QSI-i Series

50-200 Horsepower

Direct Drive Industrial Air Compressors

Instruction Manual

This manual contains important safety information and should be made available to all personnel who operate and/or maintain this product. Carefully read this manual before attempting to operate or perform maintenance on this equipment.

Manual No. 2012203634

December 2012 Edition

Table of Contents

Table of Contents

- Safety Alert Symbols
- Safety Precautions
- Spare Parts Ordering Information
- Serial/Model Identification Plate
- Royal Blue Warranty

Safety Alert Symbols

IMPORTANT!

Throughout this manual we have identified key hazards. The following symbols identify the level of hazard seriousness:

DANGER!

This symbol identifies immediate hazards which **will** result in severe personal injury, death or substantial property damage.

WARNING!

This symbol identifies hazards or unsafe practices which **could** result in personal injury, death or substantial property damage.

DANGER!

This symbol identifies life threatening electrical voltage levels which **will** result in severe personal injury or death. All electrical work **must** be performed by a qualified electrician.

CAUTION!

Identifies hazards or unsafe practices which **could** result in minor personal injury or property damage.

CAUTION!

This symbol identifies hot surfaces which **could** result in personal injury or property damage.

NOTICE!

Identifies important installation, operation or maintenance information which is not hazard related.

Safety Precautions

Read this manual and follow all instructions prior to installing or operating the compressor.

Listed below are some, but not all, safety precautions that must be observed with compressors and compressed air systems.

WARNING!

Failure to follow any of these precautions may result in severe personal injury, death, property damage and/or compressor damage.

- Air from this compressor will cause severe injury or death if used for breathing or food processing. Air used for these processes must meet OSHA 29 CFR 1910.134 or FDA21XDE178.3570 regulations.
- Disconnect and lockout all power supplies to the compressor plus any remote controllers prior to servicing the unit.
- Never assume it is safe to work on the compressor because it is not operating. Many installations have automatic start/stop controls and the compressor may start at any time.
- This compressor is designed for use in the compression of normal atmospheric air only. No other gases, vapors or fumes should be exposed to the compressor intake, nor processed through the compressor.
- Relieve all pressure internal to the compressor prior to servicing. Do not depend on check valves to hold system pressure.
- A properly sized pressure relief valve must be installed in the discharge piping ahead (upstream) of any shutoff valve (block valve), heat exchanger, orifice or any potential blockage point. Failure to install a pressure relief valve could result in the rupturing or explosion of some compressor component.
- Do not change the pressure setting of the pressure relief valve, restrict the function of the pressure relief valve, or replace the pressure relief valve with a plug. Over pressurization of system or compressor components can occur, resulting in death, severe personal injury or property damage.
- Never use plastic pipe, rubber hose, or soldered joints in any part of the compressed air system. Failure to ensure system compatibility with compressor piping is dangerous.
- Never use a flammable or toxic solvent for cleaning the air filter or any parts.
- Do not remove any guards or cabinet panels or attempt to service any compressor part while the compressor is operating.
- Do not operate the compressor at pressures in excess of its rating.
- Observe control panel displays daily to ensure compressor is operating properly.
- Follow all maintenance procedures and check all safety devices on schedule.
- Never disconnect or tamper with the high air temperature (HAT) sensors.
- Compressed air is dangerous, do not play with it.

- Use the correct fluid at all times.
- Do not rely on the discharge air line check valve.
- Do not override any safety or shutdown devices.
- Keep doors closed during operation. The operating temperature of some components is sufficient to burn the skin.

NOTICE!

These instructions, precautions and descriptions cover standard Quincy manufactured QSI® Series air compressors. As a service to our customers, we often modify or construct packages to the customers specifications. This manual may not be appropriate in those cases.

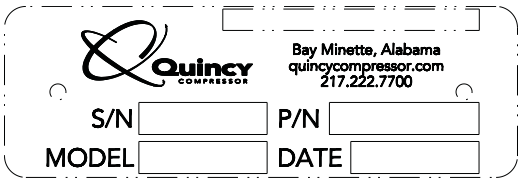
NOTICE!

Every effort has been taken to ensure complete and correct instructions have been included in this manual, however, possible product updates and changes may have occurred since this printing. Quincy Compressor® reserves the right to change specifications without incurring any obligation for equipment previously or subsequently sold. Not responsible for typographical errors.

Spare Parts Ordering Information

Quincy Compressor maintains replacement parts for Quincy compressors and accessories. A repair parts list is shipped with all new machines. Order parts from your Authorized Quincy distributor. Use only genuine Quincy replacement parts. Failure to do so may void warranty.

Serial/Model Identification Plate



Reference to the machine MODEL, SERIAL NUMBER and DATE OF ORIGINAL START-UP must be made in all communication relative to parts orders. A model/serial number plate is located on the frame or in the upper right corner of the control panel door.

Royal Blue Warranty

Quincy Compressor® Industrial Screw Products

QSI®-i Series 50-200 HP (150 psig & below)

Direct Drive Rotary Screw Air Compressors

Seller warrants products of its own manufacture against defects in workmanship and materials under normal use and service, as follows:

QSI® Packaged Compressors - Twelve (12) months from date of start-up or twenty-four (24) months from date of shipment from the factory, whichever occurs first.

Airend on Packaged Compressors (for service at full-load pressure at or below 150 psig) - Ten years (120 months) from date of startup (not to exceed 126 months from date of shipment from the factory).

Airend on Packaged Compressors (for service at full-load pressure above 150 psig) - Twelve (12) months from date of start-up or twenty-four (24) months from date of shipment from the factory, whichever occurs first.

Air/fluid Reservoir Tank - Five years (60 months) from date of start up (not to exceed 66 months from date of shipment), including parts and labor. In the event of a reservoir tank failure, the parts and labor coverage is limited to the reservoir tank itself and does not cover the separator element(s) or loss of fluid.

Air and Fluid Heat Exchangers - Five years (60 months) from date of start up (not to exceed 66 months from date of shipment), including parts and labor for the first twelve (12) months, parts only after twelve (12) months. In the event of a heat exchanger failure, the parts and labor coverage is limited to the heat exchanger itself and does not cover the loss of fluid.

Drive Motor - Five years (60 months) from date of start up (not to exceed 66 months from date of shipment), including parts and labor. Royal Blue warranty does not cover medium voltage (above 575 volt, 3 phase) motors. Before any motor repairs or replacements are performed, the factory must be contacted at the time of failure in order to approve any further action.

Drive Coupling Element - Five years (60 months) from date of start up (not to exceed 66 months from date of shipment), including parts and labor. (Machine must be installed and operated in accordance with the Operator's Manual.)

Variable Speed Drives (if applicable) - Five years (60 months) from date of start up (not to exceed 66 months from date of shipment), including parts & labor for the first year (12 months), parts only for the remainder of the warranty period. Unit must be installed indoors in a well ventilated environment & a line reactor purchase (from Quincy Compressor) is required.

Remanufactured Airend - Twelve (12) months from date of shipment from the factory.

Parts - Ninety (90) days from date of Distributor sale or one (1) year from date of factory shipment.

With respect to products not manufactured by Seller, Seller will, if practical, pass along the warranty of the original manufacturer.

The terms of coverage for the Royal Blue Warranty are listed below. Failure to follow the terms will invalidate the Royal Blue Warranty.

AUTHORIZED START-UP REQUIRED:

A properly completed start-up report and the Royal Blue Warranty registration form must be submitted by an authorized Quincy distributor to the Quincy Compressor Bay Minette office within thirty (30) days of start-up. Start-up reports must be submitted on Q-Serv.

GENUINE PARTS AND FLUIDS

The compressor must be maintained with QuinSyn-PG (8,000 hours maximum), QuinSyn-XP (12,000 hours maximum), QuinSyn-Plus (8,000 hours maximum) or QuinSyn-F fluid (4,000 hours maximum). Maximum fluid change intervals are noted per fluid. Actual fluid change interval is to be determined by fluid sampling report, not to exceed maximum fluid change interval. Fluid samples must be taken every 2,000 hours or as directed by the analysis report.

Only genuine Quincy Compressor maintenance and replacement parts may be used on the compressor.

Revised airend coverage (05/21/07).

Royal Blue Warranty

Quincy Compressor® Industrial Screw Products

QSI®-i Series 50-200 HP (150 psig & below)

Direct Drive Rotary Screw Air Compressors

Normal rules of warranty apply regardless of coverage length. Inlet valves, fluid pumps and shaft seals are covered by the standard (1 year) warranty terms and are not included in the Royal Blue Warranty program. The Royal Blue Warranty is non-transferable.

The customer and/or Quincy Distributor must keep copies of all maintenance records, parts purchases and sampling reports. The following records will be required for warranty airend replacement and/or warranty claim consideration and should be submitted to the Quincy Compressor Customer Service Department:

A completed Airend Failure Information form.

A copy of the Royal Blue Warranty Registration/ Agreement form.

Copies of all maintenance logs for the unit.

Proof of purchase of genuine Quincy parts and fluids.

Copies of all fluid analysis reports.

Notice of the alleged defect must be given to Seller in writing with all identifying details including serial number, model number, type of equipment and date of purchase, within thirty (30) days of the discovery of same during the warranty period.

Seller's sole obligation on this warranty shall be, at its option, to repair, replace or refund the purchase price of any product or part thereof which proves to be defective. If requested by Seller, such product or part thereof must be promptly returned to Seller, freight collect for inspection.

Seller warrants factory repaired or replaced parts of its own manufacture against defects in material and workmanship under normal use and service for ninety (90) days or for the remainder of the warranty on the product being repaired, whichever is longer.

This warranty shall not apply and Seller shall not be responsible nor liable for:

a) Consequential, collateral or special losses or damages;

b) Equipment conditions caused by fair wear and tear, abnormal conditions of use, accident, neglect or misuse of equipment, improper storage or damages resulting during shipment;

c) Deviation from operating instructions, specifications, or other special terms of sales;

d) Labor charges, loss or damage resulting from improper operation, maintenance or repairs made by person(s) other than Seller or Seller's authorized service station.

e) Improper application of product.

In no event shall Seller be liable for any claims, whether arising from breach of contract or warranty of claims of negligence or negligent manufacture, in excess of the purchase price.

☞ NOTICE!

Quincy Compressor reserves the right to modify or withdraw this Royal Blue Warranty program at any time on units not already covered by this ROYAL BLUE WARRANTY program.

- General Description
- The Compression Cycle
- Air Flow
- Cooling System
- Capacity Control
- Control Options
- Operating Modes
- Electrical System
- Indicators
- Gauges

General Description

QSI compressors are single stage, positive displacement, fluid-flooded rotary screw type compressors containing two precision-machined rotors. A motor directly drives the male rotor through a flexible drop out type coupling with no step up or step down gearing used. The male rotor has four lobes that mesh with a female rotor consisting of six flutes. Both rotors are housed in a single cast iron cylinder. The unit has an inlet port at the power input end and a discharge port at the opposite end.

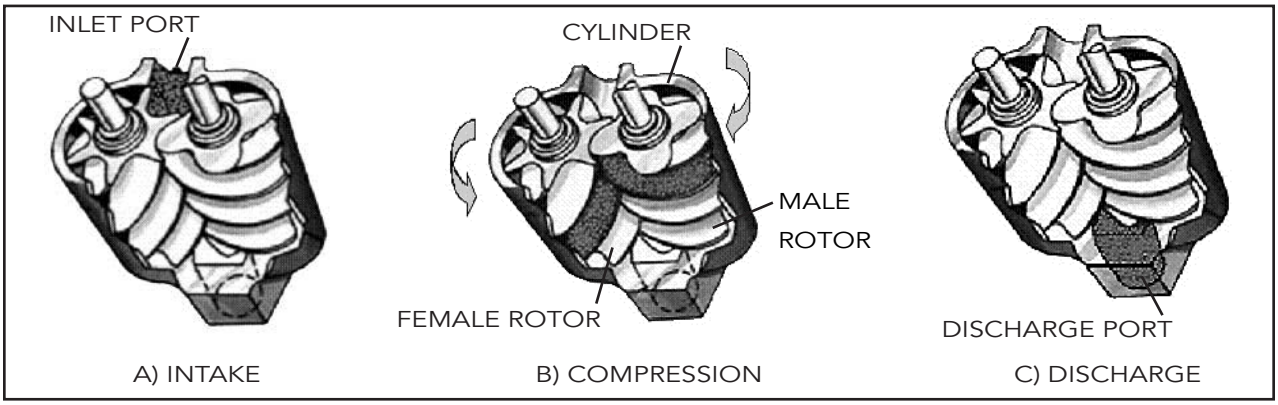
Some models are equipped with a positive displacement fluid pump mounted to the compressor to circulate fluid through the system. Models without a fluid pump use positive pressure in the reservoir to circulate the fluid.

All components are attached to a heavy-duty steel frame. Controls and indicators are arranged on a control panel. Acoustical cabinets are available to reduce sound levels.

The Compression Cycle

The compression cycle of a rotary compressor is a continuous process from intake to discharge with no reciprocating mechanisms starting and stopping as found in reciprocating compressors. The compressor consists of two rotors in constant mesh, housed in a cylinder with two parallel adjoining bores. The male drive rotor has four lobes that mesh with six flutes in the female rotor. All parts are machined to exacting tolerances.

As the rotors rotate, (male-clockwise as viewed from the power input end) air is drawn into the cylinder through the inlet port located at the power input end. A volume of air is trapped as the rotor lobes pass the inlet cut off points in the cylinders. Compression occurs as the male rotor rolls into the female flute, progressively reducing the space thereby raising the pressure. Compression continues until the lobe and flute pass the discharge port. The compressed air is then discharged into the air/fluid reservoir. There are four complete compression cycles for each complete rotation of the male rotor.



Compression Cycle

Air Flow

With the compressor operating, a partial vacuum is produced at the compressor inlet. Air entering via the compressor air filter flows through the air inlet valve into the rotor housing where it is compressed, then discharged into the air/fluid reservoir. Compressed air passes through the complete system then through a minimum pressure check valve to the service connection.

Cooling System

Fluid Coolers

Fluid coolers may use either air or water as a cooling medium. The following descriptions point out the major differences between the two types of coolers.

Air-cooled Fluid Coolers

The air-cooled fluid cooler and aftercooler are of the finned aluminum tube design. Ambient air is forced through the fins by a motor driven fan, cooling the fluid and air in the tubes. To maintain proper compressor operation, the ambient air temperature should not exceed the temperatures listed in Appendix B - Technical Data. The cooler fins must be kept clean at all times. Fluid leaving the receiver passes through a thermal mixing valve before traveling on to the cooler. The purpose of the thermal valve is to maintain a minimum fluid discharge temperature at the compressor of approximately 190°F.

Water-cooled Fluid Coolers

Water-cooled fluid coolers are of the shell and tube design. Fluid passes through the shell transferring its heat to the water flowing through the tubes. Fluid leaving the cooler passes through a thermal mixing valve and goes directly to the fluid filter and the compressor.

Aftercoolers

Aftercoolers reduce the amount of water in the discharge air. They are used to lower the temperature of the discharge air thereby condensing water vapor from the compressed air. This allows most of the contained water to be trapped and expelled from the unit, reducing water related problems downstream.

Air-cooled aftercoolers are part of the air-cooled fluid cooler. Cooling air from the fan is drawn through the aftercooler and the fluid cooler.

Water-cooled aftercoolers are placed in series with the fluid cooler. Incoming water is first directed through the aftercooler and then on to the fluid cooler.

A combination moisture separator and water trap is provided for collecting and expelling water to the customer's drain.

Capacity Control

As the motor starts driving the compressor rotors, air is drawn in, compressed and discharged into the air/fluid reservoir. When the air pressure in the air/fluid reservoir exceeds the set point of the pilot valve (normally 110 PSIG), the valve opens and passes a controlled volume of air to the inlet valve air cylinder.

NOTICE!

Other pressures are available as options.

The air forces a piston to move within the cylinder, closing the inlet valve. The compressor will continue to run, matching air demand with air delivery by constantly adjusting the position of the inlet valve.

The inlet valve regulates compressor capacity between 100% and nearly 0% of rated delivery.

When maximum pressure (typically 10 PSIG above normal full load pressure) has been obtained in the air system, complete compressor unloading occurs. The pressure switch located in the control panel sends a signal to the control and the solenoid valve opens, venting the residual pressure from the blowdown valve. At the same time, control air from the reservoir check valve is directed through the solenoid to the inlet valve air cylinder. The inlet valve is held in a closed position preventing the intake of air into the compressor and serving as a check valve preventing reverse air/fluid flow through the inlet valve and air filter.

Control Options

QSI®-i Series compressors are available with either a PLC LOGO controller (standard), an electronic controller with a color HMI touch screen or Power$ync® control.

PLC LOGO Control

The PLC LOGO controller is a universal logic module which integrates control functions, an operating and display unit, a power supply, an interface for program modules and a PC cable and basic functions required in day-to-day operation, such as functions for on/off delays. See Section IV - Operating Procedures for more information.

Electronic Control

See Section IV - Operating Procedures for more information.

Power$ync® Control

Power$ync® control equips QSI® compressors with a variable capacity airend, a capacity control system comprised of electronic controls, control solenoids and lift valves and a computerized controller. A separate Power$ync instruction manual is shipped with units using this control option.

Operating Modes

Auto Dual

Auto dual offers two choices of controlling the compressor: continuous run and auto dual. If set to continuous run, the compressor operates continuously, matching air demand as the differential pilot valve controls the position of the inlet valve. When maximum system pressure is reached, the pressure switch opens, venting the reservoir and, although the compressor continues to run unloaded, no air is compressed.

If auto dual is selected, the compressor will perform as above; however, a timer is activated when the pressure switch contacts open. This timer is adjustable within a ten (10) minute range. When the timer reaches the end of its delay period, the compressor will automatically shut down and assume a "standby" mode. Upon a drop in system air pressure, the pressure switch contacts close, restarting the compressor automatically. The timer should be set, during unit start-up, for a minimum of six (6) minutes.

During the unloaded/timing mode, if plant pressure should drop causing the pressure switch contacts to close, the compressor will continue to operate, resetting the timer and instructing the inlet valve to reopen.

Auto Demand

Auto Demand control accommodates external control signals from a Demand-A-Matic multiple compressor controller.

With the selector switch in local mode, the compressor will operate exactly as described in the auto dual description.

In remote mode, the compressor's control panel is bypassed in favor of the Demand-A-Matic multiple compressor controller. The compressor will start, build air, unload and shutdown on time delay as determined by the Demand-A-Matic controller.

Lead/lag (two compressors)

This option allows one of two different pressure control settings to be chosen for a given machine. If the demand is greater than one unit's capability, the second compressor will automatically turn itself on until the excess demand has been satisfied. Again, working with the standard auto dual control, the second machine would time out and turn itself off after the demand drops.

Load/no load

In load/no load mode, the compressor does not modulate the inlet valve. The valve is either fully open or fully closed. If systems demands include regular periods of air usage at less than full load, a large compressed air storage capability is required with this type of control. Without adequate storage, rapid cycling may occur. This will cause wide system pressure fluctuations that may affect the performance of equipment using the compressed air. Load/no load works with auto dual control to turn the compressor off during extended periods of no demand.

WARNING!

Never assume it is safe to work on a compressor because it is not operating. It may be in standby mode and could restart at any time. Follow all safety instructions in Section I-General Information and in Section VI-Servicing.

Electrical System

Wiring diagrams of the electrical system are shown in the parts manual shipped with the compressor and are also included in the control panel on all Quincy QSI compressors.

NOTICE!

Due to continuing product improvements and updates, it is recommended that the wiring diagram included in the control panel be used when servicing the electrical control.

Standard drive motors are open drip proof (ODP) 1800 RPM with a maximum ambient temperature rating of 104°F. They are not suitable for salt laden, corrosive, dirty, wet or explosive environments.

QSI-i series compressors utilize 460V incoming power through a full voltage magnetic starter (other incoming line voltages are available). A transformer in the control panel reduces this voltage to 24 VAC and 120 VAC for the various controls on the unit such as the selector switch, pressure switch, timer, high air temperature switches, solenoid and various indicator lights. Each compressor is supplied with a NEMA 4 electrical enclosure.

Air-cooled models utilize a second magnetic starter for protection of the fluid cooler fan motor. This starter is connected to the compressor starter through an interlock which ensures the fan motor is operating with the compressor motor. If the fan motor starter trips for any reason, the compressor unit will shut down.

DANGER!

High voltage could cause death or serious injury. Disconnect all power supplies before opening the electrical enclosure or servicing the compressor.

Safety Sensors

Two high air temperature (HAT) sensors are standard on QSI units. These sensors protect the unit by sensing unusually high temperatures and shutting the unit down. One is located in the discharge line from the compressor to the air/ fluid reservoir. The second is located in the top of the air/fluid reservoir. These sensors are set to trip at approximately 225°F and are not adjustable.

WARNING!

Never remove, bypass or tamper with the safety HAT switch. Failure to provide this safety feature could cause death or serious injury and property damage. If the compressor is shutting down due to high discharge temperature, contact a qualified service technician immediately.

Indicators

Power On Light (Start Button)

Indicates when power from the main disconnect switch has been turned on and there is live power at the compressor starter and control panel. This light will remain on as long as there is power to the unit, regardless of the position of the selector switch.

CAUTION!

Always check power supply disconnect. The power on light may be inoperable.

High Discharge Air Temperature Light

Indicates when the unit has sensed an unusually high discharge temperature.

Motor Overload Light

Indicates a motor overload.

NOTICE!

These indicators are only on PLC LOGO controlled units. Information is displayed on a display screen on units with electronic control or Power$ync controls.

Gauges

Hourmeter

This gauge indicates actual hours of compressor operation.

Air Pressure Gauge

This gauge indicates air pressure available for distribution to the service line.

CAUTION!

Gauge may not register when the unit is unloaded or off. Make certain all air pressure is relieved prior to servicing.

Air Outlet Temperature Gauge

This gauge indicates the temperature of the air/fluid mixture as it discharges from the compressor. The normal reading is 170-190°F.

Percent Capacity Gauge

This gauge is graduated in percent of the total capacity of the unit. Readings taken from this gauge give an indication of the amount of air being used.

