

Mercury 6-5 Hot Controller Installation Guide



For Products: -

PR0316



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

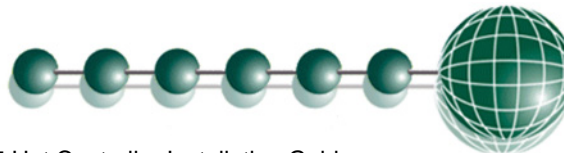


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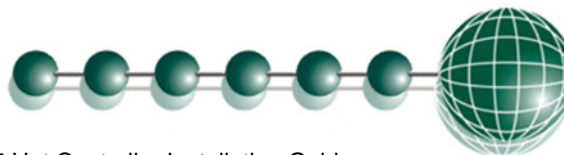
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The Mercury Range

From Resource Data Management

Description

The Mercury 6-5 Hot controller is intended for applications that require a thermostat function with logging and alarms. As well as the thermostat output, the controller has an output for fans and lights (the lights output has a built in timer function) There is a N/O alarm relay.

Configuration

The controllers are delivered pre-configured with the "Hot Controller" software.

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.

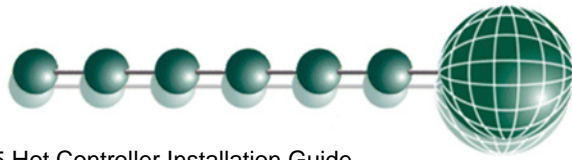
To connect to a network you must add the correct communications module.

- 485 Legacy module (Part No PR0026)
- IP Futura module (Part No PR0016)

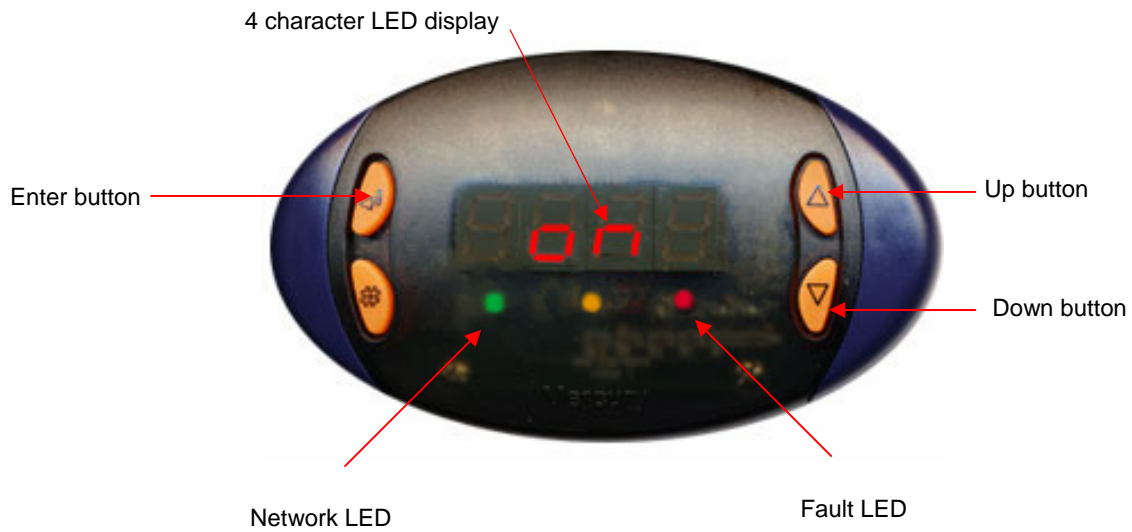
Connecting to either of these communication modules will automatically be detected on power up and this will affect the set up screens made available to you.



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Front Panel Features



Display:

4 character red LED display, used to display temperature and status messages.

Enter Button:

Button used to enter values front the menu system.

