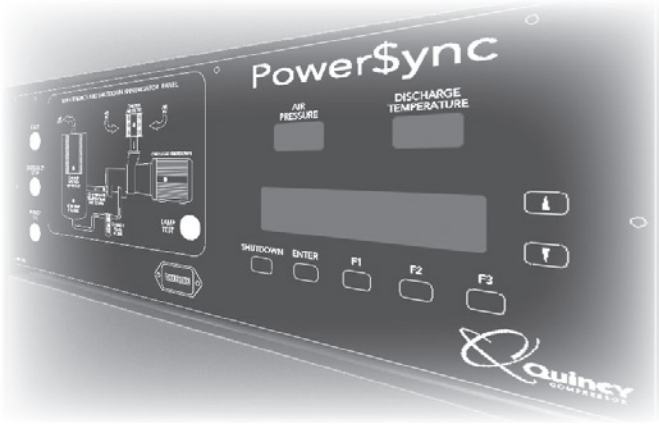
Quincy COMPRESSOR

The Science of Compressed Air



Power$ync®

Version 2.07

Service Adjustments

This manual contains important information about servicing the Power$ync Controller (Version 2.07) . The information contained in this addendum is intended for use by authorized service personnel only. Carefully read this manual before attempting to perform service on this equipment.

Manual No. 65005-P$SA2

October 2004 Edition

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☞ NOTICE!

The sequences used to access the menus and displays in this book are intended for use by authorized service personnel only.

Special Setup Options

Manufacturing Setup Menu

Press F1-F3-▼-▲ at the main start-up screen to enter the MANUFACTURING SETUP MENU. This menu allows the compressor model configuration to be set, or the hourmeters or event log to be reset:

```
******* MANUFACTURING SETUP MENU *******
SETUP MODEL AND HORSEPOWER ---->PRESS F1
RESET HOURMETERS ------------->PRESS F2
RESET EVENT LOG -------------->PRESS F3
```

Press F1 to enter the compressor model configuration:

```
COMPRESSOR MODEL ------------> QSI 500
HORSEPOWER ------------------------> 100
VOLTAGE ---------------------------> 460
******** PRESS ENTER TO ACCEPT *********
```

Press ▼ or ▲ to select the compressor model, ENTER accepts the selection and displays the following screen:

```
PRESSURE RANGE ----------> STD. PRESSURE
HORSEPOWER ------------------------> 100
VOLTAGE ---------------------------> 460
******** PRESS ENTER TO ACCEPT *********
```

Press ▼ or ▲ to select the pressure range of the compressor (LOW PRESSURE, STD. PRESSURE or HIGH PRESSURE).

☞ NOTICE!

The pressure ranges for each option are:

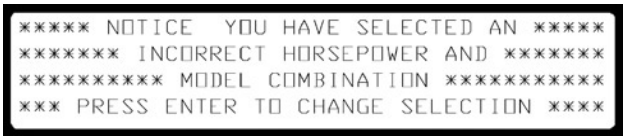
LOW PRESSURE ≈ 45 PSI (QSLP)
STD PRESSURE = 110 PSI MAXIMUM
HIGH PRESSURE ≥ 125 PSI

Press ENTER to accept and display the following screen:

```
HAT TRIP TEMPERATURE -------------> 235
HORSEPOWER ------------------------> 100
VOLTAGE ---------------------------> 460
******** PRESS ENTER TO ACCEPT *********
```

The HAT shutdown temperature can be adjusted here but should not be changed from the default value unless there is good reason to do so. Press ENTER to accept the default value and access the HORSEPOWER setting. Press ▼ or ▲ to change the HORSEPOWER setting, ENTER to accept.

The compressor is checked to verify that the selected motor is a valid match. If not, the following error message will be displayed and a different horsepower must be selected:



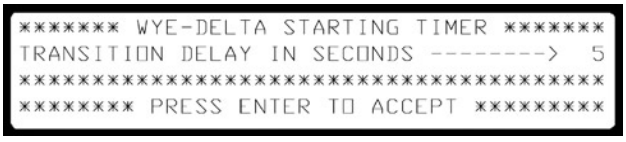
After a valid HORSEPOWER setting is entered and ENTER is pressed, the following screen will be displayed:

Press F1 for air-cooled, F2 for water-cooled.

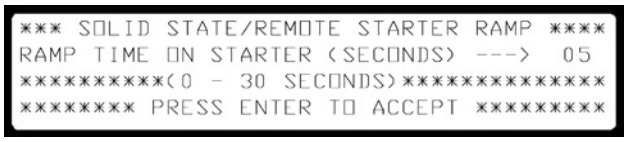
Once cooling type selection is made, the starter menu will appear:

If ACL starting is selected (F1), no further entries are required. If Y-D (F2) or remote (F3) starting, additional information is required.

If Y-D STARTING is selected, a transition time (the time that the contactor will remain in Y-starting mode before changing to Delta-run mode) is required:

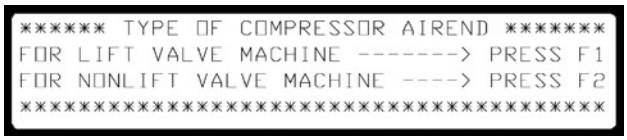


If REMOTE/SOLID STATE starter is selected, the following screen will be displayed:



This provides a delay time to match the ramp times on remote/SS starters. This will prevent 'Contactor Not Engaging" error messages that can occur if the ramp-up is longer than the preset internal times.

