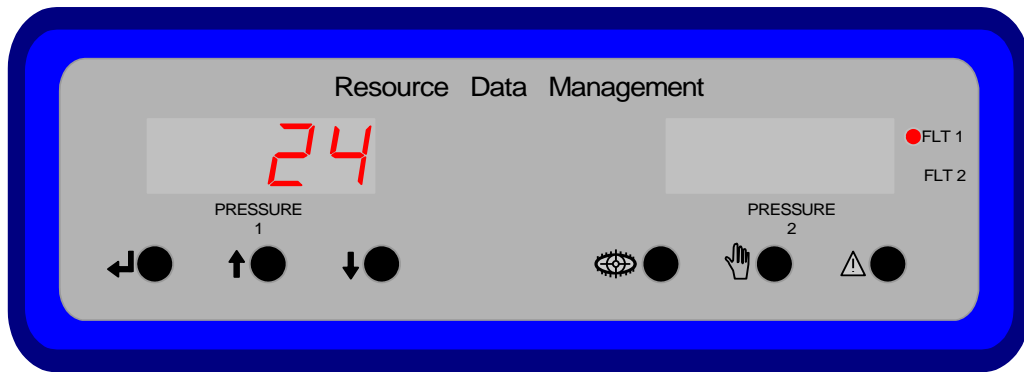




Mercury 11-10V Vari-Pack Controller

Mercury 11-10V Vari-Pack Pack/Condenser Controller Installation & User Guide

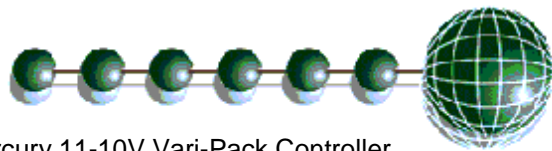


Product Numbers: -

- PR0278 (Mains version)**
- PR0279 (Low voltage version)**
- PR0280 (Mains Voltage remote display)**
- PR0281 (Low Voltage remote display)**
- PR0339 DIN rail bracket for controller**



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



Mercury 11-10V Vari-Pack Controller

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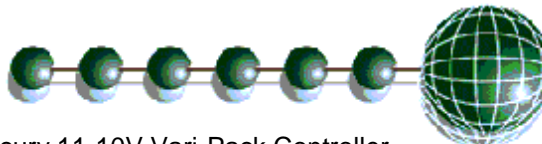
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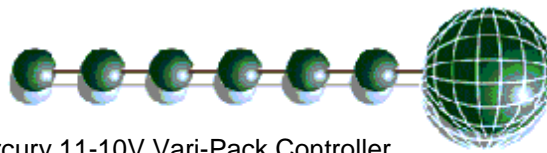
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Mercury 11-10V Vari-Pack Controller

The Mercury Range

From Resource Data Management

This documentation refers to the controller Mercury 11-10V

Description

The Mercury 11-10V is a versatile controller intended for Pack and Condenser control. It has 10 relay outputs that are configurable for compressors, loaders or fans. The 10 digital inputs can be assigned for Pack or Condenser section inputs or general alarms. There are two 4-20mA inputs for pressure transducers and one temperature probe input. The 11-10V has an analogue output (0-10V dc or 4-20mA or 0-20mA) to control variable speed devices.

The controller has 2 options, Pack or Condenser.

The control is a "Fuzzy logic" based algorithm, giving enhanced control whilst maintaining the starts/hr requirement. The algorithm also reduces the number of input parameters required for control; only a target pressure is needed.

Like all Mercury controllers, the 11-10V has a serial output that can connect directly to a PC for quick set-up (PC running RDM Communicator application) or to one of RDMs' network modules.

The controller can run off a supply voltage of 100 - 250 Vac and each relay can switch in excess of 2 Amps. There is a low voltage version : -10 - 35 Vdc or 15 - 30 Vac and also a remote display version for door mounting applications.

Configuration

The controller has two configuration options: - (see [Set/View Type](#) for changing the type)

Display value	Type
1	Pack
2	Condenser

The controller is delivered pre-configured as a Pack Controller (Type 1)

Networks

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

To connect to a network you must connect through a communications module or a Mercury Serial Hub. (See [network set-up](#))

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

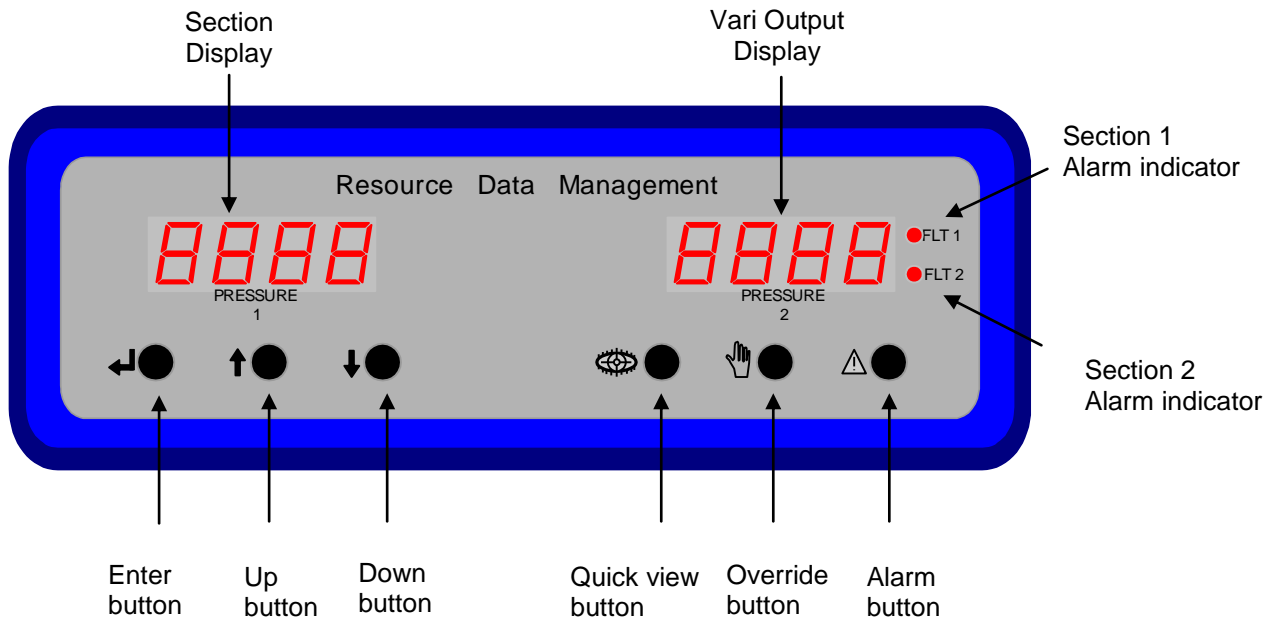
Connecting to any of these communication modules will automatically be detected on power up and this will affect the set up screens made available to you.



