MTS SENSORS

Level Plus®

Magnetostrictive Liquid Level Transmitters
with Temposonics® Technology

CHAMBERED
Data Sheet

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

MEASURING TECHNOLOGY

The absolute, linear position sensors provided by MTS Sensors rely on the company's proprietary Temposonics® magnetostrictive technology, which can determine position 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.

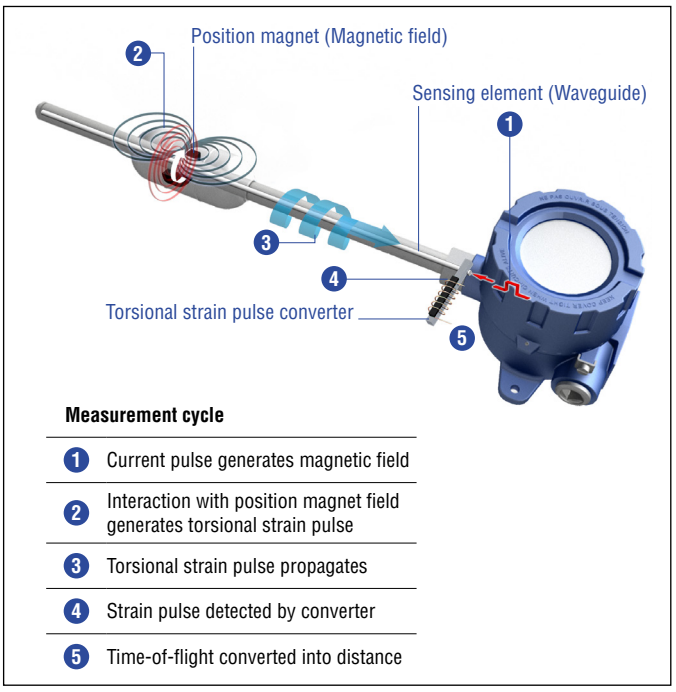


Fig. 1: Time-of-flight based magnetostrictive position sensing principle

CHAMBERED

The Level Plus® CHAMBERED 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
- Explosion Proof / 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
- IOXC
- KSR Kurbler
- PLT

Standard	Rating
FM 3610 ISA 60079-11:2014	Class I, Div. 1, Groups A, B, C, D T4 Class I, Zone 0/1, AEx ia IIC T4 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 0/1, Ex ia IIC T4 Ta= -50 to 71°C: IP65
EN 60079-11:2012	FM14ATEX0068X Ⓔx II ½ G Ex ia IIC T4 Ta= -50 to 71°C: IP65
IEC 60079-11:2011	IECEx FMG 14.0032X II ½ G Ex ia IIC T4 Ga/Gb Ta= -50 to 71°C: IP65
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 Ⓔx 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

TECHNICAL DATA

Level Output	
Measured variable	Product level
Output signal /Protocol	Modbus RTU, DDA, Analog (4-20 mA), HART®
Order length	**Rigid Pipe:** 305…3658 mm (12…144 in.) (Order length equals the measurement range plus the inactive zone. 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 to 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 to 100% relative humidity, non-condensing
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 x by 127 mm (5 in.) D x 109 mm (4.3 in.) H **Dual cavity:** 117 mm (4.6 in.) W x by 127 mm (5 in.) D x 206 mm (8.1 in.) H **Stainless steel single cavity:** 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	¾ in. FNPT conduit opening, M20 for ATEX/IECEx version
NEMA Type 4X	½ in. FNPT conduit opening
Display	
Measured variables	Product level