The compressor airend type must be entered next:



This setting tells the control system to use the lift valves or to bypass them. Press F1 or F2 to select the correct type of airend.

Once the airend type is selected, the controller will display the serial number entry screen:

Enter the machine's serial number which can be found on the serial number tag located in the upper right corner of the electrical control panel. Upon completion, the contents will be written to U19 for storage.

The display screen will then return to the MANUFACTURING SETUP MENU. To reset all hourmeters in the system (run time hours and filter hourmeters) press F2. The following acknowledgment will be displayed:

```
**************************************
****** ALL HOURMETERS RESET TO 0 *******
**************************************
******** PRESS ENTER TO EXIT ***********
```

To clear both event logs, press F3. The following confirmation message will be displayed:

```
**************************************
***** LOG MEMORY HAS BEEN CLEARED ******
**************************************
******** PRESS ENTER TO EXIT ***********
```

The setup program will again return to the MANUFACTURING SETUP MENU. Press ▲ to access an extra setup menu which allows a setting to be entered for compensating value for package drop.

```
****** MANUFACTURING SETUP MENU B ******
SEPARATOR TO PACKAGE EXIT DROP -- 00 PSI
```

This is a compensating number to improve the separator check light condition. Use pressure readings from the dry side of the separator to the package discharge. Since the separator differential pressure is taken from the sump and package discharge point, a higher than normal pressure drop through the aftercooler and water separator may offset the computed value too much.

Auxiliary/Optional Sensor Inputs

The 140265-1C Controller board can handle additional sensor inputs to enhance the operations. Pressure sensors and motor monitoring inputs can be added without additional boards (reference figure on page 4). All of these inputs are 4-20ma.

NOTICE!

Motor monitoring inputs will vary according to the vendor supplied converter. Typical connections are shown. IN8 is for the current sensor, while IN9 is for the voltage converter.

Press F1-F3-▼-▼ at the main start-up screen to access additional downstream pressure sensor activation:

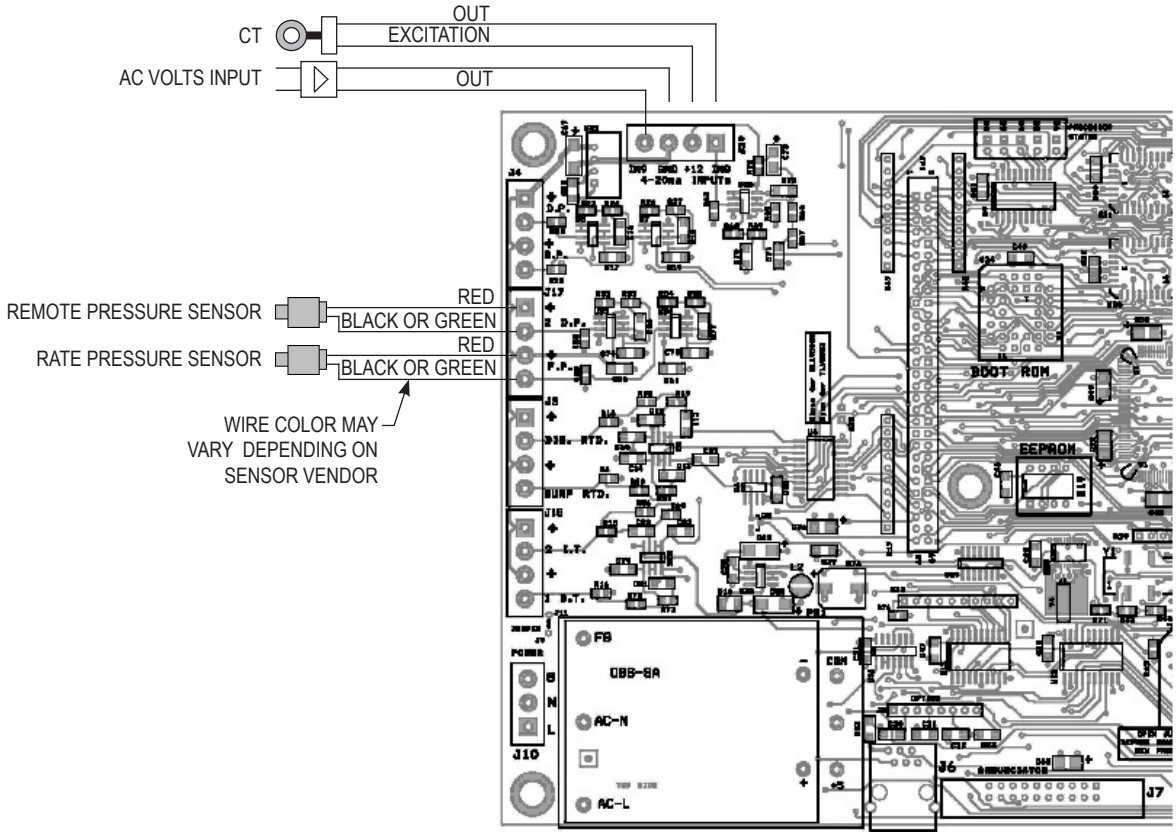
```
*** ADDITIONAL PRESSURE SENSOR SETUP ***
SETUP RATE PRESSURE SENSOR ---> PRESS F1
SETUP REMOTE PRESSURE SENSOR -> PRESS F2
********** ENTER RETURNS ***************
```

