

USER MANUAL



PROSENSE DPM3-E SERIES

DIGITAL PANEL METER FOR TRUE RMS AC OR DC VOLTAGE AND AMPERAGE ELECTRICAL INPUT SIGNALS

Models:

DPM3-E-H

DPM3-E-L

DPM3-E-A2R-H

DPM3-E-A2R-L

In this Chapter...

General Information	4
Package Contents.....	4
Recycling Instructions.....	4
General Safety Considerations.....	4
Symbols Identification.....	4
Maintenance.....	5
Technical Support.....	5
Agency Approvals.....	5
Device Description	6
Dimensions and Mounting	7
Installation.....	7
Wiring Terminals	8
Wiring Examples	10
DC/AC Voltage Input Wiring (Ranges: 2, 20, 200, 600 V).....	10
DC/AC Current Input Wiring (Ranges: 1A, 5A).....	10
DC/AC Current Input Wiring (Range: 200mA).....	10
DC/AC Current Input Wiring (Ranges: 50/60/100mV shunt).....	11
Display and Key Pad	11
Configuration:	12
Programming numerical values.....	12
Input Configuration	13
Display Configuration	14
Scaling.....	14
Programming of the scale.....	15
SCAL method.....	15
tEACH method.....	15
Weighted Average Filter P.....	15
Round.....	16
Brightness.....	16
Eco.....	16
Additional Functions	16
MAX/MIN function.....	16

Configuration Lockout.....17
Programming Mode.....17
Return to Factory Configuration.....17
Direct Access to Relay Setpoints.....17
Logic functions.....17
Logic functions menu.....18
Table of programmable functions.....19
Configuration Lock Out.....20
 Lock-out menu diagram.....21
 Lock-out menu diagram continued.....22
Output Options.....23
 Relay Configuration.....23
 Description of Operation.....23
 Relay Configuration menu diagram.....24
 Direct access to the relay setpoints value programming.....24
 Analog output.....25
 Analog output menu diagram.....25
Technical Specifications.....26

General Information

Package Contents

- DPM3-E Series True RMS Electrical Parameter digital panel meter
- Quick start guide
- Mounting panel accessories (a sealing gasket and 2 fixing clips)
- Wiring accessories (plug-in terminal block connectors and 2 key tools for wire insertion)
- 4 adhesive engineering unit label sheets

Recycling Instructions



This electronic instrument is covered by the 2002/96/CE European Directive so, it is properly marked with the crossed-out wheeled bin symbol that makes reference to the selective collection for electrical and electronic equipment which indicates that at the end of its lifetime, the final user cannot dispose of it as unsorted municipal waste.

In order to protect the environment and in agreement with the European legislation regarding waste of electrical and electronic equipment from products put on the market after August 13, 2005, the user can give it back, without any cost, to the place where it was acquired to proceed to its controlled treatment and recycling.

General Safety Considerations

All instructions and guidelines for the installation and manipulation that are present in this manual must be considered to ensure personal safety and to prevent damage to either the instrument or any equipment connected to it.

Safety of any equipment incorporated to this instrument is the responsibility of the system installer.

If this electronic indicator is used in a manner not specified by the manufacturer in this manual, the protection provided by the instrument may be impaired.

Symbols Identification



Warning: Potential risk of danger.

Read complete instructions when this symbol appears in order to know the potential risk and know how to avoid it.



Warning: Risk of electric shock.



Instrument protected by double isolation or reinforced isolation.

Maintenance

To ensure instrument accuracy, it is recommended to check its performance according to the technical specifications listed in this manual.

For front cover cleaning, just wipe with a damp cloth and neutral soap product. **DO NOT USE SOLVENTS!**

Technical Support

We strive to make our manuals the best in the industry. We rely on your feedback to let us know if we are reaching our goal. If you cannot find the solution to your particular application, or, if for any reason you need technical assistance, please call us at:

1-800-633-0405

Our technical support group will work with you to answer your questions. They are available Monday through Friday from 9:00 A.M. to 6:00 P.M. Eastern Time. We also encourage you to visit our web site where you can find technical and non-technical information about our products and our company.

www.AutomationDirect.com

Agency Approvals

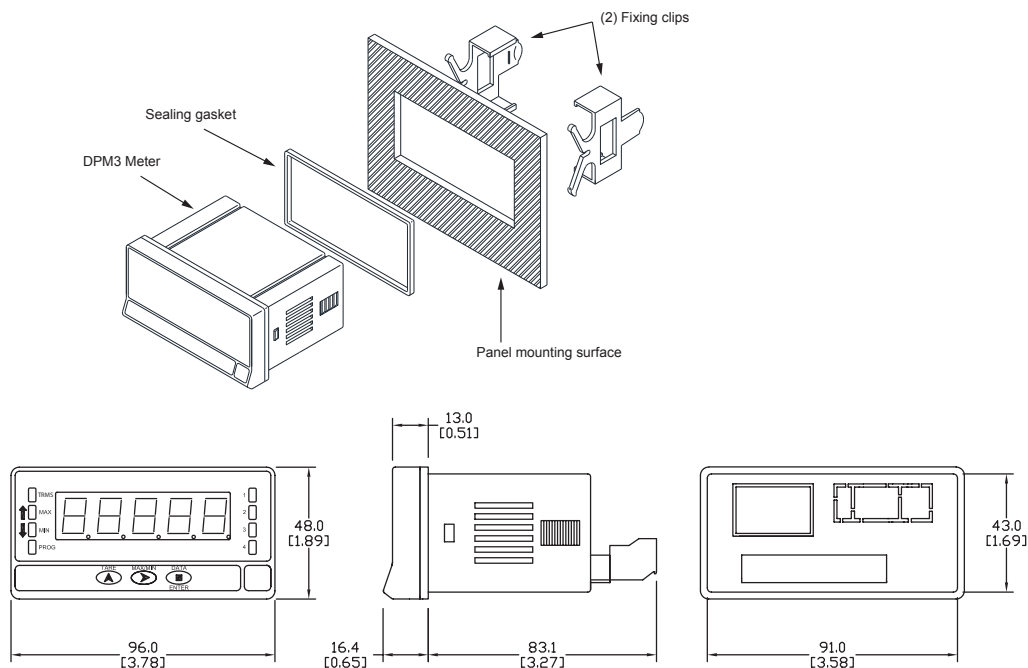


Device Description

The ProSense DPM3-E series offers a simple, feature packed digital display of True RMS AC or DC voltage or amperage electrical parameters. The 5-digit tri-color red, green or amber LED display is easily scaled into any engineering units from -19999 to 19999 with a selectable decimal point location. Two point direct or reverse acting linear scaling values can be entered manually or by introducing actual sensed values in Teach mode. Models are available with two SPDT relay outputs that can be set to activate on an increasing or decreasing input signal with hysteresis or time delay operation. Additionally the display color can be set to change on relay operation. Models are also available with a 4-20mA analog output. The meter is powered from an external AC or DC power supply. The 1/8 DIN housing is easy to install in a panel and the meter face has an IP65 rating. Configuration parameters can be totally or selectively locked out to prevent unauthorized or accidental changes to the meter's operation. Other features include memory and reset of minimum (valley) and maximum (peak) display values, display hold function, filtering to minimize display bounce, and display brightness adjustment. ProSense digital panel meters are backed by a 3 year warranty.

