

MODEL#:

SERIAL#:

DESCRIPTION OF OPERATION



For compressors equipped with the KNW Series Compressor Operator Panel with Graphic Touchscreen "HMI Terminal"

PROGRAM NUMBER:



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SAFETY PRECAUTIONS



Safety notices, marked with this symbol, are used in this publication to emphasize that a hazardous condition exists that could cause personal injury and/or damage to the equipment.

1. Read and understand the contents of this manual before installing, operating or maintaining the compressor.

2. Electricity and compressed air are dangerous. When performing maintenance or service work, make absolutely sure the electrical supply is disconnected and locked out. The discharge air lines service valve (customer furnished) must be closed and the compressor relieved of all internal pressure. DO NOT rely on the discharge air line check valve.

3. Compressed air from this unit must not be used for breathing or food processing without adequate filtering and monitoring to meet OSHA 29 CFR 1910 or FDA 21 CFR 178.3570.

4. Do not allow flammable, toxic or corrosive gases to enter the air inlet system or electrical devices.

5. Never attempt to work on compressor or remove guards, panels, covers, shields, etc. while the compressor is in operation.

6. Periodically confirm that all safety and Alarm devices are operating properly.

7. Do not override any safety or Alarm device.

8. Make certain all associated pipe and equipment beyond this compressor is compatible with maximum pressures and temperatures to be encountered during normal and adverse operation. Do not use plastic pipe in the compressed air system.

9. Keep doors closed during normal operation. The noise level inside cabinet exceeds 90 decibels (dbA) and the operating temperature of some components is sufficient to burn the skin.

10. 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.

Description of Operation

PROGRAM NUMBER: KL011B MODEL NUMBER: SERIAL NUMBER:

Revisions				
Revision	Author	Date	Description	
KL001J	GEW	01-Oct-2012	Internal program changes; no screen updates.	
KL011A	GEW	25-Jan-2013	Revisions for 2013 model year.	
	GEW	16-Aug-2013	Client/Server Lead/Lag through ENI module.	
KL011B	GEW	09-Oct-2013	Internal program changes; no screen updates.	

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1. Overview

The Kobelco KNW Series air compressor is a heavy duty, two-stage, rotary screw design that provides completely oil-free compressed air. Air is drawn in from outside the compressor, passes through a filter, is compressed to a medium pressure by the first compressor stage, passes through the intercooler to reduce temperature, is compressed to full pressure by the second stage, and finally passes through the aftercooler to reduce temperature. Both the first and second stages are driven by a single main motor. Lubricating oil is continually passed over the bearings and gears; an oil cooler prevents the oil from overheating. Air-cooled and water-cooled models are available. All models include a cabinet cooling fan to prevent overheating of the motor and cabinet components.

Resistance temperature detectors and pressure transducers are used to monitor compressor operating conditions, including detection of system air pressure. The

compressor can operate in two modes, Loaded and Unloaded. In Unloaded mode, no air is compressed, and energy consumption is greatly reduced. Loading and unloading allows the compressor to maintain system pressure in a narrow band in response to variable demand.

This description of operation focuses on the compressor control system, including the operator interface, standard control options, and special options such as Lead/Lag pressure ranges and remote control. For more information on compressor operation, including maintenance instructions and a troubleshooting guide, please consult the Operations Manual.

2. Compressor Control

The Kobelco KNW Series Oil-Free Rotary Screw Air Compressor Operator Panel uses a Programmable Logic Controller (PLC) to control and monitor compressor operation. PLC operations include controlled sequential starting and stopping, pressure control, and protection from conditions that could damage the compressor. Pilot lights, viewable from a distance, are provided for indication of operating conditions. An audible alarm is provided for alarm annunciation. Pushbuttons are provided for specific control functions, allowing continued compressor operation in the event that the terminal is off-line.

The HMI terminal is an LCD graphic display with touchscreen. The HMI terminal shows operating conditions, pressures, and temperatures. Messages to direct the operator for service, pre-alarms, and Alarms will be shown when necessary. Required settings for pressure control, temperature alarms, and control time delays are viewable and may be modified using the touchscreen. The HMI terminal will automatically 'dim' to a sleep condition if inactive, and awakens on any touch contact.

2.1 Pilot Devices

Pilot devices are located adjacent to the HMI terminal for operational control and indication. These include:

STANDBY	Green pilot light. Indicates the compressor is not running, but may automatically start at any time. Start will occur when system pressure drops to a programmed pressure. When flashing, indicates a request for remote mode confirmation (see section 5).
RUN	Yellow pilot light. Indicates the compressor is running.
LOADED	White pilot light. Indicates the compressor is loaded, air is being compressed.
ALERT	Blue pilot light. Indicates the compressor requires service. Also indicates a temperature pre-alarm, showing that compressor temperatures are approaching the "Alarm" settings. The light flashes until the "Alert" is acknowledged, then is on steady until the "Alert" condition is reset

ALARM	Red pilot light. Indicates the compressor has shutdown due to an "Alarm" condition. The light flashes until the "Alarm" is acknowledged, then is on steady until the "Alarm" condition is reset.
	Beeper. An audible alarm which sounds for an Alert or an Alarm.
RESET	Blue pushbutton marked with "R". Resets "Alert"/"Alarm" indication. If the "Alarm" or "Alert" condition has not been corrected the indication will return after one second. The compressor will not be allowed to start until an "Alarm" condition is reset successfully.
START	Green pushbutton marked with " ". Initiates the compressor start sequence. NOTE: In Remote mode, pressing 'Start' enables remote start control (see section 5).
STOP	Red pushbutton marked with "O". Initiates the compressor stop sequence.

2.2 Interface Contacts

The standard compressor includes four relays which can be used to remotely monitor the status of the following:

- Running (Energized when running)
- Loaded (Energized when loaded)
- Alarm (De-energized when in alarm condition)
- Alert (Energized when in alert condition)

The relays are Form C contacts, rated 5 amps at 240 volts.

Additional output relays can be added to monitor other conditions; see section 5.4 for information on configurable outputs.

2.3 HMI Terminal Overview

The HMI terminal shows requested information on selectable screens. Any time a touch zone, or "key", is pressed, an audible beep will sound. The terminal may also be used to modify settings affecting compressor operation, and to change the configuration of the compressor. Accessing some sections requires a password.

Blue touchzones with yellow lettering are used for navigation or for special functions; pressing a blue touchzone will bring up the screen identified on the touchzone, unless otherwise specified. Black touchzones are used to modify settings.

- When a touchzone is intended to modify a number, it will bring up a Numeric Keypad to enter the new number.
- If a touchzone toggles a setting and more than two options are available, it will bring up a dropdown menu to select the setting.
- When an attempt is made to modify a setting requiring password access, the Password Entry keypad will be brought up.

Numerical Keypad for Data Entry



Value can be changed one number at a time or cleared and a new value entered. Current value displayed at top.

Password Entry

Password:								
Ĥ	B	С	D	E	F	G	Н	ESC
Ι	J	K	L	n	N	0	Р	<-
Q	R	S	T	U	V	W	x	CLR
Y	Z	Ñ	É	Ó	Â	e	MAIL	DEL
a-z	0-9	SPC	L		«	»	<	L

Touch the '0-9' key to show number keys for password entry.

Pass	word	: [
<	>	:	;	#	7	8	9	ESC
C)	,	•	•	4	5	6	<-
ſ]	å	?	t	1	2	3	CLR
×	=	*	/	+	-	0	•	DEL
A-Z	a-z	SPC	L		«	»	<	L

Key in password for desired access level.

Press key to accept password and return to Utility page.

Passwords are required to access many settings; see individual screens for password information.

2.4 HMI Terminal Main Screens

The following screens are used to display compressor operational information and navigate to settings screens.





'Temperatures' screen

- Accessible from: Splash, Pressures, Menu
- Displays compressor temperature readings, standby status, lead/lag status, and local/remote status.
- May display "PLC NOT IN RUN". This message indicates that the PLC is not in RUN mode.
- May display "GOING TO LAG", indicating that compressor is transitioning from Lead to Lag mode see Client/Server Lead/Lag information in section 5.
- May display "REMOTE CONTROL INPUT LOST", indicating that Remote Control Enable input is deenergized; see section 5.2.
- May display "PRESS START BUTTON TO ENABLE REMOTE", indicating that remote mode needs to be initiated - see Local/Remote information in section 5.2.
- Allows manual selection of Lead/Lag and Local/Remote status; see section 5.1 and 5.2.

STAND-BY ACTIVE SUCTION VACUUM O.O inH20 PLC NOT IN RUN UNLOADED		COMPRESSOR OUTLET 	 'Pressur Access Tempe Display reading status, May dis messag 'Tempe Allows and Lo
LEAD	t 03/ RESSURE SETBACK F	MENU MENU MENU MENU MENU MENU MENU MENU	Allows and Lo 5.1 and

Pressures' screen

- Accessible from: Splash, Temperatures, Menu.
- Displays compressor temperature readings, standby status, lead/lag status, and local/remote status.
- May display special status messages, as described for 'Temperatures' screen.
- Allows manual selection of Lead/Lag and Local/Remote status; see section 5.1 and 5.2.

