



- Replaces problem sight glasses
- Visual Level Indication of 100 feet
- No process liquid in contact with indicator glass
- Ideal for high temperature, pressure and corrosive applications
- Manufactured to meet boiler specifications (ASME B31.1/B31.3)
- Magnetostrictive and radar transmitter options for non-invasive and/or redundant level control
- Software options: Registered HART DD to Revision 5/6 - IEC610804-2, AMS Aware and Fieldbus to ITK4.6



LG Series Magnetic Liquid Level Gages

Magtech LG-Series Level Gages

About Magtech

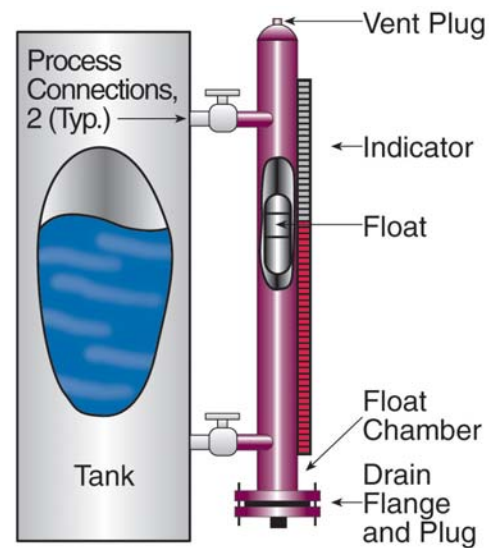
Founded in 1982, Magtech has become the world leader in the manufacture of magnetic level gages and instrumentation. Magtech mag gages and transmitters offer an ideal solution for replacing outdated technologies. Mag gages are quickly replacing problematic sight-glasses and displacers in high pressure, temperature and corrosive applications. Easy installation of Magtech gages, virtually eliminates the need for extra piping, valves, spare parts and costly maintenance.

Complimenting our line of magnetic level gages is a variety of non-intrusive level switches and transmitters. These devices simply mount to the exterior of the level gage. Magtech offers the industry's most advanced software for level control via HART and Foundation Fieldbus.

Description

Magtech level gages consist of a float column with process connections matching those of the storage tank, reactor or other vessel where level is to be measured. Process connections may be side couplings, flanges or top and bottom flanges as illustrated on the following page.

The magnetic float rises and falls within the chamber as the process level changes. Floats are custom manufactured and tested to meet process condition requirements. Contained in the float is a 360 degree magnet assembly comprised of a series of vertical magnets. A wide range of float materials are available to meet virtually any temperature, pressure and material compatibility requirement. The removable magnetic indicator is attached to the float chamber by means of worm gear clamps. Indicator options include flipper or follower types based on user preference. The follower type (lightweight magnetic cylinder) indicator is enclosed in a hermetically sealed polycarbonate or glass tube. The follower is magnetically coupled with the magnetic float contained in the chamber and moves up and down with the fluid level. The flipper type indicator (series of rotating flags) operates similarly, although visibility is heightened because all flags are rotated up to the fluid level point.



LG Series Level Gage with Flipper (roller) Indicator.

Specifications Welding meets boiler / piping codes ASME B31.1 / B31.3

Material: All wetted parts are non-ferrous compatible materials (stainless steel, monel, hastelloy etc.)