- 96 x 48mm 1/8 DIN
- Simple menu driven pushbutton configuration
- 5 digit (-19999 to 19999) tri-color (red, green, amber) LED display
- Selectable decimal point
- True RMS for AC voltage and current inputs
- AC/DC voltage input 600V, 200V, 20V, 2V
- AC/DC current input 200mA, 1A, 5A, shunt 50mV, shunt 60mV, shunt 100 mV
- AC or DC powered
- Display scaling or teaching modes
- Optional 4-20mA analog output
- Optional (2) Form C SPDT
 - Activation on increasing or decreasing input signal
 - Hysteresis or time delay operation
 - Display color change on relay operation
- Configuration for direct or reverse acting
- Total or selective configuration lock out
- Programmable functions include:
 - Minimum (valley) and maximum (peak) value memory
 - Minimum (valley) and maximum (peak) value reset
 - Hold
- Filtering to minimize display bounce
- Display brightness adjustment
- 3 year warranty

Dimensions and Mounting



Installation

To install the instrument, prepare a 92mm x 45mm panel cut-out and slide the unit inwards making sure to place the sealing gasket between the front side panel and the front bezel.

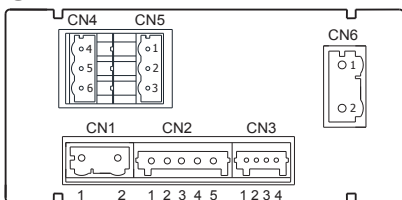
While holding the unit in place, put the fixing clips on both sides of the case and slide them through the guide tracks until they reach the panel at the rear side.

Press slightly to fasten the clips to the latching slots on the case and get the unit fully assembled and close fitted to achieve a good seal.

To remove the instrument from the panel, pull the rear fixing clips latching tabs outwards until they are disengaged, then slide the fixing clips back over the case.

Installation	
Dimensions	96 x 48 x 83.1mm (1/8 DIN)
Panel Cutout	92 x 45mm (Max. panel thickness 10mm)
Case Material	Polycarbonate UL 94 V-0

Wiring Terminals



CN1	
AC Supply	DC Supply
1 Line	1 VDC
2 Neutral	2 VDC

Polarity insensitive for DC power

CN3	
1	Common
2	Peak
3	Valley
4	Hold

CN2	
Electrical Inputs	
1	Common
2	Shunt / 2V
3	200mA
4	1A / 5A
5	20 / 200 / 600V

DPM3-E-A2R-H & DPM3-E-A2R-L 2 SPDT Relays

CN4 (Relay 2)	
4	NO2
5	CM2
6	NC2

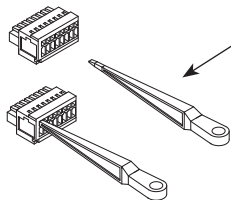
CN5 (Relay 1)	
1	NO1
2	CM1
3	NC1

NO: Normally open, CM: Common, NC: Normally closed

CN6	
Analog Output	
1	(-) 4-20mA
2	(+) 4-20mA

Terminals					
Connector	CN1	CN2	CN3	CN4 & CN5	CN6
Wire cross section	0.08 to 2.5mm ² (28 to 12 AWG)	0.08 to 1.5mm ² (28 to 14 AWG)	0.08 to 0.5mm ² (28 to 20 AWG)	0.08 to 2.5mm ² (28 to 12 AWG)	0.08 to 2.5mm ² (28 to 12 AWG)
Strip length	8 to 9mm	5 to 6mm	5 to 6mm	8 to 9mm	8 to 9mm
Manufacturer	Wago 231-202/026-000	Wago 734-105	Wago 733-104	Wago 231-303/026-000	Wago 231-302/026-000
Cage clamp connection	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade	Insertion tool or screwdriver with 0.3 mm x 1.8 mm blade	Insertion tool or screwdriver with 0.3 mm x 1.8 mm blade	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade	Insertion tool or screwdriver with 0.5 mm x 3.0 mm blade

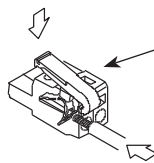
CN2 and CN3 Terminals



Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.


CN1, CN4, CN5 and CN6 Terminals



Insertion Tool (included with meter)

Insert wires into the proper terminal while using the insertion tool to open the clip inside the connector. Release the insertion tool to fix wire to the terminal.

Refer to the instructions in this manual to preserve safety protections.


 **WARNING: If this instrument is not installed and used in accordance with these instructions, the protection provided against hazards may be impaired.**

To meet the requirements of EN 61010-1 standard, where the unit is permanently connected to main supply, it is obligatory to install a circuit breaking device easily reach by the operator and clearly marked as the disconnecting device.


To guarantee electromagnetic compatibility, the following guidelines should be kept in mind:

- Power supply wires should be separately routed from signal wires and never run in the same conduit.
- Use shielded cable for signal wiring.
- Cables section should be $\geq 0.25 \text{ mm}^2$.

Before connecting signal wires, signal type and input range should be verified to be within the right limits. Do not connect simultaneously more than one input signal to the meter.

 **CAUTION:** Connect only one input signal range to the meter. Hazardous signal levels may be present on unused inputs.

CAUTION: The isolation rating of the input common of the meter with respect to the option card common and to the Logical Functions common (if used) is 250 Vrms and 500 Vrms with respect to AC Power (terminals 1 and 2 of connector CN1). To be certain that the ratings are not exceeded, these voltages should be verified by a high-voltage meter before wiring the meter.

