prosense® Digital Panel Meter DPM2-AT/DPM2L-AT Series

Quick Start Guide

▼AUTOMATIONDIRECT.com

Models:
DPM2-AT-HL
DPM2L-AT-HL
DPM2-AT-2R-HL
DPM2L-AT-2R-HL

14mm Display
20mm Display

CE

3505 HUTCHINSON ROAD
CUMMING, GA 30040-5860

This Quick Start Guide provides basic information for configuring the ProSense DPM2 series digital panel meters. For more specific information and advanced configuration instructions please visit www.AutomationDirect.com and download the free instruction manual for the DPM2 series.

Features

- 96 x 48mm 1/8 DIN
- 14mm, 4 digit (-9999 to 9999) or 20mm 4 digit (-1999 to 9999) red LED display
- Selectable decimal point
- Process (±10V, ±200V and ±20mA)
- Temperature (RTD: Pt100, Pt1000, TC: J, K, T, N, Resolution: 1°F, 0.1°F, 1°C, 0.1°C)
- Potentiometer (100Ω to 100kΩ)
- Resistance (999.9Ω, 9999Ω and 50kΩ)
- AC or DC powered

- Sensor excitation voltage 24V
- Optional (2) Form C SPDT relays
  N.O. or N.C. operation
  Activation on increasing or decreasing input signal
  Hysteresis or time delay operation
- Display scaling or process teaching modes
- Configuration for direct or reverse acting linear processes
- Minimum and maximum value memory
- Total or selective configuration lock out

Dimensions and Mounting

Sealing gasket
DPM2 Meter
(2) Fixing clips
Panel mounting surface
48mm
60mm
96mm
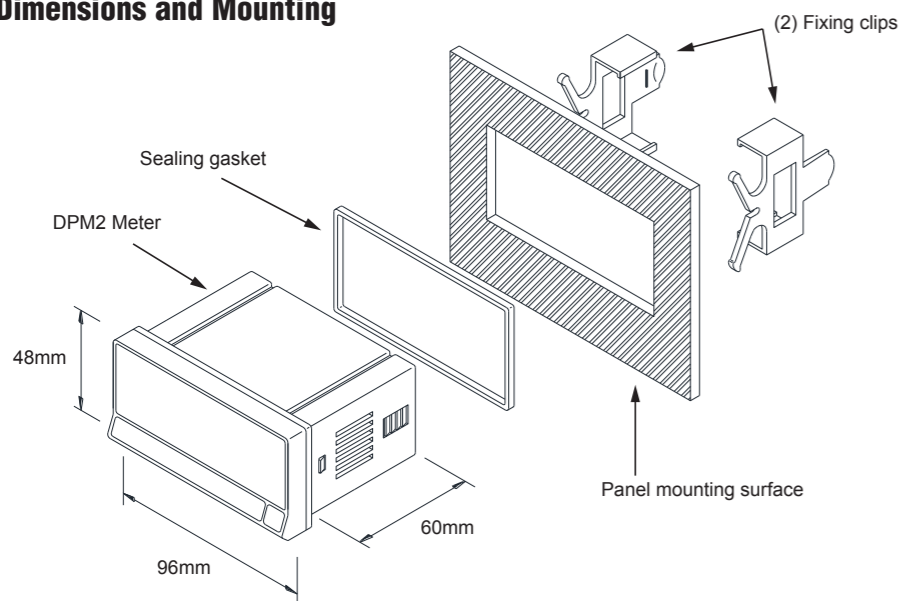
To install the instrument, prepare a 92mm x 45mm panel cut-out and slide the unit inwards making sure to place the sealing gasket between the front side panel and the front bezel.

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

| Installation	
Dimensions	96 x 48 x 60mm (1/8 DIN)
Panel Cutout	92 x 45mm (Max. panel thickness 10mm)
Case Material	Polycarbonate UL 94 V-0

⚠ **WARNING! Electric shock danger**

1. Keep away from high-voltage and high-frequency environment during the installation to prevent interference. Avoid using the device in environments which contain: (a) dust or corrosive gas; (b) high humidity or high radiation; (c) shock or vibration

2. Make sure the input power is switched off when installing or uninstalling the DPM2 to prevent harm to personnel or equipment.

