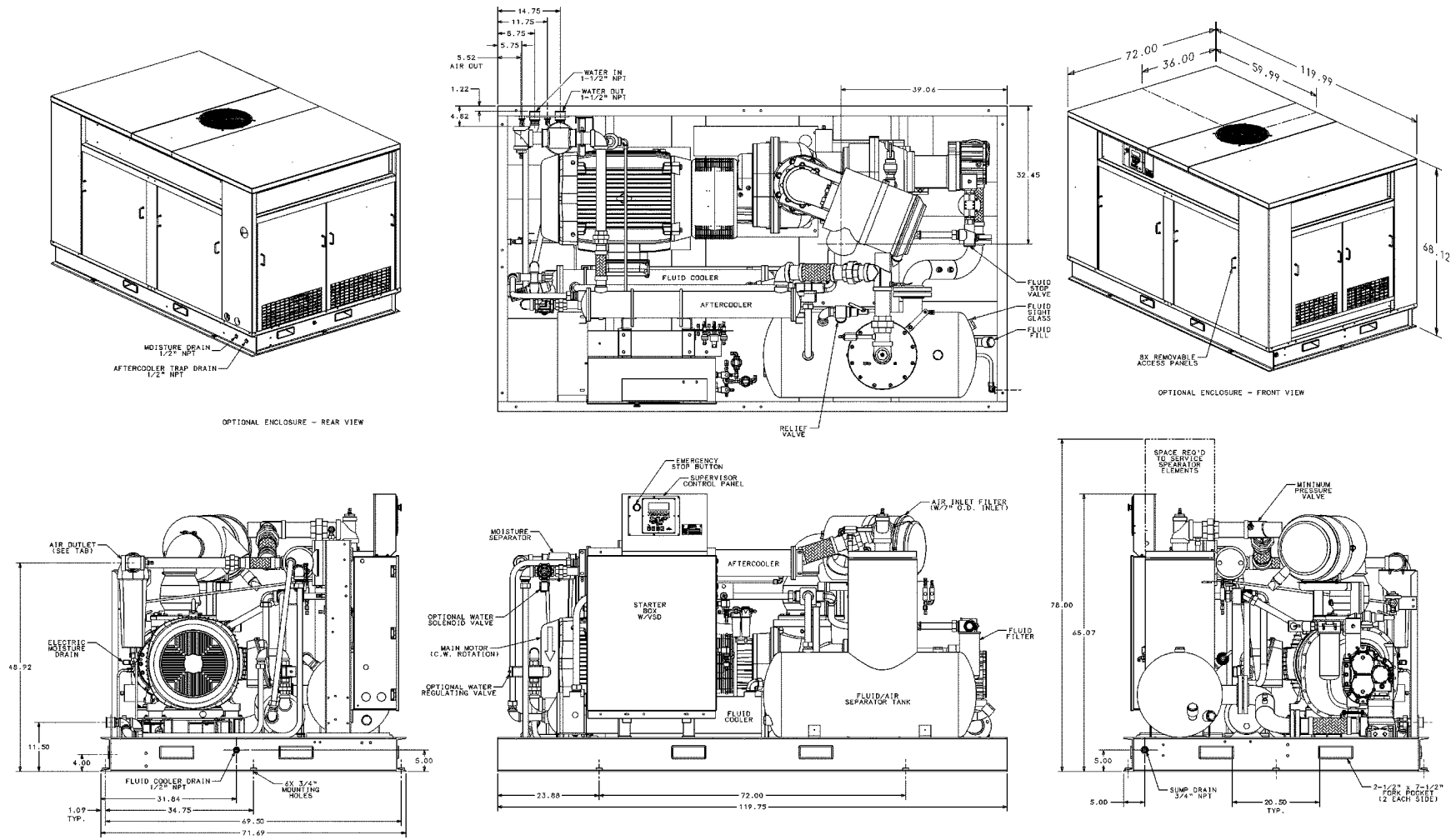
NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- 1/2".
4. APPROX. PACKAGE WEIGHT: SEE TABULATION
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

PACKAGE WEIGHTS

PACKAGE HORSEPOWER	WEIGHT W/O ENCLOSURE	WEIGHT W/ ENCLOSURE
150HP	6,950#	7,925#
200HP	7,150#	8,125#

Figure 3-10: Identification—V200TS—100/150HP WC SER



Identification—V200TS—100/150HP WC SER
NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- .1/2".
4. APPROX. PACKAGE WEIGHT: SEE TABULATION
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