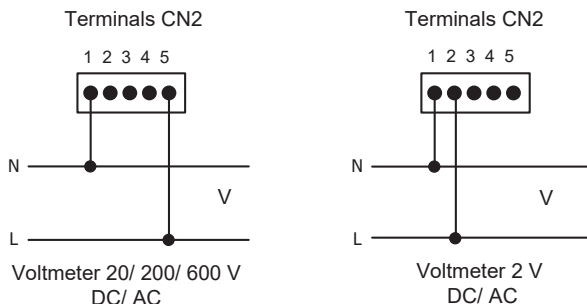
 **CAUTION:**

1. Where possible, connect the neutral side of the signal (including current shunts) to the input common of the meter. If the input signal is sourced from an active circuit, connect the lower impedance (usually circuit common) to the input signal common of the meter. (pin 1 CN2)
2. For phase to phase line monitoring where a neutral does not exist, or for any other signal input in which the isolation voltage rating is exceeded, an isolating potential transformer must be used to isolate the input voltage from earth. With the transformer, the input common of the meter can then be earth referenced for safety.
3. When measuring line currents, the use of a current transformer is recommended. If using external current shunts, insert the shunt in the neutral return line. If the isolation voltage rating is exceeded, the use of an isolating current transformer is necessary.

Wiring Examples

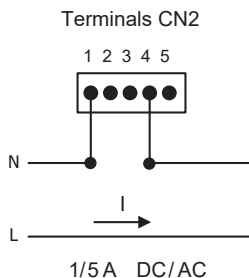
DC/AC Voltage Input Wiring (Ranges: 2, 20, 200, 600 V)

Note: MAXIMUM VOLTAGE APPLICABLE IS: 600V DC/ AC

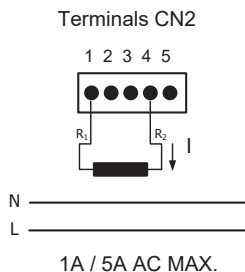


DC/AC Current Input Wiring (Ranges: 1A, 5A)

DC/AC Direct Connection



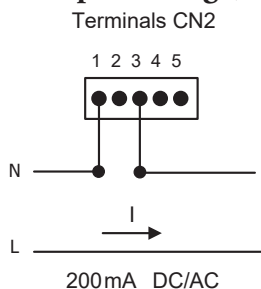
Connection using and AC Current Transformer



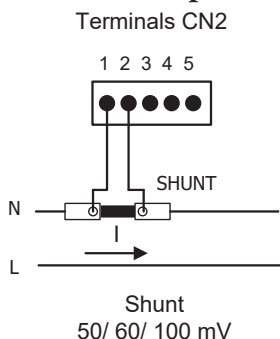
Important:

When using a current transformer, the input impedance (R_i) of the DPM3 is 14 mOhms. To maintain measurement accuracy, use connecting wires of appropriate gauge and length to prevent the total resistance of the measuring circuit ($R_1+R_2+R_i$) from exceeding the Burden rating of current transformer .

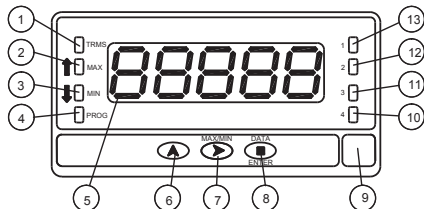
DC/AC Current Input Wiring (Range: 200mA)



DC/AC Current Input Wiring (Ranges: 50/60/100mV shunt)



Display and Key Pad



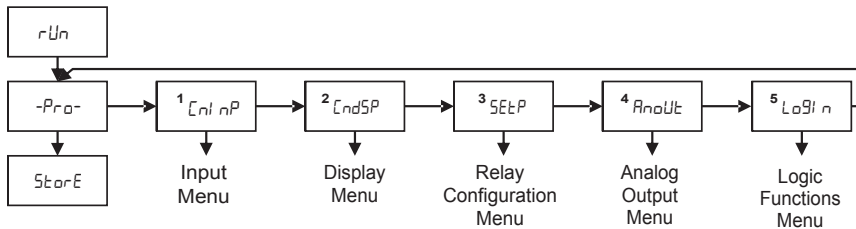
Programming Panel			
#	Description	Run Mode	Programming Mode
1	True RMS	Indicates reading AC using true RMS	---
2	MAX	Indicates peak displayed	---
3	MIN	Indicates valley displayed	---
4	PROG	---	Indicates programming mode
5	DISPLAY	Displays the input variable	Displays programming parameters
6	UP	Direct access to setpoints	Increments the value of the flashing digit
7	SHIFT/MAX/MIN KEY	Recalls Max/Min values	Moves to the right
8	ENTER KEY	Enters in PROG mode. Displays data	Accepts data. Advances program
9	Free space for units label		---
10	LED Output 4	---	---
11	LED Output 3	---	---
12	LED Output 2	Activaton Output 2	Programming output 2
13	LED Output 1	Activation Output 1	Programming output 1

Configuration:

When the power is applied to the meter, a display test begins automatically to check the function of the LED's and digits. Once this test is finished the display shows the internal software version and then the unit goes to **RUN** mode.

Configuration follows a structure composed of a number of menus and submenus. By pressing the **ENTER** key, the display show "Pro". Pressing the **SHIFT** key repeatedly provides access to the main menu level which includes menus for input configuration (**CnInP**), display configuration (**CndSP**), relay configuration if present (**SEtP**), analog output configuration if present (**Anout**), logic functions configuration (**LoGIn**). Press **ENTER** to access the submenus under each main menu.

If configuration has been totally locked-out, when pressing **ENTER** to access the main menu level, the display shows **dAtA** instead of **Pro**. This indicates that it is only possible to see programmed information and that it is not allowed to modify any parameter from the entire configuration. In this visualization mode, the meter automatically switches back to **RUN** mode after 15 seconds sine the last key press.



Programming Key Pad

- ▣ **ENTER**: Vertical displacement.
- ▲ **UP**: Changes active digit.
- ▶ **SHIFT**: Horizontal displacement.

The progress through the programming routines is done by pressing **ENTER** key. In general, push **SHIFT** key a certain number of times to select an option and push **ENTER** key to validate the change and move forward to the next step of the program.

Programming numerical values

When the parameter is a numerical value, the display will show the first of the digit to be programmed blinking.

Digit selecting: Press repeatedly the **SHIFT** key to shift from left to right over all the display digits.

Changing the digit value: Press repeatedly the **UP** key to increase the value of blinking digit until it has the desired value.

The minus sign is programmed depending on the variable type. A variable that represents the value of an input will be able to take a value in the range -19999 to 19999, without taking into account the decimal point. When a digit is selected it shows values from (0) to (9), and then (-1), (-), and comes back to show values from 0 to 9. A variable that represents a display value

will be able to take a value in the range -19999 to 19999, without taking into account the decimal point. In these case the first digit shows 0, 1, -1, 2, 3 or -.

