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## Represented by:



### Zimco Instrumentation Inc.

11141 15 Street NE, Calgary, AB, T3K 0Z5, Canada

Phone: 403-253-8320 Email: info@zimco.ca Website: www.zimco.ca





Questtec Solutions has a long history of quality, experience, and care in the development and engineering of the liquid level gage and valve product lines.

Over the past fifty years, under the direction of Daniel Measurement and Control, **Questtec Solutions'** products have been consistently refined to remain one of the industry leaders in liquid level measurement. Today, **Questtec Solutions** carries on this legacy with renewed dedication in order to bring you real solutions.

**Questtec Solutions**, employs over 125 years of collective experience with all aspects of the liquid level gage and valve product lines. With a new state-of-the-art manufacturing facility, and custom weld shop fabrication services, **Questtec Solutions** is able to provide flexibility to tailor to its customer's specific needs.



## **125+ YEARS**

of collective experience in liquid level gage and valve product lines



## NEW STATE-OF-THE-ART MANUFACTURING FACILITY



## CUSTOM WELD SHOP FABRICATION SERVICES

provide flexibility to tailor to its customer's specific needs

When choosing your liquid level measurement solutions provider, why not choose the best? The symmetry of a field-tested, reputable product, coupled with the energy of new management, has positioned Questtec Solutions to be best suited to assist you in solving your liquid level measurement challenges.

## **Questtec Solutions** delivers engineered solutions to meet the most complex level bridle requirements.

In addition to the existing Daniel Liquid Level Gage and Valve line, this new facility, allows **Questtec Solutions** to offer new products, which include:

















## At Questtec Solutions, we strive to exceed our customer's expectations by using a hands-on approach.

For every project, we take our customers through a step-by-step process to identify both cost efficient options, as well as, effective solutions for even the most challenging applications. Our approach, high quality products, and experienced team members are testimony to customer confidence in **Questtec Solutions** as a leader in the liquid level instrumentation industry.



ENGINEERED SOLUTIONS



FULL-RANGE CAPABILITIES



WORLD CLASS
MANUFACTURING FACILITY



TOP NOTCH
WELDING FACILITY



## MAGNE-TRAC

### A LEADER IN LIQUID LEVEL MANAGEMENT



#### **ENGINEERED SOLUTIONS**

With collaborative efforts of our dynamic outside sales team and network of domestic and international product representatives, we provide quick insight and responsiveness that customers warrant. In addition, our knowledgeable inside sales team will work alongside production staff to deliver flexible lead times, a variety of options for customized bids, and explore all possible solutions for each individual project.



### **FULL-RANGE CAPABILITIES**

Engineering operations are an essential aspect of developing, adapting, and refining any product line. We offer complete engineering services to all of our customers. From the early development stages of projects, our accomplished engineers will review applications to find efficient solutions. Our approval drawings provide real options for customers' application in regards to applicable code and standards. We recognize that focusing on the engineering of each unit benefits in the assimilation of our products for seamless operations.



#### **WORLD CLASS MANUFACTURING FACILITY**

Our manufacturing is split into three distinct skill centers: machining, fabrication, and assembly. All shop work is carefully documented and inspected throughout the manufacturing process. Our production planners follow assigned orders, and communicate job specific requirements to the shop floor. We maintain focus on quality, speed, exceeding customer expectations.

CNC machining and laser engraving capabilities



### TOP NOTCH WELDING FACILITY

#### **QUALIFICATIONS**

Section IX Weld Procedures (WPS)	Procedure Qualifications (PQR)
Welder Certification (Level II Weld Inspector on Staff)	Conforms with PED (Pressure Equipment Directive)
Standard Welds GTAW	MTR (Material Test Reports)
PMI (Positive Material Identification)	Pressure Piping Stamp (PP)
NB-415 Accreditation of R Repair Organizations (R Stamp)	CNC Precision Manufacturing
ASME "S" & "R" and "U, Div. 1" Stamp / ASME B 31.1, B31.3	Over 35 Weld Procedures for numerous material grades

#### **TESTING PROCEDURES**

PWHT (Post Weld Heat Treat)	Dye-Penetration (performed in-house)
Radiography	Ultrasonic
Magnetic Particle Testing	Destructive Testing

## APPLICATION OPPORTUNITIES

LIQUID LEVEL MEASUREMENT



**CHEMICAL & PETROCHEMICAL** 



**METALS & MINERALS** 



REFINING



OIL & GAS



**POWER GENERATION** 



**AEROSPACE** 



FOOD PROCESSING



**PULP & PAPER** 

### **APPROVALS**







CSA



NACE



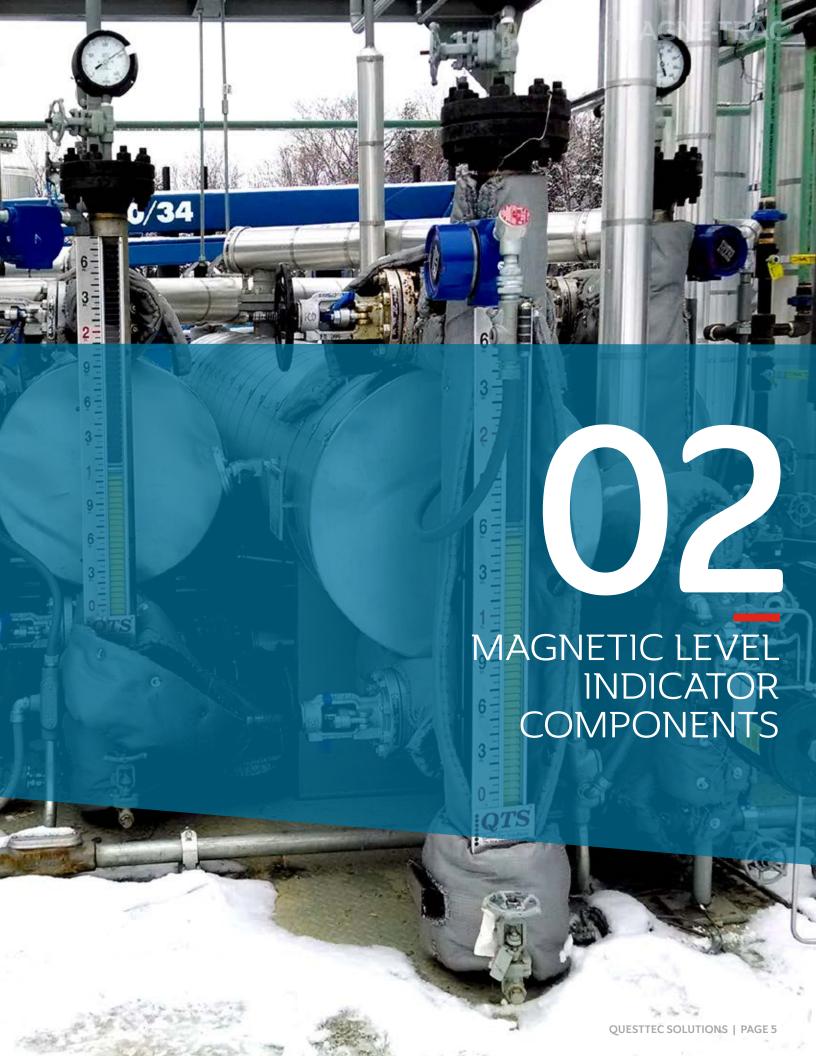
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1EC







## MAGNETIC LEVEL INDICATOR COMPONENTS

## A Magnetic Level Indicator (MLI) consists of 5 major components

Constructed of non-magnetic materials including standard 316 SST. Exotic materials such as Alloy 20 & Hastelloy C are available. Traditional inlet & outlet mounted design displaying liquid level to match the vessel level. Complete with flange end closure for accessibility to the float. Magne-Trac chambers are available to ASME 31.1 and 31.3.

### **FEATURES**

Innovative Flag Design Maximizes Magnetic Field

Wide Flags for Enhanced Indicator View

Impact Resistant Polycarbonate Indicator Window

Corrosion Resistant Moving Parts

Wide Variety of Materials

Available to ASME 31.1 / 31.3 Standards

## What is a Magnetic Level Indicator, or MLI?

An MLI is a safe and effective way to provide local level indication. With options for non-invasive/externally mounted instrumentation, such as magnetic level switches and transmitters, make the technology a go-to solution for many difficult and demanding applications that require reduced leak points with clear, visible, and reliable level indication. At **Questtec Solutions**, we have built our business on a readiness to adapt to specific customer requirements in terms of customer materials, fabrication, and delivery requirements. Our standard configuration is by no means the limits to our capacity of supply.



INDICATOR .....

Indicators provide a high-contrast visual representation of the liquid level.

**LEARN MORE, PAGE 9** 

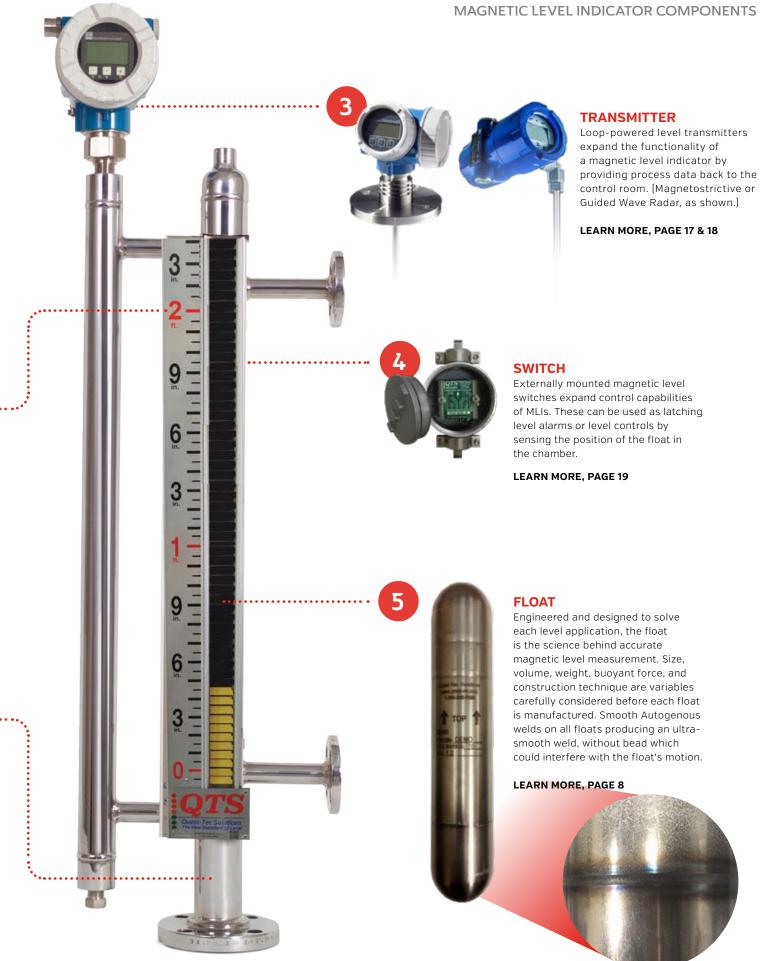
A chamber is custom-engineered and constructed per the highest manufacturing standards. A wide range of non-magnetic materials such as stainless steel, exotic alloys, and hard plastics are available for construction.

