

***PM-ic the Intelligent answer***



## ***PM-ic Power Monitors***

***GAS SUPPLY CONTROL STATION  
with  
Fan Power Ventilation Inter-lock***

***For Models: PM-1P-10-3ic / PM-1P-10-4ic***

***INSTALLATION and COMMISSIONING  
INSTRUCTIONS***

## Product Overview

The **PM** Fan power monitor unit is based on a range of products and ancillary equipment designed to meet the ever changing requirements of the catering industry and associated regulations.

The system comes in a number of models for you to select which are based on our “patented” system.

### **PM-1P-10-3C/4C Power Monitor**

Three and four channel unit *with over & under current monitoring*

The controller has been designed to make for easy system commissioning.

## Contents

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- 4.0 Wiring and connection details
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### 1.01 Opening the unit

The **PM** unit is made up of four (4) main component parts, two (2) PCB circuit boards, one (1) base enclosure and one (1) fascia.

The enclosure and fascia are held together via four screws. The base enclosure houses the main PCB circuit boards and the fascia is attached to it via a multi-core cable loom.

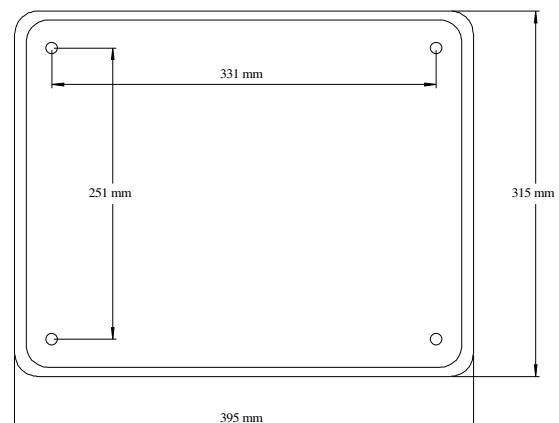
To open the enclosure, first remove the four screws and lift off the fascia.

Place the screws in a safe place until the base enclosure has been fixed, wired and is ready for reassembly and set-up.

### 1.02 Fixing details

The **PM** unit has four (4) mounting holes which can be used (*as shown*)

*Note: Ensure that the enclosure is mounted on a clean and level surface away from the direct cooking area or surfaces.*



## 1.03 Cable entry

The **PM** unit has space above, below and from behind the unit to allow for cable entry holes to be drilled. Care should be taken to prevent the PCBs from damage.

## 1.04 Electrical connections

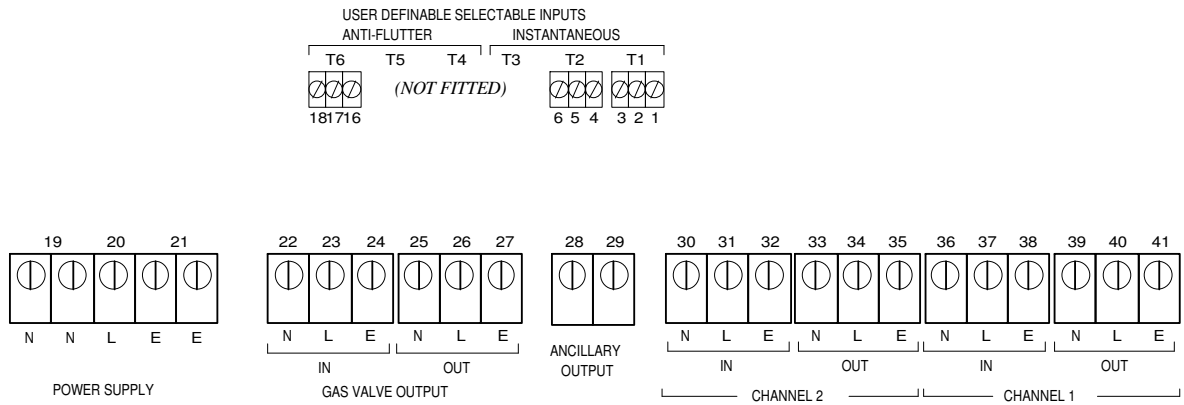
There are two sets of terminals mounted along the edges of each main PCB circuit board.

Terminals 1 to 18 are the smaller terminals (1.5 mm<sup>2</sup> cable) and are used for the interlocking devices such as “fire alarm” and “remote knock-off units”.