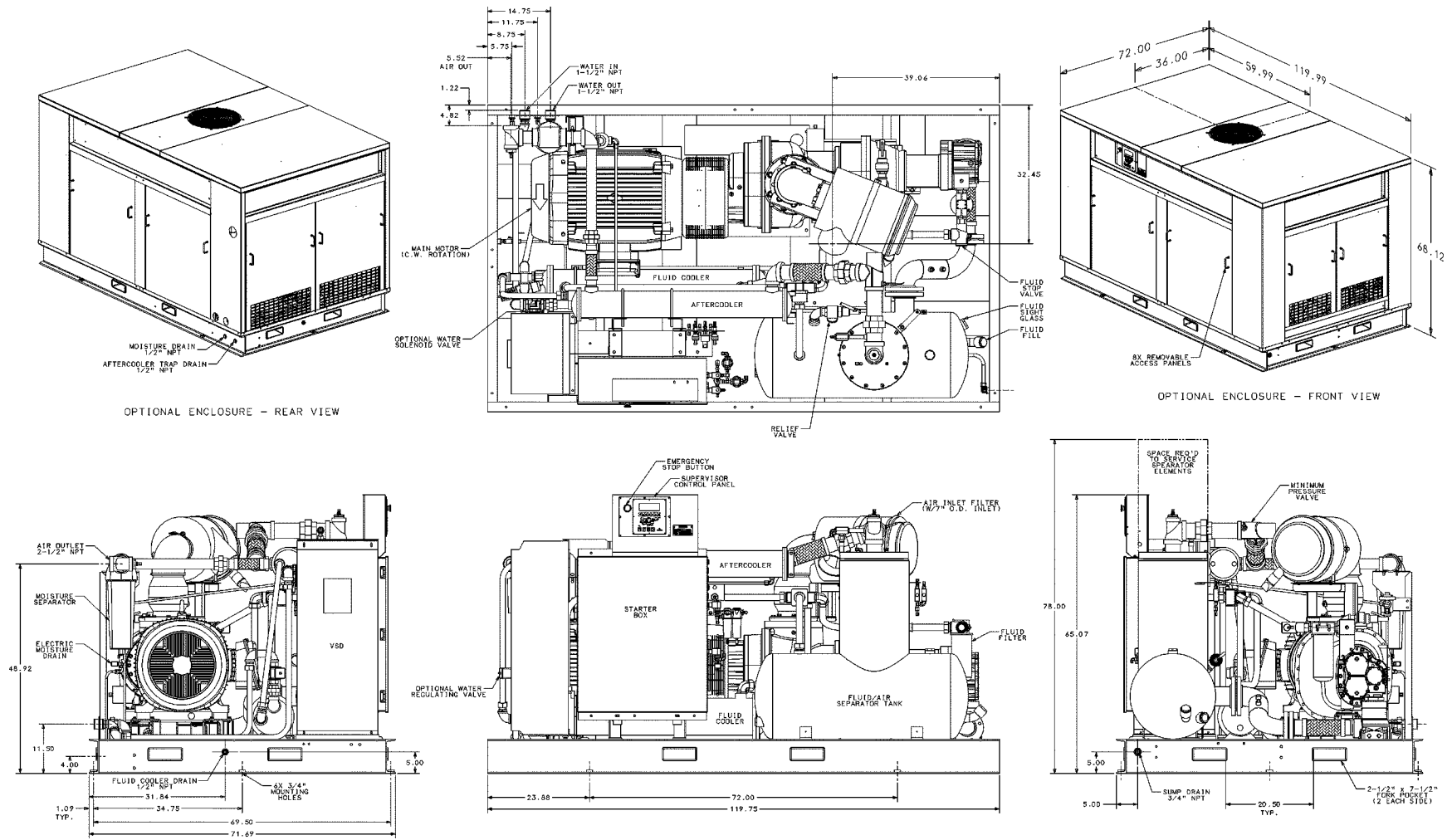
AIR OUTLET SIZE

PACKAGE HORSEPOWER	AIR OUTLET PORT SIZE
100HP	2" NPT
125HP	2" NPT
150HP	2-1/2" NPT

PACKAGE WEIGHTS

PACKAGE HORSEPOWER	WEIGHT W/O ENCLOSURE	WEIGHT ENCLOSURE
100HP	6,775#	7,750#
125HP	7,075#	8,050#
150HP	7,475#	8,450#

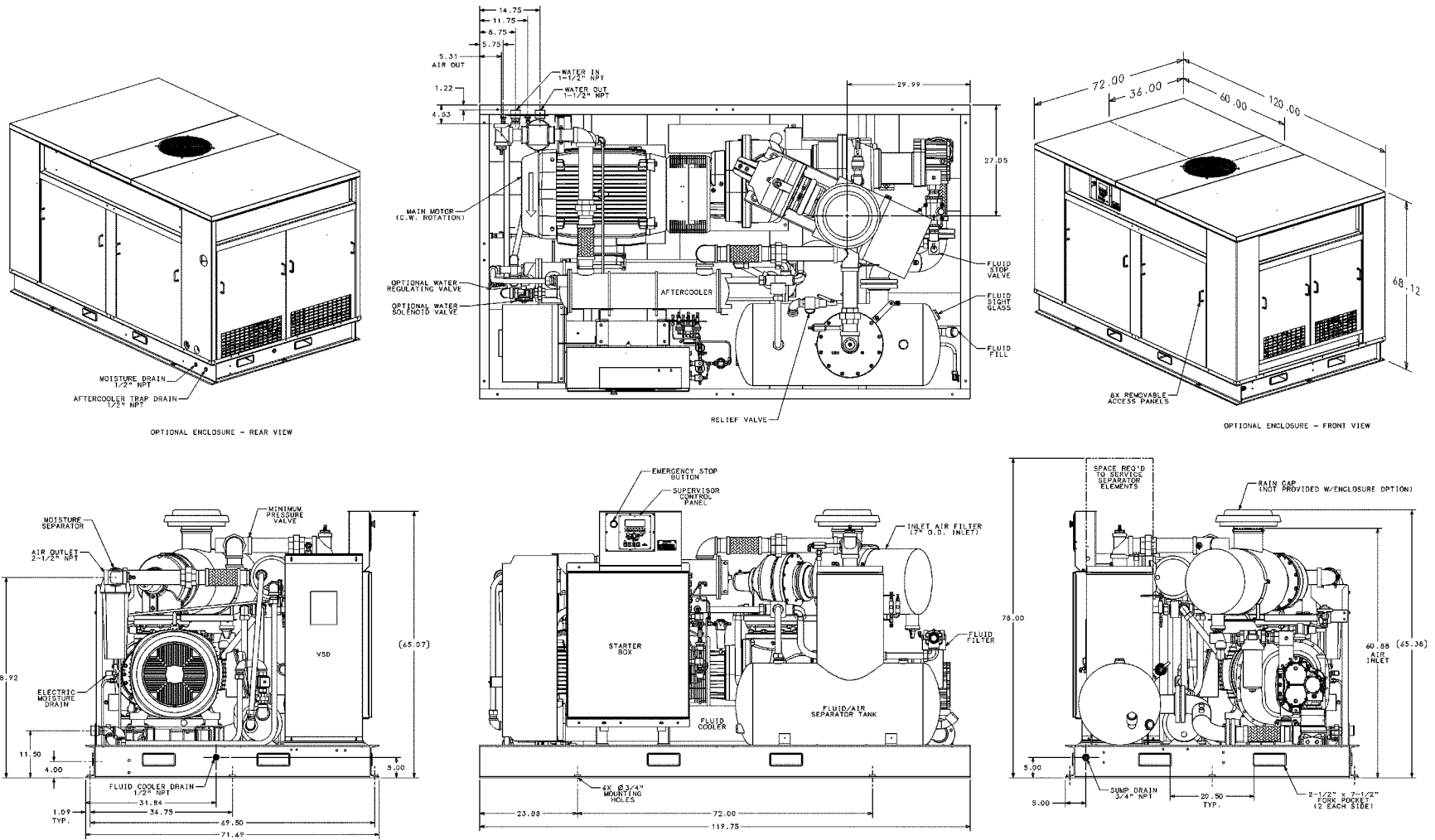
Figure 3-11: Identification—V200TS—150 WCAC SER MTD VSD



NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- .1/2".
4. APPROX. PACKAGE WEIGHT: 7,475# W/O ENCLOSURE 8,450# W/ ENCLOSURE
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

