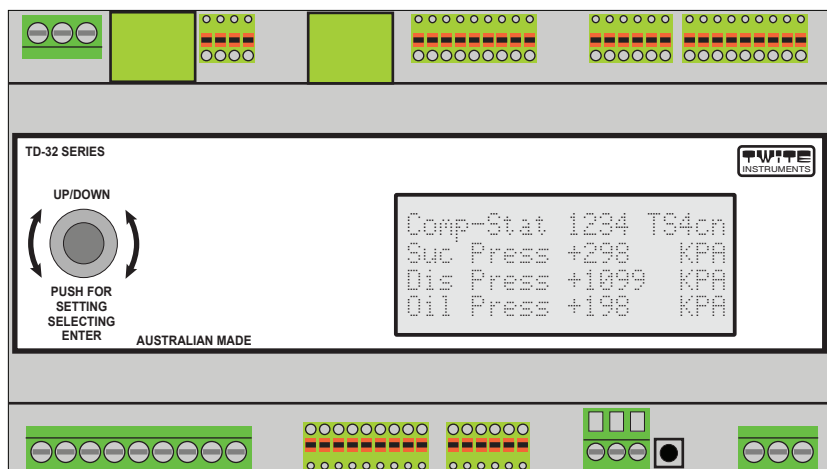


MultiScan

OPERATING MANUAL MODEL TD-32-R



RECIPROCATING COMPRESSOR CONTROLLER



TWITE INSTRUMENTS PTY. LTD. ®*A.C.N. 050 199 758**A.B.N. 41 050 199 758*

No. 18 Flanagan Drive. Tatura VICTORIA AUSTRALIA 3616.

PO. Box 176 SHEPPARTON VICTORIA AUSTRALIA 3630.

Telephone (03) 5824 1177, 0417 50 60 11. FAX (03) 5824 1185

© Copyright 2012 Twite Instruments Pty. Ltd. All rights reserved.

No part of this publication may be reproduced, translated into another language, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior written consent of TWITE INSTRUMENTS Pty. Ltd.

Every precaution has been taken in the preparation of this publication.

TWITE INSTRUMENTS assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

Specifications of the MultiScan Model TD-32-R and Control Modules Associated with this unit are subject to change without notice.

Twite Instruments Pty. Ltd. or any of its Partners, Principals or Employees cannot be held responsible or liable for any loss of product, produce or buildings where any of Twite Instruments Pty. Ltd. Products are found to be responsible for the loss of any product, produce or buildings.

Contents

Mounting Dimensions	8
Terminal Numbers and Position	9
MultiScan positioning and Mounting	10
Control Output Power Connections	11
MultiScan Digital Temperature Input Terminals	12-13
MultiScan Analog Temperature Input Terminals	14-15
Temperature channels used for control	16-17
MultiScan Pressure & 4-20ma Input Terminals Up to 8 Possible	18-19
MultiScan Digital Input Terminals	20-21
MultiScan 4-20ma Current Input Terminals	22
MultiScan 4-20ma Current Output Terminals	23
MultiScan Alarm and Output Terminals	24
MultiScan RS485 Terminals	25-26
MultiScan 2 Wire Serial Inputs	27-28
MultiScan RS232 Terminals	29
LCD Display Contrast Adjust	30
Battery Replacement	31
Program Chip Replacement	32
Expansion Socket	33-35
Sensor Positioning (Temperature and Pressure)	36
Compressor Control	37-44
Alarm Action	45-47
Alarm History	48
DATA LOGGING	48-49
UP/Down knob and switch FUNCTIONS	50
Overview	50
The ROTARY/PUSH knob	50
The X50 Switch	50
Display pages	51-60
PASSWORD	61-62
USERS PASSWORD	62
CHANGE PASSWORD	63
DISABLE PASSWORD	63
Password Unknown	63

Contents

SETTING FUNCTIONS	64-66
OVERVIEW	64
Functions and the No. of each	65-66
1 "Control Auto or OFF"	67
2 "Compressor Set Point"	67
3 "Compressor Diff'tial"	67
4 "Comp Slow Load Time"	67
5 "Fast Load Set Point"	68
6 "Comp Fast Load Time"	68
7 "Comp'or Unload Time"	68
8 "Pump Down Set Point"	68
9 "Cmp Start/Start Time"	69
10 "Comp Equalizer Sol'd"	69
11 "Oil Return Interval"	69
12 "Comp Stages Inverted"	70
13 "Hard Piped Stages Nu"	70
14 "Comp cntl PRESS-TEMP"	70
15 "Comp Stage 1 Dly YesNo"	70
16 "Compre'r Step Amount"	71
17 "Compressor Min % Run"	71
18 "Comp Proportional Ct"	71
19 "Type of Compressor"	72
20 "Compressor Number ID"	72
21 "High Alarm Temp're"	72
22 "Warn Temp From High"	73
23 "Low Alarm Temp're"	73
24 "Warn Temp Above Low"	73
25 "Hi Temp Alarm Delay"	74
26 "Low Temp Alarm Delay"	74
27 "High Alarm Press KPA"	74
28 "Warn Press From High"	75
29 "Low Alarm Press KPA"	75
30 "Warn Press Above Low"	75
31 "Hi Press Alarm Delay"	76
32 "Lo Press Alarm Delay"	76

Contents

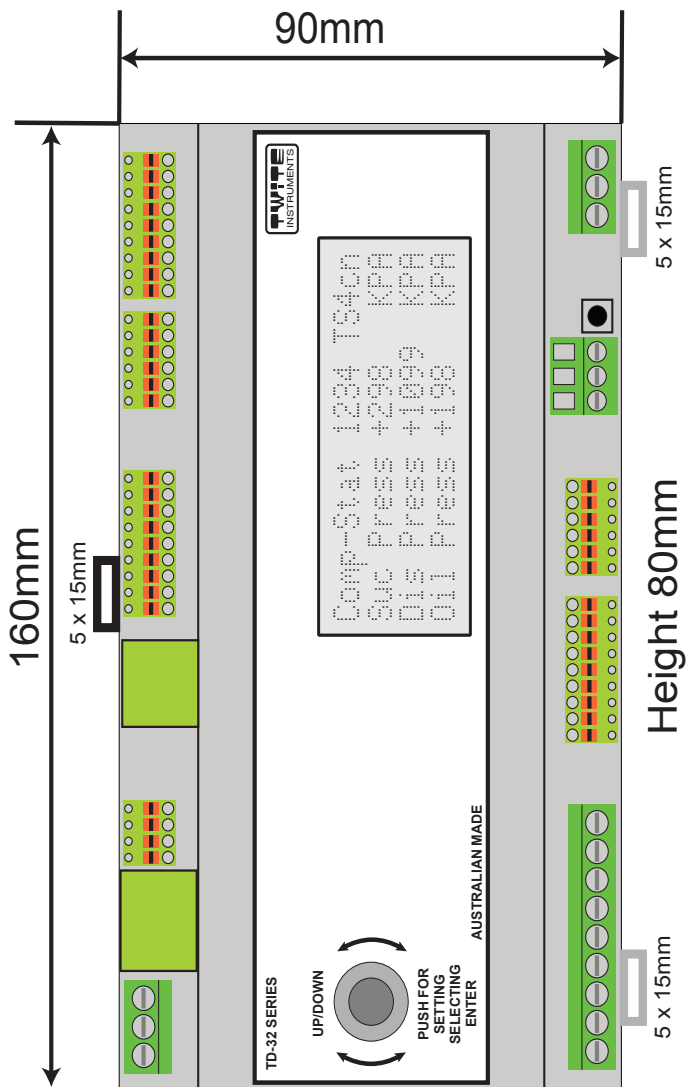
33	"Dig Temp's Connected"	76
34	"PT100 Temp Connected"	77
35	"Press's Connected"	77
36	"Set 4-20 Input Span"	77
37	"Digital IN Connected"	78
38	"Digital IN Inverted"	78
39	"Temp Sen's Comp Ctrl"	78
40	"Temp Sen's Comp Suc"	79
41	"Comp Tmp Sen for Dis"	79
42	"Temp Sensors for Oil"	79
43	"Sump Heat Set Point"	80
44	"Sump Heat Diff'tial"	80
45	"Set Data Logging"	80
46	"Set Time & Date"	81
47	"Password YES/NO"	81
48	"Change Password"	82
49	"Ram Memory Check"	82
50	"Test Display/Rst log"	82
51	"Set Dig Temp Offset"	83
52	"Set PT100 Tmp Offset"	83
53	"Add Dig Temp Sensor"	84
54	"Set RS485/232 Baud"	84
55	"Display Brightness"	84
56	"Number of Resets S/N"	85
57	"TempScan Connected"	85
58	"Reset Comp'sor Hours"	85
59	"4-20 Weight Average"	85
60	"High Current Alarm"	86
61	"Type of refrigerant"	86
62	"Computer Connected"	86
63	"LED Display Intens'y"	86
64	"Reset Password"	87
65	"Display Annunciation"	87
66	"Oil Pres Calculation"	87
67	"Temp Sen for Intermd"	88
68	"Analog PT100 / AD590"	88

Contents

STARTUP DEFAULT SET POINTS & COMPLETE RESET	89
SET POINTS CRC:- Cyclic Redundancy Check & Limp Home	89
VERSION NUMBER	89
DEFAULT VALUES	90-91
SPECIFICATIONS	95-96

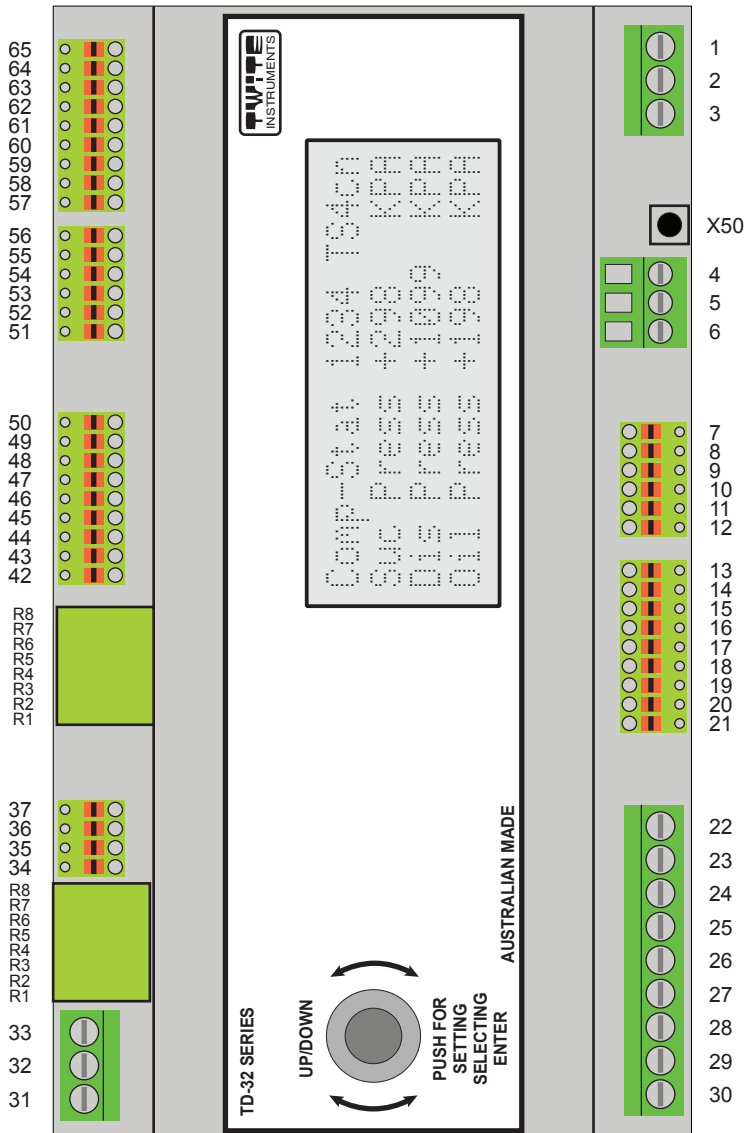
INSTALLATION :-

DIN RAIL MOUNT SIZE OF UNIT.



INSTALLATION :-

TERMINAL NUMBERS.



INSTALLATION :-

MULTISCAN POSITIONING AND MOUNTING.

The unit should be mounted at a level for easy viewing and access to setting knob, using the DIN rail mounting to mount to the DIN rail within the cabinet. Ensure it is in a dry area and not in direct sunlight and not subject to any vibration.

The unit must be mounted as far away from contactors, switching motors, solenoids etc. as possible and if possible mount the unit within its own cabinet.

MULTISCAN UNIT POWER CONNECTION.

Power to the unit must be 24 V dc. and connected to the terminal Block numbers 1 = Ground, 2 = the negative or ground side and 3 = the positive side).

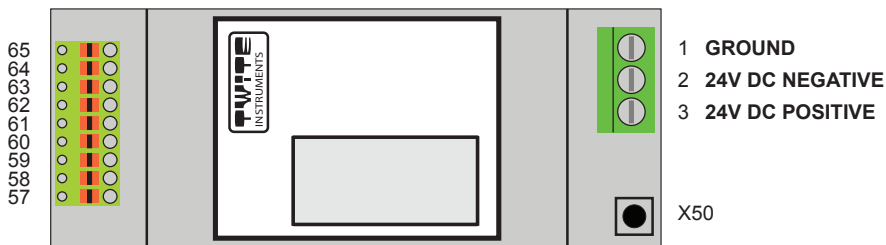
NOTE:- If more than one MultiScan is connected to the same 24v dc power supply, all terminals numbered 2 must be connected to the same side of the 24v dc (ground) and all terminals numbered 3 must be connected to the other side of the 24v dc (positive).

The power supply that is used must be used for the MultiScan only (not connected to any other units including a 24v DC TempScan) and the cable must not run near or with any control cables.

The power supply cables must be kept away from any control cables that are connected to the relay control outputs, also sensor and transducer cables must be kept away from the control cables.

NOTE:- Terminal 1 and 2 are connected together on the circuit board.

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.

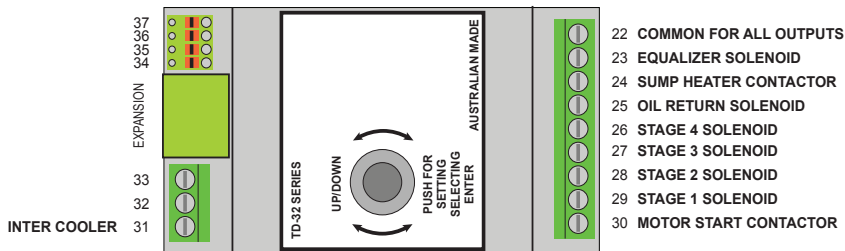
CONTROL OUTPUT POWER CONNECTIONS :-

Power for compressor and condenser control can be up to 24 V ac. and connected to the terminal Block

MULTISCAN CONTROL OUTPUT POWER CONNECTIONS. VOLTAGE ON ANY CONTROL OUTPUT AND COMMON MUST NOT EXCEED 24 VOLTS AC AND TOTAL CURRENT OF ALL OUTPUTS MUST NOT EXCEED 5 AMPS. ALL CONTROL CABLES MUST BE KEPT AWAY FROM THE SENSOR AND POWER CABLES THAT RUN THE UNIT.

Terminal No.

- 22 - The Active common input.
- 23 - Equalizer solenoid.
- 24 - Sump heater contactor.
- 25 - Oil return solenoid.
- 26 - Stage 4 solenoid.
- 27 - Stage 3 solenoid.
- 28 - Stage 2 solenoid.
- 29 - Stage 1 solenoid.
- 30 - Motor start contactor.
- 31 - Inter Cooler contactor.



INSTALLATION CONT.

MULTISCAN DIGITAL TEMPERATURE INPUT TERMINALS :-

DS18B20 Digital Type (up to 8 temperature sensors may be connected):-

Temperature probes are fitted with 1 meter of cable each (may be extended to a maximum distance of 100 meters using twisted pair shielded cable).

The shield must be connected to ground at the MultiScan terminal number 50 and the shield of the sensor cable, the positive, terminal number 48 must be connected to the white wire of the sensor and the signal, terminal number 49 must be connected to the blue wire of the sensor.

The joins for any extensions must be kept dry and clean and not subject to any voltage or damage will occur.

