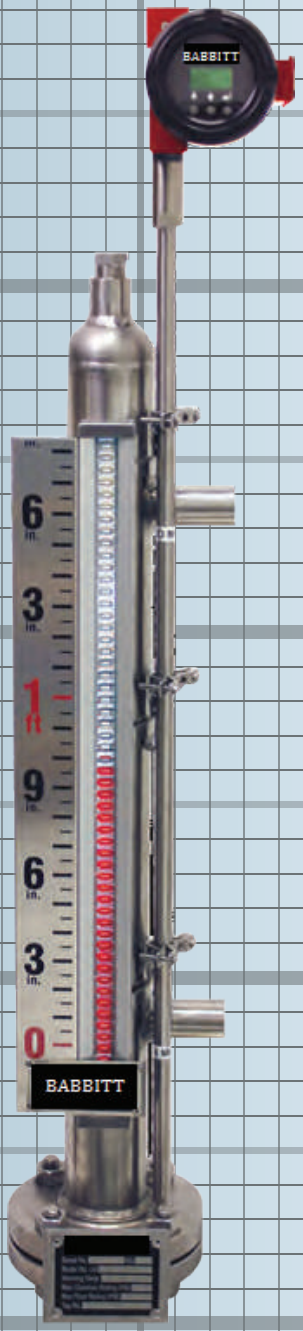
BABBITT

MAGNETIC LEVEL INDICATORS

Simple • Safe • Reliable

- Boiler Water
- Acids / Caustics
- Propane / Fuels
- Chemicals



- ASME Code Welded
- 12” to 40 feet
- Process connection any size NPT or Flange
- Easy to read flipper scale
- Fluid never contacts the glass

- Hi/Lo MLS Switches
- 4-20mA Transmitters
- Heat Tracing
- Insulation Blankets

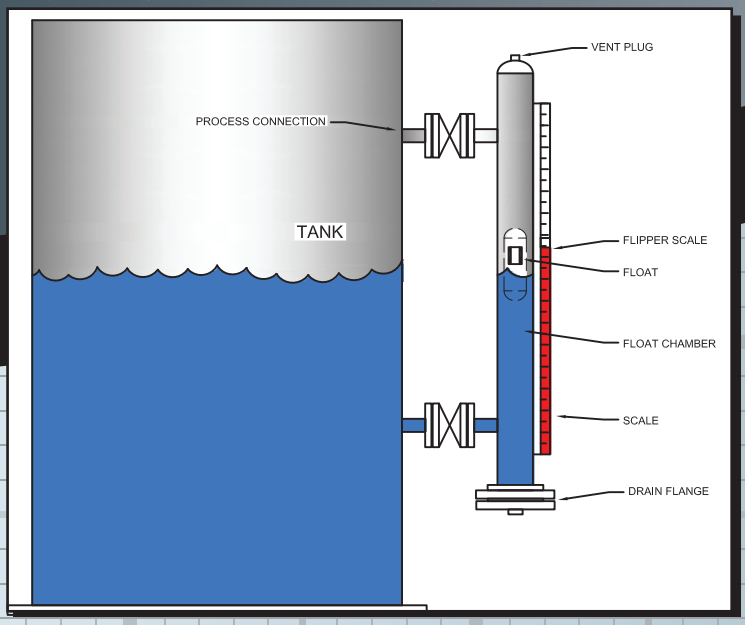
LG-Series Magnetic Level Indicators

Theory of Operation

Babbitt Magnetic Level Indicators are a safe, simple and reliable way to measure fluid level inside a tank. These visual indicators are an alternative to sight glasses and provide a non-invasive, low maintenance, cost-effective level solution. They are especially safe for flammable, toxic, corrosive liquids because the fluid never contacts the indicating glass. Should the glass ever break, there is no possibility of leakage.

