

OPERATION MANUAL

FIELD MOUNTED PROCESS INDICATOR



8080MK

INTERNATIONAL METAL ENGINEERING

Released on 25th February 2009

PRINCIPLE OF OPERATION

The Model 8080MK 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 whatsoever.

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 is fed into an A/D Convertor before being 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 of the panel overlay provides total immunity to corrosive atmospheres, high humidity (including condensation) and dust.

The 8080MK 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 8080MK is designed to be field mounted in a certified weather-proof or flameproof enclosure. The instrument should be first installed in the required enclosure and clamped to position using the mounting screws provided.

All inter-connections to the instrument should be made with strong multi-strand wire of the order of 1.5 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 any Power Line cables (even separate router channels), to prevent 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.

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.

The instrument operates purely on current loop (4-20 mA DC) – it has no external power supply.

It is not necessary to provide a “4 to 20 mA DC” current signal as a source for calibration. The following parameters can be set during calibration :

- Scale Range corresponding to 4 mA
- Scale Range corresponding to 20 mA
- Decimal Position

PROCEDURE

To recalibrate the instrument, connect a reliable analog signal of 4 to 20 mA DC at the Input Signal Terminals in the indicated polarities. Minimum of 12 mA DC is required for the following procedure.

[All settings to be done using(◀) and (▲) keys].

KEY PRESSED	DISPLAY	ALTERNATING DISPLAY	FUNCTION
Press and hold the (▼) and (▲) key together for 2 seconds	-	-	Instrument goes into “Calibration” mode.
	t LO	Random Internal count of the microcontroller	Precisely adjust 4.000 mA DC input signal at the input terminals. The internal count of the microcontroller will change accordingly.
Press (▲) key to save the count value	Display will blink once indicating value saved	Random Internal count of the microcontroller	Low Input Signal Value (corresponding to 4 mA DC) has been Saved. Do not press (▲) if you do not need or want to calibrate.
PROG P	t hi	Random Internal count of the microcontroller	Precisely adjust 20.00 mA DC input signal at the input terminals. The internal count of the microcontroller will change accordingly.
Press (▲) key to save the count value	Display will blink once indicating value saved	Random Internal count of the microcontroller	High Input Signal Value Saved. Do not press (▲) if you do not need or want to calibrate.
PROG P	RngL	0000	The desired Zero (lower) range setting for the process being measured may be set using (▼) and (▲) keys. The minimum Zero level possible is -999.
PROG P	RngH	2000	The desired Span (upper) range setting for the process being measured may be set using (▼) and (▲) keys. The maximum Span level possible is 9999.
PROG P	dP	200.0	Set the Decimal Position. Pressing (▲) key will shift the Decimal by one position to the left with each key-press.
PROG P	(process value)		(corresponding to actual current at the input)

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

TECHNICAL SPECIFICATIONS

Model	:	8080MK.
Type	:	Digital Loop-powered Indicator.
Input Signal	:	4 to 20 mA DC.
System	:	Two-wire.
Indication	:	4 digit seven-segment LED display.
Display height	:	0.3".
Forward Voltage Drop	:	3.0 Volts @ 20 mA.
Sensing Resistance	:	3.30 Ohms.
Range	:	-999 to 9999.
Calibration Range	:	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 Switchpad.
Power Supply	:	Nil (Loop-powered).
Settings	:	Zero, Span, Decimal point.
Response time	:	Typically 20 mS.
Linearity	:	± 0.1% FS.
Resolution	:	± 0.1%, ± 1 digit.
Execution	:	Field mounting.

