WOOJIN INC

PS-LBI01AQ/PS-LBI02AQ

Nuclear Qualified Digital Bargraph Indicators

Application

PS Series is WOOJIN's second generation nuclear qualified digital bargraph indicator supporting wide range of input signals. PS Series can replace most panel and switchboard meters that are being used today. Nuclear Non-safety-related Class bargraph indicators consist of models PS-LBI01AQ / PS-LBI02AQ that fit easily into standard 6" edgewise and DIN size panel cutouts. These models are direct replacement for Dixson, Weschler, Sigma/International Instruments and other common size equivalents. WOOJIN's full color TFT-LCD bargraph indicators offer the best of analog and digital solid state instrumentation. The expended bar display and single moving point display gives you the 0.85% and 0.21% resolution with analog trend indication respectively and provides the operator with a quick view on the status of the measured signal or control setpoints. The digit display provides the highest accuracy readings of the signal variables.

Models PS-LBI01AQ / PS-LBI02AQ are Nuclear Non-safety Class

- Nuclear Non-safety-related Class
  The software has been verified and validated (V&V) to IEEE 7-4.3.2 2003. Also Seismic qualification has been performed IEEE 344 2004.

Our Nuclear Quality Program has been audited by a member of KEPIC. WOOJIN's total generic qualification program eliminates industry concerns about dedicated qualification of commercial equipment.

Feature

- High resolution bar display, configurable for single moving point display or standard expanded bar
- Four setpoint relays configurable for hysteresis & delay operation
- Isolated analog retransmit output, selectable volts or mA
- Auxiliary transducer power supply
- RS-485 for data communication
- Operating zone-mark indication
- Under / Over range indication
- Accurate square root & power factor extraction
- Pluggable screw anchored terminal connection

Options

- High-capacity setpoints relays available
- Horizontal-mount version available
- NEMA 12, NEMA 4X type enclosure available

Specification

BAR DISPLAY
Type full color TFT-LCD
Size 3.7" display
Resolution 0.85% full scale for expanded bar
0.21% of full scale for moving point
Color red/yellow/green tri-color
Pointer Mode selectable standard expanded bar or single moving point
Display Mode selectable normal or bipolar(or dual slope)

DIGIT DISPLAY
Type full color TFT-LCD
Size 0.3" for single type, 0.2" for dual type
Resolution -99999~99999 for single type
- 9999~ 9999 for dual type
Color green

OPERATING ZONE-MARK INDICATION
Up to 5 zone-marks can be programmed. Each of programmed zone-marks are displayed on the gradations.

PROGRAMMABLE OVER/UNDER RANGE INDICATION
Bar Display When input is out of range, the all or bottom segment of bar will be illuminated.
Digit display reading to ±10% over/under range.

RESPONSE TIME
≤ 250ms for DC, thermocouple, RTD signals

INPUT SENSITIVITIES (Reference ANSI C39.1 Std. Sensitivities)
Standard Input (DIP switch and/or software configurable)
DC Amps 10uA ~ 250mA
DC Volts 10mV ~ 250V
Thermocouples
Type E -270 ~ 1000℃
Type J -210 ~ 1200℃
Type K -270 ~ 1372℃
Type T -270 ~ 400℃
RTDs Alpha[1] 3850ppm/℃ Std.
100Ohms Pt -200 ~ 850℃
200Ohms Pt -200 ~ 850℃
RS-485 Data Comm.

ACCURACY[2]
DC Amps&Volts 0.01% of full span ± 1 count[3]
T/C (Larger of 0.1% of full span, or ±1℃) ± 1 count
RTD 0.1% of full span ± 1 count

SETPOINT RELAY[4]
Contact Output 4 Form A (or B) Relays
Mode HI, LO, selectable
Set Ability 0.1% of full scale
Hysteresis 0.5%,1%,2% of full scale, selectable
Delay 0~10sec
Contact Capacity[5] 0.5A, 60V

ANALOG RETRANSMIT
Analog retransmit signal is selectable current or voltage and output range is programmable.
Current Programmable between 0 and 24mA
Self-powered output
Compliance voltage : 24V max.
Voltage Programmable between 0 and 10V
Accuracy 0.1% of full span

COMMUNICATIONS
RS-485 2-wire
Protocol Modbus RTU / ASCII

TRANSDUCER POWER SUPPLY
Output Ratings typical 24V, 60mA

CASE MATERIAL
Non-glare black PC or ABS case complying with UL94 V-0

POWER REQUIREMENT
Line Voltage 85~264VAC, 47~63Hz
120~375VDC
Power Consumption Typical 3.0VA for single type and 6.4VA for dual type. Depends upon LCD's brightness and options.

