

# MODEL PB40

## FORM AND FIT REPLACEMENT FOR THE GE DB40 AND OTHER STANDARD 4 1/2" INCH SWITCHBOARD METERS. SINGLE AND DUAL ANALOG INPUT VERSIONS

- Black Anodized 6061-T6 Aluminum Machined Bezel
- Single 101 Segment tri-color bargraph can be programmed for a solid red, green or yellow bar as well as tri-color
- 5 (0.6" Tall) RED Digits with Decimal Points
- User definable messages can be placed on numeric display at user defined displayed values. Limited to 5 characters
- Choice of Power Input, 9-36VDC or 90-265VAC/110-370VDC
- DC and RMS Analog Inputs with support for Strain-Gage, RTD, Thermocouple, Potentiometer, Volts and Amps
- 5, 10, 12, 24VDC or 10uA to 1.5mADC Programmable Excitation
- Isolated ModBus, USB, RS232C or RS485 communications
- 2 piece screw connectors for all Signal and Power lines
- Plastic Acrylic front plate with anti-reflective coating
- Optional Annealed glass front lens, 0.125" thick
- Fits into standard 4" diameter switchboard mounting hole with 3.375" mounting centers for the studs.
- Conformal Coated Boards



### ORDERING INFORMATION

PB40- [A] [B] [C] - [D] [E] - [F] [G] [H] [I]

**A Display Style**

Single 101 segment tri-color bargraph...0

**B Temperature Range**

Standard 0-60C.....0  
 Extended -40 to +85C.....E  
 Special.....S

**C Power Input**

90-265VAC/110-370VDC.....0  
 9-36VDC.....1  
 Special.....S

**D Communications**

RS232C.....232  
 RS485.....485  
 USB communication.....USB  
 ModBus RTU.....MOD

**E Analog Input (See note 1)**

Not required.....0  
 DC Volts and Amps, 1 Channel.....DC1  
 RMS Volts and Amps, 1 Channel.....RMS1

**F Relay Output**

Not required.....0  
 4 each 5 amp relays.....1  
 Dual MIL-PRF-28750 Solid State Relays...2

**Mounting Hardware**

If you would like us to include 1/4" x 20 socket caps mounting hardware.  
 HK-PB40-BO Black Oxide  
 HK-PB40-SS 316 Stainless Steel

**G Analog output or 2nd Analog Input (note 2)**

Not required.....0  
 Single channel 16 BIT Isolated Output...1  
 DC Volts and Amps.....DC2

**H Environmental Seal & Front Plate**

Not Sealed to Front Panel, Acrylic Lens....0  
 NEMA 4X Front Panel, Acrylic Lens.....1  
 Not Sealed to Front Panel, Glass Lens....2  
 NEMA 4X Front Panel, Glass Lens.....3

**I External Intensity Control**

Not required.....(Leave Field Blank)  
 PWM, TTL Level Signal.....P  
 Voltage Input Intensity Control.....V

**Part Number Example**

PB40-000-232DC1-111 calls for a single 101 segment tri-color bargraph display with a 5 digit numeric, standard 0-60 deg C operating temperature range, AC power input, RS232 communications, single DC analog input, 4 relay output, single analog output and NEMA 4X front panel seal with Acrylic Lens. Intensity is controlled through the serial port.

**Note 1:**

DC analog inputs support ranges from mVDC to 300VDC and from 0.01mADC to 3 AMPS DC (including 1-5VDC, 4-20mADC) as well as RTD Thermocouple and Strain-Gage, Excitation is standard. RMS inputs only support True RMS with levels up to 300V and 3 AMPS RMS.

**Note 2:** If ordering with Dual analog inputs, analog input 1 controls the bargraph, analog input 2 controls the numeric display.