Up Button:

Button used to scroll up through the menu items

Down Button:

Button used to scroll down through the menu items

Network LED (Green):

Green LED used to indicate network Status:

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

Defrost LED (Amber):

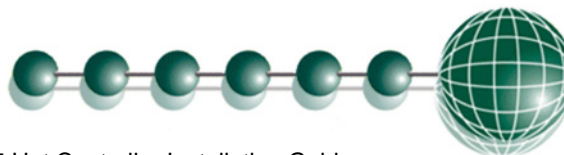
Not Used

Fault LED (Red):

Red LED, used to indicate alarm status

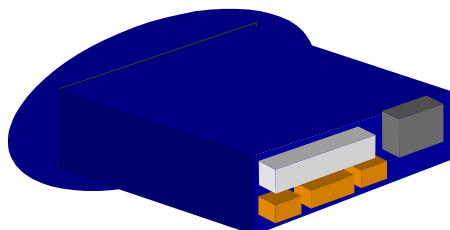


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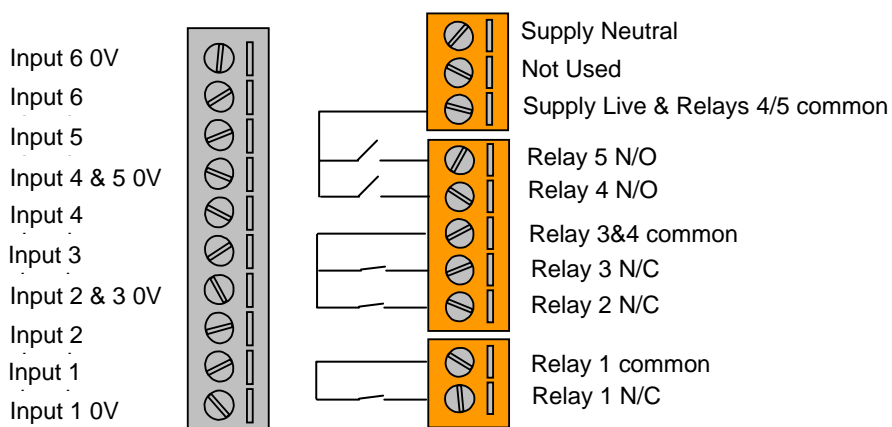


Connections

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.



Comms connector



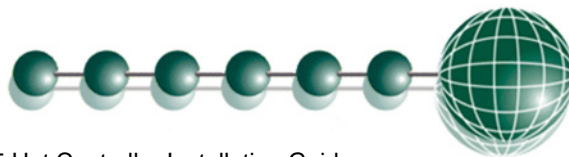
Do not connect an earth.
All probe inputs are PT1000 only.

Input/Output Allocation Tables

Hot Controller	Input/Output	Alarm Action	Comments
Input 1	Air on Temperature	Yes	PT1000
Input 2	Air off Temperature	Yes	PT1000
Input 3	Door Open	Yes	0 volt return
Input 4	Not used	-	
Input 5	Not used	-	
Input 6	Logging Probe	Conditional	PT1000
Relay 1	Heater (N/C)	N/A	
Relay 2	Fans (N/C)	N/A	
Relay 3	Lights (N/C)	N/A	
Relay 4	Alarm (N/O)	N/A	
Relay 5	Heater (N/O)	N/A	



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Setup Mode

Setup through front buttons



To enter setup 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.

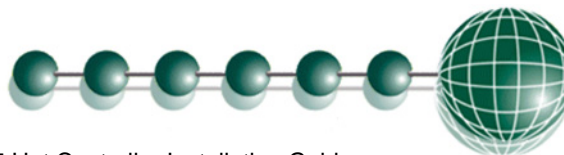
Setup Function Menu

(Common to all types)

Display	Option	Explained in Paragraph
IO	View Inputs / Outputs and States	Input / output table
PArA	Set/View Parameters	Set view parameters
Unit	Celsius/Fahrenheit option	Set View Unit
tyPE	View Controller Type (1 only)	
rtc	Set/view Clock (rtc = Real Time Clock)	Real Time Clock
nEt	Set/view network configuration	Network Configuration
SoFt	View software version	
dEF	No action	
FANS	Toggle Fans Only mode	Fans
CASE	Toggle Case Off mode	Case Off
Lits	Toggle Lights Only mode	Lights
ESC	Exit Setup mode	



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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

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.

Unit. Set/view temperature unit

From the function menu scroll to select Unit

Press enter and the value will be displayed: -

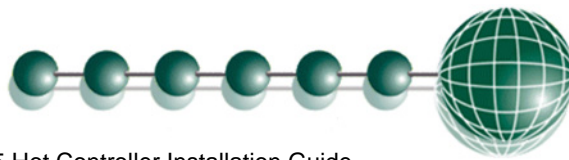
0 for Celsius
1 for Fahrenheit

Use the up or down keys to select the units and press enter.

