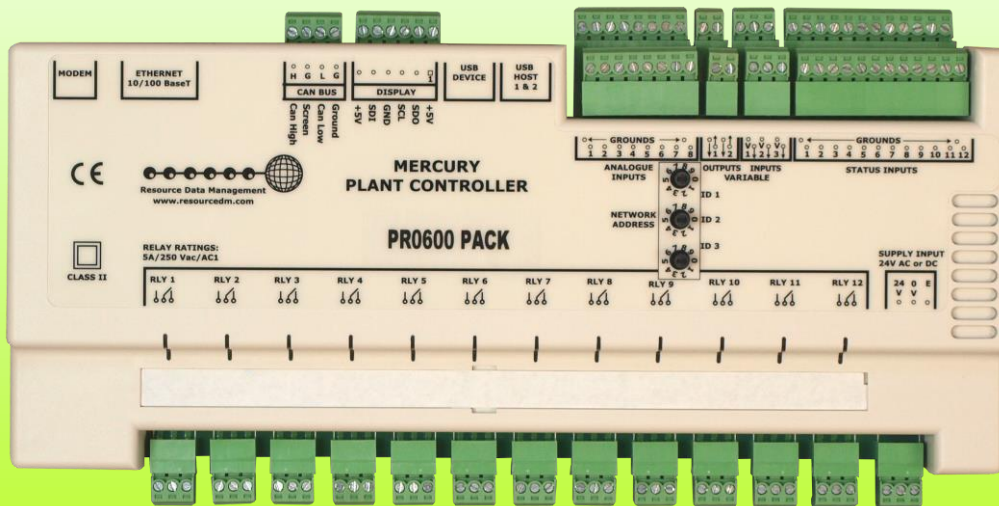


Intuitive

**PR0650-PACK
PR0650D-PACK**



Plant

PR0600-PACK

Intuitive and Plant Pack Controller Installation & User Guide

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The Intuitive and Mercury Range

From Resource Data Management

This documentation refers to the controllers Mercury Plant Controller and Intuitive Plant Controller

Description

These are versatile controllers intended for Pack and/or Condenser control. Both controllers are identical in function with the Intuitive controller having the added benefits of a fused supply & relay outputs, higher relay ratings and the option of an integral display. Both controller variants have 12 relay outputs that are configurable for compressors, loaders, trim compressors or fans. The 12 status inputs can be assigned for Pack or Condenser section inputs or general alarms. There are three (4-20mA, 0-5Vdc or 0-10Vdc) inputs for pressure transducers; 2 for control purposes and 1 monitoring. The Pressure readings obtained from the three inputs can be broadcast over a Data Manager IP network for use by RDM Mercury Switch (PR0018-PHI). There are 8 temperature probe inputs and 2 analogue outputs (either can be set to 0-10Vdc, 0-5Vdc, 4-20mA or 0-20mA) to control variable speed devices. Both controller types have 10 software type options, see table below

The "Fuzzy" based algorithm, will give enhanced control whilst maintaining the starts per hour requirement. The algorithm also reduces the number of input parameters required for control; only a target pressure is needed.

Note: In fuzzy logic if an inverter is being used it is not included in anti-short cycle timer (Starts per hour P-23/43)

The "staged" type allows the user to fully program the output stages to the desired elements.

The Plant controllers have an embedded Ethernet port to allow for connection to a Data Manager system without the need for a communications module. A USB port allows for a direct PC connection.

All relays are volt-free and can be mixed between low and high voltage sources. The controllers require a 24Vac or 24Vdc PSU (PSU available from RDM: - PR0625).

Intuitive / Plant Controller Descriptions	Part Number
Intuitive Controller with Pack application (No Internal Display)	PR0650-PACK
Intuitive Controller with Pack application (Internal Display)	PR0650D-PACK
Plant Controller with Pack Application	PR0600-PACK

Configuration Types

The controllers have ten configuration options: -

Display value	Type	Control Type
1	Pack	Fuzzy
2	Dual Pack	Fuzzy
3	Pack/Condenser	Fuzzy
4	Dual Condenser	Fuzzy
5	Condenser	Fuzzy
6	Pack	Staged
7	Dual Pack	Staged
8	Pack/Condenser	Staged
9	Dual Condenser	Staged
10	Condenser	Staged

Both controllers are delivered pre-configured as a Pack Controller (Type 1) See [Type Change](#)

See [Set-up](#) to change the controller type.

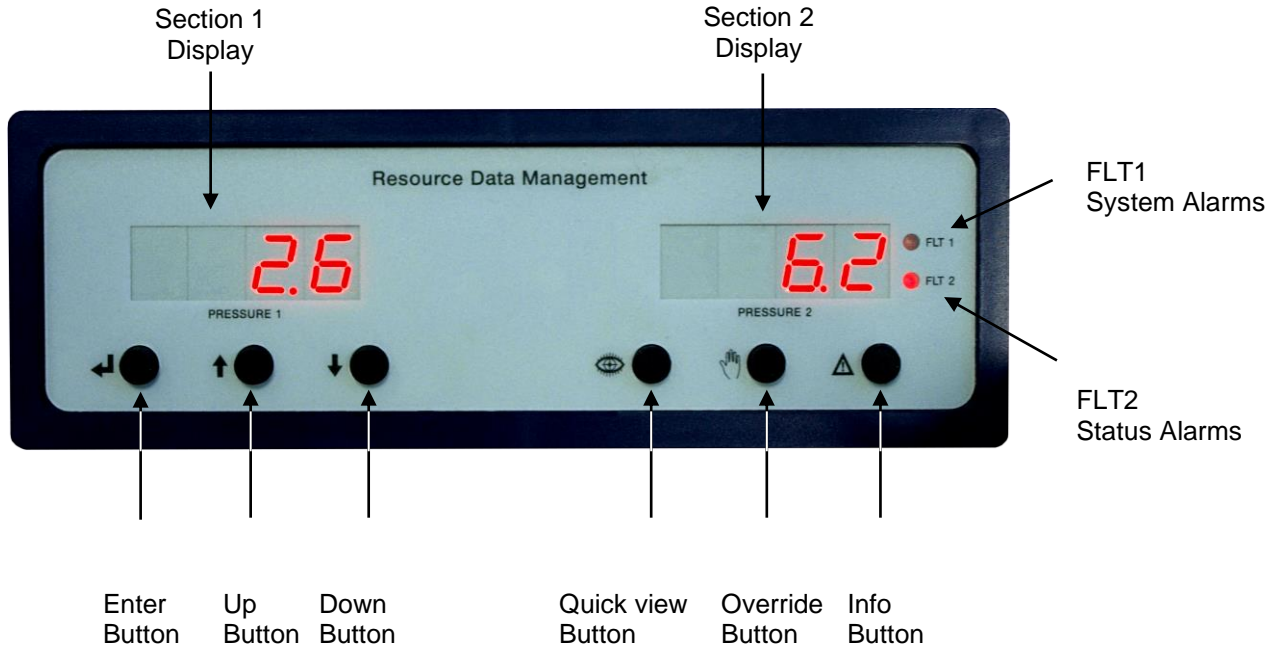


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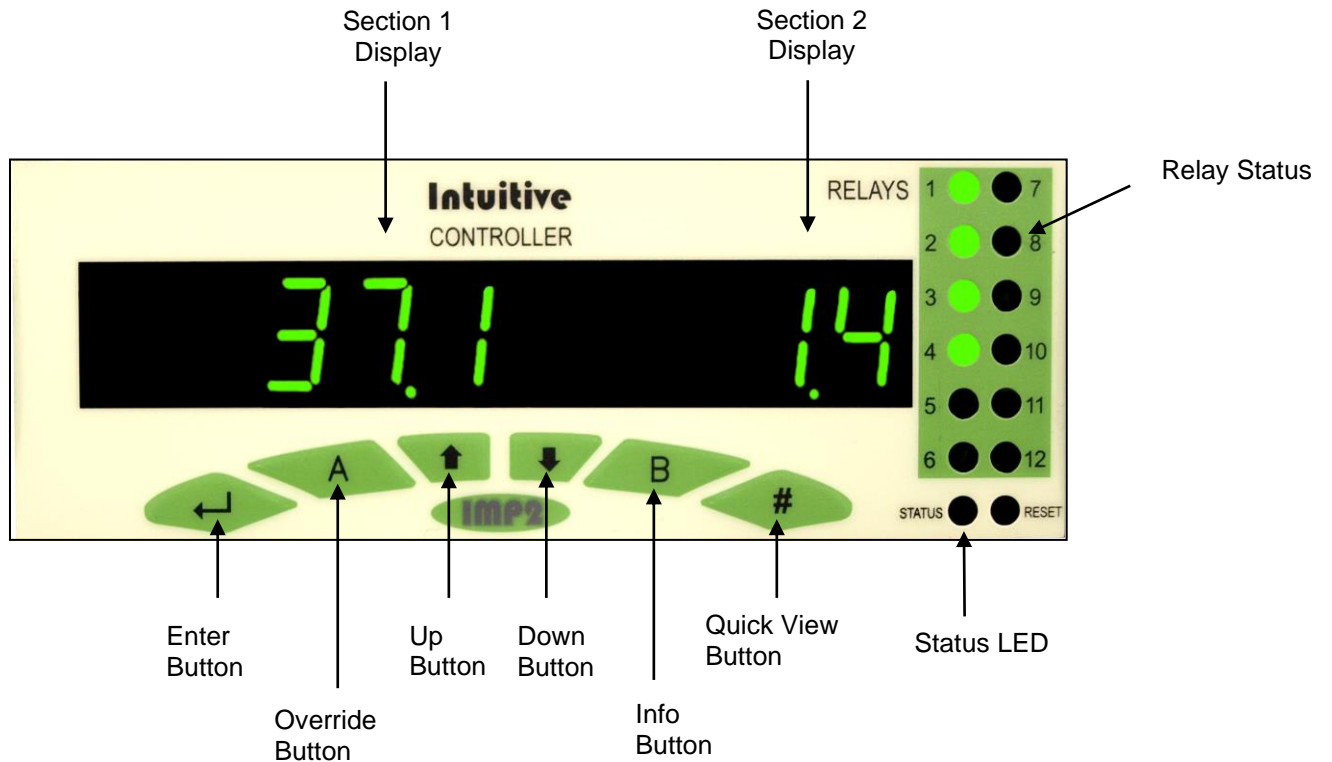
Front Panel Displays

Remote Display (PR0620)

The remote display PR0620 will operate with either the Plant or Intuitive Controller. **Note** the Plant controller doesn't have an internal display option, only the remote display can be used.



Integral Display (PR0650D-PACK)



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Section 1 Display

4 character display, shows the pressure (suction for pack, discharge for condensers)
 In set-up mode, displays the set-up menu items
 In quick view mode, indicates the target pressure
 In Override mode, indicates and allows the relays to be forced on

Section 2 Display

4 character display, shows the pressure (suction for pack, discharge for condensers)
 In set-up mode, display is blank
 In Override mode, display is blank

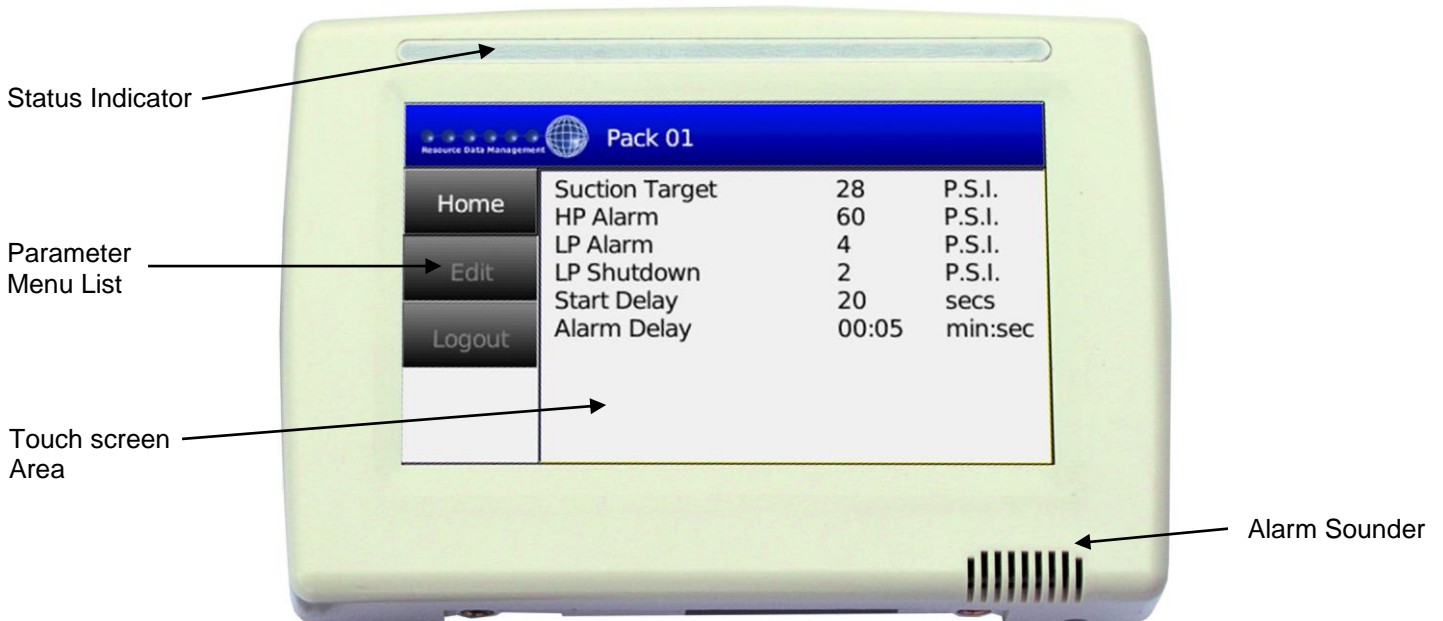
Front Panel Remote Display Buttons

- Enter Button:** - Used along with down button to enter menu items.
- Up Button:** - Used to scroll up.
- Down Button:** - Used to scroll down.
- Quick View Button:** - Used to view the target pressure (See [Quickview](#) section).
- Override Button:** - Used with the "Enter" button, to go into the override mode. (See [Override](#) section).
- Info Button:** - Used to view the current analogue outputs values. (See [Info](#) section).

Front Panel, Integral display (Intuitive Range) Buttons

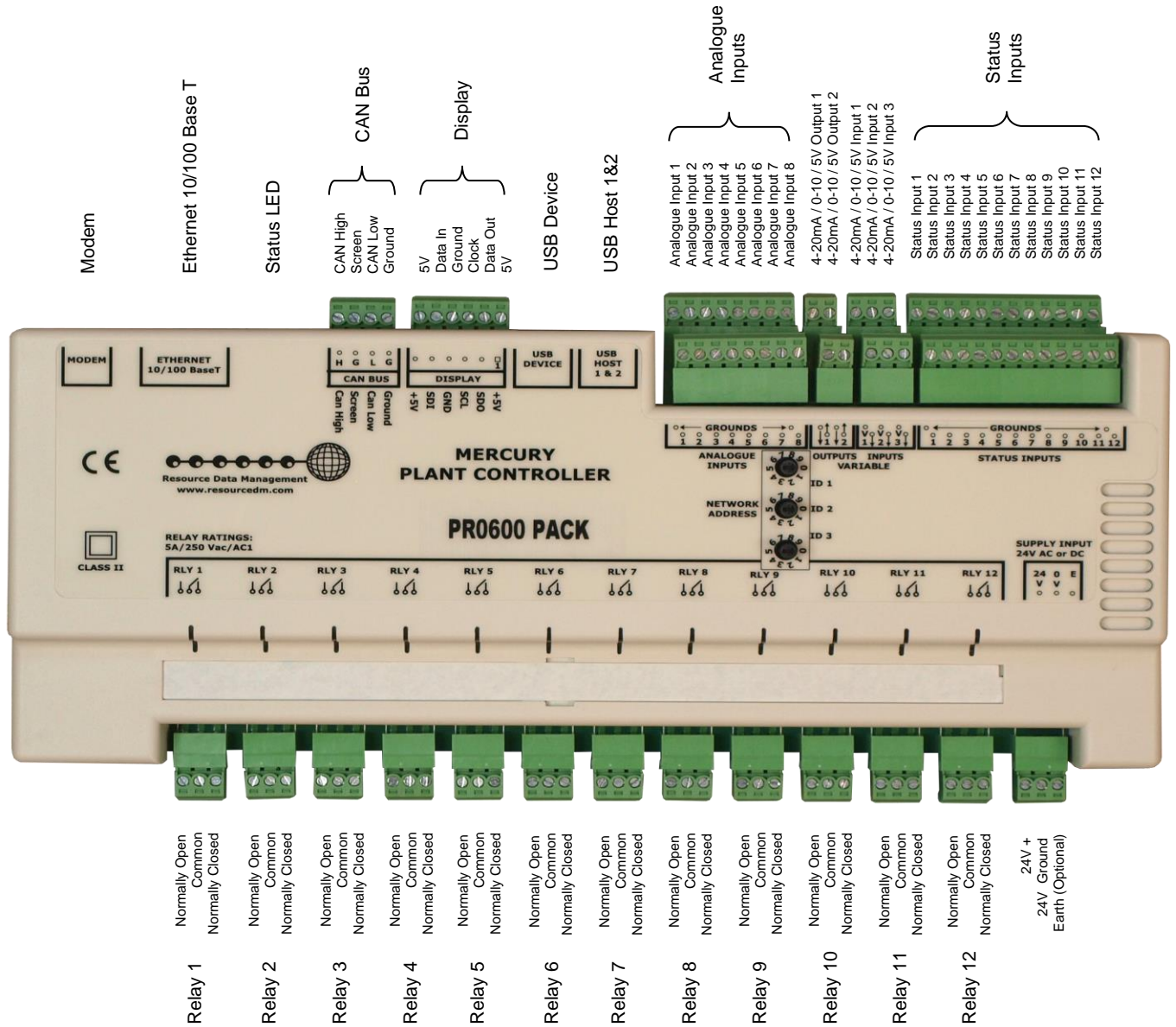
- Enter Button:** - Used along with down button to enter menu items.
- Override Button "A":** - Used with the "Enter" button, to go into the override mode. (See [Override](#) section).
- Up Button:** - Used to scroll up.
- Down Button:** - Used to scroll down.
- Info Button "B":** - Used to view the current analogue outputs. (See [info](#) section).
- Quick View Button "Hash":** - Used to view the target pressures (See [Quickview](#) section).

