



Model 100A02
4-digit Panel Meter / Controller
Installation and Operating Manual

**For assistance with the operation of this product,
contact PCB Piezotronics, Inc.**

Toll-free: 800-828-8840
24-hour SensorLine: 716-684-0001
Fax: 716-684-0987
E-mail: info@pcb.com
Web: www.pcb.com



Repair and Maintenance

PCB guarantees Total Customer Satisfaction through its “Lifetime Warranty Plus” on all Platinum Stock Products sold by PCB and through its limited warranties on all other PCB Stock, Standard and Special products. Due to the sophisticated nature of our sensors and associated instrumentation, **field servicing and repair is not recommended and, if attempted, will void the factory warranty.**

Beyond routine calibration and battery replacements where applicable, our products require no user maintenance. Clean electrical connectors, housings, and mounting surfaces with solutions and techniques that will not harm the material of construction. Observe caution when using liquids near devices that are not hermetically sealed. Such devices should only be wiped with a dampened cloth—never saturated or submerged.

In the event that equipment becomes damaged or ceases to operate, our Application Engineers are here to support your troubleshooting efforts 24 hours a day, 7 days a week. Call or email with model and serial number as well as a brief description of the problem.

Calibration

Routine calibration of sensors and associated instrumentation is necessary to maintain measurement accuracy. We recommend calibrating on an annual basis, after exposure to any extreme environmental influence, or prior to any critical test.

PCB Piezotronics is an ISO-9001 certified company whose calibration services are accredited by A2LA to ISO/IEC 17025, with full traceability to SI through N.I.S.T. In addition to our standard calibration services, we also offer specialized tests, including: sensitivity at elevated or cryogenic temperatures, phase response, extended high or low frequency response, extended range, leak testing, hydrostatic pressure testing, and others. For more information, contact your local PCB Piezotronics distributor, sales representative, or factory customer service representative.

Returning Equipment

If factory repair is required, our representatives will provide you with a Return Material Authorization (RMA) number, which we use to reference any information you have already provided and expedite the repair process. This number should be clearly marked on the outside of all returned package(s) and on any packing list(s) accompanying the shipment.

Contact Information

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3425 Walden Ave.
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Toll-free: (800) 828-8840
24-hour SensorLine: (716) 684-0001
General inquiries: info@pcb.com
Repair inquiries: rma@pcb.com

For a complete list of distributors, global offices and sales representatives, visit our website, www.pcb.com.

Safety Considerations

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the precautions required to avoid injury. While our equipment is designed with user safety in mind, the protection provided by the equipment may be impaired if equipment is used in a manner not specified by this manual.

Discontinue use and contact our 24-Hour Sensorline if:

- Assistance is needed to safely operate equipment
- Damage is visible or suspected
- Equipment fails or malfunctions

For complete equipment ratings, refer to the enclosed specification sheet for your product.

Definition of Terms and Symbols

The following symbols may be used in this manual:



DANGER

Indicates an immediate hazardous situation, which, if not avoided, may result in death or serious injury.

**CAUTION**

Refers to hazards that could damage the instrument.

**NOTE**

Indicates tips, recommendations and important information. The notes simplify processes and contain additional information on particular operating steps.

The following symbols may be found on the equipment described in this manual:



This symbol on the unit indicates that high voltage may be present. Use standard safety precautions to avoid personal contact with this voltage.



This symbol on the unit indicates that the user should refer to the operating instructions located in the manual.



This symbol indicates safety, earth ground.



PCB工业监视和测量设备 - 中国RoHS2公布表

PCB Industrial Monitoring and Measuring Equipment - China RoHS 2 Disclosure Table

| 部件名称 | 有害物质 | | | | | |
|--|--------|--------|--------|--------------|------------|--------------|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 住房 | 0 | 0 | 0 | 0 | 0 | 0 |
| PCB板 | X | 0 | 0 | 0 | 0 | 0 |
| 电气连接器 | 0 | 0 | 0 | 0 | 0 | 0 |
| 压电晶体 | X | 0 | 0 | 0 | 0 | 0 |
| 环氧 | 0 | 0 | 0 | 0 | 0 | 0 |
| 铁氟龙 | 0 | 0 | 0 | 0 | 0 | 0 |
| 电子 | 0 | 0 | 0 | 0 | 0 | 0 |
| 厚膜基板 | 0 | 0 | X | 0 | 0 | 0 |
| 电线 | 0 | 0 | 0 | 0 | 0 | 0 |
| 电缆 | X | 0 | 0 | 0 | 0 | 0 |
| 塑料 | 0 | 0 | 0 | 0 | 0 | 0 |
| 焊接 | X | 0 | 0 | 0 | 0 | 0 |
| 铜合金/黄铜 | X | 0 | 0 | 0 | 0 | 0 |
| 本表格依据 SJ/T 11364 的规定编制。 | | | | | | |
| 0：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。 | | | | | | |
| X：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。 | | | | | | |
| 铅是欧洲RoHS指令2011/65/ EU附件三和附件四目前由于允许的豁免。 | | | | | | |

CHINA RoHS COMPLIANCE

| Component Name | Hazardous Substances | | | | | |
|------------------------|----------------------|--------------|--------------|--------------------------------|--------------------------------|---------------------------------------|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Chromium VI Compounds (Cr(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) |
| Housing | O | O | O | O | O | O |
| PCB Board | X | O | O | O | O | O |
| Electrical Connectors | O | O | O | O | O | O |
| Piezoelectric Crystals | X | O | O | O | O | O |
| Epoxy | O | O | O | O | O | O |
| Teflon | O | O | O | O | O | O |
| Electronics | O | O | O | O | O | O |
| Thick Film Substrate | O | O | X | O | O | O |
| Wires | O | O | O | O | O | O |
| Cables | X | O | O | O | O | O |
| Plastic | O | O | O | O | O | O |
| Solder | X | O | O | O | O | O |
| Copper Alloy/Brass | X | O | O | O | O | O |

This table is prepared in accordance with the provisions of SJ/T 11364.

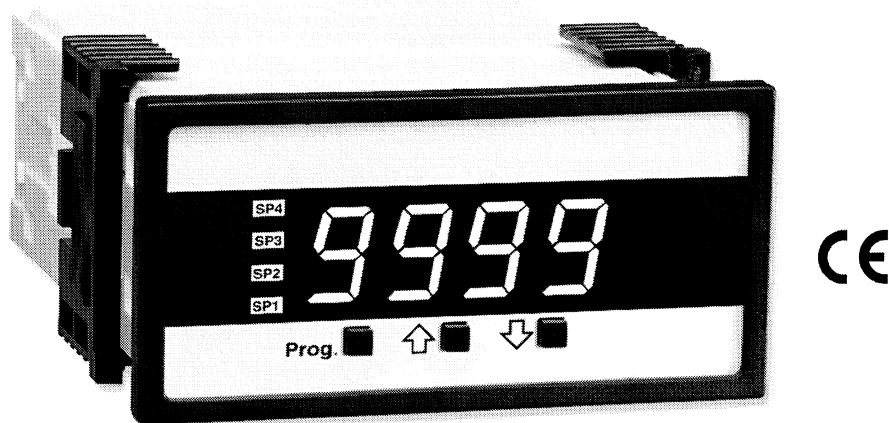
O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: Indicates that said hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement of GB/T 26572.

Lead is present due to allowed exemption in Annex III or Annex IV of the European RoHS Directive 2011/65/EU.



Model 100A02 Indictor / Power Supply Panel Meter



Operating Guide with Enclosed Warranty Information

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MANUAL NUMBER: 30233
MANUAL REVISION: NR
ECN NUMBER:

Table of Contents

| | |
|--|----------------|
| <i>Introduction.....</i> | <i>Page 3</i> |
| <i> General Features, Software Features</i> | |
| <i>Specifications.....</i> | <i>Page 4</i> |
| <i>Controls and Indicators.....</i> | <i>Page 6</i> |
| <i>Glossary of Programming Symbols.....</i> | <i>Page 7</i> |
| <i>Software Logic Tree.....</i> | <i>Page 8</i> |
| <i>Programming the 100A02.....</i> | <i>Page 9</i> |
| <i>Wiring and Installation.....</i> | <i>Page 15</i> |
| <i>Accessories.....</i> | <i>Page 18</i> |
| <i>ESD Sensitivity.....</i> | <i>Page 20</i> |
| <i>Ordering Information.....</i> | <i>Page 21</i> |

Warranty/Serviceing

| | |
|--|----------------|
| <i>Warranty, Service & Return Procedure.....</i> | <i>Page 22</i> |
| <i>Customer Service</i> | <i>Page 23</i> |

Introduction

The Model 100A02 Indicator / Power Supply is an intelligent 4-digit modular panel meter with software features for monitoring, measurement, and control applications complete with 0.56" LED in a 1/8 DIN 96x48 case. The 100A02 operates from a single power supply and will supply 24Vdc Excitation for sensor power, and accept a 0-20 VDC input signal. The 100A02 may be ordered to accept a 4-20 mA input signal with 24 VDC Excitation.

