

# Level Plus<sup>®</sup>

Magnetostrictive Liquid Level Transmitters  
with Temposonics<sup>®</sup> Technology

## **CHAMBERED** Data Sheet

- Designed for Magnetic Level Gauge (MLG)
- No Scheduled Maintenance or Recalibration
- Hazardous Area Certified



## TEMPOSONICS® TECHNOLOGY

Temposonics® Technology is the manner in which MTS applies the principles of magnetostriction to create a reliable position measurement system for use in industrial environments. Inside the sensor a torsional strain pulse is induced in a specially designed magnetostrictive waveguide by the momentary interaction of two magnetic fields. One field comes from a moving magnet, which passes along the outside of the transducer tube, and the other field is generated from a current pulse which is applied to the waveguide. The interaction between these two magnetic fields produces a strain pulse which travels at sonic speed along the sensor waveguide, until the pulse is detected at the head of the transducer. The position of the moving magnet is precisely determined by measuring the elapsed time between the application of the current pulse and the arrival of the strain pulse. As a result, MTS is able to create a reliable position measurement system that is capable of providing an accurate and repeatable measurement.

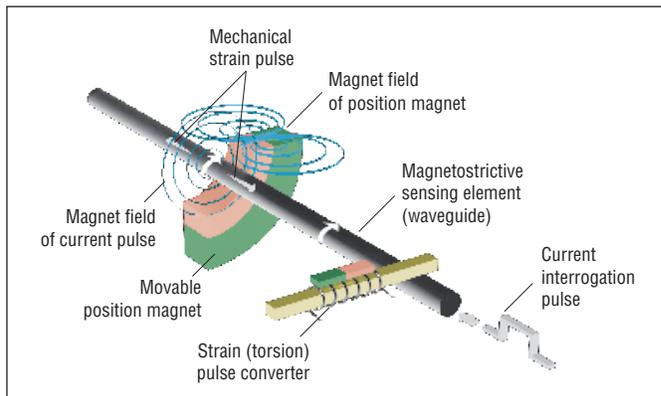


Fig. 1: Time-based magnetostrictive position sensing principle

## CHAMBERED

The Level Plus® CHAMBERED liquid level transmitter satisfies the demand for an accurate and robust liquid-level sensor with unsurpassed flexibility to meet most process application conditions. The CHAMBERED transmitter provides external measurement of most Magnetic Level Gauges (MLG) from popular suppliers. Once the transmitter is installed and calibrated there is no requirement for scheduled maintenance or recalibration.

### Set it and forget it!

#### Features:

- No Scheduled Maintenance or Recalibration
- Integral Display
- Intrinsically Safe

#### Applications:

- Magnetic Level Gauge
- Bypass Chamber

#### Markets:

- Petroleum and Petrochemical
- Chemical
- Power Generation

#### Compatible with:

- Houdec
- Bonetti
- Hawk
- Bliss Arand
- Jerguson
- Kenco
- Wika
- Quest-tec
- Penberthy

| Standard          | Rating   |
|-------------------|--|
| FM 3610           | Class I, Div. 1, Groups A, B, C, and D T4<br>Class I, Zone 0/1, AEx ia IIC T4<br>Ta= -50 to 71°C: IP65 |
| C22.2 No. 157     | Class I, Div. 1, Groups A, B, C, and D T4<br>Class I, Zone 0/1, Ex ia IIC T4<br>Ta= -50 to 71°C: IP65  |
| EN 60079-11:2012  | FM14ATEX0068X<br>II ½ G Ex ia IIC T4<br>Ta= -50 to 71°C: IP65  |
| IEC 60079-11:2011 | IECEx FMG 14.0032<br>II ½ G Ex ia IIC T4 Ga/Gb<br>Ta= -50 to 71°C: IP65                                |