LEARN MORE, PAGE 12



## **MAGNE-TRAC**

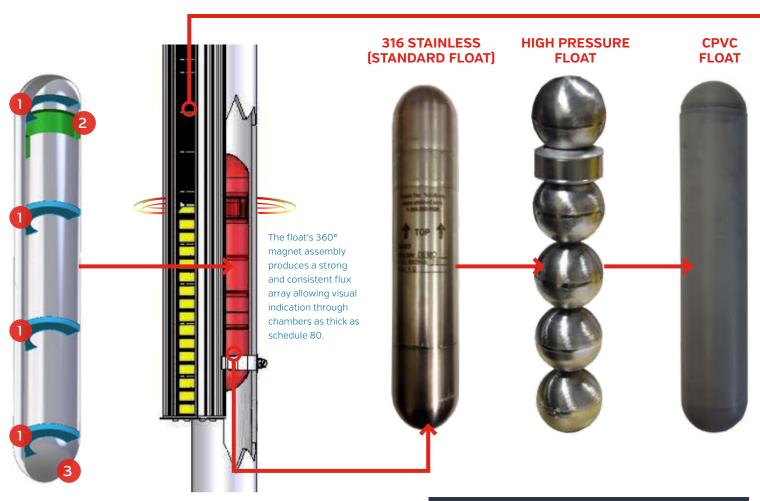




## TECHNOLOGY

## Precision Manufactured Float: The magnetic float is the most crucial component within Questtec Solutions' magnetic level indicators.

Constantly pushing the limits of design structure, buoyancy, density, weight and pressure Questtec stays on the cutting edge of innovation. Our engineers aim to provide customers with the most effective solutions no matter how difficult the applications or extreme the environments. Questtec boast solutions for a variety of unique high pressure/high temperature, flashing, interface and corrosive processes.



- 1. STIFFENING RINGS;
- 2. MAGNET:
- 3. FLOAT BODY

### **CAPABILITIES**

Process pressures up to 4,500+ psig [310 bar]<sup>1</sup>

Process temperatures up to  $800^{\circ}F$   $[427^{\circ}C]^{1}$ 

High tempature magnets to 1000°F (538°C)

Total level specific gravities as low as 0.331

Interface float designs available for liquid specific gravity differentials as little as 0.1

Adequate buoyancy to operate effectively and freely in many viscous liquids, including crude oil

'maximum capabilities can vary depending on combination of pressure, temperature, and media specific gravity

## WIDE FLAG INDICATOR DESIGN

## Standard indicators consist of anodized aluminum housing; black & yellow rotating flags; and a clear UV scratch resistant polycarbonate window.

Each flag is 1.4" wide to heighten overall viewing capabilities from up to 200ft. The non-corrosive flag materials also eliminate problems with deterioration often encountered with market standard aluminum flag/stainless steel pins. Magne-Trac™ indicators are constructed with a UV scratch resistant polycarbonate window as standard, eliminating the fragility often encountered with glass while still forming a high integrity fit. The tightly sealed housing contains a single column wide flag assembly all aligned within an extruded aluminum case.

### **SCALE OPTIONS**

In addition to the standard stainless steel scale (graduated in feet and inches), other custom scale options are available

Inches only

Offset zero (plus & minus scale divisions)

Negative/Positive (boiler service)

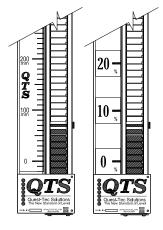
Percent (0 to 100) -10% increment std.

Metric (mm/M)

Volumetric (gallons, liters)

Decimal feet (0.1ft or 0. 01ft.divisions)

Given the characteristics of every vessel are different, drawings or strapping tables must be supplied.





**EACH FLAG CONTAINS** 

TWO HIGH STRENGTH

**MAGNETS** 

est-Tec Solutions





## MAGNETIC LEVEL INDICATOR SPECIFICATION



## The Questtec Magne-Trac Engineered to your Specifications!

In applications for extreme pressure, temperature, vibration, and highly corrosive or hazardous material, the Magne-Trac gage will perform where others fail. Features include lower installation costs, easy to read liquid level indication, and low maintenance. The Magne-Trac gage is constructed of non-magnetic materials including standard 316 SST. Exotic materials such as Alloy 20 & Hastelloy C are also available. Traditional inlet & outlet-mounted design display liquid level to match the vessel level. Comes complete with flange end closure for accessibility to float. Magne-Trac chambers are available to ASME 31.1 and 31.3.

FEATURES	
Innovative Flag Design Maximizes Magnetic Field	Wide Flags for Enhanced Indicator View
Low Specific Gravities	Corrosion Resistant Moving Parts
Wide Variety of Materials	High Pressure Applications
Available to ASME B31.1/31.3 Standards	

SPECIFICATIONS		
Manageria a Danas	Standard single section	12 to 216in
Measuring Range	Multi section (custom)	>216in
Temperature Range	-320°F to 800°F	
Pressure Range	Full Vacuum to 4500 PSIC	à
Minimum Specific Gravity	As low as 0.33	

 $<sup>*</sup> Consult \ factory \ for \ additional \ limits/options$ 

MATERIALS OF CONSTRUCTION			
Chamber Materials	Standard Alloys	304/304L 316/316L Other 300 series stainless	
*NACE Material available on request	Plastics/ Composites	CPVC PVDF (KYNAR)	
	Exotic Allys	Titanium, Hastelloy-C276, Alloy20	
Chamber Diameters	2" Sch 40 [Std] 2-1/2" Sch 40 or 80 3" Sch 40 *Selected as appropriate		
Oversized Chamber (Flashing, Boiling & Dirty Service)	3" Sch 40 with smaller OD floats		
Pressure Class Ratings		ANSI 150#; 300#; 600#; 900#; 1500#; 2500#	
	<b>Process Connection</b>	1/2" to 10+ DN20 to DN150	
Process Connections	Process Connection Types	MNPT, FNPT, Weldolet®, Sockolet®, Sockweld Flange, Weldneck Flange, Lap Joint Flange; RTJ Flanged, Plain Pipe Stub	

VISUAL INDICATION	
Indicator Flags	1.4" Wide Flag Assembly in Yellow/Black [Additional Colors Available on Request]
Indicator Housing	Anodized Aluminum Stainless Steel casing available upon request
Scale Options	Ft/Inches (Std.), Metric, Percentage, Volume, etc. Custom Scales Available

FLOAT SPECIFICATIONS	
Float Materials	316/316L, Titanium, Hastelloy-C276, CPVC
Specific Gravity Range	As low as 0.33
Pressure	Up to 4500 PSIG @ 100°F
High Temp Magnets	Up to 1000°F *Selected by Questtec application

TEMPERATURE OPTIONS	
High	Insulation Blankets, Electric or Steam Tracing High Temperature Indicators, etc.
Low	Insulation Blankets, Cryogenic Insulation with Non-Frost Extensions, etc.

LEVEL TRANSMITTER & DISCRETE ALARM OPTIONS	
Transmitter Options	MTLT-5000 Magnetostrictive Guided Wave Radar (Use Page 22 for GWR Options)
Switch Options	MTLS-1A; MTLS-5A; MTLS-10A; MTLS-PNEU



## The Questtec Magne-Trac Plus combines the rugged versatility of the Magne-Trac with the flexibility, accuracy and reliability of a Guided Wave Radar Transmitter inserted into a Bridle-Trac Bypass Chamber.

The two independent level technologies work together to provide reliable level indication and monitoring. The unique design couples the versatility of an MLI and reliability of GWR with minimum vessel penetration and maximum ease of installation with virtually maintenance-free operation.

Change in the process tank level corresponds to change in the Magne-Trac Plus chambers. The float within the chamber actuates flags for visual indication. The instrument mounted within the second chamber also reacts according to the level change.

SPECIFICATIONS		
Managina Danas	Standard single section	12 to 216in
Measuring Range	Multi section (custom)	>216in
Temperature Range	-320°F to 800°F	
Pressure Range	Full Vacuum to 4500 PSIG	
Minimum Specific Gravity	As low as 0.33	
Unique Dual Chamber Design	ber Design True Independent Level Measurement Devices.	

<sup>\*</sup>Consult factory for additional limits/option:

# BRIDLE-TRAC (BT) BRIDLE-TRAC PLUS (BTP)

## The Questtec Bridle-Trac is an ideal means of utilizing the power of many technologies without mounting directly into process vessel. The Questtec Bridle-Trac external chamber is a self-contained cage designed for use with our top mounting level transmitters or switches. Quality construction and a wide selection of configurations make

The Questtec Bridle-Trac external chamber is a self-contained cage designed for use with our top mounting level transmitters or switches. Quality construction and a wide selection of configurations make this cage an ideal means of utilizing the power of our many technologies without mounting directly into the process vessel. The chamber is suitable for use with Guided Wave Radar, RF Capacitance Transmitters, Electronic point sensors and top mounted displacer switches. In addition, mount Level Gages and Valves to your Instrument Bridle for ease of maintenance. In addition, the Bridle-Trac Plus allows the utilization of all our other technology offerings such as Magne-Trac, Glass-Trac, Steam-Trac, Armor-Trac and other 3rd party instrumentation with ancillary connections as needed.

### **SPECIFICATIONS**

Sealed or flanged-top chamber options

2", 3" and 4" nominal chamber diameters to accommodate all sensing elements, Schedule 40 pipe as a minimum

Carbon steel or 316 stainless steel materials of construction

Rugged Questtec commercial construction available as well as ASME B31.3, ASME B31.1, NACE or combined NACE and ASME B31.3 construction options

Rated for pressures up to 5000 psi (345 bar)

For applications to 842°F [450°C]

Lengths for measuring ranges to twenty feet (6.1 m)

Broad selection of process connections sizes and types

Head flange bolting included with flange-top models

Suitable for use with RF capacitance transmitters, all electronic point sensors and top mounted displacer switches

Optimal design for use with Guided Wave Radar transmitter:

- Smallest possible chamber diameters
- Pressure rating to match High Temperature, High Pressure (HTHP) and High Pressure (HP) probes
- Temperature rating to match HTHP probe
- Space above and below measuring range to accommodate measurement transition zones







## The Questtec Solution Eco-trac series offers the same functionality, robustness, and reliability of our Magne Trac series at more cost efficient design for light industrial services.

