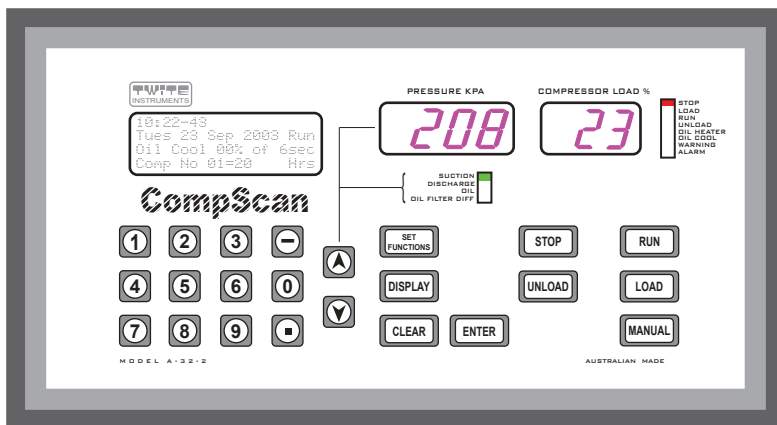


# COMPSCAN OPERATING MANUAL MODEL A-32-S



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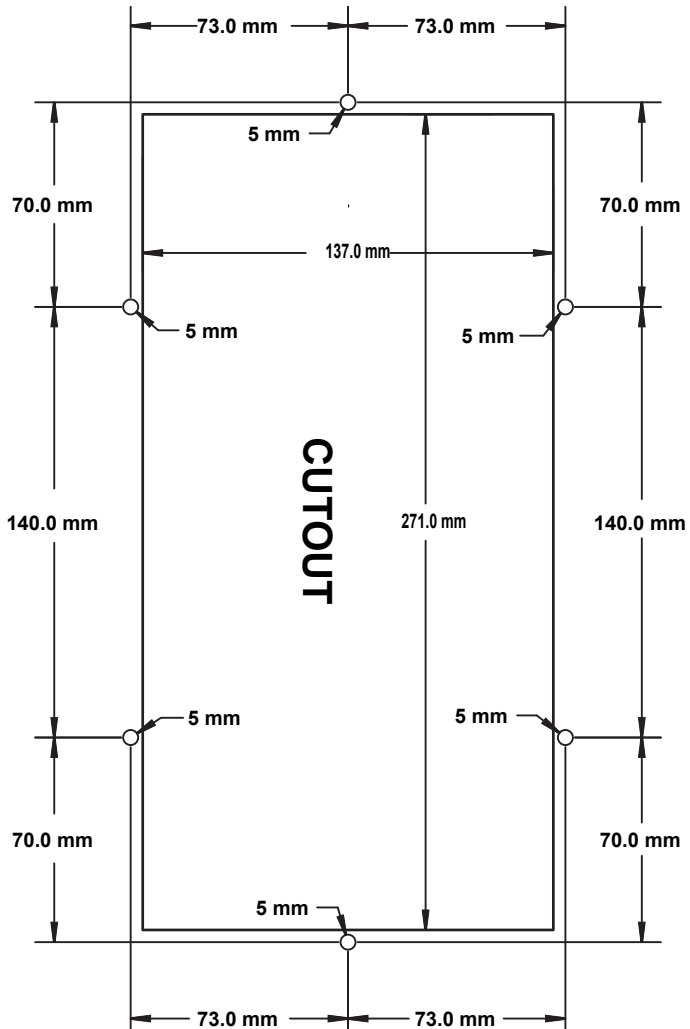
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## INSTALLATION :-

### PANEL MOUNT CUTOUT.





## INSTALLATION :-

### COMPSCAN POSITIONING AND MOUNTING.

The unit should be mounted at a level for easy viewing and access to keyboard, using fixing screws. Ensure it is in a dry area and not in direct sunlight.

The unit must not be subject to any vibration.

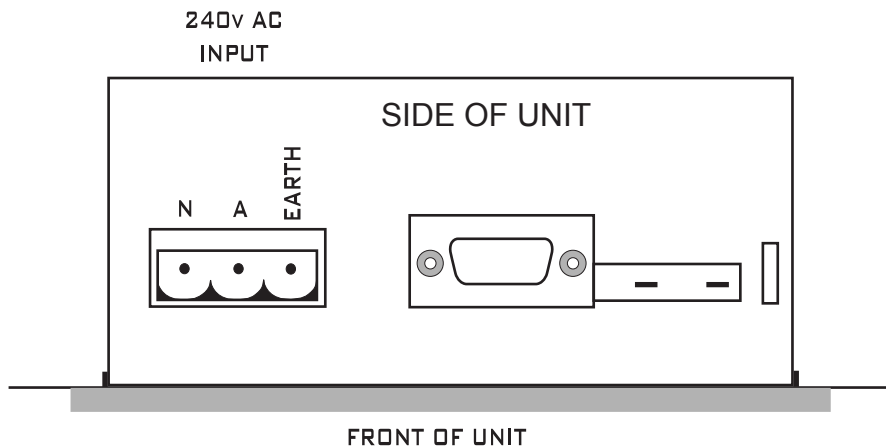
**The unit must not be mounted in or near electrical cabinets (*switch boards with contactors switching motors, solenoids etc.. for example*), it must be placed at least 4 meters from other cabinets in its own cabinet. If it is to be connected to a PRINTER, COMPUTER or MODEM the RS232 cable must not exceed 6 metres. The unit may be mounted in an office and control boards mounted remotely.**

### COMPSCAN UNIT POWER CONNECTION.

Power to the main unit must be 240 V ac. and connected to the terminal Block E. A. N. for E = EARTH, A = ACTIVE and N = NEUTRAL.

**The power supply for the CompScan must be a direct line from the main switch board and not an extension of control power etc.**

**NOTE:- The power supply for the unit should be left on at all times to conserve the battery power for the Real Time Clock and Set Points memory. See Battery Replacement later in this manual to change the battery.**



## INSTALLATION CONT.

### COMPSCAN CONTROL POWER TERMINALS :-

### COMPSCAN COMPRESSOR CONTROL POWER CONNECTION.

Power for compressor control can be up to 240 V ac. and connected to the terminal block.

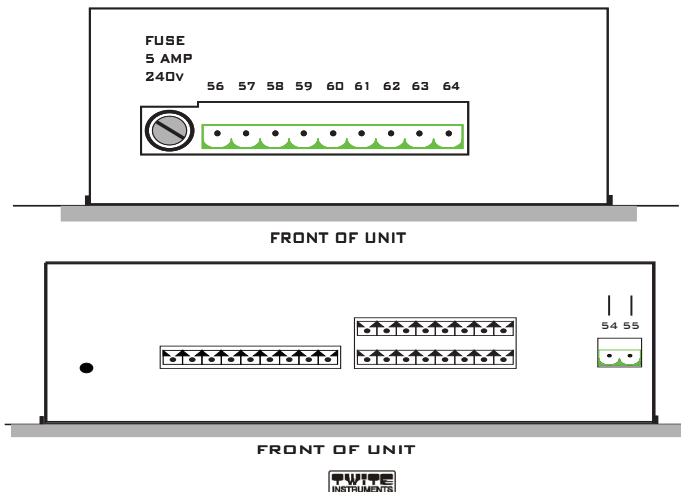
Output Terminals 59, 60, 63 and 64 may be connected to solid state relays, as such 24 to 240v AC must be used and not DC.

The power supply for the CompScan must be a direct line from the main switch board and not an extension of control power etc.

### COMPSCAN COMPRESSOR CONTROL OUTPUT POWER CONNECTIONS. TOTAL CURRENT MUST NOT EXCEED 5 AMPS

#### Terminal No.

- |      |   |   |
|------|---|---|
| 56 - | The Active common input. for first 8 relays (fused) |   |
| 57 - | Oil Pump active output.                             | 58 - Motor Run active output.                     |
| 59 - | Load Solenoid active output.                        | 60 - Unload Solenoid active output                |
| 61 - | Oil Heater Element active output                    | 62 - Oil Cool Solenoid active output.             |
| 63 - | VI Inc or Start Bypass sol output.                  | 64 - VI Dec or Stop Bypass or oil return sol out. |
| 54 - | Economizer Common Input (not fused)                 | 55 - Economizer active output (not fused)         |



## **INSTALLATION CONT.**

### **COMPSCAN TEMPERATURE INPUT TERMINALS :-**

#### **AD590 TYPE (plastic type supplied with unit if required):-**

Temperature probes are fitted with 3 meters of cable each (may be extended or cut to a maximum distance of 300 meters using twisted pair shielded cable). If extended, the shield must only be connected at the CompScan end only and must be continuous for the full length. The joins for any extensions must be kept dry and clean and not subject to any voltage or damage will occur.

The sensors are usually supplied as 1 (suction) green cable sheath, 2 (discharge) red cable sheath, 3 (oil, manifold) violet cable sheath and 4 (oil separator) blue or black cable sheath. If an intermediate sensor is supplied, 4 (intermediate) blue or black cable sheath. Colours may not always be as stated.

Each sensor is calibrated at the factory and must be connected to its correct input for accurate temperatures to be displayed.

Sensors may be calibrated by the end user. See later for calibrating sensors.

**Sensor cables must not run parallel or near voltage cables & must be kept well away from voltage and other control cables, at least 2 meters.**

**Internal jumpers that are required for this type of sensor to be used are shown on the next page.**

**The function "Type of Temp Sensor" must be set to AD590 for these sensors.**

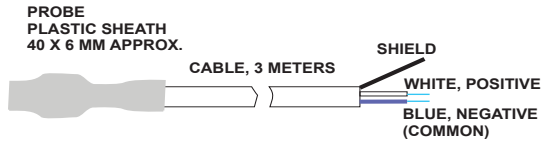
#### **Terminal No.**

- 20 - Shield of each cable (may not be used in all cases).
- 19 - Common (all Blue (negative) wires to sensors).
- 1 - Positive (white) for Suction temperature, (Green cable).
- 2 - Positive (white) for Discharge temperature, (Red cable).
- 3 - Pos (white) for Oil Manifold temp, (Violet cable).
- 4 - Pos (white) for Oil Separator temp, (Blue or Black cable). If req.
- 5 - Pos (white) for intermediate temp, (Blue or Black cable).
- 6 - Not used
- 7 - Not used
- 8 - Not used

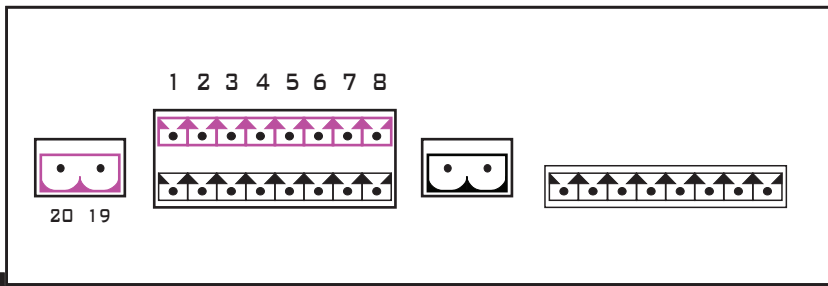
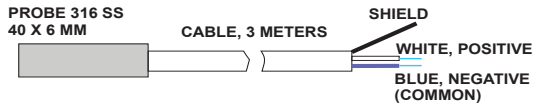
### INSTALLATION CONT.

#### COMPSCAN TEMPERATURE INPUT TERMINALS CONT. :-

##### SUPPLIED WITH UNIT IF REQUIRED

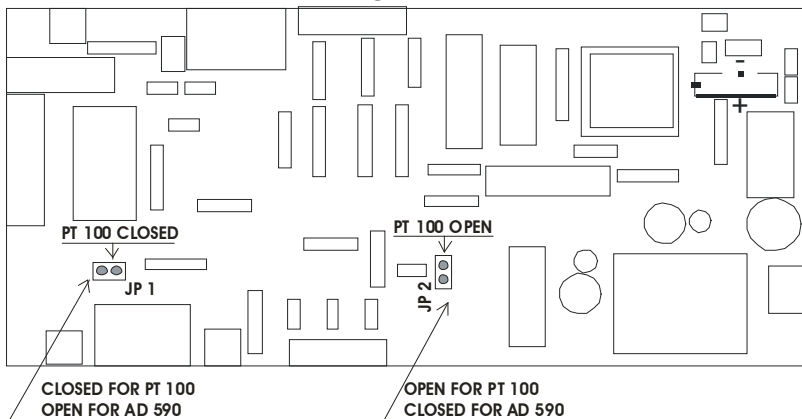


##### OPTIONAL EXTRA



##### FRONT OF UNIT

##### TOP



## **INSTALLATION CONT.**

### **COMPSCAN TEMPERATURE INPUT TERMINALS CONT. :-**

#### **PT100 TYPE (user must supply):-**

Temperature probes that are of the type PT100 (platinum type with a resistance value of 100 OHMS at 0.0 oC) can be fitted to the unit.

These type must be supplied by the end user and may use only the 2 wire type of sensor. Below is the wiring diagram and the internal jumpers that are required to allow for this type of sensor to be used.

If a sensor is not used in any position the terminals that the sensor would be inserted must be shorted together with a minimum length of cable.

**Sensor cables must not run parallel or near voltage cables & must be kept well away from voltage and other control cables, at least 2 meters.**

**Internal jumpers that are required for this type of sensor to be used are shown on the next page.**

**The function "Type of Temp Sensor" must be set to PT100 for these sensors.**

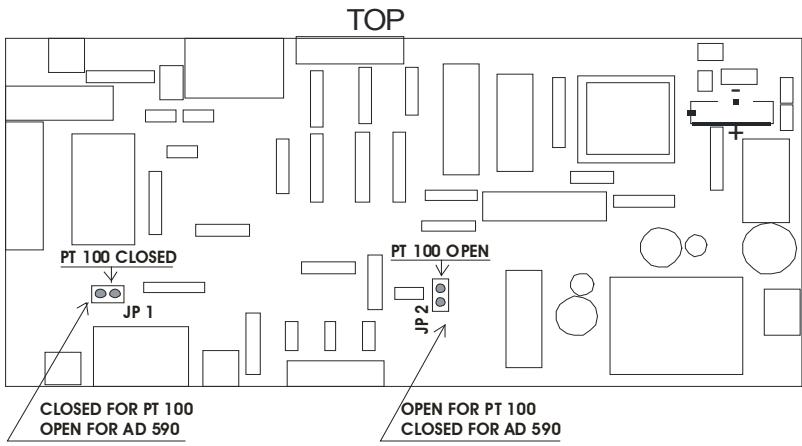
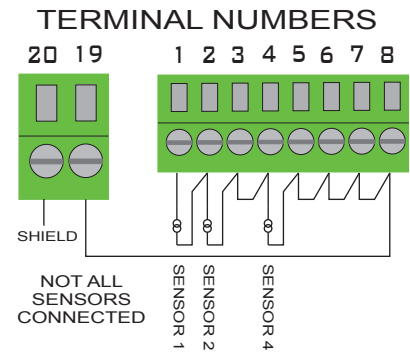
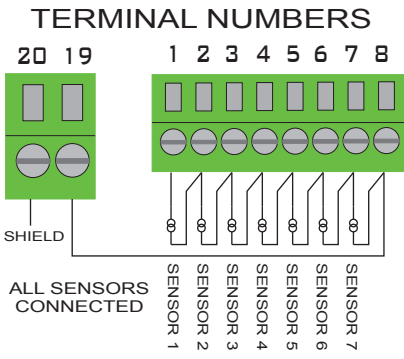
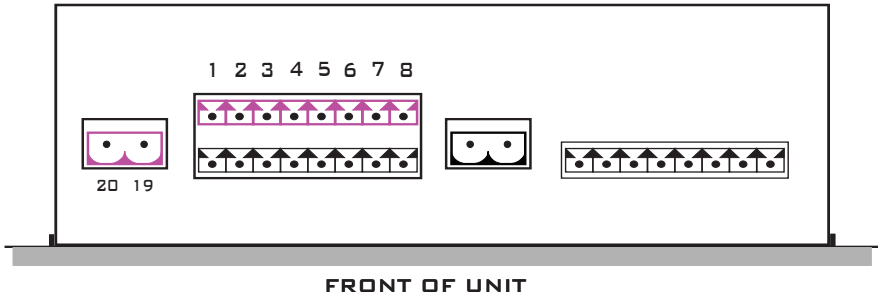
Sensor numbers are for the same temperature input as the AD590 type.

#### **Terminal No.**

- 20 - Shield of each cable (may not be used in all cases).
- 19 - Sensor number 7 second wire and also connected to Term No. 8.
- 1 - Sensor number 1 first wire.
- 2 - Sensor number 1 second wire and sensor number 2 first wire.
- 3 - Sensor number 2 second wire and sensor number 3 first wire.
- 4 - Sensor number 3 second wire and sensor number 4 first wire.
- 5 - Sensor number 4 second wire and sensor number 5 first wire.
- 6 - Sensor number 5 second wire and sensor number 6 first wire.
- 7 - Sensor number 6 second wire and sensor number 7 first wire.
- 8 - Sensor number 7 second wire and also connected to Term No. 19.

### INSTALLATION CONT.

#### COMPSCAN TEMPERATURE INPUT TERMINALS CONT. :-



## **INSTALLATION CONT.**

### **COMPSCAN PRESSURE & 4-20MA INPUTS TERMINALS:-**

Pressure transducers must be of the 4 to 20ma type and a recommended span of -1 Bar to +24 Bar. Other spans may be used if required and the span may be programmed into the CompScan.

The voltage supplied for the transducers is 11v DC. The transducer must be able work correctly on this voltage.

The cable from the CompScan to the transducers must be twisted pair shielded type and can be up to a maximum distance of 300 meters.

The shield must be connected at the CompScan end only and all connections must be kept dry and clean.

The positive of each transducer must be connected to the COM of the terminal block and each Negative must be connected to its particular input terminal.

The shield must be connected to the shield terminal.

**Sensor cables must not run parallel or near voltage cables & must be kept well away from voltage and other control cables, at least 2 meters.**

#### **Terminal No.**

- 18 - Shield of each cable.
- 17 - Common (all Positive wires to transducers).
- 9 - Negative for Suction Pressure.
- 10 - Negative for Discharge Pressure.
- 11 - Negative for Oil Pressure before filter.
- 12 - Negative for Oil Pressure after filter.
- 13 - Negative for Intermediate Pressure if used.
- 14 - Negative for slide valve 4-20ma input terminal. (check next page for connections)
- 15 - Negative for Volume Index 4-20ma input terminal. (check next page for connections)
- 16 - Negative for current 4-20ma input terminal. (check next page for connections)

**NOTE:- If the 4-20ma slide valve, volume index or current input (set in "4-20ma in Connected") is set to connected, the 4-20ma input will take precedence over the slide valve pot, volume index pot or current input if it is set to connected.**

## INSTALLATION CONT.

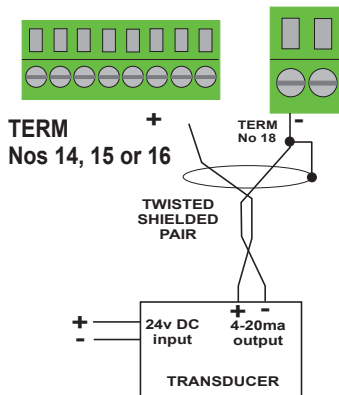
### COMPSCAN PRESSURE & 4-20MA INPUT TERMINALS (NOT PRESSURE):-

**NOTE:-** If the 4-20ma slide valve is self powered from an external source (24 volts ac or dc) the common of the slide pot output must be connected to the term No. 18 (GND) and the signal output connected to the term No. 14.

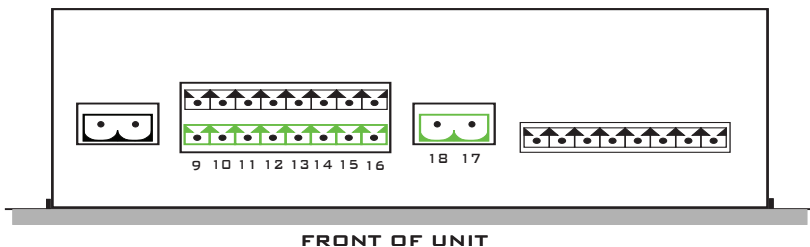
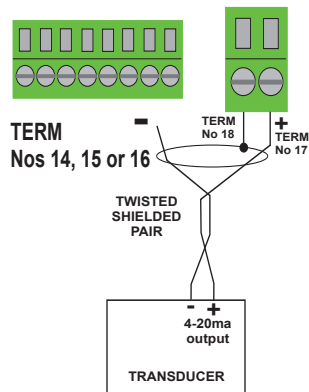
If the 4-20ma volume index input is self powered from an external source (24 volts ac or dc) the common of the slide pot output must be connected to the term No. 18 (GND) and the signal output connected to the term No. 15.

If the 4-20ma current input is self powered from an external source (24 volts ac or dc) the common of the transducers output must be connected to the term No. 18 (GND) and the signal output connected to the term No. 16.