General Features

- External transmitters, signal conditioners, or power supplies can be eliminated by direct connection of the sensor to the indicator/controller.
- Optional isolated 16 bit analog output. User or factory scalable to 4 to 20 mA across any desired digital span from \pm one count to the full scale range of – 1999 to 9999 (12000 counts).
- Auto-sensing AC/DC power supply. For voltages between 85-265 V AC / 95-370 V DC
- 24 VDC excitation to power sensor.
- Standard red LED with display range –1999 to 9999 (12000 counts).
- Four annunciator LEDs provide front panel alarm status indication for up to four setpoints.
- Optional two 5 amp form A relays.
- Automatic intelligent averaging smoothes noisy signals, while providing a fast display response to real level changes.
- Programmable Time Delay to 9999 seconds. For set point/ relay thresholds.

Software Features

Three-button front panel programming of:

- Scale Factor
- Offset
- Decimal point setting.
- Four-level brightness control of digital display.
- Peak and valley. View and reset.
- Four programmable setpoints.
- Adjustable delay-on-make and delay-on-break time for setpoints 1 and 2.
- Relay activation can be selected to occur above (HI) or below (LO) each setpoint.
- Hysteresis setting for all four setpoints (if four relays are installed).

Specifications

- **Input Specs:** 0 to 20 VDC (option for 4-20 mA)
- **Excitation:** 24Vdc
- **A/D Converter:** 14 bit single slope
- **Accuracy:** $\pm 0.05\%$ of reading + 2 counts
- **Temp. Coeff.:** 100 ppm/ $^{\circ}\text{C}$ (Typical)
- **Warm up time:** 2 minutes
- **Conversion Rate:** 5 conversions per second (Typical)
- **Display:** 4 digit 0.56" Red LED display, Range –1999 to 9999 counts.
- **Polarity:** Assumed positive. Displays – negative
- **Decimal Selection:** Front panel button selectable, X•X•X•X•
- **Positive Overrange:** Top segments of digital display flash
- **Negative Overrange:** Bottom segment of digital display flash
- **Optional Relay Output:** Two 5 A Form A (SPST) relays 230VAC/30VDC standard.
- **Optional Analog Output:** Isolated 16 bit user scalable 4-20mA retransmit @ 0 to 500 ohms max loop resistance.
- **Power Supply:** Auto sensing wide range supply 85-265 VAC / 95-370 VDC @ 2.5W max 3.5W
- **Operating Temp.:** 0 to 60 $^{\circ}\text{C}$
- **Storage Temp:** –20 $^{\circ}\text{C}$ to 70 $^{\circ}\text{C}$.
- **Relative Humidity:** 95% (non condensing)
- **Case Dimensions:** 1/8 DIN, Bezel: 96x48 mm (3.78"x1.89")
Depth behind bezel 117 mm (4.61")
Plus 11.8 mm (0.47") for Right-angled connectors, or plus 20 mm (0.79") for Straight-thru connectors.
- **Weight:** 6.5 oz., 8.5 oz when packed

Please Note:

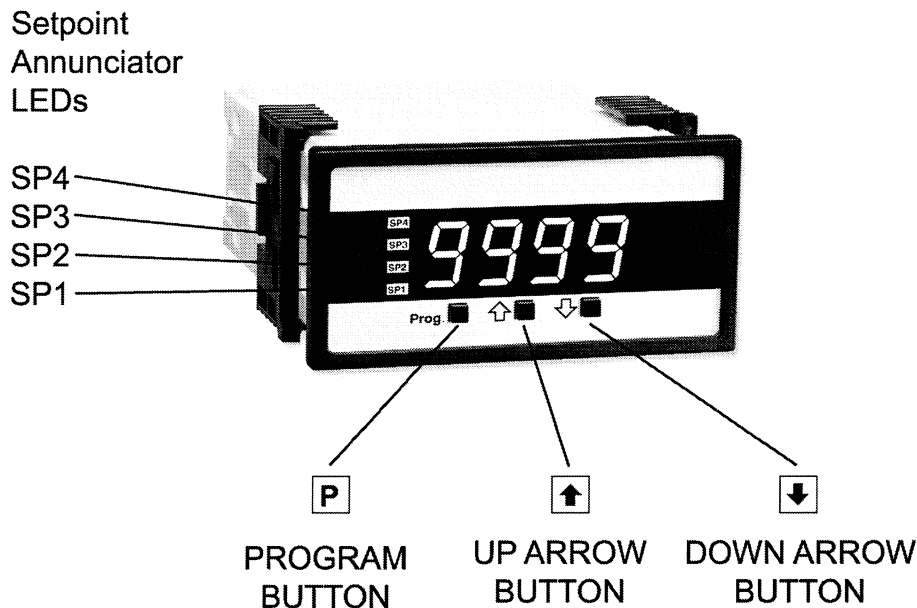
Units are equipped with a 4-digit display, capable of '9999' maximum counts for a 20VDC input (or 20mA input, if specifically ordered as such).

If ordered, PCB Piezotronics, Inc., will set the offset and fullscale range to match a specific sensor (see Two Point Analog Output Range Settings under 'Digital Scaling Procedure' of this manual). In the case, where the output of the sensor exceeds the maximum digits available, the meter will be preset an order of magnitude lower. Example: If the sensor is 7500 psi = 5 Volt output (assume 30,000psi = 20VDC), the meter will be preset to display '3000' at 20VDC. Hence, displaying '750' at 7500 psi. The same holds true for 4-20mA option.

As a rule of thumb, the following holds true:

- 5 Volt sensor output, 2500 pressure units maximum; else 1 order of magnitude lower
- 10 Volt sensor output, 5000 pressure units maximum; else 1 order of magnitude lower
- 4-20mA sensor output, 9999 pressure units maximum; else 1 order of magnitude lower

Controls and Indicators



Front Panel Buttons

- **Program Button**

The **P** button is used to move from one program step to the next. When pressed at the same time as the **↑** button, it initiates the **calibration mode**. When pressed at the same time as the **↓** button, it initiates the **setpoint setting mode**.

- **Up Button**

When in the operational display, pressing the **↑** button alone, allows you to view and reset the Peak and Valley (Highest and Lowest Readings.)

When in **calibration mode** or the **setpoint setting mode** the **↑** button is used to increase the value of the displayed parameter.

- **Down Button**

When in the operational display, pressing the **↓** button alone allows you to view, but not change, the setting of setpoint 1,2,3,& 4.

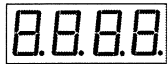
When in **calibration mode** or the **setpoint setting mode** the **↓** button is used to decrease the value of the displayed parameter.

Glossary of Programming Symbols

To explain software-programming procedures, logic diagrams are used to visually assist in following the programming steps. The following symbols are used to represent various functions and associated display elements of the 100A02:

Symbol

Explanation



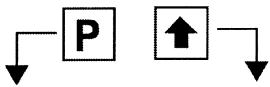
This symbol represents the OPERATIONAL DISPLAY.

Symbol

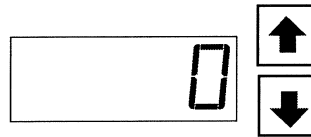
Explanation







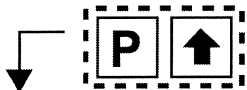
Text or numbers shown between square brackets in a procedure indicate the programming code name of the function or the value displayed on the meter display.



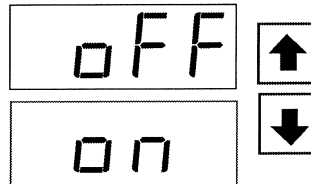
When a button is shown, press and release it to go onto the next step in the direction indicated by the arrow. When two or more buttons are shown, each with an arrow, this indicates there are a number of programming choices.







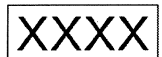
When the  and  buttons are shown together, the display value can be increased by pressing and releasing the  button or decreased by pressing and releasing the  button.



