

Resource
Data Management

Indoor air Quality Monitor

Commissioning/User Guide
Revision V1.3c



PR0238-XXX

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The Indoor Air Quality Monitor (Wall Mount)

From Resource Data Management

Description

The Indoor Air Quality Monitor (IAQM) series are designed to gather data for the assessment of air quality in an indoor space. It does this by measuring temperature, relative humidity, air pressure and CO₂ level then transmitting this across a network for analysis and data retention purposes. The unit contains three temperature sensors and two humidity sensors for increased accuracy and multiple redundancy.

A duct mounted version is also available, part number PR0237.

The IP variant of the IAQM can be used as a standalone unit which can be connected to a front end, such as a DMTouch, via an ethernet connection using the XML protocol and allows data logging of all measured values in the front end. The values shown when logged onto a DMTouch are listed here: [IO: Input/Output Menu](#)

The CAN bus variant allows the unit to be connected to an RDM CAN bus network enabling all the inputs, outputs and parameters to be utilized by a CAN bus equipped device such as an Intuitive TDB Controller or DMTouch running a TDB application.

The IAQM has a single relay available providing a set of low voltage, normally closed dry contacts which can be utilized using a TDB program.

The Wall Mount IAQM can be mounted to a standard Pattress box using RDM's existing multi-territory mounting bracket (supplied), allowing for sampling of the ambient air in a room. The Wall Mount IAQM has the option of having an inbuilt LCD for displaying data locally as well as sharing this information over a network connection.

Front Display and Keypad (optional)



Under normal operation the display will show current relative humidity and will alternate between current temperature and current CO₂ PPM every 3 seconds.

When standalone mode is switched off then all the values and icons shown on the display are controlled by a TDB program running on the DMTouch or Intuitive TDB controller that the display is connected to via a CAN bus connection. The display characters available are shown on the right.



Build Options and Ordering Information

Part Number	Description
PR0238-C-D-NFCO	Indoor air quality wall mount monitor with CAN bus interface and display.
PR0238-C-ND-NFCO	Indoor air quality wall mount monitor with CAN bus interface and no display.
PR0238-E-D-NFCO	Indoor air quality wall mount monitor with Ethernet interface and display.
PR0238-E-ND-NFCO	Indoor air quality wall mount monitor with Ethernet interface and no display.

Supported Products

The IAQM can currently be used by the following RDM product ranges:

Part Number	Description
PR05XX-XX	DMTouch
PR06XX-TDB	Intuitive V2 and Mini Intuitive TDB Controller
PR0617-XXX	TouchXL TDB Controller
PR0680-CD-NF MDM	miniDM

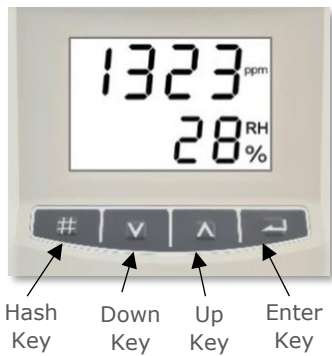


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Menu Access Using Keypad



Hold the Enter and Down keys together for 3 seconds, the display will show "Ent"

Press the enter key once, display will show "IO" this is the Input/Output menu.

Pressing the Up key will scroll through the following menus:

PArA > Unit > PrES > IP or CA n > SoFt > OFSt > ESC > IO

Press the enter key to select the desired menu which are detailed below.

PArA: Parameter Menu

Pressing the Enter key will select the first parameter P-01, pressing the Enter key again will show the current value of P-01, pressing the Up and Down keys allow the value to be changed. Pressing the Enter key returns to the parameter number, pressing the Up and Down keys scrolls through the parameters, P-02, P-03 and so on. After 30 seconds of inactivity the display will revert back to showing current values and any changed settings will be saved. Selecting the ESC menu and pressing the Enter key will also save the settings.