OPERATING INFLUENCES
Ambient Temperature Affects less than ±0.01% of span per 1℃ within normal limit conditions.

OPERATING CONDITIONS

Condition	Normal Limits	Storage Limits	Normal Reference
Ambient Temperature	10~40℃	-40~85℃	23±2℃
Ambient Humidity	≤ 95%RH (Non-Condensing)	≤ 95%RH (Non-Condensing)	40~60%RH (Non-Condensing)

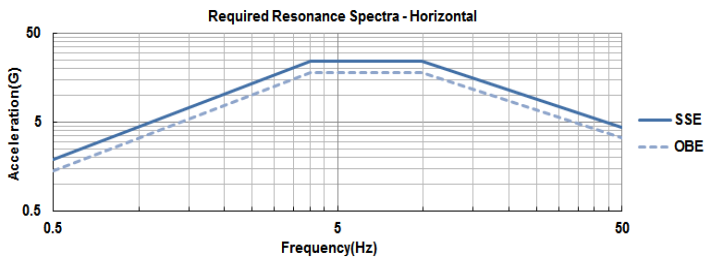
MOUNTING
Front panel mounting

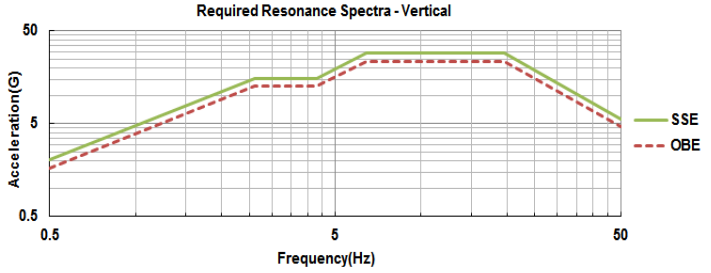
WEIGHT
Typical 760g for single type and 820g for dual type. Depends upon options.

1. Other Alpha ratings available
2. Accuracy is calibrated accuracy at normal reference conditions
3. 1 count is defined as a ± unit value change of the right-most digit
4. Single type only
5. High-capacity setpoints relays available - 5A, 240VAC / 5A, 150VDC

※ **Options and features vary between models, contact factory for specifics.**

Required Resonance Spectra



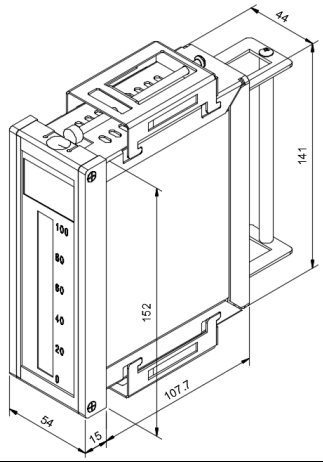


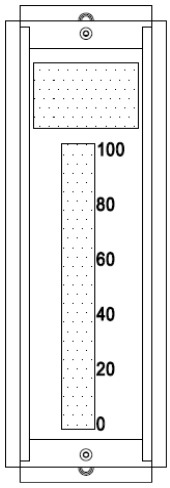
Damping Factor : Operating Basis Earthquake(OBE) 2%, Safe Shutdown Earthquake(SSE) 3%