Terminals 19 to 41 are the larger terminals (4 mm<sup>2</sup> cable) and are for the power connections for the fans, gas valve and power supply to the unit.

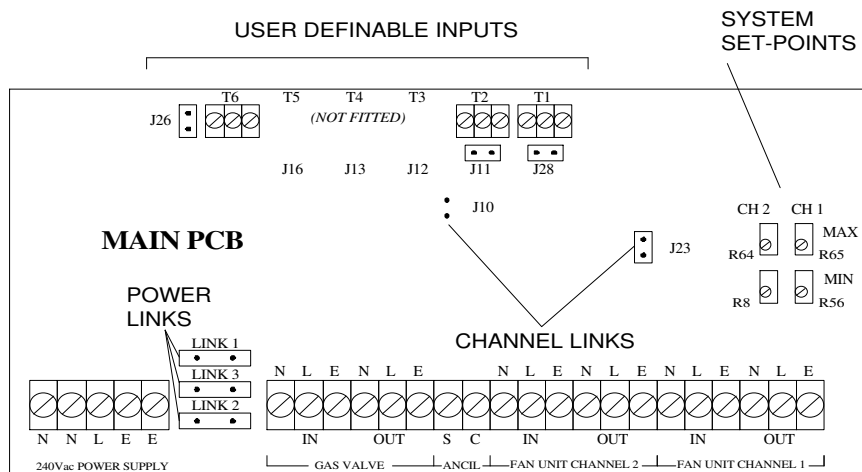
The terminals are of the rising clamp type with protection.

All cabling should be kept to the top or bottom of the unit within the designated area. No cables should be placed or laid across the PCBs as they may cause damage.



## 1.05 Component Locations

The **PM** unit has a number of components which need to be adjusted to set the system correctly. These are located on the right hand side of the main PCBs, under the top terminals and bottom left as detailed.



Follow these instructions to correctly set-up each of the PCBs for your unit.

## 2.0 Set-up and Commissioning

The set-up and commissioning of your **PM** unit is in two parts, **Initial** and **Functional**.

### 2.01 Initial Set-up

Once all of the wiring has been completed and tested and the system is ready to be set-up and commissioned, the following sequence **MUST** be followed to ensure the **PM** unit and system operate correctly.

- a) **Input Jumpers**, Ensure that the correct input jumpers have been removed as detailed in sections: 4.0 & 5.0. (located as detailed in 1.05)
- b) **Power Links**, Ensure that these links have been selected correctly for your installation as detailed in sections: 4.0 & 5.0. (located as detailed in 1.05)
- c) **Channel Link**: Ensure that links J23 and J10 are in the correct positions to select the required number of channels for your installation.
- d) Ensure that fire alarm and knock-off switches (if fitted) are all in the operational position.
- e) Ensure that you have set-up your fans, balanced the air system and you have set the min speed on the speed controllers (*if fitted*) to the minimum design air flow rate for the area.

### 2.02 Functional Set-up

Once the above has been carried out, the system is now ready to be powered up.

#### 2.02.1 Working on one channel at a time, (CH1 and then CH2, CH 3 and then CH 4)

Before you start, turn the MAX pot (R65 / R64) approximately 15 times CLOCKWISE.

To set the MINIMUM current:

1. Set the respective fan to its MIN speed and then set the MIN pot (R56 / R8) to its set point by adjusting the pot ANTI-CLOCKWISE until the green LED above the pot is on. (*If green LED is on to start with, adjust CLOCKWISE until it goes off and back ANTI-CLOCKWISE to bring it on again*).
2. Adjust the same fan slowly from its MIN speed to its MAX speed; if the green LED goes off at any point, adjust the MIN pot ANTI-CLOCKWISE until it comes back on.
3. When the fan is at its MAX speed, turn the MIN pot one further full turn ANTI-CLOCKWISE to allow for any fluctuations. This pot is now set, and does not need to be adjusted again.

To set the MAXIMUM current:

1. Set the MAX pot (R56 / R8) to its set point by adjusting the pot ANTI-CLOCKWISE until the green LED above the pot is off, and then turning the pot CLOCKWISE until the LED comes back on.
2. Adjust the same fan slowly from its MAX speed to its MIN speed; if the green LED goes off at any point, adjust the MAX pot CLOCKWISE until it comes back on.
3. When the fan is at its MIN speed, turn the MAX pot one further full turn CLOCKWISE to allow for any fluctuations. This channel is now set correctly, and you can proceed to the second channel (if required).