#### EXTERNAL POWER CONNECTIONS Transducer provides power



#### LOOP POWER CONNECTIONS CompScan sends power



## INSTALLATION CONT.

### COMPSCAN DIGITAL INPUT TERMINALS:-

8 Digital inputs are supplied of which 8 may be used or not used. All inputs are optically isolated.

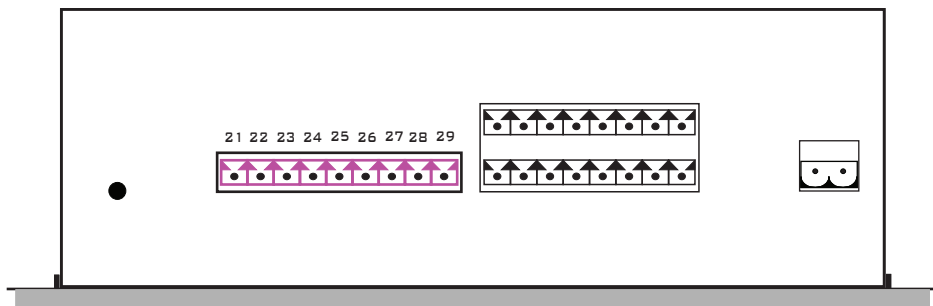
If function "Digital Inputs NO/NC" is set for "Norm Connected" Each Digital input is ON if its input is connected (shortage) to the COM pin of the digital input terminal strip and OFF if not connected (open circuit).

No voltage is to be applied to any input of the digital inputs.

The distance from the switch (voltage free relay contacts) to switch digital inputs must not exceed 10 meters and must not be run parallel or next to voltage cables.

### Terminal No.

- 21 - Common for all 8 digital inputs.
- 22 - Remote RUN input.
- 23 - Remote OFF input.
- 24 - Emergency Switch input.
- 25 - Fully Loaded Micro Switch if used.
- 26 - Fully Unloaded Micro Switch if used.
- 27 - Motor Auxiliary. Feedback for the motor is running.
- 28 - Oil Level Float switch if used.
- 29 - Auxiliary 1 switch. Switches comp off if connected



FRONT OF UNIT

## INSTALLATION CONT.

### COMPSCAN DIGITAL INPUT TERMINALS CONT.:-

#### DESCRIPTIONS:-

21 - **Common for all 8 digital inputs.**

22 - **Remote RUN input.**

Used to turn the compressor on from a remote location. If the emergency switch is pressed the compressor will turn off. If the emergency switch is reset the compressor will turn on from its idle state, i.e.. motor will unload then start. If the Run switch is pressed and then the remote switch is turned on then off the compressor will turn off and remain off.

**DEFAULT with function "Digital Inputs NO/NC" set to "N-O"**  
**Compressor is set to run if the input is connected (shorted) to common and turns off if open circuit.**

23 - **Remote OFF input.**

Used to turn the compressor OFF from a remote location. Can be used for other digital inputs etc.. Also goes into alarm state and the compressor cannot be turned on until the alarm has been cleared.

**DEFAULT with function "Digital Inputs NO/NC" set to "N-O"**  
**Compressor turns off if the input is connected (shorted) to common.**

24 - **Emergency Switch input.**

If the emergency switch is pressed the display will indicate this and the compressor will be set to the turned off state. The remote run input will start the compressor if active when the emergency switch is reset.

**DEFAULT with function "Digital Inputs NO/NC" set to "N-O"**  
**Compressor turns off if the input is connected (shorted) to common. The display will indicate that the emergency switch is pressed.**

25 - **Fully loaded micro switch.**

Tells the unit that the compressor is fully loaded if connected. Used in place of or in conjunction with the Slide valve pot.

**DEFAULT with function "Digital Inputs NO/NC" set to "N-O"**  
**Fully Loaded is indicated if the input is connected (shorted) to common.**

## INSTALLATION CONT.

### COMPSCAN DIGITAL INPUT TERMINALS CONT.:-

#### DESCRIPTIONS CONT :-

#### 26 - Fully unloaded micro switch.

Tells the unit that the compressor is fully unloaded if connected.  
Used in place of or in conjunction with the Slide valve pot.

**DEFAULT with function "Digital Inputs NO/NC" set to "N-O"  
Full Load is indicated if the input is connected (shorted) to common.**

#### 27 - Motor Auxiliary.

Goes into alarm if the motor has not started after a time delay and the compressor is turned off. Connect voltage free relay contacts across this input and power the relay from the motor supply.

**DEFAULT with function "Digital Inputs NO/NC" set to "N-O"  
If the compressor motor is running, the connection must be shorted to common. If the connection remains open (circuit) the alarm will become active and the compressor will turn off.**

#### 28 - Oil Level Float switch input

Used to indicate that the oil level is low in the separator (30 second delay imposed with this alarm).

**DEFAULT with function "Digital Inputs NO/NC" set to "N-O"  
Oil level low is indicated if the input is open (circuit) to common.**

#### 29 - Auxiliary input 1.

Used to turn the compressor off.

**DEFAULT with function "Digital Inputs NO/NC" set to "N-O"  
The connection must be shorted to common while the motor in on. If the connection becomes open (circuit) the alarm will become active and the compressor will turn off.**

## INSTALLATION CONT.

### COMPSCAN CURRENT INPUT TERMINALS:-

The current input is via 2 wires and must use twisted pair shielded cable and not run near voltage cables.

The current transformer used can be one of the following type, 100/5, 150/5, 200/5, 300/5, 400/5, 500/5, 600/5, 800/5 NOT-C current transformer or a 4-20ma output current transducer (see 4-20ma inputs). This is set in the type of current transformer in setting of functions. If the set point is set to NOT-C then neither current transformer may be used and the display will not show the AMPS used for the motor.

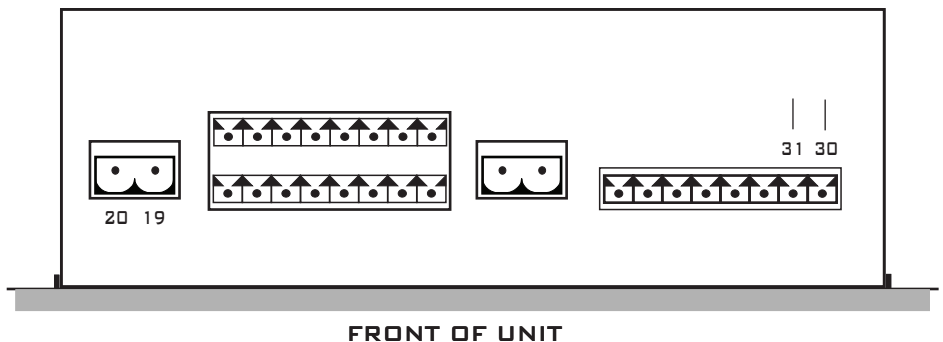
If a 4-20ma transducer is used, the current transformer type must be set to any type other than "NOT-C" and the span of the 4-20ma transducer is set using function "4-20ma in Span"

The resistor shunt must be 0.1 OHM across the transformer terminals and must never be disconnected while the motor is running.

The active of the motor cable must pass through the transformer hole.

The resistor shunt terminals connected to the current transformer must be connected to, 1 terminal connected to terminals 30 and 31 & shield to 37.

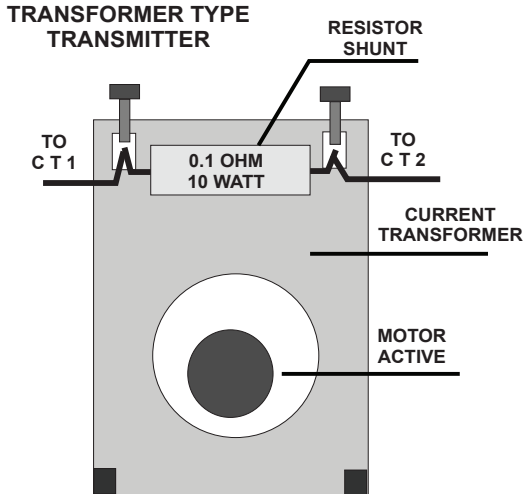
**WARNING:- There is a delay of 10 seconds on the current alarm before the motor will be turned off.**



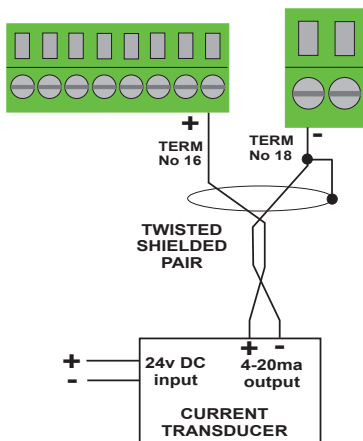
## INSTALLATION CONT.

### COMPSCAN CURRENT INPUT TERMINALS CONT.:-

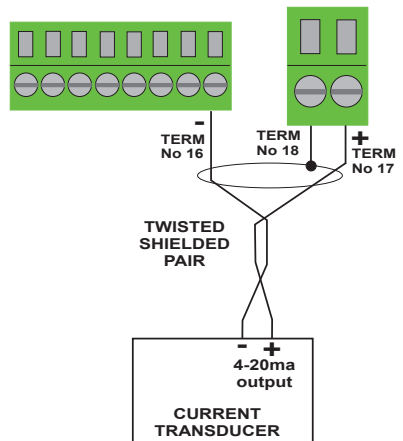
**NOTE:- FOR 40-20MA CURRENT INPUTS SEE PAGE 17**



### EXTERNAL POWER CONNECTIONS Transducer provides power



### LOOP POWER CONNECTIONS CompScan sends power



## INSTALLATION CONT.

### COMPSCAN 4 TO 20 MA OUTPUT TERMINALS:-

**The 4 - 20ma No. 2 output is for variable speed motors.**

The output must be loop powered from the variable speed controller from 12 to 30 volts DC. The positive line from the variable speed controller must be connected to terminal No. 40 and the Ground line from the variable speed controller must be connected to the terminal No. 39. The Shield, terminal No 38 must be used to protect the signal and must be connected at the CompScan end only.

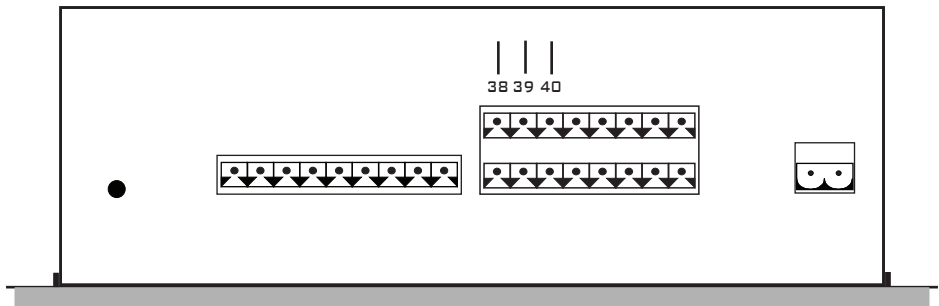
Terminal number 39 = - (GND), terminal number 41 = +11v to 30v DC.

The 4 - 20ma output increases from 4 - 20ma in 255 steps.

The compressor goes through a normal start-up routine (unloading etc.).

When the motor starts, the 4-20ma output will be at the minimum run percentage (function "Min Slide Valve Pos%").

The compressor will then continue to load up to fully loaded and the 4-20ma output control will be adjusted according to the required percentage depending on the suction pressure or at the percentage required from the TempScan if connected.



**FRONT OF UNIT**

## INSTALLATION CONT.

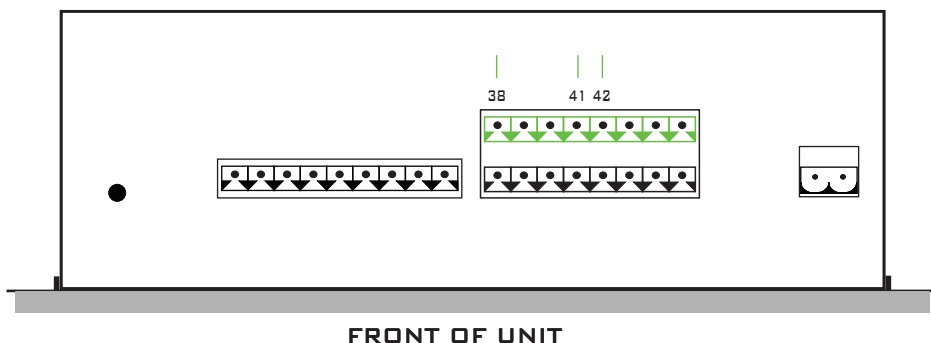
### COMPSCAN 4 TO 20 MA OUTPUT TERMINALS CONT:-

#### The 4 - 20ma No. 1 output is for oil cooling output.

The output must be loop powered from the cooling controller from 12 to 30 volts DC. The positive line from the variable valve controller must be connected to terminal number 42 and the Ground line from the cooling controller must be connected to terminal number 41. The Shield terminal (No 38) may be used to protect the signal and must be connected at the CompScan end only.

Panel Mount terminal number 41 = - (GND), terminal number 42 = +11v to 30v DC.

The 4 - 20ma output varies from 4 - 20ma in 255 steps to maintain the desired oil temperature.



## INSTALLATION CONT.

### COMPSCAN SLIDE VALVE & INDEX POT TERMINALS :-

The slide valve terminals are as follows.

<b>Term No.</b>	<b>Function</b>
37	GND (the terminal of the pot when the compressor is unloaded).
36	LDH (the terminal of the pot when the compressor is fully loaded).
35	WIPE (the wipe terminal of the pot).

The volume ratio pot terminals are as follows.

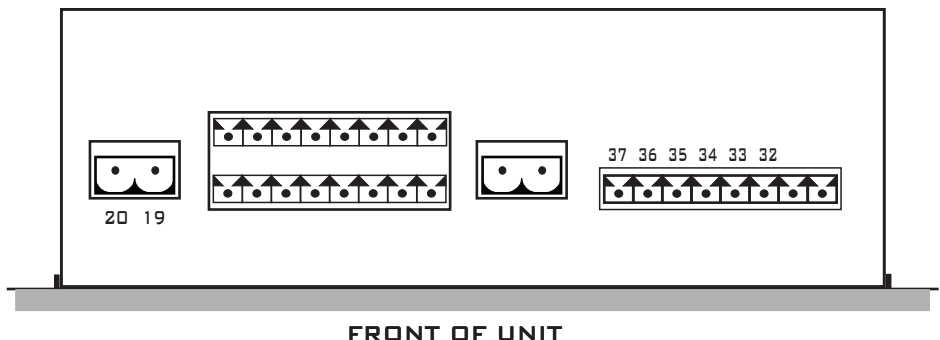
<b>Term No.</b>	<b>Function</b>
34	GND (the terminal of the pot when the index valve is unloaded).
33	LDH (the terminal of the pot when the index valve is fully loaded).
32	WIPE (the wipe terminal of the pot).

To calibrate the pots to read correctly see setting function numbers 67 to 70.

**NOTE:-** If the 4-20ma slide valve input (set in "4-20ma in Connected) is set to connected, the 4-20ma input will take precedence, also the set point 51 "Load Pot Connected" must be set to "Yes".

The same applies to the volume index 4-20ma input if used.

There is a 20 second delay for alarms associated with both pot inputs.



## INSTALLATION CONT.

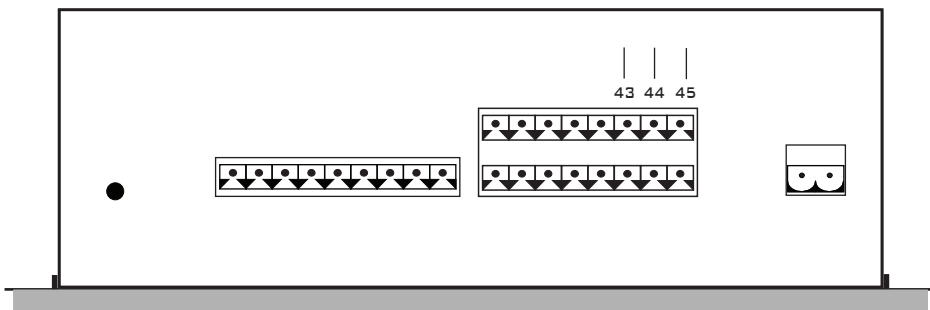
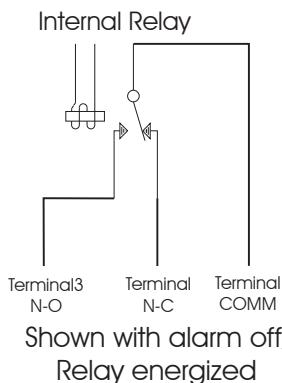
### COMPSCAN ALARM AND OUTPUT TERMINALS:-

The Alarm Relay is of the voltage free type with a common, normally connected and normally not connected outputs.

The maximum voltage that can be applied to the alarm relay contacts is 24v AC/DC at 1AMP.

Terminals. NO = 45, COMM = 44, NC = 43. (With relay in an energized state)

The Relay is energized (powered on) when not in the alarm state and the normally connected terminal is active (connected). This allows for an alarm to be activated using a battery backup alarm system to trigger if the CompScan unit losses power.



**FRONT OF UNIT**

## INSTALLATION CONT.

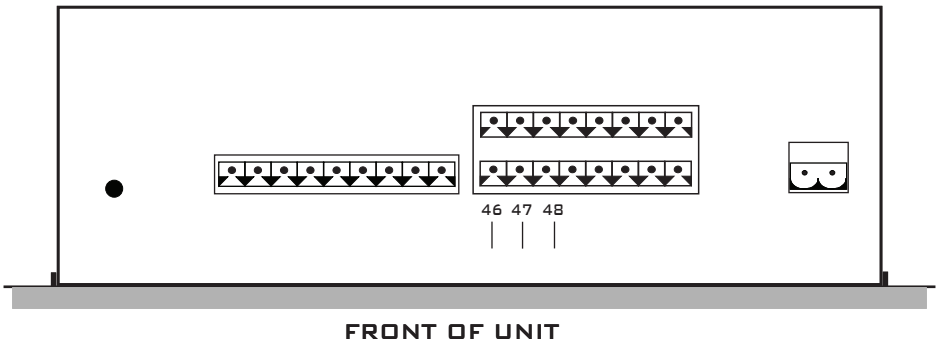
### **COMPSCAN EXTERNAL RELAY CONTROL TERMINALS:-**

All Control Relay outputs can be controlled externally via a single pair control line to a remote relay board (A-32R-4)

The cable must be single twisted shielded pair cable and must not run near voltage cables.

The maximum distance from the CompScan is 500 meters and the shield must be connected at the CompScan end only.

The terminal No. 48 must be connected to the Serial Input + and terminal No. 47 must be connected to the Serial Input - terminal on the remote relay board. The shield must be connected to terminal No. 46.



### INSTALLATION CONT.

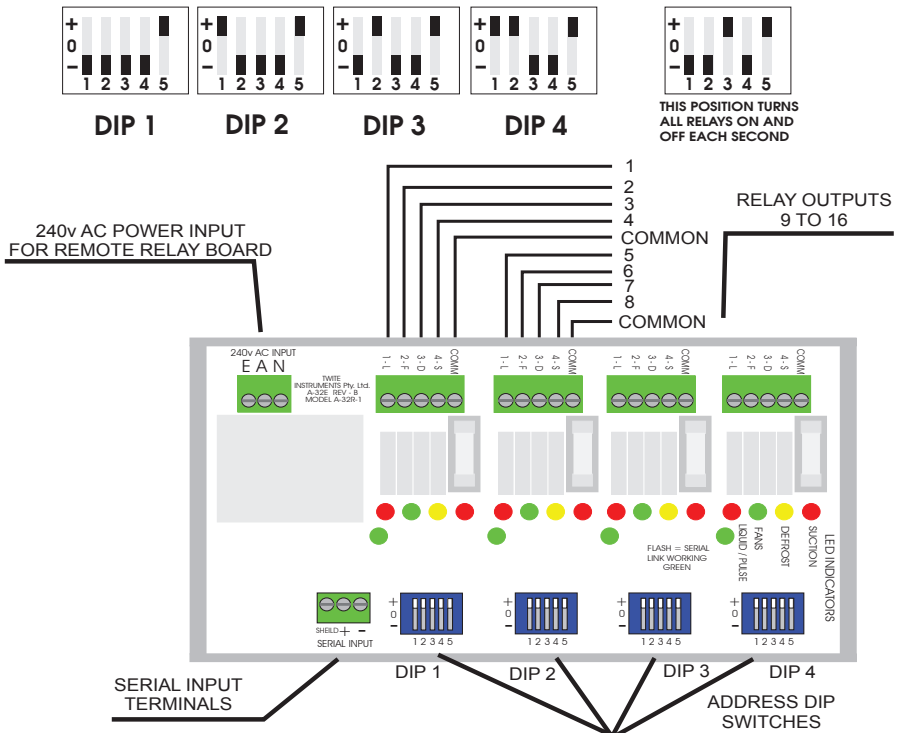
#### COMPSCAN EXTERNAL RELAY CONTROL TERMINALS CONT.-:

The Relay outputs commons are as shown on the below diagram. The Control outputs 1 to 10 are as the below diagram.

The Common of the relay modules must be placed in line with the Emergency Switch on the CompScan so that the Emergency Switch cuts the power to the Common inputs mechanically.