Press F1 to activate and configure the RATE PRESSURE SENSOR. This input is a down-line sensor that conveys the trends in pressure usage to the compressor control system to tailor the system's response to those changes.

```
***** RATE CONTROL PRESSURE SENSOR *****
CALIBRATE ZERO SETTING -------> PRESS F1
ACTIVATE PRESSURE USE --------> PRESS F2
CANCEL USE OF SENSOR ---------> PRESS F3
```

Press F1 to access the calibration menus:

```
***** RATE CONTROL PRESSURE SENSOR *****
** ZERO PRESSURE CALIBRATION;  REMOVE **
* PRESSURE CONNECTION, PRESS ENTER WHEN
**************** STABLE ****************
```



Once the zero is set, the program goes to the scale setting:

```
***** RATE CONTROL PRESSURE SENSOR *****
ENTER TRANSDUCER PRESSURE SCALE ---> 250

PRESS UP AND DOWN TO CHANGE, ENTER TO END
```

Press ▲ or ▼ to set the full scale pressure range of the sensor. Press ENTER to accept and return to RATE CONTROL PRESSURE SENSOR menu.

Press F2 to activate the RATE CONTROL PRESSURE SENSOR and display the following message:

```
***** RATE CONTROL PRESSURE SENSOR *****
 NOTICE: RATE CONTROL PRESSURE SENSOR IS
******** ACTIVE IN THE SYSTEM **********
****************************************
```

Press F3 to deactivate the use of this sensor and remove it from the start-up test routine:

```
***** RATE CONTROL PRESSURE SENSOR *****
 NOTICE: RATE CONTROL PRESSURE SENSOR IS
************** DEACTIVATED **************
****************************************
```

The program returns to the ADDITIONAL PRESSURE SENSOR SETUP menu. Press F2 to activate and configure the REMOTE PRESSURE SENSOR. This input is a down-line sensor that tells the compressor control system the pressure to use in control (Auto Dual Mode Only).

```
***** REMOTE LINE PRESSURE SENSOR ******
CALIBRATE ZERO SETTING -------> PRESS F1
ACTIVATE PRESSURE USE --------> PRESS F2
CANCEL USE OF SENSOR ---------> PRESS F3
```

Press F1 to access the calibration menus.

```
***** REMOTE LINE PRESSURE SENSOR ******
** ZERO PRESSURE CALIBRATION;  REMOVE **
* PRESSURE CONNECTION, PRESS ENTER WHEN
**************** STABLE ****************
```

Once the zero is set the program goes to the scale setting:

```
***** REMOTE LINE PRESSURE SENSOR ******
ENTER TRANSDUCER PRESSURE SCALE ---> 250

PRESS UP AND DOWN TO CHANGE,ENTER TO END
```

Press ▲ or ▼ to set the full scale pressure range of the sensor. Press ENTER to accept and return to REMOTE LINE PRESSURE SENSOR menu.

Press F2 to activate the REMOTE LINE PRESSURE SENSOR. The following message will be displayed:

```
***** REMOTE LINE PRESSURE SENSOR ******
** NOTICE: REMOTE PRESSURE SENSOR IS ***
******** ACTIVE IN THE SYSTEM **********
****************************************
```

Press F3 to deactivate the use of this sensor and remove it from the start-up test routine:

```
***** REMOTE LINE PRESSURE SENSOR ******
** NOTICE: REMOTE PRESSURE SENSOR IS ***
**************** DEACTIVATED **********
****************************************
```

NOTICE!

See COMPRESSOR SERVICE MENU 4 for voltage and current monitor setup.

Compressor Service Menus

The COMPRESSOR SERVICE MENUS allow the service technician to access shutdown logs, network diagnostics, pressure transducer calibration (zero and scale), clear sequences & schedules, setup display units (english/metric), set the global network speed, activate power monitoring, and disable the reverse rotation check restore on power-up.

Press ENTER-F3-▼-F1 at the main start-up screen to access COMPRESSOR SERVICE MENU 1:

```
****** COMPRESSOR SERVICE MENU 1 *******
VIEW EVENT LOG ---------------> PRESS F1
NETWORK DIAGNOSTICS ----------> PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

Press F1 to view the EVENT LOG:

```
ENTRY:  01  TIME  00:00   DATE:  00/00/00
EVENT LOGGED:  NOT USED OR EMPTY
PARAMETER ----- (1-4):   000 000 000 000
PARAMETER ----- (5-8):   000 000 000 000
```

This display shows only the 16 logs stored in the EEPROM. Resolved details may be seen in COMPRESSOR DIAGNOSTIC MENU 1. Press ▲ or ▼ to scroll through the event log, ENTER to return to COMPRESSOR SERVICE MENU 1.

Press F2 at COMPRESSOR SERVICE MENU 1 to access the Network Diagnostic screen:

```
A: T5L09   B: T0L00   C: T0L00   D: T0L00
E: T0L00   F: T0L00   G: T0L00   H: T0L00
I: T0L00   J: T0L00   K: T0L00   L: T0L00
M: T0L00   N: T0L00   O: T0L00   P: T0L00
```

Press ▲ or ▼ to access a second diagnostic screen which is not available in the general diagnostics menu:

```
STATUS:  60   CONFIG:  00   DIAG:  00
RECON:  1234   NAK:  0000   MYRECON:  1234
NET SPEED:  2.5 Mbps   NET PRESSURE:  000
****************************************
```

The variables shown are the internal registers of the COM20020 chip.

STATUS:
The contents of the STATUS register on the chip in hexadecimal format.

CONFIG:
Unused at this time.

DIAG:
Displays the chip's internal diagnostic register in hexadecimal format.

RECON:
Indicates the number of reconfigurations that have occurred in the network and can be used to determine whether a communications problem exists between machines on the network. A reconfiguration will occur when the signal requesting information from compressors on the network is lost or scrambled. This will happen occasionally in noisy environments. The control has been designed to recover from these occasional problems. If there is only one compressor powered up this number will have no meaning. If more than one compressor in the network has power, a RECON number that increases at a rate greater than one count per second indicates a possible communications problem.

NAK:
EACH TIME INFORMATION IS SENT OUT ON THE NETWORK THE CONTROL LOOKS FOR AN ACKNOWLEDGMENT SIGNAL THAT INDICATES THAT THE INFORMATION WAS RECEIVED. THE NAK NUMBER INDICATES THE NUMBER OF TIMES THAT NO ACKNOWLEDGMENT WAS RECEIVED. THIS NUMBER SHOULD BE ZERO. IF IT IS SOMETHING OTHER THAN ZERO, AND IF ALL NETWORK MACHINES ARE SHOWING THE SAME NAK NUMBER, THERE MAY BE A PROBLEM WITH THE TERMINATOR BOX.

MYRECON:
This number indicates the number of times that this particular control has reconfigured itself. If this number is changing at a rate significantly different from the RECON rate, a communications problem at that machine may be indicated.

NET SPEED:
Indicates the data rate being used to communicate with the other compressors. 2.5 Mbps is the factory default (fastest).

NETWORK AVERAGE PRESSURE:
The network controls the operation of machines by comparing the target pressure setting to the average pressure of all the compressors on the network.

Press ENTER to return to COMPRESSOR SERVICE MENU 1, then press ▲ to advance to COMPRESSOR SERVICE MENU 2:

```
****** COMPRESSOR SERVICE MENU 2 *******
TRANSDUCER CALIBRATION -------> PRESS F1
CLEAR SCHEDULE AND SEQUENCE --> PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

Press F1 to enter the pressure transducer calibration menus.

```
*** PRESSURE TRANSDUCER CALIBRATION ****
FOR TRANSDUCER ZERO ADJ. -----> PRESS F1
FOR TRANSDUCER SCALE ADJ. ----> PRESS F2
******** PRESS ENTER TO RETURN *********
```

Press F1 to access PRESSURE TRANSDUCER ZERO ADJUSTMENTS:

```
* PRESSURE TRANSDUCER ZERO ADJUSTMENTS *
TO ZERO LINE PRESSURE --------> PRESS F1
TO ZERO SUMP PRESSURE --------> PRESS F2
******** PRESS ENTER TO RETURN *********
```

Press F1 to zero the line pressure transducer, F2 to zero the sump pressure transducer. ENTER returns to PRESSURE TRANSDUCER CALIBRATION menu.

If F1 is pressed, the following message will be displayed:

```
** LINE PRESSURE TRANSDUCER ZERO SET ***
**** VENT TRANSDUCER TO ATMOSPHERE *****
**** WAIT FOR PRESSURE TO STABILIZE ****
**** PRESS ENTER TO SET AND RETURN *****
```

The pressure line to the transducer should be removed to ensure that the sensor is at zero. By disconnecting the tubing, the static head due to any trapped fluid is removed. The other transducers are calibrated in the same fashion.

PRESS ENTER to set the transducer and return to PRESSURE TRANSDUCER CALIBRATION menu. Press F2 to access the scale adjustment menus:

```
* PRESSURE TRANSDUCER SCALE ADJUSTMENTS*
TO SCALE LINE PRESSURE -------> PRESS F1
TO SCALE SUMP PRESSURE -------> PRESS F2
******** PRESS ENTER TO RETURN *********
```

This section matches the transducer pressure scale with the output voltages.

Press F1 to scale the line pressure transducer, F2 to scale the sump pressure transducer. ENTER returns to PRESSURE TRANSDUCER CALIBRATION menu.

If F1 is pressed, the following message will be displayed:

```
**** LINE PRESSURE SCALE ADJUSTMENT ****
ENTER 'ZERO' PRESSURE SCALE -------> 000
ENTER MAXIMUM PRESSURE SCALE ------> 250
PRESS UP AND DOWN TO CHANGE, ENTER TO END
```

Press ▲ or ▼ to change the transducer range. The standard transducers have a pressure range from 0 to 250 psig. Press ENTER to accept the value entered. The system will then prompt for the voltages used:

```
**** LINE PRESSURE SCALE ADJUSTMENT ****
ENTER 'ZERO' PRES. VOLTAGE OUT --> 1.000
ENTER MAX. PRES. VOLTAGE OUT ----> 5.000
PRESS UP AND DOWN TO CHANGE, ENTER TO END
```

Standard output voltages for the SETRA transducers used on Quincy Compressors are 1.00 to 5.00. Other transducers in the system are setup in a similar fashion.