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**2.02.2** Repeat the above for CH2 (R8-min & R64 max), then CH3 and CH4 (if required).  
When all channels have been set, push the “system set/reset” button and release, the gas valve LED will go to GREEN and the gas valve output and ancillary output will be activated.

**2.02.3 With the system running and the gas valve output on, the following tests should be carried out.**

- 1) Press the Emergency Gas Shut Off on the front of the panel; the gas valve output will go off and the gas valve output LED will go out.
- 2) Twist Emergency Gas Shut Off to release it and press the green SYSTEM SET pad to restart.
- 3) Repeat this for any remote knock-off button fitted and the fire alarm.
- 4) Switch off each fan in turn and watch the gas valve output go off.
- 5) The set-up is now complete and the system is ready for normal operation.

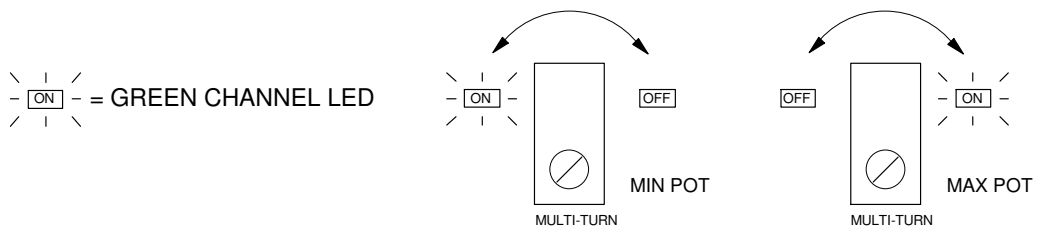
**2.02.4 PM-1P-10-3(ic) and PM-1P-10-4(ic) Unit (3 and 4 channel models)**

The PM-ic unit PCB circuit board is used within the 3 and 4 channel PM models and the sequence of set-up is the same for channels 3 and 4 respectively.

The circuit boards for the PM-1P-10-3(ic) and PM-1P-10-4(ic) are inter-linked so that all of the channels on the model selected must be operational before the gas valve output will switch on.

**2.02.5 Adjustment Potentiometers**

The two adjustment POTs per channel are multi-turn units (approx: 10 turns). These enable fine setting of the two switching points (min & max).



## **3.0 Fault finding**

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In the event that your PM unit has not operated, the following has been designed to help you identify your problem and offer a course of action for you to take.

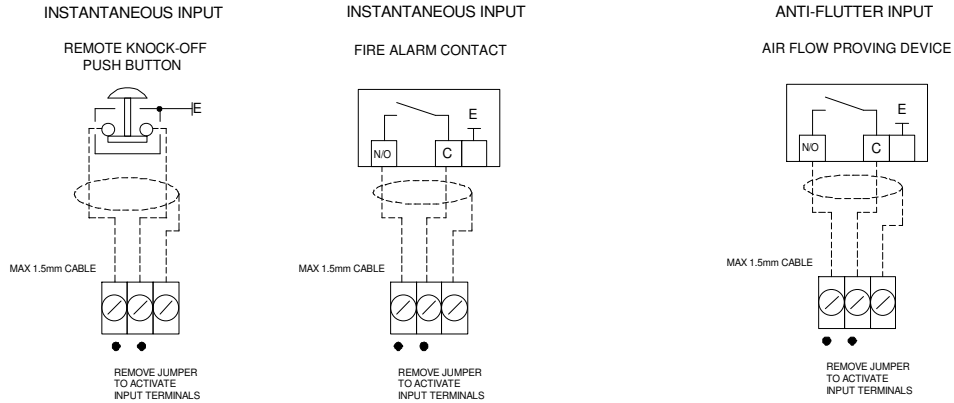
**Fault finding** Only to be carried out by a qualified engineer