SET POINTS DIAGNOSTIC CONFIG METERS PAU LOG OUT PRESSURES TEMPERATURES	 'Menu' screen Accessible from: Pressures, Temperatures, most other screens with a 'Back' button "Password Logout" logs out active password. "Pressures" brings up Pressures screen; "Temperatures" brings up Temperatures screen. "Meters" brings up Meters and Information section of menu (shown to left; selected menu section is identified with red color): Shows compressor information including model, serial number, and program version. Displays numbers of load/unload cycles, and short cycles: see section 6.5. Displays total hours running and loaded: see section 6.5.
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SET POINTSI/O DIAGNOSTICDIAGNOSTICTERM INAL DIAGNOSTICCONFIGALARM LISTMETERSALARM LISTP/W LOG OUTTREND DATAPRESSURESSERVICE	 "Diagnostic" brings up Diagnostics section of menu (shown to left; selected menu section is identified with red color): "I/O Diagnostic": see section 5.4. "Terminal Diagnostic": brings up diagnostic screens; see section 6.1. "Alarm List" : see section 4. "Trend Data": graph of past temperature and pressure readings; see section 6.3. "Service" brings up Service screen; see section 6.5.
SET POINTSTRANSDUCER CALIBRATIONDIAGNOSTICSTARTER CONFIGCONFIGSTARTER CONFIGURATIONMETERSLEAD/LAG REMOTE MODEP/W LOG OUTINPUT/OUTPUT CONFIGURATIONPRESSURESFRESSURE SETBACK	 "Config" brings up Configuration section of menu (shown to left; selected menu section is identified with red color): "Transducer Calibration": see section 2.5. "Starter Configuration": see section 5.5. "Lead/Lag Remote Mode": see section 5.1, 5.2. "Input/Output Configuration": see section 5.4. "Pressure Setback": see section 5.3.
SET POINTSTEMPERATURE SET POINTSDIAGNOSTICPRESSURE SET POINTSCONFIGDELAY SET POINTSMETERSDELAY SET POINTSP>W LOG OUTTERMINAL SETTINGSPRESSURESFXTERNAL SETTINGSTEMPERATURESSETTINGS	 "Set Points" brings up Settings section of menu (shown to left; selected menu section is identified with red color): "Temperature Set Points": see section 4. "Pressure Set Points": see section 3.2. "Delay Set Points": see section 3.4. "Terminal Settings": see section 6.4. "External Pressure Switch Settings": see section 5.6.

2.5 Transducer Calibration

Under normal circumstances, it should not be necessary to calibrate any transducer. All transducers are factory calibrated before shipment. Before attempting to calibrate a transducer, check it for proper operation, proper type, and range. Calibration is done from the Transducer Calibration screen, accessible from the Menu.

 Allows calibration of pressure transducers. "1st Stage Suction TRANSDUCER 0 PSIG 0 PSIG
--

To calibrate a transducer:

- 1. Shut off the compressor. Connect regulated pressure or vacuum to the transducer.
- 2. Using a calibrated test gauge, set the pressure to the value shown in the label of the lower block on the calibration screen. When the pressure is at the appropriate value, enter the value shown in "Raw Input" in the lower block.
- 3. Using a calibrated test gauge, set the pressure to the value shown in the label of the upper block on the calibration screen. When the pressure is at the appropriate value, enter the value shown in "Raw Input" in the upper block.

'Set Amibient' sets the PLC's ambient pressure value, used in adjusting transducer readings, to the current reading of the inlet air transducer. This allows the compressor to adjust to differing atmospheric pressures due to altitude of installation. This function should be used only when the compressor is stopped.

3. Normal Compressor Operation

3.1 Start Sequence

The PLC monitors for normal conditions of the compressor. If all parameters are acceptable, then starting will be permitted. The PLC controls the timing of the start sequence, as follows:

- 1. The oil pump starter will energize immediately to start the oil pump. The "Start Initiated" screen will display if the Pressure or Temperature screen was selected; the oil pump graphic will animate, and the RUN light will be turned on.
- 2. When Lube Oil pressure reaches 20 PSI (0-3 frame compressors) or 8 PSI (00 frame compressors), the compressor run relay will energize, closing the compressor main starter, starting the compressor drive motor. Compressor graphic will animate.
- 3. When Transition Control is enabled, start-to-run transition will occur when the first stage suction stabilizes (varies less than ±3 "H2O for at least 3 seconds) with a minimum transition time of 3 seconds. If the pressure fails to stabilize after 28 seconds, start-to-run transition will be forced.
- 4. The cooling fan starter will energize to start the fan motor; cooling fan animation will display. When Up-To-Speed (UTS)/Transition Check is enabled the Fan will start 1.5 seconds after the UTS/Transition signal from the starter is active. If UTS/Transition Check is disabled the Fan will start 1.5 seconds after Lube Oil Pressure is achieved.

START INITIATED	 'Start Initiated' screen This screen is automatically brought up when the compressor is started if
LUBE OIL 0.0 ist STAGE suction vacuum 0.0 inH20	 up when the compressor is started, if Pressure or Temperature screen was showing. Displays "Start Initiated" as start-up sequence occurs; displays "Start-Up Complete" when sequence is finished. "Lube Oil Pump Running" or "Lube Oil Pump Stopped" shows the current status of the lube oil pump. "Compressor Accelerating" or "Compressor Running" shows the current status of the main motor. "Cooling Fan Running" or "Cooling Fan Stopped" shows the current status of the cabinet cooling fan. Press "Pressures" or "Temperatures" to return to status screens.

3.2 Loading Operation

The PLC controls loading of the compressor. "Loaded" is when the compressor inlet capacity control valve is open, and air is being drawn in and compressed. "Unloaded" is when the capacity control valve is closed, and air is not being compressed.

Load control will be enabled 5 seconds after the motor has reached full speed, if "UTS/Transition Check" input is enabled (see section 5.5), or 20 seconds after the main motor has started. Loading and unloading are determined by the PLC which continuously monitors compressor outlet air pressure and compares the pressure to

setpoints stored in the PLC. The PLC controls a 4-way solenoid valve which operates the capacity control valve. If discharge pressure is lower than the "LOAD" set point, the PLC will energize the solenoid valve, loading the compressor. The LOAD light turns on and "LOADED" is indicated on the Temperature page and the Pressure page. If the discharge pressure exceeds the "UNLOAD" set point, the PLC will de-energize the solenoid valve, unloading the compressor. The LOAD light turns off and "UNLOADED" is displayed on the Temperature and Pressure page.

The Temperature and Pressure pages of the HMI Terminal include a Manual Unload key. When pressed, this key forces the compressor to remain unloaded. To return to automatic load control, the Manual Unload key must be pressed a second time. As with automatic unloading, when manually unloaded for more than a preset time, the compressor will go into standby.

WARNING: The compressor will remain unloaded as long as Manual Unload is selected. The compressor may shut down on Standby timer and automatically restart when Manual Unload is deselected.

An optional LEAD/LAG control is available, allowing two pressure bands to be programmed for installations having two compressors. A LEAD/LAG key is provided on the Temperature page and the Pressure page, to select lead (high) or lag (low) pressure operation. Details of LEAD/LAG control are in Section 5.1.

PRESSURE SET POINTS UNLOAD COMPRESSOR COMPRESSOR COMPRESSOR COMPRESSOR UNLOAD ISH ISH	 'Pressure Setpoints' screen Accessible from: Menu. "Compressor Outlet" displays current system pressure. "Pressure Setback Active" may display; see section 5.4. "Compressor Unload" and "Load" determine load and unload points in standard operation. Designation changes to "Lead" when Lead/Lag is enabled. "Lag Unload" and "Load" determine load and unload points when operating in Lag mode. See section 5.3. "Compressor Max Operating Pressure" is highest pressure expected in normal operation; exceeding this pressure will trigger a Compressor Over Pressure Alert. "Low Outlet Pressure Alert" and "High Outlet Pressure alerts occur, if
	desired. A '0' in these fields

	disables the alert.Pressure units are selectable.
--	--

Pressure settings are factory set as specified by customer. Maximum available pressure is dependent on compressor size, gear ratio, horsepower, and elevation.

3.3 Shutdown Sequence

The PLC controls the timed Shutdown sequence of the compressor. Once the Shutdown sequence has begun, the compressor will not restart until the sequence is complete.

The Shutdown sequence is as follows:

- 1. The load solenoid de-energizes, unloading the compressor. After 5 seconds, the main motor run relay de-energizes, stopping the compressor. (If the compressor is already unloaded, the main motor will stop immediately.)
- 2. After a settable delay following the compressor stop, the oil pump motor stops.
- 3. After a settable delay, the cabinet cooling fan motor stops.

The cabinet cooling fan can be restarted while the compressor is in standby mode in case of a high temperature alert, if "Standby Cabinet Cooling" is enabled.

