Model 100A02

Digital Indicator/Controller

Installation and Operating Manual

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

Division toll-free 888-684-0015

24-hour SensorLine^{SM} 716-684-0001

Fax 716-686-9129

E-mail pressure@pcb.com

PCB PIEZOTRONICS $^{INC.}$

PRESSURE DIVISION

The information contained in this document supersedes all similar information that may be found elsewhere in this manual.

Total Customer Satisfaction – 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 to have your purchase price refunded in lieu of the repair, replacement, or exchange of the product.

Service – Due to the sophisticated nature of the sensors and associated instrumentation provided by PCB Piezotronics, user servicing or repair is not recommended and, if attempted, may void the factory warranty. Routine maintenance, such as the cleaning of electrical connectors, housings, and mounting surfaces with solutions and techniques that will not harm the physical material of construction, is acceptable. Caution should be observed to insure that liquids are not permitted to migrate into devices that are not hermetically sealed. Such devices should only be wiped with a dampened cloth and never submerged or have liquids poured upon them.

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Calibration – Routine calibration of sensors and associated instrumentation is recommended as this helps build confidence in measurement accuracy and acquired data. Equipment calibration cycles are typically established by the users own quality regimen. When in doubt about a calibration cycle, a good "rule of thumb" is to recalibrate on an annual basis. It is also good practice to recalibrate after exposure to any severe temperature extreme, shock, load, or other environmental influence, or prior to any critical test.

PCB Piezotronics maintains an ISO-9001 certified metrology laboratory and offers calibration services, which are accredited by A2LA to ISO/IEC 17025, with full traceablility to N.I.S.T. In addition to the normally supplied calibration, special testing is also available, such as: sensitivity at elevated or cryogenic temperatures, phase response, extended high or low frequency response, extended range, leak testing, hydrostatic pressure testing, and others. For information on standard recalibration services or special testing, contact your local PCB Piezotronics distributor, sales representative, or factory customer service representative.

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Materials Authorization (RMA) Number. This RMA number should be clearly marked on the outside of all package(s) and on the packing list(s) accompanying the shipment. A detailed account of the nature of the problem(s) being experienced with the equipment should also be included inside the package(s) containing any returned materials.

A Purchase Order, included with the returned materials, will expedite the turn-around of serviced equipment. It is recommended to include authorization on the Purchase Order for PCB to proceed with any repairs, as long as they do not exceed 50% of the replacement cost of the returned item(s). PCB will provide a price quotation or replacement recommendation for any item whose repair costs would exceed 50% of replacement cost, or any item that is not economically feasible to repair. For routine calibration services, the Purchase Order should include authorization to proceed and return at current pricing, which can be obtained from a factory customer service representative.

Warranty – All equipment and repair services provided by PCB Piezotronics, Inc. are covered by a limited warranty against defective material and workmanship for a period of one year from date of original purchase. Contact PCB for a complete statement of our warranty. Expendable items, such as batteries and mounting hardware, are not covered by warranty. Mechanical damage to equipment due to improper use is not covered by warranty. Electronic circuitry failure caused by the introduction of unregulated or improper excitation power or electrostatic discharge is not covered by warranty.

Contact Information – International customers should direct all inquiries to their local distributor or sales office. A complete list of distributors and offices can be found at www.pcb.com. Customers within the United States may contact their local sales representative or a factory customer service representative. A complete list of sales representatives can be found at www.pcb.com. Toll-free telephone numbers for a factory customer service representative, in the division responsible for this product, can be found on the title page at the front of this manual. Our ship to address and general contact numbers are:

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Depew, NY 14043 USA
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PCB PIEZOTRONICS INC.

Model 100A02 Indictor / Power Supply Panel Meter

CE

Operating Guide with Enclosed Warranty Information

3425 Walden Avenue, Depew, New York 14043-2495

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Warranty/Servicing

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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 ± 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).

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Specifications

- **Input Specs**: ...... 0 to 20 VDC (option for 4-20 mA)

- **Excitation**: 24Vdc

- **A/D Converter**: ...... 14 bit single slope

- **Accuracy**: ...... ±0.05% of reading + 2 counts

- **Temp. Coeff.**: ...... 100 ppm/°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 °C

- **Storage Temp**: ...... –20 °C to 70 °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

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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

