Mercury 6-5 M/E Installation Guide

For Products: -

PR0310 **PR0311**
PR0320 **PR0321**
PR0325 **PR0326**

Qualified for Energy Technology List www.eca.gov.uk

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

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The Mercury Range

From Resource Data Management

Types

This documentation refers to the 6 input controller 6-5M and 6-5E Version 9.* software.

There are two hardware types of the Mercury controller; one that has Relay 1 as a Solid Sate Relay for switching EEV's and one that has Relay1 as an electro-mechanical relay for switching solenoid LLV's. These are named 6-5E and 6-5M respectively.
The controller supports PT1000 or NTC2K or NTC2K25 temperature probes (note: probe types cannot be mixed)

Variants: -

1. Mercury 6-5E Electronic expansion valve type with Genus and IP protocol (PR0311)
2. Mercury 6-5M Mechanical expansion valve type with Genus and IP protocol (PR0310)

Note: Version 9. does not support 3rd party protocol communications. Version 8.7 (Jan 2004) was the last version that included support for 3rd party protocol.*

Configuration

The controllers are delivered pre-configured: -

- 6-5M as an Integral controller HT (Type 1)
- 6-5E as Remote case controller LT (Type 3)

The controller gives you up to six configuration options: -

Display value	Type (M & MT)	Type (E & ET)
1	Integral controller HT	N/A
2	Integral controller LT	N/A
3	Remote case controller LT	Remote case controller LT
4	Remote case controller HT	Remote case controller HT
5	Coldroom controller LT	Coldroom controller LT
6	Coldroom controller HT	Coldroom controller HT

Networks

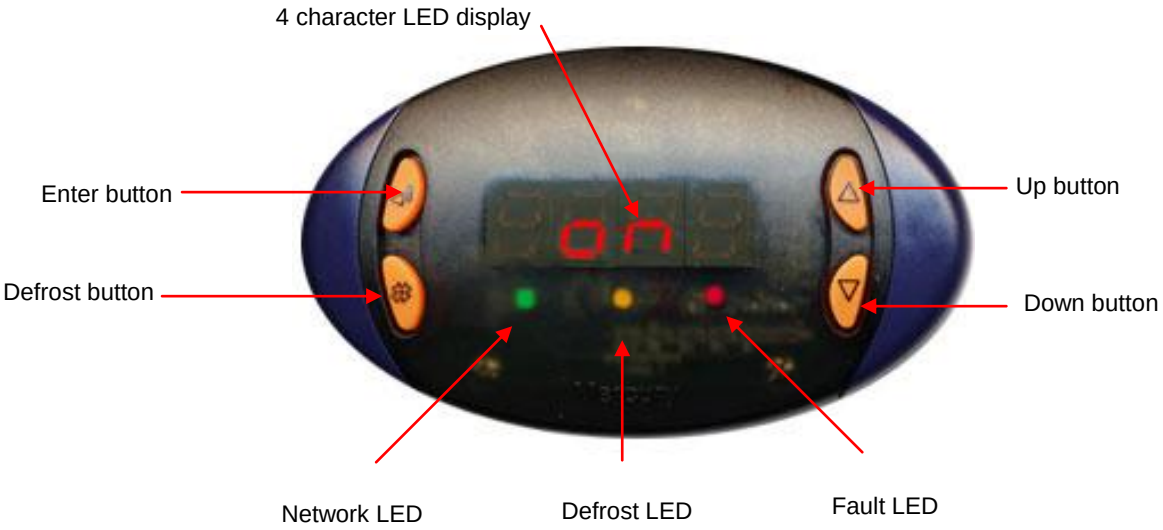
The controllers are capable of connecting to either a TCP/IP local area network or a RS485 network or controlling in standalone mode with no network output.

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.

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

Defrost Button:

Press and hold this button to force a manual defrost

Network LED:

Green LED used to indicate network Status:

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

Defrost LED:

Yellow LED, used to indicate defrost status

Fault LED:

Red LED, used to indicate alarm status

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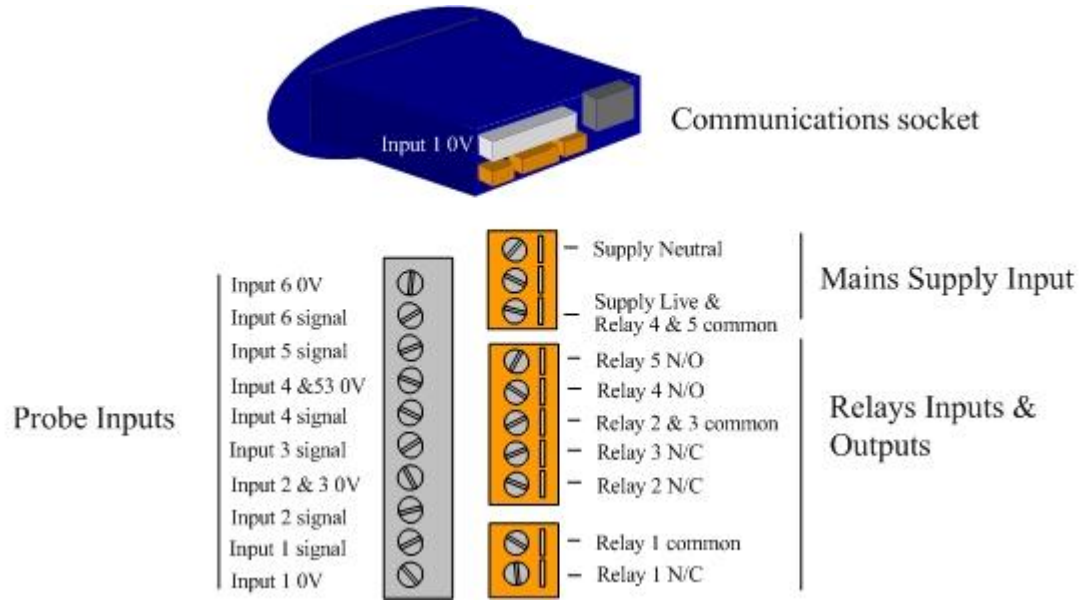
Connections

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.



Do not connect an earth.

Input/Output Allocation Tables

The following tables indicate; on a controller type basis, the functions of the inputs and outputs. Also the digital inputs which are derived by switching in a fixed value resistor across the input

Input / Output allocation tables for the 6-5M

Case Controller (Type 3 & 4)	Models: M & MT	Alarm Action	Plant input (switched resistors *)
Input 1	Air on Temperature	Yes	
Input 2	Air off Temperature	Yes	
Input 3	Evaporator Temperature	No	Plant fault 1
Input 4	Suction Line Temperature	No	Case Clean Switch
Input 5	Defrost Termination (if used)	No	
Input 6	Logging Probe (If fitted)	Conditional	
Relay 1	Liquid Line Valve (N/C)	N/A	
Relay 2	Fans (N/C)	N/A	
Relay 3	Lights (N/C)	N/A	
Relay 4	Suction Line Valve/Trim Heater (N/O)	N/A	
Relay 5	Defrost Heater (N/O)	N/A	

* For PT1000 probes, use 820 Ohm switched resistors
For NTC2K and NTC2K25 probes, use 590 Ohm switched resistors

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Coldroom Controller (Type 5 & 6)	Models: M	Alarm Action	Plant input (switched resistors*)
Input 1	Air on Temperature	Yes	
Input 2	Air off Temperature	Yes	Man trap
Input 3	Evaporator Temperature	No	Plant fault 1
Input 4	Suction Line Temperature	No	Case Clean
Input 5	Defrost Termination (if used)	No	Door Switch
Input 6	Logging Probe (If fitted)	Conditional	
Relay 1	Liquid Line Valve (N/C)	N/A	
Relay 2	Fans (N/C)	N/A	
Relay 3	Remote (N/C)	N/A	
Relay 4	Suction Line Valve	N/A	
Relay 5	Defrost Heater (N/O)	N/A	