 "Compressor Decelerating" or "Compressor Stopped" shows the current status of the main motor. "Cooling Fan Running" or "Cooling Fan Stopped" shows the current status of the cabinet cooling fan. Press "Pressures" or "Temperatures" to return to status screens.
--

SHUT DOWN SHUT DOWN DELAYS LUBE OIL PUMP STOP: -0 STAND-BY LUBE OIL PUMP STOP: -0 STAND-BY LUBE OIL PUMP STOP: -0 STAND-BY CABINET COOLING: DISABLED CABINET COOLING: FAN MINIMUM RUN TIME: -0 MIN	 'Shutdown Delays' screen Accessible from: Menu, other Delay screens. "Lube Oil Pump Stop": affects shutdown sequence time; see above. "Vent Fan Stop" affects shutdown sequence time; see above. "Standby Cabinet Cooling": If enabled, allows the cooling fan to run if a temperature alert occurs while the compressor is in Standby. Cabinet cooling fan will run for the duration of the "Fan Minimum Run Time" or until temperature is below Alert setpoint, whichever is longer.
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SETPOINT	USER SETTING	FACTORY SETTING - 00/A00	FACTORY SETTING - 0/A0	FACTORY SETTING - 1/A1	FACOTRY SETTING - 2/A2	FACTORY SETTING - 3	UNITS
STOP FAN DELAY		20	20	20	20	20	Sec.
MINIMUM LIMIT		0	0	0	0	0	Sec.
MAXIMUM LIMIT		300	300	300	300	300	Sec.
STOP PUMP DELAY		3	25	25	25	25	Sec.
MINIMUM LIMIT		0	0	0	0	0	Sec.
MAXIMUM LIMIT		30	120	120	120	120	Sec.
COOLING FAN RUN TIME		5	5	5	5	5	Min.
MINIMUM LIMIT		0	0	0	0	0	Min.
MAXIMUM LIMIT		60	60	60	60	60	Min.

Default shutdown sequence settings:

3.4 Standby

Standby mode allows the compressor to shut down automatically when it has not been loaded for a period of time, in order to conserve energy. While the compressor is in Standby, the green "Standby" light on the control panel will be lit. The compressor will restart automatically from Standby if it detects a drop in pressure below the "Load" setpoint. If applicable, it will also restart upon receiving a "load" signal from a sequencer or external contact.

Two types of Standby are available: "Standard" and "Smart". In "Standard" mode, When the Compressor is running unloaded, a timer is started. If the compressor outlet pressure

does not drop below the Load pressure setting, the compressor will shut-down in Stand-By mode.

In "Smart" mode, when the compressor is unloaded, the program uses the difference between successive system pressure measurements, taken every 30 seconds, to calculate expected pressure at the end of the "Standby Delay" time. If the calculated pressure is above the load pressure setting for six consecutive 30-second cycles, the compressor will shut-down in stand-by mode. To prevent unnecessary motor starts, the compressor is not permitted to shut-down in "Smart" Standby mode until it has been running for at least 20 minutes.

SHUE POWN STAND-BY STEND-BY DELAYS STEND-BY STANDARD STANDBY ENABLED STEND-BY LEAD STANDBY DELAY DELAYS LAG STANDBY DELAY DELAYS LAG RETURN FROM DELAYS STANDBY DELAY	 'Standby Delays' screen Accessible from: Menu, other Delay screens. "Standard Standby Enabled" or "Smart Standby Enabled" determines standby mode. "Lead Standby Delay": time compressor must be unloaded to go to Standby, if in Lead. "Lag Standby Delay": time compressor must be unloaded to got to Standby, if in Lead. "Lag Standby Delay": time compressor must be unloaded to got to Standby, if in Lead. "Lag Return From Standby": Delay after compressor detects pressure drop before restarting, if in Lag.
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Default standby settings:

SETPOINT	USER SETTING	FACTORY SETTING - 00/A00	FACTORY SETTING - 0/A0	FACTORY SETTING - 1/A1	FACOTRY SETTING - 2/A2	FACTORY SETTING - 3	UNITS
LEAD STANDBY DELAY		10	10	15	20	30	Min.
MINIMUM LIMIT		10	10	15	20	30	Min.
MAXIMUM LIMIT		60	60	60	60	60	Min.
LAG STANDBY DELAY		10	10	15	20	30	Min.
MINIMUM LIMIT		10	10	15	20	30	Min.
MAXIMUM LIMIT		60	60	60	60	60	Min.
LAG RETURN FROM STANDBY DELAY		0	0	0	0	0	Min.
MINIMUM LIMIT		0	0	0	0	0	Min.
MAXIMUM LIMIT		60	60	60	60	60	Min.

3.5 Auto Restart, Timed Load Cycle

The "Timed Load Cycle Power Saver" option prevents the compressor from running loaded for excessive periods of time in response to low demand. When enabled, if the compressor is running loaded, system pressure is above the Load setpoint, and pressure is increasing, a timer is started. After the "Timed Load Cycle" delay has passed, the compressor will unload even if system pressure is below the Unload pressure setpoint. "Auto Restart" allows the compressor to automatically restart after shutting down due to power failure.

STEND-BY STEND	 'Other Delays' screen Accessible from: Menu, other Delay screens. "Timed Load Cycle Power Saver Option": time for Power Saver option; see above. A 0 in this field disables the option. "Lead Auto Restart After Power Failure": time after power is restored before compressor will restart, if in Lead. A 0 in this field disables the option. "Lag Auto Restart After Power Failure": time after power is restored before compressor will restart, if in Lead. A 0 in this field disables the option.
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Default "Other Delay" settings:

SETPOINT	USER SETTING	FACTORY SETTING - 00/A00	FACTORY SETTING - 0/A0	FACTORY SETTING - 1/A1	FACOTRY SETTING - 2/A2	FACTORY SETTING - 3	UNITS
TIMED LOAD CYCLE		0	0	0	0	0	Min.
MINIMUM LIMIT		0	0	0	0	0	Min
MAXIMUM LIMIT		300	300	300	300	300	Min.
LEAD AUTO RESTART		0	0	0	0	0	Sec.
MINIMUM LIMIT		0	0	0	0	0	Sec.
MAXIMUM LIMIT		60	60	60	60	60	Sec.
LAG AUTO RESTART		0	0	0	0	0	Sec.
MINIMUM LIMIT		0	0	0	0	0	Sec.
MAXIMUM LIMIT		300	300	300	300	300	Sec.

4. Alerts And Alarms

An Alert is any condition that requires operator intervention that does not shut down the compressor; an Alarm is a condition that shuts the compressor down immediately. After an Alarm has occurred, the compressor will not operate until the condition that caused the alarm has ceased.

When an Alert or Alarm has occurred, the HMI Terminal will display the Alarms screen. the Alert or Alarm light as appropriate will turn on, and the beeper will sound. The beeper may be silenced by pressing the "ACK" key. This will not reset the alarm.

Pressing the 'RESET' key on the Alarm page, or the "Reset" button on the panel, will clear an alarm condition, but only if the cause of the alert or alarm has been corrected.

Pressing the "ESC" key will return the HMI terminal to the page that was displayed when the Alarm or Alert occurred. While an alarm is active, a flashing bell will be visible in the upper right corner of most screens. After the ESC key is pressed, the Alarm page will return if the Alarm is still active and the Alarm Page Delay setting has elapsed.

ACK RESET ESC TIME i ↓	 'Alarms' screen Accessible from: Menu; most screens via a hidden key in the upper right corner. "ACK" acknowledges alarm and silences audible alarm. "Reset" resets alarm/alert, if problem has been corrected "ESC" returns to previously displayed screen. "i" displays more information about selected alarm/alert. Arrow keys scroll up and down list of alarms.
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For a complete list of alert and alarm conditions, see Appendix A.

Some alarms are not triggered until the relevant condition has existed for a specified number of seconds, to prevent nuisance alarms. These delays are adjusted from the "Alarm Delays" screen.

SHUT DONN DELAYS ALERTALARM DELAYS BACK	ALARM DELAYS MOTOR SERVICE ALERTO HRS LOW LUBE OIL PRESSURE -O SEC STARTER FAILURE -O SEC LOSS OF COMMUNICATIONS -O SEC LAG IN USE ALERT -O SEC	 'Alarm Delays' screen Accessible from: Menu, other Delay screens. "Motor Service Alert" sets hours motor runs before Motor Service Alert occurs; see section 6.5. A '0' in this field disables the alert. "Low Lube Oil Pressure": time for which the Low Lube Oil Pressure alarm is temporarily disabled on startup, to allow the oil pump to start. "Starter Failure": settable debounce time for starter failure alarm. "Loss of Communications": settable debounce for communications loss alarm. Only applicable to compressors with "Remote Net" mode control. "Lag in Use": settable debounce for Lag in Use alert. A 0 in this field disables the alert. The alert is required to be enabled on NFPA99 compressors
		compressors.

Default alarm delay settings:

SETPOINT	USER SETTING	FACTORY SETTING - 00/A00	FACTORY SETTING - 0/A0	FACTORY SETTING - 1/A1	FACOTRY SETTING - 2/A2	FACTORY SETTING - 3	UNITS
MOTOR SERVICE ALERT		2200	2200	2200	2200	2200	Hours
MINIMUM LIMIT		0	0	0	0	0	Hours
MAXIMUM LIMIT		8800	8800	8800	8800	8800	Hours
LOW LUBE OIL PRESSURE DELAY		20	20	20	20	30	Sec.
MINIMUM LIMIT		0	0	0	0	0	Sec.
MAXIMUM LIMIT		60	60	60	60	60	Sec.
STARTER FAILURE		10	10	10	10	10	Sec.
MINIMUM LIMIT		0	0	0	0	0	Sec.
MAXIMUM LIMIT		60	60	60	60	60	Sec.
LOSS OF COMMUNICATIONS DELAY		20	20	20	20	20	Sec.
MINIMUM LIMIT		0	0	0	0	0	Sec.
MAXIMUM LIMIT		60	60	60	60	60	Sec.
LAG IN USE ALERT DELAY		0	0	0	0	0	Sec.
MINIMUM LIMIT		0	0	0	0	0	Sec.
MAXIMUM LIMIT		999	999	999	999	999	Sec.