NOTICE!

These gauges are only on PLC LOGO controlled units. Information is displayed on a display screen on units with electronic control or Power$ync controls.

- Receiving
- Moving the Unit to the Installation Site
- Location
- Piping Connections
- Relief Valves
- Electrical
- Guards
- Manual Vent and Shutoff Valves
- Water and Sewer Facilities at the Installation Site (water-cooled)
- Intake Air
- Compressor Rotation
- Fan Rotation

Receiving

Upon receipt, immediately inspect the compressor for any visible damage that may have occurred during shipment. If visible damage is found, the delivering carrier should make a notation on the freight bill and the customer should request a damage report. If the shipment is accepted and damage is found later, it is classified as concealed damage. Concealed damage should be reported to the delivering carrier within 15 days of delivery. The delivering carrier must prepare a damage report. Itemized supporting papers are essential to filing a claim.

Read the compressor nameplate to be sure the compressor is the model and size ordered and that optionally ordered items are included.

Check the reservoir and pressure relief valves to be sure they are adequate for the pressure at which you intend to operate.

Moving the Unit to the Installation Site

Forklift slots are provided in one side and one end of the main frame. Use of chains and slings should be limited to the main frame. Do not attempt to lift the unit by attaching to any components. Optional lifting eyes are available.

CAUTION!

Improper lifting may result in component or system damage, or personal injury. Follow good shop practices and safety procedures when moving the unit.

Location

Locate the compressor on a level surface in a clean, well-lit and well-ventilated area. Allow sufficient space (four feet of clearance on all sides and top of the compressor) for safe and proper daily inspection and maintenance. The entire length of the frame base must be supported. Shim where necessary but do not use wood.

Ambient temperature should not exceed 120°F. High ambient temperatures may result in a high air temperature shutdown. All models are intended for indoor installation; however, it is possible, with certain modifications, to accommodate some outdoor locations. Cabinet models are water-resistant but not water tight. Sheltering from rain, snow and freezing temperatures is mandatory.

WARNING!

Do not operate in temperatures below 34°F or above the limits outlined in Appendix B - Technical Data.

Do not locate the unit where the hot exhaust air from other compressors or heat generating equipment may be drawn into the unit. Never restrict the flow of exhaust air from the fluid cooler or cooling fan. Heated exhaust air must be exhausted outside to prevent high temperature conditions in the compressor room. If the room is not properly ventilated, compressor operating temperatures will increase and cause a high temperature shutdown.

CAUTION!

Clean, fresh air, of sufficient quantity, is required for proper compressor operation.

In high humidity areas, avoid placing the compressor in a basement or other damp locations. Control the compressor temperatures and monitor compressor fluid for signs of water contamination. Fluid and filter changes may need to be increased in high humidity areas. Increased operating temperatures may be required.

Quincy QSI compressors are essentially vibration free, however, some customers may choose to bolt the unit to the floor to prevent the accidental breakage of piping or electrical connections as a result of being bumped. Use only lag bolts to secure the unit. Do not pull the bolts down tight. Overtightening the lag bolts may place the frame in a twist or bind causing breakage of fluid coolers, piping and reservoirs.

WARNING!

Under no circumstances should a compressor be installed in an area exposed to a toxic, volatile or corrosive atmosphere, nor should toxic, volatile or corrosive agents be stored near the compressor.

Piping Connections

Never join pipes or fittings by soldering. Lead-tin solders have low strength, a low creep limit, and may, depending on the alloy, start melting at 360°F. Silver soldering and hard soldering are forms of brazing and should not be confused with lead-tin soldering. Never use plastic, PVC, ABS pipe or rubber hose in a compressed air system.

Piping Fit-up

Care must be taken to avoid assembling the piping in a strain with the compressor. Piping should line up without having to be sprung or twisted into position. Adequate expansion loops or bends should be installed to prevent undue stress at the compressor resulting from the changes between hot and cold conditions. Pipe supports should be mounted independently of the compressor and anchored, as necessary, to limit vibration and prevent expansion strains. Piping should never be of smaller size than the connection on the compressor unit.

Relief Valves

Pressure relief valves are sized to protect the system. Never change the pressure setting or tamper with the valve. Only the relief valve manufacturer or an approved representative is qualified to make such a change.

DANGER!

Relief valves are to protect system integrity in accordance with ANSI/ ASME B19 safety standards. Failure to provide properly sized relief valves will result in death or serious injury.

Relief valves are to be placed ahead of any potential blockage point that includes, but is not limited to, such components as shut-off valves, heat exchangers and discharge silencers. Ideally, the relief valve should be threaded directly into the pressure point it is sensing, not connected with tubing or pipe and pointed away from any personnel. Always direct discharge from relief valves to a safe area away from personnel.

Relief Valve

CAUTION!

ASME coded pressure vessels must not be modified, welded, repaired, reworked or subjected to operating conditions outside the nameplate ratings. Such actions will negate code status, affect insurance status and may cause death, serious injury and property damage.

Electrical

Before installation, the electrical supply should be checked for adequate wire size and capacity. During installation, a suitable fused disconnect switch or circuit breaker should be provided. Any unreasonable voltage unbalance (5%) between the legs must be eliminated and any low voltage corrected to prevent excessive current draw. The installation, electric motor, wiring and all electrical controls must be in accordance with National Electric Code, and all state and local codes. A qualified electrician should perform all electrical work. **Air compressors must be grounded in accordance with applicable codes.** See control panel for the proper wiring diagram.

Quincy would like to emphasize the importance of providing adequate grounding for air compressors. The common practice of grounding units to building structural steel may not actually provide adequate grounding protection, as paint and corrosion build-up may exist.

CAUTION!

NEMA electrical enclosures and components must be appropriate to the area in which they are installed.

Pneumatic Circuit Breakers or Velocity Fuses

The Occupational Safety and Health Act, Section 1926.303 Paragraph 7 published in Code of Federal Regulations 29 CFR 1920.1 (revised 07/01/1982), states "all hoses exceeding 1/2" inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of a hose failure." These pneumatic safety devices are designed to prevent hoses from whipping, which could result in a serious or fatal accident.

Guards

All mechanical action or motion is hazardous in varying degrees and needs to be guarded. Guarding shall comply with OSHA Safety and Health Standards 29 CFR 1910.219 in OSHA manual 2206 (revised 11/07/1978) and any state or local codes.

Manual Vent and Shutoff Valve

Install a manual valve to vent the compressor and the compressor discharge line to atmosphere. If the air receiver tank services a single compressor, the manual valve can be installed in the receiver. When a manual shut-off valve (block valve) is used, a manual valve should be installed upstream from the valve, and a pressure relief valve installed upstream from the manual vent valve. These valves are to be designed and installed to permit maintenance to be performed in a safe manner. Never substitute a check valve for a manual shut-off valve (block valve) if the purpose is to isolate the compressor from a system for servicing.

WARNING!

Removal or painting over safety labels will result in uninformed conditions. This could result in personal injury or property damage. Warning signs and labels shall be provided with enough light to read, conspicuously located and maintained for legibility. Do not remove any warning, caution or instructional material attached.

Water and Sewer Facilities at the Installation Site (water-cooled)

Make sure the water supply is connected and open. Piping supplied by the user should be at least equal to the connections provided on the compressor. Sewer facilities should be readily accessible to the installation site and meet all the requirements of local sewer codes, plus those of the compressor. Make sure water inlet and discharge connections are correct.

Intake Air

Clean air is essential for your Quincy QSI compressor. Always select a source providing the cleanest air possible. When an outside air source is used, keep all piping as short and direct as possible. Use vibration isolators and support all piping correctly. Piping size should be at least as large as the inlet valve opening and increased several sizes for extremely long piping runs. The piping must be leak free and clean after fabrication.

WARNING!

Relieve compressor and system air pressure by opening the appropriate manual relief valve prior to servicing. Failure to relieve all system pressure could result in death or serious injury and property damage.

Compressor Rotation

WARNING!

Compressor rotation must be checked prior to start-up. Operating the compressor with incorrect rotation will result in extreme damage to the compressor and warranty coverage will be voided.

Proper rotation is clockwise (as viewed from the power-input end). The power-input end of the compressor is marked with an arrow noting the proper rotation. To check for proper rotation, jog the starter button, allowing the motor to turn 2 or 3 revolutions. Observe the drive element for correct direction. If incorrect rotation is observed, lock out power supply, reverse electrical leads L_1 and L_3 at the motor starter. Recheck for correct rotation.

Fan Rotation (air-cooled)

Check the fan rotation at the same time the compressor rotation is being checked. Fan airflow should be drawing air into the machine from the side, discharging out the top.

- Prior to Starting
- Starting the Compressor
- Stopping the Compressor
- PLC Controller Operation
- Electronic Controller Operation

Prior to Starting

CAUTION!

Provisions should be made to have the instruction manual readily available to the operator and maintenance personnel. If, for any reason, any parts of the manual become illegible or if the manual is lost, have it replaced immediately. The instruction manual should be read periodically to refresh one's memory. This may prevent a serious accident.

Before starting the compressor, review Sections II and III of this manual. Be certain that all installation requirements have been met and that the purpose and use of the controls are thoroughly understood. Before placing the compressor into operation, do the following:

- Remove all loose items and tools from around the compressor.
- Check fluid level in the air/fluid reservoir. See Section VII - Compressor Fluids.
- Check the fan and fan mounting for tightness.
- Manually rotate the compressor through enough revolutions to be certain there are no mechanical interferences.
- Check all pressure connections for tightness.
- Check to make sure all relief valves are in place.
- Check to make sure all panels and guards are in place and securely mounted.
- Check fuses, circuit breakers and thermal overloads for proper size.
- Close the main power disconnect switch and jog the starter switch button to check the rotational direction of the compressor.
- Check the fan rotation (air flows through the coolers).
- Water-cooled models - Check inlet and discharge water piping for proper connections.

Starting the Compressor

- Secure all enclosure panels on compressor.
- Open the service valve to the plant air distribution system.
- Select the mode of operation and start the compressor.
- Watch for excessive vibration, unusual noises or air/fluid leaks. If anything unusual develops, stop the compressor immediately and correct the condition.
- Control settings have been adjusted at the factory; however, they should be checked during start-up and readjusted, if necessary. Some applications may require a slightly different setting than those provided by the factory. Refer to Section VI - Servicing. Never increase air pressure settings beyond factory specifications.
- Observe compressor operation closely for the first hour of operation and frequently for the next seven hours. Stop and correct any noted problems.

Stopping the Compressor

Normal Operation

Close the service valve to the plant air distribution system. Allow the pressure to build within the reservoir and the compressor to fully unload. Press the stop button or remove power at the main disconnect switch or panel.

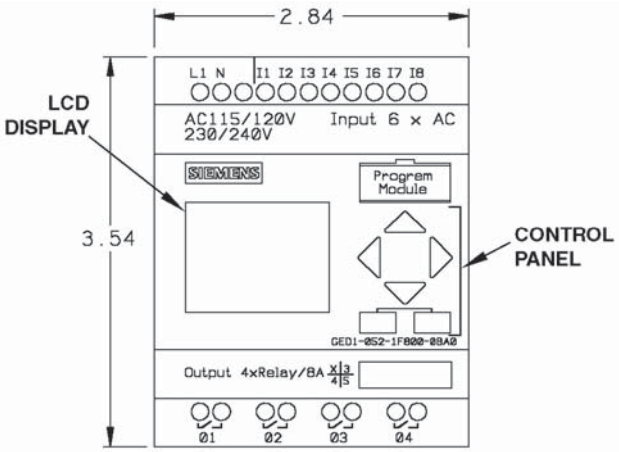
NOTICE!

Close the service valve when the compressor is not being used to prevent the system's air pressure from leaking back into the compressor if the check valve leaks or fails.

Emergency

Press the emergency stop button or cut the power at the main disconnect switch or panel.

PLC Controller Operation (gauge machine)



PLC Program Installation

After verifying that the LOGO controller connections are correct (reference the appropriate wiring diagram in series WP1962), install the PLC program module chip as follows :

- Make sure that all power to the electrical enclosure is turned off and perform the appropriate lockout/ tagout procedures.
- Using a small flathead screwdriver, carefully remove the blank program chip module, located in the upper right hand corner of the controller face (just above the up/down arrow keys), from the PLC controller.
- Carefully insert the red chip module, Quincy part number 143819, into the chip slot.

CAUTION!

There is only one way to insert the chip. Do not try to force the program chip into the slot. Doing so will damage the chip and render it useless.

- Reapply power and the PLC controller will run off of the red program chip module.

LOGO Program Block Functions

Block B02 - A latching relay used to latch the start signal in and supply a continuous start signal to the program. To disengage the start signal, remove power to the logo controller by pressing the stop button or by removing power to the compressor using a disconnect.

Block B03 - An off-delay timer which will time out and shutdown the machine during non usage periods. The default setting is 10 minutes. This timer may be adjusted from 0 minutes to 99 hours. Contact the Quincy service department to change the setting on this timer.

When the pressure switch opens (no signal from input I2), the off time will begin. If the pressure switch does not close again before the time setting is reached, the compressor will shutdown. The compressor will restart when the pressure switch closes or can be restarted by turning the selector switch to the continuous run position as long as there are no fault conditions present.

Block B05 - A latching relay used to supply voltage to the H.A.T. annunciator panel light. When the H.A.T. probe circuit opens (no signal from input I3), the Q3 output will energize and send power to the annunciator indicator light. The light will stay energized until power to the LOGO controller is removed. Remove power to the LOGO controller by pressing the stop button or by removing power to the compressor using a disconnect.

Block B06 - A latching relay which prevents the unit from starting when a fault condition is present. It latches when there is a fault condition such as a motor overload trip, high air temperature, M1 contactor opening or if the fan contact does not close within the specified amount of time (refer to block B09 for fan timer function). Resetting the fault condition will not reset the program. To reset the

program once the fault is corrected, remove power to the LOGO controller by pressing the stop button or by removing power to the compressor using a disconnect.

Block B09 - An on-delay timer used to ensure that the fan contactor engages. This block has a fixed 3-second time setting and cannot be adjusted. Timing will begin upon input to the trigger (Q1). If the fan contactor normally open auxiliary contact does not close within 3-seconds (input from I4 to the reset on the timer), the unit will shutdown and will not restart until power has been removed from the LOGO controller.

Block B11 - An on-delay timer used to energize the wye-delta shorting contactor coil for initial starting purposes only. The trigger for this timer is block B17. The default setting is 6 seconds and may be adjusted from 0 seconds to 99 seconds. Contact the Quincy service department to change the setting on this timer. At the end of the time delay period, the shorting contactor coil will disengage.

Block B15 - An on-delay timer used to ensure that the shorting contactor coil engages before the main contactor coil engages. B15 has a fixed time setting of 1/2 second and cannot be adjusted.

Block B17 - An on-delay timer used as the auto-restart timer. The trigger for this timer is input I1. The default setting is 0 seconds and can be adjusted from 0 seconds to 99 hours at any time after the program is loaded on the LOGO controller.

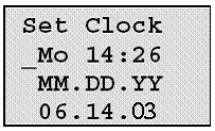
Block B18 - An up/down counter used to log the number of times that the main contactor M1 is engaged. It will record up to 999,999 starts before resetting itself to 0.

Block B19 - An up/down counter used to log the number of times that the unload solenoid valve is energized. It will record up to 999,999 activations before resetting itself to 0.

Setting the Day, Time & Date

To set the day of the week, time of day and current date in the controller, press the ESC and OK buttons at the same time to display the parameterization menu.

Use the △ or ▽ arrow on the control panel to select 'Set Clock', then press OK to display the clock settings.



The cursor is positioned before the day of the week. Scroll through the days of the week using the △▽ arrow keys. When the display shows the correct day, move the cursor to the time position using the ◁▷ arrow keys.

The clock uses military time. Change the hour value using the △▽ arrow keys, then use the ◁▷ arrow keys to move the cursor to the minute value. Set the clock to the correct time and repeat the procedure to set the date.

Once all settings are correct, press OK to accept the changes.

To switch between summer and winter time (daylight savings time):

With the LOGO controller in RUN mode:

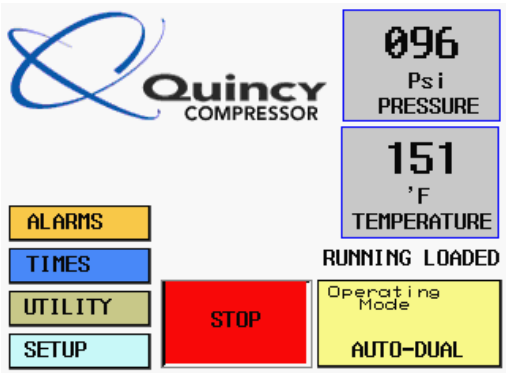
Press OK and △ at the same time to 'spring' forward one hour.

Press OK and ▽ at the same time to 'fall' back one hour.

Electronic Controller Operation

Basic startup Screen:

At startup, the HMI display screen displays the basic parameters and current compressor conditions, i.e., pressure, temperature and operating status.

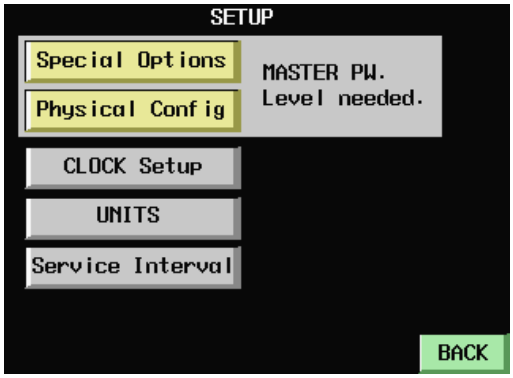


Alarm conditions and service messages will be shown on the left-hand side of the screen. Alarms resulting in shutdown will be red, other messages will be black.

The buttons on the left side of the screen can be pressed to access the various menus.

SETUP Menu:

The SETUP menu provides access to settings for the auto restart interval, operating mode, load and unload pressures, password setup, compressor configuration, network setup, controller language and display units, service intervals for the filters and calibration of the temperature and pressure sensors.



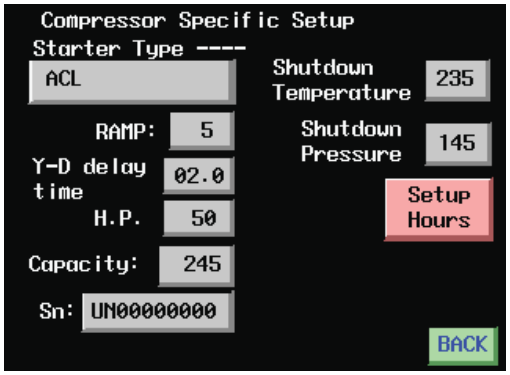
Auto restart - A value of '0' turns the auto restart feature off. Input value is the desired delay, in seconds, before the unit restarts following the restoration of power to the unit. This setting should be high enough to allow sufficient time for things to stabilize before a the unit starts.

Set Operating Mode - select one of the 3 basic operating modes; auto-dual, continuous run or network mode. If set to network mode, the violet boxes will give the load and unload values for THIS compressor, based on it's position in a sequence.

1. PASSWORD - The menu buttons in yellow require a password to be entered before they will activate. To access those setup menus, press PASSWORD and enter the password (777).

If the main SETUP menu screen is exited, the password must be re-entered.

2. CONFIG. - Press this button to enter specific information regarding the compressor's physical parameters.



NOTICE!

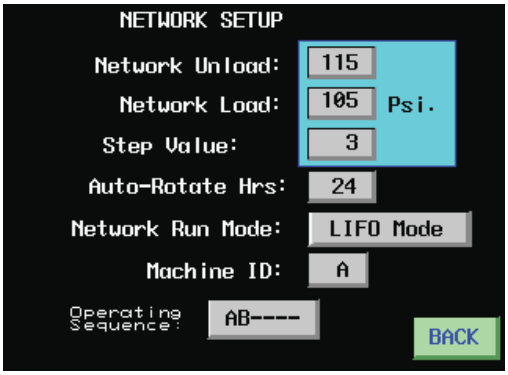
The password to access this menu is 1000 and this password should not be changed.

Select the starter type (ACL, Y/D or Solid State) by pressing the bar to rotate the selection.

RAMP time is for Solid State/Soft Starts to match the 'up to speed' intervals.

'Get Hours' and 'Restore Hours' are used to transfer the stored operating hours when changing out the controller. This prevents the run-time hours and filter times from being lost.

3. NET. SETUP - Sets the operating parameters for Network mode. The load and unload points are configured from a base load machine and are automatically assigned based on the STEP value and the compressor's position in the sequence.



EXAMPLE: If the Base load compressor ('A') has the pressures assigned as shown, pressure settings for compressor 'B' would be 1 psi below compressor 'A'; 114 unload and 104 load, and compressor 'C' would be 113 unload and 103 load, and so forth.

Network run mode can be set to 'LIFO Mode', 'AUTO-ROTATE Mode' or 'POWER SAVER'.

LIFO MODE is last in, first out sequencing. AUTO ROTATE mode should only be used with compressors that are matched in capacity. This mode equalizes the running hours by shifting the sequence every time the set hours expire.

NOTICE!

Power Saver mode is not currently available. When it becomes available, it will select the most efficient mode of operation by selecting the lowest horsepower combination to satisfy the demand.

If AUTO ROTATE mode is selected, the rotation will be the hours entered. The machine ID relates to the compressor being programmed, and identifies its position in the operating sequence.

Operating Sequence is the desired run list of compressors, with the left-most compressor being the BASE load, and the right-most compressor being the TRIM.

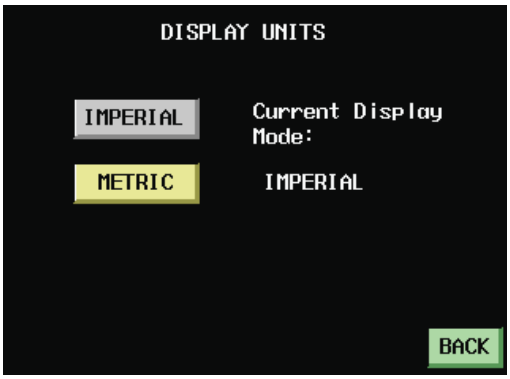
eMail - This option requires an additional module to be added to the controller.