Setpoint
Annunciator
LEDs

SP4
SP3
SP2
SP1

| P | ⬆ | ⬇ |
| PROGRAM BUTTON | UP ARROW BUTTON | DOWN ARROW BUTTON |
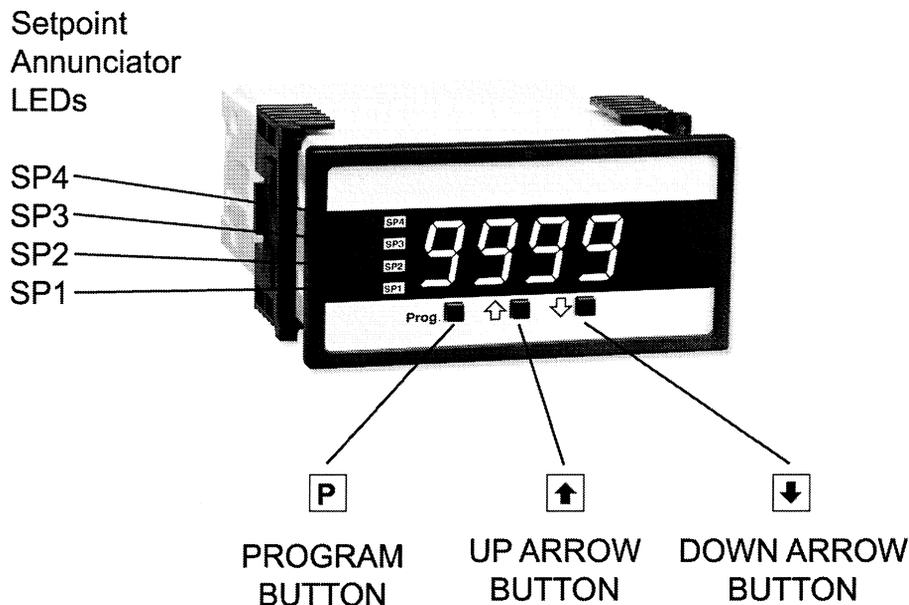
Front Panel Buttons

- **Program Button**

The $\boxed{P}$ button is used to move from one program step to the next. When pressed at the same time as the $\boxed{⬆}$ button, it initiates the **calibration mode**. When pressed at the same time as the $\boxed{⬇}$ button, it initiates the **setpoint setting mode**.

- **Up Button**

When in the operational display, pressing the $\boxed{⬆}$ 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 $\boxed{⬆}$ button is used to increase the value of the displayed parameter.

- **Down Button**

When in the operational display, pressing the $\boxed{⬇}$ 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 $\boxed{⬇}$ 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	Symbol	Explanation
8.8.8.8.	This symbol represents the OPERATIONAL DISPLAY.	**[ScALE]** **[9999]**	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.
P **↑**	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.	**0** ↑ ↓	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.
P **↑**	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.	**oFF** **on** ↑ ↓	When the ↑ and ↓ buttons are shown with two displays, either display can be selected by pressing and releasing the ↑ or ↓ buttons.
XXXX **0**	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."	**hhhh** **[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.
2Ero **0** ↑ ↓	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.	**cLo** **XXXX** ↑ ↓ **P**	A dotted box indicates these functions are omitted or bypassed when the related hardware is not present.
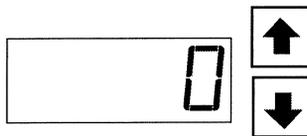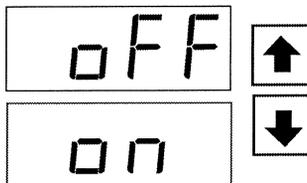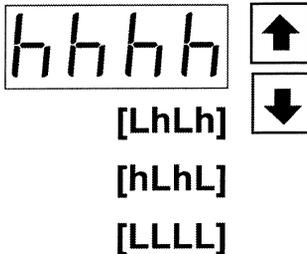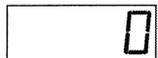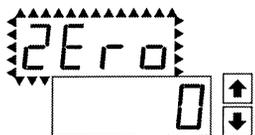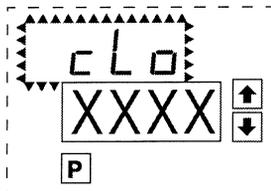
P is the PROGRAM button, **↑** is the UP button, **↓** is the DOWN button.

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 [*] button in the preceding step will not be saved.

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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.