USB Touch Screen Display (PR0615)

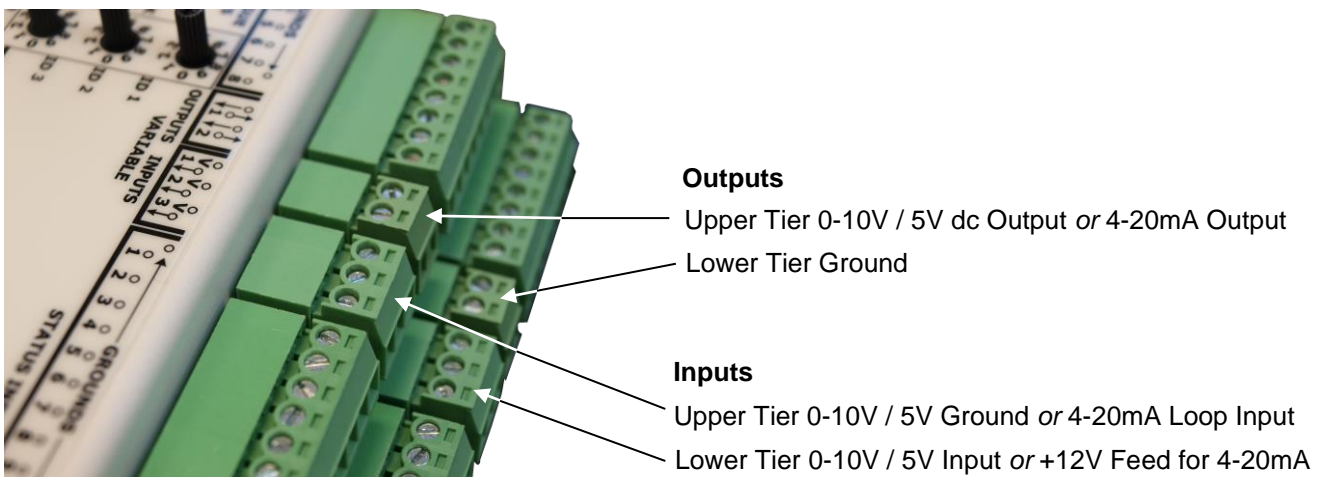


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Mercury Plant Controller I/O Connections



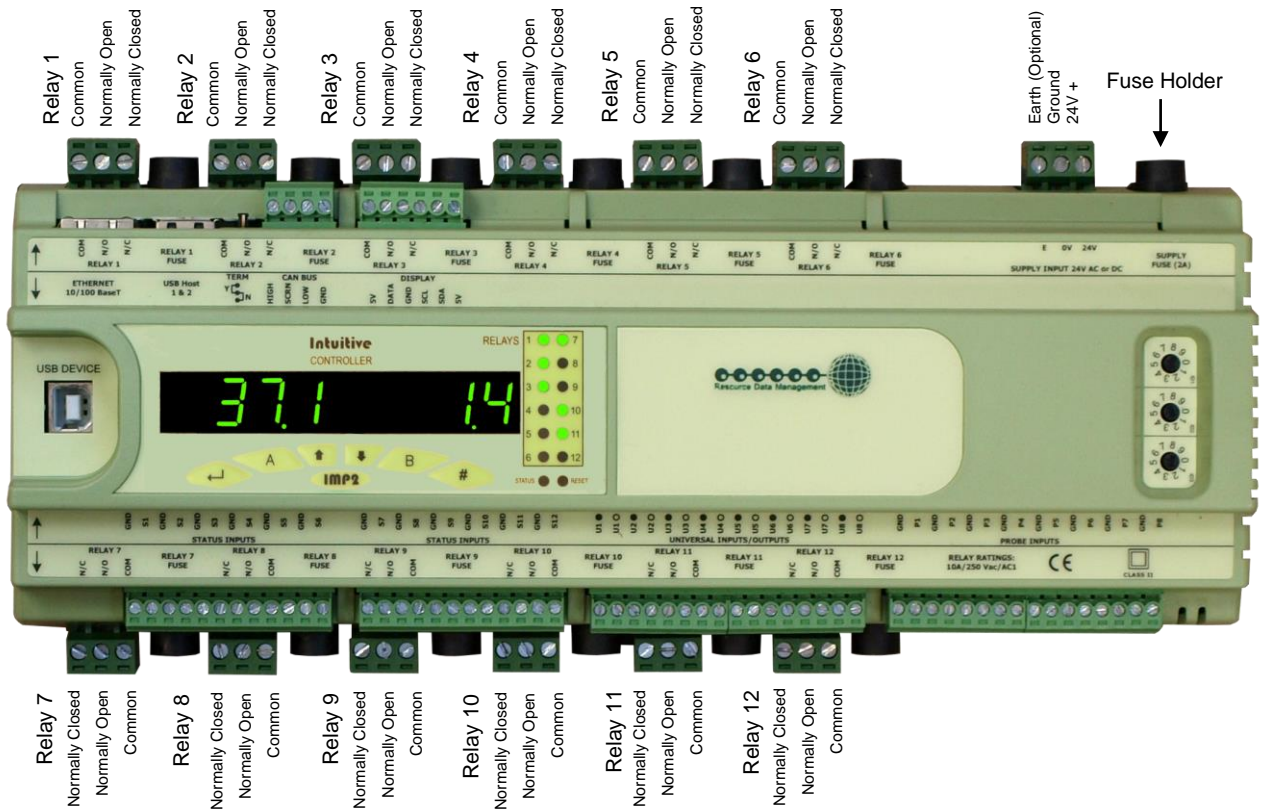
Mercury Plant Controller Variable Analogue Input / Output Connections



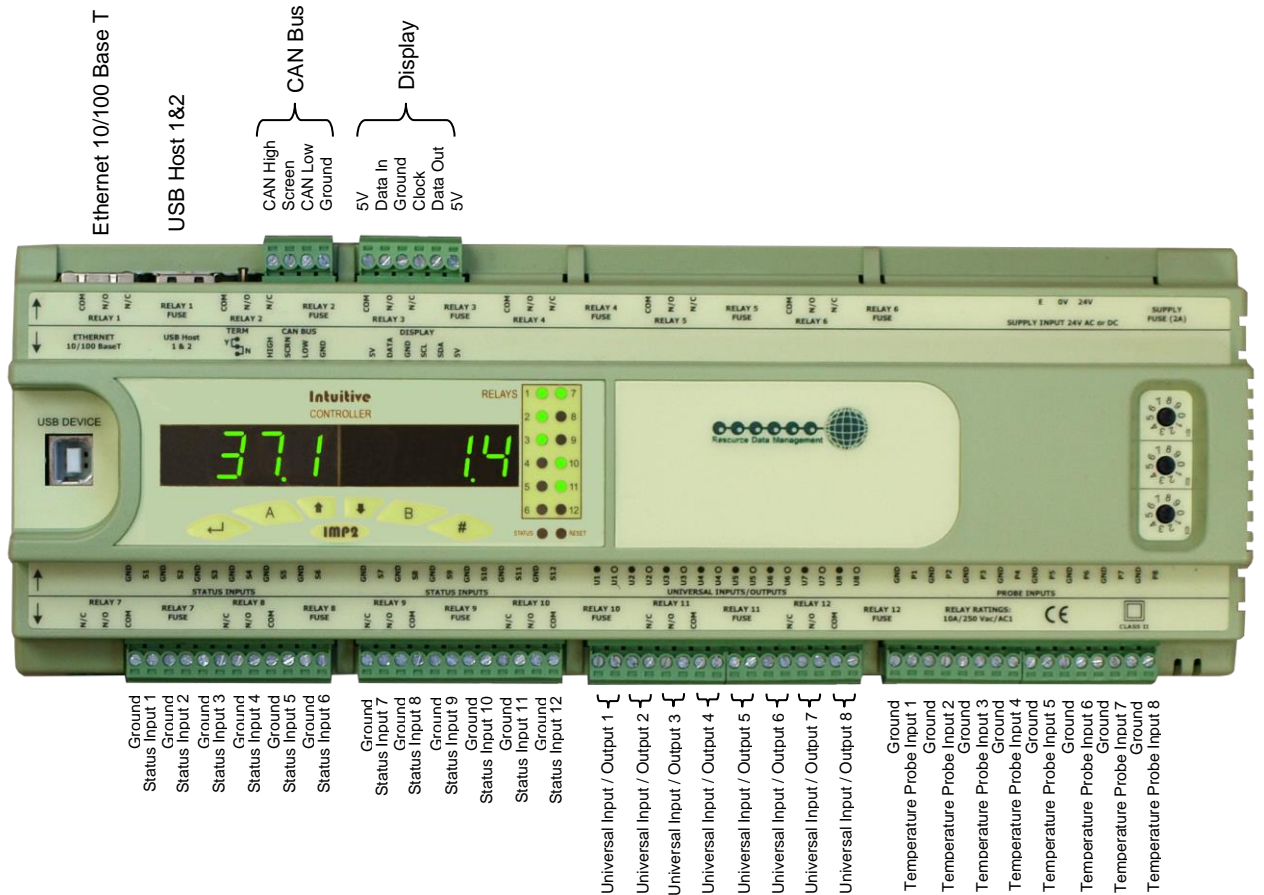
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Intuitive Plant Controller I/O Connections

Bottom Row Connections



Top Row Connections



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Intuitive Plant Controller, Universal Analogue Input / Output Connections

0 or 4 -20mA Input	
U1-U3 ●	0 or 4-20mA Loop Input or 0-10V / 5V Ground
U1-U3 ○	12v Transducer Feed or 0-10V / 5V Input
U4-U5 ●	Ground
U4-U5 ○	0 or 4-20mA Output or 0-10V / 5V Output
U6-U8	Unused (May be used for future development)

Input/s & Outputs

All Types	Description	Comments
Status Inputs 1-12	0V return or 24 Vac	Note 1
Analogue Inputs 1-8	Probe input	Note 2
Analogue Inputs 1-3	Analogue input	4-20mA or 0-10V / 5V Input See note 3
Analogue Outputs 4-5	Analogue output	4-20mA or 0-10V / 5V Output
Relay 1-12	N/O, N/C and Common	Volt Free
Status LED	Healthy LED	When powered up the LED will flash off/on every 0.5 seconds. Note 3

Note 1: 24 Vac must have the same 24 Vac return as the supply voltage. If using the Plant controller 24V power supply only the 24Vac signal from the supply is required for the status input.

Note 2: Several probe types are available, see [Probe Type](#)

Note 3: The Status LED is not present on older variants of the Mercury Plant controller hardware. If the status LED is present and the Plant controller software is V1.7 or greater then Analogue inputs 1 to 3 are configurable either as a 4-20mA input or a 0-10V / 5Vdc input. If the above criteria is not met then Analogue inputs 1 to 3 are configurable as 4-20mA inputs only. On the Intuitive Plant controller the analogue inputs and outputs are universal and can be configured for 0-10V / 5Vdc or 4-20mA

Setting up the controller

Set-up access to the controller can be achieved several ways

- Through the front mounted buttons on the remote display
- Direct access by PC via a USB connection
- Direct access by a PC via an Ethernet Connection
- Through the RDM Data Manager.
- Through a USB Touch screen display (PR0615)

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. Alternatively use either a PC connection for configurations or load a configuration from a memory-stick



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Set-up Menu

LH Display	RH Display	Option	Explained in Paragraph
IO		View Input/Output States	View Input/Output States
PArA		Set/view Parameters	Set/view parameters
Unit		Set/View Probe Type & Units	Set/View Units
Uni		Set Universal I/O	Universal IO
StA		Set Status Input Type	Set Input Type
rLy		Inverts the relay function	Set Relay Output
TyPE		Set/View Controller Type	Set/view product type
rtc		Set/view Clock (rtc = Real Time Clock)	Real Time Clock
nEt		Set/view network configuration	Network Configuration
bCSt		Broadcast (Pressures)	Broadcast
SoFt		View software version	
USb		Save/Load onto USB device	USB
OFSt		Temperature probe offsets	Set Probe Offsets
ESC		Exit set-up mode	

Recommended set-up method

It is recommended that this controller is set-up using a direct connection to a PC See [Setup via a PC](#)

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.

Universal IO

Setting up from controller display, navigate to the screen "Uni" and select from the following table for U-01 to U-08 This selects what Universal IO (U-01 to U-08) can be set for.

NOTE: UniIO U-01 to U-03 can only be set as Inputs, **UniIO U-04 and U-05** can only be set for Outputs and **UniIO U-06 to U-08** are seen in settings but are not present on the controller hardware and are for future development.

U-01 to U-03 (Variable Inputs) can be set to 0, 1 or 2.
 U-04 and U-05 (Variable Outputs) can be set to 3, 4, 5 or 6.
 U-06 to U-08 do not do anything.

- 0. 4-20mA Input
- 1. 0-10V Input
- 2. 0-5V Input
- 3. 4-20mA Output
- 4. 0-20mA Output
- 5. 0-10V Output
- 6. 0-5V Output

NOTE: Universal I/O U-01 to U-03 can only be set as Inputs, **Universal I/O U-04 and U-05** can only be set for Outputs and **Universal I/O U-06 to U-08** are not used in this application and should not be changed.

Input Type

The 3 analogue inputs can be set to either of the following

- 0. 4 – 20mA Input
- 1. 0 – 10Vdc Input (Default)
- 2. 0 – 5Vdc Input

Output Type

The 2 analogue outputs can be set to either of the following: -

- 3. 4 – 20mA Output
- 4. 0 – 20mA Output
- 5. 0 – 10V dc Output (Default)
- 6. 0 – 5V dc Output



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Status Input Type

Navigate to the screen "StA"

Selects whether the status inputs require a 0V return or 24Vac return See: [Note 1](#)

Select 1 for Input type 0V return
 Select 2 for Input type 24V ac return

rtc. Real time clock

(This will automatically synchronise on network systems)

1. Use the up or down buttons to scroll through the display until the display reads "rtc"
2. Press enter. The display will show "t-1". Press enter again
3. Scroll hours up or down (0 – 23) press enter
4. Use up button to select "t-2", press enter
5. Scroll minutes up or down (0 – 59) press enter
6. Repeat for t-3 (seconds 0 – 59)
7. Repeat for t-4 (Days up to 31)
8. Repeat for t-5 (months up to 12)
9. Repeat for t-6 (Year up to 99)
10. Use up button to display "ESC", press enter to display "rtc"

Time clock is now set

type. Set/ view controller type

1. From the function menu scroll to "type", press enter
2. Use the up/down buttons to scroll through the type values. (See [configuration](#) on page 4)
3. Press enter.

The controller will reset with the selected type now programmed.

Type Change

NOTE: When changing controller types from one type to another always check the parameters and the controller configuration to ensure they are appropriate for the application selected.

Broadcast

0 = No broadcast. 1 = Broadcast Pressures. 2 = Broadcast CO2 Load Cycling

Set for 1. Allows pressure readings from the variable analogue inputs to be broadcast over a Data Manager IP network, for use with a Mercury Switch and Mercury IP Module. This remote pressure is used by the Mercury Switch and IP Module to calculate the Evaporator temperature.

Set for 2. Allows a pressure reading from the variable analogue inputs to be used by the Data Manager to start shutting down controllers (load shedding) on the IP network if certain pressure limits are exceeded, the relevant Data Manager set up page is shown below,

Pressure Device must be "\$Pack" followed by the rotary switch network setting of the plant controller (788 in this case)

Pressure Item must be Press1, Press2 or Press3 depending on which of the analogue inputs is being read.

Pack Type set to "Old"

Other settings:			
Ambient Temperature Device	INP002 ▾	Load Pressure Limit 1	34
Ambient Temperature Input	Probe Temp ▾	Load Pressure Diff	2
Pressure Device	\$Pack788	Load Pressure Time 1 (s)	60
Pressure Item	Press1	Load Pressure Limit 2	36
Pack Type	Old ▾	Load Pressure Time 2 (s)	60
		Load Pressure Start Stage 2	2

[Set fail Information](#)

Note: Mercury Plant Controller Software must version 2.4 or higher

Note: If broadcasting pressure to a Mercury Switch. Mercury switch must be software version 1.9 or higher.