This product is safe and very economical alternative to sight glass sight glass technology to reduce leak points and broken glass concerns. The fixed design and specification allow for a quick, cost effective solution to many applications. The EcoTrac series meets and exceeds ASME class 150 ratings in most cases and is ideal for low pressure and temperature applications. Well suited for but not limited to applications such as skid systems, boiler feed water tanks, refrigeration units, wastewater treatment facilities and other light industrial applications. The Eco-Trac series can be combined with our magnetic level transmitters provide continuous level monitoring and magnetic level switches for discrete high and low alarms.

### MATERIALS OF CONSTRUCTION

304SS or 316SS Chamber and Flanges

304SS or 316SS Chamber and Carbon Steel Flanges

Chamber/Pipe: 2" sch40

VESSEL CONNECTIONS	
M.NPT: 1/2" to 1", sch80	Flange: ½" to 2" RFSW, sch40

OPERATING CONDITIONS	
Min SG	0.65
Max Pressure Rating	500 PSIG
Max Temperature Rating:	300° F
Maximum Length	(Centers/Visible) 220"
Minimum Length	(Centers/Visible) 8"

VISUAL INDICATOR		
Aluminum Housing with	Flags: Black/Yellow	
Polycarbonate Shield	No Scale (std.)	Weatherproof

FLOAT	
12" long oblong, 316SS (std.)	Titanium





MTLS-1A MTLS-5A
1 AMP 5 AMP



MTLS-10A 10 AMP



MTLT-5000

## ECO-TRAC PLUS



## The Eco-Trac Plus series offers the same functionally, robustness and reliability of our Magne-Trac Plus series with a fixed cost-efficient design for light industrial services.

Just like the Eco-Trac series this product is an economical alternative to sight glass technology. The ETP series is combined with the highly reliable guided wave radar harnessing the benefit of two independent technologies in one cost effective solution for visual indication and level monitoring needs. The ETP series also meets and exceeds ASME class 150# ratings and is ideal for low pressure and temperature solution making it well suited for applications such as skid systems, boiler feed water tanks, refrigeration units, wastewater treatment facilities and many other light industrial applications. The ETP series can still be combined with our magnetic level transmitters and switches to provide an even higher level of redundancy.

### MATERIALS OF CONSTRUCTION

304SS or 316SS Chamber and Flanges

304SS or 316SS Chamber and Carbon Steel Flanges

Chamber/Pipe: 2" sch40

VESSEL CONNECTIONS	
M.NPT: ½" to 1", sch80	Flange: ½" to 2" RFSW, sch40

OPERATING CONDITIONS	
Min SG	0.65
Max Pressure Rating	500 PSIG
Max Temperature Rating:	300° F
Maximum Length	(Gliders/Visible) 220"
Minimum Length	(Centers/Visible) 8"

VISUAL INDICATOR		
Aluminum Housing with	Flags: Black/Yellow	Weatherproof
Polycarbonate Shield	No Scale	

FLOAT	
12" long oblong, 316SS	Titanium





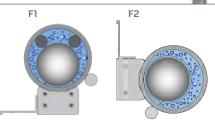
## OPTIONAL EQUIPMENT

## HIGH-TEMPERATURE INSULATION BLANKET

## These items are listed on the Specification Guide for items to add to our MLI.

**Questtec Solutions** specializes in custom fiberglass insulation blankets for MLIs of all shapes and sizes. They are constructed with high-quality materials capable of constant contact with temperatures up to 1,000° F  $[538^{\circ}$  C]. This insulation is available as personal protection or with heat tracing options for freeze protection or process temperature maintenance.

## FLASHING DESIGNS (FLOR F2)



The Flashing design encompasses an oversized chamber with either guide rods [F1] or perforated tube [F2] to allow the outgassing to bypass the smaller sized float that is situated towards one side of the chamber ideal for liquids that boil, flash and/or outgas.

The F1-guide rode solution is ideal for shorter indication lengths (<8 ft), aggressive applications and dirty services (small,

suspended particles). The F2-perforated tube design is ideal for long indication lengths (> 8ft) and clean liquids.
Applications:

- Anhydrous Ammonia,
- · Carbon Dioxide,
- · Liquid Nitrogen,
- Light Hydrocarbons and Pressureliquified gases (propane, butane, methane...)

## HERMETICALLY-SEALED FLAG INDICATOR (HS)



#### No gaskets: can't leak or fog

Designed to meet needs of chemical wash down, severe environments and offshore industry. Flag indicators are purged with inert gas and permanently sealed in:

- Glass tubing with 100% fused glass end seals to 400° F (204° C) process temperatures

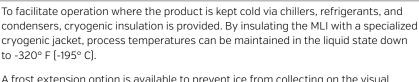
## HEAT TRACING: ELECTRIC (EH) & STEAM (ST)



For applications where process freeze protection or temperature maintenance is required, heat tracing will allow the MLI to operate uninterrupted throughout harsh, cold conditions.

Electric Heat Tracing is available in self-regulating, constant wattage, and mineral insulated varieties. Contact the factory for more information.

COLD INSULATION & FROST EXTENSION



A frost extension option is available to prevent ice from collecting on the visual indicator, thereby decreasing the visibility. The extension is constructed of durable acrylic plastic and is provided standard with all cryogenic insulation

MAGNETIC PARTICLE TRAP (MP)



Magnetic Particle Traps provide protection for MLIs. The particles are composed mostly of ferrite, often from carbon steel piping. The trap keeps magnetic particles out of float chamber. The Trap fits in line with the process connection. The trap collects the particles which can be cleaned periodically to ensure continued operation of the magnetic level indicator.



## MAGNETOSTRICTIVE LIQUID LEVEL TRANSMITTER





### **PRINCIPLES OF OPERATION**

The MTLT5000-Magnetostrictive M or L Series is based upon the magnetostrictive principle. The sensing tube contains a wire which is pulsed at fixed time intervals. The interaction of the current pulse with the magnetic field created by the magnetic float causes a torsion stress wave to be induced in the wire. This torsion propagates along the wire at a known velocity from the position of the magnetic float and toward both ends of the wire. The microprocessor-based electronics measure the elapsed time between the start and return pulses and convert it into a 4-20 mA DC output which is proportional to the level being measured.

FEATURES	
High Accuracy	4/20mA Analog with HART
AMS Aware	Two Channel Output
Explosion Proof and/or Intrinsically Safe	No scheduled Maintenance or Recalibration (due to non-contact design of sensing element)

Designed and Tested with Questtec Magne-Trac Series

SPECIFICATIONS		
LEVEL OUTPUT		
Full Range	.5 ft. to 25 ft.	
Non-Linearity	.035% of Full Scale	
Repeatability	.01% of Full Scale or 0.015in (0	.381)*
Operating Temperature	Electronics: -40°F (-40C) to 16 Sensing Element: -40°F (-40°C) Process Temperature: -40°F 9	C) to 257°F (125°C)
Output: Signal/Protocol	Standard 4-20mA DC, 2 Wire H	HART
Inherent Accuracy	+,(-) 0.039in (1mm) 20" (508mm) to 300" (7620mn	n)
TRANSMITTER LOOP		
Input Voltage	10.5-28 VDC	
Fail Safe	High (>21.4mA), or Low (<3.8m	A)
CALIBRATION		
Zero Adjust Range	Anywhere within active length	1
Span Adjust Range FIELD INSTALLATION	FS > 6" from zero	
Mounting	External mounted with QTS Z-	bracket
Wiring	2-wire twisted shielded cable 3	3/4" FNPT Conduit Opening
ENVIRONMENTAL		
Housing Type	NEMA Type 4X Epoxy Coated Ca	ast Aluminum, 316L Stainless Steel
Humidity	0 to 100% humidity, non-cond	ensing
HOUSING OPTIONS/ DIMENSIONS		T
Single and Dual Cavity	¾" FNPT Conduit M20 for ATEX/IECEX Version	
Safety Approval	FM/CSA: Explosion-Proof Class I, Groups B, C, D Class II, Groups E, F, G Division I, NEMA 4X	FM/CSA: Intrinsically Safe Class I, Groups A, B, C, D Class II, Groups E, F, G Division I, NEMA 4X

## GUIDED WAVE RADAR FOR REDUNDANT LEVEL TECHNOLOGY



## The E&H Guided Wave Radar works with high-frequency radar pulses which are guided along a probe.

These top mounted, direct insertion radars measure interface and direct level of liquids and solids, both of high and low pressures and temperatures. GWR technology provides dependable level indication through pulsating high-frequency, microwave energy down the probe within a bypass chamber. A GWR will read the true level of the process, even in the density diverges over time.

#### PRINCIPLES OF OPERATION

Levelflex works with high-frequency radar pulses which are guided along a probe. As the pulse impacts the medium surface, the characteristic impedance changes and part of the emitted pulse is reflected. The time between pulse launching and receiving is measured and analyzed by the instrument and constitutes a direct measure for the distance between the process connection and the product surface.

ADVANTAGES		
	Mounts in bridle chamber to the Magne- Trac and provides Redundant Level	No wet calibration required, simple setup without adjustment
	Simultaneous acquisition of interface layer and total level of clear and emulsions interface	Not affected by density of the medium
	High Measuring accuracy	Models available to meet applications up to 752° at 5800 psi

#### FMP50

Levelflex FMP50 is the instrument for basic applications in liquids which do not place high demands on temperature and pressure ranges or chemical resistance. Particularly in basic supply or storage applications as well as utility processes FMP50 is the best choice.

FEATURES	
Accuracy	Rod probe: +/- 2 mm (0.08 in) Rope probe: +/- 2 mm (0.08 in)
Process temperature	-20+80 °C (-4+176 °F)
Process pressure absolute / max. over- pressure limit	Vacuum6 bar, (Vacuum87 psi)
Max. mea- surement distance	Rod: 4 m (13 ft) Min DK>1.6 Rope: 12 m (40 ft) Min DK>1.6
Main wet- ted parts	Rod probe: 316L, PPS, Viton Rope probe: 316, PPS, Viton

#### **FMP51**

Continuous level measurement of liquids, pastes and slurries but also for interface measurement. The measurement is not affected by changing media, temperature changes, gas blankets or vapors.

FEATURES	
Process connections	Thread or flange
Tempera- ture	-40 to +200°C [-40 to +392°F]
Pressure	-1 to +40bar (-14.5 to +580psi)
Maximum measuring range	Rod 10m (33ft), rope 45m (148ft), coax 6m (20ft)
Accuracy	±2mm (0.08")
Dielectric Constant	1.6 (Rod probe, Rope probe), 1.4 (Coax probe)

International explosion protection certificates, overfill prevention WHG SIL, marine approval, 5-point linearity protocol

#### **FMP54**

Continuous measurement in liquids under extreme conditions. Excellent for steam boilers, toxic media using gas tight feed-through guarantee. Reliable results in case of gas and steam phases. Reliable in moving surface, foam and changing medias.