* For PT1000 probes, use 820 Ohm switched resistors
For NTC2K and NTC2K25 probes, use 590 Ohm switched resistors

Mobile Controller (Type 1 & 2)	Models: M	Alarm Action	Plant input (switched resistors*)
Input 1	Air on Temperature	Yes	
Input 2	Air off Temperature	Yes	
Input 3	Evaporator Temperature	No	Plant fault 1
Input 4	Suction Line Temperature	No	Case Clean
Input 5	Defrost Termination (if used)	No	Plant fault 2
Input 6	Logging Probe (If fitted)	Conditional	
Relay 1	Compressor A (N/C)	N/A	
Relay 2	Fans (N/C)	N/A	
Relay 3	Lights (N/C)	N/A	
Relay 4	Compressor B (N/O)	N/A	
Relay 5	Defrost Heater (N/O)	N/A	

* For PT1000 probes, use 820 Ohm switched resistors
For NTC2K and NTC2K25 probes, use 590 Ohm switched resistors

Input / Output allocation tables for 6-5E

Case Controller (Type 3 & 4)	Models: E	Alarm Action	Plant input (switched resistors*)
Input 1	Air on Temperature	Yes	Plant Fault 1
Input 2	Air off Temperature	Yes	Case Clean
Input 3	Evaporator Temperature	Yes	
Input 4	Suction Line Temperature	Yes	
Input 5	Defrost Termination (if used)	No	
Input 6	Logging Probe (If Fitted)	Conditional	
Relay 1	Liquid Line Valve (N/C)	N/A	
Relay 2	Fans (N/C)	N/A	
Relay 3	Lights (N/C)	N/A	
Relay 4	Suction Line Valve/Trim Heater (N/O)	N/A	
Relay 5	Defrost Heater (N/O)	N/A	

* For PT1000 probes, use 820 Ohm switched resistors
For NTC2K and NTC2K25 probes, use 590 Ohm switched resistors

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Coldroom Controller (Type 5 & 6)	Models: E	Alarm Action	Plant input (switched 820 Ohms*)
Input 1	Air on Temperature	Yes	Plant Fault 1
Input 2	Air off Temperature	Yes	Case Clean
Input 3	Evaporator Temperature	Yes	
Input 4	Suction Line Temperature	Yes	
Input 5	Defrost Termination (if used)	No	Door Switch
Input 6	Logging Probe (If Fitted)	Conditional	Man Trap
Relay 1	EEV Valve (N/C)	N/A	
Relay 2	Fans (N/C)	N/A	
Relay 3	Remote (N/C)	N/A	
Relay 4	Suction Line Valve	N/A	
Relay 5	Defrost Heater (N/O)	N/A	

* For PT1000 probes, use 820 Ohm switched resistors
For NTC2K and NTC2K25 probes, use 590 Ohm switched resistors

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.

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	Probe type and Celsius/Fahrenheit option	Set View Unit
tyPE	Set/View Controller Type	Set/view controller type
rtc	Set/view Clock (rtc = Real Time Clock)	Real Time Clock
nEt	Set/view network configuration	Network Configuration
SoFt	View software version	
dEF	Start Defrost	Defrost
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

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 case/coldroom configuration types. (see configuration table on page 4)
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.

Unit. Set/view temperature unit and Probe type

From the function menu scroll to select Unit

Press enter and the value will be displayed: -

Probe Types

0 for PT1000 Celsius
1 for PT1000 Fahrenheit
2 for NTC2K Celsius
3 for NTC2K Fahrenheit
4 for NTC2K25 Celsius
5 for NTC2K25 Fahrenheit

Note: Temperature range for NTC2K25 is restricted to -37 °C to +54 °C for probe inputs with a secondary function (switched resistors) and -37 °C to +60 °C for inputs that have no secondary function.

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

This function is now complete

Parameter Tables:

Parameter table for Case Controller M (Type 3 and Type 4)

Number	Parameter	Range °C (°F)	Step	Units	Def. LT °C (°F)	Def. HT °C (°F)
P-01	Cut-in Temp	-42 to 30 (-43.6 to 86)	0.1	Deg	-20 (-4)	0.0 (32)
P-02	Diff	0 to 10 (0 to 18)	0.1	Deg	2 (3.6)	1.5 (2.7)
P-03	Control Weight	0 to 100	1	%	50	50
P-04	Display Weight	0 to 100	1	%	50	50
P-12	Relay 4 Mode	0 = Suction Line 1 = Trim Heater			0	0
P-13	Trim in Defrost	0 (Off), 1(On)			0	0
P-14	Trim Level	0 to 100	1	%	100	100
P-85	Key-switch Mode	0 = Case Off 1 = Fans only 2 = toggle	1		0	0
P-87	Control Probe type	0 = Use Air on Probe 1 = Use Log Probe	1		0	0
P-90	Resistor Case Off	0 (Disabled), 1 (Enabled)			0	0
P-92	Fans temperature mode	0 = Off 1 = Temperature 2 = Over-temperature 3 = Temp/OT	1		0	0
P-93	Fans Off Temperature	-42 to 30 (-43.6 to 86)	0.1	Deg	-10 (14)	8 (46.4)
P-20	Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-21	UT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-30 (-22)	-2 (28.4)
P-22	OT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-15 (5)	5 (41)
P-23	Log Probe Type	0 (Off), 1 (Logging), 2 (Logging/Alarm)			Off	Off
P-24	Slug Log Probe	0 (Off), 1 (On)			Off	Off
P-25	Log Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-26	Log UT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-35 (-31)	-1 (30.2)
P-27	Log OT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-12 (10.4)	6 (42.8)
P-40	Defrost Mode	0 (Local), 1 (Remote)			Local	Local
P-41	Defrost Start	00:00 to 23:59	00:01	hh:mm	01:00	01:00
P-42	Defrosts per Day	0 to 8	1		6	6
P-43	No Defrost Time	0 to 25	1	hours	8	8
P-44	Def Terminate	-42 to 30 (-43.6 to 86)	0.1	Deg	14 (57.2)	10 (50)
P-45	Def Min Time	00:00 to 99:00	01:00	mm:ss	05:00	05:00
P-46	Def Max Time	00:00 to 99:00	01:00	mm:ss	24:00	24:00
P-47	Drain Down	00:00 to 24:00	00:15	mm:ss	01:30	01:30
P-48	Recovery Time	00:00 to 99:00	01:00	mm:ss	30:00	30:00
P-89	Pump Down Time	00:00 to 99:00	01:00	mm:ss	00:00	00:00
P-86	Fan Delay mode	0 = Time 1 = Temp	1		Time	Time
P-49	Fan Delay	00:00 to 99:00	01:00	mm:ss	00:00	00:00
P-88	Fan Delay Temp	-42 to 30 (-43.6 to 86)	0.1	Deg	-20 (-4)	0.0 (32)
P-50	Fans In Defrost	0 (Off), 1 (On)			On	On
P-60	Lights Mode	0 (Local), 1 (Remote), 2 (Man Off), 3 (Man On)			Local	Local
P-61	Sun Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00

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P-62	Sun Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-63	Mon Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-64	Mon Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-65	Tue Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-66	Tue Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-67	Wed Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-68	Wed Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-69	Thu Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-70	Thu Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-71	Fri Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-72	Fri Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-73	Sat Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-74	Sat Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
dFLt	Restore default values					

Parameter table for Mobile Controller M (Type 1 and Type 2)