Note: If broadcasting to a Mercury IP Module. IP Module must be software version 1.1 or higher

See RDM Mercury Switch User Guide (PR0018-PHI) for further information.



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

Set/ View Probe Types & Units

This operation is only available at the controller display or via a PC connection to the Plant controller. It cannot be set remotely via the Data manager front end system. Probe type changes apply to all probes on a controller and cannot be set individually to different types. This option allows the user to set the probe types and units.

Note: If the units are set to °C, pressure will be displayed in Bar, if units are set to °F, pressure will be displayed in PSI.

Unit Number	Probe Type	Units	Unit Number	Probe Type	Units
0	Probes not used	°C	11	NTC2K25	°C
1	PT1000	°C	12	NTC2K25	°F
2	PT1000	°F	13	NTC100K	°C
3	NTC2K	°C	14	NTC100K	°F
4	NTC2K	°F	15	NTC5K	°C
5	NTC470R	°C	16	NTC5K	°F
6	NTC470R	°F	17	NTC6K	°C
7	NTC700R	°C	18	NTC6K	°F
8	NTC700R	°F	19	NTC10K	°C
9	NTC3K	°C	20	NTC10K	°F
10	NTC3K	°F	21	NTC10K (2)	°C
			22	NTC10K (2)	°F

Temperature probe range -60 degrees Celsius to +128 degrees Celsius.

Set/ View Offset

This feature allows the probe display temperature to be offset by the value selected: Each of the 8 probes has an individual offset, see the table below: - C-01 = Probe 1 etc.

Note: This can only be set at the controller display and cannot be set remotely by a Data Manager front-end.

"OFSt" Display	Range	Step	Default
C-01 to C-08	±20°	0.1	0

Network Configuration

There are two network connection options

- IP-L (Rotary switches set to "000")
- IP-r (Rotary switches set to "****" where * is a number between 0 and 9)

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 (normally used mode) allows you to give each controller on the system a unique network ID. This ID is then allocated a dynamic IP address by the system DHCP server (such as the RDM Data Director)

IP-L

To configure the Plant Controller for IP-L, set all three rotary switches to zero. The unit should then be connected to the network.

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. Note: this option must be selected to save any changes made in this menu



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IP-r

To configure the communication module for IP-r, set the three rotary switches to give each controller a unique identifier (other than 000). The module should then be connected to the controller and the network via the Ethernet port. The Data Manager will use DHCP to allocate the controller an IP address.

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

IP1: Shows the first IP address value	(10 in the example below)
IP2: Shows the second IP address value	(1 in the example below)
IP3: Shows the third IP address value	(2 in the example below)
IP4: Shows the forth IP address value	(86 in the example below)

Example: 10.1.2.86

PArA. Set/view parameters

1. From the function menu scroll to PArA
2. 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 the parameter set-up mode. Selecting dFLt will reset all parameters back to the default values for the current controller type.

Set-up Using Touch Screen Display

When the controller is powered on with the Touch Screen Display connected, the normal parameter menus will be shown on the home page, these can be configured in the normal way (see USB Touch screen User Guide).

When commissioning the controller there is another parameter menu available which gives access to:

- Control Type
- Probe Type
- Universal IO Setup
- Status Input Type (0v or 24v)
- Broadcast
- Temperature Probe Offsets
- Network Settings
- Logging Frequency
- Relay Invert
- Relay Starts & Run Hours

This commissioning menu can be accessed in the following way:

Power the controller on with the USB Touch Screen disconnected.

Allow the controller to boot up (this has happened once the green status LED has changed from solid green to flashing green).

Plug in the USB Touch Screen display within 30 seconds.

Touch the Parameters tab on the menu bar, the first item displayed will be "Control Type".

Once all the relevant commissioning parameters have been set, restart the controller with the USB Touch Screen display connected.

Once the controller has restarted the Parameters tab will show the standard control settings, the first item to be displayed will be "Trans1 Span". Alternatively, disconnecting the Touch Screen Display and reconnecting will have the same effect as restarting the controller.



Parameter Tables

Parameter table for Controller (Types 1-5, Fuzzy)

Not all parameters apply to all controllers types, for example P-401 is night setback for condenser fans so will not appear on a controller if it is set up as a pack (compressor) controller (type 1). In the right hand columns, a tick will be shown if that parameter applies to that type, if it does not apply it will be greyed out.

No.	Parameter	Range	Step	Units	Default				
					Pack (Type 1)	Dual Pack (Type 2)	Pack/Condenser (Type 3)	Dual Condenser (Type 4)	Condenser (Type 5)
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	13.8	13.8	13.8	34.4	34.4
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0	0	0	0	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	13.8	13.8	34.4	34.4	13.8
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0	0	0	0	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8	13.8	13.8	13.8	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0	0	0	0	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	2.1	2.1	2.1	12.7	12.7
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5	0.5	0.5	0.5	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5	0.5	0.5	0.5	0.5
P-23	Section 1 Starts/Hour	0 - 60	1	-	10	10	10		
P-24	Section 1 Run Smallest **	0 = Off, 1 = On	1	-	0	0	0		
P-26	Section 1 Inverter	0 = Off, 1 = On	1	-	0	0	0	0	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retry 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0	0	0	0	0
P444	Section 1 INV Minimum	0 - 100	1	%	0	0	0	0	0
P446	Section 1 INV Maximum	0 - 100	1	%	100	100	100	100	100
P490	Section 1 Gas Dump	0 = Off, 1 = On	1	-	0	0	0		
P492	Section 1 Gas Diff	-3.4 - 180	0.1	Bar	0.5	0.5	0.5		
P470	Section 1 Always Run last	0 = Off, 1 = On	1	-	0	0	0		
P495	Sect 1 Compressor Unload	0 = Off, 1 = On	1	-	0	0	0		
P497	Sect 1 Equal	0 = Off, 1 = On	1	-	0	0	0		
P-27	Section 1 Response On Speed	1 – 60	1	-	5	5	5	5	5
P-28	Section 1 Response Off Speed	1 – 60	1	-	5	5	5	5	5
P-29	Section 1 Optimise Limit	-3.4 - 180	0.1	Bar	2.0	2.0	2.0		
P-30	Section 1 Alarm Delay	00:00 – 99:00	01:00	min:sec	05:00	05:00	05:00	05:00	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	4.1	4.1	4.1	17.9	17.9
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	0.6	0.6	0.6	6.8	6.8
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	0.4	0.4	0.4	6.2	6.2
P-34	Section 1 Low Alarm Delay	00:00 – 99:00	01:00	min:sec	00:00	00:00	00:00	00:00	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0	0	0	0	0
P400	Section 1 Sticky Fans	0 - 12	1	-				0	0
P401	Section 1 Night Set Back	0 = Off, 1 = On 2 = Local, 3 = Remote	1	-				0	0
P402	Section 1 Night Reduction	0 - 100	1	%				30	30
P403	Section 1 Night Set Back On Time	00:00 – 23:59	00:01	min:sec				20:00	20:00
P404	Section 1 Night Set Back Off Time	00:00 – 23:59	00:01	min:sec				08:00	08:00
P405	Section 1 Night Set Back Pressure Limit	-3.4 - 150	0.1	Bar				25	25



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

No.	Parameter	Range	Step	Units	Default				
P406	Section 1 Day Reduction	0 - 100	1	%				30	30
P407	Section 1 Day Pressure Limit	-3.4 - 150	0.1	Bar				25	25
P600	Section 1 Fan Rev	0 = Off, 1 = On, 2 = Local, 3 = Remote	1	---				0	0
P601	Section 1 Fan Rev Start	00:01 – 23:59	00:01	hrs:min				00:00	00:00
P602	Section 1 Fan Rev Length	00:00 – 99:00	01:00	min:sec				00:00	00:00
P603	Section 1 Fan Rev Delay	00:00 – 00:99	01:00	min:sec				00:00	00:00
P604	Section 1 Fan Rev Fix	0 = Off, 1 = On	1	---				1	1
P605	Section 1 Fan Rev Variable	0 – 100	1	%				0	0
P408	Section 1 Transducer fail Level	0 - 100	1	%				45	45
P409	Section 1 Control Type	0 = Fixed, 1 = Floating 2 = Float Drop	1	-				0	0
P410	Section 1 Float Select	0 = Probe 1, 1 = Probe 2 2 = Probe 3, 3 = Probe 4 4 = Probe 5, 5 = Probe 6 6 = Probe 7, 7 = Probe 8 8 = Remote	1	-				1	1
P411	Section 1 Drop select	0 = Probe 1, 1 = Probe 2 2 = Probe 3, 3 = Probe 4 4 = Probe 5, 5 = Probe 6 6 = Probe 7, 7 = Probe 8 8 = Remote	1	-				2	2
P414	Section 1 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar				6.0	6.0
P415	Section 1 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar				8.2	8.2
P416	Section 1 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar				10.9	10.9
P417	Section 1 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar				14.2	14.2
P418	Section 1 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar				18.1	18.1
P419	Section 1 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar				23.0	23.0
P420	Section 1 Low Limit	-3.4 - 180	0.1	Bar				8.2	8.2
P421	Section 1 High Limit	-3.4 - 180	0.1	Bar				23.0	23.0
P422	Section 1 Condenser offset	0 – 20	0.1	°C				6	6
P438	Section 1 Split	0 = Off, 1 = On	1					0	0
P430	Section 1 Split Temp	-60.0 – 128.0	0.1	°C				7.2	7.2
P432	Section 1 Split Temp Diff	0.0 – 10.0	0.1	°C				2.0	2.0
P434	Sect 1 Split Press	-3.4 - 150	0.1	Bar				15.2	15.2
P436	Sect 1 Split Press Diff	-3.4 - 150	0.1	Bar				1.4	1.4
P440	Section 1 Heat Reclaim	0 = Off, 1 = On, 2 = On Rly.	1	-				0	0
P473	Section 1 Ext Target	-3.4 - 180	0.1	Bar	3.1	3.1	3.1	14.7	14.7
P-40	Section 2 Target Pressure	-3.4 - 180	0.1	Bar		2.1	12.7	12.7	
P474	Section 2 External Target Pressure	-3.4 – 180	0.1	Bar		3.1	14.7	14.7	
P-41	Section 2 Target Pressure Above P-40	-3.4 - 180	0.1	Bar		0.5	0.5	0.5	
P-42	Section 2 Target Pressure Below P-40	-3.4 - 180	0.1	Bar		0.5	0.5	0.5	
P-43	Section 2 Starts/Hour	0 – 60	1	-		10			
P-44	Section 2 Run Smallest **	0 = Off, 1 = On	1	-		0			
P-46	Section 2 Inverter	0 = Off, 1 = On	1	-		0	0	0	
P443	Section 2 INV Bypass	0 = Disabled 1 = 1 + no retry 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-		0	0	0	
P445	Section 2 INV Minimum	0 - 100	1	%		0	0	0	
P447	Section 2 INV Maximum	0 - 100	1	%		100	100	100	
P471	Section 2 Always Run last	0 = Off, 1 = On	1	-		0			
P496	Sect 2 Compressor Unload	0 = Off, 1 = On	1	-		0			
P498	Sect 1 Equal	0 = Off, 1 = On	1	-		0			
P-47	Section 2 Response On Speed	1 - 60	1	-		5	5	5	
P-48	Section 2 Response Off Speed	1 - 60	1	-		5	5	5	
P-49	Section 2 Optimise Limit	-3.4 - 180	0.1	Bar		2.0			



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

No.	Parameter	Range	Step	Units	Default				
P-50	Section 2 Alarm Delay	00:00 – 99:00	01:00	min:sec		05:00	05:00	05:00	
P-51	Section 2 HP Alarm	-3.4 - 180	0.1	Bar		4.1	17.9	17.9	
P-52	Section 2 LP Alarm	-3.4 - 180	0.1	Bar		0.6	6.8	6.8	
P-53	Section 2 LP Shut-down	-3.4 - 180	0.1	Bar		0.4	6.2	6.2	
P-35	Section 2 Low Alarm Delay	00:00 – 99:00	01:00	min:sec		00:00	00:00	00:00	
P449	Section 2 Fail	0 = Off, 1 = On	1	-		0	0	0	
P450	Section 2 Sticky Fans	0 - 12	1	-			0	0	
P451	Section 2 Night Set Back	0 = Off, 1 = On 2 = Local, 3 = Remote	1	-			0	0	
P452	Section 2 Night Reduction	0 - 100	1	%			30	30	
P453	Section 2 Night Set Back On Time	00:00 – 23:59	00:01	min:sec			20:00	20:00	
P454	Section 2 Night Set Back Off Time	00:00 – 23:59	00:01	min:sec			08:00	08:00	
P455	Sect 2 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar			25	25	
P456	Section 2 Day Reduction	0 – 100	1	%			30	30	
P457	Section 2 Day Pressure Limit	-3.4 - 180	0.1	Bar			25	25	
P610	Section 2 Fan Reverse	0 = Off, 1 = On 2 = Local, 3 = Remote	1	---			0	0	
P611	Section 2 Fan Rev Start	00:01 – 23:59	00:01	hrs:min			0	0	
P612	Section 2 Fan Rev Length	00:00 – 99:00	01:00	min:sec			00:00	00:00	
P613	Section 2 Fan Rev Delay	00:00 – 99:00	01:00	min:sec			00:00	00:00	
P614	Section 2 Fan Rev Fix	0 = Off, 1 = On	1	---			0	0	
P615	Section 2 Fan Rev Variable	0 – 100	1	%			0	0	
P458	Section 2 Transducer fail Level	0 – 100	1	%			45	45	
P459	Section 2 Control Type	0 = Fixed, 1 = Floating 2 = Float Drop	1	-			0	0	
P460	Section 2 Float Select	0 = Probe 1, 1 = Probe 2 2 = Probe 3, 3 = Probe 4 4 = Probe 5, 5 = Probe 6 6 = Probe 7, 7 = Probe 8 8 = Remote	1	-			1	1	
P412	Section 2 Drop Select	0 = Probe 1, 1 = Probe 2 2 = Probe 3, 3 = Probe 4 4 = Probe 5, 5 = Probe 6 6 = Probe 7, 7 = Probe 8 8 = Remote	1	-			2	2	
P461	Section 2 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar			6.0	6.0	
P462	Section 2 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar			8.2	8.2	
P463	Section 2 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar			10.9	10.9	
P464	Section 2 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar			14.2	14.2	
P465	Section 2 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar			18.1	18.1	
P466	Section 2 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar			23.0	23.0	
P467	Section 2 Low Limit	-3.4 - 180	0.1	Bar			8.2	8.2	
P468	Section 2 High Limit	-3.4 - 180	0.1	Bar			23.0	23.0	
P469	Section 2 Condenser offset	0 – 20	0.1	°C			6	6	
P439	Section 2 Split	0 = Off, 1 = On	1	-			0	0	
P431	Section 2 Split Temp	-60 - 128	0.1	°C			7.2	7.2	
P433	Section 2 Split Temp Diff	0.0 – 10.0	0.1	°C			2.0	2.0	
P435	Sect 2 Split Press	-3.4 - 180	0.1	Bar			15.2	15.2	
P437	Sect 2 Split Press Diff	-3.4 - 180	0.1	Bar			1.4	1.4	
P441	Sect 2 Heat reclaim	0 = Off, 1 = On 2 = On Rly	1	-			0	0	
P475	Discharge Trip	-3.4 – 50.0	0.1	Bar			22.8		
P476	Discharge Trip Diff	-3.4 – 50.0	0.1	Bar			2.0		
P472	Run Proof	0 = Off, 1 = On	1	-	0	0	0		
P-60	Status fault Delay	00:00 – 60:00	00:01	min:sec	00:10	00:10	00:10	00:10	00:10
P-61	General Alarm Delay	00:00 – 60:00	00:01	min:sec	00:10	00:10	00:10	00:10	00:10
P-62	Standby Delay	00:00 – 60:00	00:01	min:sec	00:10	00:10	00:10	00:10	00:10
P480	Liquid Level	0 = Off, 1 = On	1	-	0	0	0	0	0
P481	High Liquid Level	0 – 100	1	%	80	80	80	80	80



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

No.	Parameter	Range	Step	Units	Default				
P482	Low Liquid Level	0 – 100	1	%	20	20	20	20	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	min:sec	05:00	05:00	05:00	05:00	05:00
P494	Dual Standby See: Standby Mode	0 = Off, 1 = On	1	-		1	1	1	
P-80	Status Fault 1	((0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2 N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0	0	0	0	0
P-91	Status Fault 12								
P100	Section 1 Stage 1	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan (5) Inverter (6) Trim (7) Comp Run	1	-	0	0	0	0	0
P111	Section 1 Stage 12								
P120	Section 1 Stage 1 Size	0.0 – 60.0	0.1	-	0.0	0.0	0.0		
P131	Section 1 Stage 12 Size								
P140	Section 2 Stage 1	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan (5) Inverter (6) Trim (7) Comp Run	1	-		0	0	0	
P151	Section 2 Stage 12								
P160	Section 2 Stage 1 Size	0.0 – 60.0	0.1	-		0.0			
P171	Section 2 Stage 12 Size								
dFLt	Restore Default Settings (Front panel Only)								

* Span and Offset allows for the full range of the transducer to be used by the controller.
 Span is the full range of the transducer
 Offset is the value below zero.

Example: RDM PR0160 with range: -1 bar to 20 bar
 Span would be 21 bar
 Offset would be -1 bar

If only transducer input 1 is in use please see [Note 10](#) also.