Temperature Alarms/Alerts

Temperature alerts and alarms occur when the compressor senses dangerously high temperature. Alerts occur at a lower temperature than alarms, and are disabled when the compressor is off. If a temperature alarm occurs while the compressor is not running, the cabinet cooling fan may be set to turn on temporarily in an attempt to reduce compressor cabinet temperature. This prevents nuisance alarms due to external heat sources. This function can be configured from the "Shutdown Delays" screen; see section 3.3.

TEMPERATURE SETPOINTS PLERT PLARM 0 COMPRESSOR INLET 0 IST STREE DISCHARGE 0 2ND STREE SUCTION 0 2ND STREE SUCTION 0 EMPERATURE	 'Temperature Settings' screen 1 Accessible from: Menu, 'Temperature Settings' screen 2. Temperatures are settings at which temperature alerts or alarms will occur. "°F" or "°C" determines whether temperatures are displayed in Fahrenheit or Celsius. Press to toggle units. Current temperatures are displayed in label boxes.
TEMPERATURE SETPOINTS FILERT FILERT 0 2nd STAGE DISCHARGE 0 0 COMPRESSOR OUTLET 0 LUBE OIL 0 0	 'Temperature Settings' screen 2 Accessible from: Menu, 'Temperature Settings' screen 1. Temperatures are settings at which temperature alerts or alarms will occur. "°F" or "°C" determines whether temperatures are displayed in Fahrenheit or Celsius. Press to toggle units. Current temperatures are displayed in label boxes.

Default temperature alert/alarm settings:

SETPOINT	USER SETTING	FACTORY SETTING - 00/A00	FACTORY SETTING - 0/A0	FACTORY SETTING - 1/A1	FACOTRY SETTING - 2/A2	FACTORY SETTING - 3	UNITS
INLET ALERT		122 (50)	122 (50)	122 (50)	122 (50)	122 (50)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		180 (82)	180 (82)	180 (82)	180 (82)	180 (82)	°F (°C)

SETPOINT	USER SETTING	FACTORY SETTING - 00/A00	FACTORY SETTING - 0/A0	FACTORY SETTING - 1/A1	FACOTRY SETTING - 2/A2	FACTORY SETTING - 3	UNITS
1st STAGE DISCHARGE ALERT		580 (304)	455 (235)	412 (211)	412 (211)	400 (204)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		590 (310)	464 (240)	421 (216)	421 (216)	410 (210)	°F (°C)
1st STAGE DISCHARGE ALARM		590 (310)	464 (240)	421 (216)	421 (216)	410 (210)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		590 (310)	464 (240)	421 (216)	421 (216)	410 (210)	°F (°C)
2nd STAGE SUCTION ALERT		165 (73)	140 (59)	140 (59)	140 (59)	140 (59)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		175 (79)	150 (65)	150 (65)	150 (65)	150 (65)	°F (°C)
2nd STAGE SUCTION ALARM		175 (79)	150 (65)	150 (65)	150 (65)	150 (65)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		175 (79)	150 (65)	150 (65)	150 (65)	150 (65)	°F (°C)
2nd STAGE DISCHARGE ALERT		580 (304)	455 (235)	446 (230)	446 (230)	445 (229)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		590 (310)	464 (240)	455 (235)	455 (235)	446 (230)	°F (°C)
2nd STAGE DISCHARGE ALARM		590 (310)	464 (24)	455 (235)	455 (235)	455 (235)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		590 (310)	464 (240)	455 (235)	455 (235)	455 (235)	°F (°C)
COMPRESSOR OUTLET ALERT		125 (51)	125 (51)	125 (51)	125 (51)	125 (51)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		200 (93)	200 (93)	200 (93)	200 (93)	200 (93)	°F (°C)
COMPRESSOR OUTLET ALARM		200 (93)	200 (93)	200 (93)	200 (93)	200 (93)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		200 (93)	200 (93)	200 (93)	200 (93)	200 (93)	°F (°C)
LUBRICANT ALERT		170 (77)	170 (77)	170 (77)	170 (77)	170 (77)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		180 (82)	180 (82)	180 (82)	180 (82)	180 (82)	°F (°C)
LUBRICANT ALARM		180 (82)	180 (82)	180 (82)	180 (82)	180 (82)	°F (°C)
MINIMUM LIMIT		32 (0)	32 (0)	32 (0)	32 (0)	32 (0)	°F (°C)
MAXIMUM LIMIT		180 (82)	180 (82)	180 (82)	180 (82)	180 (82)	°F (°C)

5. Special-Purpose Compressor Control Options

5.1 Lead/Lag Control

When a compressor is set up for Lead/Lag control, it will operate at either of two pressure ranges, determined by whether the compressor is in Lead or Lag. Lead/Lag status can be selected using the HMI Terminal. Compressors can be rotated between Lead and Lag status, to equalize wear, or to meet changing demands better by using different-capacity compressors at different times.

The purpose of Lead/Lag control is to allow two compressors to operate at once, with one operating as LEAD and maintaining system pressure, and the other operating as LAG and loading only as necessary when system pressure drops. For example, consider a system with two compressors, A and B. Compressor A is set up as Lead, and B as Lag. Compressor A, as Lead, will load when system pressure drops to 90 PSI, and unload when pressure reaches 100 PSI. Compressor B, as Lag, will load only when system pressure drops to 85 PSI, and will unload when system pressure reaches 95 PSI. Therefore, when system pressure is above 95 PSI, only Compressor A will run; when system pressure is below 90 PSI, both compressors will run, and when system pressure is below 90 PSI, both compressors will run, and when system pressure is below 90 PSI, both compressors will run and when system pressure is below 90 PSI.

In Manual or Automatic modes, this form of Lead/Lag control requires no connection between the two compressors. In External mode, control requires an external dry contact to connect to the compressor. In Client or Server modes, the RJ45 port on the compressor HMI displays must be connected, using a CAT5 crossover cable.

There are five modes of Lead/Lag control. Mode may be selected on the "Lead/Lag and Remote Modes" screen.

- **MANUAL ONLY:** Compressor operates as Lead or Lag based on user selection on Temperature or Pressure screen, and does not change position unless selection is changed. No connection between compressors is required.
- **AUTOMATIC:** Compressor alternates between Lead and Lag automatically, at intervals selected by time and date or by run time, as selected on the Configuration screen. No connection between compressors is required.
- **EXTERNAL:** Lead/Lag status is determined by an external signal; requires configured input (see below). A dry contact signal from the customer control system is required for each compressor.
- CLIENT: Compressor is connected to other compressor by Ethernet, as described below. Compressor alternates between Lead and Lag automatically, at intervals selected on Configuration screen. The Client compressor controls automatic rotation. When either compressor changes from Lead to Lag or vice versa, the other will change to the opposite setting; when switching positions, the former Lead compressor will be maintained in a 'Going to Lag' state and continue operating using Lead setpoints until the new lead compressor has had enough time to start, at which point the former lead compressor is given an 'unload' signal

and begins to operate using lag setpoints. Terminal must be modified by programming tool to include client communication.

 SERVER: Compressor is connected to other compressor by Ethernet, as described below. When either compressor changes from Lead to Lag or vice versa, the other will change to the opposite setting. The Server compressor does not control automatic rotation; auto-rotation time settings will not be visible. Terminal must be modified by programming tool to include server communication. If a Server compressor is not connected to a Client compressor, it will operate as if Lead/Lag were disabled. To facilitate future expansion, most terminals will ship in this mode.



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Client/Server Lead/Lag Option

Two compressors in Client/Server Lead/Lag mode must be connected using a crossover Ethernet cable. Alternatively, the modules can be connected through an Ethernet switch or hub. Wire is normally connected between the provided Ethernet modules; under some circumstances connection is made between the HMI display Ethernet ports.

Pinouts and wire colors for the crossover cable are as follows. On a standard cable, both ends follow the wire/pin combination shown below on the left. If converting a standard cable to a crossover cable, it is only necessary to modify one end; reconnect the wires according to the right side of the diagram.

PIN	WIRE		WIRE	PIN
TX+ 1	White/green		White/orange	1 TX+
TX- 2	Green		Orange	2 TX-
RX+ 3	White/orange		White/green	3 RX+
4	Blue	——————————————————————————————————————	Blue	4
5	White/blue		White/blue	5
RX- 6	Orange		Green	6 RX-
7	White/brown		White/brown	7
8	Brown		Brown	8

The RJ-45 port is located on the front of the communications module; module is mounted on the electrical enclosure backpanel, beside the PLC.

Location of RJ-45 port for Ethernet connection



Node 1 and Node 2 PLCs are factory configured. If the modules are connected correctly, the green "Link" light beside each RJ-45 port will be lit. If machines are not connected properly, a "Loss of Network Comms" alert will occur.

5.2 Local/Remote Operation

When a compressor is set up for Local/Remote control, it can be operated based on either local system pressure as determined by the compressor's own sensors, or on signals from an external device. Local/Remote status can be selected using the HMI Terminal. In modes that require a remote signal to start the compressor, the local Start button will not start the compressor, but the local Stop button acts as an override for the remote signal, and if pressed, will stop the compressor immediately. It will also return the compressor to Local mode; Remote must be re-enabled before the compressor can be operated remotely.