Each sensor is calibrated to ± 0.5 degrees Celsius (manufactures statement).

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.

Terminal No.

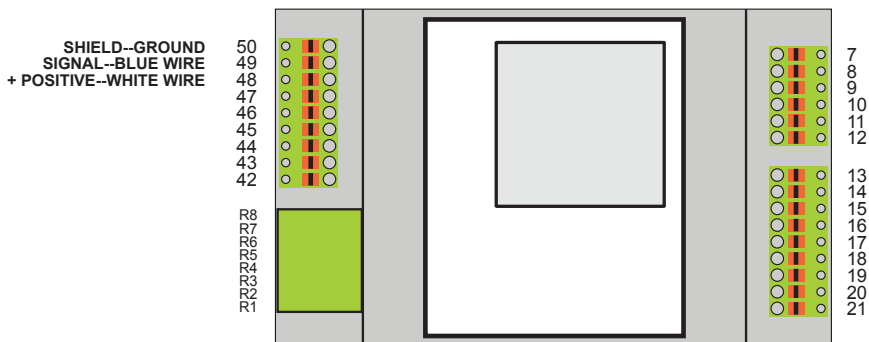
- 50 - Shield of each cable (Ground).
- 49 - Signal all Blue wires to sensors.
- 48 - Positive White for each sensor.

Any sensor may be used for compressor control (if controlled on temperature), compressor oil, compressor suction, compressor discharge and compressor intermediate temperature, if more than one sensor is used, the average of all sensors used will be used as the temperature.

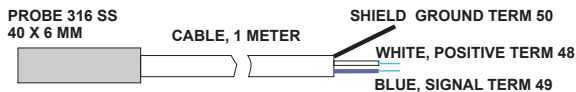
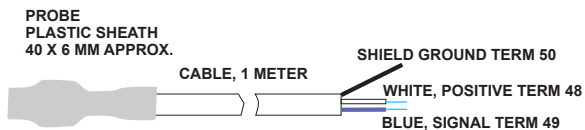
INSTALLATION CONT.

MULTISCAN DIGITAL TEMPERATURE INPUT TERMINALS CONT :-

DS18B20 Digital Type. Up to 8 temperature sensors may be connected



Types of sensors Available



INSTALLATION CONT.

MULTISCAN ANALOG TEMPERATURE INPUT TERMINALS :-

PT100 Analog Type (up to 7 temperature sensors may be connected) or

AD590 Analog Type (up to 7 temperature sensors may be connected)

But not both types on the same MultiScan.

When the MultiScan is ordered, the type of sensor to be used must be stipulated as the PCB must be configured by the manufacture.

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

The PT100 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.

AD590 types can be supplied by the manufacturer if required.

Sensors may be extended to a maximum distance of 100 meters using twisted pair shielded cable.

If extended, the shield must be connected to ground at the MultiScan 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.

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

Any sensor may be used for compressor control (if controlled on temperature), compressor oil, compressor suction, compressor discharge and compressor intermediate temperature, if more than one sensor is used, the average of all sensors used will be used as the temperature.

INSTALLATION CONT.

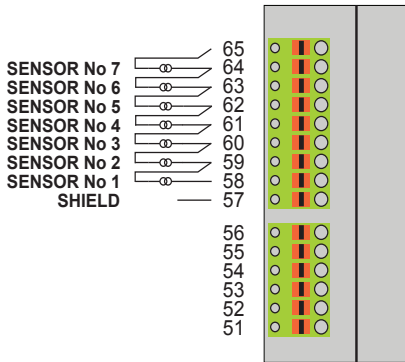
MULTISCAN ANALOG TEMPERATURE INPUT TERMINALS CONT:-

PT100 Analog Type (up to 7 temperature sensors may be connected):-

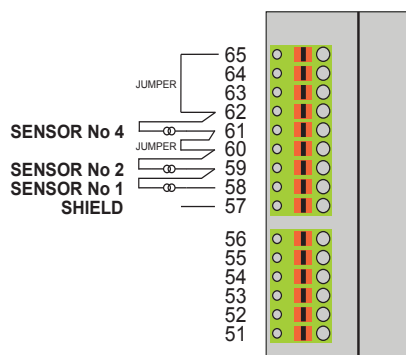
Terminal No.

- 57 - Shield of each cable.
- 58 - Sensor number 1 first wire.
- 59 - Sensor number 1 second wire and sensor number 2 first wire.
- 60 - Sensor number 2 second wire and sensor number 3 first wire.
- 61 - Sensor number 3 second wire and sensor number 4 first wire.
- 62 - Sensor number 4 second wire and sensor number 5 first wire.
- 63 - Sensor number 5 second wire and sensor number 6 first wire.
- 64 - Sensor number 6 second wire and sensor number 7 first wire.
- 65 - Sensor number 7 second wire.

ALL SENSORS CONNECTED PT100



NOT ALL SENSORS CONNECTED PT100



AD590 Analog Type (up to 7 temperature sensors may be connected):-

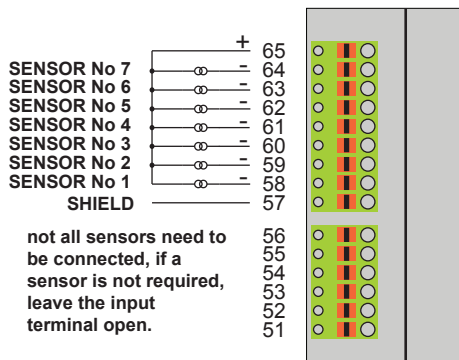
Terminal No.

- 57 - Shield of each cable.
- 58 - Sensor number 1 negative wire.
- 59 - Sensor number 2 negative wire.
- 60 - Sensor number 3 negative wire.
- 61 - Sensor number 4 negative wire.
- 62 - Sensor number 5 negative wire.
- 63 - Sensor number 6 negative wire.
- 64 - Sensor number 7 negative wire.
- 65 - Common for all sensors (Positive).

INSTALLATION CONT.

MULTISCAN ANALOG TEMPERATURE INPUT TERMINALS CONT:-

SENSORS CONNECTED AD590



TEMPERATURE AND PRESSURE CHANNELS USED FOR CONTROL:-

Default Temperature Sensors used for each Function:

Digital Sensor Number 1 :	Compressor control sensor (temperature control)
Digital Sensor Number 2 :	Compressor Oil control sensor.
Digital Sensor Number 3 :	Compressor Suction sensor.
Digital Sensor Number 4 :	Compressor discharge sensor.
Digital Sensor Number 5 :	Compressor intermediate sensor.
Digital Sensor Number 6 :	Spare.
Digital Sensor Number 7 :	Spare.
Digital Sensor Number 8 :	Spare.
Analog Sensor Number 1 to 7 :	Spares.

Compressor control:

Suction pressure or temperature can be used for compressor control.

If pressure is used the pressure input used is Suction Pressure, 4-20ma input number 1.

If temperature is used, any temperature sensor can be used for control and can be set by the end user and is used.

If more than one sensor is selected, the average of all sensors that return a valid temperature are averaged and is the temperature used for control.

INSTALLATION CONT.

TEMPERATURE AND PRESSURE CHANNELS USED FOR CONTROL:

Oil probe temperature:

Any temperature sensor can be used for the oil probe and can be set by the end user.

If more than one sensor is selected, the average of all sensors that return a valid temperature are averaged and is the temperature used.

Compressor Suction probe temperature:

Any temperature sensor can be used for the compressor suction probe and can be set by the end user.

If more than one sensor is selected, the average of all sensors that return a valid temperature are averaged and is the temperature used and used for the super heat calculation.

Compressor discharge probe temperature:

Any temperature sensor can be used for the compressor discharge probe and can be set by the end user.

If more than one sensor is selected, the average of all sensors that return a valid temperature are averaged.

Compressor intermediate probe temperature:

Any temperature sensor can be used for the compressor intermediate probe and can be set by the end user.

If more than one sensor is selected, the average of all sensors that return a valid temperature are averaged.

INSTALLATION CONT.

MULTISCAN PRESSURE & 4-20MA INPUT TERMINALS UP TO 8 POSSIBLE:-

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 MultiScan.

The voltage supplied for the transducers is 12v DC. The transducer must be able work correctly on this voltage.

The cable from the MultiScan 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 MultiScan 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 high voltage cables & must be kept well away from high voltage and other control cables, at least 2 meters.

Terminal Inputs for channels 1-4

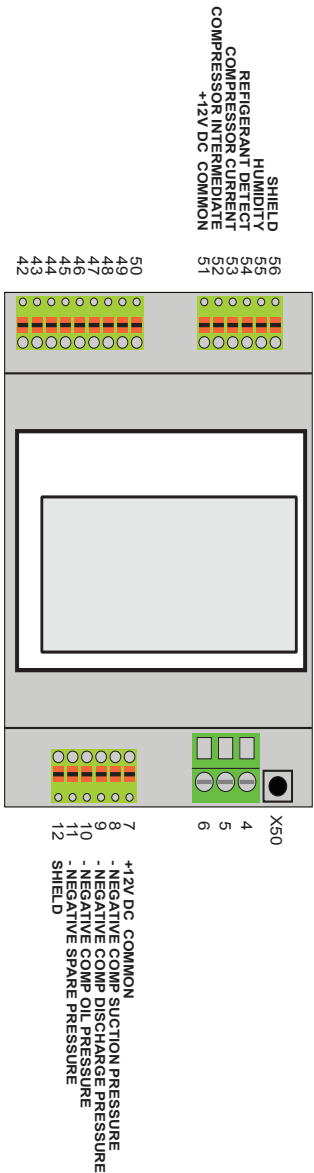
- 12 - Shield of each cable.
- 7 - Common +12 Volts (all Positive wires to transducers).
- 8 - Negative for Compressor Suction Pressure.
- 9 - Negative for Compressor Discharge Pressure.
- 10 - Negative for Compressor Oil Pressure.
- 11 - Negative for Spare Pressure.

Terminal Inputs for channels 5-8

- 56 - Shield of each cable.
- 51 - Common +12 Volts (all Positive wires to transducers).
- 52 - Compressor Intermediate Pressure if used.
- 53 - Compressor motor current if used
- 54 - Negative for refrigerant detector if used.
- 55 - Humidity input.

INSTALLATION CONT.

MULTISCAN PRESSURE & 4-20MA INPUT TERMINALS CONT.:-



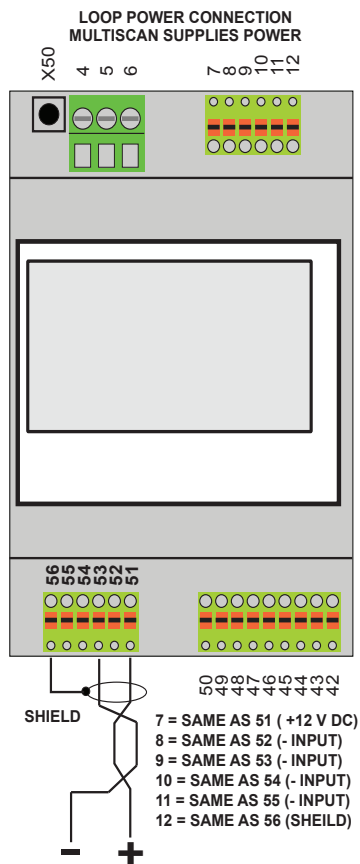
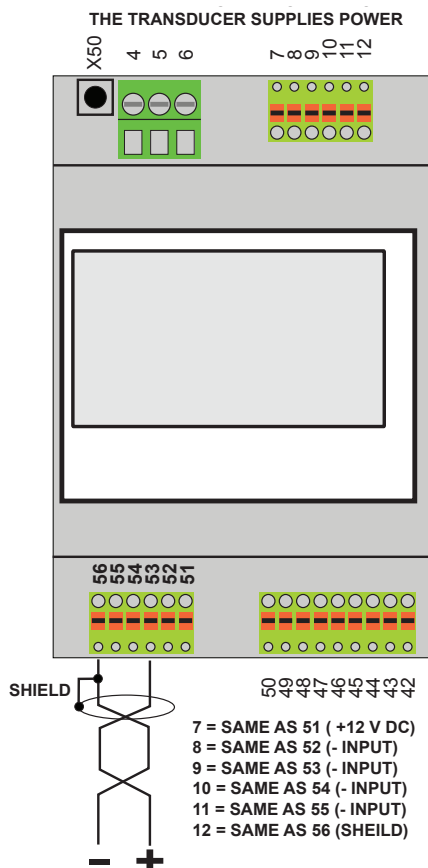
INSTALLATION CONT.

MULTISCAN PRESSURE & 4-20MA INPUT TERMINALS CONT.:-

The current input is via a 4-20ma transducer and can be loop powered or not. Shown below are the two ways of interfacing the transducer to the MultiScan.

The same is used for the input terminals 7 to 12.

NOTE:- There is a delay of 15 seconds on the current alarm before the compressor motor will be turned off.



INSTALLATION CONT.

MULTISCAN DIGITAL INPUT TERMINALS:-

8 Digital inputs are supplied. All inputs are optically isolated.

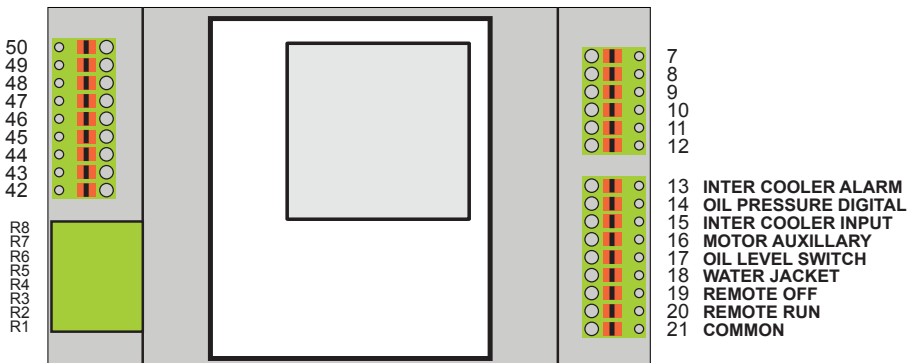
Each Digital input is ON if its input is connected (shortage) to the COM pin of the digital input terminal strip and OFF if not connected (open circuit) if the function "Digital IN Inverted" for each input is set to "NO" and the inverse is true for each input if the function "Digital IN Inverted" is set to "YES".

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 high voltage (240 and above) cables.

Terminal No.

- 21 - Common for all 8 digital inputs.
- 20 - Remote RUN input.
- 19 - Remote OFF input, overrides above input remote run
- 18 - Water Jacket input. Alarm input. Shuts all controls OFF
- 17 - Oil Level digital input.
- 16 - Motor auxiliary.
- 15 - Inter Cooler digital input to turn on inter cooler.
- 14 - Oil pressure digital input.
- 13 - Inter Cooler alarm digital input.



INSTALLATION CONT.

COMPSCAN DIGITAL INPUT TERMINALS CONT.:-

DESCRIPTIONS:-

- 21 - Common for all 8 digital inputs.**
- 20 - Remote RUN Input. (IF NOT USED THE UNIT WILL RUN ON START UP IF FUNCTION 1 (CONTROL AUTO OR OFF) IS SET TO YES).**
Used to turn the system ON from a remote location if closed. The system will run automatically to the set points set for temperature and pressure etc. The system will shut down if this input is turned off.
- 19 - Remote OFF Input.**
Used to turn the whole system OFF from a remote location immediately if closed. This input also causes an alarm after a 10 second delay and if a TempScan is connected, the TempScan will also go into alarm.
- 18 - Compressor Water Jacket Input.**
Used to turn the compressor OFF after a 10 second delay if the water jacket flow switch open circuits. Also an alarm is activated within the system.
- 17 - Oil Level Input.**
Turns the compressor OFF after a 10 second delay if the oil level digital switch open circuits. Also an alarm is activated within the system.
- 16 - Motor Auxiliary Digital Input.**
Turns the compressor OFF after a 10 second delay if the this digital switch is closed. Also an alarm is activated within the system.
- 15 - Inter Cooler Turn on Digital Input.**
Turns the inter cooler solenoid on if this input is closed.
- 14 - Oil Pressure Digital Input.**
Goes into alarm after a 10 second delay and turns the compressor off if an oil pressure digital input is present and open circuit.
- 13 - Inter Cooler Alarm Input.**
Goes into alarm and turns the compressor off if this input is closed.

