

Mercury 2 Compressor Supervisor Installation Guide



**For Product: -
PR0710-COM**



Ensure that all power is switched off before installing or maintaining this product

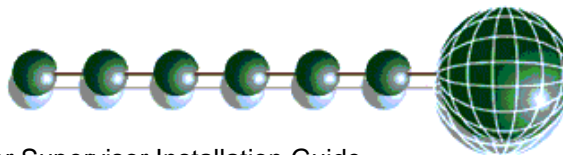


Table of Contents:

THE MERCURY 2 RANGE 3

Description 3

Configuration 3

Networks..... 3

Front Panel Features 4

 LED's: - 4

 Valve..... 4

 Fans..... 4

 Alarm 4

 HACCP 4

Connections 5

Input/Output Allocation Tables 6

 Type 1 - Part Wind Controller 6

 Type 2 - Pole Controller 6

 Type 3 - Direct on Line..... 7

Relay State and functional operation 7

Setting up the controller 8

 Set-up Mode..... 8

 Set-up through front buttons 8

 Set-up Function Menu..... 8

Recommended set-up method 9

 rtc. Real time clock (This will automatically synchronise on network systems) 9

 type. Set/view controller type 9

 PArA. Set/view parameters (This can be achieved at the network front end) 9

Parameter Tables:..... 10

 Parameter table for Compressor Supervisor Part Wind controller (Type 1) 10

 Parameter table for Compressor Supervisor Pole controller (Type 2)..... 10

 Parameter table for Compressor Supervisor Direct on Line controller (Type 3) 11

Probe Offset 11

Network Configuration 12

 485 Legacy module..... 12

 IP Futura module..... 13

 IP-L 13

 IP-r..... 13

Viewing 14

 Input/Output table for Direct on Line Controller 14

 Input/Output table for Pole Controller 14

 Input/Output table for Part Wind Controller..... 15

Manual Reset..... 15

Display Messages..... 16

Network Alarms 16

Specification 17

 General 17

 Power requirements: 17

 Relays 17

 Warning: 17

 Inputs: 18

Installation:..... 18

 Panel Cut-out: 18

 Fixing:..... 18

 Clearances: 18

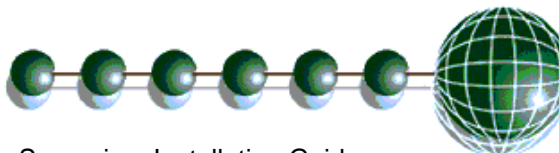
 Fuse: 18

 Cleaning: 18

Disclaimer..... 19



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The Mercury 2 Range

From Resource Data Management

This documentation refers to the Compressor Supervisor Controller

Description

The Mercury Compressor Supervisor controller is a monitoring device for compressors.

The Mercury Compressor Supervisor supports PT1000 probes only.

Configuration

The controller is delivered pre-configured as a Part Wind controller. (Type 1)

The controller gives three configuration options: - (see [set-up](#) for changing the type)

Display value	Type
1	Part Wind Controller
2	Pole Controller
3	Direct on Line

Networks

The controllers are capable of connecting to either a TCP/IP local area network or a RS485 network or controlling in standalone mode with no network output.

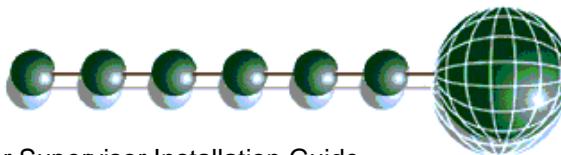
To connect to a network you must add the correct communications module.

- 485 Legacy module (Part No PR0026)
- IP Futura module (Part No PR0016)
- Mercury Hub (Part No. PR0018 or PR0018-PHI)

Connecting to either of these communication modules will automatically be detected on power up and this will affect the set up screens made available to you.



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Front Panel Features

LED's: -

Valve
(Control Enable)



Fans
(Fans Relay)



Lights
(Not Used)



Defrost
(Not Used)



On-Line



- Off No network attached
- Flashing Attempting to Log on to network
- Steady On-line

Service
(Not Used)



Alarm
(Alarm Relay)



HACCP
(Remote Command)



Keys

Enter



Up



Down



Defrost



Note: Function keys illuminate when pressed, illumination is turned off 20 seconds after the key is used. Press and hold the defrost button to force a manual defrost