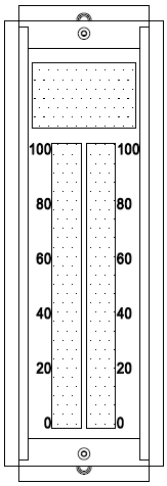
Dimensions

PS Series Digital Bargraph Indicator

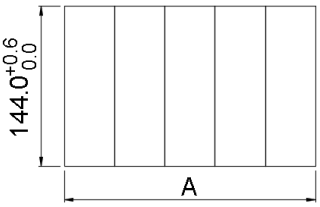
Dimensions given in millimeters







Panel Cutout Dimensions

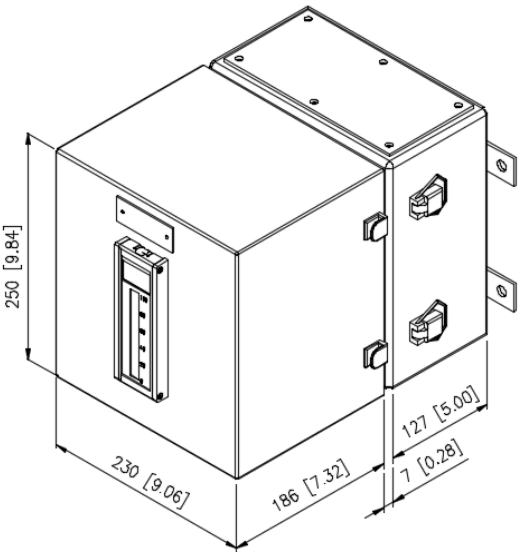


Dimension "A"

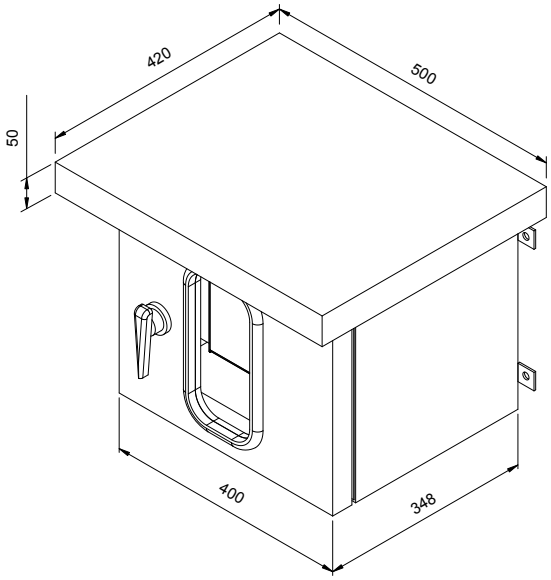
#UNIT	$A^{+0.6}_{-0.0}$ mm
1	45.0
2	89.4
3	133.6
4	177.5
5	221.7

NEMA 12 / NEMA 4X Type Enclosure

Dimensions given in millimeters



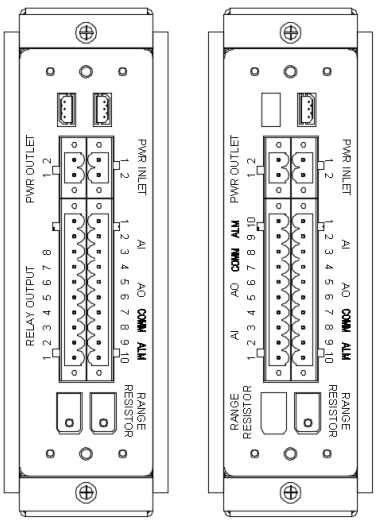
NEMA 12 Enclosure



NEMA 4X Enclosure

Terminal Connection

PS Series Digital Bargraph Indicator



INPUT(AI)
VOLTAGE / CURRENT
(3) Hot side (+) (4) Return Side (-)

THERMOCOUPLE
(3) Lead 1 (+) (4) Lead 2(-)

RTD
(2) Lead 1 (a) (3) Lead 2 (b) (4) Lead 3 (b')

TRANSDUCER POWER
(1) 24VDC + (4) 24VDC -

POWER
INNET
(1) Live (2) Neutral

OUTNET
(1) Live (2) Neutral

ANALOG RETRANSMIT(AO)
(5) Hot side (+) (6) Return Side (-)

COMMUNICATIONS
RS-485
(7) DATA+ (8) DATA-

ALARM(ALM) OUTPUT(SINGLE TYPE ONLY)
(9) N.O.(or N.C.) (10) COM_{ALM}

RELAY OUTPUT
(1) Relay4 N.O.(or N.C.) (2) COM_{RY}
(3) Relay3 N.O.(or N.C.) (4) COM_{RY}
(5) Relay2 N.O.(or N.C.) (6) COM_{RY}
(7) Relay1 N.O.(or N.C.) (8) COM_{RY}

* Applicable wire range is 12~22AWG
* Relay contacts are selectable Normally Open or Normally Close