TD-503E & TD-503T

Signal Processor & Controller 5 Digit, 3 Display 0.31" LEDs in a 1/8 DIN Case

A powerful, intelligent, 5-digit, 3-display modular signal processor and controller with advanced software features for monitoring, measurement, control, and communication applications in a 48x96 mm case.

General Features

- Modular construction with interchangeable input and output modules.
- 3 displays with optional red, green, or superbright red 7-segment, 8 mm (0.31") high LEDs.
- Friendly front panel or PC programming.
- Supplier developed PC software for meter programming via a PC (serial output module required).
- Intuitive, user friendly calibration procedures.
- On demand functions from the program button.
- 4 input channels for multi-channel processing.
- Up to 7 digital inputs (external contact closures and logic level inputs).
- More than 100 input signal conditioner modules available.
- Built-in 5 / 10 / 24 V DC sensor excitation voltage in selected input modules.
- Auto-sensing high or optional low voltage AC / DC power supply.
- Serial output communications port (RS-232 / RS-485 / ModBus / Ethernet / DeviceNet).
- Isolated analog output (programmable for 0 / 4 to 20 mA, 0 to 10 VDC.
- Dual totalizers processing independent signals.
- 6 independent programmable setpoints.
- Programmable front panel setpoint annunciator LEDs.
- Setpoint tracking.
- Setpoints activated from any register in the meter.
- Setpoints activated from digital inputs.
- Up to 6 independent programmable electromechanical or 4 solid state relays, or 22 opto-isolated 1/0s on a plug-in module.
- Relay latching.
- Manual relay reset.
- Hysteresis / Deviation / PID control.
- 7 relay timer modes.
- Custom programming using supplier or customer developed macro written in meterBASIC.
- Code blanking. Make your OEM meter perform complex functions but appear simple to use by hiding set-up codes, etc.
- Display text editing. Customize display text for OEM applications.
- Smart digital filtering and programmable input averaging with averaging window for quick response time to large signal changes.
- Internal program safety lockout switch to prevent tampering.
- Peak and valley retention.
- Data logging within the meter (up to 4000 samples depending on date / time stamp).
- Autozero maintenance.
- Eight-level display and annunciator brightness control.
- Optional NEMA-4 front cover.

Table of Contents

Two-point Calibration

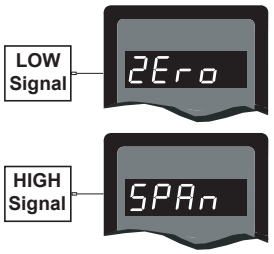
Two-point calibration is the most commonly used method of calibrating 320 Series meters when a low and high input source is available.

Example Calibration Procedure

Calibrate channel 1 (CH1) using the two-point calibration method. Set the calibration mode display to **[111]**.

The low input source is applied to the meter when setting the zero value.

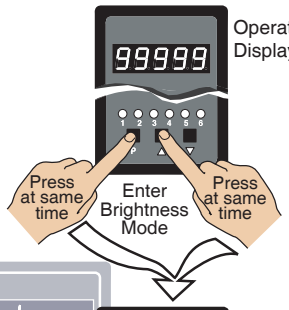
The high input source is applied to the meter when setting the span value.



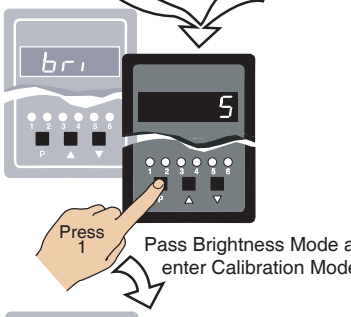
START HERE

TWO-POINT CALIBRATION

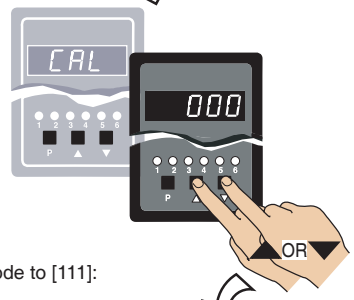
Step 1



Step 2

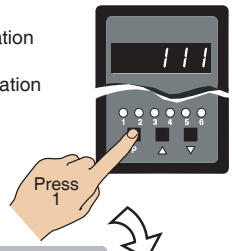


Step 3



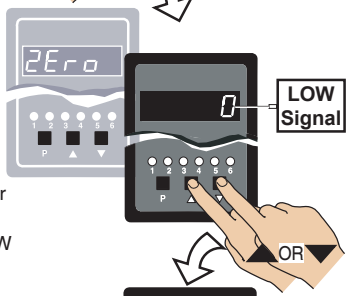
Set Calibration Mode to [111]:
1st Digit = 1
Selects calibration procedures
2nd Digit = 1
Selects 2-point calibration
3rd Digit = 1
Selects CH1 for calibration