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Front Panel: -



Section Display

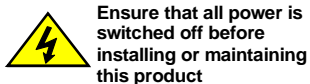
4 character display, shows the pressure (suction for pack, discharge for condensers)
 In set-up mode, displays the set-up menu items
 In quick view mode, indicates the target pressure
 In alarm view mode, indicates the alarm number
 In Override mode, indicates and allows the number of stages forced on

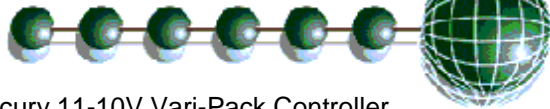
Vari Output Display

4 character display, shows the percentage of the analogue output.
 In set-up mode, display is blank
 In alarm view mode, indicates the alarm channel (e.g. S101 = section 1 input 1)
 In Override mode, display is blank

Front Panel Buttons

- Enter Button: -** Used 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)
In "alarm view" mode, used to view the alarm occurred
- Override Button: -** Used with the "Enter" button, to go into the override mode. (See [Override](#) section)
- Alarm Button: -** Used to enter the "alarm view" mode. (See [View Alarms](#) section)



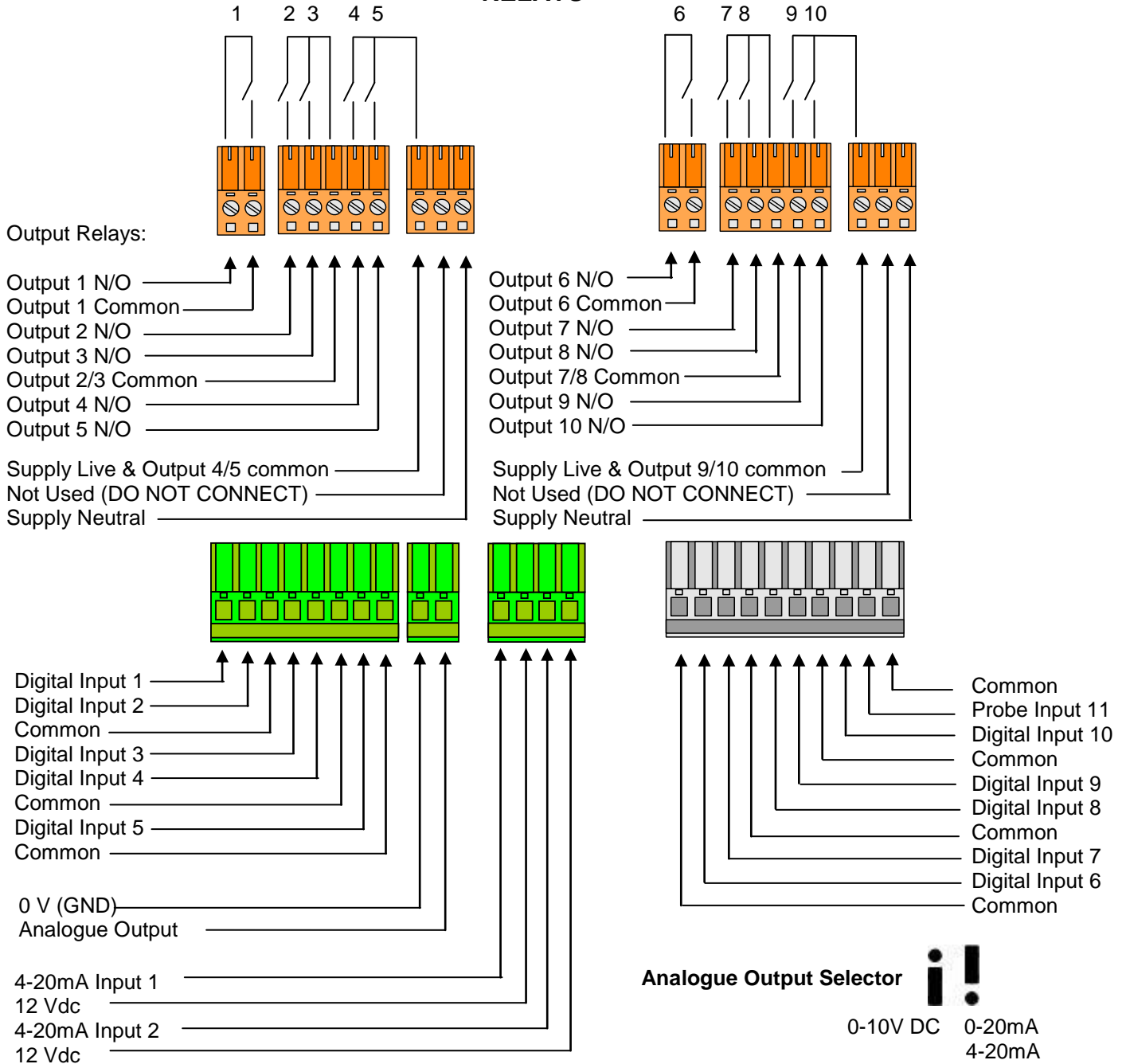


Mercury 11-10V Vari-Pack Controller

Connections (Mains Version: PR0278 & PR0280)

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

RELAYS

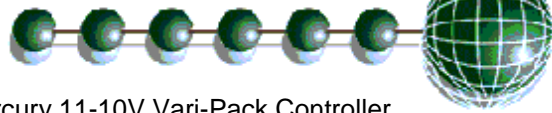


Probe input is PT1000 only. Note : Temperature Probe is on Probe I/P 11 only

Both Supplies must be connected. Do not connect an earth.