In Local mode, the compressors can be started and stopped using the Start and Stop pushbuttons located on the panel; loading and unloading are controlled by the local PLC. In Remote modes that include remote starting, the local Start button is used to "arm" the compressor to remote control; when the compressor is placed in Remote mode, the Standby light will flash to indicate confirmation of remote control. When the Start button is pressed, the Standby LED will remain solid to indicate that the compressor may start at any time when the Remote Run contact closes. If an alarm shutdown occurs, the compressor will automatically return the compressor to Local mode.

There are seven modes of Remote operation. Mode may be selected on the "Lead/Lag Remote" screen. Input configuration is automatically set as appropriate to mode; see Input/Output Configuration below.

- **REMOTE RUN**: Starting and stopping is controlled by a remote maintained contact; if the contact is closed, the compressor will run, and if it is open, the compressor will stop.
- **REMOTE LOAD**: Starting and stopping is controlled by the local Start and Stop buttons, but compressor loading is determined by a remote maintained contact. The compressor will load when the contact is energized, and unload when it is deenergized. As in Local mode, if the compressor has been unloaded for a set time it will automatically enter Standby mode and shut down; it will start up when it receives a signal to load.

- **REMOTE RUN AND LOAD**: Both starting and loading are controlled by remote maintained contacts; the run contact must be closed for the compressor to run, and the load contact must be closed for the compressor to load.
- **REMOTE UNLOAD**: Starting and stopping are determined by the local Start and Stop buttons. Compressor loading is controlled by local pressure settings and a remote contact; in order for the compressor to load, pressure must be below the local Load setpoint and the contact must not be energized. When the contact is energized, the compressor will be forced to unload. As in Local mode, if the compressor has been unloaded for a set time it will automatically enter Standby mode and shut down; it will start up when the pressure drops to the Load point and the Remote Unload contact is de-energized.
- REMOTE NET: As in Remote Run And Load mode, start/stop and load/unload functions are controlled remotely; in Remote Net, these functions are controlled via the PLC's communications port rather than via relays connected to the input and output modules. This mode is reserved for use with a Rogers Machinery Company external sequencer, and should not be used without consulting the factory.
- START-STOP INPUTS: Compressor starting and stopping are controlled by two
 remote contacts; the local Start button will not start the compressor. While both
 contacts are open, the compressor will remain in Standby. When the remote start
 contact closes and the remote stop contact is closed, the compressor will start.
 When the remote stop contact is open the compressor will stop. The remote stop
 contact will take priority over the remote start input. This remote mode will
 operate normally whether the signals are continuous or momentary, but they must
 be the same type. It is recommended to always reset the remote start interface
 signal when stopping the compressor.
- **START-STOP AND LOAD**: In this mode starting and stopping are controlled by two remote contacts, as in Start-Stop Inputs mode; loading and unloading is controlled by a third maintained contact.



5.3 Setback Mode

"Setback Mode" allows the compressor to operate at a lower pressure than normal at specified times. If standard system pressure is not required except during standard onshift times, but a lower pressure must be maintained constantly, "Setback Mode" will save energy by operating the compressor less while off-shift.

There are three modes of Setback operation. Mode may be selected on the "Pressure Setback Settings" screen.

- **MANUAL:** Compressor enters Setback (operating at lower pressure settings) when a remote enable contact is energized. Inputs must be appropriately configured for remote signal; see section 5.4.
- **AUTOMATIC:** Compressor enters Setback at specified times, as defined on "Pressure Setback Times" screen; see below.
- MANUAL AND AUTOMATIC: As in Automatic mode, compressor enters Setback at specified times. Additionally, compressor will enter Setback when the remote enable contact is energized; this overrides the normal pressure operation due to time settings. Inputs must be appropriately configured for remote signal; see section 5.4.

PRESSURE SETBACK SETTINGS	 'Pressure Setback Settings' screen Accessible from: Menu. "Setback Mode" enables Setback
SETBACK MODE: Disabled	mode and selects type of Setback
SETBACK UNLOAD	operation; see above. "Unload Pressure" determines
PRESSURE0 PSIG	pressure at which the compressor will
SETBACK LOAD	unload when operating in Setback.
PRESSURE0 PSIG	Pressure units are selectable. "Load Pressure" determines pressure
FORCE TO: SETBACK	at which the compressor will load
FORCE TO: SETBACK	when operating in Setback mode. "Force To" buttons, when in an
PRESSURE PRESSURE PRESSURE	Automatic setback mode, will force the
TIME SETTINGS	compressor to either Setback or
PRESSURE	Normal pressure settings. The
COMPRESSOR0.0 PSIG	settings will return to portation
	 compressor to either Setback or Normal pressure settings. The settings will return to normal operation at the next automatic change. "Time Settings" brings up "Pressure Setback Times" screen.

Setback mode can be configured to operate the compressor at normal pressure during independently specified times on weekdays, Saturday (if desired), and Sunday (if desired). These times apply in "Automatic" or "Manual And Automatic" Setback mode .

PRESSURE SETBACK TIMES MONDAY- FULL PRESSURE -0:00 FRIDAY SETBACK -0:00 SATURDAY FULL PRESSURE -0:00 ALL DAY SETBACK -0:00 SUNDAY FULL PRESSURE -0:00 ALL DAY SETBACK -0:00 SUNDAY FULL PRESSURE -0:00 ALL DAY SETBACK -0:00 BACK PRESSURE SETBACK PRESSURE SETBACK -0:00 BACK PRESSURE -0:00 BACK PRESSURE -0:00 BACK SETBACK -0:00 BACK SETBACK -0:00 SETBACK -0:00 00 SETBACK -0:00 00	 Accessible from: Pressure Setback Settings. "Back" returns to Pressure Setback Settings. "Monday - Friday": Settings apply to all weekdays. "Full Pressure Start Time" determines time of day at which compressor will begin to operate at standard pressure setting. "Setback Start Time" determines time of day at which compressor will fall back to Setback. "Saturday": "All Day" will operate compressor at Setback pressure for all of Saturday. "Set Times" will operate compressor at normal pressure between specified times. "Sunday": "All Day" will operate compressor at Setback pressure for all of Sunday. "Set Times" will operate compressor at normal pressure between specified times.
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5.4 Input/Output Configuration

The compressor PLC includes a number of input and output signals which can be configured to meet the needs of the application, such as discrete remote control signals, external alarm contacts, and specialized status contacts. In some cases selecting a Lead/Lag or Local/Remote setting will automatically set input or output configuration options.



Inputs

Normally, Inputs 6 and 7 are used for remote control functions and Inputs 5 and 10 are used for external alarm contacts. Input 5 may also be used for remote control functions if the compressor is configured accordingly. Some input modes are designed to work with specific lead/lag or remote mode, and are selected automatically when these modes are used, and may not be available for manual selection. Available input options are:

- Input 5, I:0/5:
 - o None
 - Remote Stop: In Remote Start/Stop mode, this input will accept a momentary or continuous signal to stop the compressor.
 - Remote Control Enable: If configured, this input must receive a continuous signal in order for the compressor to operate in remote mode.
 - External Lead/Lag: If "External" Lead/Lag mode is selected, this input must receive a signal for the compressor to operate in Lag mode.
 - Receiver Level Switch: This option is intended for water-cooled healthcare package compressors. Input for a level switch to detect water in the downstream receiver, triggering an alarm.
 - External Interlock: (alert or alarm): Used for run inhibit conditions not otherwise specified as an option.
 - Vibration: Input for a vibration switch; triggers an alarm when excess vibration at the air end is detected.
 - Z-Purge Pressure Switch: Input for a pressure switch from a Z-Purge pressurization device, used in hazardous conditions to reduce the risk of sparking.

• Input 6, I:0/6:

o None

- Rem Start / Rem Run: Input for a remote signal. In Remote Run, Remote Run And Load, or Remote Start/Stop mode, this input must receive a continuous signal for the compressor to run.
- External Lead/Lag: As described above.
- Dryer Alarm: This option applies to compressors with a third-party air dryer downstream. Input that generates an alarm when the dryer reports a fault; the alarm will shot down the compressor.
- Dryer Alert: This option applies to compressors with a third-party air dryer downstream. Input that generates an alert when the dryer reports a fault; the alert is for information only and will not shut down compressor.
- External Interlock: As described above.
- Pressure Setback: Input for a remote signal. In Manual Pressure Setback mode, this input must be enabled for compressor to use Setback pressure settings.
- Vibration: As described above.

• Input 7, I:0/7:

- o None
- Remote Load : Input for a remote signal; in Remote Load or Remote Run And Load mode, this input must receive a continuous signal for the compressor to load, while in Remote Unload, the compressor will unload when this input is energized.
- External Lead/Lag: As described above.
- Dryer Alarm: As described above.
- Dryer Alert: As described above.
- Vibration: As described above.
- Z-Purge Pressure Switch: As described above.
- Cooling Water Flow Switch: Water-cooled compressors only. Input for a flow switch used to confirm that cooling water is reaching the compressor.