** Run smallest = on: - When all compressors are off (because the target pressure has been satisfied) the controller, when the pressure rises, will always turn on the smallest compressor after the variable output has reached 100%. If the ASC timer is running for the smallest compressor, the controller will **NOT** bring on any other available compressors, the variable output will remain at 100% and the controller will wait until the ASC Timer has elapsed and then turn on the smallest.

Please note that this is true for **any** pressure condition.



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

Parameter table for Controller (Types 6-10, Staged)

Not all parameters apply to all controllers types, for example P-401 is night setback for condenser fans so will not appear on a controller if it is set up as a pack (compressor) controller (type 6). In the right hand columns, the controller type will be shown (6-10) if that parameter applies to that type, if it does not apply it will be greyed out.

No.	Parameter	Range	Step	Units	Default				
					Pack (Type 6)	Dual Pack (Type 7)	Pack/Condenser (8)	Dual Condenser (9)	Condenser (10)
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	13.8	13.8	13.8	34.4	34.4
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0	0	0	0	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	13.8	13.8	34.4	34.4	13.8
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0	0	0	0	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8	13.8	13.8	13.8	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0	0	0	0	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	2.1	2.1	2.1	12.7	12.7
P473	Section 1 Ext. Target Press	-3.4 - 180	0.1	Bar	3.1	3.1	3.1	14.7	14.7
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5	0.5	0.5	0.5	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5	0.5	0.5	0.5	0.5
P-23	Section 1 Number of Stages	0 - 12	1	-	0	0	0	0	0
P-24	Section 1 Stage On Delay	00:00 - 60:00	00:01	min:sec	00:10	00:10	00:10	00:10	00:10
P-25	Section 1 Stage Off Delay	00:00 - 99:00	00:01	min:sec	00:10	00:10	00:10	00:10	00:10
P-26	Section 1 Inverter	0 = Off, 1 = On	1	-	0	0	0	0	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retry 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0	0	0	0	0
P444	Section 1 INV Minimum	0 - 100	1	%	0	0	0	0	0
P446	Section 1 INV Maximum	0 - 100	1	%	100	100	100	100	100
P490	Section 1 Gas Dump	0 = Off, 1 = On	1	-	0	0	0		
P492	Section 1 Gas Diff	-3.4 - 150	0.1	Bar	0.5	0.5	0.5		
P470	Section 1 Always Run last	0 = Off, 1 = On	1	-	0	0	0		
P-27	Section 1 Response On Speed	1 - 60	1	-	5	5	5	5	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5	5	5	5	5
P-29	Section 1 Optimise Limit	-3.4 - 150	0.1	Bar	2.0	2.0	2.0		
P-30	Section 1 Alarm Delay	00:00 - 99:00	01:00	min:sec	05:00	05:00	05:00	05:00	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	4.1	4.1	4.1	17.9	17.9
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	0.6	0.6	0.6	6.8	6.8
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	0.4	0.4	0.4	6.2	6.2
P-34	Section 1 Low Alarm Delay	00:00 - 99:00	01:00	min:sec	00:00	00:00	00:00	00:00	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0	0	0	0	0
P400	Section 1 Sticky Fans	0 - 12	1	-				0	0
P401	Section 1 Night Set Back	0 = Off, 1 = On 2 = Local, 3 = Remote	1	-				0	0
P402	Section 1 Night Reduction	0 - 100	1	%				30	30
P403	Section 1 Night Set Back On Time	00:00 - 23:59	00:01	min:sec				20:00	20:00
P404	Section 1 Night Set Back Off Time	00:00 - 23:59	00:01	min:sec				08:00	08:00
P405	Section 1 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar				25	25
P406	Section 1 Day Reduction	0 - 100	1	%				25	25
P407	Section 1 Day Pressure Limit	-3.4 - 180	0.1	Bar				25	25
P600	Section 1 Fan Rev	0 = Off, 1 = On, 2 = Local, 3 = Remote	1	---				0	0



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

No.	Parameter	Range	Step	Units	Default				
P601	Section 1 Fan Rev Start	00:01 – 23:59	00:01	hrs:min				00:00	00:00
P602	Section 1 Fan Rev Length	00:00 – 99:00	01:00	min:sec				00:00	00:00
P603	Section 1 Fan Rev Delay	00:00 – 00:99	01:00	min:sec				00:00	00:00
P604	Section 1 Fan Rev Fix	0 = Off, 1 = On	1	---				1	1
P605	Section 1 Fan Rev Variable	0 – 100	1	%				0	0
P408	Section 1 Transducer fail Level	0 – 100	1	%				45	45
P409	Section 1 Control Type	0 = Fixed, 1 = Floating 2 = Float Drop	1	-				0	0
P410	Section 1 Float Select	0 = Probe 1, 1 = Probe 2 2 = Probe 3, 3 = Probe 4 4 = Probe 5, 5 = Probe 6 6 = Probe 7, 7 = Probe 8 8 = Remote	1	-				1	1
P411	Section 1 Drop select	0 = Probe 1, 1 = Probe 2 2 = Probe 3, 3 = Probe 4 4 = Probe 5, 5 = Probe 6 6 = Probe 7, 7 = Probe 8 8 = Remote	1	-				2	2
P414	Section 1 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar				6.0	6.0
P415	Section 1 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar				8.2	8.2
P416	Section 1 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar				10.9	10.9
P417	Section 1 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar				14.2	14.2
P418	Section 1 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar				18.1	18.1
P419	Section 1 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar				23.0	23.0
P420	Section 1 Low Limit	-3.4 - 180	0.1	Bar				8.2	8.2
P421	Section 1 High Limit	-3.4 - 180	0.1	Bar				23.0	23.0
P422	Section 1 Condenser offset	0 – 20	0.1	°C				6	6
P438	Section 1 Split	0 = Off, 1 = On	1	-				0	0
P430	Section 1 Split Temp	-60.0 – 128.0	0.1	°C				7.2	7.2
P432	Section 1 Split Temp Diff	0.0 – 10.0	0.1	°C				2.0	2.0
P434	Sect 1 Split Press	-3.4 - 180	0.1	Bar				15.2	15.2
P436	Sect 1 Split Press Diff	-3.4 - 180	0.1	Bar				1.4	1.4
P440	Section 1 Heat Reclaim	0 = Off, 1 = On, 2 = On Rly.	1	-				0	0
P-40	Section 2 Target Pressure	-3.4 - 180	0.1	Bar		2.1	12.7	12.7	
P474	Section 2 External Target Pressure	-3.4 - 180	0.1	Bar		3.1	14.7	14.7	
P-41	Section 2 Target Pressure Above P-40	-3.4 - 180	0.1	Bar		0.5	0.5	0.5	
P-42	Section 2 Target Pressure Below P-40	-3.4 - 180	0.1	Bar		0.5	0.5	0.5	
P-43	Section 2 Number of Stages	0 – 12	1	-		0	0	0	
P-44	Section 2 Stage-on Delay	00:00 – 60:00	00:01	min:sec		00:10	00:10	00:10	
P-45	Section 2 Stage-off Delay	00:00 – 99:00	00:01	min:sec		00:10	00:10	00:10	
P-46	Section 2 Inverter	0 = Off, 1 = On	1	-		0	0	0	
P443	Section 2 INV Bypass	0 = Disabled 1 = 1 + no retry 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-		0	0	0	
P445	Section 2 INV Minimum	0 – 100	1	%		0	0	0	
P447	Section 2 INV Maximum	0 – 100	1	%		100	100	100	
P491	Section 2 Gas Dump	0 = Off, 1 = On	1	-		0			
P493	Section 2 Gas diff	-3.4 - 180	0.1	Bar		0.5			
P471	Section 2 Always Run last	0 = Off, 1 = On	1	-		0			
P-47	Section 2 Response On Speed	1 – 60	1	-		5	5	5	
P-48	Section 2 Response Off Speed	1 – 60	1	-		5	5	5	
P-49	Section 2 Optimise Limit	-3.4 - 180	0.1	Bar		2.0			
P-50	Section 2 Alarm Delay	00:00 – 99:00	01:00	min:sec		05:00	05:00	05:00	
P-51	Section 2 HP Alarm	-3.4 - 180	0.1	Bar		4.1	17.9	17.9	



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

No.	Parameter	Range	Step	Units	Default				
P-52	Section 2 LP Alarm	-3.4 - 180	0.1	Bar		0.6	6.8	6.8	
P-53	Section 2 LP Shut-down	-3.4 - 180	0.1	Bar		0.4	6.2	6.2	
P-35	Section 2 Low Alarm Delay	00:00 – 99:00	01:00	min:sec		00:00	00:00	00:00	
P449	Section 2 Fail	0 = Off, 1 = On	1	-		0	0	0	
P450	Section 2 Sticky Fans	0 – 12	1	-			0	0	
P451	Section 2 Night Set Back	0 = Off, 1 = On 2 = Local, 3 = Remote	1	-			0	0	
P452	Section 2 Night Reduction	0 – 100	1	%			30	30	
P453	Section 2 Night Set Back On Time	00:00 – 23:59	00:01	min:sec			20:00	20:00	
P454	Section 2 Night Set Back Off Time	00:00 – 23:59	00:01	min:sec			08:00	08:00	
P455	Section 2 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar			25	25	
P456	Section 2 Day Reduction	0 - 100	1	%			25	25	
P457	Section 2 Day Pressure Limit	-3.4 - 180	0.1	Bar			25	25	
P610	Section 2 Fan Reverse	0 = Off, 1 = On 2 = Local, 3 = Remote	1	---			0	0	
P611	Section 2 Fan Rev Start	00:01 – 23:59	00:01	hrs:min			0	0	
P612	Section 2 Fan Rev Length	00:00 – 99:00	01:00	min:sec			00:00	00:00	
P613	Section 2 Fan Rev Delay	00:00 – 99:00	01:00	min:sec			00:00	00:00	
P614	Section 2 Fan Rev Fix	0 = Off, 1 = On	1	---			0	0	
P615	Section 2 Fan Rev Variable	0 – 100	1	%			0	0	
P458	Section 2 Transducer fail Level	0 – 100	1	%			45	45	
P459	Section 2 Control Type	0 = Fixed, 1 = Floating 2 = Float Drop	1	-			0	0	
P460	Section 2 Float Select	0 = Probe 1, 1 = Probe 2 2 = Probe 3, 3 = Probe 4 4 = Probe 5, 5 = Probe 6 6 = Probe 7, 7 = Probe 8 8 = Remote	1	-			1	1	
P412	Section 2 Drop Select	0 = Probe 1, 1 = Probe 2 2 = Probe 3, 3 = Probe 4 4 = Probe 5, 5 = Probe 6 6 = Probe 7, 7 = Probe 8 8 = Remote	1	-			2	2	
P461	Section 2 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar			6.0	6.0	
P462	Section 2 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar			8.2	8.2	
P463	Section 2 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar			10.9	10.9	
P464	Section 2 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar			14.2	14.2	
P465	Section 2 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar			18.1	18.1	
P466	Section 2 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar			23.0	23.0	
P467	Section 2 Low Limit	-3.4 - 180	0.1	Bar			8.2	8.2	
P468	Section 2 High Limit	-3.4 - 180	0.1	Bar			23.0	23.0	
P469	Section 2 Condenser offset	0 - 20	0.1	°C			6	6	
P439	Section 2 Split	0 = Off, 1 = On	1	-			0	0	
P431	Section 2 Split Temp	-60 - 128	0.1	°C			7.2	7.2	
P433	Section 2 Split Temp Diff	0.0 – 10.0	0.1	°C			2.0	2.0	
P435	Sect 2 Split Press	-3.4 - 180	0.1	Bar			15.2	15.2	
P437	Sect 2 Split Press Diff	-3.4 - 180	0.1	Bar			1.4	1.4	
P441	Sect 2 Heat reclaim	0 = Off 1 = On 2 = On Rly	1	-			0	0	
P475	Discharge Trip	-3.4 – 50.0	0.1	Bar			22.8		
P476	Discharge Trip Diff	-3.4 – 50.0	0.1	Bar			2.0		
P472	Run Proof	0 = Off, 1 = On	1	-	0	0	0		
P-60	Status fault Delay	00:00 – 60:00	00:01	min:sec	00:10	00:10	00:10	00:10	00:10
P-61	General Alarm Delay	00:00 – 60:00	00:01	min:sec	00:10	00:10	00:10	00:10	00:10
P-62	Standby Delay	00:00 – 60:00	00:01	min:sec	00:10	00:10	00:10	00:10	00:10
P480	Liquid Level	0 = Off, 1 = On	1	-	0	0	0	0	0
P481	High Liquid Level	0 – 100	1	%	80	80	80	80	80
P482	Low Liquid Level	0 – 100	1	%	20	20	20	20	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	min:sec	05:00	05:00	05:00	05:00	05:00



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

No.	Parameter	Range	Step	Units	Default				
P494	Dual Standby See Standby Mode	0 = Off, 1 = On	1	-		1	1	1	
P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2 N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0	0	0	0	0
P-91	Status Fault 12								
P100	Section 1 Stage 1 Relay 1	0 = Off 1 = On	1	-	0	0	0		
P111	Section 1 Stage 1 Relay 12								
P112	Section 1 Stage 2 Relay 1	0 = Off 1 = On	1	-	0	0	0		
P123	Section 1 Stage 2 Relay 12								
P124	Section 1 Stage 3 Relay 1	0 = Off 1 = On	1	-	0	0	0		
P135	Section 1 Stage 3 Relay 12								
P136	Section 1 Stage 4 Relay 1	0 = Off 1 = On	1	-	0	0	0		
P147	Section 1 Stage 4 Relay 12								
P148	Section 1 Stage 5 Relay 1	0 = Off 1 = On	1	-	0	0	0		
P159	Section 1 Stage 5 Relay 12								
P160	Section 1 Stage 6 Relay 1	0 = Off 1 = On	1	-	0	0	0		
P171	Section 1 Stage 6 Relay 12								
P172	Section 1 Stage 7 Relay 1	0 = Off 1 = On	1	-	0	0	0		
P183	Section 1 Stage 7 Relay 12								
P184	Section 1 Stage 8 Relay 1	0 = Off 1 = On	1	-	0	0	0		
P195	Section 1 Stage 8 Relay 12								
P196	Section 1 Stage 9 Relay 1	0 = Off 1 = On	1	-	0	0	0		
P207	Section 1 Stage 9 Relay 12								
P208	Section 1 Stage 10 Relay 1	0 = Off 1 = On	1	-	0	0	0		
P219	Section 1 Stage 10 Relay 12								



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

No.	Parameter	Range	Step	Units	Default				
P220	Section 1 Stage 11 Relay 1	0 = Off 1 = On	1	-	0	0	0		
↓	↓								
P231	Section 1 Stage 11 Relay 12								
P232	Section 1 Stage 12 Relay 1	0 = Off 1 = On	1	-	0	0	0		
↓	↓								
P243	Section 1 Stage 12 Relay 12								
P244	Section 2 Stage 1 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P255	Section 2 Stage 1 Relay 12								
P256	Section 2 Stage 2 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P267	Section 2 Stage 2 Relay 12								
P268	Section 2 Stage 3 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P279	Section 2 Stage 3 Relay 12								
P280	Section 2 Stage 4 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P291	Section 2 Stage 4 Relay 12								
P292	Section 2 Stage 5 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P303	Section 2 Stage 5 Relay 12								
P-304	Section 2 Stage 6 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P315	Section 2 Stage 6 Relay 12								
P316	Section 2 Stage 7 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P327	Section 2 Stage 7 Relay 12								
P328	Section 2 Stage 8 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P339	Section 2 Stage 8 Relay 12								
P340	Section 2 Stage 9 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P351	Section 2 Stage 9 Relay 12								
P352	Section 2 Stage 10 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P363	Section 2 Stage 10 Relay 12								
P364	Section 2 Stage 11 Relay 1	0 = off 1 = on	1	-		0			
↓	↓								
P375	Section 2 Stage 11 Relay 12								



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

No.	Parameter	Range	Step	Units	Default				
P376 ↓	Section 2 Stage 12 Relay 1 ↓	0 = off 1 = on	1	-		0			
P387	Section 2 Stage 12 Relay 12								
dFLt	Restore Default Settings (Front panel Only)								

* Span and Offset allows for the full range of the transducer to be used by the controller.
Span is the full range of the transducer
Offset is the value below zero.

Note. The controller uses absolute pressure; if gauge pressure is required, add +1 Bar to the offset value.

Example: Danfoss AKS 33 with range: -1 bar to 12 bar
Span would be 190 (13 bar)
Offset would be -15 (-1 bar)

If only transducer input 1 in use please see [Note 10](#) also.