<b>Fault</b>		<b>Possible cause</b>	<b>Action</b>
No Power On LED	a.	No power to the unit	Check power supply to unit, mains cables and terminals
	b.	Primary transformer fuse "blown"	Remove cover and check if "blown". If yes, check for any signs of a wiring fault and rectify before replacing with a new fuse.
	c.	None of the above	Call for further assistance
Gas valve output lamp is not lit and gas valve is closed	a.	Fans are not running	Check that the fans are running correctly
	b.	Fans are running but unit not set correctly	Check that the respective channel lamps are on. Action as detailed in set-up instructions
	c.	User definable input operated	Check if remote knock-off and fire alarm inputs and any other remote circuits have been activated
	d.	Emergency Gas Shut off push button on the front of the unit has been pressed	Twist and reset
Gas valve output lamp is on and gas valve is closed	a.	No power to gas valve	Check in / out terminals to see if 240Vac is present and check cables to gas valve.
	b.	Gas valve not operational	Check if 240Vac is present at gas valve terminals. If yes replace gas valve.
Gas valve open but no gas at appliance	a.	Gas supply has been isolated or is blocked	Check gas supply
	b.	No gas pressure	Check gas supply
Channel lamp not on	a.	Fans are not running	Check that the fans are running correctly
	b.	Fans are running but unit not set correctly	Check that the respective channel lamps are on. Action as detailed in set-up instructions

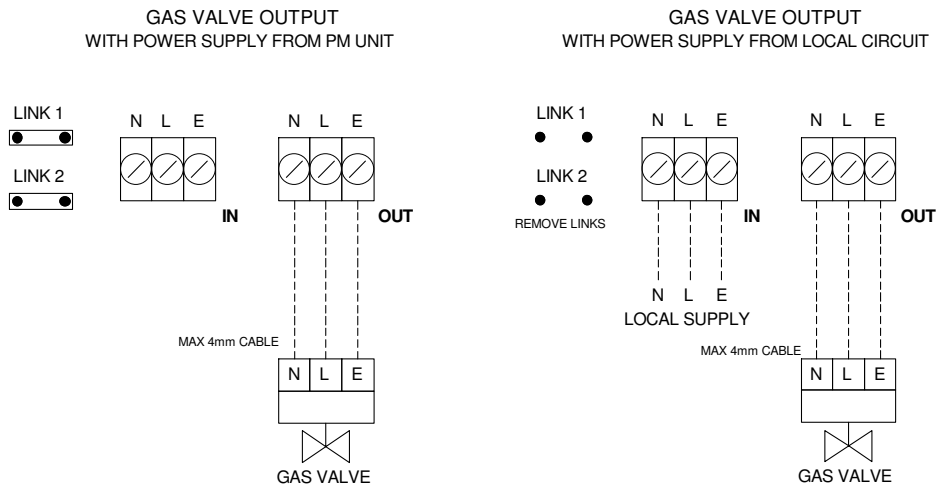
## 4.0 Wiring and connection details

The following information should be read in conjunction with the respective PM wiring diagram for your model.

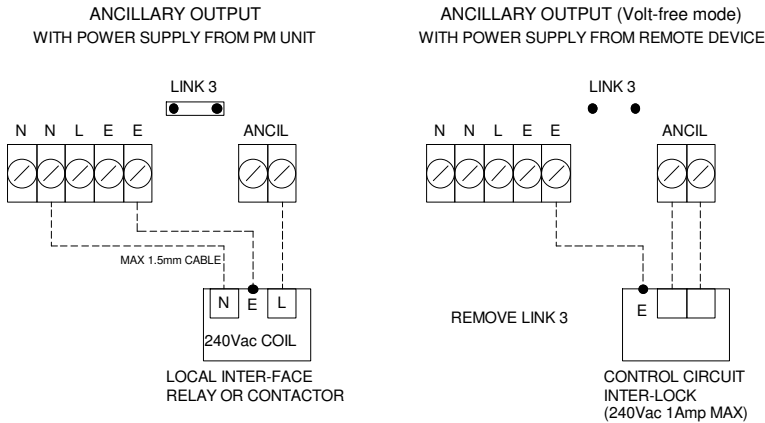
### User definable inputs



### Gas Valve Output



### Ancillary Output (Electric Fryer etc)



## 5.0 Technical Specification

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The following information should be read in conjunction with the wiring diagram for the model being fitted and commissioned. It is correct at the time of going to print, but we reserve the right to change at any time the materials and information hereto detailed.