MAIN MENU
Operational Display
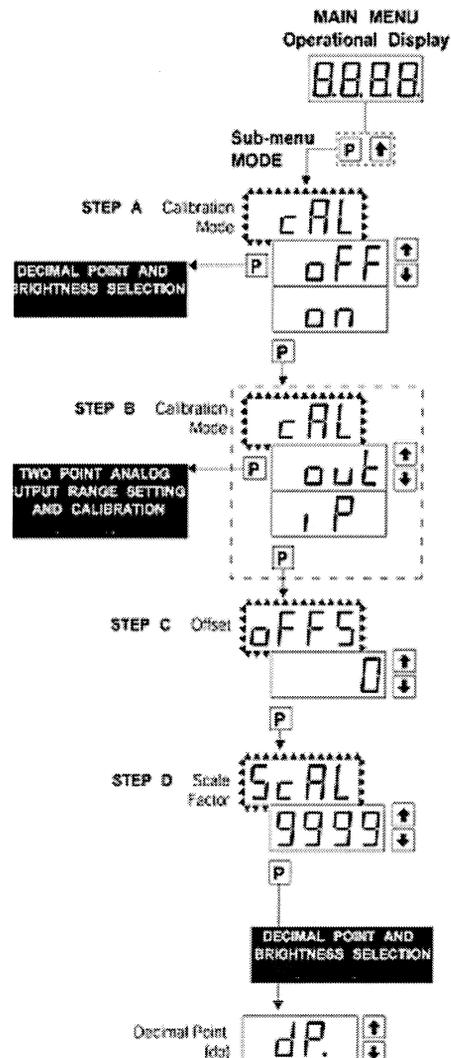
Two Point Analog Output Range Setting and Calibration

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).
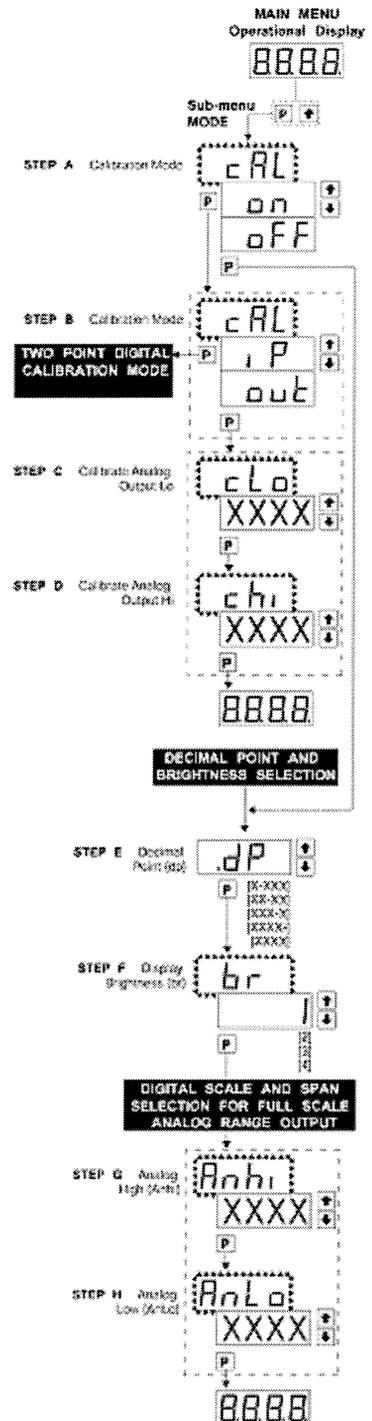
Decimal Point and Brightness Selection

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.

MAIN MENU
Operational Display

8.8.8.8.

Sub-menu
MODE   P   ↑

STEP A Calibration Mode   c AL
                                on
                                oFF
                        P

STEP B Calibration Mode   c AL
TWO POINT DIGITAL   P   i P
CALIBRATION MODE   out
                        P

STEP C Calibrate Analog   c Lo
        Output Lo   XXXX
                        P

STEP D Calibrate Analog   c hi
        Output Hi   XXXX
                        P

8.8.8.8.

**DECIMAL POINT AND
BRIGHTNESS SELECTION**

STEP E Decimal   .dP
        Point (dp)   P |X·XXX|
                              |XX·XX|
                              |XXX·X|
                              |XXXX·|
                              |XXXX|

STEP F Display   br
        Brightness (br) |
                        P

**DIGITAL SCALE AND SPAN
SELECTION FOR FULL SCALE
ANALOG RANGE OUTPUT**

STEP G Analog   Anhi
        High (Anhi)   XXXX
                        P

STEP H Analog   AnLo
        Low (AnLo)   XXXX
                        P

8.8.8.8.

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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 $\boxed{P}$ and $\boxed{\downarrow}$ buttons at the same time.
   Display toggles between [SP1] and the previous [SP1] setting.

STEP B Setpoint1 (SP1)
1) Using the $\boxed{\uparrow}$ and $\boxed{\downarrow}$ buttons, adjust the display to the desired SP1 value.
2) Press the $\boxed{P}$ 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 $\boxed{\uparrow}$ and $\boxed{\downarrow}$ 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 $\boxed{P}$ 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 $\boxed{\uparrow}$ and $\boxed{\downarrow}$ 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 $\boxed{P}$ button. Display toggles between [hYST] and the previous [hYST] setting.