Babbitt Magnetic Level Indicators, also referred to as Level Gauges, consist of a chamber, a magnetic float and a flipper type indicator scale mounted to the side of the chamber. Understanding the operation of the Magnetic Level Indicator is quite simple. The fluid in the tank seeks its own level inside the chamber. The magnetic float in the chamber rises and falls with the fluid level. As the Magnetic float rises and falls, it changes the orientation of the flippers on the scale providing a visual level indication. In addition, as the magnetic float rises and falls, it actuates any transmitter or alarm switches that are attached to the side of the gauge.

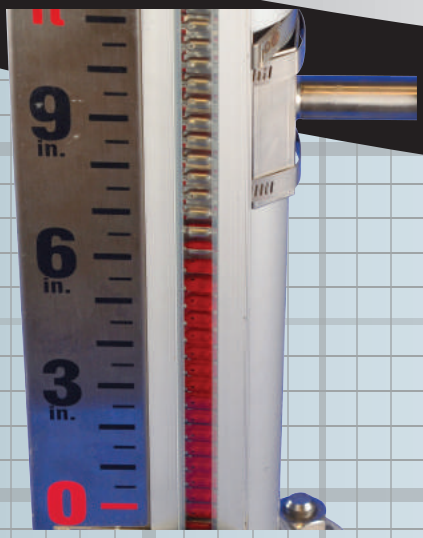
BABBITT LG SERIES
MAGNETIC LEVEL INDICATOR



Construction	Standard	Alternative as required
Chamber Material	316SS/L dual grade Stainless Steel	CPVC, Kynar, Hastelloy, Monel 400 or Inconel
Chamber Size	2 ½" Sch.10 or Sch.40 welded pipe	2", 3, 4" or schedules up to Sch.160 may be required depending upon the application
Chamber Flanges	316SS/L dual grade Stainless Steel ANSI B16.5 RF slip on type	ANSI weld neck, socket weld or lapjoint as well as other flanges faces such as RTJ and flat face
Process Connections	1" 3000# FNPT unless otherwise Specified; vent/drains are ½" 3000# FNPT	Upgrades to ANSI Flanges, other size/rating NPT, vents/drains or socket weld connections are available
Float	316 Stainless Steel. Float material and size is determined by the process conditions	Floats are available in a variety of materials. Floats are available for processes up to 3400 psig and specific gravities as low as 0.40 (See page 3)
Indicator	Red and silver metal flags, high temperature design reading in feet and inches with ½" divisions	Optional all Stainless Steel housing for harsh enviroments. Other color flags available as well as other units of measurement such as mm & %.
Chamber Design	Chamber designed to ANSI B31.1 And B31.3 and ASME Boiler Code PG60. Welding and welder Qualification in accordance with ASME Section IX	Non-standard welding procedures, qualifications or testing may be supplied if required as well as proprietary customer design specifications.
Testing	Functional and calibration test	MTR's, radiography, hydrostatic pressure test, PMI, Dye penetrant, NACE or witness testing available

Increased reliability with rugged non pressurized floats

Babbitt floats are designed specifically to meet the process conditions of the application. Float construction is determined by the process fluid, pressure, temperature and specific gravity of the fluid. Inside each sealed float is a 360 degree ring of magnets. Most processes use a stainless steel float, but other materials of construction are available, including exotic metals and plastics. High pressure titanium floats are suitable for specific gravities as low as 0.41 and pressures as high as 3400 psi.



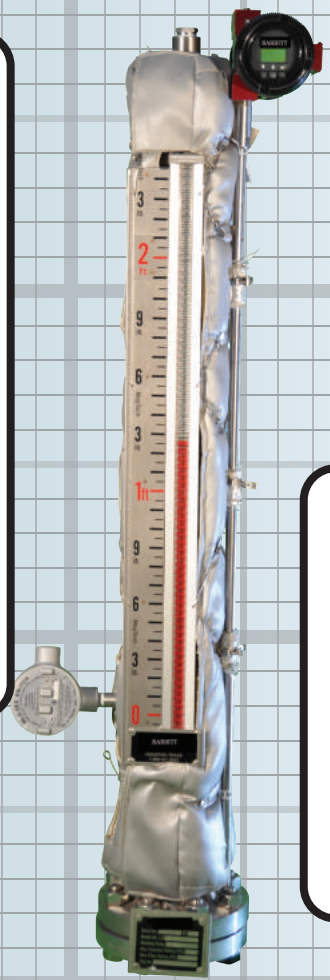
Flipper indicator provides higher usability and safety