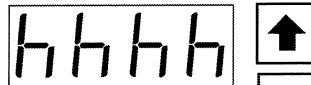
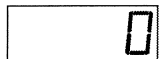
When two buttons are shown side by side and enclosed by a dotted line, they must be pressed at the same time then released to go onto the next programming step.



When the  and  buttons are shown with two displays, either display can be selected by pressing and releasing the  or  buttons.





If the display is shown with XXXX it means the value displayed will be the previously set value. When a number is shown it indicates the initial factory default setting or a specific "example number."

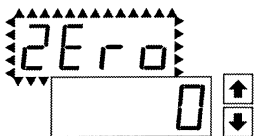


[LhLh]

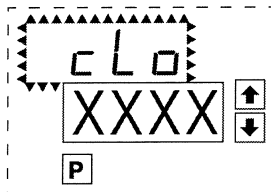
[hLhL]

[LLLL]




When there are more than two display selections they are shown in brackets below the first display and are also selectable by pressing and releasing the  or  buttons.



When two displays are shown together with bursts, this indicates that the display is toggling (flashing) between the name of the function and the value.

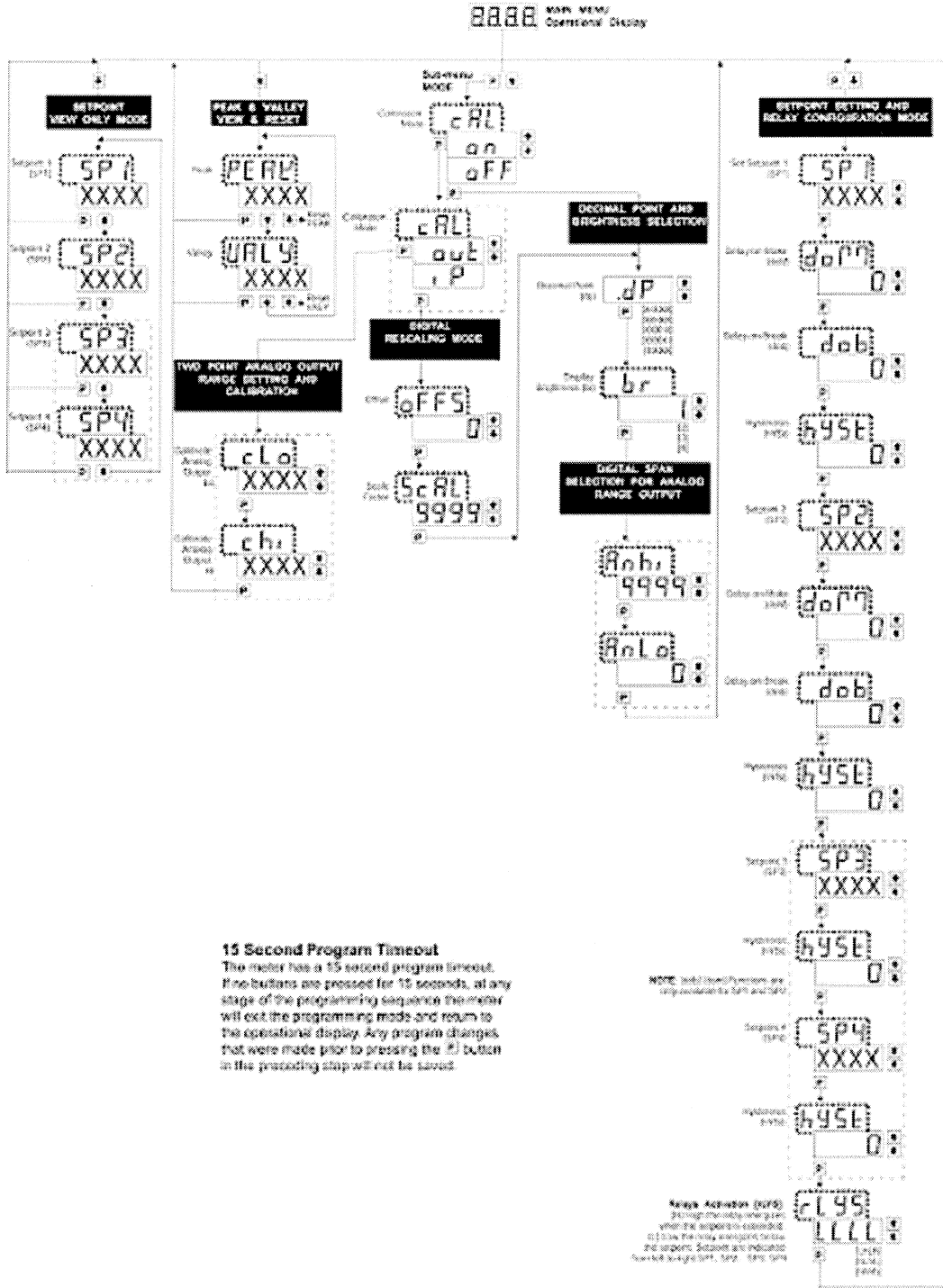


A dotted box indicates these functions are omitted or bypassed when the related hardware is not present.

 is the PROGRAM button,  is the UP button,  is the DOWN button.

Software Logic Tree

operation, as shown below in the software logic tree. After the meter has been powered up, the four digits light up for three seconds and then settle to the operational display indicating the input signal.



15 Second Program Timeout
 The meter has a 15 second program timeout. If no buttons are pressed for 15 seconds, at any stage of the programming sequence the meter will exit the programming mode and return to the operational display. Any program changes that were made prior to pressing the [R] button in the preceding step will not be saved.

NOTE: valid character functions are only available for SP1 and SP2.

Single Activation (SPS)
 Pressing the right arrow key when the setup is complete will allow the user to skip the next step and return to the operational display.

Programming the 100A02

Digital Scaling

The 100A02 meter may be rescaled without applying an external signal by changing the Offset and Scale factor.

Offset is the reading that the meter will display for a zero input. The Offset may be set to any value from -1999 to +9999. The default value of the Offset is 0.

Scale factor is the gain of the meter. The displayed reading is directly proportional to the Scale factor. The default value of the Scale factor is 2000, but it may be set to any value between -1999 and +9999.

For an input of 20V (or 20mA if current input option) a calibrated meter will read 2000 with the default Scale factor of 2000, 1000 with a Scale factor of 1000, and 500 with a Scale factor of 500.

Digital Scaling Procedure

STEP A Enter the Calibration Mode

- 1) Press the **P** and the **↑** buttons at the same time. Display toggles between [cAL] and [oFF].
- 2) Press the **↑** or **↓** button. Display changes from [oFF] to [on].
- 3) Press the **P** button. Display toggles between [cAL] and [out].

STEP B Select Between Calibration of Input or Output

Note: If the analog output option is not present, Step B is skipped and the program goes directly from Step A to Step C.

- 1) Press the **↑** or **↓** button to select the display toggling from [cAL] to [iP].
- 2) Press the **P** button. Display toggles between [oFFS] and the previous offset setting.

STEP C Set the Offset on the Digital Display

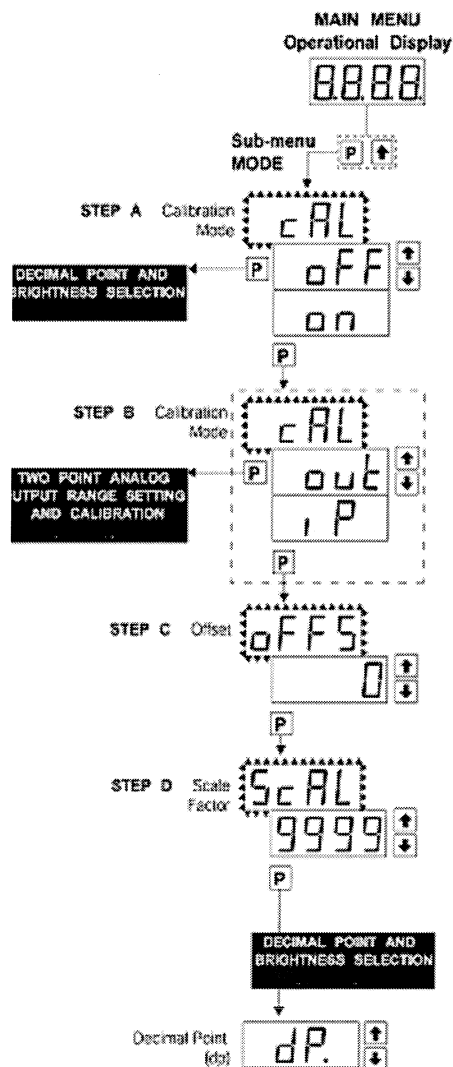
- 1) Using the **↑** and **↓** buttons, adjust the digital display to the desired offset. This is the reading the meter will display for a zero input. (Factory Default is 0)
- 2) Press the **P** button. Display toggles between [SCAL] and the previous scale factor.