Step 4



Enter Cal Mode [111]
For 2-point calibration
of CH1

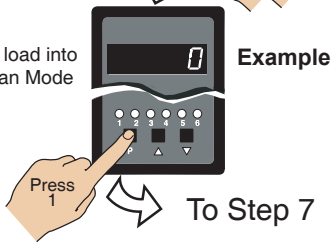
Step 5



5.1. Adjust display to desired reading for zero input

5.2. Apply the LOW input signal

Step 6

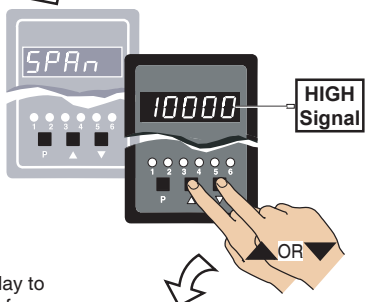


Set reading for zero load into meter and enter Span Mode

To Step 7

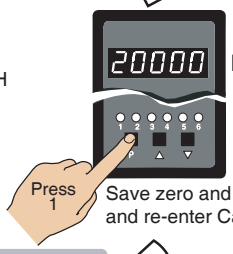
From Step 6

Step 7

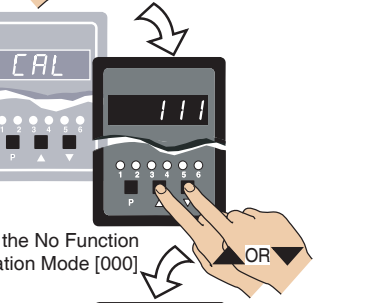


7.1. Adjust display to desired reading for span input

7.2. Apply the HIGH input signal

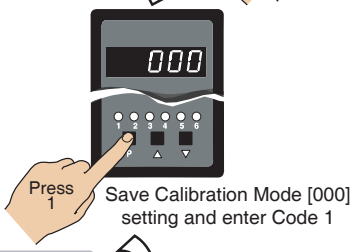


Step 8

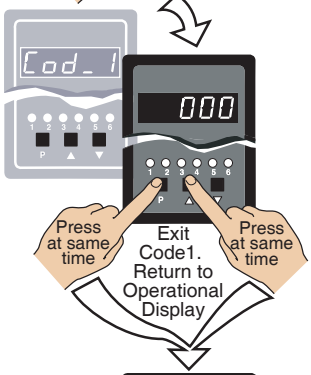


Step 9

Select the No Function Calibration Mode [000]