Number	Parameter	Range °C (°F)	Step	Units	Def. LT °C (°F)	Def. HT °C (°F)
P-01	Cut-in Temp	-42 to 30 (-43.6 to 86)	0.1	Deg	-20 (-4)	3.5 (38.3)
P-02	Diff	0 to 10 (0 to 18)	0.1	Deg	2.5 (4.5)	2.5 (4.5)
P-03	Control Weight	0 to 100	1	%	40	30
P-04	Display Weight	0 to 100	1	%	40	30
P-05	Lag Comp Delay	00:00 to 15:00	00:05	mm:ss	00:40	00:10
P-06	Anti SC Time	00:00 to 15:00	00:05	mm:ss	03:00	03:00
P-07	Lag Cut Out Diff	0 to 10 (0 to 18)	0.1	Deg	2.5 (4.5)	2.5 (4.5)
P-85	Key-switch Mode	0 = Case Off 1 = Fans only 2 = toggle	1		0	0
P-87	Control Probe type	0 = Use Air on Probe 1 = Use Log Probe	1		0	0
P-90	Resistor Case Off	0 (Disabled), 1 (Enabled)			0	0
P-92	Fans temperature mode	0 = Off 1 = Temperature 2 = Over-temperature 3 = Temp/OT	1		0	0
P-93	Fans Off Temperature	-42 to 30 (-43.6 to 86)	0.1	Deg	-10 (14)	8 (46.4)
P-20	Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-21	UT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-30 (22)	-2 (28.4)
P-22	OT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-15 (5)	5 (41)
P-23	Log Probe Type	0 (Off), 1 (Logging), 2 (Logging/Alarm)			Off	Off
P-24	Slug Log Probe	0 (Off), 1 (On)			Off	Off
P-25	Log Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-26	Log UT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-35 (-31)	-1 (30.2)
P-27	Log OT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-12 (10.4)	6 (42.8)
P-40	Defrost Mode	0 (Local), 1 (Remote)			Local	Local
P-41	Defrost Start	00:00 to 23:59	00:01	hh:mm	01:00	01:00
P-42	Defrosts per Day	0 to 8	1		6	6
P-43	No Defrost Time	0 to 25	1	hours	8	5
P-44	Def Terminate	-42 to 30 (-43.6 to 86)	0.1	Deg	10 (50)	10 (50)

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P-45	Def Min Time	00:00 to 99:00	01:00	mm:ss	05:00	05:00
P-46	Def Max Time	00:00 to 99:00	01:00	mm:ss	25:00	30:00
P-47	Drain Down	00:00 to 24:00	00:15	mm:ss	01:30	00:30
P-48	Recovery Time	00:00 to 99:00	01:00	mm:ss	30:00	30:00
P-89	Pump Down Time	00:00 to 99:00	01:00	mm:ss	00:00	00:00
P-86	Fan Delay mode	0 = Time 1 = Temp	1		0	0
P-49	Fan Delay	00:00 to 99:00	01:00	mm:ss	03:00	03:00
P-88	Fan Delay Temp	-42 to 30 (-43.6 to 86)	0.1	Deg	-20 (-4)	0.0 (32)
P-50	Fans In Defrost	0 (Off), 1 (On)			On	On
P-91	Defrost Type	0 = Electric, 1 = gas	1		0	0
P-60	Lights Mode	0 (Local), 1 (Remote), 2 (Man Off), 3 (Man On)			Local	Local
P-61	Sun Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-62	Sun Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-63	Mon Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-64	Mon Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-65	Tue Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-66	Tue Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-67	Wed Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-68	Wed Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-69	Thu Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-70	Thu Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-71	Fri Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-72	Fri Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-73	Sat Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-74	Sat Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
dFLt	Restore default settings					

Parameter table for Coldroom Controller M (Type 5 and Type 6)

Number	Parameter	Range °C (°F)	Step	Units	Def. LT °C (°F)	Def. HT °C (°F)
P-01	Cut-in Temp	-42 to 30 (-43.6 to 86)	0.1	Deg	-20 (-4)	0 (32)
P-02	Diff	0 to 10 (0 to 18)	0.1	Deg	2 (35.6)	1.5 (34.7)
P-03	Control Weight	0 to 100	1	%	50	50
P-04	Display Weight	0 to 100	1	%	50	50
P-85	Key-switch Mode	0 = Case Off 1 = Fans only 2 = toggle	1		0	0
P-87	Control Probe type	0 = Use Air on Probe 1 = Use Log Probe	1		0	0
P-90	Resistor Case Off	0 (Disabled), 1 (Enabled)			0	0
P-92	Fans temperature mode	0 = Off 1 = Temperature 2 = Over-temperature 3 = Temp/OT	1		0	0
P-93	Fans Off Temperature	-42 to 30 (-43.6 to 86)	0.1	Deg	-10 (14)	8 (46.4)
P-20	Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-21	UT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-30 (22)	-2 (28.4)
P-22	OT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-15 (5)	5 (41)
P-23	Log Probe Type	0 (Off), 1 (Logging),			Off	Off

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		2 (Logging/Alarm)				
P-24	Slug Log Probe	0 (Off), 1 (On)			Off	Off
P-25	Log Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-26	Log UT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-30 (22)	-2 (28.4)
P-27	Log OT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-15 (5)	5 (41)
P-40	Defrost Mode	0 (Local), 1 (Remote)			Local	Local
P-41	Defrost Start	00:00 to 23:59	00:01	hh:mm	01:00	01:00
P-42	Defrosts per Day	0 to 8	1		6	6
P-43	No Defrost Time	0 to 25	1	hours	8	8
P-44	Def Terminate	-42 to 30 (-43.6 to 86)	0.1	Deg	14 (57.2)	10 (50)
P-45	Def Min Time	00:00 to 99:00	01:00	mm:ss	05:00	05:00
P-46	Def Max Time	00:00 to 99:00	01:00	mm:ss	24:00	24:00
P-47	Drain Down	00:00 to 24:00	00:15	mm:ss	01:30	01:30
P-48	Recovery Time	00:00 to 99:00	01:00	mm:ss	30:00	30:00
P-89	Pump Down Time	00:00 to 99:00	01:00	mm:ss	00:00	00:00
P-86	Fan Delay mode	0 = Time 1 = Temp	1		0	0
P-49	Fan Delay	00:00 to 99:00	01:00	mm:ss	03:00	03:00
P-88	Fan Delay Temp	-42 to 30 (-43.6 to 86)	0.1	Deg	-20 (-4)	0.0 (32)
P-50	Fans In Defrost	0 (Off), 1 (On)			Off	Off
P-80	Door alarm dly	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-81	Door Closes LL	0 (No), 1 (Yes)			No	No
P-82	Door Stops Fan	0 (No), 1 (Yes)			No	No
dFLt	Restore default settings					

Parameter table for Case Controller E (Type 3 and Type 4)

Number	Parameter	Range °C (°F)	Step	Units	Def. LT °C (°F)	Def. HT °C (°F)
P-01	Cut-in Temp	-42 to 30 (-43.6 to 86)	0.1	Deg	-20 (-4)	0.0 (32)
P-02	Diff	0 to 10 (0 to 18)	0.1	Deg	2 (3.6)	1.5 (2.7)
P-03	Control Weight	0 to 100	1	%	50	50
P-04	Display Weight	0 to 100	1	%	50	50
P-08	Superheat Ref	4 to 12 (7.2 to 21.6)	0.1	Deg	6 (10.8)	6 (10.8)
P-09	EEV Prop. Gain	0 to 10	0.1		2.2	2.2
P-10	EEV Integral Gain	0 to 10	0.1		1.8	1.8
P-11	EEV Integer Time	00:00 to 05:00	00:01	mm:ss	03:00	03:00
P-12	Relay 4 Mode	0 (Suction Line), 1 (Trim Heater)			0	0
P-13	Trim in Defrost	0 (Off), 1(On)			0	0
P-14	Trim Level	0 to 100	1	%	100	100
P-85	Key-switch Mode	0 = Case Off 1 = Fans only 2 = toggle	1		0	0
P-87	Control Probe type	0 = Use Air on Probe 1 = Use Log Probe	1		0	0
P-90	Resistor Case Off	0 (Disabled), 1 (Enabled)			0	0
P-92	Fans temperature mode	0 = Off 1 = Temperature 2 = Over-temperature 3 = Temp/OT	1		0	0
P-93	Fans Off Temperature	-42 to 30 (-43.6 to 86)	0.1	Deg	-10 (14)	8 (46.4)
P-20	Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00