FEATURES	
Process connections	Thread or flange
Tempera- ture	-196 to +450°C (-320 to +842°F)
Pressure	Vacuum -1 to +400bar (Vacuum -14.5 to +5,800psi)
Maximum measuring range	Rod 10m (33ft), Rope 45m (148ft), coax 6m (20ft)
Accuracy	Rod ±2mm (0.08")
Dielectric Constant	1.6 (Rod probe, Rope probe), 1.4 (Coax probe)
International	evalosion protection

International explosion protection certificates, overfill prevention WHG, SIL, marine approval, steam boiler approval, 5-point linearity protocol

#### **FMP55**

Combination of capacitance and guided wave radar measuring principle in one device. The instrument guarantees safe measured value acquisition even in emulsion layers and issues level and interface layer signals simultaneously.

FEATURES	
Process connections	Thread or flange
Tempera- ture	-50 to +200°C (-58 to +392°F)
Pressure	-1 to +40bar (-14.5 to +580psi)
Maximum measuring range	Rod 4m (13t), rope 10m (33ft), coax 6m (20ft)
Accuracy	Rod ±2mm (0.08")
Dielectric Constant	1.6 (Rod probe, Rope probe), 1.4 (Coax probe)
International	explosion protection

International explosion protection certificates, overfill prevention WHG, SIL, marine approval

## **MAGNE-TRAC**<sup>™</sup> **PRODUCTS**

## **SWITCHES**







MTLS-10A



MTLS-PNEU

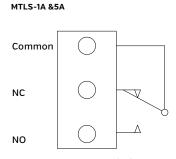
## Questtec level switches are hermetically sealed, non-mercury, bi-stable latching switches, which are designed for use with Magne-Trac level gages.

### **LEVEL SWITCHES**

The bias magnet design latches the switch maintaining the contact after the level continues to rise or fall. The switch will change state when the float magnet passes by. The switches are fully adjustable and non-invasive. Level switches are mounted to the Magne-Trac chamber with all 316 Stainless Steel worm gear pipe clamps. Switch points can be changed easily at any time without any interruption to the visual indication or process.

Standard Enclosure is Cast Aluminum Junction box. Optional, Stainless Steel Junction box. Enclosure Rating is FM/CSA. Level Switches are C Clamp mounted on MLI (standard), clamp mounted on MLI with insulation pad and or attached to a switch mount rod.

#### **SWITCH WIRING**

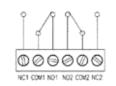


Green = Common Red = NCBlue = NO

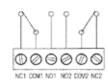
Red (NC) = Closed when float below switch

Blue [NO] = Closed when float above switch

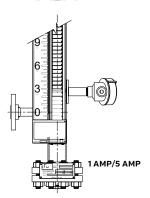
MTLS-10A



Contacts position when



Contacts position when Float is higher than switch Float is lower than switch



1AMP

(NO HOUSING)

All switches field adjustable. Loosen the mounting clamps and position at desired location. Ensure that the switch always remains in close proximity to the internal float.

10AMP

A switch mount rod is an available alternative method for mounting the MTLS to an MLI when insulation is present. The rod assembly, which is welded to the MLI chamber, allows the switch to slide along the full length. When the desired position is selected, simply tighten it in place. Consult Factory.

MODEL	Max Volts	Max Current	Max Power	Dead Band	Max Temp	Min Temp	Contacts	Enclosure Classification
MTLS-1A	120 VAC/ 150 VDC	1.0 AMPS	25W	0.50 la ab	302°F	-40°F	CDDT	Class 1 Div 1
MTLS-5A	125 /250 VAC	.5.0 AMPS	1200W	0.50 Inch	(150°C)	[-40°C]	SPDT	Groups B, C, D
MTLS-10A	110/250VA C (Resistive)	10.1 AMPS	2500W	0.50 inch	248°F	-40°F	2 SPDT	Class 1 & 2 Div
MILS IOA	110/220 VDC	0.5/0.25 Amps	55W	0.50 IIICII	(120°C)	(-40°C)	23101	Groups B, C, D
MTLS-PNEU	Not Applicable	N/A	N/A	0.50 Inch	200°F [93°C]	0°F [-17°C]		







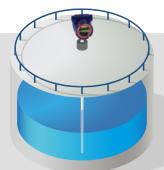
ELECTRONICS	
Input Voltage	10.5 to 28 Vdc
Fail Safe	High, Full scale (Modbus, DDA) Low, 3.5 mA default or High, 22.8 mA (Analog, HART®)
Rev. Polarity Protection	Series diode

MOUNTING	
Flexible Hose	1 in. Adjustable MNPT or BSPP fitting, Flange mount

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 & Dual Cavity	34 in. FNPT conduit opening, M20 for ATEX/IECEx version	
NEMA Type 4X	½ in. FNPT conduit opening Low, 3.5 mA default or High, 22.8 mA (Analog, HART®)	

\* Whichever is greater | ∆ Contact factory for longer lengths. | ♦ Contact factory for specific temperature ranges.



Product Level
Interface Level
Temperature

3-IN-I MEASUREMENT

The Level Plus® RefineME® liquid level transmitter satisfies the demand for an accurate and robust liquid-level sensor with unsurpassed flexibility to meet most process application conditions.

The RefineME® transmitter provides 3-in-1 measurement using one process opening for product level, interface level, and temperature measurements. Once the transmitter is installed and calibrated there is no requirement for scheduled maintenance or recalibration. Set it and forget it!

FEATURES	
3-in-1 Measurement: Product, Interface, Temperature	No Scheduled Maintenance or Recalibration
Inherent Accuracy ±1mm	Integral Display
Intrinsically Safe	API Temperature Corrected Volumes

APPLICATIONS		
Inventory Control	Bulk Storage	Custody Transfer

MARKETS		
Petroleum and Petrochemical	LPG terminals	Mining

LEVEL OUTPUT	
Measured Variable	Product level and interface level
Output signal /Protocol	Modbus RTU, DDA, Analog (4-20 mA), HART®
Order length	Rigid Pipe: 305mm [12in] to 7620mm [300in]
Inherent Accuracy	±1 mm (0.039 in.)
Repeatability	0.001% F.S. or 0.381 mm (0.015 in.) * (any direction)

TEMPERATURE OUTPUT	
Measured Variable	Average and multi-point temperatures [Modbus, DDA] Single point temperature [Analog, HART®]
Temperature Accuracy (Modbus, DDA)	±0.2 °C (0.4 °F) range -40 °C (-40 °F) to -20 °C (-4 °F), ±0.1 °C (0.2 °F) range -20 °C (-4 °F) to 70 °C (158 °F), ±0.15 °C (0.3 °F) range 70 °C (158 °F) to 100 °C (212 °F), ±0.5 °C (0.9 °F) range 100 °C (212 °F) to 105 °C (221 °F)
Temperature Accuracy (Analog, HART®)	±0.28 °C (0.5 °F) range -40 °C (-40 °F) to 105 °C (221 °F)

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) ◊ Temperature element: -40 °C (-40 °F) to 105 °C (221 °F)
Vessel Pressure	Rigid Pipe: 2000psi (138 bar)
Materials	Wetted parts: 316L stainless steel † Non-wetted parts: 316L stainless steel, Epoxy coated aluminum

DISPLAY	
Measured Variables	Product level, interface level and temperature

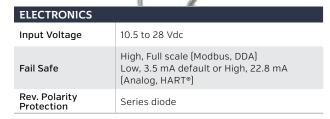
## MAGNE-TRAC™ PRODUCTS

TANK SLAYER® (IN-TANK)
TRANSMITTER

MEASURE MORE WITH LESS



Connections



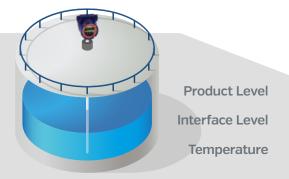
MOUNTING	
Flexible Hose	1 in. Adjustable MNPT or BSPP fitting, Flange mount
WIRING	
	4-wire shielded cable or twisted pair, Daniel

Woodhead 6-pin male connector, 4570 mm

(180 in.) Integral cable with pigtail

ELECTRICAL CONNECTIONS	
Single & Dual Cavity	34 in. FNPT conduit opening, M20 for ATEX/IECEx version
NEMA Type 4X	1/2 in. FNPT conduit opening Low, 3.5 mA default or High, 22.8 mA (Analog, HART®)

- \* Whichever is greater |  $\Delta$  Contact factory for longer lengths. |
- ♦ Contact factory for specific temperature ranges.



3-IN-I MEASUREMENT

## The Level Plus® Tank Slayer® liquid level transmitter satisfies the demand for an accurate and robus liquid-level sensor with unsurpassed flexibility to meet most process considitions.

The Tank Slayer® transmitter provides 3-in-1 measurement using one process opening for product level, interface level, and temperature measurements. Once the transmitter is installed and calibrated there is no requirement for scheduled maintenance or recalibration. **Set it and forget it!** 

FEATURES	
3-in-1 Measurement: Product, Interface, Temperature	No Scheduled Maintenance or Recalibration
Inherent Accuracy ±1mm	Integral Display
Intrinsically Safe & Hazardous Area Certified	API Temperature Corrected Volumes

APPLICATIONS		
Inventory Control	Bulk Storage	Custody Transfer

MARKETS		
Petroleum and Petrochemical	LPG terminals	Mining

LEVEL OUTPUT	
Measured Variable	Product level and interface level
Output signal /Protocol	Modbus RTU, DDA, Analog (4-20 mA), HART®
Order length	Flexible hose: 1575 mm (62 in.) to 22000 mm (866 in.) Δ§
Inherent Accuracy	±1 mm (0.039 in.)
Repeatability	0.001% F.S. or 0.381 mm (0.015 in.) * (any direction)

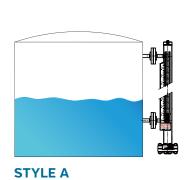
TEMPERATURE OUTPUT	
Measured Variable	Average and multi-point temperatures (Modbus, DDA) Single point temperature (Analog, HART®)
Temperature Accuracy (Modbus, DDA)	±0.2 °C (0.4 °F) range -40 °C (-40 °F) to -20 °C (-4 °F), ±0.1 °C (0.2 °F) range -20 °C (-4 °F) to 70 °C (158 °F), ±0.15 °C (0.3 °F) range 70 °C (158 °F) to 100 °C (212 °F), ±0.5 °C (0.9 °F) range 100 °C (212 °F) to 105 °C (221 °F)
Temperature Accuracy (Analog, HART®)	±0.28 °C (0.5 °F) range -40 °C (-40 °F) to 105 °C (221 °F)

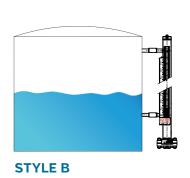
ENVIRONMENTAL	
Enclosure Rating	NEMA Type 4X, IP65
Humidity	0 to 100% relative humidity, non-condensing
Operating Temperatures	Electronics: -40 °C (-40 °F) to 71 °C (160 °F) Sensing element: -40 °C (-40 °F) to 125 °C (257 °F) ◊ Temperature element: -40 °C (-40 °F) to 105 °C (221 °F)
Vessel Pressure	Flexible Hose: 260 psi (18 bar)
Materials	Wetted parts: 316L stainless steel † Non-wetted parts: 316L stainless steel, Epoxy coated aluminum

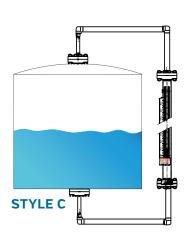
DISPLAY	
Measured Variables	Product level, interface level and temperature

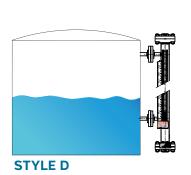


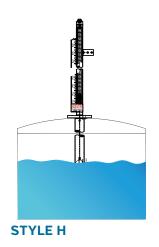
# TYPICAL TANK CONFIGURATIONS QUESTITEC SOLUTIONS

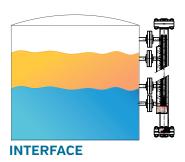












STYLE D

## **MAGNE-TRAC** MODEL NUMBER

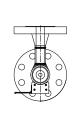
The Questtec Solutions Magne-Trac utilizes a nonmagnetic pipe chamber mounted directly to a vessel. The process connections from the chamber to the vessel act as an inlet and outlet that allow the liquid level in the pipe chamber to match the level in the process vessel. Inside the chamber, a custom designed float rises and falls with the level of the liquid in the chamber. A 360° magnet array within the float projects a magnetic field through the pipe chamber to an externally mounted indicator to provide a visual read out of the liquid level within the vessel.