STEP D Set the Scale factor on the Digital Display

- 1) Using the **↑** and **↓** buttons, adjust the meter display to the desired Scale factor. The default value is 2000, for which a 20V input will read 2000. If the Scale factor is changed the display will change proportionally. Therefore if the Scale factor is changed to 1000 then for the same 20V input the display will read 1000.
- 2) Press the **P** button.

The Digital Calibration Procedure Mode is Now Complete.

The menu branches to the DECIMAL POINT AND BRIGHTNESS SELECTION, (see page 10) and the display flashes [dP] and the previous decimal point selection.



Two Point Analog Output Range Setting and Calibration

STEP A Enter the Calibration Mode

- 1) Press the **P** and the **↑** buttons at the same time. Display toggles between [cAL] and [oFF].
- 2) Press the **↑** or **↓** button. Display changes from [oFF] to [on].
- 3) Press the **P** button. Display toggles between [cAL] and [out].

Note: If at this point the display skips directly to toggle between [oFFS] and the previous [oFFS] setting, the software is detecting that the optional analog output hardware is NOT installed.

STEP B Enter the Analog [oUT] Output Mode

- 1) Press the **P** button. Display toggles between [cLo] and internal scale factor.

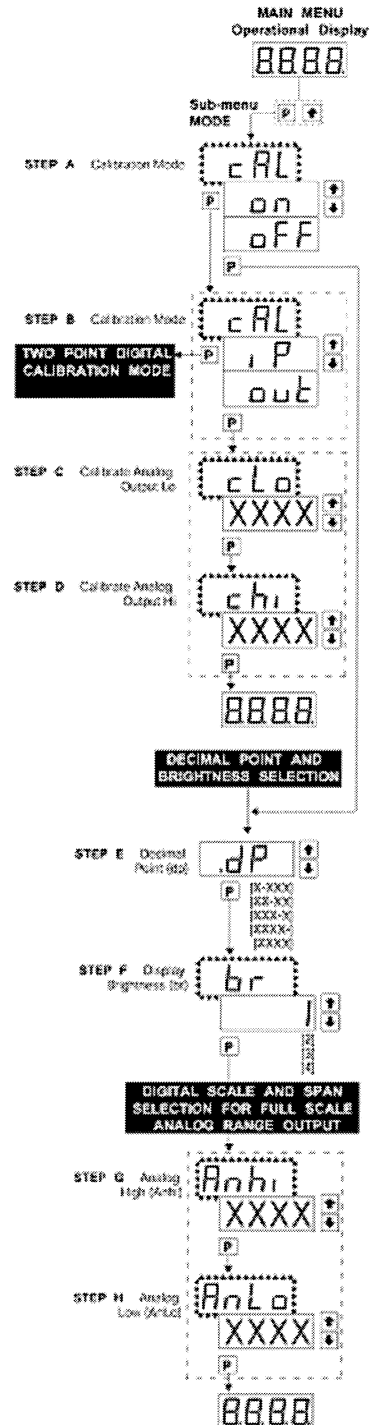
STEP C Set or Calibrate the [cLo] Low Analog Output Range

- 1) Connect a multimeter to pins 16 and 17 on the output module. Using the **↑** and **↓** buttons, adjust the analog output to the desired low value as shown on the multimeter display. cLo may be adjusted to any value from -0.3mA to 17mA.
- 2) Press the **P** button. Display toggles between [cHi] and internal scale factor.

STEP D Set or Calibrate the [cHi] Analog Output Range

- 1) Using the **↑** and **↓** buttons, adjust the analog output to the desired high value as shown on the multimeter display. cHi may be adjusted to any value from 17mA to 21mA.
- 2) Press the **P** button. The display exits the calibration mode and returns to the operational display.

Note: Having established the Low and High range of the analog output, the digital span can now be selected which will set the two digital points between which the analog output will occur. (See Digital Span selection next page).



Decimal Point and Brightness Selection

STEP A Enter the Decimal Point and Brightness Mode Through the Sub Menu [CAL]{oFF}

- 1) Press the **P** and the **↑** buttons at the same time. Display toggles between [cAL] and [oFF].
- 2) Press the **P** button. Display shows the previous [dp] selection.

STEP E Set the Decimal Point

- 1) Using the **↑** and **↓** buttons, adjust the display to the desired decimal point setting.
- 2) Press the **P** button. Display toggles between [Br] and the previous [Br] setting.

STEP F Set the Display Brightness

- 1) Using the **↑** and **↓** buttons, adjust the display to the desired brightness setting (4 is the brightest setting).
- 2) Press the **P** button. Display brightness changes to new setting and display toggles between [Anhi] and the previous [Anhi] setting.

Digital Span Selection for Analog Range Output

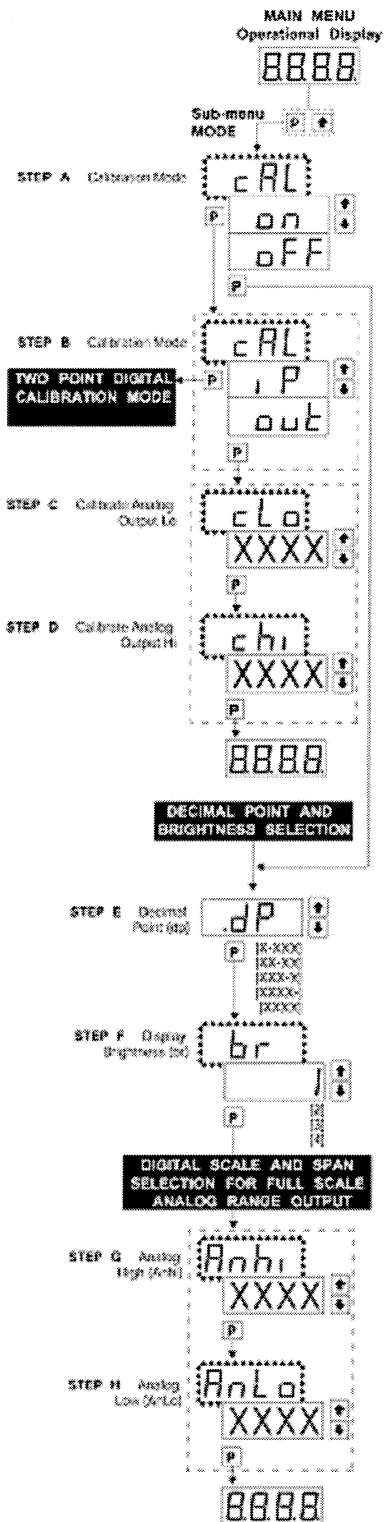
STEP G Setting the Digital Span Point for Analog High Output

- 1) Using the **↑** and **↓** buttons, adjust the display to the desired digital value which sets the point at which the selected analog high output range will occur.
- 2) Press the **P** button. Display toggles between [AnLo] and the previous [AnLo] setting.

STEP H Setting the Digital Span Point for Analog Low Output

- 1) Using the **↑** and **↓** buttons, adjust the display to the desired digital value which sets the point at which the selected analog low output range will occur.
- 2) Press the **P** button. The display exits the calibration mode and returns to the operational display.

Note: Any two digital scale points from -1999 to 9999 can be selected. The digital scale points for analog high and analog low can be reversed for reversed 20-4mA output. The span of the digital scale can be as small as two counts however small spans cause the 16 bit D to A to increment in stair case steps.



Setpoint Setting and Relay Configuration Mode

The following programming steps are required to enter the setpoint values and configure the relay functions in a meter with two relays using two setpoints. Generally if no relays are installed the software auto detects the missing relays and deletes reference to them from the menu. In some cases setpoints without relays are operational for display purposes only.

STEP A Enter the Setpoint Mode

- 1) Press the **P** and **↓** buttons at the same time.
Display toggles between [SP1] and the previous [SP1] setting.

STEP B Setpoint1 (SP1)

- 1) Using the **↑** and **↓** buttons, adjust the display to the desired SP1 value.
- 2) Press the **P** button. Display toggles between [doM] and the previous [doM] setting.

STEP C Set the SP1 Delay-on-Make (doM) Delay Time Setting

- 1) Using the **↑** and **↓** buttons, adjust the display to the desired [doM] value (0 to 9999 seconds). The reading must continuously remain in an alarm condition until this delay time has elapsed before the relay will make contact (energize).
- 2) Press the **P** button. Display toggles between [dob] and the previous [dob] setting.