TECHNICAL DRAWING

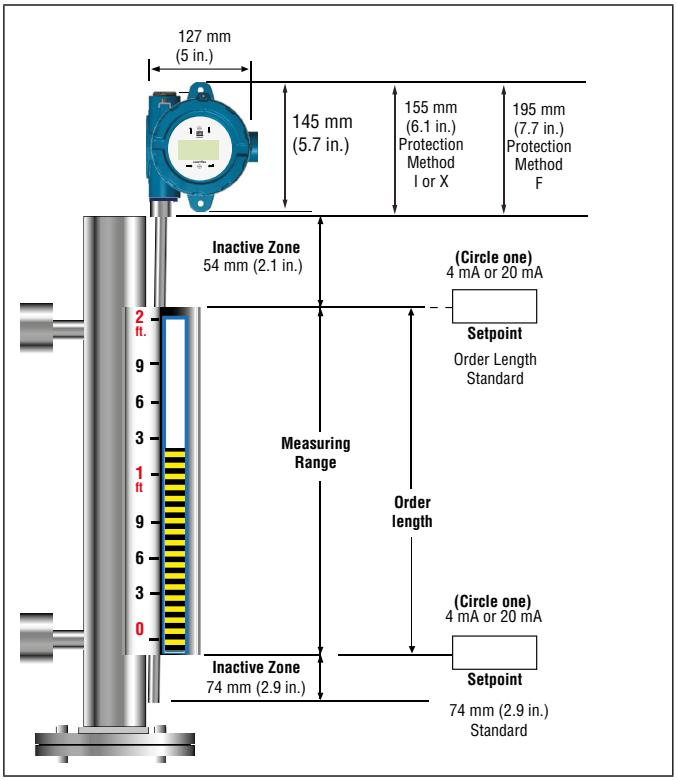


Fig. 2: CHAMBERED mounting, bottom flange

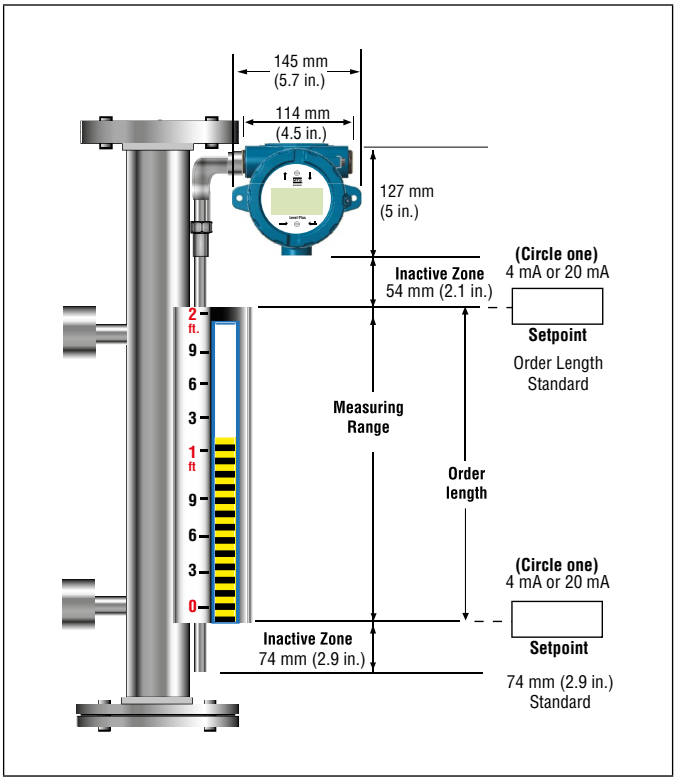


Fig. 3: CHAMBERED mounting, top and bottom flange

TRANSMITTER INACTIVE ZONE REFERENCE

Length	Inactive Zone
<3.66 m (12 ft.)	74 mm (2.9 in.)

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

*/ 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																			
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
3	1 Loop with HART®
6	1 Loop with HART® and SIL 2

c	Housing type
D	Single cavity with display
E	Dual cavity with display
L	Stainless steel single cavity w/display

d	Electronics mounting
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
8	Bottom mount

e	Sensor pipe
B	5/8" OD Pipe
R	½" OD Pipe
B	10 mm OD Pipe

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

g	Process connection type
X	None

h	Process connection size
X	None

i	Number of Digital Thermometers (DT's)
0	None

j	Digital Thermometer placement
X	None

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

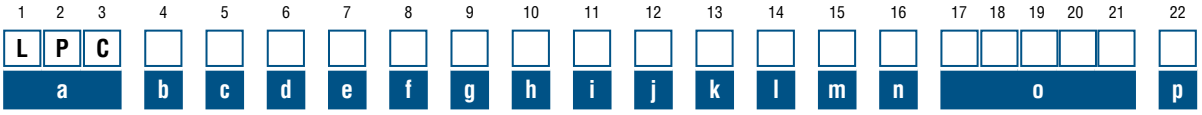
l	Protection method
F	Explosion proof / Flameproof (only for housing type D, E, or L)
I	Intrinsically Safe
X	No approval

m	Gas group
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 (Instrinsically Safe only)
4	IIB + H2 (Explosion Proof / Flameproof only)
X	None

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

o	Length (no decimal spaces)
X X X X X	Rigid sensor pipe: 305…3658 mm (code as 00305 to 03658)
X X X X X	Rigid sensor pipe: 12…144 in. (code as 01200 to 14400)

*/ Note: Contact factory for other materials



p	Special
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).

MTS®
SENSORS

Authorised distributor

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For customer service, call 1300-735-292
To fax an order, use 1800-067-639
To email an order, ordersau@thermofisher.com

In New Zealand:
For customer service, call 0800-933-966
To fax an order, use 0800-329-246
To email an order, ordersnz@thermofisher.com

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