### MT ORIENTATION

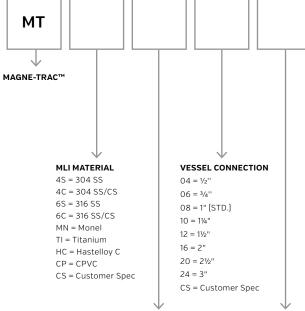
INDICATOR SWITCHES 0 180° 0 270° 0 180° 0 270° 0 180° 0 270°





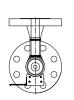






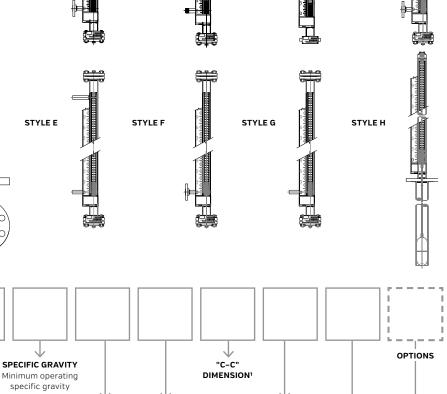
#### MLI STYLE FLANGE CLASS A = See Chart (Std) 01 = 150#

03 = 300# B = See Chart C = See Chart 04 = 400# 06 = 600# D = See Chart 09 = 900# F = See Chart F = See Chart 15 = 1500# G = See Chart 25 = 2500# H = See Chart CS = Customer Spec (All Styles Use a Flange for End Closure) Z = Customer Spec



STYLE A

STYLE B



STYLE C

These parameters must be based on Maximum Operating Conditions and are the basis for Float construction.

PRESSURE TEMPERATURE

MAXIMUM

MAXIMUM

CHAMBER

Flanges

B1 = ASMF B311

B3 = ASME B31.3

F1 = Guide Rod

F2 = Perforated Tube

SC = Special Coating

AS = ASME "S" Stamp

AU = ASME "U" Stamp

IV = Inverted Chamber

SO = Slip on Flanges

#### INDICATOR STYLE WF = Wide Flag

ST = Follower

HF = High Temp Flag

XX = None

### VENT/DRAIN

AA = ½" Top Vent & ½" Drain (NPT) BB =  $\frac{3}{4}$ " Top Vent &  $\frac{3}{4}$ " Drain [NPT]

CC = 1" Top Vent & 1" Drain [NPT]

AB =  $\frac{1}{2}$ " Top Vent &  $\frac{3}{4}$ " Drain [NPT]  $AC = \frac{1}{2}$ " Top Vent & 1" Drain [NPT]

BA =  $\frac{3}{4}$ " Top Vent &  $\frac{1}{2}$ " Drain [NPT]

 $BC = \frac{3}{4}$ " Top Vent & 1" Drain [NPT

CA = 1" Top Vent & 1/2" Drain [NPT]

CB = 1" Top Vent & 3/4" Drain [NPT]

XA = 1/2" Vent or Drain

XB = 3/4" Vent or Drain

XC = 1" Vent or Drain

XX = None

CS = Customer Specified

#### TEMP CONTROL SCALE/INDICATOR

MS = Metric Scale PS = Percentage Scale

WN = Weld Neck Flanges NS = Negative Scale SL = Stub End/Lap Joint SH = SS Indicator

Housing RJ = Ring Joint Flanges SS = Custom Scale BW = All Butt Weld (specify) Construction

FE = Non Frost Extension

DI = Dual Indication IF = Interface Indication

AR = Arrow Pointers

CI = Cryogenic Insulation CRN = ABSA w/ Frost Extension HB = High Temp

Insulation Blanket FH = Flectrical Heat

Tracing FP = Freeze Protection

(Electrical) ST = Steam Tracing

(Specify Type)

VD = Vent & Drain Valves (Specify Type) IS = Isolation Valves

## TESTING/MATERIAL

Certifications NM = NACE MR0175

### TRANSMITTER/ SWITCHING OPTIONS

MT = Magnetostrictive Transmitter RX = Reed Switches

(Specify Amperage)

### Endress+Hauser 🖾 VAR PARTNER

## **MAGNE-TRAC**

The Questtec Solutions Magne-Trac Plus combines the Magne-Trac magnetic level gage with the Bridle-Trac bypass chamber. It may be used with our VAR Partner E&H GWR or customer specified radar for redundant level measurement. See page 4 for listing of our partners GWR models. The Magne-Trac Plus is recommended in applications that require both visual and electronic level viewing.

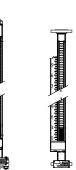
## STYLE A STYLE B

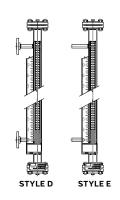
**BRIDLE STYLES** 

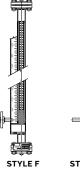
CHAMBER

(1)

**MT STYLES** 



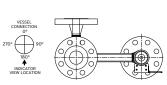




## STYLE G

## MTP ORIENTATION

AT TRANSMITTER INDICATOR SWITCHES 0 180° 0 270° 0 180° 0 270° 0 180° 0 270°





CHAMBER

(3)

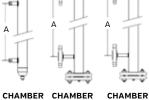
"C-C"

DIMENSION

STYLE C



[4]



[5]



CHAMBER

(7)

(6)

BRIDLE

MATERIAL

3C = A105 CS

4S = 304 SS



CHAMBER

(8)

OPTIONS

Note: Overall length will always be greater than measuring length (ML). Please specify if a max overal length is required.

**MTP** 

MAGNE-

TRAC™

PLUS

CHAMBER

[2]

MAXIMUM PRESSURE

SPECIFIC

GRAVITY

MAXIMUM **TEMPERATURE** 

These parameters must be based on Maximum Operating Conditions and are the basis for Float construction.

#### **BRIDLE** CHAMBER SIZE

16 = 2" [Std.] 24 = 3"

32 = 4" CS = Cust.Specified

6S = 316 SS MN = Monel TI = Titanium HC = Hastelloy C

CP = CPVCCS = Cust.

Specified

RADAR Z = No Radar G = Guided Wave

F = Free Space

**TEMP CONTROL** 

Insulation w/ Frost

Insulation Blanket

FP = Freeze Protection

Valves (Specify Type) IS = Isolation Valves

EH = Electrical Heat

ST = Steam Tracing

VD = Vent & Drain

[Specify Type]

Certifications

TRANSMITTER/

**SWITCHING** 

NM = NACE MR0175

CRN = ABSA

TESTING/MATERIAL

CI = Cryogenic

Extension

Tracing

(Electrical)

HB = High Temp

#### CHAMBER

SC = Special Coating AS = ASME "S" Stamp AU = ASME "U" Stamp SO = Slip on Flanges IV = Inverted Chamber WN = Weld Neck

Flanges SL = Stub End/Lap Joint Flanges RJ = Ring Joint Flanges BW = All Butt Weld

Construction B1 = ASME B31.1 B3 = ASME B31.3

#### SCALE/INDICATOR MS = Metric Scale

PS = Percentage Scale

NS = Negative Scale SH = SS Indicator Housing

SS = Custom Scale (specify)

FE = Non Frost Extension

DI = Dual Indication

IF = Interface Indication

AR = Arrow Pointers

MT = Magnetostrictive Transmitter RX = Reed Switches

(Specify Amperage) LG = Level Gage

MII / BRIDI F STYLE

**MLI MATERIAL** 

4C = 304 SS/CS

6C = 316 SS/CS

4S = 304 SS

6S = 316 SS

MN = Monel

CP = CPVC

TI = Titanium

HC = Hastelloy C

CS = Customer

Specified

AX = See Charts (Std.) BX = See Charts CX = See Charts DX = See Charts EX = See Charts FX = See Charts

GX = See Charts

ZZ = Cust. Specified

06 = 3/408 = 1" 10 = 11/4 12 = 11/2" 16 = 2" [Std.]