CERTIFICATION

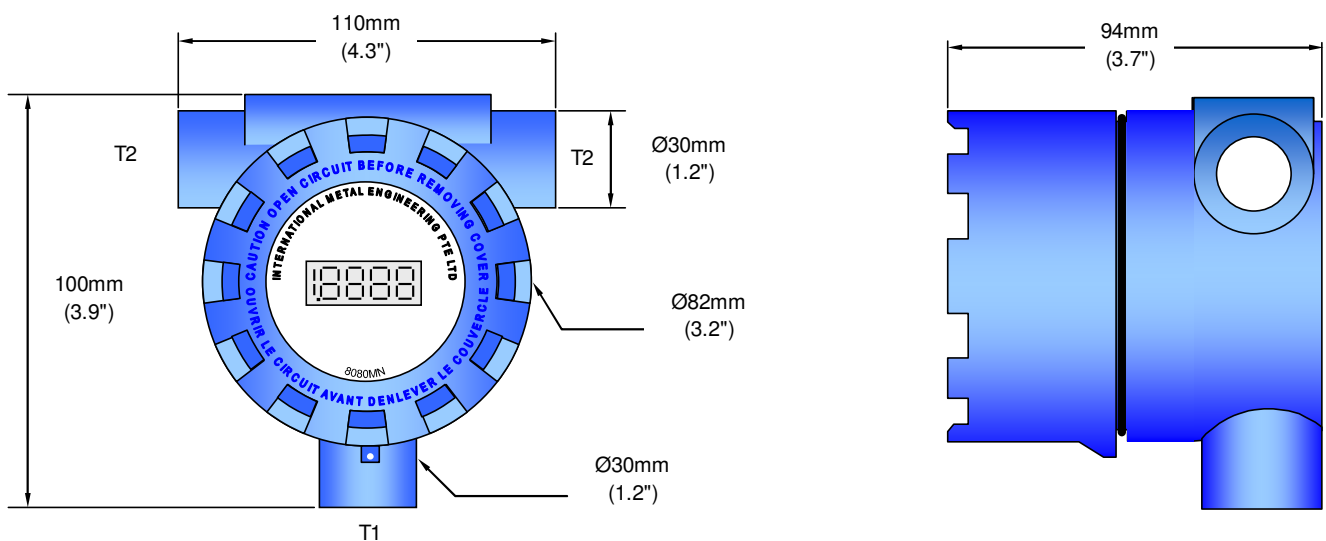
Both the Aluminum and the SS316 housing are certified NEMA4X and IP68.

ATEX / IECEx EX PROOF CERTIFICATIONS

ATEX II 2 G D
 Ex d IIC T6 Gb
 Ex tb IIIC 85°C Db IP68
 Ta = -40°C to +60°C

CONFIGURATION AND ORDERING INFORMATION

IME MODEL	DESCRIPTION			
8080MK	Field Mounted Process Indicator With 4 Digit LED			
	CODE	OPTIONS, HOUSING		
	A	Die cast Aluminum, Blue Epoxy Painted		
	T	Stainless Steel SS316, Electro-Polished		
		CODE	CONDUIT SIZE (T2)	PROCESS CONNECTION (T1)
		01	3/4" NPT	M16 x 2P
		02	1/2"NPT	M16 x 2P
		03	M20 x 1.5P	M16 x 2P
		04	3/4" NPT	1/2"NPT
		05	1/2"NPT	1/2"NPT
		06	M20 x 1.5P	1/2"NPT
		07	3/4" NPT	3/4" NPT
		08	1/2"NPT	3/4" NPT
		09	M20 x 1.5P	3/4" NPT
		10	3/4" NPT	1/2"BSP
		11	1/2"NPT	1/2"BSP
		12	M20 x 1.5P	1/2"BSP
		13	None	3/4" NPT
		14	None	M20 x 1.5
		16	None	1/2"BSP
		17	None	1/2"NPT
		CODE	EXPLOSION PROOF CERTIFICATION*	
		NO	NONE	
		E1	ATEX/IECEX Explosion Proof Certified, NEMA4X	
		CODE	ACCESSORIES	
		RC	SS316 2" Pipe/ Wall Mounting Bracket, IME Model 175RC	
		PM	SS316 2" Pipe/ Wall Mounting Bracket, IME Model 175PM	
		NR	SS316 2" Pipe/ Wall Mounting Bracket, IME Model 175NR	
		MM	SS316 2" Wall/Panel Mounting Bracket, IME Model 175MM	
8080MK	A	03	E1	MM ← Typical Model Number



Conduit Size & Instrument Connection As Per Specified

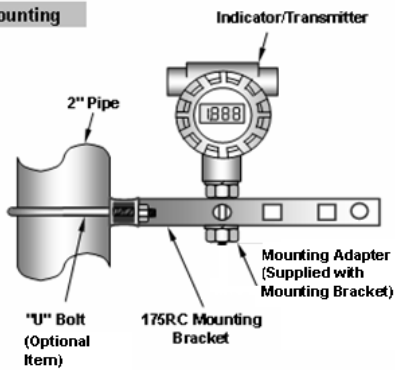
Note:

1. T2 is defined as the two Connections, in tandem, where normally the conduits would be connected.
2. T1 is defined as the Instrument Connection, which is perpendicular to the conduit connections
3. M16 X 2 Entry is not a through entry but only a provision for the mounting bracket.