STEP D Set the SP1 Delay-on-Break (dob) Delay Time Setting

- 1) Using the **↑** and **↓** buttons, adjust the display to the desired [dob] value (0-9999 seconds). The reading must continuously remain in a non-alarm condition until this delay time has elapsed before the relay will break contact (de-energize).
- 2) Press the **P** button. Display toggles between [hYST] and the previous [hYST] setting.

STEP E Set the Hysteresis Setting for Setpoint 1

- 1) Using the **↑** and **↓** buttons, adjust the display to the desired hysteresis [hYST] value.
- 2) Press the **P** button. Display toggles between [SP2] and the previous [SP2] setting.

Note: Steps, F, G, H, and I have functionally the same procedure as steps B, C, D, and E shown above.

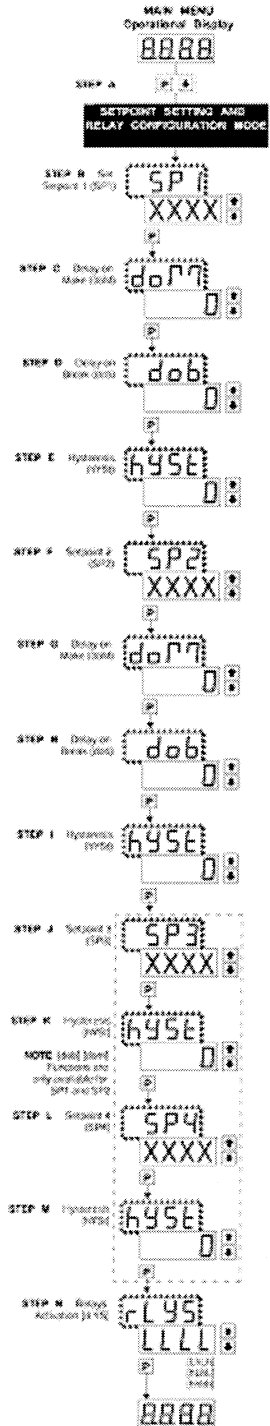
STEP F Set Setpoint 2 (SP2)

STEP G Set the SP2 Delay-on-Make (doM) Delay Time Setting

STEP H Set the SP2 Delay-on-Break (dob) Delay Time Setting



STEP I Set the Hysteresis Setting for Setpoint 2


- 1) Using the **↑** and **↓** buttons, adjust the display to the desired hysteresis [hYST] value.
- 2) Press the **P** button. Display toggles between [rLYS] and the previous relay setting.



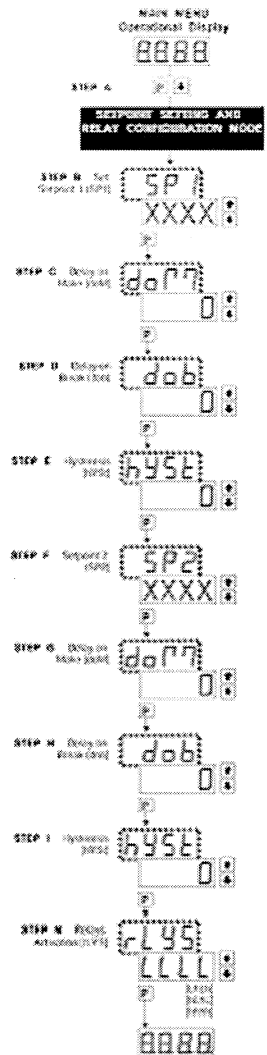
STEP N Set Relay Activation mode [rLYS]

(h) High the relay energizes when the setpoint is exceeded. (L) Low the relay energizes below the setpoint. The setpoint is indicated from left to right SP1, SP2.

Using the  and  buttons, adjust the reading on the display to the desired relay settings: [Lh--], [hL--], [hh--], [LL--].

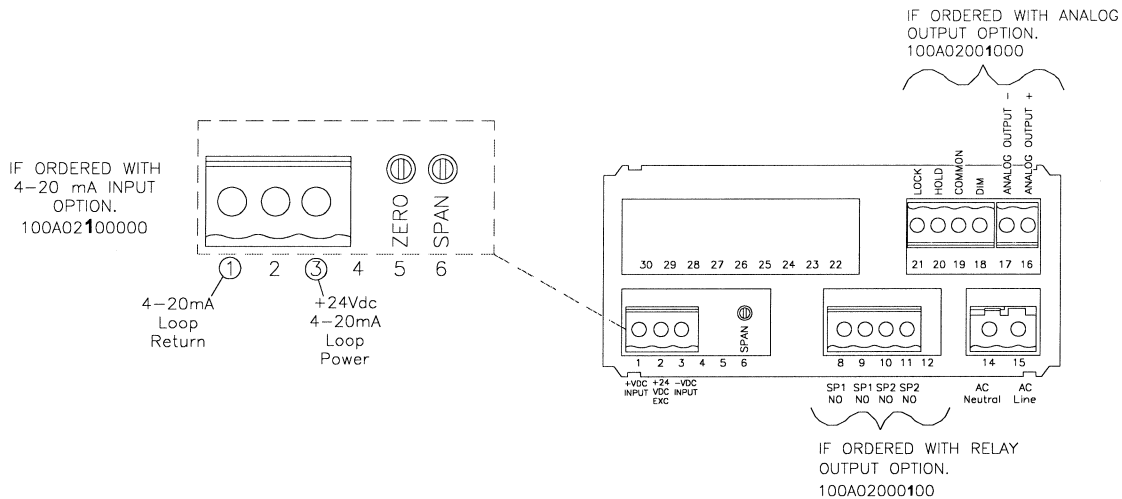
- 1) Press the  button. The meter exits the setpoint mode and returns to the operational display.

The Setpoint Relay programming mode is now complete.



Wiring and Installation

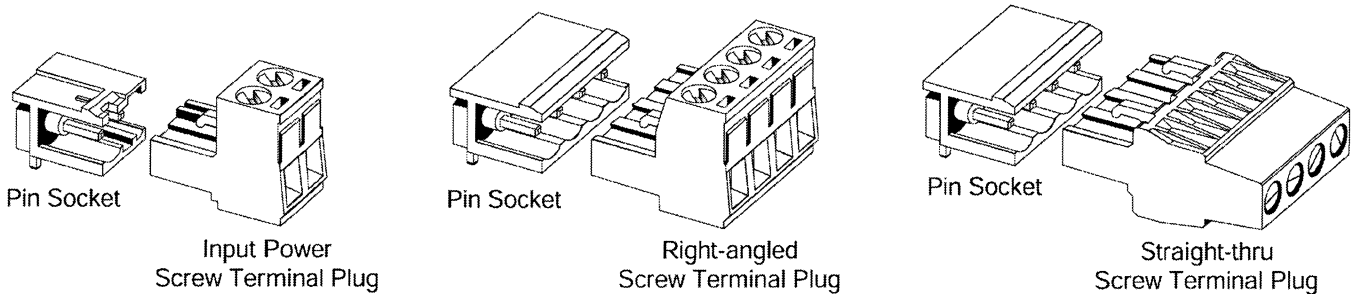
Pinout Diagram



The Rear View of the Meter diagram shows the meter with the relay configuration: outputs dual 5 Amp Form A relays. An analog output module is also shown as installed.

The 100A02 uses plug-in type screw terminal connectors for all input and output connections. The power supply connections (pins 14 and 15) have a unique plug and socket outline to prevent cross connection. The main board and input signal conditioner use right-angled connectors as standard. The output module uses straight-thru connectors as standard.

Connectors



WARNING
 AC and DC input signals and power supply voltages can be hazardous. DO NOT connect live wires to screw terminal plugs, and DO NOT insert, remove, or handle screw terminal plugs with live wires connected.

Pin Descriptions

Input Signal - Pins 1 to 6

- Pin 1** +VDC input (4 to 20mA Process Loop/Return)
- Pin 2** 24 VDC Excitation (no connection for process loop)
- Pin 3** -VDC input (+4 to 20mA/+24Vdc Process Loop/Excitation)
- Pin 4** No Connection
- Pin 5** No Connection (zero potentiometer with 4-20 mA option)
- Pin 6** SPAN Potentiometer

Relay Output - Pins 8 to 12

- Pin 8** SP1 NO. (Normally Open 5 Amp Form A.)
- Pin 9** SP1 NO.
- Pin 10** SP2 NO. (Normally Open 5 Amp Form A.)
- Pin 11** SP2 NO.
- Pin 12** No Connection

AC/DC Power Unit - Pins 14 and 15

- Pin 14** AC/DC Neutral. Neutral power supply line.
- Pin 15** AC/DC Line. Live power supply line.