INSTALLATION CONT.

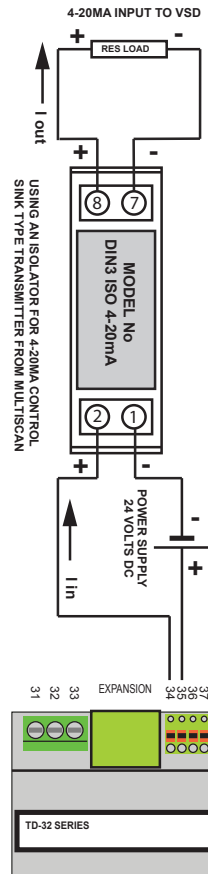
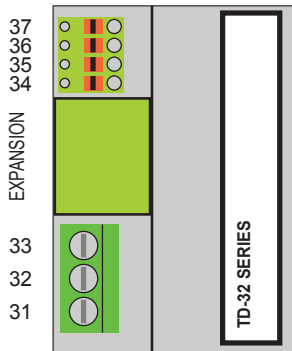
MULTISCAN 4 TO 20 mA OUTPUT TERMINALS:-

The 4 - 20ma outputs are for variable speed motor on the compressor

It is recommended that a 4-20ma isolator is used. The components are available from the manufacturer and must be wired as shown below.

For variable motor speed control see later for operation parameters.

COMPRESSOR 4-20ma +
COMPRESSOR 4-20ma -



INSTALLATION CONT.

MULTISCAN ALARM AND OUTPUT TERMINALS:-

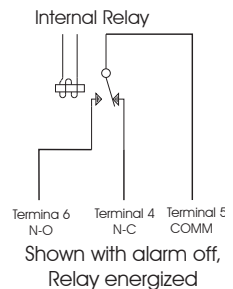
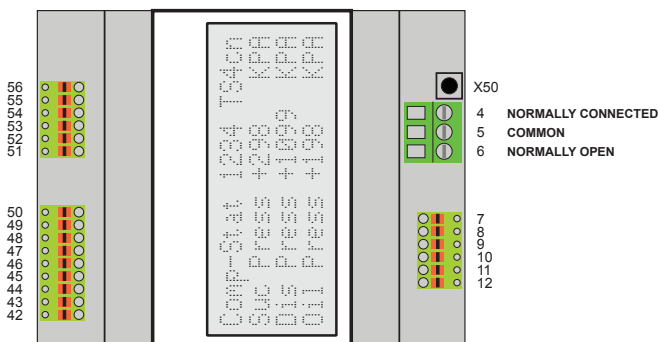
The Alarm Relay is of the voltage free type with a common, normally connected and normally not connected outputs.

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

Terminals.

- 4 = Normally connected
- 5 = Common
- 6 = Normally open

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 MultiScan unit losses power.



INSTALLATION CONT.

MULTISCAN RS485 TERMINALS:-

TempScan Connected for Compressor Control.

The RS485 4 wire and or the 2 wire serial terminals are used for communicating with a TempScan if connected.

NOTE:- The 2 wire serial can be used for compressor control in conjunction with the 4 wire RS485 serial or on its own. This allows for the compressor to be turned off when required from the TempScan within 1 second compared to the turn off time of up to 20 seconds using the 4 wire RS485 serial only. See later for compressor control.

The MultiScan compressor section is one of a number (1 to 27 set in setting functions) connected together through the RS485 Terminals as below.

All TX+ are connected, 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 high voltage cables.

The first display ("Comp-Stat 123 TS4cn" or TS2cn" or "TS2cn4cn" on top line) will indicate whether the 4 and or 2 wire communications are successful, the right hand position will show "--" instead of "cn" if no communications are received from the TempScan after 60 seconds.

An alarm will sound after 10 minutes if no communications are received and the compressor will turn off.

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

TempScan Terminal Number		MultiScan Connection	
Terminal No.	50	TX+	Term No. 43
Terminal No.	49	TX-	Term No. 42
Terminal No.	70	RX+	Term No. 45
Terminal No.	69	RX-	Term No. 44
Terminal No.	43	SHIELD	

The shield must be connected at the TempScan end only.

INSTALLATION CONT.

MULTISCAN RS485 TERMINALS:-

TempScan Connected for Compressor Control cont.

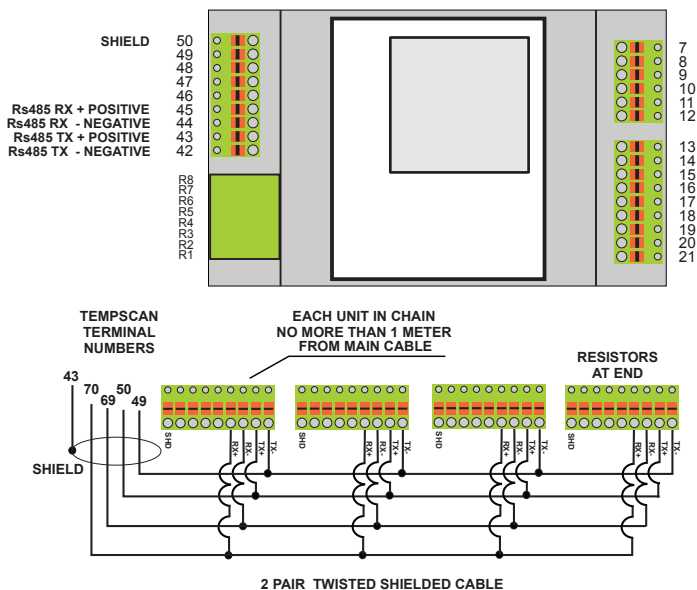
The connection to each unit must be continuous from the TempScan then one to the next then the next etc..

The units must be connected in a daisy chain configuration and not spider from one point.

A Computer is not allowed to be connected to units that are set to connect to a TempScan using the 4 wire RS485 communications.

The unit at the end of the line must have 2 x 120 OHM resistors placed across the TX terminals 42 & 43 and one across the RX terminals 44 & 45.

All MultiScans that are connected and the set point "TempScan Connected" set to "TempScan 2 Wire Ctl" or "TempScan 4 Wire Ctl" or "TempScan 2&4 WireCtl" can supply compressor information to the Tempscan software and the compressor is controlled by the TempScan.



INSTALLATION CONT.

MULTISCAN 2 WIRE SERIAL INPUTS :-

TempScan Connected for Compressor Control cont.

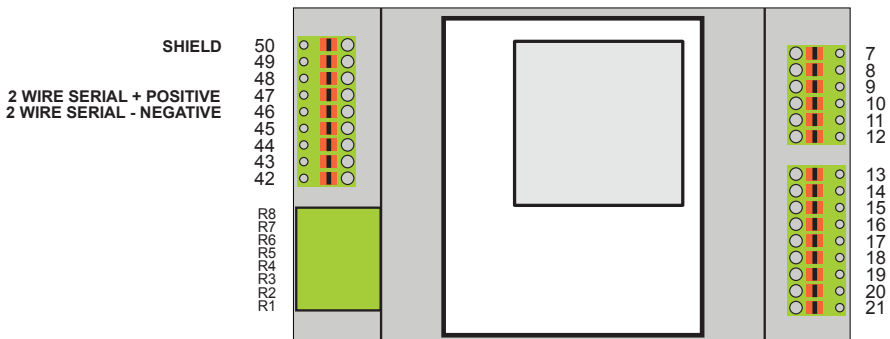
The 2 wire serial can be used alone or in conjunction with the 4 wire serial control from the TempScan. The display ("Comp-Stat 123 TS2cn" on top line) will indicate whether the 2 wire communications are successful, the right hand position will show "--" instead of "cn" if no communications are received from the TempScan after 10 seconds.

An alarm will sound after 10 minutes if no communications are received and the compressor will turn off.

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

TempScan Terminal Number		Connection
Terminal No.	61	+
Terminal No.	62	-
		Term No. 47
		Term No. 46

The shield must be connected at the TempScan end only.



INSTALLATION CONT.

MULTISCAN 2 WIRE SERIAL INPUTS :-

TempScan Connected cont.

To set the DIP switch.

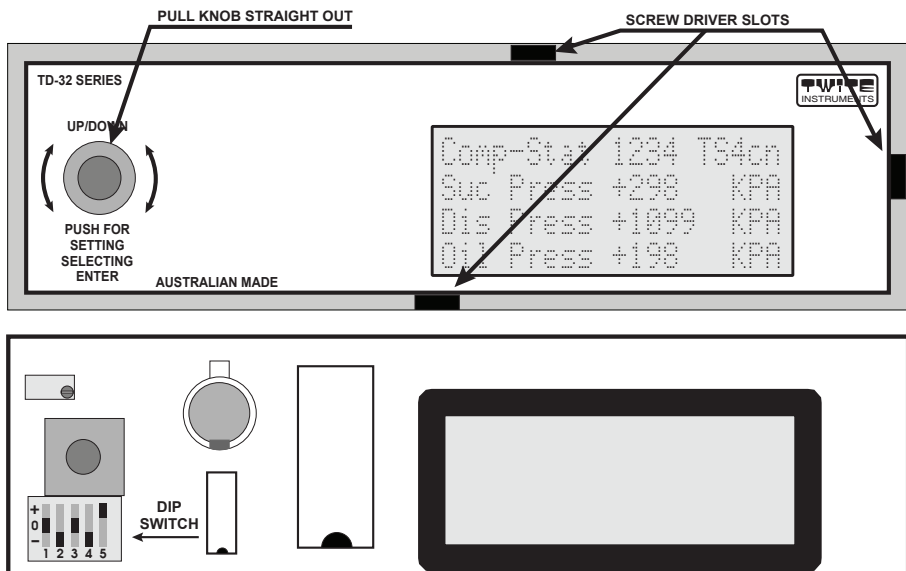
Remove the knob by pulling straight out.

Remove the front panel by levering it out from the display end and two sides (top and bottom) using a small screw driver being careful not to damage the front panel or the unit.

Switch each DIP switch (1 on the left to 5 on the right) to the correct channel number from 1 to 27.

The settings for each compressor channel number are displayed later in this manual.

The DIP switches have three positions, up, middle and down for each switch.



INSTALLATION CONT.

MULTISCAN RS232 TERMINALS:-

All MultiScan units have a RS232 port.

Computer or Modem Connected:-

A Computer is allowed to be connected if The MultiScan unit is set to "Single Stand Alone" using set function "TempScan Connected".

For computer or standard modem the cable used is a 9 pin D connector (female) to the RJ45 connector (female 8 way) on the MultiScan available from the manufacture.

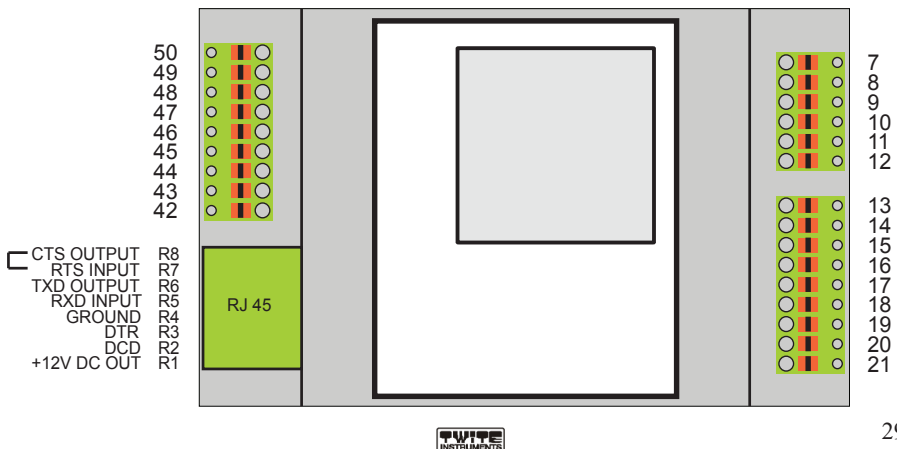
For GSM (wireless) modem connection, a standard straight though RJ45 (8 way) cable is used and is available from the manufacture.

NOTE:- Do not connect pin 1 to a computer or dial up modem as this is used to power the SAM (stand alone modem) wireless GSM modem.

The maximum distance the cable can be is 5 meters.

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 MultiScan can be communicated with the computer using MultiScan software available separately.



INSTALLATION CONT.

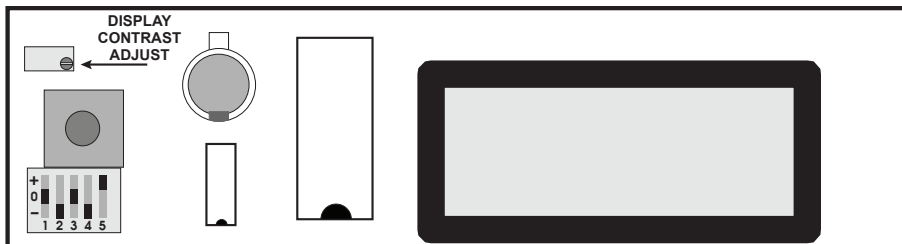
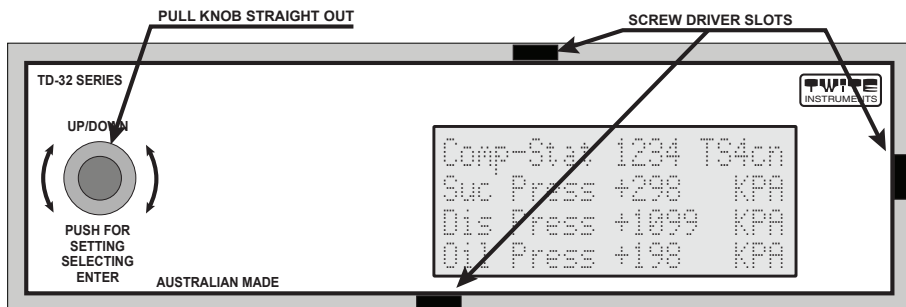
LCD DISPLAY CONTRAST ADJUST.

This trim pot adjusts the intensity of the LIQUID CRYSTAL DISPLAY. This should not normally need adjusting.

Remove the knob by pulling straight out.

Remove the front panel by levering it out from the display end and two sides (top and bottom) using a small screw driver being careful not to damage the front panel or the unit.

To adjust the contrast turn the screw on the pot shown below.



INSTALLATION CONT.

BATTERY REPLACEMENT.

If the backup battery needs replacing, the display will flash "Replace Battery" on the bottom line each second.

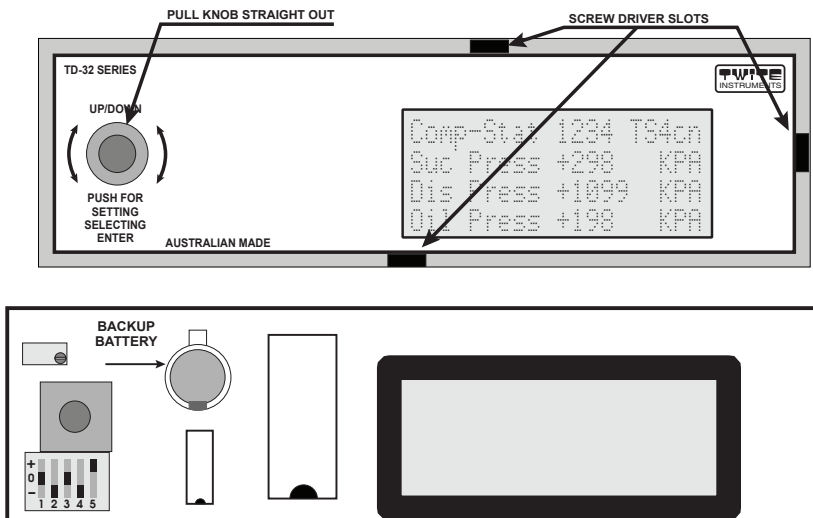
Turn off the power to the unit.

Remove the knob by pulling straight out.

Remove the front panel by levering it out from the display end and two sides (top and bottom) using a small screw driver being careful not to damage the front panel or the unit.

Replace the battery (+ to the top) and cover power on the unit. All set points will be loaded on the first minute change. The clock may need setting after a new battery is installed.

When replacing the battery, all data logged and alarms logged will be lost, save all data logged if required before turning off the power.



INSTALLATION CONT.

PROGRAM CHIP REPLACEMENT.

If the program chip needs replacing do the following.