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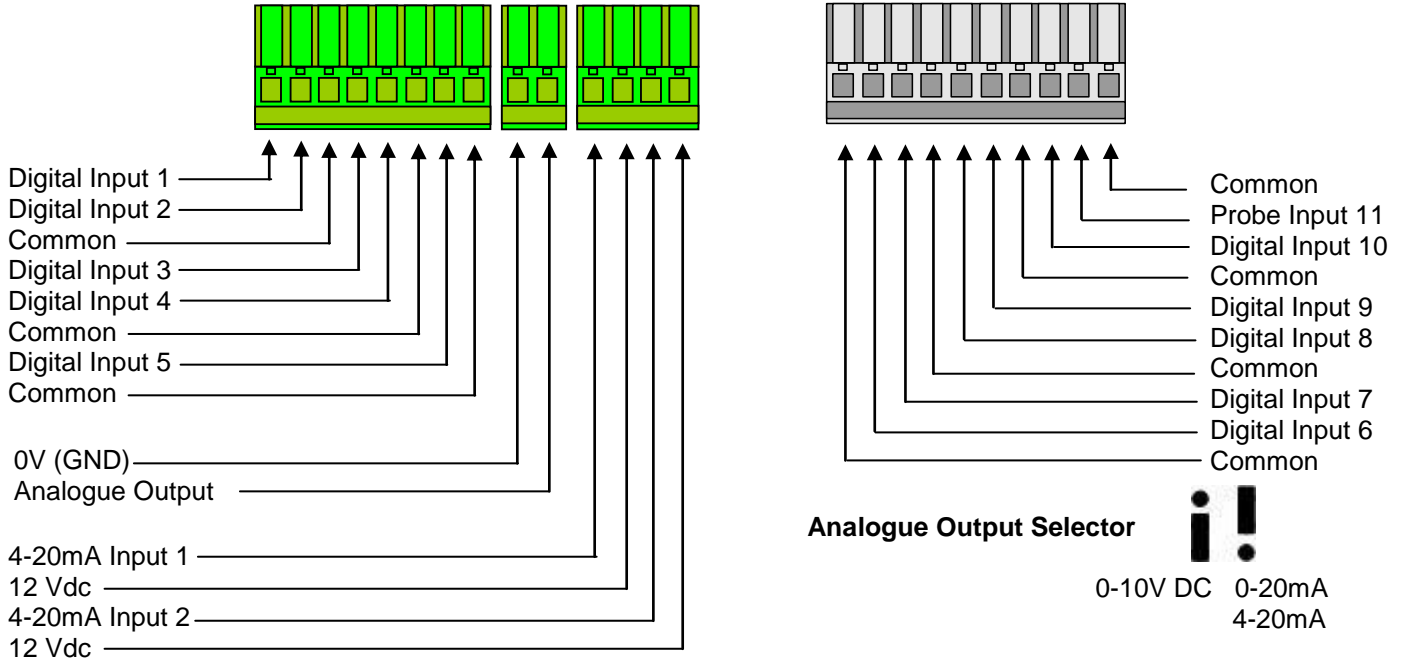
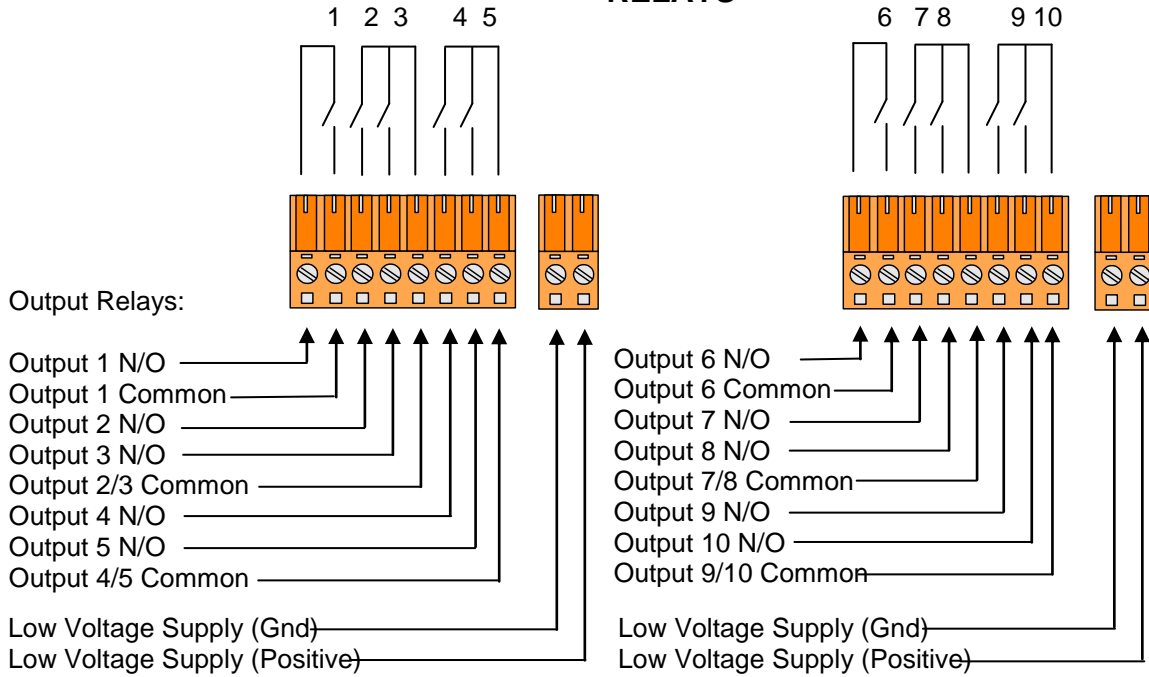


Mercury 11-10V Vari-Pack Controller

Connections (Low Voltage Version: PR0279 & PR0281)

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

RELAYS



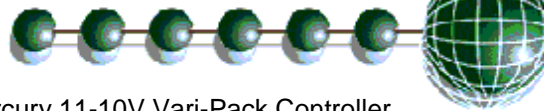
Probe input is PT1000 only. Note : Temperature Probe is on Probe I/P 11 only

Both Supplies must be connected.

Low Voltage Supply (Gnd) can be Earthed if required



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



Mercury 11-10V Vari-Pack Controller

Input/Output Allocation Tables

All Types	Description	Alarm Action	Comments
Digital Input 1	0V return	Yes	Variable Speed device
Digital Input 2	0V return	Yes	See note 1
Digital Input 3	0V return	Yes	
Digital Input 4	0V return	Yes	
Digital Input 5	0V return	Yes	
Digital Input 6	0V return	Yes	
Digital Input 7	0V return	Yes	
Digital Input 8	0V return	Yes	
Digital Input 9	0V return	Yes	
Digital Input 10	0V return	Yes	
Probe Input 11	PT1000 Temperature	No	Monitor probe only
Standby Input	Puts the controller into standby	Yes	590 Ohm resistor on Probe I/P See Standby Mode
4-20mA Input 1	Section 1 Pressure transducer	Yes	See note 3
4-20mA Input 2	Section 2 Pressure transducer	Yes	See note 3
Analogue output	Variable voltage/current output	N/A	See note 4
Relay 1	Variable O/P Device Enable	N/A	
Relay 2	N/O	N/A	See note 2
Relay 3	N/O	N/A	
Relay 4	N/O	N/A	
Relay 5	N/O	N/A	
Relay 6	N/O	N/A	
Relay 7	N/O	N/A	
Relay 8	N/O	N/A	
Relay 9	N/O	N/A	
Relay 10	N/O	N/A	

Note 1: Digital inputs are configured as either "stage" inputs or as "general" depending on the set-up
Digital inputs can be configured as "normally open" or "normally closed"

Note 2: All relay outputs are normally open. The functional allocation depends on the set-up parameters.

Note 3: Pressure transducers must be of the current loop 4-20mA type. Excitation voltage (12 Vdc) is provided for each transducer input.
The range of the transducer will vary according to the application, this can be set to match the transducer by changing the "[span and offset](#)" in the controller parameters.

Note 4: This output is selectable: either 0-10V DC or 0-20mA / 4-20mA

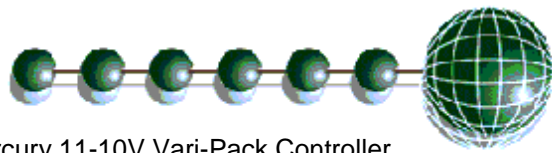
Analogue Output - Out

From the controller software menu select "Out".