Press ENTER to return to COMPRESSOR SERVICE MENU 2, then F2 to CLEAR SCHEDULE AND SEQUENCE. This will clear all the schedules and sequences previously programmed. The following acknowledgment will be displayed if F2 is pressed:

```
****************** NOTICE ******************
****** SEQUENCE AND SCHEDULE DATA ******
********** HAS BEEN CLEARED ***********
******** PRESS ENTER TO RETURN *********
```

Press ENTER to return to COMPRESSOR SERVICE MENU 2, then press ▲ to advance to COMPRESSOR SERVICE MENU 3.

```
****** COMPRESSOR SERVICE MENU 3 *******
SELECT DISPLAY UNITS ----------->PRESS F1
GLOBALLY CHANGE NETWORK SPEED ->PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

Press F1 to select the display units:

```
******** SELECT DISPLAY UNITS **********
METRIC PRESSURE AND TEMPERATURE ----- F1
ENGLISH PRESSURE AND TEMPERATURE ---- F2
********** ENTER RETURNS **************
```

Press F1 to select metric display units - pressures will be in BARS, temperatures will be in °C.

Press F2 to select english (imperial) units - pressures will be in PSIG, temperatures will be in °F.

The following acknowledgment screen will be displayed, and the panel will show the new displays immediately:

```
********** DISPLAY UNITS **********
** NOTICE: THE TEMPERATURE AND PRESSURE
** DISPLAY UNITS ARE NOW -- METRIC -- **
********** ENTER RETURNS **********
```

Press ENTER to return to COMPRESSOR SERVICE MENU 3. Press F2 to access the speed selection for the network cable:

```
 CAUTION! THIS WILL CHANGE THE NETWORK *
SPEED *** SELECTED SPEED -----> 2.5 Mbps
*** UP/DOWN TO SELECT DESIRED SPEED ****
******** PRESS ENTER TO RETURN *********
```

Available speed options are: 2.5 Mbps, 1.25 Mbps, 625 Kbps, 312 Kbps, and 156 Kbps. Lower speeds can be selected to provide better signals over longer ranges. However, slowing the network down too much may disrupt the orderly transfer of data. Use the fastest setting that fits the situation. 2.5 Mbps is the default speed setting. Changing the speed will send the new value over the network and require all connected compressors to be restarted to lock in the new settings.

☞ NOTICE!

Do not change the speed setting unless you are ready to shutdown all compressors.

Press ENTER to return to COMPRESSOR SERVICE MENU 3, then press ▲ to advance to COMPRESSOR SERVICE MENU 4.

```
****** COMPRESSOR SERVICE MENU 4 *******
SELECT POWER MONITORING ------->PRESS F1
REVERSE ROTATION CHECK ON/OFF ->PRESS F2
UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

The POWER MONITORING option requires installation of the interface modules to provide signals on the current and voltage being applied to the main motor (reference 'Auxiliary/Optional Sensor Inputs' (pages 3-5) & diagram on page 4 for connections).

Prior to activating the power monitor option, shutdown the compressor and remove power. Follow lockout, tagout procedures.

- Connect the voltage and current modules as shown in the wiring diagram.
- Temporarily disconnect the motor voltage input from the module.
- Apply power. The green LED lamp on the voltage module should illuminate and the start-up boot sequence should run normally.

Access COMPRESSOR SERVICE MENU 4 and press F1 to SELECT POWER MONITORING:

```
* MONITOR MAIN MOTOR CURRENT & VOLTAGE *
POWER MONITOR IS CURRENTLY: OFF

ENTER RETURNS, F1->ON, F2->OFF, F3->CAL.
```

F1 activates the power monitoring option, and allows self-test at start-up.

F2 turns power monitoring OFF.

F3 accesses the power monitoring option calibration menus. When activating this feature for the first time, calibration must be done to tell the controller the desired scales and other settings.

☞ NOTICE!

Calibration of the power monitoring option should be done with the voltage input module disconnected from the 3-phase power to establish a stable zero point.

```
******* SETUP OF VOLTAGE MONITOR *******
*** FULL SCALE VOLTAGE -------: 0460
*** ZERO VOLTAGE INPUT -------> PRESS F2
* ENTER RETURNS, F1 SETUP, UP FOR NEXT *
```

Press F1 to adjust the voltage scale (set to full scale of the module, not the input voltage). Next, press F2 to establish the zero point. The display will return to the MONITOR MAIN MOTOR CURRENT AND VOLTAGE screen.

Press F3, then ▲ to access the current sensor setup menu:

```
******* SETUP OF CURRENT MONITOR *******
*** FULL SCALE CURRENT ------:  0100
*** ZERO CURRENT INPUT ------> PRESS F2
 ENTER RETURNS, F1 SETUP, DOWN FOR PREV.
```

Press F1 to setup the full scale current of the sensor, then F2 to set the zero point and complete the calibration of these monitors.

Remove power again, reconnect the motor voltage input to the voltage-sensing module and reapply power.

☞ NOTICE!

Refer to the Compressor Maintenance Menus to access the voltage monitoring display.

ENTER returns to COMPRESSOR SERVICE MENU 4. Press F2 to turn off the reverse rotation test:

```
* REVERSE ROTATION TESTING DURING START
*** NOTE:  THIS IS PERMANENTLY ACTIVE ***
   STATUS:   OFF LOGGED - 00/00/00  00:00
*** F1-> ON, F2-> OFF, ENTER RETURNS ***
```

This menu turns the reverse rotation check ON or OFF permanently (unlike the setting for this test accessible through COMPRESSOR MAINTENANCE MENU 7). If set here, this test remains as set (ON OR OFF) in the event of a power loss. Since there is a possibility that the loss of power may be due to utility work that could reverse phases, this test condition is stored in the log as an indication of change.