NOTICE!

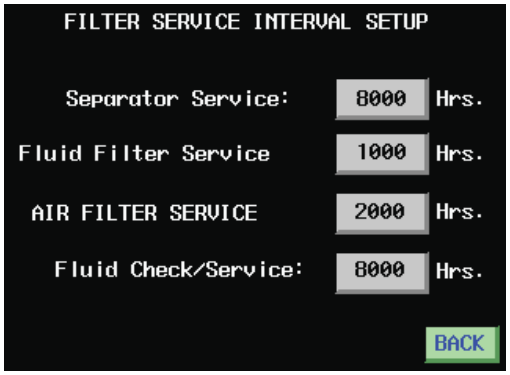
Future option - not yet available.

4. LANGUAGE - Press to select the display language: English, Spanish or French.

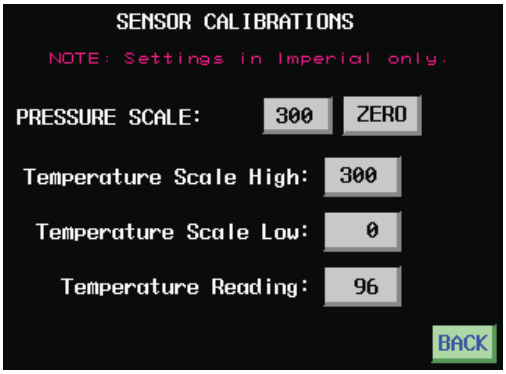
5. UNITS - Press to select the display units: Imperial or metric.



6. FILTERS - Press to setup service intervals for the various filters in the compressor When the counter reaches zero (0), a message to check the filter condition will be displayed on the main screen.



7. CALIBRATE - Allows calibration of the temperature and pressure sensors. The normal span is 0-300 for both the pressure transducer and the temperature sensor.

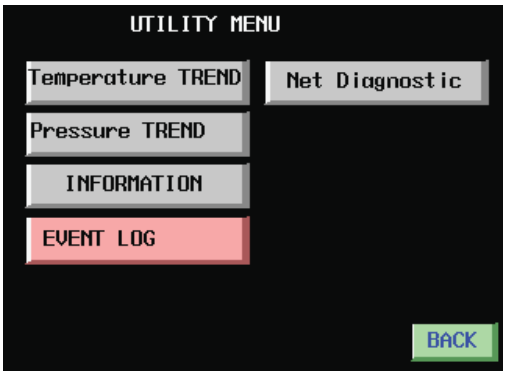


To calibrate the pressure sensor, vent the sensor to atmosphere, and press the ZERO button.

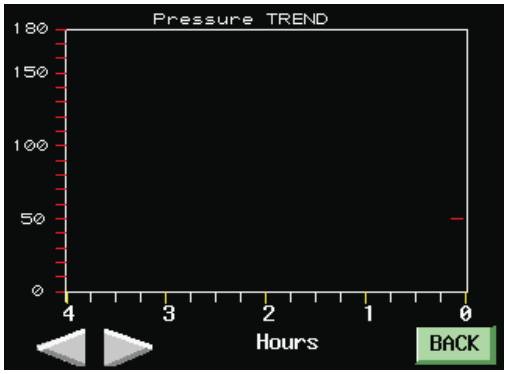
To calibrate the temperature probe, enter the current temperature of the probe (preferably in a thermal calibration block).

UTILITY Menu:

The UTILITY menu provides access to temperature and pressure trend information, setting the clock, view the compressor parameters, or look at the event log.



1. TREND display(s) - The Temperature TREND and Pressure TREND screens display the statistics for the last 128 hours of operation (5.33 Days), in 4 hour pages.



Press the scroll buttons to advance left or right through the available pages. The most recent is Page 0, the oldest page is page 31. Samples are taken approximately every 16 seconds.

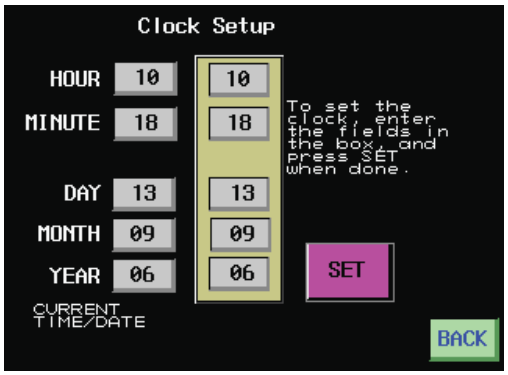
NOTICE!

The scales on these screens will be displayed in the controllers selected display units (Metric or Imperial).

2. Clock SETUP - Press to set the real time clock contained in the controller.

NOTICE!

The clock will remain valid for up to 200 days with power off.



The left column shows the current time and date settings in the controller. The right column (in the shaded box) shows the new settings. Once the correct information is entered, press SET to update the controller settings.

3. INFORMATION - This screen provides basic information about the compressor as well as the software version of the HMI and PLC.

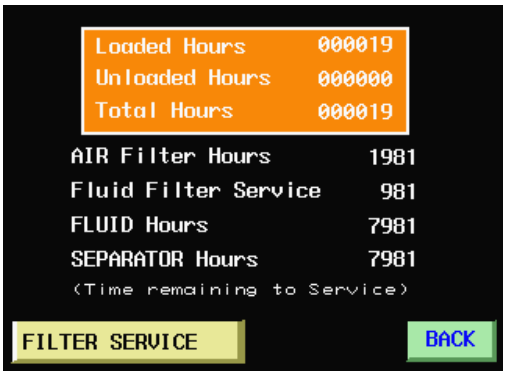
4. EVENT LOG - The event log displays a list of faults or other alarms with the date and time of the event. The most recent event is at the top of the list.

Up to 200 events can be stored. Press the scroll buttons to scroll through the events.

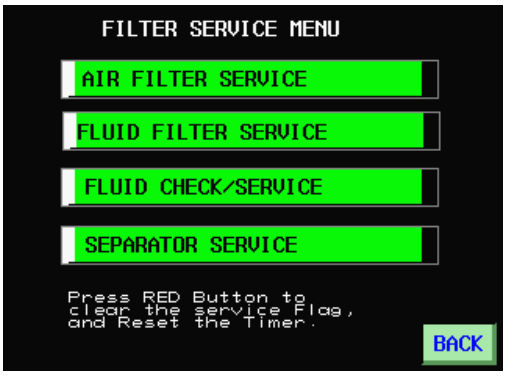
The event log information will be cleared if a control panel software upgrade is performed.

TIMES Menu:

This menu displays the current operating hours and the usage time on the various filter elements.



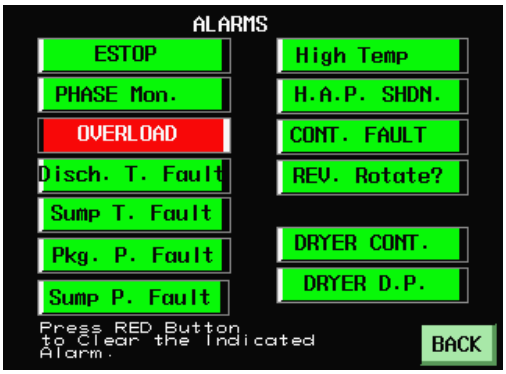
When the filter hours reach '0', an alarm message will be displayed on the main display screen indicating that it is time to perform service. Once service has been performed, press filter service to reset the counter.



The appropriate bar will be red when service is needed. Press the red bar to reset the hours for that filter.

ALARMS Menu:

The Alarms menu shows any pending alarms and allows you to clear those alarms after the fault has been corrected.



ESTOP - The Emergency Stop button on the panel had been pushed.

PHASE MON. - If installed, this indicates that there was a loss of phase fault recorded.

OVERLOAD - The main motor overload has tripped.

TEMP. FAULT - The temperature probe is faulty, either an open circuit or shorted.

PRES. FAULT - The pressure transducer is faulty, either an open circuit or shorted.

HIGH Temp - Discharge temperature is greater than the shutdown temperature.

H.A.P. SHDN. - Package pressure exceeded the maximum allowed pressure.

CONT. FAULT - The contactor fails to match the desired state (running or stopped).

*DRYER CONT. - If an integrated dryer is installed, a fault condition can occur if the contactor fails to match the correct state.

*DRYER D.P. - A dewpoint fault on the dryer.

* Dryer faults will not stop the compressor.

- General Information
- Inspection
- Safety
- Installation
- Start-up & Operation
- Maintenance
- Automatic Drains
- Troubleshooting

General Information

The Quincy Air Drying System is designed to cool and remove moisture from compressed air. When properly installed, the unit requires little maintenance or adjustments.

Inspection

Inspect equipment. Any concealed shipping damage must be reported to the carrier immediately. Damage claims should be filed by the consignee with the carrier.

Safety

When using air compressors and compressed air accessories, basic safety rules and precautions must always be followed, including the following:

1) Read all instructions fully.
2) Wiring, breakers and other electrical equipment must conform to local and national electrical codes. Do not operate this unit with damaged wiring or after the unit or air handling parts have been dropped or damaged in any manner. Notify authorized service facility for examination, repair or other adjustments.
3) Use suitable parts & accessories. Do not use air pressurized accessories or parts in the air system not suitable for the maximum air pressure.
4) Release air pressure slowly. Fast moving air will stir up dust and debris, which may be harmful. Release air pressure slowly when depressurizing your system to avoid bodily injury.
5) Secure drain lines. Fasten drain lines to floor or drain. Pressurized air may periodically pass through drain lines, which will cause an unsecured line to whip and may cause bodily injury.

WARNING!

Air from compressor and from Quincy Air Drying System, as equipped, is not safe for human respiration (breathing).

To provide safe, breathable air, compressor must be capable of producing at least Grade D breathing air as described in Compressed Gas Association Commodity Specification G7.1-1966. Special filtering, purifying and associated alarm equipment must be used to convert compressed air to "Breathing Air." Other special precautions must also be taken. Refer to OSHA 29 CFR 1910.134.

DISCLAIMER OF WARRANTY If this unit is used to produce breathing air, the special equipment and precautions expressed in OSHA 29 CFR 1910.134 for specifications of the necessary equipment and special precautions to make Breathing Air MUST BE used or any warranties are VOID and manufacturer disclaims any liability whatsoever for loss, personal injury or damage.

Installation

Electronic timer operated auto drains are installed on integrated dryers. Auto drains include a particle strainer upstream from the drain valve. To clean, close the shut-off valve and depressurize the drain line. All drain outlets may be combined for condensate disposal. Dispose the condensate in compliance with local and federal government requirements.

WARNING!

Drain outlet tubing will periodically contain pressurized air. An unsecured drain tube will whip around potentially causing bodily injury.

CAUTION!

Do not combine any two or more drain inlet lines through one single automatic drain valve. This will reduce or eliminate the proper drainage.

WARNING!

Wiring to the dryer must meet the national (NEC) and local code requirements. Check the voltage specified on the nameplate to the electrical power connecting to the dryer. Electrical connections must be made by an electrician.

Start-up & Operation

The non-cycling design of the refrigerated dryer assures proper dew point control at all load conditions. The refrigerant compressor runs continuously when the fan dryer is "ON". All dryers are installed with fan cycling switch. These fans will cycle with respect to the load changes, ambient temperature fluctuations, and the cleanliness of the condenser. Standard units are designed to operate under the following conditions:

1) Inlet Air Temperature: 100°F design 120°F maximum
2) Inlet Air Pressure: 100 PSIG design 175 PSIG maximum
3) Ambient Air Temperature: 40°F minimum 110°F maximum

NOTICE!

At temperatures above the 100°F design, refrigeration capacity will decrease. Operating air pressures below the 100 PSIG design will reduce system capacity.

Start-up Procedure

Air dryers with three-phase power supply are equipped with a compressor crankcase heater. This heater must be energized by closing the disconnect switch or circuit breaker a minimum of 6 to 10 hours before start-up. Power to the air dryer can be left on to energize the crankcase heater for the off-cycle, during evening or weekend shutdowns.

CAUTION!

STARTING THE DRYER WITHOUT ENERGIZING THE CRANKCASE HEATER WILL CAUSE PREMATURE FAILURES OF THE REFRIGERANT COMPRESSOR. Failure to comply with procedure of energizing crankcase heater before start-up may void warranty.

Operating Range & Control Settings

(R-134a refrigerant)

1) Suction Pressure: 25 to 33 PSIG
2) Discharge Pressure: 100 to 160 PSIG
3) Low Pressure Switch: CUT OUT: 20 PSIG CUT IN: 45 PSIG
4) High Pressure Switch: 250 PSIG
5) Fan Control: CUT OUT: 110 PSIG CUT IN: 150 PSIG

Shutdown Procedure

Turn the power switch to the OFF position.

CAUTION!

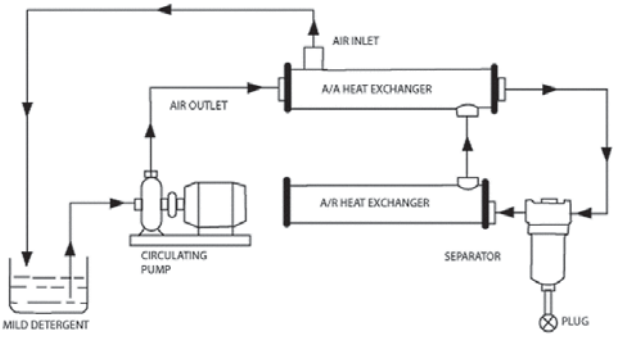
Contact factory before authorizing any warranty refrigeration service on the air dryer. Identify the dryer by model and serial numbers when calling factory.

Maintenance

The dryer is factory tested before shipping. All controls are calibrated for automatic operation. If the dryer is installed in clean surroundings, within the temperature limits of the specified ambient, the dryer will run trouble-free for a very long time. Routine maintenance procedures recommended are the following:

1) Check the fan motor(s) for proper operation to maintain the cooling air to be drawn through the condenser and blown over the refrigerant compressor.
2) Clean the condenser periodically to maintain the proper heat transfer on the condenser coil. Dirty condenser will raise the head pressure of the refrigeration system and trip the compressor "off" at the overload control. Running the compressor on high head pressures may cause premature failures. Check the ambient temperature limits to be maintained at the installation.
3) Pressure drop across the dryer may increase slowly as the particulate material coming through the air stream plugs up the internals of the heat exchanger. A back-flush procedure is recommended to clean the air system.

To back-flush, disconnect air dryer, plug the drain line and fill the air system with the detergent water solution. Hold it for 4-6 hours. Circulate the detergent from air outlet to air inlet with a pump. Flush the system with warm water. If pressure-drop still exists, contact factory.



Back-flush Flow Diagram

NOTICE!

A dryer bypass assembly is included with every dryer equipped compressor. This bypass will allow the compressor to continue to operate while the dryer is being serviced or if the dryer is inoperable.

Automatic Drains

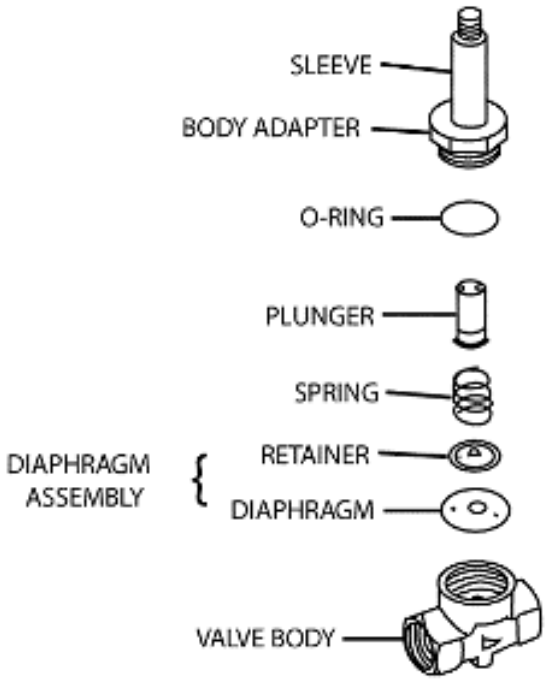
The recommended settings for the drain time are determined by the dryer moisture load. The cycle time should be adjusted to approximately 2 minutes. The drain time should be set3-5 seconds, so the drain expels all of the liquid and then a short burst of air. These adjustments may be refined by trail and error method.

Periodically check the automatic drains for proper drainage. If the drains are not functioning, the condensed moisture will be re-entrained downstream of the air dryer. Electronic solenoid operated drains may be manually tested periodically for proper operation.

Drain Valve Clean Up Procedure

A) Depressurize the drain valve.
B) Disconnect the power source.
C) Remove the valve from the compressed air system.
D) Remove the solenoid coil.
E) Remove the stainless steel sleeve from valve body.
F) Clean the valve body internals, and all other components.
G) Replace diaphragm as needed. The valve rebuild kit is available.
H) Assemble the valve parts.
I) Connect the solenoid coil.

J) Install the drain val



Drain Valve

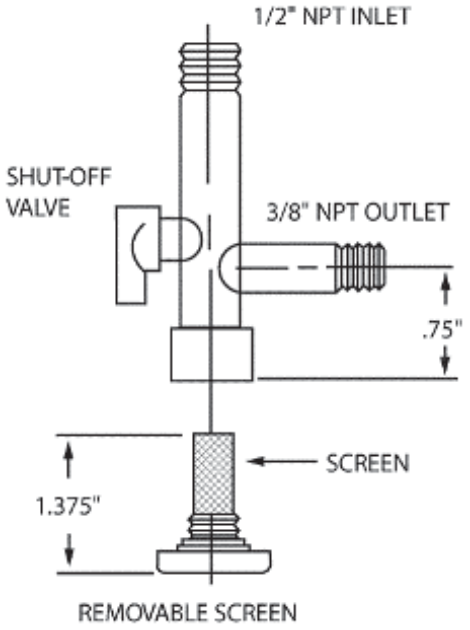
Recommended Operation and Maintenance for the Particle Strainer

The particle strainer should be cleaned once every week or as needed.

1) Close the shut-off valve on the particle strainer.
2) Depressurize the drain by pressing the drain PRESS TO TEST on DRAIN TEST key.
3) Unscrew bottom of the particle strainer and clean the screen.

CAUTION!

Failure to depressurize may cause bodily injury.



Particle Strainer

Compressor

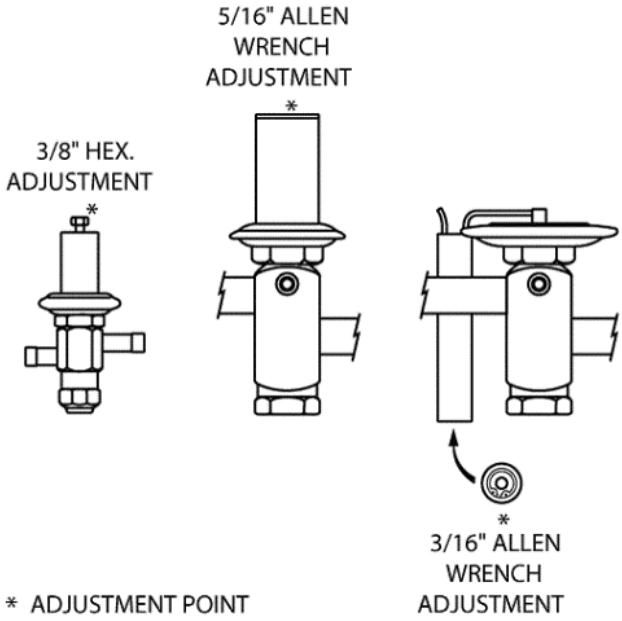
Refrigerant compressors normally do not need any maintenance. The compressor will unload or adjust for different load conditions with the refrigeration controls. Any time power is applied to the compressor, and the suction pressure is higher than the specified readings, the compressor is either not pumping or failed electrically, or tripped "off" at the overload protection. If the compressor does not automatically reset within a few minutes, it requires servicing. Service must be performed by a qualified refrigeration technician.