STEP E Set the Hysteresis Setting for Setpoint 1
1) Using the $\boxed{\uparrow}$ and $\boxed{\downarrow}$ buttons, adjust the display to the desired hysteresis [hYST] value.
2) Press the $\boxed{P}$ 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 $\boxed{\uparrow}$ and $\boxed{\downarrow}$ buttons, adjust the display to the desired hysteresis [hYST] value.
2) Press the $\boxed{P}$ button. Display toggles between [rLYS] and the previous relay setting.

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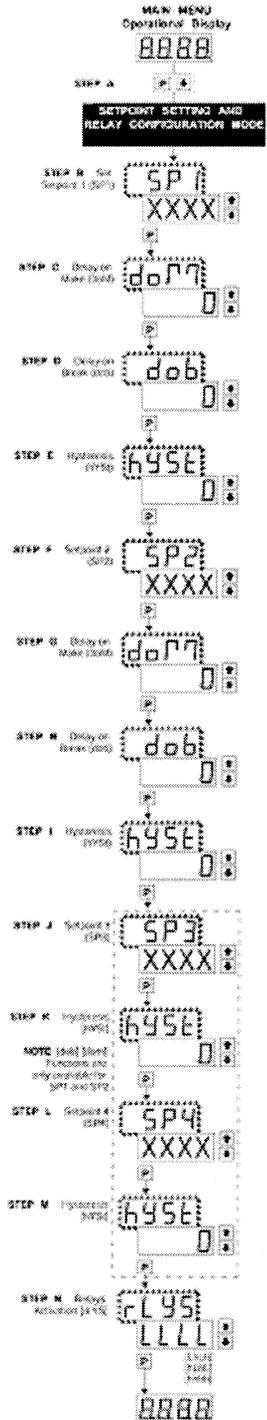
STEP N Set Relay Activation mode [rLYS]

   (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 P button. The meter exits the setpoint mode and returns to the operational display.

    The Setpoint Relay programming mode is now complete.

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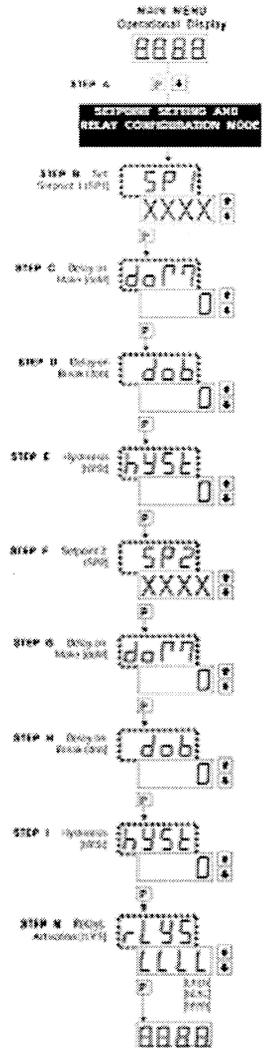
Wiring and Installation

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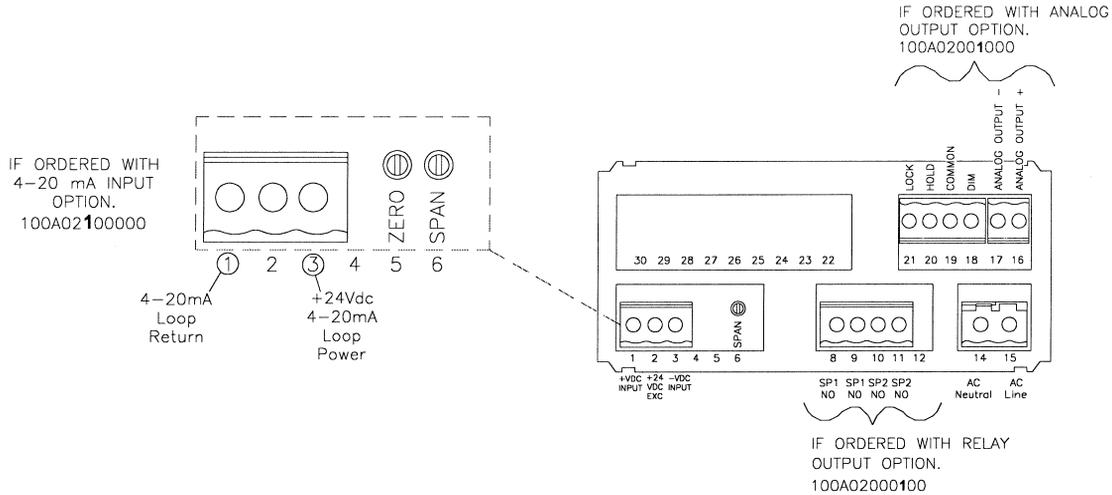
The Rear View of the Meter diagram shows the meter with the relay configuration: outputs dual 5 Amp Form A relays. An analog output module is also shown as installed.

