

OPERATION MANUAL

DIGITAL LOOP POWERED INDICATOR

Model : JM-408

DIGITAL LOOP POWERED INDICATOR

JM-408

PRINCIPLE OF OPERATION

The Model JM-408 Digital process Indicator is a compact, rugged and reliable indicating instrument which is specifically designed for accurate process measurement applications in areas without power availability.

The Indicator accepts an industrial standard current input signal of 4 to 20 mA DC and displays the actual process value calibrated in the desired units, on a linear scale. The process value is displayed on a 4-Digit seven-segment red LED digital display module. There is no necessity of any external Power Supply.

The instrument is fully configurable and can be calibrated on any scale range from –999 to +9999 units. Decimal Point setting is also provided in the instrument.

The principal of operation is briefly as follows :- The Input signal is passed through a series of amplification and conditioning stages. Initially, the signal is conditioned internally and fed to a signal convertor circuit. Thereafter, the transduced signal output of this convertor is fed into an A/D Convertor before being finally passed through a Decoder/Driver digitizing circuit which displays the input signal in the form of decimal digits on a seven-segment display module.

The field mounted unit has no potentiometers to adjust and all settings can be performed digitally using only the three membrane switches that are available on the front panel. The NEMA4X rating provides total immunity to corrosive atmospheres, high humidity (including condensation) and dust.

The JM-408 Indicator is therefore an ideal single unit substitute to conventional analog indicators because of its easy set up procedure and inherent accuracy in process control, besides other superior characteristics like immunity to Shocks, Dust, Ambient temperatures, Humidity and Corrosive atmospheres. Its main advantage is that it is completely current loop-driven, eliminating the requirement of any external power supply source and associated cabling.

The instrument is manufactured using selected high-grade components which guarantee its reliability and long operational parts. There are no moving parts and no potentiometers that may drift over time and in high vibration applications.

INSTALLATION

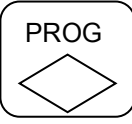

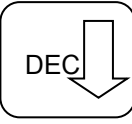
The Model JM-408 is designed for field mounting in an Aluminum die-cast enclosure with IP65 ingress protection. The instrument should be first installed on the required panel face by means of the two clamps provided for the same.

All inter-connections to the instrument should be made with strong multi-strand wire of the order of 2.5 sq.mm. The ends of the wires should be properly ferruled and suitable lugs must be used for effective termination. The Cables carrying the Input Signal should be properly isolated from the Power Line cables (even separate router channels), to prevent any electromagnetic interferences in the Input Signal readings from disturbances in the Mains Power Line. There is no requirement of power supply or earthing. It is recommended that the polarities of the input signal be double-checked for correctness before energizing the instrument.

OPERATION

CONTROL KEYS

The instrument has three keys on the front panel, functions of which are described below :

	<p>The PROG or PROGRAM key is the central co-ordinating key to access the settings of the instrument. Pressing this Key allows the operator to sequentially view, change and save the parameters such as Zero and Span settings and Decimal Point for the digital display.</p>
	<p>The INC or Incrementing key allows the operator to select the numeral in the digit being set. The digit will sequentially display 0, 1, 2....9 on each pressing of the INC key. This may be used to set the calibration range of the instrument.</p>
	<p>The DEC or Decrementing key allows the operator to select the numeral in the digit being set. The digit will sequentially display 9, 8, 7....1 on each pressing of the DEC key. This may be used to set the calibration range of the instrument.</p>

SETTINGS

The following is the sequence of settings possible on the Digital Loop Indicator :

Since the input signal to the Loop Indicator is 4 to 20 mA DC, the reference signal is internally generated for calibration. As such, no external signal is required to be fed to the input terminals at the time of calibration.

First, ensure that the terminations have been made as per the enclosed Terminal Diagram and the input signal has been connected at the terminals in the correct polarity. On energizing the input signal, the digital display will immediately indicate the actual process value. (For calibration details of the Indicator, please refer to the Technical Specifications).

The scale calibration can be changed whenever required with the help of the three-key Membrane Keyboard on the front panel. The Decimal position also may be selected by using the keyboard (see Calibration section). However, it is strongly recommended that only authorized personnel should attempt any alterations or rectifications in the instrument.

All settings and adjustments must be done from the three-key Membrane Keypad on the front panel of the module.

CONNECTIONS

- Locate the two-way terminals on the rear of the module.
- Connect the analog current loop input signal of 4 to 20 mA at the terminals in the indicated polarity.

PROGRAMMING INSTRUCTIONS

CALIBRATION

(Note: Bold Text indicates flashing)

KEY PRESSED	DISPLAY	FUNCTION
(POWER ON)	Process Mode	Actual process value
PRESS ↑↓ TOGETHER FOR 2 SEC	t-LO	Internal Factory Setting (not for customer Use)
PROG P	t-hi	Internal Factory Setting (not for customer Use)
PROG P	r n G L	Range Low Setting Use ↑ and ↓ keys
PROG P	r n G H	Range High Setting Use ↑ and ↓ keys
PROG P	d P	Decimal Point Setting Use ↑ and ↓ keys
PROG P	- - - -	Saving of settings and re-initialisation
	Process Mode	

This completes the entire settings of the Loop Powered Digital Indicator. (Note: All parameters to be shifted/selected using INC and DEC keys).

TECHNICAL SPECIFICATIONS

Model	:	JM-408
Type	:	Digital Loop-powered Indicator.
Input Signal	:	4 to 20 mA DC.
System	:	Two-wire.
Indication	:	4 digit seven-segment LED display.
Display height	:	0.5".
Forward Voltage Drop	:	3.0 Volts @ 20 mA.
Sensing Resistance	:	3.30 Ohms.
Range	:	0.0 to 100.0
Calibration Range	:	As per required (Configurable).
Under-Range indication	:	Indication of "Err" on display.
Over-Range indication	:	Indication of "Err" on display.
Polarity	:	Auto-Sensing.
Calibration	:	By three-key Membrane Keypad.
Power Supply	:	Nil (Loop-powered).
Settings	:	Zero, Span, Decimal point.
Response time	:	Typically 20 mS.
Linearity	:	$\pm 0.1\%$ FS.
Resolution	:	$\pm 0.1\%$, ± 1 digit.
Ambient temperature	:	0 to 50 °C.

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