## TECHNICAL DATA

| Level Output                |  |
|-----------------------------|--|
| Measured variable           | Product level  |
| Output signal /Protocol     | Modbus RTU, DDA  |
| Order length                | <b>Rigid Pipe:</b><br>305 mm (12 in.) to 3658 mm (144 in.) $\Delta\S$  |
| Inherent Accuracy           | $\pm 1$ mm (0.039 in.)   |
| Repeatability               | 0.001% F.S. or 0.381 mm (0.015 in.) *<br>(any direction)   |
| Electronics                 |  |
| Input voltage               | 10.5 to 28 Vdc   |
| Fail safe                   | High, Full scale for digital   |
| Reverse polarity protection | Series diode   |
| EMC                         | <b>Stage 1:</b> Line-to-ground surge suppression; IEC 61000-4-5, IEC 61326-3-2<br><b>Stage 2:</b> Line-to-line and line-to-ground transient suppressors; IEC 61000-4-4 , IEC 61326-3-2   |
| Environmental               |  |
| Enclosure rating            | NEMA Type 4X, IP65   |
| Humidity                    | 0 to 100% relative humidity, non-condensing  |
| Operating temperatures      | <b>Electronics:</b> -40 °C (-40 °F) to 71 °C (160 °F)<br><b>Sensing element:</b> -40 °C (-40 °F) to 125 °C (257 °F) $\diamond$   |
| Materials                   | 316L stainless steel, Epoxy coated aluminum  |
| Field Installation          |  |
| Housing dimensions          | <b>Single cavity:</b><br>145 mm (5.7 in.) W x by 127 mm (5 in.) D x 109 mm (4.3 in.) H<br><b>Dual cavity:</b><br>117 mm (4.6 in.) W x by 127 mm (5 in.) D x 206 mm (8.1 in.) H<br><b>Stainless steel single cavity:</b><br>178 mm (7.1 in.) W x by 135 mm (5.3 in.) D x 153 mm (6 in.) H |
| Wiring                      |  |
| Connections                 | 4-wire shielded cable or twisted pair, Daniel Woodhead 6-pin male connector, 4570 mm (180 in.) integral cable with pigtail   |
| Electrical Connections      |  |
| Single and Dual Cavity      | $\frac{3}{4}$ in. FNPT conduit opening, M20 for ATEX/IECEx version   |
| NEMA Type 4X                | $\frac{1}{2}$ in. FNPT conduit opening   |
| Display                     |  |
| Measured variables          | Product level  |

\* Whichever is greater

$\Delta$  Contact factory for longer lengths.

$\diamond$  Contact factory for specific temperature ranges.

$\dagger$  Contact factory for alternative materials.

$\S$  Order length equals the measurement range plus the inactive zone.

