

Product Specifications



Features

- High accuracy and repeatability
- FM/CSA approved intrinsically safe
- 316L SS wetted parts
- Temperature range: -30 to 248°F
- Loop powered 4-20 mA output
- Multi-drop HART Communication
- No maintenance required

Applications

- General Process Control
- Batching Tanks
- Inorganic Chemicals
- Fuels and Solvent
- Industrial Organic Chemicals
- Detergents and Soaps
- Lubricating Oils
- Interface Measurement

Markets

- Chemical Processing
- Water Treatment
- Petrochemical

MC420 level transmitters offer 4-20 mA loop-powered circuitry for level measurement (one level or interface, depending on float selection). They are available in lengths up to 216 inches (5486 mm) and can be installed in applications with process temperatures between -30 and 248°F (-34 to 120 °C). A NEMA Type 4X rated electronics housing of 316L SS provides protection against corrosion. In addition, the electronics are permanently sealed to provide high reliability and resistance to harsh process conditions.

MC420 transmitters are approved by FM/CSA for use in intrinsically safe applications. Appropriate safety barriers are required when installing these transmitters in hazardous areas.

Easy two-step calibration is accomplished, without removing the electronic housing, by using the MTS supplied magnet. Standard calibration can also be completed using the HART® interface.

Like all Level Plus transmitters, the MC420 uses a magnetostrictive design and has only one moving part—the float. This simple design ensures that no scheduled maintenance or recalibration is required—ever.

The outer tube, of the MC420, is constructed of rigid 5/8 in. 316L stainless steel as is the 3/4 in. NPT process connection. A stainless steel float (MTS Part No. 251981-1) is provided with each transmitter.

PARAMETER SPECIFICATION

LEVEL OUTPUT

Measured Variable:	Product Level
Full Range:	18 in. to 18 ft. (457 mm to 5486 mm)
Non-Linearity:	0.02% FS (Independent BSL) or 1/32 in. (0.794 mm)
Repeatability:	0.005% FS or 0.005 in. (0.127 mm)*
Process Temperature:	-30 to 248°F (-34 to 120°C)

ELECTRONICS

Input Voltage Range:	10.5 to 36.1 Vdc
Safety Approval:	CSA/FM approved intrinsically safe for Class I, Groups A, B, C and D Class II, Groups E, F and G Class III Enclosure 4X

ENVIRONMENTAL

Operating Temperature:	Electronics -30 to 160°F (-34 to 71°C)
Vessel Pressure:	(Dependent on float pressure rating)

FIELD INSTALLATION

Length (excluding housing):	18 in. to 18 ft. (457 mm to 5486 mm)
Mounting:	3/4 in. NPT adjustable fitting

* Whichever is greater

All Specifications are subject to change. Please contact MTS for specifications critical to your needs.

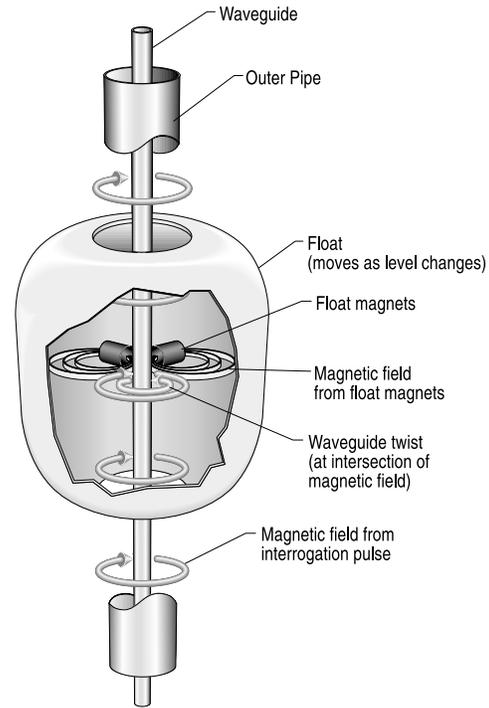


PRINCIPLE OF MAGNETOSTRICTION

The level transmitter is composed of three concentric members. The outermost member is a protective, product-compatible outer pipe that withstands aggressive or harsh process industry applications.