If link is in 0-20mA/4-20mA position then the following applies: - 0 = 0-20mA 1 = 4-20mA
If link in 0-10 V position then Out must be set to 0: - 0 = 0-10V 1 = Should not be used



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



Mercury 11-10V Vari-Pack Controller

Setting up the controller

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

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

Set-up Mode

Set-up through front buttons

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

Set-up Menu for Single Pack controller (Type1)

LH Display	RH Display	Option	Menu Item seen in type:	Explained in Paragraph
IO		View Input/Output States	All types	View Input/Output States
PArA		Set/view Parameters	All types	Set/view parameters
Unit		Set/View units	All types	Set/View Units
TyPE		Set/View Controller Type	All types	Set/view product type
rLy		Set/View Relay Invert	All types	Set/View Relay Invert
Out		Set 0-20mA or 4-20mA	All types	Set Out
rtc		Set/view Clock (rtc = Real Time Clock)	All types	Real Time Clock
nEt		Set/view network configuration	All types	Network Configuration
SoFt		View software version	All types	
ESC		Exit set-up mode		

Recommended set-up method

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

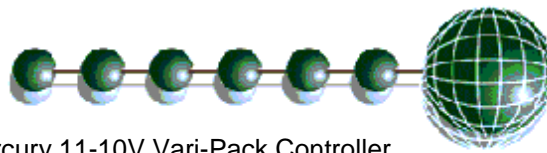
rtc. Real time clock (This will automatically synchronise on network systems)

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



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



Mercury 11-10V Vari-Pack Controller

Set/View Relay Invert

When enabled this feature will invert all relay operation on the controller e.g. if relay 1 is off and the relay invert feature is enabled it will invert the relay to on. This feature affects all relays on the controller.

- 0 = Normal Relay Operation (Default)
- 1 = Inverted Relay Operation

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.

PArA. Set/view parameters

(We recommend setting parameters from "Communicator" or the network front end such as "Data Director")

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.

See [Parameter Tables](#) for values

Set/View Units

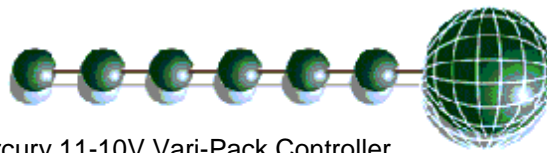
This option allows the user to set the pressure units to either PSI or BAR. The user can also select an option to display the monitoring probe temperature, if used, in °F.

- 0 = PSI °C (default)
- 1 = BAR °C
- 2 = PSI °F
- 3 = BAR °F

Once activated, the controller parameters and display units will be in the set units. Note. If using the controller on a Genus system, bar units will not display on the system front-end



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



Mercury 11-10V Vari-Pack Controller

Network Configuration

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

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

- 485 Legacy, or
- IP Futura

485 Legacy module

The legacy module provides for Genus compatibility

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

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

Value	Network Type
1	Genus compatible (all versions)
2	Not available

The 485A option shows a value representing the name of the controller in a Genus compatible network.

In a Genus compatible system, the value shown is of the form 05-6. This means the controller would try to log onto a Genus compatible network using the name 'RC05-6'.

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

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

Fast Network Address Reset

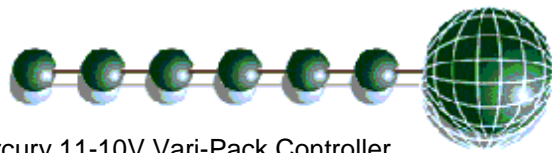
The CLrA option will clear out the network address and name in the controller. The 'ClrA' message will flash for confirmation. Press the Enter button to execute the command, Up or Down buttons to cancel.

To enter this mode, use the Up/Down button from the "nEt" menu screen until "clrA" is reached.

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



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



Mercury 11-10V Vari-Pack Controller

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

IP Futura module

In an IP system there are two options

- IP-L
- IP-r

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

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

IP-L

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

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

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

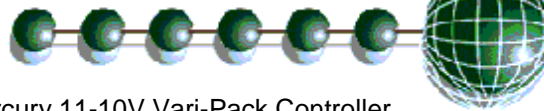
IP-r

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

- 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



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



Parameter Tables:

Parameter table for Pack Controller (Type 1)

Number	Parameter	Range	Step	Units	Default
P-01	Target Pressure	-50 - 560	1	PSI	30
P-02	Transducer Span*	-50 - 560	1	PSI	200
P-03	Transducer Offset*	-50 - 560	1	PSI	0
P-85	Response On	1 - 15	1		10
P-86	Response Off	1 - 15	1		10
P-04	Number of Starts/hr	0 - 60	1		6
P-05	Optimise Limit	-50 - 560	1		30
P-80	Startup Delay	0 - 5 mins	1	mins/sec	0
P-82	Run Smallest**	0 = off, 1 = on	1		0
P-98	Probe Offset	-50°C - 70°C	0.1	°C	0.0
P -31	Liquid Level	0 = off, 1 = on	1		0
P -32	High Liquid Level	0 - 100	1	%	80
P -33	Low Liquid Level	0 - 100	1	%	20
P-13	HP Alarm Pressure	-50 - 560	1	PSI	60
P-14	LP Alarm Pressure	-50 - 560	1	PSI	4
P-15	LP Shut-down Pressure	-50 - 560	1	PSI	2
P-16	Alarm Delay	0 - 99	1	mins	5
P-81	General Alarm Delay	0 - 60 mins	1	mins/sec	3 mins
P-22 ↓ P-30	Stage 2 Type *** ↓ Stage 10 type	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan			0
P-51 ↓ P-60	Stage 1 Size ↓ Stage 10 size				
P-41 ↓ P-50	Stage 1 Input Type † ↓ Stage 10 Input Type	(0) N/O (1) N/C (2) Unused,			2
dFLt	Restore Default Settings				
ESc					

* 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.

Eg Danfoss AKS 33 with range: -1 bar to 12 bar

Span would be 190 (13 bar)

Offset would be -15 (-1 bar)

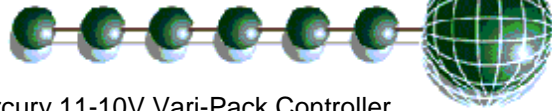
Run smallest=on: - When all compressors are off (because the target pressure has been satisfied) the controller, when the pressure rises, will always turn on the smallest compressor after the variable output has reached 100%. If the ASC timer is running for the smallest compressor, the controller will **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.