• Input 10, I:0/10:

- o None
- Remote Control Enable: As described above.
- External Lead/Lag: As described above.
- Receiver Level Switch: As described above.
- Phase Monitor: Special alarm input, for a phase monitor alarm signal. If the input receives a signal, the Phase Loss alarm is triggered.
- CO Monitor: Special alarm input, for a carbon monoxide monitor. If the input receives a signal, the High CO alarm is triggered.
- Lubricant Sump Level: Special alarm input, for a level switch at the oil sump. If the input receives a signal, the Lubricant Sump Level Low alarm is triggered.
- Vibration: As described above.
- Pressure Setback: As described above.

Outputs

Outputs 0-3 on PLC-X1 output module are used for four status relays (Running, Loaded, Alert, and Alarm), as described in section 2.2. Additional relays may be connected to the remaining outputs to monitor the status conditions described below.

Available output options are:

- Output 4, O:1/4:
 - o None
 - o In Remote: Energizes when compressor enters remote mode.
 - Lag In Use: Energizes when compressor is operating in "Lag" mode and pressure drops below Lag Load setpoint, causing compressor to load.
 - In Lead: Energizes when compressor is in Lead mode.
 - Low Lubricant Pressure: Output energizes when a Low Lubricant Pressure alarm occurs.

• Output 5, O:1/5:

- o None
- In Local: Energizes when compressor enters local control mode.
- Lag In Use: See above.
- In Lag: Energizes when compressor is in Lag mode.
- Check Inlet Air Filter: Energizes when an Inlet Air Filter High Differential Pressure alert occurs.

• Output 6, O:1/6:

- o None
- In Remote: See above.
- Lag In Use: See above.
- o In Lead: See above.
- External Pressure Switch: Energizes when pressure is in a specified range; see section 5.6. This enables control of a secondary compressor or other device.
- 1st Stage Discharge Temp Alarm: Energizes when a 1st Stage Discharge High Temp alarm occurs.

• Output 7, 0:1/7:

- o None
- In Local: See above.
- Lag In Use: See above.
- In Lag: See above.
- External Pressure Switch: See above.
- 2nd Stage Discharge Temp Alarm: Energizes when a 2nd Stage Discharge High Temp alarm occurs.

5.5 Starter Configuration

Compressors can be configured to operate using various types of main motor starter. Normally, 00, 0, and 1 frame compressors use a two-step Wye-Delta starter; 2 and 3 frame compressors use a solid-state soft starter. Consult factory for further information about available starter options. **Do not modify these settings without consulting factory.**

STARTER CONFIGURATION TRANSITION CONTROL: DISABLED UTS>TRANSITION CONFIRM: ENABLED FAULT SOURCE: STARTER	 'Starter Configuration' screen Accessible from: Menu. "Transition Control" determines whether the PLC controls the transition to full speed. This should be enabled when using a two-step starter. "UTS/Transition Confirm" determines whether PLC uses a signal from the starter to confirm that the compressor has reached full speed. This is enabled except when using some models of soft starter; contact factory. "Fault Source" determines whether starter faults are indicated by a motor overload or a starter control board signal.
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5.6 External Pressure Switch

The External Pressure Switch option allows the compressor to energize one or two status relays when detected system pressure is within specified ranges. This allows the compressor to control other compressors or auxiliary equipment, or to provide status information to a plant control system. To use External Pressure Switch control, outputs O:1/6 and/or O:1/7 must be configured accordingly; see section 5.4.

If only one output is configured for External Pressure Switch operation, that output will energize according to the range specified as 'PS1'. 'PS2' is displayed only when both available outputs are configured for External Pressure Switch operation.

Two modes of operation are available for use with two outputs: Lead/Lag and Static. In Lead/Lag mode, the "PS1" and "PS2" settings switch outputs at specified times, allowing control of two other compressors using a Lead/Lag-like mode. In Static mode, the two pressure ranges each control a single output and do not switch.

EXTERNAL PRESSURE SWITCH	 'External Pressure Switch' screen Accessible from: Menu.
PS1 PRESSURE SWITCH COMPLEX LEAD/LAG PS2 UNLOAD 0.00 CHANGE DALLY PS2 0:1/7 LOAD 0.00 AT 0:1/7 BACK COMPRESSOR -0.0 PSIG ADVANCE	 "Pressure Switch Configuration" determines mode; see above. "Change Position", if Lead/Lag configuration is selected, will rotate the outputs, changing the output now designated as "PS1" to "PS2" and vice versa, at the specified times. Current output selection is shown below 'PS1', 'PS2' labels. "Compressor Outlet" displays current system pressure. "PS1 Unload" and "Load" determine system pressure readings at which 'PS1' output will de-energize and energize. "PS2" Unload" and "Load" determine system pressure readings at which 'PS1' output will de-energize and energize. "PS2" Unload" and "Load" determine system pressure readings at which 'PS2' output will de-energize and energize, if configured. "Advance" forces PS1 and PS2 outputs to change position.

6. Informational Settings

6.1 Diagnostic Screens

Diagnostic screens display the current value of all PLC inputs and outputs. These screens are primarily intended to help technicians locate and correct problems in the field. Diagnostic screens are available from the Menu screen.

6.2 Data Logging

Data logging records compressor operating information and list of alarms, and may be retrieved by saving data to a USB flash drive or connecting to the terminal FTP via Ethernet.. Trend charts save Input Status, Output Status, Short Cycles, Running Time, Loaded Time, and Load/Unload Cycles. Data is logged every 5 seconds. Data logging is controlled from the Trend Settings screen.

To save data, insert a USB flash drive in the port located on the back of the display. A message will be displayed indicating that a flash drive has been detected. If the display does not detect the proper backup file structure on the drive, you will be prompted to create it. When the correct file structure exists, touch the "Save Trend Data to Flash" cell to save all trend data, or the "Save Alarm List to Flash" to save only the alarm list.

The terminal will indicate that data is transferring; when it is done, the drive can be removed safely. Data files are in CSV format and can be opened in Microsoft Excel.



6.3 Temperature and Pressure Trends

"Trending" pages are available to display recent temperature and pressure readings for the compressor. These can help to identify problems with the compressor and possible settings modifications for greater efficiency.

Two trend charts can be shown: Temperatures and Pressures. Data is recorded every 5 seconds. Displayed section of the trend charts can be adjusted on the "Trend Settings" screen. This affects only what data is *displayed*; if data is not displayed, it is not lost.

TEMPS TREND CHART TIME SCALE MINIMUM MAXIMUM UALUE ERASE SCONDS MHEN FULL OVERWRITE PRESSURES TREND CHART TIME SCALE MINIMUM MAXIMUM UALUE ERASE OUTATA PRESSURES TREND CHART TIME SCALE MINIMUM MAXIMUM UALUE ERASE OUTATA SCALE MINIMUM MAXIMUM UALUE ERASE OUTATA BECONDS MINIMUM MAXIMUM UALUE ERASE OUTATA BECK SAVE FLASH OVERWRITE BACK SAVE FLASH ERASE OUTATA	 'Trenc Acce "Tim time "Min Valu sma Tem sam "Ter are suct "Era recc char "Wh whe "Ove to al "Sto data "Tre
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'Trend Settings' screen

- Accessible from: Menu.
- "Time Scale" determines range of time over which values are shown.
- "Minimum Value" and "Maximum Value" determine largest and smallest values shown on chart. Temperatures are shown in the same units as selected on the "Temperatures" page. Pressures are shown in PSI, except 1st stage suction pressure, which is in "H20.
- "Erase Chart Data" erases all recorded data for the specified chart.
- "When Full" determines behavior when chart buffer is full.
 "Overwrite" erases the oldest data to allow new data to be saved;
 "Stop Recording" stops saving data.
- "Trend Help" brings up Help

screen.

Trend chart settings

T4 - TREND CHARTS	User	Factory	Minimum	Maximum	Units
	Setting	Setting	Limit	Limit	
PRESSURES, TIME SCALE		2400	60	99999	Sec.
PRESSURES, MINIMUM VALUE		-30	-30	600	Chart
PRESSURES, MAXIMUM VALUE		60	0	600	Chart
TEMPERATURES, TIME SCALE		2400	60	99999	Sec.
TEMPERATURES, MINIMUM VALUE		60	0	600	Chart
TEMPERATURES, MAXIMUM VALUE		500	0	600	Chart

Touch the center of either trend chart to bring up the History screen, which can be used to modify the range of data displayed on the chart.

The Temperature trend chart can be used to measure temperature differentials across the intercooler and aftercooler. Reductions in temperature differentials here may indicate loss of cooler efficiency; the coolers may need to be cleaned.



The Pressure trend chart can be used to determine variations in system pressure due to usage patterns, which can be used to find the most efficient settings for your compressor. It can also be used to monitor pressure rise across each air end, which can help identify problems with the air end.



6.4 Terminal Settings

These options affect the HMI. Exercise care when modifying "Current Date/Time", as time affects automatic lead/lag and pressure setback operation.



6.5 Service Information

The compressor requires service at regular intervals. Service intervals are dependant on compressor usage; see Operations Manual for details regarding required maintenance. The compressor tracks load/unload cycles and total running hours, allowing maintenance to be performed at appropriate intervals. A 'Service Alert' occurs when the

load counter indicates that the compressor is due for maintenance; these timers are normally reset during service by the service technician.

A "Motor Service Alert" occurs when the motor run timer indicates that the motor has run for long enough to require service.

Additionally, the compressor tracks 'short cycles' . A 'short cycle' occurs when the compressor loads and unloads again, or unloads and then loads again, within a minute. Short cycles are indicative of incorrect compressor settings or a problem in the plant air system. Frequent cycling can shorten the life of the compressor and should be avoided. A 'Short Cycle Alert' occurs after a specified number of short cycles; this indicates that compressor settings should be reviewed.