Step 10



Step 11

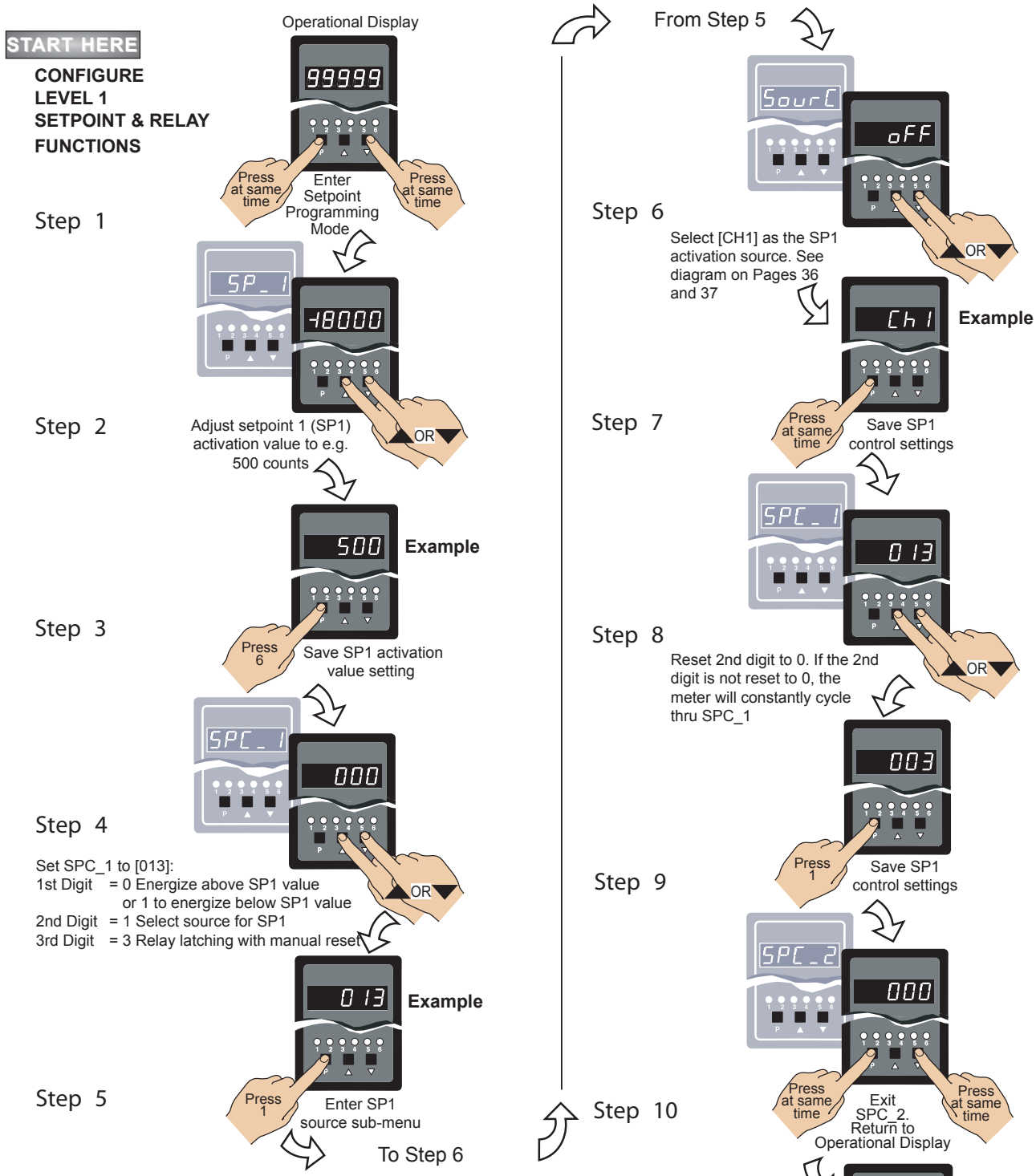
Setpoint Programming Mode – Programming Procedures

Example Procedure:

The following procedure describes how to program setpoint 1 (SP1) for the following **Level 1** setpoint and relay functions:

- SP1 to activate from Channel 1 (CH1).
- Relay to energize above or below SP1 value.
- Relay to latch with manual relay reset.

See *Setpoints and Relays Supplement (NZ201)* for procedures to program all setpoint and relay operational levels (Level 1 to Level 3).



Programming tip

All required setpoint activation values (SP1 to SP6) can be adjusted before programming setpoint and relay control function settings. See *Setpoint Programming Mode Logic Diagram* on Page 34.

Setpoint & Relay Control Settings Diagram

The diagram below and continued on Page 35 shows the 1st, 2nd, and 3rd digit control settings for the setpoints and relays.

FIRST DIGIT

Relay Energize Function

0 Energized ABOVE setpoint value.

1 Energized BELOW setpoint value.

2 Energized ABOVE setpoint value with FALLING INPUT SIGNAL INITIAL START-UP INHIBIT.

3 Energized BELOW setpoint value with RISING INPUT SIGNAL INITIAL START-UP INHIBIT.

SECOND DIGIT

SP Activation Source

0 Activate Setpoint Source from Selected Register

1 Select Source for Setpoint

Note:
[X1X] is a register selection procedure only. To finish, reset to [X0X] to activate the selection, or reset to 2-7 as required for digital input selection.

