# General Specifications

# Model MLX
# Loop Powered Process Indicator

**GS 60A02S01-01E-A**

*The Model MLX Loop-Powered Process Indicator receives DC current signals from electronic transmitters and indicates process measurement values. Standard models are general purpose.*




## STANDARD SPECIFICATIONS

### □FUNCTIONAL SPECIFICATIONS

**Input:** 4-20mA DC 2-wire
**Voltage Drop:** 3.5V at 20mA
**LCD Display**
Numerical: Six 7-segment digits
Alpha-numerical: Six 14-segment characters
Bar graph: 20-segment Bar graph.
Symbols: P, SP, T, F, %, √, x10, x100, x1000
Configuration: User configurable for desired engineering units.
Method: User configurable from front panel
**Zero & Span:** Zero and span can be set between ±999999.
**Turn-on Time:** 12 second (includes power on self-test and memory integrity check)
**Update Time:** 1 second
**Isolation:** Input/Output/Ground isolated to 500V DC

### □PERFORMANCE SPECIFICATIONS

**Accuracy:** ± 0.05% of full scale +1 digit
**Operating Current:** 3.6mA to 28mA
**Ambient Temperature:** -40 to +80°C (-40 to 176°F)
**Ambient Humidity:** 0 to 100%RH at 23°C (73°F)
**Ambient Temperature Effect:** 0.1°C per 10°C
**Over range:** 200mA without damage
**Maximum error:** +0.02%, -0.03% (of full scale)
**Conformity (Linearity):** 0.03%
**Hysteresis error:** 0.03%
**Repeatability:** 0.03%
**Vibration:** 3G @ 10-150Hz
**Shock:** 50G
**Explosion Protection:** FM, CSA, ATEX, and IEC

### □PHYSICAL SPECIFICATIONS

**Enclosure Material**
Housing: Low copper cast aluminum alloy with Polyurethane resin baked finish - Deep sea moss green (equivalent of Munsell 0.6GY3.1/2.0) or SUS316 cast stainless steel (ASTM CF-8M)
Name plate: 316 SST
Tag: 316 SST
Wired tag: 316 SST
**Degrees of Protection:** NEMA 4X, IP67
**Mounting:** Nominal 2" (50mm) pipe mount or surface. (horizontal or vertical)
**Weight:** 1.25kg (2.70 lbs)*
*: Without mounting bracket
Add 0.8 kg (0.35 lbs) for mounting bracket
**Electrical Connection:** ½ NPT female or M20 female

## FEATURES

**User interface**
A front panel push button switch combined with four touch switches allows easy configuration of the indicator (calibration, span, zero and engineering units).

**Root extraction**
For applications where the process variable is non-linear and based on the square root, 3/2 root or 5/2 root, the MLX can be configured to display the root function of the input.

**Field Configurable**
Via the front panel user interface, the process variable parameters can be modified as desired in the field.

**LCD Display features**
The LCD display includes a bar graph for an analog indication of the process variable magnitude. The 6 digit display and 6 character display (combined with several symbols) give an instant view of all process variable parameters. A menu system allows customizing parameters such as decimal point position, engineering units, status of symbols and state of bar graph.

**Self-diagnostics**
Built-in diagnostics operate at power-up and during operation for ease of maintenance and troubleshooting.

**EMC Conformity Standard:** CE
EN61326-1 Class A, Table 2
(For use in industrial location)

**Built-in Loop Protection**
Includes circuitry that, in the event of MLX failure, automatically takes the MLX out of the loop thus maintaining loop integrity.


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## MODEL AND SUFFIX CODES

| Model | Suffix Codes | Description |
|---|---|---|
| **MLX** | …… ..... | Loop Indicator |
| Input signal | **-A**…….... | 4 to 20mA DC |
| Mounting | **1**…….....<br>**2**…….... | 2 inch Horizontal Pipe<br>2 inch Vertical Pipe (or wall mount) |
| Housing | **1**…….....<br>**2**…….... | Cast aluminum alloy<br>SUS316 cast stainless steel and ASTM CF-8M[*1] |
| Communication | **-1**…… | Standard |
| Electrical Connection | **0**…….<br>**2**…….<br>**3**…….<br>**4**…….<br>**5**…….<br>**6**……. | ANSI ½ - 14NPT female, two electrical connections without blind plug<br>ANSI ½ - 14NPT female, two electrical connections and one 316 SST blind plug<br>ISO M20 x 1.5 female, two electrical connections without blind plug<br>ISO M20 x 1.5 female, two electrical connections and one 316 SST blind plug<br>ISO G1/2 x 14 female, two electrical connections without blind plug<br>ISO G1/2 x 14 female, two electrical connections and one 316 SST blind plug |
| Optional Codes | | / □Optional specification |

