Quincy COMPRESSOR

an EnPro Industries company

QSD™ Series

Oil-Free Rotary Screw Air Compressor

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. 65040-AB

January 2001 Edition

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Standard Warranty

Quincy Compressor Division
Industrial Screw Products
QSD™ - Rotary Screw Air Compressors

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

QSD™ Packaged Compressors - Twelve (12) months from date of start-up or eighteen (18) months from date of shipment from the factory, whichever occurs first.

Airend on Packaged Compressors - Thirty-six (36) months from date of start-up or forty-two (42) months from date of shipment from the factory, whichever occurs first.

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.

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:

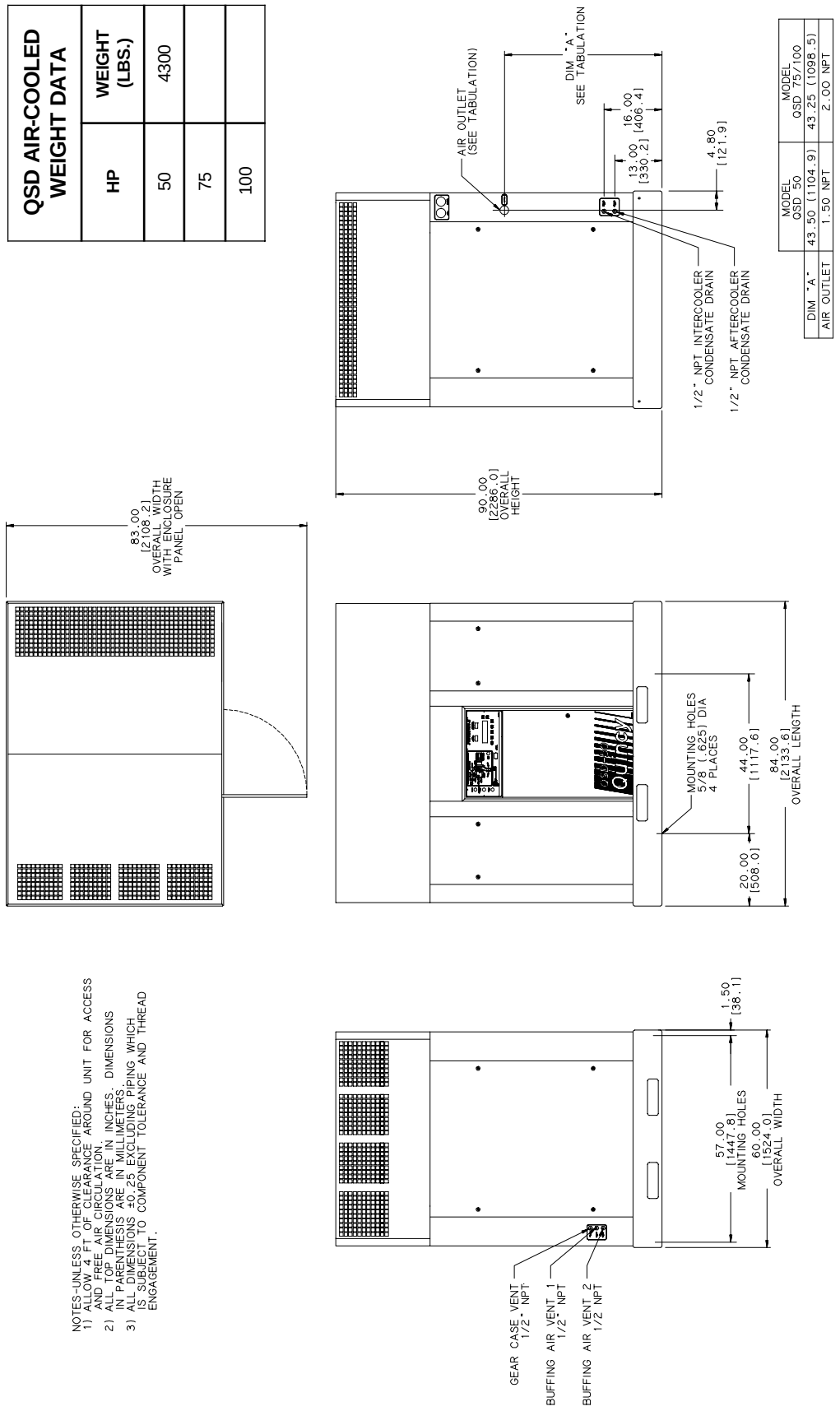
a) Consequential, collateral or special losses or damages;
b) Equipment conditions caused by fair wear and tear, abnormal conditions of use, accident, neglect or misuse of equipment, improper storage or damages resulting during shipment;
c) Deviation from operating instructions, specifications, or other 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.

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

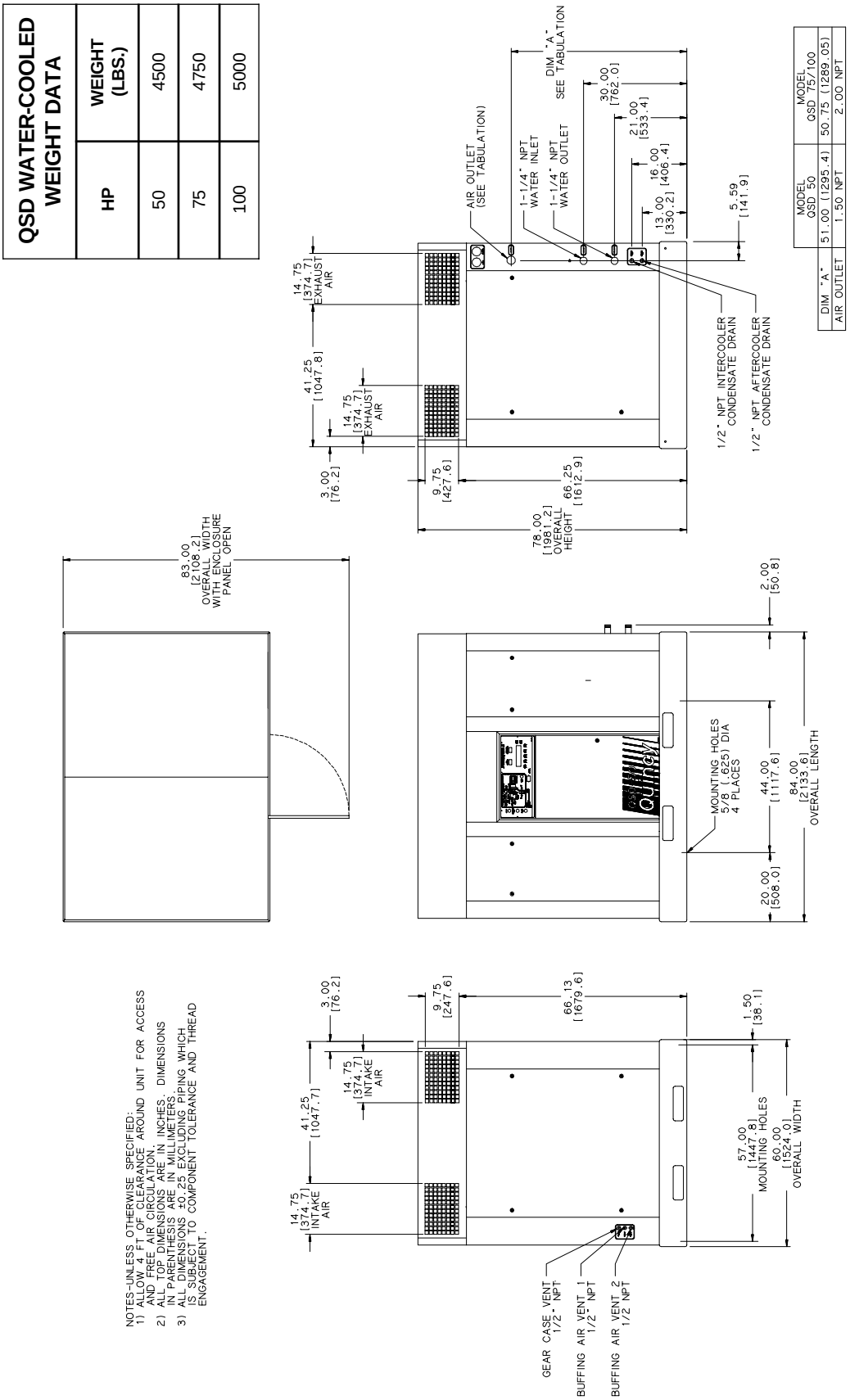
DIMENSIONAL DATA *(air-cooled)*

QSD AIR-COOLED WEIGHT DATA	
HP	WEIGHT (LBS.)
50	4300
75	
100	



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

QSD WATER-COOLED WEIGHT DATA	
HP	**WEIGHT (LBS.)**
50	4500
75	4750
100	5000



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- **Safety Precautions**
- **Safety Alert Symbols**
- **Serial/Model Identification Plate**
- **Spare Parts Ordering Information**

Safety Precautions

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

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

Failure to follow any of these warnings 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 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 shut-off 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 noise level inside cabinet exceeds 100 decibels (dBA) and the operating temperature of some components is sufficient to burn the skin.

NOTICE

These instructions, precautions and descriptions cover standard Quincy manufactured QSD™ 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.

NOTE

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.

Safety Alert Symbols

IMPORTANT!

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

⚠DANGER

Immediate hazards which will result in severe personal injury or death.

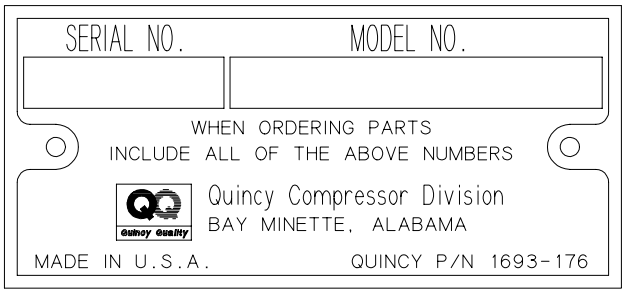
⚠WARNING

Hazards or unsafe practices which could result in personal injury or death.

⚠CAUTION

Hazards or unsafe practices which could result in minor personal injury, product or property damage.

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 or warranty claim. A model/serial number plate is located on the frame OR IN the upper right corner of the control panel door.

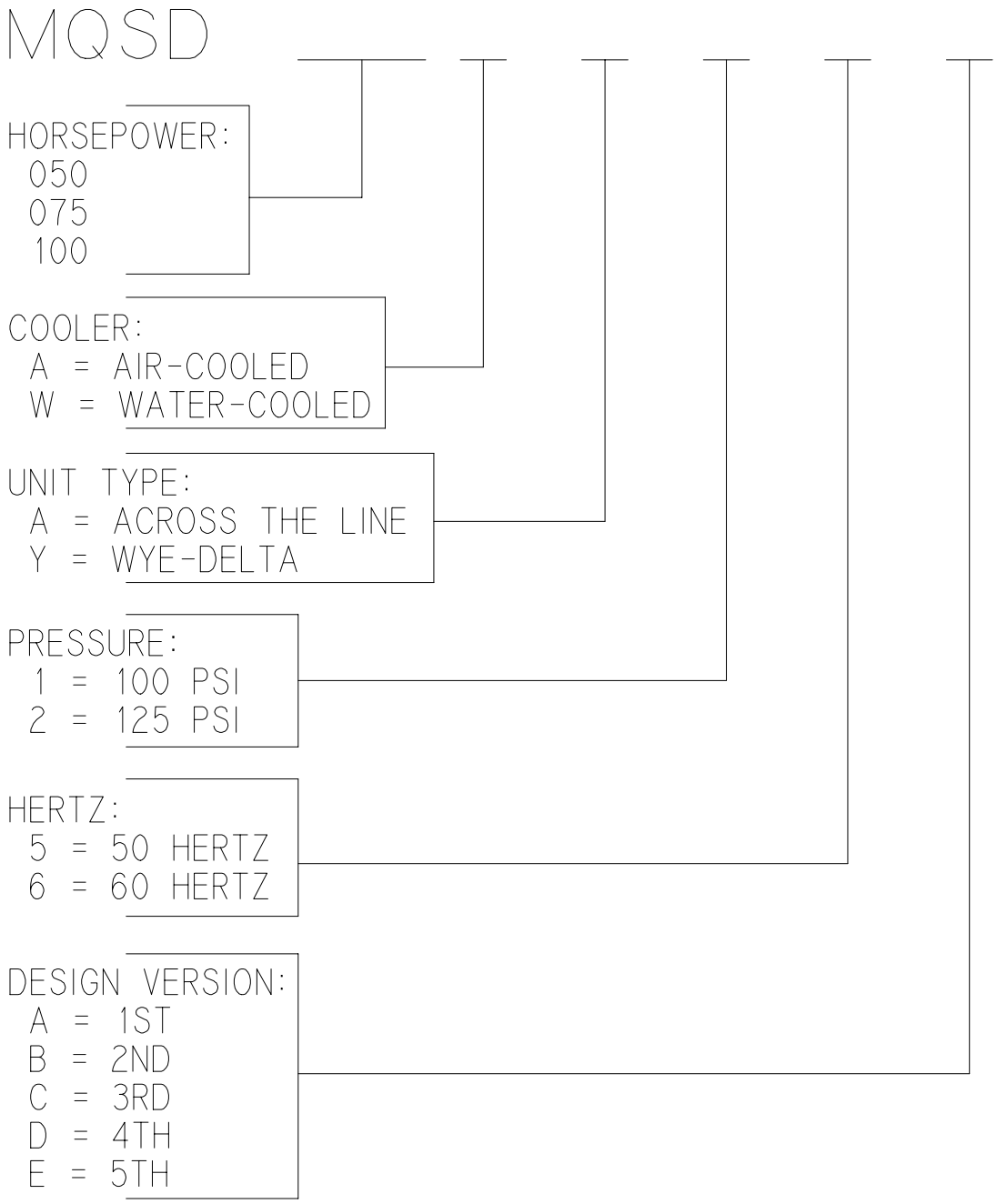
Spare Parts Ordering Information

BFGoodrich, Quincy Compressor Division maintains replacement parts for Quincy compressors. 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.

⚠DANGER

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 OR FDA 21 XDE 178.3570 regulations.

MODEL IDENTIFICATION



- **General Description**
- **The Compression Cycle**
- **Cooling System**
- **Lubricating Fluid System**
- **Moisture Separator**
- **Capacity Control System**
- **Electrical System**
- **Indicators**

General Description

The QSD™ compressor is a two-stage, positive displacement, oil-free rotary screw unit consisting of two precision-machined rotors per stage. The male rotor of each stage are turned by a set of precision timing gears which are driven by the motor through a flexible drop-out type coupling. Both rotors (of each stage) are housed in a single cast iron cylinder with water jackets surrounding them.

All models are equipped with a positive displacement fluid pump mounted to the gearbox to circulate fluid through the bearing system and to the gear mesh. The fluid cooler, fluid pressure relief valve, and fluid filter are also mounted on the gearbox.

All components are attached to a heavy-duty steel frame. Controls and indicators are arranged on a control panel. An acoustical cabinet is included to reduce machine sound levels.

The Compression Cycle and Air Flow

The compression cycle of the two-stage QSD™ rotary compressor is a continuous process from the intake of stage one to the discharge of stage two. Each stage consists of two rotors in constant mesh, housed in a cylinder with two parallel adjoining bores. Each male rotor has lobes that mesh with flutes in the female rotor. The rotors are synchronized via AGMA12 timing gears. All parts are machined to exacting tolerances.

As the rotors of stage one rotate, air is drawn into the cylinder through the inlet port located immediately after the air cleaner connection. 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 intercooler. The air then flows through a moisture separator/trap assembly to remove condensate from the cooling process. From there the air flows to the inlet of stage two. Air inlet pressure at the stage two inlet should be between 30 to 36 psig.

In stage two, the above compression process is repeated. Discharge air pressure from stage two will be the requested system pressure. From stage two the compressed air travels through an aftercooler and a second moisture separator/trap assembly. The compressed air passes through a minimum pressure check valve and into the compressed air distribution system.

Cooling System

Water-cooled

The QSD™ water-cooled cooling system is divided into two parallel circuits.

The coolant flows from the inlet manifold through the intercooler, into the stage one compressor jacket and from the compressor jacket to the outlet manifold.

The second circuit flow is to the aftercooler, to the fluid cooler located in the gearbox and finally through the stage two compressor jackets to the outlet manifold.

The inlet coolant manifold contains a coolant flow switch which prevents the compressor from starting if there is inadequate coolant flow. The switch will also shut down the compressor if there is a loss of coolant.

NOTE

If the compressor is shut down during freezing weather, the drain plugs located at both ends on the underside of the coolers along with the plug on the coolant line from the fluid cooler should be removed. Compressed air at 15-20 psig should be injected into the system to remove the remaining coolant.

To maintain the efficiency of the cooling system provisions have been made for chemical cleaning of the system.

To conserve water, an optional, normally closed solenoid valve is available. This valve will automatically start and stop the water flow in unison with the compressor. The valve should be located in the inlet line to the compressor to provide isolation of the compressor cooling system from the supply.

Air-cooled

The QSD™ air-cooled cooling system is comprised of three separate cooling sections.

The first cooler is the intercooler, which reduces the stage one discharge temperature. The air then passes through a moisture separator/trap, then into stage two of the compressor.

The stage two cooler cools the water/glycol (70/30) mixture which is circulated through the fluid cooler and the jackets of the compressor stages.

The third cooling process takes place in the aftercooler which cools the discharge air from stage two, which then passes through a moisture separator/trap assembly before entering the distribution system.

A coolant flow switch is installed to prevent the compressor from starting if the coolant circulating pump fails or to shut down the compressor if there is a loss of coolant.

NOTE

If the compressor is shut down for an extended period and temperatures are expected to be less than 0°F, drain system of all coolant.

A fan located below the coolers draws air through a baffled inlet over the airend and motor, discharges it across the coolers and exhausts it out the top and end of the machine.

Lubricating Fluid System

Lubrication is provided by a pump located on the gearbox. The gearbox also acts as the fluid reservoir and supports the fluid cooler and fluid filter.

The fluid from the pump passes through a filter then to the fluid galley on the top of the gearbox where it is distributed to the gears and bearings. A fluid pressure relief valve is located under the fluid galley cover to maintain a specified fluid pressure.

Moisture Separator

Two combination moisture separator and water traps are provided for collecting and removing condensate at both the intercooler and aftercooler discharge and expelling it to the customer's drain.

A drain valve is located below the buffing air vents. It is recommended that this valve be opened daily or more often as atmospheric (high humidity) conditions require.

Capacity Control System

The standard method of capacity control for the QSD™ oil-free compressor is Continuous Run with load/no-load.

The Continuous Run Mode of operation is ideal for a compressed air system that will operate at full load conditions most of the time, with minimal unloaded time.

The QSD™ allows very consistent and tight control of air system pressure by constantly monitoring package discharge pressure and operating within a deadband of as low as 5 PSI. This means the system pressure never needs to fall below the normal required pressure.

The recommended receiver size for a QSD™ oil-free compressor is a minimum of three (3) gallons per rated compressor CFM; the more the better. If there is more than one compressor, the receiver must be sized based on the total CFM of all compressors. ***This should be increased to a minimum of five (5) gallons per total compressor CFM for systems with sharp changes in demand***. The receiver must be located immediately adjacent to the compressor and before any additional system components such as dryers and filters. This allows the Power$sync II™ controller to operate the compressor coincident to system demand changes without dramatic episodes of rapid loading and unloading (cycling) of the machine.