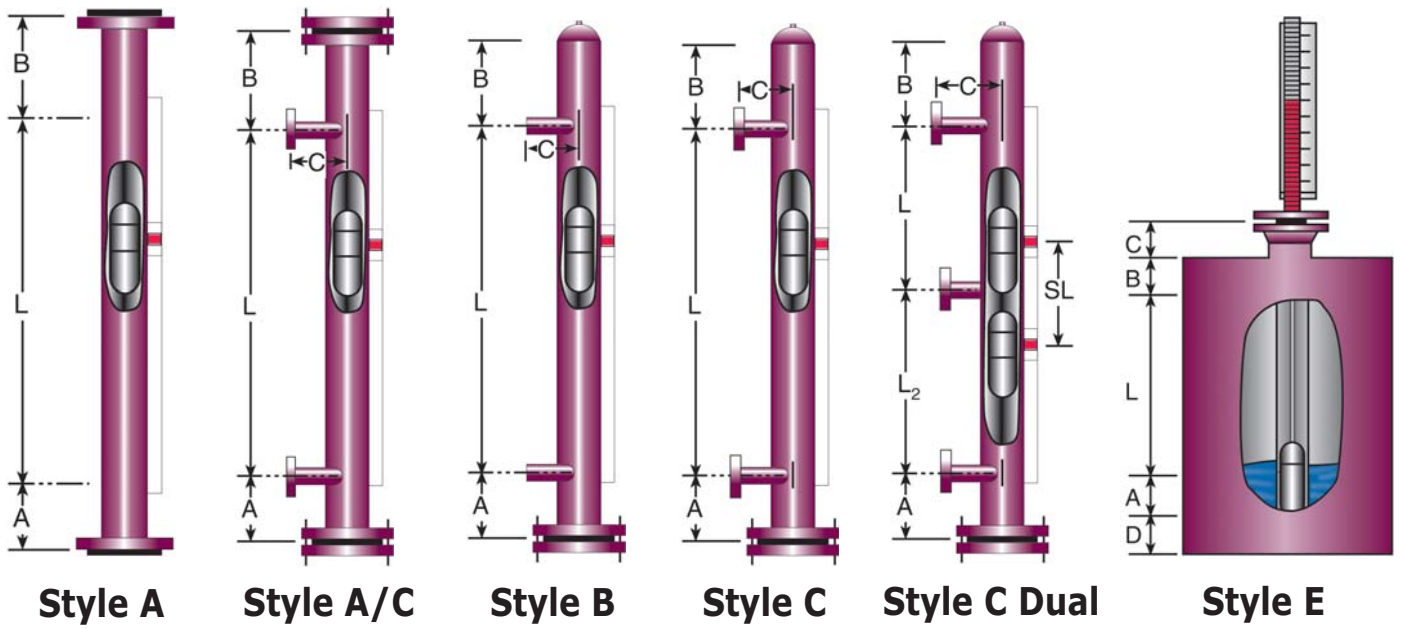
Float Chamber: 2-4 inch pipe with raised face slip-on blind flanges (standard)
Pressure rating: Up to 4500 PSI (310 bar)
Minimum specific gravity: .25
Temperature rating: -200 to 1100 °F (593 °C)

Scale: Feet and inches (standard) with ½ inch divisions; resolution approximately ¼ inch. Other options available.

Indicator: 7/8 inch diameter by 1 1/4 inch long, brightly colored follower (flippers optional). Indicator is all metal construction (no plastic parts)

* Note: All LG-Series gages are hydrostatically tested to 1 ½ times pressure rating specified. Consult factory for testing of socket weld process connections.

Magtech Level Gage Mounting Styles



Mag Gage Dimensions (Nominal, may vary)

Dimension	A	B	C*	D	L	L2	SL
All Styles:	8 in.	6 in.	4 in.	2 in. min.	Specify	Specify	8 in. min.
Style E:	All custom - consult factory for detailed drawing						

NOTE: When LTM Transmitters are used; consult Factory for A & B dimensions

Process Connections

Couplings: 3000# threaded, 1/2 to 2 inch FNPT
Flanges: 1/2 to 2 inch lap joint standard (other types available)
Note: Consult factory for special requirements

Note:

All bolt holes straddle center lines unless otherwise specified; 1/2 inch vent and drain standard; others available