Press ENTER to return to COMPRESSOR SERVICE MENU 4, then press ▲ to advance to COMPRESSOR SERVICE MENU 5.

```
****** COMPRESSOR SERVICE MENU 5 *******
VIEW ANALOG INPUT SIGNALS ----->PRESS F1

UP FOR NEXT MENU/DOWN FOR PREVIOUS MENU
```

Press F1 to access the ANALOG INPUT VOLTS screen:

```
*** ANALOG INPUT VOLTS ENTER EXITS *****
 D.P.  1.51v    S.P.  1.21v   1D.T.  0.00v
 D.T.  2.01v    S.T.  1.92v   2I.T.  0.01v
2D.P.  0.00v IN8 0.00v IN9 0.00v FP 0.00v
```

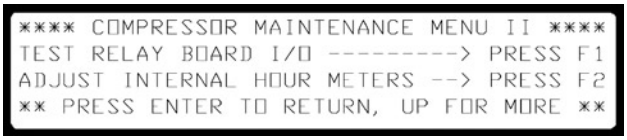
This screen displays the inputs to the analog converter in volts. The labels corresponds to the label on the circuit board to identify the input signal:

- D.P. - Discharge Pressure (package)
- S.P. - Sump Pressure
- 1D.T. - Stage 1 Discharge Temperature (QSD only)
- D.T. - Airend Discharge Temperature
- S.T. - Sump temperature.
- 2I.T. - Stage 2 Inlet Temperature (QSD only)
- 2D.P. - Stage 2 Discharge Pressure (QSD)
  Remote Pressure Sensor (QSI)
- IN8 - Motor Current sensor input
- IN9 - Motor Voltage sensor input
- FP - Fluid pressure input (QSD)
  Rate Pressure sensor (QSI)

Compressor Maintenance Menu II

Compressor Maintenance Menu II allow the service technician to run test procedures for the relay board, adjust total hours, clear the cycle counter, temporarily disable the start-up HAT function, and setup the modem watchdog time-out value.

Press Enter-F3-▼-F2 at the main start-up screen to access Compressor Maintenance Menu II:



Press F1 to enter the relay board test menus.

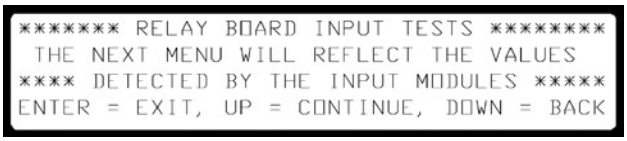
CAUTION!

The main power feed should be disconnected from the contactors during this section to avoid accidental starts.

The following cautionary message will be displayed before starting this test sequence:

If ready to test, press F1. If not, press ENTER to return to Compressor Maintenance Menu II.

F1 will cause the following message to be displayed:

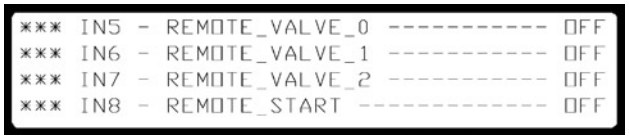


Press ▲ to continue.

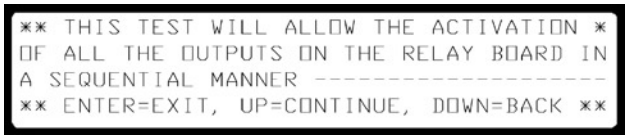
The next two menus will display the input conditions as sensed on the relay board. On indicates that there is 120 VAC applied to the board, and the associated LED should be on. Off indicates that there is no voltage present. Press ▲ to see the next set of inputs.

NOTICE!

The following inputs will be valid only on 4C (or higher) boards. 4A and 4B boards will show false On indications.



Press ▲ to advance to the next part of the test - activation of the output relays. The controller will continue to monitor the sump pressure and if a pressure rise is detected the test will abort (in case the motor has started).



Press ▲ to continue with the output activation:

Press ▲ or ▼ to scroll through the relays and display the current state of each relay. Press F1 to turn the selected relay On or F2 to turn it Off. When On, the LED lamp associated with the relay will be on (4B and 4C boards), and power will be switched to the output terminals. Press Enter to exit when finished.

Press ENTER again to return to COMPRESSOR MAINTENANCE MENU II, then press F2 to change the internal hourmeters:

```
*** CORRECT EEPROM HOURMETER CONTENTS **
  COMPRESSOR TOTAL HOURS ---- 012345
 Use UP/DOWN to adjust, cannot decrease
ENTER ->SETS,   F1 ->ABORTS,    F3 ->LOCKS
```

Press ▲ or ▼ to set the value, ENTER to advance to the next digit. The existing hours are displayed and cannot be decreased - only increased. When the count is corrected, press ENTER to accept the setting, then F3 to lock the new value in memory. Press F1 to abort the change and retain the previous reading.

Press ▲ from COMPRESSOR MAINTENANCE MENU II to access COMPRESSOR MAINTENANCE MENU IIB:

```
**** COMPRESSOR MAINTENANCE MENU IIB ***
CLEAR THE CYCLE COUNTER ------> PRESS F1
HAT TEST MODE ----------------> PRESS F2
** PRESS ENTER TO RETURN, UP FOR MORE **
```

Press F1 to clear the cycle counter. This counter stores how many times the compressor is loaded and unloaded, and can be used to determine service intervals on various seals involved with the inlet and blowdown valves. This counter may also need to be reset when upgrading a board from a previous version to remove random numbers. No message will be displayed here.

Press F2 to access setup mode for package HAT testing:

```
****************** NOTICE ******************
* THE COMPRESSOR HAT IS SET TO NORMAL **
***** TRIP POINTS FOR COOLER TESTS *****
********** PRESS ENTER TO RETURN ********
```

Under normal operation, the compressor has an elevated HAT setting during start-up (higher than the normal run setting). Activating HAT TEST MODE turns this off to allow package tests. Powering down will restore the normal operation.