This function is now complete



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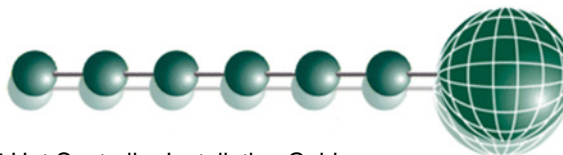


Parameter Table:

Number	Parameter	Range °C (°F)	Step	Units	Default °C (°F)
P-01	Cut-in Temp	0 to 300 (-43.6 to 572)	0.1	Deg	75 (167)
P-02	Diff	0 to 30 (0 to 86)	0.1	Deg	5 (41)
P-03	Control Weight	0 to 100	1	%	50
P-04	Display Weight	0 to 200	1	%	50
P-20	Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00
P-21	UT Alarm	-49 to 350 (-56.2 to 662)	0.1	Deg	65 (149)
P-22	OT Alarm	-49 to 350 (-56.2 to 662)	0.1	Deg	85 (185)
P-23	Log Probe Type	0 (Off), 1 (Logging), 2 (Logging/Alarm)			Logging
P-24	Slug Log Probe	0 (Off), 1 (On)			Off
P-25	Log Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00
P-26	Log UT Alarm	-49 to 350 (-56.2 to 662)	0.1	Deg	65 (149)
P-27	Log OT Alarm	-49 to 350 (-56.2 to 662)	0.1	Deg	85 (185)
P-80	Door Alarm Delay	00:00 to 99:00	01:00	mm:ss	00:00
P-60	Lights Mode	0 (Local), 1 (Remote), 2 (Man Off), 3 (Man On)			Local
P-61	Sun Lights On	00:00 to 23:59	00:01	hh:mm	08:00
P-62	Sun Lights Off	00:00 to 23:59	00:01	hh:mm	20:00
P-63	Mon Lights On	00:00 to 23:59	00:01	hh:mm	08:00
P-64	Mon Lights Off	00:00 to 23:59	00:01	hh:mm	20:00
P-65	Tue Lights On	00:00 to 23:59	00:01	hh:mm	08:00
P-66	Tue Lights Off	00:00 to 23:59	00:01	hh:mm	20:00
P-67	Wed Lights On	00:00 to 23:59	00:01	hh:mm	08:00
P-68	Wed Lights Off	00:00 to 23:59	00:01	hh:mm	20:00
P-69	Thu Lights On	00:00 to 23:59	00:01	hh:mm	08:00
P-70	Thu Lights Off	00:00 to 23:59	00:01	hh:mm	20:00
P-71	Fri Lights On	00:00 to 23:59	00:01	hh:mm	08:00
P-72	Fri Lights Off	00:00 to 23:59	00:01	hh:mm	20:00
P-73	Sat Lights On	00:00 to 23:59	00:01	hh:mm	08:00
P-74	Sat Lights Off	00:00 to 23:59	00:01	hh:mm	20:00
dFLt	Restore default settings				



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Network Configuration

The final section to setup 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

In a legacy system, there are currently 2 options.

- Genus
- Woodley 3rd Party (base version only)

Connecting a 485 legacy module to the controller will govern which set up screens are made available.

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

* These options are only available when the network type is set to Genus compatible.

The 485t option shows a value representing the network type. The possible values are:

Value	Network Type
1	Genus compatible (all versions)

The 485A option shows a value representing either the name of the controller in a Genus compatible network, or the address of the controller in a Woodley network.

If the controller is set for Genus compatible then the value shown is of the form 05-6. This means the controller would log onto a Genus compatible network using the name 'RC05-6'.

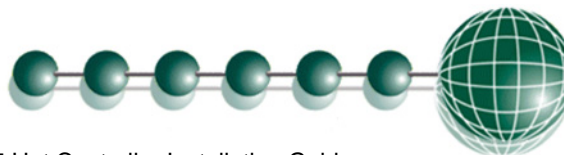
The following options are only available when the network type is set to Genus compatible.

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.



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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.

IP Futura module

In an IP system there are two options

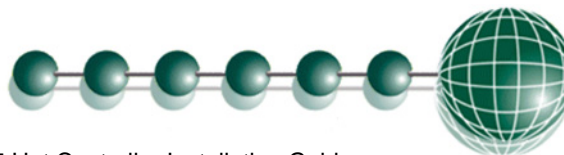
- IP-L
- IP-r

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)



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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.