## Inputs:

- Fan Power 240Vac 50Hz (0 – 10 Amps max each channel) *Optional 20Amp*
- Optional fire alarm
- Optional air flow differential pressure switch or proving product
- Optional remote emergency stop

## Outputs:

- Fan Power 240Vac 50Hz (0 – 10 Amps max each channel) *Optional 20Amp*
- Gas Valve output selectable 240Vac or volt-free contact (6 Amp 240Vac 50Hz)
- Ancillary output selectable 240Vac or volt-free contact (4 Amp 240Vac 50Hz)

## PCB adjustments and jumper links (Main PCB – issue 9):

MIN	Current level switch point	0 to 10 Amps (each channel)
MAX	Current level switch point	0 to 10 Amps (each channel) 30 sec delay *
J28	Remote emergency stop	Yes/No
J11	Fire alarm	Yes/No
J26	Air flow DPS ( <i>if required</i> )	Yes/No (Anti-flutter)
J10/23	Channel select	Yes/No
LED	Green indicator	Current switch point (each channel)
LED	Red indicator	Gas valve output activated

## Front of unit indication and switches:

### LEDs

Power on			
Gas Valve Output	<i>Off</i>	=	<i>Closed</i>
	<i>Green</i>	=	<i>Open</i>
Fan 1-4	<i>Off</i>	=	<i>Fault</i>
	<i>Green</i>	=	<i>Running</i>

### Switch

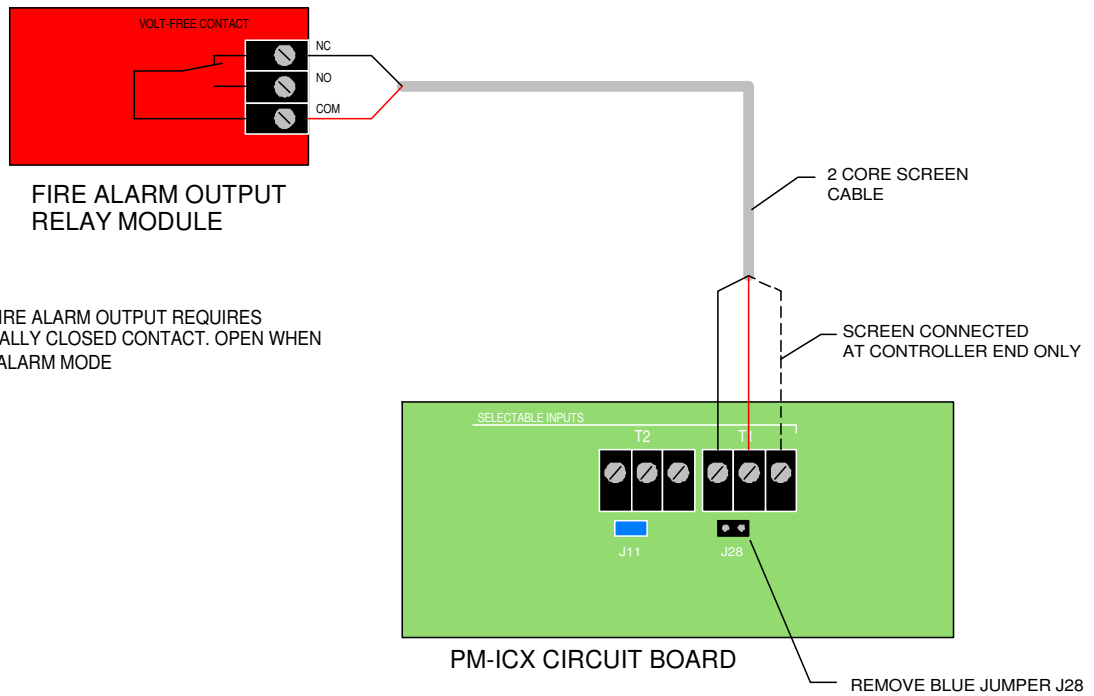
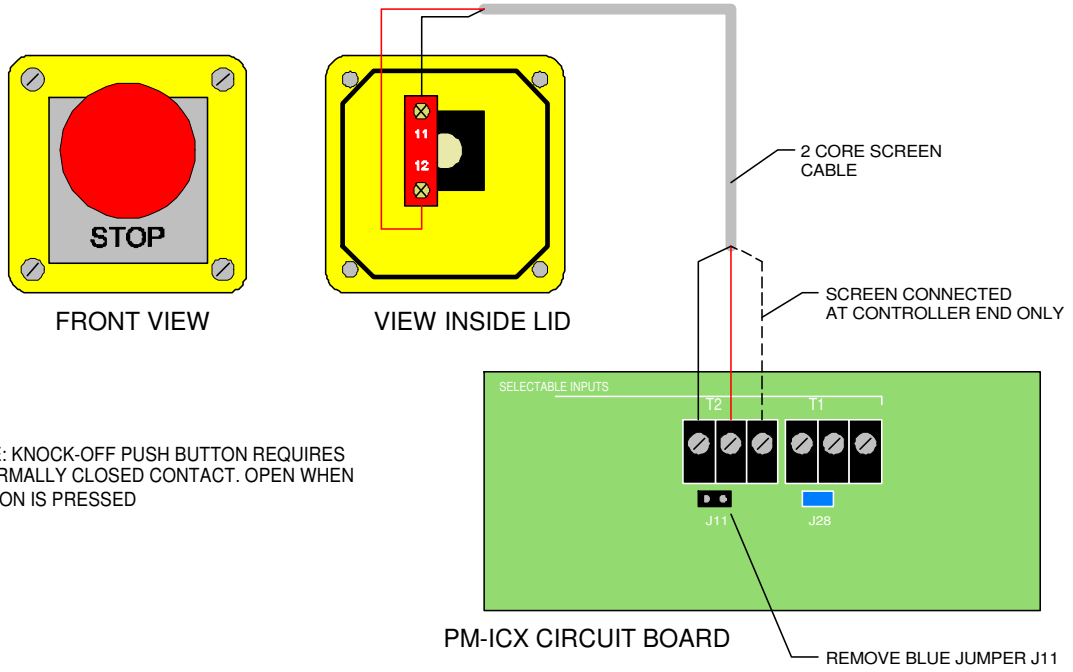
System Set	<i>Keyswitch</i>	=	<i>Start system when fans are running</i>
Emergency Gas Shutoff	<i>Pushbutton</i>	=	<i>Shuts gas off immediately</i>