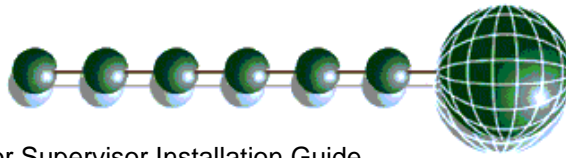
Main Display



4 character blue LED display, used to display Time and status information

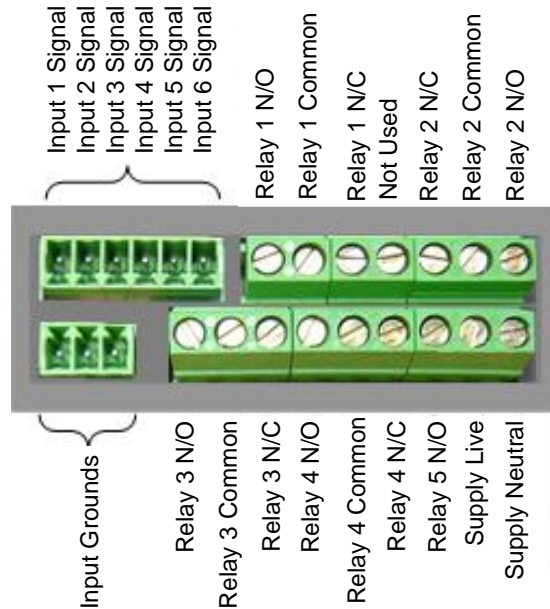


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Connections

All connections are made to the back of the controller. The diagram below shows the connection detail. Inputs and outputs are assigned according to the chosen configuration. See [Specification](#) for further details on connections.

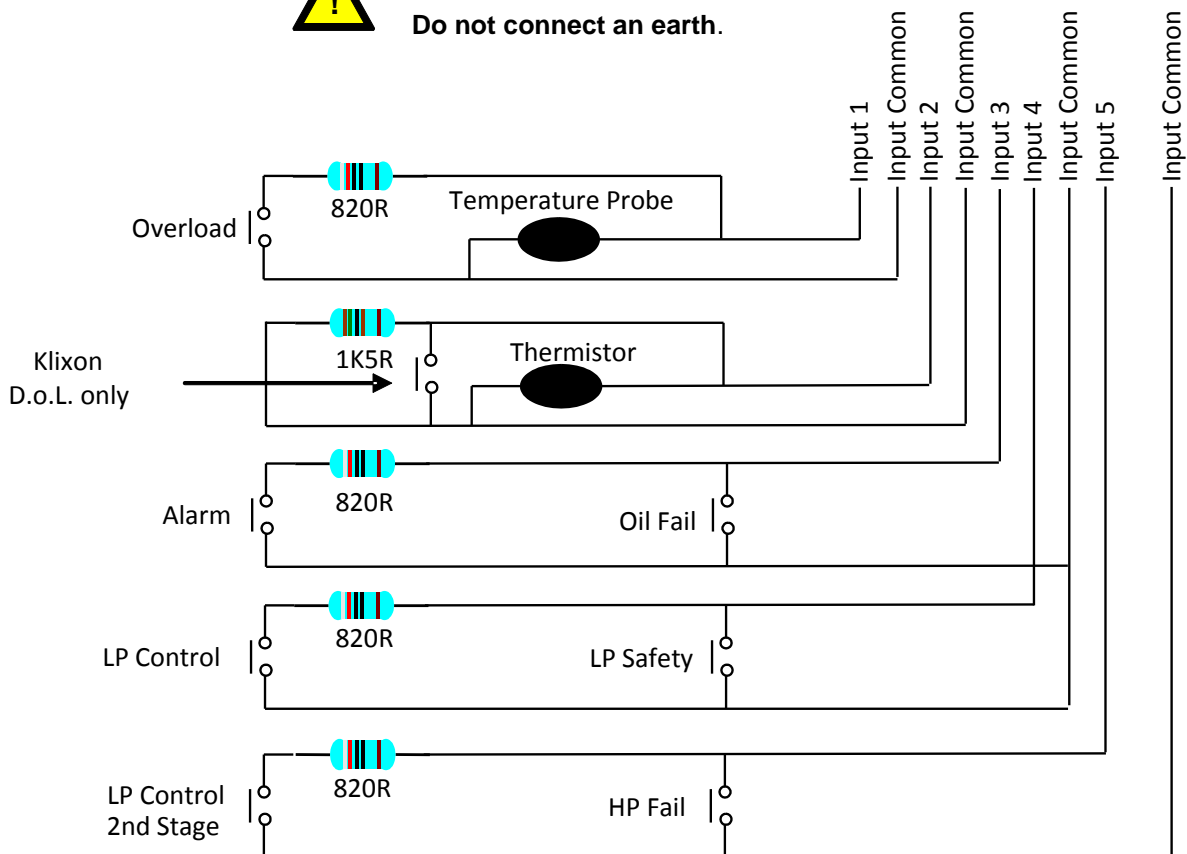


Note:

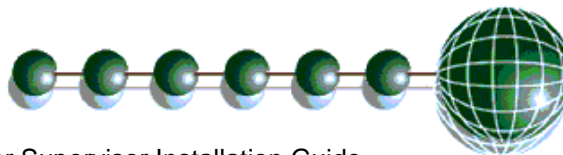
Suitable mechanical restraints on the wiring to the controller may be required; dependant on cable types, to prevent undue stress or distortion on the controller connectors.



Do not connect an earth.



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Input/Output Allocation Tables

Type 1 - Part Wind Controller

Input	Description	(Switched Resistor)*
Input 1	Temperature Probe (PT1000)	Overload
Input 2	Thermistor	Not Used
Input 3	Oil Fail ***	Alarm
Input 4	LP Safety ***	LP Control
Input 5	HP Fail ***	LP Control 2nd stage
Input 6	Not Used	Not Used
Relay 1	Alarm **	
Relay 2	Fans	
Relay 3	1 st Stage	
Relay 4	2 nd Stage	
Relay 5	Not Used	

* For PT1000 probes use 820 Ohm

** The alarm relay is de-energised for no alarm. Use the NC and Common for “Loop break” on alarm or use the NO and Common for “Loop make” on alarm.

*** 0 volt return to activate

Type 2 - Pole Controller

Input	Description	(Switched Resistor)*
Input 1	Temperature Probe (PT1000)	Overload
Input 2	Thermistor	Not Used
Input 3	Oil Fail ***	Alarm
Input 4	LP Safety ***	LP Control
Input 5	HP Fail ***	LP Control 2nd stage
Input 6	Not Used	Not Used
Relay 1	Alarm **	
Relay 2	Fans	
Relay 3	Low Speed	
Relay 4	High Speed	
Relay 5	Not Used	

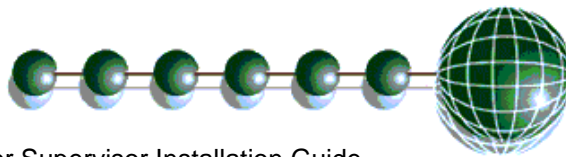
* For PT1000 probes use 820 Ohm

** The alarm relay is de-energised for no alarm. Use the NC and Common for “Loop break” on alarm or use the NO and Common for “Loop make” on alarm.

*** 0 volt return to activate



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Type 3 - Direct on Line

Input	Description	(Switched Resistor)*
Input 1	Temperature Probe (PT1000)	Overload
Input 2	Thermistor (or Klixon)	Not Used
Input 3	Oil Fail ***	Alarm
Input 4	LP Safety ***	LP Control
Input 5	HP Fail ***	LP Control 2nd stage
Input 6	Not Used	Not Used
Relay 1	Alarm	
Relay 2	Fans	
Relay 3	Compressor	
Relay 4	Not Used	
Relay 5	Not Used	

* For PT1000 probes use 820 Ohm

** The alarm relay is de-energised for no alarm. Use the NC and Common for “Loop break” on alarm or use the NO and Common for “Loop make” on alarm.

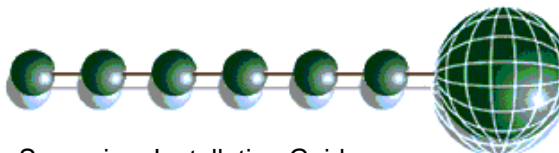
*** 0 volt return to activate

Relay State and functional operation

Relay State:	Function State	Wired contact
Relay 1 off	Alarm Relay = Alarm	N/C
Relay 1 on	Alarm Relay = Ok	N/C
Relay 2 off	Fans = Off	N/O
Relay 2 on	Fans = On	N/O
Relay 3 off	1 st Stage/Low Speed/Comp Off	N/O
Relay 3 on	1 st Stage/Low Speed/Comp On	N/O
Relay 4 off	2 nd Stage/High Speed Off	N/O
Relay 4 on	2 nd Stage/High Speed On	N/O



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Setting up the controller

Access to the controller can be achieved several ways

- Through the front mounted buttons
- Direct access by PC or palm top into the rear comms port. This requires a software package available on the RDM website
- Through legacy front end panels on 485 networks
- Through the RDM Data Director or Data Manager.