2 Digital Input – Capture Pin
3 Digital Input – D1
4 Digital Input – D2
5 Digital Input – D3
6 HOLD Pin
7 LOCK Pin

THIRD DIGIT

SP Delay & Timing Functions

0 No Latching
1 Relay Latched
2 Manual Relay Reset
3 Relay Latched with Manual Relay Reset
4 Relay Latched Off

5 Hysteresis, Deviation & PID Mode → **See Set Up Hysteresis, Deviation & PID Mode Settings below**

6 Timer Modes:
- Normal Delay.
- Repeat ON.
- Pulse ON.
- 1-Shot ON.
- Repeat OFF.
- Pulse OFF.
- 1-Shot OFF.

→ **Go to Page 35**

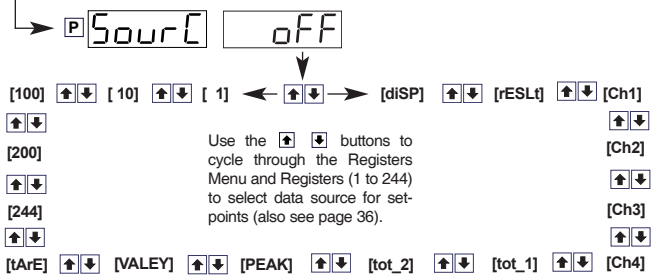
Note:
In PID mode, all Timer Modes on SP1 set in [XX6] are not functional.

7 Advanced Functions Mode:
- Reset Trigger.
- Reset Destination.
- Reset Mode.
- Reset Constant.
- Trigger Print from SP.
- Trigger Log from SP.
- Annunciator Flashing & SP Tracking.

Note:
[XX5], [XX6], and [XX7] are set up procedure settings only. To finish, reset to 0-4 as required for setpoint latching and relay reset modes.

