



OPERATION AND MAINTENANCE MANUAL

COMPRESSOR MODEL KDS-EAC 1170/1250 SERIES



This manual contains important safety information.
Do not destroy this manual.

This manual must be available to the personnel who operate and maintain this equipment.

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FOREWORD

INFORMATION

The contents of this manual are considered to be proprietary and confidential to Keystone Drill Services, Inc. (herein referred to as “Keystone Drill”) and should not be reproduced without the prior written permission of Keystone Drill.

Nothing contained in this document is intended to extend any promise, warranty, or representation, expressed or implied, regarding the Keystone Drill products described herein. Any such warranties or other terms and conditions of sale of products shall be in accordance with the standard terms and conditions of sale for such products, which are available upon request.

This manual contains instructions and technical data to cover all routine operation and scheduled maintenance tasks by operation and maintenance staff. Major overhauls are outside the scope of this manual and should be referred to an authorized Keystone Drill Service department.

All components, accessories, pipes, and connectors added to the compressed air system should be:

- of good quality, procured from a reputable manufacturer and, wherever possible, be of a type approved by Keystone Drill.
- clearly rated for a pressure at least equal to the compressor safety valve setting.
- compatible with the compressor oil.
- accompanied with instructions for safe installation, operation, and maintenance.

Details of approved equipment are available from the Keystone Drill Service department. The use of repair parts other than those included within the approved parts list may create hazardous conditions over which Keystone Drill has no control. Therefore, Keystone Drill cannot be held responsible for equipment in which non-approved repair parts are installed.

Keystone Drill reserves the right to make changes and improvements to products without notice and without incurring any obligation to make such changes or add such improvements to products sold previously.

The intended uses of this compressor are outlined below, and examples of unapproved usage are also given. However, Keystone Drill cannot anticipate every application or work situation that may arise. If in doubt, consult supervision.

This compressor has been designed and supplied for above ground operation to be used for compression of normal ambient air containing no additional gases, vapors, or particles within the ambient temperature range specified in the General Data section of this manual.

This compressor should NOT be used:

- for direct or indirect human consumption of the compressed air.
- outside the ambient temperature range specified in the General Data section of this manual.
- when an actual or foreseeable risk of hazardous levels of flammable gases or vapors exists.
- with other than Keystone Drill approved components.
- with guards, controls, or switches missing or disabled.
- for storage or transportation of materials inside or on the enclosure.

Keystone Drill accepts no responsibility for errors in translation of this manual from the original English version.

You, as the customer, are expected to provide certain service and maintenance items. Your Keystone Drill dealer will provide all other more detailed service and maintenance items on a special preventive maintenance schedule for each compressor. It is very important that the minimum service and maintenance requirements explained in this manual be performed at the required intervals. Exceeding these intervals may reduce the reliability of the compressor.

The purpose of this manual is to train the operator with functions, operation, and basic service and maintenance requirements of the compressor. During the preparation of this manual, every effort was made to ensure the adequacy and accuracy of the contents.

Your Keystone Drill dealer will assist with setup and initial startup of the compressor. They will also provide brief operating and service instructions. Before starting the compressor, this manual and instructions should be carefully read to obtain a thorough knowledge of the duties to be performed. Please take pride in the compressor, keep it clean, and in good mechanical condition.





SAFETY

SAFETY PRECAUTIONS

Never operate the compressor without first observing all safety warnings and carefully reading the Operation and Maintenance Manual shipped from the factory with this compressor.

Ensure the operator reads and understands the decals and consults the manuals before operation or maintenance.

Ensure maintenance personnel are adequately trained, competent, and have read the manuals.

Ensure all protective covers are in place and panel doors are closed during operation.

A weekly visual check must be made of all fasteners/fixing screws securing mechanical parts. In particular, safety-related parts.

All components which are loose, damaged, or unserviceable must be rectified without delay.

Air discharged from this compressor may contain carbon monoxide or other contaminants which will cause serious injury or death. Do not breathe discharged air.

This compressor can produce loud noises when the service valve is vented. Always wear hearing protection.

Never inspect or service the compressor without first disconnecting the electric supply cables, however, ensure there is no power to the cables prior to disconnecting. The 600 volt supply must be de-energized (with Approved Lock Out/Tag Out Protection) until the service and/or maintenance procedure is completed.

Do not use petroleum products (solvents or fuels) under high pressure as this can penetrate the skin and result in serious illness. Wear eye protection while cleaning the compressor with compressed air to prevent debris from injuring eye(s).

Rotating fan blade can cause serious injury. Do not operate without fan guard in place.

Use care to avoid contacting hot surfaces (air receiver, air discharge piping, etc.)

Never operate the compressor with guards, covers, or screens removed. Keep hands, hair, clothing, tools, blow gun tips, etc. away from moving parts.

COMPRESSED AIR

Compressed air can be dangerous if incorrectly handled. Prior to performing any maintenance or service on the compressor, ensure all pressure is vented from the system and the compressor cannot be started accidentally.

Ensure the compressor is operating at the rated pressure and the rated pressure is known to all relevant personnel.

All air pressure equipment installed in, or connected to, the compressor must have safe working pressure ratings of at least the compressor safety valve setting.

If more than one compressor is connected to one common downstream plant, effective check valves and isolation valves must be fitted and controlled by work procedures, to ensure one compressor cannot accidentally be pressurized or over pressurized by another.

Compressed air must NOT be used for a direct feed to any form of breathing apparatus or mask.

Compressed air can cause serious injury or death. Relieve pressure before removing filler plugs/caps, fittings, valves, hoses, or covers.

Air pressure can remain trapped in air supply line which can result in serious injury or death. Always carefully vent air supply line at tool or vent valve before performing any service or maintenance.

Discharged air contains a very small percentage of compressor lubricating oil and care should be taken to ensure that downstream equipment is compatible.

If the discharged air is to be ultimately released into a confined space, adequate ventilation must be provided.

When using compressed air, always use appropriate personal protective equipment.

All pressure containing parts, especially flexible hoses and their couplings, must be regularly inspected, be free from defects, and be replaced according to the manual instructions.

Avoid bodily contact with compressed air.

The safety valve located in the separator tank must be checked periodically for correct operation.

Whenever the compressor is stopped, air will flow back into the compressor from downstream devices or systems unless the service valve is closed. Install a check valve at the compressor service valve to prevent reverse flow in the event of an unexpected shutdown when the service valve is open.

Disconnected air hoses whip and can cause serious injury or death. Always attach a safety flow restrictor to each hose at a source of supply or branch line in accordance with OSHA Regulation 29CFR Section 1926.302(b).

Never allow the compressor to sit shutdown with pressure in the separator tank or piping.

ELECTRICAL

Be sure the machine is properly grounded/earthed in accordance with site and National Code requirements.

The main circuit breaker on this machine has an 800A rating. Connect to appropriate power source.

The opening of the branch-circuit protective device may be an indication that a fault current has been interrupted. All current-carrying parts and other components protected by this device should be examined and replaced if damaged.



The compressor contains a Soft Starter and Variable Frequency Drive. When it is switched off and the motor is stopped, the capacitors store a potentially lethal voltage. DO NOT REMOVE COVERS FROM DRIVES and attempt any service work unless properly trained. There are no user serviceable components under the individual drive covers. Wait at least 10 minutes after disconnecting power before servicing or troubleshooting Soft Starter or Variable Frequency Drive component fuses or connections within the control panel.

MATERIALS

Ensure that adequate ventilation of the cooling system is maintained at all times.

The following substances are used in the manufacture of this compressor and may be hazardous to health if used incorrectly:

- compressor oil
- preservative grease, lubricating grease
- rust preventative
- thread sealant
- thread locking compound



Avoid ingestion, skin contact, and inhalation of fumes.

Should compressor oil come into contact with the eyes, irrigate with water for at least 5 minutes. Should compressor oil come into contact with the skin, wash off immediately. Consult a physician if large amounts of compressor oil are ingested or if compressor oil is inhaled. Never give fluids or induce vomiting if the patient is unconscious or having convulsions.

Safety data sheets for compressor oils should be obtained from the oil supplier.

Do NOT start or operate this compressor in a confined area.

This compressor may include such materials as oil and oil/air filters which may require proper disposal when performing maintenance or service tasks. Contact local authorities for proper disposal of these materials.

TRANSPORT

When loading or transporting the compressor, ensure that the specified lifting and tie down points are used, and that the compressor is loaded or transported by the end designated on the compressor.

When loading or transporting the compressor, ensure that the towing vehicle, its size, weight, towing hitch, winch, and electrical supply are all suitable to provide safe and stable towing. Do not exceed gross vehicle weight rating. Do not exceed the capabilities of the towing vehicle for loading, unloading, or towing.




Before transporting the compressor, ensure:



- the panel doors are closed and secure.
- all ancillary equipment is stored and in a safe and secure manner.
- all electrical connections and air hoses are properly disconnected.

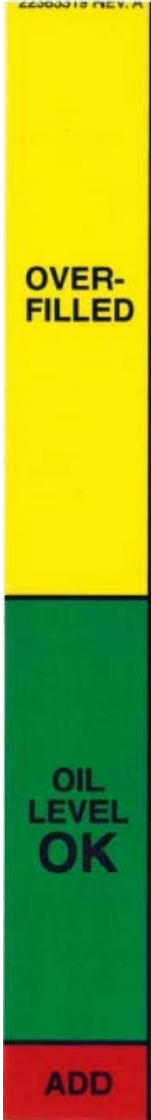

DECALS



Decals are located on the compressor to point out potential safety hazards. Read and follow these instructions. If you do not understand these instructions, inform your supervisor.

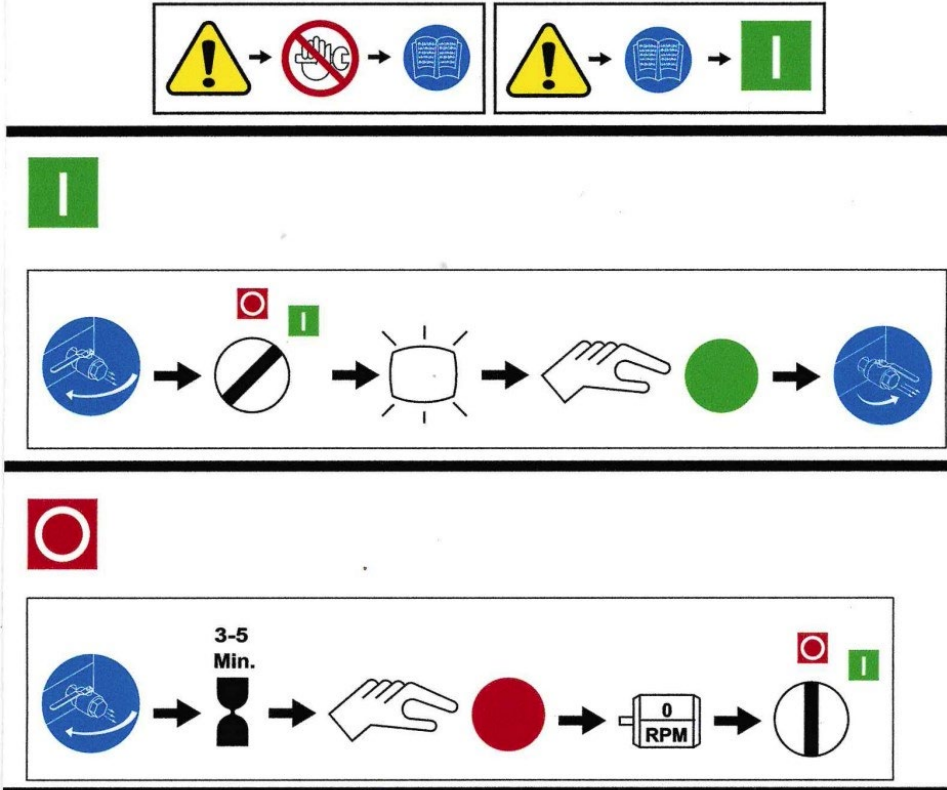

If decals are illegible or missing, please contact Keystone Drill for a replacement. Ensure that all of the following decals are present on the compressor.