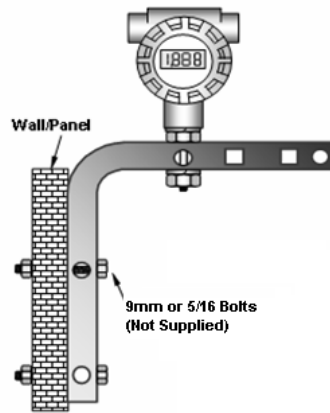
IME MODEL 175RC

Mounting Methods

Pipe Mounting



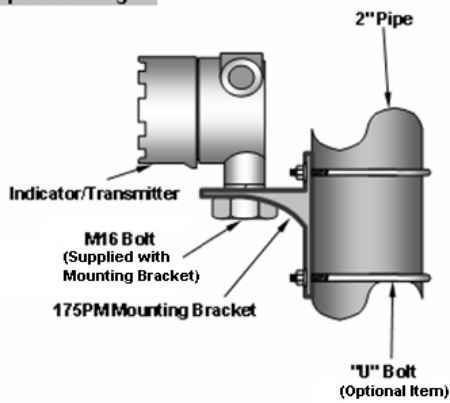
Wall/ Panel Mounting



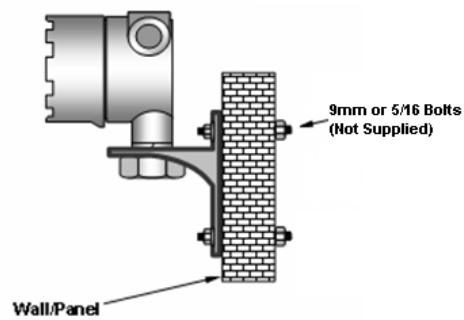
IME MODEL 175PM

Mounting Methods

Pipe Mounting



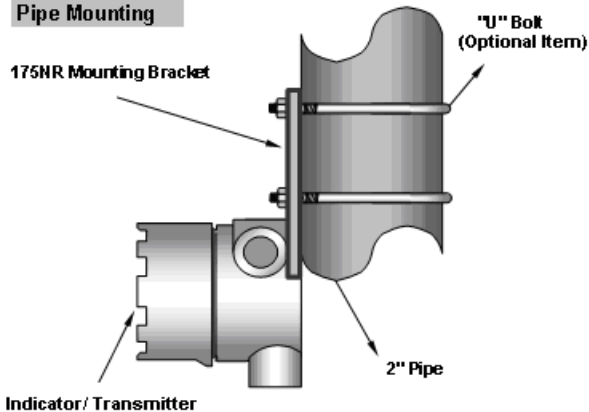
Wall/ Panel Mounting



IME MODEL 175NR

Mounting Method

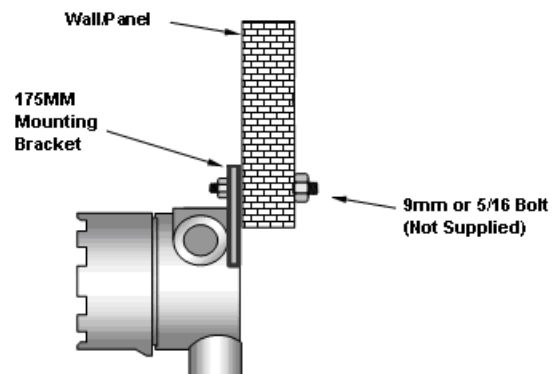
Pipe Mounting



IME MODEL 175MM

Mounting Method

Wall/ Panel Mounting



WARRANTY

International Metal Engineering Pte. Ltd. (IME) for the effective period of the warranty set out below, warrants that its standard products will be free from defects in materials and workmanship under normal use and service.

International Metal Engineering Pte Ltd.'s obligation under this warranty shall not arise until Buyer returns the defective product, freight prepaid to IME's facility in Singapore or any other authorized destination, specified in writing by IME.

The only responsibility of IME under this warranty is, at its option and sole discretion, to replace or repair, free of charge any defective component part of such product.

EFFECTIVE PERIOD OF WARRANTY

Three years from date of invoice for new products. For repairs the warranty shall be one year from the date of shipment.

LIMITATION OF WARRANTY

The warranty set forth herein does not extend to and shall not apply to:

Products which have been repaired or altered by other than IME's personnel, unless Buyer has properly altered or repaired the products in accordance with procedures previously approved in writing by IME.

Products, which have been subject to misuse, neglect, accident, or improper installation or operation.

Products, which have been mechanically damaged.

The warranty and remedies set forth above are in lieu of all other warranties expressed or implied, oral or written, either in fact or by operation of law, statutory or otherwise, including warranties of merchantability and fitness for a particular purpose, which IME specifically disclaims.

IME neither assumes nor recognizes any other liability in connection with the sales, installation or use of its products.

IME shall have no liability for incidental or consequential damages of any kind arising out of the sale, installation or use of its product.

The IME address to which notices, authorizations, and approvals and written communications pertaining to this warranty are to be delivered is:

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