

## Data Sheet

### **Level Plus<sup>®</sup> – CHAMBERED**

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

- Designed for Magnetic Level Gauge (MLG)
- No scheduled maintenance or recalibration
- Hazardous area certified



## MEASURING TECHNOLOGY

The absolute, linear position sensors provided by Temposonics rely on the company's proprietary Temposonics® magnetostrictive technology, which can determine positions with a high level of precision and robustness. Each Temposonics® position sensor consists of a ferromagnetic waveguide, a position magnet, a strain pulse converter and supporting electronics. The magnet, connected to the object in motion in the application, generates a magnetic field at its location on the waveguide. A short current pulse is applied to the waveguide. This creates a momentary radial magnetic field and torsional strain on the waveguide. The momentary interaction of the magnetic fields releases a torsional strain pulse that propagates the length of the waveguide. When the ultrasonic wave reaches the end of the waveguide it is converted into an electrical signal. Since the speed of the ultrasonic wave in the waveguide is precisely known, the time required to receive the return signal can be converted into a linear position measurement with both high accuracy and repeatability.

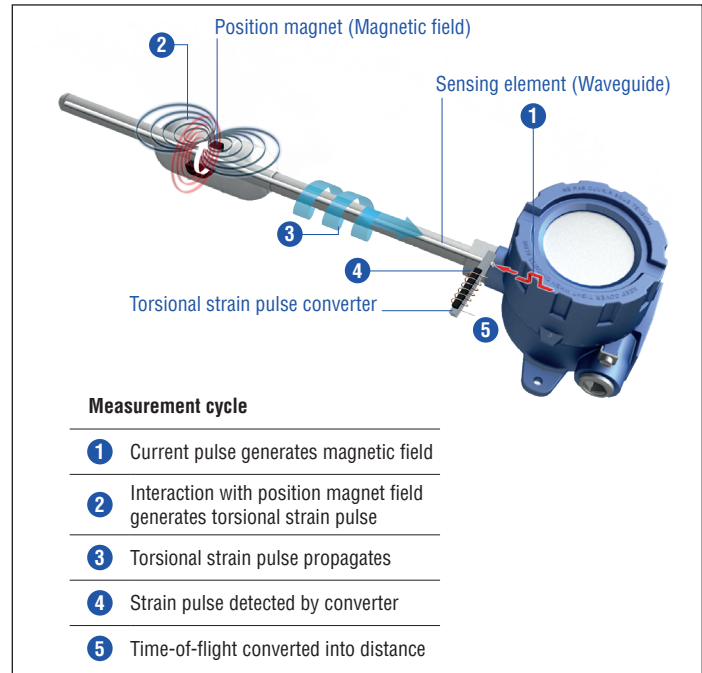


Fig. 1: Time-of-flight based magnetostrictive position sensing principle

## CHAMBERED

The Level Plus® CHAMBERED 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
- Explosionproof/Flame proof

### Applications:

- Magnetic Level Gauge
- Bypass chamber

### Markets:

- Petroleum and petrochemical
- Chemical
- Power generation

### Compatible with:

- Houdec
- Hawk
- Bliss Anand
- Jerguson
- Kenco
- Wika
- Quest-tec
- Penberthy
- Klinger
- ISE Magtech
- ABB (K-tek)
- Bonetti
- SOR
- Krohne
- Nihon Klingage
- FOXC
- KSR Kuebler
- Shridhan

Standard	Certification
FM 3610 ISA 60079-11:2014	Class I, Div. 1, Groups A, B, C, D T4 Class I, Zone 0, AEx ia IIC T4 Ga Ta= -50 to 71 °C: IP65
C22.2 No. 157 C22.2 No. 60079-11:2014	Class I, Div. 1, Groups A, B, C, D T4 Class I, Zone 0, Ex ia IIC T4 Ga Ta= -50 to 71 °C: IP65
EN 60079-11:2012	FM14ATEX0068X Ex II 1 G Ex ia IIC T4 Ga Ta= -50 to 71 °C: IP65
IEC 60079-11:2011	IECEx FMG 14.0032X Ex ia IIC T4 Ga Ta= -50 to 71 °C: IP65
UKSI 2016:1107	FM22UKEX0069X Ex II 1 G Ex ia IIC T4 Ga/Gb Ta = -50 to 71 °C
FM 3615 ISA 60079-1	Class I, Div. 1, Groups A, B, C, D T6...T3 Class I, Zone 0/1, AEx db IIB+H2 T6...T3 Ga/Gb Ta= -40 to 71 °C: IP65
C22.2 No. 30 C22.2 No. 60079-1	Class I, Div. 1, Groups B, C, D T6...T3 Ex db IIB+H2 T6...T3 Ga/Gb Ta= -40 to 71 °C: IP65
EN 60079-1:2014	FM16ATEX0068X Ex II ½ G Ex db IIB+H2 T6...T3 Ga/Gb Ta= -40 to 71 °C: IP65
IEC 60079-1:2011	IECEx FMG 16.0033X Ex db IIB+H2 T6...T3 Ga/Gb Ta= -40 to 71 °C: IP65
UKSI 2016:1107	FM22UKEX0070X Ex II ½ G Ex db IIB+H2 T6...T3 Ga/Gb Ta = -40 to 71 °C

Fig. 2: Certifications of CHAMBERED level transmitter

## TECHNICAL DATA

Level output	
Measured variable	Product level
Output signal/protocol	Modbus RTU, DDA, Analog (4...20 mA), HART®
Order length	305...3658 mm (12...144 in.) (Order length equals the measurement range. Contact factory for longer lengths)
Inherent accuracy	±1 mm (0.039 in.)
Repeatability	0.001 % F.S. or 0.381 mm (0.015 in.) whichever is greater (any direction)
Electronics	
Input voltage	10.5...28 VDC
Fail safe	High, full scale (Modbus, DDA) Low, 3.5 mA default or high, 22.8 mA (Analog, HART®)
Reverse polarity protection	Series diode
EMC	EN 61326-1, EN 61326-2-3, EN 61326-3-2, EN 61000-6-2, EN 61000-6-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8
Environmental	
Enclosure rating	NEMA Type 4X, IP65
Humidity	0...100 % relative humidity, no condensation
Operating temperatures	Electronics: -40...+71 °C (-40...+160 °F) Sensing element: -40...+125 °C (-40...+257 °F) (Contact factory for specific temperature ranges)
Materials	316L stainless steel, epoxy coated aluminum
Field installation	
Housing dimensions	Single cavity: 145 mm (5.7 in.) W × by 127 mm (5 in.) D × 109 mm (4.3 in.) H Dual cavity: 117 mm (4.6 in.) W × by 127 mm (5 in.) D × 206 mm (8.1 in.) H Stainless steel single cavity: 178 mm (7.1 in.) W × by 135 mm (5.3 in.) D × 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	¾ " FNPT conduit opening, M20 for ATEX/IECEX/UKCA version
NEMA Type 4X	½ " FNPT conduit opening
Display	
Measured variables	Product level

## TECHNICAL DRAWING

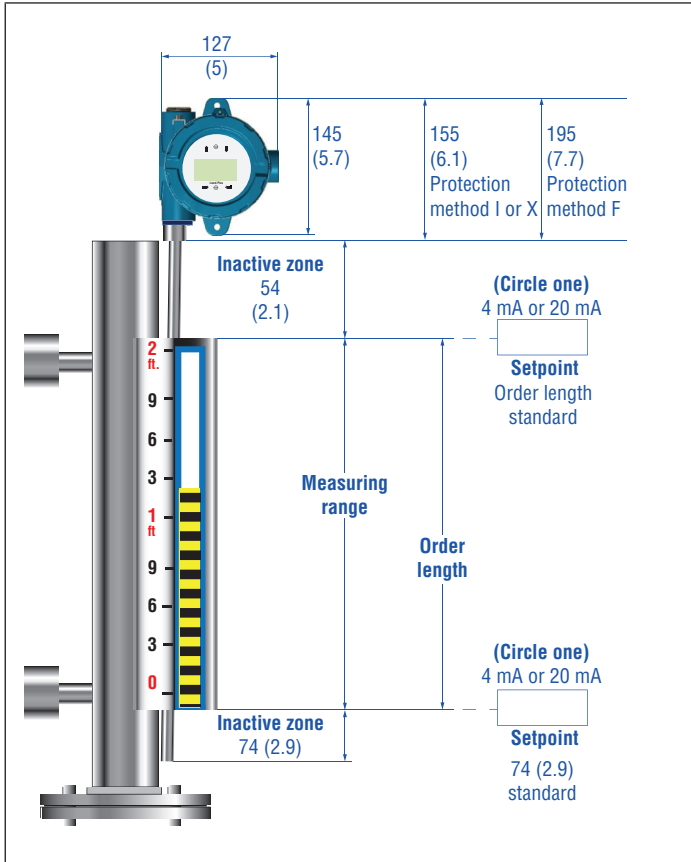


Fig. 3: CHAMBERED mounting, bottom flange<sup>1</sup>

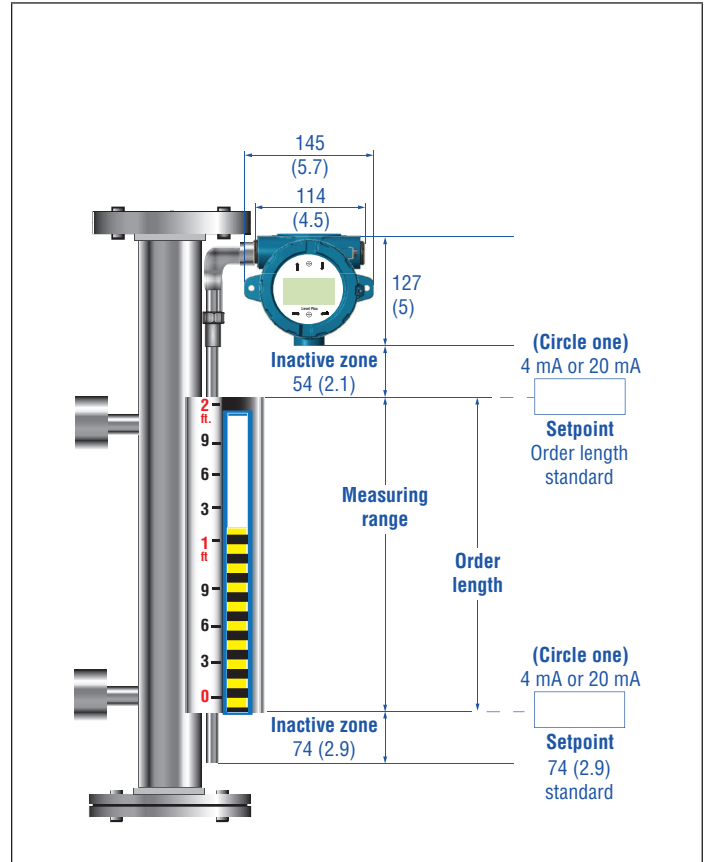


Fig. 4: CHAMBERED mounting, top and bottom flange<sup>1</sup>

## LEVEL TRANSMITTER INACTIVE ZONE REFERENCE

Order length	Inactive zone
< 3658 mm (144 in.)	74 mm (2.9 in.)

Controlling design dimensions are in millimeters and measurements in ( ) are in inches

1/ The ambient temperature rating, Ta = -50 °C (-58 °F) to 71 °C (160 °F), must not be exceeded due to the mounting of the level transmitter to the MLG and exposure to the process temperature

## 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					1	X	X	0	X																					
a			b		c		d		e		f		g		h		i		j		k		l		m		n		o			p

<b>a</b>	<b>Sensor model</b>		
L	P	C	CHAMBERED level transmitter

<b>b</b>	<b>Output</b>
D	DDA
M	Modbus
3	1 Loop with HART®
6	1 Loop with HART® and SIL 2

<b>c</b>	<b>Housing type</b>
D	Single cavity with display
E	Dual cavity with display
L	Stainless steel single cavity with display

<b>d</b>	<b>Electronics mounting</b>
3	90° bend (housing top left)
4	90° bend (housing top right)
5	90° bend (housing bottom left)
6	90° bend (housing bottom right)
7	Top mount (housing top right)
8	Bottom mount (housing bottom left)

<b>e</b>	<b>Sensor pipe</b>
B	5/8" OD pipe
R	1/2" OD pipe
Y	10 mm OD pipe

<b>f</b>	<b>Materials of construction (Wetted parts) <sup>2</sup></b>
1	316L stainless steel

<b>g</b>	<b>Process connection type</b>
X	None

<b>h</b>	<b>Process connection size</b>
X	None

<b>i</b>	<b>Number of Digital Thermometers (DT's)</b>
0	None

<b>j</b>	<b>Digital Thermometer placement</b>
X	None

<b>k</b>	<b>Notified body</b>
B	INMETRO
C	CEC (FMC)
E	ATEX
F	NEC (FM)
I	IEC
K	KC
N	NEPSI
P	CCOE
T	CML/TIIS
U	UKCA
X	None

<b>l</b>	<b>Protection method</b>
F	Explosionproof/flameproof (only for housing type D, E, or L)
I	Intrinsically safe
X	No approval

<b>m</b>	<b>Gas group</b>
A	Group A (not available with "C = CEC (FMC)" notified body and "F = Flameproof/explosion" proof protection method)
B	Group B
C	Group C
D	Group D
3	IIC (intrinsically safe only)
4	IIB + H2 (explosionproof/flameproof only)
X	None

**n o p** Continued on next page

2/ Note: Contact factory for other materials

## Level Plus® CHAMBERED

Data Sheet

## ORDER CODE

n	Unit of measure
M	Millimeters (Metric)
U	Inches (US customary)

o	Length (no decimal spaces)
X X X X X	305...3658 mm (code as 00305...03658)
X X X X X	12...144 in. (code as 01200...14400)

p	Special
R	Reverse measurement (Select with Electronic Mount 5, 6, and 8)
S	Standard product

### NOTICE

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

Manuals, Software & 3D Models available at:  
[www.temposonics.com](http://www.temposonics.com)

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