RUN HOURS	SHORT CYCLES SHORT CYCLE ALERT THRESHOLD MOTOR RUN HOURS REMAINING TO NEXT MOTOR SERVICE RESET MOTOR SERVICE TIMER		 'Hours and Service Meters' screen Accessible from: Service screen. 'Back' returns to Local Service screen. "Run Hours" displays total time the compressor has been run. "Loaded Hours" displays total time the compressor has been loaded. "Load Cycles" displays total number of load/unload cycles since last service.
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	 "Short Cycles" displays total number of short cycles since counter was last reset. "Short Cycle Alert Threshold": number of short cycles that must be detected before alert occurs. A 0 in this field disables the alert. "Motor Run Hours Remaining To Next Motor Service" displays time before next motor service. "Reset" buttons resets this timer to full value.
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APPENDIX 1: Index of Alerts and Alarms

The following messages may be displayed when an Alert or Alarm occurs. An Alert will not shut the compressor down, but requires operator intervention to correct as soon as possible. An Alarm will shut the compressor down; the compressor will not run until the condition has been corrected. See section 4 for more information.

Alarms and alerts include a 4-digit identification code. This code is to assist in troubleshooting when contacting the factory.

MESSAGE DISPLAYED	CAUSE/NOTES	CORRECTIVE ACTION
[ALARM 0000] MAIN MOTOR OVERLOAD	Alarm is indicated when the overload relay on compressor drive starter is tripped.	Overload relay must be manually reset before alarm can be cleared. If a solid state starter is used, this alarm indicates a trip of the starter alarm relay; refer to manufacturer's instruction manual for diagnostic information.
[ALARM 0001] MAIN MOTOR STARTER FAULTED	Applies to compressors with solid state starter only. Solid state starter indicates fault.	Consult manufacturer's instructions for troubleshooting and directions to reset fault at starter.
[ALARM 0002] LUBE OIL PUMP MOTOR OVERLOAD	Oil pump motor starter overload relay tripped.	Overload relay must be manually reset to clear alarm. Check amperage and inspect motor wiring.
[ALARM 0003] FAN MOTOR OVERLOAD	Fan motor starter overload relay tripped.	Overload relay must be manually reset to clear alarm. Check amperage and inspect motor wiring.
[ALARM 0004] MAIN MOTOR FAILED TO START	Compressor motor starter auxiliary input is not present when expected.	Inspect compressor motor starter and auxiliary contacts. Check to ensure PLC is correctly configured for your starter type.
[ALARM 0005] MAIN MOTOR TRANSITION FAILED	Applies to two-step starters only. Transition confirmation input fails to report completed transition.	Inspect compressor motor starter and auxiliary contacts. Check to ensure PLC is correctly configured for your starter type.
[ALARM 0006] CHECK MAIN MOTOR STARTER AUX CONTACT	When the compressor is off the PLC input for the starter auxiliary contact should be off. When the compressor is running the PLC input should be on. Alarm is indicated when input state is wrong for current operating mode.	Inspect compressor motor starter and auxiliary contacts.
[ALARM 0007] CHECK TRANSITION AUX CONTACTS	Applies to compressors with wye-delta starter only. When the compressor is not up to speed, contact should be off. Alarm is indicated when input state is wrong for current operating mode.	Inspect compressor motor starter and auxiliary contacts.
[ALARM 0008] MAIN MOTOR STARTER STUCK	Compressor motor starter auxiliary input is present when not expected. Also trips 'Lube Failsafe' alarm.	Inspect compressor motor starter and auxiliary contacts. Check to ensure PLC is correctly configured for your starter type.

MESSAGE DISPLAYED	CAUSE/NOTES	CORRECTIVE ACTION
[ALARM 0009] RUNNING IN REVERSE	1st stage suction air transducer reports pressure rise instead of expected drop.	Check transducer, wiring, and input modules; check pressure tubing. Observe motor for correct rotation; if rotation is incorrect, lock off power to compressor and exchange two leads.
[ALARM 0010] UNDIRECTED RUN DETECTED	Pressure sensors detect compressor is operating when it should be stopped.	Inspect compressor motor starter. Check to ensure PLC is correctly configured for your starter type.
[ALARM 0100] 1st STAGE DISCHARGE RTD SHORTED	Signal from RTD is out of range for the PLC.	Inspect first stage discharge RTD, wiring, input modules.
[ALARM 0101] 1st STAGE DISCHARGE RTD OPEN	Signal from RTD is out of range for the PLC.	Inspect first stage discharge RTD, wiring, input modules.
[ALARM 0102] 2nd STAGE SUCTION RTD SHORTED	Signal from RTD is out of range for the PLC.	Inspect second stage suction RTD, wiring, input modules.
[ALARM 0103] 2nd STAGE SUCTION RTD OPEN	Signal from RTD is out of range for the PLC.	Inspect second stage suction RTD, wiring, input modules.
[ALARM 0104] 2nd STAGE DISCHARGE RTD SHORTED	Signal from RTD is out of range for the PLC.	Inspect second stage discharge RTD, wiring, input modules.
[ALARM 0105] 2nd STAGE DISCHARGE RTD OPEN	Signal from RTD is out of range for the PLC.	Inspect second stage discharge RTD, wiring, input modules.
[ALARM 0106] COMPRESSOR OUTLET RTD SHORTED	Signal from RTD is out of range for the PLC.	Inspect compressor outlet RTD, wiring, input modules.
[ALARM 0107] COMPRESSOR OUTLET RTD OPEN	Signal from RTD is out of range for the PLC.	Inspect compressor outlet RTD, wiring, input modules.
[ALARM 0108] LUBE OIL RTD SHORTED	Signal from RTD is out of range for the PLC.	Inspect RTD, wiring, input modules.
[ALARM 0109] LUBE OIL RTD OPEN	Signal from RTD is out of range for the PLC.	Inspect RTD, wiring, input modules.
[ALARM 0110] COMPRESSOR OUTLET TRANSDUCER SHORTED	Faulty transducer; poor connections.	Inspect compressor outlet transducer, wiring, input modules.
[ALARM 0111] COMPRESSOR OUTLET TRANSDUCER OPEN	Faulty transducer; poor connections.	Inspect compressor outlet transducer, wiring, input modules.
[ALARM 0112] LUBE OIL TRANSDUCER SHORTED'	Faulty transducer; poor connections.	Replace transducer, inspect electrical connections.
[ALARM 0113] LUBE OIL TRANSDUCER OPEN	Faulty transducer; poor connections.	Replace transducer, inspect electrical connections.
[ALARM 0200] HIGH CABINET TEMPERATURE	Cabinet temperature switch has tripped, indicating dangerously high temperature inside cabinet.	Check temperature switch and wiring for proper operation; check actual temperature with infrared gun. If actual temperature is above switch setting, refer to manual for temperature troubleshooting.

MESSAGE DISPLAYED	CAUSE/NOTES	CORRECTIVE ACTION
[ALARM 0201] HIGH 1st STAGE DISCHARGE TEMP	Air temperature at first stage discharge is over Alarm point.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALARM 0202] HIGH 2nd STAGE SUCTION TEMP	Air temperature at second stage suction is over Alarm point.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALARM 0203] HIGH 2nd STAGE DISCHARGE TEMP	Air temperature at second stage discharge is over Alarm point.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALARM 0204] HIGH COMPRESSOR OUTLET TEMP	Air temperature at compressor discharge is over Alarm point.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALARM 0205] HIGH LUBE OIL TEMP	Oil temperature is over Alarm point.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALARM 0210] HIGH COMPRESSOR OUTLET PRESSURE	Pressure switch reports air pressure at compressor discharge is dangerously high.	Check pressure switch for proper operation; if switch is operating properly, refer to manual for pressure troubleshooting.
[ALARM 0211] HIGH INTERSTAGE PRESSURE	Interstage air pressure is over 50 PSIG.	Check transducer, wiring, and input modules. Check condition of 2nd stage airend.
[ALARM 0212] LOW LUBE OIL PRESSURE	Oil pressure lower than oil pressure setpoint.	Check oil pressure setpoint of PLC. If pressure setpoint is correct, check for low oil level (using sight gauge on oil sump), and proper adjustment of relief valve. This alarm can also be due to a defective oil pump, or to oil too cold for proper operation; if compressor is outside, crankcase heaters may be necessary to ensure proper heating.
[ALARM 0301] RECEIVER HIGH LIQUID LEVEL	Applicable only to water-cooled healthcare package compressors. Level switch in downstream air receiver indicates high liquid level.	Verify that inputs are correctly configured. Inspect switch and wiring. If switch is operating properly, check coolers for leaks. Check auto drain traps for proper operation.
[ALARM 0302] INCOMMING POWER OUT-OF-PHASE	Phase monitor input reports problem with incoming power phase. Alarm only active if input is configured accordingly; see section 5.	Verify that inputs are correctly configured. Inspect phase monitor, check power connections.
[ALARM 0303] HIGH CARBON MONOXIDE	Carbon monoxide monitor input has tripped, indicating high CO levels in air.	Verify that inputs are correctly configured. Check wiring and inspect monitor.