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

Pin Socket

Input Power
Screw Terminal Plug

Pin Socket

Right-angled
Screw Terminal Plug

Pin Socket

Straight-thru
Screw Terminal Plug
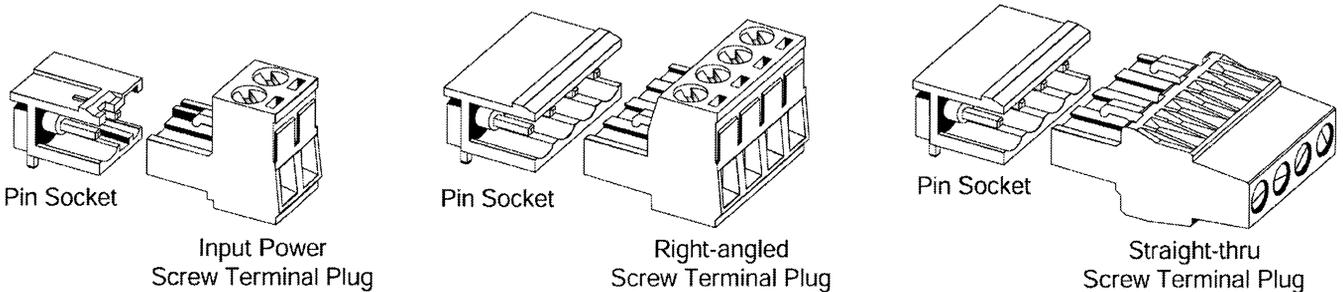
⚠ **WARNING**
AC and DC input signals and power supply voltages can be hazardous. DO NOT connect live wires to screw terminal plugs, and DO NOT insert, remove, or handle screw terminal plugs with live wires connected.

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.

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Case Dimensions and Panel Cutout

FRONT VIEW
1/8 DIN 96x48mm

48 mm (1.89")

8888

Prog.

3.9 mm (0.15") typical

96 mm (3.78")
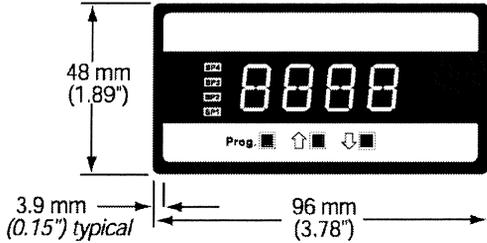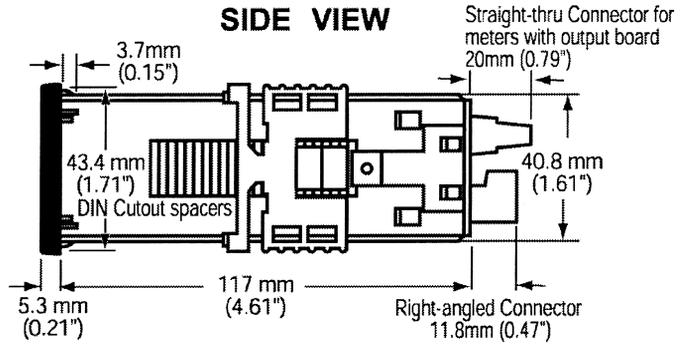
PANEL CUTOUT

Case will mount in standard 1/8 DIN coutouts

4mm (0.16") 8 places

Mosaic Fitting 87.4mm (3.45")

40.8mm (1.61")

43.4mm (1.71")

45 mm (1.77")

91.6mm (3.6")

Snug Fitting

3mm (0.12") 8 places

Loose Fitting

1/8 DIN Cutout spacers

92 mm (3.62")
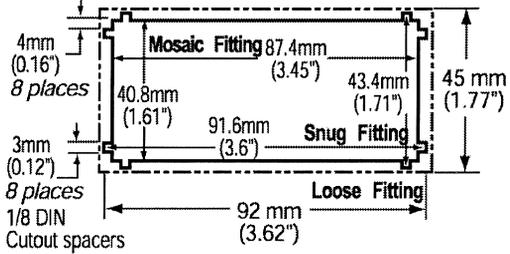
IMI's 96x48mm case is particularly suitable for mounting in mosaic panels or insulative panels up to 2" thick. They can also stack mount, 2 up in existing cutouts for 1/4 DIN (96x96mm) or 4 up in 1/2 DIN (96X192mm).

SIDE VIEW

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

3.7mm (0.15")

43.4 mm (1.71") DIN Cutout spacers

40.8 mm (1.61")

5.3 mm (0.21")

117 mm (4.61")

Right-angled Connector 11.8mm (0.47")

TOP VIEW

Max. panel thickness 50mm (1.97")

91.6mm (3.6") DIN Cutout Spacer

96 mm (3.78")

95.4mm (3.77")

87.4mm (3.45") mosaic fitting

4.7mm (0.19") DIN Cutout Spacer

For additional strength, extra Mounting Slide Clips can be ordered and doubled up one behind the other.