OPTIONAL TOP BOARD PINS

Analog Output - Pins 16 and 17

Pins 16 and 17 are the analog output pins on the optional output module.

- Pin 16** Positive (+) analog output.
- Pin 17** Negative (-) analog output.

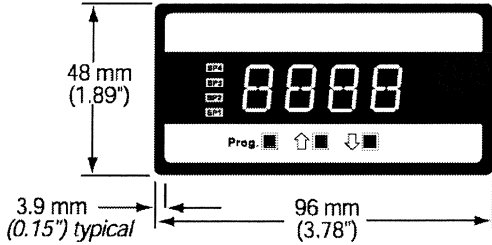
Rear Panel Function – Pins 18 to 21

- Pin 18** DIM. By connecting the display dim (DIM) pin to the COMMON pin, the display brightness setting is halved.
- Pin 19** COMMON. To activate the LOCK or DIM functions from the rear of the meter, the respective pins have to be connected to the COMMON pin. This pin is connected to the internal power supply ground.
- Pin 20** HOLD. By connecting the HOLD pin to the COMMON pin, the display reading is frozen, however, A/D conversions continue. When the HOLD pin is disconnected from the COMMON pin, the correct reading is displayed.
- Pin 21** LOCK. By connecting the LOCK pin to the COMMON pin, the meter's parameters can be viewed but not changed.

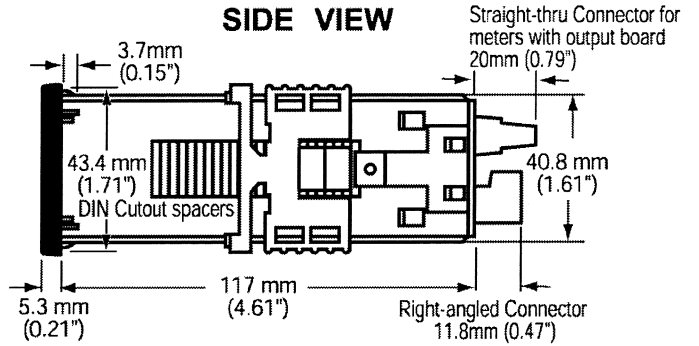
Case Dimensions and Panel Cutout

FRONT VIEW

1/8 DIN 96x48mm

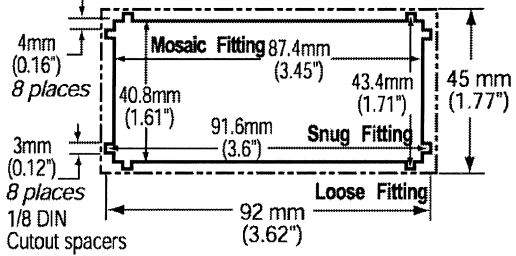


SIDE VIEW



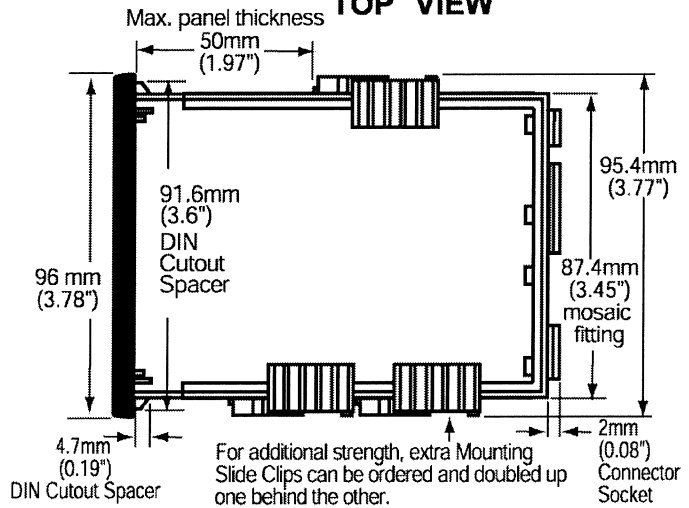
PANEL CUTOUT

Case will mount in standard 1/8 DIN cutouts



IMI's 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).

TOP VIEW

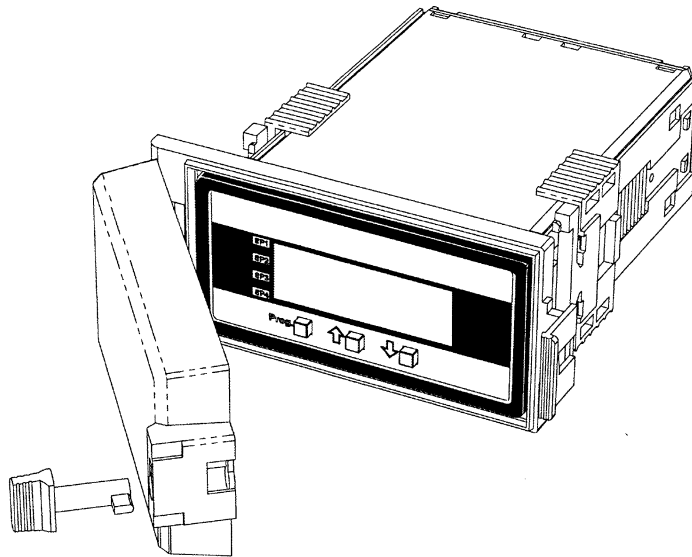


Accessories

NEMA 4X Lens Cover

The lens cover is designed to be dust and water proof to NEMA-4X standards. The lens cover consists of a base and cover with a cam hinge and key-lock locking device.

An O-ring, or neoprene gasket forms a seal between the base and the panel. The cam hinge prevents the cover from closing when opened until pushed closed. The cover has a tapered recess that, when closed, forms a capillary seal with a tapered ridge on the base. Turning the key-lock tightens the cover to the base, insuring seal integrity. A safety catch keeps the cover closed even when the key is turned to the open position and removed. The keyhole can also be used to attach a safety seal clop, preventing unauthorized opening.