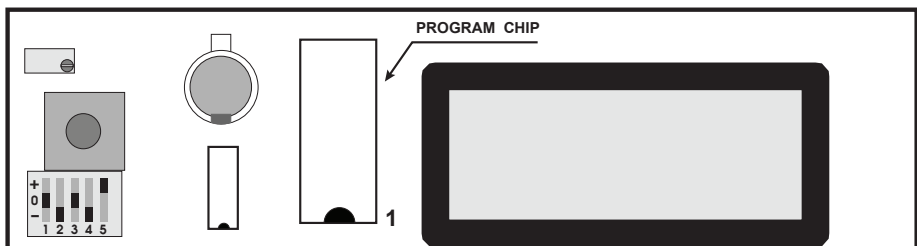
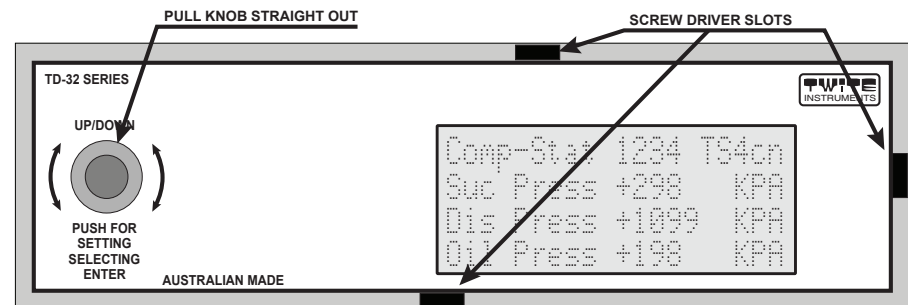
Turn the power off to the unit.

Remove the knob by pulling straight out.

Remove the front panel by levering it out from the display end and two sides (top and bottom) using a small screw driver being careful not to damage the front panel or the unit.

Pull out the program chip straight up and out of its socket.

Place the new program chip into the socket making sure that all pins are lined up to the socket and that the chip orientation is correct. The pin 1 next to the position indicated and the half moon cutout is to the bottom.



INSTALLATION CONT.

EXPANSION SOCKET.

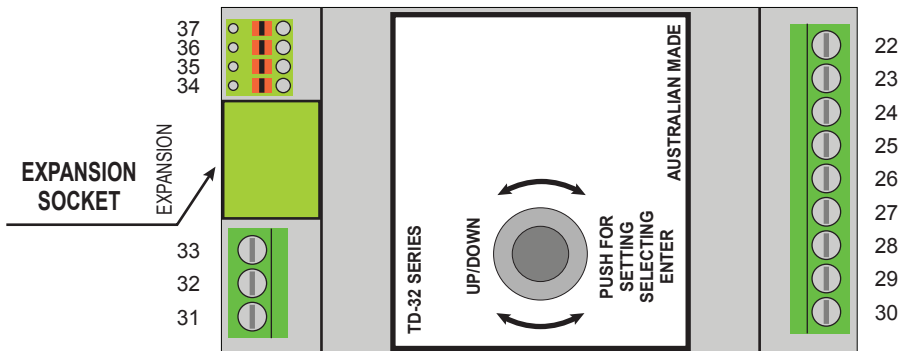
The Expansion socket is used for other modules to be added if required.

Additional LED panel display is available as an optional extra.

To install the LED panel display, follow the below diagrams and connect the cable from the TD-32-R expansion socket (making sure the orientation is correct) to the INPUT socket of the TD-32-D board (making sure the orientation is correct).

The LED display will indicate the compressors suction pressure or temperature (depending on the control type of the compressor) and the control of the relays for control on the Bar LED's.

Top LED	=	Compressor motor is on.
2nd. LED	=	One or more stages are on.
3rd. LED	=	Compressor motor is running at 100% if VSD control.
4th. LED	=	Equalizer solenoid is on.
5th. LED	=	Oil return solenoid is on.
6th. LED	=	Oil heater is on.
7th. LED	=	Inter cooler solenoid is on.
8th. LED	=	Alarm is active (Flashes).

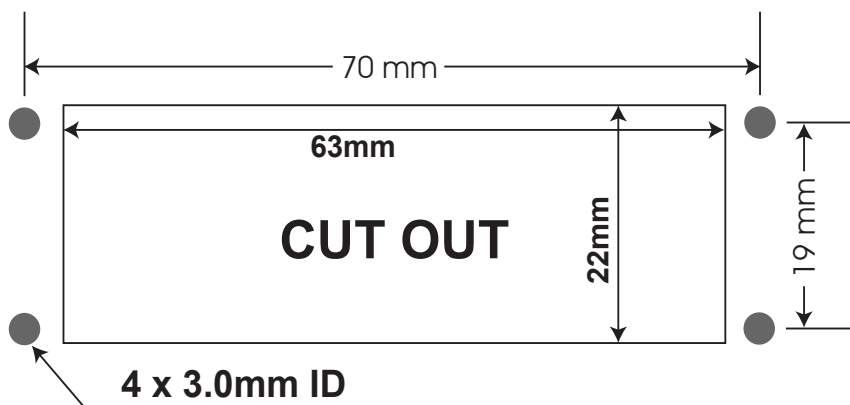


INSTALLATION CONT.

EXPANSION SOCKET CONT.

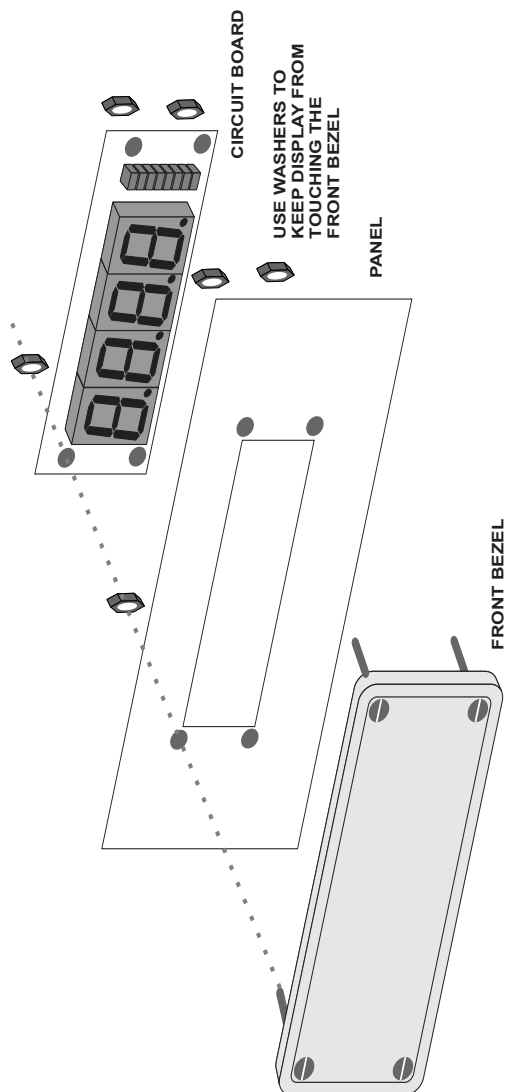
The LED display can be mounted onto a front panel. If the LED display touches the front bezel before the unit is secure, use the washers to set the circuit board back so that the display does not touch the bezel.

Cut the panel as in the diagram with 4 x 3mm holes at each corner to the diagram. place the bezel to the front of the panel and fix it with 4 x 3mm nuts (do not over tighten, otherwise damage to the bezel will occur). Place the circuit board to the rear of the panel (making sure the correct orientation, point UP arrow the UP) and place 4 x 3mm nuts to fix the circuit board in place making sure that the LED does not touch the front bezel.



INSTALLATION CONT.

EXPANSION SOCKET CONT



INSTALLATION CONT.

SENSOR POSITIONING (TEMPERATURE AND PRESSURE) :-

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

The digital temperature sensors must not be exposed to temperatures below -50.0 °C or above +125.0 °C and the analog sensor span is -30.0 oC to 125.0 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. The stainless steel sheath (if used) may be immersed in a liquid that will not corrode AISI 304 Stainless Steel.

Pressure transducers must not exceed there pressure maximums and minimums.

OPERATION.

COMPRESSOR CONTROL:-

STAND ALONE CONTROL:-

The compressor may be controlled using the compressor suction pressure (4-20ma input number 1) or temperature. If temperature control is used, the sensor or sensors may be selected from any one or multiple sensors. If multiple sensors are selected, it uses the average of selected sensors for control. The default (if none selected) is Digital number 1.

The control type can be any one of the following.

- 1 stage stepped with or without equalizer solenoid on start up.**
- 2 stage stepped with or without equalizer solenoid on start up.**
- 3 stage stepped with or without equalizer solenoid on start up.**
- 4 stage stepped with or without equalizer solenoid on start up.**
- 1 stage stepped and variable with or without equalizer solenoid on start up.**
- 2 stage stepped and variable with or without equalizer solenoid on start up.**
- 3 stage stepped and variable with or without equalizer solenoid on start up.**
- 4 stage stepped and variable with or without equalizer solenoid on start up.**

The variable is a 4-20ma output to control a variable speed drive.

Stages 1 to 4 may be inverted (energized for unloaded) or not (energized to load).

The Compressor uses fast load, slow load and unload times and pump down set points (*user programmable*) for loading and unloading a compressor.

Start to Start.

The start to start time on power up is always 30 seconds.

Also the compressor has a user programmable Start to Start timer in minutes.

Oil Return.

The oil return (oil return relay) also is timed and dependent on discharge temperature (if used), oil temperature (if used) and motor on run time.

Hard Piped Stages.

Number of hard piped stages can be entered to allow for correct indication of stages loaded. This is the number of stages that are active (on) after 15 seconds from when the motor starts.

OPERATION CONT.

COMPRESSOR CONTROL CONT:-

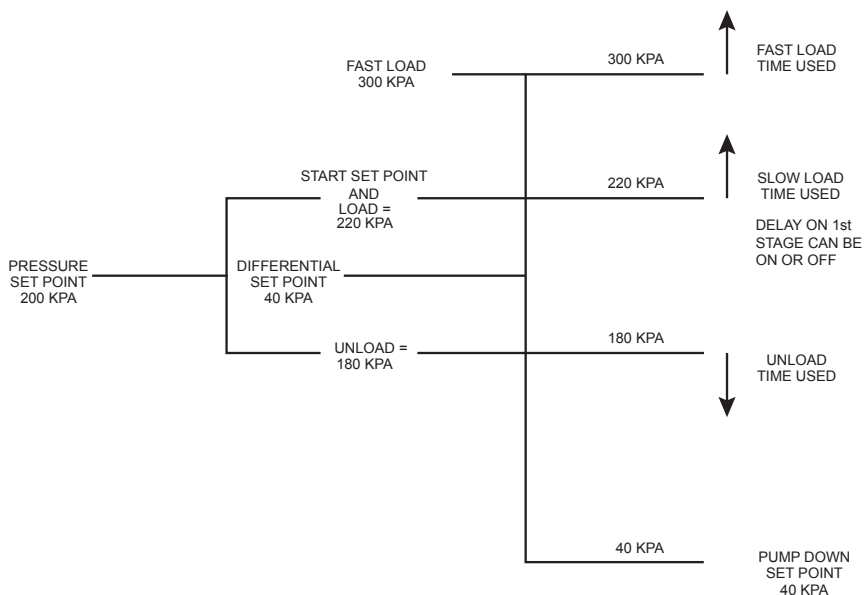
STAND ALONE CONTROL CONT:-

Step Amount.

The step amount when using variable speed drives can be set between 1 and 10 percent for each step for each time the compressor needs to be loaded or unloaded.

Compressor minimum run.

When using variable speed drives, the minimum run percentage may be set between 0 to 100 percent for each stage of turn on. This is the percentage of speed at the time each stage is loaded and the minimum speed when the stage is to be unloaded. The last stage (stage 1) is left at 100% until the pump down set point is reached.



OPERATION CONT.

COMPRESSOR CONTROL CONT:-

STAND ALONE CONTROL CONT:-

Equalizer Solenoid.

An equalizer solenoid may be used to bypass the suction to discharge lines on motor start. The equalizer solenoid is turned on by half the set point (time set in seconds) before the motor starts and remains on for half the set point (time in seconds) after the motor starts.

If an equalizer solenoid is used the equalizer solenoid turns on with the motor start and the first or more (depending on number of hard piped stages) turn on after half the time of the equalizer solenoid time out.

If no equalizer solenoid is used the motor will turn on for 15 seconds before any stages are allowed to turn on.

Compressor proportional control.

The proportional control can be used to decrease the time between loading and unload the compressor stages and or the percentage of speed.

If 0 is selected, no proportional control is used.

If set to 1 to 10 proportional control is used as a proportion of the selected amount. The higher the number, the more time is taken off the load and unload times in seconds.

When the pressure/temperature is in the loading stage and counting down to load the compressor and if the pressure/temperature decreases, the count down for loading holds until the pressure/temperature increases again.

When the pressure/temperature is in the unloading stage and counting down to unload the compressor and if the pressure/temperature increases, the count down for unloading holds until the pressure/temperature decreases again.

OPERATION CONT.

TEMPSCAN COMPRESSOR CONTROL:-

TEMPSCAN COMPRESSOR CONTROL USING 2 WIRE COMMUNICATIONS ONLY:-

The 2 wire serial link must be connected and is used for compressor control.

The DIP switch must be set to the required compressor number (**SHOWN IN THE NEXT PAGE**) and the function "Compressor Number ID" should be set to the same number.

The function "TempScan Connected" must be set to either "TempScan 2 Wire Ctl" or "TempScan 2&4 WireCtl".

The function "Type of Compressor" must be set to the same compressor number as in the TempScan to allow correct loading % on the SCADA software.

The TempScan will control all functions of the compressor except the oil return solenoid (if used) and the inter cooler control including loading, unloading, start to start timing and the pressure or temperature inputs to the TempScan.

The information from the MultiScans compressor status can be displayed on the TempScan SCADA software via the TempScan if the TempScan is connected to a computer using the 4 wire serial communications if connected and the function "Compressor Number ID" is set to the required number.

The MultiScan compressor alarm functions will still operate and turn the compressor off if required.

The equalizer solenoid is used for this control type and is set and operated by the TempScan.

OPERATION CONT.

TEMPSCAN COMPRESSOR CONTROL:-

THE FOLLOWING IS FOR A COMPRESSOR THAT IS CONTROLLED IN STEPPED MODE, STAGE 1, STAGE 2, STAGE 3 ETC.

TEMPSCAN COMPRESSOR CONTROL USING 2 WIRE COMMUNICATIONS ONLY CONT:-

Compressor number DIP switch settings for MultiScan compressor control using 2 wire serial wire and or 4 wire serial comms (stepped).

CHAN No.	SWITCHES POSITION	CHAN No.	SWITCHES POSITION	CHAN No.	SWITCHES POSITION	CHAN No.	SWITCHES POSITION	CHAN No.	SWITCHES POSITION
1		7		13		19		25	
2		8		14		20		26	
3		9		15		21		27	
4		10		16		22		12	
5		11		17		23		1	
6		12		18		24			

OPERATION CONT.

TEMPSCAN COMPRESSOR CONTROL CONT:

TempScan Compressor Control using 4 Wire (RS485) Communications:-

The TempScan will control all functions of the compressor except the oil return solenoid (if used) and inter cooler control including loading, unloading, start to start timing and the pressure or temperature inputs to the TempScan.

The function "Compressor Number ID" must be set to the required number.

The function "TempScan Connected" must be set to either "TempScan 4 Wire Ctl" or "TempScan 2&4 WireCtl".

The information from the MultiScans compressor status can be displayed on the TempScan SCADA software via the TempScan if the TempScan is connected to a computer.

The MultiScan compressor alarm functions will still operate and turn the compressor off if required.

The compressor may be controlled in step mode or variable speed mode from the TempScan.

The function "Type of Compressor" is not used and can be set to any type.

The TempScan sets the type of compressor control. If the TempScan is set to 1 to 4 stages stepped the MultiScan compressor control will load and unload on the stages set by the TempScan. If the TempScan is set to variable the MultiScan will turn on stage 1 when required and after the motor has started for 15 seconds all other stages will be turned on and the 4-20ma output will vary the speed of the motor that has been received from the TempScan and use the suction pressure/temperature input to the TempScan.