VESSEL

04 = 1/2"

06 = 3/4

08 = 1"

10 = 11/4"

12 = 11/2"

16 = 2"

24 = 3"

20 = 21/2"

CS = Customer

Specified

CONNECTION

20 = 21/2" 24 = 3" CS = Cust. Specified

FLANGE CLASS TOP BRIDLE CONNECTION 01 = 150#

03 = 300# 04 = 400# 06 = 600#09 = 900# 15 = 1500# 25 = 2500# CS = Customer Specified

(All Styles Use a Flange

## VENT/DRAIN ←

XX = None

XX = None

XA = 1/2" Vent or Drain XB = 3/4" Vent or Drain

XC = 1" Vent or Drain

INDICATOR STYLE 

HF = High Temp Flag

WF = Wide Flag

ST = Follower

 $AA = \frac{1}{2}$ " Top Vent &  $\frac{1}{2}$ " Drain [NPT] BB =  $\frac{3}{4}$ " Top Vent &  $\frac{3}{4}$ " Drain [NPT]

CC = 1" Top Vent & 1" Drain [NPT]  $AB = \frac{1}{2}$ " Top Vent &  $\frac{3}{4}$ " Drain [NPT] AC = 1/2" Top Vent & 1" Drain (NPT)

 $BA = \frac{3}{4}$ " Top Vent &  $\frac{1}{2}$ " Drain [NPT]  $BC = \frac{3}{4}$ " Top Vent & 1" Drain [NPT]

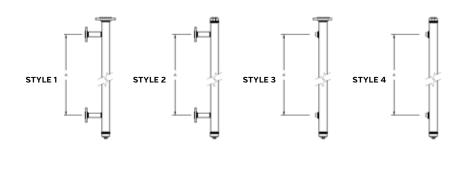
CA = 1" Top Vent & 1/2" Drain [NPT] CB = 1" Top Vent & 3/4" Drain [NPT]

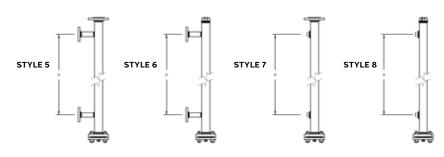
CS = Customer Specified

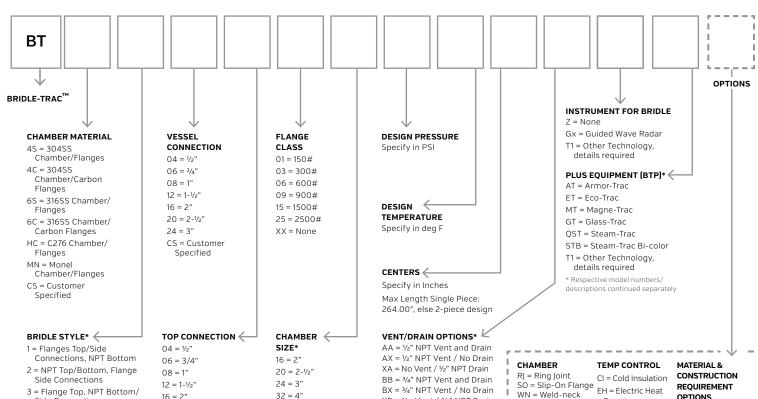
## **OUESTTEC SOLUTIONS | PAGE 26**

## **BRIDLE-TRAC**

The Questtec Solutions Bridle-Trac utilizes a pipe chamber mounted directly to a vessel with two or more process connections. These connections act as an inlet and outlet that allow the liquid level in the pipe chamber to match the level in the process vessel. A Bridle-Trac may be referred to in the industry as a bridle chamber, a stilling well, a bypass chamber, a cage or a standpipe. It may be used with a customer specified radar for level measurement. All standard chambers are manufactured to Questtec's Heavy Duty Design. Requirements to ASMEB31.1, 31.3 and NACE Design is available upon request.







- Side Connections 4 = NPT Top/Bottom/Side
- Connections
- 5 = Flange Top/Bottom/Side Connections
- 6 = NPT Top, Bottom/Side Connections
- 7 = Flange Top/Bottom, NPT Side Connections
- 8 = NPT Top/Side Connections, Flange Bottom
- \* All Flanges are RFSW Standard

16 = 2"

 $20 = 2 - \frac{1}{2}$ 24 = 3"

CS = Customer

CS = Customer Specified

\*Schedule selected by pressure/tem perature or custome

XB = No Vent / 3/4" NPT Drain CC = 1" NPT Vent and Drain

CX = 1" NPT Vent / No Drain XC = No Vent / 1" NPT Drain

XX = None

\*MNPT hex plug included

Flange

SL = Stub End/Lap Joint Flange BW = Butt-Weld Tee design for

full-bore process connections IV = Inverted Style

Chamber SC = Special Coating AS = ASME "S'

Stamp

Stamp

ALL = ASMF "LL

Trace\* ST = Steam Trace\*

HB = Insulation Blanket VD = Vent/Drain

Valves\* IS = Isolation Valves\*

\*Details Required

## OPTIONS

NM = NACF\* (MR0175 or MR0103)

B1 = B31.1 Compliant Construction B3 = B31.2

Compliant Construction CRN = Canadian

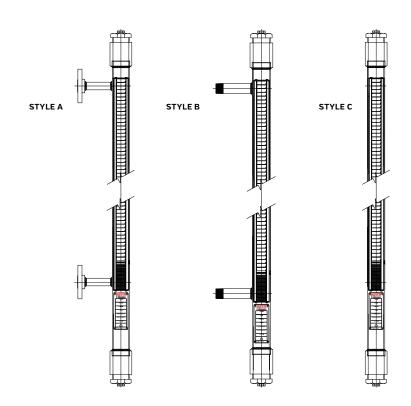
Registration Number\* \*Details Required

## MAGNE-TRAC\*\*

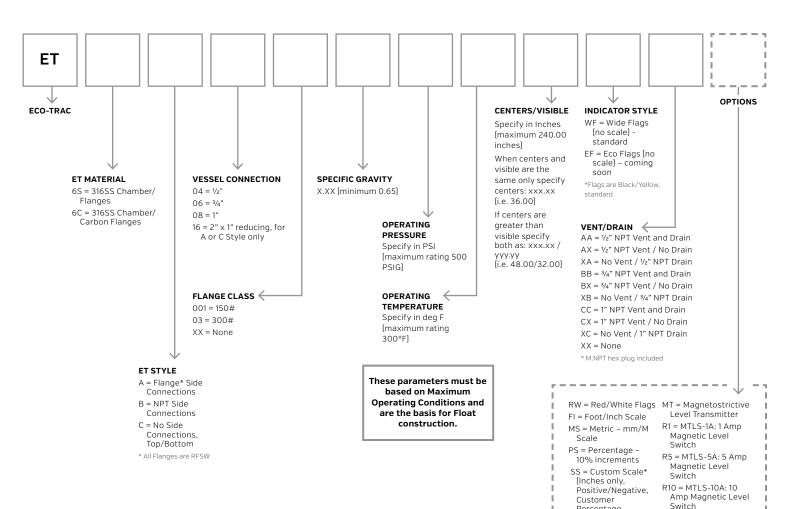
### **SPECIFICATION SHEET**



This product is safe and very economical alternative to sight glass sight glass technology to reduce leak points and broken glass concerns. The fixed design and specification allow for a quick, cost effective solution to many applications. The EcoTrac series meets and exceeds ASME class 150 ratings in most cases and is ideal for low pressure and temperature applications. Well suited for but not limited to applications such as skid systems, boiler feed water tanks, refrigeration units, wastewater treatment facilities and other light industrial applications. The Eco-Trac series can be combined with our magnetic level transmitters provide continuous level monitoring and magnetic level switches for discrete high and low alarms.



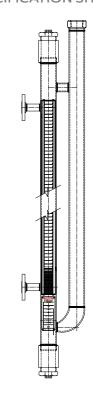
Percentage, Volumetric] VD = NPT Ball Valves\* \* Details Required

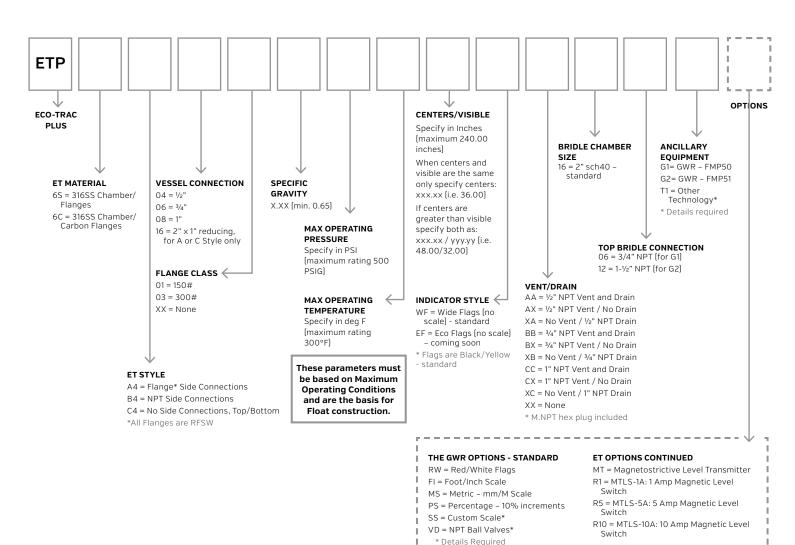


### SPECIFICATION SHEET

## ECO-TRAC PLUS

Just like the Eco-Trac series this product is an economical alternative to sight glass technology. The ETP series is combined with the highly reliable guided wave radar harnessing the benefit of two independent technologies in one cost effective solution for visual indication and level monitoring needs. The ETP series also meets and exceeds ASME class 150# ratings and is ideal for low pressure and temperature solution making it well suited for applications such as skid systems, boiler feed water tanks, refrigeration units, wastewater treatment facilities and many other light industrial applications. The ETP series can still be combined with our magnetic level transmitters and switches to provide an even higher level of redundancy.



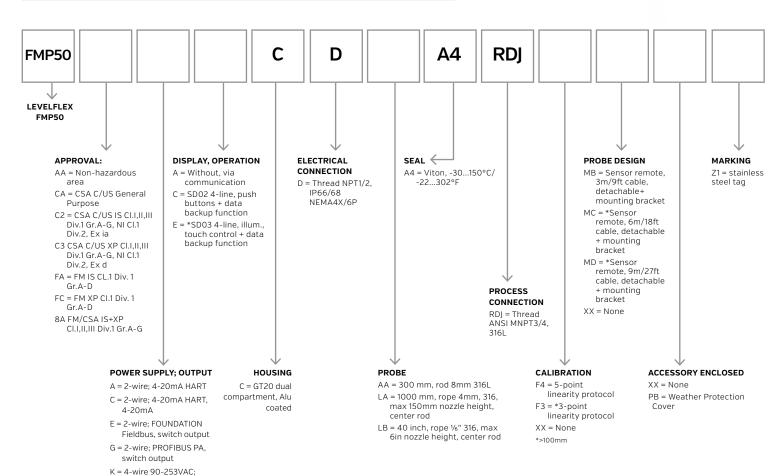


## LEVEL FLEX FMP50

Levelflex FMP50 is the instrument for basic applications in liquids which do not place high demands on temperature and pressure ranges or chemical resistance. Particularly in basic supply or storage applications as well as utility processes FMP50 is the best choice. Levelflex FMP50 guided radar is used for continuous level measurement of liquids, pastes and slurries. The measurement is not affected by changing media, temperature changes, gas blankets or vapors.