The Relay controls are voltage free and a maximum of 240v AC 3AMPS is allowed on the control relays.

The Address DIP switches must be set to the following positions. If all are set to the + (positive) the relays will all turn on/off each second for that channel. This used for testing of the communications and relays.



## **INSTALLATION CONT.**

### **COMPSCAN EXTERNAL RELAY CONTROL TERMINALS CONT.:-**

The Relay outputs from 1 to 8 are as follows.

1 to 8 Equal the relay outputs of the CompScan.

9 Economizer Solenoid on.

For compressors that require the economizer function.

10 Oil Return Solenoid. Can also be set to Term 64, done in set points.

For oil return from separator to compressor

11 Spare 1

12 Spare 2

13 Spare 3

14 Spare 4

15 Spare 5

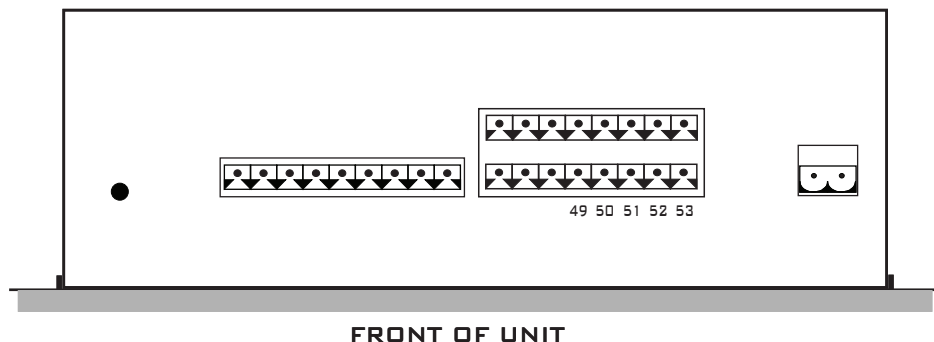
16 Spare 6

## INSTALLATION CONT.

### COMPSCAN RS485 TERMINALS:-

The RS485 terminals are used for communicating with other CompScan units or a TempScan if connected.

Panel Mount terminals. Shield = 49, TX+ = 53, TX- = 52, RX+ = 51, RX- = 50.



If the set point "RS485/232 Connection" (see later in set points) is set to the following, the communications are as follows:-

### "Single Stand Alone"

The CompScan is a single unit which operates on its own. The Compressor number can be any from 1 to 27.

It will send its data to a Printer through the RS232 port (see later) at the data log times.

No connection can be made to the RS485 Terminals.

The CompScan will not turn off until the PUMP DOWN set point has been reached. Also it will not unload if the % is under the minimum slide valve %. Set point No. 57 "Min Slide Valve Pos%" The minimum % value that the compressor can run at.

## INSTALLATION CONT.

### COMPSCAN RS485 TERMINALS CONT.:-

#### "Multiple CompScans"

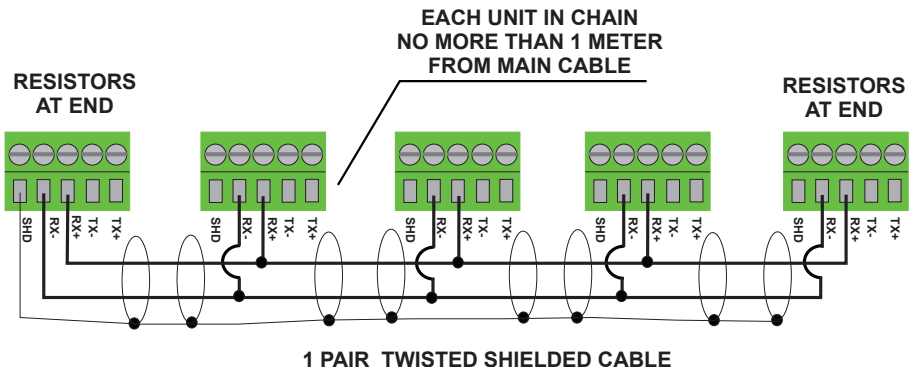
The CompScan is one of a number (up to 27 A-32-R and or A-32-S) connected together through the RS485 Terminals as below. All RX+ are connected and all RX- connected in series using twisted pair shielded cable and not run near voltage cables. The time display (first display) will indicate "CompScan --" if no communications are received from the number 1 CompScan after 60 seconds and will display "CompScan Cn" if communications are successful. If the CompScan is set to number 1, it will display "CompScan Mr". Alarm will sound after 10 minutes if no comms, and compressors with no comm's above number 1 will turn off.

**The shield must be connected to one end only.**

The connection to each unit must be continuous from one to the next then the next etc.. The units must be connected in a daisy chain configuration and not spider from one point.

It will send its data to a Printer through the RS232 port (see next) at the data log times. The printer must be connected to the compressor that is set to number 1.

The unit at each end of the line must have 2 x 120 OHM resistors placed in the socket behind the terminal block as shown or in the terminal blocks from TX+ to TX- and RX+ to RX-. The resistors on the panel mount unit must be placed externally into the terminals.



## **INSTALLATION CONT.**

### **COMPSCAN RS485 TERMINALS CONT.:-**

#### **"Multiple CompScans" cont.**

Each CompScan must have a different number and one must be number 1.

The CompScan that is set to number 1 will control all other units in the chain. CompScans may be models A-32-R or A-32-S or a combination of either.

The order of turn on for each compressor is in the compressor numbers, i.e. compressor number 1 turns on first, when it has reached full load, compressor number 2 will turn on, when number 2 is fully loaded compressor number 3 will turn on etc.

#### **Each compressor loads and unloads using its own set points and delays.**

Each compressor that is not set to number 1 will turn off (after unloading, or its last stage off) at its own UNLOAD set point, when all other compressors have turned off that have a higher number than 1, the compressor that is set to number 1, will turn OFF (at minimum % load) at its PUMP DOWN set point.

The compressor that is set to number 1 will not allow the next compressor (number order) to turn on (regardless of its set points) until the compressor that precedes it is fully loaded.

The compressor that is set to number 1 will not allow a compressor to turn off or unload (regardless of its set points) until the compressor that is after it (number order) has been turned off (at its UNLOAD set point).

**NOTE:- If there is no compressor set to number 1 or the communications fail between compressors after 10 minutes, all compressors other than number 1 will go into alarm and turn off. The number 1 compressor will continue to operate with its own set points unless an alarm occurs within itself.**

## INSTALLATION CONT.

### TempScan Connected:-

The CompScan is one of a number (up to 27) connected together through the RS485 Terminals as below. All TX+ are connected in series, all TX- connected in series and all RX+ connected in series, all RX- connected in series using twisted pair shielded cable and not run near voltage cables. The time display (first display) will indicate "TempScan --" if no communications are received from the TempScan after 60 seconds and will display "TempScan Cn" if communications are successful. Alarm will sound after 10 minutes if no comms, and the compressor will turn off.

The cable is connected to the TempScan via the below terminal numbers.

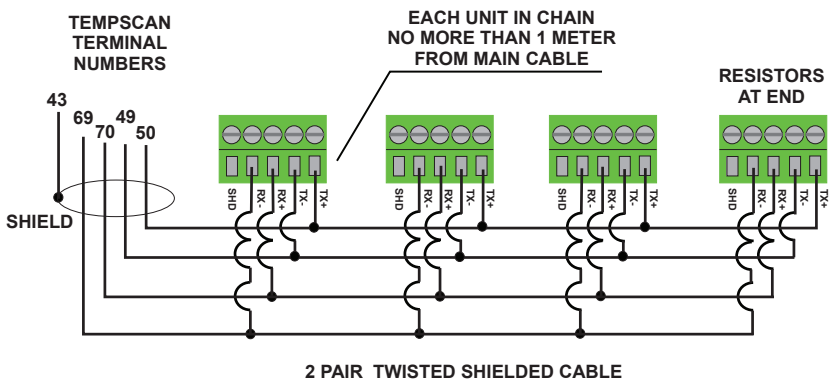
TempScan Terminal Number	Connection	CompScan Term No.
Terminal No. 50	TX+	Term No. 53
Terminal No. 49	TX-	Term No. 52
Terminal No. 70	RX+	Term No. 51
Terminal No. 69	RX-	Term No. 50
Terminal No. 43	SHIELD	Term No. 49

### The shield must be connected at the TempScan end only.

The connection to each unit must be continuous from the TempScan then one to the next then the next etc.. The units must be connected in a daisy chain configuration and not spider from one point.

A Printer or Computer is not allowed to be connected to units that are connected to a TempScan.

The unit at the end of the line must have 1 x 120 OHM resistor placed in the terminal block from TX+ to TX- and 1 x 120 OHM resistor placed in the terminal block from RX+ to RX-.



## **INSTALLATION CONT.**

### **COMPSCAN RS485 TERMINALS CONT.:-**

#### **TempScan Connected:- cont.**

All Compressors are controlled by the TempScan and its pressure/temperature inputs including turn on or off and all stage turn on and stage turn off.

Each CompScan (model A-32-S) will load and unload to within 10% of the required load percentage provided by the TempScan. The CompScan will use its own slow load, fast load and unload delay times in seconds to arrive at the required load percentage provided by the TempScan connected to within 10%.

If the CompScan load percentage is lower than the minimum run percentage set point, the unit will load the compressor until it is equal to or higher (by no more than 10%) than the minimum run percentage.

Start to Start times are controlled by the TempScan.

The order of compressor turn on and off is controlled by the TempScan.

All compressors must have a different number and can be from 1 to 27 inclusive.

**NOTE:- If the communications fail between the compressors and TempScan, after 10 minutes, all compressors will go into alarm and turn off.**

## INSTALLATION CONT.

### COMPSCAN RS232 TERMINALS:- (NOTE:- NOT YET AVAILABLE)

All CompScan units have a RS232 port at the right hand end plate.

The socket is a Male 9 Pin D connector.

### Printer Connected:-

A Printer is allowed to be connected if The CompScan units are set to "Single Stand Alone" or "Multiple CompScans" in the set point "RS485/232 Connection" (function number 30).

The cable used is a standard 9 pin to 25 D connector for serial input printers (recommended type EPSON LX300).

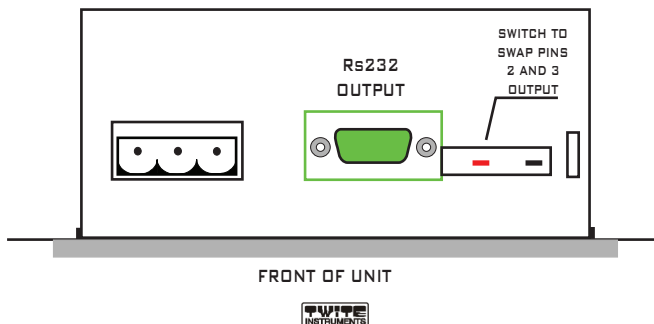
If more than 1 CompScan is connected together, the printer must be connected to compressor number 1, set in set point functions.

The maximum distance the cable can be is 10 meters. If a longer distance is required, a RS232 to RS485 convertor must be placed at the CompScan end and at the Printer end.

The Pin 2 and Pin 3 of the 9 Pin D connector can be reversed if required by the Switch shown below. This may be required if the cable is not standard or communications with the printer fail to initialize.

The Baud rate must be 9600, the stop bit must be set to "1", the parity must be set to "NONE" and bit length must be set to "8".

The CompScan will send data to the printer at the same times as the data log is done if set.



## **INSTALLATION CONT.**

### **SENSOR POSITIONING (TEMPERATURE AND PRESSURE) :-**

The temperature sensors must not be exposed to temperatures below -50.0 oC or above +150.0 oC

Sensors and cables should not be fully immersed in any liquid for long periods of time. They may be immersed for short periods for calibration purposes only.

Pressure transducers must not exceed their pressure maximums and minimums.

Temperature probes and Pressure transducers must be placed in the appropriate positions to give accurate readings of the process required.

### **LCD DISPLAY CONTRAST ADJUST.**

This trim pot adjusts the intensity of the LIQUID CRYSTAL DISPLAY (*top left hand display*). This should not normally need adjusting. On the panel mount type consult the manufacture.

To adjust the LCD display intensity, remove the left side panel and adjust the trim pot on the topside of the top (*display*) board for correct viewing.

### **LED DISPLAY CONTRAST ADJUST.**

See LED Brightness in Setting functions for this adjustment.

## **INSTALLATION CONT.**

### **COMPRESSOR CONTROL. :-**

Depending on the set point of "RS485/232 Connection" (function number 30), compressors are controlled differently. See earlier for descriptions of different compressor control types.

Compressors use fast load, slow load and unload times (*user programmable*) for loading and unloading a compressor. Also each compressor has a user programmable Start to Start timer in minutes. See set functions for compressors for all set points regarding compressor control set points.

### **Stop Switch pressed:**

When the Stop switch has been pressed the compressor motor will turn off immediately regardless of load. The oil pump and unload solenoid may stay on for the time in seconds with set point 80 to unload the comp. The oil heater will turn on and off to control the oil temperature according to its set point and differential.

### **Run Switch pressed or remote run digital input active:**

The compressor will be in stand-by mode until the suction pressure reaches the turn on (fast load) set point in KPA. When this is reached the compressor will begin the start-up process.

The compressor will turn on the unload solenoid and oil pump (if required) (if not fully unloaded to the minimum slide valve start percentage) or the unload micro switch is active (turned on) if used.

The unload solenoid and oil pump (if required) will be active (on) until either of the unload indicators show that the compressor is unloaded fully (minimum slide valve %). If the compressor does not fully unload (minimum slide valve %) within 5 minutes, the alarm will activate and the compressor cannot turn on.

If the oil pump (oil pressure after filter) does not reach its set pressure value, it will turn off and on (set point No. 83 and 82) to reach the minimum operating pressure and the alarm will sound if this pressure is not reached and compressor will not start, oil pump and unload solenoid will turn off.

After unloading fully (minimum slide valve %) the motor will start.

If the **MANUAL** switch is pressed the compressor will turn on (after unloading and start to start time out) regardless of the suction pressure and there after run in manual mode. To load and unload the compressor the "Load" and "Unload" keys must be pressed. The compressor will turn off after 30 minutes if in manual mode.

## **INSTALLATION CONT.**

### **COMPRESSOR CONTROL CONT. :-**

#### **Load and Unload switches pressed:**

When the compressor is running if the load switch is pressed the load solenoid will activate for its set time (in seconds and tenths of seconds) each time it is pressed.

When the compressor is running if the unload switch is pressed the unload solenoid will activate for its set time (in seconds and tenths of seconds) each time it is pressed.

If progressive load and unload is set to "YES" the time the solenoids are on will vary depending on how far the suction pressure is from the load and unload set points.

#### **When the compressor turns off due to pump down set point reached:**

When the compressor is off due to the suction pressure pump down set point being reached. The compressor cannot start again until the start to start time out has finished. The controller will attempt to unload the compressor before turning off by leaving the oil pump and the unload solenoid on for the time set in set point number 80. Also the motor can be set to stay on to help unload the compressor using set point number 84.

#### **Load and Unload actions while running automatically:**

When the compressor is running automatically, the load solenoid will turn on (for the length set in "Load Pulse Time" in seconds and tenths of seconds) when the load pressure is reached (the suction pressure set point plus half of the differential set point) after the time delay (set in Comp Slow Load Time) providing that the maximum % (set point) or the maximum current (set point) has not been reached.

If the suction pressure reaches the Compressor Start Pressure (set point) while running the load solenoid will turn on (for the above time) after each time delay set with Comp Fast Load Time.

When the compressor reaches full load with the slide valve pot reading 100% or the fully loaded micro switch is on if used, the compressor will not attempt to load the compressor any more unless it was unloaded first.

## INSTALLATION CONT.

### COMPRESSOR CONTROL CONT. :-

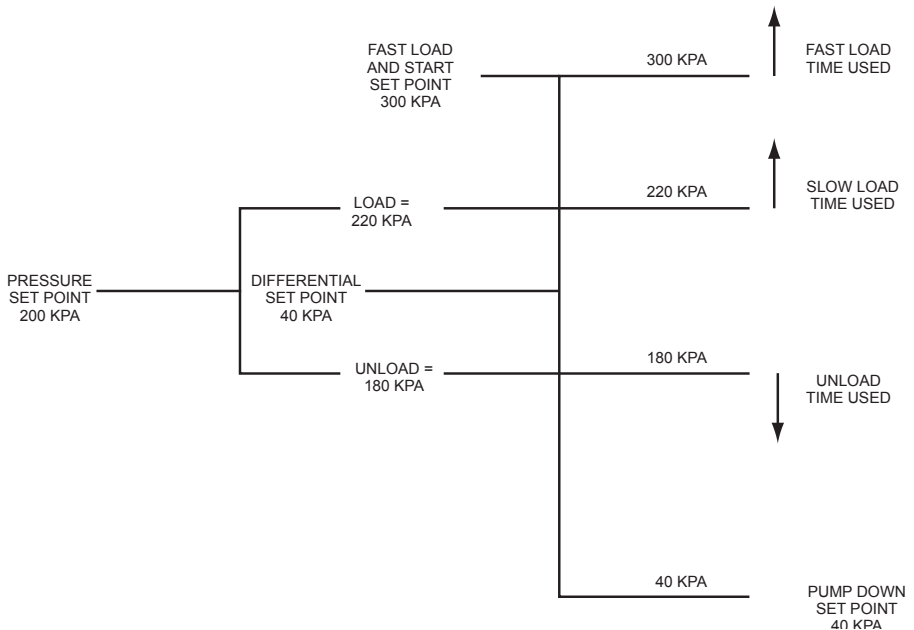
#### Load and Unload actions while running automatically cont:

When the compressor is running automatically, the unload solenoid will turn on (for the length set in "Un Load Pulse Time" in seconds and tenths of seconds) when the unload pressure is reached (the suction pressure set point minus half of the differential set point) after the time delay (set in Comp Unload Time).

The Unload solenoid will not be turned on if the "Min Slide Valve Pos" (the minimum slide valve position in %) percentage set point is equal to or above the current percentage of the slide valve.

If the current percentage of the slide valve is above the minimum slide valve percentage the compressor is able to unload.

The compressor will turn off when the suction pressure reaches the "Pump Down Set Point".



## **INSTALLATION CONT.**

### **OIL PUMP VARIATIONS :-**

There are 4 ways for the oil pump depending on the compressor model number. Set in function number 71 :- "Oil Pump Type Used".

The oil pressure indicators are as follows.

#### **For Full Lube compressors:**

The "Oil Bf Flt" is the (Oil pressure before the filter - Discharge pressure).

The "Oil Af Flt" is the (Oil pressure after the filter - Discharge pressure).

#### **For all other types of compressors:**

If the oil pump (if fitted) is on.

The "Oil Bf Flt" is the (Oil pressure before the filter - Discharge pressure).

The "Oil Af Flt" is the (Oil pressure after the filter - Discharge pressure).

If the oil pump (if fitted) is off or no oil pump.

The "Oil Bf Flt" is the (Oil pressure before the filter - Suction pressure).

The "Oil Af Flt" is the (Oil pressure after the filter - Suction pressure).

### **1 Full Lube**

The oil pump on this system is on (running) continuously while the motor is on (running).

When the compressor needs to start (turn on pressure set point), the oil pump will start and the motor will not start until the required pressure (set in set points) is reached and the compressor is unloaded to its set point. If the required pressure is not reached within the time out (set in set points) the unit will turn off and an alarm will be active and the compressor cannot turn on.

The oil pump will remain on while the motor is running.

## **INSTALLATION CONT.**

### **OIL PUMP VARIATIONS CONT:-**

#### **2 Cycle Pump**

The oil pump on this system is on (running) while the motor is on (running) only if the pressure (Discharge pressure - Suction pressure) drops below a set point (set in set point No 93).

When the pressure (Discharge pressure - Suction pressure) goes above a set point (set in set point No. 94) the pump will turn off.

If oil pressures drop below their alarm set points the unit will go into alarm and the compressor will turn off.

When the compressor needs to start (turn on pressure set point), the oil pump will start and the motor will not start until the required pressure (set in set points) is reached. If the required pressure is not reached within the time out (set in set points) the unit will turn off and an alarm will be active and the compressor cannot turn on.

#### **3 Pre Lube Pump**

The oil pump on this system is off while the motor is on (running).

When the compressor needs to start (turn on pressure set point), the oil pump will start and the motor will not start until the required pressure (set in set points) is reached. If the required pressure is not reached within the time out (set in set points) the unit will turn off and an alarm will be active and the compressor cannot turn on.

If oil pressures drop below there alarm set points the unit will go into alarm and the compressor will turn off.

#### **4 No Oil Pump**

The oil pump on this system is supplied from the discharge pressure while the motor is on (running).

If the pressure falls below its set point (set in set points) an alarm will activate and the compressor will turn off and not be able to come on until the alarm is reset.

## INSTALLATION CONT.

### COMPRESSOR CONTROL CONT. :-

#### Oil Heating:

The oil heater is used to keep the oil at an ideal temperature when the compressor is off or in stand-by mode and turned off if the motor is running. The temperature is set with set point No. 59 and set point No. 60 as is the differential. The temperature used is the separator temperature probe.