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

P-21	UT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-30 (-22)	-2 (28.4)
P-22	OT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-15 (5)	5 (41)
P-23	Log Probe Type	0 (Off), 1 (Logging), 2(Logging/Alarm)			Off	Off
P-24	Slug log probe	0 (No), 1 (Yes)			No	No
P-25	Log Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-26	Log UT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-35 (-31)	-1 (30.2)
P-27	Log OT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-12 (10.4)	6 (42.8)
P-40	Defrost Mode	0 (Local), 1 (Remote)			Local	Local
P-41	Defrost Start	00:00 to 23:59	00:01	hh:mm	01:00	01:00
P-42	Defrosts per Day	0 to 8	1		6	6
P-43	No Defrost Time	0 to 25	1	hours	12	12
P-44	Def Terminate	-42 to 30 (-43.6 to 86)	0.1	Deg	14 (57.2)	10 (50)
P-45	Def Min Time	00:00 to 99:00	01:00	mm:ss	05:00	05:00
P-46	Def Max Time	00:00 to 99:00	01:00	mm:ss	24:00	24:00
P-47	Drain Down	00:00 to 24:00	00:15	mm:ss	01:30	01:30
P-48	Recovery Time	00:00 to 99:00	01:00	mm:ss	30:00	30:00
P-89	Pump Down Time	00:00 to 99:00	01:00	mm:ss	00:00	00:00
P-86	Fan Delay mode	0 = Time 1 = Temp	1		0	0
P-49	Fan Delay	00:00 to 99:00	01:00	mm:ss	00:00	00:00
P-88	Fan Delay Temp	-42 to 30 (-43.6 to 86)	0.1	Deg	-20 (-4)	0.0 (32)
P-50	Fans In Defrost	0 (Off), 1 (On)			On	On
P-60	Lights Mode	0 (Local), 1 (Remote), 2 (Man Off), 3 (Man On)			Local	Local
P-61	Sun Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-62	Sun Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-63	Mon Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-64	Mon Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-65	Tue Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-66	Tue Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-67	Wed Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-68	Wed Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-69	Thu Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-70	Thu Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-71	Fri Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-72	Fri Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
P-73	Sat Lights On	00:00 to 23:59	00:01	hh:mm	08:00	08:00
P-74	Sat Lights Off	00:00 to 23:59	00:01	hh:mm	20:00	20:00
dFLt	Restore default settings					

Parameter table for Coldroom Controller E (Type 5 and Type 6)

Number	Parameter	Range °C (°F)	Step	Units	Def. LT °C (°F)	Def. HT °C (°F)
P-01	Cut-in Temp	-42 to 30 (-43.6 to 86)	0.1	Deg	-20 (-4)	0.0 (32)
P-02	Diff	0 to 10 (0 to 18)	0.1	Deg	2 (3.6)	1.5 (2.7)
P-03	Control Weight	0 to 100	1	%	50	50
P-04	Display Weight	0 to 100	1	%	50	50
P-08	Superheat Ref	4 to 12 (7.2 to 21.6)	0.1	Deg	6 (10.8)	6 (10.8)
P-09	EEV Prop. Gain	0 to 10	0.1		2.2	2.2
P-10	EEV Integral Gain	0 to 10	0.1		1.8	1.8

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

P-11	EEV Integer Time	00:00 to 05:00	00:01	mm:ss	03:00	03:00
P-85	Key-switch Mode	0 = Case Off 1 = Fans only 2 = toggle	1		0	0
P-87	Control Probe type	0 = Use Air on Probe 1 = Use Log Probe	1		0	0
P-90	Resistor Case Off	0 (Disabled), 1 (Enabled)			0	0
P-92	Fans temperature mode	0 = Off 1 = Temperature 2 = Over-temperature 3 = Temp/OT	1		0	0
P-93	Fans Off Temperature	-42 to 30 (-43.6 to 86)	0.1	Deg	-10 (14)	8 (46.4)
P-20	Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-21	UT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-30 (-22)	-2 (28.4)
P-22	OT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-15 (5)	5 (41)
P-23	Log Probe Type	0 (Off), 1 (Logging), 2 (Logging/Alarm)			Off	Off
P-24	Slug Log Probe	0 (Off), 1 (On)			Off	Off
P-25	Log Alarm Delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-26	Log UT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-35 (-31)	-1 (30.2)
P-27	Log OT Alarm	-49 to 60 (-56.2 to 140)	0.1	Deg	-12 (10.4)	6 (42.8)
P-40	Defrost Mode	0 (Local), 1 (Remote)			Local	Local
P-41	Defrost Start	00:00 to 23:59	00:01	hh:mm	01:00	01:00
P-42	Defrosts per Day	0 to 8	1		6	6
P-43	No Defrost Time	0 to 25	1	hours	12	12
P-44	Def Terminate	-42 to 30 (-43.6 to 86)	0.1	Deg	14 (57.2)	10 (50)
P-45	Def Min Time	00:00 to 99:00	01:00	mm:ss	05:00	05:00
P-46	Def Max Time	00:00 to 99:00	01:00	mm:ss	24:00	24:00
P-47	Drain Down	00:00 to 24:00	00:15	mm:ss	01:30	01:30
P-48	Recovery Time	00:00 to 99:00	01:00	mm:ss	30:00	30:00
P-89	Pump Down Time	00:00 to 99:00	01:00	mm:ss	00:00	00:00
P-86	Fan Delay mode	0 = Time 1 = Temp	1		0	0
P-49	Fan delay	00:00 to 99:00	01:00	mm:ss	03:00	03:00
P-88	Fan Delay Temp	-42 to 30 (-43.6 to 86)	0.1	Deg	-20 (-4)	0.0 (32)
P-50	Fans In Defrost	0 (Off), 1 (On)			On	On
P-80	Door alarm delay	00:00 to 99:00	01:00	mm:ss	20:00	20:00
P-81	Door Closes EEV	0 (No), 1 (Yes)			No	No
P-82	Door Stops Fan	0 (No), 1 (Yes)			No	No
dFLt	Restore default settings					

P90 Note:

Parameter P90 default value is off, care must be taken when replacing an older controller with this version. If the Case Off function is required, this parameter must be changed to on.

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

Relay and screen states during defrost

State:	Pump Down	Defrost Min	Defrost Max	Drain Down	Fan Delay	Recovery
Screen:	DEF	DEF	DEF	DEF	DEF	Pd
Def LED:	On	On	On	Off	Off	Off
RL1 1LLV	Closed	Closed	Closed	Closed	Open	Open
RL4 Suc	On	On	On	On	Off	Off
RL4 Trim on in defrost	On	On	On	On	On	On
RL4 Trim off in defrost	Off	Off	Off	Off	Off	On
RL5 Defrost Relay	Off	On	On	Off	Off	Off
RL3 Lights relay	On	On	On	On	On	On
RL2 Fan Relay (On in def)	On	On	On	On	Off	On
RL2 Fan Relay (Off in def)	Off	Off	Off	Off	Off	On

Defrost Type (P-91)

If P-91 is set to gas, compressor 1 is switched on for the duration of the defrost cycle.