The above process is repeated for parameters P-01 to P-04

Display	Parameter	Description	Step	Units	Range	Default
P-01	Auto Co2 Calibration	Provides an automatic calibration of the CO2 sensor every 7 days when enabled.	1	-	On/Off	Off
P-02	Standalone	If the Air Quality Monitor is being used by a TDB program (CAN bus variant only) then this parameter should be set to Off. Otherwise set to On	1	-	On/Off	Off
P-03	Auto Button	Used in the CAN bus variant to decide how buttons press information is sent. If set to auto then data be sent periodically. If set to Off then the data will be polled by the TDB program.	1	-	On/Off	On
P-04	Sensor Period	Used in the CAN bus variant to specify how often data is transmitted on the CAN bus network.	1	Seconds	0 - 3600	5
dFLT	Default	Pressing the Enter key sets all parameters back to default. Use with Caution.				

NOTE: All parameters, with the exception of P-02 Standalone mode, should not need to be changed under normal circumstances and should be left at default values.

Unit: Temperature Units Menu (Default 0)

Set to value 0 for degrees centigrade or value 1 for degrees Fahrenheit.

PrES: Pressure Units Menu (Default 0)

Set to value 0 for millibar (mbar) or value 1 for Inch of Mercury (inHg).
(The inHg unit cannot currently be displayed on a Data Manager front end.)



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IP: IP Network Menus (IP variants only)

Parameter	Description	Range	Default
AtYP	Selects network type IP-r or IP-l. If set to IP-r then an IP address is automatically issued by the front end's DHCP server, such as a DMTouch. If set to IP-l a fixed static IP address can be entered.	IP-r or IP-l	IP-r
Id	When network type parameter AtYP is set to IP-r a 3-digit identification number can be set using parameters Id-1, Id-2 and Id-3, this is the equivalent of the rotary switch settings on an IP interface. When connected to a DMTouch the IAQM will be logged on with a device name corresponding to this number. For example, Id-1 set to 1, Id-2 set to 2 and Id-3 set to 3 then the device will log onto the DMTouch with device name 123.	000 to 999	000
IP-r/l	When parameter AtYP is set to IP-r the IP address, netmask length and default gateway address can be viewed using parameters IP-1, IP-2, IP-3, IP-4, nL, gt-1, gt-2, gt-3 and gt-4. When parameter AtYP is set to IP-l the IP address, netmask length and default gateway address can be viewed and set using parameters IP-1, IP-2, IP-3, IP-4, nL, gt-1, gt-2, gt-3 and gt-4. For example, if IP-1=10, IP-2=1, IP-3=2, IP-4=80 and nL=24 then the IP address is 10.1.2.80 and netmask length is 24.	0.0.0.0 to 255.255.255.255	0.0.0.0

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

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

CAN: CAN bus Device Number Menu (CAN bus variants only)

Parameter	Description	Range	Default
nId	Selects the CAN bus network ID of the device.	00 to 09	00

SoFt: Software Menu

Displays the current software version of the IAQM, 1.3 for example.

OFSt: Offset Menu

Allows calibration of the temperature and humidity sensors built into the IAQM, using parameters C-01 to C-05 each channel can have an offset of +/-10 applied.

Parameter	Description	Step	Units	Range	Default
Probe 1 Offset	Allows calibration of temperature sensor 1	0.1	°C	-10 - +10	-3.0
Probe 2 Offset	Allows calibration of temperature sensor 2	0.1	°C	-10 - +10	-6.0
Probe 3 Offset	Allows calibration of temperature sensor 3	0.1	°C	-10 - +10	-3.0
Probe 4 Offset	Allows calibration of humidity sensor 1	0.1	%	-10 - +10	5.0
Probe 5 Offset	Allows calibration of humidity sensor 2	0.1	%	-10 - +10	4.0



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IO: Input/Output Menu

The current values of individual sensor readings and relay output can be viewed.