#### Note:-

**If the separator temperature probe is set to not connected (ER-C displayed) the heater is turned on and the compressor is allowed to start, regardless of the actual temperature of the separator oil while the motor is off.**

**If the separator temperature probe is in over range (ER-O displayed) the heater is turned off and compressor is not allowed to start.**

**If the separator temperature probe is reading a temperature and is higher or equal to the minimum oil temperature start temperature (set in set point No.74) the compressor is allowed to start and the oil heater will turn on and off with its set point (No 59) with its differential set point (No 60) while the motor is off.**

#### Oil Cooling:

The oil may be cooled in either of three ways (set in set points). The manifold or discharge (set in "Oil Cooling Temp Sen" Function number 98) temperature probe is used to control the temperature and must be connected and operating properly for the compressor to run.

#### 1. Water pump:

If this is used the oil cooling relay is turned on and off to the oil cool set point and the "Oil Heat Differential" while the motor is running.

#### 2. Liquid injection:

If this is used, the liquid injection solenoid is pulsed at a rate determined by the oil cooling set point temperature and the amount of difference from the current oil temperature using a 6 to 10 second cycle. The amount of cooling pulse is displayed on the LCD in conjunction with the Real Time Clock display.

## **INSTALLATION CONT.**

### **COMPRESSOR CONTROL CONT. :-**

#### **3. 4-20ma Output:**

If this is used, the first 4-20ma output will set its 4-20ma output to a value to maintain the correct oil temperature. The amount of cooling the 4-20ma output is displayed as a percentage on the LCD in conjunction with the Real Time Clock display.

#### **Oil Filter Differential Warning:**

If the pressure of the oil after the filter falls below the pressure of the oil before the filter by a set amount (set in set points) for 60 seconds or more a warning will be issued to indicate that the oil filter may need changing. This is only compared while the motor is running.

#### **Progressive Load and Unload:**

If progressive load/unload is used the length of the load and unload pulses are increased above the set points (for load and unload pulses) by a value depending on the difference between the load pressure set point or the unload pressure set point.

The amount of the increase cannot be more than 3 seconds regardless of the difference.

The value is equal to 0.1 of a second for every 10 KPA of pressure difference.

#### **Motor Current Forced Unload:**

If the current of the motor goes to equal or higher than a preset amount (set in set points) the compressor will unload for 1 pulse every 2 seconds until the current falls below the set point.

The load pulse will not be allowed to operate regardless of the suction pressure for 3 minutes. The forced unload condition is displayed as an "F" on the left LED digit of the percentage of load.

## INSTALLATION CONT.

### COMPRESSOR CONTROL CONT. :-

### VOLUME INDEX :- (NOT AVAILABLE IF FUNCTION NUMBER 99 "OIL RETURN RELAY OUT" IS SET TO "TERM NUM 64")

The volume index setting is used only when function "Volume Index Pot Con" is set to "YES" and uses a potentiometer or a 4-20ma input (set using function "4-20ma in Connected").

Function "Bypass Sol'ds YES/NO" must also be set to "NO" if volume index control is to be used.

**Also function 99 "Oil Return Relay Out" must be set to "Ext Relay Ctl". If this function is set to "Term 64" then it will over ride the stop bypass and volume index dec output and only be available for oil return.**

If function "Volume Index Pot Con" is set to "NO" no action will be done for volume index control even if the 4-20ma input is set to connected.

The volume index valve is controlled using the actual volume index compared to the volume index of the valve position.

The load and unload solenoids will be turned on to match the volume index value with the volume index position to within 0.1 if possible.

By pressing the Display "KEY" and rotating through the various pages of display, the suction pressures evaporating temperature and discharge pressures condensing temperature will be displayed on the LCD along with the volume index actual and the volume index slide valve position.

```

Evap Temp      -32.5 oC
Condens Temp   +23.2 oC
VI Calculated   4.0
VI Slide Pos.   3.0
  
```

The actual volume index

The volume slide valve index

## INSTALLATION CONT.

### TYPES OF COMPRESSORS :-

Compressors may be any one of the following, set in "Compressor Type" (function number 48) :-

- 1 STG                      Single stage compressor 0, 100 %
- 2 STG                      Dual stage compressor 0, 100%
- 1 STG                      Single stage compressor with economizer 0, 100%

For TempScan control of compressors see the TempScan manual.

### Bypass Solenoids:

Bypass solenoids can be used for starting the compressor and stopping the compressor.

**If set point number 75 "Bypass Sol'ds YES/NO" is set to "YES". :**

Relay output number 7 will turn on at the same time the motor is turned on and remain on for the time in seconds of set point number 76 "Bypass Sol Start Tme".  
Relay output number 8 will turn on at the same time the motor is turned off and remain on for the time in seconds of set point number 77 "Bypass Sol Stop Time".

**If set point number 75 "Bypass Sol'ds YES/NO" is set to "NO". :**

Relay outputs 7 and 8 are used for volume index slide valve solenoids.

**Also function 99 "Oil Return Relay Out" must be set to "Ext Relay Ctl".**

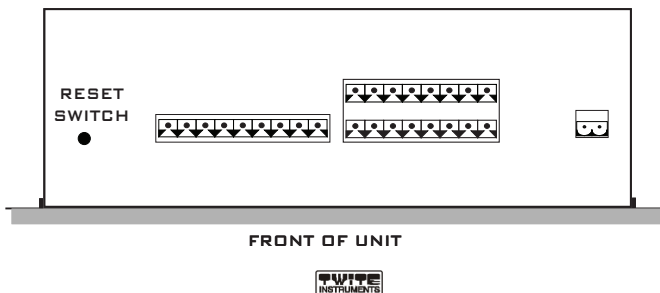
**If this function is set to "Term 64" then it will over ride the stop bypass and volume index dec output and only be available for oil return.**

### RESET SWITCH.

By pressing this switch the system will reset.

Set points and data logged will not be affected by pressing this switch.

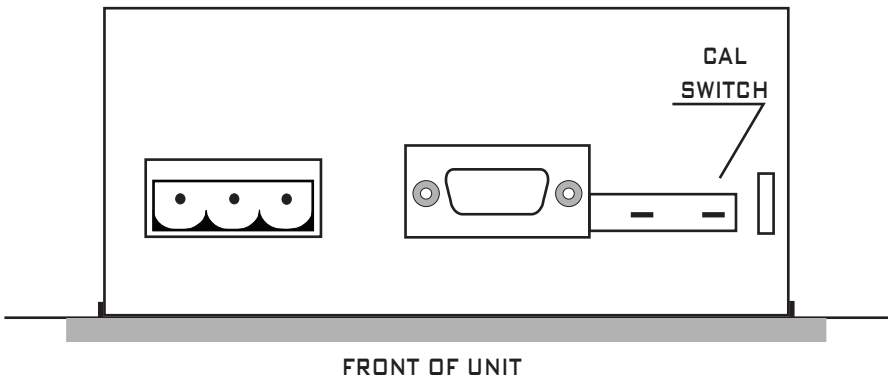
This is only required if the system locks up and is not functioning properly. If after pressing RESET the unit still does not perform correctly call your nearest service agent.



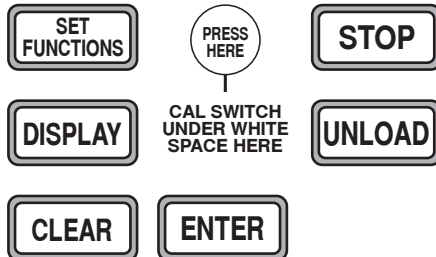
## INSTALLATION CONT.

### CAL SWITCH.

These 2 switches are used for setting of some of the functions. See Setting Functions for which functions require the pressing of this switch. Either switch may be used with the appropriate functions and must be held pressed while the "ENTER" key is pressed and held until the alarm beep is sounded for the function to operate properly. After finishing with the "CAL" switch, if the slide switch was used, be sure it placed back into the OFF position. The right most LED digits decimal point will light to indicate that the cal switch is pressed.



### FRONT PANEL



## OPERATION.

### **ALARM ACTION:-**

If any one of the pressure transducers (suction, discharge, oil or intermediate) or temperature alarms or digital alarms go to the active state, The compressor will turn off and the Display will indicate what the alarm's that was/were and the time it went into alarm.

To reset the alarms, Press the "CLEAR" key when the display is displaying Alarms Logged.

The total number of alarms are displayed and the order in which each alarm went into alarm.

To select different alarms that are active press the “▲” “UP” (ARROW) KEY and the “▼” “DOWN” (ARROW) KEY. and each alarm will be displayed on the LCD and LED display. The alarm displays will revolve around in a circular fashion to display all alarms that are active.

The following is a sample of the alarms displayed. The Right hand LED bar display bottom LED will flash (red) and the buzzer will sound and the alarm relay will turn off. To disable the buzzer press any key.

```
ALARMS LOGGED STATUS
TOTAL No. ALARMS 01
order 01  Disch Pres
17:46 04 Jan
```

The LCD displays the total number of alarms, the order of the alarms and the time in went into alarm.

The LED display will show the value of the alarm (dig if a digital alarm).

If no alarms are active the display will show:-

```
ALARMS LOGGED STATUS
NO ALARMS LOGGED
```

## OPERATION CONT.

### ALARM ACTION CONT.:-

The following is the display for each alarm and its meaning:-

"Suct Temp "	The suction temperature is in alarm
"Disch Temp"	The discharge temperature is in alarm.
"Oil Man Tm"	The oil manifold temperature is in alarm
"Oil Sep Tm"	The oil separator temperature is in alarm.
"Int/Ec Tmp"	The intermediate temperature is in alarm.
"Suct Press"	The suction pressure is in alarm
"Disch Pres"	The discharge pressure is in alarm.
"Oil Bf Flt"	The oil before filter pressure is in alarm
"Oil Af Flt"	The oil after filter pressure is in alarm.
"Int/Ec Prs"	The intermediate pressure is in alarm.
"Slide 4-20"	The 4-20ma slide valve input is in alarm
"Remote Run"	The remote run digital is in alarm (not used)
"Remote OFF"	The remote OFF digital is in alarm.
"Emerg Swch"	The emergency switch has been pressed.
"Motor Aux"	The motor auxiliary digital is in alarm.
"Oil Level"	The oil float digital input is in alarm
"Auxiliary 1"	The auxiliary 1 digital input is in alarm.
"Slide Pot"	The slide pot is in alarm (reading below -10% or above 110%)
"Vol/Ra Pot"	The volume ratio pot is in alarm.
"Current "	The motor current is in alarm.
"CompScan C"	No signal from compressor No. 1 received for 10 minutes.
"TempScan C"	No signal from TempScan has been received for 10 min.
"Unld Start"	The compressor failed to unload fully to start running.
"Oil Pre St"	Oil pressure failed reach adequate pressure for motor start.
"Lo Cur Alm"	Low current alarm, indicates that the coupling may have failed.
"Super Heat"	If the super heat, (the calculated saturation temperature from the suction pressure minus the actual suction temperature) is below or equal to the alarm set point.

**See CompScan Digital Input Terminals for more information on digital alarm inputs.**

## OPERATION CONT.

### WARNING ACTION:-

A warning log and values will be displayed if any value goes into the warning zone (see later for warning set points) and will be displayed on the LCD and LED as in the alarm displays and the Warning LED will flash (yellow bar LED second bottom). The compressor will not turn of for any warnings logged.

To reset the Warnings, Press the "CLEAR" key when the display is displaying Warnings Logged.

The total number of warnings are displayed and the order in which each warning went into that state.

### WARNING ACTION CONT.:-

To select different warnings that are active press the “▲” “UP” (ARROW) KEY and the “▼” “DOWN” (ARROW) KEY. and each warning will be displayed on the LCD and LED display. The warnings display will revolve around in a circular fashion to display all warnings that are active.

The following is a sample of the warnings displayed.

```

WARN  LOGGED  STATUS
TOTAL No. Warn'S   01
order 01  Disch Pres
17:46 04 Jan
  
```

The LCD displays the total number of warnings, the order of the warnings and the time in went into that state.

The LED display will show the value of the warning.

If no warnings are active the display will show:-

```

WARN  LOGGED  STATUS
NO WARNINGS LOGGED
  
```

## **OPERATION CONT.**

The following is the display for each warning and its meaning:-

"Suct Temp"	The suction temperature warning
"Disch Temp"	The discharge temperature warning.
"Oil Man Tm"	The oil manifold temperature warning.
"Oil Sep Tm"	The oil separator temperature warning
"Int/Ec Tmp"	The intermediate temperature warning.
"Suct Press"	The suction pressure warning.
"Disch Pres"	The discharge pressure warning.
"Oil Bf Flt"	The oil before filter pressure warning.
"Oil Af Flt"	The oil after filter pressure warning
"Int/Ec Pr"	The intermediate pressure warning.
"Slide 4-20"	The 4-20ma slide valve input warning.
"Oil Filter"	The differential of the oil pressure between the filter input and output is equal or greater that the set point.

## **OPERATION CONT.**

### **DISPLAY FUNCTIONS:-**

#### **LIQUID CRYSTAL DISPLAY (*TOP LEFT*).**

Used to time and date, display logged data and menu driven instructions and values while setting parameters.

See “DISPLAY” KEY.

#### **LED DISPLAY (*TOP MIDDLE AND RIGHT*).**

Used to display channels temperature and pressure and for values while displaying alarm status and data logged. The 3 Digit display shows the current percentage that the compressor is loaded.

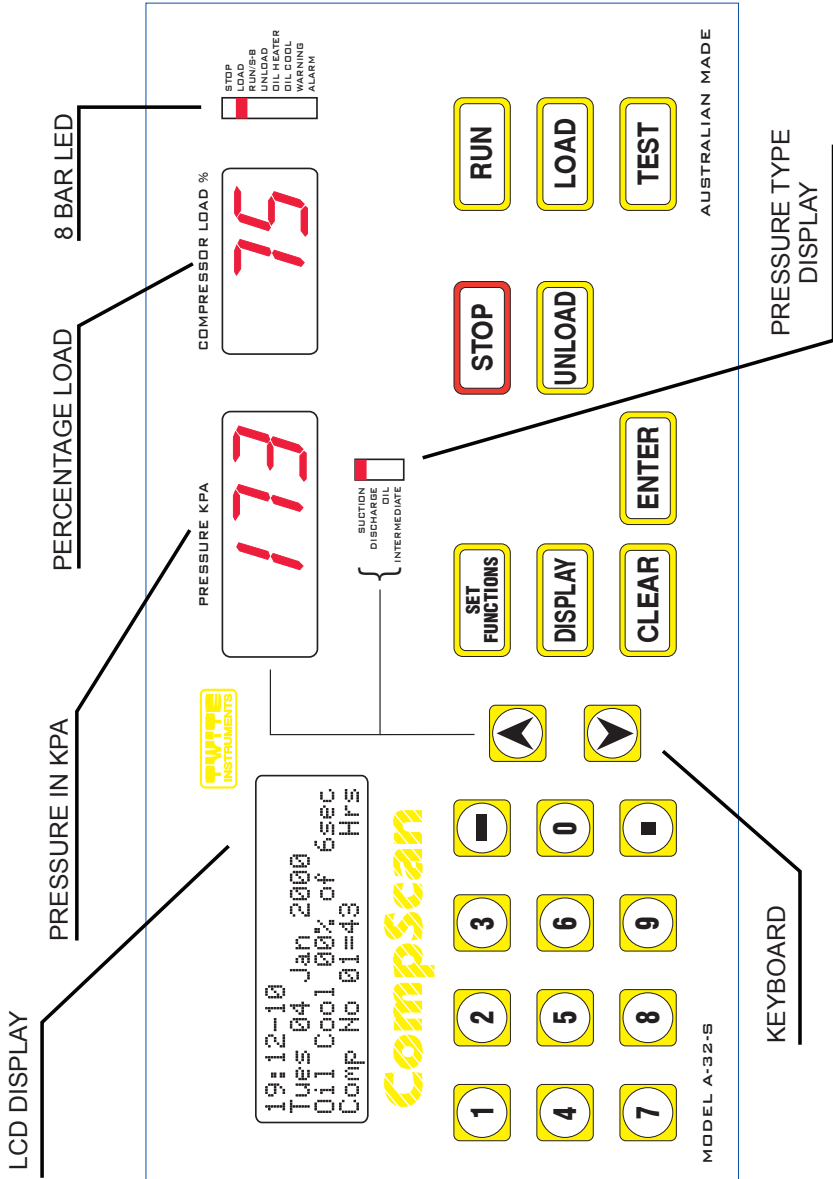
See “DISPLAY” KEY.

#### **CHANNEL STATUS INDICATORS (*8 LED BAR*).**

- |                                    |  |
|------------------------------------|--|
| 1 <sup>st</sup> LED ( <i>top</i> ) | - ( <i>GREEN</i> ) The compressor is in the OFF state.                     |
| 2 <sup>nd</sup> LED                | - ( <i>RED</i> ) The load solenoid is on.                                  |
| 3 <sup>rd</sup> LED                | - ( <i>YELLOW</i> ) The compressor is running or in stand-by mode.         |
| 4 <sup>th</sup> LED                | - ( <i>RED</i> ) The unload solenoid is on.                                |
| 5 <sup>th</sup> LED                | - ( <i>RED</i> ) The sump heater is turned on.                             |
| 6 <sup>th</sup> LED                | - ( <i>GREEN</i> ) The oil cool injection solenoid is on or water pump on. |
| 7 <sup>th</sup> LED                | - ( <i>YELLOW</i> ) Flashing, warning has been logged.                     |
| 8 <sup>th</sup> LED                | - ( <i>RED</i> ) Flashing, at least one alarm is active.                   |

### OPERATION CONT.

### DISPLAY FUNCTIONS CONT.:-



## **KEYBOARD FUNCTIONS :-**

### **OVERVIEW**

**If the wrong key is pressed at any time the key beep will beep twice to indicate this and nothing will be changed.**

While the unit is in normal running mode, i.e.. not setting functions or displaying ALARMS LOGGED STATUS or WARN LOGGED STATUS or Data Logged Display The pressure value on the LED may be displayed for the Suction, Discharge, Oil Before Filter or Manifold (after filter) (if connected) by Pressing the “▲” & “▼” keys

If the unit is displaying Data Logged, pressing the “▲” & “▼” keys will advance/decrement logged data time of log and will indicate this on the LCD. Pressing any of the left hand number keys the logged data for different values (temperatures, pressures and digital inputs etc.). that were logged at that time. The right hand Bar LEDs will show the status and the % load of the compressor at that time.

If Alarms Logged or Warnings logged is displayed, pressing the “▲” & “▼” keys will advance/decrement to the next/pervious alarm/warning if logged.

### **Setting parameters.**

There are 2 passwords for setting of functions. 1 Engineers password which must be used for most functions to be available for changing and 1 user password that can be set to any number between 1 and 5999.

Only the first 8 functions can be set by the user without the Engineers Password.

If the password is requested after the "SET FUNCTIONS" key is pressed, see PASSWORD for entering the correct PASSWORD.

When a flashing cursor is displayed on the Liquid Crystal Display the Value or Function may be changed to another by pressing the “▲” & “▼” (“UP/DOWN” arrow or entering a valid value on the left hand number keys).

Holding the “UP” or “DOWN” arrow key (“▲” & “▼”) on will increase or decrease the value displayed faster on some functions.

## **KEYBOARD FUNCTIONS CONT.**

### **OVERVIEW CONT.**

If CHANNEL SELECTION is required for a function, select the channel by pressing the “▲” key and press “▼” to select "YES" or "NO" for that channel. More than one channel may be set to a value at the same time.

When the channels have been selected, press the “ENTER” key to enter the channels selected. The value that is displayed on the LCD will be the value of the last channel that was selected and is the value used for the “▲” & “▼” (“UP/DOWN”) keys to use as a reference to alter or if a value is entered on the left hand number keys a new number will be input.

If no channels were selected (*and were required*) the function will not proceed and the displays will revert to there normal functions.

If the "ENTER" key is pressed without the value being changed all channels that were selected will be updated with the value displayed on the LCD.

If the "CLEAR" key is pressed before the "ENTER" key is pressed the value will not be updated the channels that were selected and the displays will revert to there normal functions.

To alter the value press the “▲” (“UP” arrow) key to increase the value or press the “▼” (“DOWN” arrow) key to decrease the value or enter the value on the left number keys. This will be the value entered into the channels that were selected when the "ENTER" key is pressed. Holding the “▲” (“UP” arrow) or the “▼” (“DOWN” arrow) will advance/decrease the value faster.

When entering a value using the left hand number keys the Auto Key Delay is active. If a value of -2.5 is required, press "-" then "2" then "." then "5", -2.5 will be displayed. If the key beep sounded for the second time (*auto key press time out*), before the next key is pressed in the above sequence a new value will be started on the display.

The time out for the second or third key is to be pressed can be set using Set Functions "Key Select Delay".

After the correct value has been entered press the “ENTER” key and the value will be entered into memory for all the channels selected if required and will not be affected by a power failure.

## KEYBOARD FUNCTIONS CONT.

### OVERVIEW CONT.

If more than one value is required (*i.e. set real time clock*) the unit will request each value in turn to be altered. After each value has been entered press the "ENTER" key. After all required values have been altered (*or checked*), the displays will revert to normal run mode. If the "CLEAR" key is pressed before all set points are entered and before the "ENTER" key is pressed, none of the entered values will be updated.