NOTE

Continuous operation with rapid load/no-load cycles will reduce component life. Cycle rates should never exceed six (6) per minute. Proper receiver sizing is essential for reliable operation.

The QSD™ does not use an inlet valve, but rather the patented Power$sync® lift valve technology to unload the machine. With this type of control, the unit is operating either at full capacity or 0% capacity, depending on system pressure.

Suction or inlet valves on competitor designs act to close the inlet to the compressor and induce a vacuum in both compressor stages as it continues to try to compress air. This vacuum creates a reverse pressure differential across the bearing seals, causing the bearing fluid to migrate toward the compression chamber when the machine is unloaded.

The QSD™ incorporates patented Power$sync® lift valves on both stages of compression. The valves, one per stage, actually relieve the compressor stages ability to compress air. Because the unloading is positive, and no vacuum is created, unloaded horsepower is minimized. Also, since the compressor stages are not creating a vacuum in the unloaded state, there is no tendency for the bearing fluid to migrate toward the compression chambers, reducing the likelihood of fluid contamination of the air.

The QSD™ loads and unloads in response to the air system pressure. The Power$sync II™ controller monitors package discharge pressure into the compressed air system and either opens or closes the lift valves to load or unload the compressor, based on preset pressure values. Upon start-up, the QSD™ will operate at full capacity up to a predetermined maximum value, usually 5 PSI above the normal plant air system operating level. The blowdown valve and both lift valves are closed at this time. When the preset pressure value is reached, the Power$sync II™ controller opens both lift valves and the blowdown valve simultaneously, reducing the compressor output to 0%. The QSD™ will continue to operate in the unloaded condition, with the lift valves and the blowdown valve in the open position, until the Power$sync II™ controller detects a reduction in pressure indicating a reset condition. This pressure, like the unload, is determined by the customer, based on the air system operating requirements. The Power$sync II™ controller reacts to the signal by closing the lift valves and the blowdown valve, thus reloading the compressor and returning to 100% output to complete the cycle.

NOTE

If the stage two discharge blowdown valve fails to open an excessive pressure differential across stage two will occur. The unit will shut down automatically to prevent excessive temperature build-up in the stage two airend.

The Power$ync II™ controller allows the customer to select Auto Dual as an alternate control method. Auto Dual incorporates a timer which will turn the compressor off if it remains in the unloaded condition for a preset length of time. If the system pressure remains above the preset pressure for the programmed time interval, Power$ync II™ places the compressor in Standby Mode, with the drive and fan motors de-energized. The Power$ync II™ controller waits for an indication of demand, recognized as a drop in system pressure to a preset minimum pressure level, and automatically restarts the compressor.

Essentially equal to Continuous Run, Auto Dual goes a step beyond to offer the opportunity for additional power savings in a system with more dramatic differences in demand. As demand changes with shift changes or varying operations, the Power$ync II™ controller will allow the QSD™ compressor to go into Standby Mode when compressor output is not needed. Like the Continuous Run Mode, a properly sized air receiver will ensure that the compressor operates and reacts properly as air system demand changes.

NOTE

Refer to section VIII for Power$ync II™ operating instructions.

Electrical System

A diagram of the electrical system is shown in the parts manual shipped with the compressor. A wiring diagram is also included in the control panel of all Quincy compressors.

NOTE

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

NOTE

Standard drive motors are open, drip-proof, with a maximum ambient temperature rating of 40°C. They are not suitable for salt laden, corrosive, dirty, wet or explosive environments.

The standard QSD™ compressor utilizes 460V incoming power through an across the line magnetic starter. A transformer in the control panel reduces this voltage to 120 VAC for the various controls on the unit. These controls include the selector switch, pressure switch, timer, high air temperature (HAT) safety switches, solenoid valve and various indicator lights. Other incoming line voltages are available as options. A NEMA 4 electrical enclosure is standard.

Back-up Control

The QSD™ Power$ync II™ controller is supplied with a back-up control for emergency operations if the electronic control is inoperative. The Back-up Mode is a simplified system of operations and is not intended for long-term operation. When Back-up Mode is selected all power is removed from the Power$ync II™ controls, thus the indicator lights located on the annunciator panel will be inoperable. The back-up control uses a PLC for the logic circuit. In the Back-up Mode, the PLC monitors several different areas of the unit to ensure they are in the proper ranges for normal operation.

⚠CAUTION

Under no condition should the QSD™ be switched from Power$ync II to Back-up Mode or vice versa without first removing all power to the unit.

⚠CAUTION

Always inspect for component failure before operating in Back-up Mode. Operating the unit with faulty components may void warranty.

Shutdown Conditions

NOTE

If one of the following conditions occurs at any time the unit will immediately shutdown. The unit should not be restarted until the problem has been corrected.

- The fluid pressure does not reach 15 PSI within five (5) seconds at start-up or does not maintain pressure during normal operation.
- The HAT's are open at start-up or at any time during operation.
- The drive or fan contactor overloads trip.
- The coolant flow switch does not close within five (5) seconds after start-up.
- The interstage pressure switch does not open within five (5) seconds after start-up *(Back-up Mode only)*.
- The second stage pressure switch does not open within five (5) seconds after start-up *(Back-up Mode only)*.
- Both the interstage and second stage pressure switches are open at start-up *(Back-up Mode only)*.
- The second stage pressure switch does not close within five (5) seconds after the load/unload pressure switch opens and does not reopen within five (5) seconds after the load/unload pressure switch closes *(Back-up Mode only)*.

⚠WARNING

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

Safety Sensors

Four (4) high air temperature RTD's are standard on QSD™ units. These protect the unit by sensing unusually high temperatures and shutting the unit down. Power$sync II™ monitors the following areas for high air temperature conditions:

- Stage One Discharge
- Stage Two Discharge
- Stage Two Inlet
- Package Discharge

Shutdowns for the Power$sync II™ RTD's is 435°F on discharge locations, and 150°F on Stage 2 inlet and 165°F on package discharge.

In Back-up Mode, two HAT switches monitor stage one and stage two discharge temperature. These switches are nonadjustable and set to trip at approximately 470°F.

NOTE

The back-up control circuit has two (2) HAT switches. There are no indicator lights for these HAT shutdowns. These HAT switches can also cause a shutdown in Power$sync II™ Mode as a back-up to the RTD's.

⚠WARNING

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

Indicators

Main Power on Light

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 control selector switch.

⚠CAUTION

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

High Discharge Air Temperature Lights

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

NOTE

There is no indication of high temperature shutdown on the control panel in Back-up Mode.

Motor Overload Fault

Indicates excessive amp draw of drive motor.

NOTE

There is no indication of motor overload shutdown on the control panel in Back-up Mode.

There is a mechanical indicator on the overload relay.

Fluid Filter Change Light

Indicates excessive pressure differential across the fluid filter. It is used to determine fluid filter change intervals.

NOTE

There is no indication of fluid filter change on the control panel in Back-up Mode.

Air Intake Filter Service Light

This indicator signals when the filter element needs to be replaced.

NOTE

There is no indication of air intake filter pressure drop on the control panel in Back-up Mode.

Low Lube Light

This indicator signals that the compressor has shutdown due to low fluid pressure.

NOTE

There is no indication of low fluid pressure on the control panel in Back-up Mode.

There is no indication if the coolant flow switch is not satisfied and the contacts are open. This will shutdown the unit. Refer to troubleshooting section for corrective action. Power$ync II™ will show "Emergency Stop Button Pressed" if the emergency stop button is pressed, the coolant flow switch contacts open or either of the high air temperature (HAT) switches open. These shutdowns operate in any mode by using the emergency stop circuit.

- **Receiving**
- **Moving the Unit to the Installation Site**
- **Location**
- **Piping Connections**
- **Manual Shutoff Valves**
- **Relief Valves**
- **Electrical**
- **Guards**
- **Water and Sewer Facilities at the Installation Site (Water-cooled models only)**
- **Fluid Level**
- **Compressor Rotation**
- **Fan Rotation**

Receiving

Upon receipt of the compressor, immediately inspect for any visible signs of damage which may have occurred in shipment. If damage is found at the time of delivery, have the delivering carrier make a notation on the freight bill and request a damage report. If the shipment is accepted and it is later found that the compressor unit was damaged, this is classified as concealed damage. If concealed damage is found, report it within 15 days of delivery to the delivering carrier, who 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 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

When a forklift is used to move the unit to its installation site, use forklift slots provided in the side or 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 attachment to any components.

⚠CAUTION

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

Location

Locate the compressor on a level surface, indoors, in a clean, well lit and well ventilated area, free from excessive dust, dripping liquids, hydrocarbons, and toxic, corrosive or flammable gases. Allow sufficient space (four feet of clearance on all sides and top of the compressor) for safe and proper daily inspections and maintenance. The entire length of the base must be supported. Shim where necessary, but do not use wood. Quincy recommends installing closed cell foam between the base and the floor. The machine must be protected against freezing and excessive ambient temperatures. Sheltering from freezing temperatures is mandatory. Ambient temperature should not exceed 110°F (failure to heed this may result in a high air temperature shutdown). For air-cooled units, careful consideration of room size and shape must be done so that hot exhaust air from the fan does not recirculate within the room, causing the operating temperatures to rise. All models are intended for indoor installation.

⚠CAUTION

This compressor should not be operated in temperatures below 40°F or above 110°F.

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 acoustic enclosure. This heated air must be exhausted to the outside to prevent high ambient conditions in the room. If the room is not properly ventilated, the compressor operating temperatures will increase and cause a high temperature shutdown.

NOTE

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

⚠WARNING

Never locate the compressor inlet system where it can ingest toxic, volatile or corrosive vapors, air temperatures exceeding 110°F, water or extremely dirty air. Death, serious injury or property damage could result.

⚠CAUTION

Removal or modification of sound insulation could result in high sound levels which may be hazardous to personnel.

Quincy QSD™ models 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 as this may, under certain circumstances, place the frame in a twist or bind causing eventual breakage of coolers, piping, etc.

Do not remove or deface any Danger, Warning, Caution or instructional labels found on the compressor. Labels should be provided with enough light to read and be conspicuously located and maintained for legibility. .

⚠WARNING

Removal or defacing of safety labels will result in uninformed conditions, which could result in personal injury or property damage.

Piping Connections

A drip leg with a drain valve should be mounted adjacent to the QSD™ service connection and extend below the package air connection. The drip leg should be drained daily to avoid accumulation of condensate and debris.

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. The piping should never be smaller than the connection on the compressor.

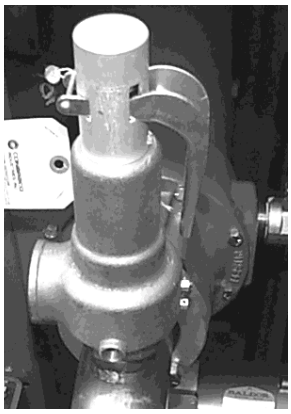
Manual Shutoff Valve

Install a manual shut-off valve (block valve) to vent the compressor and discharge line to the atmosphere. In those instances where the air receiver tank services a single compressor, the manual shut-off valve can be installed in the receiver. When a manual shut-off valve is used, a pressure relief valve is installed upstream from the manual shut-off valve. These valves should 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 if the purpose is to isolate the compressor from a system for servicing. If a manual shut-off valve is installed at the service connection, it must be open to allow air to pass to the service line when the compressor is operating. Provide drip legs in the air piping from the compressor as good installation practices dictate.

NOTE

Never operate the compressor with the shut-off valve closed. If the compressor is operated with the shut-off valve closed, a pressure related shutdown will occur.

Pressure 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.

⚠WARNING

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

Relief valves are placed ahead of any potential blockage point which 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. Always direct discharge from relief valves to a safe area away from personnel.

Electrical

Before installation, the electrical supply should be checked for adequate wire size and branch circuit capacity. During installation, a suitable fused disconnect switch or circuit breaker should be provided per local electrical codes. Where a 3-phase motor is used to drive the compressor, any unreasonable voltage unbalance (5%) between the legs must be eliminated and any low voltage corrected to prevent excessive current draw. The installation and wiring must be in accordance with National Electric Code and all state and local codes. A qualified electrician must perform all electrical work. **This unit must be grounded in accordance with applicable codes.** See control panel for the proper wiring diagram.

NOTE

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

⚠CAUTION

NEMA electrical enclosures, conduit, motor 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 the Code of Federal Regulations 29 CFR 1920.1, revised July 1, 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." The 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 be in compliance with OSHA Safety and Health Standards 29 CFR 1910.219 in OSHA manual 2206 Revised November 7, 1978 and any state or local codes.

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

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 absolutely sure water inlet and discharge connections are correct.**

Clean air is essential for your Quincy 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.

Table 3-1 – Water Flow

MODEL	50	75	100
GPM @ 50°F	10	13	16
GPM @ 70°F	12	16	20
GPM @ 90°F	15	20	24
WATER PRESS (MAX/MIN)	40/100	40/100	40/100

Minimum water quality is listed in Table 3-2. The quality of the cooling water should be tested regularly, especially when using an open cooling tower.

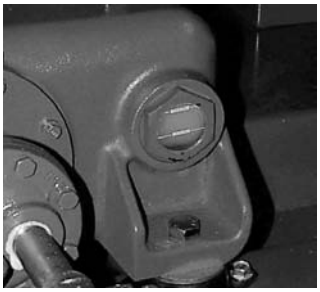
Contact the factory if you plan to use a water/glycol coolant, salt or brackish water.

Table 3-2 – Water Quality

ITEM	ONCE THROUGH WATER SYSTEM	COOLING TOWER WATER SYSTEM
PH AT 77°F (25°C)	6.5 – 8.0	6.5 – 8.0
CONDUCTIVITY AT 77°F (25°C) (UV/CM)	<500	<200
TOTAL HARDNESS AS CACO3 (PPM)	<200	<50
M-ALKALINITY AS CACO3 (PPM)	<100	<50
CHLORINE LON;CL (PPM)	<200	<50
SULFURIC ACID IRON; SO4 (PPM)	<200	<50
TOTAL IRON; FE (PPM)	<1.0	<0.3
SILICA, SIO2 (PPM)	<50	<30
SULFUR ION; S 2 (PPM)	0	0
AMMONIUM ION; NH4+ (PPM)	0	0

Fluid Level

The compressor is filled at the factory with the correct amount of fluid. A fluid tag is provided which identifies the type of fluid installed when the unit was shipped. The fluid level is monitored by a sightglass with the compressor running. The fluid level should be maintained in the run zone. Fluid can be added by removing the fill plug after the machine is shut down and any internal pressure is relieved. **DO NOT OVER FILL.**



Fluid Level Sightglass

Compressor Rotation

The compressor rotation must be checked prior to start-up. Proper rotation is counter-clockwise as viewed from the power-input end. The power-input end of the compressor is marked with an arrow (located on the motor adapter) noting the proper rotation. To check for proper rotation, briefly jog the start button, allowing the motor to turn two or three 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. **Allowing the compressor to rotate in the wrong direction will result in extensive damage to the compressor and will void warranty**.

Fan Rotation

After the compressor rotation is checked, check the fan rotation. Fan air flow should be outward, pushing the air out the discharge vent of the acoustical enclosure. The discharge vent is located just above the service line connection on the end of the acoustical enclosure.

- **Prior to Starting**
- **Starting the Compressor**
- **Stopping the Compressor - Normal Operation**
- **Stopping the Compressor - Emergency**

Prior to Starting

⚠CAUTION

Provisions should be made to have the instruction manual readily available to the operator and maintenance personnel. If the manual becomes illegible or lost, have it replaced immediately. The instruction manual should be read periodically to prevent a serious accident.

Before starting the unit, review Sections II and III of this manual and be certain that all installation requirements have been met and that the purpose and use of each of the controls and all warnings are thoroughly understood. Adhere to the following checklist before placing the compressor into operation:

- Remove all loose items and tools from around the compressor.
- Check fluid level in the gearbox.
- Check the fan and fan mounting for tightness.
- Manually rotate the compressor through enough revolutions to be certain there is no mechanical interference.
- Ensure that all pressure relief valves are in place and properly sized.
- Make sure all panels and guards are in place and securely mounted.
- Check fuses, circuit breakers and thermal overloads for proper size.
- After all the above conditions have been satisfied close the main power disconnect switch, jog the starter switch button to check the rotation of the compressor
- Install the coupling guard.
- Check the fan rotation (air should push outward through the enclosure).
- Check inlet and discharge water piping for proper connections, adequate supply and open drain.

NOTE

When freezing temperatures are expected before the next start-up, drain all cooling water as follows:

- **Drain inlet and outlet water lines at the cabinet connections.**
- **Remove drain plugs from fluid cooler and stage one water jacket tube.**
- **Inject compressed air at 15-20 psig into the system to remove the remaining coolant.**

Starting the Compressor

- Secure all enclosure panels on compressor.
- 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 **(never increase pressure settings beyond factory specifications)**. Refer to Section VII - Service Adjustments.
- Observe compressor operation closely for the first hour of operation and frequently for the next seven hours. Stop and correct any noted problems.

NOTE

If the unit fails to start consult Section IX - Troubleshooting. Do not adjust the unload pressure more than 5 PSIG beyond the full load pressure rating of the machine.

Stopping the Compressor - Normal Operation

Press the shutdown button on the keypad below the main display.

NOTE

It is always a good practice to close the service valve when the compressor is not being used. It will prevent the system's air pressure from leaking back into the compressor if the check valve leaks or fails.

Stopping the Compressor - Emergency

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

Table 4-1 – Pressure Readings

MARKING	NORMAL LOADED READING	NORMAL UNLOADED READING	SHUTDOWN CONDITION
STAGE ONE DISCHARGE PRESSURE	27-38 PSIG	2-4 PSIG	>50 PSIG
STAGE TWO DISCHARGE PRESSURE	60-131 PSIG	0-2 PSIG	MAX UNLOAD +12 PSIG
FLUID PRESSURE	18-28 PSIG	18-28 PSIG	<15 PSIG

Table 4-2- Temperature Readings (Water-cooled)

MARKING	NORMAL LOADED READING	NORMAL UNLOADED READING	SHUTDOWN CONDITION
STAGE ONE DISCHARGE TEMPERATURE	300-410°F	< 250°F	>425°F
STAGE TWO DISCHARGE TEMPERATURE	325-410°F	< 250°F	>425°F

The following procedure should be used 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 the manual shut-off valve (block valve) between the 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.

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- **Safety**
- **Fluid Specifications**
- **Air Filter**
- **Input Shaft Seal**
- **Airend Sealing System**

Safety

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:

- Always check power supply disconnect. The Power-on light may be inoperable.
- Wait for the unit to cool before starting service. Temperatures may exceed at 350°F when the compressor is working.
- Clean up fluid spills immediately to prevent slipping.
- Loosen, but do not remove, flange or component bolting. Then, carefully pry apart same to be sure there is no residual pressure before removing the bolting.
- 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.

Fluid Specifications

Each QSD™ unit comes equipped with a fluid level sight gauge, fluid fill opening, and a fluid drain located on the gearbox.

QSD™ compressors are factory filled with Quinsyn GL or Quinsyn GLF (food grade) synthetic fluid. The use of other brands or types of fluid may reduce the design life of the compressor or cause problems with filtration or bearing performance. Consult Quincy Compressor before changing brands or types of fluid.

Quinsyn GL or GLF synthetic fluid is available from any authorized Quincy Distributor and is recommended for use in all Quincy QSD™ oil-free compressors. Failure to follow this recommendation will adversely affect your warranty.