NOTE:- The equalizer solenoid is not available when a TempScan is controlling the compressor in this mode.

OPERATION CONT.

TEMPSCAN COMPRESSOR CONTROL CONT:

TempScan Compressor Control using 4 Wire (RS485) & 2 Wire Communications:-

The TempScan will control all functions of the compressor except the oil return solenoid (if used) and inter cooler control including loading, unloading, start to start timing and the pressure or temperature inputs to the TempScan.

The DIP switch must be set to the required compressor number (**SHOWN IN THE NEXT PAGE**) and the function "Compressor Number ID" must be set to the same number.

The function "TempScan Connected" must be set to either "TempScan 2&4 WireCtl".

The information from the MultiScans compressor status can be displayed on the TempScan SCADA software via the TempScan if the TempScan is connected to a computer.

The MultiScan compressor alarm functions will still operate and turn the compressor off if required.

The function "Type of Compressor" must be set to the same compressor number as in the TempScan to allow correct loading % on the SCADA software.

The TempScan sets the type of compressor control. If the TempScan is set to 1 to 4 stages stepped the MultiScan compressor control will load and unload on the stages set by the TempScan. If the TempScan is set to variable the MultiScan will turn on stage 1 with the motor output on when required and after the motor has started for 15 seconds all other stages will be turned on and the 4-20ma output will vary the speed of the motor that has been received from the TempScan and use the suction pressure/temperature input to the TempScan.

With the 2 wire serial connected, this allows for the compressor to be turned off when required from the TempScan within 1 second compared to the turn off time of up to 20 seconds using the 4 wire RS485 serial only.

OPERATION CONT.

TEMPSCAN COMPRESSOR CONTROL:

THE FOLLOWING IS FOR A COMPRESSOR THAT IS CONTROLLED IN VARIABLE SPEED MODE, 0 TO 100 %.

TempScan Compressor Control using 4 Wire (RS485) & 2 Wire Communications cont:-

NOTE:- The equalizer solenoid is not available when a TempScan is controlling the compressor in this mode.

Compressor number DIP switch settings for MultiScan compressor control using 2 wire and 4 wire serial comms (variable).

CHAN No.	SWITCHES POSITION	CHAN No.	SWITCHES POSITION	CHAN No.	SWITCHES POSITION	CHAN No.	SWITCHES POSITION	CHAN No.	SWITCHES POSITION
1		7		13		19		25	
2		8		14		20		26	
3		9		15		21		27	
4		10		16		22		COND 12 LIQ LEV 1	
5		11		17		23			
6		12		18		24			

OPERATION CONT.

ALARM ACTION:-

Some alarms will turn the system off and some will indicate the alarm but the system will still run. If any sensor used in a control temperature/pressure goes into alarm, that control temperature/pressure will alarm and the system will shut down.

All alarms are indicated on the alarm display page in the order and time they were activated.

To scroll through alarms, turn the knob to the alarm page and press the knob once then turn the knob clockwise or anticlockwise to display each alarm.

To reset the alarms, Press the knob again, if any alarm is still active the alarm will sound and each new alarm is displayed. If no new alarms are still active the display reverts to normal running mode.

While the alarms are displayed, pressing the knob and holding it down for 3 seconds the display will revert to the normal run displays and different pages can be displayed by turning the knob clockwise and anticlockwise.

All alarms have a minimum delay of 10 seconds. Over range sensors have a delay of 20 seconds and no sensor (on digital temperature sensors only) alarms have a delay of 20 seconds.

The following is a sample of the alarms displayed. The buzzer will sound and the alarm relay will turn off. To disable the buzzer press the x50 button or the spin knob.

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

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. The N = No alarm on this input. The M = the compressor will turn off and A = Only an alarm will sound on this input but the system will continue to run.

If a channel is set to "not connected" no alarm will activate on that input:-

1	"Dig Temp 1"	A	The digital temperature No 1 is in alarm.
2	"Dig Temp 2"	A	The digital temperature No 2 is in alarm.
3	"Dig Temp 3"	A	The digital temperature No 3 is in alarm.
4	"Dig Temp 4"	A	The digital temperature No 4 is in alarm.
5	"Dig Temp 5"	A	The digital temperature No 5 is in alarm.
6	"Dig Temp 6"	A	The digital temperature No 6 is in alarm.
7	"Dig Temp 7"	A	The digital temperature No 7 is in alarm.
8	"Dig Temp 8"	A	The digital temperature No 8 is in alarm.
9	"Analog Tmp1"	A	The analog temperature No 1 is in alarm.
10	"Analog Tmp2"	A	The analog temperature No 2 is in alarm.
11	"Analog Tmp3"	A	The analog temperature No 3 is in alarm.
12	"Analog Tmp4"	A	The analog temperature No 4 is in alarm.
13	"Analog Tmp5"	A	The analog temperature No 5 is in alarm.
14	"Analog Tmp6"	A	The analog temperature No 6 is in alarm.
15	"Analog Tmp7"	A	The analog temperature No 7 is in alarm.
16	"Not Used"	N	No alarm in this position.
17	"Suction Prs"	M	The suction pressure transducer is in alarm.
18	"Discharge P"	M	The discharge pressure transducer is in alarm.
19	"Oil Press "	M	The oil pressure transducer is in alarm.
20	"Spare Press"	A	The condenser discharge transducer is in alarm.
21	"Cmp Interm"	M	The compressor intermediate pressure is in alarm.
22	"Cmp Current"	M	The motor current transducer is in alarm..
23	"Refrig Det "	A	The refrigerant detector is in alarm.
24	"Humidity %"	A	The humidity percentage input is in alarm.
25	"Comp Cont'l"	M	Any compressor control temperature sensor is in alarm.
26	"Spare Alarm "	N	Not used
27	"Comp Oil Tm"	M	Any oil temperature sensor is in alarm.
28	"Comp Suct'n"	M	Any compressor suction temperature sensor is in alarm.
29	"Disch Temp"	A	Any discharge temperature sensor is in alarm.
30	"Spare Alarm "	N	Not used
31	"Comp Int'md"	A	Any compressor intermediate temperature sensor is in alarm.

OPERATION CONT.

ALARM ACTION CONT.:-

32	"Spare Alarm 1"	N	Not used
33	"Remote ON "	N	Not used
34	"Remote OFF"	M	Digital input to shut the system down. (10 sec delay).
35	"Water Jack"	M	Digital input for no water jacket flow. (10 sec delay).
36	"Oil Level"	M	Digital input from compressor oil level (10 sec delay).
37	"Motor Aux"	M	Digital input motor auxiliary failed. (10 sec delay).
48	"Inter C ON "	N	Digital input to turn the inter cooler solenoid on.
39	"Oil Press"	M	Digital input compressor oil pressure failed. (10 sec delay).
40	"Inter C Alm"	A	Digital input inter cooler failed. (10 sec delay).
41	"Super Heat"	M	Super heat = 0 or less on compressors suction (see below).
42	"Super Sat T"	A	Compressor super saturated Temperature.
43	"TempScan 2"	S	TempScan 2 wire room only control failed.
44	"TempScan 4"	S	TempScan 4 wire communications failed.

The super heat is only activated if the compressor motor is on and has been on for at least 30 minutes from start. Can be deactivated by selecting no refrigerant used.

ALARM HISTORY:-

The alarm history displays the last 40 alarms that were active. After 40 alarms have been logged the next alarm is placed over the first alarm that was saved and each successive alarm placed over the next earliest alarm etc..

To display each alarm history, rotate the "UP/DOWN" knob until the alarm history page is displayed, press the knob briefly, then rotate the knob to display other alarm history information.

To revert to normal run display press the knob for 3 seconds.

The display will revert to the time display (page 1) after 240 seconds if nothing is pressed or turned.

OPERATION CONT.

ALARM HISTORY CONT:-

THE FOLLOWING IS A TYPICAL ALARM HISTORY DISPLAY.

```
ALARM HISTORY, SHOWS  
THE LAST 40 ALARMS  
OIL TEMP  
20:45 04 JAN +44.0 oC
```

IF NO ALARM IS IN A POSITION, THE FOLLOWING WILL BE DISPLAYED.

```
ALARM HISTORY, SHOWS  
THE LAST 40 ALARMS  
  
NO ALARM IN THIS POS
```

DATA LOGGING.

Data logging is done on the times set in the functions setting and can log at the below times.

Data logging may be done at timed intervals as follows:-

- | | | |
|----|------------------|---|
| 1: | NONE (don't do) | Does not do timed logging. |
| 2: | Every 1 Minute | Does a logg every minute on the minute change. |
| 3: | Every 5 Minutes | Does a logg every 5 minutes at 5, 10 15 etc. |
| 4: | Every 10 Minutes | Does a logg every 10 minutes at 10, 20, 30 etc. |
| 5: | Every 30 Minutes | Does a logg every 00, 30 minutes. |
| 6: | Every 1 Hour | Does a logg every hour on the hour change. |
| 7: | Every 2 Hours | Does a logg every 2 hours at 2, 4, 6 etc. |

To display data logged, rotate the knob until the data log display page is displayed, displays "Data Logged Display" on the top line.

DATA LOGGING CONT.

Press the knob briefly to hold the display. Rotating the knob will go to the next/previous time to be displayed.

When the displayed time reaches the end/start the display will roll over to the first/last displayed log.

To change the parameter to be displayed at each displayed data log push the "KNOB" and it will display each parameter in turn and roll over to the first parameter after the last parameter is displayed.

Holding the x50 switch while pressing the KNOB changes the displayed parameter to the previous one, converse to the previous which changes the parameter to the next one to be displayed.

Press the knob for 3 seconds to revert to the normal run display pages.

The display will revert to the time display (page 1) after 240 seconds if nothing is pressed or turned.

The third line displays the parameter and its value.

The fourth line displays the time and date of the log and the following:-

The following is a sample of data logged page:-

```
Data Logged Display
<>=Time Push =Value
Yat Milk Tn 28.7 oC
11:14 14 Jan Pick UP
```

If no their is data logs to display the display will show the following.

```
Data Logged Display
No Data Logged
```

UP/DOWN KNOB AND SWITCH FUNCTIONS :-

OVERVIEW

The following switches are available for setting of functions etc.

- 1: The ROTARY/PUSH knob - for displaying different pages, data logged, alarms and setting/entering values of functions.

- 2: The X50 Switch -for incriminating or detrainment by 50 (5.0 oC) values while setting of values when the rotary switch is turned.

DISPLAY PAGES.

The following displays are available by rotating the "ROTARY/PUSH" knob clockwise and anticlockwise while no setting of functions is being done.

NOTE: If after 240 seconds the knob was not used, the display will revert to page 1.

If a value displayed is in error, the following may be displayed the meaning is as follows:

Er-Ovr The sensor or transducer is in an open circuit or shortage out or the sensor has failed.

No-Sen The temperature sensor is not responding, check cable and sensor.

No-Con The sensor or transducer has been set to "Not Connected".

If sensors, transducers or digital inputs have been set to "Not Connected", the value may not be displayed.

If all inputs within the one page are set to "Not Connected", the page may be skipped to the next/previous page automatically,

PAGE 1:

If TempScan connected:- The status of the compressor, stages on or percentage loaded and TS4cn or TS2cn or TS2cn4cn. (see TempScan connected previously) on the top line.

The suction pressure or temperature on the second line.

The discharge pressure on the third line.

The oil pressure on the fourth line, also oil return interval left and also the start to start time left on the fourth line.

If Stand Alone:- The 1234 = each stage that is on, the E = equalizer solenoid is on and the 50% is the percentage of the variable speed drive output if used.

The control temperature/pressure for the compressor second line.

The last 2 lines as above.

```

Comp-Stat 12    TS4cn
Suc Press +300   KPA
Dis Press +1100  KPA
Oil Press +245   KPA
  
```

DISPLAY PAGES CONT.

PAGE 2:

The temperature of the digital sensor number 1 on the top line.
The temperature of the digital sensor number 2 on the second line.
The temperature of the digital sensor number 3 on the third line.
The temperature of the digital sensor number 4 on the fourth line.

NOTE:- Annunciations depending on set function "Display Annunciations" can be displayed instead of "Dig Temp 1" etc.

```
Dig Temp 1 +26.5  oC
Dig Temp 2 +26.5  oC
Dig Temp 3 +26.5  oC
Dig Temp 4 +26.5  oC
```

PAGE 3:

The temperature of the digital sensor number 5 on the second line.
The temperature of the digital sensor number 6 on the second line.
The temperature of the digital sensor number 7 on the third line.
The temperature of the digital sensor number 8 on the fourth line.

NOTE:- Annunciations depending on set function "Display Annunciations" can be displayed instead of "Dig Temp 1" etc.

```
Dig Temp 5 +26.5  oC
Dig Temp 6 +26.5  oC
Dig Temp 7 +26.5  oC
Dig Temp 8 +26.5  oC
```

DISPLAY PAGES CONT.

PAGE 4:

The temperature of the Analog sensor number 1 on the second line.

The temperature of the Analog sensor number 2 on the third line.

The temperature of the Analog sensor number 3 on the fourth line.

The temperature of the Analog sensor number 4 on the fourth line.

NOTE:- Annunciations depending on set function "Display Annunciations" can be displayed instead of "Ang Temp 1" etc.

```
Ang Temp 1 +26.5  oC
Ang Temp 2 +26.5  oC
Ang Temp 3 +26.5  oC
Ang Temp 4 +26.5  oC
```

PAGE 5:

The temperature of the Analog sensor number 5 on the second line.

The temperature of the Analog sensor number 6 on the second line.

The temperature of the Analog sensor number 7 on the third line.

The fourth line blank.

NOTE:- Annunciations depending on set function "Display Annunciations" can be displayed instead of "Ang Temp 1" etc.

```
Ang Temp 5 +26.5  oC
Ang Temp 6 +26.5  oC
Ang Temp 7 +26.5  oC
```

DISPLAY PAGES CONT.**PAGE 6: DIGITAL INPUTS PAGE.**

The status of all 8 digital inputs on the top line.

O=Off I=ON N=Not-Con on the second line.

Each digital input number on the third line.

The status of each digital input on the fourth line

```
      Digital Inputs
0=Off I=ON N=Not-Con
 1 2 3 4 5 6 7 8
1 0 0 0 1 0 N 0
```

DISPLAY PAGES CONT.

PAGE 7: DATA LOGGED PAGE.

To display data logged, rotate the knob until the data logg display page is displayed, displays "Data Logged Display" on the top line.

Press the knob briefly to hold the display. Rotating the knob will go to the next/previous time to be displayed.

When the displayed time reaches the end/start the display will roll over to the first/last displayed log.

To change the parameter to be displayed at each timed data log push the "KNOB" and it will display the next parameter in turn and roll over to the first parameter after the last parameter is displayed. To change back one parameter press and hold the x50 button while the "KNOB" is pushed

Press the knob for 3 seconds to revert to the normal run display pages.

The display will revert to the time display (page 1) after 240 seconds if nothing is pressed or turned.

The third line displays the parameter and its value.

The fourth line displays the time and date of the log and the following:-

The following is a sample of data logged page:-

```
Data Logged Display
<>=Time Push =Value
Comp % out 50
11:14 14 Jan percent
```

If no their is data loggs to display the display will show the following.

```
Data Logged Display
No Data Logged
```

DISPLAY PAGES CONT.

PAGE 8: ALARMS PAGE.

To scroll through alarms, turn the knob to the alarm page and press the knob once then turn the knob clockwise or anticlockwise to display each alarm.

To reset the alarms, Press the knob again, if any alarm is still active the alarm will sound and each new alarm is displayed. If no new alarms are still active the display reverts to normal running mode.

While the alarms are displayed, pressing the knob and holding it down for 3 seconds the display will revert to the normal run displays and different pages can be displayed by turning the knob clockwise and anticlockwise.

All alarms have a minimum delay of 10 seconds. Over range sensors have a delay of 20 seconds and no sensor (on digital temperature sensors only) alarms have a delay of 10 seconds.

The following is a sample of the alarms displayed. The buzzer will sound and the alarm relay will turn off. To disable the buzzer press the x50 button or the spin knob.

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

If no alarms are active the display will show:-

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


DISPLAY PAGES CONT.

PAGE 9: ALARM HISTORY PAGE.

The alarm history displays the last 40 alarms that were active. After 40 alarms have been logged the next alarm is placed over the first alarm that was saved and each successive alarm placed over the next earliest alarm etc..