FEATURES	
Process temperature	-20+80 °C (-4+176 °F)
Process pressure absolute / max. over-pressure limit	Vacuum6 bar, (Vacuum87 psi)
Accuracy	Rod probe: +/- 2 mm (0.08 in) Rope probe: +/- 2 mm (0.08 in)
Max. measurement distance	Rod: 4 m (13 ft) Min DK>1.6 Rope: 12 m (40 ft) Min DK>1.6
Main wetted parts	Rod probe: 316L, PPS, Viton Rope probe: 316, PPS, Viton





4-20mA HART L 4-wire 10,4-48VDC; 4-20mA HART

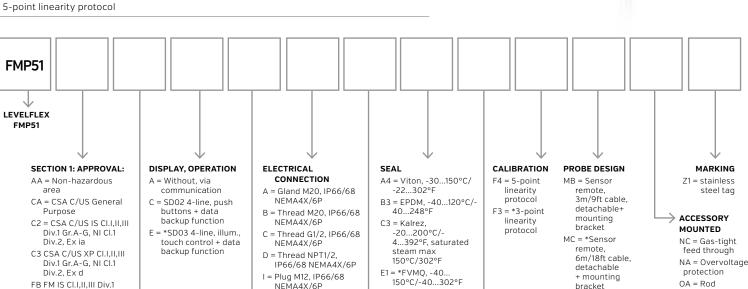
## EVELFLEX FMP51 — OPTION IN MTP/ETP/BT/BTP)

Levelflex FMP51 for level measurement even under extreme process conditions like high temperature and high pressure in the process industry. FMP51 offers maximum reliability even in case of moved surface and foam or when numerous tank baffles interfere with the measurement. Levelflex FMP51 is used for continuous level measurement of liquids, pastes and slurries but also for interface measurement. The measurement is not affected by changing media, temperature changes, gas blankets or vapors.

Process Connections Thread or flange	
<b>Temperature</b> -40 to +200°C (-40 to +392°F)	
Pressure -1 to +40bar (-14.5 to +580psi)	
Maximum measuring range Rod 10m (33ft), rope 45m (148ft), coax 6m (20ft)	)
<b>Accuracy</b> ±2mm [0.08"]	
Dielectric Constant 1.6 [Rod probe, Rope probe], 1.4 [Coax probe]	

International explosion protection certificates, overfill prevention WHG SIL, marine approval,





### POWER SUPPLY; OUTPUT

A = 2-wire; 4-20mA HART

C = 2-wire; 4-20mA HART, 4-20mA

E = 2-wire; FOUNDATION Fieldbus, switch output compartment, 316L

Gr.A-G, AEx ia, NI Cl.1

Gr.A-G, AEx d, NI Cl.1

Cl.I,II,III Div.1 Gr.A-G

FD FM XP CI.I,II,III Div.1

8A FM/CSA IS+XP

Div.2

Div.2

G = 2-wire; PROFIBUS PA, switch output

K = 4-wire 90-253VAC: 4-20mA HART

L 4-wire 10,4-48VDC; 4-20mA HART

HOUSING

C = GT20 dual compartment, Alu coated

B = GT18 dual

A = GT19 dual compartment,

Plastics PBT

#### AM = 12 inch, rod 1/2" AllovC BA = 591 mm, rod 16mm 316L, 500mm divisible

BB = 23 inch. rod 0.63in 316L, 20inch divisible

BC = 1091 mm, rod 16mm 316L, 1000mm divisible

BD = 43 inch, rod 0.63in 316L, 40inch divisible IA = 1000 mm, rope 4mm, 316, max 150mm nozzle height, center rod

MB = 1000 mm, rope 4mm 316, max 300mm nozzle height, center rod

LB = 40 inch, rope 1/6" 316, max 6in nozzle height, center rod

MD = 40 inch, rope 1/6" 316, max 12in nozzle height, center rod

UA = 300 mm, coax 316L

UB = 12 inch, coax 316L

PROBE ←

AA = 300 mm, rod 8mm 316L

AC = 300 mm, rod 12mm 316L

AL = 300 mm, rod 12mm AlloyC

AB = 12 inch, rod 1/3" 316L

AD = 12 inch, rod 1/2" 316L

UC = 300 mm, coax AlloyC

UD = 12 inch, coax AlloyC

PROCESS CONNECTION AEJ = 1-1/2" 150lbs RF, 316/316L flange ANSI B16.5 AQJ = 1-1/2" 300lbs RF, 316/316L flange ANSI B16.5 AQM = 1-1/2" 300lbs, AlloyC>316/316L flange ANSI B16.5 AFJ = 2" 150lbs RF, 316/316L flange ANSI B16.5 AFM = 2" 150lbs, AlloyC>316/316L flange ANSI B16.5 ARJ = 2" 300lbs RF, 316/316L flange ANSI B16.5 ARM = 2" 300lbs, AlloyC>316/316L flange ANSI B16.5 AGJ = 3" 150lbs RF, 316/316L flange ANSI B16.5 AGM = 3" 150lbs, AlloyC>316/316L flange ANSI B16.5 ASJ = 3" 300lbs RF, 316/316L flange ANSI B16.5 ASM = 3" 300lbs, AlloyC>316/316L flange ANSI B16.5 AHJ = 4" 150lbs RF, 316/316L flange ANSI B16.5 ATJ = 4" 300lbs RF, 316/316L flange ANSI B16.5 AJJ 6" 150lbs RF, 316/316L flange ANSI B16.5 AKJ 8" 150lbs RF, 316/316L flange ANSI B16.5

MD = \*Sensor

remote.

bracket

9m/27ft cable,

detachable

+ mounting

center washer d=75mm/2.95", 316L pipe diam-eter DN80/3" +

DN100/4" OB = Rod center washer d=45mm/ 1.77", 316L pipe diameter DN50/2" -DN65/2-1/2'

OC = Rope

center washer d=75mm/2.95", 316L pipe diameter DN80/3" + DN100/4" OD = Rod center washer d=48-95mm/ .88-3.74", PEEK, interface measurement. pipe diameter DN50/2" + DN100/4"

## LEVELFLEX FMP54 (G4 — OPTION IN MTP/ETP/BT/BT/P)

Levelflex FMP54 for continuous level measurement in liquids under extreme conditions. The process connection with its ceramic-graphite seal safeguards high temperature and high pressure applications as they occur in steam boilers and toxic media like ammonia. The gas tight feed through guarantees additional safety. Only the gas phase compensation of the FMP54 gives reliable results in case of gas and steam phases. Reliable measurement in case of moving surface and foam or in changing medias.

FEATURES	
Process connections	Thread or flange
Temperature	-196 to +450°C (-320 to +842°F)
Pressure	Vacuum -1 to +400bar (Vacuum -14.5 to +5,800psi)
Maximum measuring range	Rod 10m (33ft), Rope 45m (148ft), coax 6m (20ft)
Accuracy	Rod ±2mm [0.08"]
Dielectric Constant	1.6 (Rod probe, Rope probe), 1.4 (Coax probe)



AFJ = NPS 2" CI.150 RF, 316/316L flange ASME B16.5

ARJ = NPS 2" CI.300 RF, 316/316L flange ASME B16.5

AAJ = NPS 2" CI.300/600 RF, 316/316L flange ASME

A6J = NPS 2" CI.1500 RF, 316/316L flange ASME B16.5

AGJ = NPS 3" Cl.150 RF, 316/316L flange ASME B16.5

ASI = NPS 3" CI.300 RF. 316/316L flange ASME B16.5

ABJ = NPS 3" CI.300/600 RF, 316/316L flange ASME

A7J = NPS 3" CI.1500 RF, 316/316L flange ASME B16.5

AHJ = NPS 4" CI.150 RF, 316/316L flange ASME B16.5

ATJ = NPS 4" CI.300 RF, 316/316L flange ASME B16.5

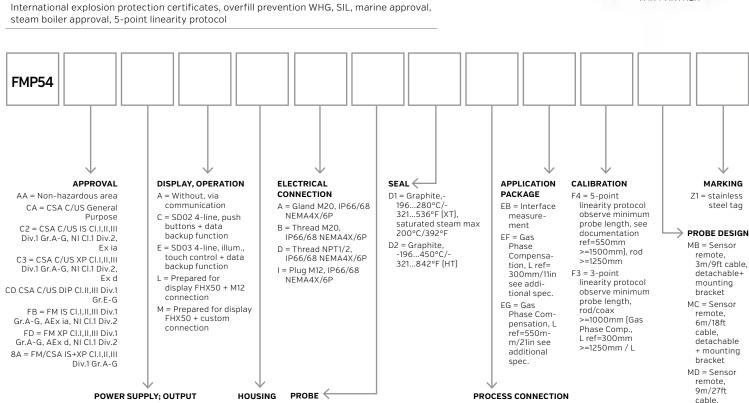
AOJ = NPS 4" CI.600 RF, 316/316L flange ASME B16.5

AZJ = NPS 4" CI.900 RF, 316/316L flange ASME B16.5

detachable

+ mounting

bracket



AA = 300 mm, rod 16mm 316L

AF = 12 inch, rod 0.63in 316L

BA = 618 mm, rod 16mm 316L,

BB = 24 inch, rod 0.63in 316L,

BC = 1118 mm, rod 16mm 316L.

BD = 44 inch, rod 0.63in 316L,

LA = 1000 mm, rope 4mm, 316

LB = 40 inch, rope 1/6" 316

UA = 300 mm, coax 316L

UB = 12.000 inch, coax 316L

500mm divisible

20inch divisible

1000mm divisible

40inch divisible

C = GT20 dual

B = GT18 dual

A = GT19 dual

plastic PBT

compartment,

coated

compartment, Alu.

compartment, 316L

A = 2-wire; 4-20mA HART

B = 2-wire; 4-20mA HART,

C = 2-wire; 4-20mA HART +

E = 2-wire; FOUNDATION

G = 2-wire; PROFIBUS PA,

K = 4-wire 90-253VAC;

L = 4-wire 10,4-48VDC;

Fieldbus, switch output

switch output

4-20mA analog

switch output

4-20mA HART

4-20mA HART

## LEVELFLEX FMP55 (G5 — OPTION IN MTP/ETP/BT/BTP)

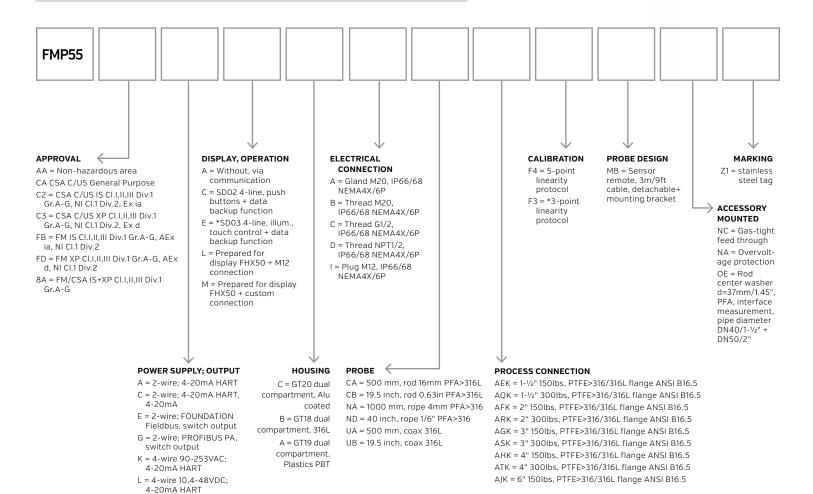
Levelflex FMP55 guided radar with SensorFusion offers the worldwide first combination of the capacitance and guided radar measuring principle in one device. The instrument guarantees safe measured value acquisition even in emulsion layers and issues level and interface layer signals simultaneously. This makes the FMP55 Multiparameter the new standard in interface measurement especially in the oil & gas, chemical and petrochemical industry.