⚠CAUTION

Do not mix different grades or types of fluid. Do not use inferior grades of fluids. Failure to follow these recommendations may cause severe fluid breakdown, resulting in the information of varnish and sludge throughout the system. This will result in clogging of the cooler and internal fluid passages. Warranty will be voided.

Fluid Life

Quinsyn GL or GLF fluid can be used for one (1) year or 8,000 hours depending upon application and recommendations from the fluid analysis. Draining of the fluid should be done while the fluid is hot to carry away more impurities. It is strongly suggested that a reputable fluid analysis program be followed to establish fluid change intervals.

A free fluid analysis service is provided with the use of Quinsyn GL or Quinsyn GLF fluid. This analysis provides important information regarding the performance of the fluid and assists in detecting any special problems which might arise. Fluid samples should be taken at the time of fluid filter changes or at 1,000 hour intervals. Fluid sample bottles, labels and instructions are provided with the compressor package at the time of shipment. Additional sample bottles may be purchased through your distributor.

⚠WARNING

Hot fluid under pressure could cause death or serious injury. Do not remove the fluid fill plug and attempt to add fluid to the fluid reservoir while the compressor is in operation or when the system is under pressure. Be sure that the compressor's red mushroom stop button is pushed in and that the main power disconnect switch is in the off position and locked out to assure that the compressor will not start automatically or by accident. Close unit shut-off valve to eliminate buffing air venting.

Fluid Filter

The fluid filter is a spin on, full flow unit. Replacement of the filter requires spinning off the complete cartridge and replacing it with a new one. **USE GENUINE QUINCY REPLACEMENT FILTERS ONLY.**

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 up to it's operating temperature.
- Every 1,000 hours.
- Every fluid change.

Air Filter

A heavy-duty air filter is standard on all QSD™ compressors. This air filter uses a dry type element. Air passes through the filter element with an efficiency of 99.9% (as tested by SAE J726 test code specifications). To change the element, unscrew the strap bolts and remove and replace the old element. Tighten the bolts snugly after making certain the element is seated correctly on its mounting base.

NOTE

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 void if a failure is determined to be caused by inadequate filtration.

Input Shaft Seal

NOTE

The QSD™ airend does not contain a scavenge system. A small fluid weep from the seal is normal.

Compressor shaft seals are wear items that may eventually have to be replaced. The input shaft seal on QSD™ units is field serviceable. The internal carbon ring seals on the individual stages are not field serviceable. To replace the input shaft seal, a complete understanding of the installation procedure and special tools are required. Should you decide to replace the seal yourself, ask your Quincy distributor for the complete illustrated instructions (available as a Service Alert) at the time you order the seal and special tools (see parts book for shaft seal and tool kit part numbers). If your distributor does not have a copy of these instructions, they can be ordered from Quincy Compressor at no charge.

Shaft seal replacement on QSD™ units requires the removal of the drive motor to allow use of the wear sleeve removal and installation tools:

1) Remove coupling guards and coupling halves.
2) Remove drive motor.
3) Remove the drive coupling hub and key from the compressor shaft.
4) Remove the four bolts that secure the seal adapter to the suction housing.
5) Insert two of the seal adapter retaining bolts into the seal adapter jack holes and turn clockwise pushing the seal adapter away from the gearcase housing.
6) Check the inboard face of the seal adapter to make sure no shims are removed. **Do not lose or damage shims since they need to be reused.** Disassemble the seal adapter for inspection or service by taking the following steps:

⚠CAUTION

After removing the seal adapter, do not allow the outer face of the bearing to move. This will cause the bull gear and shaft to fall in the gearbox, damaging the gear and bearings.

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) To remove the seal wear sleeve, 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. Using a ratchet and socket, turn the puller jackscrew clockwise in against the end of the compressor shaft. **Do NOT use an impact wrench with this tool.**

Preparation for New Seal Installation

1) 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® that was between the wear sleeve and shaft. Using a fine file or emery cloth, deburr the key area of the rotor shaft. Cover the keyway with masking tape to prevent any damage to the new seal during installation.
2) Clean the seal adapter with clean, fast drying solvent. 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.
3) Position the seal so the two lips that face the same direction face the gear and the single lip faces the drive motor.
4) With the lips of the seal facing the correct direction, 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 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.
4) Preheat the seal wear sleeve to 350°F in a small oven. 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

1) Apply a thin coat of compressor fluid to the outer face of the seal wear sleeve and seal lip.
2) Cover the keyway in the compressor shaft with masking tape so there is no chance of damage occurring to the seal face during installation.
3) Apply Loctite® 515 or 518 to the gearbox seal adapter mounting flange. Use a roller to apply a uniform, thin coat on the flange. Remove any excess Loctite® around the fluid feed hole.
4) Install the shims in the same order as removed. Thickest shims should be facing the seal adapter. Thinnest shims should be in the middle of the shim stack.
5) Slide the proper seal installation sleeve against the wear sleeve with the taper toward the end of the input shaft. Lubricate the seal lips and installation sleeve with compressor fluid. Carefully slide the seal adapter with the new seal installed over the end of the rotor shaft and up against the adapter bore.
6) Align the fluid feed hole with the slot on the seal adapter and evenly draw the adapter into the bore, install the four retaining bolts and tighten to the specified torque. Remove the installation sleeve.

Airend Sealing System

The airends have a redundant shaft seal arrangement that consists of three segments:
1) A primary set of seals on the dry side with a pressurized buffing air flow.
2) A sinuous seal with an air dam.
3) An atmospheric fluid drain on the bearing side.

The sealing system incorporates a redundant seal system to ensure no fluid enters the compressor chamber. The seal consists of multiple, floating carbon ring seals and a sinuous path to prevent bearing fluid from migrating into the compression chamber. In addition to the physical seals and a drain pocket, there is a positive flow of buffing air introduced in the floating carbon rings to create a pressure differential which sweeps fluid to the drain pocket. The buffing air for stage one is supplied from the interstage piping through a pressure regulator. The pressure regulator is factory set at 4-5 PSI. The pressure setting should be checked at every service interval and adjusted if necessary. Outlet of the buffing air is routed through collection filters. These filters collect the fluid vapors normally present in the buffing air drain. The filters should be drained occasionally. Collection levels and frequency of draining will vary depending on operating conditions. If a drastic change in the collection levels occur without a change in operating conditions, call the factory for service.

There is a smoke eliminator to remove and collect trace amounts of fluid vapor and return them to the gearcase. If the collection filter for the smoke eliminator requires frequent draining, replace the smoke eliminator.

NOTE

Do not restrict the air flow from the vents located at the outlet end of the package. Doing so may cause fluid leaks.

- **Pressure Switch**

⚠WARNING

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

Pressure Switch (Back-up Operating Mode)

The PS1 pressure switch will determine at what pressure the compressor will load and unload. The range adjustment is made by turning the adjustment to increase the cut-in /cut-out pressure and to lower the cut-in/cut-out pressure on PS1. Never exceed the maximum factory pressure rating.

NOTE

See Section VIII - Power$sync II™ Operation for electronic control operation of this unit.

⚠CAUTION

Before returning compressor to service in Back-up Mode, check for possible component failure. Certain mechanical failures can be mistaken as a microprocessor failure. Continued operation with faulty components may void warranty.

Adjusting Pressure Switch

The following procedure should be used 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 the compressor and plant air system to prevent any back flow of air into the compressor. Never depend upon a check valve to isolate the system.
3) Open the manual shut-off valve and wait for the pressure in the compressor 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.
5) Remove supply tube going to pressure switch.
6) Connect regulated source of air with calibrated gauge.
7) Set pressure supply at trip point of pressure switch.
8) Adjust switch to trip at trip point.
9) PS2, PS3, and PS4 are not adjustable. Verify settings are correct per steps 1 through 7.

PS1 Desired unload pressure (adjustable)
PS2 Interstage 23 PSI (fixed)
PS3 Stage 2 discharge 23 PSI (fixed)
PS4 Fluid 15 PSI (fixed)

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- **Introduction to Power$ync II™ *(version 1.04)***
- **Back-up Mode Operation**
- **Single Machine Operational Mode**
- **Multiple Machine Operational Mode**
- **Pressure Settings**
- **Network Installation**
- **Network Voltage Tests on Power$ync II® Systems**
- **Network Setup**
- **Start-up**
- **Power-up Displays**
- **Start-up Displays**
- **Operational Displays**
- **Compressor Settings and Maintenance Displays**
- **Cautionary and Shutdown Displays**
- **Shutdown Log Messages**

Introduction to Power$ync II™

⚠WARNING

Always disconnect and follow lockout/tag-out procedures before attempting any repair or adjustment to any electrical component on this compressor.

The Power$ync II™ control for the QSD model compressors consists of a two-stage oil-free airend and an associated computerized controller. Together, these features have been designed to provide the best full-load and unloaded efficiencies available in the compressor industry. Besides providing outstanding single machine efficiencies, this control includes multi-machine control.

This control uses four pressure transducers and four RTD temperature probes for the computerized controller. The pressure transducers are located in the control panel. Each transducer is plumbed to its own specific location. Pressure is measured at the discharge of stage one, discharge of stage two, and the discharge of the package. Package discharge is located on the customer side of the package check valve. Fluid pressure is also measured.

The RTD temperature probes are installed at the discharge of each compressor stage, at the inlet of stage two and at the discharge of the package.

There is a coolant flow switch to prevent the unit from running if there is no coolant flow. If the unit is shut down by the coolant flow switch, the control will display 'Emergency Stop Button Pressed'.

Back-up Mode Operation

The Power$ync II™ control on QSD™ compressors has a built-in feature not found on other oil-free compressors. In the unlikely event of a failure of any component of the electronic control, the electronic control may be switched off and the machine operated in Back-up Mode until the problem is taken care of.

The Back-up Mode must not be used to bypass a shutdown condition that occurred in Power$ync II™ Mode. The cause of the shutdown must be found and corrected before operating the compressor any further. The Back-up Mode **must not** be used for continuous operation.

The Back-up Mode is a separate control circuit using pressure switches, snap disk temperature switches and a PLC. The settings of the pressure switches should be verified before operating in this mode. After disconnecting power, PS1 should be set to open at the unload pressure of the package and is the only adjustable pressure switch. PS2 and PS3 are not adjustable and are factory set to open at 23 psig. PS4 is not adjustable and is factory set to close at 15 psig.

With these settings verified, activate the Back-up Mode as follows:

1) Disconnect power from the compressor.
2) Open the electrical enclosure door, and turn the selector switch to Back-up Mode.
3) Close the electrical enclosure door and reconnect power to the compressor.
4) Wait thirty seconds and press START.

Do not switch modes with power on the compressor!

While running in Back-up Mode, there is no power going to the electronic control. The displays on the electronic control will be dark and the keypad will be inactive. Pressures and temperatures may be read on the gauges located at the package discharge connection.

Single Machine Operational Modes

There are two modes of operation that can be used for single machine installations, Continuous Run and Auto Dual.

Continuous Run

In Continuous Run Mode, the compressor uses an adjustable pressure deadband to match compressor output to system demand. As the pressure rises above the full-load pressure setting, a signal is sent to unload the airend, reducing the air delivery. Should the pressure rise to a point indicating there is no system demand, the control will unload the compressor and blow the piping down to atmospheric pressure. It will continue to run in this unloaded state until system pressure drop indicates additional air demand.

This control mode is best used for systems that have only brief periods of time with no system demand. Systems with little compressed air storage capacity will also run better with a control scheme using a pressure deadband to moderate changes in loading levels.

Auto Dual Control

This method of control operates identically to the Continuous Run Mode when responding to a system demand. If there is no system demand, Auto Dual control goes a step beyond Continuous Run to provide additional power savings. In the Auto Dual Mode, the control will start a shutdown timer when the compressor unloads. The timer will count down a preset waiting period. If there has been no drop in system pressure during this waiting period, the control will turn the compressor motor(s) off and will stand by, continuing to monitor system pressure. When a demand returns to the system, the controller will restart the compressor to satisfy the air requirements.

Auto Dual Mode is best used for systems that have extended periods (usually half an hour or more) during which there is no system demand. A very small continuous system demand can be handled with adequate compressed air storage capacity and a reasonable pressure deadband, allowing the power savings associated with having the compressor turned off.

Auto Dual Time Delay

The factory setting for this delay is ten (10) minutes. The purpose of the delay is to prevent the motor from starting too many times within a given period. To maximize the energy savings benefit of having the machine off instead of just unloaded, this timer should be set low enough to allow the machine to turn itself off during periods of no demand.

If the compressor attempts to start too many times, a safety timer will be activated which forces a 25-minute cool-down period. The control will then reset and allow the machine to shut down based on the adjustable timer setting.

Multiple Machine Operational Mode

The control method used for multiple Power$ync II™ compressor installations is the Network Mode. Connecting multiple machines to form a network, scheduling machines and sequencing machines are thoroughly covered in this section. In Network Mode, all compressors share information about their capacity, configuration and load setting.

Network Mode uses an adjustable pressure band for controlling the compressor response to changes in system demand. With the system at full load (all compressors operating at their maximum output) an increase in system pressure above the set pressure indicates a drop in demand. The control will respond by unloading the trim machine in the sequence.

Network Load Delay Time

In multiple machine network applications, control is passed from machine to machine based on the programmed sequence. In the sequence 'ABCD', the 'A' machine is the base machine and the 'D' machine starts with the pointer. If the system demand for air drops, the 'D' machine will pass the pointer to the 'C' machine. Further reductions in system demand may trigger the 'C' machine to pass the pointer to the 'B' machine. An increase in demand would cause the pointer to be passed back to 'C' and then back to 'D'.

When the demand is decreasing, the machine with the pointer passes that control to the next machine in the sequence when it has unloaded and the system pressure is still trying to climb. After a machine has transferred the pointer, it will completely unload, start its shutdown timer and turn itself off.

When the demand is increasing, the load delay time setting allows the controller to wait the programmed number of seconds before loading up, or starting the next machine down the list due to a pressure drop of short duration.

Pressure Settings

NOTE

The following explanation applies to single machine applications and to the base load machine in multiple machine applications. Trim machines, in multiple machine applications, will be held to their assigned pressure bands.

The load pressure is the maximum pressure at which the machine will operate at full capacity. As the demand for air drops, the pressure will rise to the unload pressure. At the unload pressure, all Power$ync II™ valves will open. At this point, the compressor will not be compressing air. The maximum load and unload pressures are determined by the available motor horsepower and the pressure ratings of various components in the compressor package. The technical data sheets for the individual compressor models show this maximum number.

The differential between the load pressure and the unload pressure cannot be set to less than 5 PSIG. At the maximum setting for both load and unload pressures, the differential will be 15 PSIG. At the minimum load setting (75 PSIG) and the maximum unload setting (125 PSIG, for example), the differential can be great.

To determine the proper pressure and differential settings, several factors must be considered. The first consideration is the actual pressure required in the plant air distribution system to maintain proper equipment performance. For maximum energy efficiency, do not maintain more pressure in the system than is required. Almost all systems have some leaks. More air will pass through a leak at a higher pressure than at a lower pressure. Many pneumatic tools and devices are rated to operate at a particular pressure. Operating them at a higher pressure increases the amount of air that they consume. Increasing the pressure by ten percent will increase the volume consumed by the system by a proportional amount without an associated increase in productivity. It is prudent, therefore, to maintain the lowest system pressure that provides efficient tool and device performance.

The second consideration is the storage capability of the distribution system. A distribution system with little or no storage capacity will operate better with a wider differential between load pressure and unload pressure. Systems that have more compressed air storage capacity (three gallons per cubic foot of compressor capacity or better) can improve compressor energy consumption by using a more narrow pressure differential. The benefit of having adequate storage capacity is a more consistent system pressure and smoother operation of equipment. The differential should be initially set at 15 PSIG. If the system pressure remains steady throughout a typical work cycle, the differential can be reduced to as low as 5 PSIG. If the system pressure fluctuates greatly at 15 PSIG, indicating little system storage capacity, the differential may need to be broadened.

The third consideration is the nature of air consumption within the system itself. A system that is subject to rapid, cyclic air consumption may require a wider differential than one that has a steady air requirement. As with the other considerations, improvements in energy efficiency can be obtained by adjusting the pressure settings to maintain the lowest acceptable steady pressure.

NOTE

Cycling more frequently than six times a minute may cause a high temperature condition that may result in a shutdown.

Power$ync II™ is factory set to operate efficiently for most compressed air systems. It has pressure limits based on its particular configuration. Use the factory setting for a while before making any changes. When making changes, document the change and the resulting system pressure and fluctuation. Documenting the changes and results will allow the compressor to be fine-tuned for a particular application.

Network Installation

Power$ync II™ compressors need to be wired together to form a network that will take advantage of the sophisticated multiple machine control capability built into the software. To do this, you will need the following:

1) A three-wire cable (Quincy part number 141234-01, -02 or -03 communications cable).
2) One cable terminator box (Quincy part number 140715).
3) Conduit is required for NEMA 4 applications and strongly recommended for all other applications.

The maximum total cable length from the terminator box, through each compressor in the network and to the last compressor in line must be less than 600'.

Connecting Cable to the Power$ync II™ Circuit Board

The first machine in the network will have one cable coming out of the Power$ync II™ control enclosure. All other machines on the network will have one cable in and one cable out. The outbound cable on the last machine will be connected to the terminator box which must have access to a 110-volt electrical outlet. No cable ends or crimping tools are required to complete the installation.

1) On the first machine in the network, open the Power$ync II™ control panel by removing the five screws on the face. Tilt the hinged face down to expose the circuit boards and power supply inside.

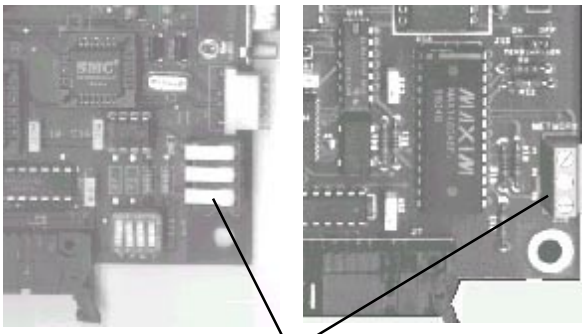
2) Remove one of the hole plugs on the back of the control enclosure. Insert the end of the communications cable and bring it to the far right, lower corner of the enclosure. Make certain that there are a few inches of extra length at this point.

3) Remove 1.5" of the outer insulating cover. Carefully retract the braided wire shielding to expose the bare ground wire and the foil cover for the two insulated wires.

4) Remove excess braided wire shielding, being careful not to damage the ground wire.

5) Remove the foil cover to expose the two internal wires and nylon filler. Trim off the nylon filler and strip 3/8" to 1/2" of insulation off the wires.

6) Locate the communications wiring terminal in the lower right corner of the main circuit board (marked J10). There are three small white levers on the wiring terminal. Open the top lever, marked “1” on the circuit board, by inserting a fingernail or small screwdriver under the left edge and lifting. Lift the lever until it is standing straight out. 1B boards have a screw terminal connector.



J10

1A BOARD **1B BOARD**

7) Insert the bare end of the white wire in the opening on the right side of the wiring terminal segment marked “1”. Holding the wire in place, push the number “1” lever back down to lock the wire into the terminal.

8) Repeat steps six and seven with the bare ground wire in the center, or number “2” terminal position.

9) Repeat steps six and seven with the blue wire in the lower, or number “3” terminal position.

10) Run the communications cable from the first compressor to the second compressor in the network.

11) Bring the cable into the control enclosure and strip the wires as previously outlined.