## OPTIONAL SPECIFICATIONS (For Explosion Protected Type)

| Item | Description | Code |
|---|---|---|
| Factory Mutual (FM) | FM Explosion-proof/FM Dust-Ignition-Proof Approval<br>Conforms to: FM3600, FM3615, UL 1203<br>Explosionproof/Dust-Ignition-Proof for Class I, II, III, Division 1 & 2, Groups A – G,<br>Class I, Zone 1, Group IIC T4 Ambient Temperature: –40 to 80°C (–22 to 176°F)<br>Temperature class: T4 | **FF1** |
| | FM Intrinsically Safe/FM Explosion-proof/ FM Dust-Ignition-Proof /FM Non-incendive Approval<br>Conforms to: FM3600, FM3610, FMRC 3611, FM 3615, FM 3616, UL 913, UL 1203,<br>UL 60079-0, UL 60079-11<br>Intrinsically Safe for Class I, II, III, Division 1 & 2, Groups A - G,<br>Zone 20, Class I, Zone 0, AEx ia IIC, T4 Ga –40°C < Ta < 80°C (–22 to 176°F)<br>Explosion-proof/Dust-Ignition-Proof for Class I, II, III, Division 1 & 2, Groups A - G,<br>Class I, Zone 1, Group IIC T4 Amb. Temp.: –40 to 80°C (–40 to 176°F)<br>Non-incendive for Class I, II, III, Division 2, Groups A - D, F, G,<br>Class I, Zone 2, Group IIC T4<br>Enclosure: "NEMA 4X", Temp. Class: T4, Amb. Temp.: –40 to 80°C (–40 to 176°F)<br>Intrinsically Safe Apparatus Parameters<br>[Groups A - G] Vmax=28 V, Imax=115 mA, Pmax=0.65 W, Ci=0 nF, Li=0 H<br>Non-Incendive Apparatus Parameters<br>[Groups A - G] Vmax=30 V, Imax=150 mA, Pmax=0.85 W | **FU1** |
| CENELEC ATEX | ATEX Intrinsically Safe/ATEX Flameproof/ATEX Non-incendive Approval<br>Applicable Standard: EN 60079-0, EN 60079-1, EN 60079-11, EN 60079-26, EN 60079-31<br>II 1G Ex ia IIC T4 Ga Entity parameters : Ui=28 V, Ii=115 mA, Pi=0.65 W, Ci=0 nF, Li=0 H<br>II 2G Ex d IIC T4 Gb<br>II 2D Ex tb IIIC T135 Db<br>II 3G Ex nA IIC T4 Gc Entity parameters : Ui=30 V, Ii=150 mA, Pi=0.85 W<br>Degree of protection : IP66 and IP67<br>Temperature class: T4, Ambient Temperature: –40 to 80°C (–40 to 176°F) | **KU21** |
| Canadian Standards Association (CSA)<br>Canadian Standards Association (CSA) | CSA Intrinsically Safe/CSA Explosionproof/ CSA Dust-Ignition-Proof /CSA Non-incendive Approval<br>Certified to: CSA C22.2 No. 25, CSA C22.2 No. 30, CSA C22.2 No. 157, CSA C22.2 No. 213,<br>CSA C22.2 No. 60079-0, CAN/CSA E60079-11<br>Explosionproof/Dust-Ignition-Proof for:<br>Class I, II, III; Groups A - G; Divisions 1 & 2.<br>Class I, Zone 1, Group IIC T4.<br>Tamb. –40°C to 80°C<br>Intrinsically Safe for:<br>Class I, Division 1, II, III; Groups A - G; Divisions 1 & 2.<br>Zone 20, Class I, Zone 0<br>AEx ia IIC T4<br>Tamb. –40°C to 80°C<br>Entity parameters: Ui=28 V, Ii=115 mA, Pi=0.65 W, Ci=0 nF, Li=0 H<br>Non-Incendive for:<br>Class I, II, III; Groups A - D, F, G; Divisions 2.<br>Class I, Zone 2, Group IIC T4.<br>Tamb. –40°C to 80°C<br>Entity parameters: Ui=30 V, Ii=150 mA, Pi=0.85 W<br>Enclosure rating: "Type 4X."<br>Temperature Class: T4<br>Ambient Temperature: –40°C to 80°C | **CU1** |