IF THE WRONG KEY IS PRESSED AT ANY TIME THE ALARM BEEP WILL BEEP TWICE TO INDICATE THIS AND NOTHING WILL CHANGE.

### "SET FUNCTIONS" KEY

When the "SET FUNCTIONS" key is first pressed the last function that was altered will appear on the LCD and the LED display will remain the same until the "ENTER" key is pressed to select that function at which time the LED display will be turned off. The FUNCTIONS and there meaning are described in the following pages in short form then in detail.

```

SETTING FUNCTIONS
Press UP or DOWN or
Enter Function No 10
Comp Suctn Set Point
  
```

To change from one function to another, press the "▲" or "▼" (*up/down arrow*) keys to display each function in numerical order, or enter the function number on the left number keys.

When entering a value for the required function to set/check using the left hand number keys the Auto Key Delay is active. If function number of 11 "High Alarm Temp're" is required, press "1" then "1", 11 will be displayed after Function No . If the key beep sounded for the second time (*auto key press time out*), before the "1" key is pressed in the above sequence a new value will be started on the display.

## KEYBOARD FUNCTIONS CONT.

### OVERVIEW CONT.

If a lesser number i.e. "0" was pressed the unit will beep twice and display the lowest allowed function number, and if a higher number was entered than allowed it will beep twice and display the highest function number allowed.

The time out for the second or third key is to be pressed can be set using Set Functions "Key Select Delay".

When the required function to be altered (*or checked*) is displayed, press the "ENTER" key. and follow the instructions displayed on the LCD display.

### "ENTER" KEY

Used to select the function or value to be checked or changed.

When setting functions the display will display one of the following.

If Channel selection is required, Press the "▼" for YES/NO for that channel and press "▲" to select the next channel. Channel selection rotates around in a circular fashion so if the wrong channel was selected it can be de selected next time that channel is displayed.

```
Temp's Connected
Select Channel's
^ = Chan v = Yes/No
YES   Suction
```

If Channel selection was not required, the way in which the value may be changed and the type of set point without the value under the flashing cursor.

```
Comp Suctn Set Point
Press UP or DOWN or
Enter Value Required
150   Pressure KPA
```

The above displays are an indication only, other channel select values and types of ways to enter values may be displayed depending on the function that is being set or checked.

The "CAL" switch is required on some functions. See CAL SWITCH.

## KEYBOARD FUNCTIONS CONT.

### OVERVIEW CONT.

#### “▲” “UP” (ARROW) KEY

Used to advance to the next channel to display or when setting functions, increase to the next function or to increase the value displayed. If held down the value will change faster automatically.

#### “▼” “DOWN” (ARROW) KEY

Used to decrement to the previous channel to display or when setting functions, decrement to the previous function or to decrease the value displayed. If held down the value will change faster automatically.

#### “DISPLAY” KEY.

The following displays are available by pressing the “DISPLAY” key when in normal use, (*i.e. while the unit is running and no setting of functions is being done*). Also pressing a number key from 0 to 9 selects each display immediately (as shown for each display). If Data Logged Display is displayed the "Display" key must be pressed to go to the next display.

The Display revolves around, i.e.. when the last one is displayed by pressing the "DISPLAY" key, pressing it again displays the first one described here.

1: (No. 0) Time and date on the LCD. and The Compressor number and the number of hours the compressor has been running. Also a Time out of Start to Start time left before the compressor can start again if not 0 minutes (precedence) or "No\_load" if the compressor cannot load because of maximum percentage reached or maximum current has been reached.

```

13:33-14
Tues 19 Dec 1995
Oil Cool 88% of 6sec
Comp No 01=43      Hrs
  
```

## KEYBOARD FUNCTIONS CONT.

### OVERVIEW CONT.

### “DISPLAY” KEY CONT.

2: (No. 1) The Temperatures of all connected channels on the LCD and Pressure on the 1st LED and percentage on the right most LED and the compressor status on the 8 LED bar display.

```
Suct Temp      +28.1 oC
Disch Temp     +78.8 oC
Oil Temp       +34.4 oC
OilSep Tmp     +56.0 oC
```

3: (No. 2) The Pressures of all connected channels on the LCD and Pressure on the 1st LED and percentage on the right most LED and the compressor status on the 8 LED bar display.

```
Suct Pres      +150   KPA
Disch Pres     +1023  KPA
Oil Bf Flt     +203   KPA
Oil Af Flt     +200   KPA
```

4: (No. 3) The Digital input status of channels 1 to 4 on the LCD and Pressure on the 1st LED and percentage on the right most LED and the compressor status on the 8 LED bar display.

```
Dig IN Full Load NO
Dig Full Unload  NO
Dig IN Rem't Run OFF
Dig IN Auxil'y 1 OFF
```

**KEYBOARD FUNCTIONS CONT.**

**“DISPLAY” KEY CONT.**

5: (No. 4) The Digital input status of channels 5 to 8 on the LCD and Pressure on the 1st LED and percentage on the right most LED and the compressor status on the 8 LED bar display.

```
DigIN Full Unld OFF
DigIN Motor Aux OFF
DigIN Oil Float OFF
DigIN Auxillary1 N-C
```

6: (No. 5) The Motor current and Intermediate Temp & Pressure (if connected) on the LCD (if any) and alarm value on the 1st LED and the compressor status on the 8 LED bar display.

```
Motor Cur +150 AMPS
Variable Speed 45 % only if used (% motor speed)
Intmed Tmp +30.0 oC
Intmed Pres +600 KPA
```

7: (No. 6) The Alarms Logged on the LCD (if any) and alarm value on the 1st LED and the compressor status on the 8 LED bar display.

```
ALARMS LOGGED STATUS
Total No. Alarms 01
order 01 Suct Press
20:45 04 Jan
```

8: (No. 7) The Warnings Logged on the LCD (if any) and warning value on the 1st LED and the compressor status on the 8 LED bar display.

```
WARN LOGGED STATUS
Total No. Warn's 01
order 01 Suct Press
20:45 04 Jan
```

## KEYBOARD FUNCTIONS CONT.

### “DISPLAY” KEY CONT.

9: (No. 8) The Data Logged on the LCD (if any) and the compressor status on the 8 LED bar display and the % load on the LED at the time of the log. Pressing the Number Keys displays the different logged values at the time of log and pressing the “▲” & “▼” will advance or decrease to the next or previously logged data.

**NOTE: TO GO TO ANOTHER DISPLAY FROM THIS DISPLAY, THE "DISPLAY" KEY MUST BE PRESSED.**

```
Data Logged Display
S-T/S-H +28.7 +52.7 Suction Temp / Super Heat (dual on this
Suct Press +160 KPA logged display only) The 0 (zero) key.
20:45 04 Jan
```

10: (No. 9) The Compressor Volume Index the LCD and the compressor status on the 8 LED bar display and the % load on the LED.

```
Evap Temp -32.5 oC
Condens Temp +23.2 oC
VI Calculated 4.0 The actual volume index
VI Slide Pos. 3.0 The volume slide valve index
```

11: (Minus Sign) The Compressor Ratio the LCD and the compressor status on the 8 LED bar display and the % load on the LED.

```
Actual Oil Pressures
Before Flt +133 KPA
After Flt +124 KPA
Press Diff +09 KPA
```

## KEYBOARD FUNCTIONS CONT.

### “DISPLAY” KEY CONT.

12 (Decimal Point): The Suction pressure, the calculated saturation temperature, the actual suction temperature and the super heat on the LCD and the compressor status on the 8 LED bar display and the % load on the LED.

```
Suc Press   +82    KPA
Suc S Tmp   -28.0  oC
Suc Temp    +24.3  oC
Super Heat  +45.1  oC
```

12 (Display Only): The alarm history, the last 40 alarms can be displayed by pressing the up/down arrows. These alarms cannot be cleared. When the memory is filled with 40 alarms the next alarm will be written over the oldest alarm etc.

```
Alarm History, Shows
The Last 40 Alarms
Oil Bf Flt
15:14 20 Aug
```

### “CLEAR” KEY.

The Clear key is used to Clear and Reset Alarms and Warnings if active, and to clear from a function while in SET FUNCTIONS mode.

### “LEFT SIDE NUMBER, - , AND . ” KEYS.

These keys are used to enter a value while using SET FUNCTIONS, not all functions allow these keys to be used, i.e.. a YES or NO for some functions only allow the “▲” & “▼” to be used. See Overview for Auto Key Repeat and entering an invalid value for more information.

## **KEYBOARD FUNCTIONS CONT.**

### **OVERVIEW CONT.**

#### **“STOP” KEY.**

This key is used to stop the compressor from operating. This is not an emergency OFF key, as it uses software control to turn the compressor off.

#### **“EMERGENCY STOP” BUTTON.**

The EMERGENCY STOP button is the large red button (if fitted) on the unit. This button mechanically switches off the active control cable from the control relays but allows the CompScan to keep running and will sound the alarm. To reset the emergency stop button, Twist the button clockwise.

#### **“RUN” KEY.**

This key is used to start the compressor operating. The compressor may not start immediately due to Start to Start time out or the suction pressure is not at the start value.

#### **“LOAD” KEY.**

This key may be used to manually load the compressor to the next stage. If the maximum number of stages are already loaded the Key Beep will Beep twice to indicate this.

#### **“UNLOAD” KEY.**

This key may be used to manually unload the compressor to the previous stage. If no stages are loaded the Key Beep will Beep twice to indicate this.

#### **“MANUAL” KEY.**

This key may be used to manually start the compressor regardless of the suction pressure. The load and unload keys can be pressed to test the compressor.

## **PASSWORDS :-**

### **USING ENGINEERS PASSWORD**

*(use SET FUNCTIONS, ENTER, VALUE keys)*

The engineers password is required on some set points and to allow changing set points above function number 10. The display will request the password when "SET FUNCTIONS" key is pressed then "ENTER" is pressed to select that function to change with the following message.

```
Enter Engineers  
Password
```

```
█
```

**NOTE:-** flashing cursor.

The PASSWORD consists of A NUMBER BETWEEN 0000 AND 5999 inclusive and only known to an authorized person that is able to change certain set points.

The Engineers password cannot be changed and is 1111.

Which functions that require this password are indicated in the following section.

### **USERS PASSWORD**

When the password is required *(can be turned on or off)* the display will request the password when "SET FUNCTIONS" key is pressed then "ENTER" is pressed to select that function to change/check with the following message.

```
Enter Users  
Password
```

```
█
```

**NOTE:-** flashing cursor.

## **PASSWORDS CONT.:-**

### **USERS PASSWORD CONT.**

The PASSWORD consists of A NUMBER BETWEEN 0000 AND 5999 inclusive.

To enter the password enter the value using the left hand number keys until the correct number is displayed, then press the “ENTER” key. If the password number was correct the unit will go to the next step for setting functions. If the number was incorrect the alarm will beep and the unit will revert to its normal running display with the displayed data that was displayed before the “SET FUNCTIONS” key was pressed.

### **CHANGE PASSWORD**

LCD display “Change Password” use SET FUNCTIONS, ENTER, ▲ and ▼ or enter VALUE keys.

Allows the Password to be changed. If the Password is inactive (*i.e.. is set to OFF*) this function will automatically require the users password before you can change it.

### **DISABLE PASSWORD**

(use SET FUNCTIONS, ENTER, ▲ and ▼ or enter VALUE keys)

LCD display “Pass Word YES/NO”

Changes the PASSWORD function to ACTIVE or NON ACTIVE.

### **PASSWORD UNKNOWN**

If the pass word has been lost it is possible to reset the pass word to “1111” by pressing and holding the CAL key when selecting function "Reset Password"

## KEYBOARD FUNCTIONS.

### FUNCTIONS AND THE NO. OF EACH

*THE \* MEANS, CAL SWITCH MUST BE USED FOR THIS FUNCTION.*

*THE ^ MEANS, ENGINEERS PASSWORD REQUIRED FOR FUNCTION.*

1	"Comp Suctn Set Point"	The compressor suction set point in KPA..
2	"Comp Suctn Diff'tial"	The compressor suction differential in KPA..
3	"Comp Slow Load Time"	The slow load time in seconds..
4	"Comp Fast Load Time"	The compressor fast load in seconds.
5	"Comp Start Pressure"	The comp fast load & Start pressure in KPA..
6	"Compre'r Unload Time"	The compressor unload time in seconds.
7	"Pump Down Set Point"	The compressor pump down set point in KPA.
8	"Start - Start Time"	The compressor start to start time in minutes.
9	"Set Factory Defaults" ^	Set up factory defaults for all functions.
10	"Allow Other Settings" ^	Allow the user to set other functions (time out).
11	"High Alarm Temp're"	High alarm temperature (select channels).
12	"Warn Temp From High"	Warning temp from high alarm (select channels).
13	"Low Alarm Temp're"	Low alarm temperature (select channels).
14	"Warn Temp above Low"	Warning temp above low alarm (select channels).
15	"Hi Temp Alarm Delay"	High temp alarm in seconds (select channels).
16	"Low Temp Alarm Delay"	Low temp alarm in seconds (select channels).
17	"Hi Alarm 4-20ma Inpt"	High alarm 4-20ma inputs (select channels).
18	"Warn 4-20ma From Hi"	Warn pressure from high alarm (select channels)
19	"Lo Alarm 4-20ma Inpt"	Low 4-20ma inputs alarm (select channels).
20	"Warn 4-20ma above Lo"	Warn pressure above low (select channels).
21	"Hi 4-20ma Alm Delay"	High 4-20ma Alm Dly seconds (select channels)
22	"Lo 4-20ma Alm Delay"	Low 4-20ma Alm Dly seconds (select channels).
23	"Compressor Number"	The compressor number from 1 to 27 incl.
24	"Set Data Logging"	The time between data logging and printing.
25	"Key Select Delay"	The delay between key select and new number.
26	"Set Time & Date"	Set the real time clock.
27	"Temp's Connected"	Set which temperature channels are connected.
28	"4-20ma in Connected"	Set which 4-20ma inputs channels are connected.
29	"Digital IN Connected"	Set which digital inputs are connected.
30	"RS485/232 Connection"	Set the type of serial communications.
31	"Password YES/NO"	Set whether the users password is required.
32	"Change Password"	Change users password (requires users password)
33	"Set RS485/232 Baud"	Set the RS485 and RS232 Baud rate.
34	"LED Brightness"	Set brightness of LED display & LCD back light.

## KEYBOARD FUNCTIONS CONT.

### FUNCTIONS AND THE NO. OF EACH

*THE \* MEANS, CAL SWITCH MUST BE USED FOR THIS FUNCTION.*

*THE ^ MEANS, ENGINEERS PASSWORD REQUIRED FOR FUNCTION.*

35	"4-20ma Input Span "	Set 4-20ma trans. input span (select channels)
36	"Do 4-20ma Offset" *	Sets offset values for pressure inputs (select chs)
37	"Reset Compre'r Hours"	Sets compressor hours to 0.
38	"Current Trans'r Type"	Sets the type of current transformer type.
39	"High Current Alarm"	Sets the high motor current alarm.
40	"Reset Calib'n Offset" *	Resets all calibration offsets to 0.
41	"Cal Hi Values Check" *	Set/Check high temp calibration values (sel chs)
42	"Cal Lo Values Check" *	Set/Check low temp calibration values (sel chs)
43	"Calibrate Tmp Sensor" *	Calibrating temperature sensors (select channels)
44	"Ram Memory Check" *	Checks all memory.
45	"Test Display/Rst Log"	Tests displays & data logged to "no data logged"
46	"Number of Resets"	Displays the number of resets (power fail etc.)
47	"Reset Password"	Resets the users password to 888
48	"Compressor Type"	Sets the type of compressor this unit is for.
49	"Save Eng'rs Defaults"	Saves all current set points to non vol memory.
50	"Oil Return Interval"	Time between the oil return turns on in minutes.
51	"Load Pot Connected"	Sets if the Load (Slide Valve) pot is connected.
52	"Volume Index Pot Con"	Sets if the volume ratio pot is connected.
53	"Progressive Ld/Unld"	Sets if progressive load and unload is used.
54	"Load Pulse Time"	Sets time the load pulse is on to 1/10 second.
55	"Unload Pulse Time"	Sets time the unload pulse is on to 1/10 second.
56	"Min Slide Valve St %"	The minimum % value that the comp can start at.
57	"Min Slide Valve Pos%"	The minimum % value that the comp can run at.
58	"Current Limit Unload"	The current limit for forced unload of comp.
59	"Oil Heat temperature"	The Oil heater temperature set point.
60	"Oil Heat Differential"	The Oil heater temperature differential.
61	"Oil Cool Temperature"	The Oil cooling temperature set point.
62	"Type of Oil Cooling"	Whether liquid injection, water pump or 4-20ma.
63	"Oil Cool Period Time"	The time in seconds for liq. Inj. cooling pulses.
64	"Oil Pre Start Time"	The time out for oil press. to each before alarm.
65	"Oil Pressure Pre Run"	The oil pressure to reach before comp can start.
66	"Oil Filter Difl Wrn"	The warning set point for the filter pressure drop.
67	"Set 0 % Load Pot" *	Setting the 0% position of the slide valve pot
68	"Set 100 % Load Pot" *	Setting the 100% position of the slide valve pot
69	"Set Low Vol/Ind Pot" *	Setting the Low position of the volume ratio pot.

**KEYBOARD FUNCTIONS CONT.****FUNCTIONS AND THE NO. OF EACH****THE \* MEANS, CAL SWITCH MUST BE USED FOR THIS FUNCTION.****THE ^ MEANS, ENGINEERS PASSWORD REQUIRED FOR FUNCTION.**

70	"Set High Vol/Ind Pot" *	Setting the High position of volume ratio pot.
71	"Oil Pump Type Used"	Sets the type of oil pump used.
72	"Low Mt Current Alarm"	The low current value for alarm, (shaft break).
73	"Unload Oil Pump Strt"	Whether the oil pump is on to unload compressor before the compressor is allowed to start.
74	"Min Oil Tmp Motor St"	The minimum temperature of the oil in the separator at which the compressor can start.
75	"Bypass Sol'ds YES/NO"	Whether bypass solenoids are used or volume ratio is used for relay outputs 7 and 8.
76	"Bypass Sol Start Tme"	The time in seconds the start solenoid is on.
77	"Bypass Sol Stop Tme"	The time in seconds the stop solenoid is on.
78	"Refrigerant Used"	The type of refrigerant used in R values
79	"Super Heat Low Alarm"	The Low alarm set point for the super heat.
80	"Oil Pump Stop Delay"	Time in sec the oil pump is on after motor stops.
81	"4-20ma Oil Cool Diff"	The differential for 4-20ma oil cooling only.
82	"Unload Turn OFF Cnt"	Time in seconds for comp to unload to turn off.
83	"Oil Pressure ON Trys"	No of tryes for oil pressure to rise for comp start.
84	"Motor ON Unld Count"	Time of motor to be on after pump down reached
85	"Offset % to TempScan"	The req. load % with respect to the TempScan
86	"No of Comps in Multi"	The number of compressors in multi comps.
87	"Economizer Start % "	The start load % for when the economizer is on.
88	"Variable Speed Drive"	Whether variable speed drive is used or not.
89	"Variable Speed Step%"	The step in % for each load/unload for Var drive.
90	"Volume Ind. Auto/Man"	Whether volume ratio is automatic or manual
91	"Volume Index Set Pnt"	The set point required for volume ratio if manual
92	"Digital Inputs NO/NC"	Digital inputs, normally open or normally closed.
93	"Cycle Oil Pump ON Pr"	The turn on pressure for the cycle oil pump.
94	"Cycle Oil Pump OFF Pr"	The turn off pressure for the cycle oil pump.
95	"Type of Temp Sensor"	The type of temperature sensor that is used.
96	"Maximum % Stop Load"	Maximum percentage the compressor can load to.
97	"Stop Load at Current"	Maximum current the compressor can load to.
98	"Oil Cooling Temp Sen"	Cooling temp sensor to manifold or discharge.
99	"Oil Return Relay"	Oil return relay Term 64 or Ext Relay Board.

## **KEYBOARD FUNCTIONS CONT.**

### **1 “Comp Suctn Set Point”**

Sets the Compressor Pressure set point value in KPA with the Compressor Differential, for when the compressors use the Slow Load/Unload set points. See Compressor Control.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **1** TO SELECT `Comp Suctn Set Point`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 - 500 KPA.

PRESS “ENTER”

SELECTION COMPLETE.

### **2 “Comp Suctn Diff’tial”**

Sets the Compressor Pressure Differential set point value in KPA, with the Compressor Pressure set point, for when the compressors use the Slow Load/Unload set points. See Compressor Control.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **2** TO SELECT `Comp Suctn Set Point`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 - 500 KPA.

PRESS “ENTER”

SELECTION COMPLETE.

### **3 “Comp Slow Load Time”**

Sets the Slow Load Time in seconds for the compressor to load. See Compressor Control.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **3** TO SELECT `Comp Slow Load Time`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 - 300 SECONDS.

PRESS “ENTER”

SELECTION COMPLETE.