12) Bring another cable into the control enclosure and strip the wires as previously outlined. This second cable will be run to the next compressor in the network or, if this is the last compressor in a network, it will be run to the terminator box.

13) After the two cables have been stripped to expose 3/8" of bare wire, tightly twist the blue wire from each cable together. Next, twist the white wires together. Finally, twist the two bare wires together.

14) Install these wires into the wiring terminal of the second compressor as outlined in steps six and seven.

15) Run the cable that is not attached to the first compressor to the third compressor and repeat steps 11 through 14.

16) When the wiring is complete on the last compressor in the network, run the unattached end to the terminator box and plug the box into a 110 volt outlet.

Rocker Switch Settings

1A Boards - Immediately to the left of the lower right mounting bolt (just below the network wiring terminal) there is a four-segment rocker switch . The individual rockers are numbered from left to right, 4, 3, 2, and 1. These switches are in the ON position when the end of the rocker closest to the numbers is pressed down. All switches are set in the ON position at the factory.

The ON position is the correct position for all single machine applications. It is also the correct position for all machines installed at the end of a network. The end machine in a network is the one with only one cable attached to the wiring terminal. Machines with two cables attached, both cables going to other machines or one cable going to another machine and the other cable going to the terminator box, are considered middle machines.

On all middle machines switch number 4 must be set to the OFF position by rocking the switch so that the end away from the numbers is pressed down.

1B Boards - On 1B boards there is no dip switch to set. Only the termination jumper at J13 needs to be set. This should be in the ON position on the compressor at the end furthest from the network terminator power supply. This is the machine with only 1 cable entering. All other boards should have this jumper in the OFF position.

Network Voltage Tests on Power$ync II™ Systems

Voltage tests at J10 on the 140265-1QD board can be used to do a rough test on network connections.

The top connection should be approximately 2.5-2.9 volts when operation is normal. The lower connection should be about 1.9 volts. The voltage generally drops on the top connection if the terminator, the dip switch or the jumper are incorrect.

Always check the terminator power supply module to see if there is power present in its location and that the voltage output is present as listed on the nameplate.

NOTE

The power outlet for this terminator should be always powered, not tapped from the compressor supply. This is to keep the network properly terminated if one of the compressors is shut off for service.

The primary cause of network faults other than terminator settings, is the use of improper cable to connect the compressors. The wrong cable may work for short range connections, but will definitely not work over longer runs.

Network Setup

For applications that see very little demand change or applications that have demand changes that correspond to the full capacity of selected compressors, these compressors may be networked together.

There are nine positions available for machines in a network *(see Compressor Settings and Maintenance Displays, pages 45-58)*. The unload and load pressure settings function much the same way that the pressure switch settings would in a purely mechanical, multi-machine controller.

There are nine possible electronic pressure switches that can be used to determine compressor load and unload settings. When setting up a sequence, remember that the first machine ID in the sequence will be assigned to the number one pressure setting. The next machine ID to the right will be assigned to the number two pressure setting. A two machine example of this can be easily illustrated as follows:

1>115U 110L	2>113U 108L	3>000U 000L
4>000U 000L	5>000U 000L	6>000U 000L
7>000U 000L	8>000U 000L	9>000U 000L

UP/DOWN DEADBAND, F1 EDIT, ENTER RETURN

The number one position pressure has been set to unload at 115 PSIG and load at 110 PSIG. The number two position has been set to unload at 113 PSIG and load at 108 PSIG. In the sequence 'AB', the 'A' machine would run at the 110 to 115 PSIG setting and the 'B' machine would run at the 108 to 113 PSIG setting. If the sequence were changed to 'BA', the 'B' machine would run at the 110 to 115 PSIG setting and the 'A' machine would run at the 108 to 113 PSIG setting. In order to rotate machines through different pressure settings, sequence changes must be programmed.

⚠ WARNING

Do not set load pressures higher than the full load pressure rating of the compressor. Do not set unload pressures higher than the full load pressure rating of the compressor when compressors are set to run load/no load.

Start-up

The Power$ync II™ four-line, forty-character display provides information in English, should a problem occur. If the operating requirements were properly noted when the machine was ordered, it will be completely ready to run once installed. All settings have been adjusted at the factory per the instructions on the order. If the operating requirements have changed since the machine was ordered, the control can be easily adjusted for new parameters.

NOTE

The voltage unbalance between phases should not exceed ±5%. If this unbalance is not corrected, the current draw may be excessive.

Once the wiring between the disconnect and the compressor is complete, the discharge piping has been connected to the air system and the water source for water-cooled units is connected and turned on, close the disconnect to provide power to the control. The power-on indicator will light on the control panel and the computer will run a short diagnostic program to confirm that all software and hardware are functioning properly. Should a software or hardware problem be identified, the computer will display the nature of the problem. If the problem is minor, the computer will allow the compressor to operate after an operator confirms knowledge of the problem. If the problem is major, the computer will prevent the compressor from operating in Power$ync II™ Mode until the problem has been corrected. In most cases, even with a major fault in the computer control system, the compressor can still be operated in Back-up Mode until repairs can be made. A complete description of these diagnostic message displays can be found under the Power-up Displays heading of this section.

The diagnostic program also checks the function of the LCD display screen. If the controller cannot properly communicate with the display, it will flash all the amber warning lights to draw attention to this fact. If there is a fault with the LCD display's memory, then only the RED LED's will flash.

After the diagnostic program has determined that all systems are functional, the computer will display a message prompting the operator to either press ENTER to move into the menu section or press START to begin compressor operation.

⚠WARNING

Under no circumstances, should any welding be done on the compressor package. Welding can damage the computerized controller.

Power-up Displays

This section will identify minor fault conditions, major fault condition that will prevent the compressor from running in any mode of operation and major fault conditions that will prevent the compressor from running in the Power$ync II™ Mode, but will allow Back-up Mode operation.

When power is turned on to the unit, the computer will run a short diagnostic program to confirm that the machine is ready to operate. If the diagnostic check finds a problem with the computer or sensors, a message will be displayed describing the nature of the problem.

There are two categories of problems that can be detected, those which would result in unsafe operating conditions (the computer is programmed to prevent the compressor from running if this type of problem is detected) and those which should be corrected as soon as possible, but will not result in an unsafe operating condition. The computer is programmed to allow the compressor to operate with minor problems that do not affect the safe operation of the compressor after an operator acknowledges the problem by pressing ENTER.

⚠WARNING

Always disconnect and follow lockout/tag-out procedures before attempting any repair or adjustment to any electrical component on this compressor. Failure to do so could result in serious injury or death.

Detected problems that will prevent the Power$ync II™ controller from allowing the compressor to operate include:

NOTICE
STG 2 DISCH PRESSURE SENSOR HAS FAILED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

NOTICE
PACKAGE PRESSURE SENSOR HAS FAILED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

NOTICE
FLUID PRESSURE SENSOR HAS FAILED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

NOTICE
STG 1 DISCH PRESSURE SENSOR HAS FAILED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

NOTICE
PACKAGE DISCHARGE RTD SENSOR HAS FAILED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

NOTICE
STG 1 DISCH RTD SENSOR HAS FAILED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

NOTICE
STG 2 DISCH RTD SENSOR HAS FAILED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

NOTICE
STG 1 INPUT RTD SENSOR HAS FAILED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

NOTICE
STG 2 INPUT RTD SENSOR HAS FAILED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

These displays indicate that the computer did not get a valid signal from a sensor or transducer. There are two probable causes: a disconnected wire or a failed sensor or transducer. Disconnect the main power supply to the compressor and check the connection at the temperature probe and the controller. If a loose connection is found, correct the problem and repeat the start-up procedure. If all connections are tight, the problem is a failed sensor or transducer. If a spare part is available, replace and repeat the start-up process. If no spare part is available, contact a service representative. The compressor can be operated in Back-up Mode.

NOTICE
A MOTOR OVERLOAD IS TRIPPED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

This display indicates that either the main drive motor overload or the fan motor overload was found to be in the tripped position. The controller will also read a loose connection to the overload as a tripped overload. Disconnect the main power supply to the compressor, check all wiring on the overload for tightness and check the wiring at the controller. Correct the condition responsible for the tripped overload, reset the overload and repeat the start-up procedure. If the problem persists, contact your service representative.

NOTICE
RELAY BOARD COMMUNICATIONS FAILURE
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

This message will appear if the main computer cannot properly communicate with the relay board located in the main electrical enclosure box (below the Power$ync II™ control panel). Disconnect the main power supply to the compressor, check that all cables to and from the relay board are tight and then repeat the start-up procedure. If the problem persists, contact your service representative. The compressor can be operated in Back-up Mode.

MAJOR DIAGNOSTIC FAILURE
CORRECT PROBLEM NOW
PRESS → ENTER TO RERUN DIAGNOSTICS

If the computer is unable to complete its diagnostic check, it will display this message. Disconnect the main power supply to the compressor and check all electrical connection to all boards and sensors. Reapply power and press ENTER to rerun the diagnostic check. If the machine again displays this message, contact your service representative. The compressor can be operated in Back-up Mode.

NOTICE
U19 MEMORY FAILURE
CONTACT YOUR SERVICE REPRESENTATIVE

This display indicates that the setup memory cannot be accessed by the operating program. Probable causes are badly corrupted data or a mechanical failure of the memory chip. Contact your service representative for proper diagnosis and repair. The compressor can be operated in Back-up Mode.

One of the following three messages may be displayed if wiring to the starter is changed or if a remote starter is installed. These messages could indicate an error in the wiring which would cause the drive motor to start as soon as power is applied to the compressor or a failed component in the starting system. Power$ync II™ will alert the operator if it attempts to shut down the compressor and the compressor does not respond *(see Warning and Shutdown Displays)*. If power is disconnected, and then reapplied without having corrected the fault, one of the following displays will be visible:

NOTICE
A CONTROL RELAY IS NOT DISENGAGED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

This display indicates that the control relay that signals the starter to engage is not functioning properly. The cause may be a jammed or shorted START button or relay. Immediately disconnect the power to the compressor and determine the cause of the malfunction. If the cause cannot be determined and corrected, contact your local service representative. ***Do not attempt to operate the compressor in Back-up Mode.***

NOTICE
MAIN CONTACTOR IS NOT DISENGAGED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

NOTICE
WYE CONTACTOR IS NOT DISENGAGED
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

These messages indicate a starter that is not functioning properly or has been incorrectly wired into the system. If the compressor has a starter that was not provided by Quincy Compressor, this message may indicate that the starter has been incorrectly wired to the auxiliary contacts. Low supply voltage can cause starters to "chatter". The arcing associated with starter "chatter" can weld the contacts together (preventing the starter from disengaging) or cause catastrophic destruction of the starter. Immediately disconnect the power to the compressor and determine the cause of the malfunction. If the cause cannot be quickly and easily corrected, contact your service representative. ***Do not attempt to operate the compressor in Back-up Mode.***

Detected problems that will not result in an unsafe operating condition but should be corrected as soon as possible include:

NOTICE
DEADBAND DATA ERROR

PRESS F1 TO CLEAR

In Network Mode, an unload pressure setting and a reload pressure setting are required. If the controller cannot find pressure settings that are within a reasonable range during the diagnostic program, it will display this message. To correct the problem, go to Network Menu 1 and select SETUP NETWORK PRESSURES. Confirm the pressure ranges and press ENTER . The display will then change to NETWORK UNLOAD/LOAD PRESSURE SETUP. The current network unload pressure setting will be flashing. Use the UP and DOWN arrow keys (located to the right of the display window) to select the setting. Press F1 to change the setting and press ENTER to accept the settings. This warning is most likely to occur at initial start-up after a circuit board change, chip change, software upgrade or if the EEPROM chip on the circuit board fails (U19). Entering load and unload pressure settings will correct the problem unless the EE chip has failed.

NOTICE
U19 DATA CHECKSUM ERROR

PRESS F2 TO UPDATE

Power$ync II™ uses a checksum function to confirm the information in the setup memory. If the information in the memory has changed, the checksum number will not be the same. This message indicates that the diagnostic program has detected such a change. There are default values for this information that will allow the Power$ync II™ computer to operate the compressor if it cannot find the correct checksum number in the setup information. Operation using the default checksum may not be as efficient as operation would be with all correct configuration information entered. Press F2 to install the default checksum into the computer memory and all subsequent restarts will be completed using this default information. To achieve the highest level of efficiency, it is important that the Power$ync II™ computer have the correct configuration data. Your service representative can enter that data and initialize the system.

NOTICE
U19 DATA NOT INITIALIZED

PRESS F2 TO INITIALIZE

The Power$ync II™ computer is programmed with information concerning the configuration of the machine onto which it is installed. This information includes; motor horsepower, type of cooling, type of starting, pressure ranges, etc. Power$ync II™ needs this information to provide the most efficient operation. At start-up, the computer confirms that all this information is in its memory. It will display this message if it cannot find the information in memory. There are default values for this information that will allow the Power$ync II™ computer to operate the compressor if it cannot find the information. Operation using default values may not be as efficient as operation would be with all configuration information entered and initialized. Press F2 to install the default information into memory and all subsequent restarts will use the default information. To achieve the highest level of efficiency, it is important that the Power$ync II™ computer have the correct configuration data. Your service representative can enter that data and initialize the system.

NOTICE
AIR CLEANER VACUUM SWITCH FAULTY
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

Quincy Compressors use a vacuum switch to determine the restriction on the inlet air filter. Should the Power$ync II™ computer fail to receive a valid signal from this switch during the diagnostic check, it will display the above message. Since this will not result in unsafe operating conditions, the computer will allow the compressor to run after the acknowledgment by an operator. To continue the diagnostic program and start the machine, press ENTER. Because proper filtration is important to the service life of the compressor, correct the fault as soon as possible. If the element has been recently changed and does not appear to be clogged, a likely cause of these displays is a loose connection at either the switch or the controller.

NOTICE
FLUID FILTER DELTA-P SWITCH FAULTY
REFER TO YOUR SERVICE MANUAL OR
CONTACT YOUR SERVICE REPRESENTATIVE

The condition of the fluid filter is monitored by a differential pressure switch. This switch is designed to alert the user when the differential pressure across the filter element reaches a pressure indicating that the element needs to be changed. Should the Power$ync II™ computer fail to receive a valid signal from this switch during the diagnostic check, it will display the above message. Since this will not result in unsafe operating conditions, the computer will allow the compressor to run after the acknowledgment by an operator. To continue the diagnostic program and start the machine, press ENTER. Because proper filtration is important to the service life of the compressor, correct the fault as soon as possible. If the element has been recently changed and does not appear to be clogged, a likely cause of these displays is a loose connection at either the switch or the controller.

NOTICE
A FILTER NEEDS SERVICING
PLEASE REPLACE AS SOON AS POSSIBLE

When the differential pressure across the fluid filter or the air filter exceeds the recommended limits, the computer will light an LED indicator on the compressor schematic and display the above warning. The display will only stay on a brief period of time, but the LED will remain on until the indicated filter element hourmeter has been reset, indicating that the element has been changed. The computer will also log the event in the SHUTDOWN LOG which records the time, date and nature of the warning condition.

MINOR DIAGNOSTIC FAILURE
TO RUN COMPRESSOR → PRESS ENTER
YOU MUST CORRECT PROBLEM
AS SOON AS POSSIBLE

There are several areas that are checked during start-up that will alert the Power$ync II™ controller of potential problems with the diagnostic procedure. These potential problems will not create an unsafe operating condition, but should be corrected as soon as possible. Contact your service representative and arrange a service call to identify and correct the condition causing this message to appear. Press ENTER to allow the compressor to operate while service is being arranged.

NOTICE
THIS COMPRESSOR MACHINE ID
IS ALREADY IN USE
PRESS ENTER TO CONTINUE

If a new machine is added to an existing network and a valid machine ID was not programmed before the network was established, the default machine ID on the new compressor may already be in use by another compressor in the network. If this warning is displayed, go to NETWORK CONFIGURATION MENU 2 and select SET MACHINE ID. Select a machine ID not in use by another compressor in the network using the UP arrow key and press ENTER. The display will indicate that it is updating the other compressors on the network.

Start-up Displays

Once the diagnostic program has determined that the compressor is ready to begin operation, the following display will prompt the user to start the machine:

```
STG 1 OUT TEMP_____STG 2 IN TEMP_____
2 STAGE  VERSION 1.04
PRESS ENTER KEY TO SELECT MENU OR
PRESS START BUTTON TO START COMPRESSOR
```

Each compressor is shipped from the factory with the start-up configuration that was noted on the order. If this configuration is satisfactory, press START to begin compressor operation. Should a change in the configuration be required, or should you desire to check that the proper configuration has been entered into the controller, press ENTER. At this menu, press the button sequence F1-DOWN-UP-ENTER to lock out all adjustment menus. With the control locked, all operational displays will be functional but access to adjustment menus will be stopped. When pressing this sequence of buttons, a message will appear warning that you have pressed the wrong button.

```
NOTICE
THE KEYBOARD IS SECURED AGAINST
POSSIBLE UNINTENDED ALTERATIONS
SEE MANUAL TO UNLOCK THIS FUNCTION
```

This is aimed at discouraging people from finding the combination to the lock by accident. Pressing the same sequence again will unlock the adjustment displays and menus. The purpose of this lockout feature is to prevent unauthorized personnel from making changes to any setting on the compressor.

The UP or DOWN arrow keys will access the auxiliary pressure sensor displays:

```
ADDITIONAL SENSORS
STG 1 OUT P_____STG 2 OUT P_____
FLUID PRESSURE_____
UNITS: _____STG 2 OUT TEMP_____
```

This display is of the pressure readings for STAGE 1 OUT, STAGE 2 OUT and the FLUID PRESSURE. These pressures provide verification of the normal operation of the compressor.

Operational Displays

When START is pressed, one of three displays should appear, depending on the mode of operation selected. If, however, the compressor has been manually stopped and an immediate restart is attempted, one of the following messages may appear:

```
WARNING COMPRESSOR IS STARTING
COMPRESSOR WILL START WHEN THE STAGE 2
DISCHARGE PRESSURE IS UNDER 10 PSI
STAGE 2 DISCHARGE PRES _____
```

To avoid starting against a load, the Power$ync II™ controller monitors the pressure in the Stage 2 discharge pipe. It will not allow the compressor to start until the pressure has been relieved (down to 10 PSIG) through the blowdown valve. When the pressure reaches that level, the compressor will restart without further action.

A starting display confirms that the compressor is starting and has all valves open:

```
STG 1 OUT TEMP_____STG 2 IN TEMP_____
COMPRESSOR IS STARTING

HOURS_____STG  2 OUT TEMP_____
```

Power$ync II™ checks for the proper rotation of the compressor at start-up. If the compressor is rotating in the wrong direction, the controller will shut the machine down and display the following message:

```
NOTICE
COMPRESSOR HAS SHUT DOWN
**NOTICE** POSSIBLE REVERSE ROTATION
REFER TO YOUR SERVICE MANUAL
```

Power$ync II™ checks for reverse rotation by watching the pressure rise in the STAGE 2 discharge. It will shut the compressor down if the STAGE 2 discharge pressure does not reach 8 PSIG within fifteen seconds of the time that the start button is pushed. If this message is displayed, disconnect and lockout and tag-out the power supply to the compressor. Remove two of the three leads supplying power to the starter. Reverse their position and reinstall them. Restore power to the compressor and begin the start-up procedure again.