The heart of the transmitter design is the innermost member—the waveguide—a formed element constructed of a proprietary magnetostrictive material. A low current interrogation pulse is generated in the transmitter electronics and transmitted down the waveguide

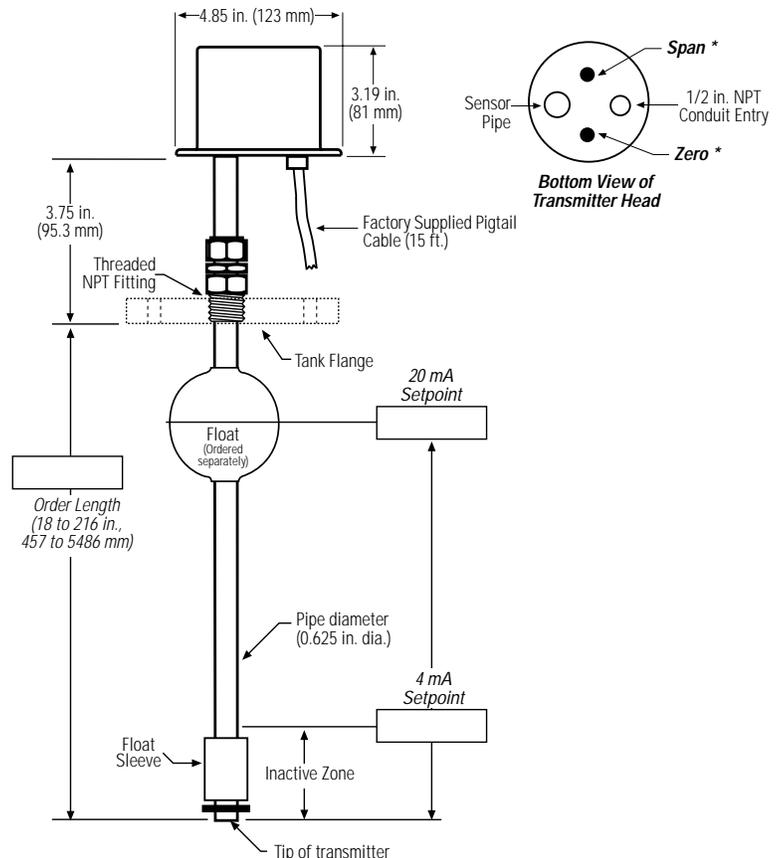
creating an electromagnetic field along the length of the waveguide. When this magnetic field interacts with the permanent magnetic field of a magnet mounted inside the float, a torsional strain pulse, or waveguide twist, results. This waveguide twist is detected as a return pulse. The time period between the initiation of the interrogation pulse and the detection of the return pulse is used to determine the level measurement with a high degree of accuracy and reliability.



DIMENSIONS

The MC420 transmitter is typically mounted in a blind flange that has been drilled and tapped. However, in applications with smaller vessels and tanks, the transmitter can be mounted directly to the vessel via a 3/4 inch NPT fitting.

The factory supplied 15 foot pigtail cable terminates in a 1/2 inch NPT conduit fitting at the electronics housing.



* Sensors located within the sealed instrument enclosure allow for zero and span adjustment by placing the supplied calibration magnet in the appropriate recess at the bottom of the electronics housing.

SPECIFICATIONS

PARAMETER	SPECIFICATION
LEVEL OUTPUT	
Measured Variable:	Product level/ interface depending on float selection
Full Range:	18 to 216 in. (457 mm to 5486 mm)
Non-linearity:	0.02% F.S. (Independent BSL) or 1/32 in. (0.794 mm)*
Repeatability:	0.005% F.S. or 0.005 in. (0.127 mm)*
Time Constant:	1 second
Sensor Operating Temperature:	-30 to 248°F (-34 to 120°C)
GAUGE LOOP	
Input Voltage Range:	10.5 to 36.1 Vdc
Reverse Polarity Protection:	Series diodes
Transient Protection:	line-to-line; IEC 61000-4-4
Safety Approval:	CSA/FM approved intrinsically safe for Class I, Groups A, B, C, and D; Class II, Groups E, F, and G; Class III; Enclosure 4X
CALIBRATION**	
Zero Adjust Range:	Anywhere within the active length
Span Adjust Range:	Full Scale ≥ 6.0 in. (152 mm) from zero
ENVIRONMENTAL	
Humidity:	0 to 100% R.H.
Electronics Operating Temperature:	-30 to 160°F (-34 to 71°C)
Vessel Pressure:	Dependent on float pressure rating
Materials (wetted parts):	316L stainless steel
FIELD INSTALLATION	
Gauge Length:	Up to 216 inches (5486 mm)
Mounting:	3/4 in. NPT adjustable fitting

HOW TO ORDER MC420 TRANSMITTERS

Use the guide below to build model numbers for the MC420 transmitters. Model numbers are required to place orders and are helpful in identifying installed products.