### **4 “Comp Fast Load Time”**

Sets the Fast Load Time in seconds for the compressor to load. See Compressor Control.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **4** TO SELECT `Comp Fast Load Time`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 - 100 SECONDS.

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 5 “Comp Start Pressure”

Sets the Start compressor running and Fast Load Pressure value in KPA for when the Fast Load Time is used to load the Compressor. See Compressor Control.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **5** TO SELECT `Comp Start Pressure`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 100 - 1000 KPA.

PRESS “ENTER”

SELECTION COMPLETE.

### 6 “Compre'r Unload Time”

Sets the Unload Time in seconds for the compressor to unload. See Compressor Control.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **6** TO SELECT `Compre'r Unload Time`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 - 300 SECONDS.

PRESS “ENTER”

SELECTION COMPLETE.

### 7 “Pump Down Set Point”

Sets the Pump Down Pressure set point value in KPA for when the last compressor stage is turned off. See Compressor Control.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **7** TO SELECT `Pump Down Set Point`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 - 200 KPA.

PRESS “ENTER”

SELECTION COMPLETE.

### 8 “Start - Start Time”

Sets the Start to Start time for Compressor. When a Compressor is turned on the time in minutes before it is allowed to come on again is set using this function. Start to Start time is set to 2 minutes if a power failure occurs then the set time is used from then on.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **8** TO SELECT `Start - Start Time`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 1 TO 30 MINUTES.

PRESS “ENTER”

SELECTION COMPLETE.

## **KEYBOARD FUNCTIONS CONT.**

### **9 “Set Factory Defaults”**

Sets the Factory Defaults for all set points to default value's. The factory defaults are any one of 10 sets. 1 set is the Engineers defaults. These defaults are the current set points and are saved automatically and may be the same as other defaults with 1 or more set points changed and are saved automatically or by using the set point "Save Eng'rs Defaults". This can reload these set points if previously saved. The other 9 default set points are fixed and are listed near the end of the manual.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **9** TO SELECT Set Factory Defaults

PRESS "ENTER"

ENTER ENGINEERS PASSWORD IF REQUIRED

PRESS ▲ ▼ TO SELECT THE REQUIRED DEFAULT SETTINGS.

PRESS "ENTER"

SELECTION COMPLETE.

### **10 “Allow Other Settings”**

Sets whether other settings (set points 11 and up) are able to be checked or changed. This set point when set to YES automatically resets to NO after a time out.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **10** TO SELECT Allow Other Settings

PRESS "ENTER"

ENTER ENGINEERS PASSWORD IF REQUIRED

PRESS ▲ ▼ TO SELECT YES or NO.

PRESS "ENTER"

SELECTION COMPLETE.

### **11 “High Alarm Temp're”**

Sets the High Alarm Temperature set points for each or all temperature probes.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **11** TO SELECT High Alarm Temp're

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS "ENTER"

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR -50.0 to +150.0 oC.

PRESS "ENTER"

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 12 “Warn Temp From High”

Sets the High warning Alarm Temperature set points from the high alarm set point for each or all temperature probes. The temperature set point is subtracted from the high alarm set point which becomes the warning set point. i.e. if the high alarm set point is set at 50.0 and the warning set point is set at 10.0. the warning alarm will occur at 40.0.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **12** TO SELECT Warn Temp From High

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0.0 to +50.0 oC.

PRESS “ENTER”

SELECTION COMPLETE.

### 13 “Low Alarm Temp're”

Sets the Low Alarm Temperature set points for each or all temperature probes.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **13** TO SELECT Low Alarm Temp're

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR -50.0 to +150.0 oC.

PRESS “ENTER”

SELECTION COMPLETE.

### 14 “Warn Temp Above Low”

Sets the Low warning Alarm Temperature set points above the low alarm set point for each or all temperature probes. The temperature set point is added to the low alarm set point which becomes the warning set point. i.e. if the low alarm set point is set at -10.0 and the warning set point is set at 10.0. the warning alarm will occur at 0.0.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **14** TO SELECT Warn Temp Above Low

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0.0 to +50.0 oC.

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 15 “Hi Temp Alarm Delay”

Sets the High Alarm Temperature delay set points for channels in seconds.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **15** TO SELECT Hi Temp Alarm Delay

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 20 120 SECONDS.

PRESS “ENTER”

SELECTION COMPLETE.

### 16 “Lo Temp Alarm Delay”

Sets the Low Alarm Temperature delay set points for channels in seconds.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **16** TO SELECT Lo Temp Alarm Delay

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 120 SECONDS.

PRESS “ENTER”

SELECTION COMPLETE.

### 17 “Hi Alarm 4-20ma Inpt”

Sets the High Alarm pressure and or the 4-20ma inputs set points for each or all pressure (slide valve volume ratio, current (2 alarms)) transducers.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **17** TO SELECT Hi Alarm 4-20ma Inpt

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 4000 UNITS.

PRESS “ENTER”

SELECTION COMPLETE.

### 18 “Warn 4-20ma From Hi”

Sets the High warning Alarm Pressure set points from the high alarm set point for each or all pressure (4-20ma inputs) transducers. The pressure (4-20ma inputs) set point is subtracted from the high alarm set point which becomes the warning set point. i.e. if the high alarm set point is set at 1000 and the warning set point is set at 100. the warning alarm will occur at 900.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **18** TO SELECT Warn 4-20ma From Hi

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 300 UNITS.

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 19 “Lo Alarm 4-20ma Inp”

Sets the Low Alarm Pressure and or the slide valve 4-20ma set points for each or all pressure (slide valve volume ratio, current (2 alarms)) transducers.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **19** TO SELECT `Lo Alarm 4-20ma Inp`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR -200 TO 1000 UNITS.

PRESS “ENTER”

SELECTION COMPLETE.

### 20 “Warn 4-20ma above Lo”

Sets the Low warning Alarm Pressure (or 4-20ma inputs) set points above the low alarm set point for each or all pressure (4-20ma inputs) transducers. The pressure (4-20ma inputs) set point is added to the low alarm set point which becomes the warning set point. i.e. if the low alarm set point is set at 10 and the warning set point is set at 20. the warning alarm will occur at 30.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **20** TO SELECT `Warn 4-20ma above Lo`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 300 UNITS.

PRESS “ENTER”

SELECTION COMPLETE.

### 21 “Hi 4-20ma Alm Delay”

Sets the High Alarm Pressure (or 4-20ma inputs) delay set points for channels in seconds.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **21** TO SELECT `Hi 4-20ma Alm Delay`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 120 SECONDS.

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 22 “Lo 4-20ma Alm Delay”

Sets the Low Alarm Pressure (or 4-20ma inputs) delay set points for channels in seconds.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **22** TO SELECT `Lo 4-20ma Alm Delay`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT YES OR NO FOR THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 20 120 SECONDS.

PRESS “ENTER”

SELECTION COMPLETE.

### 23 “Compressor Number”

Selects the Identification of a units compressor from 1 to 27. If it is number 1 it will control the turn on and off of other compressors if they are set as such and the serial link is in place. The compressors will be turned on in there number order for loading up the system.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **23** TO SELECT `Compressor Number`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 1 - 27

PRESS “ENTER”

SELECTION COMPLETE.

### 24 “Set Data Logging”

Sets the data logging times (*puts information including the value and time*) into memory for retrieval latter via the display, printer or computer.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **24** TO SELECT `Set Data Logging`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ FOR NONE (*DON'T DO*), 1, 5, 10, 30, 60, 120 MINUTES.

PRESS “ENTER”

SELECTION COMPLETE.

### 25 “Key Select Delay”

Sets the Total number of timer cycles before the key select is reset. When a key is pressed in some functions i.e.. selecting value 23 is done by pressing 2 then 3 before the second beep is sounded, if the second beep is heard before the 3 was pressed the value number will be 3. The time allowed before the second beep (*key select delay reset*) is set by using this function.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **25** TO SELECT `Key Select Delay`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 1 - 30 CYCLES.

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 26 “Set Time & Date” Sets the Real Time Clock

PRESS “SET FUNCTIONS”  
 ▲ ▼ OR ENTER FUNCTION No. **26** TO SELECT `Set Time & Date`  
 PRESS “ENTER”  
 ENTER PASSWORD IF REQUIRED  
 PRESS ▲ ▼ FOR 0 to 23 FOR HOURS IN 24 HOUR MODE.  
 PRESS “ENTER”  
 PRESS ▲ ▼ 0 to 23 FOR HOURS IN 24 HOUR MODE.  
 PRESS “ENTER”  
 PRESS ▲ ▼ FOR 0 to 59 FOR MINUTES.  
 PRESS “ENTER”  
 PRESS ▲ ▼ FOR 0 to 59 FOR SECONDS.  
 PRESS “ENTER”  
 PRESS ▲ ▼ FOR 1 to 7 FOR DAY ( 1 = SUNDAY, 2 = MONDAY ETC.).  
 PRESS “ENTER”  
 PRESS ▲ ▼ FOR 1 to 31 FOR DATE.  
 PRESS “ENTER”  
 PRESS ▲ ▼ FOR 1 to 12 FOR MONTH.  
 PRESS “ENTER”  
 PRESS ▲ ▼ FOR 0 to 99 FOR YEAR.  
 PRESS “ENTER”  
 PRESS ▲ ▼ FOR 0 to 99 FOR CENTURY.  
 PRESS “ENTER”  
 SELECTION COMPLETE.

### 27 “Temp's Connected” Sets whether each temperature probe is connected or not. If set to NO it will not cause an alarm regardless of the alarm set point..

PRESS “SET FUNCTIONS”  
 ▲ ▼ OR ENTER FUNCTION No. **27** TO SELECT `Temp's Connected`  
 PRESS “ENTER”  
 ENTER PASSWORD IF REQUIRED  
 PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK  
 PRESS ▼ TO SELECT “YES” OR “NO” FOR THE CHANNEL TO BE CONNECTED OR NOT  
 PRESS “ENTER”  
 SELECTION COMPLETE.

### 28 “4-20ma in Connected” Sets whether each pressure transducer and or slide valve 4-20ma, volume index 4-20ma or current 4-20ma inputs are connected or not., If set to NO it will not cause an alarm regardless of the alarm set point. If the slide valve, volume index and current inputs are set to yes, these inputs will over ride the other type (pots or transformer) inputs but the pots/current inputs must be set to on/current transformer type to operate.

PRESS “SET FUNCTIONS”  
 ▲ ▼ OR ENTER FUNCTION No. **28** TO SELECT `4-20ma in Connected`  
 PRESS “ENTER”  
 ENTER PASSWORD IF REQUIRED  
 PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK  
 PRESS ▼ TO SELECT “YES” OR “NO” FOR THE CHANNEL TO BE CONNECTED OR NOT  
 PRESS “ENTER”  
 SELECTION COMPLETE.

## **KEYBOARD FUNCTIONS CONT.**

### **29 “Digital IN Connected”**

Sets whether each Digital Input is connected or not. If set to NO it will not cause an alarm regardless of the input state, if slide valve 4-20ma is set to connected it will take precedence over the slide valve potentiometer connected in function number 51 "Load Pot Connected". Also function 51 "Load Pot Connected" must be set to "YES" if a 4-20ma slide valve is used.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **29** TO SELECT Digital IN Connected

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT "YES" OR "NO" FOR THE CHANNEL TO BE CONNECTED OR NOT

PRESS "ENTER"

SELECTION COMPLETE.

### **30 “RS485/232 Connection”**

Sets the type of serial link connection is between CompScans if connected. See earlier in the manual for operation using the serial communications.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **30** TO SELECT RS485/232 Connected

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ FOR SINGLE STAND ALONE, MULTIPLE COMPSkans, TEMPSCAN CONNECTED.

PRESS "ENTER"

SELECTION COMPLETE.

### **31 “Password YES/NO”**

Selects whether the User Password is required for setting functions or not.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **31** TO SELECT Password YES/NO

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ FOR YES/NO FOR THE USER PASSWORD TO BE ACTIVE (REQUIRED) OR NOT

PRESS "ENTER"

SELECTION COMPLETE.

### **32 “Change Password”**

Sets the User Password of a number from 0000 to 5999. If the user password was not active when this function is selected, the password required to change the password.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **32** TO SELECT Change Password

PRESS "ENTER"

ENTER USER PASSWORD

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 to 5999 FOR THE PASSWORD NUMBER.

PRESS "ENTER"

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 33 “Set RS485/232 Baud”

Sets the Baud Rate of the RS485/232 Ports. The Stop bit is set to 1 and the Parity is set OFF automatically. This must be 2400 or above if connected to a computer.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **33** TO SELECT Set RS485/232 Baud

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ FOR 110, 300, 1200, 2400 OR 9600 BAUD.

PRESS “ENTER”

SELECTION COMPLETE.

### 34 “LED Brightness”

Sets the Brightness of the LED display.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **34** TO SELECT LED Brightness

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 1 - 15 Inclusive

PRESS “ENTER”

SELECTION COMPLETE.

### 35 “4-20ma Input Span”

Sets the Low and High input span for pressure transducers and 4-20ma inputs for each channel. If setting the slide valve pot input, set the low to 0 (%) and the high to 100 (%). If setting the volume ratio index 4-20ma input, set the low to 22 (displays 2.2 when running) and the high to 60 (displays 5.0 when running) or the values for the type of compressor used, this is used for both the 4-20ma volume ratio input and the volume ratio pot if used. Function "Volume Ratio Pot Con" must be set to Yes if either a pot or a 4-20ma transducer is used.

If setting the 4-20ma current input, set the low to 0 and the high to the maximum current output of the transducer.

The 4-20ma inputs for slide valve, volume ratio index and current 4-20ma inputs must be set to yes connected in the function "4-20ma in Connected" for these values to be used and if set to connected the 4-20ma inputs take precedence over the pot/current transformer inputs.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **35** TO SELECT 4-20ma Input Span

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT "YES" OR "NO" TO SELECT THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR -200 TO 3000 UNITS FOR THE LOW VALUE OF TRANSDUCER.

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR -200 TO 3000 UNITS FOR THE HIGH VALUE OF TRANSDUCER.

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 36 “Do 4-20ma Offset”

For automatically setting the 4-20ma input offsets. All 4-20ma inputs must be disconnected to do this function. This function should not be used unless by an authorized technician. If reset calibration values was done on the 4-20ma inputs this must be re done after to set the correct values.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **36** TO SELECT Do 4-20ma Offset

ENTER PASSWORD IF REQUIRED

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”.

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT “YES” OR “NO” FOR THE CHANNEL TO BE CONNECTED OR NOT

PRESS “ENTER”

WAIT FOR THE LED DISPLAY TO SHOW A VALID VALUE ( 410 APPROX. ) ON EACH SELECTED CHANNEL. ALSO WAIT FOR OTHER CHANNELS SELECTED TO BE DONE ( AT LEAST 1 MINUTE ).

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”.

SELECTION COMPLETE.

### 37 “Reset Compre'r Hours”

Resets the number of hours the compressor has run The number of hours run is displayed on the first display (Time and Date) on the 4th line. A maximum of 999,999 hours is allowed.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **37** TO SELECT Reset Compre'r Hours

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS “ENTER”

SELECTION COMPLETE.

### 38 “Current Trans'r Type”

Sets the current transducer type from the below types. If NOT-C is selected no current transducer is connected (transformer or 4-20ma transducer).

If the 4-20ma current input is set to connected (function "4-20ma in Connected" using a 4-20ma current transducer), this set point must be set to any transformer type except

"NOT-C". The 4-20ma current input span is set using function "4-20ma Input Span".

If a current transformer is used, the type of transformer used must be selected below and the 4-20ma current input (function "4-20ma in Connected") must be set to NO (not connected).

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **38** TO SELECT Current Trans'r Type

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS “ENTER”

PRESS ▲ ▼ FOR NOT-C, 100/5, 200/5, 400/5, 800/5, 100/1, 200/1, 400/1 OR 800/1 TYPE.

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 39 “High Current Alarm”

Sets the High Current alarm for the motor.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **39** TO SELECT High Current Alarm

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 2000 AMPS

PRESS “ENTER”

SELECTION COMPLETE.

### 40 “Reset Calib'n Offset”

Resets the temperature calibration values of the channels selected to 0.00. This function should not be used unless by an authorized technician.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **40** TO SELECT Reset Calib'n Offset

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT “YES” OR “NO” FOR THE CHANNEL DISPLAYED TO BE RESET TO 0.00

PRESS “ENTER”

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”

SELECTION COMPLETE.

### 41 “Cal Hi Values Check”

Altering or checking the Calibration offset values of the channels selected at 100.00 °C. This function should not be used unless by an authorized technician.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **41** TO SELECT Cal Hi Values Check

ENTER PASSWORD IF REQUIRED

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT “YES” OR “NO” FOR THE CHANNEL TO ALTER OR CHECK AT 100.00 OC

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR -20.00 TO +20.00

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”

SELECTION COMPLETE.

### 42 “Cal Lo Values Check”

Altering or checking the Calibration offset values of the channels selected at 0.00 °C. This function should not be used unless by an authorized technician.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **42** TO SELECT Cal Lo Values Ck

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT “YES” OR “NO” FOR THE CHANNEL TO ALTER OR CHECK AT 0.00 OC

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR -20.00 TO +20.00

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 43 “Calibrate Tmp Sensor”

For Calibrating Temperature Sensors at 0.00 °C. and at 100.00 °C. This function should not be used unless by an authorized technician.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **43** TO SELECT `Calibrate Tmp Sensor`

PRESS “ENTER”

ENTER PASSWORD REQUIRED

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT “YES” OR “NO” FOR THE CHANNEL TO CALIBRATE

PRESS “ENTER”

PLACE SENSOR'S INTO A STIRRED ICE BATH WHICH IS AT 0.00 OC. AND WAIT FOR THE TEMPERATURE (*ON THE LAST SENSORS CHANNEL NUMBER*) THAT IS DISPLAYED ON THE LED TO SETTLE.

PRESS & HOLD CAL SWITCH IN AND PRESS ▼ TO ENTER THE LOW VALUE OFFSET VALUE INTO E<sup>2</sup>PROM.

PLACE SENSOR'S INTO A BOILING WATER BATH WHICH IS AT 100.00 OC. AND WAIT FOR THE TEMPERATURE (*ON THE LAST SENSORS CHANNEL NUMBER*) THAT IS DISPLAYED ON THE LED TO SETTLE.

WHEN THE TEMPERATURE REACHES 95.00 °C (*APPROX.*) THE DISPLAY WILL SHOW THE TEMPERATURE MINUS 100.00 °C.

PRESS & HOLD CAL SWITCH IN AND PRESS ▲ TO ENTER THE HIGH VALUE OFFSET VALUE INTO E<sup>2</sup>PROM.

PRESS “ENTER”

SELECTION COMPLETE.

### 44 “Ram Memory Check”

For Testing the RAM and E<sup>2</sup>PROM memory. This function will not remove the contents of memory. If any error messages display on the LCD call your nearest service agent for service. This function can take up to 2 minutes. This function should not be used unless by an authorized technician. If an error occurs it will display the memory type error. Call the service centre if an error message is displayed.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **44** TO SELECT `Ram Memory Check`

PRESS “ENTER”

ENTER PASSWORD AND “ENTER” IF REQUIRED

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”, HOLDING THE CAL SWITCH UNTIL THE FIRST BEEP.

PRESS “CLEAR”, AFTER THE 2nd. BEEP WHEN “Done Press Clear” IS DISPLAYED TO INDICATE NO ERRORS.

SELECTION COMPLETE.

### 45 “Test Display/Rst Log”

For Testing the LED displays. All LED's will be on at full intensity. Also resets all data logged to so that no data has been logged (required if data logged is corrupt. **Also displays version number see Software version.**

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **45** TO SELECT `Test Displays`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS & HOLD CAL SWITCH IN AND PRESS “ENTER”.

PRESS “CLEAR”

SELECTION COMPLETE.

## **KEYBOARD FUNCTIONS CONT.**

### **46 “Number of Resets”**

For viewing the number of resets the unit has performed. After this function has been done the number of resets is set to 0.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **46** TO SELECT `Number of Resets`

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS & HOLD CAL SWITCH IN AND PRESS "ENTER".

PRESS "CLEAR"

SELECTION COMPLETE.

### **47 “Reset Password”**

For Resetting the password to 888 if the password is unknown.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **47** TO SELECT `Reset Password`

PRESS & HOLD CAL SWITCH IN AND PRESS "ENTER".

PRESS "CLEAR"

SELECTION COMPLETE.

### **48 “Compressor Type”**

Selects the type of compressor from 1 to 2 stage and economizer.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **48** TO SELECT `Compressor Type`

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS "ENTER"

PRESS ▲ ▼ FOR 1 Stage Comp'r, 2 Stage Comp'r or 1 Stage Econ'r.

PRESS "ENTER"

SELECTION COMPLETE.

### **49 “Save Eng'rs Defaults”**

Saves all current set points to non volatile memory. These default values may be put back into the set points at any time using the set point function "Set Factory Defaults" and selecting "Engineers Defaults". All set points are also saved automatically and are checked every 5 seconds. See CRC check at the end of the manual for more information.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **49** TO SELECT `Save Eng'rs Defaults`

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS & HOLD CAL SWITCH IN AND PRESS "ENTER". AND WAIT FOR KEY BEEP UNTIL RELEASING CAL.