Babbitt flipper scales are safe because the process fluid never contacts the glass. Should the glass ever break, there is no possibility of leakage. Babbitt indicators contain small metal flags that are red on one side and silver on the other. As the magnetic float passes with the rising or falling liquid, the flags rotate 180 degrees, showing the other color. Red indicates the liquid level while silver indicates the vapor space. These brightly colored flags can be seen and read from a distance of more than 100 feet. Each scale assembly is custom made and is one continuous piece up to 20 feet, with no joints or blind spots. Custom scale options are available, see page 8.

Insulation

Insulation is recommended when indicators are to be used under extreme temperature conditions. Factory installed, removable insulation blankets are available in two configurations. The standard blanket is for temperatures to 500˚F (260˚C) and consists of a 2 inch thick (compressed to 1 inch), 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, aluminum-skinned “foamglass” insulation with indicator frost extension to prevent “icing” and flashing for fluids with low boiling points is provided.

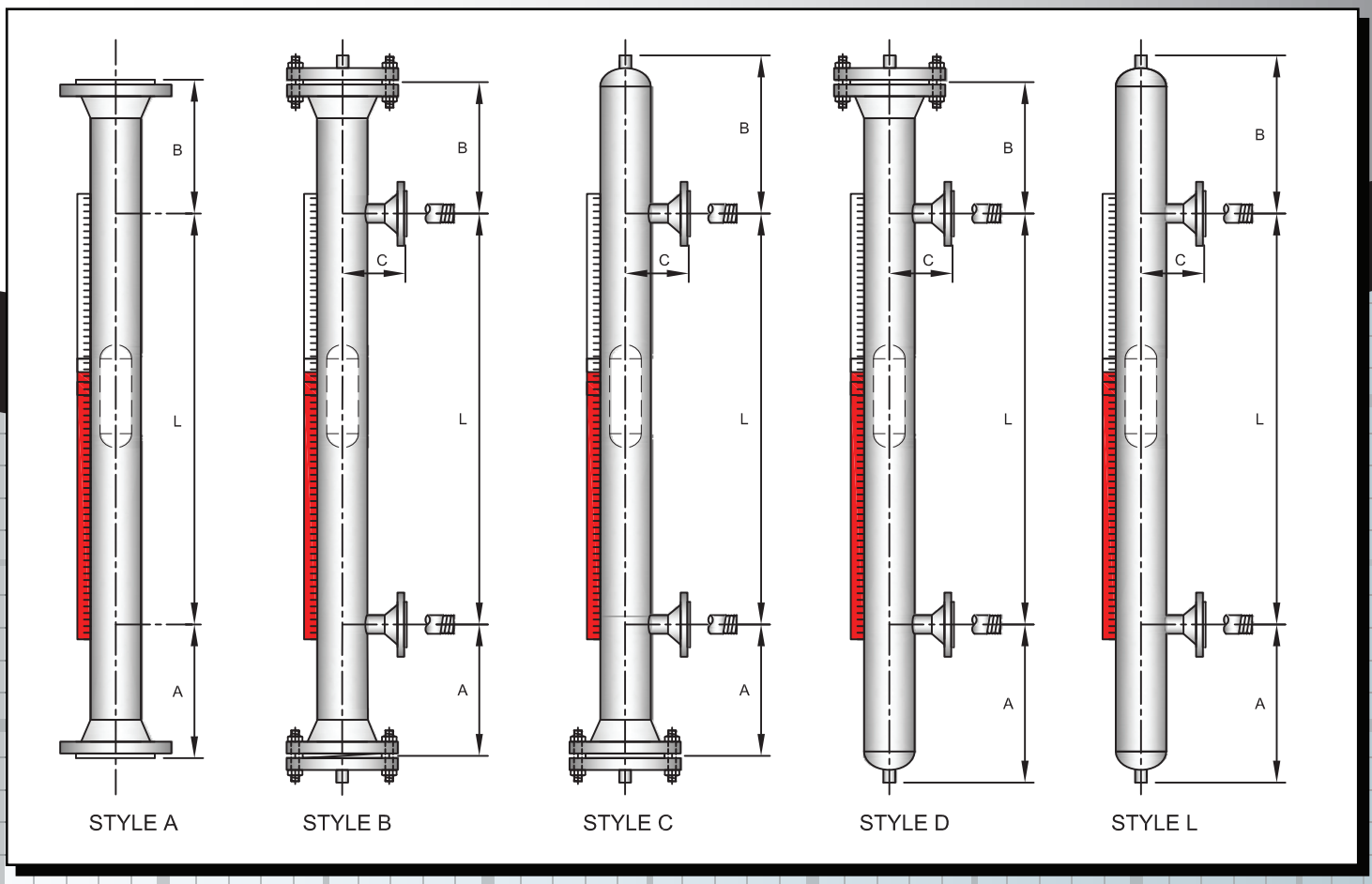


Heat tracing

A wide variety of electrical and steam heat tracing options are available. 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 Babbitt indicators is accomplished by traversing four lengths of the gauge with ¼ inch or 3/8 inch stainless steel tubing.

Standard Magnetic Level Indicator Mounting Styles

All Babbitt Magnetic Level Indicators are custom made based on your requirements