Expansion Valve

Integrated air dryers are equipped with a thermostatic expansion valve, factory set to maintain a superheat of 8 to 10°F. These valves do not need adjustment in normal operation. Generally, superheat adjustments are needed only at the time of valve replacement. Expansion valve service must be performed by a qualified refrigeration technician

Hot Gas Bypass Valve

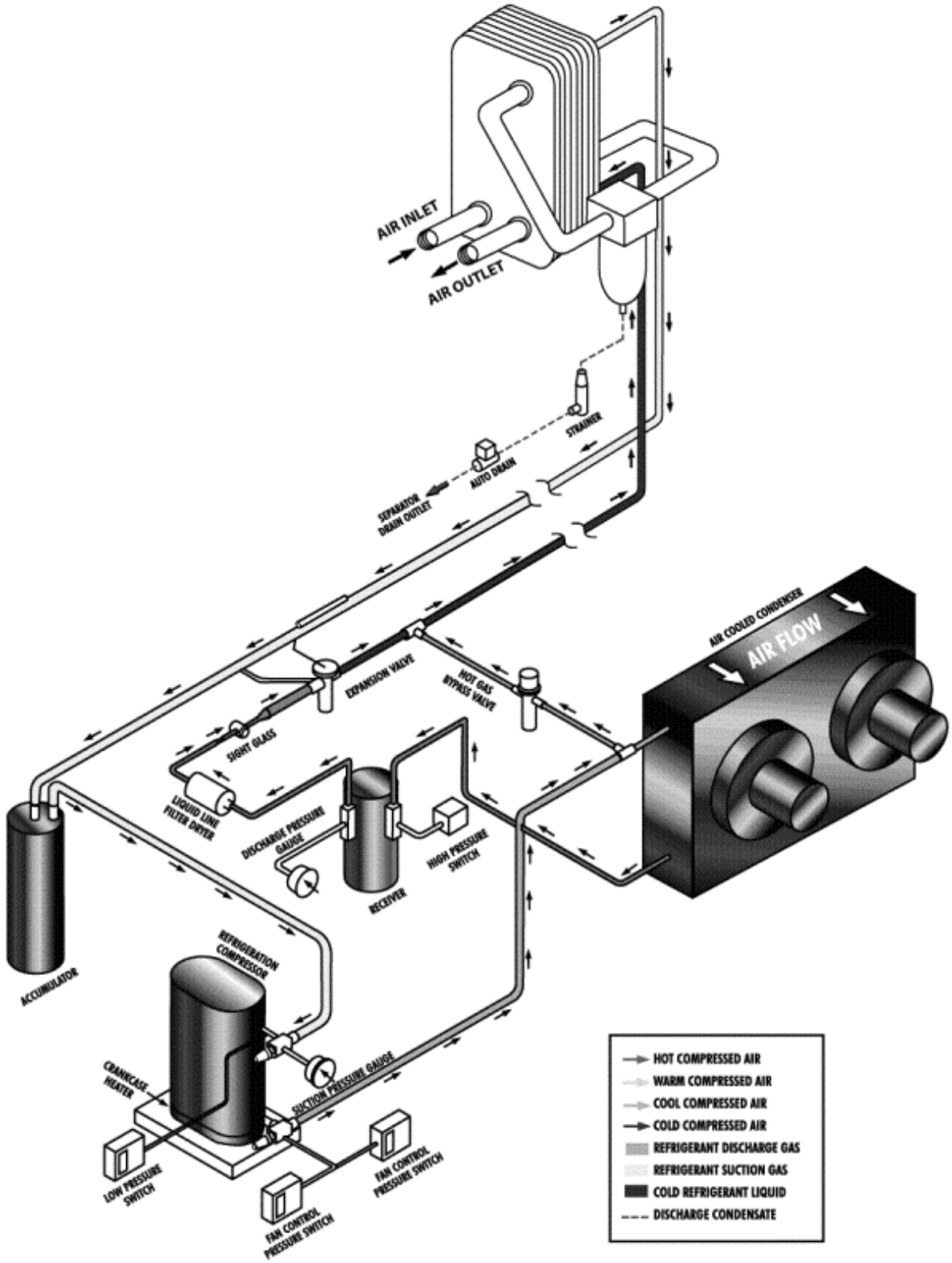
Integrated air dryers come equipped with modulating hot gas bypass valves. This valve maintains the refrigerant suction pressure in varying load conditions. The dryer will run from no load to full load conditions without freeze-up. The operation of this valve is automatic. If the valve needs adjustment, turn the adjusting stem clockwise to raise the suction pressure, and counterclockwise to lower the suction pressure. This adjustment should be made under a no-load condition. When the adjustment is made, turn one quarter of a turn at a time, and wait 3 to 5 minutes between adjustments. Once the adjustment is complete, secure the adjusting stem with the locknut that is provided. Careful adjustment of this valve is necessary for normal operation of the air dryer. Hot gas bypass valve adjustment may be made by maintenance personnel.



Hot Gas Bypass Valve Adjustments

Dual Pressure Switch

This safety switch protects the refrigeration system. If the refrigerant pressure falls below or above the normal operating range, this switch trips the compressor. Manually reset the switch after rectifying the fault to run the dryer again.



Flow Diagram

NOTICE!

The alarm indication light (red) signifies the refrigerant compressor is not running. The reasons can be:

- Low suction pressure
- High discharge pressure
- Electrical problems
- Loss of refrigerant
- Dirty condenser
- Leaking evaporator, etc.

Refer to Troubleshooting in the next column for problem analysis and remedy. Call the factory if further assistance is required.

Troubleshooting

The following conditions can cause abnormal operation or malfunction of the air dryer

- High inlet air temperatures
- Dirty condenser
- Low ambient temperatures
- Malfunctioning automatic drains at aftercooler, or dryer
- Refrigerant overcharge
- Leaky evaporator
- Electrical power supply more than ±10% of the rated voltage
- Low inlet air pressures
- High ambient temperatures
- Compressed air flow greater than rated capacity
- Undersized fuses
- Refrigerant undercharge

If any of these symptoms are noticed, refer to Section VIII - Troubleshooting.

- Preparing for Maintenance or Service
- Safety
- Maintenance Schedule
- Water Removal
- Air/Fluid Separator Element
- Fluid Scavenging System
- Fluid Filter
- Air Filter
- Shaft Seal
- Air and Fluid Tubing
- Service Adjustments
- Water Coolers

Preparing for Maintenance or Service

The following procedure should be followed for maximum safety when preparing for maintenance or service:

1) Disconnect and lockout the main power switch and hang a sign at the switch of the unit being serviced.
2) Close shut-off valve (block valve) between receiver and plant air system to prevent any back-up of air flow into the area to be serviced. NEVER depend upon a check valve to isolate the system.
3) Open the manual vent valve and wait for the pressure in the system to be completely relieved before starting service. DO NOT close the manual vent valve at any time while servicing.
4) Shut off water and depressurize system if water-cooled.

WARNING!

Never assume the compressor is ready for maintenance or service because it is stopped. The automatic dual control may start the compressor at any time. Death or serious injury could result.

Safety

NOTICE!

Maintenance should be performed by trained and qualified technicians only.

Safety procedures while servicing the compressor are important to both the service personnel and to those who may be around the compressor and the system it serves. Listed below are some, but not all, procedures that should be followed:

- Wait for the unit to cool before starting service. Temperatures may exceed 180°F when the compressor is operating.
- Clean up fluid spills immediately to prevent slipping.
- Loosen, but do not remove, flange or component bolts. Carefully pry apart to be sure there is no residual pressure before removing bolts.
- Never use a flammable solvent such as gasoline or kerosene for cleaning air filters or compressor parts.
- Safety solvents are available and should be used in accordance with their instructions.

CAUTION!

Unusual noise or vibration indicates a

problem. Do not operate the compressor until the source has been identified and corrected.

Maintenance Schedule

This Schedule is intended to be used as a guideline only. Depending on the specific operating conditions of your compressor, maintenance requirements may vary. The instructions in this section will give more details about determining when specific service should be performed.

Periodically/Daily (8 hours maximum):	Monitor all gauges and indicators for normal operation. Check fluid level. Drain water from air/fluid reservoir. Observe for fluid leaks. Observe for unusual noise or vibration.
Monthly:	Replace air filter. (Daily or weekly service may be required under certain conditions.) Clean fluid cooler fins (air-cooled). Wipe down entire unit to maintain appearance.
Every 6 months or 1000 running hours:	Take fluid sample. Replace fluid filter. Inspect control lines and repair as needed.
Periodically/yearly:	Replace air/fluid separator elements. Check all bolts for tightness. Lubricate motors. Check safety (HAT) shutdown system. Test pressure relief valve for proper operation. Contact a qualified serviceman.
Every 8000 running hours:	Replace fluid.

CAUTION!

Unusual noise or vibration indicates a problem. Shutdown the compressor and do not restart until the source has been identified and corrected.

NOTICE!

Reference pages 38 thru 44 for more specific instructions on performing general maintenance. Reference Section VII - Compressor Fluids for instructions regarding taking fluid samples and selecting an appropriate fluid for your machine.

NOTICE!

Failure to follow these maintenance and service recommendations may adversely affect your warranty. Maintain accurate and complete maintenance records to ensure

warranty compliance.

Water Removal

Water vapor may condense in the reservoir and must be removed. The frequency with which water must be removed is determined by the ambient air conditions. Your QSI compressor is equipped with a low loss fluid drain and timer solenoid valve. The timer should be adjusted to allow the drain to blowdown as necessary according to the humidity level at the installation site.

Air/Fluid Separator Element

The separator element is a one piece construction that coalesces the fluid mist, passing through the filtering media, into droplets that fall to the bottom of the separator element to be picked up by a scavenging tube and returned to the compressor. Use care when handling the separator element to prevent it from being damaged. Denting may destroy the effectiveness of the filtering media and result in excessive fluid carryover. Even a very small hole punctured through the element will result in a high fluid carryover. Larger models use two air/fluid separator elements.

WARNING!

Do not remove the metal clips from the separator element. Their function is to prevent an electrostatic build-up which could spark a fire. Use genuine Quincy replacement separators.

Continuity Testing of Separator Elements

NOTICE!

Electrical continuity between all separator element metal surfaces must be checked prior to replacing any separator element. Do not install if continuity is not present. Return the separator element to your Quincy Distributor for replacement.

Prior to installation, test the separator element as follows:

1) Locate a continuity test light or a volt-ohm-meter (v-o-m) capable of reading 20 ohms.
2) Assure that battery has proper charge. Touch the probe leads together to assure the light works or to zero calibrate the meter.
3) Contact the grounding staple on the separator element gasket with the ground probe of the test indicator.
4) Touch the top cap of the separator element with the other probe. The indicator light should illuminate on the test or the v-o-m test must read no more than 20 ohms.
5) Touch the bottom cap of the separator element. The indicator light should illuminate on the test or the v-o-m test must read no more than 20 ohms.
6) Touch the inside wire mesh (do not puncture the element media). The indicator light should illuminate on the test or the v-o-m test must read no more than 20 ohms.
7) If the separator element has a gasket on each side of the flange, repeat steps 3 through 7.
8) If the separator element fails any of the above test , return it to your Quincy Distributor for replacement.
9) Make sure the compressor is bonded (wired) to an earth ground to dissipate static electricity.

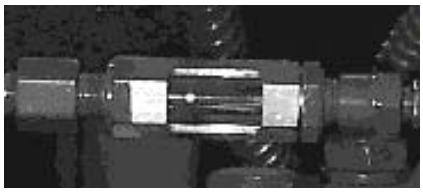
Fluid Scavenging System

Fluid from inside the separator element is returned to the inlet valve or airend by a scavenger tube positioned inside the separator element, through an orifice and tube connected to the compressor. Failure to keep the orifice clean will result in excessive fluid carryover. Cleaning of the orifice should be performed when the following conditions exist:

- When no fluid is seen moving through the sight glass.
- When excessive fluid carryover is detected.
- Every fluid change.
- Once per year.

NOTICE!

Do not ream the orifice or change the orifice size. Do not install the orifice reversed.



Scavenge Line Sightglass

Air Filter

A high performance, heavy duty air filter is standard on QSI models. The heavy duty filter element is a single stage, dry type filter with straight through flow which exhibits a 99.7% efficiency for arrestance at a particle size of 1µ or larger. Filter elements are constructed from a special nanofiber material that yields up to 10 times more efficient filtration than traditional cellulose fiber elements. The single stage straight through design provides improved containment and encapsulation of contaminants, as well as providing a non-metallic element which is incinerable.

To replace the filter element, unlatch the three spring clips on the rear of the air filter mounting box. Pull the mounting box forward and away from the filter element, which is securely fitted into a circular collar at the top of the inlet valve elbow. The filter is held in place by friction fit of the sealing gasket. While pulling the filter toward you, gently wiggle it from side to side to remove it. Reverse these steps to install the new filter element.

NOTICE!

Intake filtration equipment supplied from the factory may not be adequate for extremely dirty applications or some forms of dust or vapors. It is the customer's responsibility to provide adequate filtration for those conditions. Warranty will be voided if inadequate filtration causes a failure.

Fluid Filter

The fluid filter is a spin on, full flow unit. Replacement of the filter requires spinning off the cartridge and replacing it with a new one.

NOTICE!

Use genuine Quincy replacement filters only.

Spin-on Fluid Filter

The initial filter change should occur after the first 500 hours of operation. During normal service, the filter cartridge should be replaced under the following conditions, **whichever occurs first**:

- as indicated by the fluid filter maintenance indicator when the fluid is at normal operating temperature
- every 1,000 hours
- every fluid change

NOTICE!

The fluid filter maintenance indicator may read high upon start up on cool mornings due to sluggish fluid creating higher than normal differential pressures. Monitor indicator after the fluid warms up.

Fan Motor

The following procedure should be followed in the event the fan motor assembly needs removed for servicing or replacement. Retain all fasteners for reassembly.

1. Remove the j-box cover on the fan motor, and disconnect the electrical leads. Then loosen the conduit nut on the j-box, and set the electrical conduit to the side

Shaft Seal

Compressor shaft seals are wear items that may eventually have to be replaced. Special tools and a complete understanding of the installation procedure are required for a successful seal replacement. Ask your Quincy distributor for complete illustrated instructions (available as a Service Alert) at the time you order the seal and special tools, if you decide to replace the seal yourself. If your distributor does not have a copy of these instructions, they can be ordered from Quincy Compressor at no charge.

QSI compressors incorporate a fluid scavenge system to complement the use of a triple lip seal assembly. Any complaint of shaft seal leakage requires that the scavenge system be inspected for proper operation prior to the replacement of the shaft seal. Proper inspection consists of the following:

- Assure that the scavenge line itself is not plugged.
- Inspect the performance of the scavenge line check valve by removing the fitting located at the bottom of the motor adapter. Remove the check ball and inspect for wear. If the check valve is stuck open, fluid can backflush from the airend into the seal cavity and appear as a leak. If the check valve is stuck closed the seal cavity will not scavenge. Replace if necessary.
- Remove the coupling guards and coupling halves
- Remove the drive coupling hub and key from the compressor shaft.
- Remove the drive motor.
- Remove the four bolts securing the seal adapter to the suction housing.
- Insert two of the seal adapter retaining bolts into the seal adapter jack holes and turn clockwise (pushing the seal adapter away from the suction housing).
- After the seal adapter outer o-ring has cleared the seal adapter bore, remove the adapter for inspection.
- Disassemble the seal adapter as follows:

a. With the face of the seal adapter up, insert two small, flat screwdrivers under the outer lip of the fluid slinger and pop the slinger from the seal adapter bore.

b. Using a brass drift, tap the shaft seal assembly from the seal bore.

c. Inspect both seal lips for excessive wear, lip flaws or damage.

d. Inspect the outer o-ring on the fluid slinger for cuts or nicks.

e. Inspect the outer o-ring on the seal adapter for cuts and nicks.

f. Slide the wear sleeve removal tool over the end of the shaft and allow the jaws of the tool to snap on the backside of the wear sleeve. Tighten the outer shell of the tool down over the inner jaws.

g. Using a ratchet and socket, turn the puller jack screw clockwise in against the end of the compressor shaft to remove the seal wear sleeve.

CAUTION!

Do not use an impact wrench with this tool.

Preparation for New Seal Installation

- Inspect the compressor shaft for burrs or deep scratches at the wear sleeve area. Using a 100-grit emery cloth, lightly sand horizontally any rust or Loctite™ on the shaft. Using a fine file or emery cloth, deburr the key area of the rotor shaft. Cover the keyway with masking tape to prevent damage to the new seal during installation.
- Clean the seal adapter with fast drying solvent. Assure that the scavenge drain in the seal adapter is clean and open. Place the outer face of the seal adapter on a flat, hard surface.
- Remove the new triple lip seal from the package and inspect for damage or imperfections on the seal lips.
- Apply a thin coat of Loctite™ 290 to the outer steel case of the seal and position the seal in the seal adapter bore.
- Insert the proper seal driver over the seal. Insert the proper wear sleeve driver in the seal driver and tap the new seal into the bore with a medium sized hammer.
- Preheat the wear sleeve (in a small oven) to 350°F. **Do not preheat in warm oil.**
- Apply a thin film of Loctite™ to the inner diameter of the wear sleeve and immediately install on the compressor shaft using the proper wear sleeve driver. Drive the wear sleeve on the shaft until the driver bottoms on the shaft shoulder.

Seal Installation

- Apply a thin coat of compressor fluid to the outer face of the wear sleeve and seal lip.
- Slide the proper seal installation sleeve against the wear sleeve with the taper toward the end of the rotor shaft.
- Install a new o-ring on the seal adapter and lubricate with compressor fluid.
- Install a new o-ring around the scavenge port (use petroleum jelly to hold the o-ring on the seal adapter face during installation).
- Carefully slide the seal adapter with the new seal installed over the end of the rotor shaft and up against the adapter bore.
- Using care not to damage the o-ring, evenly draw the adapter into the bore, install the four retaining bolts and tighten to the specified torque.
- Remove the installation sleeve.
- Apply a thin film of compressor fluid to the o-ring and seal lip of the outer fluid slinger.
- Install the outer slinger over the end of the rotor shaft and push into the scavenge bore using both thumbs.
- Reinstall drive motor, and coupling.
- Reinstall the coupling guards before starting the compressor.

Air and Fluid Tubing

Flareless tubing is used in the air piping to eliminate pipe joints and provide a cleaner appearance. Replacement tubing and fittings are available; however, special installation procedures must be followed. Your authorized distributor has the necessary instructions and experience to perform these repairs.

WARNING!

Failure to install flareless tubing or fittings correctly may result in the tubing coming apart under pressure. Serious injury and property damage may result.

Service Adjustments

Differential Pilot Valve

WARNING!

Never adjust the pressure higher than the factory setting. Death or serious injury and compressor or property damage could result.

Open a manual vent valve to allow the compressor to exhaust air to the outside and start the unit. By manual regulation, slowly close the valve, allowing the unit to build air pressure to the desired modulation point and hold (100 PSIG standard). Adjust the screw on the bottom of the differential pilot valve so that a slight stream of air can be felt coming from the orifice adjacent to the adjustment screw.

When this air is felt, air is beginning to pass through the pilot valve to the air cylinder on the inlet valve, causing the valve to modulate toward its closed position, thereby reducing the volume of air being compressed.

To raise the pressure, turn the adjusting screw in (clockwise). To lower the pressure, turn the screw out (counter clockwise). Maximum full load pressure is 115 PSIG for standard QSI units. Minimum full load pressure with modulation and standard controls is 75 PSIG.

Pressure Switch

The pressure switch determines what pressure the compressor will load and unload. Standard factory settings are 100 PSIG cut-in, 125 cut-out. If a lower setting is desired, adjust the differential pilot valve first and set the pressure switch cut-out point to 15 PSIG over the desired full load pressure. The range adjustment is made by turning the screw clockwise to increase the cut-in/cut out pressure.

Drive Coupling Alignment -QSI 245i-1000i

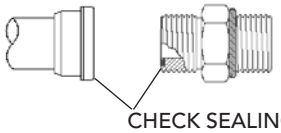
These QSI units are direct coupled between the airend and the drive motor through the use of a transition piece. Realignment of the coupling is not necessary.

WARNING!

Do not operate the unit without both coupling halves and guards in place.

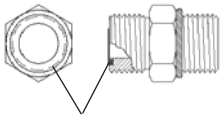
ASSEMBLING THE FACE SEAL END

1) CHECK SEALING SURFACES



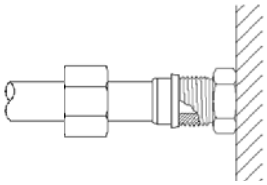
CHECK SEALING SURFACE AND GROOVE FOR DAMAGE OR MATERIAL BUILDUP.

2) INSTALL O-RING



CORRECTLY SIZED O-RING IS 0.070" THICK AND ITS O. D. TOUCHES THE OUTSIDE EDGE OF THE GROOVE.

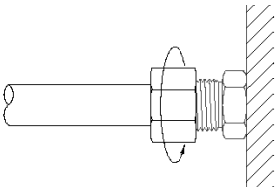
3) POSITION TO FITTING



ENSURE THAT O-RING IS PROPERLY SEATED IN THE GROOVE.

POSITION AND HOLD FLAT SEALING FACE AGAINST O-RING.

4) THREAD ON NUT BY HAND & 5) WRENCH TIGHTEN

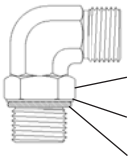


IF PROPERLY ALIGNED, THE NUT SHOULD THREAD ON EASILY BY HAND.

WRENCH TIGHTEN TO RECOMMENDED TORQUE FOR FACE SEAL END.

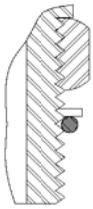
ASSEMBLING ADJUSTABLE END TO PORT

1) CHECK SEALING SURFACES & INSTALL O-RING



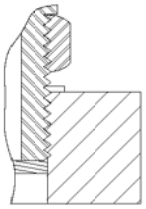
- INSPECT FITTING FOR DAMAGE
- USE O-RING INSTALLATION TOOL TO INSTALL O-RING
- APPLY SMALL AMOUNT OF LUBRICANT TO O-RING

2) BACK OFF NUT



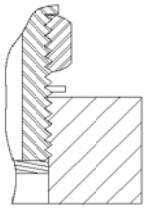
BACK OFF LOCKNUT TO ITS UPPERMOST POSITION

3) THREAD INTO PORT



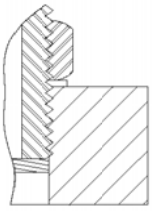
THREAD FITTING INTO THE PORT UNTIL THE BACKUP WASHER CONTACTS THE SURFACE

4) BACK OFF FOR ALIGNMENT



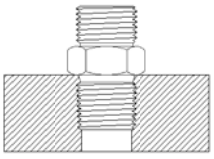
POSITION FITTING FOR ATTACHING LINE BY UNTHREADING UP TO 360°

5) WRENCH TIGHTEN



WRENCH TIGHTEN LOCKNUT

ASSEMBLING NON-ADJUSTABLE PORT END



- INSPECT SEALING SURFACES FOR DAMAGE
- INSTALL O-RING
- THREAD FITTING INTO PORT AND WRENCH TIGHTEN

SEAL-LOK ASSEMBLY TORQUES (IN LBS)								
DASH SIZE	4	6	8	10	12	16	20	24
FACE SEAL END	220 (+/-) 10	320 (+/-) 25	480 (+/-) 25	750 (+/-) 35	1080 (+/-) 45	1440 (+/-) 90	1680 (+/-) 90	1980 (+/-) 100

Water Coolers

When zinc anodes are used for a particular application, they should be inspected two weeks after initial startup and also anodes need to be checked once a month until a wear pattern is established for a given application/environment.

The zinc anodes must be replaced when the zinc body is 75% depleted.