To display each alarm history, rotate the "UP/DOWN" knob until the alarm history page is displayed, press the knob briefly, then rotate the knob to display other alarm history information.

To revert to normal run display press the knob for 3 seconds.

The display will revert to the time display (page 1) after 240 seconds if nothing is pressed or turned.

The following is a typical alarm history display.

```
ALARM HISTORY, SHOWS  
THE LAST 40 ALARMS  
OIL TEMP  
20:45 04 JAN +44.0 oC
```

IF NO ALARM IS IN A POSITION, THE FOLLOWING WILL BE DISPLAYED.

```
ALARM HISTORY, SHOWS  
THE LAST 40 ALARMS  
  
No ALARM IN THIS Pos
```

DISPLAY PAGES CONT.

PAGE 10: WARNINGS PAGE.

To scroll through warnings, turn the knob to the warn logged page and press the knob once then turn the knob clockwise or anticlockwise to display each warning.

To reset the warnings, Press the knob again, if any warning is still active the lcd backlight will flash and each new warning is displayed. If no new warnings are still active the display reverts to normal running mode.

While the warnings are displayed, pressing the knob and holding it down for 3 seconds the display will revert to the normal run displays and different pages can be displayed by turning the knob clockwise and anticlockwise.

All warnings have a minimum delay of 20 seconds. Only temperatures and 4-20ma inputs can have warning alarms.

The following is a sample of the warnings displayed. The lcd backlight will flash but no buzzer alarm and the alarm relay will not activate. Any warning will not shut down any control function.

```
WARN LOGGED STATUS
TOTAL No. Warns  01
order 01  Disch Pres
17:46 04 Jan KPA
```

If no warnings are active the display will show:-

```
WARN LOGGED STATUS
NO WARNINGS LOGGED
```

DISPLAY PAGES CONT.**PAGE 11:**

The compressor suction temperature on the top line.

The compressor suction pressure on the second line.

The compressor saturated temperature on the third line.

The compressor super heat on the fourth line

```

Comp Suctn +27.2  oC
Suc Press  +300  KPA
Satur'd tm -1.8   oC
Super Heat +28.7  oC

```

PAGE 12:

The number of hours the compressor has run on the top line.

The second line is cleared.

The third line is cleared.

The compressor amps on the fourth line

```

Comp'r Run 544    Hrs

Compressor 00     AMPS

```

PAGE 13:

The compressor suction pressure on the top line.

The compressor intermediate pressure on the second line.

The refrigeration gas detector on the third line.

The humidity input on the fourth line

```

Comp'r Suc 250    KPA
Comp'r Int 430    KPA
Refrig Det 10     PPM
Humidity          %

```

DISPLAY PAGES CONT.**PAGE 14: THIS DISPLAY IS SHOWN FOR 5 SECONDS ON START UP.**

The time and date on the top line.

The copyright on the second line.

MultiScan Model No. on the third line.

The model number and version on the fourth line

```
13:19-26  16/05/2007
Copyright Twite Inst
MultiScan Model No.
TD-32-R   Ver No. 01
```

PASSWORD:-

USERS PASSWORD :-

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

```
Enter Users
          Password
0000
```

NOTE:- flashing cursor.

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

To enter the password rotate the knob to the first value required then press "ENTER" knob for the next number etc. until the correct number is displayed, press "ENTER", knob again to finish entering the password number. If the password number was correct the unit will go to the next step for setting functions.

If the number was incorrect the unit will display the following.

```
Wrong Password
Press X50
or Try Again
0000
```

If X50 is pressed the display will revert to its normal running display with the displayed data that was displayed before the "SET" knob was pressed.

PASSWORD CONT.:-

CHANGE PASSWORD

(use "SET" knob, "ENTER" knob, rotate UP/DOWN knob.)

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.

This is done using the "Password YES/NO" function

DISABLE PASSWORD

(use "SET" knob , "ENTER" knob, rotate UP/DOWN knob).

This is done using the "Password YES/NO" function

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 **"0888"** by using the function "Reset Password" and pressing and holding the X50 switch while the "KNOB" is pressed.

SETTING FUNCTIONS.

OVERVIEW:

To set any function, the following switches are used:-

If the password is required, then it must be entered before any function can be changed.

The large knob is used for "SET FUNCTIONS" key on the first press and then becomes the "ENTER" key there after.

After pressing the Knob for the first time. Rotating this knob clockwise by one click increases the value by 1 function and rotating anticlockwise by one click decreases the value by 1 function.

When the correct function is displayed for changing or checking press the knob to go to that function to change or check.

If channels are required for the function the display will indicate this.

Turn the knob to select each channel and press the knob to select or deselect each channel as required or not required.

When all channels that require changing turn the knob to display "----> Continue Next" and press the knob. This will now go to the next section and the value of the last channel that was selected will be displayed for changing.

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

Rotate the knob to increase or decrease the value by 1 count each click.

If the "X50" button is pressed when rotating the knob the value will increase or decrease by 50 each click.

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

SETTING FUNCTIONS.

OVERVIEW CONT.:

When a flashing cursor is displayed on the Liquid Crystal Display the Value or Function may be changed to another by rotating the knob ("UP/DOWN").

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

If the following is displayed after the last "ENTER" knob press, redo the function. The "ENTER" knob was not pressed for the required time for the value to be saved. This only applies to values that must be saved to the EEPROM.

```
The Enter Switch was  
not pressed for the  
required time.  
Press X50 and Re-Do
```

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" knob. After all required values have been altered (*or checked*), the displays will revert to normal run mode.

When the "SET" knob is first pressed the last function that was altered will appear on the display The FUNCTIONS and there meaning are described in the following pages in short form then in detail.

```
SETTING FUNCTIONS  
Turn Dial < or > for  
Required Function 9  
Set Data Logging
```

To change from one function to another, turn the "DIAL" (*up/down arrow*) knob to display each function in numerical order.

FUNCTIONS.

FUNCTIONS AND THE NO. OF EACH:-

1	"Control Auto or OFF"	Turns the control from auto or OFF.
2	"Compressor Set Point"	The compressor set point pressure/temperature.
3	"Compressor Diff'tial"	The compressor differential pressure/temperature.
4	"Comp Slow Load Time"	Ramp up time in seconds for compressor load.
5	"Fast Load Set Point"	Fast load set point in pressure/temperature.
6	"Comp Fast Load Time"	Time in seconds for fast compressor loading.
7	"Comp'or Unload Time"	Time in seconds for compressor unload stage.
8	"Pump Down Set Point"	The pump down set point for the compressor.
9	"Cmp Start/Start Time"	The start to start time in minutes for compressor.
10	"Comp Equalizer Sol'd"	Time in seconds for the comp equalizer solenoid.
11	"Oil Return Interval"	Time in minutes between comp oil return.
12	"Comp Stages Inverted"	Whether comp stages 2,3 & 4 are inverted or not.
13	"Hard Piped Stages Nu"	Number of compressor hard piped stages.
14	"Comp cntl PRESS-TEMP"	Compressor control on pressure or temperature.
15	"Comp Stg 1 Dly YesNo"	Compressor start use first stage delay or not.
16	"Compre'r Step Amount"	Step % amount for each load step for compressor.
17	"Compressor Min % Run"	Minimum % for each compressor stage to run at.
18	"Comp Proportional Ct"	Amount of proportional control on compressor.
19	"Type of Compressor"	The type of compressor used.
20	"Compressor Number ID"	Sets the compressor number for 4 wire comms.
21	"High Alarm Temp're"	The high alarms for temperature sensors.
22	"Warn Temp From High"	Warning from high alarm temperature sensors.
23	"Low Alarm Temp're"	The low alarms for temperature sensors.
24	"Warn Temp Above Low"	Warning above low alarm temperature sensors.
25	"Hi Temp Alarm Delay"	The high alarm delays for temperature sensors.
26	"Low Temp Alarm Delay"	The low alarm delays for temperature sensors.
27	"High Alarm Press KPA"	The high alarms for pressure/40-20ma sensors.
28	"Warn Press From High"	Warning from high alarm pressure sensors.
29	"Low Alarm Press KPA"	The low alarms for pressure/40-20ma sensors.
30	"Warn Press Above Low"	Warning above low alarm pressure sensors.
31	"Hi Press Alarm Delay"	The high alarm delays pressure/40-20ma sensors.
32	"Lo Press Alarm Delay"	The low alarm delays pressure/40-20ma sensors.

FUNCTIONS.

FUNCTIONS AND THE NO. OF EACH CONT:-

33	"Dig Temp's Connected"	The 8 digital temp sensors that are connected.
34	"Anolog Tmp Connected"	The 7 Analog temp sensors that are connected.
35	"Press's Connected"	The pressure and 4-20ma inputs connected.
36	"Set 4-20 Input Span"	The span of pressure transducers & 4-20ma.
37	"Digital IN Connected"	The Digital inputs connected or not connected.
38	"Digital IN Inverted"	Whether a digital input is inverted or not.
39	"Temp Sen's Comp Ctrl"	Temperature sensors used for compressor control.
40	"Temp Sen's Comp Suc"	Temperature sensors used for compressor suction.
41	"Comp Tmp Sen for Dis"	Temp'ture sensors used for compressor discharge.
42	"Temp Sensors for Oil"	Temperature sensors used for comp oil temp.
43	"Sump Heat Set point"	Sets the sump heater temperature set point.
44	"Sump Heat Diff'tial"	Sets the sump heater differential.
45	"Set Data Logging"	The data logged times or none don't do.
46	"Set Time & Date"	Sets the real time clock.
47	"Password YES/NO"	Use the password or not for setting functions.
48	"Change Password"	Change the password. Password must be used.
49	"Ram Memory Check"	Checks all memory for any faults.
50	"Test Display/Rst log"	Displays model number & resets all data logged.
51	"Set Dig Temp Offset"	Set the digital temperature sensors offset.
52	"Set PT100 Tmp Offset"	Set the PT100 temperature sensors offset.
53	"Add Dig Temp Sensor"	Add a new digital temperature sensor.
54	"Set RS485/232 Baud"	Set the baud rate for serial communications.
55	"Display Brightness"	The brightness of the displays back light.
56	"Number of Resets S/N"	The number of resets performed and serial No.
57	"TempScan Connected"	TempScan connected or not for comp and cond.
58	"Reset Comp'sor Hours"	Reset the compressor run hours.
59	"4-20 Weight Average"	The 4-20ma inputs averaging value.
60	"High Current Alarm"	High current alarm for compressor.
61	"Type of refrigerant"	Type refrigerant used for super heat calculation.
62	"Computer Connected"	Wether a Computer is connected or not.
63	"LED Display Intens'y"	The brightness of the LED display.
64	"Reset Password"	Resets the password to 888.
65	"Display Annunciation"	Display annunciation yes or no for temperatures.
66	"Oil Pres Calculation"	Calculate the oil pressure - suction or interm.
67	"Temp Sen for Intermd"	The temp sensor used for the intermediate temp.
68	"Analog PT100 / AD590"	Wether the analog sensors are PT100 or AD590.

FUNCTIONS CONT.

1 “Control Auto or OFF”

Sets whether the compressor is on automatic or off.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Control Auto or OFF” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR YES or NO [Control Auto].

PRESS “KNOB”

SELECTION COMPLETE.

2 “Compressor Set point”

Sets the set point in suction pressure or temperature (depends on which required) for the compressor to operate at.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Compressor Set Point” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR -100 (-10.0) to +500 (+50.0) [KPA or oC]

PRESS “KNOB”

SELECTION COMPLETE.

3 “Compressor Diff’tial”

Sets the differential in suction pressure or temperature (depends on which required) for the compressor to operate at.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Compressor Diff’tial” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR +10 (+1.0) to +100 (+10.0) [KPA or oC]

PRESS “KNOB”

SELECTION COMPLETE.

4 “Comp Slow Load Time”

Sets the slow load time in seconds that the compressor is loaded to the next stage using the control value divided by 2. If the proportional setting is more than 0, this time is automatically adjusted down as the set point increases to the actual control value.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Comp Slow Load Time” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 0 to 1800 [Seconds]

PRESS “KNOB”

SELECTION COMPLETE.

FUNCTIONS CONT.

5 “Fast Load Set Point”

Sets the value at which the compressor loads using the fast load set point. If the proportional setting is more than 0, this time is automatically adjusted down as the set point increases to the actual control value.

PRESS “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “Fast Load Set Point” on bottom line.
PRESS “KNOB”
ENTER PASSWORD IF REQUIRED
ROTATE KNOB ▲ ▼ FOR -100 (-10.0) to +1000 (+10.0) [KPA or oC]
PRESS “KNOB”
SELECTION COMPLETE.

6 “Comp Fast Load Time”

Sets the fast load time in seconds that the compressor is loaded to the next stage. If the proportional setting is more than 0, this time is automatically adjusted down as the set point increases to the actual control value.

PRESS “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “Comp Fast Load Time” on bottom line.
PRESS “KNOB”
ENTER PASSWORD IF REQUIRED
ROTATE KNOB ▲ ▼ FOR 0 to 1800 [Seconds]
PRESS “KNOB”
SELECTION COMPLETE.

7 “Compr’or Unload Time”

Sets the unload time in seconds that the compressor is unloaded to the previous stage using the control value divided by 2. If the proportional setting is more than 0, this time is automatically adjusted down as the set point increases to the actual control value.

PRESS “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “Compr’or Unload Time” on bottom line.
PRESS “KNOB”
ENTER PASSWORD IF REQUIRED
ROTATE KNOB ▲ ▼ FOR 0 to 1800 [Seconds]
PRESS “KNOB”
SELECTION COMPLETE.

8 “Pump Down Set Point”

Sets the value at which the compressor turns off.

PRESS “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “Pump Down Set Point” on bottom line.
PRESS “KNOB”
ENTER PASSWORD IF REQUIRED
ROTATE KNOB ▲ ▼ FOR -200 (-20.0) to +500 (+50.0) [KPA or oC]
PRESS “KNOB”
SELECTION COMPLETE.

FUNCTIONS CONT.

9 “Cmp Start/Start Time”

Sets the start to start time that the compressor is allowed to start again from the last time it started in minutes.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Cmp Start/Start Time” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 0 to 60 [Minutes]

PRESS “KNOB”

SELECTION COMPLETE.

10 “Comp Equalizer Sol'd”

Sets the time that the equalizer solenoid is on before and after the compressor starts. If the compressor type is set to have 4 stages, an equalizer solenoid can not be used. The value entered is divided by 2 for the both times ie. if set to 10, the equalizer solenoid is turned on for 5 seconds before the compressor starts and remains on for 5 seconds after the compressor starts.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Comp Equalizer Sol'd” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 0 to 100 [Seconds]

PRESS “KNOB”

SELECTION COMPLETE.

11 “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. The first allowed turn on after motor start is 30 minutes if the compressor has been off for 5 hours or more other wise the minimum time for the purge to turn on is set at 1 minute after motor start and from then on the “Oil Return Interval” set point is the time between oil return times while the motor is on. If set to 0 there will be no oil return function.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Oil Return Interval” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 0 to 240 [Minutes]

PRESS “KNOB”

SELECTION COMPLETE.

FUNCTIONS CONT.

12 “Comp Stages Inverted”

For inverting compressor stages. If set to NO, all stages (1 to 4 will energize to load. If set to YES all stages (2 to 4) will energize to unload, stage 1 is used for motor start. If the compressor is off all stages will not be energized. If an equalizer solenoid is used it will not be inverted.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Comp Stages Inverted” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR YES or NO [Stgs Inverted]

PRESS “KNOB”

SELECTION COMPLETE.

13 “Hard Piped Stages Nu”

Sets the number of compressor load stages are permanently on.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Hard Piped Stages Nu” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 1, 2, 3, or 4 [Hard Piped]

PRESS “KNOB”

SELECTION COMPLETE.

14 “Comp cntl PRESS-TEMP”

Selects whether the compressor is controlled using suction pressure or temperature.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Comp cntl PRESS-TEMP” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR Control on Pressure or Ctrl on Temperature.

PRESS “KNOB”

SELECTION COMPLETE.

15 “Comp Stage 1 Dly YesNo”

Sets whether the compressor uses the delay for stage 1 when the compressor starts or not.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Comp Stg 1 Dly YesNo” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR YES or NO

PRESS “KNOB”

SELECTION COMPLETE.