→ **Go to Page 35**

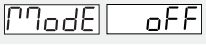
Select Source for Setpoint Functions

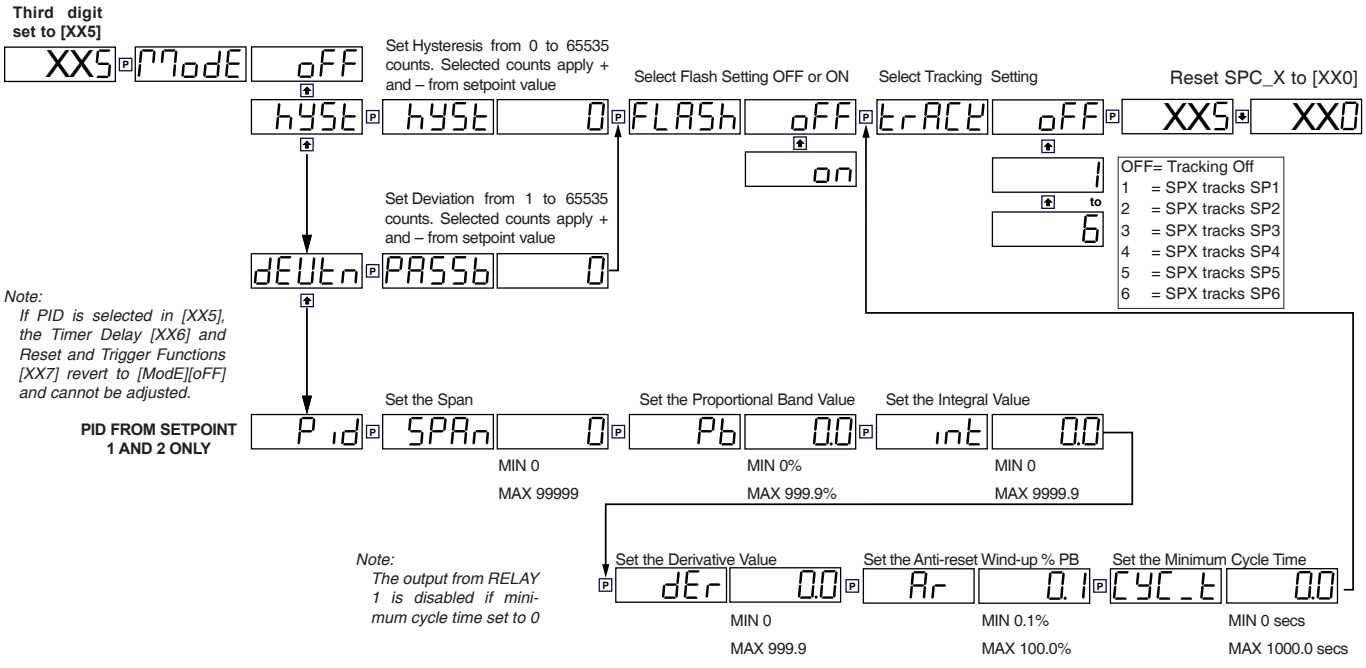


Set Up Hysteresis, Deviation & PID Mode Settings

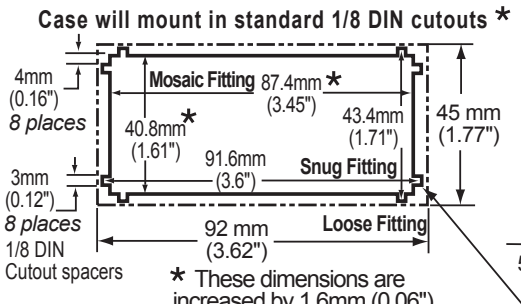
Programming Tip

If you do not require any of the functions in this mode, ensure it is set to:



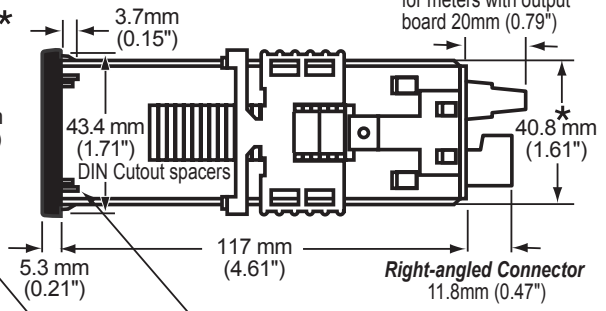


PANEL CUTOUT



* These dimensions are increased by 1.6mm (0.06") when the ***metal surround case*** is installed.

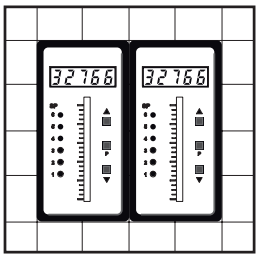
SIDE VIEW



Straight-thru Connector for meters with output board 20mm (0.79")

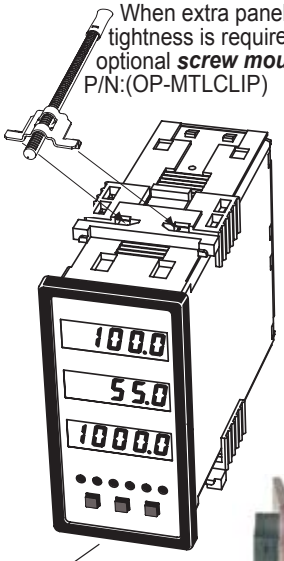
Right-angled Connector 11.8mm (0.47")

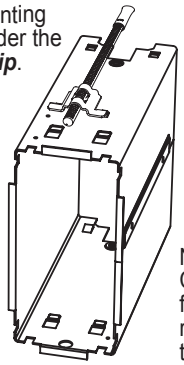
For extra strength in portable applications, the 8 DIN spacers should be snipped off and the **Mosaic fitting** cutout used. Alternatively, the **High Strength Panel Mounting Kit** (Part # OP-PMA96X48) can be used.



The 96x48mm case is particularly suitable for mounting in mosaic panels or insulative panels up to 2" thick. They can also stack mount, 2 up in existing cutouts for 1/4 DIN (96x96mm) or 4 up in 1/2 DIN (96X192mm).