The normal operating displays are dependent on the mode of operation selected. These displays include:

```
STG 1 OUT TEMP_____STG 2 IN TEMP_____
COMPRESSOR IS RUNNING IN AUTO DUAL MODE
PRESS ENTER KEY TO SELECT MENU
HOURS_____STG 2 OUT TEMP_____
```

This display indicates that the compressor is running in the Auto Dual Mode and shows the total number of hours on the machine.

If the system air demand falls below a predetermined minimum, the compressor will unload and start a timer that will count down to shutdown. The following display indicates that condition:

```
STG 1 OUT TEMP_____STG  2 IN TEMP_____
COMPRESSOR IS UNLOADED
MINUTES LEFT TO SHUTDOWN → _____
HOURS_____STG. 2 OUT TEMP_____
```

The countdown display will alert operators that the compressor is detecting little or no system air demand and is operating in the unloaded mode. It also displays the total time left until the unit shuts down and goes into standby mode.

If there is no demand for a predetermined amount of time, the compressor will turn off the main drive (and fan) motor and wait until additional air is required. If additional air usage is detected, the machine will restart automatically. While the compressor is in Standby Mode, the following message will be displayed:

```
STG 1 OUT TEMP_____STG 2 IN TEMP_____
COMPRESSOR HAS TIMED OUT AND SHUT DOWN
**WARNING** WILL RESTART AUTOMATICALLY
WHEN LINE PRESSURE IS_____PSIG
```

If Continuous Run Mode has been selected, the following message will be displayed after the compressor is started:

```
STG 1 OUT TEMP_____STG 2 IN TEMP_____
RUNNING IN CONTINUOUS RUN MODE
PRESS ENTER KEY TO SELECT MENU
HOURS_____STG  2 OUT TEMP_____
```

Continuous Run Mode is the second primary operational Mode and is identical to Auto Dual Mode except the compressor will not turn itself off and go into Standby Mode. When the system demand falls below a preset minimum, the compressor will unload, but it will continue to run. The following display indicates an unloaded condition:

```
STG 1 OUT TEMP_____STG 2 IN TEMP_____
COMPRESSOR IS UNLOADED

HOURS_____STG  2 OUT TEMP_____
```

The last of the three primary operational mode displays indicates that the compressor has been setup to run with other Power$ync II™ machines in a network. This Network Mode allows several machines to work together to deliver the greatest number of CFM for the least amount of power input. The following display indicates that the compressor has been setup for this type of operation:

```
STG 1 OUT TEMP_____STG 2 IN TEMP_____
RUNNING IN NETWORK MODE POSITION___ OF___
PRESS ENTER KEY TO SELECT MENU
HOURS_____STG  2 OUT TEMP_____
```

Besides indicating that the machine is running in a network, this display also indicates the position in that network assigned to this particular unit. Units running in Network Mode will load, unload and shutdown similar to Auto Dual Mode.

The following display in the operational group indicates that SHUTDOWN has been pressed.

```
STG 1 OUT TEMP_____STG 2 IN TEMP_____
PROGRAMMED SHUTDOWN

HOURS_____STG  2 OUT TEMP_____
```

This display indicates that the compressor has been intentionally turned off and has not experienced an emergency shutdown. When SHUTDOWN is pressed, the controller will open the bypass valves to unload the compressor and then open the blowdown valve to vent the pressure in the system piping. When the pressure has been vented, the

controller will turn the machine off. If SHUTDOWN is pressed accidentally and the unit is in the process of shutting down but has not yet stopped, the programmed shutdown can be aborted by pressing SHUTDOWN again.

Compressor Settings and Maintenance Displays

The initial Start-up Display *(page 43)* offers the user the choice to press START (to begin compressor operation) or ENTER (to move to the compressor setup and maintenance menu). Once compressor operation begins, the operator will see one of the Operational Displays *(pages 43-44)*. If ENTER is pressed, the operator will be directed into a variety of setup and maintenance displays which allow changes to operating pressures, mode of operation, date and time, or to check and/or reset maintenance hourmeters. These setup and maintenance options can be accessed at any time during normal compressor operation by pressing ENTER when the controller has an Operational Display showing.

The Setup Menu portion of the Power$ync II™ control displays can be divided into several groups; Pressure Settings, Mode of Operation, Maintenance Hourmeters, Modem Communications, Clock and Control Testing.

IMPORTANT

a) If a situation occurs requiring a WARNING message to be displayed, that message will interrupt any active display.

b) ENTER will always accept the displayed data and either move forward to the next display or backward to the previous display, depending on the requirements of the display.

c) If the display does not make reference to ENTER, pressing ENTER will take the operator back to the previous display.

From the initial Start-up Display or any of the Operational Displays, pressing ENTER will call the first Setup Menu.

Mode and Pressure Displays

```
COMPRESSOR SETUP MENU
MODE AND PRESSURE MENU → PRESS F1
MAINTENANCE MENU → PRESS F2
PRESS ENTER TO RETURN
```

Press F1 to access the Mode and Pressure Menu to select Auto Dual, Continuous Run or Network Mode. Press F2 to move into the Maintenance Menu where hourmeters can be checked and set, time and date can be changed and Power$ync II™ valve operation can be checked. Press ENTER to return to the previous display.

F1allows the mode of operation to be selected or changed. For an explanation of the modes of operation refer to pages 32-33.

```
COMPRESSOR MODE OF OPERATION
AUTO DUAL TIMED STOP → PRESS F1
CONTINUOUS RUN → PRESS F2
NETWORK SCHEDULED ROTATION → PRESS F3
```

Press F1 to access the Auto Dual Configuration Menu. Press F2 to access theContinuous Run Configuration Menu. F3 accesses the Network Configuration Menu. Although it is not displayed in this menu, ENTER can be pressed to return to the previous Setup Menu. Pressing any F key will result in the compressor switching modes of operation as soon as ENTER is pressed.

```
AUTO DUAL CONFIGURATION
SET LOAD/UNLOAD PRESSURES → PRESS F1
SET SHUTDOWN TIMER → PRESS F2
```

The Auto Dual Configuration Menu allows the operator to set various operating parameters for a compressor running in this mode. The compressor comes from the factory with preset parameters based on the information provided on the order. These should only be changed if system conditions are different from those present at the time the order was placed.

The pressures at which the compressor is operating at full load and is unloaded are adjustable by pressing F1at the above configuration menu. The following message will be displayed:

```
UNLOAD/LOAD PRESSURE SETUP
COMPRESSOR UNLOAD PRESSURE → _____
COMPRESSOR LOADED PRESSURE → _____
PRESS ENTER TO ACCEPT VALUE
```

Read Pressure Settings (pages 34-35) before setting or modifying pressures. *When the Unload/ Load Pressure Setup Menu is displayed, the Compressor Unload Pressure setting will be flashing. Use the UP or DOWN arrow keys to change the setting. Once the desired setting is reached, press ENTER to accept. The Compressor Loaded Pressure setting will then begin to flash. Again, use the UP or DOWN arrow keys to change the setting. Press ENTER to accept the Loaded Pressure setting and return to the Auto Dual Configuration Menu .*

At the Auto Dual Configuration Menu Press F2 to adjust the delay time. This delay is the time between when a signal is sent to unload the compressor and when a signal is sent to shut the machine down.

```
AUTO DUAL TIMER SETUP
TIMED STOP DELAY IN MINUTES → _____

PRESS ENTER TO ACCEPT VALUE
```

Before changing this setting from the default setting, read Auto Dual Time Delay (page 33). *Use the UP or DOWN arrow key to change the time setting from the default 10 minutes. When the desired time is displayed, press ENTER to accept the data and return to the Auto Dual Configuration Menu.*

Press F2 at the Compressor Mode of Operation Menu to select the Continuous Run Configuration. Under this mode of operation, the compressor will load and unload as system demands are met, but will not time out and shutdown the main motor.

```
CONTINUOUS RUN CONFIGURATION
SET LOAD/UNLOAD PRESSURES → PRESS F1
**************************************
PRESS ENTER TO RETURN
```

Press F1 to change the load and unload pressures.

```
UNLOAD/LOAD PRESSURE SETUP
COMPRESSOR UNLOAD PRESSURE → _____
COMPRESSOR LOADED PRESSURE → _____
PRESS ENTER TO ACCEPT VALUE
```

Read Pressure Settings (pages 34-35) before setting or modifying pressures. *When the Unload/ Load Pressure Setup Menu is displayed, the Compressor Unload Pressure setting will be flashing. Use the UP or DOWN arrow keys to change the setting. Once the desired setting is reached, press ENTER to accept. The Compressor Loaded Pressure setting will then begin to flash. Again, use the UP or DOWN arrow keys to change the setting. Press ENTER to accept the Loaded Pressure setting and return to the Continuous Run Configuration Menu .*

Before making changes to the Network Configuration, read Multiple Machine Operational Mode (page 33).

Press F3 at the Compressor Mode of Operation Menu to access Network Configuration Menu 1. The following display will appear on the screen:

```
NETWORK CONFIGURATION MENU 1
SET SHUTDOWN TIMER → PRESS F1
SET MACHINE ID → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

There are five Network Configuration Menus in the Power$ync II™ system. These menus can be accessed by pressing the UP or DOWN arrow keys located to the right of the message display window. Menu 1 allows the operator to adjust the Machine ID and/or the Shutdown Timer setting. Press F1 at Network Configuration Menu 1 to access the Shutdown Timer Setup display.

```
AUTO DUAL TIMER SETUP
TIMED STOP DELAY IN MINUTES → _____
**************************************
PRESS ENTER TO ACCEPT VALUE
```

This is the time that the compressor will run in an unloaded state prior to shutting down. The compressor will then be in standby mode, and will restart when the system demand requires it.

```
********** MACHINE ID SETUP**********
MACHINE ID FOR THIS COMPRESSOR → ____
**************************************
PRESS ENTER TO ACCEPT VALUE
```

In order for compressors on a network to communicate properly, each machine must be assigned an individual identifier. Power$ync II™ uses letters, A through F, to identify individual compressors on the network. Each machine on the network must be assigned a different letter. Use the UP or DOWN arrow keys to scroll through the alphabet until the desired letter is reached. When the letter desired is reached, press ENTER to accept.

If the letter selected is currently being used by another compressor on the network, the following message will be displayed:

```
NOTICE
THIS COMPRESSOR MACHINE ID
IS ALREADY IN USE
PRESS ENTER TO CONTINUE
```

If this message is displayed, press ENTER to return to the Machine ID selection display so a new letter can be selected.

If the selected machine ID is not in use by another compressor on the network, pressing ENTER will be followed by this display:

```
PLEASE WAIT
NETWORK CONFIGURATION IN PROGRESS
```

This message will be briefly displayed as the controller communicates its ID and operational capabilities to the other compressors on the network. The display will then automatically return to the Network Configuration Menu 1.

Press the UP key at Network Configuration Menu 1 to move the controller to Network Configuration Menu 2. This menu is used to set sequences and schedules for multiple machine operation.

```
NETWORK CONFIGURATION MENU 2
SET SEQUENCE → PRESS F1
SET SCHEDULE → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

Press F1 to access the Network Sequence Setup display. A sequence is defined as the order in which compressors will respond to changes in system demand. Power$ync II™ allows the operator to set up to nine different sequences.

NOTE

Schedule and sequence information can be set from any machine on the network. The network, however, looks to the machine ID closest to 'A' for automatic updating of the network. This automatic updating occurs every 17 minutes. If schedule and sequence changes are being made from a machine other than the 'A' machine at the time that the network automatically updates, the new information may be erased and old schedule and sequence data used in its place. It is advisable to make all changes to the schedules and sequences from the 'A' machine. If that is not practical, ALWAYS review the changes made before transferring them to the other machines on the network and then reconfirm the changes after they have been transferred.

```
NETWORK SEQUENCE SETUP
SEQUENCE NUMBER TO CHANGE → ____

PRESS ENTER TO ACCEPT VALUE
```

Before setting or changing a sequence, read Network Setup (page 37). *Press the UP or DOWN arrow keys to change the sequence number selected. Press ENTER to select the sequence number indicated and move to the edit display. Having sequence changes planned and documented will aid in evaluating future changes and maximize power savings.*

When ENTER is pressed to accept a sequence number, the following edit display will appear:

```
SEQUENCE: _____ NETWORK DATA: ______
1 > A  2 > B  3 > C  4 > - 5 > - 6 > -

UP/DOWN POSITION, F1 EDIT, ENTER RETURN
```

This display will immediately indicate which sequence is ready to be edited. The machine ID letter in the first position will be flashing at a fast rate and the model designation of that machine will be displayed in NETWORK DATA:. There are six position numbers that can be used in a sequence. This corresponds to the maximum number of compressors that can be networked together. Press the UP key once to cause the machine ID letter in the first position to stop flashing and cause the machine ID letter in the second position to start flashing. All positions can be accessed to make changes or additions by using the UP or DOWN arrow keys. Press F1 to edit the desired position.

```
SEQUENCE: ______ NETWORK DATA: ______
1 > A  2 > B  3 > C  4 > -5 > -6 > -

UP/DOWN MACHINE ID, ENTER RETURN
```

When the position number of the machine to be changed is flashing at a fast rate, press F1 to change the rate at which the machine ID letter flashes to a slower rate. This indicates that changes can be made to that particular position number. Use the UP or DOWN arrow keys to select the machine ID. Once the proper machine ID has been selected, press ENTER to accept. The machine ID just selected will again flash at a rapid rate. This indicates that the control is ready to be moved to the next position number with the UP or DOWN arrow keys. This process is repeated until all positions are correct.

NOTE

When a compressor machine ID is already assigned to a sequence position, it cannot be assigned to another position without generating a fault warning message. If, for example, machine 'A' is assigned to position '4', you cannot assign machine 'A' to position '1' without first removing it from position '4'. When editing the machine ID for a particular position, the UP arrow key will scroll through the alphabet in ascending order. The DOWN arrow key will scroll in descending order. The alphabet contains a dash before the letter 'A'. The dash indicates that there is no compressor assigned to that position. In the above example, change position '4' to a dash before assigning machine 'A' to position '1'.

If an operator tries to assign the same machine ID letter to two positions, the following fault message will be displayed:

```
YOU HAVE USED THE SAME MACHINE TWICE
PLEASE PRESS ENTER TO CONTINUE EDIT
```

To change schedule information, press F2 at Network Configuration Menu 2. The first portion of the schedule that will be available to change is the day of the week.

```
NETWORK SCHEDULE SETUP
DAY TO CHANGE → MONDAY

PRESS ENTER TO ACCEPT VALUE
```

Use the UP or DOWN arrow keys to scroll to the proper day of the week for which a change is required. When the correct day is flashing in the display, press ENTER to accept the day and proceed to the schedule menu.

The following menu identifies the day of the week for which schedule changes are to be made and the sequence that is to be scheduled.

```
DAY : MONDAY        SEQ : ABCD
1 > 00:00 SQ:0 2 > 00:00 SQ:0 3 > 00:00 SQ:0
4 > 00:00 SQ:0 5 > 00:00 SQ:0 6 > 00:00 SQ:0
7 > 00:00 SQ:0 8 > 00:00 SQ:0 9 > 00:00 SQ:0
```

When this display is shown, the first time slot will be flashing at a fast rate. Use the UP or DOWN arrow keys to identify the time slot to edit. When the correct time slot is flashing, press F1. This will start the hours slot flashing at a slow rate, indicating that the controller is ready to accept a new number. Use the UP or DOWN arrow keys to change the hour number. When the hour number has been set, press ENTER to accept the number and start the minute number flashing. Follow the same procedure to set the minutes correctly as was done with the hours. Press ENTER to accept the number and move to the sequence number for editing.

```
DAY : MONDAY        SEQ : ____
1 > 00:00 SQ:0 2 > 00:00 SQ:0 3 > 00:00 SQ:0
4 > 00:00 SQ:0 5 > 00:00 SQ:0 6 > 00:00 SQ:0
7 > 00:00 SQ:0 8 > 00:00 SQ:0 9 > 00:00 SQ:0
```

Use the UP or DOWN arrow keys to scroll through the sequence numbers. As the numbers scroll, the actual compressor sequence will be displayed in the area to the right of SEQ:. When the desired sequence is displayed, press ENTER.

When ENTER is pressed, the edited time slot will once again begin to flash.

```
DAY : MONDAY        SEQ : ____
1 > 00:00 SQ:0 2 > 00:00 SQ:0 3 > 00:00 SQ:0
4 > 00:00 SQ:0 5 > 00:00 SQ:0 6 > 00:00 SQ:0
7 > 00:00 SQ:0 8 > 00:00 SQ:0 9 > 00:00 SQ:0
```

With the schedule just edited flashing again, follow the same procedure to change the next schedule if needed. If no other changes are required, press ENTER to return to Network Configuration Menu 3.

If an invalid time is entered during the scheduling procedure, the following message will be displayed:

```
YOU HAVE ENTERED AN INVALID TIME
PLEASE PRESS ENTER TO CONTINUE EDIT
```

Press ENTER to correct the invalid time.

If no other changes are required, press ENTER to return to Network Configuration Menu 2. Press the UP arrow key to move to Network Configuration Menu 3.

```
NETWORK CONFIGURATION MENU 3
TRANSFER NETWORK DATA → PRESS F1
SETUP NETWORK PRESSURES → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

Press F1 to transfer information to a new machine added to the network. Otherwise, network information is transferred to all machines on the network whenever these menus are exited.

If the network is powered-up, but not running, or if there are only two machines on the network, the following message may be too quick to be seen.

```
PLEASE WAIT
TRANSFERRING NETWORK DATA TO
ALL ON-LINE COMPRESSORS
```

Press F2 to edit the networked pressure deadbands:

```
1>000U  000L   2>000U  000L   3>000U  000L
4>000U  000L   5>000U  000L   6>000U  000L
UP/DOWN DEADBAND, F1 EDIT, ENTER RETURN
```

When this screen is displayed, the unload and load pressure settings will be flashing for position number one. To edit position number one, press F1. The unload pressure setting will start flashing slowly, indicating that this number is ready to edit. Use the UP and DOWN arrow keys to change the setting. Once the correct setting has been specified, press ENTER to accept. The load pressure setting will now begin to flash slowly. Follow the same procedure to change the load pressure setting. When the unload and load pressure settings have been accepted, the control will flash both settings, indicating that you can now move to another position setting. To move to the second position, use the UP arrow key. Following the same procedure, adjust the unload and load pressures for all machines on the network. Press ENTER to transfer this data to all on-line compressors and return to Network Configuration Menu 3.

Press the UP arrow key to move to Network Configuration Menu 4. From this display, sequences and schedules can be cleared from all on-line networked compressors at one time, from one machine.

```
NETWORK CONFIGURATION MENU 4
CLEAR SEQUENCE → PRESS F1
CLEAR SEQUENCE AND SCHEDULE → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

To clear a particular sequence from the memory, press F1.

When F1 is pressed, the following display will appear:

```
NETWORK SEQUENCE ERASE
SEQUENCE NUMBER TO CLEAR → 1

PRESS ENTER TO ACCEPT VALUE
```

Use the UP or DOWN arrow keys to scroll to the proper sequence number to clear. Once the proper sequence number is displayed, press ENTER.

The control will display a warning message to prevent the accidental erasure of a particular sequence. This warning message gives the option of continuing the process of erasing a sequence or aborting the process.

```
NOTICE
YOU HAVE SELECTED SEQUENCE  1  TO CLEAR
NOTICE
PRESS F1 TO CLEAR OR ENTER TO ABORT
```

Press either F1 or ENTER to complete the process and return the display to Network Configuration Menu 4.