FUNCTIONS CONT.

16 “Compe'r Step Amount”

Sets the step amount in percentage that the compressor will load and unload each time if a variable speed drive is used.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Compe'r Step Amount” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 1 to 10 [% Per Step]

PRESS “KNOB”

SELECTION COMPLETE.

17 “Compressor Min % Run”

Sets the minimum percentage that each stage will start at when turned on if a variable speed drive is used.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Compressor Min % Run” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 0 to 100 [% at Stage 1]

PRESS “KNOB”

ROTATE KNOB ▲ ▼ FOR 0 to 100 [% at Stage 2]

PRESS “KNOB”

ROTATE KNOB ▲ ▼ FOR 0 to 100 [% at Stage 3]

PRESS “KNOB”

ROTATE KNOB ▲ ▼ FOR 0 to 100 [% at Stage 4]

PRESS “KNOB”

SELECTION COMPLETE.

18 “Comp Proportional Ct”

Sets the amount of PID that is used to control the load and unload times depending on how much difference there is between the set point and the actual value.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Comp Proportional Ct” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 0 to 10 [Prop 0 = none]

PRESS “KNOB”

SELECTION COMPLETE.

FUNCTIONS CONT.

19 “Type of Compressor”

Sets the type of compressor that is connected to the unit.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Type of Compressor” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 1 Stage Stepped, 2 Stage Stepped, 3 Stage Stepped, 4 Stage Stepped,
1 Stage Stepped Var, 2 Stage Stepped Var, 3 Stage Stepped Var or 4
Stage Stepped Var,

PRESS “KNOB”

SELECTION COMPLETE.

20 “Compressor Number ID”

Sets the number of the compressor to be used for connection to a TempScan.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Compressor Number ID” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 1 TO 27

PRESS “KNOB”

SELECTION COMPLETE.

21 “High Alarm Temp'ture”

Sets the high alarm temperature for temperature sensors. Only sensors that are set to
“Connected” will be available for selection.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “High Alarm Temp'ture” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]
TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

PRESS “KNOB” CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS “KNOB”

ROTATE KNOB ▲ ▼ FOR -50.0 to +150.0 [Degrees C].

PRESS “KNOB”

SELECTION COMPLETE.

FUNCTIONS CONT.

22 “Warm Temp From High”

Sets the warning alarm temperature for temperature sensors that are from the high alarm set point. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"
 ROTATE KNOB ▲ ▼ TO SELECT "Warm Temp From High" on bottom line.
 PRESS "KNOB"
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]
 PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
 CONTINUE TO SELECT REQUIRED CHANNELS
 ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]
 PRESS "KNOB"
 ROTATE KNOB ▲ ▼ FOR 0.0 to +30.0 [Degrees C].
 PRESS "KNOB"
 SELECTION COMPLETE.

23 “Low Alarm Temp'ture”

Sets the low alarm temperature for temperature sensors. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"
 ROTATE KNOB ▲ ▼ TO SELECT "Low Alarm Temp'ture" on bottom line.
 PRESS "KNOB"
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]
 PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
 CONTINUE TO SELECT REQUIRED CHANNELS
 ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]
 PRESS "KNOB"
 ROTATE KNOB ▲ ▼ FOR -50.0 to +150.0 [Degrees C].
 PRESS "KNOB"
 SELECTION COMPLETE.

24 “Warm Temp Above Low”

Sets the warning alarm temperature for temperature sensors that are above the low alarm set point. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"
 ROTATE KNOB ▲ ▼ TO SELECT "Warm Temp Above ow" on bottom line.
 PRESS "KNOB"
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]
 PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
 CONTINUE TO SELECT REQUIRED CHANNELS
 ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]
 PRESS "KNOB"
 ROTATE KNOB ▲ ▼ FOR 0.0 to +30.0 [Degrees C].
 PRESS "KNOB"
 SELECTION COMPLETE.

FUNCTIONS CONT.

25 “Hi Temp Alarm Delay”

Sets the high alarm temperature delay for temperature sensors. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"
 ROTATE KNOB ▲ ▼ TO SELECT "Hi Temp Alarm Delay" on bottom line.
 PRESS "KNOB"
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]
 PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
 CONTINUE TO SELECT REQUIRED CHANNELS
 ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]
 PRESS "KNOB"
 ROTATE KNOB ▲ ▼ FOR 0 to 1800 [Seconds].
 PRESS "KNOB"
 SELECTION COMPLETE.

26 “Lo Temp Alarm Delay”

Sets the low alarm temperature delay for temperature sensors. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"
 ROTATE KNOB ▲ ▼ TO SELECT "Lo Temp alarm Delay" on bottom line.
 PRESS "KNOB"
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]
 PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
 CONTINUE TO SELECT REQUIRED CHANNELS
 ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]
 PRESS "KNOB"
 ROTATE KNOB ▲ ▼ FOR 0 to 1800 [Seconds].
 PRESS "KNOB"
 SELECTION COMPLETE.

27 “High Alarm Press KPA”

Sets the high alarm pressure inputs and 4-20ma inputs. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"
 ROTATE KNOB ▲ ▼ TO SELECT "High Alarm Press KPA" on bottom line.
 PRESS "KNOB"
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Suction Press etc.]
 PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
 CONTINUE TO SELECT REQUIRED CHANNELS
 ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]
 PRESS "KNOB"
 ROTATE KNOB ▲ ▼ FOR -100.0 to +4000 [Pressure KPA].
 PRESS "KNOB"
 SELECTION COMPLETE.

FUNCTIONS CONT.

28 “Warm Press From High”

Sets the warning alarm pressure for pressure sensors that are from the high alarm set point. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"
 ROTATE KNOB ▲ ▼ TO SELECT "Warm Press From High" on bottom line.
 PRESS "KNOB"
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE
 PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
 CONTINUE TO SELECT REQUIRED CHANNELS
 ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]
 PRESS "KNOB"
 ROTATE KNOB ▲ ▼ FOR 0 to 300 [KPA, PPM %].
 PRESS "KNOB"
 SELECTION COMPLETE.

29 “Low Alarm Press KPA”

Sets the low alarm pressure inputs and 4-20ma inputs. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"
 ROTATE KNOB ▲ ▼ TO SELECT "Low Alarm Press KPA" on bottom line.
 PRESS "KNOB"
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Suction Press etc.]
 PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
 CONTINUE TO SELECT REQUIRED CHANNELS
 ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]
 PRESS "KNOB"
 ROTATE KNOB ▲ ▼ FOR -100.0 to +4000 [Pressure KPA].
 PRESS "KNOB"
 SELECTION COMPLETE.

30 “Warm Press Above Low”

Sets the warning alarm pressure for pressure sensors that are above the low alarm set point. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"
 ROTATE KNOB ▲ ▼ TO SELECT "Warm Press Above Low" on bottom line.
 PRESS "KNOB"
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE
 PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
 CONTINUE TO SELECT REQUIRED CHANNELS
 ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]
 PRESS "KNOB"
 ROTATE KNOB ▲ ▼ FOR 0 to 300 [KPA, PPM %].
 PRESS "KNOB"
 SELECTION COMPLETE.

FUNCTIONS CONT.

31 “Hi Press Alarm Delay”

Sets the high alarm delay for pressure inputs and 4-20ma inputs. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Hi Press Alarm Delay" on bottom line.

PRESS "KNOB"

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Suction Press etc.]

PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS "KNOB"

ROTATE KNOB ▲ ▼ FOR 0 to 1800 [Seconds].

PRESS "KNOB"

SELECTION COMPLETE.

32 “Lo Press Alarm Delay”

Sets the low alarm delay for pressure inputs and 4-20ma inputs. Only sensors that are set to "Connected" will be available for selection.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Lo Press Alarm Delay" on bottom line.

PRESS "KNOB"

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Suction Press etc.]

PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS "KNOB"

ROTATE KNOB ▲ ▼ FOR 0 to 1800 [Seconds].

PRESS "KNOB"

SELECTION COMPLETE.

33 “Dig Temp's Connected”

Sets whether each digital type temperature sensor is connected or not. All digital sensors may be selected in this function.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Dig Temp's Connected" on bottom line.

PRESS "KNOB"

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]

PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS "KNOB"

SELECTION COMPLETE.

FUNCTIONS CONT.

34 “Analog Tmp Connected”

Sets whether each PT100 or AD590 (depending on which type is installed) type temperature sensor is connected or not. All PT100 or AD590 sensors may be selected in this function.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Analog Tmp Connected” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Analog Tmp 1 etc.]

PRESS “KNOB” TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS “KNOB”

SELECTION COMPLETE.

35 “Press's Connected”

Sets whether each pressure transducer (or any 4-20ma input) is connected or not. All 8 channels may be selected in this function.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Press's Connected” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Suction Press etc.]

PRESS “KNOB” TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS “KNOB”

SELECTION COMPLETE.

36 “Set 4-20 Input Span”

Sets the Low and High input span for pressure transducers and or the Refrigerant Transducer input and other 4-20ma inputs. Only sensors that are set to “Connected” will be available for selection.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Set 4-20 Input span” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Suction Press etc.]

PRESS “KNOB” TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS “KNOB”

ROTATE KNOB ▲ ▼ FOR -200 to 20000 [4-20ma Low].

PRESS “KNOB”

ROTATE KNOB ▲ ▼ FOR -200 to 20000 [4-20ma High].

PRESS “KNOB”

SELECTION COMPLETE.

FUNCTIONS CONT.

37 “Digital IN Connected”

Sets whether each digital input is connected or not. All 8 channels may be selected in this function.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Digital IN Connected” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Room Run Inpt etc.]

PRESS “KNOB” TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS “KNOB”

SELECTION COMPLETE.

38 “Digital IN Inverted”

Sets whether each digital input is inverted or not. The default is that a digital input is open off if not connected to ground and on if connected to ground. This function can reverse one or more to be the case. All 8 channels may be selected in this function.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Digital IN Inverted” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Remote Run etc.]

PRESS “KNOB” TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS “KNOB”

SELECTION COMPLETE.

39 “Temp Sen's Comp Ctrl”

Sets the temperature sensors that are used for compressor control if it is to be controlled on temperature. All sensors (both digital and PT100) that are set to “Connected” will be available for selection. If more than one sensor is selected, the average of the selected sensors will be used for the control temperature.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Temp Sen's Comp Ctrl” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]

PRESS “KNOB” TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS “KNOB”

SELECTION COMPLETE.

FUNCTIONS CONT.

40 “Temp Sen's Comp Suc”

Sets the temperature sensors that are used for the compressor suction line to calculate the super heat. All sensors (both digital and PT100) that are set to "Connected" will be available for selection. If more than one sensor is selected, the average of the selected sensors will be used for the compressors suction line temperature.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Temp Sen's Comp Suc" on bottom line.

PRESS "KNOB"

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]

PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS "KNOB"

SELECTION COMPLETE.

41 “Comp Tmp Sen Dis”

Sets the temperature sensors that are used for the compressor discharge line. All sensors (both digital and PT100) that are set to "Connected" will be available for selection. If more than one sensor is selected, the average of the selected sensors will be used for the compressors suction line temperature.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Comp Tmp Sen Dis" on bottom line.

PRESS "KNOB"

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]

PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS "KNOB"

SELECTION COMPLETE.

42 “Temp Sensors for Oil”

Sets the temperature sensors that are used for the compressor oil probe. All sensors (both digital and PT100) that are set to "Connected" will be available for selection. If more than one sensor is selected, the average of the selected sensors will be used for the oil temperature.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Temp Sensors for Oil" on bottom line.

PRESS "KNOB"

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]

PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS "KNOB"

SELECTION COMPLETE.

FUNCTIONS CONT.

43 “Sump Heat Set Point”

Sets the temperature for the sump heater control. This is only used when the compressor is off.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Sump Heat Set Point” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 0.0 to +50.0 °C

PRESS “KNOB”

SELECTION COMPLETE.

44 “Sump Heat Diff’tial”

Sets the temperature differential for the sump heater control.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Sump Heat Diff’tial” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 0.2 to +10.0 °C

PRESS “KNOB”

SELECTION COMPLETE.

45 “Set Data Logging”

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

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Set Data Logging” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR None (don't do), Every 1 Minute, Every 5 Minutes, Every 10 Minutes,
Every 30 Minutes, Every 1 Hour or Every 2 Hours.

PRESS “KNOB”

SELECTION COMPLETE.

FUNCTIONS CONT.

46 “Set Time & Date”

Sets the Real Time Clock

PRESS “KNOB”
 ROTATE KNOB ▲ ▼ TO SELECT “Set Time & Date” on bottom line.
 PRESS “KNOB”
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR THE HOURS (24 HOUR) [Hours]
 PRESS “KNOB”
 ROTATE KNOB ▲ ▼ FOR THE MINUTES [Minutes]
 PRESS “KNOB”
 ROTATE KNOB ▲ ▼ FOR THE SECONDS [Seconds]
 PRESS “KNOB”
 ROTATE KNOB ▲ ▼ FOR THE DAY [Day SUN = 1]
 PRESS “KNOB”
 ROTATE KNOB ▲ ▼ FOR THE DATE [Date]
 PRESS “KNOB”
 ROTATE KNOB ▲ ▼ FOR THE MONTH [Month]
 PRESS “KNOB”
 ROTATE KNOB ▲ ▼ FOR THE YEAR [Year]
 PRESS “KNOB”
 ROTATE KNOB ▲ ▼ FOR THE CENTURY [Century]
 PRESS “KNOB”
 SELECTION COMPLETE.

47 “Password YES/NO”

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

PRESS “KNOB”
 ROTATE KNOB ▲ ▼ TO SELECT “Password YES/NO” on bottom line.
 PRESS “KNOB”
 ENTER PASSWORD IF REQUIRED
 ROTATE KNOB ▲ ▼ FOR YES or NO [Password].
 PRESS “KNOB”
 SELECTION COMPLETE.

FUNCTIONS CONT.

48 “Change Password”

Sets the Password of a number from 0000 to 5999. If the password was not active when this function is selected, the password will be required. If the wrong password is entered, the display will indicate this. You can try again or press the x50 button to revert to normal running.

PRESS “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “Change Password” on bottom line.
PRESS “KNOB”
ROTATE KNOB ▲ ▼ FOR 1 to 5 [Password].
PRESS “KNOB”
ROTATE KNOB ▲ ▼ FOR 1 to 9 [Password].
PRESS “KNOB”
ROTATE KNOB ▲ ▼ FOR 1 to 9 [Password].
PRESS “KNOB”
ROTATE KNOB ▲ ▼ FOR 1 to 9 [Password].
PRESS “KNOB”
ROTATE KNOB ▲ ▼ FOR 0 to 5999 [Password].
PRESS “KNOB”
SELECTION COMPLETE.

49 “Ram Memory Check”

For Testing the RAM and EEPROM 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 20 seconds. This function should not be used unless by an authorized technician.

PRESS “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “Ram Memory Check” on bottom line.
ENTER PASSWORD IF REQUIRED
PRESS AND HOLD “KNOB” UNTIL “Done Press ENTER” is displayed on the bottom line.
RELEASE “KNOB”
PRESS “KNOB”
SELECTION COMPLETE.

50 “Test Display/Rst Log”

Displays the model number and version number and resets the data logged to nothing logged.

PRESS “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “Test Display/Rst Log” on bottom line.
ENTER PASSWORD IF REQUIRED
PRESS “KNOB” “Done Press ENTER” is displayed on the bottom line.
PRESS “KNOB”
SELECTION COMPLETE.

FUNCTIONS CONT.

51 “Set Dig Temp Offset”

Sets an offset into non volatile ram for any or all digital temperature sensors. This is required if the temperature reading is wrong. To check the accuracy of the sensors, place them into an ice bath (0.0 oC) and check the reading. If the sensor does not read 0.0 oC, the amount of discrepancy can be entered so that the sensor will read accurately at 0.0 oC. Only sensors that are set to "Connected" will be available for selection

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Set Dig Temp Offset" on bottom line.

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]

PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS "KNOB"

ROTATE KNOB ▲ ▼ FOR -20.0 TO +20.0 oC [Degrees C]

SELECTION COMPLETE.