LG Series Order Information

*Model LG6 - B - 3/4" - 300# - 0.92 - 100F - 250 - 36"- x

Mounting Style _____
 A, A/C, B, C,
 C Dual or E

Process Conn. 1/2 to 2 in. _____

Flange Rating _____

Specific Gravity of Measured Fluid _____

Max. Operating Temp. (F or C) _____

Max. Operating Press. (psig or bar) _____

Measurement Length "L" (in. or metric) _____

Options (for options not listed consult factory) _____

Typical Options

- (FS) Flipper indicator with scale
- (FL) Flippers (no scale)
- (FO) Follower Indicator
- (LJ) Lap joint with stub end
- (SO) Raised face slip-on flanges
- (WN) Raised face weld neck flanges
- (RJ) Ring joint flanges
- (CS) Carbon steel flanges
- (N) NACE
- (FC) FNPT couplings
- (MC) MNPT couplings
- (SW) Socket weld couplings
- (ST) Steam tracing
- (HT) Heat tracing
- (IB) Insulation blanket
- (EP) Electropolished/sanitary service
- (PI) Polycarbonate indicator
- (I) Interface (specify both gravities)
- (DI) Dual indication (follower only)
- X Special Options (specify)

Typical Service

Acetic Acid
Alcohols
Aldehydes
Alkyls
Aluminum Chloride
Anhydrous Ammonia
Asphalt
Benzene
Boiler Feedwater
Brine

Butanes
Caustic Soda
Chlorine
Condensate
Crude Oil
Diesel Fuels
Dowtherm
Freon/ Refrigerants
Hydrofluoric (HF) Acid
Hydrochloric Acid

Hydrocarbon Mixtures
Liquid Propane
Molten Sulfur
Phosgene
Scrubbers
Seal Pots
Steam Drum
Sulfuric Acid
Sumps
Wastewater

Typical Applications



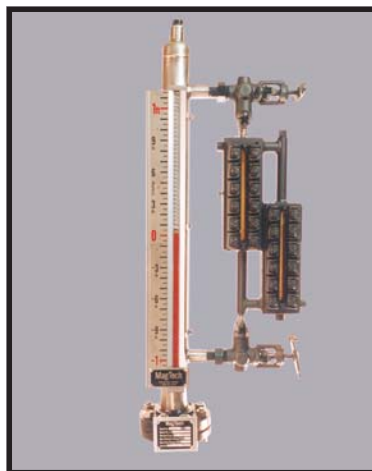
Before A process vessel with three float switches, two short sight glasses, a pneumatic level controller and 15 valves with associated plumbing.



After The same vessel shown at left after installation of a MagTech gage, providing increased control outputs at half the cost.



Redundancy Magnetostrictive and/or radar transmitters may be mounted in a separate chamber for redundant level control.



Drumsite Magtech's "Drum-site" combines the safety and convenience of a mag gage with a water column and sight glass as required by ASME boiler code B31.3-PG60.



Interface In applications where a vessel contains two liquids of different densities (min. 0.1 S.G. differential); Gage has two floats and two indicators.

Extruded Outlet Design

Safety and reliability are an ever increasing challenge as the chemical and refining industries push the limits of pressure and temperature in their processes. High pressure and cyclic process services require more stringent vessel, piping and process connection design. To meet these customer needs, Magtech has acquired a new T-Drill machine to form extruded outlets. Our T-Drill features fully computerized automation control allowing for ultra-precision machining for a more reliable gage design.

There has been a great deal of misconception regarding the use of extruded outlets on mag gages. Most importantly, Magtech's T-Drill provides a fully x-rayable process connection in compliance with ASME B31.1 and B31.3 boiler and piping codes. Another concern is the effect of the extrusion on the corrosion resistance of the material. This effect is negligible in low carbon stainless steel. Work hardening is in fact increased to some degree, but in every instance this serves to improve the strength of the collar.

- Both Sch. 10 and Sch. 40 materials have been tested by certified independent labs to comply with maximum allowable working pressures (400% safety margin) as required by ASME standards
- Eliminates the need for expensive pipe-tees and minimizes the number of welds in the chamber
- 100% X-rayable process connection welds
- Eliminates internal pipe distortion (important in cyclic service)
- Provides full bore process connections and all butt-weld construction
- Eliminates post weld pipe straightening



How does it work?