TECHNICAL DRAWING

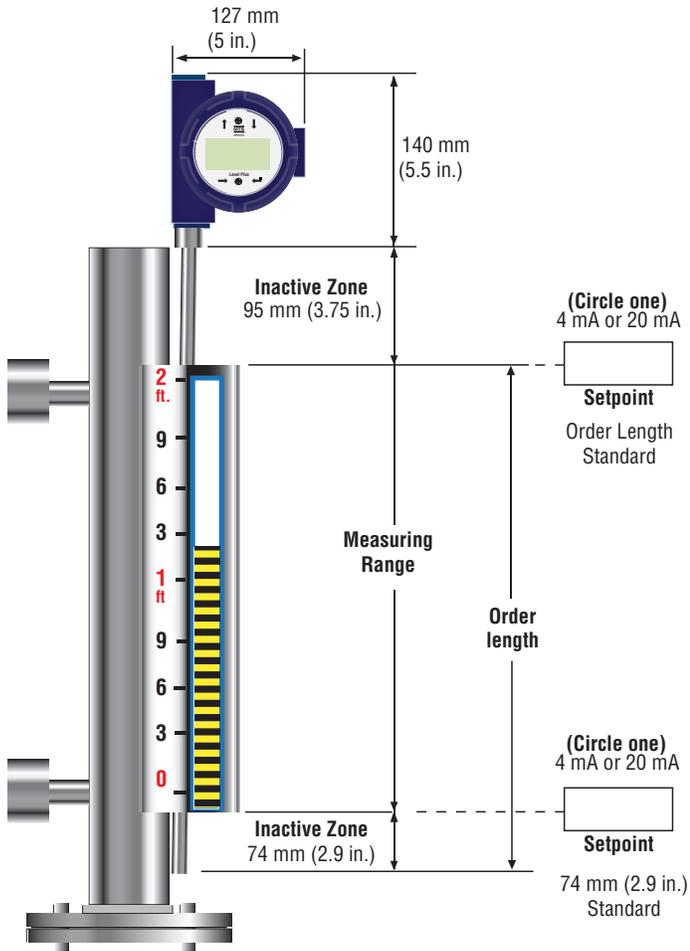


Figure 2. CHAMBERED mounting, bottom flange

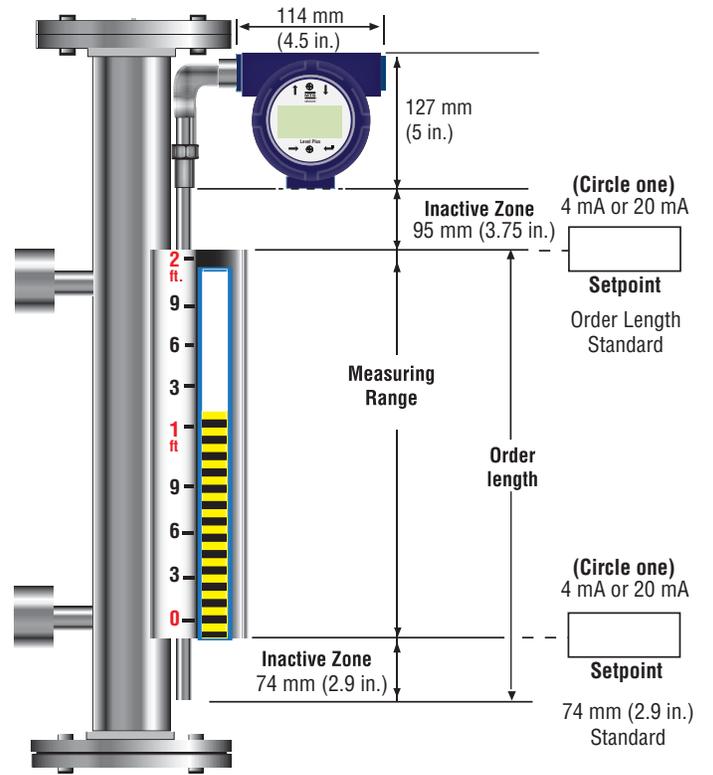


Figure 3. CHAMBERED mounting, top and bottom flange

Transmitter Inactive Zone Reference

| Length          | Inactive Zone   |
|-----------------|-----------------|
| <7.6 m (25 ft.) | 74 mm (2.9 in.) |

## ORDER CODE

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| L | P | C |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| a | b | c | d | e | f | g | h | i | j  | k  | l  | m  | n  | o  |    |    |    | p  |    |    |    |

| a     | Sensor model                |
|-------|-----------------------------|
| L P C | CHAMBERED Level Transmitter |

| b | Output |
|---|--------|
| M | Modbus |
| D | DDA    |

| c | Housing type               |
|---|----------------------------|
| A | NEMA housing w/cable       |
| B | NEMA housing w/terminal    |
| C | NEMA housing w/connector   |
| D | Single cavity with display |
| E | Dual cavity with display   |
| L | SS single cavity w/display |

| d | Electronics mounting          |
|---|-------------------------------|
| 1 | Standard                      |
| 3 | 90° bend housing top left     |
| 4 | 90° bend housing top right    |
| 5 | 90° bend housing bottom left  |
| 6 | 90° bend housing bottom right |

| e | Sensor pipe   |
|---|---------------|
| B | 5/8" OD pipe  |
| R | 1/2" OD pipe  |
| Y | 10 mm OD pipe |

| f | Materials of construction (Wetted parts) |
|---|--|
| 1 | 316L stainless steel                     |

*Note: Contact factory for other materials*

| g | Process connection type |
|---|-------------------------|
| X | None                    |

| h | Process connection size |
|---|-------------------------|
| X | None                    |

| i | Number of DT's (Digital Thermometer) |
|---|--------------------------------------|
| 0 | None                                 |

| j | DT Placement |
|---|--------------|
| X | None         |

| k | Notified body |
|---|---------------|
| C | CEC (FMC)     |
| E | ATEX          |
| F | NEC (FM)      |
| I | IEC           |
| X | None          |

| l | Protection method |
|---|-------------------|
| I | IS                |
| X | No approval       |

| m | Gas group |
|---|-----------|
| A | Group A   |
| B | Group B   |
| C | Group C   |
| D | Group D   |
| 1 | IIA       |
| 2 | IIB       |
| 3 | IIC       |
| X | None      |

| n | Unit of measure       |
|---|-----------------------|
| M | Metric - Millimeters  |
| U | US customary - Inches |

| o         | Length (no decimal spaces)                          |
|-----------|---|
| X X X X X | Rigid Pipe: 12 to 144 in (code as 01200 to 14400)   |
| X X X X X | Rigid Pipe: 305 to 3658 mm (code as 00305 to 03658) |

| p | Special          |
|---|------------------|
| S | Standard Product |

## ORDERING NOTE



Accessories such as floats, cables, and displays have to be ordered separately. All accessories are shown in the Accessories Catalog (551103).

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