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**MADE  
 IN  
 USA**



# SPECIFICATIONS

## Power Input

- 5 Watts Maximum
- 9-36VDC, Isolated to 1500VDC, UL Listed
- 90-265VAC or 110-370VDC, Isolated to 3000VDC, UL Listed
- External fuse should be installed, Rated at 4 Amps

## Environmental

- Operating Temp 0 to 60 Degrees C Standard
- Operating Temp -40 to 85 Degrees C Optional
- Storage Temp -55 to 95 Degrees C
- Humidity 5% to 95% Non-Condensing

## Analog Input (Typical at 25C, per channel)

- 24 BIT Low Noise Delta-Sigma A/D converter
- ANSI C39.1 standard Field selectable inputs support mADC, mVDC, ADC, VDC, RTD, Strain-Gage and Thermocouples. Input impedance is 1 Meg ohm minimum for voltage inputs
- Field selectable Excitation of 5V, 10V, 12V or 24VDC with 50mA source current as well as a constant current source up to 1.5mADC with 2VDC of maximum compliance voltage
- Isolation 1500 VDC to all other I/O
- Accuracy 0.05% +/- 2 counts for DC voltage or current
- Accuracy 0.2 deg C for RTD (10 ohm copper 0.00427, pt100 0.00385 and 0.00392, pt1000 0.00385, 120 ohm nickel 0.00672)
- Accuracy 0.8 deg C for Thermocouple inputs
- Linearity 0.01%
- Accuracy 0.1% +/- 2 counts for AC voltage or current, Crest Factor of 1
- Drift Approximately +/- 100 ppm per degree C from -40 to +85C
- Concurrent 50Hz and 60Hz noise rejection
- Front end Instrumentation Amplifier offers best noise immunity
- Programmable gain up to 128 for those really small signals
- NMRR, PSRR and CMRR Attenuation 100dB minimum
- Internal Noise 1.5mVRMS maximum
- Exclusive Internal Health subroutines monitor A/D performance as well as Sensor open or short conditions
- Programmable sampling rate and smart filtering
- User programmable 9th order Polynomial and 25 point X-Y table Linearization
- Thermocouple Cold Junction Compensation accuracy +/- 0.5C
- Protected from external Transients to ANSI/IEEE C37.90.1

## Analog Output

- 16 BIT Low Noise Monotonic D/A Converter
- Isolation 1500 VDC to all other I/O
- Accuracy 0.05%
- Linearity 0.08%
- Programmable voltage and current output
- -10V to +10V and 0-24mADC (and anything in between)
- Output can be set for non-linear function using a 25 point user definable X-Y table
- 10mA drive current in Voltage mode, 22VDC sourcing Excitation in current mode
- Protected from external Transients to ANSI/IEEE C37.90.1

## Relay Outputs

- 4 Relays, Normally Open (Form A)
- Rated to 5A at 250VAC / 30VDC Resistive
- Programmable hysteresis
- Can be set for normally closed or open in software
- 300,000 cycle life rating at 2 amps
- Dielectric strength between coil and contacts 2000VAC/60Hz
- Surge Withstand rated to 6000VAC for 50uSec
- MOV's across all contacts for protection

## MIL-PRF-28750 Solid State Relay Outputs

- Tested to MIL-PRF-28750 per DESC 90091-004
- Rated to 400mA at 60VDC maximum
- Programmable hysteresis
- Can be set for normally closed or open in software
- internally fused with PTCC rated 400mA hold, 800mA trip
- Dielectric strength 1000VAC between input and output
- Surge Withstand rated to 600VDC for 50uSec
- MOV's across all contacts for protection

## Display

- 5 Full LED Digits with Decimal Point 8.8.8.8.8.
- Display Range: -19999 to 99999
- Choice of Red, Green or Amber Color
- Superb Visibility 7 Segment 0.30" High LEDs
- 51 or 101 Segment Tri-Color LED Bargraph
- Face Plate: Plastic Acrylic with non-reflective coating, or optional Annealed Glass 0.125" thick.
- NEMA 4X front panel seal available