PART #	DECAL	QTY
604853		1
604841		4
604844		3




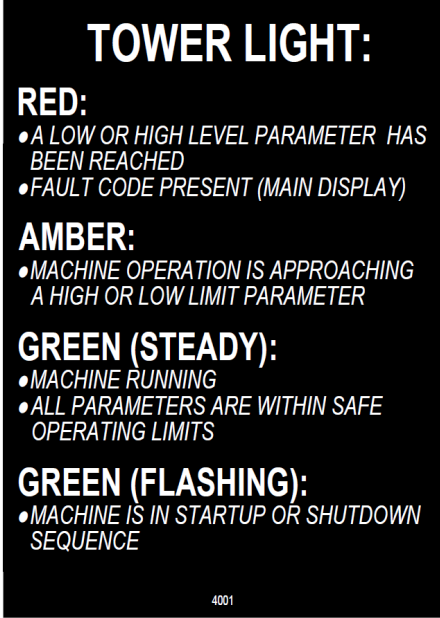
PART #	DECAL	QTY
604842	 <p style="text-align: center;">54568779 REV. C</p>	4
604838	 <p style="text-align: right; font-size: small;">54629902 REV. C</p>	1

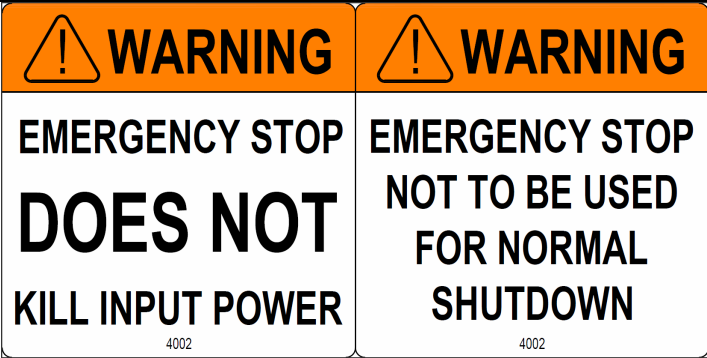
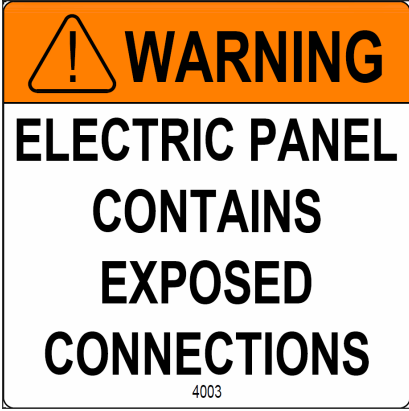


PART #	DECAL	QTY
604849		1
604843	 <p style="text-align: right; font-size: small;">54568795 REV. C</p>	1







PART #	DECAL	QTY
634719	 <p data-bbox="894 701 1036 720">46622761 REV A</p>	1
634720	 <p data-bbox="943 1178 1045 1197">54604996 REV. C</p>	1







PART #	DECAL	QTY
634721	 <p>46652274 REV. A</p>	1
619884	 <p>1093</p>	1





PART #	DECAL	QTY
635148		4
635149		2
635150		2
635151		2





PART #	DECAL	QTY
635152		2
635153		2
635154		4
635155		1

PART #	DECAL	QTY
635156		2
635157		2
635158		2
635159		1

PART #	DECAL	QTY
635160		2
635161		2
635164		4
635165		2
606792		1
606807		2

PART #	DECAL	QTY
606819	 <p>DANGER HIGH PRESSURE AIR</p> <p>1041</p>	1
606820	 <p>DANGER HOT</p> <p>1042</p>	2
606846	 <p>EYE PROTECTION REQUIRED</p> <p>1064</p>	2
606858	 <p>GUARD MUST BE IN PLACE WHEN OPERATING</p> <p>1088</p>	2
606861	 <p>HEARING PROTECTION REQUIRED</p> <p>1098</p>	2
606876	 <p>LUBRICATION POINT</p> <p>1111</p>	1

PART #	DECAL	QTY
616447	 <p>DO NOT EXCEED RATED PRESSURE <i>MAX. OPERATING PRESSURE</i> 350 PSI 2042</p>	1
616462	 <p>COMPRESSOR OIL DRAIN 2026</p>	1
619178	 <p>MANUAL BLOWDOWN VALVE 1128</p>	1
619180	 <p>HOSE WHIP RESTRAINTS MUST BE IN PLACE WHEN OPERATING SEE SAFETY & OPERATION MANUAL 1225</p>	1

PART #	DECAL	QTY
606888		1
635174		2
635221		2
635351		2





GENERAL DATA

GENERAL DATA INFORMATION

MODEL	KDS-EAC1250
COMPRESSOR	
Air Delivery – cfm (m ³ /min)	1250 (35.4)
Rated Operating Pressure – psi (bar)	350
Safety Valve Setting – psi (bar)	425
MAIN MOTOR	
Operating Speed (rpm)	1789
Nominal Horsepower of package (kW)	500 (370)
Full Load Amps at 480Vac (A)	568
FAN MOTOR	
Operating Speed (rpm)	1765
Nominal Horsepower of package, HP (Kw)	30 (22)
Full Load Amps at 480Vac (A)	35.1
AMBIENT TEMPERATURE RANGE	
With Standard Features, °F (°C)	-4 to 104 (-20 to 40)
MAIN POWER SERVICE REQUIREMENTS	
Nominal Supply Voltage (Vac)	600
Operating Frequency (Hz)	60
Operating Voltage (Vac)	480
Input Panel Circuit Breaker Rating (A)	800
Soft Start Circuit Breaker Rating (A)	800
VFD Circuit Breaker Rating (A)	60
Three Phase with Ground	L1-White/Black, L2-Red, L3-Blue, GND-Green

TRANSFORMER	
Primary Voltage (Vac)	600 Delta
Secondary Voltage (Vac)	480/277 Wye
KVA	630
Type	Isolated, Dry-type
Conductor	Aluminum
MEASUREMENTS/WEIGHTS	
Overall Length – feet (meters)	17 (5.2)
Overall Width – feet (meters)	8 (2.4)
Overall Height – feet (meters)	8 (2.4)
Operating Weight, with Compressor Oil, lb (kg)	24,000 (10,886)

SERVICE PARTS

PART NUMBER	DESCRIPTION	QUANTITY
627999	Filter, Oil Compressor	1
608507	Separator, Oil Compressor	1
600844	Filter Element, Air Inlet Primary	1
604905	Filter Element, Air Inlet Secondary	1


CAUTION

Any departure from the specifications may make this equipment unsafe.

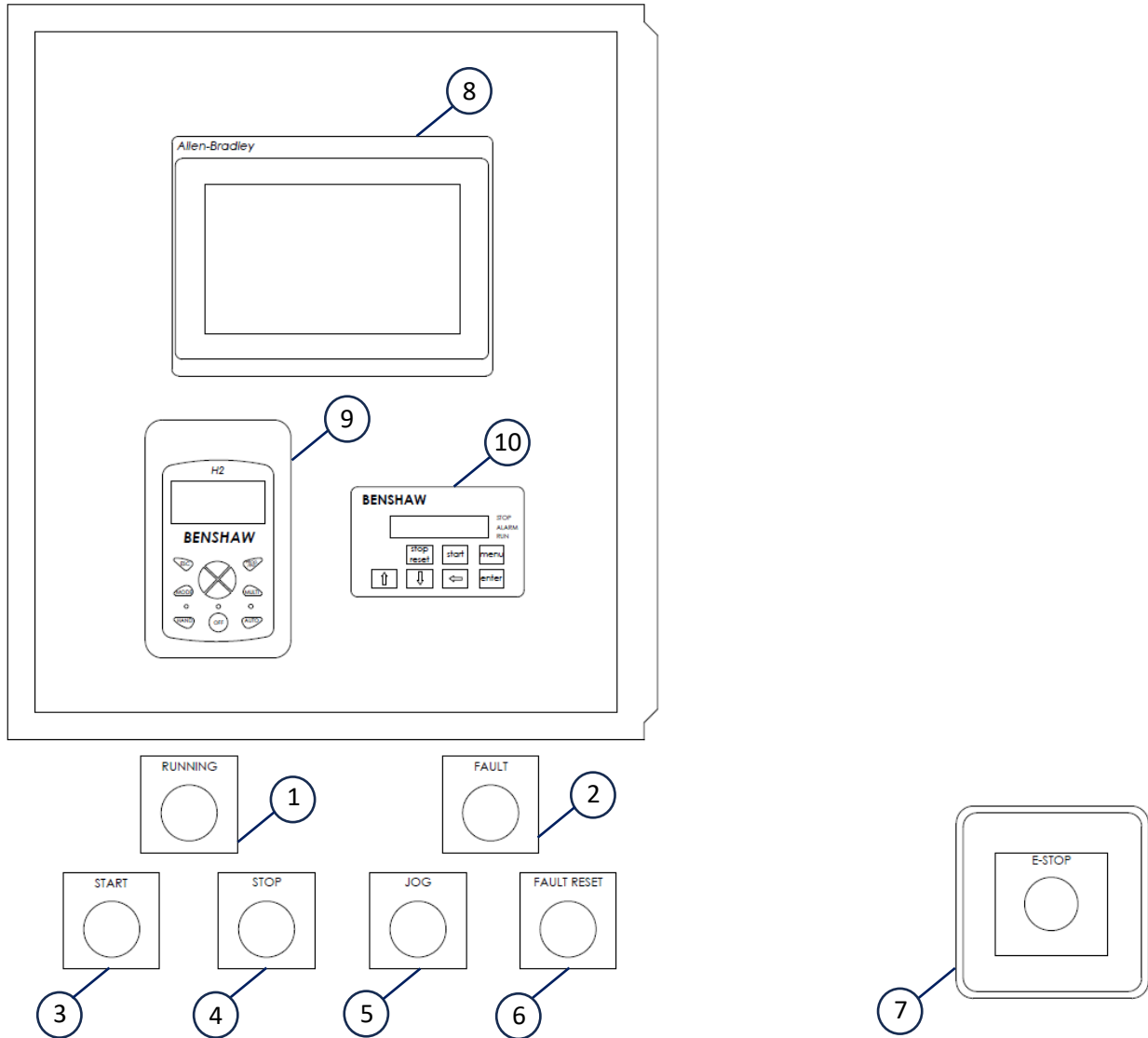




OPERATING INSTRUCTIONS

OPERATING CONTROLS AND INSTRUMENTS

CONTROL PANEL



- | | | | |
|----|-----------------------|-----|---------------------------------|
| 1. | RUNNING LIGHT (GREEN) | 6. | FAULT RESET BUTTON (BLACK) |
| 2. | FAULT LIGHT (RED) | 7. | EMERGENCY STOP BUTTON (RED) |
| 3. | START BUTTON (BLACK) | 8. | PANELVIEW TOUCH-SCREEN DISPLAY |
| 4. | STOP BUTTON (RED) | 9. | VFD CONTROLLER (FAN MOTOR) |
| 5. | JOG BUTTON (BLACK) | 10. | STARTER CONTROLLER (MAIN MOTOR) |

PANELVIEW

The PanelView 800 Display is a touch-screen device that is used for displaying compressor data, warnings, and to control different features. The display defaults to the automatic screen on start-up and does not require interaction for running the equipment. If necessary, the machine can be started or stopped in automatic mode from the screen shown in Figure 1 by pressing the corresponding buttons on the display. The following information is to familiarize the operator with the PanelView and its different features. Understanding how to operate will be explained later in the Chapter.