FEATURES	
Process connections	Thread or flange
Temperature	-50 to +200°C (-58 to +392°F)
Pressure	-1 to +40bar (-14.5 to +580psi)
Maximum measuring range	Rod 4m (13t), rope 10m (33ft), coax 6m (20ft)
Accuracy	Rod ±2mm (0.08")
Dielectric Constant	1.6 [Rod probe, Rope probe], 1.4 [Coax probe]

International explosion protection certificates, overfill prevention WHG, SIL, marine approval



Endress+Hauser

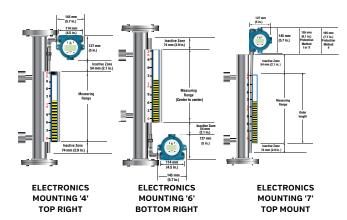


## MAGNE-TRAC\*\* SPECIFICATION SHEET

## MTLT 5000

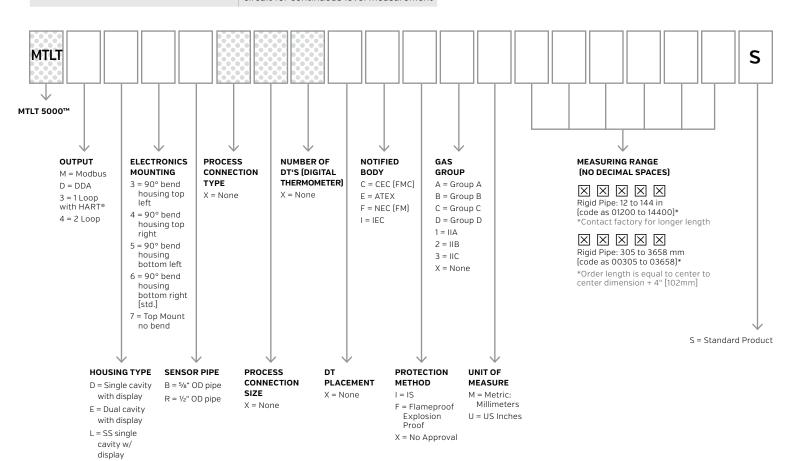
The MTLT5000-Magnetostrictive M or L Series is based upon the magnetostrictive principle. The sensing tube contains a wire which is pulsed at fixed time intervals. The interaction of the current pulse with the magnetic field created by the magnetic float causes a torsion stress wave to be induced in the wire. This torsion propagates along the wire at a known velocity from the position of the magnetic float and toward both ends of the wire. The microprocessor-based electronics measure the elapsed time between the start and return pulses and convert it into a 4-20 mA DC output which is proportional to the level being measured.

FEATURES	
No maintenance required	Multidrop HART Communications
FM Approved Explosion Proof/IS	NEMA 4x/7 enclosures
Modular design	Adjustable output damping
Up to .001" resolution	2-wire loop powered
RFI/EMI protection	Available up to 300 inches
Process temperature range: -30 to 250°F	Offers a 4/20 mA 2-wire loop powered circuit for continuous level measurement



"QTS STANDARD"

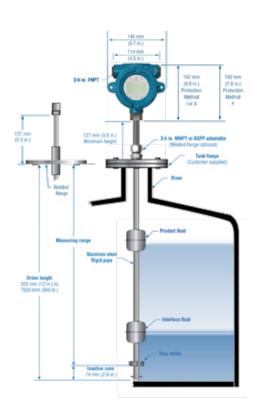




## LEVEL PLUS REFINEME® (LPR SERIES)

Designed for process control in industrial environments: The Level Plus RefineME® liquid level transmitter satisfies the demand for an accurate and robust liquid-level sensor with unsurpassed flexibility to meet most process application conditions. The RefineME® transmitter provides 4-in-1 measurement using one process opening for product level, interface level, temperature and volume measurements. Once the transmitter is installed and calibrated there is no requirement for scheduled maintenance or recalibration for the expected 10 year life of the sensor.

- 4-IN-1 Measurement (Product, Interface, Temperature, Volume)
- · Stainless steel, Nickel Alloy C-276, or FEP wetted parts
- Inherent Accuracy ±1 mm
- · No scheduled maintenance or recalibration
- · Hazardous area certified
- · Set it and forget it!

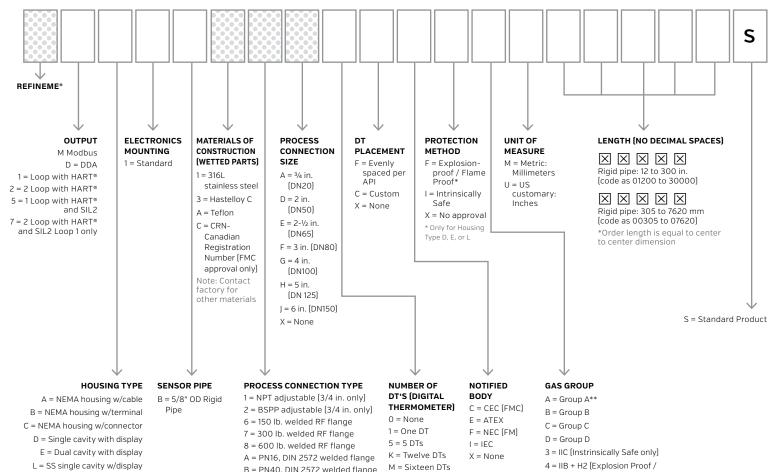


Flameproof only)

\*\* Group A not available with C=CEC (FMC) notified body and F=Flameproof/Explosion Proof protection method

X = None





B = PN40, DIN 2572 welded flange

C = PN64, DIN 2572 welded flange

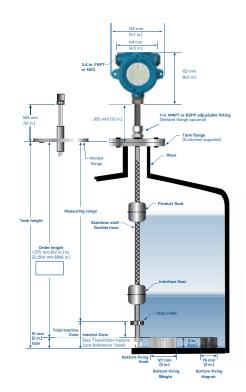
D = PN100, DIN 2572 welded flange

## MAGNE-TRAC\*\* SPECIFICATION SHEET

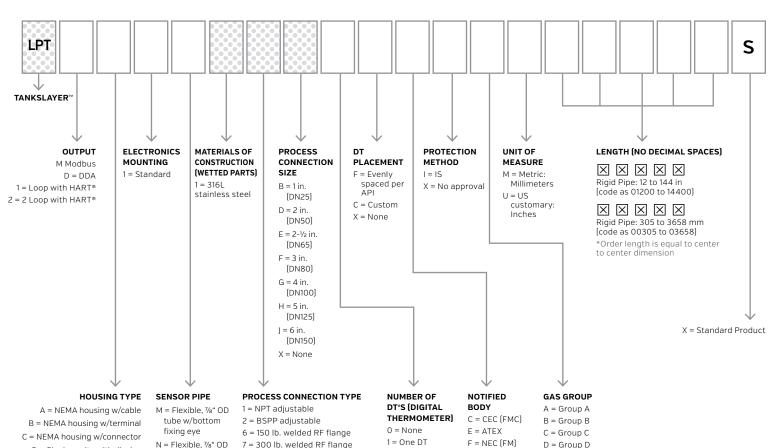
## TANK SLAYER

The Level Plus® Tank Slayer® liquid level transmitter satisfies the demand for an accurate and robus liquid-level sensor with unsurpassed flexibility to meet most process considitions. The Tank Slayer® transmitter provides 3-in-1 measurement using one process opening for product level, interface level, and temperature measurements. Once the transmitter is installed and calibrated there is no requirement for scheduled maintenance or recalibration. Set it and forget it!

FEATURES	
No maintenance required	Multidrop HART Communications
FM Approved Explosion Proof/IS	NEMA 4x/7 enclosures
Modular design	Adjustable output damping
Up to .001" resolution	2-wire loop powered
RFI/EMI protection	Available up to 866 inches
Process temperature range: -30	Offers a 4/20 mA 2-wire loop powered circuit for continuous level measurement







5 = 5 DTs

K = Twelve DTs

M = Sixteen DTs

I = IEC

X = None

1 = IIA

2 = IIB

3 = IIC

X = None

## hardward QUESTTEC SOLUTIONS | PAGE 36

tube w/bottom

fixing weight

P = Flexible, 7/8" OD

tube w/bottom

fixing magnet

S = Flexible, 7/8" OD tube w/o bottom fixing 8 = 600 lb. welded RF flange

A = PN16, DIN 2572 welded flange

B = PN40, DIN 2572 welded flange

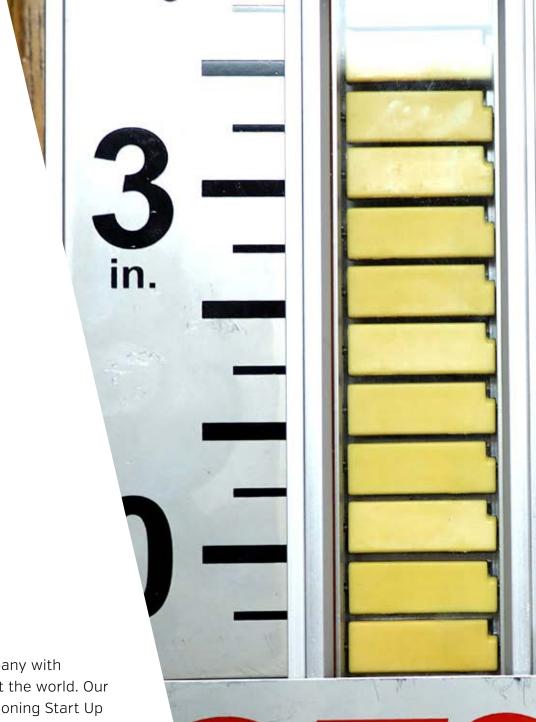
C = PN64, DIN 2572 welded flange

D = PN100, DIN 2572 welded flange

D = Single cavity with display

L = SS single cavity w/display

E = Dual cavity with display



**Questtec** is an International Company with Representatives based throughout the world. Our Partners can assist with Commissioning Start Up and Calibration, 24 Hour Service and Repair Support.

866.240.9906

### IMMEDIATE HELP VIA-REMOTE MAINTENANCE

Using the remote maintenance service TeamViewer, the Questtec service technician can assist you immediately, check the instrument configuration and perform certain analysis.











ew Standard of Leve

VWW.QTSLEVEL.COM 1-866-240-9906





## Represented by:



## Zimco Instrumentation Inc.

11141 15 Street NE, Calgary, AB, T3K 0Z5, Canada

Phone: 403-253-8320 Email: info@zimco.ca Website: www.zimco.ca