To clear all sequence and schedule information from all compressors on the network, press F2.

```
NOTICE
YOU WILL CLEAR ALL SEQUENCE AND SCHEDULE
NOTICE
PRESS F1 TO CLEAR OR ENTER TO ABORT
```

Press either key to complete the process and return to Network Configuration Menu 4.

From Network Configuration Menu 4, press the UP arrow key to move to Network Configuration Menu 5.

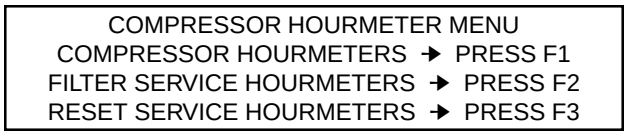
```
NETWORK CONFIGURATION MENU 5
POINTER PASSING DELAY TIME (SECONDS)  ___

ENTER ACCEPTS VALUE / EXITS MENU
```

Press the UP or DOWN key to increase or decrease this value. Press ENTER to return to the previous display.

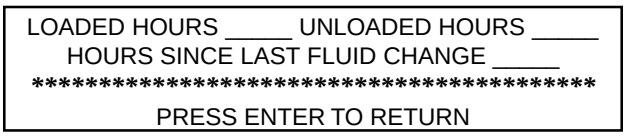
Press F2 at the Compressor Setup Menu to access the Maintenance Menus. There are four main Compressor Maintenance Menus that allow the operator to check or reset maintenance hourmeters, time and date, view diagnostics, and set modem baud rate. The operator can also access the compressor configuration information. Once in the Compressor Maintenance Menu, use the UP and DOWN arrow keys to move between menus. Compressor Maintenance Menu 1 contains maintenance hourmeters and time and date information.

To access maintenance hourmeters, press F1. To move to another maintenance menu, press the UP arrow key.

The Compressor Hourmeter Menu allows access to compressor hourmeters that include loaded hours, unloaded hours, lubricant hours, line filter hours, intake filter hours, and lubricant filter hours. It also allows these hourmeters to be reset when maintenance is performed.

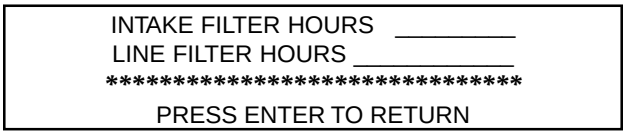


Press F1 to access loaded and unloaded, lubricant and line filter hourmeters. Press ENTER to return to the previous display.



This display shows the number of hours that the compressor has been running at some load level and the number of hours that the compressor has been running unloaded. Logging these hourmeter readings will help determine if changes to sequence or schedule routines should be made in network applications. Logging fluid hours and comparing them to the results of the fluid analysis will allow the advance scheduling of fluid changes. Comparing fluid hours to analysis reports and temperature logs will also aid in diagnosing ambient conditions which might be shortening fluid life. Press ENTER to return to the hourmeter menu.

Press F2 at the Compressor Hourmeter Menu to access the filter hourmeters.



Inlet filter, and fluid filter hours can be logged to help anticipate preventative maintenance. Line filter hours refers to the control line filter that assures clean air to the pneumatic controls on the compressor package. This hourmeter is a reminder that, although there is no element to change and the filter automatically drains, its operation should be checked periodically. An improperly operating control line filter will affect the proper operation of the compressor controls. Press ENTER to return to the Compressor Hourmeter Menu.

Press F3 at the Compressor Hourmeter Menu to access three additional menus used to reset maintenance hourmeters after service has been performed. To scroll through these three reset menus, use the UP and DOWN arrow keys.

RESET HOURMETER MENU 1
RESET FLUID FILTER HOURS → PRESS F1
RESET FLUID HOURS → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU

Press F1 to reset the fluid filter hourmeter after replacement.

A confirmation message will be displayed before the hourmeter is actually reset.

PRESS F1 TO RESET FLUID FILTER HOURS

PRESS ENTER TO RETURN

If this is the correct hourmeter to reset, press F1 again. If this is not the hourmeter that needs to be reset, press ENTER to return to the previous menu.

After pressing F1, another message confirms that the hourmeter has been reset.

FLUID FILTER HOURS RESET TO 0

PRESS ENTER TO RETURN

Press ENTER to return to the Reset Hourmeter Menu 1.

From the Reset Hourmeter Menu 1, press F2 to reset the fluid hourmeter. A confirmation message will be displayed before the hourmeter is actually reset.

PRESS F1 TO RESET FLUID HOURS

PRESS ENTER TO RETURN

If this is the correct hourmeter to reset, press F1 again. If this is not the hourmeter that needs to be reset, press ENTER to return to the previous menu.

FLUID HOURS RESET TO 0

PRESS ENTER TO RETURN

Press ENTER to return to the Reset Hourmeter Menu 1.

RESET HOURMETER MENU 2
RESET LINE FILTER HOURS → PRESS F1
RESET INTAKE FILTER HOURS → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU

From the Reset Hourmeter Menu 2, press F1 to reset the line filter hourmeter. A confirmation message will be displayed before the hourmeter is actually reset.

From the Reset Hourmeter Menu 2, press F2 to reset the inlet air filter hourmeter.

PRESS F1 TO RESET AIR FILTER HOURS

PRESS ENTER TO RETURN

If this is the correct hourmeter to reset, press F1 again. If this is not the hourmeter that needs to be reset, press ENTER to return to the previous menu.

AIR FILTER HOURS RESET TO 0

PRESS ENTER TO RETURN

Press ENTER to return to the Reset Hourmeter Menu 2.

COMPRESSOR MAINTENANCE MENU 1
MAINTENANCE HOURMETERS → PRESS F1
TIME AND DATE → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU

To view or set time, date, and day of the week, press F2. To scroll to another Maintenance Menu, use the UP and DOWN arrow keys. To return to the previous display, press ENTER.

Power$ync II™ uses military time (i.e., 8:00AM is 08:00 and 2:00PM is 14:00).

```
TIME MENU
TO VIEW CURRENT TIME → PRESS F1
TO SET TIME AND DATE → PRESS F2
PRESS ENTER TO RETURN
```

To view the current time and date without changing them, press F1.

```
TIME AND DATE MENU
CURRENT TIME ON THIS CONTROL 00:00
CURRENT DATE ON THIS CONTROL 00/00/00
PRESS ENTER TO RETURN
```

Press ENTER to return the display to the Time Menu.

To reset the time and date, press F2 at the Time Menu. Because changing the time or date can disrupt schedule information, the control will display the following warning:

```
NOTICE
YOU ARE ABOUT TO RESET THE CLOCK
TO CHANGE THE TIME AND DATE → PRESS F3
TO ABORT PRESS ENTER
```

Press F3 to move the display to the Set Time Menu.

```
SET TIME MENU
CURRENT TIME → 00:00

PRESS ENTER TO ACCEPT VALUE
```

When this menu is displayed, the hours number will be flashing. Use the UP or DOWN arrow key to change the hour setting. When the hour setting is correct, press ENTER, the minute setting will now be flashing. Follow the above procedure to change the minute setting and press ENTER to accept the change. The control will briefly display a message that it is transferring the new time setting to all on-line compressors. There is no need to reset each compressor in a network. The control will automatically synchronize the network clocks.

The control will now move to the Set Date Menu.

```
SET DATE MENU
CURRENT DATE → 00/00/00

PRESS ENTER TO ACCEPT VALUE
```

Follow the same procedure used to change the time. When the correct date has been entered or confirmed, the display will ask for the day of the week.

```
SET DAY MENU
CURRENT DAY → MONDAY

PRESS ENTER TO ACCEPT VALUE
```

The current setting for the day of the week will be flashing. If it is incorrect, use the UP or DOWN arrow key until the correct day of the week is shown. Then press ENTER to accept. The display will indicate that the control is transferring the updated date and day information to the other compressors on the network.

From Compressor Maintenance Menu 1, press the UP arrow key to move the display to Compressor Maintenance Menu 2. This menu allows the operator to test the lift valve system or to check various control settings.

```
COMPRESSOR MAINTENANCE MENU 2
COMPRESSOR CONTROL TEST → PRESS F1
COMPRESSOR INFORMATION → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

To test the operation of the Power$ync II® valves, press F1. To move to another maintenance menu, use the UP or DOWN arrow keys.

The Control Test menu will be available only when the compressor is in a stopped state to allow testing of the electrical and valve controls.

```
COMPRESSOR CONTROL TEST MENU 1
**********************************
UNLOAD VALVE TEST → PRESS F1
**********************************
```

Press F1 again to proceed with the test, or press ENTER to return to Compressor Maintenance Menu 2. If the compressor is running, pressing F1 will have no effect.

```
UNLOADING VALVE TEST
STAGE 1 VALVE
PRESS F1 TO OPEN      PRESS F2 TO CLOSE
PRESS ENTER FOR NEXT
```

Press F1 to open STAGE 1 lift valve. Press F2 to close STAGE 1 lift valve. Be sure to close STAGE 1 lift valve before proceeding. Press ENTER to go to the next test menu.

```
UNLOADING VALVE TEST
STAGE 2 VALVE
PRESS F1 TO OPEN      PRESS F2 TO CLOSE
PRESS ENTER TO RETURN
```

Press F1 to open STAGE 2 lift valve. Press F2 to close STAGE 2 lift valve. Be sure to close STAGE 2 lift valve before proceeding. Press ENTER to return to Compressor Maintenance Menu 2.

Press F2 at Compressor Maintenance Menu 2 to display the following compressor information menus:

```
SERIAL NUM: _______   VER: ___.___
MODEL: _____________  HORSEPOWER: _______
VOLTAGE: ___________  STARTER: _____________
COOLING: ___________  UNITS: _____________
```

This display shows the serial number of the compressor, the software version running, the model number, drive motor horsepower, drive motor voltage, type of starter, type of cooling and type of units that temperature and pressure are displayed in. Use the UP arrow key to move to the next display. Press ENTER to return to Compressor Maintenance Menu 2.

```
HAT (2) TEMP:_______  INTER. PRESS: _________
MAX UNLOAD: _______   MIN LOAD: _____________
LOAD PRESS:_______    UNLOAD PRESS: _______
FLUID PRESS: _______  MACHINE ID: ___________
```

This display shows the HAT shutdown STAGE 2 setting, interstage shutdown pressure setting, maximum unloaded pressure setting, minimum full load pressure setting, current load pressure setting, current unload pressure setting, fluid pressure setting and machine ID. Use the UP arrow key to move to the next display. Press ENTER to return to Compressor Maintenance Menu 2.

```
OPERATING MODE: _____________________________
AUTO DUAL TIME: ____  WYE DELTA TIME: ____
HAT STG. 1 DISCH _______  STG. 2 IN _________
HAT PACKAGE DISCH CAPACITY _____________
```

This display shows the current operating mode (Continuous Run, Auto Dual or Network), timer setting in minutes for turning off the unit after it has unloaded, timer setting in seconds for switching from wye to delta (if a wye-delta starter has been provided), STAGE 1 temperature shutdown, STAGE 2 inlet temperature shutdown, package temperature shutdown, and rated capacity in CFM. Use the UP arrow key to move to the next display. Press ENTER to return to Compressor Maintenance Menu 2.

```
**LOAD/UNLOAD CYCLES: _____TOTAL
**CYCLES/MINUTE:_____**********
LOADED TIME:_____(SECS)**********
UNLOADED TIME:       **********
```

The LOAD/UNLOAD CYCLES is a total count of the number of times this compressor has cycled while running in Power$ync II™ Mode. This can be useful to determine if the blowdown solenoid valve needs to be serviced or replaced. The CYCLES/MINUTE displays the number of cycles that have occurred in the last minute. This number is updated every minute as long as the compressor is running. LOADED TIME and UNLOADED TIME display, in seconds, how long the compressor was loaded and unloaded in the last cycle. Tests have shown that short cycles can cause overheating of the compressor. To ensure that short cycling will not cause overheating of the

compressor, make sure the load time seconds never go below 15 and unload time seconds are always more than 2. This can be accomplished by sizing air storage correctly for your system demand needs. Use the UP arrow key to move to the next display. Press ENTER to return to Compressor Maintenance Menu 2.

P CALIBRATION DATE:		09/27/00
T CALIBRATION DATE:		09/27/00
UNIT CONFIGURATION DATE:		09/27/00
CURRENT TIME/DATE	00:00	09/27/00

The P CALIBRATION DATE is the date that the pressure transducers were calibrated. The T CALIBRATION DATE is the date that the temperature sensors were calibrated. These dates should be within one or two months of the unit configuration date. If not, it is possible that the sensors have been recalibrated since the machine left the factory, which may affect the safe operation and warranty of the compressor. Contact your local Quincy service representative to assure that the compressor is operating properly. Use the UP arrow key to move to the next display. Press ENTER to return to Compressor Maintenance Menu 2.

From Compressor Maintenance Menu 2 press the UP arrow key to access Compressor Maintenance Menu 3. This menu allows the user to set the modem baud rate, if the Modem Communications Package has been installed.

COMPRESSOR MAINTENANCE MENU 3
SET MODEM BAUD RATE → PRESS F1
COMPRESSOR DIAGNOSTIC MENU → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU

Press F1 to set the modem baud rate.

Changes to the modem baud rate setting should only be made if the standard modem that is part of the Modem Communications Package option is being replaced with a different model. The correct baud rate for the factory modem is 2400. Changing the baud rate from the factory setting may adversely affect communications.

MODEM BAUD RATE SETUP
SET BAUD RATE → _____

PRESS ENTER TO RETURN

Use the UP or DOWN arrow keys to adjust the baud rate to the desired specification. 2400 Baud is the recommended setting. Press ENTER to accept and return to Compressor Maintenance Menu 3.

Press F2 at Compressor Maintenance Menu 3 to view the Compressor Diagnostic Menu:

COMPRESSOR DIAGNOSTIC MENU
VIEW SHUTDOWN LOG → PRESS F1
NETWORK DIAGNOSTIC → PRESS F2
TRANSDUCER PARAMETER CHECK → PRESS F3

Press F1 to view the shutdown log.

ENTRY: 01 TIME: 20:16 DATE: 09/27/00
SHUTDOWN CODE: CONTACTOR FAULTY
USE UP/DOWN KEYS TO VIEW OTHER ENTRIES
PRESS ENTER TO RETURN

This display shows shutdown and service alarms beginning with the most recent event. It indicates the entry number, time of the entry, date of the entry and nature of the shutdown or service alarm. Use the UP or DOWN arrow keys to view other entries. The log will hold the 16 most recent alarm conditions. As new alarm conditions occur, the computer will drop the oldest and add the newest. A new machine may have entries in the log resulting from the assembly testing stages.

Press F2 at the Compressor Diagnostic Menu to check the operating status of the network:

```
NETWORK DIAGNOSTIC MENU 1
TALKING TO OTHERS: YES     ERRORS: 0000
NETWORK AVERAGE PRESSURE:  110
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

The network diagnostic menus have been designed to aid in troubleshooting network problems that may occur. These menus can be accessed before starting the compressors to ensure that good communications have been established between all compressors on the network. If a problem should occur after the compressors are operating, their operating mode can be changed to Auto Dual (to operate independently and maintain system pressure) and the network diagnostics will continue to function as long as the machines are wired together.

TALKING TO OTHERS will show YES or NO. This can be used to determine whether or not a communications problem exists between machines. NO will occur when the signal requesting information from compressors on the network is lost or scrambled. This might happen occasionally in noisy environments. The control has been designed to recover from these occasional problems. If only one compressor is powered up, this indication has no meaning. When Network Diagnostic Menu 1 is entered, a snapshot of the current communications is taken to determine if this value is YES or NO and it will not change the value until you press ENTER to exit this menu. The most likely cause of a communication problem is a poor cable or poor cable connections. The next most likely cause is an incorrect setting on the number 4 rocker of the S1 switch on the lower right corner of the main circuit board (1A versions, 1B versions have a jumper). The last possible source of this problem is an incorrectly wired terminator box, or a terminator that is not plugged into a 115 volt outlet.

ERRORS is the number of various errors detected from other machines in the network. Each time information is sent out on the network, the control looks for an acknowledgement signal that the information was received. The ERRORS number indicates the number of times that no acknowledgment was received. This number should be zero, or very small. If the number is increasing, there is a problem in the network.

The network controls the operation of machines by comparing the average pressure reading to the pressure band assigned to that compressor. Individual machines have pressures different from other compressors on the network. The NETWORK AVERAGE PRESSURE display shows the actual average pressure.

Press the UP arrow key at Network Diagnostic Menu 1 to display to Network Diagnostic Menu 2.

```
NETWORK DIAGNOSTIC MENU 2
SCHEDULED SEQUENCE: ABCDEF
OPERATING SEQUENCE:_______
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

This menu shows the sequence that is scheduled to be operating at that particular time and the sequence that is actually operating. These two should be identical. If they are not, the network needs to be resynchronized. This may occur if a machine has been out of the network when network sequence and schedule changes were made or if a new machine is added to the network.

Press the UP arrow key at Network Diagnostic Menu 2 to move to Network Diagnostic Menu 3.

```
NETWORK DIAGNOSTIC MENU 3
TO RESYNCHRONIZE THIS MACHINE
ON THE NETWORK → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

Any time a machine has been powered down, it will automatically resynchronize with the other machines on the network as soon as power is reapplied. If, however, there has been a communication (cable) problem that was corrected without powering down any of the machines on the network, it is possible that the network communications chip lost its synchronization with the other networked machines. Press F2 to resynchronize the communications between machines without having to power down the control.

Press the UP arrow key at Network Diagnostic Menu 3 to display the network diagnostic screen:

```
A:T5L09    B:T4L09    C:TOL00    D:T4L05
E:TOL00    F:TOL00

NETWORK CONNECTION DATA CONFIDENCE
```

This display gives an overall view of network operations. The letter to the left of the colon is the machine ID. To the right of the colon is the letter T followed by a number and the letter L followed by a number. The T number reflects the condition of the countdown timer. If valid communication between machines is not maintained, this timer will begin to count down from 5. As soon as communications can be confirmed, the counter is reset. The control is designed to deal with a certain degree of miscommunication. A well connected and communicating network will show the numbers 4 or 5 after the T. If the T number is 3 or less, communication to that particular compressor is not satisfactory. To the right of the timer number is the list state number. A number from 00 to 09 indicates the operating state of the compressor. Any other number should be disregarded. Other numbers may be displayed when another machine on the network is being started. The different operating states indicated by these numbers are:
00 - Trim control for the network has passed to the left. This will usually indicate a machine that is in the process of timing out and shutting down, is already shut down or is not scheduled to be operating.
01 - Trim control for the network has passed to the left.
02 - Trim control for the network is currently being passed to the left.
03 - 07 - Trim control for the network is at this machine.
08 - Trim control for the network is currently being passed to the right.
09 - Trim control for the network has passed to the right.

The example shown indicates that the 'A' machine is running fully loaded and has passed trim control to the right in the sequence, the 'B' machine is running fully loaded and has also passed trim control to the right in the sequence and the 'D' machine has trim control. The 'C' machine is either not in the scheduled sequence or the power to that machine has been turned off. The T numbers, 4 and 5, show that the network is communicating well with the three operating machines. This display also shows that there is no communication with any of the other possible network nodes.

```
NETWORK DIAGNOSTIC MENU 5
NETWORK LOAD DELAY TIME _____ XX
(SECONDS)
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

This menu shows the time, in seconds, that the compressor will delay in passing the pointer downward. This is to allow pressure fluctuations time to level out, if there is a drop in pressure.

Press ENTER to return to the Compressor Diagnostic Menu.

Press F3 to enter the Transducer Parameter Check Menu. This menu allows diagnostics of possible faults in the pressure and temperature transducers by providing an indication of their operating condition.