3. Before switching on the input power, check the signal connection, e.g. the input voltage and polarity. Voltage that is too high may cause damage to the DPM2.

4. Front cover should be cleaned only with a soft cloth soaked in neutral soap product. DO NOT USE SOLVENTS.

5. Outputs remain active in Programming Mode.

Wiring Terminals

Note: For additional wiring information download complete manual from www.AutomationDirect.com

Output relay terminals
(DPM2-AT-2R-HL &
DPM2L-AT-2R-HL only)
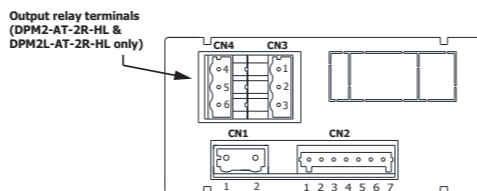
CN1		
AC Supply		**DC Supply**
1	Line	1	VDC
2	Neutral	2	VDC

Polarity insensitive for DC power

CN2	
1	Common / RTD B / -TC / Pot. Term. 1
2	RTD A / +TC / 10kΩ res. / Pot. center
3	50kΩ res. / Pot. Term. 2
4	RTD B Pt100
5	+20mA
6	Excitation +24V
7	+10/200VDC

(DPM2-AT-2R-HL & DPM2L-AT-2R-HL only)

CN4 (Relay 2)		CN3 (Relay 1)	
4	NO2	1	NO1
5	CM2	2	CM1
6	NC2	3	NC1

NO: Normally open contact.
CM: Common
NC: Normally closed contact.

Terminals

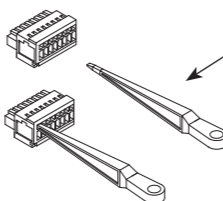| Connector	CN1	CN2	CN3 & CN4
Wire cross section	0.08 to 2.5mm² (28 to 12 AWG)	0.08 to 1.5mm² (28 to 14 AWG)	0.08 to 2.5mm² (28 to 12 AWG)
Strip length	8 to 9mm	6 to 7mm	8 to 9mm
Manufacturer	Wago 231-202/026-000	Wago 734-107	Wago 231-303/026-000
Cage clamp connection	Insertion tool or screwdriver with 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 0.5 mm x 3.0 mm blade

CN2 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, CN3, CN4 Terminals
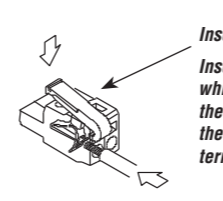
Insertion Tool (included with meter)

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.
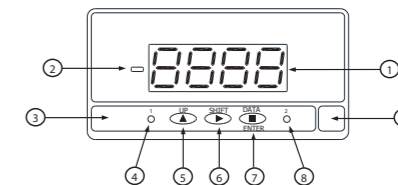
⚠ **Warning:** If this instrument is not installed and used in accordance with these instructions, the protection provided by it against hazards may be impared. To meet the requirements of EN 610101-1 standard, where the unit is permanently connected to main supply, it is obligatory to install a circuit breaking device that is easily reachable by the operator and clearly marked as the disconnecting device.

To guarantee electromagnetic compatibility, the following guidelines should be followed:

- Power supply wires should be separately routed from signal wires and never ran in the same conduit.
- Use shielded cable for signal wiring.
- Cable cross-section must be ≥0.25mm²

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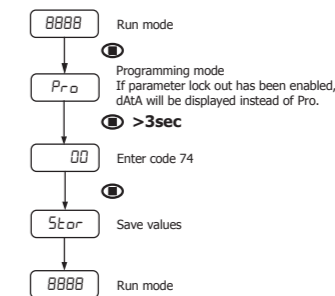