Set-up Mode

Set-up through front buttons



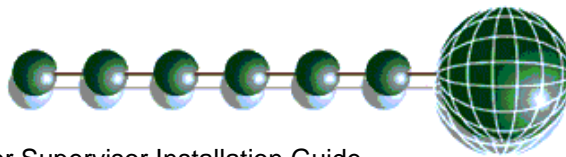
To enter set-up mode, hold the Enter and Down buttons together for approximately 3 seconds until the message “Ent” appears on the display. Now press the Enter button again to enter the function menu. IO will be displayed. Scroll up or down to go through the list.

Set-up Function Menu

Display	Option	Explained in Paragraph
IO	View Inputs / Outputs and States	IO
PArA	Set/View Parameters	PArA
tyPE	View Controller Type	tyPE
rtc	Set/view Clock (rtc = Real Time Clock)	rtc
nEt	Set/view network configuration	nEt
SoFt	View software version	
OFSt	Probe 1 Offset	Probe Offset



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Recommended set-up method

If you are not connecting to a network and want to set up the controller through the buttons we recommend you use the following order from the function menu.

rtc. Real time clock (This will automatically synchronise on network systems)

- a. Use the up or down buttons to scroll through the display until the display reads “rtc”
- b. Press enter. The display will show “t-1”. press enter again
- c. Scroll hours up or down (0 – 23) press enter
- d. Use up button to select “t-2”, press enter
- e. Scroll minutes up or down (0 – 59) press enter
- f. Repeat for t-3 (seconds 0 – 59)
- g. Repeat for t -4 (Days up to 31)
- h. Repeat for t -5 (months up to 12)
- i. Repeat for t -6 (Year up to 99)
- j. Use up button to display “ESC”, press enter to display “rtc”

Time clock is now set

type. Set/view controller type

- a. From the function menu scroll to select type, press enter
- b. Use the up/down buttons to scroll through Compressor Supervisor configuration types. (see configuration table)
- c. Press enter.
- d. Scroll to select “ESC”
- e. Press enter

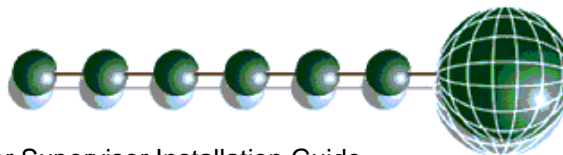
Controller type configuration is now set

PArA. Set/view parameters (This can be achieved at the network front end)

- a. From the function menu scroll to select PArA
- b. Pressing Enter while PArA is displayed will enter the parameter menu. The first parameter option will be displayed as P-01. Pressing the Up or Down button will present the other parameter options P-02, P-03 etc. See the parameter list below to find what parameter number corresponds to which actual parameter. Pressing the Enter button will show the current value of the selected parameter. Press Up or Down to modify the value and press Enter again to save the value. The parameter list number will be displayed again. Two other options are present in the parameter menu – dFLt and ESC. Selecting ESC will exit setup mode. Selecting dFLt will reset all parameters back to the default values for the current type of controller.



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Parameter Tables:

Parameter table for Compressor Supervisor Part Wind controller (Type 1)

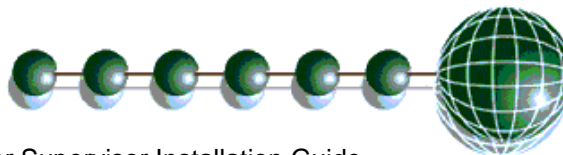
Number	Parameter	Range	Step	Units	Default
P-01	Power On Delay	00:00 to 01:00	00:01	mm:ss	00:05
P-02	Starts Per Hour	6 to 60	1		10
P-03	Oil Comp Type	0 (Reciprocal), 1 (Scroll)			0
P-04	Oil Alarm	0 (Off), 1 (On)			1
P-05	Oil Alarm Delay	00:05 to 02:15	00:01	mm:ss	00:45
P-06	Part Wind Delay	0.5 to 1.1	0.1	sec	0.9
P-07	Therm. Reset	0 (Manual), 1 (Auto)			0
P-08	Probe Option	0 (Off), 1 (Logging), 2 (Control)			2
P-09	Log Probe Alm	-50 to 100	0.1	Deg	0.0
P-10	Log Probe Diff	1 to 25	0.1	Deg	2
P-11	Log Probe Alm Dly	00:00 to 02:00	00:01	hh:mm	00:15
P-12	Temp Set Point	-10 to 80	0.1	Deg	0
P-13	Temp Diff	1 to 25	0.1	Deg	10
P-14	BST Change Over	0 (Off), 1 (On)			1