## Screw Connections

- 2 piece screw connectors for power, signal I/O and relays
- 3.5mm spacing between terminals, accepts AWG# 16-26
- Connectors rated to 10 amps, 300VAC
- 2.5KV Withstand between terminals
- UL, CSA and VDE approved

## Serial Communications

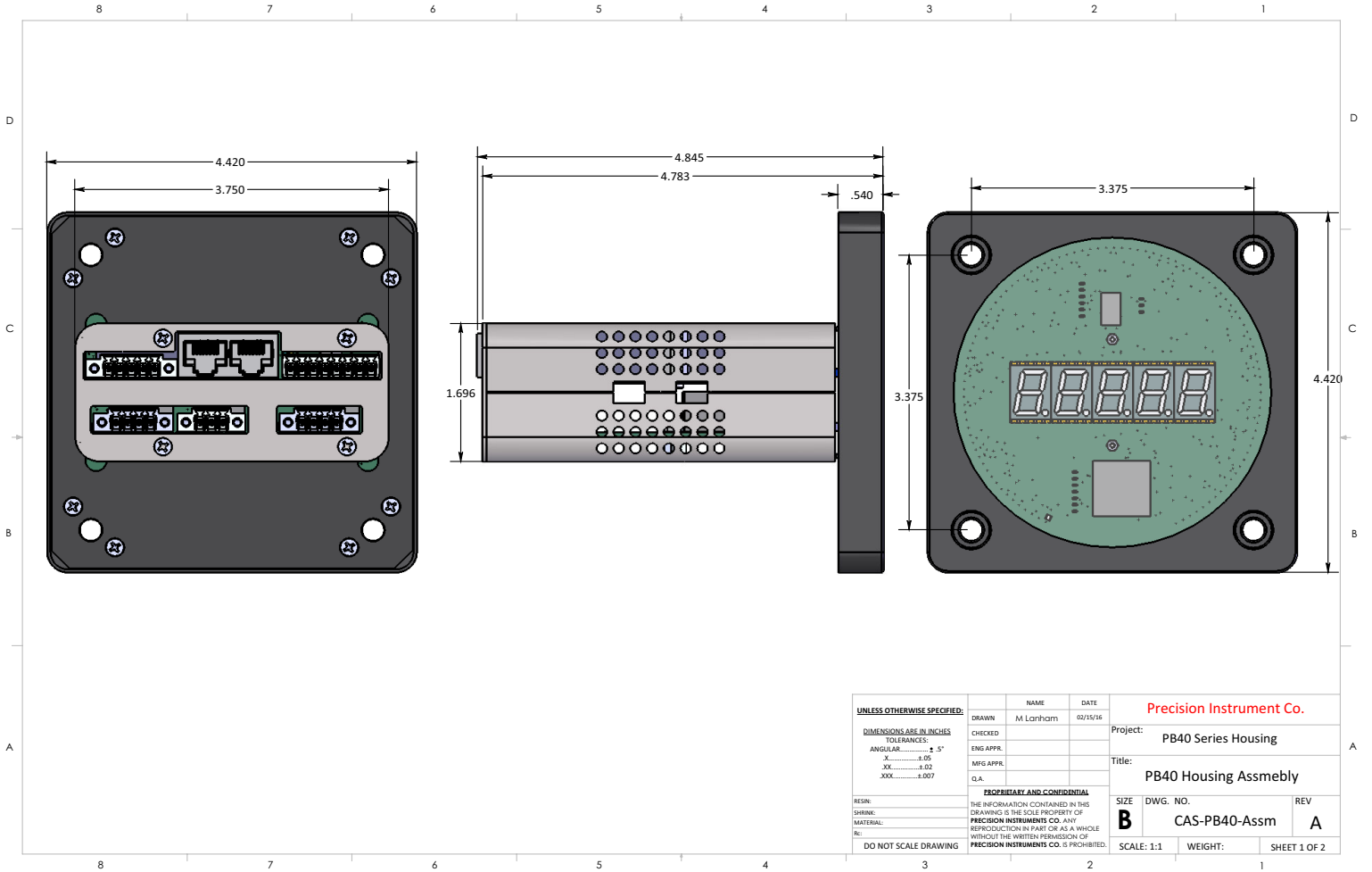
- Dual RJ45-8 connectors for simplified wiring for serial
- ModBus RTU over serial RS485, USB, RS232C or RS485
- 1/8th unit load allows up to 256 nodes on the RS485 bus
- 8 data bits, no parity, 1 stop bit
- Baud rates from 1200 to 38400
- Can be set as a silent monitor or to echo incoming commands out its transmit line
- ESD protected to +/-25KV using the human body model
- Transient protected to ANSI/IEEE C37.90.1
- Isolation 1500 VDC to all other I/O

## EMI Characteristics (Pending qualification)

### \*\* 9-36VDC power input version \*\*

- Radiated Emissions EN55022 Class B
- Radiated Susceptibility EN61000-4-3 Criteria A;10V/m
- Conducted Emissions EN55022 class B
- Conducted Susceptibility EN61000-4-6 Criteria A; 3VRMS
- EFT ; EN61000-4-4 +/- 4KV
- Surge ; EN61000-4-5 to +/- 2KV
- ESD ; EN61000-4-2 Criteria B +/- 4KV

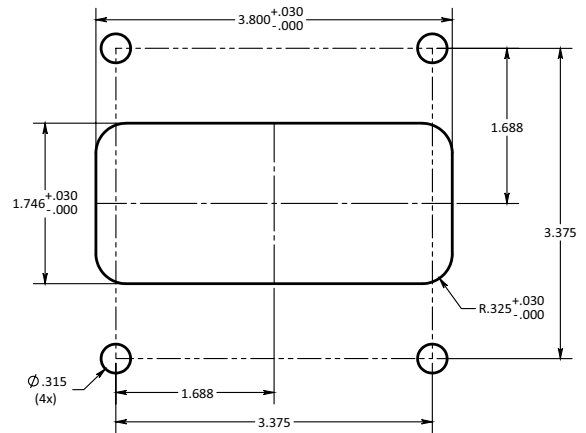
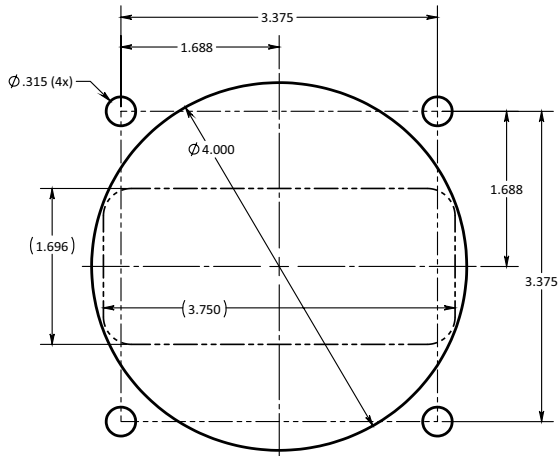
# Mechanical Information



# Panel Cutout

All dimensions in Inches, unless otherwise stated.

**PB40 Panel Cutout Dimensions**



<b>UNLESS OTHERWISE SPECIFIED:</b>		NAME	DATE	Precision Instrument Co.	
DIMENSIONS ARE IN INCHES		DRAWN	M Lanham	02/15/16	Project: PB40 Series Housing
TOLERANCES:		CHECKED			Title: PB40 Housing Assmly
ANGULAR..... ± 5°		ENG APPR.			SIZE DWG. NO. REV
X..... ± 0.05		MFG APPR.			<b>B</b> CAS-PB40-Assm <b>A</b>
XX..... ± 0.02		C.A.			SCALE: 1:1 WEIGHT: SHEET 2 OF 2
XXX..... ± 0.007		<b>PROPRIETARY AND CONFIDENTIAL</b>		THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF PRECISION INSTRUMENTS CO. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF PRECISION INSTRUMENTS CO. IS PROHIBITED.	
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