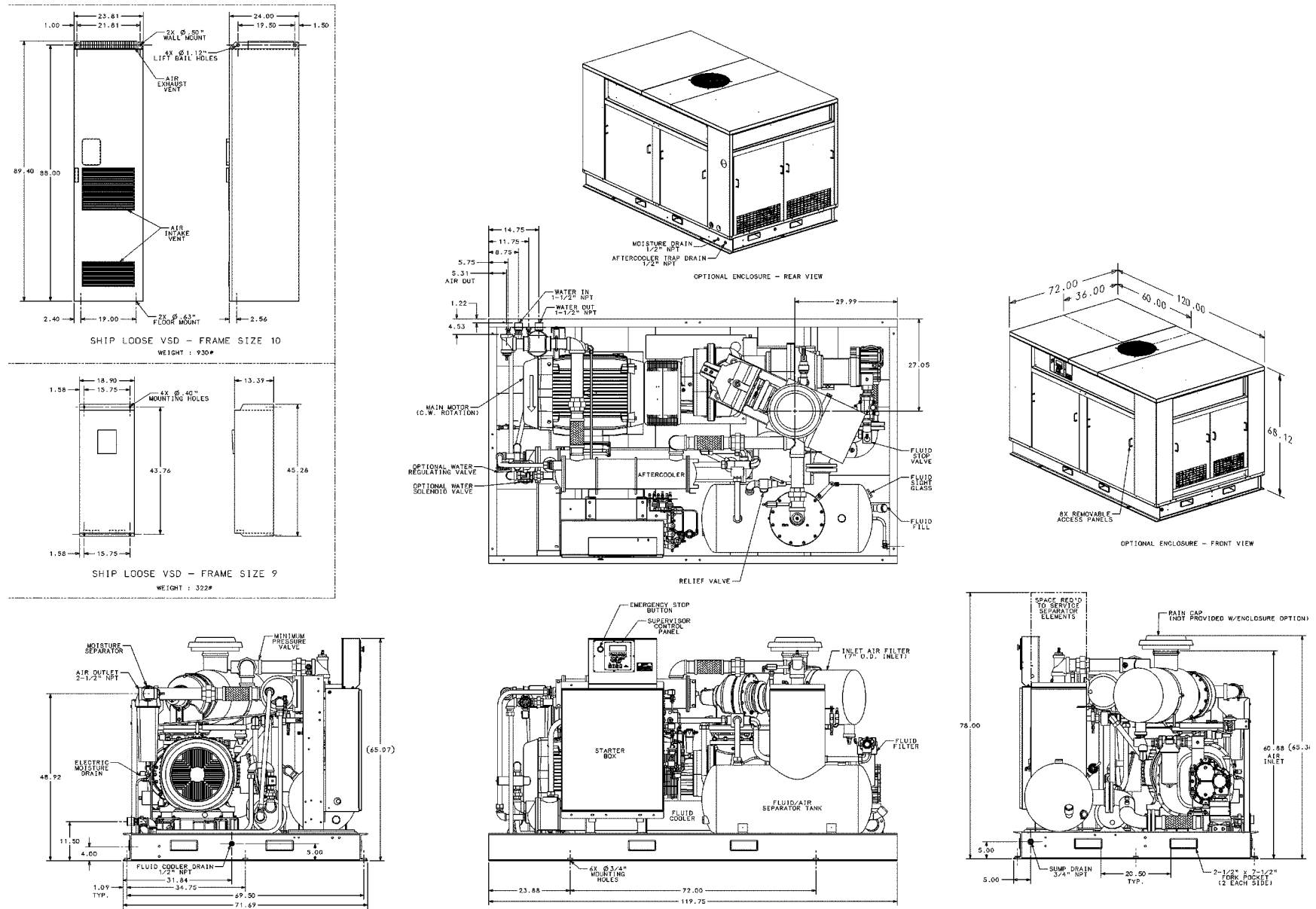
Figure 3-12: Identification—V200TS—200HP WCAC SER MTD VSD



Identification—V200TS—200HP WCAC SER MTD VSD
NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- 1/2".
4. APPROX. PACKAGE WEIGHT:
7,225# W/O ENCLOSURE
8,200# W/ENCLOSURE
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

Figure 3-13: Identification—V200TS—150/200 WCAC SER REM VSD



02250183-736 R01

Identification—V200TS—150/200 WCAC SER REM VSD
NOTES

1. ALLOW 4' MINIMUM CLEARANCE AROUND MACHINE FOR ACCESS AND FREE CIRCULATION OF AIR.
2. A FOUNDATION OR MOUNTING CAPABLE OF SUPPORTING THE WEIGHT OF THE MACHINE AND RIGID ENOUGH TO MAINTAIN THE COMPRESSOR FRAME LEVEL AND THE COMPRESSOR IN ALIGNMENT IS REQUIRED. THE COMPRESSOR FRAME MUST BE LEVELED AND SECURED WITH FOUNDATION BOLTS, AND FULL UNIFORM CONTACT MUST BE MAINTAINED BETWEEN THE FRAME AND FOUNDATION. IT IS RECOMMENDED THAT THE FRAME BE GROUTED TO THE FOUNDATION. THE COMPRESSOR UNIT AND DRIVER MUST BE ALIGNED (IF APPLICABLE) AFTER THE FRAME INSTALLATION IS COMPLETED AS SPECIFIED IN THE OPERATORS MANUAL. NO PIPING LOADS SHALL BE TRANSMITTED TO THE MACHINE BY EXTERNAL CONNECTIONS.
3. ALL DIMENSIONS ARE +/- 1/2".
4. APPROX. PACKAGE WEIGHT: SEE TABULATION
5. RECOMMENDED INCOMING CUSTOMER POWER SUPPLY TO BE ON UPPER LEFT SIDE OF ELECTRICAL ENCLOSURE.

PACKAGE WEIGHTS

PACKAGE HORSEPOWER	WEIGHT W/O ENCLOSURE	WEIGHT W/ ENCLOSURE
150HP	6,700#	7,675#
200HP	6,900#	7,875#

NOTES

Section 4

INSTALLATION

4.1 COMPRESSOR MOUNTING— SUPPORT AND LOCATION

A foundation or mounting capable of supporting the weight of the compressor, and rigid enough to maintain the compressor frame level and the compressor in alignment is required. The compressor frame must be leveled and secured with foundation bolts, and full uniform contact must be maintained between the frame and foundation. It is recommended that the frame be grouted to the foundation. The compressor unit and driver must be aligned after installation as specified in the Operator's Manual. No piping loads shall be transmitted to the compressor or the cooling package at the external connections.

Piping loads must be eliminated through the use of flex connectors or other systems which prevent piping loads from being transmitted to the compressor.

Special consideration should be made to meet national and local electrical codes for the required space around and in front of the electrical panel. Lighting should be provided for future service requirements.

Accessibility for fork lift trucks, overhead cranes and maintenance vehicles should be given careful consideration in order to provide any maintenance that may be required. Adequate space around the unit should be provided for access to all components of the compressor.

Softer surfaces in walls or ceilings will absorb sound and minimize ambient noise levels. Harder, reflective surfaces will increase ambient noise levels.

Water-cooled compressors must have permission for cooling water supply and drainage available.

NOTE

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

4.2 VENTILATION AND COOLING

AIR-COOLED COMPRESSORS

An area with adequate space must be provided for the compressor and its components. Air-cooled compressors require a minimum of 3 feet (1 meter) around the perimeter of the compressor.

The location should be free from standing water and allow access to clean air that is free from exhaust and paint fumes, dust, metal filings or caustic chemicals.

Cooling air should be removed from the area in order to prevent the re-introduction of heated exhaust air back into the compressor's cooling system.

Reduced headroom above the compressor will require that cooling air be either ducted or in some way deflected away from the compressor. Inadequate ventilation will result in higher ambient operating temperatures.

NOTE

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

A weather hood 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 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 on and around the compressor drops or may drop below 35°F (1.7°C).

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

WATER-COOLED COMPRESSORS

Adequate cooling water flow must be supplied to water-cooled compressors. Water delivery must be verified to assure constant delivery per columns outlined in Table 4-1: Water Flow Requirements. The figure shown are for full-load operation utilizing an aftercooler. Cooler water will reduce water-flow requirements and warmer water will increase water-flow requirements.

Consult the Sullair Service Department for assistance in these setups.

Water quality is critical to proper cooling of the compressor. Excessive build-up of lime, scale or other deposits can restrict the flow of water to the compressor. These deposits act as a thermal insulator and reduce the efficiency of the water cooler.

The cleaning of piping and water coolers is the customer's responsibility. Inspect all piping for

deposits and clean as necessary. Refer to Water Quality Recommendations on page 103.