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 50 “Oil Return Interval”

Sets the time between the oil return solenoid is turned on in minutes. The time the solenoid is on for is set at 5 minutes. The solenoid will not turn on if the discharge temperature is below 55.0 degrees Celsius. NOTE:- an external relay board is required for this output.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **50** TO SELECT Oil Return Interval

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 1 TO 240 MINUTES

PRESS “ENTER”

SELECTION COMPLETE.

### 51 “Load Pot Connected”

Sets whether a load pot (slide valve pot) is connected or not. If slide valve 4-20ma is set to connected it will take precedence over the slide valve potentiometer connected in this function. Also if a 4-20ma slide valve is used this function must be set to “YES”.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **51** TO SELECT Load Pot Connected

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ TO SELECT YES or NO.

PRESS “ENTER”

SELECTION COMPLETE.

### 52 “Volume Index Pot Con”

Sets whether a volume index pot is connected or not. If volume index 4-20ma input is set to connected it will take precedence over the volume index input potentiometer connected in this function. Also if a 4-20ma volume index input is used this function must be set to “YES”.

**NOTE:- The displayed high and low values for this function must be set in function “4-20ma Input Span” and is displayed to 1 decimal point.**

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **52** TO SELECT Volume Ratio Pot Con

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ TO SELECT 1, 2, 3 OR 4

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 53 “Progressive Ld/Unld”

Sets whether progressive load and unload is used or not. If used the amount of time in tenths of seconds is added to the set time of the load and unload pulses. For every 10 KPA pressure difference from the load, fast load and unload values 1 tenth of a second is added to the set on times (set in another set point). The maximum amount of time allowed to be added is 3.0 seconds.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **53** TO SELECT `Progressive Ld/Unld`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ TO SELECT YES or NO

PRESS “ENTER”

SELECTION COMPLETE.

### 54 “Load Pulse Time”

Sets the time in seconds and tenths of seconds that the load solenoid is on for each load pulse (without progressive Ld/Unld used) from 0.1 to 6.0 seconds.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **54** TO SELECT `Load Pulse Time`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0.1 TO 6.0 SECONDS

PRESS “ENTER”

SELECTION COMPLETE.

### 55 “Unload Pulse Time”

Sets the time in seconds and tenths of seconds that the unload solenoid is on for each load pulse (without progressive Ld/Unld used) from 0.1 to 6.0 seconds.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **55** TO SELECT `Unload Pulse Time`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0.1 TO 6.0 SECONDS

PRESS “ENTER”

SELECTION COMPLETE.

### 56 “Min Slide Valve St %”

Sets the minimum percentage of the slide valve (load pot) at which the compressor is allowed to start running.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **56** TO SELECT `Min Slide Valve St %`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 10 % LOADED

PRESS “ENTER”

SELECTION COMPLETE.

## **KEYBOARD FUNCTIONS CONT.**

### **57 “Min Slide Valve Pos%”**

Sets the minimum percentage of the slide valve (load pot) at which the compressor is allowed to unload. The minimum percentage that the compressor will unload to before it turns off due to its pump down set point.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **57** TO SELECT Min Slide Valve Pos%

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 100 % LOADED

PRESS “ENTER”

SELECTION COMPLETE.

### **58 “Current Limit Unload”**

Sets the maximum current in AMPS at which the compressor can run at. If the current reaches or is greater than this set point, the compressor will automatically unload every 2 seconds until the current is reduced below the set point. The compressor will not be able to load again for a minimum of 3 minutes before the compressor can load again.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **58** TO SELECT Current Limit Unload

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 to 1000 Max Unld

PRESS “ENTER”

SELECTION COMPLETE.

### **59 “Oil Heat Temperature”**

Sets the temperature set point of the oil heater. This is turned on if the oil temperature is below this set point plus half the differential set point and off if the oil temperature is above this set point plus half the differential whether the compressor is on or off.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **59** TO SELECT Oil Heat Temperature

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0.0 TO 150.0 Degrees C

PRESS “ENTER”

SELECTION COMPLETE.

### **60 “Oil Heat Differen'l”**

Sets the temperature differential set point of the oil heater and oil cooling.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **60** TO SELECT Oil Heat Differen'l

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0.2 TO 10.0 Degrees C

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 61 “Oil Cool Temperature”

Sets the temperature set point of the oil cooling. Depending on the type of cooling required (set in next set point), the solenoid is turned on if the oil temperature is above the set point plus half the oil heat differential and off if below the set point plus half the oil heat differential (water cooled). The solenoid is pulsed for a time determined by the amount of difference between the oil temperature and the set point for a percentage of from 3 to 6 seconds (set point adjustable) (liquid injection) or 4-20ma output to cool the oil.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **61** TO SELECT Oil Cool Temperature

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0.0 TO 100.0 Degrees C

PRESS “ENTER”

SELECTION COMPLETE.

### 62 “Type of Oil Cooling”

Sets the type of cooling required for oil cooling between Liquid Injection (refrigerant) or Water Pump or 4-20ma output.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **62** TO SELECT Type of Oil Cooling

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ TO SELECT LIQUID INJEC'N or WATER PUMP ON or 4-20ma OUTPUT

PRESS “ENTER”

SELECTION COMPLETE.

### 63 “Oil Cool Period Time”

Sets the time from 3 to 6 seconds for the liquid injection (if used) solenoid is to be on for a percentage (of this time 3 to 6 seconds) depending on the amount of cooling is required.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **63** TO SELECT Oil Cool Period Time

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 3 TO 6 SECONDS

PRESS “ENTER”

SELECTION COMPLETE.

### 64 “Oil Pre Start Time”

Sets the timeouts for all pre starts to be done (set point number 83) for the oil pressure to reach before the motor can run. If these timeouts occur, an alarm will be activated and the compressor will turn off and not turn on until the alarm is reset. Only used if Full Lube, Pre Lube and Cycle Pump type Oil Pump is used.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **64** TO SELECT Oil Pre Start Time

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 120 SECONDS

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 65 “Oil Pressure Pre Run”

Sets the pressure set point for the oil pressure is to reach before the motor can run. If this set point pressure is not reached by the "Oil Pre Start Time" set point, an alarm will occur and the compressor will turn off and not turn on until the alarm is reset. Only used if Full Lube, Pre Lube and Cycle Pump type Oil Pump is used and not used if their is no oil pump (set in oil pump type).

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **65** TO SELECT Oil Pressure Pre Run

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 500 KPA

PRESS "ENTER"

SELECTION COMPLETE.

### 66 “Oil Filter Dif'l Wrn”

Sets the pressure difference set point between the oil pressure before the filter and the oil pressure after the filter. If the pressure is equal to or greater than this set point a warning will be activated. The oil filter must be changed or cleaned if this warning occurs.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **66** TO SELECT Oil Filter Dif'l Wrn

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 500 KPA

PRESS "ENTER"

SELECTION COMPLETE.

### 67 “Set 0 % Load Pot”

Sets the value that the unit reads when the load pot (slide valve pot) is at 0%. When this function is selected and the first enter press is pressed, the percentage LED will display CAL and the actual value of the pot is displayed on the 4 digit pressure LED. To unload the pot press the "Down" (arrow) key. This turns on the unload solenoid and turns the oil pump on (if set point number 73 is set to "Yes") to allow the unit to unload. When fully unloaded and the reading is stable, press the "ENTER" key wit the CAL key pressed to update the value into non volatile ram.

**NOTE:- If a 4-20ma slide valve signal is used the above does not apply. The 4-20ma slide valve signal is fixed at 4ma = 0% and 20.0ma =100% and is set in the 4-20ma input span for the slide valve and should be set to 0 to 100. It can be adjusted to allow for discrepancies for the 4-20ma signal as for pressures.**

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **67** TO SELECT Set 0 % Load Pot

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

FULLY UNLOAD THE COMPRESSOR

PRESS AND HOLD THE CALIBRATION BUTTON AND PRESS THE ENTER KEY

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 68 “Set 100 % Load Pot”

Sets the value that the unit reads when the load pot (slide valve pot) is at 100%. When this function is selected and the first enter press is pressed, the percentage LED will display CAL and the actual value of the pot is displayed on the 4 digit pressure LED. To unload the pot press the "UP" (arrow) key. This turns on the load solenoid and turns the oil pump on (if set point number 73 is set to "Yes") to allow the unit to load. When fully loaded and the reading is stable, press the "ENTER" key key wit the CAL key pressed to update the value into non volatile ram.

**NOTE:- If a 4-20ma slide valve signal is used the above does not apply. The 4-20ma slide valve signal is fixed at 4ma = 0% and 20.0ma =100% and is set in the 4-20ma input span for the slide valve and should be set to 0 to 100. It can be adjusted to allow for discrepancies for the 4-20ma signal as above.**

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **68** TO SELECT Set 100 % Load Pot  
 PRESS "ENTER"  
 ENTER PASSWORD IF REQUIRED  
 FULLY UNLOAD THE COMPRESSOR  
 PRESS AND HOLD THE CALIBRATION BUTTON AND PRESS THE ENTER KEY  
 SELECTION COMPLETE.

### 69 “Set Low Vol/Ind Pot”

Sets the value that the unit reads when the volume ratio pot reads at lowest when the compressors volume index slide is fully unloaded. The value is kept in memory to offset the reading so that the display reads the low value at this point. When this function is selected and the first enter press is pressed, the percentage LED will display CAL and the actual value of the pot is displayed on the 4 digit pressure LED. To unload the pot press the "Down" (arrow) key. This turns on the unload solenoid and turns the oil pump on (if set point number 73 is set to "Yes") to allow the unit to unload. When fully unloaded and the reading is stable, press the "ENTER" key key wit the CAL key pressed to update the value into non volatile ram.

NOTE:- The lowest value displayed for the volume ratio pot and 4-20ma volume ratio input is set in the "4-20ma Input Span" function.

**NOTE:- If a 4-20ma signal is used the above does not need to be done.**

**The 4-20ma and pot low and high span points are set using the function "4-20ma input span" for the volume index valve and should be set to values required depending on the type of compressor used.**

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **69** TO SELECT Set Low Vol/Ind Pot  
 PRESS "ENTER"  
 ENTER PASSWORD IF REQUIRED  
 FULLY UNLOAD THE COMPRESSORS VOLUME RATIO  
 PRESS AND HOLD THE CALIBRATION BUTTON AND PRESS THE ENTER KEY  
 SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 70 “Set High Vol/Ind Pot”

Sets the value that the unit reads when the volume index pot reads at highest when the compressors volume ratio is fully loaded. The value is kept in memory to offset the reading so that the display reads the high value at this point. When this function is selected and the first enter press is pressed, the percentage LED will display CAL and the actual value of the pot is displayed on the 4 digit pressure LED. To load the pot press the "UP" (arrow) key. This turns on the load solenoid and turns the oil pump on (if set point number 73 is set to "Yes") to allow the unit to load. When fully loaded and the reading is stable, press the "ENTER" key key wit the CAL key pressed to update the value into non volatile ram.

**NOTE:- If a 4-20ma signal is used the above does not need to be done.**

**The 4-20ma and pot low and high span points are set using the function "4-20ma input span" for the volume index valve and should be set to values required depending on the type of compressor used.**

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **70** TO SELECT Set High Vol/Ind Pot

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

FULLY UNLOAD THE COMPRESSORS VOLUME RATIO

PRESS AND HOLD THE CALIBRATION BUTTON AND PRESS THE ENTER KEY

SELECTION COMPLETE.

### 71 “Oil Pump Type Used”

Sets the type of oil pump used on the compressor. See earlier in this manual for the operation of each type of oil pump used.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **71** TO SELECT Oil Pump Type Used

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ TO SELECT FULL LUBE PUMP, CYCLE PUMP, PRE LUBE PUMP or NO OIL PUMP

PRESS "ENTER"

SELECTION COMPLETE.

### 72 “Low Mt Current Alarm”

Sets the low current alarm. If the low current alarm is activated, the compressor will turn off and not turn on until the alarm is reset. If this alarm occurs, it may mean that the coupling between the compressor and the compressor has broken. There is a delay of 30 seconds before the alarm will be activated.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **72** TO SELECT Low Mt Current Alarm

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 100 AMPS

PRESS "ENTER"

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 73 “Unload Oil Pump Strt”

Sets whether the oil pump (if full pump, pre lube or cycle pump) is turned on to unload the compressor before the compressor can start or not..

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **73** TO SELECT `Unload Oil Pump Strt`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ TO SELECT YES or NO.

PRESS “ENTER”

SELECTION COMPLETE.

### 74 “Min Oil Tmp Motor St”

Sets the temperature set point of the oil before the compressor can start. If the oil separator probe is not connected the oil temperature probe on the manifold will be used.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **73** TO SELECT `Min Oil Tmp Motor St`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0.0 TO 150.0 Degrees C

PRESS “ENTER”

SELECTION COMPLETE.

### 75 “Bypass Sol'ds YES/NO”

Sets whether bypass solenoids are used when starting the compressor and stopping the compressor. If YES is selected, relay outputs 7 and 8 are used for start/stop bypass solenoids respectively. If NO is selected the relay outputs 7 and 8 are used for load/unload the volume ratio slide valve respectively.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **75** TO SELECT `Bypass Sol'ds YES/NO`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ FOR YES OR NO.

PRESS “ENTER”

SELECTION COMPLETE.

### 76 “Bypass Sol Start Tme”

Sets the time that the start bypass solenoid is on for. The solenoid is turned on at the same time the motor is started and turns off after this time in seconds. Set point number 75 “Bypass Sol'ds YES/NO” must be set to YES for this function to be active.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **76** TO SELECT `Bypass Sol Start Tme`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 50 SECONDS

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 77 “Bypass Sol Stop Time”

Sets the time that the stop bypass solenoid is on for. The solenoid is turned on at the same time the motor is turned off and turns off after this time in seconds. Set point number 75 "Bypass Sol'ds YES/NO" must be set to YES for this function to be active.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **76** TO SELECT `Bypass Sol Stop Time`

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 50 SECONDS

PRESS "ENTER"

SELECTION COMPLETE.

### 78 “Refrigerant Used”

Sets the type of refrigerant used. The following refrigerants available are NOT USED (no alarm will be activated if this is selected and no display), R717, R 507, R 12, R 22, R 134a, R 404A, R 407B, R 407C.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **78** TO SELECT `Refrigerant Used`

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS "ENTER"

PRESS ▲ ▼ FOR THE TYPE OF REFRIGERANT USED (OR NONE-USED).

PRESS "ENTER"

SELECTION COMPLETE.

### 79 “Super Heat Low Alarm”

Sets the Low Alarm Temperature set point for the super heat. The super heat is calculated from the actual suction temperature minus the saturation suction temperature calculated using the suction pressure.

The super heat alarm is checked 45 minutes after the compressor starts and if in alarm after this delay, a further 120 second delay is performed before the alarm is activated.

This 45 minute delay is to allow for the increase of suction pressure while the compressor is off, which in turn will lower the super heat because of the actual suction temperature remains low because of the sensor location within the suction line is in a cold sink.

The 120 second delay is provided to cater for false triggering.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **79** TO SELECT `Super Heat Low Alarm`

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS "ENTER"

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0.0 to +10.0 oC.

PRESS "ENTER"

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 80 “Oil/UnLd Sol OFF Del”

Sets the time that the oil pump and unload solenoid remains on after the motor is turned off in seconds.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **80** TO SELECT Oil/UnLd Sol OFF del

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 20 SECONDS

PRESS “ENTER”

SELECTION COMPLETE.

### 81 “4-20ma Oil Cool Diff”

Sets the temperature differential set point of the oil cooling for the 4-20ma output No 1.

**NOTE:- This is used for the 4-20ma number 1 only and is only available in the panel mount unit.**

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **81** TO SELECT 4-20ma Oil Cool Diff

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0.2 TO 10.0 Degrees C

PRESS “ENTER”

SELECTION COMPLETE.

### 82 “Oil ON/OFF Try Times”

Sets the times in seconds the oil pump turns on and off for while trying to reach the operation pressure set in another function. If after all tries, the pressure does not reach the required value the unit will go into alarm.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **82** TO SELECT Oil ON/OFF Try Times

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ FOR 5 TO 30 SECONDS

PRESS “ENTER”

SELECTION COMPLETE.

### 83 “Oil Pressure ON Trys”

Sets the number of tries the compressor uses for oil pressure to reach its operating pressure before the compressor can start. If on each start of the oil pump, if the pressure is not reached within the time out (set in another function) period, the unit will stop the oil pump and restart the oil pump after the required number of seconds for the next try.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **83** TO SELECT Oil Pressure ON Trys

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 1 TO 5 TRYs

PRESS “ENTER”

SELECTION COMPLETE.

## **KEYBOARD FUNCTIONS CONT.**

### **84 “Motor ON Unld Count”**

Sets the time in seconds for the motor (and oil pump (if required) and the unload solenoid) is turned on to unload the compressor after the pump down pressure is reached (or TempScan/master CompScan sends a stop signal).

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **84** TO SELECT Motor ON Unld Count

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 60 SECONDS

PRESS “ENTER”

SELECTION COMPLETE.

### **85 “Offset % to TempScan”**

Sets the amount of difference in percentage that the load percentage of the compressor is adjusted to match the TempScan requirement. If variable speed is used, the percentage required from the TempScan is the speed percentage (the compressor is fully loaded when using variable speed drives).

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **85** TO SELECT Offset % to TempScan

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 5 TO 20 PERCENT

PRESS “ENTER”

SELECTION COMPLETE.

### **86 “No of Comps in Multi”**

Sets the total number of compressors in a multi compressor setup using compressor number 1 as the control compressor.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **86** TO SELECT No of Comps in Multi

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 1 TO 27 COMPRESSORS

PRESS “ENTER”

SELECTION COMPLETE.

### **87 “Economizer Start %”**

Sets the percentage of load when the economizer solenoid is switched on. If no load pot or 4-20ma input is used the economizer will not turn on until the digital fully load input is on.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **87** TO SELECT Economizer Start %

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 100 PERCENT

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 88 “Variable Speed Drive”

Sets whether a variable speed drive is used for control or not. If set to "NO", the compressors are controlled using the load and unload solenoids.

If set to "YES", the compressor is loaded to full load and the variable speed (4-20ma output) is controlled to the required percentage. Also the variable speed uses the lowest percentage run set point to not allow the unit to run below that set point.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **88** TO SELECT Variable Speed Drive

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ FOR YES OR NO

PRESS "ENTER"

SELECTION COMPLETE.

### 89 “Variable Speed Step%”

Sets the percentage of step for each load and unload when using variable speed drive. If Progressive load/unload is active these values will increase/decrease according to the amount of difference between the load/unload set points and the actual suction pressure.

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **89** TO SELECT Variable Speed Step%

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 1 TO 25 PERCENT

PRESS "ENTER"

SELECTION COMPLETE.

### 90 “Volume Ind. Auto/Man”

Sets whether the volume index slide valve is automatic (automatically set using the actual volume ratio of the pressures) or manual (manually set the volume index using the function "Volume Index Set Pnt.").

PRESS "SET FUNCTIONS"

▲ ▼ OR ENTER FUNCTION No. **90** TO SELECT Volume Ind. Auto/Man

PRESS "ENTER"

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ FOR AUTOMATIC OR MANUAL

PRESS "ENTER"

SELECTION COMPLETE.

## **KEYBOARD FUNCTIONS CONT.**

### **91 “Volume Index Set Pnt.”**

Sets the value of the volume ratio to use if manual volume ratio is used instead of automatic volume ratio.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **91** TO SELECT `Volume Index Set Pnt.`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR BETWEEN THE HIGH AND LOW OF THE 4-20MA INPUT SPAN ON CHANNEL 7 (“VOL-I 4-20”) SET POINT.

PRESS “ENTER”

SELECTION COMPLETE.

### **92 “Digital Inputs NO/NC”**

Sets whether the digital inputs are normally closed (on if the input is closed, default) or normally open (on if the input is open).

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **92** TO SELECT `Digital Inputs NO/NC`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS ▲ TO SELECT CHANNELS TO CHANGE/CHECK

PRESS ▼ TO SELECT “YES” OR “NO” TO SELECT THE DISPLAYED CHANNEL

PRESS “ENTER”

PRESS ▲ ▼ TO SELECT “Norm Open” OR “Norm Closed” FOR THE SELECTED CHANNELS.

PRESS “ENTER”

SELECTION COMPLETE.

### **93 “Cycle Oil Pump ON Pr”**

Sets the pressure at which the cycle oil pump turns on. The pressure used is the Discharge pressure - (minus) the Suction pressure.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **93** TO SELECT `Cycle Oil Pump ON Pr`

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 100 KPA

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 94 “Cycle Oil Pump OFF Pr”

Sets the pressure at which the cycle oil pump turns off. The pressure used is the Discharge pressure - (minus) the Suction pressure. The oil pump is only turned on if the motor is running.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **94** TO SELECT Cycle Oil Pump OFF Pr

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS “ENTER”

PRESS ▲ ▼ OR USE NUMBER KEY PADS FOR 0 TO 100 KPA

PRESS “ENTER”

SELECTION COMPLETE.