When extra panel mounting tightness is required, order the optional ***screw mount clip***. P/N:(OP-MTLCLIP)



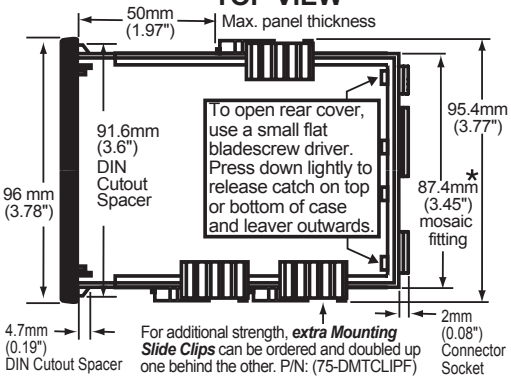


Metal Surround Case uses ***Metal Screw Mount Clips*** and has a max. panel thickness mounting of 15.5 mm (0.61").

NOTE: The Metal Surround Case is pre-installed at the factory and cannot be removed without damage to the case.

Metal Surround Case
(P/N: OP-MTL96X48)

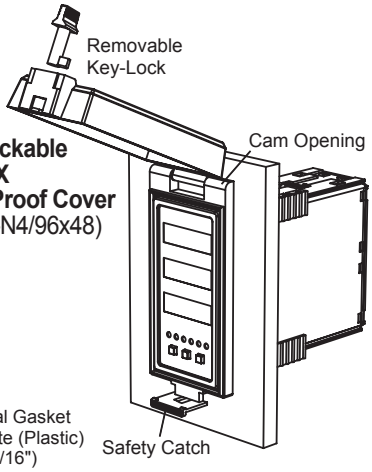
TOP VIEW



Various bezel colors are available. Black is standard.

Panel adaptor plates are available to retrofit most existing panel cutouts.

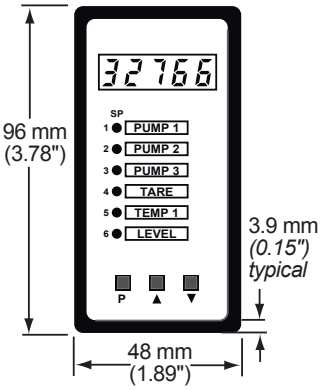
High Strength Panel Mounting Kit
P/N: OP-PMA96X48



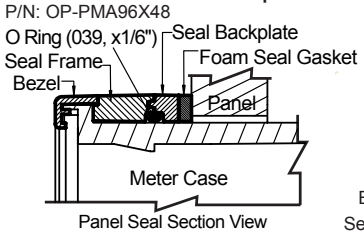
Clear Lockable NEMA 4X Splash Proof Cover
P/N:(OP-N4/96x48)

FRONT VIEW

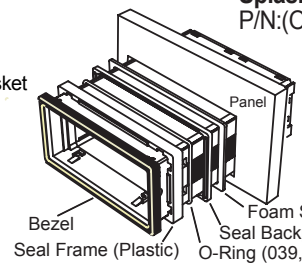
1/8 DIN 48x96mm



96x48 Panel to Case Seal Adaptor Kit
P/N: OP-PMA96X48



Panel Seal Section View



WARRANTY

The supplier warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from date of shipment. The supplier's obligations under this warranty are limited to replacement or repair, at its option, at its factory, of any of the products which shall, within the applicable period after shipment, be returned to The supplier's facility, transportation charges pre-paid, and which are, after examination, disclosed to the satisfaction of The supplier to be thus defective. The warranty shall not apply to any equipment which shall have been repaired or altered, except by The supplier, or which shall have been subjected to misuse, negligence, or accident. In no case shall The supplier's liability exceed the original purchase price. The aforementioned provisions do not extend the original warranty period of any product which has been either repaired or replaced by The supplier.

USER'S RESPONSIBILITY

We are pleased to offer suggestions on the use of our various products either by way of printed matter or through direct contact with our sales/application engineering staff. However, since we have no control over the use of our products once they are shipped, NO WARRANTY WHETHER OF MERCHANTABILITY, FITNESS FOR PURPOSE, OR OTHERWISE is made beyond the repair, replacement, or refund of purchase price at the sole discretion of The supplier. Users shall determine the suitability of the product for the intended application before using, and the users assume all risk and liability whatsoever in connection therewith, regardless of any of our suggestions or statements as to application or construction. In no event shall The supplier's liability, in law or otherwise, be in excess of the purchase price of the product.

The supplier cannot assume responsibility for any circuitry described. No circuit patent licenses are implied. The supplier reserves the right to change circuitry, specifications, and prices without notice at any time.

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