52 “Set Analog Tm Offset”

Sets an offset into non volatile ram for any or all PT100 or AD590 (depending on which temperature sensor has been installed) temperature sensors. This is required if the temperature reading is wrong. To check the accuracy of the sensors, place them into an ice bath (0.0 oC) and check the reading. If the sensor does not read 0.0 oC, the amount of discrepancy can be entered so that the sensor will read accurately at 0.0 oC. Only sensors that are set to "Connected" will be available for selection

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Set Analog Tm Offset" on bottom line.

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Analog Tmp 1 etc.]

PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS "KNOB"

ROTATE KNOB ▲ ▼ FOR -20.0 TO +20.0 oC [Degrees C]

SELECTION COMPLETE.

FUNCTIONS CONT.

53 “Add Dig Temp Sensor”

All digital temperature sensors have a unique serial number embedded within the sensor. To add a sensor or replace an existing sensor, do the following. Remove all currently connected sensors (hard wired). Place the new sensor into the correct terminals and do the following. If more than one sensor channel is selected the display will indicate this and jump out of the function. All sensor numbers are available to select from in this function.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Add Dig Temp Sensor” on bottom line.

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNEL TO ADD SENSOR ON TO [Dig Temp 1 etc.]

PRESS “KNOB” TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]
CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS “KNOB” MAKE SURE SENSOR IS CONNECTED CORRECTLY.

PRESS “KNOB” THE SENSORS SERIAL NUMBER WILL BE DISPLAYED ON THE BOTTOM LINE.

IF THE ACCESS TO THE SENSOR FAILED THE DISPLAY WILL INDICATE THIS. CHECK CONNECTIONS AND REPLACE THE SENSOR AND TRY AGAIN.

PRESS “KNOB” ENTERS THE SERIAL NUMBER INTO NON VOLATILE RAM

PRESS “KNOB”

SELECTION COMPLETE.

54 “Set RS485/232 Baud”

Sets the Baud Rate of the RS485 and RS232 Ports. The Stop bit is set to 1 and the Parity is set OFF automatically. This should be 9600 if connected to a computer.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Set RS485/232 Baud” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 110, 300, 1200, 2400, 4800 or 9600 [Baud Rate].

PRESS “KNOB”

SELECTION COMPLETE.

55 “Display Brightness”

Sets the brightness of the displays back light. 0 = off and 255 = full on.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Display Brightness” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 0 to 255.

PRESS “KNOB”

SELECTION COMPLETE.

FUNCTIONS CONT.

56 “Number of Resets S/N”

Displays the number of times the unit was reset (power failures) and the serial number of the unit. After this function the number of resets counter is set to 0.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Number of Resets S/N” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

PRESS “KNOB”

Done Press ENTER on the bottom line

PRESS “KNOB”

SELECTION COMPLETE.

57 “TempScan Connected”

Sets whether a TempScan is connected for control. The compressor can be connected to a TempScan or not. If the compressor is connected to a TempScan, all controls for the compressor except oil return and inter cooler are controlled by the TempScan.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “TempScan Connected” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

PRESS “KNOB”

FOR “Single Stand Alone”, “TempScan 2 Wire Ctl”,
“TempScan 4 Wire Ctl” or “TempScan 2&4 WireCtl”

PRESS “KNOB”

SELECTION COMPLETE.

58 “Reset Comp'sor Hours”

Sets the compressor run hours to 0.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “Reset Comp'sor Hours” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

PRESS “KNOB”

Done Press ENTER on the bottom line

PRESS “KNOB”

SELECTION COMPLETE.

59 “4-20 Weight Average”

Sets the amount of averaging to do on the 4-20ma input channels. The higher the number the smoother the value displayed.

PRESS “KNOB”

ROTATE KNOB ▲ ▼ TO SELECT “4-20 Weight Average” on bottom line.

PRESS “KNOB”

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR 0 to 10 [Pressure KPA].

PRESS “KNOB”

SELECTION COMPLETE.

FUNCTIONS CONT.

60 “High Current Alarm”

Sets the high current alarm for the compressor motor. The alarm is not used if the motor is off and there is a 10 second delay before the alarm can be activated.

PRESS “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “High Current alarm” on bottom line.
PRESS “KNOB”
ENTER PASSWORD IF REQUIRED
ROTATE KNOB ▲ ▼ FOR 0 to 2000 [AMPS]
PRESS “KNOB”
SELECTION COMPLETE.

61 “Type of Refrigerant”

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 “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “Type of Refrigerant” on bottom line.
PRESS “KNOB”
ENTER PASSWORD IF REQUIRED
ROTATE KNOB ▲ ▼ FOR THE TYPE OF REFRIGERANT OR Not Used
PRESS “KNOB”
SELECTION COMPLETE.

62 “Computer Connected”

Sets whether a computer is connected to the unit. If a computer is connected and 4 wire communications to a TempScan is also connected with other modules (CompScans etc.) are also connected, the 4 wire communications from the TempScan cannot be done while this unit is set to “Yes” for computer connected.

PRESS “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “Computer Connected” on bottom line.
PRESS “KNOB”
ENTER PASSWORD IF REQUIRED
ROTATE KNOB ▲ ▼ FOR Yes or No.
PRESS “KNOB”
SELECTION COMPLETE.

63 “LED Display Intens'y”

Sets the brightness of the LED display from 0 = Dull and 15 = full on. This is an optional extra module that can be fitted to the unit.

PRESS “KNOB”
ROTATE KNOB ▲ ▼ TO SELECT “LED Display Intens'y” on bottom line.
PRESS “KNOB”
ENTER PASSWORD IF REQUIRED
ROTATE KNOB ▲ ▼ FOR 0 to 15.
PRESS “KNOB”
SELECTION COMPLETE.

FUNCTIONS CONT.

64 “Reset Password”

Resets the password to 888. The x 50 must be pressed while this is done for the last "KNOB" push. If the x50 switch is not pressed the display will indicate that resetting the password is not allowed. If the x50 switch is pressed the display will indicate that the password was reset to 888.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Reset Password" on bottom line.

PRESS "KNOB" **WITH THE X50 SWITCH PRESSED.**

PRESS "KNOB"

SELECTION COMPLETE.

65 “Display Annunciation”

Sets whether to display the temperature annunciations when displaying the temperatures. Instead of displaying "Dig Temp 1" it will display the control or indication of that temperature sensor i.e. "Room Cntl". If more than 1 sensor is allocated to a control or indication, it will show that by displaying the control or indication for all sensors allocated to that control or indication.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Display Annunciation" on bottom line.

PRESS "KNOB"

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR YES or NO.

PRESS "KNOB"

SELECTION COMPLETE.

66 “Oil Pres Calculation”

Sets whether to display the actual oil press using the formula of the oil press minus (-) the first stage suction pressure or the oil pressure minus (-) the intermediate stage pressure.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Oil Pres Calculation" on bottom line.

PRESS "KNOB"

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR Oil - 1st Stage Suc or Oil - Interm't Stage.

PRESS "KNOB"

SELECTION COMPLETE.

FUNCTIONS CONT.

67 “Temp Sen for Intermd”

Sets the temperature sensors that are used for the compressor intermediate probe. All sensors (both digital and analog) that are set to "Connected" will be available for selection. If more than one sensor is selected, the average of the selected sensors will be used for the intermediate temperature.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Temp Sen for Intermd" on bottom line.

PRESS "KNOB"

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING CHANNELS TO CHECK/CHANGE [Dig Temp 1 etc.]

PRESS "KNOB" TO SELECT OR NOT TO SELECT SELECTED CHANNEL [YES NO]

CONTINUE TO SELECT REQUIRED CHANNELS

ROTATE KNOB ▲ ▼ TO DISPLAY -----> [Continue Next]

PRESS "KNOB"

SELECTION COMPLETE.

67 “Analog PT100 / AD590”

Sets the temperature sensors that are used for the analog (1 to 7) to be either PT100 or AD590 temperature sensors.

PRESS "KNOB"

ROTATE KNOB ▲ ▼ TO SELECT "Analog PT100 / AD590" on bottom line.

PRESS "KNOB"

ENTER PASSWORD IF REQUIRED

ROTATE KNOB ▲ ▼ FOR SELECTING PT100 or AD590 Temperature sensors

PRESS "KNOB"

SELECTION COMPLETE.

STARTUP 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.

Remove the power from the unit. Press and hold the x50 button and with the knob pressed, apply power to the unit and all set points will be set to a default value and the real time clock will be started with a valid time. The display will indicate that a reset was preformed.

The temperature offset values will not be changed. The temperature offset values can be changed to 0 using there set points. This should not be required unless the temperature offset values were lost. If they were lost, re calibration of the temperature sensors will have to be done or if the temperature offset values were saved (written down manually) they can be re entered using there set points.

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

SET POINTS CRC:- CYCLIC REDUNDANCY CHECK & LIMP HOME.

A CRC check is done on all set points each minute and if the set points become corrupt for any reason the saved set points will be loaded into all set points for the system to use these set points.

Set points are automatically saved each time any set point is changed.

If the CRC check is not correct and the saved set values have been loaded into the set points to use, The Display will indicate this with the "-" between the minutes and seconds on the real time clock showing "->" (right pointing arrow). The unit will continue to run as normal.

Press the "x50" button to revert to normal displays noting that the set points have been re loaded and should be checked to make sure all set points are the required values.

VERSION NUMBER.

THIS IS DISPLAYED WHEN "TEST DISPLAY/RST LOG" FUNCTION IS EXECUTED. THE LCD WILL DISPLAY THE COPY RIGHT INFORMATION AND THE MODEL NUMBER AND SOFTWARE VERSION. ALSO THE MODEL NUMBER AND VERSION NUMBER IS DISPLAYED ON THE LAST PAGE OF THE NORMAL RUN DISPLAY PAGES.

DEFAULT VALUES.

1	"Control Auto or OFF"	AUTO	
2	"Compressor Set Point"	200	KPA
3	"Compressor Diff'tial"	40	KPA
4	"Comp Slow Load Time"	60	SECONDS
5	"Fast Load Set Point"	300	KPA
6	"Comp Fast Load Time"	20	SECONDS
7	"Comp'or Unload Time"	30	SECONDS
8	"Pump Down set Point"	120	KPA
9	"Cmp Start/Start Time"	15	MINUTES
10	"Comp Equalizer Sol'd"	0	SECONDS
11	"Oil Return Interval"	60	MINUTES
12	"Comp Stages Inverted"	NO	
13	"Hard Piped Stages Nu"	1	
14	"Comp cntl PRESS-TEMP"	PRESSURE	
15	"Comp Stg Dly YesNo"	NO	
16	"Compre'r Step Amount"	5	%
17	"Compressor Min % Run"	20, 50, 60, 75	%
18	"Comp Proportional Ct"	0	
19	"Type of Compressor"	1	STAGE STEPPED
20	"Compressor Number ID"	1	
21	"High Alarm Temp're"	ALL +150.0	oC
22	"Warn Temp From High"	ALL +5.0	oC.
23	"Low Alarm Temp're"	ALL -50.0	oC
24	"Warn Temp Above Low"	ALL +5.0	oC.
25	"Hi Temp Alarm Delay"	ALL 1800	
26	"Low Temp Alarm Delay"	ALL 1800	
27	"High Alarm Press KPA"	ALL 3000	KPA
28	"Warn Press From High"	ALL 30	KPA
29	"Low Alarm Press KPA"	ALL -100	KPA
30	"Warn Press Above Low"	ALL 30	KPA
31	"Hi Press Alarm Delay"	ALL 1800	SECONDS
32	"Lo Press Alarm Delay"	ALL 1800	SECONDS
33	"Dig Temp's Connected"	ALL CONNECTED	
34	"Analog Tmp Connected"	ALL NOT CONNECTED	
35	"Press's Connected"	FIRST 4 CONNECTED, REST NOT	
36	"Set 4-20 Input Span"	AMPS 0 TO 500, HUMIDITY 0 TO 100 REST ALL 0 TO 3000	%

DEFAULT VALUES.**DEFAULT VALUES CONT:-**

37	"Digital IN Connected"	REMOTE RUN CONNECTED COND WATER LEVEL CONNECTED REST NOT CONNECTED
38	"Digital IN Inverted"	NONE
39	"Temp Sen's Comp Ctrl"	Dig Temp Number 1
40	"Temp Sen's Comp Suc"	Dig Temp Number 2
41	"Comp Tmp Sen for Dis"	Dig Temp Number 6
42	"Temp Sensors for Oil"	Dig Temp Number 5
43	"Sump Heat et Point"	40.0 oC
44	"Sump Heat Diff'tial"	1.0 oC
45	"Set Data Logging"	EVERY 1 MIUTE
46	"Set Time & Date"	VALID TIME AND DATE
47	"Password YES/NO"	NO
48	"Change Password"	
49	"Ram Memory Check"	
50	"Test Display/Rst log"	
51	"Set Dig Temp Offset"	ALL 0.0 oC
52	"Set PT100 Tmp Offset"	ALL 0.0 oC
53	"Add Dig Temp Sensor"	
54	"Set RS485/232 Baud"	9600
55	"Display Brightness"	255
56	"Number of Resets S/N"	
57	"TempScan Connected"	SINGLE STAND ALONE
58	"Reset Comp'sor Hours"	0
59	"4-20 Weight Average"	1
60	"High Current Alarm"	300 AMPS
61	"Type of refrigerant"	NONE (NOT USED)
62	"Computer Connected"	NO
63	"LED Display Intens'y"	15
64	"Reset Password"	0888
65	"Display Annunciation"	NO
66	"Oil Pres Calculation"	Oil - 1st Stage Suc
67	"Analog PT100 / AD590"	PT100

SPECIFICATIONS A-32-R

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

TEMPERATURE INPUTS

<i>(Digital)</i>	:-	18B20 temperature sensor
<i>(Analog)</i>	:-	PT100 or AD590 temperature sensor.
MAX TEMPERATURE INPUTS	:-	17
4-20ma INPUTS SUPPLY	:-	12V DC
MAX 4-20ma INPUTS	:-	8
4-20ma RANGE	:-	-200 KPA/PPM to +3000 KPA/PPM
4-20ma OUTPUTS	:-	1
4-20ma OUTPUTS POWER	:-	Loop powered 12 - 36 V dc.
DIGITAL INPUTS	:-	8
LCD DISPLAY	:-	4 line x 20 character super twist.
KEYBOARD SETTING	:-	Spin up/down and push and x50 button
RESOLUTION <i>(temperature)</i>	:-	0.1 oC.
REPEATABILITY <i>(temperature)</i>	:-	0.2 oC.
RANGE		
<i>(Digital)</i>	:-	-25.0 - +125.0 Degrees C
<i>(Analog)</i>	:-	-50.0 - + 150.0 Degrees C
ACCURACY AD590 oC	:-	+/-0.5% -30.0 - +130.0
<i>(Digital)</i>	:-	+ - 0.5 Degrees C
<i>(Analog)</i>	:-	User select
ALL MEMORY BACKUP	:-	1 year minimum.
ALARM SET POINT RANGE		
<i>(HIGH & LOW)</i>	:-	-50.0 oC to +150.0 oC.
ALARMS SET POINT		
RESOLUTION	:-	0.1 oC.
ALARM DELAY SET RANGE		
<i>(HI & LO)</i>	:-	0 - 1800 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 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	:-	220 loggs.
PASSWORD	:-	0000-5999 (<i>may be active or not active</i>).
Compressor Number ID.	:-	set between 1 and 27 inclusive.
RS 232 PORT (FULL DUPLEX)	:-	4 pin push in connector, maximum distance allowed, 6 meters.
RS 485 PORT (FULL DUPLEX)	:-	4 x, terminals. Maximum distance allowed, 500 meters
BAUD RATE	:-	110, 300, 1200, 2400, 4800, 9600.
STOP BITS	:-	1. (<i>fixed</i>),
PARITY	:-	none (<i>fixed</i>).
COMPUTER COMMUNICATIONS	:-	Most functions are available via computer & RS232.
CONTROL SERIAL (TO TempScan)	:-	2 wire. maximum distance 500 metres. (<i>coax twisted pair</i>).
CONTROL SERIAL (TO TempScan)	:-	4 wire. maximum distance 500 metres. (<i>RS485 coax twisted 2 pair</i>).
CONTROL OUTPUTS	:-	9 Rating, 24v AC 5AMP total over the 11 Outputs voltage free.
POWER SUPPLY	:-	24 V dc +/- 10%
MOUNTING	:-	DIN Rail Mount
SIZE	:-	L 160mm x W 100mm x 80mm.