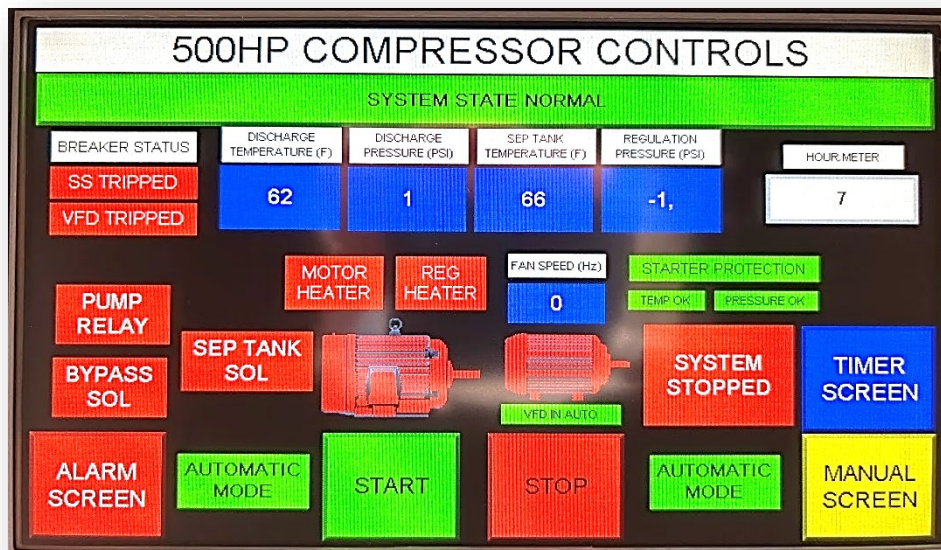


Figure 1- Display in AUTOMATIC MODE, no warnings, control panel breakers open

AUTOMATIC MODE (DEFAULT) SCREEN

SYSTEM STATUS

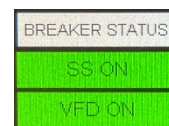
The top of the display indicates the system status by text and color. A normal status is shown in Figure 1 with a green ribbon across the top of the screen. Below are the different status designations:

Color	Status	Meaning
Green	Normal	All readings are within normal parameters
Yellow	Warning	Data is approaching the limits of set parameters
Orange	Pre-start Warning	Current parameters are outside of automatic mode starting parameters
Red	Alarm	A reading is outside of set parameters. System shuts down

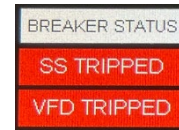
BREAKER STATUS

The breaker status indicates whether the breakers on the control panel are open (tripped) or closed (on).

Text (Color)	Status
SS ON (green)	Soft Starter circuit is closed, energized
VFD ON (green)	VFD circuit is closed, energized



Text (Color)	Status
SS TRIPPED (red)	Soft Starter circuit is open, de-energized
VFD TRIPPED (red)	VFD circuit is open, de-energized





WARNING

Although the Breaker Status may indicate that the breakers are tripped (open), there is still power being supplied to the Control Panel.

COMPRESSOR DATA

The compressor information is displayed across the top half of the screen inside of four blue squares. The parameters displayed are Discharge Temperature, Discharge Pressure, Separator Tank Temperature, and Regulation Pressure. The values listed in the image below are reference only.

DISCHARGE TEMPERATURE (F)	DISCHARGE PRESSURE (PSI)	SEP TANK TEMPERATURE (F)	REGULATION PRESSURE (PSI)
175	393	112	49

OPERATING INDICATORS

The various blocks and images across the center of the screen show the operating status via their symbol color. A red icon/symbol indicates that the operation is off or stopped. A green icon/symbol indicates that the operation is on or running. These icons/symbols are not interactive (in AUTOMATIC MODE) and are only displaying feedback from the automated process.

Text/Symbol	Description	Color	Meaning
PUMP RELAY	Regulation compressor	Red / Green	Off / On
BYPASS SOL	Solenoid for butterfly valve	Red / Green	Off / On
SEP TANK SOL	Solenoid for startup	Red / Green	Off / On
MOTOR HEATER	Heater for main motor	Red / Green	Off / On
REG HEATER	Regulation orifice heater	Red / Green	Off / On
TEMP OK	Temperature parameters for starting	Blue / Red / Green	Low / High / OK
PRESSURE OK	Pressure parameters for starting	Blue / Red / Green	Low / High / OK
SYSTEM STOPPED	System is not running, status	Red	Off
SYSTEM RUNNING	System is running (or in process), status	Green	On
AUTOMATIC MODE	Automatic mode controls	Green	Automatic
MANUAL MODE	Manual mode controls	Amber	Manual
VFD IN AUTO	VFD operations are process controlled	Green	Automatic
VFD IN MANUAL	VFD is manually controlled	Amber	Manual
LARGE MOTOR	500HP compressor motor	Red / Green	Off / On
SMALL MOTOR	30HP fan motor	Red / Green	Off / On

INTERACTIVE CONTROLS

Some of the buttons in AUTOMATIC MODE are interactive to allow the operator to control the unit from the screen and monitor different aspects of the process. Below are the buttons that are interactive on the AUTOMATIC MODE screen.

NOTE: Some of these controls navigate you to different screens within the program. Review the full Operations section of this manual to understand how to properly navigate the program prior to pressing any interactive buttons.

Text	Description
ALARM SCREEN	Navigates to the Alarm Screen to review a log of Alarms and ability to reset
START	Starts the automatic process for running the compressor
STOP	Stops the process for running the compressor and enters shut-down process
TIMER SCREEN	Navigates to Timer Screen to adjust parameters for operations *see below*
MANUAL SCREEN	Navigates to Manual Screen for controlling the unit manually

*Timer Screen is password protected to limit access to parameter controls.

MANUAL MODE SCREEN

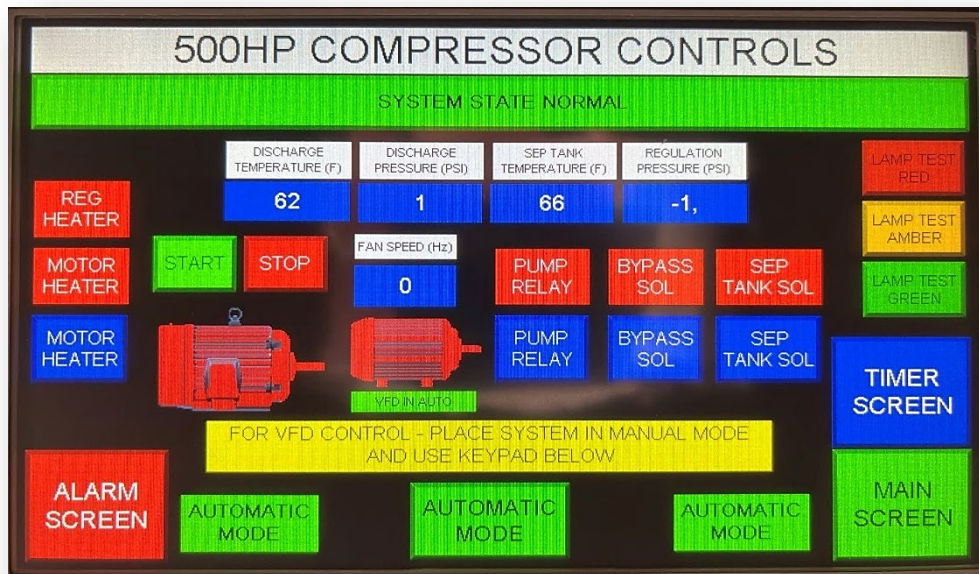


Figure 2 – Display on MANUAL SCREEN, no warnings, system stopped, in AUTOMATIC MODE

The MANUAL SCREEN is similar to the AUTOMATIC SCREEN with system status, compressor data and operating indicators but adds the ability to manually control different parts of the machine independently.

OPERATING INDICATORS

Various blocks and images across the screen show the operating status via their symbol color. A red icon/symbol indicates that the operation is off or stopped. A green icon/symbol indicates that the operation is on or running. These specific icons/symbols are not interactive and are only displaying feedback from the manual controls.

NOTE: The 30HP motor icon (small motor) is feedback from the VFD controller external to the PanelView controls.

Text/Symbol	Description	Color	Meaning
PUMP RELAY	Regulation compressor	Red / Green	Off / On
BYPASS SOL	Solenoid for butterfly valve	Red / Green	Off / On
SEP TANK SOL	Solenoid for startup	Red / Green	Off / On
MOTOR HEATER	Heater for main motor	Red / Green	Off / On
REG HEATER	Regulation orifice heater	Red / Green	Off / On
AUTOMATIC MODE	Automatic mode controls are active	Green	Automatic
MANUAL MODE	Manual mode controls are active	Amber	Manual
VFD IN AUTO	VFD operations are process controlled	Green	Automatic
VFD IN MANUAL	VFD is manually controlled	Amber	Manual
LARGE MOTOR	500HP compressor motor	Red / Green	Off / On
SMALL MOTOR	30HP fan motor	Red / Green	Off / On

MANUAL CONTROLS

The purpose of the MANUAL SCREEN is to operate different features independently from the automated process. Below are the buttons that are interactive on the MANUAL SCREEN.

Text	Description	Color
MOTOR HEATER	Operates the main motor heater	Blue
START	Starts the 500HP compressor motor	Green
STOP	Stops the 500HP compressor motor	Red
PUMP RELAY	Operates the regulation compressor	Blue
BYPASS SOL	Operates the solenoid for butterfly valve	Blue
SEP TANK SOL	Operates the solenoid for startup	Blue
LAMP TEST RED	Operates the red tower light	Red
LAMP TEST AMBER	Operates the amber tower light	Amber
LAMP TEST GREEN	Operates the green tower light	Green
AUTOMATIC MODE	Places the unit into Automatic Mode	Green
MANUAL MODE	Enables manual controls and disables automated processes	Amber
ALARM SCREEN	Navigates to the Alarm Screen to review a log of Alarms and ability to reset	Red
TIMER SCREEN	Navigates to Timer Screen to adjust parameters for operations	Blue
MAIN SCREEN	Navigates to Main Screen for controlling the unit automatically	Green

ALARM SCREEN

If there is a machine fault or the Emergency Stop switch was pressed, the screen will display a System Status message notifying the operator that an alarm is present.