Part number	Description
147880-038	3/8NPT fitting
147880-050	1/2NPT fitting

- Fluid Specifications
- Lubrication
- Fluid Level
- Fluid Sample Valve
- Factors Affecting Fluid Life
- Sampling Procedures
- Fluid Analysis Program - General
- Understanding the Analysis Report
- QuinSyn-Plus
- QuinSyn-PG
- QuinSyn-XP
- QuinSyn-F
- QuinSyn Flush
- Cleaning and Flushing With QuinSyn Flush
- Converting to QuinSyn-Plus
- Converting to QuinSyn-PG
- Converting to QuinSyn-XP
- Fluid Parameters

Fluid Specifications

The three functions of compressor fluid are:

- lubricate the bearings and rotors
- remove heat from the air as it is being compressed thus lowering the compressed air discharge temperature
- seal the rotor clearances.

We recommend that all Quincy rotary screw compressors be filled with one of the following synthetic fluids:

QuinSyn-Plus - Standard fill.

QuinSyn-PG - Optional fill for high humidity installations.

QuinSyn-XP - Standard fill for high pressure applications.

QuinSyn-F - Food grade applications.

A fluid tag is attached to each Quincy rotary screw compressor indicating the type of fluid provided in the initial fill. All of the above fluids are available from any authorized Quincy distributor.

CAUTION!

Do not mix different grades or types of fluid. Do not use inferior grades of fluids.

NOTICE!

Failure to follow these fluid recommendations will adversely affect your warranty.

Lubrication

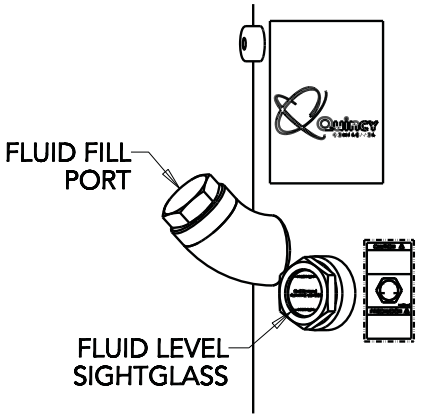
Your new Quincy QSI compressor has been designed for optimum overall performance without the use of a positive displacement fluid pump. For applications requiring a fluid pump, Quincy compressors are equipped with a positive displacement fluid pump mounted to the compressor and directly driven by one of the rotors. Fluid is circulated through the cooler, fluid filter, and into the compressor.

In the compressor, fluid is diverted through internal passages to ensure positive lubrication of the bearings and shaft seal. The remainder of the fluid is injected at the beginning stage of the compression cycle to seal clearances and to cool and lubricate the rotors. Models not equipped with a fluid pump use pressure differential to circulate the fluid. Positive pressure maintained in the reservoir forces the fluid throughout the machine.

Each Quincy compressor is filled at the factory with the correct amount of one of the synthetic fluid listed in the Fluid Specifications. Mineral oil can be requested and used in specific applications. The use of other brands or types of fluid may reduce the design life of the compressor or cause problems with filtration or carryover. Consult the Quincy Service Department before changing brands of fluid.

Fluid Level

Fluid level is monitored by a sightglass on the reservoir. The fluid level should be checked while the compressor is in operation and should be between the 'MINIMUM' and 'MAXIMUM' lines on the sightglass. **DO NOT OVER FILL**.



Each unit comes equipped with a fluid level sightglass, a fluid fill port and a fluid drain on the reservoir. There is also a pressure gauge at the wet side of the reservoir to indicate reservoir pressure. Reference this gauge prior to removing the fluid fill plug to ensure that the pressure has been relieved. The fluid fill plug is drilled to allow some pressure to escape before the plug is completely removed. Should you hear pressurized air venting through the hole, immediately screw the plug back into the reservoir. Relieve the pressure in the machine before proceeding.

CAUTION!

Hot fluid under pressure could cause death or serious injury. Do not remove the fluid fill plug and attempt to add fluid to the reservoir while the compressor is in operation or when the system is under pressure. Be sure that the compressor is stopped and that the main power disconnect switch is off and locked out to assure that the compressor will not start automatically.

Revised Fluid Level instructions. (07/16/07).

Fluid Sample Valve

QSI models are equipped with a fluid sample valve located at the discharge of the fluid filter.

Fluid samples should be taken from the sample valve while the compressor is running at normal operating temperature (see Sampling Procedures - page 49).

Fluid Sample Valve

Factors Affecting Fluid Life

To protect your investment, check for the following, which can affect the long life of QuinSyn:

1) High operating temperatures
2) Contaminants:
   a. Other fluids
   b. Strong Oxidizers such as:
      - acids
      - sulfur
      - chlorine
      - burnt fuel -
        i.e. exhaust from: forklifts, boilers, jet aircraft
      - nitrogen oxides
      - ozone
      - welding fumes
      - plastic molding fumes

   c. Ammonia
   d. Solvent fumes:
      - chlorinated degreasers
      - ink solvents

   e. Airborne dust and particles
   f. Paper digester fumes

Locate your compressor in the coolest area possible. For every 18°F above 195°F, the operating life of any fluid is reduced to about half that at 195°F. Some mineral oils begin to form varnish at temperatures above 200°F. QuinSyn-Fluids are more forgiving than mineral oil at high temperatures. QuinSyn-XP is designed to operate at sustained temperatures above 200°F. The life of other QuinSyn-Fluids will be shortened at high temperatures.

Air intake should provide contaminant-free, cool air. A Quincy heavy-duty intake filter will reduce the risk of abrasion and increased wear. An air filter does not eliminate reactive gases. Inspect your filter monthly and replace as required.

Sampling Procedures

Preferred sample location is the fluid filter. If unable to take sample from fluid filter, proceed as follows:

1. Shutdown and lockout compressor.
2. Relieve pressure in reservoir.
3. Remove plug from reservoir drain line.
4. Drain water from reservoir and discard in approved manner.
5. Fill sample bottle with fluid.
6. Close valve and replace plug in drain line.
7. Return compressor to service and check fluid level during operation. Service with fluid as required.

Using fluid filter sample valve, proceed as follows:

1. Open valve, drain 2-4 ounces of fluid from filter and discard in an approved manner.
2. Fill sample bottle.
3. Close valve.

After collecting sample from either of the above methods:

1. Fill out information label completely.*

Be certain to provide all information as to possible hazards related to a given sample. If this situation exists, all information shall be clearly marked on the sample bottle label.

2. Attach Sample Bottle Label to the bottle and put bottle in mailer.
3. Place Shipping Label on the outside of the mailer and send it by UPS.

FROM: _____
Customer Fax # _____

Model No._____ Serial No._____
Fluid_____ Sample Date_____
Hours on Fluid _____ Hours on Machine_____
Distributor_____
Sample From o Reservoir o Filter

Sample Bottle Label

FROM:

TO:

Quincy Compressor Fluid Analysis
2300 James Savage Road
Midland, MI 48642-6535

Shipping Label

Note: A fluid sample valve kit is available from Quincy Compressor. Contact the Service Department and ask for part number 143286.

Fluid Analysis Program - General

Quincy's fluid analysis program is offered to all customers using QuinSyn-Fluids in Quincy Compressor Rotary Screw Compressors. This service provides optimum drain intervals for compressors operating on QuinSyn-Fluids. Monitoring of the total acid number (TAN), barium level and/or viscosity throughout the life of the fluid provides maximum protection to your machine, while best utilizing the extended life features of QuinSyn.

The fluid analysis provides historical information, detailing items such as hours on the fluid, viscosity and total acid number (TAN). Should results appear unusual or suspicious, a detailed analysis can pinpoint specific contaminants. A detailed report is furnished to you, your Quincy Distributor and the Quincy Compressor factory upon completion of the fluid analysis.

Although QuinSyn-Fluids are rated by hours of life expectancy under normal operating conditions, it is recommended that fluid samples be taken every 500 to 2000 hours and sent to Quincy Compressor Fluid Analysis until a history of performance in a specific compressor application is established. Once the appropriate drain interval is established, the frequency of the fluid analysis can be reduced unless operating conditions change.

NOTICE!

All Quincy Compressor extended airend warranty programs require that fluid samples be sent to Quincy Compressor Fluid Analysis a minimum of every 2,000 hours.

The depletion of antioxidants, change of viscosity, barium and acid levels all occur with time. It is extremely important to change QuinSyn before the antioxidants are completely depleted. If the fluid is left in the compressor beyond its useful life, removing all of the spent fluid is difficult. The oxidation products remaining can considerably shorten the life of the new fill of QuinSyn-Fluid.

PRODUCT ANALYSIS REPORT

(a)

(b)

Customer	(d)
Comp. Mfr.	(e)
Fluid Type	(f)
Serial Number	(g)
Model Number	(h)
Hrs. on Fluid	(i)
Hrs. on Machine	(j)
Sample Date	(k)
I.D. #	

(c)

Evaluation: (1)

Physical Properties* Results (m)

Water by Karl Fischer (ppm)	Viscosity 40° C (cSt)	TAN Total Acid #	Particle Count								ISO Code	Antioxidant Level
			5 um	10 um	15 um	20 um	25 um	30 um	35 um	40 um		

* Property values, not to be construed as specifications

Spectrochemical Analysis (n)

Sample Date (Fluid Hours)	Values below are in parts per million (ppm)																	
	Silver (Ag)	Alum. (Al)	Chrom (Cr)	Copp. (Cu)	Iron (Fe)	Nickel (Ni)	Lead (Pb)	Tin (Sn)	Titan (Ti)	Vanad (V)	Bari (Ba)	Calc. (Ca)	Mag. (Mg)	Mol. (Mo)	Sod. (Na)	Phos. (P)	Sili. (Si)	Zinc[2] (Zn)

Quincy Compressor Fluid Analysis
2300 James Savage Road
Midland, MI 48642-6535

Thank you for this opportunity to provide technical assistance to your company. If you have any questions about this report please contact us at 1-800-637-8628 or fax 1-517-496-2313.

*means this parameter not tested

Accuracy of recommendations is dependant on representative fluid samples and complete correct data on both unit and fluid.

CC List

Understanding the Analysis Report

Reference page 51 for a copy of a blank analysis report.

a) REPORT DATE - The date that the fluid was analyzed.

b) REPORT NUMBER - The assigned number to this report.

c) CUSTOMER ADDRESS - The name and address of person that this report is being mailed to. This information is being taken from the sample bottle as it is received.

d) CUSTOMER - The owner of the unit that the sample came from.

e) COMPRESSOR MANUFACTURER - Brand of compressor sample was taken from.

f) FLUID TYPE - This should always be one of the fluids listed on page 46.

g) SERIAL NUMBER - The unit serial number of the Quincy compressor the fluid sample was taken from.

h) MODEL NUMBER - The model number of the Quincy compressor that the fluid sample was taken from.

i) HOURS ON FLUID - These are the actual hours that the QuinSyn-Fluid has been in the unit since the last fluid change.

j) HOURS ON MACHINE - This is the total hours on the compressor hourmeter.

k) SAMPLE DATE - The date that the sample was taken from the compressor.

NOTICE!

Items c) through k) are information provided by the service person supplying the fluid for analysis. Incomplete or incorrect information will affect the report's accuracy.

l) EVALUATION - This is a brief statement made by the technician performing the actual fluid analysis. This statement addresses the condition of the fluid and filter. This statement will also note any problems that need attention.

m) PHYSICAL PROPERTIES RESULTS - Particle size is measured in microns. See Fluid Parameters on page 60.

n) SPECTROCHEMICAL ANALYSIS - See Fluid Parameters on page 60.

QuinSyn-Plus

QuinSyn-Plus is a synthetic hydrocarbon/ ester fluid. It is an ISO 46 viscosity fluid with an 8,000 hour life under normal operating conditions (exact fluid life is determined by the fluid analysis program).

Some advantages of QuinSyn-Plus are

- Superior demulsability (ability to separate from water)
- Less susceptible to varnish
- Extremely low volatility
- Excellent corrosion protection
- Outstanding low temperature properties
- Exceptional thermal stability
- Excellent oxidative stability
- Better gas-fluid separation

Typical Properties of QuinSyn-Plus	ISO 46
Viscosity @ 100°F ASTM D445	46.0 cSt.
Viscosity @ 210°F ASTM D445	7.5 cSt.
Viscosity Index ASTM D2270	127
Specific Gravity 60/60	0.89
Flash Point ASTM D92	475°F
Fire Point ASTM D92	540°F
Pour Point	-58°F

Applications

QuinSyn-Plus is suited for use in rotary screw air compressors operating in harsh service conditions where the fluid is exposed to higher temperatures for extended periods of time. Fluid thermostat temperature settings can be elevated to assist in reducing water content in the fluid in high humidity applications. Please consult Quincy Service Department for any thermostat changes.

Disposal

QuinSyn-Plus is considered nonhazardous waste. Disposal of this fluid should be done in accordance with Local, State, and Federal regulations. Should condensate need to be treated, Quincy's QIOWA fluid/ water separators are required.

Fluid Analysis Program

QuinSyn-Plus fluid is included in Quincy's fluid analysis program.

NOTICE!

To maintain extended warranty compliance, fluid samples of QuinSyn-Plus must be sent to Quincy Compressor® Fluid Analysis a minimum of every 2,000 hours.

QuinSyn-PG

QuinSyn-PG is a custom blended polyalklene glycol/ester (PAG). QuinSyn-PG is an ISO 46 viscosity fluid with an 8,000 hour life under normal operating conditions (exact fluid life is determined by the fluid analysis program).

Typical Properties of QuinSyn-PG	ISO 46
Viscosity @ 100°F ASTM D445	52.4 cSt.
Viscosity @ 210°F ASTM D445	9.4 cSt.
Viscosity Index ASTM D2270	163
Specific Gravity 60/60	0.98
Flash Point ASTM D92	485°F
Fire Point ASTM D92	525°F

Applications

QuinSyn-PG is the recommended fluid in high humidity applications due to its ability to hold water. QuinSyn-PG is best suited for applications where high humidity exists and the machine cannot be shut down to drain water from the reservoir.

Disposal

QuinSyn-PG is considered nonhazardous waste. Disposal of this fluid should be done in accordance with Local, State, and Federal regulations. Separation of this fluid from condensate will require those separators designed to handle fluid emulsions. The QIOWA fluid/water separator is suitable for separation of fluid emulsions such as QuinSyn-PG. Please contact Quincy's Service Department for more details.

Fluid Analysis Program

The fluid sampling for QuinSyn-PG has been extended to 2,000 hours because of the superior quality and forgiving nature of this fluid. The new five-year extended warranty with QuinSyn-PG requires 2,000 hour sampling as a condition of maintaining the warranty.

NOTICE!

To maintain warranty compliance, fluid samples of QuinSyn-PG must be sent to Quincy Compressor® Fluid Analysis a minimum of every 2,000 hours.

Primary concerns with this fluid are the total acid number (TAN) and barium levels. QuinSyn-PG will not be condemned on water percentage nor antioxidants but will be condemned on low barium and high TAN values. The barium in the fluid acts as a corrosion inhibitor, therefore we have set low limits for this additive (see page 60 for limits).

QuinSyn-XP

QuinSyn-XP is a custom blended polyolester (POE) fluid ideally suited for rotary screw air compressors. QuinSyn-XP is an ISO 68 viscosity fluid with a 12,000 hour life at 100 & 125 psig full flow under normal operating conditions and 8,000 hours as a high pressure fluid (exact fluid life is determined by the fluid sampling program).

QuinSyn-XP is the factory fill for high pressure units (defined as units over 125 psig full flow).

Typical Properties of QuinSyn-XP	ISO 68
Viscosity @ 100°F ASTM D445	60.0 cSt.
Viscosity @ 210°F ASTM D445	9.8 cSt.
Viscosity Index ASTM D2270	131
Specific Gravity 60/60	0.95
Flash Point ASTM D92	570°F
Fire Point ASTM D92	645°F

Applications

QuinSyn-XP is designed for applications where the fluid is exposed to elevated temperatures for extended periods of time.

Fluid thermostat temperature settings can be elevated to assist in reducing water content in the fluid in high humidity applications. Consult Quincy's Service Department before making thermostat changes.

Disposal

QuinSyn-XP is considered nonhazardous waste. Disposal of this fluid should be done in accordance with Local, State, and Federal regulations. Should condensate need to be treated, Quincy's QIOWA fluid/water separators are required.

Fluid Analysis Program

The primary concern with QuinSyn-XP is the total acid number (TAN). Supplemental "on site" TAN kits will be applicable to this fluid as well as QuinSyn-PG.

NOTICE!

To maintain warranty compliance, fluid samples of QuinSyn-XP must be sent to Quincy Compressor® Fluid Analysis a minimum of every 2,000 hours.

QuinSyn-F

QuinSyn-F is Quincy's food grade fluid, suitable in applications where there may be incidental food contact. Compliant with FDA 21 CFR 178.3570 (Lubricants With Incidental Food Contact), QuinSyn-F is authorized by the USDA with an H-1 rating for use in federally inspected meat and poultry plants. Since the fluid is viewed as a possible indirect food additive, the limit for food contact is 10 ppm. Near white in color and low in volatility, QuinSyn-F is ideal for clean service. A five-year extended warranty is available with the use of QuinSyn-F.

Fluid Life

QuinSyn-F provides an expected life of 4,000 hours under normal operating conditions.

Disposal

QuinSyn products are considered nonhazardous under the OSHA Hazard Communication Standard 21 CFR 1910.1200. They carry no hazardous labels or warnings under that standard.

Typical Properties of QuinSyn-F

Viscosity @ 100°F ASTM D445	43.0 cSt.
Viscosity @ 210°F ASTM D445	7.5 cSt.
Viscosity Index ASTM D2270	139
Flash Point ASTM D92	495°F
Fire Point ASTM D92	560°F
Pour Point	-76°F
Specific Gravity 60/60	0.83
Color*	White

*Changes to color will occur during operation.

QuinSyn Flush

QuinSyn Flush is a specially formulated synthetic fluid capable of dissolving varnish and solubilizing sludge from lubricating systems while they are operating. QuinSyn Flush contains oxidation and rust inhibitors, and can be used as a short-term fluid (for a maximum of 500 hours). It is fully compatible with mineral oils and QuinSyn synthetic fluids, and is highly recommended for use as a flushing fluid when converting to QuinSyn-PG from QuinSyn or QuinSyn IV.

Applications

Cleaning fluid for removal of varnish, dirt and oxidized fluid from compressor fluid systems.

Flushing fluid when changing from other fluids to QuinSyn-Fluids.

Typical Properties of QuinSyn Flush

Viscosity @ 100°F ASTM D445	43.3 cSt.
Viscosity @ 210°F ASTM D445	5.6 cSt.
Viscosity Index	65
Flash Point ASTM D92	444°F
Fire Point ASTM D92	520°F
Pour Point	–45°F
Specific Gravity 60/60	0.965

Cleaning and Flushing With QuinSyn Flush

Normal Machines

Flushing **clean** machines presently using:

A. Mineral Oils -

Drain compressor thoroughly while hot including all the low areas. Shut down and lockout the machine. Detach lines and drain. Inspect machine; if clean, change filters and separator elements and proceed as follows:

Fill with QuinSyn Flush and run machine until it reaches normal operating temperature. Drain and refill with a fresh charge of the QuinSyn-Fluid selected for your machine. Send a fluid sample to Quincy Compressor® Fluid Analysis at 200 hours.

B. Polyalklene glycols (PAG) or Silicone -

Drain compressor thoroughly as in (A). Fill machine with QuinSyn Flush and run for 500 hours. Send a fluid sample to Quincy Compressor® Fluid Analysis. Flush may need to be repeated several times. Analysis will determine if further flushes are needed.

Fill with the QuinSyn-Fluid selected for your machine. Send a fluid sample to Quincy Compressor® Fluid Analysis at 200 hours.

Varnished Machines

Always clean **slightly varnished** machines using mineral oils or PAO fluids with QuinSyn Flush using the following procedure:

Drain thoroughly as in (A) and fill with QuinSyn Flush. Run the machine for 300 hours and take a fluid sample. Send fluid sample to Quincy Compressor® Fluid Analysis to determine if further flushes are needed. Continue compressor operation until results of fluid analysis are reported. Drain or continue operation as advised by fluid analysis.

Always clean **medium to heavily varnished** machines using mineral oils or PAO fluids with QuinSyn Flush using the following procedure:

Drain thoroughly as in (A) and fill with QuinSyn Flush. Run the machine for 300 hours and take a fluid sample. Send fluid sample to Quincy Compressor® Fluid Analysis to determine if further flushes are needed. Run the flush for an additional 300 hours. Drain thoroughly as in (A) and inspect the compressor. If clean, flush with another half charge of QuinSyn Flush and run for 30 minutes. Drain completely. Change filters and separator elements and fill with a fresh charge of the QuinSyn-Fluid selected for your machine. Send fluid sample to Quincy Compressor® Fluid Analysis at 200 hours.

Extremely varnished machines should not be put back into service until mechanically or chemically cleaned. After proper cleaning, fill with a fresh charge of the QuinSyn-Fluid selected for your machine. Send fluid sample to Quincy Compressor® Fluid Analysis at 200 hours.

Converting to QuinSyn-Plus

Normal Machines

A. Any QuinSyn-Fluid ***(except QuinSyn-PG)*** - No flush required. Drain Compressor thoroughly while hot, including all the low areas, fluid lines and the fluid cooler. Shut down and lockout the machine. Change the separator and all the filters on the compressor. Refill the reservoir and system with a full charge of QuinSyn-Plus.

B. Mineral Oils and QuinSyn-PG - Drain compressor thoroughly while hot including all the low areas. Shut down and lockout the machine. Detach lines and drain. Inspect machine; if clean, change filters and separator elements. Fill with QuinSyn Flush and run machine until it reaches normal operating temperature. Drain and refill with a fresh charge of new QuinSyn-Plus. Send a fluid sample to Quincy Compressor® Fluid Analysis at 200 hours.

Varnished Machines

For **slightly to extremely varnished** machines using mineral oils or PAO fluids, flush the compressor with QuinSyn Flush following the procedures outlined on page 57.

Converting to QuinSyn-PG

Normal Machines

Flush **clean** machines presently using QuinSyn or QuinSyn IV with QuinSyn Flush following the procedures outlined on page 57 before converting them to QuinSyn-PG.

NOTICE!