Babbitt Magnetic Level Indicator Mounting Styles

Style A – Flanged top and bottom, no top or bottom blind and no side process connections
Style B – Flanged top and bottom with either NPT or Flange side process connections
Style C – Closed top, flanged bottom with either NPT or Flange side process connections
Style D – Flanged top, closed bottom with either NPT or Flange side process connections
Style L – Closed top and bottom with or without NPT or Flange side process connections

Standard Dimensions

	A	B	C	L
Style A	**12**	**8**	**4**	**Specify**
Style B	**12**	**8**	**4**	**Specify**
Style C	**12**	**8**	**4**	**Specify**
Style D	**12**	**8**	**4**	**Specify**
Style L	**12**	**8**	**4**	**Specify**

Notes:
Standard dimensions are based on standard 8”-10” floats. Some process conditions will require a longer float which may change A and B dimensions. If spacing is a concern, A and B dimensions can be shortened to meet your requirements, however a reduction in measuring range may be required.

Transmitters

LT-1

The LT-1 Level Transmitter is designed to be used with the LG Series Magnetic Level Indicators to provide a 4/20mA signal proportional to level. The LT-1 is a low cost alternative where precise measurement and communication is not required. The unit mounts externally on the chamber and consist of a sensor tube made up of a string of resistors and magnetically operated reed switches. The LT-1 is an analog transmitter with no digital display and provides step up level in ½ inch increments (¼ inch resolution is available for units under 30" in measuring length.) This transmitter is the preferred choice for applications with significant vibration.