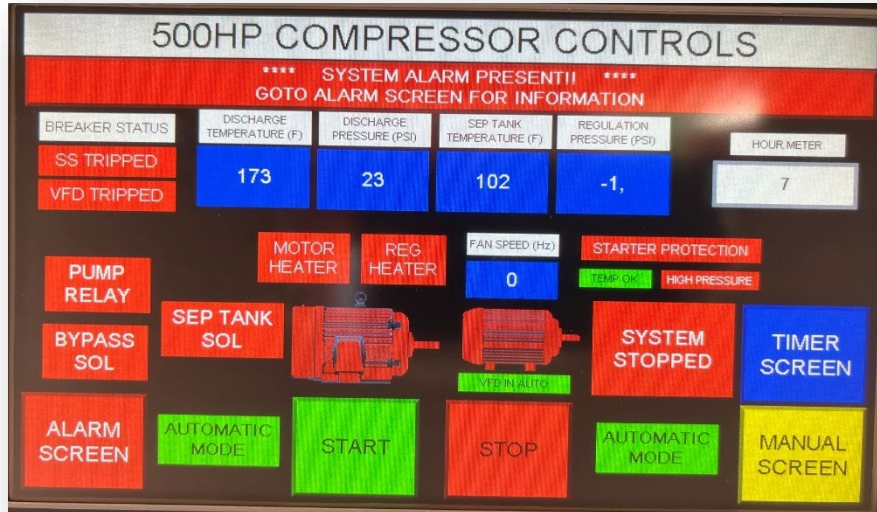


Figure 3 - Main display showing Alarm Status

The Alarm Screen shows the operator what caused the machine to fault and logs the information with a timestamp. The Alarm Screen is accessible from both the Automatic and the Manual Screen by pressing the Alarm Screen button in the lower left portion of the screen.

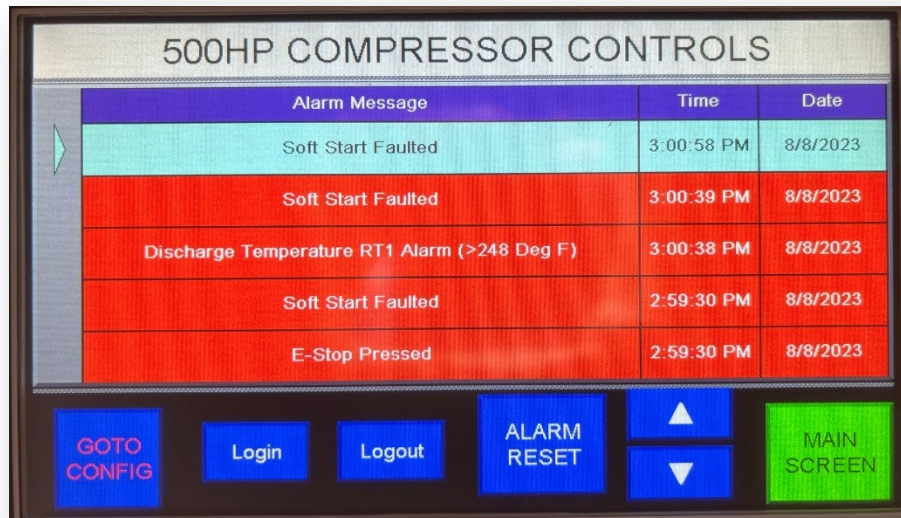


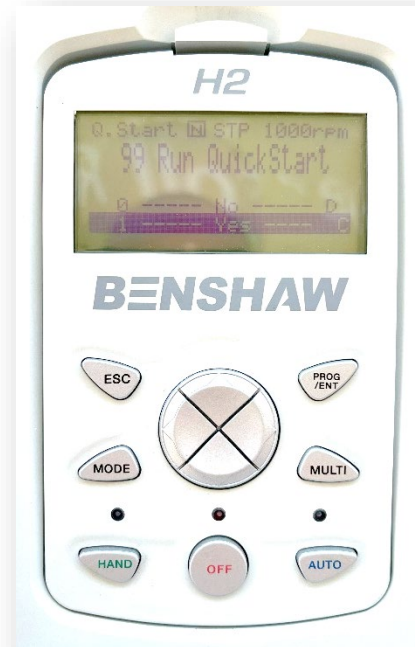
Figure 4 - Alarm Screen showing faults

All of the buttons across the bottom of the screen are interactive. To return to the Main Screen, press the green button in the lower right corner of the screen.

VFD CONTROLLER

The VFD (Variable Frequency Drive) for the compressor operates the fan motors for cooling the unit. The VFD monitors the cooling temperature and is designed to fluctuate depending on how hot the machine gets. When the PanelView is in AUTOMATIC MODE with the VFD controller set to AUTO (default setting upon startup), the controller does not need to be monitored or controlled for operation.

Text	Description
ESC	Escape
PROG/ENT	Selection button for different operations
MODE	Navigate through different modes
MULTI	Refer to VFD manual
HAND	Operates the VFD manually
OFF	Stops the VFD when running
AUTO	Allows the program to run automatically
ARROWS	Navigate the cursor within the display



⚠ CAUTION

When controlling the fan motor manually, the program no longer controls the speed relative to the system temperature. The user is responsible for monitoring and controlling the speed when using manually. Thermal shutdowns will remain active regardless of control method.

SOFT START CONTROLLER

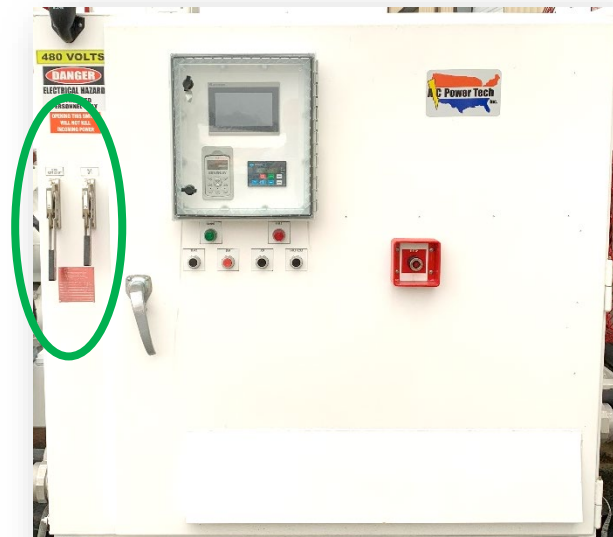
The Soft Start Controller displays data relative to the 500HP electric motor. Parameters may also be adjusted from the controller, however, it is suggested to contact Keystone Drill prior to any adjustments.

When in MANUAL MODE, all operations will be conducted from the PanelView display. The only interaction with the controller, in any MODE, would be to utilize the up and down arrows to view different information.



BREAKERS

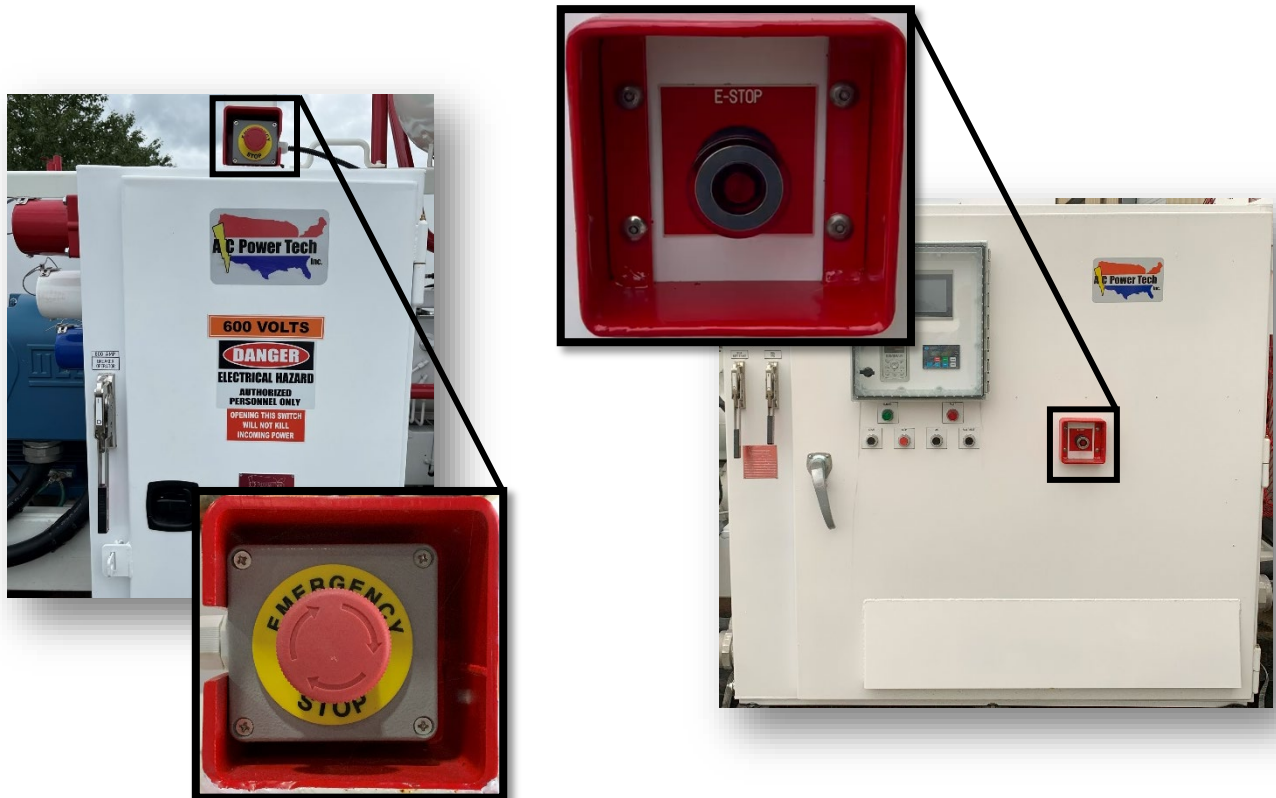
Each compressor is equipped with three breakers; 800A input breaker, 800A Soft Start breaker, and 60A VFD breaker. The input breaker is located on the input panel (lower left image), while the soft start breaker and the VFD breaker are located on the control panel (lower right image). When the breaker handles are down, with the black cover exposed, they are open (off). When the breaker handles are up, with the red cover exposed, they are closed (on).



EMERGENCY STOP

There are two E-STOP switches on each compressor, and on opposite sides of the unit. One switch is located on the front of the control panel (lower right image) and the other switch is located on the top of the input panel (lower left image).

Each E-STOP switch is enclosed in a red box to easily identify the location.

**⚠ WARNING**

Pressing the E-STOP switch does not kill incoming power.

⚠ CAUTION

Do not press the E-STOP switch to shut down the machine under normal conditions.