Power supply:	240Vac 50Hz
Transformer:	F3 1Amp Primary Transformer Fuse
Consumption:	Approx 5VA
Housing:	IP 54
Dimensions:	395 x 315 x 130mm (approx)
Ambient range:	-10 to +40 Deg.C
Country of Origin:	UK

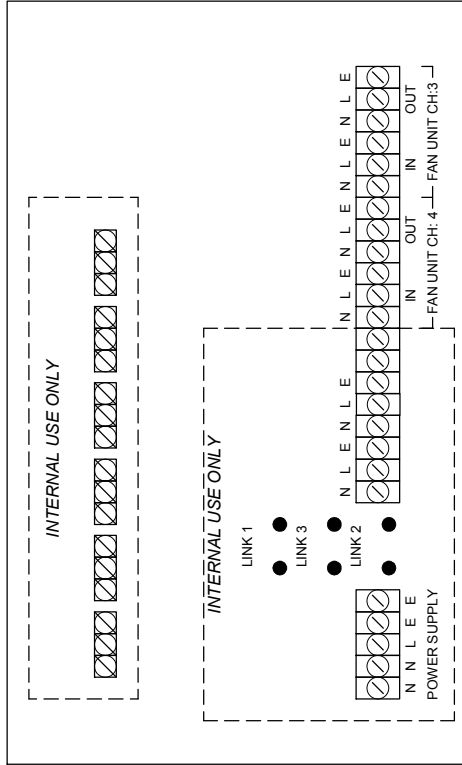
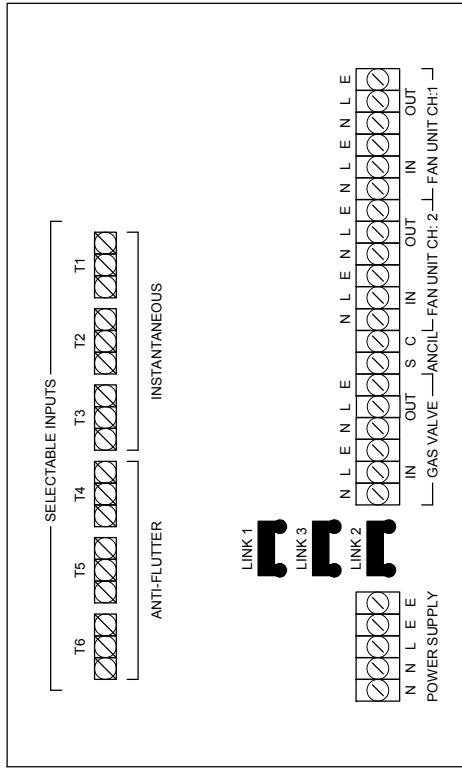
Note: The MAX current level settings have a 30 sec over current delay before switching off the gas valve and ancillary outputs.