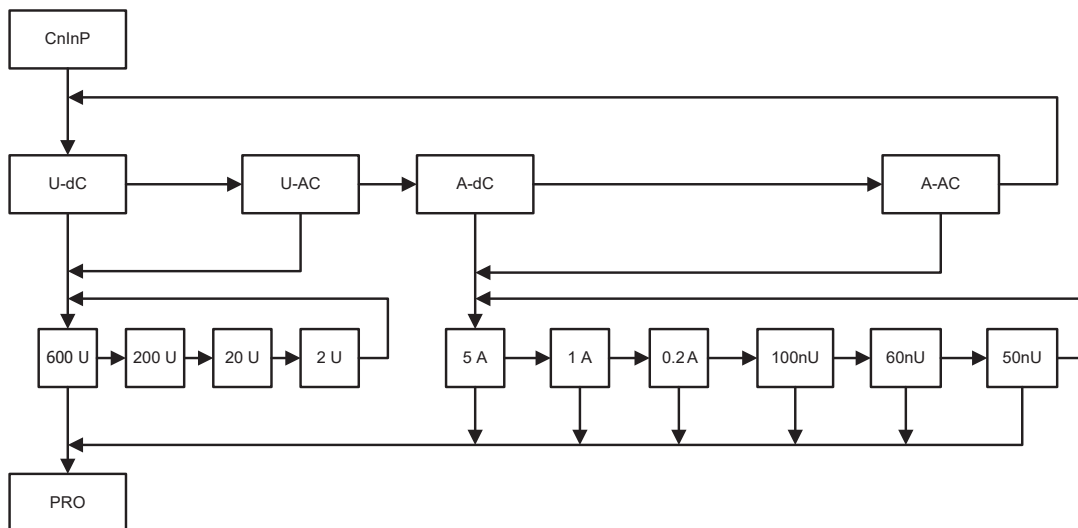
Completion of each submenu routine returns the meter to **Pro** mode. To save data entered or changed during configuration press the **ENTER** key while in **Pro** mode. **StorE** will be displayed for a few seconds while all of the configuration data is stored in memory. The meter will then return to **RUN** mode.

Input Configuration

The figure below shows the input configuration menu. Divided into four submenus, each one of them separated by the dotted line in the manual, each menu corresponds to the programming of the different types of input: Volt dc, Volt ac, Amp dc, Amp ac. Once the type of signal has been selected you have then to select the range. Usually the 100, 60, 50mV (nU) ranges are shunts signals. .

Programming Keys (Bottom view)

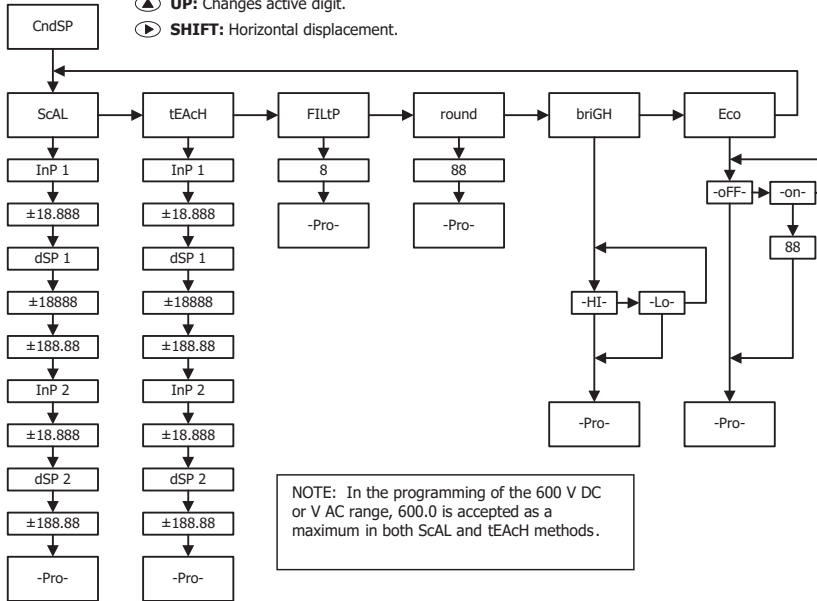
- ⬇ **ENTER**: Vertical displacement.
- ⬆ **UP**: Changes active digit.
- ⬇ **SHIFT**: Horizontal displacement.



Display Configuration

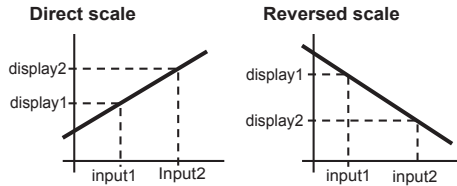
Programming Key Pad

- ▣ **ENTER**: Vertical displacement.
- ▲ **UP**: Changes active digit.
- ▶ **SHIFT**: Horizontal displacement.



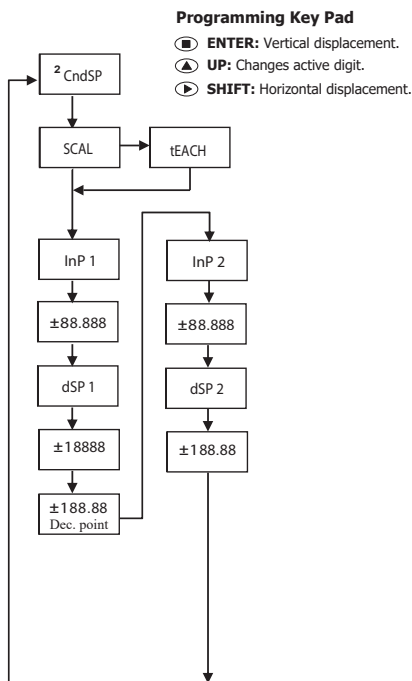
Scaling

For linear signals, scaling is achieved by programming two coordinates (InP1, DSP1) and (InP2, dSP2), between which is established a linear relation where each input signal value corresponds to a display value. The relationship can be direct or reversed. In order to obtain more accuracy, points 1 and 2 should be located approximately at both extremes of the process.



Programming of the scale

There are two methods for programming the scale, the **SCAL** method and the **tEACH** method.



SCAL method

The input and display values are programmed manually. This method can be used when the value of the signal at each points of the process is known.

tEACH method

The input values are introduced directly from actual electrical values. The input signal device must be connected to the meter and operational when each point is programmed. The display values are programmed manually. This method can be used when it is possible to bring the process to the conditions of each one of the points to be programmed.