RECEPTACLES, POWER SUPPLY

The supply power will be connected to the unit at the input panel using the Eaton Roughneck connections located on the left side of the panel (image below). This configuration is designed to accept three single-feeders of 600VAC supply power, and a single equipment ground.

Cable receptacles will be male and the Panel receptacles will be female.

Color	Phase/Line
White/Black	L1
Red	L2
Blue	L3
Green	Ground



⚠ DANGER

Be sure that supply lines are de-energized before connecting or disconnecting cables.

When the cables are installed into the receptacles, be sure to utilize the locking device that retains the cable within the receptacle. Between use, install the weather caps into the receptacles to protect the connections from wear.

RUNNING THE COMPRESSOR

The following section will inform the operator on the proper procedures for unit preparation and starting the compressor. The steps are intended to be followed in order.

UNIT PREPARATION

Prior to connecting the supply power or starting the unit, the operator must inspect the electrical and mechanical components to ensure safe operation.

Open the Input Panel Breaker, Control Panel Breaker and VFD Breaker prior to inspecting the unit.

⚠ DANGER

All steps within this section must be done prior to connecting supply power. Failure to comply may result in serious injury or death. If any discrepancies are identified, lock out/tag out the unit per site SOP until the issue is corrected.

ELECTRICAL

- Check the grounding straps from the transformer, motor, and panels to the skid to ensure connections are tight and that the straps are intact.
- Ensure the receptacle locking devices are operating and that the locking pins are present.
- If the unit was stored outdoors, check inside the panels for any standing water that may need to be evacuated.
- Check any exposed cables for worn or damaged insulation.
- Ensure all guards, clamps, and supports are in place for cables.
- Check panels and enclosures for any damage.

MECHANICAL

- Check the belts on the fan motor for any damage and for proper tension.
- Check the fan guard for missing hardware or damage.
- Check compressor piping and hoses for any loose connections or damage.
- Ensure the coupling guard is in place and secure.
- Check for fluid leaks and ensure compressor oil level is within operating limits.

SUPPLY CABLES

Connect the power supply electric cables to the Input Panel receptacles. Once the cables are installed into the receptacles, be sure to utilize the locking device and pin to retain the cables. Cable color and receptacle color should match the proper phase.

Connect the supply ground to the equipment ground receptacle on the Input Panel.

When routing the cables, be sure to reduce the amount of strain on the cables and compressor equipment.



Be sure that supply lines are de-energized before connecting or disconnecting cables.

SERVICE AIR CONNECTION



All air pressure equipment installed in or connected to the compressor must have safe working pressure ratings of at least the safety valve setting, and materials compatible with the compressor oil.

Do not connect the air discharge on this compressor onto a common header with any other unit of any description, or any other source of compressed air, without first making sure a check-valve is used between the header and the compressor. If this compressor is connected in parallel with another compressor of higher discharge pressure and capacity, a safety hazard could occur in a back-flow condition.

Unrestricted air flow from a hose will result in a whipping motion of the hose which can cause serious injury or death. A safety device must be attached to the hose at the source of supply to reduce pressure in case of hose failure or other sudden pressure release. Reference: OSHA regulation 29 CFR Section 1926.302 (b).

AIR HOSE RESTRAINT

Safety devices such as hose restraints (whipchecks or whipsocks) must be properly sized and used to prevent hose whipping if a connection fails.

The mounts and/or shackles are to be of the same or greater strength as the restraint. An engineer should be consulted about suitability of whipchecks, whipsocks, mounts, mounting points, shackles, and fittings as well as strength rating of materials. Restraints must be used at the hose origination, termination, and each hose-to-hose connection.

Hoses can fail in areas other than at connecting points and require daily inspection of hoses for:

- Cuts, cracks or kinks
- Weakened clamps due to rust and corrosion
- Damaged connections
- Deformity
- Incorrect or incompatible components or fittings
- Any visible damage

Hoses must be selected that are rated for the application as to the maximum pressure and temperature to be encountered as well as compatible with the materials being conveyed inside the hose. Hoses must be compatible with the compressor oil.

The Compressor is equipped with tie-down lugs at the discharge pipe that are designed to accept shackles for restraining the hose.



BREAKERS

Prior to closing the breakers, the supply electric cables may be energized.

 **WARNING**

Follow site PPE guidelines and SOP for energizing/de-energizing systems. Do not open or close a breaker while the unit is under load.

Close the Input Panel Breaker. Close the Soft Start Breaker and the VFD Breaker on the Control Panel.

 **WARNING**

With the Breakers closed (ON), the system is considered energized.

AIR OUTLET

With the panel prepared to run, the compressor will need to be configured to minimize the initial load on the electric motor.

Open the manual blowdown valve to ensure the separator tank has been vented of all pressure. Once all pressure is vented, close the valve.

Close the discharge ball valve to isolate the compressor.

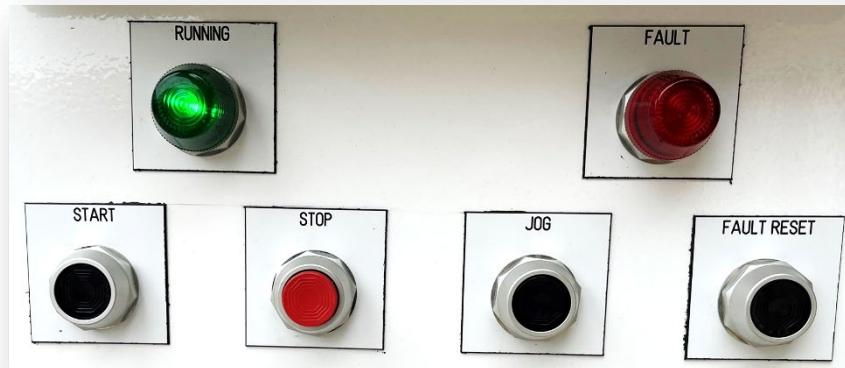
STARTING THE COMPRESSOR

If this is the first time running the compressor with this configuration, i.e., new site, different generator, different distribution panel, etc., the compressor rotation will need to be confirmed prior to running. There is a potential for the phases to be misconfigured between the power source and the compressor. Once correct rotation is confirmed, start-up may proceed. If incorrect rotation was observed, notify site management.

The Operator may observe and monitor parameters displayed on the PanelView. If feedback is within start-up parameters, the unit is ready to run in AUTOMATIC MODE.

AUTOMATIC MODE

Press the START button on the Control Panel.



When the machine enters the start-up process, the control panel monitors several parameters prior to starting, which may cause a delay in the starting process. Depending on the ambient temperature, the process may take up to 5 minutes if below 25°F.

⚠ CAUTION

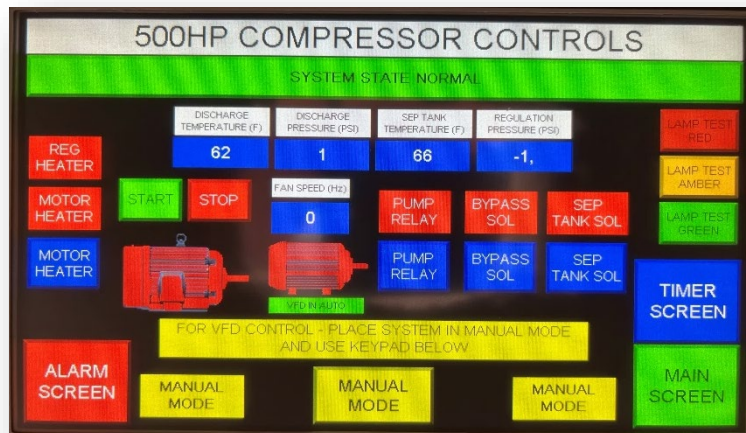
The regulation pressure of the compressor must be below 20psi in order for the control panel to allow the compressor to start.

When the unit enters the running process, the green indicator will illuminate (RUNNING).

In the event the controller detects a parameter outside of normal starting limits, the PanelView will display the cause. Depending on the cause, the starting process may enter a time-delayed process or may be unable to be run in AUTOMATIC MODE. If the unit fails to run in AUTOMATIC MODE, and the cause for being outside starting parameters is deemed safe for equipment and personnel to be run manually, proceed to starting the compressor in MANUAL MODE.

MANUAL MODE

Starting the compressor manually eliminates the automated process involved with different functions of the starting procedure. In order to properly start the compressor, this procedure needs to be conducted manually per the following:



1. Navigate to the MANUAL SCREEN on the PanelView controller.
2. Enter MANUAL MODE
3. Press the blue BYPASS SOL button (icon above button will turn from red to green)
4. Press the blue PUMP RELAY button (icon above button will turn from red to green)
5. Pause for five seconds
6. Press the green START button above the large motor image (image will turn from red to green)
7. Once the motor reaches full speed, press the blue PUMP RELAY button (icon above button will turn from green to red)
8. Press the blue BYPASS SOL button (icon above button will turn from green to red)
9. Using the VFD Controller, press the HAND button to enter MANUAL MODE
10. Using the arrows on the VFD Controller, navigate the cursor on the screen to adjust the speed of the cooling fan

⚠ CAUTION

When in MANUAL MODE, the fan speed is not controlled by the temperature of the discharge, as it is when in AUTOMATIC MODE. The Operator must monitor the temperature and adjust the fan speed accordingly.

MONITOR AND CONTROL

With the compressor started and operating at full speed, review the parameters on the PanelView display. The Operator should conduct a walk-around inspection of the unit to ensure that the compressor is running safely. The visual inspection should include:

- Check for fluid leaks
- Check for signs of air leaks and bad connections
- Check for excessive vibration
- Check for loosening hardware

If there is minimal discharge pressure displayed on the PanelView and the compressor motor is at full speed, it is possible the butterfly valve may be stuck. Use a wrench to mechanically operate the butterfly at the regulation pneumatic cylinder.

Following the visual inspection and assurance that the compressor is making air, the next subsequent compressor in the air package may begin the starting sequence.

If the discharge pressure is lower than the desired output, adjust the minimum relief valve on the separator tank to the proper range.

When there is a demand for air, the discharge ball valve can be opened to supply air downstream.

PARAMETERS

The equipment's status is indicated by the tower lights on the control panel and provides a general idea on the health of the compressor from a distance. Some of the parameters that are monitored by the control panel are:

Parameter	Warning (Amber)	Upper Limit/Fault (Red)
Discharge Temperature	230°F	248°F
Separator Tank Temperature	230°F	248°F
Motor Winding Thermostat	N/A	311°F

When the green tower light is illuminated, all parameters are within normal operating ranges. If parameters reach the warning limit, the amber tower light will illuminate, but the compressor will continue to run. If the upper limits are reached, the red tower light will illuminate, and the compressor will shut down in a fault status. The alarm will need to be reviewed and cleared prior to restarting the compressor.