Programming Panel

#	Description	Run Mode	Programming Mode
1	4 digit display Red	Shows value according to configuration.	Shows steps and data during configuration.
2*	Minus sign	Illuminates for negative readings.	Illuminates for negative values.
3	Keyboard	----	----
4	Setpoint 1 LED	Illuminates when setpoint 1 turns active.	Illuminates when setpoint 1 turns active.
5	UP key	No application	Shows setpoint value. Increases value of active digit.
6	SHIFT key	Displays maximum and minimum stored values. After 3s of pressing, sets maximum and/or minimum memorized value to current display value.	Shifts active digit to the next right digit.
7	DATA/ENTER key	Changes to PRO mode.	Validates selected data and parameters. Moves one step forward in configuration menu. Changes to RUN mode.
8	Setpoint 2 LED	Illuminates when Setpoint 2 turns active.	Illuminates when setpoint 2 turns active.
9	Free space for units label	----	----

* Only for standard size display models

Return to Factory Configuration

8888	Run mode
Pro	Programming mode. If parameter lock out has been enabled, dAtA will be displayed instead of Pro.
00	>3sec — Enter code 74
Stor	Save values
8888	Run mode

Total Configuration Lock-out

Note: For selective lock-out configuration download complete manual from www.AutomationDirect.com

8888	Run Mode — >3sec
CodE	Enter code (default code is 0000). If code is forgotten, perform Return to Factory Configuration to again have access to parameters lock out configuration.
0000	
LiSt	Select LiSt and tLoc will momentarily display
tLoc	
no → YES	Select YES for complete lock out of all parameters. When locked out parameter values can be viewed but not changed.
nAH	nAH: Lock out of Maximum/Minimum Value Function? (Yes or No)
no	
Refer to manual for options.	
Stor	Save values
8888	Run Mode

Additional Help and Support

- For additional information on this product download the complete manual from www.AutomationDirect.com
- For additional technical support and questions, call our Technical Support team @ 1-800-633-0405 or 770-844-4200
- A QR link to configuration and programming videos is located on the back of this document.

Model DPM2-AT-HL & DPM2L-AT-HL Application:

Type J thermocouple input with 0.1°F resolution and fixed display range of -238.0°F to 999.9°F

Note: For additional configuration information download the complete manual from www.AutomationDirect.com

`8888` Run Mode	
`Pro`	Programming Mode. If total parameter lock out has been enabled, dAtA will be displayed instead of Pro
`InP`	Input Menu
`ProC` → `tEnP`	Process input menu / Temperature input menu
`tC`	Thermocouple input
`- I -`	1=Type J for this example
`I°c` → `0.I°c` → `I°F` → `0.I°F`	Select 0.1°F resolution for this example. Note: display range is automatically set for -238.0°F to 999.9°F when Type J and 0.1°F resolution is selected
`oFS`	oFS: Offset provides compensation for a known difference between the temperature measured by the sensor and the actual temperature.
`00.0`	Offset value: ±99 for resolution of 1° or ±9.9 for resolution of 0.1°. Enter 0.0 for this example.
`Stor`	Save Values
`8888`	Run Mode

ENTER: Vertical displacement.
UP: Changes active digit.
SHIFT: Horizontal displacement.