*** Stage 1 is the Variable output device enable relay. For correct operation, the variable device must be the smallest size. (Or equal size)



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



Mercury 11-10V Vari-Pack Controller

Parameter table for Condenser Controller (Type 2)

Number	Parameter	Range	Step	Units	Default
P-01	Target Pressure	-50 - 560	1	PSI	185
P-02	Transducer Span*	-50 - 560	1	PSI	500
P-03	Transducer Offset*	-50 - 560	1	PSI	0
P-85	Response On	1 - 15	1		10
P-86	Response Off	1 - 15	1		10
P-87	Control Type	Fixed = 0 Floating = 1	1		0
P-80	Startup Delay	0 - 5 mins	1	mins/sec	0
P-98	Probe Offset	-50°C - 70°C	0.1	°C	0.0
P-06	Night Set-Back Mode	0 = Off, 1 = On 2 = Local 3 = Remote †††	1		0
P-07	Night Set-Back Reduction	0 - 100	1	%	30
P-08	Night Set-Back On Time	00:00 – 23:29	1	Hrs:Mins	20:00
P-09	Night Set-Back Off Time	00:00 – 23:29	1	Hrs:Mins	08:00
P-10	Night Set-Back Pressure Limit ††	-50 - 560	1	PSI	250
P-11	Day Set-Back reduction	0 - 100	1	%	25
P-12	Day Set-Back Pressure Limit ††	-50 - 560	1	PSI	250
P-17	Output if transducer fails	0 - 100	1	%	45
P -31	Liquid Level	0 = off, 1 = on	1		0
P -32	High Liquid Level	0 - 100	1	%	80
P -33	Low Liquid Level	0 - 100	1	%	20
P-13	HP Alarm Pressure	-50 - 560	1	PSI	260
P-14	LP Alarm Pressure	-50 - 560	1	PSI	100
P-15	LP Shut-down Pressure	-50 - 560	1	PSI	90
P-16	Alarm Delay	0 - 99	1	Mins	5
P-81	General Alarm Delay	0 - 60 mins	1	mins/sec	3 mins
P-212	Stage 2 Type **	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan			0
P-30	Stage 10 Type				
P-41	Stage 1 Input Type †	(0) N/O (1) N/C (2) Unused,			2
P-50	Stage 10 Input Type				
P-90	Pressure at 0 °C	-50 - 560	1	PSI	86
P-91	Pressure at 10 °C	-50 - 560	1	PSI	102
P-92	Pressure at 20 °C	-50 - 560	1	PSI	139
P-93	Pressure at 30 °C	-50 - 560	1	PSI	186
P-94	Pressure at 40 °C	-50 - 560	1	PSI	244
P-95	Pressure at 50 °C	-50 - 560	1	PSI	313
P-97	Low Pressure Limit	-50 - 560	1	PSI	120
P-97	High Pressure Limit	-50 - 560	1	PSI	300
dFLt	Restore Default Settings				
ESc					



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



Mercury 11-10V Vari-Pack Controller

* 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.

Eg Danfoss AKS 33 with range: -1 bar to 12 bar

Span would be 190 (13 bar)

Offset would be -15 (-1 bar)

** Stage 1 is the Variable output device enable relay.

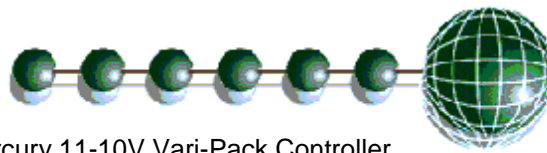
† Note: Section Stage fault delays are fixed at 15 seconds

†† This will give an alarm if reached

††† Use GP timer mode; Use "General" mode, Output Channel "12" to operate this function



Ensure that all power is
switched off before
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Mercury 11-10V Vari-Pack Controller

Configuration of inputs and outputs:

Stage Inputs:

Digital inputs can be configured as Normally Open, Normally closed or Unused. Each input, when assigned will attach to the corresponding section stage. If there are any output stages configured as "None" at the end of the relay assignment, the digital inputs for those stages will become a "General Alarm" input.

Section Stages:

Section stages can be set up as: - None, Unused, Compressor, Loader or Fan. These parameters determine which relay is assigned to the section outputs. Note: relay 1 is always the enable relay for the variable output, leaving a total of 9 relays that can be assigned in any combination.

Stage	Description	
None	Use this option to end the number of stages in the controller If the controller is a 2 section type (Type 2 or 3) this will indicate the end of the 1st section and start assigning subsequent relays to the 2nd stage	
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	
Fan	Use this option to assign a relay to a fan	

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.

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

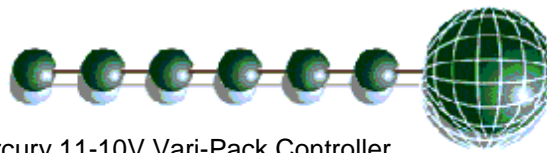
Once the controller has been set-up and configured, normal operation will resume. The controller operates a "fuzzy logic" based control algorithm. The controller will determine the stages to bring on and off using the fuzzy logic rules and adhering to the starts/hr criteria. Note that on and off delays will vary according the current conditions. The response time for devices switching on and off can be varied by adjusting parameters P85 and P86 (1 is the slowest response, 15 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.

Floating Head Pressure

When the condenser controller is used in the "Floating Head pressure" mode, parameters P90 to P97 must be used to profile a pressure curve from the temperature probe. The temperature probe would be situated such that it's reading ambient air temperature. This pressure conversion from the ambient temperature becomes the "Target Setpoint" and P01 is only used as a default for instance when the probe is disconnected or develops a fault. P96 and P97 allow for a lower and upper limit to be set for the pressure range. The temperature probe shares the input used for the standby switch. P98 can be used to calibrate this probe.



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Mercury 11-10V Vari-Pack Controller

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.

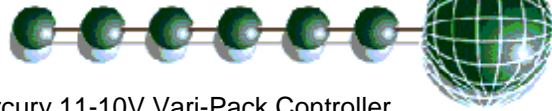
When configured as a condenser controller, loss of the pressure input will result in the variable output going the value defined in P17.

Liquid Level

Liquid level detector fitted to 4–20mA Input 2 (Input 1 being used for Suction or Discharge Pressure Transducer). Liquid level sensor must be of the current loop 4-20mA type. Excitation voltage (12 Vdc) is provided for sensor input. See parameters P-31 (Enable) P-32 (High Liquid Level Alarm Set Point) and P-33 (Low Liquid Level Alarm Set Point). There is a fixed 1 minute delay before alarming out.



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Mercury 11-10V Vari-Pack Controller

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.