Parameter	Description	Step	Units	Range
I-01	Display Temperature (average)	0.1	°C	-49 - +128
I-02	Display Humidity (average)	0.1	%	0 - 100
I-03	Atmospheric Pressure	0.1	Mbar/inHg	0 - 2000
I-04	CO2 Level	0.1	ppm	0 - 9000
I-05	Climate Index	1	-	1 - 6
I-06	CO2 Index	1	-	1 - 6
I-07	Temperature Sensor 1	0.1	°C	-49 - +128
I-08	Temperature Sensor 2	0.1	°C	-49 - +128
I-09	Temperature Sensor 3	0.1	°C	-49 - +128
I-10	Humidity Sensor 1	0.1	%	0 - 100
I-11	Humidity Sensor 2	0.1	%	0 - 100
O-01	Relay	On/Off	-	0 = Off, 1 = On
S-01	Control State	1	-	1 = Normal

Climate Index and CO2 Index

The climate index is calculated using the temperature and humidity values and gives an index of the comfort level in the area being monitored with 1 being the best score and 6 the worst. A temperature of around 21°C and humidity of 50% will give the best score, as temperature rises or humidity drops the score will increase.

The CO2 index will increase with a higher CO2 level.

CO2 Sensor Calibration (IP Variant)

The unit is supplied calibrated to a known CO2 level and will not need calibration when installing.

If required at a future date the CO2 sensor can be calibrated with fresh air (outside air) which normally has a CO2 level of around 400ppm. Manual calibration can only be carried out using the IP interface.

In the configuration menu select "Configure" followed by "CO2 Setup". The parameter field shows "CO2 Current Value", this can be set to a known calibration level or a typical fresh air level (400ppm for example), the IAQM will now be calibrated to this level.

In the parameter menu there is a setting "Auto CO2 Calibration", if this is set to On then the IAQM will calibrate automatically to the parameter "CO2 Current Value" every 7 days starting from when the unit was first powered on.

For this feature to work correctly the IAQM must be in a fresh air environment at the same time every 7 days. If the Auto Calibration occurs when the unit is measuring a CO2 level different than the value set in the CO2 Current Value Field then the calibration will not be correct, for this reason the Auto Calibration setting should be left at the default Off setting.



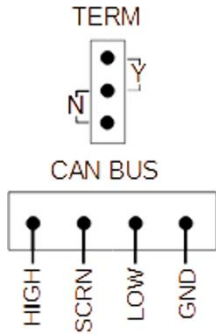
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Optional Network Interfaces

CAN bus



CAN bus communication cable must be of a standard to meet ISO11898 or equivalent and the screen cable must be connected.

Firstly, wire the CAN bus network from a compatible TDB controller or DM Touch to each IAQM unit. The Controller and IAQM unit have a termination resistor built in which is selected by a jumper, the termination jumper should be in the "Y" position on the Intuitive controller and the last IAQM device on the CAN bus network (The DM Touch does not require a termination resistor). The network should be wired in a daisy chain configuration. Only one Intuitive Plant controller / DM Touch should be connected to a single CAN bus network. The maximum allowable network cable length is 500M in total from one end of the network to the other providing a CAN bus network cable which meets ISO11898 or equivalent is used.

Each CAN bus IAQM has a unique network identifier which is set using the display buttons under the Can menu. In the associated TDB Controller or RDM front end program the expansion "Air Quality Wall" should be selected with the expansion board number matching the ID rotary switch number. All inputs and outputs, such as temperature, input and relay output, are then available to be used in the TDB program.

Incorporating the IAQM into a TDB Strategy (CAN bus type only)

In the TDB program, under the IO menu, select "Air Quality Wall" display block and add to the workspace as shown below.

Display 1 Input	Enter Key Output	All the IO that are available such as the humidity value measured by the display, button press inputs and display value outputs values and symbols are shown.
Display 2 Input	Hash Key Output	
Cool LED	Up Key Output	For more details on how to use these please consult the relevant TDB user guide.
Fans LED	Down Key Output	
Valve LED	Temperature	
Units PPM LED	Humidity	
Heat LED	Pressure	
Network LED	CO2	
Service LED		
Alarm LED		
Units C LED		
Units F LED		
Units rH LED		
Units % LED		
Backlight		
Mode 1		
Mode 2		

Name	Air Quality Wall Display
Board	CAN 0
Temp. Alias	Temperature
Humidity. Alias	Humidity
Pressure Alias	Pressure
Co2 Alias	Co2

Right clicking and selecting "Properties" allows the CAN bus ID to be entered, this should match the rotary switch set in the IAQM.