Table 4-2: Ventilation Requirements indicates the minimum ventilation requirements necessary to keep the compressor running at its normal operating temperature. The fan air requirement is the amount of air, which must flow through the compressor for proper ventilation. The heat rejection is the amount of heat that is radiated by the compressor. This heat must be removed to assure a normal operating temperature. With air-cooled compressors (100-200HP) it is possible to use this heat for space heating, providing additional pressure drop across the fan does not exceed 0.2 in W.C. Consult a Sullair office for assistance in utilizing this heat. If ductwork is added, the high static fan option is required.

DO NOT install compressor where it will be exposed to temperatures less than 32°F (0°C) without freeze protection. Consult factory for machine operation in ambient temperature less than 32°F (0°C).

If machine is equipped with water regulating valve, use the water regulating valve to adjust compressor temperature to maintain a minimum of 180°F (82.2°C); 190°F (87.8°C) for 24KT.

Temperature and pressure gauges should be installed in the water piping for use in troubleshooting of the water system. Water pressure should ideally be between 25 and 75 psig (1.7 to 5.2 bar) but must not be above 145 psig (10 bar).

Table 4-1: Water Flow Requirements				
	HP/kW	Water Temp. °F (°C)	Water Flow (Typical) GPM	Water Flow (Typical) LPM
TS20C/V200TS	100HP/75kW	70 (21)	14.0	15.3
TS20C/V200TS	100HP/75kW	80 (27)	18.75	71
TS20C/V200TS	125HP/93kW	70 (21)	17.5	66
TS20C/V200TS	125HP/93kW	80 (27)	23.5	89
TS20C/V200TS	150HP/112kW	70 (21)	21.0	79.5
TS20C/V200TS	150HP/112kW	80 (27)	28.0	106
TS20C/V200TS	200HP/150kW	70 (21)	40	151
TS20C/V200TS	200HP/150kW	80 (27)	44	166
TS20C/V200TS	250HP/187kW	70 (21)	49	185
TS20C/V200TS	250HP/187kW	80 (27)	54	204
NOTE: Recommended water pressure range is 25 to 75 psig (1.7 to 5.2 bar).				

Table 4-2: Ventilation Requirements (Typical)										
Cooling Type	Air-Cooled					Water-Cooled				
Motor HP/Kw:	100/75	125/93	150/112	200/150	250/187	100/75	125/93	150/112	200/150	250/187
Vent Fan Flow CFM, (I)	10000	14000	14000	17000	22000	2,370 (I)	2,370 (I)	2,370 (I)	2,370 (I)	2,370 (I)
Heat Rejection BTU/Hour	301980	356160	442140	583140	686880					
(I) Applies to compressors with canopy only (vent fan).										

WATER SYSTEM VENTING

Vent the system upon installation or after draining the system on start-up:

1. Open the water valve(s) allowing water to flow to the system.
2. Open the plugs (located in the water side of the aftercooler and the lubricant cooler) and allow all air to escape from the system. When water is observed at the plugs, re-install the plugs.

The system is now vented.

DRAINING THE WATER SYSTEM

If the system needs to be drained completely, follow the steps outlined below:

1. At the rear of the unit. Disconnect both the inlets and discharge water lines.
2. Remove the drain plugs located at the bottom of the aftercooler and lubricant cooler.
3. Allow the system to drain completely.

WATER QUALITY RECOMMENDATIONS

Water quality considerations are crucial to the effective operation of a water-cooled compressor and yet are the most often ignored. Premature failure of components can often be traced to a reduction in heat-transfer rate that has resulted from a reduced flow rate due to scale build-up in water-cooling lines or the coolers themselves.

SCALE

Scale is formed from calcium carbonate, which

precipitates out of water. Calcium content tends to be higher in water taken from wells than water taken from the surface of lakes. A higher pH value will also assist in the formation of lime scale. In all cases calcium will form when water that has dissolved calcium is heated. It then forms lime-scale on surfaces such as the inside of pipes and the tubing that comprises water coolers. Scale formation on the inside of pipes and inside of heat exchangers acts as a thermal insulator. This causes coolers to be less effective, and piping to have reduced water flow, making them less effective. Over time lime scale build-up can reduce water flow by 80% or greater. This renders the cooling system ineffective and will damage the system. Scale can be controlled with water treatment.

CORROSION

As contrasted to lime scale build-up, corrosion eventually causes a reduction in the wall thickness of pipes. High levels of dissolved oxygen and low pH levels assist in the creation of corrosion scale. A thin coating of lime scale is often beneficial in helping to prevent corrosion from forming.

BIOLOGICAL AND ORGANIC FOULING (SLIME)

The heightened temperatures of compressor cooling operations help to reduce the likelihood that organic fouling will become a major concern. In the event of an infestation, commercial chemical shock treatments are available to control any outbreaks.

To ensure maximum life expectancy and best performance of the compressor cooling system, refer

to Table 4-3: Water Tests.

<i>Table 4-3: Water Tests</i>		
Substances	Test Interval	Acceptable Concentration
Corrosivity Hardness, pH, Total Dissolved Solids, Temperature at inlet, Alkalinity	Monthly-if stable for 3 to 4 months, analyze quarterly	Langerlier Index 0 to 1
Iron	Monthly	<2 ppm
Sulphate	Monthly	<50 ppm
Chloride	Monthly	<50 ppm
Nitrate	Monthly	<2 ppm
Silica	Monthly	<100 ppm
Desolated Oxygen	Daily-if stable, analyze weekly	<0 ppm (as low as possible)
Oil & Grease	Monthly	<5 ppm
Ammonia	Monthly	<1 ppm

SEAWATER-COOLED UNITS

NOTE

If seawater is to be used for cooling, optional copper-nickel coolers must be selected.

Water cleanliness is critical for operation of the compressor. A strainer must be installed in the inlet piping of the water system. It is also recommended that a solenoid valve (normally closed) be installed into the water outlet side of the compressor system. Consult the Sullair Service Department for assistance in setting up these recommended precautionary functions. In addition, be aware the cleaning of coolers as a result of fouling is a customer responsibility.

The recommended flow rate cannot be exceeded. An orifice plate must be installed in the pipe-work at least 3.3 ft (1 m) before the cooler. The orifice size must be calculated to ensure that the maximum seawater flow rate cannot be exceeded. Without these precautions, the seawater flow rate through the cooler may be several times the recommended maximum, which will lead to rapid system failure.

Seawater Pressure psi (bar)	100/150HP	200/250HP
	Orifice size for 80 GPM orifice diameter in inch (mm) to give a maximum seawater flow of 80 GPM (302.8 l/min)	Orifice size for 160 GPM orifice diameter in inch (mm) to give a maximum seawater flow of 160 GPM (605.6 l/min)
25 (1.7)	.95 (24.1)	1.35 (34.3)
35 (2.4)	.88 (22.4)	1.24 (31.5)
45 (3.1)	.82 (20.8)	1.16 (29.5)
55 (3.8)	.78 (19.8)	1.10 (27.9)
65 (4.45)	.75 (19.1)	1.06 (26.9)
75 (5.2)	.72 (18.3)	1.02 (25.9)

No oil cooler manufacturer can guarantee that its products will have an indefinite life and for this reason, we suggest that the cooling system be designed to minimize any damage caused by oil cooler leaking. This can be achieved as follows:

The oil pressure should be maintained at a pressure higher than the seawater pressure. In the event of a leak occurring, the oil will be prevented from becoming contaminated.