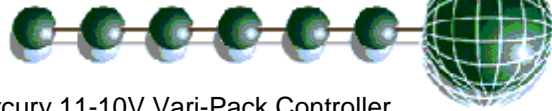
Input/Output Tables

Input/Output table for Pack Controller (Type 1)

Number	IO	Range	Units
I-01	Suction Pressure	-50 - 500	PSI
I-11	Digital Input 1	(0) Alarm (1) OK (2) Unused	
I-20	Digital Input 10		
I-31	Temperature Probe	-50 → +70	°C
I-40	Liquid Level	0 - 100	%
O-01	Relay 1	(0) Off (1) On	
O-10	Relay 10		
O-21	Optimisation Level	-50 - 500	PSI
O-31	Variable Output	0 - 100	%
S-01	Section 1 Control States	(0) Stabilize (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Fail Probe (7) Stand-by	



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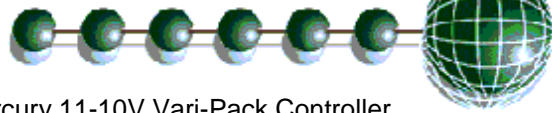


Input/Output table for Condenser Controller (Type 2)

Number	IO	Range	Units
1-01	Discharge Pressure	-50 - 560	PSI
I-11 ↓	Digital Input 1 ↓	(0) Alarm (1) OK (2) Unused	
I-20	Digital Input 10		
I-31	Temperature Probe	-50 → +70	°C
I-40	Liquid Level	0 - 100	%
O-01 ↓	Relay 1 ↓	0 1	Off On
O-10	Relay 10		
O-31	Variable Output	0 - 100	%
O-32	Night Set Back	0 = off, 1 = on	
O-33	Day Set Back	0 = off, 1 = on	
O-41	Floating pressure	-50 - 560	PSI
S-01	Section 1 Control States	(0) Stabilize (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Fail Probe (7) Stand-by	

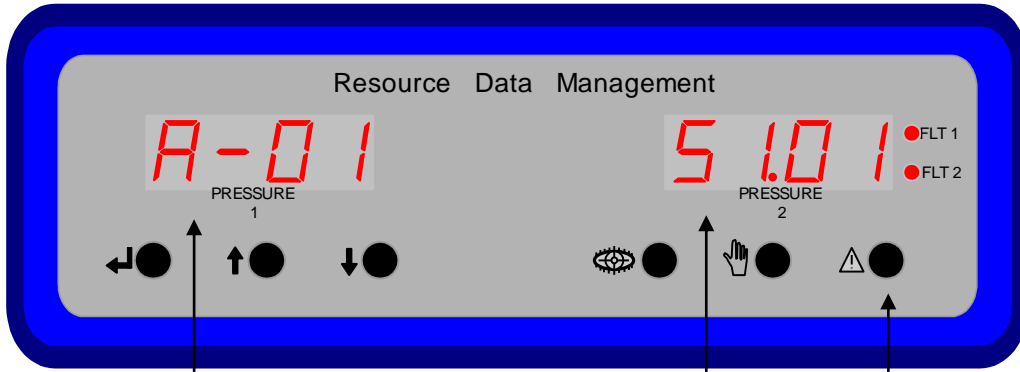


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Viewing Alarms

Press the "View Alarms" button to enter this mode, the two fault LED's will flash while in this mode.

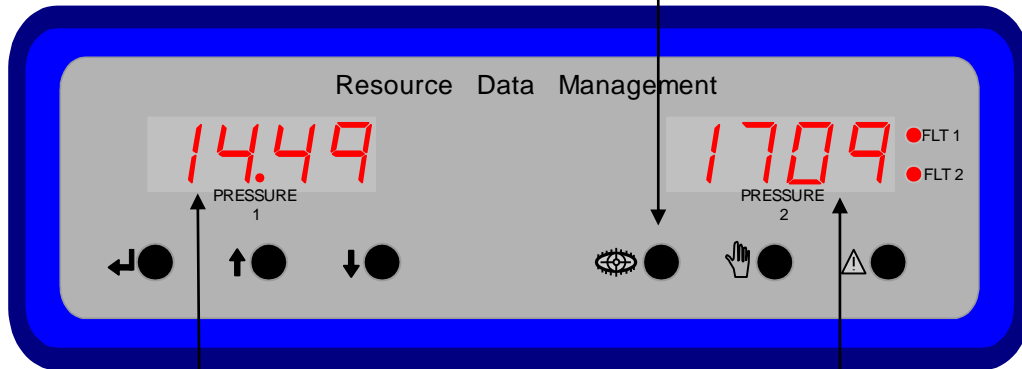


This display shows the alarm number:
E.g. Alarm 1

This display shows the alarm type:
E.g. section 1 stage 1

View Alarm button

Press the "down" button to scroll through the alarm log.
Press the "Quick View" button to see the occurred time



This display shows the alarm time:
E.g. 14:49

This display shows the alarm date:
E.g. 17:09(sept 17)

Press the "Quick View" button again to see the alarm "cleared" time & date.
20 alarms are held in the controller.

See [Alarm Display Messages](#) for alarm screens



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



Mercury 11-10V Vari-Pack Controller

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. 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. (Providing the output stages have been configured)

Press the override and enter button together for approx 3 secs.

Use the "up" button to turn the stage on, and the down button to turn the stage off.

Press "enter" to exit this mode or allow the time-out to elapse.

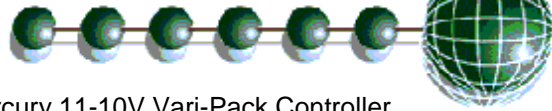
Standby Mode

The controller requires a 590 Ohm resistor present across input 11 and common (gnd) for normal operation. If the resistor is not detected; such as in a fault condition, the controller will go into standby mode. All compressors and/or fans will be turned off and an alarm (controller in standby) generated.

There is a 10 second delay for the detection of the resistor, both in and out.



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Mercury 11-10V Vari-Pack Controller

Display Messages

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

Display	System status
hiPr	High Pressure alarm
LoPr	Low Pressure alarm
Prob	Pressure Transducer alarm
Ft	Fault
LoSh	Low Pressure Shut-down

Alarm Display Messages

The following table indicates the messages that can be displayed in the "alarm view" mode.

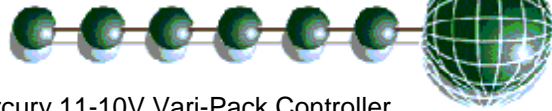
LH Display	RH Display	Message Description
A-nn	S1.xx	Section 1 Stage xx alarm
	S2.xx	Section 2 Stage xx alarm
	Ftxx	General Fault xx
	FnhP	Condenser High Pressure alarm
	FnLP	Condenser Low Pressure alarm
	FnSd	Condenser Low Pressure Shut-down alarm
	FnPr	Condenser Probe alarm
	P1hP	Pack 1 High Pressure alarm
	P1LP	Pack 1 Low Pressure alarm
	P1Sd	Pack 1 Low Pressure Shut-down alarm
	P1Pr	Pack 1 Probe alarm
	P2hP	Pack 2 High Pressure alarm
	P2LP	Pack 2 Low Pressure alarm
	P2Sd	Pack 2 Low Pressure Shut-down alarm
	P2Pr	Pack 2 Probe alarm
	Ctrl	Configuration fault
	Stby	Controller in standby
no	AL	No Alarm
AL	Act	Alarm still active

Where nn = 01 to 20 (20 alarms are stored in the controller)