```
**PACKAGE DISCH PRESSURE TRANSDUCER**
A/D CONVERTER READING_____ OFFSET_____
COMPUTED PRESSURE READING_____
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

A/D CONVERTER READING shows the voltages present at the input on the A/D converter on the board. The pressure transducers provide a voltage input which are measured at the input connectors (second pin from top at each connector). These voltages should match reasonably closely. The offset shows how far the voltage is OFF from the ideal value. The computed reading shows the value that the electronic control will display. It will show decimal values and negative values, if present. This is valuable in verifying that a zero pressure reading is correct.

Press the UP key to advance to the next menus (shown below) or ENTER to exit.

```
**STAGE 1 DISCH. PRESSURE TRANSDUCER**
A/D CONVERTER READING_____ OFFSET_____
     COMPUTED PRESSURE READING_____
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

```
**STAGE 2 DISCH. PRESSURE TRANSDUCER**
A/D CONVERTER READING_____ OFFSET_____
     COMPUTED PRESSURE READING_____
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

```
**FLUID PRESSURE TRANSDUCER**
A/D CONVERTER READING_____ OFFSET_____
     COMPUTED PRESSURE READING_____
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

The following menus show temperature probe information. These readings are more difficult to utilize, as the RTD probes are resistance devices, whose signals are processed before input to the A/D converter. Of more interest will be the OFFSET values. If these values are off by a large amount or show a variance in one RTD, a potential fault could be indicated.

```
**PACKAGE DISCH. RTD TRANSDUCER **
A/D CONVERTER READING_____ OFFSET_____
     COMPUTED PRESSURE READING_____
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

```
**STAGE 1 DISCH. RTD TRANSDUCER**
A/D CONVERTER READING_____ OFFSET_____
     COMPUTED PRESSURE READING_____
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

```
**STAGE 2 INPUT RTD TRANSDUCER**
A/D CONVERTER READING_____ OFFSET_____
     COMPUTED PRESSURE READING_____
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

```
**STAGE 2 DISCH. RTD TRANSDUCER**
A/D CONVERTER READING_____ OFFSET_____
     COMPUTED PRESSURE READING_____
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

Press ENTER to return to the Compressor Diagnostic Menu.

Press ENTER to return to Compressor Maintenance Menu 3, and press the UP key to advance to Compressor Maintenance Menu 4.

```
**COMPRESSOR MAINTENANCE MENU 4**
EDIT MODEM INIT SEQUENCE → PRESS F1
CLEAR MUFFLER FLAGS → PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

Press F1 to enter the MODEM INIT SEQUENCE editor. This menu should not require any adjusting, as it has been configured at the factory for the modem being used.

```
**MODEM INITIALIZATION**
INIT:
ATE0&D2S0=1&E3&RD1&C4#F0$R1&E12$E14&E1
* F1 TO EDIT/ENTER TO ACCEPT VALUE
```

Press ENTER to exit this menu.

From Compressor Maintenance Menu 4, press F2 to enter the muffler flag menu.

```
CLEAR WARNINGS ON MUFFLER BACK PRESSURE
RESET FLAG ON INTERSTAGE BLOWDOWN → F1
RESET FLAG ON STG. 2 BLOWDOWN → F2
**PRESS ENTER TO RETURN**
```

This menu is used to cancel the flag set by the detection of residual pressure during blowdown when the compressor unloads. The unloaded pressure in the piping should be below 5 psig during the unload period. If not, a flag will be set, and the HIGH DISCHARGE PRESSURE indicator will be blinking at 1 second intervals if the STAGE 2 blowdown fails to reach the 5 psig trip point. Likewise, the HIGH INTERSTAGE PRESSURE light will blink when the interstage does not reach the 5 psig point. ***If the setting is cleared while the indicator is lit, the indicator will remain lit.***

Press ENTER to return to the Maintenance Menus.

Cautionary and Shutdown Displays

The Power$ync II™ controller constantly monitors the operating conditions of the compressor. It has the most extensive monitoring and reporting capability of any compressor control on the market. LED indicators on a system schematic identify the location of the problem and the four-line, forty-character display explains the nature of the problem.

If an inlet air filter element or a fluid filter element has an excessive differential pressure, a light on the schematic will indicate which element is in need of service and a message will be briefly displayed that describes the nature of the fault. The display will then revert to the original operating display and the LED will remain illuminated to draw attention to the condition. In this instance, one of the following message will be displayed:

NOTICE
THE AIR FILTER NEEDS SERVICING
PLEASE REPLACE AS SOON AS POSSIBLE
CONTACT YOUR SERVICE REPRESENTATIVE

NOTICE
THE FLUID FILTER NEEDS SERVICING
PLEASE REPLACE AS SOON AS POSSIBLE
CONTACT YOUR SERVICE REPRESENTATIVE

These maintenance warnings will not cause the compressor to shutdown. Proper filtration is key to the long service life of this compressor, however, and the dirty element should be changed as soon as possible. The fluid filter does not contain a bypass valve that might allow unfiltered fluid to bypass the element. Be aware that continued operation with a prolonged high differential pressure warning indication may lead to a reduction in fluid flow to the gears and bearings. This reduction in flow may cause temperatures to rise, efficiencies to drop and reduced service life for the airend. Do not operate the compressor for extended periods of time with dirty and plugged filtration. Use only Genuine Quincy Compressor filter elements for replacement.

Conditions that would result in unsafe operation will cause the Power$ync II™ controller to shutdown the compressor or alert the operator to shut the unit down. The following messages will be displayed when the controller detects a problem that would result in an unsafe operating condition:

**********CAUTION**********
COMPRESSOR HAS SHUT DOWN
EMERGENCY STOP BUTTON WAS PRESSED

If a condition exists at the compressor or in the compressed air system that requires that the compressor be stopped immediately, the red, mushroom-shaped Emergency Stop button can be pushed and the starter will immediately disengage. The Emergency Stop button will remain depressed until it is physically released. When the Power$ync II™ controller detects that this button has been pressed, it displays the message above to alert others that the Emergency Stop button was pressed. Do not attempt to restart the compressor until it has been determined who pushed the button and why. To clear the message, press ENTER. To restart the compressor, reset the Emergency Stop button and press the green Start button. Refer to the trouble shooting section for other causes.

During the initial power-up diagnostic routine, the controller checks for correct data concerning the compressor setup parameters. As discussed earlier, the compressor will be prevented from running if there is an error in that data. While the compressor is operating, the controller continues to check the validity of that data. Should there be a problem with the setup data while the machine is operating, the following message will be displayed:

FLUID PRESSURE_____
COMPRESSOR HAS SHUT DOWN
NOTICE U19 MEMORY FAILURE
REFER TO YOUR SERVICE MANUAL

This condition will prevent the compressor from operating. Attempt to correct the situation by turning power off to the compressor and then reapplying power. This will begin the diagnostic program again. It may be possible to run the compressor on the default setup values, if the original setup data is not usable. Call your service representative if this does not correct the problem. Your service representative can determine whether correct setup information can be reentered into the controller or the memory board needs to be replaced. The compressor can be operated in Back-up Mode.

In the Network Mode, the controller continually checks for other errors. These include:

NOTICE
SEQUENCE DATA ERROR

PRESS F1 TO CLEAR

NOTICE
SCHEDULE DATA ERROR

PRESS F1 TO CLEAR

These two messages may appear if the back-up battery on the control board fails or is replaced. Press F1 to clear the display, then access the schedule and/or sequence menus and reenter that data. See Compressor Settings and Maintenance Displays for instruction on this procedure. Time and date will also have to be reset.

NOTICE
THIS COMPRESSOR MACHINE ID
IS ALREADY IN USE
PRESS ENTER TO CONTINUE

If the main memory board of the controller has to be replaced for some reason and the machine is on a network, the new board may have a default machine ID that conflicts with another machine on the network. Press ENTER to clear this screen and then reassign a new machine ID to this unit. See Compressor Settings and Maintenance Displays for instructions on this procedure.

If the controller detects temperatures above the acceptable operating range of the compressor, it will illuminate the appropriate LED on the schematic and display one of the following messages:

NOTICE!
****** COMPRESSOR HAS SHUT DOWN ******
NOTICE MOTOR OVERLOAD
TAKE CORRECTIVE ACTION

If there is a motor overload, the LED on the schematic will be illuminated and this message will be displayed.

A) On air-cooled units, this message will be displayed if either the main drive motor or the fan motor experiences an overload shutdown. Open the main electrical control enclosure to determine which overload has tripped.

B) On water-cooled units, this message will indicate a main motor overload or package vent fan motor overload.

The most common cause of a tripped overload is low voltage. If the overload trips while the unit is starting, it may indicate insufficient power available to the facility or incorrectly sized wiring to the compressor. Intermittent tripping may be the result of low voltage caused by variations in incoming power supplies or by other large horsepower motors starting on the same power supply. Intermittent voltage drops are difficult to detect without a recording voltmeter or a Dranitz meter. If it is determined that low voltage is not the cause of the tripped overload, contact your service representative.

If the controller signals the starter to engage and it does not receive confirmation that the starter contacts have closed, one of the following messages will be displayed depending on the type of starter:

NOTICE!
COMPRESSOR HAS SHUT DOWN
MAIN CONTACTOR AUX CONTACTS ARE OPEN
POSSIBLE FAILURE TO CLOSE

NOTICE!
COMPRESSOR WYE CONTACTOR
IS NOT CLOSING
REFER TO YOUR SERVICE MANUAL

NOTICE!
REMOTE STARTER
IS NOT ENGAGING
REFER TO YOUR SERVICE MANUAL

NOTICE!
COMPRESSOR WYE CONTACTOR
IS NOT OPENING
REFER TO YOUR SERVICE MANUAL

Determine the reason that the starter is not responding, correct the problem and repeat the start-up procedure. As with other faults, loose wiring should be the first item checked. If all wiring to and from the controller is tight and wiring to the starter is tight, a faulty starter may be the problem. If the starter is engaged, check wiring to the auxiliary contacts.

A potentially serious condition could exist if the main motor starter does not respond to the controller's signal to disengage. The cooling fan motor will not stop as long as the main motor is running so that cooling can be maintained in the event that the starter does not respond to a signal to perform a normal shutdown. If the starter does not respond to a signal to disengage in an emergency, an unsafe condition may result. The Power$ync II™ controller will flash all the LED safety and warning lights to draw attention to this situation, should it occur. It will also display one of the following messages, depending on the unit configuration:

NOTICE! ********* NOTICE!
COMPRESSOR MAIN CONTACTOR
IS NOT DISENGAGING
PULL MAIN DISCONNECT

NOTICE!
REMOTE STARTER
IS NOT DISENGAGING
PULL MAIN DISCONNECT

Pull the main disconnect to cut the power to the compressor. Determine the reason that the starter is not responding, correct the problem and repeat the start-up procedure. As with other faults, loose wiring should be the first item checked. If all wiring to and from the relay board is tight and wiring to the starter auxiliary contacts is tight, a faulty starter may be the problem. Determine the original cause for the shutdown. If the unit was being stopped because there was no air demand, it can be restarted after the starter problem is corrected. If the unit was being stopped due to a detected fault, correct the fault before continuing operation. ***Do not attempt to run the compressor in Back-up Mode until all faults have been corrected.***

In addition to the sensor check at power-up, the Power$ync II™ controller continually checks sensors for faults. If the controller receives a signal that is outside its expected range or fails to receive a signal, one of the following messages will be displayed depending on the sensor affected:

NOTICE!
COMPRESSOR HAS SHUT DOWN
DISCHARGE RTD FAULTY OR DISCONNECTED
REFER TO YOUR SERVICE MANUAL

NOTICE!
COMPRESSOR HAS SHUT DOWN
STG 2 OUT RTD FAULTY OR DISCONNECTED
REFER TO YOUR SERVICE MANUAL

NOTICE!
COMPRESSOR HAS SHUT DOWN
STG 2 IN RTD FAULTY OR DISCONNECTED
REFER TO YOUR SERVICE MANUAL

NOTICE!
COMPRESSOR HAS SHUT DOWN
STG 1 OUT RTD FAULTY OR DISCONNECTED
REFER TO YOUR SERVICE MANUAL

NOTICE!
COMPRESSOR HAS SHUT DOWN
PACKAGE PRESSURE SENSOR FAULTY
REFER TO YOUR SERVICE MANUAL

NOTICE!
COMPRESSOR HAS SHUT DOWN
STG 2 OUT PRESSURE SENSOR FAULTY
REFER TO YOUR SERVICE MANUAL

NOTICE!
COMPRESSOR HAS SHUT DOWN
FLUID PRESSURE SENSOR FAULTY
REFER TO YOUR SERVICE MANUAL

NOTICE!
COMPRESSOR HAS SHUT DOWN
STG 1 OUT PRESSURE SENSOR FAULTY
REFER TO YOUR SERVICE MANUAL

There are two probable causes for these displays: a disconnected wire or a failed sensor or transducer. Disconnect the main power supply to the compressor and check the connection at the temperature probe and at the controller. If a loose connection is found, correct the problem and repeat the start-up procedure. If all connections are tight, the problem is a failed sensor or transducer. If a spare part is available, replace and repeat the start-up process. If no spare part is available, contact a service representative. The compressor can be operated in Back-up Mode.

The Power$ync II™ controller also performs continuing checks on itself while the compressor is in operation. If it detects a fault, it will display one of the following two messages:

NOTICE!
COMPRESSOR HAS SHUT DOWN
NOTICE COMMUNICATION FAILURE
REFER TO YOUR SERVICE MANUAL

The Power$ync II™ controller continually checks its communication pathways between boards, even when no pertinent information is being passed. This is done to confirm that all communication pathways are functioning and ready to accept and process signals. If the controller fails to receive the proper response to its attempt to confirm that the communication pathways are functioning properly, it will try two more times and then shut the compressor down. Call your local service representative to correct this problem. The compressor can be operated in Back-up Mode.

PKG. DISCH TEMP_____
COMPRESSOR HAS SHUT DOWN
NOTICE HIGH DISCHARGE TEMPERATURE
TAKE CORRECTIVE ACTION

This display indicates that the controller has detected a high temperature condition at the temperature probe installed in the discharge line from the package to the plant air. This could be the result of a mechanical failure or it could be the result of low coolant flow. This is a serious condition. Do not attempt to restart the compressor until the cause of the shutdown has been determined and corrected. The compressor will not restart as long as the high temperature condition exists. Call your service representative if you cannot determine and correct the cause of the shutdown.

Power$ync II™ is connected to and monitors the state of the motor starter and overload. Should the controller detect a fault condition or detect that a component is not responding to commands, it will illuminate the appropriate LED on the schematic and display one of the following messages:

2 INLET TEMP _____
COMPRESSOR HAS SHUT DOWN
NOTICE! HIGH STAGE 2 INLET TEMP
TAKE CORRECTIVE ACTION

2 DISCH TEMP _____
COMPRESSOR HAS SHUT DOWN
NOTICE! HIGH STAGE 2 DISCH TEMP
TAKE CORRECTIVE ACTION

1 DISCH TEMP _____
COMPRESSOR HAS SHUT DOWN
NOTICE! HIGH STAGE 1 DISCH TEMP
TAKE CORRECTIVE ACTION

High temperature shutdowns could be caused by high ambient temperatures. Verify that the ambient temperature is within the operating limits of the compressor. A failed or broken vent fan could also cause high temperatures. For water-cooled units, the water temperature or flow might be outside the operating limits of the compressor or the cooler might need cleaning. For air-cooled units, the air flow might be blocked, the fan or fan motor may have failed, the thermal mixing valve may have failed or the cooler may need cleaning. High Stage 2 discharge temperature can be caused by a high delta-pressure across stage 2. This could be caused by a blowdown valve failure.

FLUID PRESSURE _____
COMPRESSOR HAS SHUT DOWN
NOTICE! LOW FLUID PRESSURE
TAKE CORRECTIVE ACTION

Low fluid pressure may be caused by a failed fluid pump or regulating valve.

NOTICE!
COMPRESSOR HAS SHUT DOWN
NOTICE! HIGH STAGE 2 DISCH PRESSURE
TAKE CORRECTIVE ACTION

High stage 2 discharge pressure could be caused by a clogged cooler or a failed discharge check valve.

NOTICE!
COMPRESSOR HAS SHUT DOWN
NOTICE! MOTOR OVERLOAD
TAKE CORRECTIVE ACTION

Motor overload can be caused by high ambient temperature, or operating the compressor above the designed limits of the compressor. This can happen if the discharge check valve is faulty.

CAUTION
COMPRESSOR HAS SHUT DOWN
NOTICE! POSSIBLE REVERSE ROTATION
TAKE CORRECTIVE ACTION

Possible reverse rotation is caused if stage 2 does not reach a minimum pressure shortly after the start button is pressed. This could also be caused by a faulty blowdown valve or a faulty package check valve.

CAUTION
STAGE 2 OF THE COMPRESSOR HAS EXCESSIVE PRESSURE DIFFERENTIALS CALL SERVICE
STG 1 OUT_____ STG 2 OUT _____ ENTER TO EXIT

Stage 2 with excessive pressure differentials is primarily caused by a failed blowdown valve.
The above displays indicate that the computer has found operating conditions outside the normal limits. For most of these displays, you only need to press ENTER to reset the control. If the pressure or temperature is still outside the limits, pressing ENTER will not reset the control. The corrective action for these messages is to find the cause of the indicated problem. Your service representative can provide the service needed to correct these problems.

FLUID PRESSURE _____
COMPRESSOR HAS SHUT DOWN
NOTICE FIRMWARE FAILURE
REFER TO YOUR SERVICE MANUAL

Failure of either of the two types of memory chips or a corruption of the software installed in those chips will display this message. If the problem is a failure of one of the chips, the main processor circuit board must be replaced. Contact your service representative to arrange this replacement. The compressor can be operated in Back-up Mode.

STG 1 OUT TEMP_____ STG 2 IN TEMP_____
COMPRESSOR HAS TIMED OUT AND SHUT DOWN
WILL NOT RESTART AUTOMATICALLY
COMPRESSOR NOT IN SCHEDULED SEQUENCE

When compressors are running in Network Mode, individual compressors can be scheduled out. If a particular compressor ID is left out of a sequence for a particular schedule, the network will consider that compressor out of service. This feature can be used to ensure that only certain machines run at certain times of the day. A network of three machines, ABC for example, can schedule a sequence, BC for example, that leaves one of the machines completely out. Machines that are not in the scheduled sequence will not be turned on during that schedule, regardless of system demand. If there is a possibility that the system demand might require all machines, do not leave any machines out of any sequences.

NOTICE!
THE STAGE 1 BLOWDOWN MUFFLER MAY BE BLOCKED PLEASE CHECK FOR OPERATION
COULD CAUSE OVER-PRESSURE SHUTDOWN!

NOTICE!
THE STAGE 2 BLOWDOWN MUFFLER MAY BE BLOCKED PLEASE CHECK FOR OPERATION
COULD CAUSE OVER-PRESSURE SHUTDOWN!

These two messages are warning indicators that the blowdown passages may be blocked or degrading. These will trip if the pressure during blowdown fails to reach 5 psig during an unloaded condition. This is an important message to see; the LED indicator for STAGE 2 DISCHARGE PRESSURE or HIGH INTERSTAGE PRESSURE will blink when this condition is detected. If this is allowed to continue, degradation of the compressor is likely.