SHUTTING DOWN

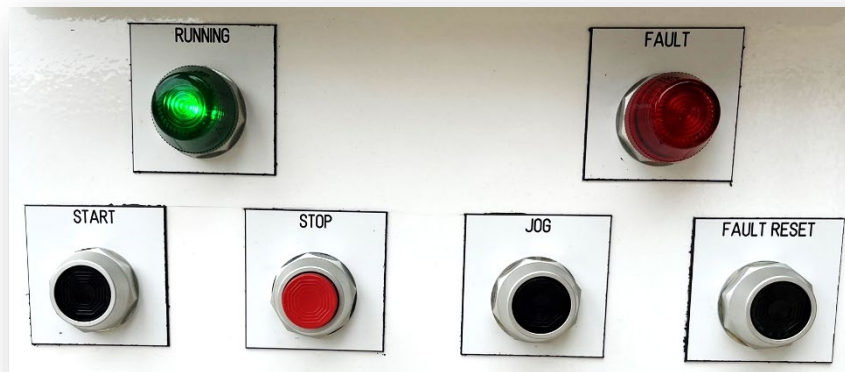
When the demand for air is complete, the shutdown sequence is to be followed in order to properly shut down the equipment.

⚠ WARNING

The E-STOP switches located on the compressor are not to be used for normal shut-down procedures. The E-STOP switches are for Emergency shut-down only. Repeated use may cause damage to the equipment.

Close the discharge ball valve to isolate the compressor. Once the compressor's regulation system equalizes the pressure, the unit is prepared for shutdown (Estimated 1-2 minutes).

Press the STOP button on the Control Panel.



The compressor will enter the shutdown process and the green indicator on the Control Panel "RUNNING" and the green tower light will begin to flash during the process. The shutdown process may take up to 90 seconds and is dependent on feedback within the system.

During the shutdown process, the fan may increase in speed to assist with cooling. As the Soft Starter receives the command for shutdown, the motor speed may fluctuate as it ramps-down for shutdown. This fluctuation is normal and is designed to reduce the impact of an immediate stop.

Once the motor stops, the automatic blowdown valve will relieve pressure from the separator tank. If the automatic blowdown valve fails to operate, pressure must be relieved from the system by means of the manual blowdown valve.

 **WARNING**

Even after pressure is relieved from the piping system, any air supply line from the compressor to a tool or compressor could remain under pressure and cause serious personal injury or death. After the compressor shuts down, carefully open a valve at any tool or compressor to exhaust the pressure in any line prior to removal or servicing.

 **CAUTION**

Never allow the compressor to sit stopped with pressure in the separator tank or piping. As a precaution, open the service valve.



MAINTENANCE

GENERAL INFORMATION

This section refers to the various components which require periodic maintenance and replacement.

The Maintenance Schedule indicates the various components' descriptions and the intervals when maintenance has to take place. Fluid capacities can be found in the General Data Section of this manual.

Compressed air can be dangerous if incorrectly handled. Please review all maintenance precautions listed below before attempting any maintenance work on the compressor.

MAINTENANCE PRECAUTIONS

Prior to attempting any maintenance work, ensure:

1. All pressure is vented from the system and the compressor cannot be started accidentally.
2. If the automatic blowdown valve fails to operate, pressure must be gradually relieved by operating the manual blowdown valve.
3. The discharge pipe/manifold area is depressurized by opening the discharge valve while keeping clear of any airflow from it.
4. Maintenance personnel are adequately trained, competent, and have read the Operation and Maintenance Manual.

WARNING

Pressure will remain in the system between the minimum pressure valve and the service valve after shutdown and operation of the automatic blowdown valve. This pressure must be relieved by disconnecting any downstream equipment and opening the discharge valve to atmosphere.

DANGER

Risk of electrical shock. Hazardous Voltage. Will cause serious injury or death. Disconnect external power source before servicing. Lockout/Tagout the equipment.

Prior to opening or removing panels or covers inside a compressor, ensure:

1. Anyone entering the compressor is aware of the reduced level of protection and the additional hazards, including hot surfaces and intermittently moving parts.
2. The compressor cannot be started. Post warning signs and/or fit anti-start devices. Use appropriate Lockout/Tagout procedures.

Prior to attempting any maintenance work on a running compressor, ensure:

1. The work carried out is limited to only those tasks which require the compressor to run.
2. The work carried out with safety protection devices disabled or removed is limited to only those tasks which require the compressor to be running with safety protection devices disabled or removed.
3. All hazards present are known (e.g. pressurized components, electrically live components, removed panels, covers and guards, extreme temperatures, inflow and outflow of air, intermittently moving parts, safety valve discharge, etc.).
4. Appropriate personal protective equipment is worn.
5. Loose clothing, jewelry, long hair etc. is made safe.
6. Warning signs indicating that Maintenance Work is in Progress are posted in a position that can be clearly seen.

Upon completion of maintenance task and prior to returning the compressor into service, ensure:

1. The compressor is suitably tested.
2. All guards and safety protection devices are refitted.
3. All panels are replaced, canopy and doors closed.
4. Hazardous materials are effectively contained and disposed of.

The maintenance schedule in this manual describes the service intervals that should be followed for “normal” applications of this compressor. This page may be reproduced and used as a checklist by service personnel.

In more severe applications such as sandblasting, quarry drilling, well drilling, and oil and gas drilling, more frequent service intervals will be required to ensure long component life.

Dust and dirt, high humidity, and high temperatures will affect lubricant life and service intervals for components such as inlet air filters, oil separation elements and oil filters.

PREVENTIVE MAINTENANCE SCHEDULE

If operating in extreme conditions (very hot, cold, dusty or wet), these time periods should be reduced.

CONSUMABLES		
PART #	DESCRIPTION	
627999	Compressor Oil Filter Element	
608507	Separator Filter Element	
600844	Primary Air Filter Element	
604905	Secondary Air Filter Element	
MEQ10	Panel – Fuse, 10A, Time Delay	
REMANUFACTURED AIRENDS		
	Assembly, Reman Airend, 1170	
	Assembly, Reman Airend, 1250	
RECOMMENDED DOOSAN FLUIDS:		
Using these fluids with original Doosan filters can extend warranty. Refer to operators manual warranty section for details or contact your KDS representative.		
Compressor Fluid	1 Gal. 5 Gal. 55 Gal.	
XHP605	--- 601377 601378	
LEGEND		
R= Replace	D= Drain	WI= When Indicated
T= Test	G= Grease	CR= Check and Report
C= Check (and Adjust or Replace if Necessary)		

	DAILY	WKLY	MO.	3 MOS	6 MOS	9 MOS	12MOS	18MOS
			250 Hrs	500 Hrs	1000 Hrs	1500 Hrs	2000 Hrs	3000 Hrs
Compressor Oil Level	C							
Panel/View	C							
Oil Leaks	C							
Emergency Stop	T							
Hoses (Oil, Air, etc.)			C					
Air Cleaner System			C					
Oil Cooler Exterior			C					
Safety Valve				C				
Fasteners, Guards				C				
Air Cleaner Elements				R/WI				
Oil Cooler			C					
Torque Electrical Connections							C	
Compressor Oil					R			
Oil Separator Element							R	
Separator Tank Exterior							CR	
Scavenge Orifice & Related Parts							C	
Scavenge Line							C	
Compressor Oil Filter Element						R		
Water Separator Drain	C							
Check for Leaks (Oil, Air)		C						

For Parts and Service Call: 1-800-221-0586

SCAVENGE LINE

The scavenge line runs from the combined orifice/check valve at drop tube in the separator tank to the fitting located in the airend.

Check that the scavenge line and tube are clear of any obstruction. Refer to the Maintenance Schedule for recommended servicing intervals. Any blockage will result in oil carryover into the discharge air.

COMPRESSOR OIL FILTER

Refer to the Maintenance Schedule for the recommended servicing intervals.

REMOVAL

WARNING

Do not remove the filter(s) without first making sure the compressor is shut down and the system has been completely relieved of all air pressure. (Refer to SHUTTING DOWN in the OPERATING INSTRUCTIONS section of this manual).

Clean the exterior of the filter housing and remove the spin-on element.

INSPECTION

Inspect the oil filter head to be sure the gasket was removed with the oil filter element. Clean the gasket seal area on the oil filter head.

CAUTION

If there is any indication of the formation of varnishes, shellacs or lacquers on the filter element, it is a warning that the compressor lubricating and cooling oil has deteriorated and that it should be changed immediately. Refer to LUBRICATION section.

Installing a new oil filter element when the old gasket remains on the filter head will cause an oil leak and can cause property damage.

REASSEMBLY

Clean the filter gasket contact area and install the new element. Tighten until the gasket makes contact with the filter housing. Tighten an additional $\frac{1}{2}$ to $\frac{3}{4}$ of a revolution.

**CAUTION**

Start the compressor (refer to **RUNNING THE COMPRESSOR and **STARTING THE COMPRESSOR** in the **OPERATING INSTRUCTIONS** section of this manual) and check for leakage before the compressor is put back into service.**

COMPRESSOR OIL SEPARATOR ELEMENT

Refer to the Maintenance Schedule in this section for the recommended servicing intervals. If the element has to be replaced, then proceed as follows:

REMOVAL

**WARNING**

Do not remove the filter(s) without first making sure the compressor is shut down and the system has been completely relieved of all air pressure. (Refer to **SHUTTING DOWN in the **OPERATING INSTRUCTIONS** section of this manual).**

Disconnect all hoses and tubes from the separator tank cover plate. Remove the drop-tube from the separator tank cover plate and then remove the cover plate. Remove the separator element.

INSPECTION

Examine the separator element. Examine all hoses and tubes and replace if necessary.

REASSEMBLY

Thoroughly clean the orifice/drop tube and filter gasket contact area before reassembly. Install the new element.

**WARNING**

DO NOT remove the staple from the anti-static gasket on the separator element since it serves to ground any possible static build-up. Do not use gasket sealant since this will affect electrical conductivity.

Reposition the cover plate, taking care not to damage the gasket, and replace the cover plate screws tightening in a criss-cross pattern to the recommended torque (refer to the torque values in this section).

Reconnect all hoses and tubes to the separator tank cover plate.

Replace the compressor oil (refer to **LUBRICATION** section).

**CAUTION**

Start the compressor (refer to RUNNING THE COMPRESSOR and STARTING THE COMPRESSOR in the OPERATING INSTRUCTIONS section of this manual) and check for leakage before the compressor is put back into service.

COMPRESSOR OIL COOLER

When grease, oil and dirt accumulate on the exterior surfaces of the heat exchangers, the efficiency is impaired. It is recommended that the heat exchangers be cleaned per the maintenance schedule in this manual, by directing a jet of compressed air. This should remove any accumulation of oil, grease and dirt from the exterior cores of the cooler so that the entire cooling area can radiate heat into the air stream.

AIR FILTER ELEMENTS

The air filter elements should be replaced regularly (refer to the Maintenance Schedule) or when indicated on the control panel, whichever comes first. The air-cleaner pre-cleaner dumps should be cleaned as indicated in the Maintenance Schedule (more frequently in dusty operating conditions).

REMOVAL

**CAUTION**

Never remove and replace element(s) when the compressor is running.

VSD filter is replaced by unlatching the cover. Clean the exterior of the filter housing and remove the filter element.

If the Safety Element is to be replaced, thoroughly clean the interior of the filter housing prior to removing the safety element.

INSPECTION

Check for cracks, holes or any other damage to the element by holding it up to a light source, or by passing a lamp inside.

**CAUTION**

If inspection reveals damage to the main element, the Safety Element must be replaced.