Parameter table for Compressor Supervisor Pole controller (Type 2)

Number	Parameter	Range	Step	Units	Default
P-01	Power On Delay	00:00 to 01:00	00:01	mm:ss	00:05
P-02	Starts Per Hour	6 to 60	1		10
P-03	Oil Comp Type	0 (Reciprocal), 1 (Scroll)			0
P-04	Oil Alarm	0 (Off), 1 (On)			1
P-05	Oil Alarm Delay	00:05 to 02:15	00:01	mm:ss	00:45
P-07	Therm. Reset	0 (Manual), 1 (Auto)			0
P-08	Probe Option	0 (Off), 1 (Logging), 2 (Control)			2
P-09	Log Probe Alm	-50 to 100	0.1	Deg	0.0
P-10	Log Probe Diff	1 to 25	0.1	Deg	2
P-11	Log Probe Alm Dly	00:00 to 02:00	00:01	hh:mm	00:15
P-12	Temp Set Point	-10 to 80	0.1	Deg	0
P-13	Temp Diff	1 to 25	0.1	Deg	10
P-14	BST Change Over	0 (Off), 1 (On)			1



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Parameter table for Compressor Supervisor Direct on Line controller (Type 3)

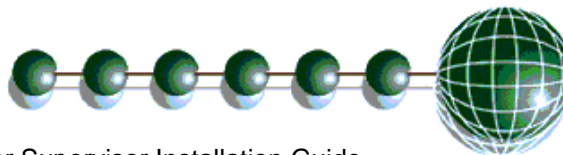
Number	Parameter	Range	Step	Units	Default
P-01	Power On Delay	00:00 to 01:00	00:01	mm:ss	00:05
P-02	Starts Per Hour	6 to 60	1		10
P-03	Oil Comp Type	0 (Reciprocal), 1 (Scroll)			0
P-04	Oil Alarm	0 (Off), 1 (On)			1
P-05	Oil Alarm Delay	00:05 to 02:15	00:01	mm:ss	00:45
P-08	Probe Option	0 (Off), 1 (Logging), 2 (Control)			2
P-09	Log Probe Alm	-50 to 100	0.1	Deg	0.0
P-10	Log Probe Diff	1 to 25	0.1	Deg	2
P-11	Log Probe Alm Dly	00:00 to 02:00	00:01	hh:mm	00:15
P-12	Temp Set Point	-10 to 80	0.1	Deg	0
P-13	Temp Diff	1 to 25	0.1	Deg	10
P-14	BST Change Over	0 (Off), 1 (On)			1

Probe Offset

This feature allows probe 1 value to be modified by an "offset". Offset values are from -10°C (-18°F) to +10°C (+18°F). When viewing probe offset through the controller display C-01 = Probe 1.



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Network Configuration

The final section to set-up is the network address. In all instances, this must be done before the controller is plugged into the site network. The controllers have an auto-initialise function, which will automatically log the device onto the site network. If the wrong address has been entered onto the network, you will have to reset the controller address by setting the address to 00-0, and then re-enter the correct address. (You may have to deregister the wrong address from the home system as well).

To set the controller onto a network you must first connect the controller to a communications module. This is either a: -

- 485 Legacy, or
- IP Futura

485 Legacy module

- This product supports Genus compatible network protocol

Connecting a 485 legacy module to the controller will determine which set up screens are made available. Note: °F values are not supported on a RS485 network system.

Display	Option
485t	485 Network Type
485A	485 Address/Name
gAdd	Show underlying network address assigned to controller
rLog	Re-log the controller back onto the network
CLrA	Clear the address/name from the controller
ESC	Exit network menu. N.B. this option must be selected to save any changes made in this menu

The 485A option shows a value representing either the name of the controller in a Genus compatible network. If the controller is set for Genus compatible then the value shown is of the form 05-6. This means the controller would try to log onto a Genus compatible network using the name 'RC05-6'.

The following options are only available when the network type is set to Genus compatible.

The gAdd option displays (in hexadecimal format) the underlying network address assigned to the controller when it was logged onto the network.

The rLog option allows the controller to be logged back onto the network with its current name. The 'rLog' message will flash for confirmation. Press the Enter button to execute the command, Up or Down buttons to cancel.

Fast Network Address Reset

The CLrA option will clear out the network address and name in the controller. The 'ClrA' message will flash for confirmation. Press the Enter button to execute the command, Up or Down buttons to cancel.