Press ENTER to return to COMPRESSOR MAINTENANCE MENU IIB, the press ▲ to advance to COMPRESSOR MAINTENANCE MENU IIB:

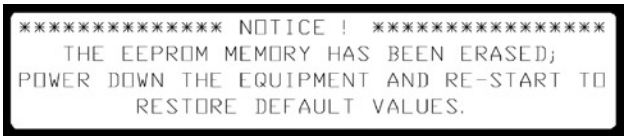
```
**** COMPRESSOR MAINTENANCE MENU IIC ***
  MODEM WATCHDOG TIMER IS 060 SECONDS

* F1-> ALTER, ENTER TO RETURN **********
```

This is the time period that the controller will wait after receiving a valid command via the serial port. If no further valid commands are received within this time period, the compressor control will be reset and externally issued commands will be turned off. Press F1 to change the setting, ENTER to return.

EEPROM Eraser

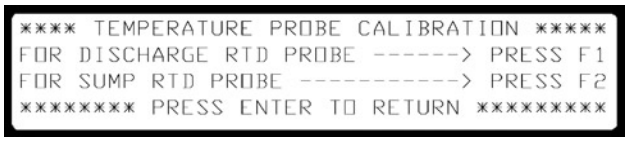
Press ENTER-F3-▼-F1-▲-F3-F3-▲ at the main start-up screen to erase the contents of the EEPROM. The following message will be displayed:



The U19 DATA NOT INITIALIZED message will be displayed after powering down and restarting the compressor. All setup, calibration and scheduling information has been erased. New information must be entered before the compressor is restarted to load a new set of default values and ensure proper operation.

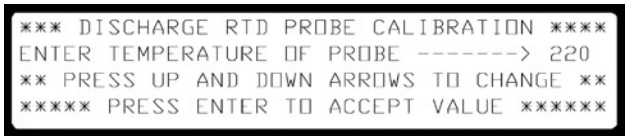
RTD Calibration

Press F2-▲-▼-F3-F2 at the main start-up screen to access the TEMPERATURE PROBE CALIBRATION menu:



Press F1 or F2 to select the probe to be calibrated. The probe should be stable at the set calibration temperature before proceeding. Press ▲ or ▼ to set the current temperature.

If F1 is pressed, the controller will display the following message:



Press ▲ or ▼ to adjust the temperature setting. When the desired setting is displayed, press ENTER to accept the setting. Calibrating the sump RTD probe is performed in the same manner (press F2 at TEMPERATURE PROBE CALIBRATION screen).

Transducer Scale Adjustment

Press ENTER-F3-▼-F1-▲-F3-F3-F3 at the main start-up screen to access the PRESSURE TRANSDUCER SCALE ADJUSTMENT menu:

```
* PRESSURE TRANSDUCER SCALE ADJUSTMENT *
ENSURE THAT TRANSDUCERS ARE ZERO'D FIRST
TO ADJUST THE SENSOR READING -->PRESS F1
************ ENTER RETURNS ************
```

Verify that the transducers are calibrated to zero and press F1 to continue:

```
* ADJUST SCALE ON DISCHARGE --->PRESS F1
* ADJUST SCALE ON SUMP -------->PRESS F2
* ADJUST SCALE ON DOWNSTREAM -->PRESS F3
************ ENTER RETURNS ************
```

Select the desired transducer by pressing F1, F2 or F3 to continue:

```
* DISCHARGE TRANSDUCER PRESSURE READING
* ADJUSTMENT: SHOULD READ -------> 105

***** F1 TO ADJUST, ENTER RETURNS ******
```

Apply a calibrating source of air pressure to the transducer to bring it close to the operating pressure and adjust the reading by pressing F1.

☞ NOTICE!

If the transducer has 105 psig applied to it from a calibrated source, the entered reading is used as a scaling factor to correct all other readings to follow. This should be used to compensate for minor discrepancies only. If the pressure difference is greater than 6 psi, check the zero calibration point before making adjustments.

Serial Port Test

To test the serial port, press F3-F3-F3 at the main start-up screen:

```
** COMPRESSOR COM. PORT TEST FUNCTION **
 Connect LOOP-BACK plug on MODEM port.

***** F1-> SENDS TEST, ENTER EXITS *****
```

Place a loop-back test plug on the MODEM port of the Power$ync board, then press F1 to initiate the test (send a signal to the port) and receive a pass/fail message.

☞ NOTICE!

A loop-back plug is a simple connection with a D-SUB plug connector (male) with pins 2 and 3 connected.

If the signal is received, the following message will be displayed:

```
** COMPRESSOR COM. PORT TEST FUNCTION **
 Connect LOOP-BACK plug on MODEM port.
  RESPONSE: COM PORT OK-Send & Receive
***** F1-> SENDS TEST, ENTER EXITS *****
```

If no signal is received within the time limit the following message will be displayed:

```
** COMPRESSOR COM. PORT TEST FUNCTION **
 Connect LOOP-BACK plug on MODEM port.
  RESPONSE: COM PORT BAD? NO LOOP BACK
***** F1-> SENDS TEST, ENTER EXITS *****
```

This message means there is an error in the circuitry on the main board (the main board may need to be replaced if the modem port is to be used).

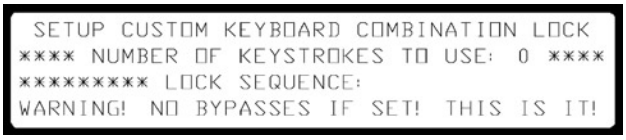
Special Functions

To prevent unauthorized personnel from making changes to compressor settings, the control panel can be locked by pressing the key sequence ▲-▼-▲-ENTER. (To unlock the control panel, press the same key sequence again.)