Where xx = 01 to 10



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



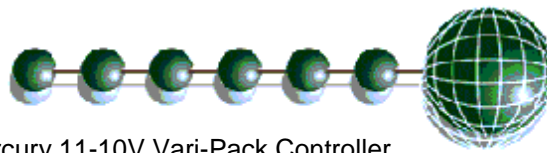
Network Alarms

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 #
Section 1 Pack High Pressure	8
Section 1 Pack High Pressure	9
Section 1 Pack Low Shutdown	10
Section 1 Pack Pressure Probe Fault	6
Section 1 Cond High Pressure	12
Section 1 Cond Low Pressure	11
Section 1 Cond Low Shutdown	11
Section 1 Cond Pressure Probe Fault	6
General Fault 1	20
General Fault 2	20
General Fault 3	20
General Fault 4	20
General Fault 5	20
General Fault 6	20
General Fault 7	20
General Fault 8	20
General Fault 9	20
General Fault 10	20
Section 1 Stage 1	3
Section 1 Stage 2	3
Section 1 Stage 3	3
Section 1 Stage 4	3
Section 1 Stage 5	3
Section 1 Stage 6	3
Section 1 Stage 7	3
Section 1 Stage 8	3
Section 1 Stage 9	3
Section 1 Stage 10	3
Configuration fault	20
Controller in standby	20



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Mercury 11-10V Vari-Pack Controller

Specification

Power requirements for PR0278 and PR0280:

Supply Voltage Range:	100 - 240 Vac \pm 10%
Supply Frequency:	50 - 60 Hz \pm 10%
Maximum supply current:	<1 Amp (with no relay loads) 12.5 Amps (with relays 4, 5, 9 and 10 fully loaded)
Typical supply current:	<1.0 Amp
Class 2 Insulation:	No protective Earth is required and none should be fitted.

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

Fuse:	10A, 240 Vac Antisurge (T) HRC conforming to IEC 60127
Or MCB:	10A, 240 Vac Type C conforming to BS EN 60898

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

Power requirements for PR0279 and PR0281:

Supply Voltage Range:	10 Vdc to 35 Vdc or 15 Vac to 30 Vac
AC Supply Frequency:	50 - 60 Hz \pm 10%
Maximum supply current:	1 Amp (Controller only)
Typical supply current:	<1.0 Amp (Controller only)
Class 2 Insulation:	The supply ground can be earthed if required.

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

Fuse:	3A, 240 Vac Antisurge (T) HRC conforming to IEC 60127
Or MCB:	3A, 240 Vac Type C conforming to BS EN 60898

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

General

Operating temperature range:	+5 ^o C to +50 ^o C
Operating Humidity:	80% maximum
Storage temperature range:	-20 ^o C to +65 ^o 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:	180mm (W) x 68mm (H) x 110mm (D)
Weight:	260 Grams
Safety:	EN61010
EMC:	EN61326; 1997 +Amdt. A1; 1998
Ventilation:	There is no requirement for forced cooling ventilation

Inputs:

Probe Input type	PT1000 for all versions
Digital Input type	0 volt return (internal pull-up resistor give hi state when there is no return)
Comms:	RS232 with flow control
4-20mA	4-20mA current loop, use the 12 Vdc output to feed the pressure transducer

Analogue Output

0 to 10 Volts DC or 4-20mA, (jumper on the back of the controller selects).



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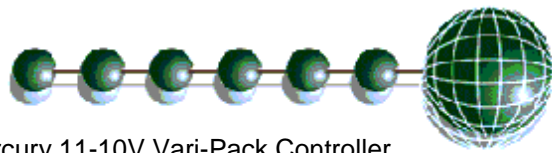
Mercury 11-10V Vari-Pack Controller

Relay Ratings for PR0278 and PR0280

Max current relay 1: Max Voltage relay 1:	6A (non inductive) 260Vac (external supply)	Exclusive common
Max current relay 2: Max Voltage relay 2: Shared common with relay 3	4A (non inductive) 260Vac (external supply)	Relays 2 and 3 share a common supply line and the loads can have a combined total of 8A.
Max current relay 3: Max Voltage relay 3: Shared common with relay 2	4A (non inductive) 260Vac (external supply)	Relay 2 or 3 can switch a maximum of 6A provided the other is at 2A or lower.
Max current relay 4: Max Voltage relay 4: Common connected to supply 1 "live"	3A (non inductive) 260Vac (Internal supply)	
Max current relay 5: Max Voltage relay 5: Common connected to supply 1 "live"	3A (non inductive) 260Vac (Internal supply)	
Max current relay 6: Max Voltage relay 6:	6A (non inductive) 260Vac (external supply)	Exclusive common
Max current relay 7: Max Voltage relay 7: Shared common with relay 8	4A (non inductive) 260Vac (external supply)	Relays 7 and 8 share a common supply line and the loads can have a combined total of 8A.
Max current relay 8: Max Voltage relay 8: Shared common with relay 2	4A (non inductive) 260Vac (external supply)	Relay 7 or 8 can switch a maximum of 6A provided the other is at 2A or lower.
Max current relay 9: Max Voltage relay 9: Common connected to supply 2 "live"	3A (non inductive) 260Vac (Internal supply)	
Max current relay 10: Max Voltage relay 10: Common connected to supply 2 "live"	3A (non inductive) 260Vac (Internal supply)	



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Mercury 11-10V Vari-Pack Controller

Relay Ratings for PR0279 and PR0281

Max current relay 1: Max Voltage relay 1:	6A (non inductive) 24Vac (external supply)	Exclusive common
Max current relay 2: Max Voltage relay 2: Shared common with relay 3	4A (non inductive) 24Vac (external supply)	Relays 2 and 3 share a common supply line and the loads can have a combined total of 8A.
Max current relay 3: Max Voltage relay 3: Shared common with relay 2	4A (non inductive) 24Vac (external supply)	Relay 2 or 3 can switch a maximum of 6A provided the other is at 2A or lower.
Max current relay 4: Max Voltage relay 4:	3A (non inductive) 24Vac (external supply)	Relays 4 and 5 share a common supply line and the loads can have a combined load of 6A
Max current relay 5: Max Voltage relay 5:	3A (non inductive) 24Vac (external supply)	
Max current relay 6: Max Voltage relay 6:	6A (non inductive) 24Vac (external supply)	Exclusive common
Max current relay 7: Max Voltage relay 7: Shared common with relay 8	4A (non inductive) 24Vac (external supply)	Relays 7 and 8 share a common supply line and the loads can have a combined total of 8A.
Max current relay 8: Max Voltage relay 8: Shared common with relay 7	4A (non inductive) 24Vac (external supply)	Relay 7 or 8 can switch a maximum of 6A provided the other is at 2A or lower.
Max current relay 9: Max Voltage relay 9:	3A (non inductive) 24Vac (external supply)	Relays 9 and 10 share a common supply line and the loads can have a combined total of 6A.
Max current relay 10: Max Voltage relay 10:	3A (non inductive) 24Vac (external supply)	

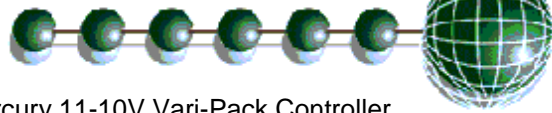
Important Safety Notice:

PR0278 and PR0280 must use a voltage level the same as the supply input voltage on all of the relays common.