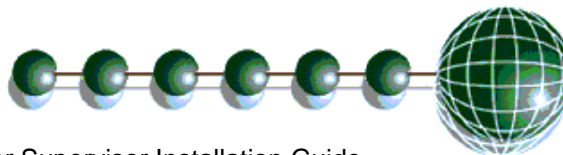
To enter this mode, hold the Enter, Up and Down buttons together for approximately 3 seconds until the message CLrA appears on the display. CLrA is the first option in the menu consisting of the following options:

Display	Option
CLrA	Clear the address/name from the controller
ESC	Exit Setup mode

Pressing the Enter button to select the CLrA option will cause the 'CLrA' message to flash for confirmation, if the network type is set to Genus compatible. Press the Enter button to execute the command, Up or Down buttons to cancel. If the network type is not set to Genus compatible then the CLrA message will not flash and the ESC option can be used to exit the menu.



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IP Futura module

In an IP system there are two options

- IP-L
- IP-r

IP-L allows you to fix an IP address into the controller, which you would use when you are connecting the controllers onto a customer's local area network. This would allow the customer to view each controller using Internet Explorer

IP-r allows you to give each controller on the system a unique number. This number is then allocated a dynamic IP address by the system DHCP server (such as the RDM Data Director)

IP-L

To configure the communication module for IP-L, set all three rotary switches to zero. The module should then be connected to the controller.

1. nEt. From the function menu you can now select nEt
 - Press enter and the display will show "IP-L", press enter
 - You can now set the address using the table below

Display	Option
IP-1	IP Address byte 1
IP-2	IP Address byte 2
IP-3	IP Address byte 3
IP-4	IP Address byte 4
nL	Network Mask Length
gt-1	Gateway Address byte 1
gt-2	Gateway Address byte 2
gt-3	Gateway Address byte 3
gt-4	Gateway Address byte 4
ESC	Exit network menu. N.B. this option must be selected to save any changes made in this menu

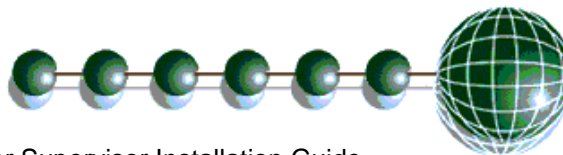
IP-r

To configure the communication module for IP-r, set the three rotary switches to give each controller a unique identifier. The module should then be connected to the controller and the network.

The green network LED on the controller will flash until it has been logged on to the network. The Green network LED will remain permanently on while it is on-line.



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Viewing

Apart from setting up the controller, you can also view the status of the inputs and outputs.

1. IO. View Inputs / Outputs and States
 - a. From the function menu, select "IO", press enter
 - b. You can now scroll through the IO tables as set out below. The tables you view will depend on the controller type configuration.

Input/Output table for Direct on Line Controller

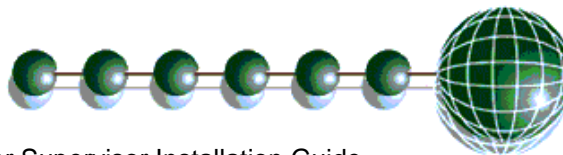
Number	IO	Range	Step	Units
I-01	Temp. Probe	-49 to 60	0.1	Deg
I-03	Klixon	0 (Ok), 1 (Alarm)		
I-04	Oil Fault	0 (Ok), 1 (Alarm)		
I-05	LP Ctrl 1	0 (Off), 1 (On)		
I-07	HP Alarm	0 (Ok), 1 (Alarm)		
I-08	LP Alarm	0 (Ok), 1 (Alarm)		
I-09	General Alarm	0 (Ok), 1 (Alarm)		
I-10	Overload	0 (Ok), 1 (Alarm)		
O-01	Comp Relay	0 (Off), 1 (On)		
O-06	Fan Relay	0 (Off), 1 (On)		
O-07	Alarm Relay	0 (Off), 1 (On)		
S-01	Control State	0 (Power Up), 1 (On), 2 (Run), 3 (Asc), 4 (Alarm)		