Defrost Termination

Defrost termination will be when the temperature parameter "def terminate" has been reached on the "defrost termination" probe. If the "defrost termination" probe is not fitted, defrost termination will occur when: -

The "coil in" probe reaches the set point (If fans are selected as "off during defrost")
Or The "air off" probe reaches the set point (If fans are selected as "on during defrost")

If the "coil in" probe is not fitted, the "air off" probe will be used.

Fan Delay after Defrost

The fans will come back on when: -

The fan delay time has elapsed if the "fan delay mode" is set to time

Or

If the fan delay mode is set to "temp", the fans will come on when the defrost termination probe reaches the fan delay set point, or on the time parameter, whichever occurs first.

If the "defrost termination" probe is not fitted, the fans will come on when: -

The "coil in" probe reaches the control set point (If fans are selected as "off during defrost")
Or The "air off" probe reaches the control set point (If fans are selected as "on during defrost")

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

485 legacy support the following protocol: -

- Genus

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.

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 also 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.

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.

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
255.255.255.252	30
255.255.255.248	29
255.255.255.240	28
255.255.255.224	27
255.255.255.192	26
255.255.255.128	25
255.255.255.0	24

Mask	Length
255.255.254.0	23
255.255.252.0	22
255.255.248.0	21
255.255.240.0	20
255.255.224.0	19
255.255.192.0	18
255.255.128.0	17
255.255.0.0	16

Mask	Length
255.254.0.0	15
255.252.0.0	14
255.248.0.0	13
255.240.0.0	12
255.224.0.0	11
255.192.0.0	10
255.128.0.0	09
255.0.0.0	08

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

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 Case Controller M (Type 3 and Type 4)

Number	IO	Range (dependant on probe type) °C (°F)	Step	Units
I-01	Control Temp.	-42 to 60 (-43.6 to 140)	0.1	Deg
I-02	Display temp	-42 to 60 (-43.6 to 140)	0.1	Deg
I-03	Air on Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-04	Air off Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-05	Evaporator Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-06	Suction Line Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-07	Superheat	-30 to 60 (-54 to 108)	0.1	Deg
I-08	Logging Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-09	Defrost Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-10	Plant Fault	0 (OK), 1 (Alarm)		
I-11	Case Clean	0 (Off), 1 (On)		
I-14	Plant Fault 2	0 (OK), 1 (Alarm)		
O-01	Liquid Line Valve	0 (Off), 1 (On)		
O-05	Defrost Control	0 (Off), 1 (On)		
O-06	Lights	0 (Off), 1 (On)		
O-07	Case 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
O-13	Last Def. Type	0 (None), 1 (Internal), 2 (External), 3 (Network), 4 (Display), 5 (Timed)		
O-14	Suction Line Valve/Trim Heaters	0 (Open/Off), 1 (Closed/On)		
O-30	Set Point Offset	-49 to 60 (-56.2 to 140)	0.1	Deg
O-31	Trim Off Period	00:00 to 05:00	00:01	mm:ss
S-01	Control State	0 (Stabilise), 1 (Normal), 2 (Defrost Min), 3 (Defrost Max), 4 (Drain Down), 5 Fan Delay 6 (Recovery), 7 (OT Alarm), 8 (UT Alarm), 9 (Fans Only), 10 (Lights Only), 11 (Case Off), 12 (Case off) 13 (Pump_Down)		

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

Input/Output table for Coldroom Controller M (Type 5 and Type 6)

Number	IO	Range (dependant on probe type) °C (°F)	Step	Units
I-01	Control Temp.	-42 to 60 (-43.6 to 140)	0.1	Deg
I-02	Display temp	-42 to 60 (-43.6 to 140)	0.1	Deg
I-03	Air on Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-04	Air off Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-05	Evaporator Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-06	Suction Line Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-07	Superheat	-30 to 60 (-54 to 108)	0.1	Deg
I-08	Logging Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-09	Defrost Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-10	Plant Fault	0 (OK), 1 (Alarm)		
I-12	Door Sensor	0 (Closed), 1 (Open)		
I-13	Person Trapped	0 (OK), 1 (Alarm)		
I-14	Plant Fault 2	0 (OK), 1 (Alarm)		
O-01	Liquid Line Valve	0 (Off), 1 (On)		
O-05	Defrost Control	0 (Off), 1 (On)		
O-07	Case Fans	0 (Off), 1 (On)		
O-08	Remote Relay	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)		
O-13	Last Def. Type	0 (None), 1 (Internal), 2 (External), 3 (Network), 4 (Display), 5 (Timed)		
O-14	Suction Line Valve	0 (Open), 1 (Closed)		
O-20	Door Open Time	00:00 to 23:59		hh:mm
O-21	Door Open Length	00:00 to 03:00		hh:mm
O-30	Set Point Offset	-49 to 60 (-56.2 to 140)	0.1	Deg
S-01	Control State	0 (Stabilise), 1 (Normal), 2 (Defrost Min), 3 (Defrost Max), 4 (Drain Down), 5 Fan Delay 6 (Recovery), 7 (OT Alarm), 8 (UT Alarm), 9 (Fans Only), 10 (Lights Only), 11 (Case Off), 12 (Case off) 13 (Pump_Down)		

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

Input/Output table for Mobile Controller M (Type 1 and Type 2)

Number	IO	Range (dependant on probe type) °C (°F)	Step	Units
I-01	Control Temp.	-42 to 60 (-43.6 to 140)	0.1	Deg
I-02	Display temp	-42 to 60 (-43.6 to 140)	0.1	Deg
I-03	Air on Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-04	Air off Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-05	Evaporator Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-06	Suction Line Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-07	Superheat	-30 to 60 (-54 to 108)	0.1	Deg
I-08	Logging Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-09	Defrost Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-10	Plant Fault	0 (OK), 1 (Alarm)		
I-11	Case Clean	0 (Off), 1 (On)		
I-14	Plant Fault 2	0 (OK), 1 (Alarm)		
O-03	Compressor A	0 (Off), 1 (On)		
O-04	Compressor B	0 (Off), 1 (On)		
O-05	Defrost Control	0 (Off), 1 (On)		
O-06	Lights	0 (Off), 1 (On)		
O-07	Case 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	Deg
O-13	Last Def. Type	0 (None), 1 (Internal), 2 (External), 3 (Network), 4 (Display), 5 (Timed)		
O-30	Set Point Offset	-49 to 60 (-56.2 to 140)	0.1	Deg
S-01	Control State	0 (Stabilise), 1 (Normal), 2 (Defrost Min), 3 (Defrost Max), 4 (Drain Down), 5 Fan Delay 6 (Recovery), 7 (OT Alarm), 8 (UT Alarm), 9 (Fans Only), 10 (Lights Only), 11 (Case Off), 12 (Case off) 13 (Pump_Down)		

Input/Output table for Case Controller E (Type 3 and Type 4)