Weighted Average Filter P

0 to 9 (4Hz to 0.05 Hz)

Sets low-pass filter cutoff frequency (Fc) which allows the meter to smooth out undesirable display reading fluctuations. The value can be modified through the **SHIFT** key. This parameter will set in reverse order the cut-off frequency of the low pass filter, getting the filter deactivated for 0 value.

Round

01 05 10

Will take each one of the values by pressing successively on the **SHIFT** key. with 01 there will be no round, 05 will round the display value at 0 to 5, and with 10 will round at 0 to 10.

Brightness

Hi Lo

Display brightness level selection.

Hi: high brightness

Lo: low brightness

Display color selection between green, red or amber is possible for both **RUN** and **Pro** modes.

Eco

on off

Allows choosing an operative mode with an up to 45% of ENERGY SAVING*

on: After a programmable time without pressing any key, display will turn off leaving only the right decimal point flashing; all functions remain active. Display will be again active after pressing any key.

off: Deactivates the function.

* Measured at 230V AC power supply, display 100.00, amber colour and with no options.

Additional Functions

Several functions can be controlled via Key Pad that will produce different actions depending on the instrument operating mode:

MAX/MIN function

With the meter in **RUN** mode: Activated after pressing the **SHIFT** key. From **RUN** mode, a press shows the maximum value (peak) read by the instrument since the last time it has been switched on, unless a **RESET MAX/MIN** is done, the **MAX** led will light up. A second press shows the minimum value in the same conditions as before, with the consequent minimum (valley) indication through the **MIN** led. A third press brings the instrument back to **RUN** mode.

Reset MAX/MIN

With the meter in **RUN** mode: Pressing the **SHIFT** key for 3 seconds, while the meter shows the peak value (**MAX**), will produce a reset of the value. Pressing **SHIFT** key for 3 seconds while the meter shows the valley value (**MIN**) will produce a reset of the value.

Configuration Lockout

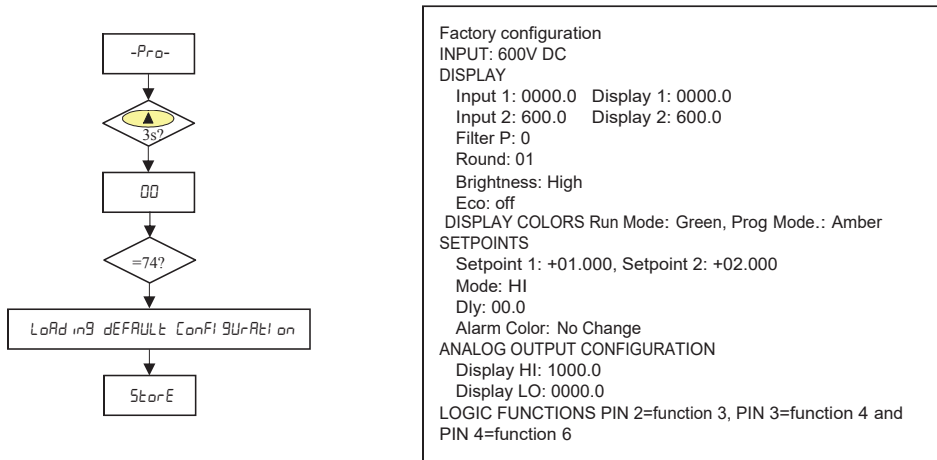
In mode **RUN** if the **ENTER** key is pressed for 3 seconds, the meter will show the indication **Code**, and following **0000**, allowing the user to introduce the security code. If the code that has been introduced is wrong, the meter will go back to **RUN** mode, if it is correct, it will allow the access to the security menu. See section detailing Configuration Lockout.

Programming Mode

One press on the **ENTER** key will bring the instrument to the Programming Mode **-Pro-** mode.

Return to Factory Configuration

After accessing programming mode, **Pro** press and hold the up key for 3 seconds. Allows entering a code of access to the reset of the configuration parameters, this code is 74. When entering this code the instrument shows the **Load inS dEFRAULt COnFI gURAtI on** legend, and then **StorE**, which means that they have been stored in the non volatile memory of the meter.



Direct Access to Relay Setpoints

If the DPM3 has relay outputs present the meter allows direct access to the programming of the setpoint values. After accessing programming mode, **Pro**, pressing the **UP** key provides access to each relay setpoint value.

Logic functions

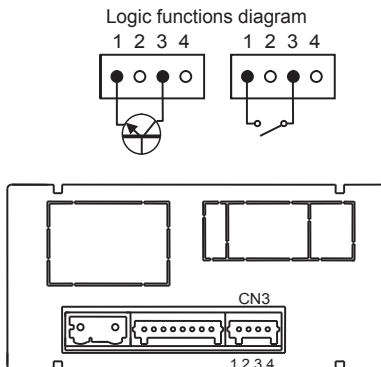
The connector CN3 provides 3 optocoupled inputs that can be operated from external switches. Three different functions may be assigned to the inputs using the front panel keys. Each function is associated to a pin (PIN 2, PIN 3 or PIN 4) that is activated by applying an external switch closure with respect to PIN 1 or COMMON. Function assignments to the inputs are achieved

through the programming of a number between 0 and 15 corresponding to one of the functions listed in the following table.

Factory configuration

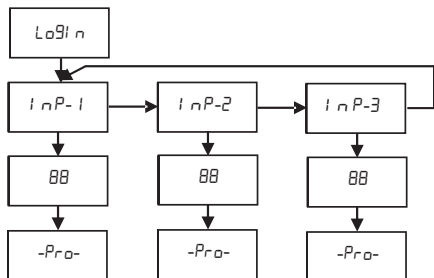
As shipped from the factory, the CN3 connector allows remote control of the PEAK, VALLEY functions as well as the HOLD function. When a HOLD is made, the display value remains frozen while the corresponding pin is activated. The HOLD state affects neither the meter internal operation nor the analog and relay outputs if present.

PIN (INPUT)	Factor Default Functions	Function
PIN 1	COMMON	
PIN 2 (INP-1)	PEAK	Function No. 3
PIN 3 (INP-2)	VALLEY	Function No. 4
PIN 4 (INP-3)	HOLD	Function No. 6



The external electronics applied to the CN3 connector inputs must be capable of withstanding a potential of 40V / 20 mA present at all terminals with respect to COMMON. In order to guarantee the electromagnetic compatibility please refer to the connection instructions in the Wiring Terminal section.

