NUPIC Audited

BA101P/SA101P
Nuclear Qualified
Programmable Bargraphs

AMETEK Dixson "PRO" (PROgrammable) Series bargraphs are the preferred choice for new applications, or to retrofit switchboard meters, other common size indicators and set point controllers. The "PRO" Series is feature-enhanced, and options are available to solve most common application problems. These models are easily configurable for maximum flexibility. Model SA carries a Class I (1E) level of qualification, and model BA carries a Class II (seismic only) level. Other nuclear qualified models are available (see data sheet P/N 071-40216).

Application

Models BA and SA nuclear-qualified bargraphs are direct replacements for GE180, Westinghouse VX252, and Sigma 1251 instruments. They can be used in new applications and as replacements for moving pointer meters. Solid state microprocessor based design provides greatly increased accuracy where loop degradation is a problem, and eliminates problems caused by shock, vibration, and static electricity.

The software has verification and validation (V&V) to IEEE-7.4.3.2, 1993, and our 10CFR50 Quality program has been audited by a member of NUPIC. EMI/RFI testing has been performed to current Nuclear Utility requirements. AMETEK Dixson's total generic

qualification program eliminates industry concerns about dedicated qualification of commercial equipment. The bargraphs' forms, fits, and functions allow for simple replacement without panel modifications or changes to seismic considerations.

Class I (1E): Includes all safety-related control loops and their various components.

Class II: Includes all instruments mounted in close proximity to any Class I component. If a component becomes detached from its mounting in a manner that it could fall onto Class I components, then that component must meet the requirements of a Class II component.

Features

- Mild-environment qualification to IEEE-323-1983 and IEEE-344-1987
- QA programs include 10CFR50, Appendix B, audited by a member of NUPIC
- Brilliant red LED display for excellent visibility
- Minimum 88,000-hour MTBF
- Rugged—high resistance to vibration and shock
- Programmable configuration using front panel switches or PC serial link using DIXPRO software
- Available with or without program switches on front
- Input signal ranges switch-selectable
- Auto-calibration algorithm
- Linearization of input signals
- Accurate square root extraction

- Min/max signal memory
- Front panel mounting
- Underrange/overrange indication

Options

- Digital display, reading to 10% over/underrange
- Green or amber LEDs
- On/off control using set point relays
- Direct temperature measurement
- Auxiliary transducer power supply
- Two-wire, isolated retransmission, 4 to 20mA
- RS-422 serial communication
- Horizontal mount version available

071-40190B

BA101P/SA101P Specifications

Note: for ISA S67.04 and RP67.04 Part II, consult factory for models and assistance.

PHYSICAL CHARACTERISTICS
Number of segments	101
Resolution	1.0%

ENCLOSURE MATERIALS:
Non-glare black PPO Noryl or Cyclolac ABS case complying with UL94 V-0 or V-1

DIGITAL DISPLAY (True minus sign) –9999 to 9999
Number of digits in each digital display	4
Resolution	0.01% ± 1 count*

ENVIRONMENTAL PERFORMANCE
Operating temperature range (MIL-E16400G, Class 4)	0 to +60° C
Storage temperature range	–40 to +85° C

POWER REQUIREMENTS Either 115/230 VAC at 50, 60, 400 Hz or 5, 12, 24 or 48 VDC
Line regulation	±10%
Power consumption (typical, depends upon options)	3.5 VA

SENSITIVITY RANGES (Reference ANSI C39.1 Std. Sensitivities)
STANDARD FULL SCALE INPUTS FROM ZERO
(DIP-switch selectable)
DC currents	500 µA to 50 mA
DC voltages	1 V to 250 V

OPTIONAL FULL SCALE INPUTS FROM ZERO
(Factory configured)
DC currents	50 µA to 250 mA
RS-422	Serial Data Comm.
DC voltages	50 mV to <1000 mV
AC currents	1 mA to 1000 mA; 5 A
AC voltages	250 mV to 250 V
Thermocouple - Type E	–100 to +1000° C
Thermocouple - Type J	–18 to +760° C
Thermocouple - Type K	–18 to +1370° C
Thermocouple - Type T	–160 to +400° C
RTD (100-ohm platinum)	–200 to +850° C

DC INPUT PARAMETERS
Linearity	0.02% of span ± 1 count*
Accuracy	0.04% of span ± 1 count*†
Zero stability	<0.01% per °C
Gain stability	<0.02% per °C