When the hydraulic system is not in use, the coolers should be isolated from incoming seawater under pressure.

The seawater outlet pipe from the cooler should have an open run to waste piping.

OUTDOOR INSTALLATION (SHELTERED)

Many times a compressor must be installed outside due to available space or other jobsite conditions. When it 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

Discharge 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 and an air dryer can remove any carryover.

NOTE

VSD compressors are NEMA 12 rated which makes them unsuitable for outside installation or in locations where they will be exposed to outside elements. All ship loose are NEMA1 rated.

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 a receiver. The installation of a drip leg or multiple drip legs, installation of a line filter(s) and the installation of isolation valve or valves.

PIPE SIZING

Pipes should be sized as a minimum to match the dimensions of the compressor's discharge connection. All piping and fittings should be rated for the discharge pressure.

USE OF AUXILIARY RECEIVER

An auxiliary receiver should be used in cases where large demand swings are expected.

ISOLATION VALVE(S)

If isolation of the compressor from the service lines is

required, isolation valves should be installed close to 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 connection.

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

A built-in aftercooler 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 aftercooler is supplied with a combination condensate separator/trap. A drain line should be installed on the condensate drain.

NOTE

For low-volume systems that do not require an auxiliary receiver, compressor response time may need to be adjusted. Consult the Sullair Service Department for assistance.

4.4 COUPLING ALIGNMENT CHECK

No coupling alignment check is required. For maintenance requirements refer to parts replacement and adjustment procedures in the maintenance section of this manual.

4.5 FLUID LEVEL CHECK

The compressor is shipped fully charged with the proper amount of fluid. However, it is necessary to check the fluid level at the time of installation and during compressor operation. Check the fluid level 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 sump tank. To be able to see the fluid level it may be necessary to start the machine and build the 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 sump tank to the maximum allowable fluid level, which is center of the sight glass.

4.6 ELECTRICAL PREPARATION

Interior electrical wiring is installed at the factory. Required customer wiring should be done by a qualified electrician in compliance with OSHA, National Electric Code and/or any applicable local electrical codes. Customer to supply power via cam-lock located on end of enclosures. An electrical check should be made to ensure that the first start-up will be successful. The compressor and drive should be properly grounded/earthed in accordance with applicable codes, regulations, and 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 circuit is balanced and not overloaded by other electrical equipment. The length of wiring from a suitable electrical power source is critical because voltage drops can adversely affect the performance of the compressor.

The applied voltage must conform to the motor and compressor data plate ratings.



WARNING

Energized internal components are a potentially FATAL SHOCK HAZARD. Disconnect all power before performing any work on the compressor's electrical system.

1. Check incoming voltage. The incoming voltage must match the compressor's wire rating/specifications.
2. Check motor starting device and overload heater sizes.
3. Check all electrical connections for tightness.
4. Jog the motor for a direction of rotation check, as explained in Motor Rotation Direction Check on *Section 4.7*.

4.7 MOTOR ROTATION DIRECTION CHECK

Motor rotation check must be done at compressor start-up after the wiring has been installed. The compressor can be damaged if it runs in the wrong direction for more than a few seconds. Motor rotation can be viewed through the opening in the drive adapter housing. 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. When looking at the motor from the end opposite the compressor unit, the shaft should turn clockwise. If reverse rotation occurs, 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 drive housing to show proper motor/compressor rotation.

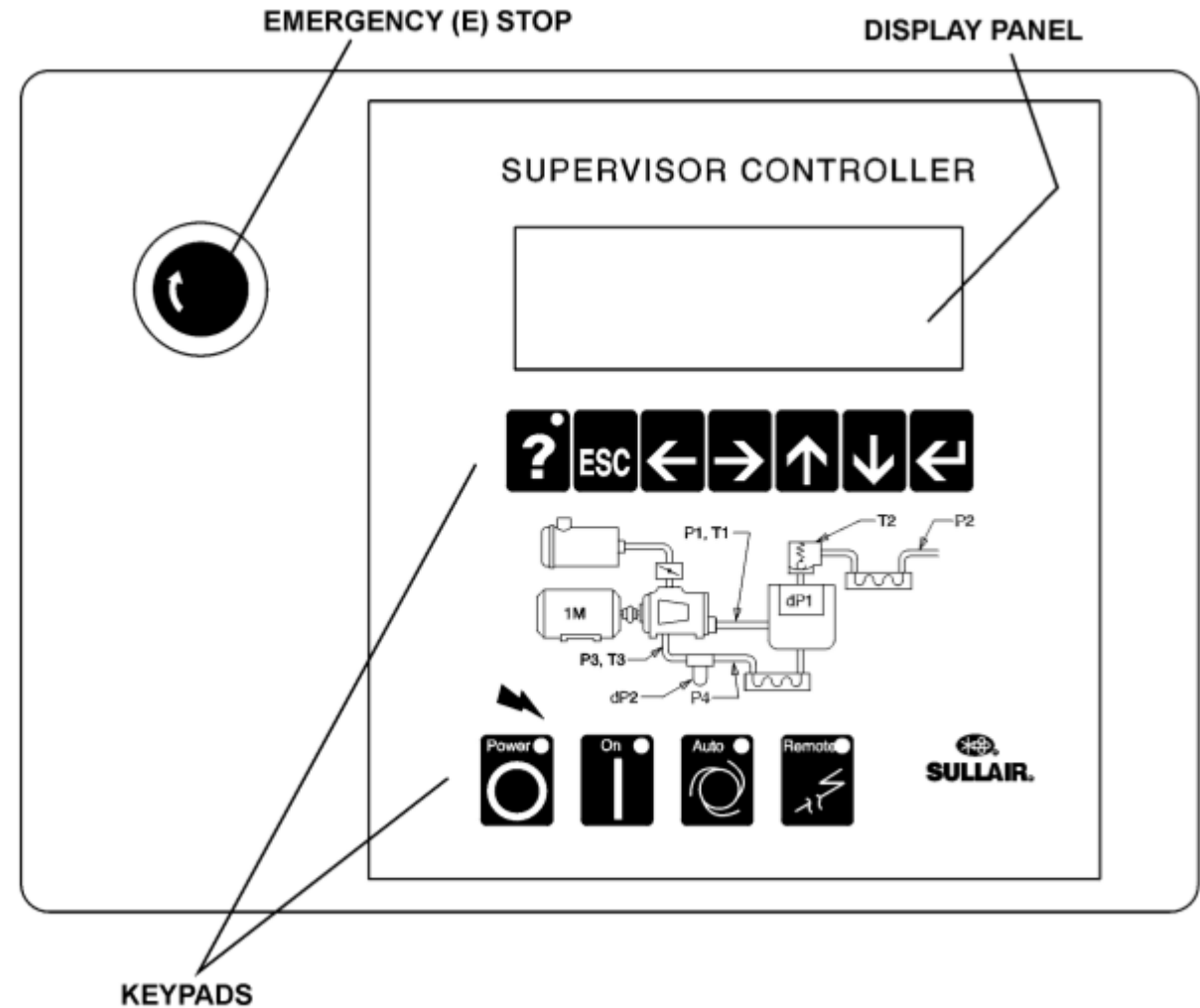
Fan motor rotation should also be checked. It should rotate clockwise when viewing the fan motor from the backside of the motor.