When the control panel is locked, pressing any key other than SHUTDOWN results in the following message being displayed:

All operational displays are functional but access to adjustment menus is denied.

A special setup menu which provides additional security is available by pressing ▲-▼-SHUTDOWN while the compressor is stopped.

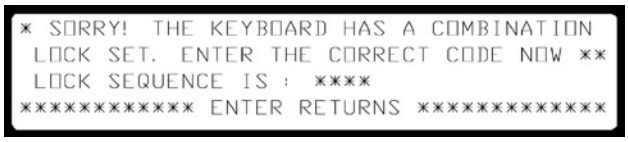


In this menu, a combination lock sequence of up to 8 keystrokes (any combination) can be entered. A setting of zero keystrokes will restore the lock to normal operation. If the sequence is lost, the setup procedure can be reconfigured.

☞ NOTICE!

If the custom lock setup is accessed during compressor operation the compressor will shutdown. Operations that lock or unlock the console will be stored in the event log.

If any key other than shutdown is pressed with the custom lock in place, the following message will appear:



This display shows the correct number of characters in the combination. Enter the correct key sequence to unlock the control.

☞ NOTICE!

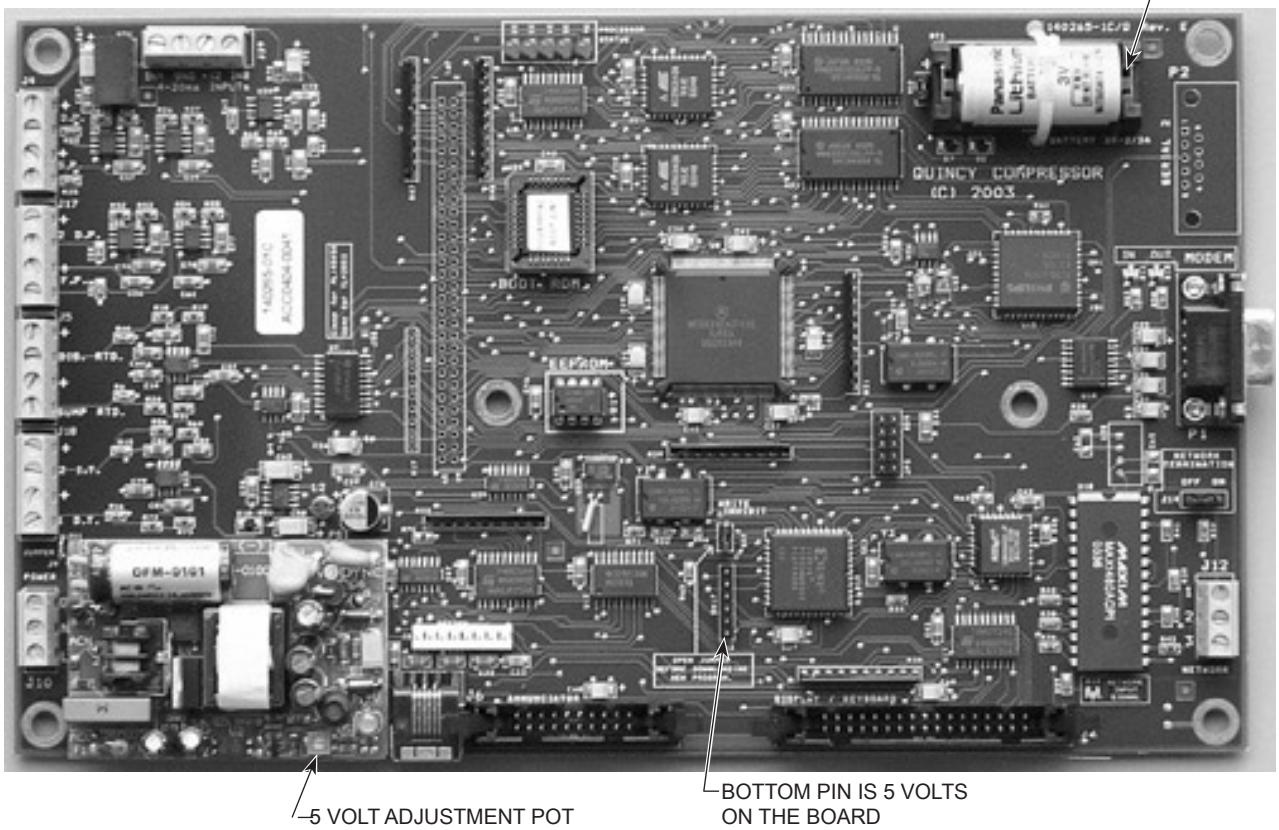
Quincy Compressor recommends that the combination is written in the box below for safekeeping. Once set, there is no way to bypass this lock.

Lock Sequence: ____

140265-1C Board Voltage Points

CAUTION

WHEN ADDING OR CHECKING THE TRANSDUCERS, BE SURE NOT TO SHORT THE +12 VOLT LINES. DOING SO WILL DAMAGE THE COWER CONVERTER (U31).



Quincy Compressor and Ortman Fluid Power Divisions

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

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

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

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

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

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

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

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

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

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

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

Quincy Compressor and Ortman Fluid Power Divisions

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

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

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

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

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

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

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

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

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

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

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

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

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

Notes

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