Input/Output table for Pole Controller

Number	IO	Range	Step	Units
I-01	Temp. Probe	-49 to 60	0.1	Deg
I-02	Therm. Winding	0 (Ok), 1 (Alarm)		
I-04	Oil Fault	0 (Ok), 1 (Alarm)		
I-05	LP Ctrl 1	0 (Off), 1 (On)		
I-06	LP Ctrl 2	0 (Off), 1 (On)		
I-07	HP Alarm	0 (Ok), 1 (Alarm)		
I-08	LP Alarm	0 (Ok), 1 (Alarm)		
I-09	General Alarm	0 (Ok), 1 (Alarm)		
I-10	Overload	0 (Ok), 1 (Alarm)		
O-02	Comp Lo Speed	0 (Off), 1 (On)		
O-03	Comp Hi Speed	0 (Off), 1 (On)		
O-06	Fan Relay	0 (Off), 1 (On)		
O-07	Alarm Relay	0 (Off), 1 (On)		
S-01	Control State	0 (Power Up), 1 (On), 2 (Run), 3 (Asc), 4 (Alarm)		



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Input/Output table for Part Wind Controller

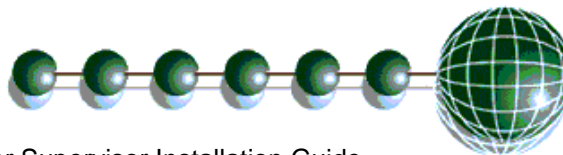
Number	IO	Range	Step	Units
I-01	Temp. Probe	-49 to 60	0.1	Deg
I-02	Therm. Winding	0 (Ok), 1 (Alarm)		
I-04	Oil Fault	0 (Ok), 1 (Alarm)		
I-05	LP Ctrl 1	0 (Off), 1 (On)		
I-07	HP Alarm	0 (Ok), 1 (Alarm)		
I-08	LP Alarm	0 (Ok), 1 (Alarm)		
I-09	General Alarm	0 (Ok), 1 (Alarm)		
I-10	Overload	0 (Ok), 1 (Alarm)		
O-04	1 st Part Wind	0 (Off), 1 (On)		
O-05	2 nd Part Wind	0 (Off), 1 (On)		
O-06	Fan Relay	0 (Off), 1 (On)		
O-07	Alarm Relay	0 (Off), 1 (On)		
S-01	Control State	0 (Power Up), 1 (On), 2 (Run), 3 (Asc), 4 (Alarm)		

Manual Reset

Press the "up" button to manually reset the controller after an alarm



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Display Messages

The following messages can appear on the Mercury display.

Display	System status
PUP	Power Up State
On	On State
RUn	Run State
ASC	Anti Short Cycle State
gEn	General Fault
TH1	Klixon Fault
TH2	Thermistor Fault
OL	Over Load
LP	Low Pressure
HP	High Pressure
OIL	Oil Fault
TP	Over Temperature Fault

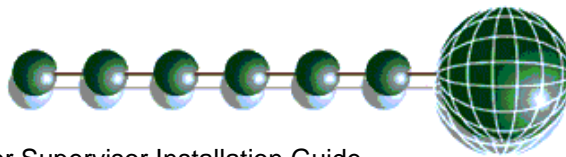
Network Alarms

The table below shows the text and associated type number that is sent to the system "front end". The type number is normally used to provide different alarm actions.

Alarm text	Type
General Fault	20
Temperature Probe Fault	6
Over Temperature Fault	4
Low Pressure Fault	9
High Pressure Fault	8
Klixon Fault	6
Thermistor Winding Fault	17
Oil Fault	18
Overload Fault	16
Power Up	7



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Specification

General

Power requirements:

Supply Voltage Range:	100 - 240 Vac \pm 10%
Supply Frequency:	50 - 60 Hz
Maximum supply current:	5.2 Amps (when relay 5 is fully loaded)
Typical supply current:	<1 Amp
Operating temperature range:	+5°C to +50°C
Operating Humidity:	80% maximum
Storage temperature range:	-20°C to +65°C
Environmental:	Indoor use at altitudes up to 2000m, Pollution Degree 1, Installation Category II. Voltage fluctuations not to exceed \pm 10% of nominal voltage
Size:	78mm (W) x 36mm (H) x 110mm (D)
Approx Weight:	170 Grams
Safety:	EN61010
EMC:	EN61326; 1997 +Amdt. A1; 1998
Ventilation:	There is no requirement for forced cooling ventilation
Class 2 Insulation:	No protective Earth is required and none should be fitted.

The host equipment must provide a suitable external over-current protection device such as: -

Fuse:	6.3A 240 Vac Antisurge (T) HRC conforming to IEC 60127
Or MCB:	6A, 240 VAC Type C conforming to BS EN 60898

The host equipment must provide adequate protection against contact to hazardous live parts.