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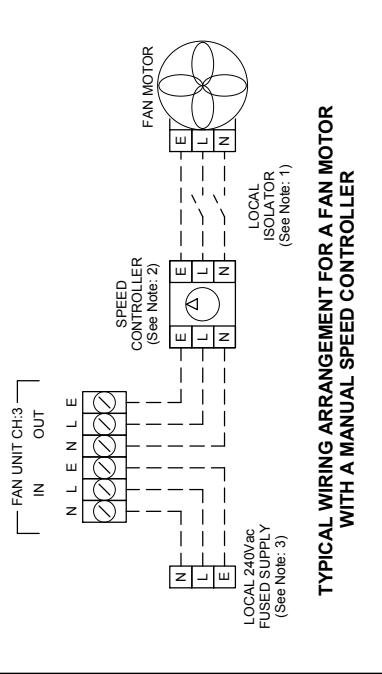
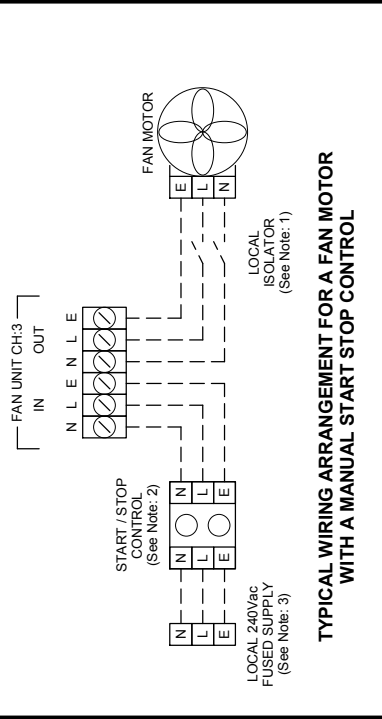
<p>0 1 2 3 4 5 6 7 8 9</p>	<p><b>PM UNIT POWER SUPPLY</b></p> <p>LOCAL 240Vac SWITCHED FUSED POWER SUPPLY (See Note: 4)</p> <p>POWER SUPPLY</p> <p>GAS VALVE IN/OUT</p> <p>LINK 1, LINK 3, LINK 2</p>	<p><b>GAS VALVE OUTPUT WITH POWER SUPPLY FROM PM UNIT</b></p> <p>LOCAL 240Vac FUSED SUPPLY (See Note: 1)</p> <p>LOCAL ISOLATOR (See Note: 1)</p> <p>GAS VALVE IN/OUT</p> <p>LINK 1, LINK 3, LINK 2</p>	<p><b>CIRCUIT BOARD LAYOUT</b></p> <p>SELECTABLE INPUTS</p> <p>ANTI-FLUTTER</p> <p>INSTANTANEOUS</p> <p>FAN UNIT CH:1 IN/OUT</p> <p>LINK 1, LINK 3, LINK 2</p>	<p><b>PM-icx FAN POWER MONITOR WIRING &amp; CONNECTION DIAGRAM</b></p> <p>DATE: 15/12/14</p> <p>DRAWN BY: JH-P</p> <p>DRAWING No: PM-WD-01</p>
<p><b>TYPICAL WIRING ARRANGEMENT FOR A FAN MOTOR WITH A MANUAL START STOP CONTROL</b></p>	<p><b>TYPICAL WIRING ARRANGEMENT FOR A FAN MOTOR WITH A MANUAL SPEED CONTROLLER</b></p>	<p><b>NOTES:</b></p> <ol style="list-style-type: none"> <li>1) LOCAL ISOLATION MUST BE PROVIDED IN ACCORDANCE WITH THE CURRENT EDITION OF THE IEE REGULATIONS.</li> <li>2) CHECK MANUFACTURER'S WIRING DETAILS FOR CORRECT CONNECTIONS AND SET-UP REQUIREMENTS.</li> <li>3) ENSURE THAT THE POWER SUPPLY IS CORRECTLY FUSED TO THE SIZE OF THE FAN MOTOR AND THAT OVERLOAD PROTECTION IS FITTED TO THE CURRENT REGULATIONS.</li> <li>4) ENSURE THAT THE SWITCHED POWER IS CORRECTLY FUSED TO THE LOADING OF THE POWER MONITOR AND / OR GAS VALVE.</li> <li>5) ENSURE SCREENED CABLE IS USED FOR TERMINALS T1, T2 &amp; T6. BELDEN 8723 OR EQUIVALENT IS RECOMMENDED.</li> </ol> <p><b>IF IN DOUBT, ASK</b></p>	<p><b>REPEAT POWER WIRING FOR CHANNEL 2 AS PER CHANNEL 1</b></p> <p><b>SELECTABLE INPUTS</b></p> <p>INSTANTANEOUS INPUT: FIRE ALARM CONTACT</p> <p>ANTI-FLUTTER INPUT: AIR FLOW PROVING DEVICE</p> <p>MAX 1.5mm CABLE</p> <p>REMOVE JUMPER TO ACTIVATE INPUT TERMINALS</p>	
<p><b>LOCAL 240Vac FUSED SUPPLY (See Note: 3)</b></p> <p><b>START / STOP CONTROL (See Note: 2)</b></p> <p><b>FAN UNIT CH:1 IN/OUT</b></p> <p><b>LOCAL ISOLATOR (See Note: 1)</b></p> <p><b>FAN MOTOR</b></p>		<p><b>LOCAL 240Vac FUSED SUPPLY (See Note: 3)</b></p> <p><b>SPEED CONTROLLER (See Note: 2)</b></p> <p><b>FAN UNIT CH:1 IN/OUT</b></p> <p><b>LOCAL ISOLATOR (See Note: 1)</b></p> <p><b>FAN MOTOR</b></p>		<p><b>LOCAL 240Vac FUSED SUPPLY (See Note: 4)</b></p> <p><b>GAS VALVE OUTPUT WITH POWER SUPPLY FROM LOCAL SUPPLY (With LINKS 1 &amp; 2 removed)</b></p> <p>LINK 1, LINK 3, LINK 2</p> <p>LOCAL ISOLATOR (See Note: 1)</p> <p>GAS VALVE</p>