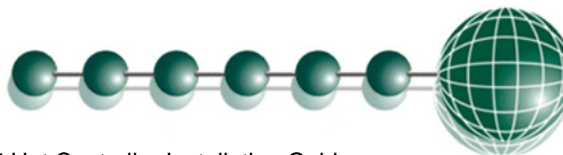
2. nEt. From the function menu you can now select nEt
 - Press enter and the display will show "IP-r", press enter
 - You can now view only the address given by the DHCP server

To ease setup, a single network mask length value is used. If the address has been specified with a network mask value in dotted IP format e.g. 255.255.255.0 then the table below gives the conversion:

Mask	Length	Mask	Length	Mask	Length
		255.255.254.0	23	255.254.0.0	15
255.255.255.252	30	255.255.252.0	22	255.252.0.0	14
255.255.255.248	29	255.255.248.0	21	255.248.0.0	13
255.255.255.240	28	255.255.240.0	20	255.240.0.0	12
255.255.255.224	27	255.255.224.0	19	255.224.0.0	11
255.255.255.192	26	255.255.192.0	18	255.192.0.0	10
255.255.255.128	25	255.255.128.0	17	255.128.0.0	09
255.255.255.0	24	255.255.0.0	16	255.0.0.0	08



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Viewing

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

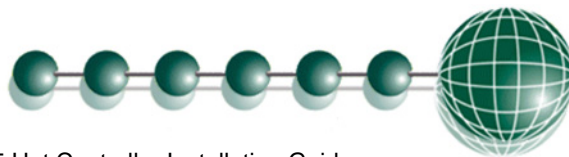
1. IO. View Inputs / Outputs and States
 - a. From the function menu, select "IO", press enter
 - b. You can now scroll through the IO tables as set out below. The tables you view will depend on the controller type configuration.

Input/Output table

Number	IO	Range °C (°F)	Step	Units
I-01	Control Temp.	0 to 300 (-43.6 to 572)	0.1	Deg
I-02	Display temp	0 to 300 (-43.6 to 572)	0.1	Deg
I-03	Air on Probe	0 to 300 (-43.6 to 572)	0.1	Deg
I-04	Air off Probe	0 to 300 (-43.6 to 572)	0.1	Deg
I-08	Logging Probe	0 to 300 (-43.6 to 572)	0.1	Deg
I-12	Door	0 (closed), 1(open)		
O-01	Heater N/C	0 (Off), 1 (On)		
O-05	Heater N/O	0 (Off), 1 (On)		
O-06	Lights	0 (Off), 1 (On)		
O-07	Fans	0 (Off), 1 (On)		
O-10	Last Def. Time	00:00 to 23:59		hh:mm
O-11	Last Def. Length	00:00 to 03:00		hh:mm
O-12	Last Def. Ctrl Temp.	-42 to 60 (-43.6 to 140)	0.1	hh:mm
S-01	Control State	0 (Stabilise), 1 (Normal), 7 (OT_Alarm), 8 (UT_Alarm), 9 (Fans_Only), 10 (Lights_Only), 11 (Case_Off)		



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Alarm Messages

The following alarms and messages can appear on the Mercury display.

Display Message	System status
Ft	Control Fault
Prb1	Probe 1 Fault
Prb2	Probe 2 Fault
Prb6	Probe 6 Fault
AL	Control State in Alarm
FAnS ONLY	Controller in Fans Only
LitS ONLY	Controller in Lights Only
CASE OFF	Controller in Case Off
Ot	Over Temperature Alarm
Ut	Under Temperature Alarm
LgOt	Log Probe Over Temperature
LgUt	Log Probe Under Temperature
door	Door Open Alarm

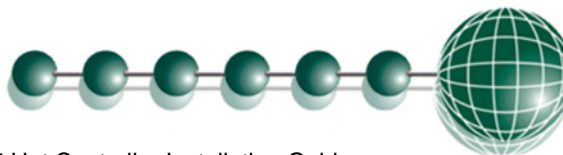
Network Alarms

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 # (index)
Case over temperature	4
Case under temperature	5
Probe 1 Faulty	6
Probe 2 Faulty	6
Probe 6 Faulty	6
Product over temperature	8
Product under temperature	9
Door Open	2



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Modifying controller states

During normal operation you can change the following states from the function menu

Fans Only “FAnS”