MESSAGE DISPLAYED	CAUSE/NOTES	CORRECTIVE ACTION
[ALARM 0304] LOW LUBE OIL SUMP LEVEL	Oil level switch reports low oil level. Alarm only active if input is configured accordingly; see section 5.	Verify that inputs are correctly configured. Inspect switch and wiring. If switch is operating properly, check oil sump for leaks and add oil of the same type as originally used. <i>Do not mix lubricants.</i>
[ALARM 0400] DRYER ALARM	External dryer contact indicates fault. Alarm only active if input is configured accordingly; see section 5,	Verify that inputs are correctly configured. Correct problem at dryer; consult dryer manufacturer's manual for troubleshooting assistance.
[ALERT 0600] HIGH INLET TEMPERATURE	Air temperature at compressor intake is abnormally high.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALERT 0601] HIGH 1st STAGE DISCHARGE TEMPERATURE	Air temperature at first stage discharge is nearing Alarm point.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALERT 0602] HIGH 2nd STAGE SUCTION TEMP	Air temperature at second stage suction is nearing Alarm point.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALERT 0603] HIGH 2nd STAGE DISCHARGE TEMP	Air temperature at second stage discharge is nearing Alarm point.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALERT 0604] HIGH COMPRESSOR OUTLET TEMP	Air temperature at compressor discharge is nearing Alarm point.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALERT 0605] HIGH LUBE OIL TEMP	Oil temperature is nearing Alarm point.	Check RTD, wiring, and input modules; check actual temperature with infrared gun or temperature gauge in RTD port. Check programmed setpoint (see Settings pages) against recorded user settings. If actual temperature is above correct setpoint, refer to manual for temperature troubleshooting.
[ALERT 0700] 1st STAGE INLET TRANSDUCER SHORTED	Faulty transducer; poor connections.	Inspect transducer, wiring, input modules.
[ALERT 0701] 1st STAGE INLET TRANSDUCER OPEN	Faulty transducer; poor connections.	Inspect transducer, wiring, input modules.
[ALERT 0702] INTERSTAGE TRANSDUCER SHORTED	Faulty transducer; poor connections.	Inspect transducer, wiring, input modules.

MESSAGE DISPLAYED	CAUSE/NOTES	CORRECTIVE ACTION
[ALERT 0703] INTERSTAGE TRANSDUCER OPEN	Faulty transducer; poor connections.	Inspect transducer, wiring, input modules.
[ALERT 0704] CHECK 1st STAGE TRANSDUCER CONNECTIONS	1st stage suction transducer fails to report expected pressure drop while running unloaded.	Check transducer, wiring, and input modules; check pressure tubing.
[ALERT 0705] LUBE OIL PRESSURE OUT-OF- RANGE	Transducer signal is out of range but not shorted or open. Faulty transducer; poor connections.	Inspect transducer, wiring, input modules.
[ALERT 0706] COMPRESSOR OUTLET PRESSURE OUT-OF- RANGE	Transducer signal is out of range but not shorted or open. Faulty transducer; poor connections.	Inspect transducer, wiring, input modules.
[ALERT 707] COMPRESSOR OVER- PRESSURE	Compressor outlet pressure switch detects high pressure conditions.	Check switch for proper operation. Check downstream conditions.
[ALERT 0708] HIGH COMPRESSOR OUTLET PRESSURE	Pressure above the High Compressor Outlet Pressure Alert setpoint is detected, indicating unusual plant conditions.	Verify that setpoint (on Pressure Setpoints screen; see section 3.2) is at correct value. If so, check downstream conditions.
[ALERT 0709] LOW COMPRESSOR OUTLET PRESSURE	Pressure below the Low Compressor Outlet Pressure Alert setpoint is detected, indicating unusual plant conditions.	Verify that setpoint (on Pressure Setpoints screen; see section 3.2) is at correct value. If so, check downstream conditions; unusual demand or a leak may be present.
[ALERT 0710] INLET RTD SHORTED	Signal from RTD is out of range for the PLC.	Inspect intake air RTD, wiring, input modules.
[ALERT 0711] INLET RTD OPEN	Signal from RTD is out of range for the PLC.	Inspect intake air RTD, wiring, input modules.
[ALERT 0800] LAG IN USE	Lag compressor is operating when only one compressor should be needed.	Applicable only to Client/Server Lead/Lag compressors; alert can be disabled from screen L1.
[ALERT 0801] PLC BATTERY LOW	PLC battery is low and in need of replacement.	Replace PLC auxiliary battery. DO NOT attempt to replace integral battery; this could permanently damage the PLC. Refer to manufacturer's instructions for battery replacement.
[ALERT 0802] HMI TERMINAL BATTERY LOW	Terminal battery is low and in need of replacement.	Replace terminal battery. Refer to manufacturer's instructions for battery replacement.
[ALERT 0803] CHECK INLET AIR FILTER	Pressure transducers indicate high pressure differential across air filter. Must be tripped for 60 seconds to cause alert.	Inspect air filter and clean or replace if necessary.
[ALERT 0804] CHECK LUBE OIL FILTER	Oil filter differential pressure switch indicates high pressure differential across oil filter. Must be tripped for 60 seconds to cause alert.	Inspect oil filter and replace if necessary. Oil temperature must be above 80°F (40°F if using synthetic lube) for alert to function; crankcase heaters may be necessary if compressor is installed outdoors.

MESSAGE DISPLAYED	CAUSE/NOTES	CORRECTIVE ACTION
[ALERT 0805] FAILED TO LOAD	Less than 10 PSIG at intercooler while compressor is loaded. 10 second delay before alert.	Inspect transducer, capacity control valve, unloading valve and associated tubing, shuttle valve, and unloading valve relay. Capacity control valve diaphragm may be ruptured.
[ALERT 0806] FAILED TO UNLOAD	More than 10 PSIG at intercooler while compressor is loaded. 20 second delay before alert.	Inspect transducer, capacity control valve, unloading valve, and unloading valve relay. Capacity control valve may be in need of rebuild.
[ALERT 0807] DRYER FAULTED	External dryer contact indicates fault. Alert only active if input is configured accordingly; see section 5,.	Verify that inputs are correctly configured. Correct problem at dryer; consult dryer manufacturer's manual for troubleshooting assistance.
[ALERT 0808] LOW Z- PURGE PRESSURE	Z-purge pressure switch reports pressure fault. Alert only active if input is configured accordingly; see section 5.	Verify that inputs are configured correctly. Check switch operation and wiring. If switch is operating properly, check air plumbing to Z-purge panel for leaks and blockages.
[ALERT 0809] HIGH VIBRATION LEVEL	Vibration switch indicates dangerous vibration in compressor stages. Alert only active if input is configured accordingly; see section 5.	Verify that inputs are configured correctly. Check switch operation and wiring. If switch is operating properly, air end failure is possible; shut down compressor and consult factory.
[ALERT 0810] LOW COOLING WATER FLOW	Cooling water flow switch tripped, indicating low flow. Alert only active if input is configured accordingly; see section 5.	Verify that inputs are correctly configured. Check switch operation and wiring. If switch is operating correctly, check upstream cooling water piping for incorrectly closed valves or obstructions in the pipe.
[ALERT 0811] SHORT LOAD/UNLOAD CYCLE	Compressor has loaded and unloaded within a 1-minute period more times than specified on Service Counters screen.	Check that Short Cycle alert trigger is set correctly (see section 6.5). Check pressure settings. Ensure that air flow is unimpeded between compressor and air receiver.
[ALERT 1000] COMPRESSOR SERVICE ALERT	Compressor has completed 500,000 load/unload cycles, and is due for annual service.	Complete service and reset cycle counter.
[ALERT 1001] EXTERNAL INTERLOCK OPEN	Normally closed interlock contact has opened, indicating problem elsewhere in system. Alarm only active if input is configured accordingly; see section 5.	Verify that inputs are configured correctly. Corrective action for this alarm varies depending on purpose of external interlock; consult local documentation for assistance.
[ALERT 1002] REVISION LETTER INCORRECT	Model and serial number on service info screen do not match.	Consult factory.
[ALERT 1003] LOSS OF NETWORK COMMS	Applicable to compressors with sequencer only. Network communications have failed.	Check communication cables between PLC, communication module, and other compressors.
[ALERT 1004] LUBE OIL FAILSAFE	Compressor motor AUX closed when compressor should be off, or vacuum reading from 1st stage suction transducer when compressor should be off. Lubricant pump will start to prevent rotor damage.	Inspect starter for proper operation, look at PLC inputs for each device.

MESSAGE DISPLAYED	CAUSE/NOTES	CORRECTIVE ACTION
[ALERT 1005] POWER LOSS	Power lost while running or in standby.	If necessary, the compressor can be programmed to restart automatically after power failure. Consult factory for more information.
[ALERT 1006] LOSS OF CLIENT/SERVER COMMS	Applicable to client/server lead/lag compressors only. Network communications have failed.	Check communication cables between display and second compressor.
[ALERT 1007] MOTOR SERVICE REMINDER	Main motor run time indicates motor is due for maintenance.	Complete service and reset timer. See page 36.
[ALERT 1008] AMBIENT PRESSURE CALIBRATION ERROR	"Set Amibent" attempted from transducer calibration page has given a pressure value outside expected range.	Do not attempt to set amibient pressure while compressor is running. Check transducer; verify that incoming air system is not blocked and no unusual atmospheric conditions exist.

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