Check the seal at the end of the element and replace if any sign of damage is evident.

REASSEMBLY

Assemble the new element into the filter housing ensuring that the seal seats properly. Before restarting the compressor, ensure all clamps are tight.

VENTILATION

Always check that the air inlets and outlets are clear of debris.

PRESSURE SYSTEM

Regularly, it is necessary to inspect the external surfaces of the system, from the airend through the service valve(s) including hoses, tubes, tube fittings and the separator tank, for visible signs of impact damage, excessive corrosion, abrasion, tightness, and chafing. Any suspect parts should be replaced before the compressor is put back into service.

ELECTRICAL SYSTEM



Risk of electrical shock. Hazardous Voltage. Will cause serious injury or death. Disconnect external power source before servicing. Lockout/Tagout the equipment. This compressor contains a Soft Start and a Variable Frequency Drive. When it is switched off and motor is shut down, the capacitors store a potentially lethal high voltage. DO NOT REMOVE COVERS FROM THE DRIVES and attempt any service work unless properly trained. There are no user serviceable components under the individual drive covers. Wait at least 10 minutes after disconnecting power before servicing or troubleshooting Drive component fuses or connections in the Control Panel.

Check the security of electrical devices and sensors to ensure terminals and or connectors are tight. Loose connections may cause local hot spot oxidation.

When removing connectors from electrical devices and sensors, inspect the terminals to ensure they have electrical grease on them. If electrical grease is not present or very minimal, then add a small amount of electrical grease to the terminals.

Dirty and/or corroded electrical terminals can be cleaned using electrical contact cleaner.

Inspect the components and wiring for signs of overheating i.e. discoloration, charring of cables, deformation of parts, acrid smells and blistered paint.

Periodically check all electrical connections for tightness and re-torque per Maintenance Chart.

LUBRICATION

**⚠ CAUTION**

Always check the oil levels before a new compressor is put into service.

If, for any reason, the compressor has been drained, it must be refilled with new oil before it is put into operation.

COMPRESSOR OIL

Refer to the Maintenance Schedule in this section for service intervals.

NOTE: If the compressor has been operating under adverse conditions, or has suffered long shutdown periods, then more frequent service intervals will be required.

**⚠ WARNING**

DO NOT, under any circumstances, remove any drain plugs or the oil filler-plug from the compressor lubricating and cooling system without first making sure that the compressor is shut down and the system has been completely relieved of all air pressure (refer to SHUTTING DOWN in the OPERATING INSTRUCTIONS section of this manual).

Completely drain the separator tank and the piping and oil cooler by removing the drain plug(s) and collecting the used oil in a suitable container.

Replace the drain plug(s) ensuring that each one is secure.

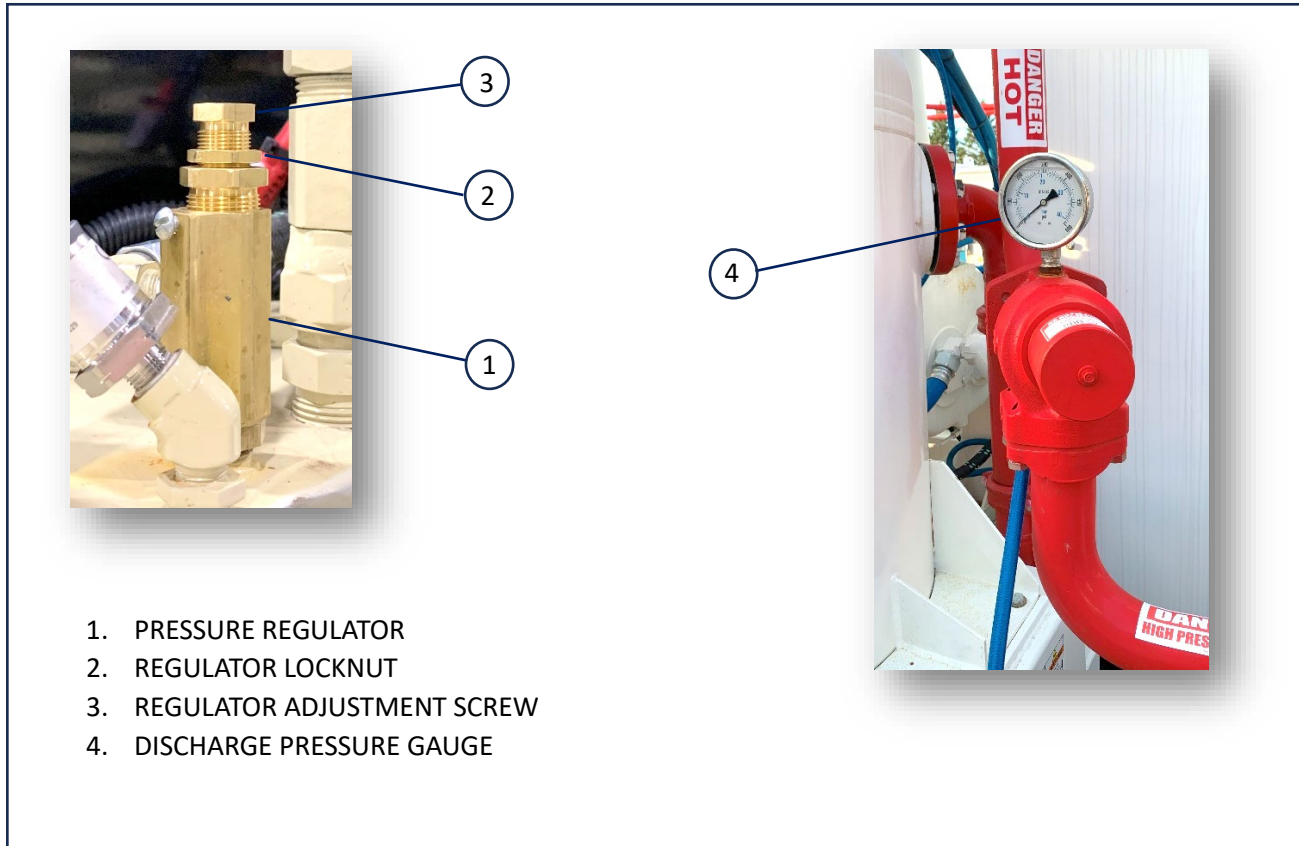
NOTE: If the oil is drained immediately after the compressor has been running, then most of the sediment will be in suspension and will therefore drain more readily. However, the oil will be hot and care must be taken to avoid contact with the skin or eyes.

**⚠ CAUTION**

Some oil mixtures are incompatible and result in the formation of varnishes, shellacs or lacquers which may be insoluble. Refer to the Portable Compressor Oil Chart.

PRESSURE REGULATION

Normally, regulation requires no adjusting, but if proper adjustment is lost, proceed as follows:



BEFORE STARTING

1. Atop the separator cover at the Pressure Regulator (Item 1) loosen the Locknut (Item 2) counterclockwise. Turn the Adjustment Screw (Item 3) counterclockwise one full turn.

NOTE: Turning the Adjustment Screw counterclockwise decreases the discharge pressure. Turning it clockwise increases the discharge pressure.

AFTER STARTING

2. Allow the compressor to warm up.
3. Open and adjust service valve on outside of the compressor to obtain the rated operating pressure on the Discharge Pressure Gauge (Item 4).

NOTE: If the rated operating pressure cannot be maintained with motor at full load speed, turn the Regulator Adjustment Screw (Item 3) as needed and adjust the service valve until motor maintains rated full load speed.

4. Close service valve.
5. If necessary, repeat step 3.
6. At Pressure Regulator (Item 1) tighten the Locknut (Item 2).

TORQUE VALUES

TABLE 1 INCH FASTENERS					TABLE 2 METRIC FASTENERS										
CAPSCREW OR NUT THREAD SIZE AND PITCH	NOMINAL DESIGN TORQUE				TYPICAL RECTANGULAR TORQUE PATTERN		NOMINAL DESIGN TORQUE						TYPICAL RECTANGULAR TORQUE PATTERN		
	SAE J249 GRADE 5 (HEAD MARKINGS)		SAE J249 GRADE 8 (HEAD MARKINGS)		PROPERTY GRADE 8.8 (HEAD MARKINGS)		PROPERTY GRADE 10.9 (HEAD MARKINGS)		PROPERTY GRADE 12.9 (HEAD MARKINGS)		TYPICAL SQUARE TORQUE PATTERN		TYPICAL CIRCULAR TORQUE PATTERN		
	(Nm.)	(FT LBF)	(Nm.)	(FT LBF)	(Nm.)	(FT LBF)	(Nm.)	(FT LBF)	(Nm.)	(FT LBF)	(Nm.)	(FT LBF)	(Nm.)	(FT LBF)	
1/4 - 20	11	8	16	12	<p>TYPICAL CIRCULAR TORQUE PATTERN</p>		M6 X 1.0	11	8	15	11	18	13	<p>TYPICAL CIRCULAR TORQUE PATTERN</p>	
5/16 - 18	24	17	33	25			M8 X 1.25	26	19	36	27	43	31		
3/8 - 16	42	31	59	44			M10 X 1.5	52	38	72	53	84	62		
7/16 - 14	67	49	95	70			M12 X 1.75	91	67	126	93	147	109		
1/2 - 13	102	75	144	106			M14 X 2.0	145	107	200	148	234	173		
9/16 - 12	148	109	208	154			M16 X 2.0	226	166	313	231	365	270		
5/8 - 11	203	150	287	212			M20 X 2.5	441	325	610	450	713	526		
3/4 - 10	361	264	509	376											

WELDING

Welding on the electric unit is prohibited, unless the guidelines specified in this section are followed. Damage to the electrical components may occur if the welder does not follow the procedure as outlined.

DO NOT attempt to weld while there is power to the unit or while the compressor is running.

DO NOT weld directly to the control panel or transformer enclosures.

DO WEAR appropriate PPE when welding.

All steps outlined are not required to be followed chronologically but must all be complete prior to welding.

- De-energize and disconnect incoming supply power to the unit. Follow LOTO procedures according to the site.
- Open the main breaker on the input panel, and the two breakers on the control panel.
- Determine the best location for grounding the welder.
 - Ensure that the location is as close as possible to the welding work being performed.
 - Prepare the surface to provide sufficient contact.
 - Certain equipment on the unit is isolated and utilizes ground straps for continuity between components. Ensure that the grounding location is directly connected to the work being performed.

Following completion of the outlined process, welding may occur. Be aware of welding being conducted and proximity to other components on the unit to prevent unintended damage.



LUBRICATION

GENERAL INFORMATION

Lubrication is an essential part of preventive maintenance, largely affecting the useful life of the compressor. Different lubricants are needed, and some components require more frequent lubrication than others. Therefore, it is important that the instructions regarding types of lubricants and the frequency of their application be explicitly followed. Periodic lubrication of the moving parts reduces to a minimum the possibility of mechanical failures.

The Maintenance Schedule shows those items requiring regular service and the interval in which maintenance should be performed. A regular service program should be developed to include all items and fluids. These intervals are based on average operating conditions. In the event of extremely severe (hot, cold, dusty or wet) operating conditions, more frequent lubrication than specified may be necessary.