Once the gage specifications are entered in the T-Drill's computer, elliptical pilot holes are milled at precise locations on the pipe. The elliptical shape of the pilot holes allows collar formation with minimal wall thinning. An extrusion "dye" (two retractable, rotating, opposing forming pins) mounted in a forming head is inserted into the pilot hole. The rotating forming head is slowly pulled back through the hole, shaping the extruded outlet. A final operation mills a butt end weld face.



The capital investment that our T-drill represents, demonstrates our commitment to meeting the challenges of continuous product improvement. Extruded outlets are quickly being adopted as a preferred design improvement by leaders in the petrochemical industry.

LTM Series Magnetostrictive Transmitter

Description



Magtech's LTM Series Magnetostrictive Level Transmitters are highly accurate, precise and offer a variety of configuration options. The LTM may be utilized as a direct insertion transmitter or externally mounted to a Magnetic Level Gage for non-invasive level control. In the gage mount configuration, the sensor is attached to the exterior of the mag gage. This allows the transmitter to be installed or serviced without removing the gage from service. As the float rises or falls with the fluid, the transmitter provides level output. LTM's are available with two-wire loop powered 4-20 mA signal output(s), or bus powered (fieldbus) with digital signal output(s).

Remote mount electronics are available for easy access or high temperature applications. Sensor probes are available in a variety of materials including stainless steel and exotic alloys (e.g. Monel, Hastalloy, etc.) or electropolished for sanitary service. All LTM's feature explosion proof dual compartment enclosures, integral displays and intrinsically safe electronics.

The "Plug-and-Play" electronics allow easy upgrades from HART to Fieldbus without replacing the sensor probe. The LTM transmitters offer the latest and most advanced software features on the market today, introducing the only registered HART DD (5.0/6.0) compliant to IEC 61804-2, and compliant to latest Foundation Fieldbus software version ITK-4.6 and AMS Aware.



Fieldbus Option

The LTM-300FF is available with Foundation Fieldbus compliant electronics (ITK-4.6), allowing the widest range of interoperability with host manufacturers. There is no PID control in the function block; keeping control in the final control element (pump, valve, etc.) where it belongs. In addition, there is no Link Active Scheduler (LAS), eliminating interference in execution or response time. The LTM-300FF offers a unique configuration method, guiding the user, step-by-step, through the calibration process, making setup and maintenance quick and easy. The LTM-300FF is explosion proof and carries FM, CSA and ATEX approvals (see LTM Series Transmitter Options) for use in hazardous locations.

Specifications

Housing:

Description/Material: Dual compartment, epoxy coated aluminum enclosure with glass window and integral LCD display.

Protection Rating: NEMA 4X, NEMA 7, IP66

Sensor Probe:

Material: 316 SS, 5/8 inch (15.88mm) Probe (standard), other materials available.

Maximum Length: 30 ft (914.4 cm)

Mounting Style: Gage mount (via 316SS brackets)

Insertion type optional

Operating Temp.: -50°F to 750°F (-45°C to 399°C)

*All transmitters have the following RFI Limits: SAMA PMC 31.1, 20 to 1000 MHz, up to 30 V/m

LTM Order Information

Model# (Example): LTM-200D-G - 30" - RM(10')

200D

300

300 FF

Measuring Length

Options

RM=Remote Electronics(Specify cable length)

ELB=Elbow mounted electronics

BM=Bottom mounted electronics

FM=Factory Mutual Approval

CSA=CSA Approval






A=Atex Approval

I=IECEX Approval

*Note:

Order information for gage mounted transmitters; for details on insertion transmitters; see LTM Series brochure.