Number	IO	Range (dependant on probe type) °C (°F)	Step	Units
I-01	Control Temp.	-42 to 60 (-43.6 to 140)	0.1	Deg
I-02	Display temp	-42 to 60 (-43.6 to 140)	0.1	Deg
I-03	Air on Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-04	Air off Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-05	Evaporator Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-06	Suction Line Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-07	Superheat	-30 to 60 (-54 to 108)	0.1	Deg
I-08	Logging Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-09	Defrost Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-10	Plant fault	0 (OK), 1 (Alarm)		
I-11	Case Clean Switch	0 (Off), 1 (On)		
O-05	Defrost Control	0 (Off), 1 (On)		
O-06	Lights	0 (Off), 1 (On)		
O-07	Case Fans	0 (Off), 1 (On)		
O-09	EEV Opening	0 to 100	0.1	%
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
O-13	Last Def. Type	0 (None), 1 (Internal), 2 (External), 3 (Network), 4 (Display), 5 (Timed)		
O-14	Suction Line Valve	0 (Open), 1 (Closed)		
O-30	Set Point Offset	-49 to 60 (-56.2 to 140)	0.1	Deg
O-31	Trim Off Period	00:00 to 05:00	00:01	mm:ss
S-01	Control State	0 (Stabilise), 1 (Normal), 2 (Defrost Min), 3 (Defrost Max), 4 (Drain Down), 5 Fan Delay 6 (Recovery), 7 (OT Alarm), 8 (UT Alarm), 9 (Fans Only), 10 (Lights Only), 11 (Case Off), 12 (Case off) 13 (Pump_Down)		

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

Input/Output table for Coldroom Controller E (Type 5 and Type 6)

Number	IO	Range (dependant on probe type) °C (°F)	Step	Units
I-01	Control Temp.	-42 to 60 (-43.6 to 140)	0.1	Deg
I-02	Display temp	-42 to 60 (-43.6 to 140)	0.1	Deg
I-03	Air on Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-04	Air off Probe	-42 to 60 (-43.6 to 140)	0.1	Deg
I-05	Evaporator Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-06	Suction Line Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-07	Superheat	-30 to 60 (-54 to 108)	0.1	Deg
I-08	Logging Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-09	Defrost Probe	-49 to 60 (-56.2 to 140)	0.1	Deg
I-10	Plant fault	0 (OK), 1 (Alarm)		
I-12	Door Sensor	0 (Off), 1 (On)		
I-13	Person trapped	0 (OK), 1 (Alarm)		
O-02	Suction Line Valve	0 (Open), 1 (Closed)		
O-05	Defrost Control	0 (Off), 1 (On)		
O-07	Case Fans	0 (Off), 1 (On)		
O-08	Remote Relay	0 (Off), 1 (On)		
O-09	EEV Opening	0 to 100	0.1	%
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
O-13	Last Def. Type	0 (None), 1 (Internal), 2 (External), 3 (Network), 4 (Display), 5 (Timed)		
O-20	Door Open Time	00:00 to 23:59		hh:mm
O-21	Door Open Length	00:00 to 03:00		hh:mm
O-30	Set Point Offset	-49 to 60 (-56.2 to 140)	0.1	Deg
S-01	Control State	0 (Stabilise), 1 (Normal), 2 (Defrost Min), 3 (Defrost Max), 4 (Drain Down), 5 Fan Delay 6 (Recovery), 7 (OT Alarm), 8 (UT Alarm), 9 (Fans Only), 10 (Lights Only), 11 (Case Off), 12 (Case off) 13 (Pump_Down)		

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
Prb3	Probe 3 Fault
Prb4	Probe 4 Fault
Prb5	Probe 5 Fault
Prb6	Probe 6 Fault
Pd	Control State in Recovery
dEF	Control Sate in Defrost
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
door	Door Open Alarm
TrAP	Person Trapped Alarm
PLnt	Plant Fault
LgOt	Log Probe Over Temperature
LgUt	Log Probe Under Temperature

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)
Missed defrost	15
Plant Fault 1	3
Case over temperature	4
Case under temperature	5
Probe 1 Faulty	6
Probe 2 Faulty	6
Probe 3 Faulty	6
Probe 4 Faulty	6
Probe 5 Faulty	6
Probe 6 Faulty	6
Door Left Open	2
Product over temperature	8
Product under temperature	9
Person Trapped	1
Plant Fault 2	3

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

Modifying controller states

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

Defrost “dEF”
Selecting the defrost option starts a defrost cycle. Selecting this option will exit the setup menu automatically. The display will show “dEF”
Defrosts can also be manually started by pressing and holding the display # button.
There is also a remote defrost command which starts a defrost cycle from the network front end or remote system.

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 “FAnS OnLy”

If a remote display with key switch is being used, this function can be invoked by turning the key switch to the fans only position (90 degrees clockwise) with parameter P85 set to "fans"

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”
If a remote display with key switch is being used, this function can be invoked by turning the key switch to the case-off position. (Clockwise 90 degrees) with parameter P85 set to "case"

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”

Note. When lights are being used in “Remote” mode with a timing channel: -

If the controller goes offline, the lights are turned ON after a delay of 5 minutes. The lights will stay on until the controller comes back on-line where they will revert to the state of the timing channel being used.

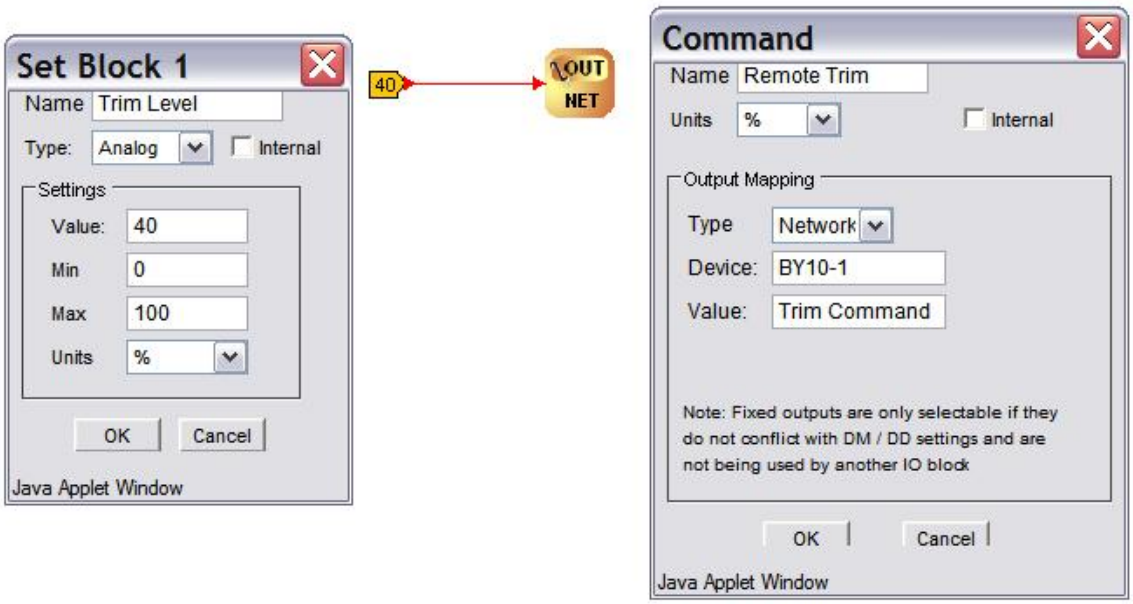
Remote Commands:

The following commands can be used by a Data Builder program: -

Command	Value to send	Description	Conditions;
Defrost Command	1	Initiates a defrost cycle	Defrost mode: remote
Defrost Command	3	Terminates the defrost	Defrost mode: remote Defrost hold: On Defrost min state complete
Trim Command	0 to 100%	Sets the trim level to this value (Trim period is 5 minutes)	Relay 4 mode: Trim Heater
Setpoint Command	±20^{O}C (±34^{O}F)	Is added to or subtracted from the setpoint	
Case Off Command	5 0	Sets the controller to Case Off Restores the controller from Case Off to Normal	
EEV Command	2 1	Shuts the valve off Restores the valve to normal operation	

Use an “Analogue Out” block configured to the controller name and in the value field type in the command you require. Use a “Setting block” as the input to the “Analogue Out” block to send the Value.