NOTES

Section 5

SUPERVISOR CONTROLLER

Figure 5-1: Supervisor Control Panel



NOTE

For information concerning all aspects of the Supervisor Controller, consult the Supervisor Controller manual no. 02250179-965.

NOTES

Section 6

MAINTENANCE

6.1 GENERAL



WARNING

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

This compressor requires a minimal amount of inspections and maintenance. The Supervisor™ Controller and other indicators alert the operator to situations requiring maintenance, or fault conditions.

6.2 DAILY OPERATION

Prior to starting the compressor, it is necessary to check the fluid level in the sump. Should the level be low, simply add the necessary amount. If the addition of fluid becomes too frequent, a simple problem has developed which is causing this excessive loss. See the *Section 7: Troubleshooting* under Excessive Fluid Consumption for a probable cause and remedy.

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



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.

6.3 MAINTENANCE AFTER INITIAL 50 HOURS OF OPERATION

After the initial 50 hours of operation, a few maintenance actions are required to clean the system of any foreign materials. Perform the following maintenance operations:

1. Clean the return line strainer. Refer to Maintenance Every 2000 Hours for location.
2. Clean the return line orifice.

6.4 MAINTENANCE EVERY 2000 HOURS

After 2000 hours of operation:

1. Clean the return line strainer. Refer to Discharge, Sump and Piping System in the parts manual.
2. Replace the fluid filter element.

6.5 FLUID MAINTENANCE

Drain the sump tank and change the compressor fluid using instructions shown in the Lubrication Guide.

6.6 FLUID FILTER MAINTENANCE

Refer to *Figure 6-1* & *Figure 6-2*. Replace the fluid filter element under any of the following conditions, or whichever occurs first:

1. Every 2000 hours.
2. When the Supervisor™ panel indicates high differential pressure.
3. Every fluid change.

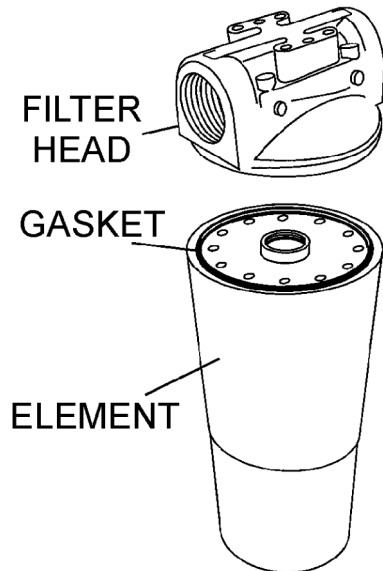


Figure 6-1: Fluid Filter Assembly, 100-150

(I) Repair Kit P/N 250025-526

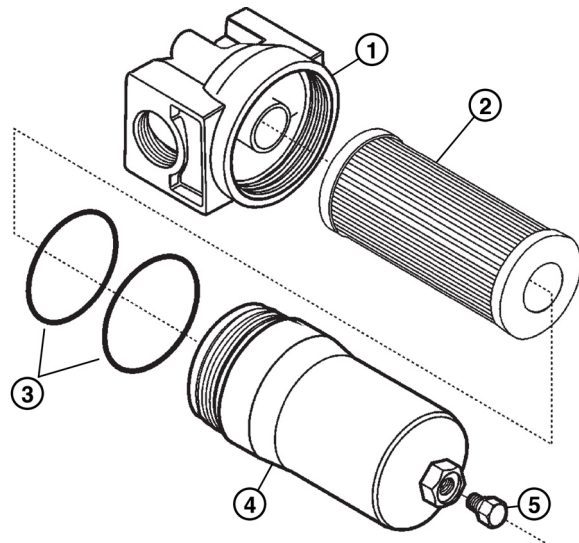


Figure 6-2: Fluid Filter Assembly, 200-250

1. Filter Head
2. Element (I)
3. O-ring Seals (I)
4. Bowl
5. Drain Plug w/O-ring (I)

(I) Element Replacement Kit P/N 02250139-995

FLUID FILTER ELEMENT REPLACEMENT

Refer to *Figure 6-1* and *Figure 6-2*.

1. Use a wrench to remove the filter canister.
2. Remove and dispose of filter element properly.

NOTE

Dispose of fluids in accordance with applicable federal, state and local regulations.

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. Thread the canister and element back on the filter head.
7. Restart compressor and check for leaks.

6.7 AIR FILTER MAINTENANCE

Refer to *Figure 6-3* & *Figure 6-4*. Air filter maintenance on air filter no. 02250140-798 should be performed when the Supervisor™ displays Air Filter Main, or once a year, whichever comes first. If the filter needs to be replaced, order replacement element #02250135-150 for 100/150HP system or replacement element #02250135-155 for 200/250HP system. Consult the following procedures to replace the air filter element.

AIR FILTER ELEMENT REMOVAL

1. Clean exterior of air filter housing.
2. Release the wing nut and remove the end cap.
3. Remove element and clean interior of housing using a damp cloth.