Logic functions menu



Programming Key Pad

- ▣ **ENTER:** Vertical displacement.
- ▲ **UP:** Changes active digit.
- ▶ **SHIFT:** Horizontal displacement.

Table of programmable functions

- **N°:** Number to select the function.
- **Function:** Function name.
- **Description:** Description and characteristics of the function.
- **Activation by:**
 - Falling edge:** the function is activated applying a falling edge to the corresponding pin with respect to common.
 - Low level:** the function will remain activated as long as the corresponding pin is held at a low level.

No.	Function	Description	Activation By
0	Deactivated	None	None
1	Deactivated	None	None
2	Deactivated	None	None
3	PEAK	Displays the peak value. (MAX.)	Low level
4	VALLEY	Displays the valley value. (MIN)	Low level
5	RESET PEAK/VALLEY	Perform a reset of the peak or the valley, depending on which is being displayed.	Falling edge
6	HOLD	Freeze the display while all the outputs remain active	Low level
7	Deactivated	None	None
8	Deactivated	None	None
9	Deactivated	None	None
10	Deactivated	None	None
11	BRIGHTNESS	Change the display brightness from Hi to Low	Low level
12	SETPOINT VALUE	Displays the selected setpoint value (see diagram next page)	Low level
13	False Setpoints	Simulates that the instrument has a four setpoints option installed	Low level
14	Deactivated	None	None
15	Deactivated	None	None
16	Remote keypad	The three logic inputs act as a remote keypad*	Edge

** It's mandatory programming the 3 logical inputs with function 16*

Configuration Lock Out

The meter is delivered with the programming not locked out, giving access to all the programming levels. Once completed the meter programming the following security measures are recommended:

1. Lock out the programming access to prevent from programmed parameters modifications.
2. Lock out Key Pad functions to prevent from accidental modifications.
3. There are two lockout modes: selective and total. If the parameters are going to be readjusted frequently, make a selective lockout. If no adjustment is going to be made, make a total lockout. Key Pad functions lockout is always possible.
4. The access to the lockout routine is allowed by entering a personalised code. We recommend changing the code set at factory and to write down your personalised code and keep it in a safe place.

TOTAL LOCKOUT

The access to the programming routines to read data is allowed even if all parameters are locked out totLC=1, but **it won't be possible to enter or modify data**. In this case, when entering in the programming mode, the display shows the indication “-dAtA-”.

PARTIAL LOCKOUT

When only some parameters are locked out, all configuration data can be read but **only non protected parameters can be modified**. In such case, when entering in the programming mode, the display shows the indication -Pro- “.

Menus or submenus that can be locked out are:

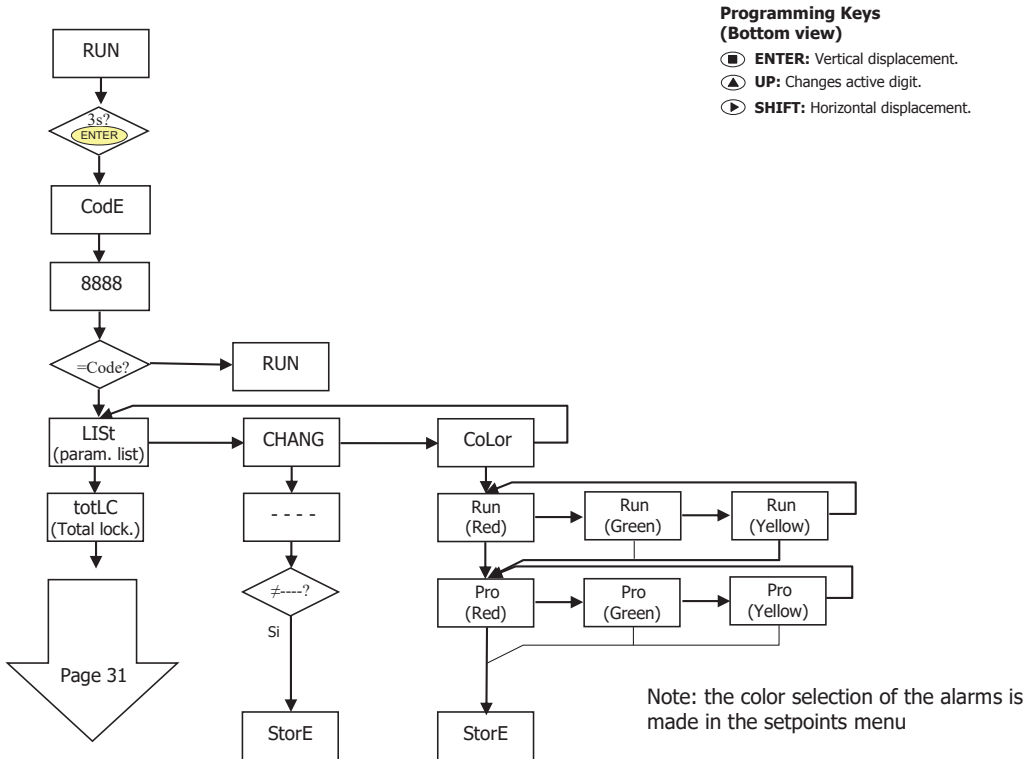
- Relay 1 configuration (SEt 1). If present in meter.
- Relay 2 configuration (SEt 2). If present in meter.
- Input configuration (InPut).
- Display (diSP).
- Display color (CoLor).
- Relay setpoints value (SPVAL). If present in meter.
- Analog output configuration (Anout). If present in meter.
- Logic inputs configuration (LoGIIn).
- Direct access to MAX. and MIN values (MAHMn).