LTM Features and Approvals

Model	LTM200D	LTM300	LTM300FF
Supply Voltage	15-36 VDC (loop)	15-36VDC (loop)	Bus powered
Calibration/ Configuration	Pushbutton	HART/Pushbutton (Registered rev.5/6)	Host/Pushbutton (Foundation Fieldbus)
Output Options	Single Analog (4-20mA) (Primary or interface)	Up to 3 outputs Primary, interface, level & temperature (1 analog 4-20mA, 2 digital)	Up to 3 outputs Primary, interface, level & temperature (All digital)
Approvals			
FM-Exp	 Class I, Div. I; Groups B,C,D Class II, Div. I; Groups E,F,G Class III, NEMA 4X, IP66	Class I Div. I; Groups B,C,D Class II, Div. I; Groups E,F,G Class III, NEMA 4X, IP66	
CSA-Exp	 Class I, Div. I; Groups B,C,D Class II, Div. I; Groups B,C,D Class III, NEMA 4X, IP66	Class I, Div. I; Groups B,C,D Class II, Div. I; Groups B,C,D Class III, NEMA 4X, IP66	Class I, Div. I; Groups B,C,D Class II, Div. I; Groups B,C,D Class III, NEMA 4X, IP66
CSA-IS	Class I, Div. I, Groups C,D	Class I, Div. I, Groups C,D	Class I, Div. I, Groups C,D
ATEX-Exp	 0344	 II 2 G EEx d IIC T4	 II 2 G EEx d IIC T4
IECEX-Exp		Ex d IIC T4	Ex d IIC T4

LT-1 Level Transmitter

The LT-1 is based on "tried and true" measurement technology, where precision accuracy and digital communication are not required. The sensor probe consists of a series of resistors and reed switches. The change in resistance caused by the magnetic float in the level gage is converted to a 4-20mA signal proportional to level. The LT-1 is available in either 1/2 or 1/4 inch resolution. This transmitter is a low cost alternative for level measurement. The following improvements have been made:

- Linearized 4-20mA output (no stepping action)
- Field reversible output
- Field reversible probe (allows transmitter to be top or bottom mounted)



LT-1 Transmitter Specifications

Sensor Probe:

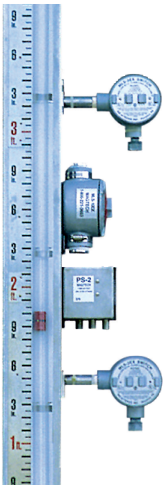
Length: Maximum 30 feet
 Resolution: 1/2 inch (1/4 inch available)
 Material: 316SS standard
 Oper. Temp. 750°F / 399°C (Process temperature)

Transmitter:

Power: 24Vdc (loop powered) nominal
 Output: 4-20mA
 Load: 750 ohm max.
 Housing: Explosion proof, Class I, Div. I, Grps. B, C & D
 Max Temp. 150°F/65.6°C (in housing)
 For high temperature applications, transmitter should be remote mounted.



Magtech Level Switches



MagTech level switches are non-invasive alarm switches that clamp to the gage chamber and are magnetically actuated by the float through the chamber wall. These switches provide a low cost, reliable alarm and control action without making additional cutouts in the vessel. The external mounting clamps make it easy to adjust the set point or service the switch anytime without interrupting the process. They are also easily added after gage installation.

All MagTech switches may be wired for rising or falling level and NC or NO operation. Each switch has approximately 1/2 inch deadband to eliminate chattering and all have "break before make" action. The MLS-3EX is CSA, ATEX, UL & C-UL listed for both the U.S. and Canada.

MLS-3 Series



MLS-3EX

The MLS-3EX is a hermetically sealed relay switch with Form C contacts. A bias magnet latches the switch, maintaining contact as the float continues to rise or fall within the gage chamber. A non-latching switch is available. The MLS-3EX is best suited for low power alarm signals.