ELEMENT INSPECTION

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

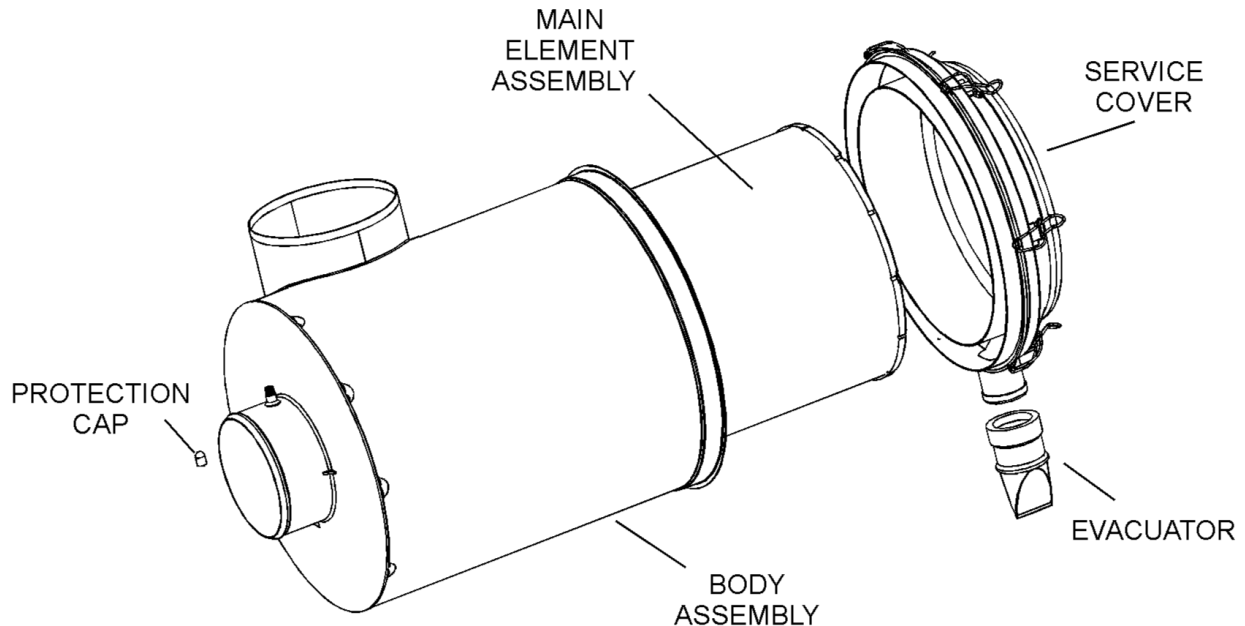


Figure 6-3: Air Filter Assembly, 100-150

(I) Replacement Element Kit P/N 02250135-150

ELEMENT REPLACEMENT

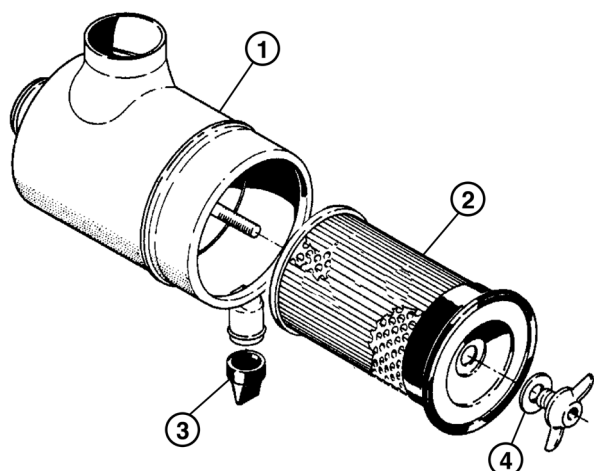


Figure 6-4: Air Filter Assembly, 200-250

1. Housing
2. Element (I)
3. Dust Collector
4. Sealing Washer

(I) Element Replacement Kit P/N 02250135-155

Element replacement is performed by reversing the removal instructions. Make sure that the element is fully seated into the housing.

6.8 SEPARATOR MAINTENANCE

Replace the separators when shown by the Supervisor™ Controller indications, or after one year, whichever comes first. The separators must be replaced. **DO NOT** attempt to clean and reinstall the separators.

SEPARATOR ELEMENT REPLACEMENT

Refer to *Figure 6-5*. The separators must be changed when indicated by the Supervisor™ Controller or once a year, whichever occurs first. Use the following procedure below to change the separators.

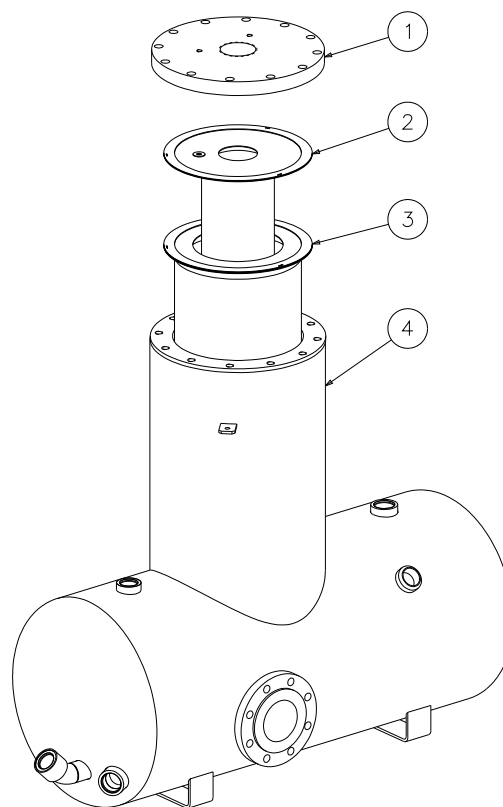


Figure 6-5: Separator Assembly

1. Cover
2. Cover Gasket (I)
3. Separators (I)
4. Sump Tank

(I) Primary Separator Replacement Kit P/N 02250034-122

(II) Secondary Separator Replacement Kit P/N 02250034-134

**CAUTION**

**Relieve all pressure from the Sump/
Receiver tank and all compressor lines.**

1. Disconnect all piping connected to the separator cover to allow removal (return lines, service lines, etc.)
2. Loosen and remove the twelve (12) $\frac{3}{4}$ " x 2-1/2" GR5 hex head capscrews from the cover plate.
3. Lift cover plate from the sump tank.
4. Remove the primary and secondary separators.
5. Scrape the old gasket material off the cover and flange on the sump tank, being careful not to let the scraps fall in the sump tank.
6. Inspect the sump tank for rust, dirt, etc.
7. DO NOT remove the grounding staples from the gaskets. DO NOT use any type of gasket eliminator. Re-insert the separator elements with the gaskets attached into the sump tank taking care not to dent it against the sump tank opening.
8. Clean the underside of the sump tank lid and remove any rust.
9. Replace the cover plate, washers, and capscrews. Torque to 200 ft-lbs(272 Nm). Verify continuity between separator elements and sump tank.
10. Re-connect all piping making sure return line tubes extend to the bottom or $\frac{1}{4}$ " above the bottom of the separators. This will assure proper fluid return flow to the compressor.
11. Check the return line strainer before re-starting the compressor. If needed, either clean or replace the strainer.

6.9 FLUID RETURN/SIGHT GLASS MAINTENANCE

Refer to *Figure 6-6*. The fluid return/sight glass subassembly is located on the side of the sump tank. Fluid return/sight glass maintenance should be performed along with that of the fluid filter. Order filter assembly no. 02250117-782, and use the following instructions as a guide:

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 the new assembly.
4. Inspect and clean the orifice inside the sight glass blocks.
5. Coat/lubricate the O-rings with silicone grease.
6. Re-attach the connectors to the sight glass/orifice blocks.

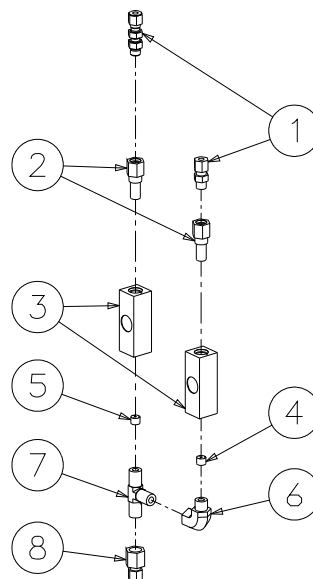


Figure 6-6: Fluid Return / Sight Glass

1. Tube Connectors
2. Filter Assembly (I)
3. Sight Glass/Orifice Block
4. Secondary Element Orifice .03
5. Primary Element Orifice .06
6. 90° Elbow
7. Pipe Tee
8. Tube Connector