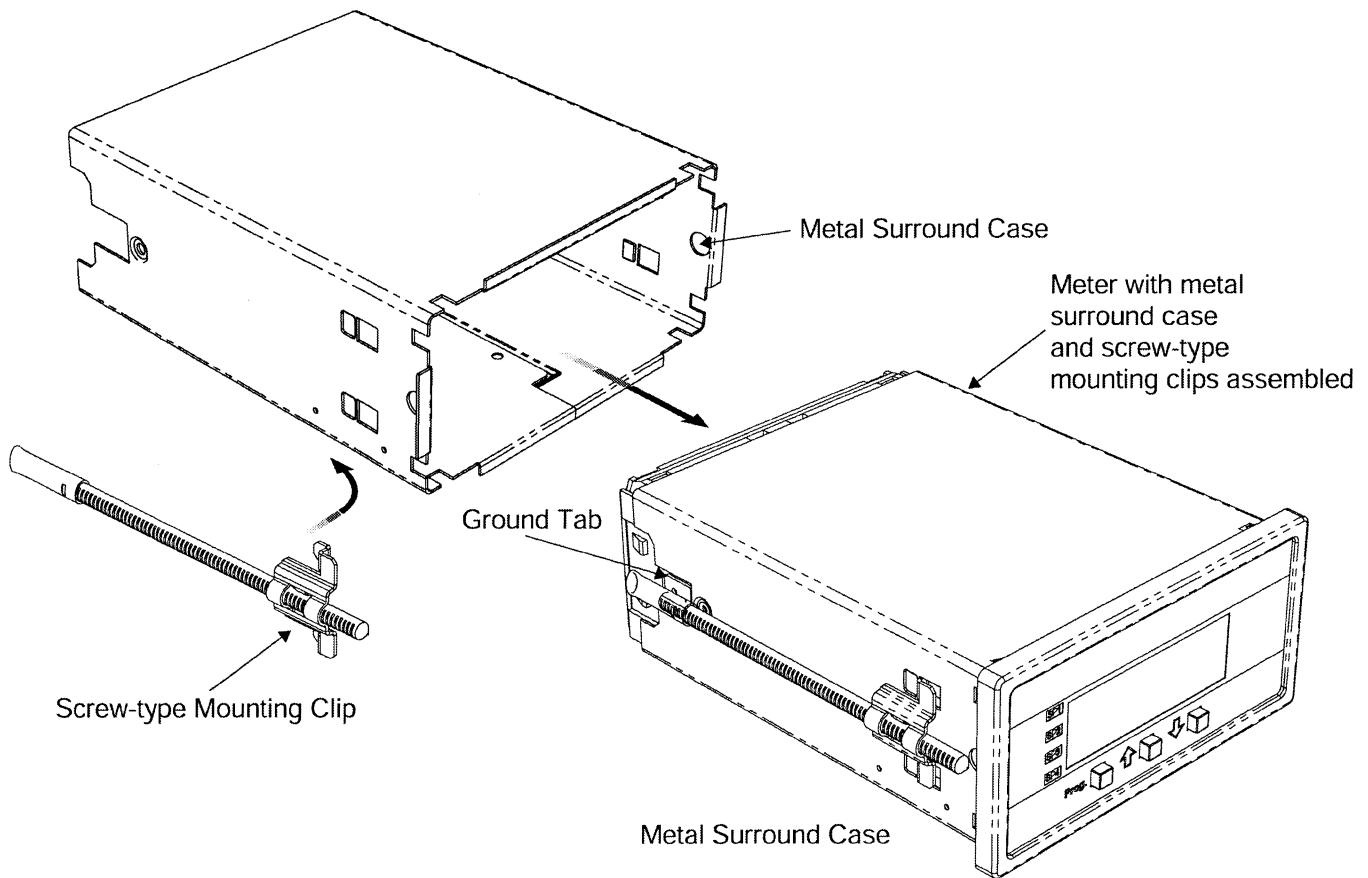


Metal Surround Case

The meter's plastic case is made from a fire retardant polycarbonate. A metal surround case can be ordered to enhance the meter's fire retardant capabilities and also provide shielding against electromagnetic interference (EMI). The metal case slides over the polycarbonate case and is held firmly in place by spring-type non-return clips. Once the metal case has been fitted to the polycarbonate case it cannot be removed.

With the metal case in place, the meter's plastic ratchet-type mounting clips can no longer be used. A pair of screw-type mounting clips are inserted into holes on the side of the metal case and used to mount the meter in the panel. A ground tab on the metal case provides a ground connection between the meter's main board and the metal case.

****Metal Surround Case must be factory installed.**



Warning 1 – ESD sensitivity

The power supply/signal conditioner should not be opened by anyone other than qualified service personnel. This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid injury.

Warning 2 – ESD sensitivity

This equipment is designed with user safety in mind; however, the protection provided by the equipment may be impaired if the equipment is used in a manner not specified by PCB Piezotronics, Inc.

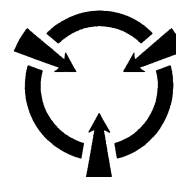
Caution 1 – ESD sensitivity

Cables can kill your equipment. High voltage electrostatic discharge (ESD) can damage electrical devices. Similar to a capacitor, a cable can hold a charge caused by triboelectric transfer, such as that which occurs in the following:

- *Laying on and moving across a rug,*
- *Any movement through air,*
- *The action of rolling out a cable, and/or*
- *Contact with a non-grounded person.*

The PCB solution for product safety:

- *Connect the cables only with the AC power off.*
- *Temporarily “short” the end of the cable before attaching it to any signal input or output.*



CAUTION
ELECTROSTATIC
DISCHARGE SENSITIVE

Caution 2 – ESD sensitivity

ESD considerations should be made prior to performing any internal adjustments on the equipment. Any piece of electronic equipment is vulnerable to ESD when opened for adjustments. Internal adjustments should therefore be done ONLY at an ESD-safe work area. Many products have ESD protection, but the level of protection may be exceeded by extremely high voltage.

Ordering Information

Part Number: **100A02 0 0 0 1 0 3**

Basic Model Number

100A02

Sensor Input

0 0-20 VDC with 24 VDC Excitation
 1 4-20mA with 24Vdc Excitation

Power Supply

0 85-265Vac/95-370Vdc

Analog Output

0 None
 1 Isolated 16 bit user scalable 4-20mA retransmit.

Additional Relay Output

0 None
 1 Dual 5 Amp Form A Relays (SPST)

Accessories

00 None
 01 96x48mm Clear Lockable Front Cover – NEMA 4X, Splash Proof.
 02 Metal Surround Case – Includes screw mounting clips.
 03 Clear Lockable Front Cover and Metal Surround Case

Ordering Example: 100A02000001

This is a standard 0-20 VDC input Indicator / Power Supply:

Power Supply: 85-265Vac/95-370Vdc

Analog Output: None

Additional Relay Output: None

Accessories: 96x48mm Clear Lockable Front Cover - NEMA 4X Splash Proof.

Warranty

PCB instrumentation is warranted against defective material and workmanship for 1 year unless otherwise expressly specified. Damage to instruments caused by incorrect power or misapplication, is not covered by warranty. *If there are any questions regarding power, intended application, or general usage, please consult with your local sales contact or distributor.*

Service

Because of the sophisticated nature of PCB instrumentation, field repair is typically **NOT** recommended and may void any warranty. If factory service is required, return the instrumentation according to the "Return Procedure" stated below. *A repair and/or replacement quotation will be provided prior to servicing at no charge.* Before returning the unit, please consult a factory PCB applications engineer concerning the situation as certain problems can often be corrected with simple on-site procedures.

Return procedure

To expedite returned instrumentation, contact a factory PCB applications engineer for a RETURN MATERIAL AUTHORIZATION (RMA) NUMBER. Please have information available such as model and serial number. Also, to insure efficient service, *provide a written description of the symptoms and problems with the equipment to a local sales representative or distributor, or contact PCB if none are located in your area.*

Customers outside the U.S. should consult their local PCB distributor for information on returning equipment. For exceptions, please contact the International Sales department at PCB to request shipping instructions and an RMA. For assistance, please call (716) 684-0001, or fax us at (716) 686-9129. You may also receive assistance via e-mail at pressure@pcb.com or visit our web site at www.pcb.com.



Customer Service

Pressure, a division of PCB Piezotronics, guarantees **Total Customer Satisfaction**. If, at any time, for any reason, you are not completely satisfied with any PCB product, PCB will repair, replace, or exchange it at no charge. You may also choose, within the warranty period, to have your purchase price refunded.

IPCB offers to all customers, at no charge, 24-hour phone support. This service makes product or application support available to our customers, day or night, seven days a week. When unforeseen problems or emergency situations arise, call the **PCB Hot Line at (716) 684-0001**, and an application specialist will assist you.



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Phone: (716) 684-0001 • USA Fax: (716) 686-9129
E-mail: pressur@pcb.com

*ICP® is a registered trademark of PCB Piezotronics, Incorporated,
which uniquely identifies PCB sensors that incorporate built-in microelectronics.*

ELECTRICAL

Power Supply Voltage (auto sensing)
 Power Consumption
 Input Signal
 Sensor Excitation
 Accuracy
 Conversion Rate
 Relay Output (dual) Individual Adjust
 Time Delay on Relay Make or Break
 Input Channels
 Hysteresis

ENGLISH

85-265 VAC/95-370 VDC
 2.5 W typ./3.5 W max.
 0 to 20 VDC
 24 VDC
 ±0.05% of reading + 2 counts
 5 Hz
 5 A Form A SPST 230 VAC/30 VDC
 0-9999 Seconds
 1
 Adjustable for Each Set Point

SI

85-265 VAC/95-370 VDC
 2,5 W typ./3,5 W max.
 0 to 20 VDC
 24 VDC
 ±0,05% of reading + 2 counts
 5 Hz
 5 A Form A SPST 230 VAC/30VDC[2]
 0-9999 Seconds [2]
 1
 Adjustable for Each Set Point

ENVIRONMENTAL

Temperature Coefficient
 Warm Up
 Operating Temperature Range
 Storage Temperature Range
 Relative Humidity

56 ppm/°F
 <2 Minutes
 +32 to +140 °F
 -4 to +158 °F
 <95% (non-condensing)

100 ppm/°C
 <2 Minutes
 0 to 60 °C
 -20 to 70 °C
 <95% (non-condensing)

MECHANICAL

Case Dimension:
 DIN
 BEZEL
 Depth Behind BEZEL
 - with Right Angle Connectors
 - with Straight Thru Connectors

4.61 x 3.45 x 1.61 in
 1/8 in
 3.78 x 1.89 in
 4.61 in
 5.08 in
 5.40 in

117 x 87,4 x 40,8 mm
 3 mm
 96 x 48 mm
 117 mm
 129 mm
 137 mm

Weight
 Material
 Electrical Connectors

8.5 oz Maximum
 Polycarbonate
 Removable Screw Terminals

241 gm Maximum
 Polycarbonate
 Removable Screw Terminals

INDICATOR

4-Digit Red LED
 Range
 Polarity: Positive
 Negative
 Decimal Point
 Positive Overrange
 Negative Overrange
 Set Point Status

0.56 in
 -1999 to 9999 Counts
 Assumed
 Displays -
 Selectable X•X•X•X•
 Top Segments Flash
 Bottom Segments Flash
 One Per Set Point (4 max)

14,2 mm
 -1999 to 9999 Counts
 Assumed
 Displays -
 Selectable X•X•X•X•
 Top Segments Flash
 Bottom Segments Flash
 One Per Set Point (4 max)



All specifications are at room temperature unless otherwise specified.