MLS-3EX-M

Specifications

Deadband:	.50 Inches (12.7mm)
Max. Temp.:	350°F (177°C) Standard 650°F (343°C) MLS-3EX-HT
Min. Temp.:	-40°F (-40°C)
Contacts:	SPDT or DPDT, Form C
Current:	1 Amp AC/DC
Switch Options:	
MLS-3	Switch only (no housing)
MLS-3EX	Standard Housing
MLS-3EX-M	ATEX Housing
MLS-3EX-2	DPDT Contacts
MLS-3EX-HT	High temp. option up to 650°F (343°C)

Approvals: UL/CUL & CSA Cl. I Grp. B,C,D; Cl. II Grp. E,F,G; Cl.III, ATEX Ex II 2G EExd IIC T6

PS-2 Series



The PS-2 is a pneumatic switch designed to control air and natural gas from 15 to 100 psi. The PS-2 is rotary cam activated and incorporates a non-bleed switch. When

the float passes, the cam rotates and latches the switch in the open position. This will allow unobstructed airflow. When the float moves back in the opposite direction the switch unlatches and blocks the airflow. The non-bleed design of the PS-2 can be used to control pneumatic alarms, valves and pumps, and is configured for rising or falling level.

MLS-10EX-C Series



The MLS-10EX-C is a DPDT cam actuated switch used to control pumps, solenoids, etc. The switch can be set by the user for rising or falling activation. The 10EX-C meets Class 1, Div. 1 codes and the internal switches are UL approved. MLS-10EX-R available for higher inductive load.

Specifications

Deadband:	.50 Inches
Max. Temp.:	200°F (93°C) Standard 450°F (232°C) Hi-Temp Version
Min. Temp.:	-40°F (-40°C)
Contacts:	DPDT, Form C
Current:	10Amps Max. @ 250VAC 5 Amps Max. @ 125VDC
Power:	2 KVA / 300W

Approvals: UL/CUL Cl. I Grp. B,C,D; Cl. II Grp. E,F,G; Cl.III

Other Options

Insulation



Magtech recommends insulation when gages are to be used under extreme temperature conditions. In high temperature applications, Magtech can provide factory installed, removable insulation blankets. The standard blanket (pictured right) for temperatures to 500°F/260°C consists of a 2 inch (compressed to 1 inch) thick, 6# Cer-Wool HP enclosed in 3201-2-SS silicone coated fiberglass cloth. For operating temperatures above 500°F/260°C, Fiberglass material (rated to 1100°F/593°C) is included on the contact surface of the blanket. In cryogenic applications (pictured left), Magtech can provide aluminum skinned "foamglas" insulation with indicator frost extension to prevent "icing" and flashing for fluids with low boiling points.



Heat Tracing

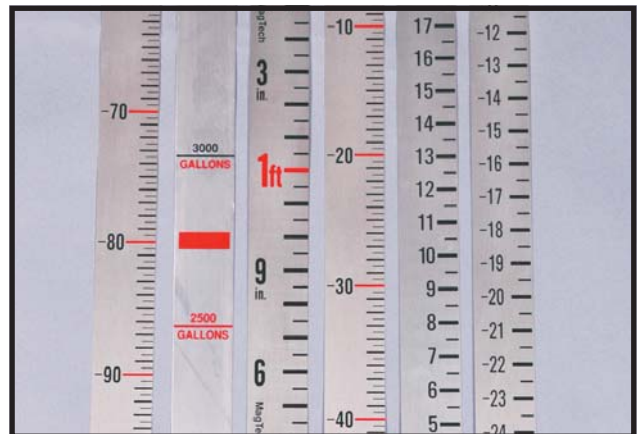
Magtech offers a wide variety of both electrical and steam heat tracing options. Heat tracing can be used for freeze protection or to maintain the process temperature of molten materials. Electrical tracing is engineered to customer specifications and can be provided with controllers. Common types are mineral insulated (MI) and self regulating (SR). Steam tracing of Magtech gages is done by traversing four lengths of the gage with 1/4 inch or 3/8 inch stainless steel tubing.

Optional Scales

In addition to the standard stainless steel scale, graduated in feet and inches; other scale options are available.

- Inches Only
- Negative/Positive (Boiler Service)
- Metric (meters, centimeters)
- Decimal feet (0.1 ft. or 0.01 ft. divisions)
- Offset zero (plus and minus scale divisions)
- Percent (0 to 100)
- Volumetric (gallons, liters)*

* Given the characteristics of every vessel are different, drawings or strapping tables must be supplied. A one-time charge for artwork may be required.