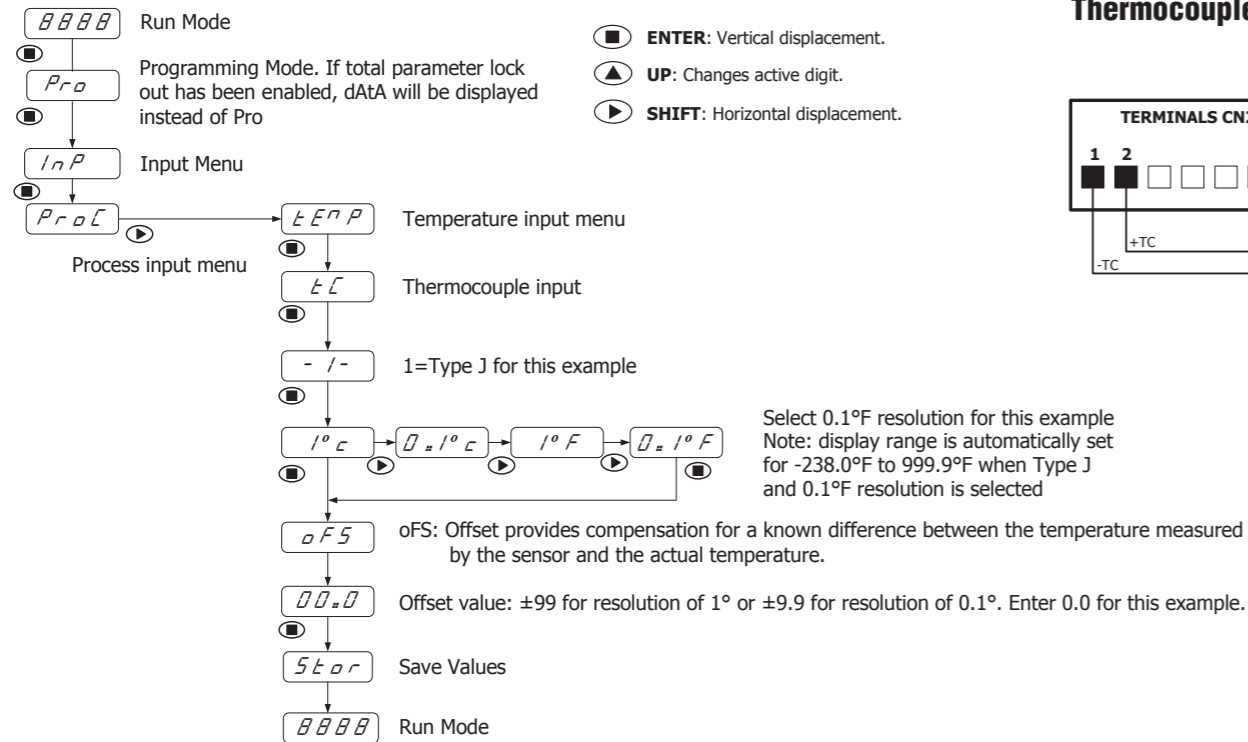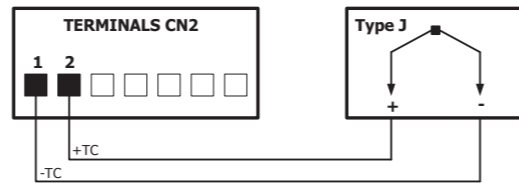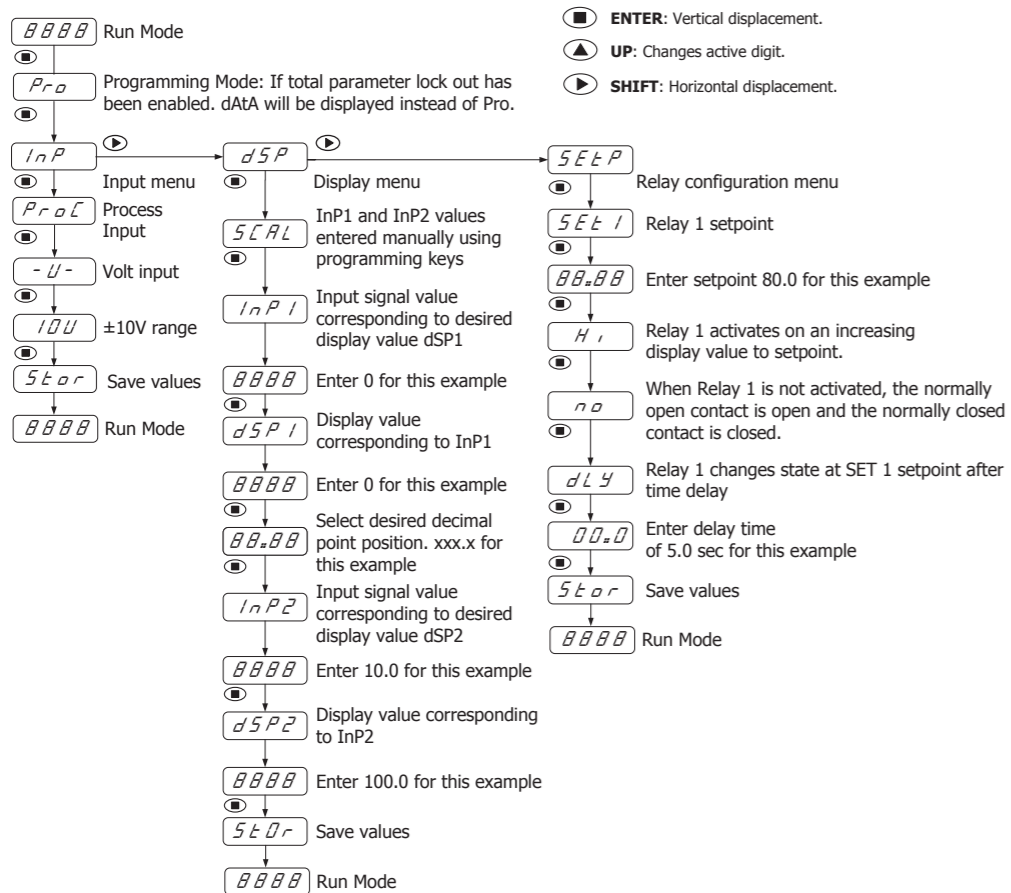### Thermocouple Wiring
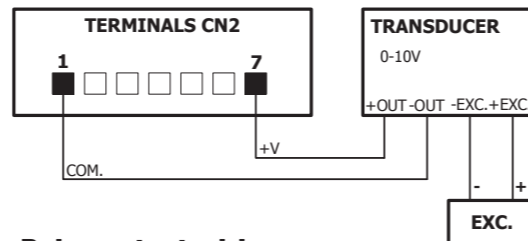
TERMINALS CN2   **Type J**