2mm (0.08") Connector Socket

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.

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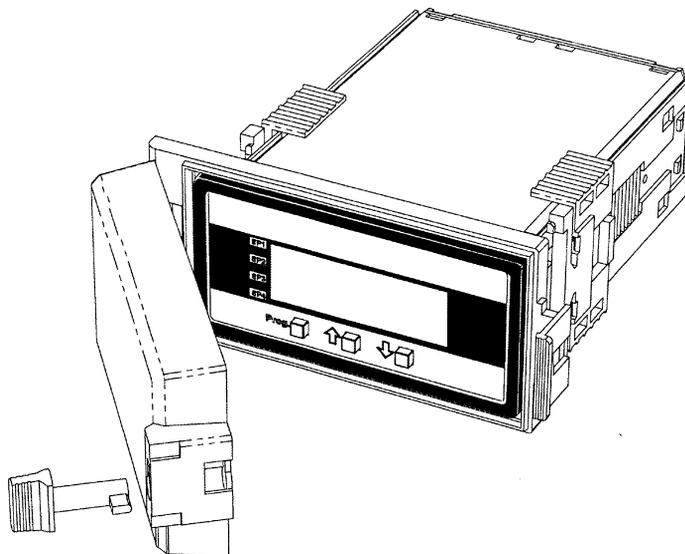
Metal Surround Case

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.

Metal Surround Case

Meter with metal surround case and screw-type mounting clips assembled

Ground Tab

Screw-type Mounting Clip

Metal Surround Case
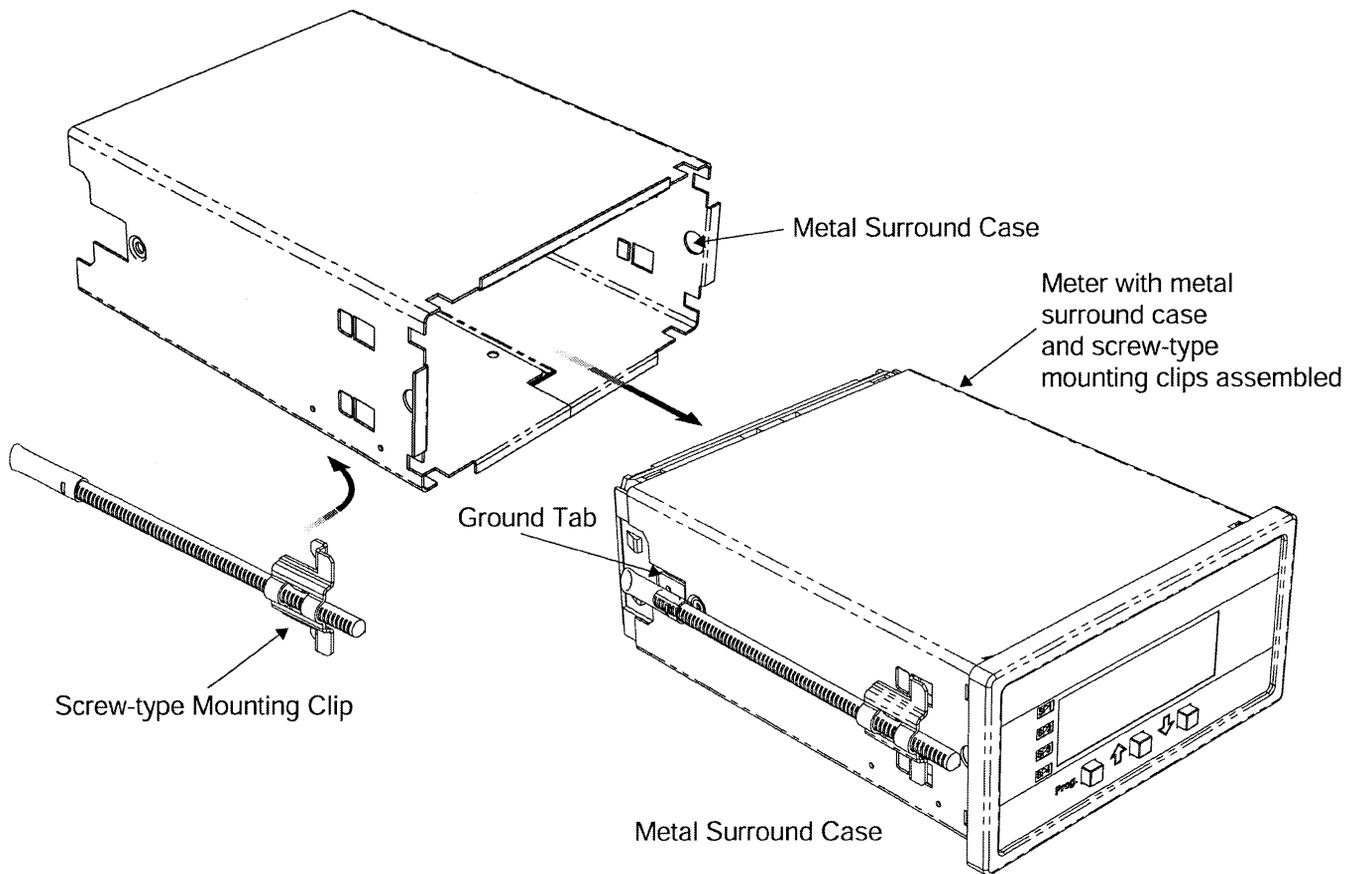
Warning 1 – ESD sensitivity