Selecting the Fans Only option will put the controller into the Fans Only state if the current state is not Fans Only. If the current state is Fans Only then the controller will change to the Normal state. Selecting this option will exit the setup menu automatically. The display will show “CASE OnLy”

Case Off “CASE”

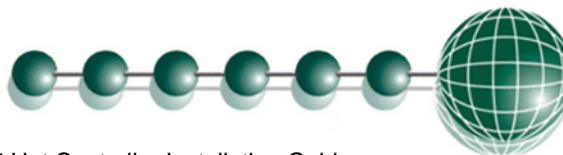
Selecting the Case Off option will put the controller into the Case Off state if the current state is not Case Off. If the current state is Case Off then the controller will change to the Normal state. Selecting this option will exit the setup menu automatically. The display will show “CASE OFF”

Lights Only “LitS”

Selecting the Lights Only option will put the controller into the Lights Only state if the current state is not Lights Only. If the current state is Lights Only then the controller will change to the Normal state. Selecting this option will exit the setup menu automatically. The display will show “LitS OnLy”



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Specification

Power requirements:

Supply Voltage Range:	100 - 240 Vac \pm 10%
Supply Frequency:	50 - 60 Hz
Maximum supply current:	5.2 Amps (when relays 4 and 5 are 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:	110mm (W) x 60mm (H) x 100mm (D)
Weight:	150 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)	
Max Voltage relay 1:	260Vac (external supply)	
Exclusive common		
Max current relay 2:	6A (non inductive)	Relays 2 and 3 share a common supply line and the loads can have a combined total of 8A.
Max Voltage relay 2:	260Vac (external supply)	
Shared common with relay 3		
Max current relay 3:	6A (non inductive)	Relay 2 or 3 can switch a maximum of 6A provided the other is at 2A or lower.
Max Voltage relay 3:	260Vac (external supply)	
Shared common with relay 2		
Max current relay 4:	3A (non inductive)	
Max Voltage relay 4:	260Vac (Internal supply)	
Common connected to Input "live"		
Max current relay 5:	3A (non inductive)	
Max Voltage relay 5:	260Vac (Internal supply)	
Common connected to Input "live"		

For compliance with the LVD, relays 2 and 3 common must be at the same potential as the supply voltage.

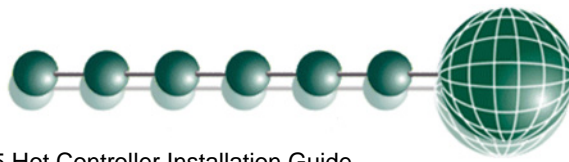


Warning:

Relays 4 and 5 outputs have hazardous voltages (Supply input voltage potential).



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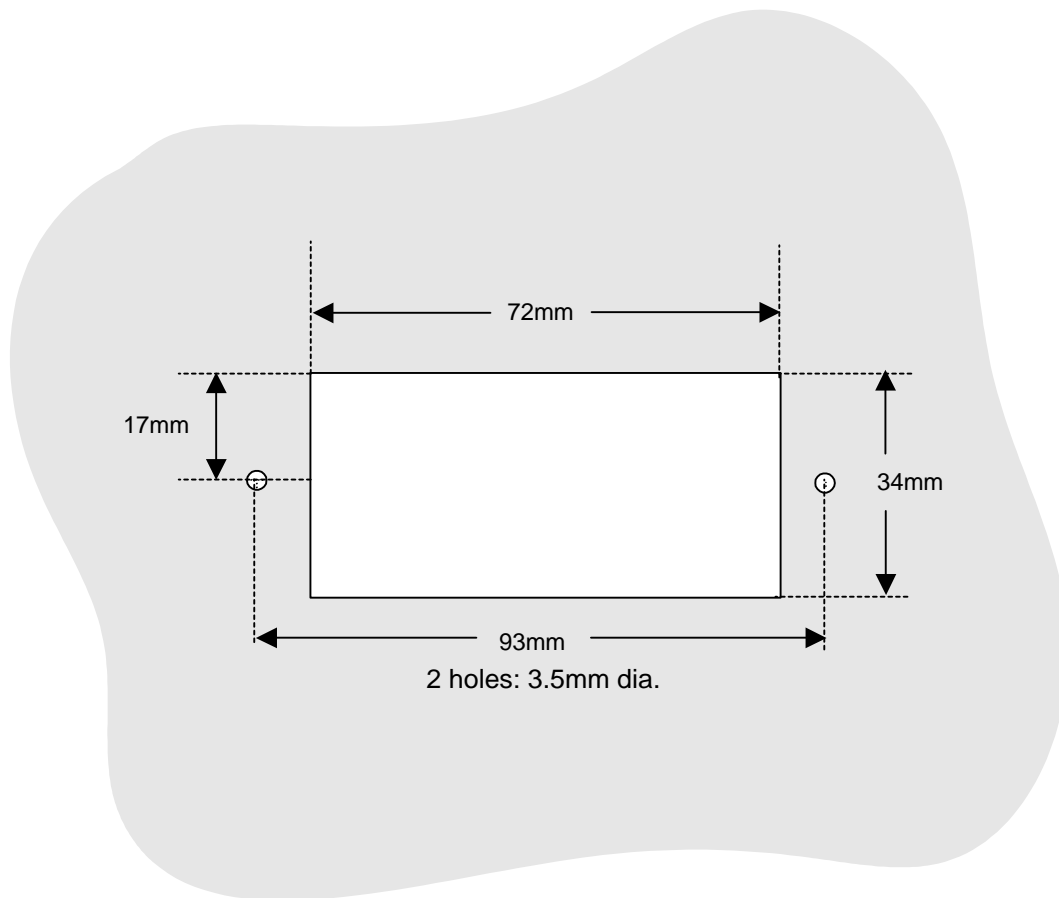
Inputs:

Input resistance: 3.01K Ohms (for PTC or NTC type probes)
Input type PT1000 for all versions

Comms: RS232 with flow control

Installation:

Panel Cut-out:



Fixing:

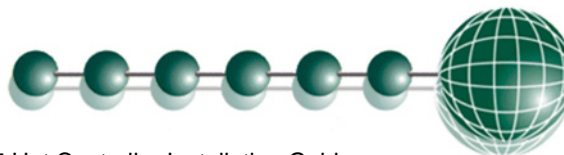
The controller can be fixed either by 2 X M3 screws from the rear or by the plastic retaining device (PR0329), obtainable from RDM.

Clearances:

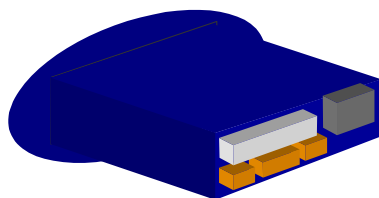
The controller must have 5mm clearance above the top and below bottom, and 25mm clearance from the sides. Clearance at the rear is dependant on the wiring.
There is no requirement for forced cooling ventilation



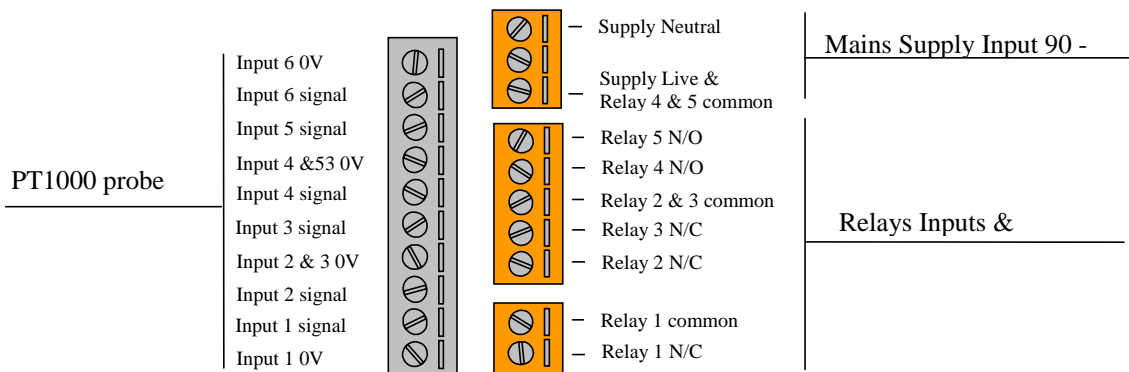
Ensure that all power is switched off before installing or maintaining this product



Wiring:



Communications socket



Relay 4 and 5 N/O are fed from the supply input

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.

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.

Please note: The specifications of the product detailed on this set up guide may change without notice. RDM Ltd shall not be liable for errors or for incidental or consequential damages, directly or indirectly, in connection with the furnishing, performance or misuse of this product or document.



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