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## OPTIONAL SPECIFICATIONS (For Explosion Protected Type)

| Item | Description | Code |
|---|---|---|
| IECEx Scheme | IEC Intrinsically Safe/IEC Flameproof/IEC Non-Incendive Approval<br>Applicable Standard: IEC 60079-0:2011, IEC 60079-1:2008, IEC 60079-11:2011, IEC 60079-26:2009, IEC 60079-31:2008<br>Explosionproof/Dust-Ignition-Proof for:<br>Ex d IIC T4 Gb<br>Ex tb IIIC T135 Db<br>Intrinsically Safe for:<br>Ex ia IIC T4 Ga<br>Entity parameters: Ui=28 V, Ii=115 mA, Pi=0.65 W, Ci=0 nF, Li=0 H<br>Non-Incendive for:<br>Ex nA IIC T4 Gc<br>Entity parameters: Ui=30 V, Ii=150 mA, Pi=0.85 W<br>Ambient Temperature: –40°C to 80°C<br>Enclosure: IP66 and IP67 | **SU2** |
| Combination of Approvals | Combination of FU1, CU1 and KU21 Approvals | **V1U** |

## OPTIONAL SPECIFICATIONS

| Item | Description | Code |
|---|---|---|
| Coating*2 | Epoxy resin coating<br>Polyurethane-Epoxy Anti-corrosion coating | **X1**<br>**X2** |
| Calibration | Calibration range and scale | **ENG** |
| Stainless steel tag plate | Stainless steel tag screw attached to housing<br>Stainless steel tag wired to housing | **SST**<br>**SSW** |
| Paint*3 | Light Blue (RAL # 5012)<br>Orange (RAL # 2008)<br>Red (Munsell # 7.5 R4/14)<br>Mint Green (CC55)<br>Silver (RAL # 9006)<br>Yellow (RAL # 1018)<br>Gray (RAL # 7046) | **P1**<br>**P2**<br>**P3**<br>**P4**<br>**P5**<br>**P6**<br>**P7** |

*1 Consult factory availability for Housing code 2.

*2 Some coating options available via Tokuchu and my require additional lead time. Consult factory for further information.

*3 Some painting options available via Tokuchu and may require additional lead time. Consult factory for further information.

## ORDERING INFORMATION

Specify the following when ordering:
1. Model and suffix codes.
2. Option codes.
3. Tag number
4. Calibration range desired (optional)

## OPTIONS

The MLX is fully field configurable from the front panel. To order a pre-configured unit, specify the /ENG option followed by the desired setpoints (zero, full scale, and engineering units).

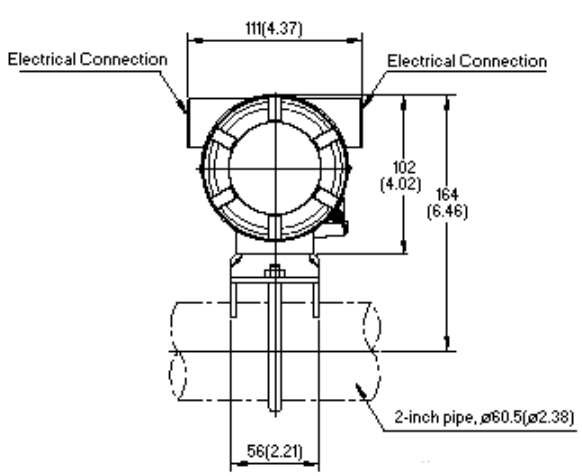
### □Example Ordering Information:

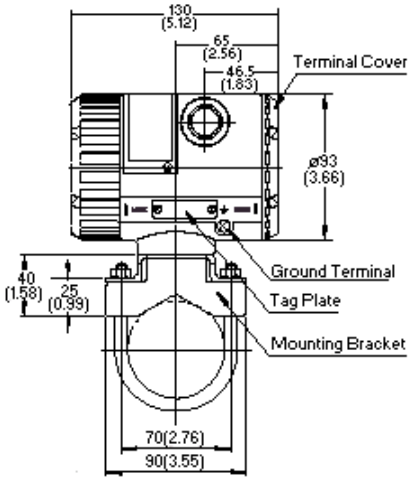
MLX-A11-10/FF1/ENG/SST
(Field Mounted Loop Indicator, 4 to 20mA DC, 2” Horizontal Pipe mount, aluminum housing, standard communication, ANSI ½ NPT electrical connection without blind plugs, FM Explosion-proof approval)
0-200 InH2O Scale in Engineering Units. Please specify Scale and Engineering units when ordering /ENG.
FT-201 Specify Tag Number when ordering /SST and/or /SSW.