PR0279 and PR0281 must use a voltage level no greater than 40 Vdc or 30 Vac on all of the relays common.



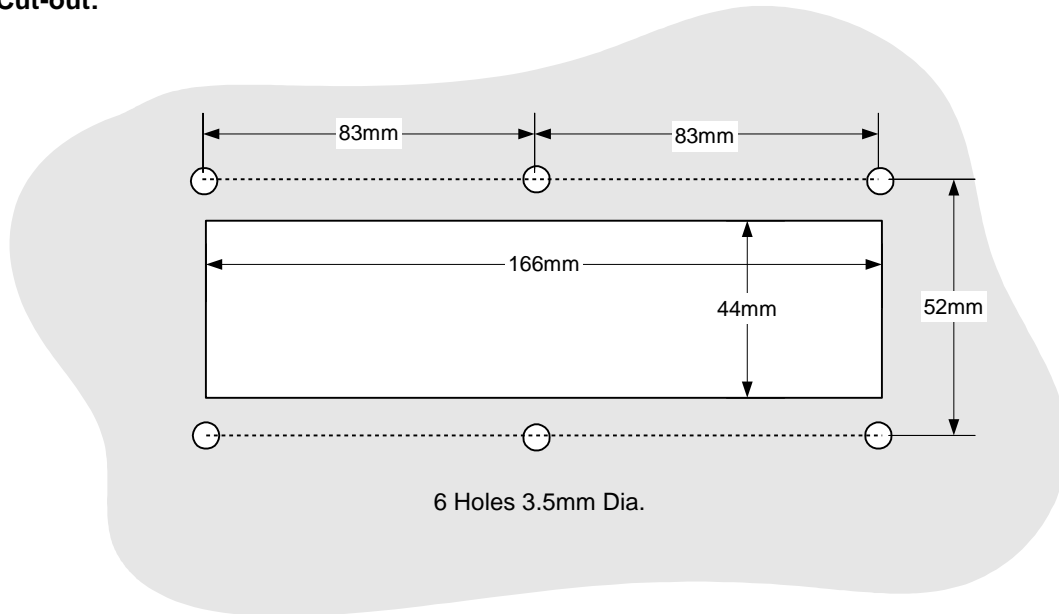
Ensure that all power is switched off before installing or maintaining this product



Mercury 11-10V Vari-Pack Controller

Installation:

Panel Cut-out:



Fixing:

6 X M3 screws from the rear fix the controller.

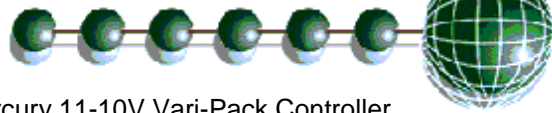
DIN rail: Use PR0039 to mount the controller to a DIN rail.

Clearances:

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



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



Mercury 11-10V Vari-Pack Controller

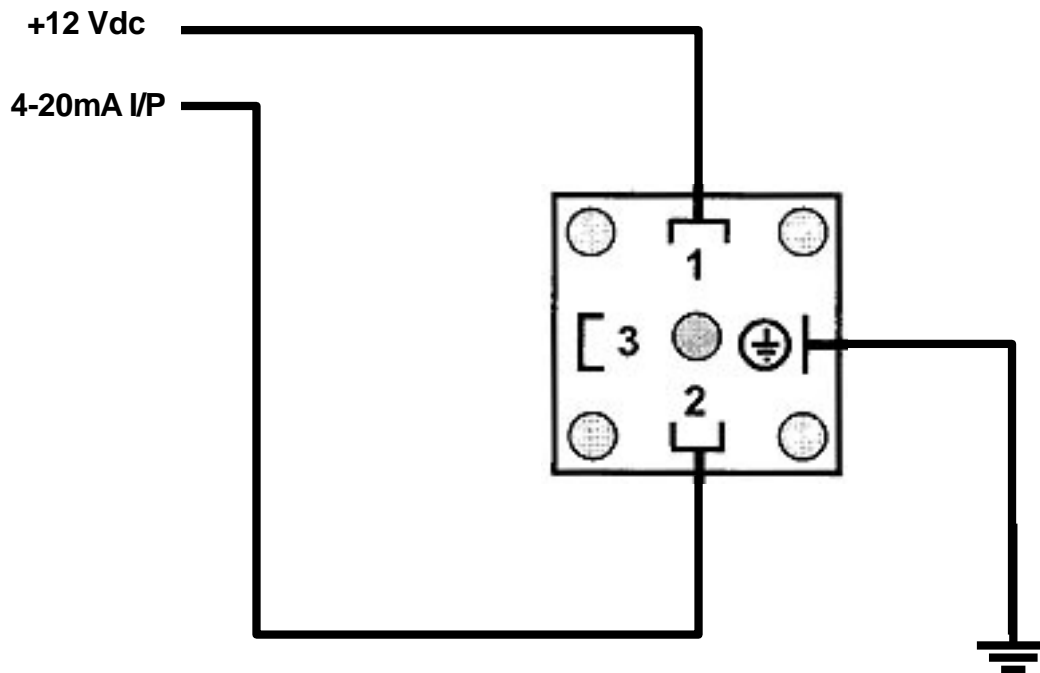
Cleaning:

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

Appendix 1

Typical Transducer Connection:

For 4-20mA type transducers the diagram below shows the connections to the Mercury 11-10P: -

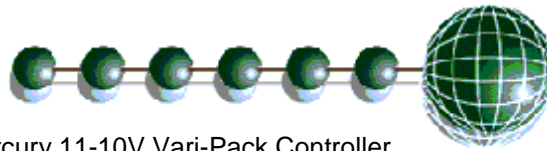


Note: The Earth connection is not necessary unless in a noisy environment.

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Mercury 11-10V Vari-Pack Controller

Revision History

Revision	Date	Changes
1.3	21/11/2005	Front sheet part numbers corrected
1.4	11/01/2006	Added condenser floating had pressure
1.5	21/02/2006	Added Night Set-Back feature
1.6	08/03/2006	Added analogue output selector, 0-10 or 4-20mA. Part Numbers changed
1.7	25/07/2006	Analogue selector jumper position corrected
1.8	24/08/2006	+5V DC output corrected to Analogue output, header changed to read Vari-pack
1.9	15/09/2006	Further clarification of standby resistor position
2.0	12/02/2007	Day set back feature added, also variable output set for transducer fail
2.1	15/08/2007	Option to display monitoring probe temperature in °F included. Ability to invert all relay operation on the controller introduced.
2.1A	0805/2009	Option to set mA output as either 0-20mA or 4-20mA. Software version brought into line with document revision number (2.1)
2.1B	29/05/2009	Liquid level detector added.
2.1C	01/06/2009	Updated feature descriptions



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