+TC
-TC

Model DPM2-AT-2RL-HL & DPM2L-AT-2RL-HL Example Application:

0-10VDC input, 0.0 to 100.0 display, relay 1 set for N.O. operation, activates on an increase to a display value of 80.0 after 5 sec. delay.
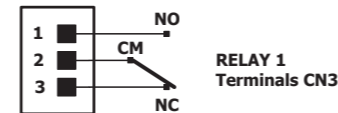
Note: For additional configuration information download the complete manual from www.AutomationDirect.com
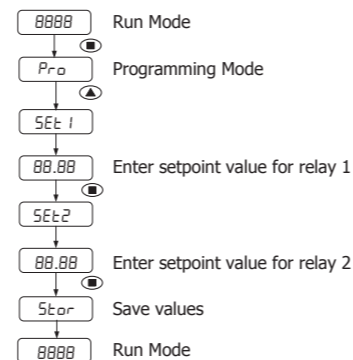
ENTER: Vertical displacement.
UP: Changes active digit.
SHIFT: Horizontal displacement.

`8888`	Run Mode
`Pro`	Programming Mode: If total parameter lock out has been enabled, dAtA will be displayed instead of Pro.
`InP`	Input menu
`ProC`	Process Input
`- U -`	Volt input
`I0U`	±10V range
`Stor`	Save values
`8888`	Run Mode

dSP Display menu
`SCAL` InP1 and InP2 values entered manually using programming keys
`InP1` Input signal value corresponding to desired display value dSP1
`8888` Enter 0 for this example
`dSP1` Display value corresponding to InP1
`8888` Enter 0 for this example
`88.88` Select desired decimal point position. xxx.x for this example
`InP2` Input signal value corresponding to desired display value dSP2
`8888` Enter 10.0 for this example
`dSP2` Display value corresponding to InP2
`8888` Enter 100.0 for this example
`StOr` Save values
`8888` Run Mode

SEtP Relay configuration menu
`SEt1` Relay 1 setpoint
`88.88` Enter setpoint 80.0 for this example
`Hi` Relay 1 activates on an increasing display value to setpoint.
`no` When Relay 1 is not activated, the normally open contact is open and the normally closed contact is closed.
`dLY` Relay 1 changes state at SET 1 setpoint after time delay
`00.0` Enter delay time of 5.0 sec for this example
`Stor` Save values
`8888` Run Mode

4-wire with external excitation

TERMINALS CN2   **TRANSDUCER** 0-10V
+OUT -OUT -EXC.+EXC.
+V
COM.
EXC.