For example, if the CAN bus address is set to 1 then the Board setting should be set to CAN 1.



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Ethernet.

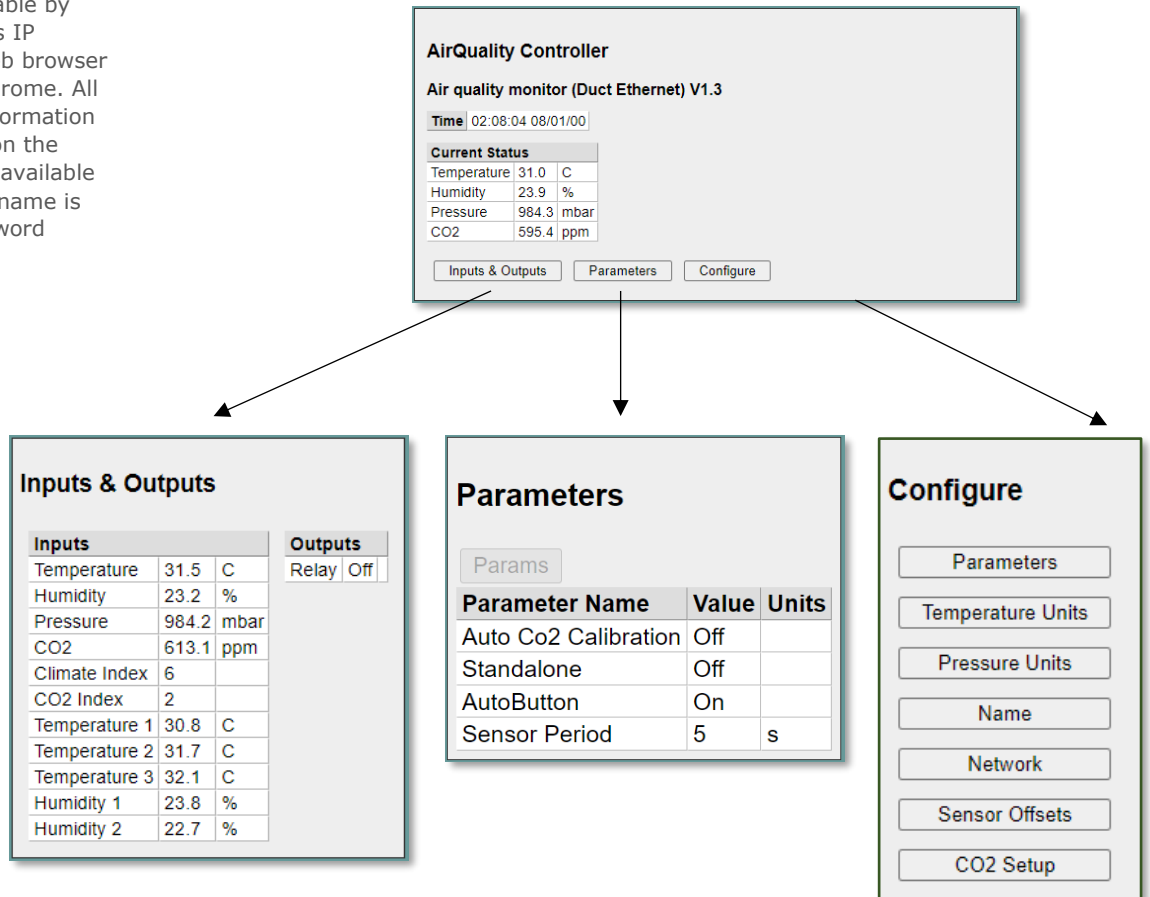
The IAQM has an embedded Ethernet port to allow for connection to an Intuitive Plant TDB controller, DM touch or Mini DM system using standard IP.

Use a standard Ethernet patch lead to connect to other equipment, such as an Intuitive Switch or 3rd party Ethernet Network Switch, into any of the 10/100 Base-T ports (not the RS232 ports on the Intuitive Switch).