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## DIMENSIONS

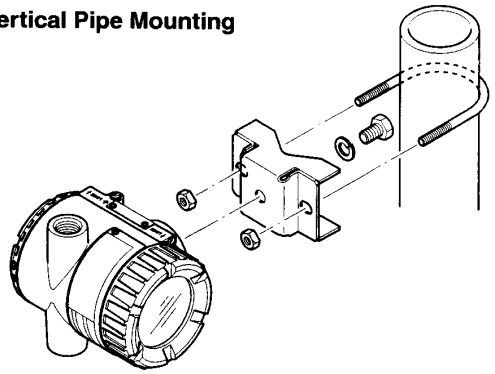
Unit: mm (Approx. inch)



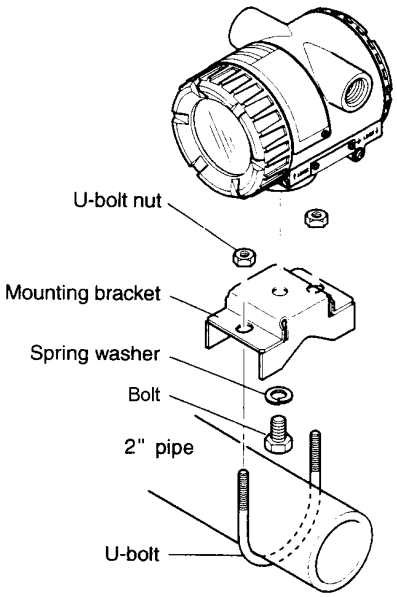




## MOUNTING

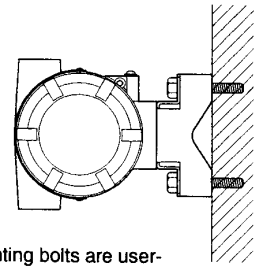
### Vertical Pipe Mounting



### Horizontal Pipe Mounting




### Wall Mounting



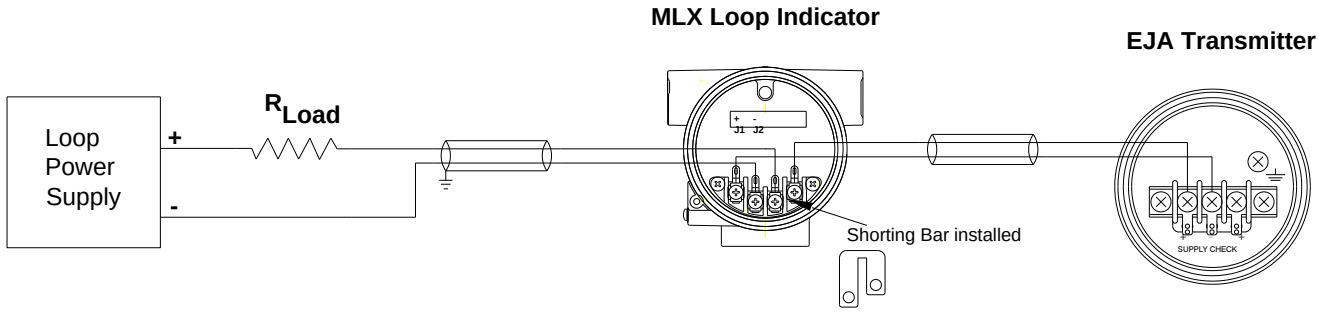
Note: Wall mounting bolts are user-supplied.

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## WIRING

The loop powered indicator series is powered by the current loop and does not require external power. All devices must be wired in series with the current loop. Twisted pair shielded cable is recommended.

The following is a typical wiring example of the MLX Loop Indicator connected to an EJA Pressure Transmitter (Note: The EJA Transmitter below can be replaced with any 4-20mA 2 wire device.




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