Lock-out menu diagram

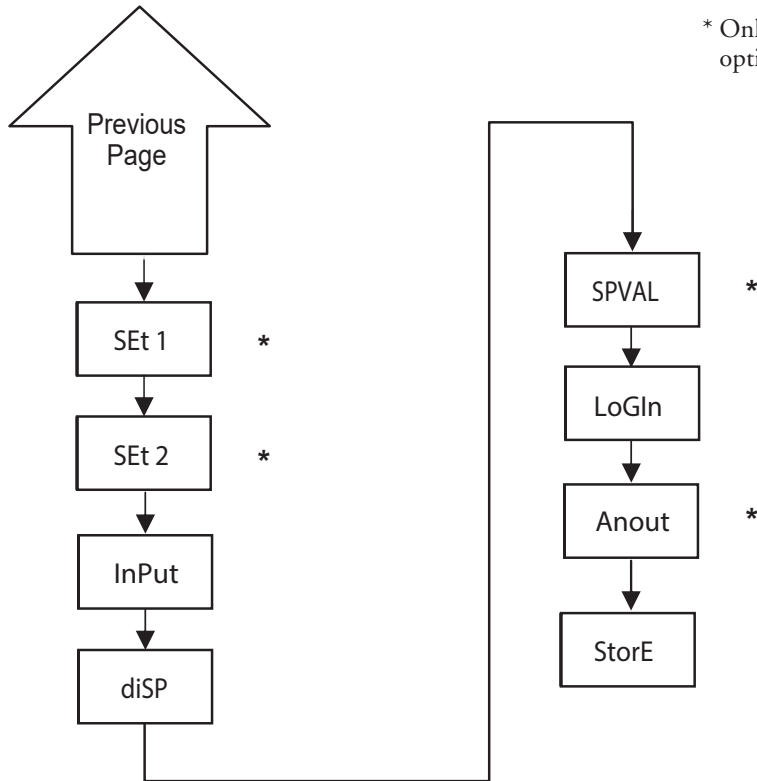
The following figure shows the lock-out menu. The access to this menu is accomplished from the run mode by pressing the **ENTER** key for 3 seconds, until the “**CodE**” indication appears. The instrument is shipped from factory with the following default code: “**0000**”. Once this code is entered, the **LISt** indication will appear, from which lockout parameters will be entered. Accessing the “**CHAnG**” menu a new personal code is entered. Write down and keep this code in a safe place (**Do not count on your memory**).

If an incorrect code is entered, the meter will return automatically to the run mode. Total lockout programming is achieved by changing the “**totLC**” variable to 1, changing it to 0, will lead to the selective lockout of the programming variables. Programming each one of the parameters to 1 will activate the lockout, if they are set to 0 programming will be accessible. Though the programming is locked out, it remains possible to visualise the current programming.

The “**StorE**” indication informs that the modifications effectuated have been stored correctly.



Lock-out menu diagram continued



0 allows its programming

1 locks the access to programming

* Only appear if the corresponding options are present in the meter

Output Options

All options are optoisolated with respect to input signal and power supply.

2500Vrms for 1 minute to signal terminals (CN2) and relays terminals (CN3 or CN4).

2500Vrms for 1 minute to power terminals (CN1) and relays terminals (CN3 or CN4).

Relay Configuration

Introduction

Some DPM3 models are equipped with either 2 relays that can provide individual alarm and control capabilities. All relays can be configured to function based on independent setpoint values within the full configured display range, time delay (in seconds), hysteresis (in counts of display) and selectable HI/LO acting.

Description of Operation

The relay outputs activate when the display value reaches the corresponding programmed relay setpoint value. The following relay operational parameters must also be set:

a. HI/ LO ACTING MODE.

In HI mode, the output activates when the display value exceeds the setpoint level and in LO mode, the output activates when the display value falls below the setpoint

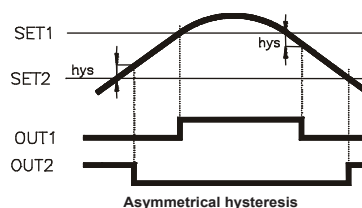
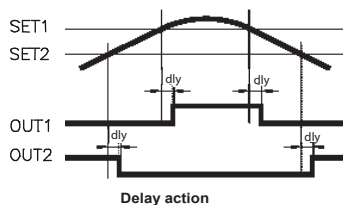
b. PROGRAMMABLE TIME DELAY or HYSTERESIS.

Each output action can be deferred by a programmable time delay or hysteresis level.

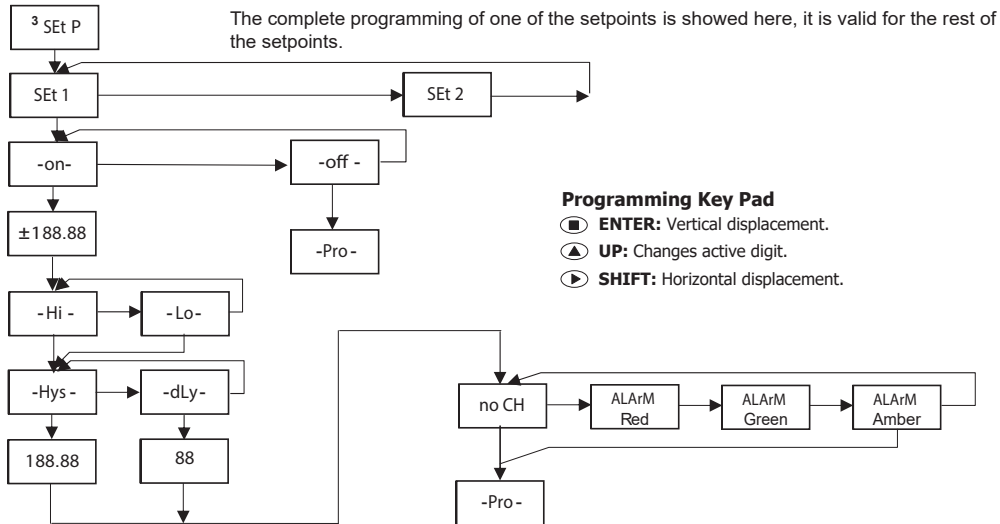
The time delay is the time that takes the output to activate after passing through the setpoint in the up or down direction, while the hysteresis band will be selected asymmetrical i.e. only acts on the output deactivation edge. The delay is programmable in seconds, from 0 to 99.

The hysteresis can be programmed, in counts, within the full display range. The decimal point appears in the same position as programmed in the display configuration module.

The figures 1 and 2 show the time delay action (dly) and the hysteresis action (hys) of two alarms (SET1 and SET2) programmed to activate in HI mode (OUT1) and LO mode (OUT2)

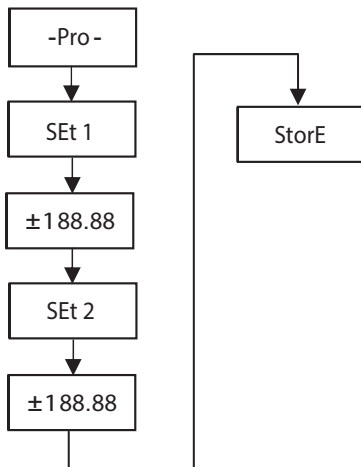


Relay Configuration menu diagram



Direct access to the relay setpoints value programming

It is possible to directly access the relay setpoint values without the need to go through the programming menu just by pressing the **UP** key in **Pro** mode, as shown in diagram below. **Setpoints configured at “off” do not appear on the list”.**



Remember that the decimal point position is determined by what has been programmed in the SCAL menu.