If all the previous fluid is not removed from the compressor, excessive foam may be visible in the fluid level sightglass. If this occurs, repeat the flushing procedure.

Varnished Machines

Flush **varnished** machines presently using QuinSyn or QuinSyn IV with QuinSyn Flush following the procedures outlined on page 57 before converting them to QuinSyn-PG.

NOTICE!

More than one flush may be required to remove varnish buildup and reduce the TAN to an acceptable level. It may be necessary to change the fluid filter more frequently while the machine is being cleaned.

Converting to QuinSyn-XP

Normal Machines

A. Any QuinSyn-Fluid - No flush required. Drain Compressor thoroughly while hot, including all the low areas, fluid lines and the fluid cooler. Shut down and lockout the machine. Change the separator and all the filters on the compressor. Refill the reservoir and system with a full charge of QuinSyn-XP.

B. Mineral Oils - Drain compressor thoroughly while hot including all the low areas. Shut down and lockout the machine. Detach lines and drain. Inspect machine; if clean, change filters and separator elements. Fill with QuinSyn Flush and run machine until it reaches normal operating temperature. Drain and refill with a fresh charge of new QuinSyn-XP. Send a fluid sample to Quincy Compressor® Fluid Analysis at 200 hours.

Varnished Machines

For **slightly to extremely varnished** machines using mineral oils or PAO fluids, flush the compressor with QuinSyn Flush following the procedures outlined on page 57.

FLUID PARAMETERS

QuinSyn-PG, QuinSyn-XP, QuinSyn-Plus & QuinSyn-F

Property	Units	Test Method	Fluid Type	New Fluid	Marginal	Unacceptable
Viscosity 40°C	cSt	ASTM D-445	QuinSyn-PG	45-55	41,61	<41, >61 (1)
			QuinSyn-XP	58-75	50, 85	<50, >85 (1)
			QuinSyn-Plus	42-51	38, 56	<38, >56 (1)
			QuinSyn-F	41-51	39, 56	<39, >56 (1)
Acid No. TAN	mg KOH/ gm	ASTM D-947	QuinSyn-PG	<0.2	0.7-0.9	>1 (1)
			QuinSyn-XP	<0.2	3-4	>4 (1)
			QuinSyn-Plus	<0.2	1.7-1.9	>2.0 (1)
			QuinSyn-F	0.2	0.8-0.9	>1 (1)
ADDITIVE METALS						
Barium	PPM	Plasma Emission	QuinSyn-PG	375-550	150	<10 (1)
			QuinSyn-XP, Plus & F	0	5-20	>20
Calcium	PPM	Plasma Emission	All	0	5-20	>20
Magnesium	PPM	Plasma Emission	All	0	5-20	>20
Molybdenum	PPM	Plasma Emission	All	0	5-20	>20
Sodium	PPM	Plasma Emission	QuinSyn-PG	0	40-50	>100
			QuinSyn-XP	0	40-50	>100
			QuinSyn-Plus & QuinSyn-F	0	5-20	>20
Phosphorus	PPM	Plasma Emission	QuinSyn-PG, Plus & F	0	5-20	>20
			QuinSynXP	<50	5-20	0
Zinc (2)	PPM	Plasma Emission	All	0	100-200	>200
WEAR METALS						
Silver	PPM	Plasma Emission	All	0	5-10	>10
Aluminum	PPM	Plasma Emission	All	0	5-10	>10
Chromium	PPM	Plasma Emission	All	0	5-10	>10
Copper	PPM	Plasma Emission	All	0	5-10	>10
Iron	PPM	Plasma Emission	All	0	5-10	>10
Nickel	PPM	Plasma Emission	All	0	5-10	>10
Lead	PPM	Plasma Emission	All	0	5-10	>10
Tin	PPM	Plasma Emission	All	0	5-10	>10
Titanium	PPM	Plasma Emission	All	0	5-10	>10
Vanadium	PPM	Plasma Emission	All	0	5-10	>10
OTHER						
Silicon	PPM	Plasma Emission	All	0	10-15	>15
Water	PPM	Karl Fisher	QuinSyn-PG	<2000	NOT REPORTED	
			QuinSynXP	<800	NOT REPORTED	
			QuinSyn-Plus	<800	NOT REPORTED	
			QuinSyn-F	<100	200	>200
Antioxidant	%	HPCL	All	95% min.	NOT REPORTED	

(1) The fluid will be condemned based on these parameters.

This page Intentionally left blank.

Issue/Probable Cause:	Corrective Action:
Failure to Start:	
Power not turned "ON"	Turn the power "ON" by closing the main disconnect switch or circuit breaker.
Blown control circuit fuse	Replace fuse. Find and correct cause.
Safety circuit shutdown resulting from high discharge air temperature	Correct the situation in accordance with the instruction in the "High Discharge Air Temperature" section of this troubleshooting guide. Restart the compressor.
Thermal overload relays tripping	Correct the cause of the overloaded condition, reset overload relay and press the start button.
Low voltage	Ask the power company to make a voltage check at your entrance meter, then compare that reading to a reading taken at the motor terminals. Use these two readings as a basis for locating the source of low voltage.
Faulty start switch	Check the switch for malfunction or loose connections.
Power failure	Check power supply to the unit.
Faulty control relay	Replace the relay.
Loose wire connections	Check all wiring terminals for contact and tightness.
Faulty High Air Temperature Switch	Check H A T switch. Contact a qualified service technician for repairs.
Faulty transformer	Check secondary voltage on transformer.

Issue/Probable Cause:	Corrective Action:
Unscheduled Shutdown:	
High discharge air temperature	Correct in accordance with the instruction in the "High Discharge Air Temperature" section of this troubleshooting guide. Restart the compressor.
Thermal motor overload relays tripping	Correct the cause of the motor overloaded condition, reset the overload relay and press the reset button.
Power failure	Check power supply and transformer fuses.
Faulty HAT sensors	Contact a qualified service technician for repairs.
Loose wire connections	Check all wiring terminals for contact and tightness.
Faulty control relay	Replace relay.
Thermal Overload Relays Tripping:	
Excessive discharge pressure	Lower full load pressure setting at control panel.
Low voltage	Check voltage and amperages while operating at full load pressure.
Loose overload connection	Tighten mounting screws on thermal overload.
Incorrect thermal overload relay setting	Check motor nameplate and compare to overload relay setting.
Loose motor or starter wiring	Check all connections for tightness.
Faulty motor	Check motor starter wiring before removing motor. Remove motor and have tested at motor manufacturer repair center.

Issue/Probable Cause:	Corrective Action:
Low Air Delivery:	
Plugged air intake filter element	Clean air filter element or replace with new element.
Excessive leaks in the service lines	Check service lines for leaks with soap suds. Repair as necessary.
Inlet valve not fully open	Check for build up or gumming of shaft.
Restricted fluid flow	Check fluid filter for plugging.
Low Receiver Pressure:	
Excessive air demand	Reevaluate air demand. Install additional compressors as needed.
Excessive leaks in the service lines	Check service lines for leaks with soap suds. Repair as necessary.
Inlet valve not fully open	Correct in accordance with the instructions in "Inlet valve not opening or closing in relation to air demand" section of troubleshooting guide.
Plugged air intake filter	Replace air filter element.
Differential pilot valve not set correctly	Adjust differential pilot valve to achieve desired modulation range.
Air pressure switch not set correctly	Adjust air pressure switch to achieve desired cut-in and cut-out pressure.
Faulty receiver pressure gauge	Check and replace as necessary.

Issue/Probable Cause:	Corrective Action:
High Receiver Pressure:	
Air pressure switch not set correctly	Adjust air pressure switch to achieve desired cut-in and cut-out pressure. Ensure unload pressure does not exceed maximum operating pressure.
Inlet valve not closing at lower air demand	Correct in accordance with instruction on "Inlet Valve not opening or closing in relation to air demand" section of this troubleshooting guide.
Blowdown valve not relieving receiver pressure	Check control solenoid and blowdown valve.
High Discharge Air Temperature and/or High Fluid Injection Temperature:	
Not enough cooling water flowing through cooler (water-cooled models only)	Clean cooler. Check water system for possible restrictions, including water temperature regulating valve. Clean or adjust, if necessary.
Inadequate circulation of cooling air at the cooler (air-cooled models only)	Check location of cooler and assure no restriction to free circulation of cooling air. Check cooler fin and clean as necessary.
Low fluid level in reservoir	Add fluid to recommended level. Check fluid system for leaks.
Cabinet panels removed	Replace all panels, ensure all sealing surfaces and materials are satisfactory.
Cooler plugged	Clean cooler, find and correct cause of contamination.
Fluid filter plugged	Replace fluid filter element(s).

Issue/Probable Cause:	Corrective Action:
High Discharge Air Temperature and/or High Fluid Injection Temperature (continued):	
Excessive ambient temperatures	Maximum ambient for proper operation is listed in data sheet. Ventilate room or relocate compressor.
Incorrect fan rotation	Correct rotation is with the fan pushing the air through the cooler. Reverse motor starter leads L_1 and L_2.
Improper fluid	Use recommended fluids only. Refer to "Compressor Fluids" section of this manual.
Clogged air filter	Clean or replace as necessary.
Faulty thermal valve	Repair or replace as necessary.
Faulty gauges	Check and replace as necessary.
Airend failure	Contact an authorized Quincy distributor.
Frequent Air/Fluid Separator Clogging:	
Faulty air filter or inadequate filter for the environment	If faulty air filter elements, replace them. If air filter is inadequate for the environment, relocate the intake air to a clean source.
Faulty fluid filter	Replace fluid filter element.
Fluid breakdown	Correct in accordance with the instruction in "Fluid Breakdown" section of the troubleshooting guide.
Incorrect fluid separator element	Use genuine Quincy replacement elements only.
Extreme operating conditions such as high compressor discharge temperatures, high ambient temperature with high humidity and high reservoir pressure	Operate compressor at recommended reservoir pressure and discharge air temperature.

Issue/Probable Cause:	Corrective Action:
Frequent Air/Fluid Separator Clogging (continued):	
Mixing different grades or types of fluids	Do not mix different grades or types of fluid. Do not mix fluids from different manufacturers.
Incorrect fluid	Follow fluid specifications as described in "Compressor Fluids" section of this manual.
Contaminated fluid	Change fluid. Service air filter and fluid filter in accordance with the recommended maintenance schedule.
Fluid Discharge Out Blowdown Valve:	
Too high fluid level in reservoir	Adjust fluid level to recommended fluid level by draining the reservoir. Use fluid level gauge as a guide.
Air/fluid reservoir blows down too fast	Check for proper blowdown valve size.
Inlet valve not closing completely	Correct in accordance with instructions in "Inlet valve not opening or closing in relation to air demand" section of this troubleshooting guide
Frequent Fluid Filter Clogging:	
Faulty Indicator	Replace indicator assembly.
Incorrect fluid filter	Use genuine Quincy replacement filters only.
Faulty, incorrect or inadequate air filter	Replace air filter element.
Fluid breakdown	See fluid breakdown section of this troubleshooting guide.
System contamination	Check and clean system of all dirt, corrosion and varnish.

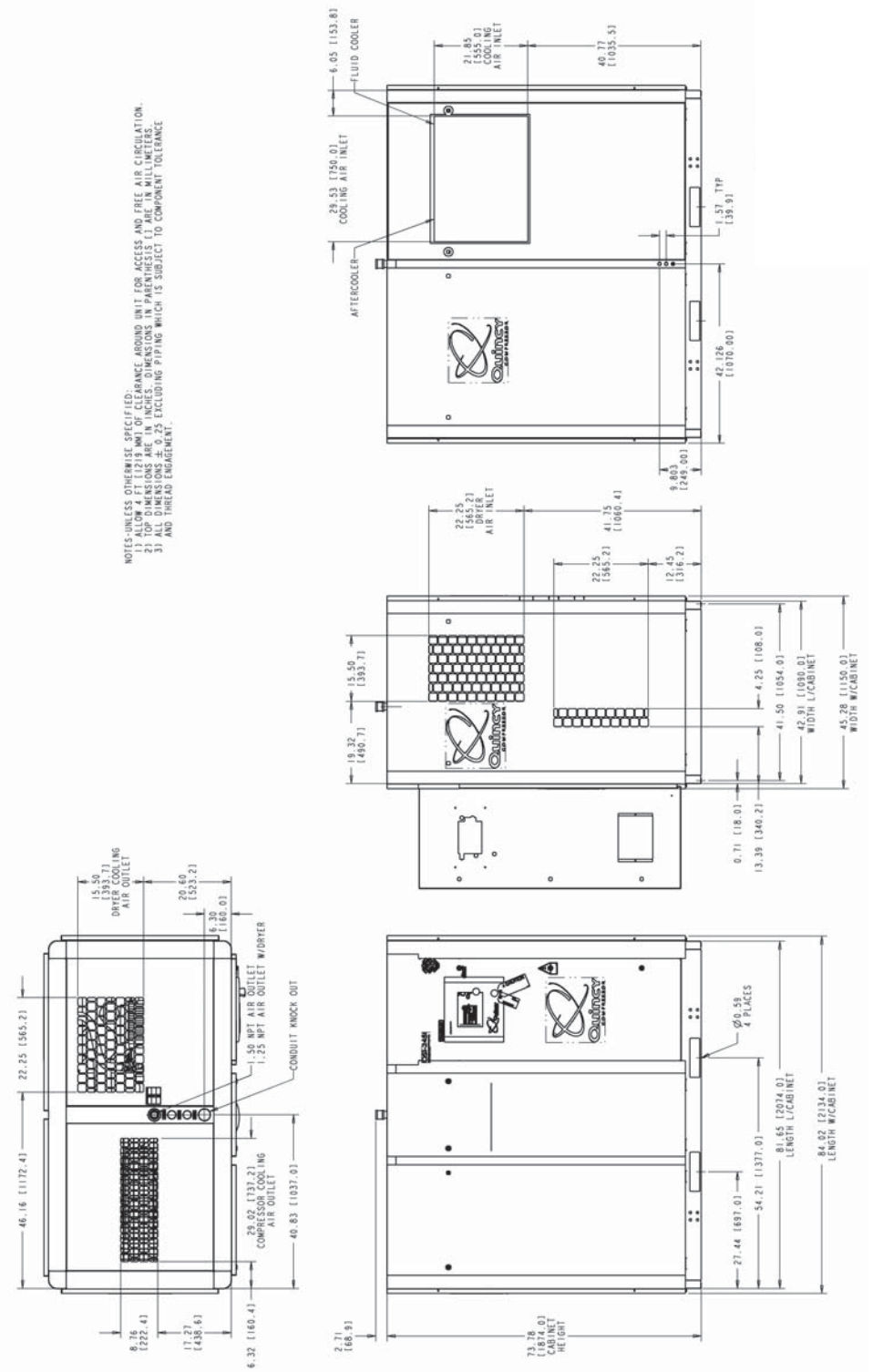
Issue/Probable Cause:	Corrective Action:
Excessive Fluid Consumption:	
Too high fluid level in the receiver	Adjust fluid level to recommended fluid level by draining the reservoir. Use fluid level gauge as a guide.
Plugged scavenger line	Clean scavenger line orifice and tube.
High discharge temperature	Correct in accordance with the instructions in "High discharge air temperature" section of this troubleshooting guide.
Low reservoir pressure with fully open inlet valve	Reservoir pressure should not fall below 50 PSIG when running loaded. Check system CFM requirement and minimum pressure check valve.
Faulty or damaged separator	Change air/fluid separator.
Leak in fluid lines	Check for leaks and correct.
Seal failure, leaks	Replace seal assembly and o-rings.
Incorrect fluid	Use recommended fluids only. See Compressor Fluid Section.
Frequent Air Cleaner Clogging:	
Compressor operating in highly contaminated atmosphere	Use remote air intake mounting.
Air cleaner not adequate for conditions	Use specialized air filter. Contact an Authorized Quincy Distributor.

Issue/Probable Cause:	Corrective Action:
Inlet Valve Not Opening Or Closing In Relation To Air Demand:	
Improper setting of air pressure switch or faulty switch	Adjust air pressure switch to proper setting or replace switch, if faulty.
Excessive moisture in control air line at air cylinder	Service control air line filter daily.
Improper functioning of inlet valve piston	Check piston and cylinder bore. Repair or replace as needed.
Jammed air inlet valve assembly	Check air inlet valve bushing and shaft. Check piston and cylinder bore. Repair or replace as needed.
Faulty solenoid valve	Repair or replace as necessary.
Faulty shuttle valve	Repair or replace as necessary.
Loose wiring connections at solenoid valve/ pressure switch	Check and tighten wiring terminals.
Broken spring in air inlet valve	Replace spring.
Compressor Does Not Unload When There Is No Air Demand:	
Incorrect air pressure switch setting	Adjust to proper setting.
Faulty air pressure switch	Replace switch.
Faulty blow down valve	Repair or replace as necessary.
Faulty solenoid valve	Repair or replace as necessary.
Faulty differential pilot valve	Repair or replace as necessary.
Leaks in control lines	Check all control line fittings and tubings.
Leaks in service lines	Check lines before MPC valve.

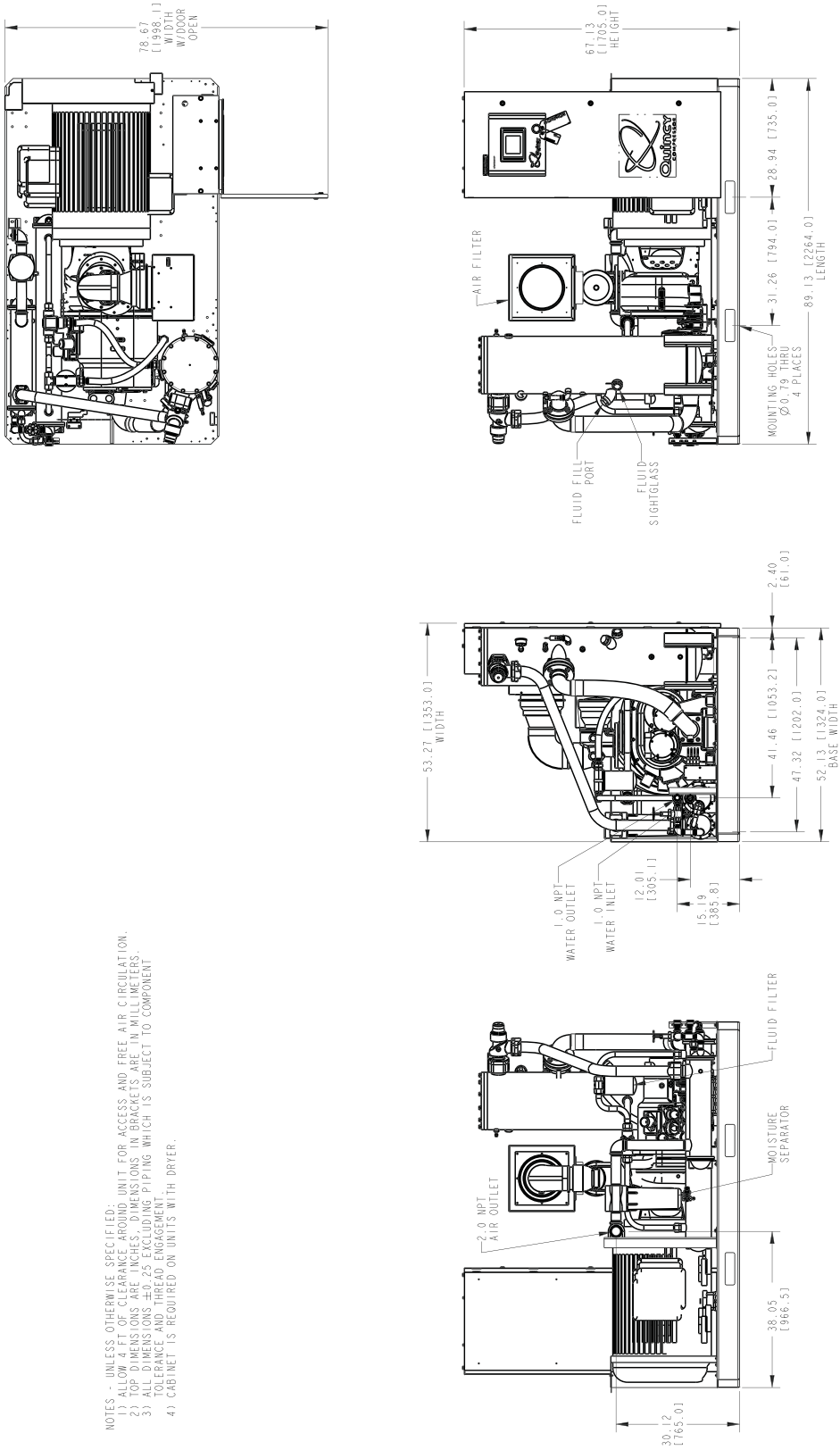
Issue/Probable Cause:	Corrective Action:
Compressor Does Not Revert To Load When Service Line Pressure Drops To Reset Pressure:	
Faulty air pressure switch	Repair or replace as necessary.
Loose wiring connection	Check and tighten wiring terminals.
Jammed air inlet valve assembly	Check and repair air inlet valve.
Faulty solenoid	Repair or replace as necessary.
Faulty differential pilot valve	Orifice plugged. Clean or replace as necessary.
Compressor Will Not Time-out Or Shut Down When Unloaded (Auto dual Only):	
Leaks in control lines	Check and repair any leaks.
Leaks in service lines	Check plant air distribution system for leaks.
Faulty air pressure switch	Repair or replace as necessary.
Faulty air pressure sensors	Replace as necessary.
Excessive Water in Plant Air Distribution System:	
Clogged moisture separator/trap	Clean or replace as required.
Installation/Application	Check other compressors on same system.
Faulty cooler/leaks	Replace cooler.