Shutdown Log Messages

The shutdown log allows the operator to view service and shutdown alarms in the reverse order of occurrence. The log gives a plain English message that will identify the source of the alarm. These messages include:

EMERGENCY STOP PRESSED

This message will appear when the red, mushroom-shaped emergency stop button has been pressed. The nature of the emergency should be determined and corrected before attempting to restart the compressor. The emergency stop button will lock in when pressed and must be turned to release. Once the button is released, the compressor can be restarted by pressing the green start button.

NOTE

The HAT snapdisk probes or the coolant flow switch will give the same error mesage.

DISCHARGE HAT SHUTDOWN

This indicates that a high temperature condition was detected. There are temperature probes in the package discharge. A high air temperature condition was detected above the set trip point. The cause of the high temperature condition MUST be determined and corrected before the compressor is restarted.

STAGE 2 IN HAT SHUTDOWN

This indicates that a high temperature condition was detected. The temperature probe at the input to STAGE 2 detected temperature above the set trip point. The cause of the high temperature condition MUST be determined and corrected before the compressor is restarted.

STAGE 1 DISCHARGE HAT SHUTDOWN

This indicates that a high temperature condition was detected. The temperature probe at the output of STAGE 1 detected temperature above the set trip point. A high air temperature condition was detected above the set trip point. The cause of the high temperature condition MUST be determined and corrected before the compressor is restarted.

STAGE 2 DISCHARGE HP SHUTDOWN

This message will be displayed should the pressure at the discharge of STAGE 2 exceed a trip point. In addition to the HP shutdown, a safety relief valve will vent tubing pressure before internal pressure levels approach maximum safe operating pressure of the system components.

MOTOR OVERLOAD

The control monitors the status of the main motor and fan motor overloads. Should one of the overloads detect an amp draw that is too high, it will shut the compressor down and the control will log the event.

CONTACTOR WELDED

The control monitors the status of the motor starters during compressor operation. If the control sends a signal to the starter to disengage and it does not receive confirmation of this, is will trip an alarm and log this message. This may indicate a failed contactor or it may indicate a fault in the wiring to the auxiliary contacts.

WYE CONTACTOR NOT CLOSED

This message will be logged if the control sends a start signal to the Y-D contactor motor starter and fails to receive confirmation that the contactor engaged.

M1 AUX CONTACT OPENED

This message will be logged if the controller detected that the auxiliary contacts on the main contactor opened up, when they should be closed. This could indicate a loose wire, or chattering contactor.

WYE AUX CONTACT CLOSED

This message is logged in Y-D starter configurations, when the controller sees an input from the auxiliary contacts when they should be open.

CONTACTOR FAILURE

This message will be logged if the control sends a start signal to the main and/or fan motor starter and fails to receive confirmation that the contactor engaged.

COMM TO RELAY BD FAILS

This indicates that communication between the microprocessor board and the relay board has been interrupted.

PKG DISCHARGE RTD FAILURE

The package discharge RTD is the temperature probe between the compressor package and the system lines. The control will log this message if it fails to receive a valid signal from this probe.

STG 2 DISCHARGE RTD FAILURE

The stage two discharge RTD is the temperature probe in the stage two discharge piping. The control will log this message if it fails to receive a valid signal from this probe.

STG 2 INPUT TEMP FAILURE

The stage two input RTD is the temperature probe in the stage two compressor airend intake. The control will log this message if it fails to receive a valid signal from this probe.

STG 1 DISCHARGE RTD FAILURE

The stage one discharge RTD is the temperature probe in the discharge tubing of the first stage airend. The control will log this message if it fails to receive a valid signal from this probe.

PKG TRANSDUCER FAILURE

The line transducer is the pressure sensor located downstream of the aftercooler. The control will log this message if it fails to receive a valid signal from this sensor.

STG 2 TRANSDUCER FAILURE

The stage two pressure transducer is the pressure sensor located in the piping exiting the second stage airend. The control will log this message if it fails to receive a valid signal from this sensor.

STG 1 DIS TRANSDUCER FAILURE

The stage one pressure transducer is the pressure sensor located in the piping exiting the first stage airend. The control will log this message if it fails to receive a valid signal from this sensor.

FLUID TRANSDUCER FAILURE

The fluid transducer is the pressure sensor located in fluid line feeding the airend bearings. The control will log this message if it fails to receive a valid signal from this sensor.

AIR FILTER CLOGGED

There is a vacuum switch downstream of the air filter element that is used to determine the differential pressure across the filter element. A high differential pressure indicates a dirty filter element. If this condition is detected, the control will log the event. This will not shut down the compressor, but it can be useful in troubleshooting.

FLUID FILTER CLOGGED

The control monitors the fluid filter element condition by reading the differential pressure across the element. Should a high differential be detected, this message will be logged. This will not shut down the compressor.

FLUID PRESSURE TOO LOW

The control will log shutdowns that occurred because of fluid pressure dropping below 10 psi., or the set trip point (typically 15 psi).

STG 1 PRESSURE TOO HIGH

This message will be logged if the control sees that the interstage pressure has risen above the trip point.

STG 2 PRESS DIFF HIGH

The control will log shutdowns that occurred because of a high differential pressure across the stage two airend. This can occur if the interstage pressure is low (10 psi or less) and the discharge of Stage two is normal (80 psi or more). Under these circumstances, high temperatures may be produced in the airend.

FLASH CHECKSUM ERROR

This message will be posted it the periodic check of the flash memory sees a change from the stored value. There is a possibility that the main program may have an error internally.

STAGE _ MUFFLER PLUGGED

The control will log this warning message when it detects that the unloaded pressure in the discharge of stage one or stage two is above 5 psig. This generally indicates that there may be a problem with the blowdown mufflers, creating high back pressure.

EMPTY OR NOT USED

The control log has no entries at that point.

INVALID CODE OR UNKNOWN

This indication means that the controller has found an entry in the log that does not match any available in it's table. This may occur after a software upgrade, or if U19 has faulty entries.

Probable Causes:	*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. Check for shorted out lift valve solenoid.
Faulty start switch	Check the switch for malfunction or loose connections.
Loose wire connections	Check all wiring terminals for contact and tightness.
Power failure	Check power supply and transformer fuses. Check power supply, power supply cables and ribbon cable going to display board.
Faulty transformer	Check secondary voltage on transformer.
Low voltage	Check the voltage at your entrance meter. 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.
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.
Faulty high air temperature switch	Check HAT switch. Contact an authorized Quincy service technician for repairs.
Thermal motor overload relays tripping	Determine and correct the cause of the motor overloaded condition. Reset overload relay.
Faulty control relay (water-cooled only)	Replace relay.
Faulty coolant shut-off valve (coolant flow switch contacts are open)	Ensure adequate water supply pressure and flow is available and supply valve is open. Verify there is not excessive backpressure on the drain side of the water system. Replace faulty water flow switch.
Setup memory failure	Turn power off and then back on. Check power cable and connection between DC power supply and microprocessor. Contact an authorized Quincy service technician to check for microprocessor failure and check for improper voltage from the DC power supply.
Setup Data Not Initialized	Initialize setup data as described on page 37 .

Probable Causes:	*Corrective Action:*
Failure to Start (continued):	
Relay board communication failure	Check cable and connection ends of communication cable between relay board and microprocessor. Unplug and then plug the connector back in at the relay board and at the microprocessor board. Contact an authorized Quincy service technician.
Safety circuit shutdown	Diagnose cause in accordance with the instructions on the LED display. Correct cause and restart compressor.
Emergency stop button pressed	Reset emergency stop button and start compressor. Check for failure of the HAT probe(s). Check for failure of the coolant flow switch.
Faulty start button	Check the button for malfunction or loose connections.
Loose wire connections	Check all wiring terminals for contact and tightness.
High discharge pressure	Compressor will start when stage 2 discharge pressure drops below 10 PSIG.
Contactor not engaging	Check control wire connections. Check for power to contactor coil. Check signal wires from contactor auxiliary contacts.
Unscheduled Shutdown:	
High air discharge temperature	Correct the situation in accordance with the instruction in the High Discharge Air Temperature section of this troubleshooting guide. Restart the compressor.
Safety circuit shutdown	Diagnose cause in accordance with the instructions on the LED display. Correct cause and restart compressor.
Faulty HAT sensors	Contact an authorized Quincy service technician for repairs.
Excessive discharge pressure	Lower full load pressure setting at control panel.
Low fluid pressure	Check fluid filter and fluid pump for plugging. Check fluid supply temperature at inlet to fluid pump for fouled cooler.

Probable Causes:	*Corrective Action:*
Unscheduled Shutdown (continued):	
HIGH PRESSURE DIFFERENTIAL	CHECK LIFT VALVE, BLOWDOWN VALVE AND MINIMUM PRESSURE CHECK VALVE OPERATION. CONTACT AN AUTHORIZED QUINCY SERVICE TECHNICIAN FOR REPAIRS.
COOLANT FLOW SWITCH OPEN	CHECK COOLANT SHUT-OFF VALVE AND WATER SUPPLY.
THERMAL MOTOR OVERLOAD RELAYS TRIPPING	CORRECT THE CAUSE OF THE MOTOR OVERLOADED CONDITION, RESET THE OVERLOAD RELAY AND PRESS THE RESET BUTTON.
INCORRECT THERMAL OVERLOAD RELAY SETTING	CHECK MOTOR NAMEPLATE AND COMPARE TO OVERLOAD RELAY SETTING.
LOOSE OVERLOAD CONNECTION	TIGHTEN MOUNTING SCREWS ON THERMAL OVERLOAD.
LOOSE WIRE CONNECTIONS	CHECK ALL WIRING TERMINALS FOR CONTACT AND TIGHTNESS.
POWER FAILURE	CHECK POWER SUPPLY AND TRANSFORMER FUSES. CHECK THE POWER SUPPLY, POWER SUPPLY CABLES AND RIBBON CABLE GOING TO DISPLAY BOARD.
LOW VOLTAGE	CHECK VOLTAGE AND AMPERAGES WHILE OPERATING AT FULL LOAD PRESSURE.
FAULTY CONTROL RELAY	REPLACE RELAY.
FAULTY MOTOR	CHECK MOTOR STARTER WIRING BEFORE REMOVING MOTOR. REMOVE MOTOR AND HAVE TESTED AT MOTOR MANUFACTURER REPAIR CENTER.
FAULTY OR DISCONNECTED RTD	CHECK WIRE CONNECTION BETWEEN RESISTANCE TEMPERATURE DETECTOR AND MICROPROCESSOR BOARD. IF RTD PERFORMANCE IS QUESTIONABLE, CONTACT AN AUTHORIZED QUINCY SERVICE TECHNICIAN.
FAULTY OR DISCONNECTED PRESSURE SENSORS	CHECK WIRE CONNECTIONS OF PRESSURE SENSORS. REPLACE SENSORS.
MOTOR OVERLOAD	CORRECT THE CAUSE OF THE OVERLOAD CONDITION. RESET THE OVERLOAD RELAY AND PRESS ENTER.
REVERSE ROTATION	CHECK FOR PROPER AIREND ROTATION. REDUCE "RAMP" TIME ON REMOTE LOW VOLTAGE OR SOLID STATE STARTERS.

Probable Causes:	*Corrective Action:*
Low Air Delivery:	
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.
Minimum pressure check valve stuck	Repair or replace as necessary.
Leaking blowdown valve(s)	Check and replace as necessary.
Plugged air intake filter	Clean or replace air filter element.
Inoperative lift valve	Contact an authorized Quincy service technician for repairs.
Frequent Air Cleaner Clogging:	
Compressor operating in highly contaminated atmosphere	Use remote air intake mounting.
Air cleaner not adequate for conditions	Use specialized air cleaner. Contact an authorized Quincy service technician.
Frequent Fluid Filter Clogging:	
Incorrect fluid filter	Use genuine Quincy replacement filters only.
System contamination	Clean system of all dirt, corrosion and varnish.
High Discharge Air Temperature:	
Excessive ambient temperatures	Maximum ambient for proper operation is listed in data sheet. Ventilate room or relocate compressor.
Inadequate coolant flow through cooler(s) (water-cooled)	Clean cooler(s). Check water system for possible restrictions.
Inadequate circulation of cooling air (air-cooled)	Check the cooler to assure there are no restrictions to free circulation of cooling air. Check fins of cooler for dirt build-up. If necessary, clean fins with air (while machine is not running). Check for hot air recirculation or hot air from other equipment.

Probable Causes:	*Corrective Action:*
High Discharge Air Temperature (continued):	
Incorrect fan rotation	The fan should push air through the coolers. If incorrect, reverse fan motor starter leads L_1 and L_2.
Blocked water flow or air flow	Clean cooler. Locate and correct cause of contamination.
Clogged air filter	Clean or replace as necessary.
Faulty solenoid valve	Check and replace 4-way solenoid valve as necessary.
Faulty gauges	Check and replace as necessary.
Faulty indicator	Check and replace as necessary.
Blowdown valve failure	Check and replace as necessary. Both mufflers should be exhausting air during unloaded operation.
Airend failure	Contact an authorized Quincy service technician.
RTD reading incorrectly	Contact an authorized Quincy service technician.
Compressor does not Unload when there is no Air Demand:	
Incorrect air pressure sensors setting	Adjust to proper setting (Back-up Mode only).
Faulty air pressure sensors	Replace sensors.
Faulty solenoid 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.
Faulty lift valve(s)	Repair or replace as necessary.
Faulty blowdown valve(s)	Repair or replace as necessary.

Probable Causes:	*Corrective Action:*
Compressor does not revert to Load when Service Line Pressure Drops to Reset Pressure:	
Loose wiring connection	Check and tighten wiring terminals.
Faulty pressure sensor	Repair or replace as necessary.
Faulty solenoid	Repair or replace as necessary.
Faulty timer	Check and replace timer.
Faulty lift valve(s)	Repair or replace as necessary.
Faulty blowdown valve(s)	No air should be blowing out from the mufflers during loaded operation.
Network out of sequence or schedule	Check and reset sequence or schedule 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.
Storage capacity too small	Add more storage capacity as close to the compressor as possible.
leaks in minimum pressure check valve	Repair or replace as necessary.
Faulty air pressure switch	Repair or replace as necessary.
Faulty air pressure sensors	Replace as necessary.
Too Rapid Cycling Between Load and Unload:	
Leaks in control lines	Check and repair any leaks.
Water or ice in control lines	Drain lines, replace as necessary.
Faulty air pressure sensors	Replace as necessary.
Storage capacity too small	Add storage capacity (minimum of three gallons per CFM).

Probable Causes:	*Corrective Action:*
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 or leaking cooler(s)	Replace cooler.
Pressure Relief Valve Exhausting:	
Air pressure not set correctly	Readjust air pressure switch so that the compressor unloads at the desired pressure.
Faulty pressure relief valve	Check relief valve for correct pressure setting. If valve is still leaking, replace it.
Excessive Fluid in Buffing Air Vent Bowls:	
Buffing air pressure regulator not set correctly	Check regulator output pressure. Check for high fluid level. Check for seal failure. Contact an authorized Quincy service technician.
Water in Buffing Air Vent Bowls:	
Plugged moisture trap drain	Check and clean moisture trap drain.
Excessive Fluid in Gearbox Vent Bowl:	
Clogged mist eliminator	Replace mist eliminator.
Faulty check valve	Replace check valve.

Probable Causes:	*Corrective Action:*
Thermal Overload Relays Tripping:	
Loose signal wire from overload(s)	Check signal wire connections.
Incorrect thermal overload relay setting	Check motor nameplate and compare to overload relay setting specifications.
Loose motor or starter wiring	Check all connections for tightness.
low voltage	Check voltage and amperages while operating the unit at full load and full pressure. Maximum tolerance ±10%.
Faulty motor	Check motor starter wiring before removing motor. Remove motor and have tested at authorized motor manufacturer repair center.
Low Delivery Pressure:	
Plugged air intake filter	Replace air filter element.
Excessive demand - Exceeds supply	Add additional compressors as needed.
Excessive leaks in service lines	Locate and eliminate air leaks in service lines.
Faulty line pressure transducer	Contact an authorized Quincy service technician.
High Interstage Pressure:	
Blowdown valve not relieving pressure	Check control solenoid and blowdown valve.
Air pressure switch not set correctly (Operating in Back-up Mode)	Readjust the air pressure switch so that the unload pressure does not exceed the maximum recommended operating pressure.

Probable Causes:	*Corrective Action:*
Network Communication Erratic or Non-Existent:	
Wrong communication cable	Use proper cable.
Communication cable connected to microprocessor incorrectly	Refer to page 35 for proper connections.
Damaged communication cable	Replace cable.
Rocker switches set incorrectly	Refer to page 36 for proper positioning.
Terminator connected incorrectly	Confirm terminator connected and plugged in as illustrated on page 36.
Machine ID letters not correct	Each machine must have its own ID letter, see machine id setup display on page 47.
Unit not in the Network Mode	Check the menu to assure all units are operating in the Network Mode.
Time and date not consistent on networked units	Synchronize date and clocks on all networked units from machine 'A'. To do this set the time on machine 'A'.
Conflicting instructions in the sequence or schedule	Check scheduling and sequence on each machine. Correct sequence and schedule from machine 'A', if needed.
Cable run exceeds maximum distance	Maximum total distance for cable length is 600'.
Erroneous Displays:	
Power cable loose or poor connection Oxidation on power cable connection. Ribbon cable going to display Low incoming voltage to the power supply Power supply adjustment incorrect	Check to assure the power cable is properly connected to the power supply and to the microprocessor. Replace power cable.
Microprocessor Will Not Display Messages:	
	Check seating ribbon cable connections. Replace if faulty.

Interval:	*Action:*
Periodically/Daily: (8 hours maximum)	Complete daily operating record. Monitor all gauges and indicators for normal operation. Check fluid level in gearcase. Observe fluid level in buffing air and smoke eliminator filter bowls. Drain filter bowls, if required. Observe for fluid leaks. Observe for unusual noise or vibration. Manually drain interstage and discharge moisture traps to verify drain mechanism is operable. Drain stage 2 inlet air line. Repaet as necessary in high humidity conditions. Drain drip legs in discharge connection to the compressed air system.
Weekly:	Check buffing air supply (pressure is set to 4-5 PSIG).
Monthly:	Service air filter as needed (daily or weekly if extremely dirty conditions exist). Clean intercooler and aftercooler and coolant cooler fins (air-cooled only). Wipe entire unit down to maintain appearance. Check tightness of power connections.
6 months or every 1000 hours:	Take fluid sample. Check and clean interstage moisture trap and drain mechanism. Change fluid filter. Check pressure switches PS1, PS2, and PS3.
Every 8000 hours:	Change fluid and fluid filter (sooner if indicated by fluid sample analysis).
Periodically/yearly:	Replace PS2, PS3 and PS4 nonadjustable pressure switches. Go over unit and check all bolts for tightness. Replace smoke eliminator element. Change air filter. Lubricate motors. Check safety shutdown system (DO NOT test by increasing discharge temperatures). Check and replace the rubber hoses going from the airends to the gearcase. Check solenoid valve. Test pressure relief valve for proper operation. Contact an authorized Quincy service technician.

Record Data Daily With Unit Running At Full Temperature And Load

Unit Serial Number: **Customer:**

Date	Air Filter Condition	Stage 1 Discharge		Stage 2 Suction	Stage 2 Discharge		Fluid Filter Condition	Package Discharge Temp	Fluid Pressure	Total Hours	Loaded Hours	Fluid Level	Condensate Trap Drain		Data Input By
		Press	Temp	Temp	Press	Temp							Inter Cooler	After Cooler	

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