OPTIONAL VERSIONS

Optional versions have identical specifications and accessories as listed for the standard model except where noted below. More than one option may be used.

Sensor Input: 100A02X00000

- 0 0-20 VDC with 24 VDC Excitation
 1 4-20 mA with 24 VDC Excitation

Analog Output: 100A0200X000

- 0 None
 1 Isolated 4-20 mA User selectable output signal

Relay Output: 100A02000X00

- 0 None
 1 Dual 5 Amp Form A relays

Accessories: 100A020000XX

- 00 None
 01 96 x 48 mm Clear Lockable Front Cover – NEMA 4X, Splash Proof
 02 Metal Surround Case – Includes Screw Mounting Clips
 03 Clear Lockable Front Cover and Metal Surround Case

OPTIONAL ACCESSORIES:

30236-01 Power Cable Assembly

NOTES:

- [1] Programmability:
 Scale Factor, Offset, Decimal Point Location, Set Point Adjustment, Peak and Valley View with Reset, LED Brightness, Time Delay on Relay Make or Break, HI or LOW Set Point Relay Action, Relay Hysteresis.
 [2] If ordered with relay output option.
 [3] See PCB Declaration of Conformance PS050 for details.

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In the interest of constant product improvement, we reserve the right to change specifications without notice.

Form DD030 Rev.F 2/23/99

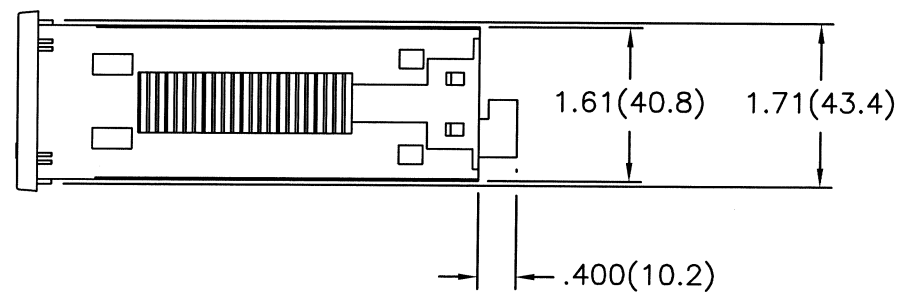
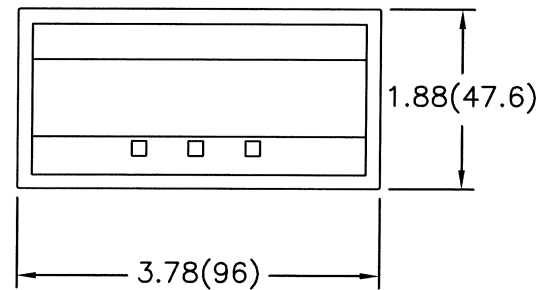
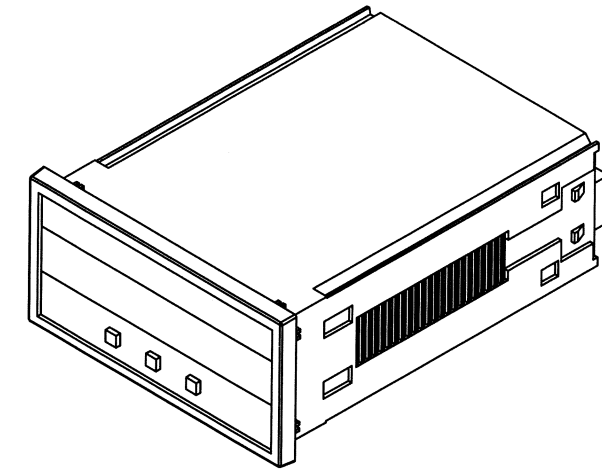
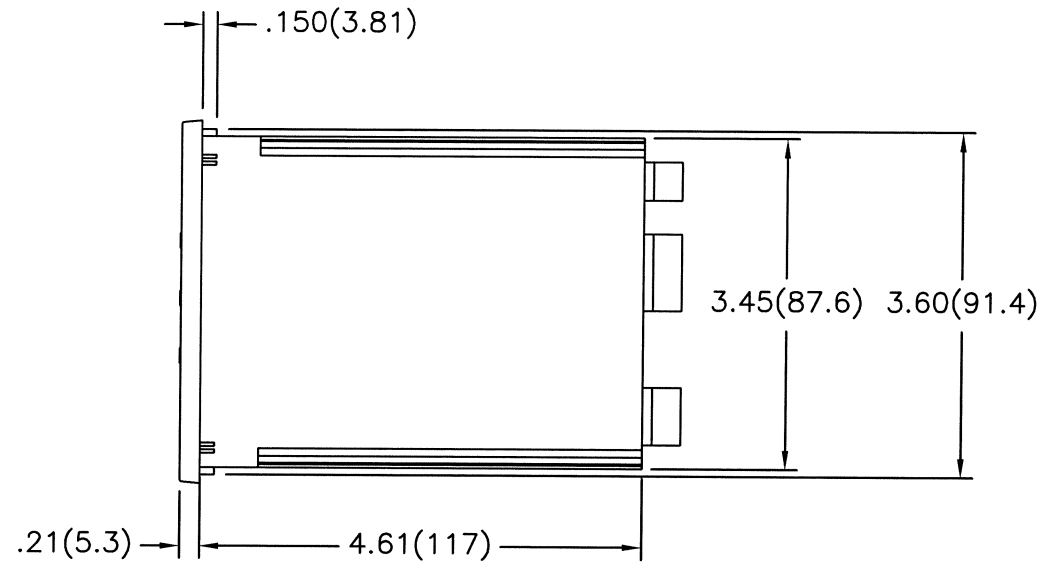
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|----------------------|----------------------|----------------------|----------------------|--------------|
| Drawn: <i>BLS</i> | Engineer: <i>RF</i> | Sales: <i>RWM</i> | Approved: <i>NIL</i> | Spec Number: |
| Date: <i>1-22-07</i> | Date: <i>1-24-07</i> | Date: <i>1/24/07</i> | Date: <i>1/26/07</i> | 30234 |

| APPLICATION | | |
|-------------|---------|-----|
| NEXT ASS'Y | USED ON | VAR |

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| REVISIONS | | | | | |
|-----------|-----|----------------------|-----|--------|--------|
| ZONE | REV | DESCRIPTION | ECN | DATE | APP'D |
| | NR | RELEASED TO DRAFTING | | 5/4/05 | DM/SLR |

30232



| UNLESS SPECIFIED TOLERANCES | |
|--|--|
| DIMENSIONS IN INCHES DECIMALS XX ±.03 XXX ±.010 ANGLES ±2 DEGREES FILLETS AND RADII .003 - .005 | DIMENSIONS IN MILLIMETERS [IN BRACKETS] DECIMALS X ±0.8 XX ±0.25 ANGLES ±2 DEGREES FILLETS AND RADII [0.07 - 0.13] |

| | | | | | |
|--|-----|--------|-------|-----|--------|
| DRAWN | ECB | 5/4/05 | MFG | RC | 5/6/05 |
| CHK'D | DM | 5/6/05 | ENGR | RF | 5/4/05 |
| APP'D | MEM | 5/6/05 | SALES | DPC | 5/6/05 |
| TITLE OUTLINE DRAWING MODEL 100A02 SERIES PANEL METER | | | | | |

| | |
|---|-------------------|
| | |
| 3425 WALDEN AVE. DEPEW, NY 14043 (716) 684-0001 EMAIL: SALES@PCB.COM | |
| CODE IDENT. NO. 52681 | DWG. NO. 30232 |
| SCALE: 1 : 2 SHEET 1 OF 1 | |

DD012 REV. C 01/21/03