MODEL _____

MC420 = Level Transmitter (-30 to 248°F, -34 to 120°C)

TRANSMITTER ORDER LENGTH _____

Standard Range: 18 to 216 in. (457 to 5486 mm), encode as 018 to 216

Standard Lengths:

Length	Code	Length	Code	Length	Code
18 in. (457 mm)	= 018	84 in. (2134 mm)	= 084	156 in. (3962 mm)	= 156
24 in. (610 mm)	= 024	96 in. (2438 mm)	= 096	168 in. (4267 mm)	= 168
36 in. (914 mm)	= 036	108 in. (2743 mm)	= 108	180 in. (4572 mm)	= 180
48 in. (1219 mm)	= 048	120 in. (3048 mm)	= 120	192 in. (4877mm)	= 192
60 in. (1524 mm)	= 060	132 in. (3353 mm)	= 132	204 in. (5182 mm)	= 204
72 in. (1829 mm)	= 072	144 in. (3658 mm)	= 144	216 in. (5486 mm)	= 216

OPTIONS _____

- FO = Non-standard float
- TO = Stainless steel tag
- FT = Non-standard float and stainless steel tag

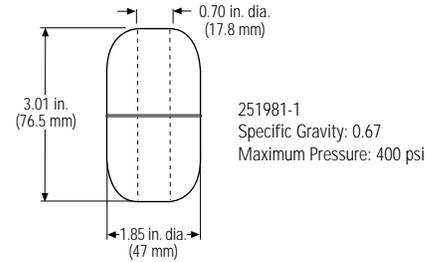
* Whichever is greater
 ** Calibration is accomplished by positioning the float and then placing an MTS supplied calibration magnet (Part No. 252416) in the "Zero" or "Span" indentation on underside of housing.
 All specifications are subject to change. Please contact MTS for specifications critical to your needs.

Floats

Illustrated at right is a standard float available with Level Plus® gauges. A wide selection of floats is available for such considerations as:

- material of construction
- corrosion resistance
- interface level measurement
- density of product or interface liquids
- viscosity
- other

For more information on floats, please refer to MTS document number 550537, or contact the MTS Level Plus Customer Service department.



M-Series PC Setup Software

The M-Series Setup Software will allow the setup and calibration of the M-Series gauges with HART communications. The software communicates via HART through a HART Adapter. Adjustments include: zero, span, offset, gauge length, head adder, gradient, and units of measure.

MTS Part Numbers:

- 252273-1: M-Series PC Setup Software on CD/Diskettes and HART Adapter
- 252273-2: M-Series PC Setup Software on CD/Diskettes
- 380068: HART to RS232 Adapter (SMAR HI-311)



MTS Panel-Mounted Universal Process Meter (With 11 Point Linearization)

MTS Part Numbers:

- 380071: LED Display Universal Process Meter
- 380072: LED Display Universal Process Meter with 2 relays (2 amp @ 250 VAC SPDT)
- 380073: LED Display Universal Process Meter with 4 relays (2 amp @ 250 VAC SPDT)



Enclosure Options:

- 401150: NEMA Type 4X enclosure for one LED Display Meter
- 401151: NEMA Type 4X enclosure for two LED Display Meters

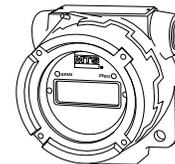
Standard 1/8 DIN, high-impact ABS plastic housing, NEMA 4X/IP65 front panel

MTS Loop-Powered LCD Display Meter

MTS Part Number 380062

FM Approved:

Explosionproof, Class I, II, III; Division 1; Groups B-G
Intrinsically Safe, Class I, II, III; Division 1; Groups A-G (when connected through the appropriate barrier)



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