Relay output wiring

1 NO
2 CM   **RELAY 1**
3 NC   Terminals CN3

Direct Access to Relay Setpoints (DPM2-AT-2RL-HL & DPM2L-AT-2RL-HL only)

`8888`	Run Mode
`Pro`	Programming Mode
`SEt1`	
`88.88`	Enter setpoint value for relay 1
`SEt2`	
`88.88`	Enter setpoint value for relay 2
`Stor`	Save values
`8888`	Run Mode

Quick start guide: DPM2-AT-HL, DPM2L-AT-HL, DPM2-AT-2R-HL, DPM2L-AT-2R-HL

Technical Specifications

Process Input	Range	Input Impedance	Resolution	Accuracy
	±20mA	<20Ω	2µA	±(0.1% rdg+15µA)
	±10V	2MΩ	1mV	±(0.1% rdg+6mV)
	±200V	2MΩ	20mV	±(0.1% rdg+0.1V)

Sensor Excitation	24V±3V@30mA

Potentiometer	Range	Maximum Measurement Current	Resolution	Accuracy
	100-100kΩ	<0.4mA	0.01% F.S.	±(0.1% rdg+0.05% F.S.)

Resistance				
	999.9Ω	2.3mA	0.1Ω	±(0.1% rdg+0.7Ω)
	9999Ω	230µA	1Ω	±(0.1% rdg+6Ω)
	50kΩ	23µA	10Ω	±(0.1% rdg+35Ω)

Temperature	RTD	Pt100 (3 wire)	Pt1000 (2 wire)
	Fixed Display Range / Resolution	-200.0°C to 800.0°C / 0.1°C; -200°C to 800°C / 1°C; -328.0°F to 999.9°F / 0.1°F; -328°F to 1472°F / 1°F	
	Measurement current	1mA	100µA
	Maximum resistance per wire	40Ω (balanced)	-
	Linearization	IEC 60751	
	Coefficient	0.00385	
	Accuracy	±(0.15% rdg+0.5°C), t<-50°C ±(1% rdg+0.5°C); ±(0.15% rdg+0.9°F), t<-58°F ±(1% rdg+0.9°F)	

Temperature	Thermocouple	J	K	T	N
	Fixed Display Range / Resolution	-150.0°C to 999.9°C / 0.1°C; -150°C to 1100°C / 1°C; -238.0°F to 999.9°F / 0.1°F; -238°F to 2012°F / 1°F	-150.0°C to 999.9°C / 0.1°C; -150°C to 1200°C / 1°C; -238.0°F to 999.9°F / 0.1°F; -238°F to 2192°F / 1°F	-150.0°C to 400.0°C / 0.1°C; -150°C to 400°C / 1°C; -238.0°F to 752.0°F / 0.1°F; -238°F to 752°F / 1°F	-150.0°C to 999.9°C / 0.1°C; -150°C to 1300°C / 1°C; -238.0°F to 999.9°F / 0.1°F; -238°F to 2372°F / 1°F
	Cold junction compensation range	-10°C to 60°C (14°F to 140°F)			
	Accuracy	±(0.1% rdg+0.6°C); ±(0.1% rdg+1.1°F)	±(0.2% rdg+0.8°C); ±(0.2% rdg+1.5°F)	±(0.1% rdg+0.6°C); ±(0.1% rdg+1.1°F)	

Conversion	Technique	Sigma-Delta
	Resolution	±16 bits
	Conversion rate	20 times per second

Display	Range	-9999 to +9999 (-1999 to +9999 for large display models), selectable decimal point position
	Type	4 digit, 14mm (0.55") or 20mm (0.79"), red
	LEDs	Relay 1, Relay 2
	Display refresh rate	50ms
	Display / Input overrange indication	"-0UE" , "0UE"

Accuracy Conditions	Temperature coefficient	100 ppm/°C
	Warm-up time	5 minutes
	Temperature	23°C±5°C

Relays (DPM2-AT-2RL-HL & DPM2L-AT-2RL_HL only)	2 Relays 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 @ 1A; Contact type..........SPDT; Operate time..........≤10ms

Power Supply and Fuses	20-265VAC 50/60 Hz or 11-265VDC (Recommended fusing 3A/250V, DIN 41661)

Power Consumption	3W

Filter	Cutoff frequency (-3dB)	7.3Hz to 0.2Hz
	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 Approval	CE

Video Link

Scan or click the QR code for a series of Configuration and Programming videos for the ProSense DMP Series Panel Meters