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.*

CAUTION
ELECTROSTATIC
DISCHARGE SENSITIVE

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 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.

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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.

PCB PIEZOTRONICS INC.

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**.

PCB PIEZOTRONICS INC.

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.

PCB PIEZOTRONICS INC.

Model Number	INDICATOR / POWER SUPPLY PANEL METER	Revision: A
100A02		ECN #: 25721

ELECTRICAL

	ENGLISH	SI
Power Supply Voltage (auto sensing)	85-265 VAC/95-370 VDC	85-265 VAC/95-370 VDC
Power Consumption	2.5 W typ./3.5 W max.	2,5 W typ./3,5 W max.
Input Signal	0 to 20 VDC	0 to 20 VDC
Sensor Excitation	24 VDC	24 VDC
Accuracy	±0.05% of reading + 2 counts	±0,05% of reading + 2 counts
Conversion Rate	5 Hz	5 Hz
Relay Output (dual) Individual Adjust	5 A Form A SPST 230 VAC/30 VDC	5 A Form A SPST 230 VAC/30VDC[2]
Time Delay on Relay Make or Break	0-9999 Seconds	0-9999 Seconds [2]
Input Channels	1	1
Hysteresis	Adjustable for Each Set Point	Adjustable for Each Set Point

ENVIRONMENTAL

	ENGLISH	SI
Temperature Coefficient	56 ppm/°F	100 ppm/°C
Warm Up	<2 Minutes	<2 Minutes
Operating Temperature Range	+32 to +140 °F	0 to 60 °C
Storage Temperature Range	-4 to +158 °F	-20 to 70 °C
Relative Humidity	<95% (non-condensing)	<95% (non-condensing)

MECHANICAL

	ENGLISH	SI
Case Dimension:	4.61 x 3.45 x 1.61 in	117 x 87,4 x 40,8 mm
DIN	1/8 in	3 mm
BEZEL	3.78 x 1.89 in	96 x 48 mm
Depth Behind BEZEL	4.61 in	117 mm
- with Right Angle Connectors	5.08 in	129 mm
- with Straight Thru Connectors	5.40 in	137 mm
Weight	8.5 oz Maximum	241 gm Maximum
Material	Polycarbonate	Polycarbonate
Electrical Connectors	Removable Screw Terminals	Removable Screw Terminals

INDICATOR

	ENGLISH	SI
4-Digit Red LED	0.56 in	14,2 mm
Range	-1999 to 9999 Counts	-1999 to 9999 Counts
Polarity: Positive	Assumed	Assumed
Negative	Displays -	Displays -
Decimal Point	Selectable X•X•X•X•	Selectable X•X•X•X•
Positive Overrange	Top Segments Flash	Top Segments Flash
Negative Overrange	Bottom Segments Flash	Bottom Segments Flash
Set Point Status	One Per Set Point (4 max)	One Per Set Point (4 max)

CE [3]

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.

Drawn: BLS	Engineer: RF	Sales: RWM	Spec Number:
Date: 7-22-01	Date: 1-24-07	Date: 1/24/07	Approved: NL
		Date: 1/26/07	30234

PCB PIEZOTRONICS™
PRESSURE DIVISION

3425 Walden Avenue, Depew, NY 14043   800-959-4464   Fax (716) 684-3823

30232

APPLICATION		
NEXT ASS'Y	USED ON	VAR

D

.150(3.81)

3.45(87.6) 3.60(91.4)

.21(5.3)   4.61(117)

C

B

1.88(47.6)

3.78(96)

1.61(40.8) 1.71(43.4)

.400(10.2)

A
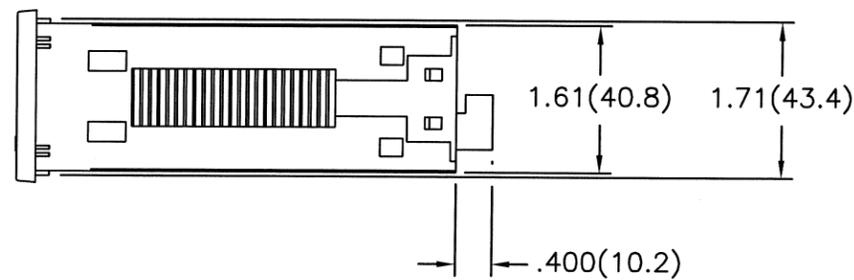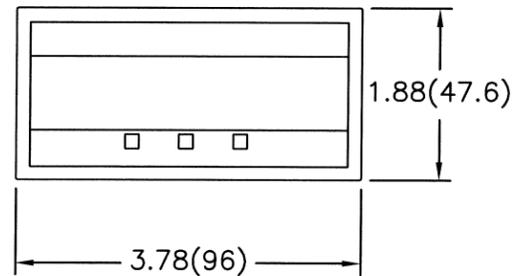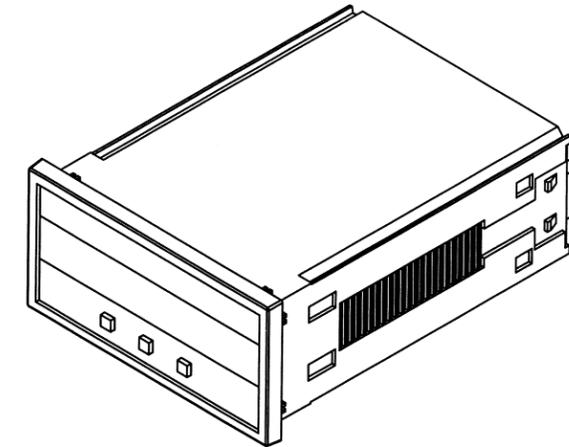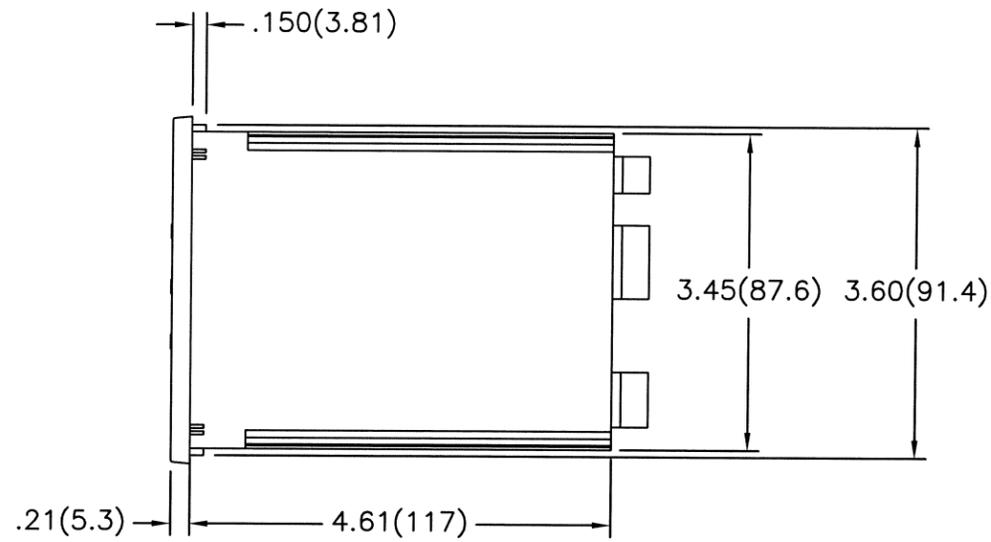
UNLESS SPECIFIED TOLERANCES		DRAWN	ECB 5/4/05	MFG	RC 5/6/05
DIMENSIONS IN INCHES	DIMENSIONS IN MILLIMETERS [IN BRACKETS]	CHK'D	DM 5/6/05	ENGR	RF 5/4/05
DECIMALS XX ±.03 XXX ±.010	DECIMALS X ±0.8 XX ±0.25	APP'D	MEM 5/6/05	SALES	DPC 5/6/05
ANGLES ±2 DEGREES	ANGLES ±2 DEGREES				

PCB PIEZOTRONICS
3425 WALDEN AVE. DEPEW, NY 14043
(716) 684-0001 EMAIL: SALES@PCB.COM

FILLETS AND RADII .003 – .005   FILLETS AND RADII [0.07 – 0.13]

DD012 REV. C 01/21/03

TITLE
OUTLINE DRAWING
MODEL 100A02 SERIES
PANEL METER

CODE IDENT. NO. 52681

DWG. NO. 30232

SCALE: 1 : 2   SHEET 1 OF 1