Homepage

With the IP variant a direct connection is available by surfing to the unit's IP address using a web browser such as Edge or Chrome. All parameters and information that are available on the built in display are available here. Default user name is "service" and password "1234"

Direct PC Connection (IP Type only)



Parameters, see: [PARA: Parameter Menu](#)

Temperature Units, see: [Unit: Temperature Units Menu](#)

Pressure Units, see: [PrES: Pressure Units Menu](#)

Name: Allows the unit to be given a unique name to differentiate it from other devices on the network.

Network: If the rotary address switches are set to 000 then a static IP address, Netmask Length and Gateway Address can be set. If rotary switches are set to non-zero values, then these values can be viewed only.

Sensor Offsets, see: [OFSt: Offset Menu](#)

CO2 Setup: Allows a calibration value to be set.



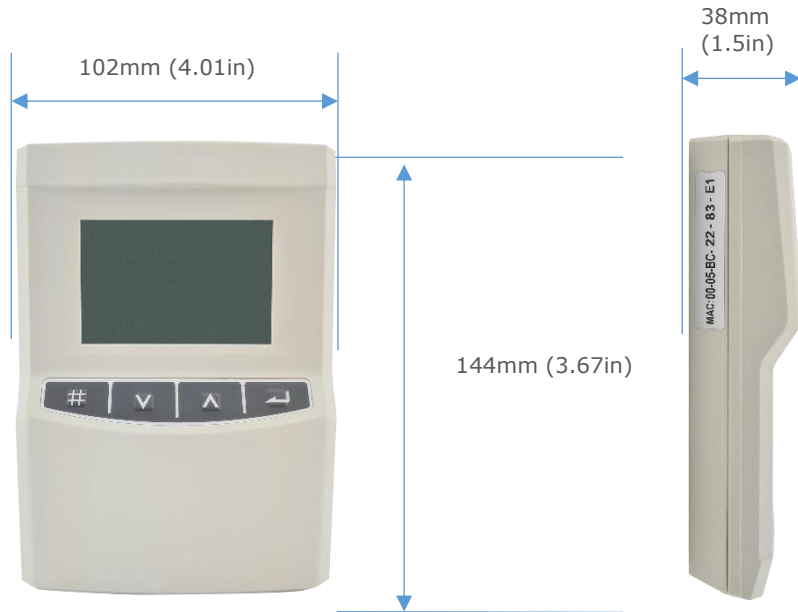
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[PArA: Parameter Menu](#)

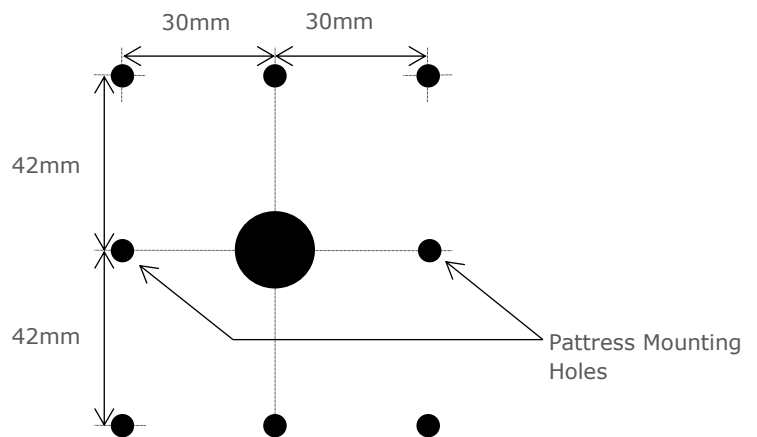
Dimensions



Mounting Details

The IAQM is supplied with a mounting bracket. The bracket is removed from the unit by removing the two screws on the back and sliding the bracket downwards and then away from the unit. The mounting plate can then be fitted to the desired surface using the mounting holes shown below.

Recommended mounting fixtures:- self-tapping screw M3 (1/8") x L25 (1") mm pan head full thread, plastic anchor 6mm (0.24") x L30mm (1.18").