A: From Primary Separator

B: From Secondary Separator

C: To Unit Second Stage

(I) Replacement Filter Assembly P/N 02250117-782

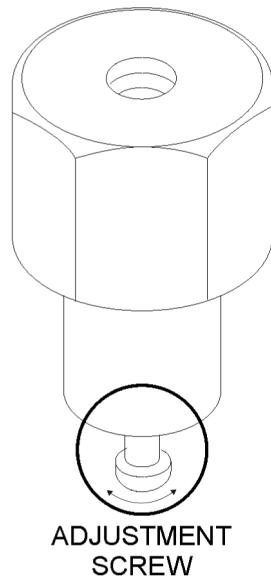


**Figure 6-7: Pressure Regulator Adjustment
100/150HP**

Rebuild Kit P/N 250019-453

Pressure Regulator 250017-280

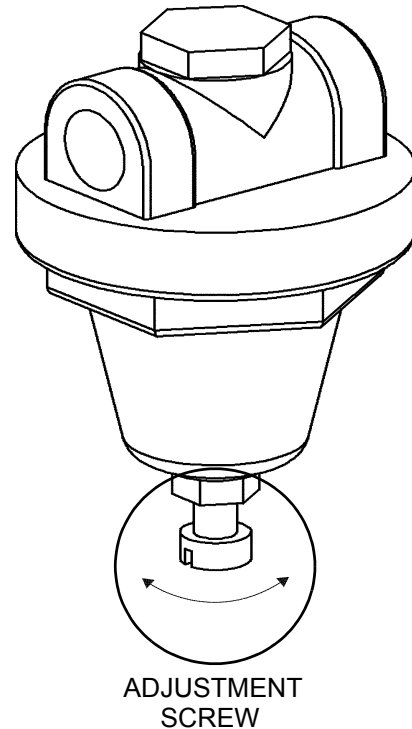


**Figure 6-8: Pressure Regulator Adjustment
200/250HP**

6.10 PRESSURE REGULATOR ADJUSTMENT

Refer to *Figure 6-7*. Start the compressor and adjust the service valve to maintain service air pressure at approximately 1 psi over its rated pressure. Turn the inlet valve regulator adjusting screw until 100psi is showing on the pressure gauge. Lock the adjusting screw in place with the locknut. The regulator is now properly set.

PRESSURE REGULATOR	REBUILD KIT P/N
02250014-608	041742
02250046-568	02250055-911
02250052-358	048409
02250186-328	02250187-734

NOTES

6.11 WATER CONDENSATE DRAIN MAINTENANCE

If the 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 (02250171-245).

6.12 CONTROL LINE FILTER

The regulators and solenoid valves, which control the compressor, are protected by a control line filter. Remove the bowl and verify condition of element and drain-float. Replace if needed, do not clean element, with element/seal kit (02250112-031) and/or float assembly/seal kit (02250115-960).

6.13 SHAFT COUPLING MAINTENANCE

The compressor unit and motor are rigidly connected through the mounting adapter housing. This arrangement makes coupling alignment unnecessary. The coupling is a jaw type in shear. If the elastomeric (rubber) element requires replacement due to wear or damage, order a replacement element and perform 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. Verify shaft hub gap = .19"
5. Install the new element by wrapping it around the jaws, engaging the cogs on the element into the jaws.
6. Reinstall the outer sleeve and secure by tightening the two screws to 45 in-lbs (5 Nm).
7. Reinstall the protective grill.

Section 7

TROUBLESHOOTING

7.1 TROUBLESHOOTING—INTRODUCTION

The information in the Troubleshooting Guide describe symptoms and usual causes for the listed discrepancies. However, **DO NOT** assume that these are the only malfunctions or fault conditions that may occur.

NOTE

For additional troubleshooting guidelines, consult the Supervisor™ Controller manual.

Table 7-1: Troubleshooting Guide

SYMPTOM	PROBABLE CAUSE	REMEDY
Compressor will not start	Main disconnect switch open	Close switch.
	Line fuse blown	Replace fuse.
	Control Transformer Fuse Blown	Reset. Should trouble persist, check whether motor starter contacts are functioning properly.
	Motor Starter Overloads Tripped	Check voltage. Should voltage check low, consult power company.
	Supervisor™ display module if no display or erratic display.	Replace

Table 7-1: Troubleshooting Guide

SYMPTOM	PROBABLE CAUSE	REMEDY
Compressor Shuts Down With Air Demand Present	Loss of control voltage	Check incoming power
	Low incoming voltage	Check control fuses and wiring. Consult power company. The Sulliar Supervisor™ will provide indication of most maintenance problems if control power has not been lost. Shutdowns will occur upon a faulty condition or a bad sender condition.
	Excessive operating pressure	Check maximum P2 pressure setting. HIGH PRESS P1 display; Max P1 pressure may be set too low. Consult factory for recalibration. Defective solenoid valve; solenoid valve should cause Sullicon Control lever to move to unload stop when the unload pressure setting P2A is exceeded. Repair if defective. Defective blowdown valve; blowdown valve should exhaust sump pressure to 30 psig (2.1 bar) for integrated coolers; 50 psig (3.4 bar) for remote coolers when maximum operating pressure is reached. Repair if defective. Open or shorted P1, P2, P3 or P4 sender message; replace sender indicated. Operating lever of inlet butterfly valve is loose on valve shaft. Reposition the valve plate and tighten lever set screw.
	HIGH TEMP T1 or T3 Message Displayed	Cooling air flow restricted; clean cooler and check for proper ventilation. Ambient temperature is too high; provide sufficient ventilation. Low fluid level; add fluid. Clogged fluid filter; change the fluid filter element as indicated by Supervisor™ control. Thermal valve not functioning properly; replace element. Open or shorted T1 or T2 sender; check for a short or open circuit to probe and correct wiring.
	Low fluid pressure (LOW PRESSURE P3 DISPLAY)	Check fluid level. Check for clogged fluid filter.
	Cooling fan motor (FAN OL display)	Check the cooling fan motor.

Table 7-1: Troubleshooting Guide

SYMPTOM	PROBABLE CAUSE	REMEDY
Compressor Shuts Down With Air Demand Present	P1 is less than 10 psig (0.7 bar) (P1 low display)	First, check starter wiring. If discharge pressure is above 10 psig (0.7 bar) was evident, then sensor is at fault—check connections from transducer. If adequate, replace transducer.
Compressor will not build up full discharge pressure	Air demand is too great	Check service lines for leaks or open valves.
	Dirty air filter	Check for filter maintenance message on Supervisor™ panel and change or clean element if required.
	Pressure Regulator Out of Adjustment	Adjust regulator according to control adjustment instructions in the Maintenance Section.
	Defective Pressure Regulator	Check diaphragm and replace if necessary (kit available).
	Broken Sullicon Spring	Replace.
Line pressure rises above unload P2 pressure setting on the Supervisor™	Leak in control system causing loss of pressure signals	Check for leaks.
	Defective solenoid valve	Check that Sullicon control lever is moved to unload stop when Supervisor™ is in NO LOAD mode. Repair or replace if necessary (kit available).
	Defective blowdown valve	Check that sump pressure is exhausted to the atmosphere when in the OFF LOAD mode. Repair or replace if necessary (kit available).
	Ruptured Sullicon control diaphragm	Replace.
	Plugged control line filter.	Clean or repair if necessary.
Excessive Fluid Consumption	Clogged return line strainer or orifice	Clean strainer (screen with o-ring replacement kit available). Clean orifice.
	Separator element damaged or not functioning properly	Check separator differential (plugged) dP1.
	Leak in the lubrication system	Check all pipes, connections and components
	Excess fluid foaming	Drain and change.
	Fluid level too high	Drain excess fluid.
Pressure Relief Valve Opens Repeatedly	Defective pressure relief valve	Replace pressure relief valve.
VSD Fault Code	—	Refer to Supervisor™ Manual



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