Testing

Magtech performs hydrostatic pressure tests on 100% of all Mag-Gages we manufacture at no additional charge. All Magtech materials are supported by material tracability reports, (MTR's) available upon request. Both NACE-075 and NACE-103 are available as well as dual NACE stamping if required. All peripheral bolts, nuts and fittings are ANSI B31.1/ B31.3 compliant. In addition, random samples are X-rayed in order to insure quality materials and workmanship. Further testing and documentation is available upon request. This includes: dimensional (as built) drawings, positive material identification (PMI), X-ray and dye penetration.

Mag-Flex Radar Chamber & MLG Combination



Description

Magtech now combines the proven reliability and rugged construction of our LG Series Magnetic Level Gage with Ohmart/Vega's Flex line of guided wave radar transmitters. The marriage of these two great names in level control, provides a system of total redundancy in a wide range of applications. The Mag-Flex dual chamber design features local indication, state of the art accuracy of GWR technology and the option to add redundant non-invasive magnetostrictive transmitters and/or level switches. Whether it's a complete redundant level control system or a simple insertion probe, you'll spend less time on set-up, maintenance, and troubleshooting with the new Mag-Flex.

Principle of Operation

Pulse: The Vegaflex emits a microwave pulse at a frequency of 2 GHz. This pulse travels down to the product surface and is "guided" by a stainless steel cable or rod. The pulse hits the surface of the product and is reflected back to the transmitter.

Target: The amount of energy that returns to the transmitter is determined by the reflective properties of the material to be measured. Conductive materials such as water and acids are very reflective and can be measured regardless of dielectric constant. For non-conductive materials, the dielectric alone determines the reflectivity.

Time: The travel time of the pulse is measured and converted to distance.

Types of Antennas

Vegaflex instruments are available with three types of antennas:

- Single Rod - Available in two thicknesses
- Cable Antenna - For long range applications
- Coaxial Antenna - For use with liquids of low reflectivity

Features & Benefits

- Available with 4-20mA / HART loop powered electronics or Foundation Fieldbus.
- Easy to use programming module or computer software makes set-up easy and fast.
- Allows the measurement of virtually all liquids and interface applications.
- 2-Wire Loop Powered: Installation cost is reduced by using existing wiring.
- Redundancy: Local indication and redundant transmitter or switch options available.
- Variety of process connections from 3/4" NPT threaded to 10" ANSI Flanges.
- No moving parts. No regular maintenance or re-calibration required.

Applications

- Displacer Replacement
- Liquid Gas Measurement
- Foam or Agitation
- Interface
- Coating, Buildup or Viscous Materials
- High Temperature / High Pressure



Other Magtech Products



MLS-4EX

MLS-4EX single or multi-point direct insertion liquid level switches, feature up to four switch points on a single probe. A wide range of mounting options and materials are available to meet application requirements.



Displacer Replacer

Existing Displacer chambers can be replaced or retro-fitted to accept LTM (magnetostrictive) and for any guided wave radar (GWR).



LTM-300S

LTM Series direct insertion level transmitter. The LTM offers single, interface, temperature or dual level measurement in one loop powered unit. Ideal for high-temp/high-pressure and corrosive services. Available with HART protocol or Foundation Fieldbus options.



LS-7000/8000

The LS-7000 and LS-8000 RF Level Switches offer peak performance at low costs. The LS series of level switches offer single or dual switch points on a single probe. Works with solids, powders, liquids and slurries. The LS level switch can easily be set to ignore significant build up of material on the probe, eliminating false alarms.



ISE-DPLC

Variety of local indicator options are available from Magtech. Contact your factory representative for details.



ABM

MagTech's ABM series ultrasonic level transmitters provide simple, non-contact measurement of liquids in a tank, sump, or other vessel. The instrument generates ultrasonic pulses, tracks travel time (compensated for air-temperature) and converts the signal to a proportional 4-20mA output.



Represented By:



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