All filters and filter elements for air and compressor oil must be obtained through KDS to assure the proper size and filtration for the compressor.

COMPRESSOR OIL CHANGE

These compressors are normally furnished with an initial supply of oil sufficient to allow operation until the first service interval indicated in the Maintenance Schedule. If a compressor has been completely drained of all oil, it must be refilled with new oil before it is placed in operation. Refer to specifications in the COMPRESSOR OIL CHART.

NOTE: Some oil types are incompatible when mixed and result in the formation of varnishes, shellacs, or lacquers which may be insoluble. Such deposits can cause serious troubles including clogging of the filters. Where possible, do NOT mix oils of different types and avoid mixing different brands. A type or brand change is best made at the time of a complete oil drain and refill.

If the unit has been operated for the time/hours indicated in the Maintenance Schedule, it should be completely drained of oil. If the compressor has been operated under adverse conditions, or after long periods in storage, an earlier change may be necessary as oil deteriorates with time as well as by operating conditions.



CAUTION

In most severe applications such as sandblasting, quarry drilling, well drilling, and oil and gas drilling, more frequent service intervals will be required to ensure long component life.

⚠ WARNING

High pressure air can cause severe injury or death from hot oil and flying parts. Always relieve pressure before removing caps, plugs, covers or other parts from pressurized air system. Ensure the air pressure gauge reads zero (0) pressure and ensure there is no air discharge when opening the manual blowdown valve.

An oil change is good insurance against the accumulation of dirt, sludge, or oxidized oil products.

Completely drain the separator tank and the piping and oil cooler by removing the drain plug(s) and collecting the used oil in a suitable container.

Replace the drain plug(s) ensuring that each one is secure.

NOTE: If the oil is drained immediately after the compressor has been running, then most of the sediment will be in suspension and will therefore drain more readily. However, the oil will be hot and care must be taken to avoid contact with the skin or eyes.

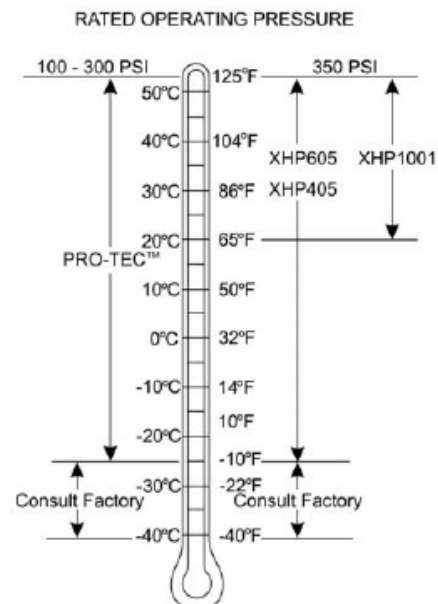
COMPRESSOR OIL CHART

Refer to this chart for the correct compressor oil required. Note that the selection of oil is dependent on the rated operating pressure of the compressor and the ambient temperature expected to be encountered before the next oil change.

NOTE: Oils listed as “preferred” are required for extended warranty.

Compressor oil carryover (oil consumption) may be greater with the use of alternative oils.

Design Operating Pressure	Ambient Temperature	Specification
100 psi to 300 psi	-10°F to 125°F (-23°C to 52°C)	Preferred: Pro-Tec™ Alternate: ISO Viscosity Grade 46 with rust and oxidation inhibitors, designed for air compressor service.
350 psi	-10°F to 125°F (-23°C to 52°C) 65°F to 125°F (18°C to 52°C)	Preferred: XHP 605 Alternate: XHP405 ISO Viscosity Grade 68 Group 3 or 5 with rust and oxidation inhibitors designed for air compressor service. Preferred: XHP605 XHP1001



Preferred Fluids – Use of these fluids with original filters can extend airtend warranty. Refer to the operator’s manual warranty section for details or contact your KDS representative.

Preferred Fluids	1 gal. (3.8 Litre)	5 gal. (19.0 Litre)	55 gal. (208.2 Litre)	220 gal. (836 Litre)
Pro-Tec™	36899698	36899706	36899714	36899722
XHP605	-	22252076	22252050	22252068
XHP1001	-	35612738	35300516	-
XHP405	-	22252126	22252100	22252118
Hydraulic Fluid - 10° to 125°F (-23C° to 52°C)	-	54758321	54758339	54758347

ELECTRIC MOTOR LUBRICATION CHART

500HP COMPRESSOR MOTOR		
	DRIVE END	NON-DRIVE END
BEARING TYPE	6322 C3	6319 C3
SEALING	WSeal	WSeal
LUBRICATION INTERVAL	6000 hours	8000 hours
LUBRICATION AMOUNT	60g	45g
LUBRICATION TYPE	Mobil Polyrex EM	Mobil Polyrex EM

30HP FAN MOTOR		
	DRIVE END	NON-DRIVE END
BEARING TYPE	6311 C3	6211 C3
DE BEARING SEAL	V Ring	V Ring
LUBRICATION INTERVAL	20,000 hours	20,000 hours
LUBRICANT AMOUNT	18g	11g
GREASE TYPE	Mobil Polyrex EM	Mobil Polyrex EM

GENERAL LUBRICATION CHART

COOLING FAN HUB	250 hours
ELECTRICAL PANEL DOOR HINGES	AS NEEDED



TROUBLESHOOTING

INTRODUCTION

Troubleshooting for an air compressor is an organized study of a particular problem or series of problems and a planned method of procedure for investigation and correction. The troubleshooting chart that follows includes some of the problems that an operator may encounter during the operation of a compressor.

The chart does not attempt to list all of the troubles that may occur, nor does it attempt to give all of the answers for correction of the problems. The chart does give those problems that are most apt to occur.

To use the troubleshooting chart:

- A. Find the “complaint” depicted as a bold heading.
- B. Follow down that column to find the potential cause or causes. The causes are listed in order to suggest an order to follow in troubleshooting.

THINK BEFORE ACTING

Study the problem thoroughly and ask yourself these questions:

1. What were the warning signals that preceded the trouble?
2. Has a similar trouble occurred before?
3. What previous maintenance work has been done?
4. If the compressor will still operate, is it safe to continue operating it to make further checks?

DO THE SIMPLEST THINGS FIRST

Most troubles are simple and easily corrected. For example, most complaints are “low capacity” which may be caused by too low a motor speed or “compressor over-heats” which may be caused by low oil level.

Always check the easiest and most obvious thing first; following this simple rule will save time and trouble.

DOUBLE CHECK BEFORE DISASSEMBLY

The source of most compressor troubles can be traced not to one component alone, but to the relationship of one component to another. Too often, a compressor can be partially disassembled in search of the cause of a certain trouble and all evidence is destroyed during disassembly. Check again to be sure an easy solution to the problem has not been overlooked.

FIND AND CORRECT BASIC CAUSE

After a mechanical failure has been corrected, be sure to locate and correct the cause of the trouble so the same failure will not be repeated. For example, a complaint of “premature breakdown” may be corrected by repairing any improper wiring connections, but something caused the defective wiring. The cause may be excessive vibration.

COMPLAINT	CAUSE	CORRECTION
1. Compressor has shutdown unexpectedly	Compressor oil temperature is too high	See Complaint 4
	Defective sensor	Identify and check sensor. Replace if necessary. See Electronic Service Manual.
	Blown fuse	Identify and replace fuse. See Electronic Service Manual.
	Airend malfunction	See Complaint 4
	Improper supply power	Identify cause for overvoltage or undervoltage. See Electronic Service Manual.
	Motor overvoltage	Compressor under load at startup. Ensure butterfly valve operation.
2. Compressor will not start or run	Emergency Stop is pushed	Check Emergency Stop switch positions and operation
	Compressor oil temperature too high	See Complaint 4
	Loose wire connection	Check wires at switches and connectors to find loose connection. Make repairs. See Electronic Service Manual.
	Defective sensor	Identify and check sensor. Replace if necessary. See Electronic Service Manual.
	Airend malfunction	See Complaint 4
	System is pressurized	Safely evacuate system pressure using the blowdown valve.
3. Low electrical system voltage	Loose wire connection	Check wires at switches and connectors to find loose connection. Make repairs. See Electronic Service Manual.
	Improper supply power	Identify cause for overvoltage or undervoltage. See Electronic Service Manual.
4. High compressor oil temperature	Ambient temperature above rated ambient temperature range	Operate in cooler environment.
	Compressor tilted beyond out-of-level operating limit	Reposition or relocate compressor to be more level.
	Low compressor oil level	Add compressor oil. Look for and repair any leaks.
	Wrong compressor oil	Change compressor oil. Review compressor oil specification.

COMPLAINT	CAUSE	CORRECTION
	Malfunctioning oil cooler pressure relief valve	Repair or replace valve.
	Blocked or restricted oil lines	Clean by flushing or replace lines.
	Airend malfunctioning	See Complaint 8, 9.
	Dirty cooler	Clean exterior of cooler
	Dirty operating conditions	Move compressor to cleaner environment.
	Clogged compressor oil filter(s)	Replace compressor oil filter(s) and change compressor oil.
	Fan speed too low	Adjust fan speed.
5. Excessive vibration	Rubber mounting isolators loose or damaged	Tighten or replace.
	Defective or imbalanced fan	Replace fan.
	Airend malfunctioning	See Complaint 8, 9.
	Defective airend drive coupling	Replace coupling.
6. Low air delivery / Low CFM	Clogged air filter element(s)	Clean or replace air filter element(s).
	Incorrect pressure regulation adjustment	Make adjustments per this manual.
	Malfunctioning inlet unloader/butterfly valve	Inspect valve. Make adjustments per this manual.
	Wrong air filter element(s)	Install correct air filter element(s).
	Compressed air leaks	Locate and repair leaks.
7. Short air filter life	Dirty operating conditions	Move compressor to cleaner environment.
	Wrong air filter element(s)	Install correct air filter element(s).
	Inadequate air filter element cleaning	Install new air filter element(s).
	Incorrect shut down procedure	Comply with procedure in this manual.
8. Compressor will not unload	Malfunctioning inlet unloader/butterfly valve	Inspect valve. Make adjustments per this manual.
	Malfunctioning pressure regulator	Check pressure regulator. Check regulation lines for leaks.
	Ice in regulation lines and/or regulation orifice	Apply heat to lines and/or orifice. Check operation of DC electric heaters, if equipped.
	Plugged vent leak	Clean and/or replace.

COMPLAINT	CAUSE	CORRECTION
9. Safety valve opens	Operating pressure too high	Reduce pressure to rated operating pressure.
	Malfunctioning inlet unloader/butterfly valve	Inspect valve. Make adjustments per this manual.
	Defective safety valve	Replace safety valve.
	Compressor will not unload fast enough	Check pressure regulator. Check regulation lines for leaks.
	Ice in regulation lines and/or regulation orifice	Apply heat to lines and/or orifice. Check operation of DC electric heaters, if equipped.
10. Excessive carryover (compressor oil in the compressed air)	Blocked separator scavenge line	Check scavenge line, drop tube, and orifice. Clean and replace as needed.
	Deteriorated separator element	Replace separator element.
	Separator tank pressure too low	Check the minimum pressure valve. Repair or replace as necessary.



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