### 95 “Type of Temp Sensor”

Sets the type of temperature sensor that is used. If AD590 is selected only that type can be used on all channels and up to 8 inputs are available. If PT100 is selected, only that type (Platinum sensors with a resistance value at 0.0 oC of 100 OHMS) can be used on all channels and only 7 sensor inputs are available and can only be of the 2 wire type.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **95** TO SELECT Type of Temp Sensor

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS “ENTER”

PRESS ▲ ▼ FOR PT100 OR AD590

PRESS “ENTER”

SELECTION COMPLETE.

### 96 “Maximum % Stop Load”

Sets the maximum percentage that the compressor can be loaded to. If it reaches or is above this set point, the compressor will not load any more. If in this mode (no more loading) the information sent to the TempScan or other CompScans will send that it is fully loaded to allow the next compressor in the chain to start..

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **96** TO SELECT Maximum % Stop Load

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS “ENTER”

PRESS ▲ ▼ FOR 0 TO 100

PRESS “ENTER”

SELECTION COMPLETE.

## KEYBOARD FUNCTIONS CONT.

### 97 “Stop Load at Current”

Sets the maximum current where no more loading of the compressor can be done. If the current reaches or is above this set point, the compressor will not load any more. If in this mode (no more loading) the information sent to the TempScan or other CompScans will send that it is fully loaded to allow the next compressor in the chain to start..

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **97** TO SELECT Stop Load at Current

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS “ENTER”

PRESS ▲ ▼ FOR 0 TO 2000

PRESS “ENTER”

SELECTION COMPLETE.

### 98 “Oil Cooling Temp Sen”

Sets which temperature sensor controls the oil cooling system between the oil manifold temperature sensor (default) or the discharge temperature sensor.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **98** TO SELECT Oil Cooling Temp Sen

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS “ENTER”

PRESS ▲ ▼ FOR Manifold or Discharge

PRESS “ENTER”

SELECTION COMPLETE.

### 99 “Oil Return Relay” (Do not change this set point while the oil return is operating (output is ON))

Sets whether the oil return relay output is in the external board (default and always can be used) or uses the relay output on terminal number 64 (used for VI decrement or bypass solenoid when turning off the compressor). If this set point is set to “Term Num 64” it will over ride other outputs irrespective of other set points.

PRESS “SET FUNCTIONS”

▲ ▼ OR ENTER FUNCTION No. **99** TO SELECT Oil Return Relay

PRESS “ENTER”

ENTER PASSWORD IF REQUIRED

PRESS “ENTER”

PRESS ▲ ▼ FOR Term Num 64 or Ext Relay Ctl

PRESS “ENTER”

SELECTION COMPLETE.

## **REPLACING THE BACKUP BATTERY.**

The unit has a battery which maintains the real time clock, all set points, data logged and alarms logged when the main power is lost.

If the battery falls below a predetermined level the display will flash "Replace Battery" on the bottom line when the real time clock is displayed while the power is connected and turned on.

To replace the battery, first save all set points to the engineers default values using set point number 49 "Save Eng's Defaults". This saves all set points to non volatile ram.

Turn the power off and disconnect the 240v AC power from the unit. Unplug all connectors from the unit.

Undo the 4 screws on the back cover and remove the back cover from the unit.

Using pointed pliers on the battery, twist anti clockwise and pull to the right and up and pull the battery out. Do not try to pull the battery straight out.

Place a new battery into the slot the same way as extraction using fingers only, put the battery in at an angle from the top until it snaps in, making sure the positive side of the battery is next to the plastic back of the battery holder and the negative side is towards the silver connector.

The battery to use must be a lithium type of 3 volts with a diameter of 20mm. Type CR2016, CR2025 or CR2032.

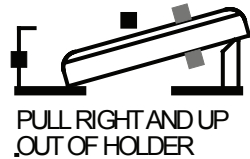
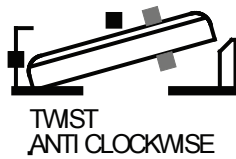
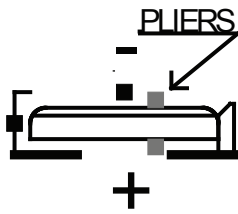
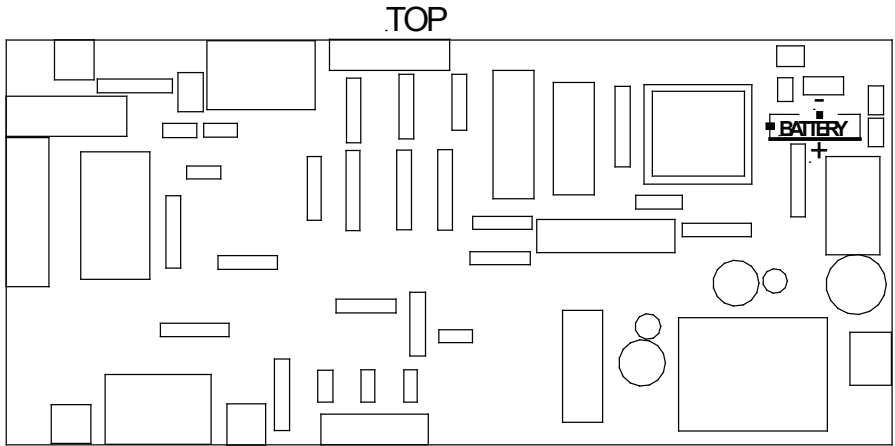
Replace the back cover and the fixing screws and all the plugs back into the unit making sure the plugs are replaced in the same sockets from where they came.

Turn the power on to the unit. The display will indicate that the engineers default values have been placed in memory. Wait 10 seconds and then press the "Clear" key.

Set the real time clock to the correct time and date.

See the next page for a diagram of where the battery is.

## BACKUP BATTERY POSITION.



## **START UP DEFAULT SET POINTS & COMPLETE RESET.**

If for any reason the unit locks up, the unit may be reset and the real time clock restarted and all set points set to the first set of default values by doing the following.

Press and release the reset switch on the right hand side of the unit, at the same time press and hold number one (1) key (on front panel, top left) and press and hold Cal switch on right side of the unit (top button, above reset switch).

While reset switch on right hand side (bottom one) is pressed and released, both other switches must be held on until the display lights up.

All set points will be loaded with the first set of default values and the "ENGINEERS DEFAULT VALUES" (set point number 49) will be loaded with the same values.

The temperature calibration values will not be changed. The temperature calibration values can be reset to 0 using set point number 40 "Reset Calib'n Values". This should not be required unless the temperature calibration values were lost. If they were lost, re calibration of the temperature sensors will have to be done or if the temperature calibration values were saved (written down manually using set points numbers 41 and 42) they can be re entered using set point numbers 41 and 42.

The 4-20ma offsets will not be changed. If the 4-20ma offset values were lost. Use set point number 36 "Do 4-20ma Offset" to re do the offsets.

When the display lights up, release the number one key and cal button and press the clear key and the unit will reset and start up with the first set of default values.

After this has been done all set points will need to be set for the users requirements.

After user set points have been set, do the "Save Engineers Defaults" set point number 49 to update current set points into non volatile ROM in for reset set points using the CRC check sum check and limp home mode if required at a latter stage.

## **SET POINTS CRC:- CYCLIC REDUNDANCY CHECK.**

A CRC check is done on all set points every 5 seconds and if the set points become corrupt for any reason the "Engineers Default Values" (loaded using set point number 49) will be loaded into all set points for the compressor to use these set points. All set points are saved to eeprom automatically, so it is not necessary to use the save engineers default values but can be done at any time.

If the CRC check is not correct and the Engineers Default Values have been loaded into the set points to use, The Display will indicate this with the "-" between the minutes and seconds shown as "->" (right arrow). This can be removed by pressing the "Clear" key. The compressor will still function normally.

## **VERSION NUMBER.**

THIS IS DISPLAYED WHEN "TEST DISPLAYS" (FUNCTION NUMBER 78 IS USED). THE LCD WILL DISPLAY "TWITE INSTRUMENT" ON THE 2ND LINE AND THE MODEL NUMBER AND VERSION NUMBER ON THE 3RD LINE.

## DEFAULT VALUES.

The default values for all 9 types of compressors are the same as shown below.

### Defaults Set Number 1.

Function Number	Function	Default Value		
1	"Comp Suctn Set Point"	150	KPA	
2	"Comp Suctn Diff'tial"	20	KPA	
3	"Comp Slow Load Time"	60	Seconds	
4	"Comp Fast Load Time"	10	Seconds	
5	"Comp Start Pressure"	250	KPA	
6	"Compre'r Unload Time"	30	Seconds	
7	"Pump Down Set Point"	100	KPA	
8	"Start - Start Time"	15	Minutes	
9	"Set Factory Defaults"	Default Values Selected		
10	"Allow Other Settings"	NO		
11	"High Alarm Temp're"	50.0	Suction	oC
		149.0	Discharge	oC
		70.0	Oil Manifold	oC
		70.0	Oil Separator	oC
		50.0	Intermediate	oC
12	"Warn Temp From High"	5.0	Suction	oC
		10.0	Discharge	oC
		5.0	Oil Manifold	oC
		5.0	Oil Separator	oC
		5.0	Intermediate	oC
13	"Low Alarm Temp're"	-49.0	Suction	oC
		0.0	Discharge	oC
		9.0	Oil Manifold	oC
		9.0	Oil Separator	oC
		5.0	Intermediate	oC
14	"Warn Temp above Low"	-35.0	Intermediate	oC
		10.0	Suction	oC
		0	Discharge	oC
		5.0	Oil Manifold	oC
		5.0	Oil Separator	oC
		5.0	Intermediate	oC

**DEFAULT VALUES.**

<b>Function Number</b>		<b>Function</b>	<b>Default Value</b>
15	"Hi Temp Alarm Delay"	0	Suction Sec
		0	Discharge Sec
		0	Oil Manifold Sec
		0	Oil Separator Sec
		0	Intermediate Sec
16	"Low Temp Alarm Delay"	0	Suction Sec
		0	Discharge Sec
		0	Oil Manifold Sec
		0	Oil Separator Sec
		0	Intermediate Sec
17	"Hi Alarm Pr/SV KPA/%"	2000	Suction KPA
		1720	Discharge KPA
		2000	Oil Before Flt KPA
		1000	Oil After Flt KPA
		1000	Intermediate KPA
		110	Slide Valve %
		110	Slide Valve %
18	"Warn Pr/SV From High"	100	Suction KPA
		100	Discharge KPA
		100	Oil Before Flt KPA
		100	Oil After Flt KPA
		100	Intermediate KPA
		0	Slide Valve %
		0	Slide Valve %
19	"Lo Alarm Pr/SV KPA/%"	40	Suction KPA
		0	Discharge KPA
		150	Oil Before Flt KPA
		100	Oil After Filter KPA
		100	Intermediate KPA
		-10	Slide Valve %
		-10	Slide Valve %
20	"Warn Pr/SV above Low"	10	Suction KPA
		0	Discharge KPA
		10	Oil Before Flt KPA
		10	Oil After Flt KPA
		10	Intermediate KPA
		0	Slide Valve %
		0	Slide Valve %

**DEFAULT VALUES.**

<b>Function Number</b>	<b>Function</b>	<b>Default Value</b>
21	"Hi Pr/SV Alarm Delay"	0 Suction Sec
		0 Discharge Sec
		0 Oil Before Flt Sec
		0 Oil After Flt Sec
		0 Intermediate Sec
22	"Lo Pr/SV Alarm Delay"	0 Suction Sec
		0 Discharge Sec
		0 Oil Before Flt Sec
		0 Oil After Flt Sec
		0 Intermediate Sec
		0 Slide valve Sec
23	"Compressor Number"	1
24	"Set Data Logging"	1 Every 1 Minute
25	"Key Select Delay"	10
26	"Set Time & Date"	A Valid Time and Date
27	"Temp's Connected"	YES Suction
		YES Discharge
		YES Oil Manifold
		YES Oil Separator
		NO Intermediate
		NO Slide Valve
28	"Press's SV Connected"	YES Suction
		YES Discharge
		YES Oil Before Filter
		YES Oil After Filter
		NO Intermediate
		NO Slide Valve
29	"Digital IN Connected"	YES Remote RUN
		YES Remote OFF
		YES Emergency Button
		NO Full Load
		NO Full Unload
		NO Motor Auxiliary
30	"RS485/232 Connection"	NO Oil Level
		NO Auxiliary 1
30	"RS485/232 Connection"	Single Stand Alone
31	"Password YES/NO"	NO
32	"Change Password"	888

**DEFAULT VALUES.**

<b>Function Number</b>		<b>Function Default Value</b>
33	"Set RS485/232 Baud"	9600
34	"LED Brightness"	15
35	"Pressure Input Span"	-100 to 2400 Suction KPA -100 to 2400 Discharge KPA -100 to 2400 Oil Bf Flt KPA -100 to 2400 Oil Af Flt KPA -100 to 2400 Intermed KPA
36	"Do 4-20ma Offset"	Calibration Values. (no change)
37	"Reset Compre'r Hours"	Resets Comp Hours Run to 0
38	"Current Trans'r Type"	N-CON (200/5 type only)
39	"High Current Alarm"	150 AMPS
40	"Reset Calib'n Offset"	0.00 for all values (no change)
41	"Cal Hi Values Check"	Cal Val (no change on def's sel)
42	"Cal Lo Values Check"	Cal Val (no change on def's sel)
43	"Calibrate Tmp Sensor"	Cal Val (no change on def's sel)
44	"Ram Memory Check"	Check Function Only
45	"Test Display/Rst Log"	Testing and Reset Log
46	"Number of Resets"	Test Number of Resets
47	"Reset Password"	888
48	"Compressor Type"	1 Stage
49	"Save Eng'r's Defaults"	Saves Current Settings
50	"Oil Return Interval"	15 Minutes for 5 Minutes
51	"Load Pot Connected"	YES
52	"Volume Ratio Pot Con"	NO
53	"Progressive Ld/Unld"	NO
54	"Load Pulse Time"	1.0 Seconds
55	"Unload Pulse Time"	1.0 Seconds
56	"Min Slide Valve St%"	10 Percent
57	"Min Slide Valve Pos%"	25 Percent
58	"Current Limit Unload"	150 AMPS
59	"Oil Heat Temperature"	40.0 oC
60	"Oil Heat Differential"	5.0 oC
61	"Oil Cool Temperature"	40.0 oC
62	"Type of Cooling"	Liquid Injection
63	"Oil Cool Period Time"	6 Seconds
64	"Oil Pre Start Time"	30 Seconds

**DEFAULT VALUES.**

Function Number	Function	Default Value
65	"Oil Pressure Pre Run"	200 KPA
66	"Oil Filter Difl Wrn"	100 KPA
67	"Set 0% Load Pot"	0 (no change with defaults sel)
68	"Set 100% Load Pot"	100 (no change with defaults sel)
69	"Set 0% Vol/Rat Pot"	0 (no change with defaults sel)
70	"Set 100% Vol/Rat Pot"	100 (no change with defaults sel)
71	"Oil Pump Type Used"	Full Lube Pump
72	"Low Current Alarm"	20 AMPS
73	"Unload Oil Pump Strt"	Yes
72	"Low Current Alarm"	20 AMPS
73	"Unload Oil Pump Strt"	Yes
74	"Min Oil Tmp Start"	9.0 oC
75	"Bypass Sol'ds YES/NO"	NO
76	"Bypass Sol Start Tme"	15 seconds
77	"Bypass Sol Stop Time"	15 seconds
78	"Refrigerant Used"	Not Used
79	"Super Heat Alarm"	0.0 oC.
80	"Oil/UnLd Sol OFF Del"	5 seconds
81	"4-20ma Oil Cool Diff"	1.0 oC.
82	"Oil ON/OFF Try Times"	10 seconds
83	"Oil Pressure ON Trys"	1 try
84	"Motor ON Unld Count"	0 seconds
85	"Offset to TempScan"	10 percent
86	"No of Comps in Multi"	27 compressors
87	"Economizer Start %"	90 percent
88	"Variable Speed Drive"	NO
89	"Variable Speed Step%"	1%
90	"Volume Ind. Auto/Man"	MANUAL
91	"Volume Index Set Pnt."	2.2
92	"Digital Inputs NO/NC"	All set to N-O
93	"Cycle Oil Pump ON Pr"	350 KPA
94	"Cycle Oil Pump OFF Pr"	500 KPA
95	"Type of Temp Sensor"	All AD590
96	"Maximum % Stop Load"	100%
97	"Stop Load at Current"	300 AMPS
98	"Oil Cooling Temp Sen"	Manifold
99	"Oil Return Relay"	All AD590

## SPECIFICATIONS A-32-S

**ALL SET POINTS ARE FOR INDIVIDUAL CHAN'S WHERE APPLICABLE.**

### TEMPERATURE INPUTS

<i>(ANALOG)</i>	:-	AD590 temperature sensor.
MAX TEMPERATURE INPUTS	:-	4
4-20ma INPUTS SUPPLY	:-	11V DC
MAX 4-20ma INPUTS	:-	4
4-20ma RANGE	:-	-200 KPA/PPM to +3000 KPA
DIGITAL INPUTS	:-	5
LCD DISPLAY	:-	4 line x 20 character super twist.
LED DISPLAY	:-	7 digit 13 mm high red.
LED BAR DISPLAY	:-	8 2mm x 5mm.
		1 = Green
		2 = Red.
		3 = Yellow.
		4 = Red.
		5 = Red.
		6 = Yellow.
		7 = Yellow.
		8 = Red.

KEYBOARD SETTING	:-	0-9, -, ., ▲, ▼, set functions, display, clear, enter..
KEYBOARD CONTROL	:-	Stop, Run, Load, Unload, Test.
RESOLUTION ( <i>temperature</i> )	:-	0.1 oC.
REPEATABILITY ( <i>temperature</i> )	:-	0.2 oC.
RANGE	:-	-50.0 - +150.0 Degrees C
ACCURACY AD590 oC	:-	+/-0.5% -30.0 - +130.0
ALL MEMORY BACKUP	:-	1 year minimum.
ALARM SET POINT RANGE ( <i>HIGH &amp; LOW</i> )	:-	-50.0 oC to +150.0 oC.
ALARMS SET POINT RESOLUTION	:-	0.1 oC.
ALARM DELAY SET RANGE ( <i>HI &amp; LO</i> )	:-	0 - 120 seconds. ( <i>1 on each channel</i> ).
ALARMS DELAY SET RESOLUTION	:-	1 second.
ALARM ( <i>INTERNAL</i> )	:-	pulsed visual and audio.
ALARM OUTPUT	:-	dry relay output, rated 24 V d.c. 1 A.

## **SPECIFICATIONS A-32-S CON'T**

ALARM INPUT (DIGITAL ACTIVATE)	:-	short to signal common for instant audible alarm.
DATA LOGGING TIME BETWEEN	:-	1, 5, 10, 30, 60, 120 minutes or none.
DATA LOGGING MAXIMUM	:-	887 logs.
PASSWORD	:-	0000-5999 (may be active or not active).
Compressor No.	:-	set between 1 and 27 inclusive.
RS 232 PORT (FULL DUPLEX)	:-	9 pin male connector, maximum distance allowed, 6 meters.
RS 485 PORT (FULL DUPLEX)	:-	4 x, terminals inside case. Maximum distance allowed, 500 meters
BAUD RATE	:-	110, 300, 1200, 2400, 4800, 9600.
STOP BITS	:-	1. (fixed),
PARITY	:-	none (fixed).
COMPUTER COMMUNICATIONS	:-	Most functions are available via computer & RS232.
CONTROL SERIAL (TO A-32R-4)	:-	2 wire. maximum distance 500 metres. (coax twisted pair).
CONTROL OUTPUTS	:-	8 Rating, 240v AC 5AMP total over the 8 Outputs voltage free.
POWER SUPPLY	:-	240 V a.c. +/- 10%, 50Hz.
PROTECTION	:-	IP53 DUST & SPLASH PROTECTION
SIZE	:-	360mm x 166mm x 67mm.

## **SPECIFICATIONS TEMPERATURE SENSORS :-**

AD590	:-	Current Sensor. maximum distance from unit allowed, 500 meters total of cable, twisted 2 wire shielded.
PT100	:-	As per user supplied parameters.

## **SPECIFICATIONS PRESSURE TRANSDUCERS :-**

POWER SUPPLY	:-	11v DC 4-20ma Output. Maximum distance from unit allowed, 500 meters total of cable, twisted Pair shielded.
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## SPECIFICATIONS A-32R-1,4 :-

### REMOTE CONTROL MODULES

POWER SUPPLY OF ALL	:-	240 V a.c. +/- 10%, 50Hz.
A-32R-1	:-	one common, 4 (STAGE 1,2,3 & 4) control NORMALLY OPEN outputs. (LIQ, FAN, DEF, SUC) Rating, 240v AC 5AMP total over the 4 Outputs Size, (H)95mm x (W)84mm x (D)60mm DIN Rail Mounting.
A-32R-4	:-	1 x 4 common, 4 x 4 (STAGE 1,2,3 & 4) control NORMALLY OPEN outputs. (LIQ, FAN, DEF, SUC) Rating, 240v AC 5AMP total over each of the 4 Outputs Size, (H)95mm x (W)184mm x (D)60mm DIN Rail Mounting.