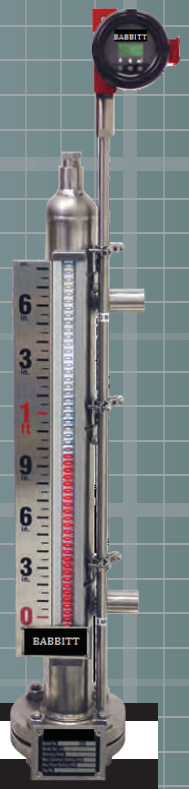
Specifications

Sensor probe	Transmitter	
Length: Maximum 20 ft (6 m)	Power:	24 V dc (loop powered) nominal
Resolution: ½ inch (¼ inch under 30" measuring length)		Output: 4-20 mA
Material: 316 stainless steel standard		Load: 750 ohm max.
Max. Operating temp.: 750 °F (399 °C) process temperature	Housing:	Explosion-proof, Class I, Div. I, Groups. B, C and D
		Maximum temperature: 150 °F (85 °C) in housing

LTM Transmitters

Babbitt LTM 250/350 series magnetostrictive level transmitters offer highly accurate and precise liquid level measurement. The LTM mounts externally to the magnetic level indicator for non-invasive level measurement. This allows the unit to be installed and serviced without having to remove the indicator from service. The LTM senses the fluid level by detecting the magnets inside the float and transmits the measurement back to the control system.

LTM transmitters are available with two-wire loop powered 4-20 mA signal output or bus powered (Fieldbus) with digital 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 or electropolished for sanitary service. LTM transmitters feature explosion-proof, dual-compartment enclosures and integral displays. "Plug-and-play" electronics allow for easy upgrades. LTM transmitters offer the latest and most advanced software features on the market, introducing a registered HART DD, Rev. 5 with AMS Aware and Rev. 7 with EDD, compliant to IEC 61804-2, and compliant to Foundation Fieldbus software version ITK-4.6



Specifications

Housing: Epoxy coated aluminum or stainless steel
Protection rating: NEMA 4X, NEMA 7, IP66

Sensor Probe

Material: 316SS, 5/8inch (15.88m) standard probe; other materials available. All wetted parts are non-ferrous Compatible materials (stainless steel, Monel, Hastelloy, ect.)
Maximum Length: 30 feet (9m)
Mounting Style: Gauge mount via 316SS brackets
Operating Temperature: -200 to 750F (-129 to 399C)
*All transmitters have the following RFI limits: SAMA PMC 31.1, 20 to 1000 MHz, up to 30V/m

For high temperature applications, the transmitter should be remote mounted

Magnetic Level Switches for LG Indicators

Babbitt MLS level switches provide low cost, reliable alarm and control functions to meet your requirements. MLS switches are non-invasive alarm switches which clamp to the side of the chamber and are magnetically actuated by the float through the chamber wall. Multiple control points can be added to the Level Indicator without having to cut additional holes in the vessel. External mounting clamps allow for easy adjustment of set points or servicing of MLS switches without interrupting the process. All Babbitt MLS Series switches can be wired for either rising or falling level and NC or NO operation. Each switch has approximately a ½ inch deadband to eliminate the possibility of chatter.

MLS-3 Series

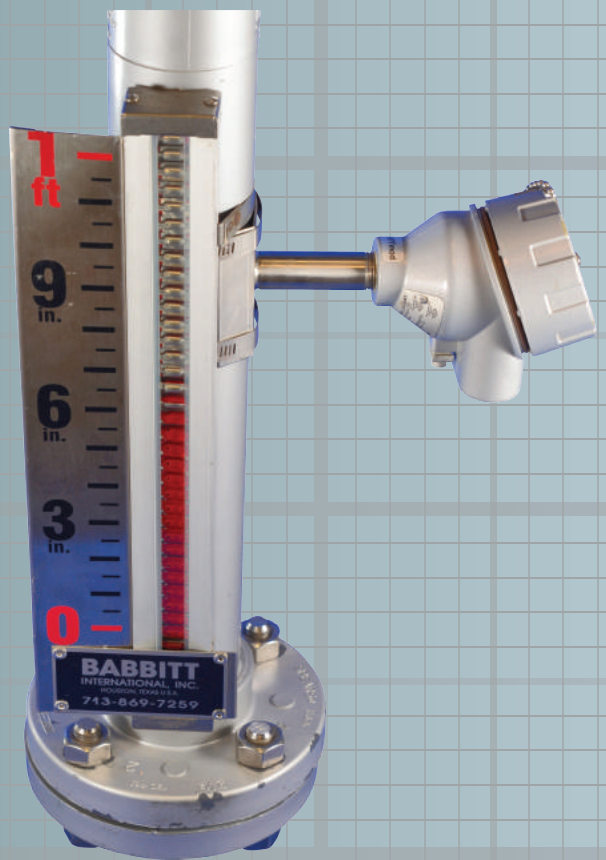
The MLS-3EX is a hermetically sealed reed switch with Form C contacts. A bias magnet latches the switch, maintaining the output contact as the float continues to rise or fall within the gauge. The switch will only unlatch when the float passes the switch again in the opposite direction. This low cost switch is best suited for low power alarm signals.