Programming Keys (Bottom view)

⬇️ **ENTER:** Vertical displacement.

Analog output

Introduction

Some DPM3 models include an analog output (4-20 mA).

The output is optoisolated with respect to the signal input and the power supply.

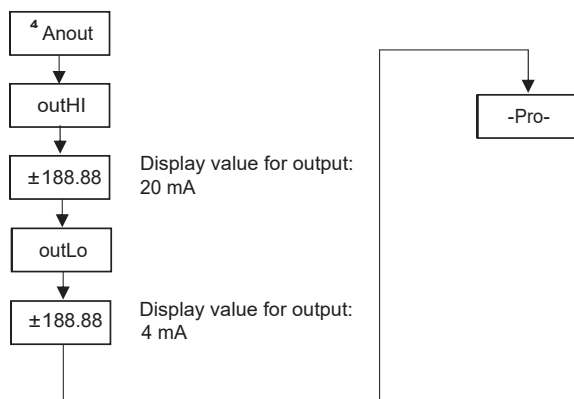
The meter provides a two terminal connector [(+) and (-)] that drives out a signal variation from 4mA to 20mA proportional to a user-defined display range.

The signal can be used to transmit display information to a variety of terminal equipment such as graphic recorders, controllers, remote displays or other devices that accept input data in analog form.

The display values producing the full scale output (**OUT-HI** and **OUT-LO**) are introduced via front-panel buttons in the same programming module.

The output signal can be set up for reverse action by programming the low display for the high output (**OUT-HI**) and the high display for the low output (**OUT-LO**).

Analog output menu diagram



Programming Key Pad

- ⬇ **ENTER**: Vertical displacement.
- ⬆ **UP**: Changes active digit.
- ⬇ **SHIFT**: Horizontal displacement.

Technical Specifications

Technical Specifications				
Input	DC Voltage	AC Voltage	DC Current	AC Current
Range...Input Impedance	2V...100kΩ	2V...75kΩ	200mA...0.75 Ω	200mA... 0.75 Ω
	20V...1MΩ	20V...850kΩ	1A...0.014 Ω	1A...0.014 Ω
	200V...1MΩ	200V...850kΩ	5A...0.014 Ω	5A...0.014 Ω
	600V...1MΩ	600V...850kΩ	50mV... 1.8 MΩ	50mV... 1.5 MΩ
			60mV...1.8 MΩ	60mV...1.5 MΩ
Input Frequency Range	–	40Hz to 10kHz True RMS Measurement	–	40Hz to 10kHz True RMS Measurement
Resolution	2V...0.1 mV	2V...0.1 mV	200mA...0.01 mA	200mA...0.01 mA
	±20V...1mV	20V...1mV	1A...1mA	1A...1mA
	±200V...10mV	200V...10mV	5A...1mA	5A...1mA
	±600V...0.1 V	600V...0.1 mV	50mV...0.01 mV	50mV...0.01 mV
			60mV...0.01 mV	60mV...0.01 mV
		100mV...0.01 mV	100mV...0.01 mV	
Accuracy	2V... 0.05% rdg ± 0.3 mV	2V... 0.3% rdg ± 0.3 mV	200mA... 0.1 % rdg ± 0.05 mA	200mA... 0.3 % rdg ± 0.05 mA
	±20V...0.05% rdg ± 3mV	20V...0.3% rdg ± 3mV	1A...0.1 % rdg ± 5mA	1A...0.3 % rdg ± 5mA
	±200V...0.05% rdg ± 30mV	200V...0.3% rdg ± 30mV	5A...0.1 % rdg ± 5mA	5A...0.3 % rdg ± 5mA
	±600V...0.05% rdg ± 0.3 V	600V...0.3% rdg ± 0.3 V	50mV... 0.1 % rdg ± 0.1 mV	50mV... 0.3 % rdg ± 0.1 mV
			60mV...0.1 % rdg ± 0.1 mV	60mV...0.3 % rdg ± 0.1 mV
		100mV...0.1 % rdg ± 0.1 mV	100mV...0.3 % rdg ± 0.1 mV	
Accuracy Conditions	AC or DC Input: 15 minutes warmup 25°C ± 5°C ambient temperature 100 ppm/°C temperature coefficient 10-75% RH non-condensing		AC Input: 3% to 100% of input range 45 Hz to 400 Hz sine wave 40 Hz to 10 kHz Accuracy +/- (1% + 20 digits) Crest Factor: 3, Accuracy +/- (0.2% + 10 digits); 5, Accuracy +/- (1% + 20 digits)	
Conversion	Technique	Sigma-Delta		
	Resolution	±15 bits		
	Conversion rate	20 times per second		
Display	Range	-19999 / +19999, 5 LED digits 14mm (Programmable color Red, Green, Amber)		
	LEDs	8, functions and outputs status		
	Display refresh rate	20 times per second		
	Display / Input overrange indication	"-oUEr" , "oUEr"		
Relays -A2R Only	(2) Relays, Form C SPDT	Nominal contact rating.....8A at 250VAC / 24VDC Maximum switching current (resistive load).....8A Maximum switching power.....2000VA / 192W Maximum switching voltage.....400VAC / 125VDC Contact resistance.....≤100mΩ at 6VDC at 1A Operate time.....≤10ms		
Analog Output -A2R Only	Type	4-20 mA Sourcing		
	Maximum load	≤500Ω		
	Resolution	13 bits		
	Accuracy	0.1%FS ±1 bit		
	Response time	10ms		
		0.5μA / °C		

Technical Specifications Continued				
Input	DC Voltage	AC Voltage	DC Current	AC Current
Power Supply and Fuses	-H High Voltage: -L Low Voltage:	85-265 VAC 50/60 Hz (100-300 VDC), (recommended fusing 0.5A/250V, DIN 41661) 22-53 VAC 50/60 Hz (10.5 - 70 VDC), (recommended fusing 2A/250V, DIN 41661)		
Power Consumption	5W without options, 8W max.			
Filter	Cutoff frequency	4Hz to 0.05Hz		
	Slope	20dB/Dec.		
Environmental Conditions	Operating temperature	-10°C to +60°C (14°F to 140°F)		
	Storage temperature	-25°C to +85°C (-13°F to 185°F)		
	Relative humidity (non-condensing)	<95% @ 40°C (104°F)		
	Maximum altitude	2000m		
	Frontal protection degree	IP65		
Environmental Air	No corrosive gases permitted			
Agency Approvals	CE			