See Example below, which sets the Trim Heater to BY10-1 at 40%



Specification

Power requirements:

Supply Voltage Range:	100 - 240 Vac ±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:	$+5^0$C to $+50^0$C
Operating Humidity:	80% maximum
Storage temperature range:	-20^0C to $+65^0$C
Environmental:	Indoor use at altitudes up to 2000m, Pollution Degree 1, Installation Category II. Voltage fluctuations not to exceed ±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: Max Voltage relay 1: Exclusive common	6A (non inductive) 260Vac (external supply)	M M
Max current relay 1: Max Voltage relay 1: Exclusive common	1.5A 280Vac (external supply)	E E
Max current relay 2: Max Voltage relay 2: Shared common with relay 3	4A (non inductive) 260Vac (external supply)	Relays 2 and 3 share a common supply line and the loads can have a combined total of 8A. Relay 2 or 3 can switch a maximum of 6A provided the other is at 2A or. lower.
Max current relay 3: Max Voltage relay 3: Shared common with relay 2	4A (non inductive) 260Vac (external supply)	
Max current relay 4: Max Voltage relay 4: Common connected to Input "live"	3A (non inductive) 260Vac (Internal supply)	
Max current relay 5: Max Voltage relay 5: Common connected to Input "live"	3A (non inductive) 260Vac (Internal supply)	

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).

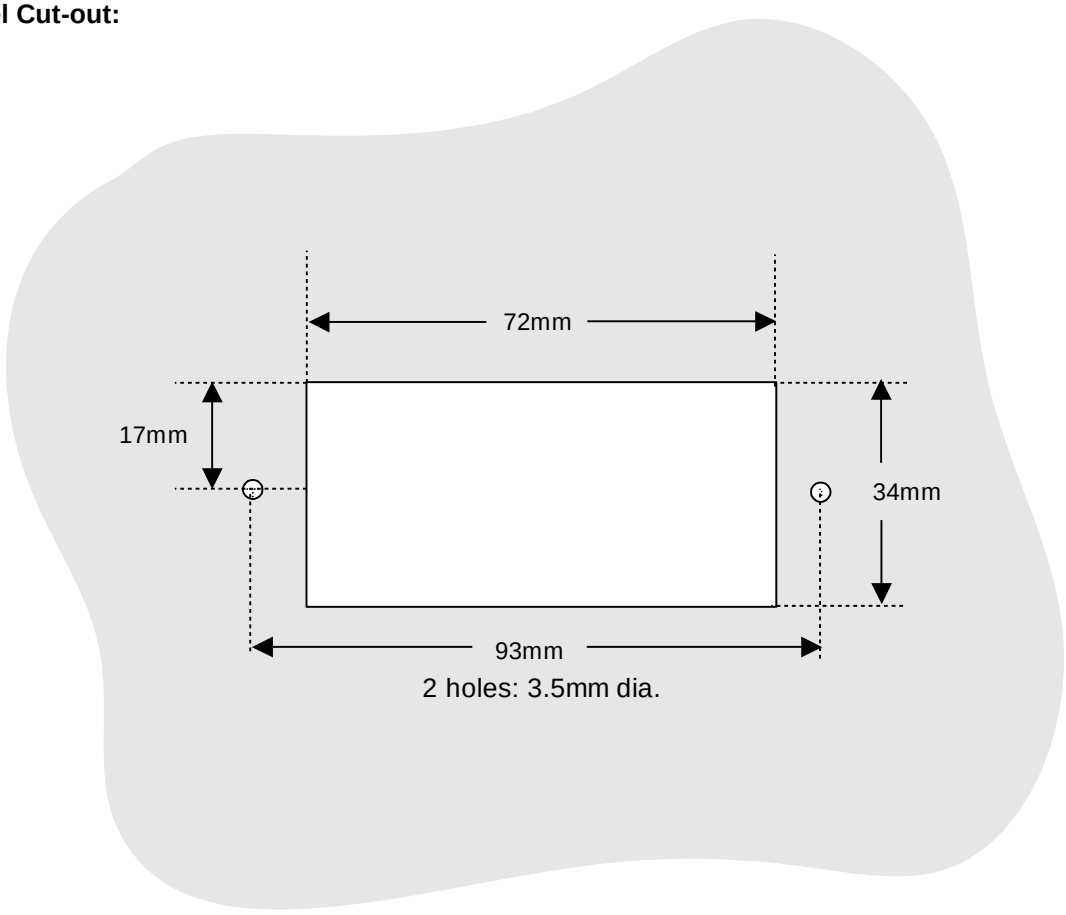
Ensure that all power is switched off before installing or maintaining this product

Inputs:

Input resistance:	3.01K Ohms (for PTC or NTC type probes)
Input type	PT1000 or NTC2K or NTC2K25 (selectable)
Comms:	RS232 with flow control

Installation:

Panel Cut-out:



Fixing:

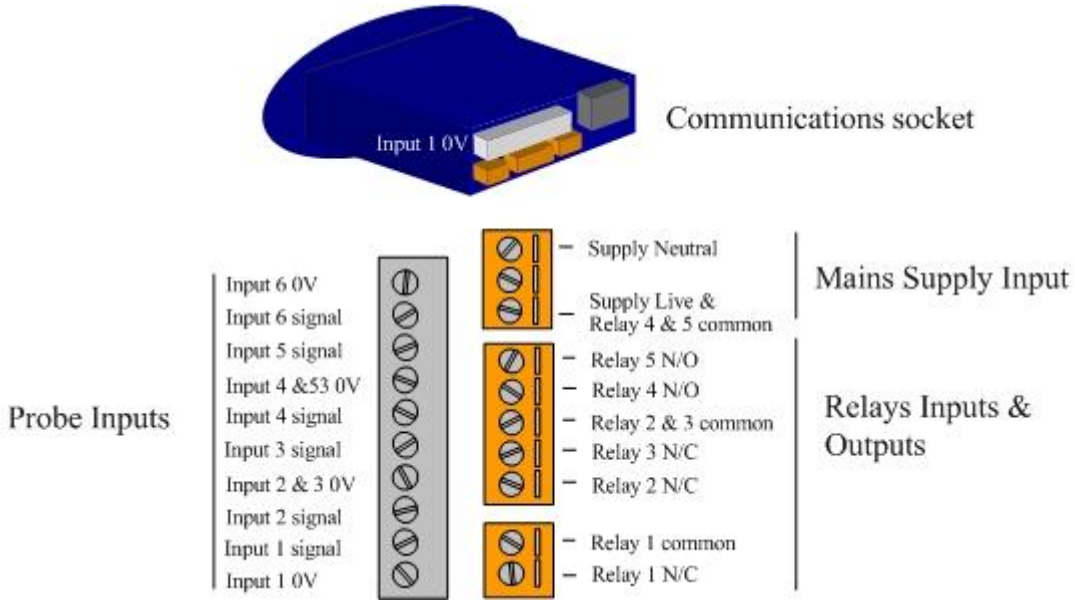
The controller can be fixed either by 2 X M3 screws from the rear or by the plastic retaining device (PR0329), obtainable from RDM.

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

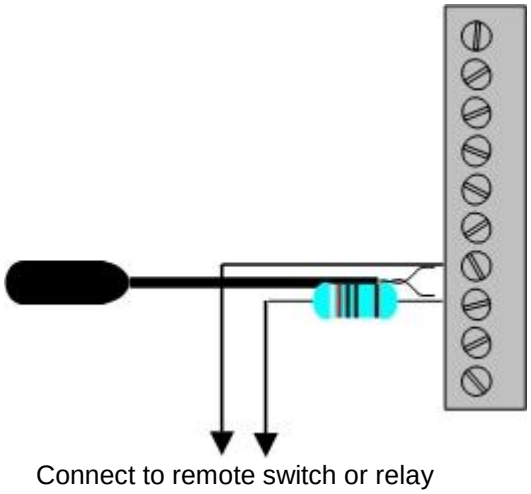
Wiring:



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.