The IAQM should not be installed near sources of disturbance of the air being measured, for example heaters, ventilation fans and humidifiers. The unit should also not be installed in an area of direct sunlight.

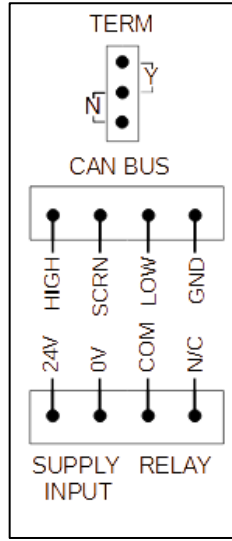


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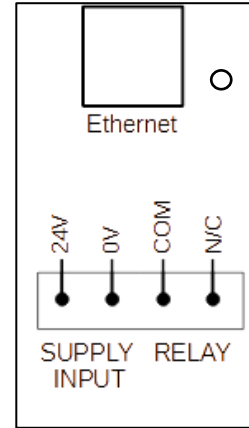
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Connection Details



CAN bus Variant

Network Activity LED (Green), ON indicates there is an Ethernet link. Flashing indicates activity on the Ethernet network connection.



Ethernet Variant

Status LEDs

There are three LEDs visible on the side of the product that provide a simple interface on display and non-display models:



Green – Status: Flashing indicates the unit is operational.

Red – Reset: Continuous or frequent resetting indicates hardware fault.

Orange – Can bus Network: Flashing indicates activity on the network connection.



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Specification

Wall Mount Indoor Air Quality Monitor PR0238-XXX	
Power Requirements	
Supply Voltage Range	24VDC $\pm 10\%$ or 24VAC $\pm 10\%$
Supply Frequency	DC or 50-60Hz $\pm 10\%$
Typical Supply Current	0.28A (24VDC) 0.6A (24VAC)
General	
Operating Temperature Range	0°C to +50°C (32°F to +122°F).
Operating Humidity	80% maximum
Storage Temperature Range	0°C to +65°C (32°F to +149°F).
Environmental	Indoor use at altitudes up to 2000m (6561ft.), Pollution Degree II, Installation Category I.
Size	144mm (3.67in) x 102mm (4.01in) x 38mm (1.5in).
Screen Size	70mm (2.75in) diagonal, 59mm (2.32in) width x 39mm (1.53in) height.
Weight	0.2kg (0.44 lb)
Safety	This product operates at voltages lower than the limits defined in the Low Voltage Directive, and therefore does not require CE marking with respect to the Low Voltage Directive
EMC	EN 61326-1:2013 FCC CFR 47 Parts 15.107 & 15.109 ICES-003 Issue 7
IP Rating*	IPX0 - *Main Enclosure and Terminals IP65 Rated.
Ventilation	There is no requirement for forced cooling ventilation
Class 3 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:	
External Supply Fuse	2A 240 Vac Anti-surge (T) HRC conforming to IEC 60127
Or External Supply MCB	2A, 240 VAC Type D conforming to BS EN 60898
Sensor Inputs	
Temperature	Resolution 0.1 °C, Accuracy ± 0.5 °C [0 to 50 °C]
Relative Humidity	Resolution 0.1 %RH, Accuracy ± 2 %RH [20 to 80 %RH] ± 5 %RH [0 to 100 %RH]
CO2	Resolution 0.1 ppm, Accuracy ± 30 ppm + 3% of Measured Value [400 to 10000 ppm]
Atmospheric Pressure	Resolution 0.1 mbar, Accuracy ± 1 mbar [300 to 1200 mbar]
Mechanical Relay	
Maximum Contact Current	0.5A (cos $\theta = 1$)
Maximum Contact Voltage	24VAC 30VDC



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Revision History

Revision	Date	Changes
1.3	22/05/2023	First Issue.
1.3a	17/07/2023	Pressure resolution and accuracy added.
1.3b	24/02/2024	CAN bus address now selected using display buttons not rotary switches.
1.3c	29/01/2024	Default probe offsets updated.



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