See wiring diagram PM-WD-05 for Ch:1 & Ch:2 details

Ch:3 & Ch:4 CIRCUIT BOARD LAYOUT

REPEAT POWER WIRING FOR CHANNEL 4 AS PER CHANNEL 3



NOTES:

- 1) LOCAL ISOLATION MUST BE PROVIDED IN ACCORDANCE WITH THE CURRENT EDITION OF THE IEE REGULATIONS.
- 2) CHECK MANUFACTURER'S WIRING DETAILS FOR CORRECT CONNECTIONS AND SET-UP REQUIREMENTS.
- 3) ENSURE THAT THE POWER SUPPLY IS CORRECTLY FUSED TO THE SIZE OF THE FAN MOTOR AND THAT OVERLOAD PROTECTION IS FITTED TO THE CURRENT REGULATIONS.
- 4) ENSURE THAT THE SWITCHED POWER IS CORRECTLY FUSED TO THE LOADING OF THE POWER MONITOR AND / OR GAS VALVE.
- 5) ENSURE SCREENED CABLE IS USED FOR TERMINALS T1, T2 & T6. BELDEN 8723 OR EQUIVALENT IS RECOMMENDED.

**IF IN DOUBT, ASK**

<p><b>TRENT PRODUCTS</b> Tel: 01782 - 844688 Fax: 01782 - 844772</p>	<p><b>DATE:</b></p> <p>08/12/14</p>	<p><b>DRAWING No:</b></p> <p>PM-ic-WD06</p>	<p><b>DRAWN BY</b></p> <p>JH-P</p>
	<p>PM-ic FAN POWER MONITOR WIRING &amp; CONNECTION DIAGRAM</p>		

FOR FURTHER TECHNICAL ASSISTANCE, PLEASE CONTACT US BY

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e-mail: [info@trentproducts.com](mailto:info@trentproducts.com)

Web site: [www.trentproducts.com](http://www.trentproducts.com)

- Note:
- i) Ensure that the electrical installation has been installed in accordance with the current edition of the IEE regulations.
  - ii) Ensure that the gas installation has been installed in accordance with the current gas regulations and Gas Safe guide-lines.
  - iii) Ensure that the ventilation and extract system has been set to the correct air flow design levels in accordance with the current regulations.
  - iv) If in doubt, ask! (contact us on or by any of the above).
  - v) Ensure that the client has been shown how to operate the system and that they have been handed the users guide.



This symbol on this product or the package indicates that disposal of this product after its lifecycle could harm the environment  
DO NOT dispose of this product (or batteries if used) as unsorted municipal waste.  
It should be disposed by a specialised company for recycling.  
This product should be returned to your distributor or to a local recycling service.  
Respect the local environment rules.

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