Plant Input Resistors:



Example of resistor fitted on Air Off probe

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

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 damped lint free cloth.

Disclaimer:

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

Appendix 1

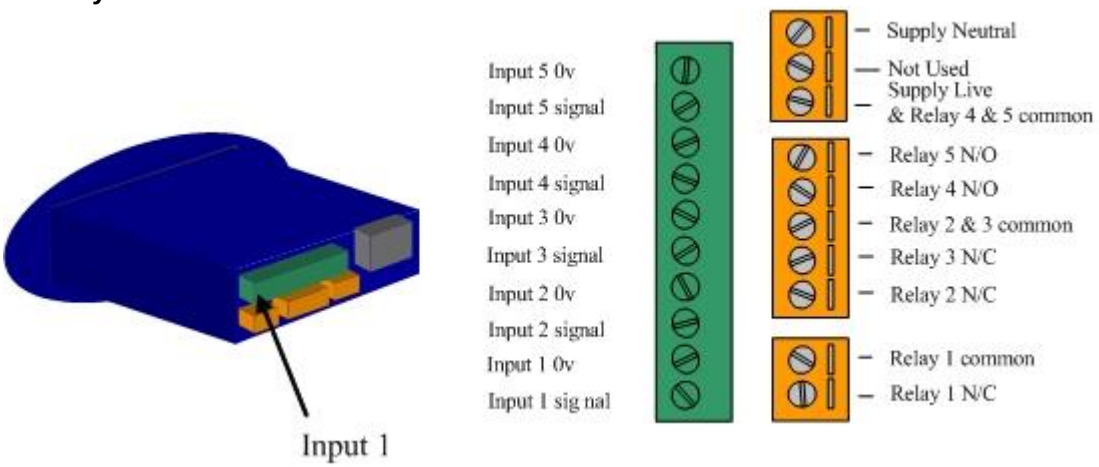
Replacing a Mercury 5-5 with a Mercury 6-5

As seen in the two diagrams below, the supply and relay connections for the two controllers are identical, and may be moved from one controller to another without the need for change.

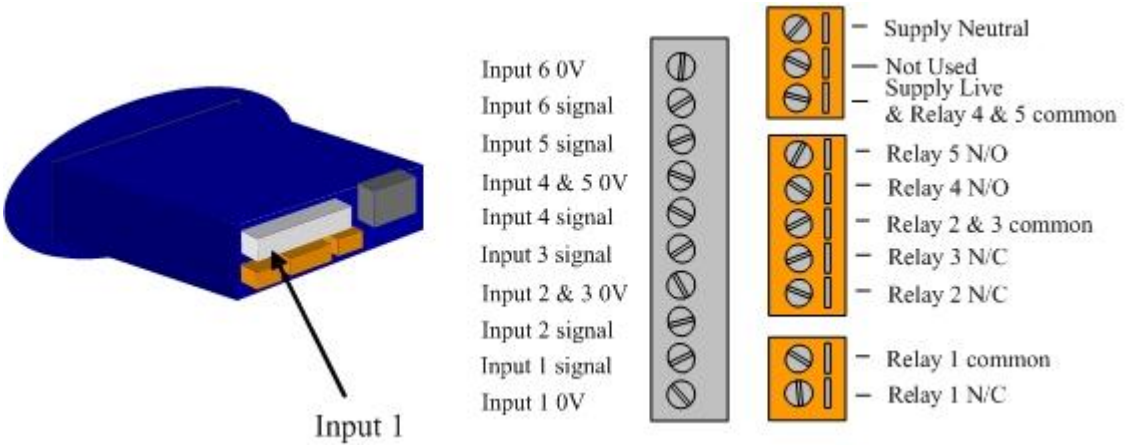
The **probe** connections for the two controllers are **different**, and if a 6-5 is replacing a 5-5, the probes must be reconnected to the appropriate positions.

*If a 6-5 is accidentally configured with 5-5 probe connections **Probes 3 and 4** will indicate faults*

Mercury 5-5 connections:

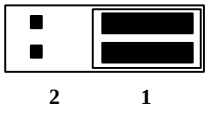


Mercury 6-5 connections:

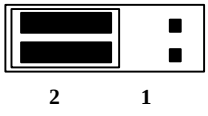


Note: If a RS485 module (PR0026) is fitted, the 2 jumper links on JP1 on the RS485 PCB must be changed from position 1 (Mercury 5) to position 2 (Mercury 6)

Mercury 5-5



Mercury 6-5



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

Appendix 2

Controller with Remote Display

The following Mercury controllers have support for remote display and remote display with key switch:

Mercury 6-5 MR	Part Number: PR0320
Mercury 6-5 ER	Part Number: PR0321

Remote Display Options:

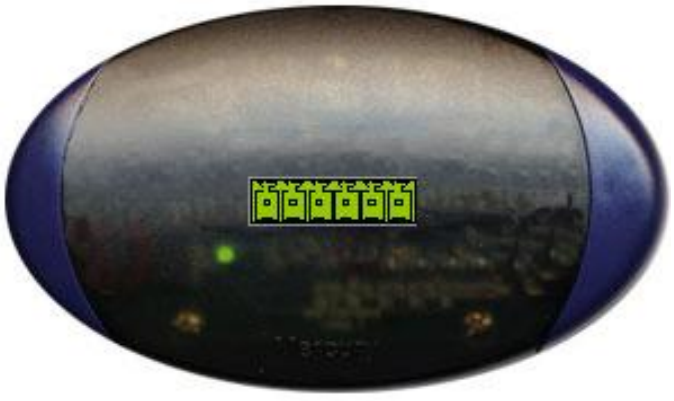
Mercury Display :	Part Number: PR0325 (includes 5 metre connection cable)
Mercury Display with Keyswitch:	Part Number: PR0326 (includes 5 metre connection cable)
DIN Display:	Part Number: PR0327
DIN Display with Keyswitch:	Part Number: PR0328
5m cable for PR0327/8:	Part Number: PR0324

Panel cut-out; the same as the Mercury controller. Depth required behind panel is: -30mm

Operation:

The above controllers with remote display operate in exactly the same way as the equivalent integrated controller.

The display with keyswitch provides the user with a "Case Off" or "Fans only" function (determined by parameter P85) by turning the key to the on position. The controller will remain in this state; irrespective of local or network settings, until the keyswitch is returned to the normal position.
If P85 is set to "toggle", the keyswitch when turned on once will turn the case off. If the keyswitch is turned on, then off and on again with a short (1 second) delay, then the case will go into the "fans only" mode.



Mercury Controller for use with remote display

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

Appendix 3

820R Resistor Part numbers

Farnell:	946-3852 or 934-3563	RS Components	144-239 or 131-249 or 148-483

590R Resistor Part numbers

Farnell:	946-9150 or 950-2424 or 108-3226	RS Components	487-5836 or 165-545

Revision History

Revision	Date	Changes	Comments
3.9	13/06/2006	Added appendix 3, resistor part numbers	
4.0	23/08/2006	Corrected relay numbers in the defrost state table	
4.1	10/11/2006	Fan off in OT and/or temperature parameter	
4.2	02/04/2007	Typo corrected on wiring diagram	
4.3	28/05/2007	Resistor part numbers updated. Contents page updated	Updated to RoSH compliant components.
4.4	26/08/2009	Added Remote Commands These commands are implemented in software Version 9.9	