Specifications	
Deadband:	.50 inches (12.7mm)
Max. Temp:	350F (177C) Standard
	650F (343C) MLS-3EX-HT
Min Temp:	-40F (-40C)
Contacts:	SPDT or DPDT, Form C
Current:	1 Amp ac/dc resistive

Switch Options	
MLS-3	Switch only (No housing)
MLS-3EX-M	Standard EXP housing
MLS-3EX-M-A	ATEX EXP Housing
MLS-3EX-2	DPDT Contacts
MLS-3EX-HT	High Temp. option up to 650F (343C)
Approvals	UL/CUL & CSA Class I Grp. B, C, D; Class II Grp. E, F, G; Class III, ATEX Ex II 2G EExd IIC T6

MLS-10EX

The MLS-10EX is a high current level switch and is an excellent choice for controlling pumps, alarms or solenoids. The switching mechanism is a cam activated internal UL approved switch. The unit can be set by the user for rising or falling activation. The MLS-10EX-C is a DPDT switch. These switches meet Class I, Div. I requirements and the internal micro-switches are UL approved. The MLS-10EX-R (relay requires auxiliary power) is available for higher inductive load.



Specifications	
Deadband	.50 inches
Max Temp:	200F (93C) Standard
	450F (232C) High temperature version
Min. Temp:	-40F (-40C)
Contacts:	DPDT Form C
Current:	10 Amps maximum at 250Vac
	5 Amps maximum at 125Vdc
Power:	2 KVA/300W
Approvals:	UL/CUL and CSA Class I Grp. B, C, D; Class II Grp. E, F, G; Class III

Magnetic Level Indicator Worksheet

Name_____Date_____

Company_____

Address_____

City_____ State_____ Zip_____

Phone_____ Email_____

All Magnetic Level Indicators are custom made. Please fill out the form below:

Quantity_____

Chamber Material (Circle one) 316SS CPVC KYNAR Monel Hastelloy Other_____

Process Fluid_____ Specific Gravity_____

Mounting Style (See Page 4)_____ Process Connection (Circle one) NPT Flange Specify Size_____

Center to Center (L Dimension in inches)_____ Max. Operating Pressure (PSIG)_____

Max. Operating Temperature (F)_____

Accessories

MLS Alarm Switches (See Page 6) Type_____ Quantity_____

4-20mA Transmitter (See Page 5) Type_____ Quantity_____

Head Mount (Circle one) Top Bottom Remote

Orientation (Circle one) Left Right(Standard)

Add on options (See Options Page 8)

_____

_____

_____

Performance & Reliability
GUARANTEED

Ordering Information

Model LG6 B - ¾" - 300# - 0.92 - 100F - 250 - 36" - X

LG6=316SS
LGCPVC=CPVC
LGPVDF=Kynar

Mounting Style
A, B, C, D or F
(see page 4)

Process Conn. Sizes

Flange Rating

Specific Gravity of Measured Fluid

Max. Operating Temperature (F)

Max. Operating Pressure (PSI)

Measurement Length "L" (in.)
(see page 4)

Options (for options not listed consult factory)
CS = Carbon steel flanges
ST = Steam trace
HT = Heat trace
IB = