MTS SENSORS

Level Plus®

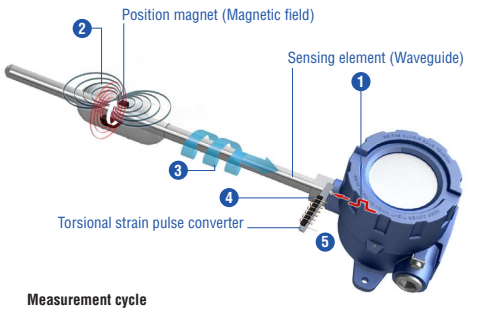
Magnetostrictive Liquid Level Transmitters
with Temposonics® Technology

CHAMBERED
Data Sheet

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

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.



Measurement cycle	
1	Current pulse generates magnetic field
2	Interaction with position magnet field generates torsional strain pulse
3	Torsional strain pulse propagates
4	Strain pulse detected by converter
5	Time-of-flight converted into distance

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
– Hawk
– Bliss Anand
– Jerguson
– Kenco
– Wika
– Quest-tec
– Penberthy
– Klinger
– ISE Magtech

Standard	Rating
FM 3610	Class I, Div. 1, Groups A, B, C, and D T4 Class I, Zone 0/1, AEx ia IIC T4 Ta= -50 to 71°C: IP65
C22.2 No. 157	Class I, Div. 1, Groups A, B, C, and D T4 Class I, Zone 0/1, Ex ia IIC T4 Ta= -50 to 71°C: IP65
EN 60079-11:2012	FM14ATEX0068X II ½ G Ex ia IIC T4 Ta= -50 to 71°C: IP65
IEC 60079-11:2011	IECEx FMG 14.0032 II ½ G Ex ia IIC T4 Ga/Gb Ta= -50 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 mm (12 in.) to 3658 mm (144 in.) Δ§
Inherent Accuracy	±1 mm (0.039 in.)
Repeatability	0.001% F.S. or 0.381 mm (0.015 in.) * (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, EN 61000-4-11
Environmental	
Enclosure rating	NEMA Type 4X, IP65
Humidity	0 to 100% relative humidity, non-condensing
Operating temperatures	**Electronics:** -40 °C (-40 °F) to 71 °C (160 °F) **Sensing element:** -40 °C (-40 °F) to 125 °C (257 °F) ◊
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

* Whichever is greater

Δ Contact factory for longer lengths.
◊ Contact factory for specific temperature ranges.
† Contact factory for alternative materials.
§ Order length equals the measurement range plus the inactive zone.

TECHNICAL DRAWING

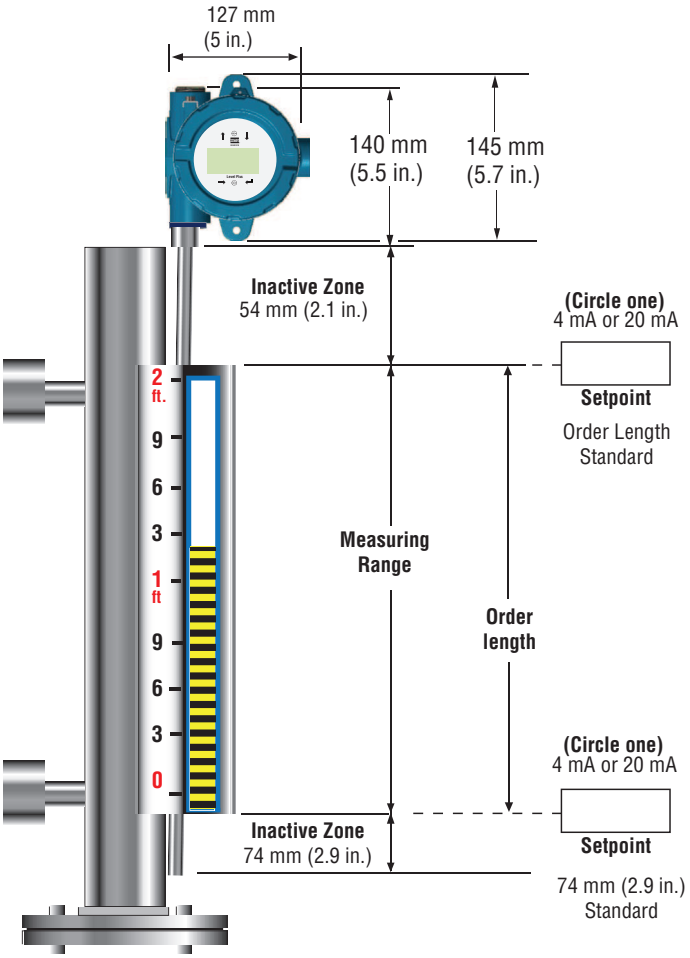


*Figure 2. CHAMBERED mounting, bottom flange **

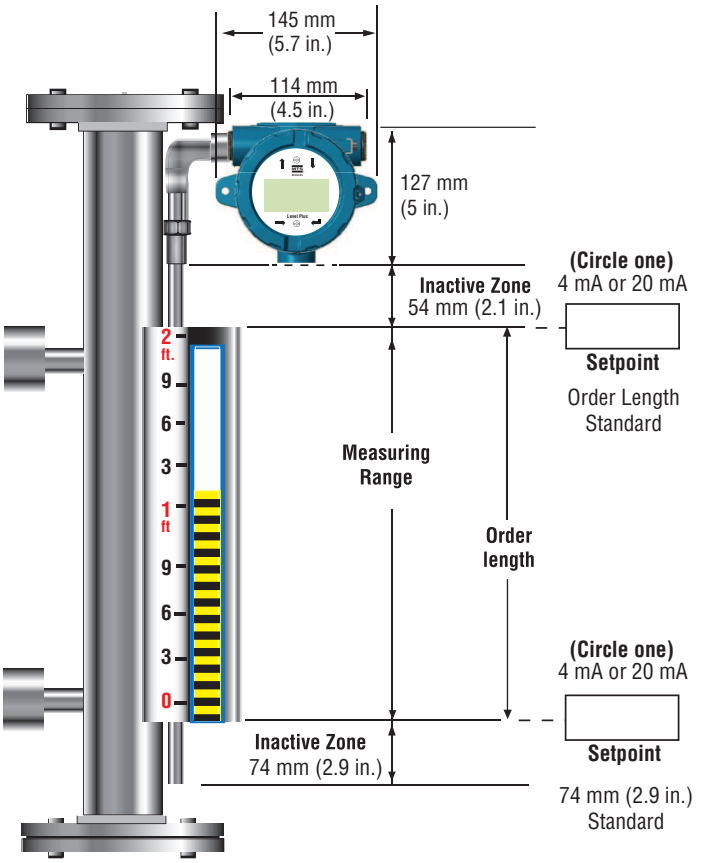


*Figure 3. CHAMBERED mounting, top and bottom flange **

* 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.

Transmitter Inactive Zone Reference

Length	Inactive Zone
<3.66 m (12 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
3	1 Loop with HART®

c	Housing type
A	NEMA housing with cable
B	NEMA housing with terminal
C	NEMA housing with connector
D	Single cavity with display
E	Dual cavity with display
L	SS single cavity with 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	⅝“ OD pipe
R	½“ 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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LEGAL NOTICES