Parameter Descriptions

Number	Parameter	Description
P-01/03/05	Transducer 1/2/3 Span	Range of the transducers
P-02/04/06	Transducer 1/2/3 Offset	Transducer value above or below zero.
P-20/40	Target Pressure	Pressure target, control will try to maintain this pressure
P473/474	External Target Pressure	Pressure target when Sect1 Run/Sect2 Run is off. Control will try to maintain this pressure until Sect1 Run/Sect2 Run is on. At this point P-20/40 used. Please see: Status Inputs
P-21/41	Target Pressure Above P-20	Set-point above the target, used to obtain a "dead-band"
P-22/42	Target Pressure Below P-20	Set-point below the target, used to obtain a "dead-band"
P-23/43	Number of Stages	Number of stages in the system
P-23/43Fuzzy	Starts per hour	Limits a compressor to this many starts per hour
P-24/44Fuzzy	Run smallest	See explanation under the parameter tables for this parameter Run Smallest
P-24/44Staged	Stage-on Delay	Delay time between stages on (Staged types only)
P-25/45Staged	Stage-off Delay	Delay time between stages off (Staged types only)
P-26/46	Inverter	Enables the inverter analogue output and associated relay.
P442/443	Inverter Bypass	Enable for Inverter Bypass feature. See INV Bypass
P444/445	Inverter Min	The minimum percentage the inverter will operate to when Inverter Bypass parameter (P-442/443) is on e.g. if set to 25% the inverter output will never go below this value
P446/447	Inverter Max	The maximum percentage the inverter will operate to when Inverter Bypass parameter (P-442/443) is on e.g. if set to 80% the inverter output will never go above this value
P490/491	Section 1/2 Gas Dump	Enables Gas Dump feature.
P492/493	Section 1/2 Gas Diff	Diff below the set point that the Gas Dump valve is opened. See Gas Dump
P470/471	Always run last	Keeps the last stage running except for a Low Shutdown condition. If the last stage is an inverter, the inverter enable will stay energised, but the inverter analogue output may well decrease to 0% if pressure is below the set-point.
P495/497	Sect 1/2 Compressor Unload	Selects the order the compressor loaders are switched off See: Compressor Loaders
P496/498	Sect 1/2 Equal	Equalises compressor run times. See: Equal run Times
P-27/47	Response On Speed	Allows the user to speed up/slow down the stage on speed (Option: - 1 to 60 with 60 being fastest response) Note: This parameter applies to the inverter output only when using any of the Staged types.
P-28/48	Response Off Speed	Allows the user to speed up/slow down the stage off speed (Option: - 1 to 60 with 60 being fastest response) Note: This parameter applies to the inverter output only when using any of the Staged types.
P-29/49	Optimise Limit	This is an offset that is added to the target pressure when using the Data Manager Energy feature Pack Optimisation. For example if target pressure is 2.1 Bar and Optimise Limit set to 0.5 Bar. The remote optimise command will only be able to optimise the current suction setpoint up to a maximum of 2.6 Bar



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

P-30/50	Alarm Delay	Delay before HP and LP alarms are signalled
P-31/51	HP Alarm	HP alarm set-point
P-32/52	LP Alarm	LP alarm set-point
P-33/53	LP Shut-down	LP shut-down set-point, all stages go off when this is reached
P-34/35	Low Alarm	Delay applied before LP Shutdown alarm is generated. Note as soon as the LP Shutdown setpoint is reached any Compressor/Condenser stages, for the associated section, still operating will go off immediately and does not wait for the LP Shutdown alarm to be created.
P448/449	Sect 1 / 2 Fail	The following will occur in the event of pressure transducer fault on Section 1 or 2: – If set to On then all Compressors or Fans will turn On in the event of a transducer failure. If set to Off then all Compressors or Fans will turn Off in the event of a transducer failure.
P400/450	Sticky Fans	Sticky fans operation allows the user to turn the fans off in a way that keeps a number of fans running longer. See Sticky Fans
P401/451	Night Set Back	Turns on the night set back level. Note This feature is intended to be used when all of the fans are controlled by the inverter. If fan relays are selected, they will never come on as the inverter is required to go to 100% before staging the next fan. There are 4 options : - Off : Night Feature is not used. Controller uses what is set in Day Reduction (P406/456) On : Night Reduction (parameter 402 / 452) is always used Local : Uses times in Night Set On and Night Set Off parameters (P403/453) (P404/454) to determine Day / Night Remote : Uses GP Timer to determine Day / Night
P402/452	Night Reduction	Reduces inverter output by this amount during night settings.
P403/453	Night Set Back On Time	Time for the night set back feature to operate
P404/454	Night Set Back Off Time	Time for the night set back feature to go off
P405/455	Night Set Back Pressure Limit	Pressure set-point to disable the night set back feature. Night set back is disabled above this level and enabled below it.
P406/456	Day Reduction	Reduces the inverter output by this amount when the timer is not in its night zone.
P407/457	Day Pressure Limit	Pressure set-point to disable the day reduction feature. Day reduction is disabled above this level and enabled below it.
P610	Section 1/2 Fan Rev (used on variable speed fans only)	This feature allows a relay to be allocated as a fan reverse signal, this will reverse the condenser fans at a preset time for a preset period to assist clearing debris that may have accumulated in the fans. The last unallocated relay before the alarm relay will be used once a fan reverse length (P-622) has been set 0 = Off, feature not used 1 = On, allows fans to be forced manually into reverse. Note: If this parameter is left set to On by mistake then there will only be one reverse fan cycle, the parameter will then need to be set to Off before it can be set to On again. 2 = Local, uses the controller's internal GP timer to switch the fans into reverse. 3 = Remote, allows a remote command sent from a TDB program running on a Data Manager.
P-611	Section 1/2 Fan Rev Start	Set the local time of day when fans are switched into reverse (only applies if P-620 set to local)
P-612	Section 1/2 Fan Rev Length	Sets the length of time fans will run in reverse
P-613	Section 1/2 Fan Rev Delay	Sets a delay period between fans stopping and being switched into reverse.
P-614	Section 1/2 Fan Rev Fix	If set to On then the fans will run in reverse at a fixed speed (set in P-625), if set to Off then the fans will run at their normal control speed.
P-615	Section 1/2 Fan Rev Variable	Sets the fixed reverse fan speed if P-624 set to On.
P-616	Section 1/2 Fan Rev Level	Fan reverse will not operate if the pressure is below this value, this is to prevent over condensing. If the pressure drops below this value during a fan reverse cycle then normal forward operation will be resumed, another reverse fan cycle cannot be activated for a minimum of one hour.
P408/458	Transducer fail Level	Sets the output level of the inverter if the transducer fails
P409/459	Control Type	Selects between Fixed, Floating or Float/ Drop Leg control for Condenser sections only. Fixed - Uses the set-point parameter as its target (P-20/40) with the corresponding pressure transducer. Floating - Uses the temperature of a selected probe converted to a pressure as the set-point along with the corresponding pressure transducer. See Floating Head Pressure Float/ Drop leg - Uses the same control method as 'Floating'. It also allows a monitoring feature for drop leg, where it uses the temperature of a selected probe mounted on the drop leg to calculate control pressure. See Drop Leg



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

P410/460	Float Select	Selects the probe that measures the “floating” temperature (Note : This would be fitted to the Air On of the Condenser) See Note Floating Head Pressure
P411/412	Sect 1 / 2 drop Select	Selects which probe is used to measure Drop Leg temperature. See Note Drop Leg
P414/461	Pressure at 0°C	Used to program the temperature to pressure conversion for floating pressure use.
P415/462	Pressure at 10°C	Used to program the temperature to pressure conversion for floating pressure use.
P415/463	Pressure at 20°C	Used to program the temperature to pressure conversion for floating pressure use.
P417/464	Pressure at 30°C	Used to program the temperature to pressure conversion for floating pressure use.
P418/465	Pressure at 40°C	Used to program the temperature to pressure conversion for floating pressure use.
P419/466	Pressure at 50°C	Used to program the temperature to pressure conversion for floating pressure use.
P420/467	Low Limit	Stops the floating pressure target from going below this level
P421/468	High Limit	Stops the floating pressure target from going above this level
P422/469	Condenser offset	Used to set a condenser differential, which is added to the incoming temperature to produce a “floating” set-point
P438/439	Sect 1 / 2 Split	Set to “On” to enable Condenser Split feature.
P430/431	Sect 1 / 2 Split Temp	If outside ambient air temperature falls to this value then the condenser split relay will come on. Note the Condenser Float temperature probe is used as the air temperature reference.
P432/433	Sect 1 / 2 Split Temp Diff	Diff above for the split temp feature (P-430/431). If outside ambient air temperature rises above Sect 1/2 Split Temp parameter plus Sect 1/2 Split Temp Diff parameter then the Condenser split relay will go off
P434/435	Sect 1 / 2 Split Pressure	If the discharge pressure rises above this setting then the condenser split relay will be forced off regardless of temperature.
P436/437	Sect 1 / 2 Split Pressure Diff	Diff below parameter for Split Pressure feature (P-434/435). If the pressure for Section1/2 falls below Sect 1/2 Split Pressure setpoint plus Sect 1/2 Split Pressure Diff parameter then the condenser split relay will return to normal operation (status depends on P-430/431).
P440/441	Sect 1 / 2 Heat Reclaim	Enable for Heat Reclaim. See : Relay Outputs 0 = Off (Not Used) 1 = On (Uses Ext Set Point) 2 = On Rly(Uses Ext Set Point and allocates a Relay)
P475	Discharge trip	If Discharge Pressure exceeds this setting All compressors go off immediately and all fans come on immediately. A Discharge Trip Alarm is generated. Note: If using an Inverter on the Compressors the output to the Inverter will go to 0% immediately as well as all compressors going off
P476	Discharge Trip Diff	Diff below for parameter P-475 at which point control goes back to normal and alarm clears.
P472	Run Proof	See section Run-Proof
P-60	Status fault Delay	Time delay before status faults are activated
P-61	General Alarm Delay	Time delay before general faults are activated
P-62	Standby Delay	Time delay before controller goes into standby mode after activation of the standby input.
P480	Liquid Level	Enable for Liquid Level feature. See Note : Liquid Level
P481/482	Liquid Level Alarm	Settings at which High and Low Liquid Level alarms are generated
P483	Liquid Level Alarm Delay	Delay applied before the Low or High liquid alarm is generated.
P494	Dual Standby	Used to place two sections into Standby from one Standby status input. (Note “Std 1 N/O or Std 1 N/C must be utilised when using this feature) See Note Standby Mode
P-80	Status Fault 1	Used to select the type of input required See: Status Inputs
↓	↓	
P-91	Status Fault 12	
P100/140 Fuzzy	Stage 1	Select the output device for this stage
↓	↓	
P111/151 Fuzzy	Stage 12	
P120/160 Fuzzy	Stage 1 Size	Sets the relative size for each compressor
↓	↓	
P131/171 Fuzzy	Stage 12 Size	
Parameters for Staged type	Stage 1 Relay 1 to 12	Maps compressor relays to stages
	↓	
	Stage 12 Relay 1 to 12	



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

Liquid Level

Liquid Level Detector uses 4-20mA or 0-5V / 10V dc on Universal Input 3 on the Plant controller. 0mA, 4mA or 0V will give a reading of 0% and 20mA, 5V or 10V will give a reading of 100%. The Span and Offset parameters for Transducer input 3 do not require adjustment and can be left at the default values. "Low Liquid Level Alarm" (P-482) and "High Liquid Level Alarm" (P-481) can be generated. The alarm has a settable delay.

Run-Proof

This is a "global" parameter. If set to ON, the Status fault inputs are used to prove that compressors are running. Configure the status inputs, using either Compressor Normally Closed or Compressor Normally Open, that correspond with each relay output. When set to N/O the input is required to become closed circuit to confirm compressor run, and vice versa. When the relay output is energised and the run proof signal isn't returned within the specified time period, then the compressor relay will go off and be taken out of the control strategy until the run proof has been reset. The run-proof feature uses the status fault delay (P-60) and all run proof signals must be returned within this delay period. Run proofs are used with compressor (Comp) stages only. This feature can be used in both Fuzzy and Staged applications.

Note: If using "Run Proofs" and Compressor Loaders.

If you have a compressor with loaders and the compressor is taken out of the control strategy all the associated loaders will be as well. You need to set up a Compressor N/O or Compressor N/C status input for the compressor **and** each loader for this to operate correctly although the loader fault inputs do not need to be physically connected.

To reset the run proof for any stage, after maintenance, and return a compressor back into the control strategy, press and hold the Override and Info buttons on the Plant Display for 3 seconds. "OFF" will show briefly on the display and the run proofs will be reset. If a Plant Display is not fitted then the controller will need to be reset using the Touch Screen Display or local PC or the controller power cycled.

Gas Dump

Gas Dump Enable (P-490/491). In Fuzzy pack control the Gas dump relay will come on when the Suction Pressure drops below the Set Point (P-20/40) plus the Gas Diff (P-492/493) and all but the last compressor has turned off.

When an Inverter output is configured using Fuzzy pack control the Gas dump relay will come on only when the Inverter is active, i.e. above 0% and all other Compressors configured in that section are off.

With Staged pack control the Gas Dump relay will come on only when last compressor is running.

The Gas dump relay will go off again when: -

The pressure rises above the Set Point (P-20/40)

Or

When the last stage compressor goes off, or Inverter Enable is turned off.

Compressor Loaders

Parameters P495/496 determine the order the compressor loaders are switched off

Giving the option to turn off one compressor and its loaders before turning off the next or to switch off all the loaders first leaving compressors running unloaded.

If P495/496 set for 0 (Off) then a compressor loader and compressor body will be switched off before another loader is switched off.

If P495/496 set for 1 (On) then all loaders will be switched off before a compressor body will be switched off leaving any compressors running unloaded before switching a compressor body off.

Example 1 (Type 1 Fuzzy)

Pack set up: 2 compressors with 2 Loaders each

Sect 1 stage 1 = Comp.

Sect 1 stage 2 = Loader.

Sect 1 stage 3 = Loader.

Sect 1 stage 4 = Comp.

Sect 1 stage 5 = Loader.

Sect 1 stage 6 = Loader.

Parameter P495 = 0 (Off)

Switching On sequence: Pressure above set point + diff

First compressor comes on. Compressor loader 1 comes on. Compressor loader 2 comes on.

Second compressor comes on. Compressor loader 1 comes on. Compressor loader 2 comes on.

Switching Off sequence: Pressure below set point – diff

One compressor loader 2 goes off. Compressor loader 1 goes off. Compressor body goes off.

Next compressor loader 2 goes off. Compressor loader 1 goes off. Compressor body goes off.

This configuration switches off one compressor and its loaders before switching off the next compressor loader.

Thus leaving one compressor fully loaded till first one is completely off.



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

Example 2 (Type 1 Fuzzy)

Pack set up: 2 compressors with 2 Loaders each

Sect 1 stage 1 = Comp.

Sect 1 stage 2 = Loader.

Sect 1 stage 3 = Loader.

Sect 1 stage 4 = Comp.

Sect 1 stage 5 = Loader.

Sect 1 stage 6 = Loader.

Parameter P495 = 1 (On)

Switching On sequence: Pressure above set point + diff

First compressor comes on. First compressor loader 1 comes on. First compressor loader 2 comes on.

Second compressor comes on. Second compressor loader 1 comes on. Second compressor loader 2 comes on.

Switching Off sequence: Pressure below set point – diff

One compressor loader 2 goes off. Compressor loader 1 goes off.

Next compressor loader 2 goes off. Compressor loader 1 goes off.

One compressor body goes off. Next compressor goes off.

This configuration switches off all loaders before switching off a compressor

Thus leaving both compressors running unloaded before switching one completely off.

NOTE: If using an Inverter with loaders

The Inverter and its loader/s will always be the last to go off.

Equal Run Times

With parameters P496/498 Set to 1 (On) the controller will bring on the compressors in a way that the running times are as near equal as possible.

If the pressure is above set point the next compressor that comes on will be the compressor that has been running for the least amount of time.

If the pressure is below set point the next compressor to go off will be the one that has been running the longest.

This configuration will try to make each compressors run hours equal.

Inverter Bypass

Inverter Bypass Parameter (P442/443) is used to set however many retries are required if the Inverter run signal is not returned in the allocated time after the inverter enable has been turned on.

P442/443 set for 1 to 5 is the number of times enable comes on including initial inverter enable turned on.

0 = Feature disabled.

1 = Inverter enable will come on once with no retries

2 = Initial turn on and 1 retry

3 = Initial turn on and 2 retries

4 = Initial turn on and 3 retries

5 = Initial turn on and 4 retries

Firstly assign the desired inverter run input using the Status Fault inputs. This input can be set as either normally closed (INV N/C) or normally open (INV N/O). When the inverter enable relay is called for by the control strategy then the inverter run signal has to be returned to the appropriate input within 2 seconds.

If the run signal is received then the control strategy will continue as normally and the variable output will begin to ramp up.

If the signal is not returned within the allotted time then the following will occur.

P442/443 set for 1 the inverter enable will stay off and bypass relay will come on.

P442/443 set for 2 to 5 the inverter enable relay will be turned off for a further 15 seconds.

This process will occur a further 1 to 4 retries depending on (P442/443) if the inverter run signal is not received in any test instance. After the retries the inverter will be taken out of the control logic, until the fault is cleared using the reset process, and the pack will operate as a standard digital pack without the use of the inverter output. At this point the Bypass relay will become like another staged relay and will cycle on and off when called for.

An "INV Bypass" alarm will be generated.

Note if the inverter run signal is not returned within the allotted time in the first instance but is successful in the second, third or fourth attempt (Depending on (P442/443) then any future inverter run tests must still complete all tests.

To reinstate the inverter output, once the fault has been rectified, either reset the Plant controller or by using the [Override](#) feature force the relay associated to the inverter on.

The status inputs should be mapped to the relay used as the Inverter Enable relay for a given section i.e. if relay 1 is the first Inverter relay then status Input 1 would become the inverter run input for Section 1. If the second Inverter relay is 5 then status Input 5 would become the inverter run input for Section 2.

Please see [Relay Outputs – Configuration](#).



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

Relay Run Hours

The total run hours for each relay can be viewed via a Laptop/PC or from the Data Manager front end. This feature informs the user of the total number of hours a given relay has been on. Therefore if a compressor is assigned to a relay the total run hours for the compressor can be viewed. To reset the run hours for any given relay connect to the Plant controller using a PC/Laptop. Login and click on the configuration link. Entering 0 into anyone of the relay hour fields and pressing the set configuration button will reset the run hours for that relay back to 0. Run hours apply to all relays including the Alarm relay.

Relay Starts

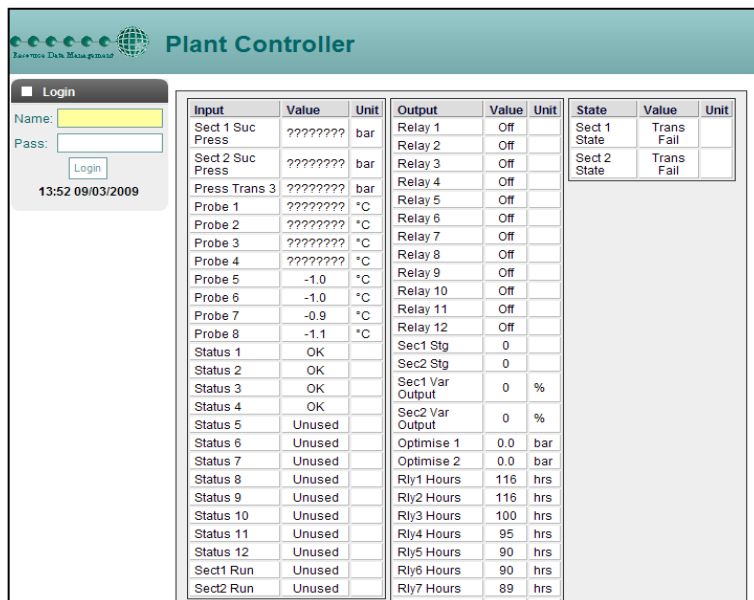
The total number starts for each relay can be viewed via a Laptop/PC or from the Data Manager front end. This feature informs the user of the total number of starts for a given relay. Therefore if a compressor is assigned to a relay the total number of starts for that compressor can be viewed. To reset the relay starts count for a given relay connect to the Plant controller using a PC/Laptop. Login and click on the configuration link. Entering 0 into anyone of the relay start fields and pressing the set configuration button will reset the count for that relay back to 0. Relay starts apply to all relays including the Alarm relay.

Setup via a PC

Log on to the RDM web site and go to Support -> Software.

Download the following folder: - Plant Controller USB drivers for Windows XP/2000. Contained within this folder are installation instructions and the drivers required to connect to the Mercury Plant controller. A USB cable is required which connects to a Type A USB connector (PC) at one end and a Type B USB connector at the other end (Plant USB Device port).

Plant Controller home page



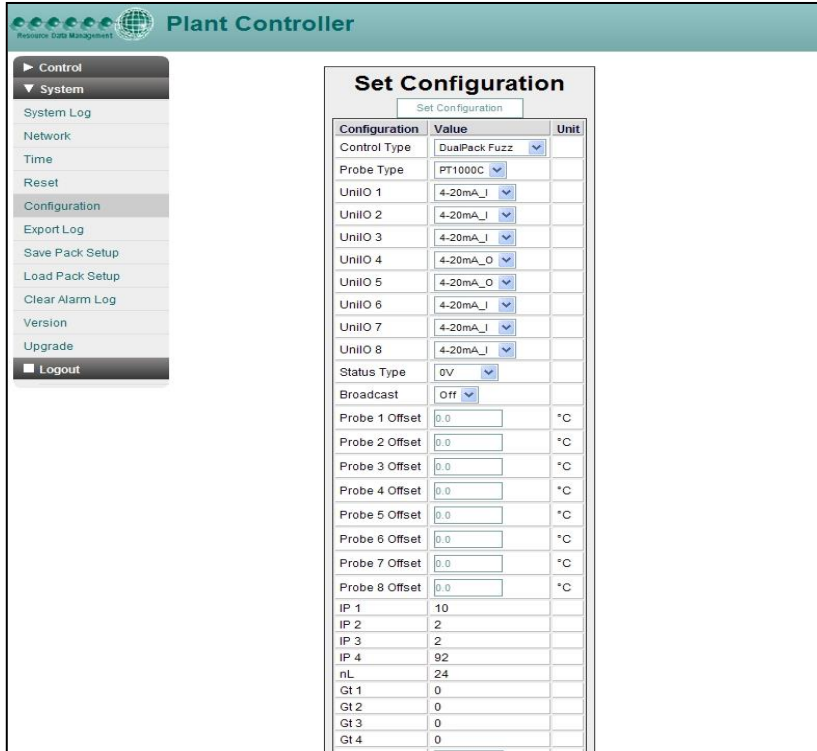
Input	Value	Unit	Output	Value	Unit	State	Value	Unit
Sect 1 Suc Press	????????	bar	Relay 1	Off		Sect 1 State	Trans Fail	
Sect 2 Suc Press	????????	bar	Relay 2	Off		Sect 2 State	Trans Fail	
Press Trans 3	????????	bar	Relay 3	Off				
Probe 1	????????	*C	Relay 4	Off				
Probe 2	????????	*C	Relay 5	Off				
Probe 3	????????	*C	Relay 6	Off				
Probe 4	????????	*C	Relay 7	Off				
Probe 5	-1.0	*C	Relay 8	Off				
Probe 6	-1.0	*C	Relay 9	Off				
Probe 7	-0.9	*C	Relay 10	Off				
Probe 8	-1.1	*C	Relay 11	Off				
Status 1	OK		Relay 12	Off				
Status 2	OK		Sec1 Stg	0				
Status 3	OK		Sec2 Stg	0				
Status 4	OK		Sec1 Var Output	0	%			
Status 5	Unused		Sec2 Var Output	0	%			
Status 6	Unused		Optimise 1	0.0	bar			
Status 7	Unused		Optimise 2	0.0	bar			
Status 8	Unused		Rly1 Hours	116	hrs			
Status 9	Unused		Rly2 Hours	116	hrs			
Status 10	Unused		Rly3 Hours	100	hrs			
Status 11	Unused		Rly4 Hours	95	hrs			
Status 12	Unused		Rly5 Hours	90	hrs			
Sect1 Run	Unused		Rly6 Hours	90	hrs			
Sect2 Run	Unused		Rly7 Hours	89	hrs			

Log in using an appropriate username and password; setup operations can then be used via the PC by clicking on the appropriate link: -

Link	Operation
Values	Shows the values being return on the controllers inputs and outputs
Settings	Shows the controllers parameter settings
Alarm Log	Shows the controllers alarm history; up to 1000 alarms are stored
Graph	Shows the controller values in graphical format
Set Parameters	Allows the user to change parameter values; see Set Parameters
System Log	Shows the changes made to the controller in chronological order
Network	Allows the user to setup: - IP Address Netmask Gateway
Time	Allows the user to set the Time or synchronise with the PC
Reset	Allows the user to reset the controller
Configuration	Allows the user to change the controller configuration; See: changing configuration
Export Log	Creates a log file of the controllers data for downloading onto a PC
Save Pack Setup	Saves the current Configuration
Load pack Setup	Allows the user to upload a pre-configuration (a stand-alone PC program is available to create Plant controller configuration files. Contact RDM for details)
Clear Alarm Log	Clears the controller alarm log completely (Yes/No choice)
Version	Shows the controllers software version

Change Configuration (PC)

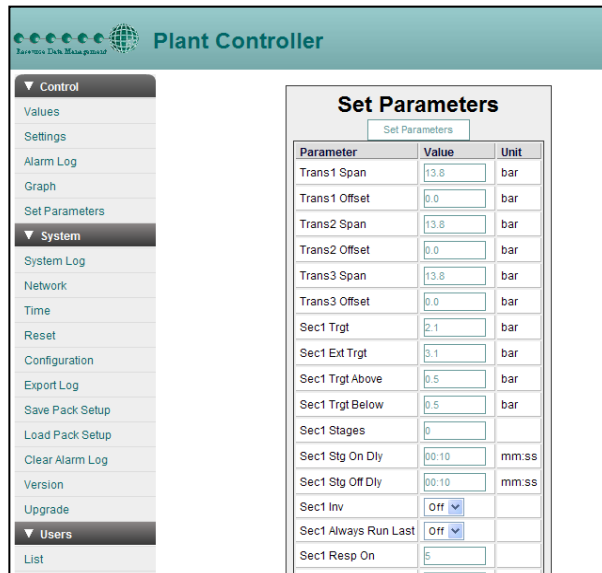
This page allows the user to change the configuration of the Pack controller: - 1 example as follows:-



The screenshot shows the 'Set Configuration' page. On the left is a navigation menu with options: Control, System (selected), System Log, Network, Time, Reset, Configuration, Export Log, Save Pack Setup, Load Pack Setup, Clear Alarm Log, Version, Upgrade, and Logout. The main content area is titled 'Set Configuration' and contains a table with the following data:

Configuration	Value	Unit
Control Type	DuaPack Fuzz	
Probe Type	PT1000C	
UnilO 1	4-20mA_I	
UnilO 2	4-20mA_I	
UnilO 3	4-20mA_I	
UnilO 4	4-20mA_O	
UnilO 5	4-20mA_O	
UnilO 6	4-20mA_I	
UnilO 7	4-20mA_I	
UnilO 8	4-20mA_I	
Status Type	0V	
Broadcast	Off	
Probe 1 Offset	0.0	°C
Probe 2 Offset	0.0	°C
Probe 3 Offset	0.0	°C
Probe 4 Offset	0.0	°C
Probe 5 Offset	0.0	°C
Probe 6 Offset	0.0	°C
Probe 7 Offset	0.0	°C
Probe 8 Offset	0.0	°C
IP 1	10	
IP 2	2	
IP 3	2	
IP 4	92	
nL	24	
Gt 1	0	
Gt 2	0	
Gt 3	0	
Gt 4	0	

Change Parameters (PC)



The screenshot shows the 'Set Parameters' page. On the left is a navigation menu with options: Control, Values, Settings, Alarm Log, Graph, Set Parameters, System (selected), System Log, Network, Time, Reset, Configuration, Export Log, Save Pack Setup, Load Pack Setup, Clear Alarm Log, Version, Upgrade, Users, and List. The main content area is titled 'Set Parameters' and contains a table with the following data:

Parameter	Value	Unit
Trans1 Span	13.8	bar
Trans1 Offset	0.0	bar
Trans2 Span	13.8	bar
Trans2 Offset	0.0	bar
Trans3 Span	13.8	bar
Trans3 Offset	0.0	bar
Sec1 Trgt	2.1	bar
Sec1 Ext Trgt	3.1	bar
Sec1 Trgt Above	0.5	bar
Sec1 Trgt Below	0.5	bar
Sec1 Stages	0	
Sec1 Stg On Dly	00:10	mm:ss
Sec1 Stg Off Dly	00:10	mm:ss
Sec1 Inv	Off	
Sec1 Always Run Last	Off	
Sec1 Resp On	5	



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Configuration of inputs and outputs

Status Inputs

Section Inputs can be set up as: -

No.	Selection Name	Description
0	Unused	Input is not used
1	Compressor Normally Open	When selected "Make" to generate Compressor Fault
2	Compressor Normally Closed	When selected "Break" to generate Compressor Fault
3	Condenser Normally Open	When selected "Make" to generate Condenser Fault
4	Condenser Normally Closed	When selected "Break" to generate Condenser Fault
5	General Normally Open	When selected "Make" to generate General Fault
6	General Normally Closed	When selected "Break" to generate General Fault
7	Standby 1 Normally Open	When selected "Make" to place Section 1 into standby and generate Standby alarm.
8	Standby 1 Normally Closed	When selected "Break" to place Section 1 into standby and generate Standby alarm.
9	Standby 2 Normally Open	When selected "Make" to place Section 2 into standby and generate Standby alarm.
10	Standby 2 Normally Closed	When selected "Break" to place Section 2 into standby and generate Standby alarm.
11	Run 1 Normally Open	When selected "Break" to use Sect 1 Ext Target (P473) OR "Rem Ext 1" See note : Ext Target
12	Run 1 Normally Closed	When selected "Make" input to use Sect 1 Ext Target (P473) OR "Rem Ext 1" Ext Target
13	Run 2 Normally Open	When selected "Break" input to use Sect 2 Ext Target (P474) OR "Rem Ext 2" Ext Target
14	Run 2 Normally Closed	When selected "Make" input to use Sect 2 Ext Target (P474) OR "Rem Ext 2" Ext Target
15	INV N/O	When selected "Break" to signal Inverter Run. Used when using Inverter Bypass relay. See Note : INV Bypass
16	INV N/C	When selected "Make" to signal Inverter Run. Used when using Inverter Bypass relay. See Note : INV Bypass

For the above, any alarms will be generated after the Status Fault Delay (P-60) has timed out. Note Standby Alarm follows the Standby Delay (P-62)

Relay Outputs

Compressor(s)/Loader(s)/Fan(s) relays are assigned using the Stage parameters for a given section.

Additional relay outputs will be assigned (if they are required) in the following order once the Stage parameters have been configured

- Condenser Split
- Heat Reclaim
- INV Bypass
- Gas Dump
- Fan Reverse
- Alarm (An alarm relay will always be allocated as long as a relay is available for it)

Section Stages

Stage	Description	
None	Use this option to end the number of stages in the controller	
Unused	Use this option to skip a relay output within a stage	
Comp	Use this option to assign a relay output to a compressor	See note 5
Loader	Use this option to assign a relay output to a compressor loader	See note 9
Fan	Use this option to assign a relay to a fan	
Inverter	Use this option to assign a relay to an Inverter	
Trim	Use this option to set a relay to a trim compressor	See note 6
Comp Run	Use this option to set a relay as a separate compressor used only when other compressors are running	See note 8

Note 5: In a pack configuration, at least 1 output must be assigned to a compressor. Loader outputs will not energise without a compressor being on. When assigning stages a Loader should follow the Compressor on which it is mounted.

Note 6: This option can be used to delay the onset of the inverter output. The "Trim" relay will come on with the Inverter enable relay but will use the starts per hour parameter. Once the trim stage is on the inverter enable relay would be energised and the inverter analogue output would begin to ramp up. The trim relay would remain on until all other stages are off and then will go off with the inverter enable relay.

Note 8: This option is used to bring on a separate compressor. This output is active when any of the other defined compressors (Comp stages) are running. This output is off when the last compressor in its section is turned off. Note if only the inverter output is configured and no other Comp stages then the Comp Run is active when the inverter output is active.

Note 9: Relays can be configured as Loaders, selected after a Compressor stage or a Compressor running on an Inverter



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Alarm Relay

Note 7. The alarm relay is assigned automatically to the last available relay after the stage relays, condenser split, heat reclaim, inverter bypass, gas dump and fan reverse have been allocated. At first power on this is likely to be relay 1 until programming of the controller is complete. The relay is energised with no alarm and de-energised when in alarm.

Stage Sizes

Stage sizes will determine the order in which compressors or loaders are switched on and off. This is a relative number between 0 and 60, reflecting the size of the compressor (usually horse power)
The default stage size is 0; stage sizes must be entered for correct operation.

Operation (Fuzzy)

Once the controller has been set-up and configured, normal operation will resume. If the appropriate Type has been selected the controller will operate using a “fuzzy logic” based control algorithm. The controller will determine the stages to bring on and off using the fuzzy logic rules and adhering to the starts/hr criteria. The response time for devices switching on and off can be varied by adjusting the response on and response off parameters (1 is the slowest response, 60 is the quickest). The fuzzy logic will attempt to optimise the compressor starts and keep them at a minimum. Before a compressor or fan is switched on, Relay 1 will energise and the variable output will ramp to 100%, when it reaches this point, the fixed device (compressor, loader or fan); will switch on and the variable output will begin its cycle again starting from 0%. When demand is satisfied, and all compressor relays are off, the variable output ramps down 0%, if demand is still satisfied, the enable relay de-energises.

Operation (Staged)

Staged operation requires the output relays to be “mapped” to a particular stage. Each stage (there are 12 stages) has to have at least 1 relay assigned for the controller to operate correctly. More than one relay can be assigned to stages in a given section and the same relay can be used in multiple stages. Note a relay cannot be assigned in both Section 1 and Section 2. As the pressure rises above the target setpoint, plus the target above value, the controller will enter Stage 1 after the stage on delay has expired. At this point any relay assigned in Stage 1 will come on and the stage on delay timer will be reset. If the pressure remains above the setpoint, plus the target above value, and the stage on delay has expired for a second time the controller will enter stage 2. At this point any relay assigned in Stage 2 will come on. Note if a relay has been assigned in Stage 1 but not used in Stage 2 then it will go off at this point. The reverse occurs when the pressure falls below the setpoint plus the target below value. The controller will step down the stages using the stage off delay (P-08) until all stages are off.

When using a variable output as the pressure rises above target setpoint, plus target above, the variable speed output will ramp up from 0% to 100% without following the stage on delay. If the pressure stays above the target setpoint and the variable output is at 100% and the stage on delay has timed out then the controller will enter Stage 1. At this point the variable output will reset to 0% and start ramping up again towards 100%. If the pressure stays above the target setpoint and the variable output is at 100% and the stage on delay has timed out then the controller will enter Stage 2. As the pressure drops below the setpoint, minus the target below, the variable output will ramp from 100% down to 0%, once the stage off delay expires the controller will stage down. Note if the variable output reaches 100% and the stage on delay has not expired the output will remain at 100% until the stage on delay has expired.

For example if set to dual Pack and pack 1 has 4 Compressors the following could be set: -

Sect1 Stg1: Rly 1 = On, **Sect1 Stg2:** Rly 1 and Rly 2 = On, **Sect1 Stg 3:** Rly 1, Rly 2 and Rly 3 = On. **Sect1 Stg 4:** Rly 1, Rly 2, Rly 3 and Rly 4 = On. This would stage relay 1 through to four on after the appropriate stage delay if the pressure is above the target setpoint and differentials.

Pack 2 would start as follows:-

Sect2 stg1: Rly 5 = On (**Note:** Starting at Relay 5 as the first 4 relays have already been allocated to Pack 1)



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Other operational features

Floating Head Pressure

When the condenser controller is used in the "Floating Head pressure" mode, the temperature to pressure parameters must be used to profile a pressure curve from the air on temperature probe for the condenser (P414 to P419 and P461 to P466). The value read from the temperature probe is added to a "Condenser Offset" (P422) and then converted to a pressure. This converted pressure replaces the "Target Setpoint" (P01) as the target pressure and P01 is only used as a default; for instance when the probe is disconnected or develops a fault. Low and high pressure levels allow for a lower and upper limit to be set for the pressure range.

The air on temperature can be read from probe inputs 1 to 8 and is settable via parameter P-410/P-460. The float temperature can also be received as a TDB command sent from a Data Manager TDB program. This would allow for a single probe temperature to be shared with multiple Plant controllers. Please see the relevant Data Builder user guide with regards to creating a TDB program. The following commands would be used in TDB to send the temperature data to the Plant controller. If P-410 is set to Remote then "S1 Rem Float" would be used in TDB to send the remote temperature used for Section 1 condenser float or if P-460 is set to Remote then "S2 Rem Float" would be used in TDB to send the remote temperature used for Section 2 condenser float.

Drop Leg

When the condenser is used in the "Float/ Drop Leg" mode, the temperature measured from the condenser Drop Leg probe is converted to a pressure and displayed. Note this is for monitoring only.

Drop Leg temperature can be read from probe inputs 1 to 8 or set to remote (settable on P411/412). When set to 'remote', it can then be read from another pack controller, which is reading the Drop Leg Temperature and sending temperature via a TDB Program to Input "S1 Rem Drop Leg" or "S2 Rem Drop Leg". This is then converted to a pressure. Please see the relevant Data Builder user guide with regards to creating a TDB program.

External Target

Pack Controller

To use Sect 1/2 Ext Target (P473/474) instead of Section 1/2 Target Pressure (P-20/40) a status Input must be set to "Run 1/2 N/O or N/C".

- When the input is activated the Target Pressure will change from (P-20/40) to (P473/474)
- When the input is de-activated the Target Pressure will revert back to (P-20/40)

Condenser Controller

Heat Reclaim must be set to "On" or "On/Rly".

To use Sect 1/2 Ext Target (P473/474) instead of Section 1/2 Target Pressure (P-20/40) a Status Input must be set to "Run 1/2 N/O or N/C".

With Heat Reclaim parameter (P440/441) set to "On" the following will occur: -

- When the input is activated the Target Pressure will change from (P-20/40) to (P473/474)
- When the input is de-activated the Target Pressure will revert back to (P-20/40)

Or

With Heat Reclaim parameter (P440/441) set to "On/Rly" the following will occur: -

- When input is activated the Target Pressure will change from (P-20/40) to (P473/474) and turn on the Heat Reclaim relay output.
- When input is de-activated the Target Pressure will revert back to (P-20/40) and turn off the Heat Reclaim relay output.

Remote TDB Command for Heat Reclaim

To use a Remote Discharge Target Set Point sent from a Data Manager TDB Program Instead of the value entered for the Ext 1/2 Target setpoint (P473/474), then the following must be configured: -

- Status Input must be set to "Run 1/2 N/O or N/C" and Heat Reclaim has to be set (P440/441) to either "On" or "On/Rly".
- When input is activated the Target Pressure will change from (P-20/40) to whatever Target Pressure is being sent from TDB program. The settable range for "Rem Ext 2" is -3.4 Bar to 150 Bar.
- When input is de-activated the Target Pressure will revert back to (P-20/40)

Send Ext Target Set Point Command to "Rem Ext 1" or "Rem Ext 2" using a Data Manager TDB program. Analogue Output block. This command can only be used to change the discharge setpoint and does not apply to the suction setpoint.



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Night Set-back

This controller; when in condenser mode has a “Night Set-back” feature for the condenser controller. The variable output can be set to reduce to a pre-determined level; either by an internal timer, or by times sent to the controller over the network. (Use a GP Timer channel in a data Manager or Data Director)

There is a High pressure limit, over which the night set-back feature will be turned off. As the pressure reduces under this limit the night set-back feature is switched on again.

Day Set-back

Similarly, this controller; when in condenser mode has a day Set-Back feature. The Day Set-Back feature uses the local night Set-Back clock, (if it's out of the night set-back time, day set-back will be on) Note: - When Set-Back mode is on, no further fan stages will come on unless the variable output reaches 100%, either by reaching the high pressure point or Set-Back going off. When configured as a condenser controller, loss of the pressure input will result in the variable output going to the value defined in P17.

Invert Relays

The operation of the relays can be inverted so that N/C contacts can be used for energisation. This can be done from the configure screen on web page. Choose the relay(s) you wish to invert and set them to on. This process can also be completed from the controller display. Navigate to the menu option **rly** and select the relay output you wish to invert for example **r-05** is relay output 5. Change from “0” to “1” to invert the relay so that the N/C contact is in use.

Please note: This operation does not invert the Alarm relay. The alarm relay is energised when there are no alarms present.

Sticky Fans

Sticky fan operation allows the user to turn the fans off in a way that keeps a number of fans running longer.

Example:

If in a Pack/Condenser configuration fans are mapped to relays 5, 6, 7, 8, 9, and 10; the following sequence will apply if **sticky fans (P450) is set to 2**

	Fan1	Fan2	Fan3	Fan4	Fan5	Fan6
On Sequence	1 st	2 nd	3 rd	4 th	5 th	6 th
Relay #	Relay 5	Relay 6	Relay 7	Relay 8	Relay 9	Relay 10
Off Sequence	6 th	5 th	1 st	2 nd	3 rd	4 th

USB Operation

The following operations can be performed using a memory-stick plugged into the USB port: -

1. Export event log U-01
2. Export logged data U-02
3. Save configuration U-03
4. Load configuration U-04
5. Upgrade the software U-05

The above requires the user to enter the USB menu via the display and press enter at the appropriate display option.

For example to save the current configuration insert a USB Memory stick into one of the USB Host ports, go to the USB software menu option, press enter, then use the up key to scroll to U-03. Now press enter, the screen will flash “USB” until the operation has completed.

The file is transferred to the memory-stick in .zip format. The USB memory stick must be formatted as FAT32.



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Viewing Inputs and Outputs

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

1. From the function menu, select "IO", press enter
2. 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 Controller Types 1-5 (Fuzzy)

Number	IO	Range	Units					
				Pack (Type 1)	Dual Pack (Type 2)	Pack/Condenser (Type 3)	Dual Condenser (Type 4)	Condenser (Type 5)
I-01	Pressure Input 1	-3.4 to 180	Bar	✓	✓	✓	✓	✓
I-02	Pressure Input 2	-3.4 to 180	Bar	✓	✓	✓	✓	✓
I-03	Pressure Input 3	-3.4 to 180	Bar	✓	✓	✓	✓	✓
I-10	Analogue Input 1	-60 to +128	°C	✓	✓	✓	✓	✓
I-17	Analogue Input 8							
I-20	Section 1 remote float	-60 to +128	°C				✓	✓
I-21	Section 2 remote float	-60 to +128	°C			✓	✓	
I-22	Section 1 remote leg drop	-60 to +128	°C				✓	✓
I-23	Section 2 remote leg drop	-60 to +128	°C			✓	✓	
I-30	Status Input 1	0 = OK 1 = Alarm 2 = Unused		✓	✓	✓	✓	✓
I-41	Status Input 12							
I-50	Section 1 Run	0 = Off, 1 = On 2 = Unused		✓	✓	✓		
I-51	Section 2 Run	0 = Off, 1 = On 2 = Unused			✓			
I-52	Section 1 Heat Reclaim	0 = Off, 1 = On 2 = Unused					✓	✓
I-53	Section 2 Heat Reclaim	0 = Off, 1 = On 2 = Unused				✓	✓	
I-54	Liquid Level	0 – 100	%	✓	✓	✓	✓	✓
I-55	Remote External Temp.1	-60 to +128	°C				✓	✓
I-56	Remote External Temp.2	-60 to +128	°C			✓	✓	
O-01	Relay 1	0 = Off, 1 = On		✓	✓	✓	✓	✓
O-12	Relay 12							
O-31	Variable Output 1	0 – 100	%	✓	✓	✓	✓	✓
O-32	Variable Output 2	0 – 100	%		✓	✓	✓	
O-41	Optimisation Level	-3.4 to 180	Bar	✓	✓	✓		
O-42	Optimisation Level Pack 2	-3.4 to 180	Bar		✓			
O-51	Section 1 Float Pressure	-3.4 to 180	Bar				✓	✓
O-52	Section 2 Float Pressure	-3.4 to 180	Bar			✓	✓	
O-53	Sect 1 Drop Leg Temp	-60 to +180	°C				✓	✓
O-54	Sect 2 Drop Leg Temp	-60 to +180	°C			✓	✓	
O-55	Sect 1 Drop Leg Press	-3.4 to 180	Bar				✓	✓



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O-56	Sect 2 Drop Leg Press	-3.4 to 180	Bar			✓	✓	
O-57	Sect 1 Split	0 = Off, 1 = On					✓	✓
O-58	Sect 2 Split	0 = Off, 1 = On				✓	✓	
O-59	Sect 1 Heat Reclaim	0 = Off, 1 = On					✓	✓
O-60	Sect 2 Heat Reclaim	0 = Off, 1 = On				✓	✓	
O-61	Section 1 Night Set-back	0 = Off, 1 = On					✓	✓
O-62	Section 1 Day Set-back	0 = Off, 1 = On				✓	✓	
O-63	Section 2 Night Set-back	0 = Off, 1 = On					✓	✓
O-64	Section 2 Day Set-back	0 = Off, 1 = On				✓	✓	
O-70	Sect.1 Bypass	0 = Off, 1 = On		✓	✓	✓	✓	✓
O-71	Sect.2 Bypass	0 = Off, 1 = On			✓	✓	✓	
O-72	Section 1 Gas Dump	0 = Off, 1 = On		✓	✓	✓		
O-73	Section 2 Gas Dump	0 = Off, 1 = On			✓			
O-90	Section 1 Fan Mode	0 = Forward 1 = Forward to Reverse Delay 2 = Reverse 3 = Reverse to Forward Delay					✓	✓
O-91	Section 2 Fan Mode	0 = Forward 1 = Forward to Reverse Delay 2 = Reverse 3 = Reverse to Forward Delay				✓	✓	
S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Standby		✓	✓	✓	✓	✓
S-02	Section 2 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by			✓	✓	✓	



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Input/ Output table for Controller Types 6-10 (Staged)

Number	IO	Range	Units					
				Pack (Type 6)	Dual Pack (Type 7)	Pack/Condenser (Type 8)	Dual Condenser (Type 9)	Condenser (Type 10)
I-01	Pressure Input 1	-3.4 to 180	Bar	✓	✓	✓	✓	✓
I-02	Pressure Input 2	-3.4 to 180	Bar	✓	✓	✓	✓	✓
I-03	Pressure Input 3	-3.4 to 180	Bar	✓	✓	✓	✓	✓
I-10	Analogue Input 1	-60 to +128	°C	✓	✓	✓	✓	✓
I-17	Analogue Input 8							
I-20	Section 1 remote float	-60 to +128	°C				✓	✓
I-21	Section 2 remote float	-60 to +128	°C			✓	✓	
I-22	Section 1 remote leg drop	-60 to +128	°C				✓	✓
I-23	Section 2 remote leg drop	-60 to +128	°C			✓	✓	
I-30	Status Input 1	0 = OK 1 = Alarm 2 = Unused		✓	✓	✓	✓	✓
I-41	Status Input 12							
I-50	Section 1 Run	0 = Off, 1 = On 2 = Unused		✓	✓	✓		
I-51	Section 2 Run	0 = Off, 1 = On 2 = Unused			✓			
I-52	Section 1 Heat Reclaim	0 = Off, 1 = On 2 = Unused					✓	✓
I-53	Section 2 Heat Reclaim	0 = Off, 1 = On 2 = Unused				✓	✓	
I-54	Liquid Level	0 – 100	%	✓	✓	✓	✓	✓
I-55	Remote External Temp.1	-60 to +128	°C				✓	✓
I-56	Remote External Temp.2	-60 to +128	°C			✓	✓	
O-01	Relay 1	0 = Off, 1 = On		✓	✓	✓	✓	✓
O-12	Relay 12							
O-20	Section 1 Stage	0-12		✓	✓	✓	✓	✓
O-21	Section 2 Stage	0-12			✓	✓	✓	
O-31	Variable Output 1	0 – 100	%	✓	✓	✓	✓	✓
O-32	Variable Output 2	0 – 100	%		✓	✓	✓	
O-41	Optimisation Level	-3.4 to 180	Bar	✓	✓	✓		
O-42	Optimisation Level Pack 2	-3.4 to 180	Bar		✓			
O-51	Section 1 Float Pressure	-3.4 to 180	Bar				✓	✓
O-52	Section 2 Float Pressure	-3.4 to 180	Bar			✓	✓	
O-53	Sect 1 Drop Leg Temp	-60 to +128	°C				✓	✓
O-54	Sect 2 Drop Leg Temp	-60 to +128	°C			✓	✓	
O-55	Sect 1 Drop Leg Press	-3.4 to 180	Bar				✓	✓
O-56	Sect 2 Drop Leg Press	-3.4 to 180	Bar			✓	✓	
O-57	Sect 1 Split	0 = Off, 1 = On					✓	✓
O-58	Sect 2 Split	0 = Off, 1 = On				✓	✓	
O-59	Sect 1 Heat Reclaim	0 = Off, 1 = On					✓	✓
O-60	Sect 2 Heat Reclaim	0 = Off, 1 = On				✓	✓	
O-61	Section 1 Night Set-back	0 = Off, 1 = On					✓	✓
O-62	Section 1 Day Set-back	0 = Off, 1 = On				✓	✓	
O-63	Section 2 Night Set-back	0 = Off, 1 = On					✓	✓
O-64	Section 2 Day Set-back	0 = Off, 1 = On				✓	✓	



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O-70	Sect.1 Bypass	0 = Off, 1 = On		✓	✓	✓	✓	✓
O-71	Sect.2 Bypass	0 = Off, 1 = On			✓	✓	✓	
O-72	Section 1 Gas Dump	0 = Off, 1 = On		✓	✓	✓		
O-73	Section 2 Gas Dump	0 = Off, 1 = On			✓			
O-90	Section 1 Fan Mode	0 = Forward 1 = Forward to Reverse Delay 2 = Reverse 3 = Reverse to Forward Delay					✓	✓
O-91	Section 2 Fan Mode	0 = Forward 1 = Forward to Reverse Delay 2 = Reverse 3 = Reverse to Forward Delay				✓	✓	
S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Standby		✓	✓	✓	✓	✓
S-02	Section 2 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by			✓	✓	✓	

QuickView

Pressing the “quickview” button during normal operation displays the target pressure. If a two-stage controller has been configured, both target pressures are displayed on the corresponding Section display. Press the “quickview” button again to go back to the normal display or wait for the time-out period to elapse.

Override

The override function allows the user to switch output stages on or off.

- Press the override and enter button together for approx.. 3 seconds until “r-01” is displayed.
- Use the “up” or “down” button to display the relays (r-01 to r-12) and analogue outputs (A-01 and A-02).
- For (r-01 to r-12) Press “Enter” and select “1” to turn the relay on and “0” to turn the relay off.
- For (A-01 and A-02) Press “Enter” and use up and down buttons to select the desired output for A-01 or A-02. Press the “Enter” button when the desired output percentage is reached. Each output can be set between 0% and 100%.

Override will last for 30 seconds then the output will return to normal operation.

Info Button

When this button is used, Section 1 and Section 2 analogue output values can be displayed. When pressed the current analogue output percentage is shown on the corresponding Section display.

Standby Mode

Once in standby all configured stages are turned off and a standby alarm is generated for the given section. There is an adjustable delay period (P-62) before a section enters standby. Once this delay expires the controller enters standby and a standby alarm is also generated for the relevant section.

Section 1 and Section 2 can be placed into standby independently using two separate status inputs or both sections can be placed into standby at the same time from a single status input. P494 determines the Standby configuration.

P494 set to 1 = On

Controller uses one status input to place both sections into standby. Parameters P-80 to P-91 (Option 7 Std 1 N/O or Option 8 Std 1 N/C) are used to place both sections into standby from a single status input

P494 set 0 = Off

Controller uses two independent status inputs to place each section into standby independently. Controller uses P-80 to P-91 (Option 7 Std 1 N/O or 8 Std 1 N/C) to put section 1 into standby. Controller uses P-80 to P-91 (Option 9 Std 2 N/O or 10 Std 2 N/C) to put section 2 into standby



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Probe Offsets

Each probe input, displayed as C-01 to C-08 from the controller display menu, can have an offset applied;

Up to $\pm 20^{\circ}\text{C}$ in increments of 0.1°C .

Display Messages

The following messages can appear on the display during normal operation.

Display	System status
HP	High Pressure alarm
LP	Low Pressure alarm
Ft TrAn	Pressure Transducer Fault
Ft	Fault
Sd	Low Pressure Shut-down
CP	Compressor Fault Compressor Run Fault
Cd	Condenser Fan Fault
gn	General Fault
Stby	Controller in Standby
Conf	Configuration / Set up error
triP	Discharge Pressure Trip alarm

Note 10: If Only 1 Transducer is fitted and the controller is set to a single section type, for example Pack, then Display 1 will show the current suction pressure but Display 2 will show Ft. Transducer input 2 is on by default to allow for the fitment of a transducer for monitoring purposes. If this probe is not fitted then set the parameter "Trans2 Span" to 0. This will clear the fault 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 #
High Pressure Alarms	8
Low Pressure Alarms	9
Low Pressure Shutdown	10
Transducer Faults	6
General Faults	20
Compressor faults	3
Condenser Faults	3
Configuration fault	20
Controller in standby	20
INV Bypass	3
Liquid Level Fault	6
Liquid Level High	4
Liquid Level Low	5
Discharge Trip	20
Float Probe Fault	6
Drop Leg Probe Fault	6



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Specification

Power requirements:

Supply Voltage Range:	24 Vac $\pm 10\%$ or 24 Vdc $\pm 10\%$
Supply Frequency:	50 – 60 Hz $\pm 10\%$
Maximum supply current:	<1 Amp
Typical supply current:	0.3 Amp
Class 2 Insulation:	No protective Earth is required. A functional earth can be connected if the equipment is located in an electrically noisy environment.

Notes: The use of centre tapped to earth transformers is not allowed. This is to prevent damage to the transformer and/or controller.

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

RDM advise the use of a suitable external over-current protection device on the Mercury Plant Controller.

Warranty may be invalidated due to excess current being unlimited if there are no fuses/circuit breakers installed

General

Operating temperature range:	-10°C to +60°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:	Mercury Plant Controller 270mm (L) x 115mm (W) x 50mm (H) Intuitive Plant Controller 280mm (L) x 122mm (W) x 67mm (H)
Weight:	Mercury Plant Controller 700 Grams Intuitive Plant Controller 750 Grams
Safety:	EN61010
EMC:	EN61326; 1997 +Amdt. A1; 1998
Ventilation:	There is no requirement for forced cooling ventilation

Inputs

Probe Input type See [Set/change Units](#) for probe types

Status Input type The preferred option is a 0 volt return through a volt free relay or 24 Vac referenced to the supply voltage. If a 24Vac signal is being sourced from the Plant controller power supply then **do not** ground the Status Input common rail, this is grounded internally.

Comms Ethernet

4-20mA 4-20mA current loop, use the 12 Vdc output to feed the device.

Analogue Outputs 0 to 10 Volts DC or 4-20mA. (Selected in the properties box of the output block)

Note 1: The 4-20mA output will not operate correctly if the target device input impedance is $>75\Omega$

Note 2: The 0-10V output will not operate correctly if the target device input impedance is $<10K\Omega$ A 50mA fuse is recommended for this output.

Note 3: On the intuitive variant, when using the universal 0-10V output to drive an inductive load such as a relay coil, a back e.m.f. protection diode must be fitted. The cathode should connect to the output terminal and the Anode to GND/Return terminal. The maximum load current that can be supplied from these outputs is 38mA. The mercury plant cannot be used to drive a relay coil.

Relay Ratings, Mercury Plant Controller

5A/250 Vac/AC1 (Resistive load).
5A/30 Vdc (Resistive load)
2A/250 Vac $\cos\phi=0.3$ on N/O contact (Inductive Load)
Lifespan approximately 120,000 operations.

Relay Ratings, Intuitive Plant Controller

10A/250 Vac/AC1 (Resistive load)
10A/30 Vdc (Resistive load)
5A/250 Vac $\cos\phi=0.4$
Lifespan approximately 200,000 operations.



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Software, Software drivers and software features and function licences

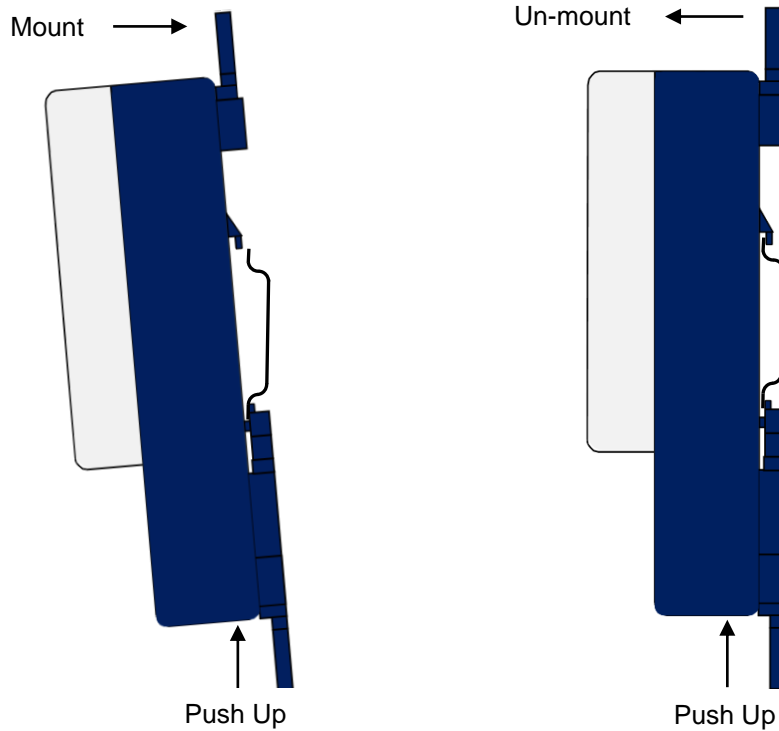
RDM product Software Licences and drivers are non-transferable. They are purchased with hardware or separately and once added to hardware for use on that hardware only. If hardware is returned and deemed out of warranty all software driver licences terminate with the hardware.

Fuse Ratings, Intuitive Plant Controller

Relay Fuses 10A Antisurge HRC, 32 x 6.3mm
Supply Fuse 2A Antisurge HRC, 32 x 6.3mm

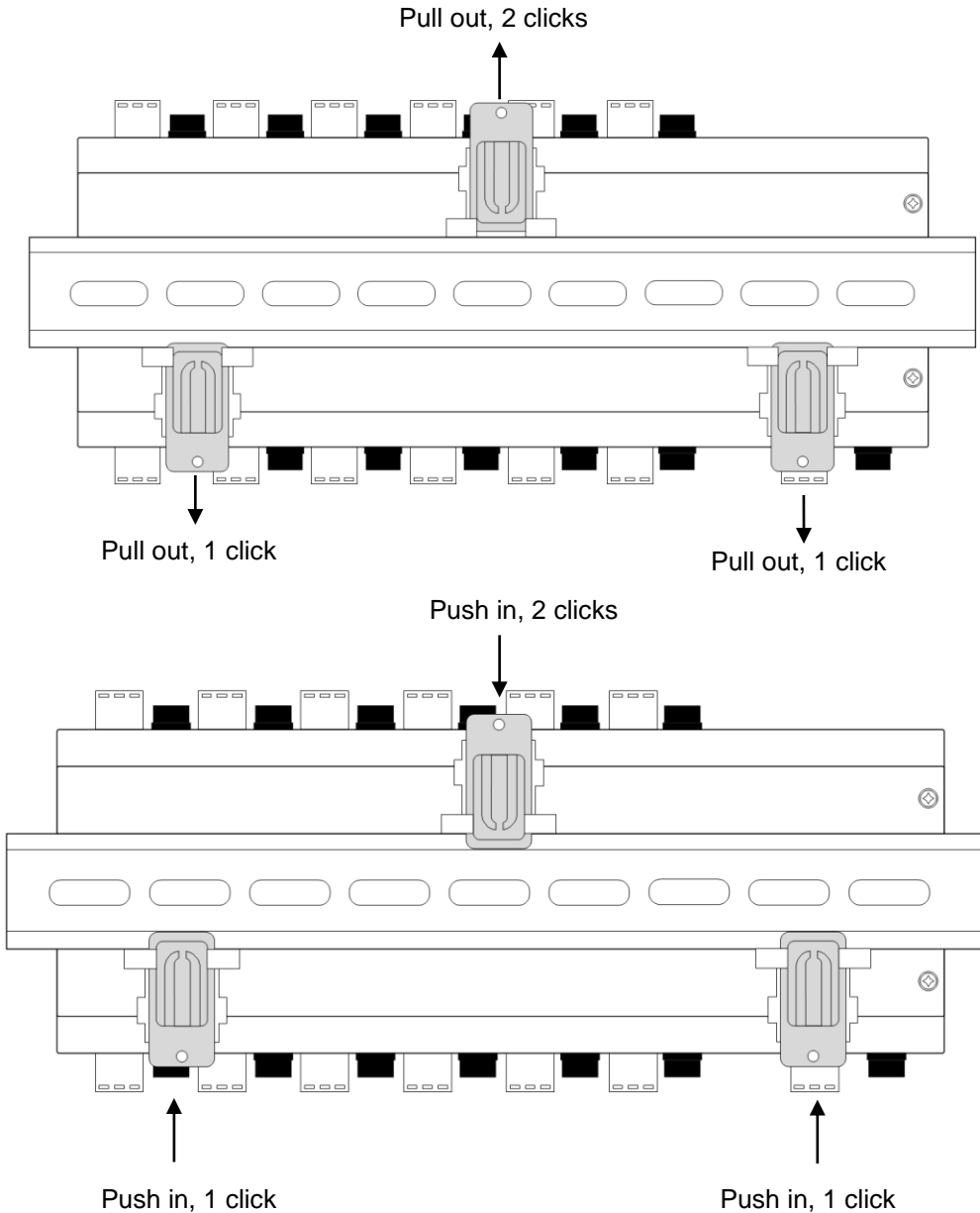
Installation

Mounting on to a DIN rail, Mercury Plant Controller



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Mounting on to a DIN rail, Intuitive Plant Controller



The Intuitive plant controller has three DIN rail mounting feet which can slide in and out to three different positions, sliding into each position is accompanied by a “click” which locks the foot into that position. To install the controller onto a DIN mounting rail, from the fully pushed in position slide the top mounting foot out by 2 clicks so that the foot is clear of the DIN rail channel. Slide the bottom two feet out by one click so that they are protruding slightly into the DIN rail channel. The controller can now be inserted onto the DIN rail by inserting the bottom lip of the DIN rail behind the two bottom mounting feet

The controller can now be pushed flat onto the DIN rail and the top foot pushed in 2 clicks to hold the controller in place. Finally, push the bottom two feet in by one click to secure the controller.

The mounting feet also have M3 holes for direct mounting where DIN rail is not being used.

Clearances

The controller must have 10mm clearance above the top and 15mm clearance from the sides. Clearance at the front and rear is dependent on the site wiring. There is no requirement for forced cooling ventilation

Cleaning

Do not wet the controller when cleaning. Clean the front by wiping with a slightly dampened 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.

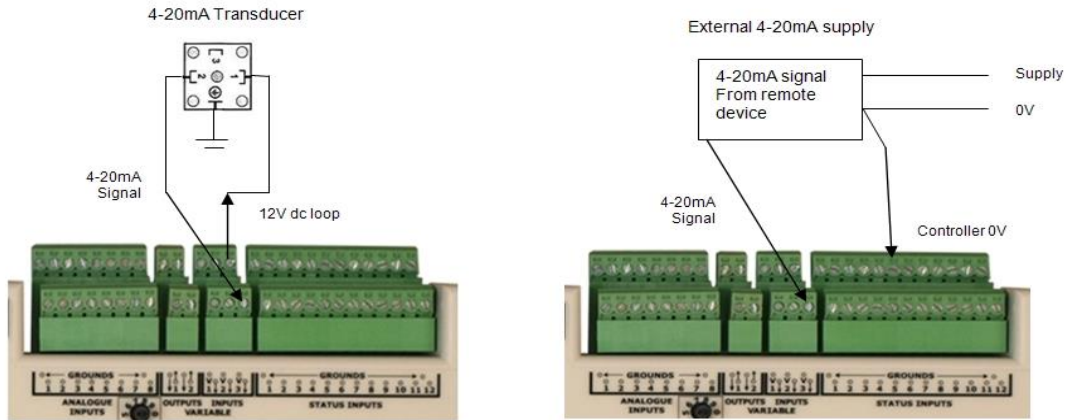


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Appendix 1 Typical Transducer Connection

For 4-20mA type transducers the diagram below shows the connections to the Plant Controller: -

Connection diagram for 4-20mA transducer with 12V dc loop and from a remote device



Section of controller showing Variable Inputs and controller 0V

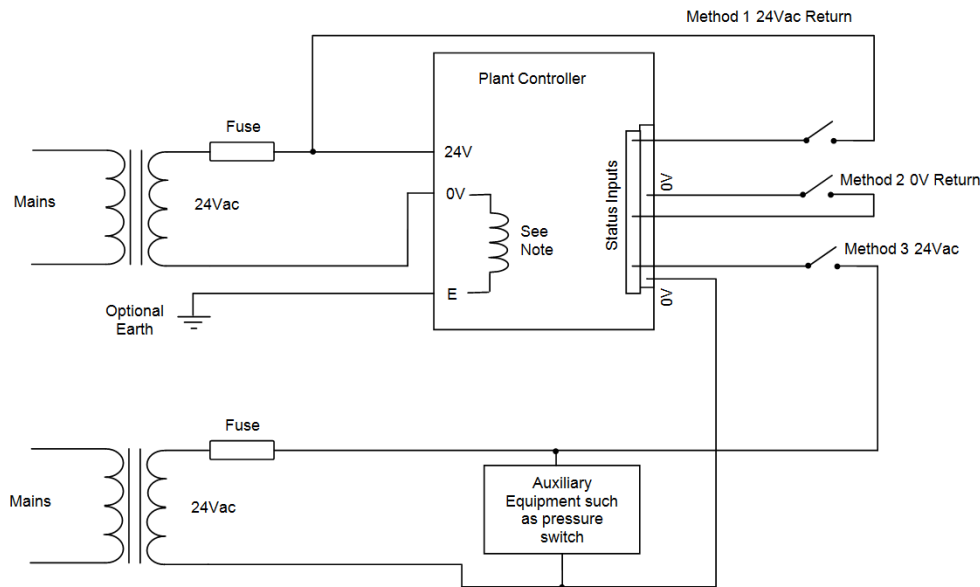
Note: The Earth connection is not necessary unless in an electrically noisy environment.

Appendix 2 – Supply & Status Input Wiring

Appendix four applies to the current version of the Plant controller hardware.

- Method 1. Uses the 24Vac of the transformer supplying the input voltage; which is returned via a switch (or relay) to the status input signal line. No 0V is required at the status connector.
- Method 2. Uses a 0V return (from the status connector) to the status signal input.
- Method 3. Uses a 24Vac signal derived from another transformer (supplying an auxiliary piece of kit) to feed the status input signal line. Note the auxiliary transformer must be referenced to the Plant Controller supply transformer.

All transformers that have a connection to the Plant Controller must have their primaries connected to the same phase. Transformer should have fuse fitted in line with 24V input as per diagram.



Note: For older versions of hardware (Software V1.6 or earlier). Please see separate data sheet.

The use of centre tapped to earth transformers is not allowed. This is to prevent damage to the transformer and/or controller



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Revision History

Revision	Date	Changes
2.7	14/04/2011	Introduction of the Intuitive range 0–5Vdc Variable Input / Output option added New feature broadcast Pressure to Mercury IP Module PR0016 Pressure input range increased from 150 Bar to 180 Bar Loader operation enhanced. Equalise Run Times feature added Ability to change status input type via front panel display
2.9a	16/02/2012	Standby now has fixed 10 second delay Trim compressor now uses starts per hour parameter Inverter is now switched off with discharge trip alarm
3.1	07/05/2013	Load shedding added and clarification of run proofs.
3.2	15/08/2013	Run proof reset method changes. USB Touch Screen set up added.
3.3	08/11/2013	Standby delay parameter added (P-62)
3.3a	06/01/2015	Operating Temperature range updated.
3.5	09/04/2015	Reverse Fans Feature Added
3.8	02/09/2015	Amending Drop Leg monitoring description
3.9	05/11/2015	Description of Digital/Status Inputs standardised to Status Inputs
4.0	29/02/2016	Fan reverse level parameter added
4.0a	18/04/2016	Spelling error amended
4.0c	20/12/2016	Update to specification page
4.0d	14/02/2017	Added ECA approval



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