Input impedance:
For voltage inputs	>200 k ohms
For 4 to 20 mADC current inputs	100-ohm compliance resistor
For 10 to 50 mADC current inputs	40-ohm compliance resistor
For all other current inputs	Consult factory
Response time (typical)	175 ms
Overload (signal)	200% or 250 VDC maximum

AC INPUT PARAMETERS (true RMS-reading)
Linearity	0.4% of span **
Accuracy	0.5% of span **
Zero stability	<0.04% per °C
Gain stability	<0.04% per °C
Input impedance for voltage inputs	>200 k ohms
Response time (typical)	325 ms
Overload (signal)	200% or 250 VDC maximum

SET POINT OPTION (internal module)
Standard set points	LO and HI
Configurable alarm	HI/HI (default) or LO/LO
Setability	0.1%
Hysteresis	1.0%

Relay response time (typical):
For DC inputs	350 ms
For AC inputs	650 ms
Relay contact ratings (three Form C):	0.4 A at 125 VAC
	2 A at 30 VDC

RETRANSMISSION ACCURACY (4 to 20 mA) ± 0.1%

LINEARIZATION
8th-order polynomial (nine terms). Refer to "PRO" Series Interface Kit
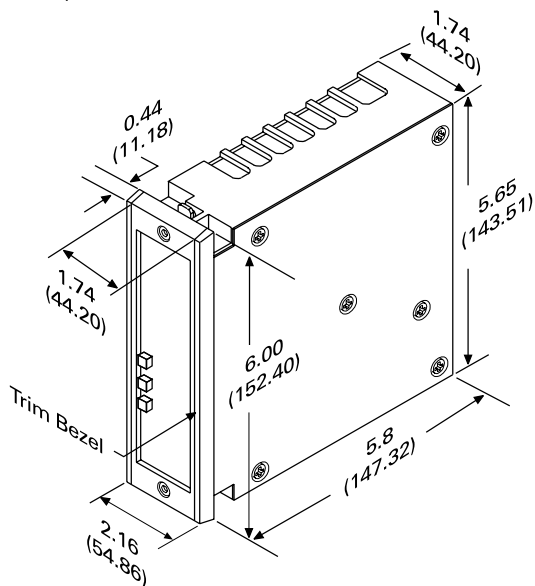
* 1 count is defined as a ± unit value change of the right-most digit.

† Call factory for thermocouple, RTD, and square root input accuracy information.
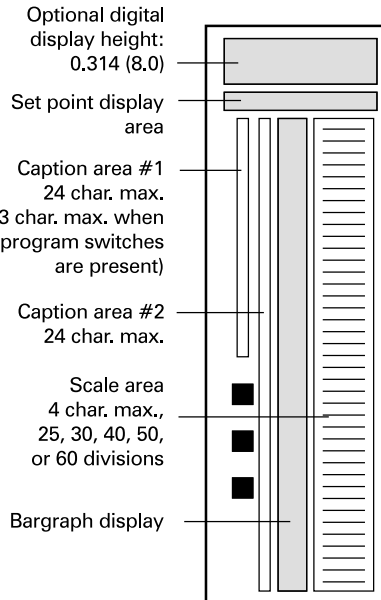
** Except for first 5% of span.
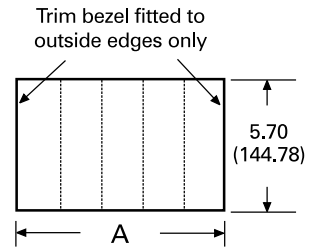
BA101P/SA101P Dimensions

Dimensions given in inches (metric in parentheses)

1.74 (44.20)
0.44 (11.18)
1.74 (44.20)
6.00 (152.40)
5.65 (143.51)
5.8 (147.32)
2.16 (54.86)
Trim Bezel

Artwork Guidelines

Optional digital display height: 0.314 (8.0)
Set point display area
Caption area #1 24 char. max. (13 char. max. when program switches are present)
Caption area #2 24 char. max.
Scale area 4 char. max., 25, 30, 40, 50, or 60 divisions
Bargraph display

Panel Cutout Dimensions

Trim bezel fitted to outside edges only

5.70 (144.78)

A

Dimension "A"	+0.03 –0.00	+0.76 –0.00
# Units	Inches	mm
1	1.77	44.96
2	3.52	89.41
3	5.26	133.60
4	6.99	177.55
5	8.73	221.74