Relays

Max current relay 1:	6A (non inductive) $\text{COS}\phi=0.4$ 2A (inductive load) 200,000 operations
Max Voltage relay 1:	250Vac, 30V dc
Exclusive common	
Max current relay 2:	6A (non inductive) $\text{COS}\phi=0.4$ 2A (inductive load) 200,000 operations
Max Voltage relay 2:	250Vac , 30V dc
Exclusive common	
Max current relay 3:	6A (non inductive) $\text{COS}\phi=0.4$ 2A (inductive load) 200,000 operations
Max Voltage relay 3:	250Vac , 30V dc
Exclusive common	
Max current relay 4:	6A (non inductive) $\text{COS}\phi=0.4$ 2A (inductive load) 200,000 operations
Max Voltage relay 4:	250Vac , 30V dc
Exclusive common	
Max current relay 5:	3A (non inductive) $\text{COS}\phi=0.4$ 2A (inductive load) 200,000 operations
Max Voltage relay 5:	250Vac (Internal supply)
Common connected to Supply Live	

For compliance with the LVD, relays 3, 4 and 5 commons must be at the same potential as the supply voltage.

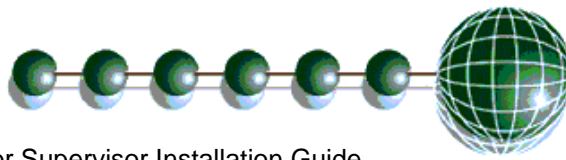


Warning:

Relay 5 output has hazardous voltages (Supply input voltage potential).



Ensure that all power is switched off before installing or maintaining this product



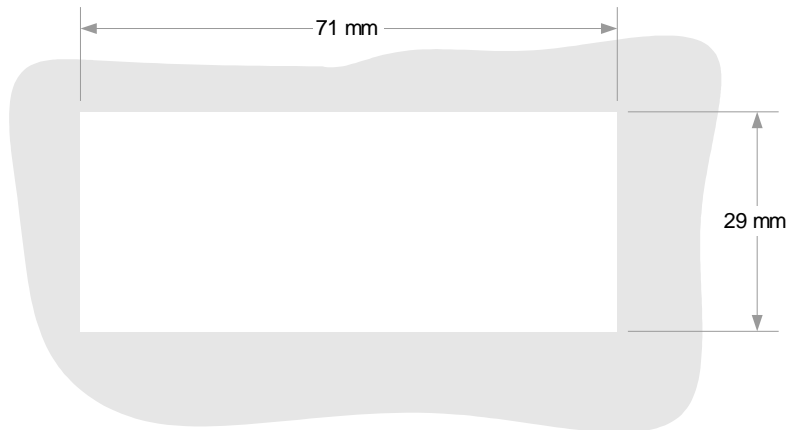
Inputs:

Input resistance: 3.01K Ohms (for PTC type probes)

Comms: RS232 with flow control

Installation:

Panel Cut-out:



The Mercury 2 fascia is 78mm x 36mm and is central around the cut-out.

Fixing:

The controller is fixed by sliding the 2 plastic retaining clips up to rear of the panel. These clips have a ratchet action and can be removed by holding in the clip sides and sliding back.

Clearances:

Space required behind the panel: 120mm + space for cable bends

Space required behind the panel on the right hand side (looking from the front): 30mm + bend radius for a Cat5 patch lead

Space required behind the panel on the left hand side (looking from the front): 20mm

There is no requirement for forced cooling ventilation

Fuse:

The host equipment must provide a suitable external over-current protection device such as: -

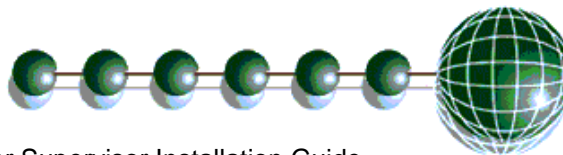
Fuse: 6.3A 240 Vac Antisurge (T) HRC conforming to IEC 60127
Or MCB: 6A, 240 VAC Type C conforming to BS EN 60898

Cleaning:

Do not wet the controller when cleaning. Clean the front by wiping with slightly dampened lint free cloth.



Ensure that all power is switched off before installing or maintaining this product



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Revision History

Revision	Date	Changes	Comments
1.0	24/11/2008	1 st Issue	
1.2	08/05/2009	Changes to relay assignment, revision history brought into line with controller software version, probe offset documented.	
1.3	18/09/2009	Technical specification amended	
1.4	29/12/2009	Technical specification amended	
1.4A	16/02/2012	Current Issue	



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