Issue/Probable Cause:	Corrective Action:
Pressure Relief Valve Exhausting:	
Differential pressure regulator not set correctly	Adjust differential pressure regulator to obtain desired modulation range.
Air pressure not set correctly	Readjust air pressure switch so that the compressor unloads at the desired pressure.
Air inlet valve not closing properly in relation to air demand	Correct in accordance with the instruction in "Inlet valve not opening or closing in relation to air demand" section of this troubleshooting guide.
Plugged separator	Replace with new air/fluid separator.
Faulty receiver pressure gauge	Check gauge for accuracy and replace if necessary. Adjust control settings.
Faulty pressure relief valve	Check pressure relief valve for correct pressure setting. If valve is still leaking, replace it.
Excessive Water Content In Fluid:	
Water drain intervals	Drain water as needed to reduce water content in fluid below 200 PPM.
Discharge temperature too low	Check operation of thermostatic valve or water regulating valve. If condition continues, consult Quincy service department.

QSI-200/245
QSI-240/300



QSI-335/370
QSI-440/500

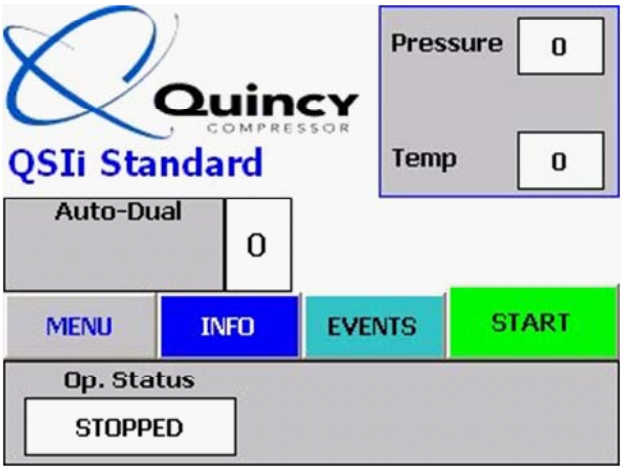


NOTES - UNLESS OTHERWISE SPECIFIED:
1) ALLOW 4 FT OF CLEARANCE AROUND UNIT FOR ACCESS AND FREE AIR CIRCULATION.
2) TOP DIMENSIONS ARE INCHES, DIMENSIONS IN BRACKETS ARE IN MILLIMETERS.
3) ALL DIMENSIONS ±0.25 EXCLUDING PIPING WHICH IS SUBJECT TO COMPONENT TOLERANCE AND THREAD ENGAGEMENT
4) CABINET IS REQUIRED ON UNITS WITH DRYER.

Model	245i	300i	370i	500i
Horsepower	50	60	75	100
Pressure (psig)	100	100	100	100
Drive Motor RPM	1800	1800	1800	1800
Flow (acfm)	243	286	365	508
Flow (m3/min)	6.88	8.10	10.33	14.38
Enclosed Sound (dBA)	66	66	68	70
Customer Connection (NPT)	1.25″	1.25″	2″	2″
Carryover (ppm)	3	3	3	3
Length - in. (mm)	74 (1880)	74 (1880)	75 (1905)	75 (1905)
Width - in. (mm)	45 (1143)	45 (1143)	54 (1372)	54 (1372)
Height - in. (mm)	84 (2134)	84 (2134)	91 (2311)	91 (2311)
Weight - lbs.(kg)	3150 (1429)	3150 (1429)	3250 (1474)	3250 (1474)

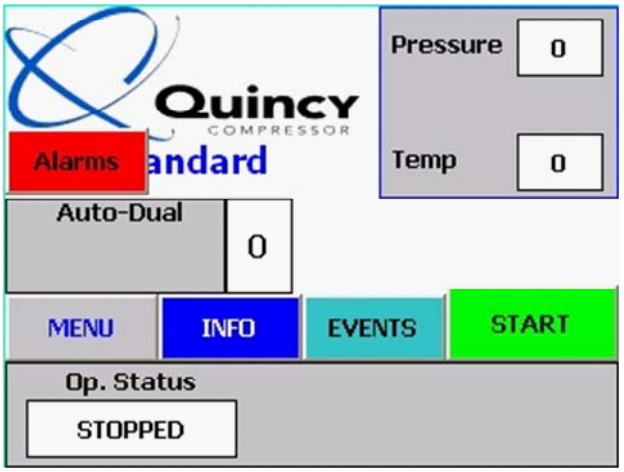
This page Intentionally left blank.

Main Screen Display:



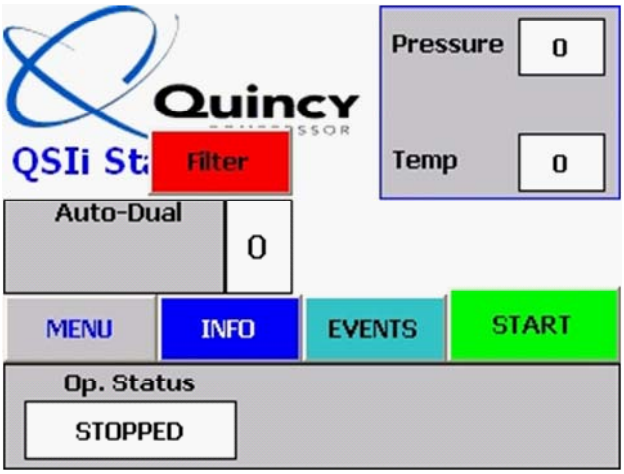
The main screen for the QSIi Standard Control allows for quick display and basic Start/Stop control of the compressor. Pressure, Temperature, and Operating Status provide the predominant displays.

In the middle right side of the screen the Start/Stop button operates the compressor.



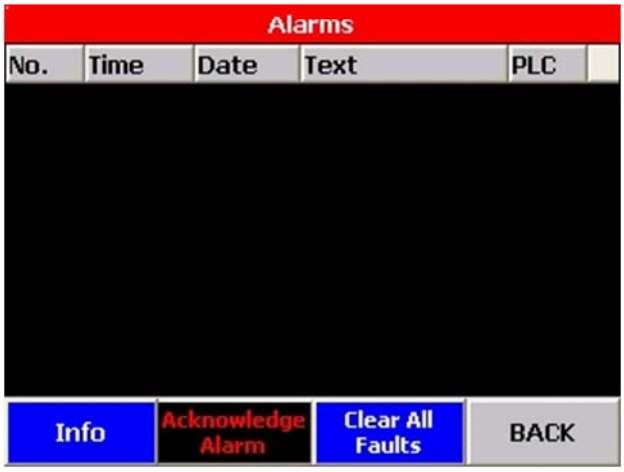
To the left of the Start there are buttons that provide access to the compressor control menu, information screen, and the control event logs.

If the compressor trips on a system fault then the Alarms button will show just under the Quincy logo. This brings up the Alarm screen where alarms can be cleared.



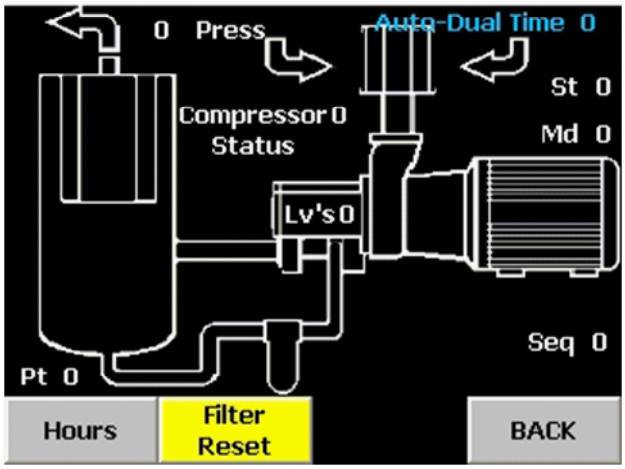
Similarly when a service trip occurs a Filter button will bring up the Filter Screen.

Alarm Screen:



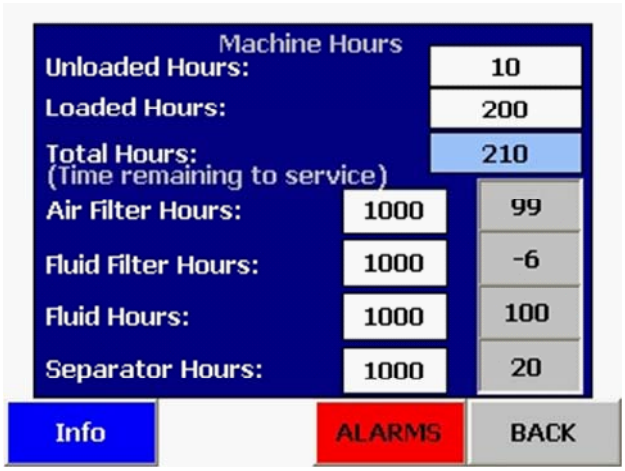
You can clear an Alarm and fault conditions from the Alarms Screen. To clear an alarm press the Clear All Faults button on the bottom of the screen. This will reset the fault within the PLC; the compressor can restart with the removal of the original cause of the alarm. The Acknowledge Alarm button clears the high-lighted alarm in the alarm log. Note that the Acknowledge Alarm button does not clear a fault but rather clears out the Alarm Log. The Acknowledge Alarm button is password protected to ensure the integrity of the Alarm Log.

Filter Screen:



The Filter Screen shows a visual representation of the compressor's current state. You can reset any filter trip condition or gain access to the Service Hours screen to reset the service indicators.

Hourmeter Screen:



The Machine Hours screen shows the compressor and the filter hourmeters. The top hourmeters show the loaded and unloaded hours for the compressor. The total hours is the sum of both the loaded and unladed hourmeters. These values can be edited by selecting either the loaded or unloaded hours field.

The service filter indicator shows the countdown timers that trip a Filter indication, when the value goes negative. The gray boxes are the hourmeters and the white boxes are the placeholder value lifespan for the service item.

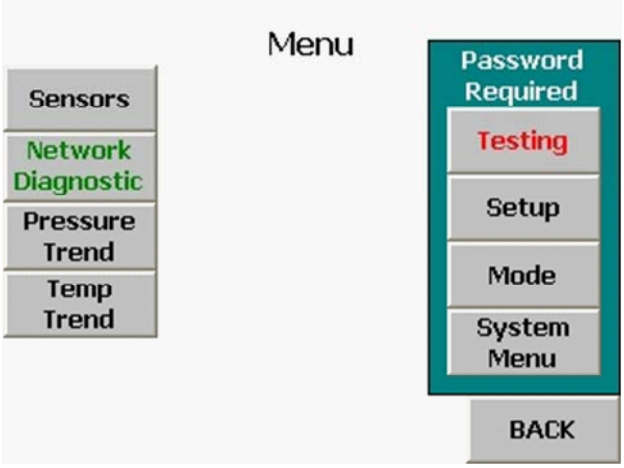
Information Screen:

The Information Screen (from the blue INFO button on the main screen) allows access to the user data stored in the HMI panel of the compressor.

Event Log:

The Event Log screen shows the compressor operating events as logged by the HMI. This log is internal to the HMI and subsequently the data is not retentive on power loss, since the HMI does not have a battery for storage.

Main Menu:



The main menu allows navigation to the operating functions of the compressor.

The inside of the turquoise box is password protected to prevent accidental access to the setup functions.

Navigation:

Sensors: Sensor calibration screen

Network Diagnostic: Network communications

Pressure/Temp Trend: Trending functions for discharge pressure and temperature

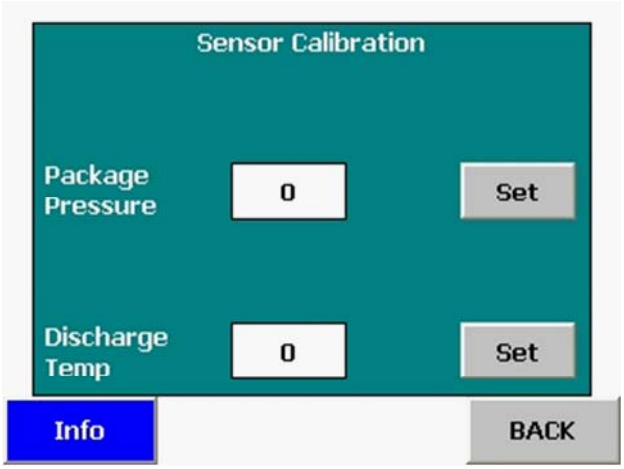
Testing: Main motor and inlet valve testing screen

Setup: Compressor specific setup

Mode: Operating Mode selection and settings

System Menu: HMI specific settings

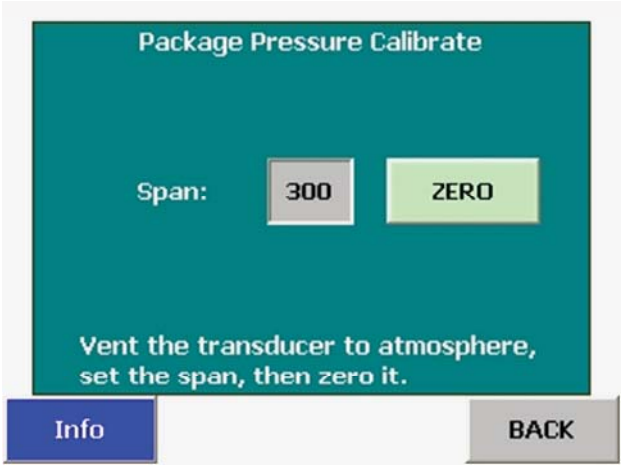
Sensors:



The sensor calibration screen controls calibration for the analog sensors.

The current reading of the sensor is displayed in white, and the Set button brings up the specific calibration screen.

Pressure Calibration:



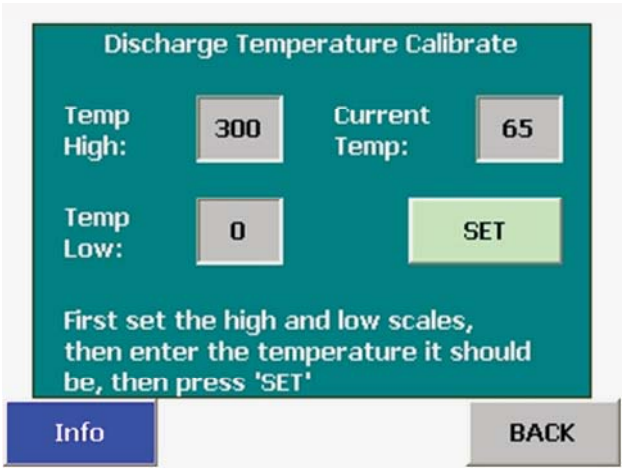
Calibrate the package pressure by bleeding the system pressure to atmosphere. Then press the ZERO button to reset the pressure to 0. Upon completion reconnect the pressure line removed in order to bleed the system to atmosphere.

The Span value changes in the pressure transducer scale.

NOTICE!

Do not change this value unless directed.

Temperature Calibration:



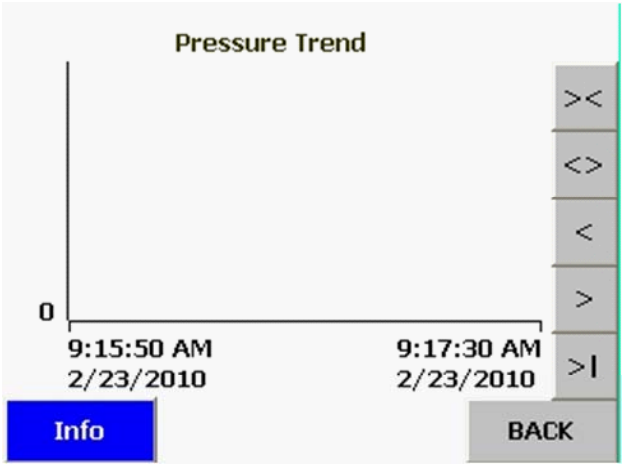
Calibrate the discharge temperature by entering the current temperature and pressing the Set button. This will change the current temperature to the value entered.

Temp High and Temp Low set the transducer scale.

NOTICE!

Do not change this value unless directed.

Pressure Trend:



The pressure trend display shows the past 16 hours of pressure data (999 points worth of data taken at 1 minute intervals). The data in this trend is stored internally in the HMI and cannot be exported.

The keys on the side of the screen provide a simple navigation to manipulate the trend view:

><: Zoom In

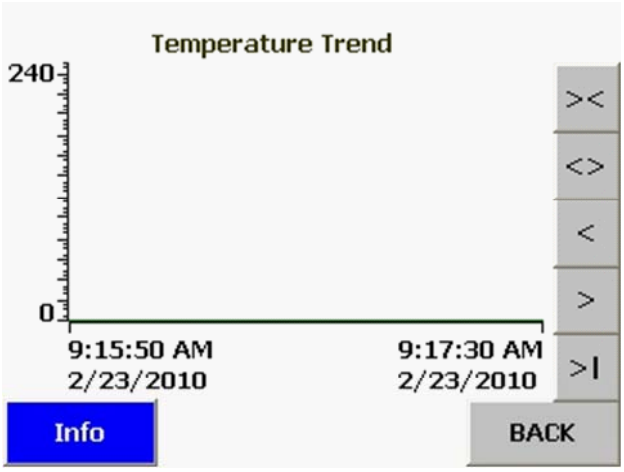
<>: Zoom Out

<: Back

>: Forward

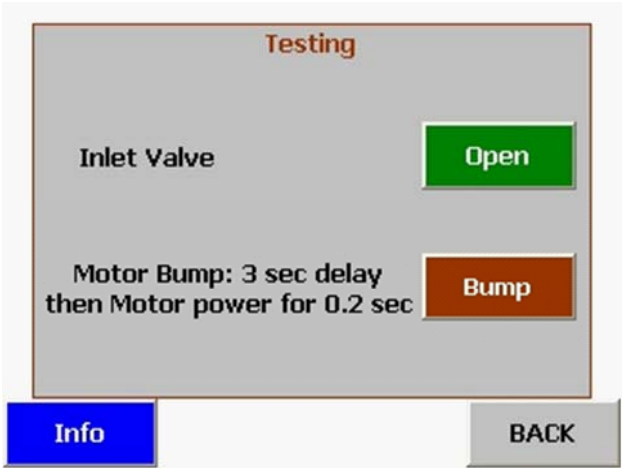
>I: Forward to the most recent data

Temperature Trend:



The temperature trend shows the past 16 hours of discharge temperature data (999 points worth of data taken at 1 minute intervals). The data in this trend is stored internally in the HMI and cannot be exported.

Testing:



The Bump button turns the motor on for 0.2 seconds to test rotation after a 3 second start up delay. The Open/Close button opens or closes the inlet valve.

Setup:

Setup controls local compressor operating settings.

Special Options: Setup of optional compressor settings

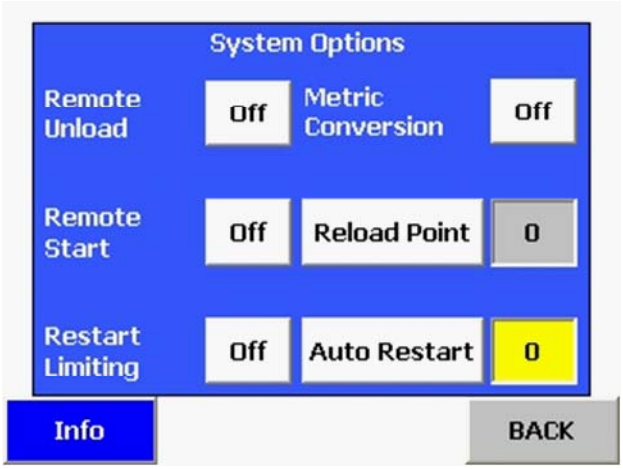
Physical Configuration: Setup of required local compressor settings

Sensor Calibration: Sensor calibration screen

Service Interval: Hours and filter interval screen

System Time: Sets and synchronizes the real time clock for both the PLC and the HMI

Special Options:



Special Options sets optional specific compressor settings.

Remote Unload: Turns on remote load/unload functionality of the compressor via direct input into the PLC or via Modbus communications.

Remote Start: Turns on remote start/stop functionality of the compressor via direct input into the PLC or via Modbus communications.

Restart Limiting: Limits restarts of the motor to less than 3 per hour.

Metric Conversion: Turns on the metric conversion feature of the compressor.

Reload Point: Sets a hard reload point that prevents the compressor from restarting unless the pressure falls under the set reload point. This value is independent of the set load point set in the various operating settings.

Auto Restart: Sets the compressor to automatically restart X seconds after power loss.

Physical Configuration Setup 1:

The physical configuration screen sets up the compressor specific parameters. Generally this entails the startup, alarm, and communications parameters.

Starter Type: Allows user selection of a specific starter type (ACL, Soft Start, or Wye-Delta).

Ramp: Sets the soft start ramp delay time (in seconds) for the controls.

Y/D Transition: Sets the Wye Delta Transition delay time (in seconds) for the controls.

HP: Sets the horsepower rating of the motor for the control network.

Capacity: Sets the unit capacity for network reporting. This setting is required to be set for network operation.

Shutdown Temp: The shutdown temperature for the unit. This is a hard fault condition and not an alarm trigger, once the unit reaches this temperature then the unit will fault and not restart until cleared.

Shutdown Pressure: The shutdown pressure for the unit. Again this is a hard fault condition and not a trigger for an alarm when the compressor reaches this pressure the unit will fault and cannot restart until the fault is cleared.

Machine ID: Sets the network ID of the compressor. When this value is changed it is critical to press the Save Data button at the bottom of the screen to reinitialize the unit to the proper network address.

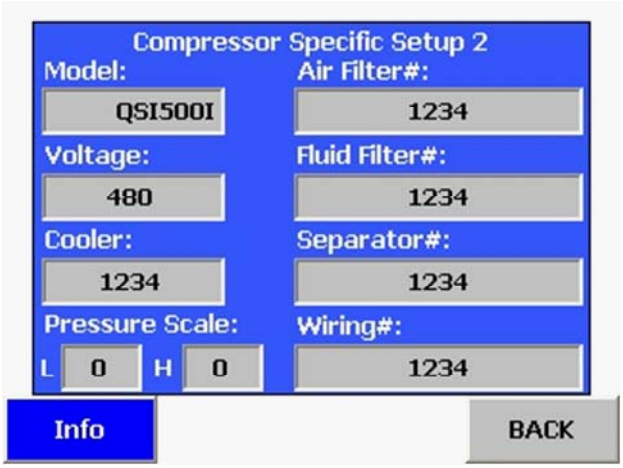
Dryer Enabled: The dryer enabled button turns on the dryer specific alarm functions when the unit comes equipped with the integrated dryer option.

HMI/PLC Rev: The HMI and PLC revision show the software code revision currently loaded on the compressor.

More: The More button brings up the second screen of the Compressor Specific Setup.

Save Data: Records all of the specific setup data onto the MMC card in the HMI device

Physical Configuration Setup 2:

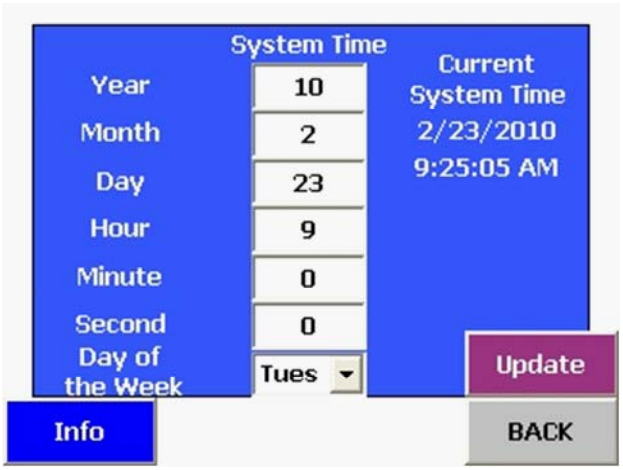


The compressor specific setup screen 2 sets the information data that is displayed in the info screen.

All values on this screen are used for informational purposes and do not have an effect on compressor's operation.

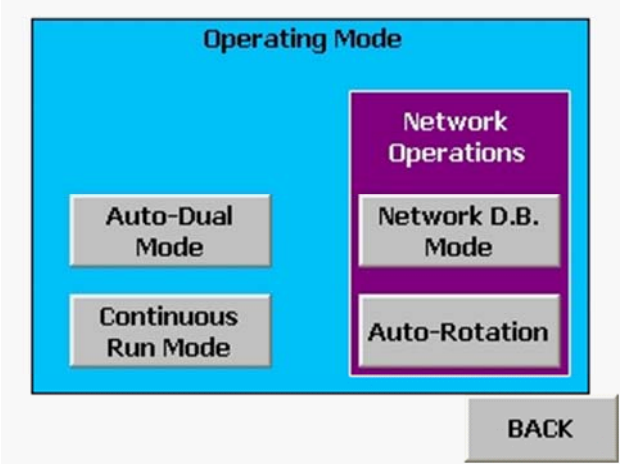
The Pressure Scale information fields set the high and low pressure scale for the pressure trend display. Any changes to this scale require a restart of the HMI.

System Time:



Set the system time in the compressor controls enter the information fields and press the Update button. The Year value is listed as the last two digits of the year (00-99).

Operating Mode Selection:



The Mode button on the Main Menu brings up the Operating Mode Menu.

Operating Mode Selection Menu allows selection of the operating mode of the compressor. The modes of operation are as follows:

Auto-Dual Mode: Sets a unload timeout that shuts the compressor down to save energy.

Continuous Run Mode: Keeps the motor running constantly to reduce motor restart time.

Network Dead Band Mode: Operates a cascade network of QSIi Standard compressors based on the entered schedule.

Network Auto-Rotation Mode: Operates a cascade network based on a set rotation of a single sequence.

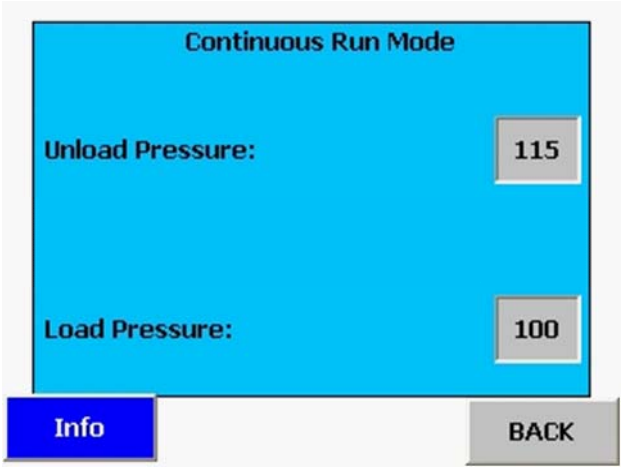
Auto-Dual Mode:

The compressor initiates a shutdown timer when the inlet valve is closed (the compressor is unloaded) in Auto-Dual Mode. When the time is complete (Auto-Dual Timeout value) the compressor will shut down the motor to save energy. The Motor will restart when the pressure falls below the Load Pressure.

The Load Pressure is the pressure point that the system must fall below to open the inlet valve or restart the compressor.

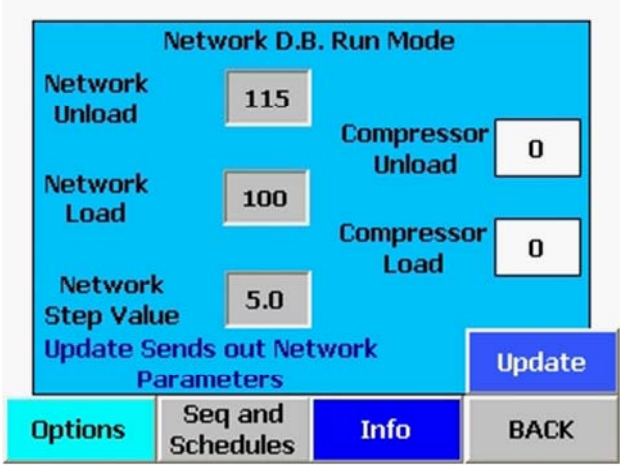
The Unload Pressure is the pressure point that will close the inlet valve when the air pressure rises above the specified pressure point. The inlet valve will remain closed until the pressure falls below the load pressure.

Continuos Run Mode:



Continuous run mode operates the same as Auto-Dual mode except there is no timer to shutdown the motor. When the compressor unloads, the system will keep the motor running. This keeps the system operational at all times and allows for a rapid response to a significant pressure demand.

Network Deadband Run Mode:



Options: The options screen allows the user to set the Auto-Dual Timeout value and the highest communications address sets the highest communications value that the network will attempt communications on a standard cycle. Do not set the highest communications address to a value less than the highest compressor on the network.

Sequence and Schedules: Lets the user set the sequence and schedules to run in network mode.

Network Deadband Mode applies the compressors in a cascade deadband network. A cascade network applies the compressors at constant pressure offset based on their position within the network sequence.

The pressure offsets apply the compressors in order of the functional need of the system. In this the first compressor in sequence will operate at the load and unload pressures as set in the Network Load and Network Unload fields. Each subsequent compressor in the sequence will operate at a different load and unload pressure points as defined by the load and unload pressures offset by the step value multiplied by the N-1 with N as the position of the compressor in sequence. This means that in our example to the left, the screen has a Network Unload Pressure of 115, a Network Load Pressure of 100, a Network Step Value of 5, and a sequence of 1, 2, 3 with 3 compressors.

Compressor 1:

Compressor Unload: 115

Compressor Load: 100

Compressor 2:

Compressor Unload: 110

Compressor Load: 95

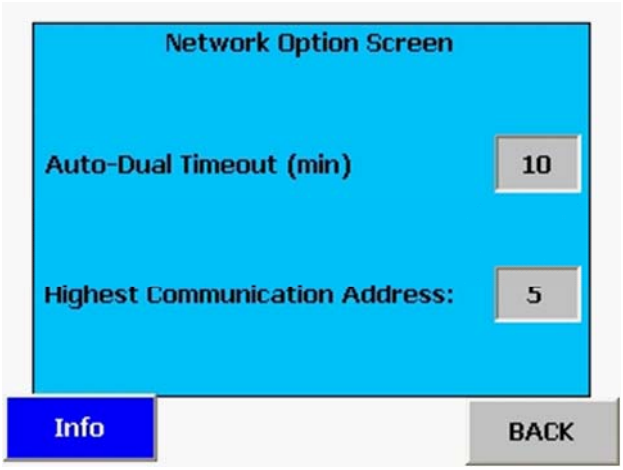
Compressor 3:

Compressor Unload: 105

Compressor Load: 90

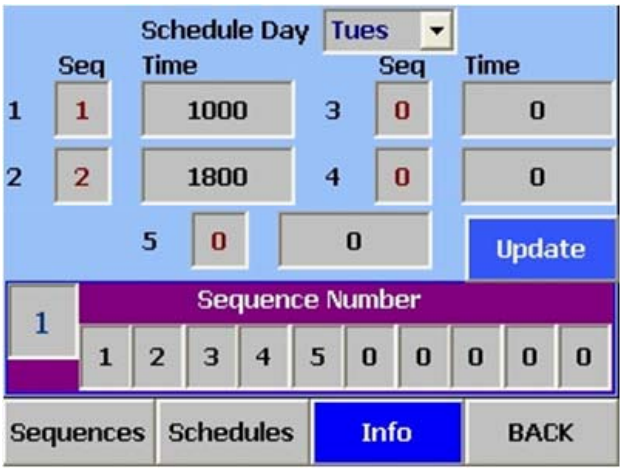
This will keep Compressor 1 loaded longer than Compressor 2 and Compressor 3.

Network Options Screen:



The Network Option Screen allows the user to set the local Auto-Dual Timeout (set individually) and the local setting for the highest communications address to check for network communications.

Network Sequence and Schedules Screen:



Schedule Day: The Schedule Day selects the day of the week to schedule.

Seq: The Sequence that the corresponding schedule is set to load.

Time: The time that the corresponding schedule is set to load at.

Schedule 1-5: The schedule values that correspond to the specified sequences and times.

Sequence Number: Loads and sets a specific sequence number, 1-10. The sequence is loaded into the 10 rectangle fields to the right of the number.

Sequence Positions 1-10: Sequence positions 1-10 to set from the sequence number loaded. Enter the desired sequence to load onto the network into these numeric entry fields. The schedules operate on a day of the week rotation, so there is a different schedule loaded for each day Sunday-Saturday. On the scheduled day the PLC checks the 5 scheduled times and determine which have already occurred of those that have already happened and which one was the latest to happen.

Sequences: Shows all sequences that have been entered into the compressor.

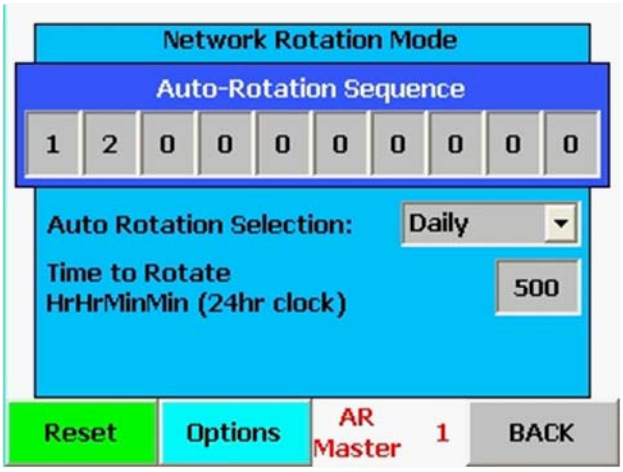
Schedules: Shows all schedules that have been entered into the compressor.

The operating sequence and schedule for the network is set from the Sequence and Schedules Screen. Network Deadband Mode allows the user to set up to 5 separate schedules for each day of the week.

A sequence is a numeric control list of up to 10 individual compressors. System controls determine sequence validity by checking for a non 0 value in the first sequence position. To schedule all of the compressor off of the sequence, set a sequence for a compressor that is not present on the current network.

A schedule is a set time that loads a specific sequence. Schedules change daily and are only valid on a specific day of the week. A sequence changes only when the system time passes the schedule of the specific to change else the last valid schedule will set the sequence. The system time must actively change to trigger a schedule changes, changes are not retroactive to previous days. Schedule time is entered in as a single numeric value in a hour hour minute minute format, for example 10:10 AM is entered as 1010, 9:35 PM is entered as 2135, and so on.

Network Rotation Mode:

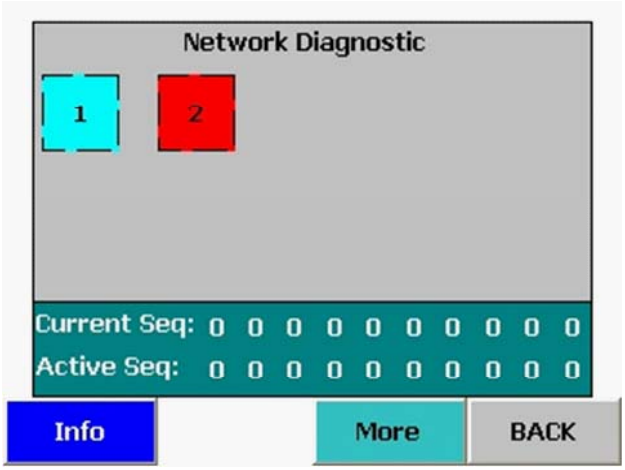


Auto-Rotation follows the same controls, as network deadband mode except there is no schedule to load. In Auto-Rotation Mode a sequence is loaded from the auto-rotation master as indicated on the bottom of the screen. The master triggers all of the sequence changes on the network to keep the rotation time accurate.

Enter the sequence in the Blue Auto-Rotation Sequence field. The remaining fields set the rotation time.

A rotation interval is set in the Auto Rotation Selection field under the selection of Daily, Weekly, and Monthly rotation. Daily rotation rotates the sequence at the same time each day. Weekly rotation rotates the sequence at the day of the week, once a week. Monthly rotation rotates the sequence on the same day of the month (1-28), once a month. The Time to Rotate field sets the time that rotation will occur on that day selected by the rotation schedule.

Network Diagnostic Screen:

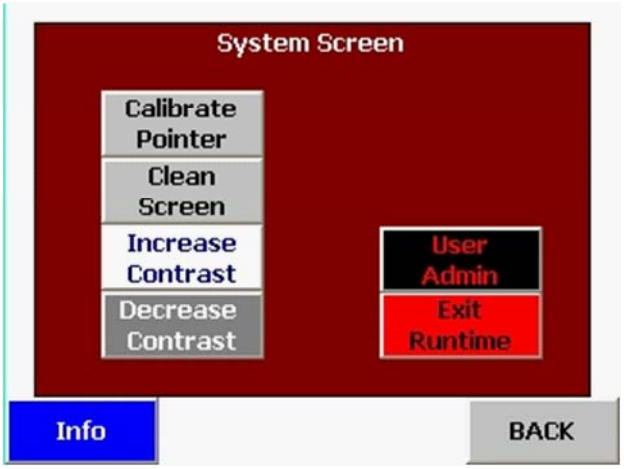


The Network Diagnostic Screen is a visual diagnostic of the current state of the compressor communications network.

Compressors present on the network displayed in the gray area of the screen as boxes. When a compressor is communicating its address on the network box will display.

The Current Sequence as loaded from Auto-Rotation or Network Deadband Mode shows under the gray Network Diagnostic area. Below the current sequence is the active sequence of compressors in the sequence responding on the communications network.

System Menu:



The System Menu button is right above the Back button on the right hand side of the Main Menu. Here you have access to HMI specific functions. These include the pointer calibration, cleaning function, contrast adjustment, user administration, and Windows CE access.

Quincy Compressor and Ortman Fluid Power Divisions

LEGAL EFFECT: Except as expressly otherwise agreed to in writing by an authorized representative of Seller, the following terms and conditions shall apply to and form a part of this order and any additional and/or different terms of Buyer's purchase order or other form of acceptance are rejected in advance and shall not become a part of this order.

The rights of Buyer hereunder shall be neither assignable nor transferable except with the written consent of Seller.

This order may not be canceled or altered except with the written consent of Seller and upon terms which will indemnify Seller against all loss occasioned thereby. All additional costs incurred by Seller due to changes in design or specifications, modification of this order or revision of product must be paid for by Buyer.

In addition to the rights and remedies conferred upon Seller by this order, Seller shall have all rights and remedies conferred at law and in equity and shall not be required to proceed with the performance of this order if Buyer is in default in the performance of such order or of any other contract or order with seller.

TERMS OF PAYMENT: Unless otherwise specified in the order acknowledgment, the terms of payment shall be net cash within thirty (30) days after shipment. These terms shall apply to partial as well as complete shipments. If any proceeding be initiated by or against Buyer under any bankruptcy or insolvency law, or in the judgment of Seller the financial condition of Buyer, at the time the equipment is ready for shipment, does not justify the terms of payment specified, Seller reserves the right to require full payment in cash prior to making shipment. If such payment is not received within fifteen (15) days after notification of readiness for shipment, Seller may cancel the order as to any unshipped item and require payment of its reasonable cancellation charges.

If Buyer delays shipment, payments based on date of shipment shall become due as of the date when ready for shipment. If Buyer delays completion of manufacture, Seller may elect to require payment according to percentage of completion. Equipment held for Buyer shall be at Buyer's risk and storage charges may be applied at the discretion of Seller.

Accounts past due shall bear interest at the highest rate lawful to contract for but if there is no limit set by law, such interest shall be eighteen percent (18%). Buyer shall pay all cost and expenses, including reasonable attorney's fees, incurred in collecting the same, and no claim, except claims within Seller's warranty of material or workmanship, as stated below, will be recognized unless delivered in writing to Seller within thirty (30) days after date of shipment.

TAXES: All prices exclude present and future sales, use, occupation, license, excise, and other taxes in respect of manufacture, sales or delivery, all of which shall be paid by Buyer unless included in the purchase price at the proper rate or a proper exemption certificate is furnished.

ACCEPTANCE: All offers to purchase, quotations and contracts of sales are subject to final acceptance by an authorized representative at Seller's plant.

DELIVERY: Except as otherwise specified in this quotation, delivery will be F. O. B. point of shipment. In the absence of exact shipping instruction, Seller will use its discretion regarding best means of insured shipment. No liability will be accepted by Seller for so doing. All transportation charges are at Buyer's expense. Time of delivery is an estimate only and is based upon the receipt of all information and necessary approvals. The shipping schedule shall not be construed to limit seller in making commitments for materials or in fabricating articles under this order in accordance with Seller's normal and reasonable production schedules.

Seller shall in no event be liable for delays caused by fires, acts of God, strikes, labor difficulties, acts of governmental or military authorities, delays in transportation or procuring materials, or causes of any kind beyond Seller's control. No provision for liquidated damages for any cause shall apply under this order. Buyer shall accept delivery within thirty (30) days after receipt of notification of readiness for shipment. Claims for shortages will be deemed to have been waived if not made in writing within ten (10) days after the receipt of the material in respect of which any such shortage is claimed. Seller is not responsible for loss or damage in transit after having received "In Good Order" receipt from the carrier. All claims for loss or damage in transit should be made to the carrier.

Quincy Compressor and Ortman Fluid Power Divisions

TITLE & LIEN RIGHTS: The equipment shall remain personal property, regardless of how affixed to any realty or structure. Until the price (including any notes given therefore) of the equipment has been fully paid in cash, Seller shall, in the event of Buyer's default, have the right to repossess such equipment.

PATENT INFRINGEMENT: If properly notified and given an opportunity to do so with friendly assistance, Seller will defend Buyer and the ultimate user of the equipment from any actual or alleged infringement of any published United States patent by the equipment or any part thereof furnished pursuant hereto (other than parts of special design, construction, or manufacture specified by and originating with Buyer), and will pay all damages and costs awarded by competent court in any suit thus defended or of which it may have had notice and opportunity to defend as aforesaid.

STANDARD WARRANTY: Seller warrants that products of its own manufacture will be free from defects in workmanship and materials under normal use and service for the period specified in the product instruction manual. Warranty for service parts will be ninety (90) days from date of factory shipment. Electric Motors, gasoline and diesel engines, electrical apparatus and all other accessories, components and parts not manufactured by Seller are warranted only to the extent of the original manufacturer's warranty.

Notice of the alleged defect must be given to the Seller, in writing with all identifying details including serial number, type of equipment and date of purchase within thirty (30) days of the discovery of the same during the warranty period.

Seller's sole obligation on this warranty shall be, at its option, to repair or replace or refund the purchase price of any product or part thereof which proves to be defective. If requested by Seller, such product or part thereof must be promptly returned to seller, freight prepaid, for inspection.

Seller warrants repaired or replaced parts of its own manufacture against defects in materials and workmanship under normal use and service for ninety (90) days or for the remainder of the warranty on the product being repaired.

This warranty shall not apply and Seller shall not be responsible or liable for:

(a) Consequential, collateral or special losses or damages;

(b) Equipment conditions caused by fair wear and tear, abnormal conditions of use, accident, neglect or misuse of equipment, improper storage or damage resulting during shipping;

(c) Deviation from operating instructions, specifications or other special terms of sale;

(d) Labor charges, loss or damage resulting from improper operation, maintenance or repairs made by person(s) other than Seller or Seller's authorized service station.

In no event shall Seller be liable for any claims whether arising from breach of contract or warranty or claims of negligence or negligent manufacture in excess of the purchase price.

THIS WARRANTY IS THE SOLE WARRANTY OF SELLERS AND ANY OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED IN LAW OR IMPLIED IN FACT, INCLUDING ANY WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR USE ARE HEREBY SPECIFICALLY EXCLUDED.

LIABILITY LIMITATIONS: Under no circumstances shall the Seller have any liability for liquidated damages or for collateral, consequential or special damages or for loss of profits, or for actual losses or for loss of production or progress of construction, whether resulting from delays in delivery or performance, breach of warranty, negligent manufacture or otherwise.

ENVIRONMENTAL AND OSHA REQUIREMENTS: At the time of shipment of the equipment from the factory, Quincy Compressor / Ortman Fluid Power will comply with the various Federal, State and local laws and regulations concerning occupational health and safety and pollution. However, in the installation and operation of the equipment and other matters over which the seller has no control, the Seller assumes no responsibility for compliance with those laws and regulations, whether by the way of indemnity, warranty or otherwise.

Quincy Compressor Products: 217.222.7700
E-mail: info@quincycompressor.com
Website: www.quincycompressor.com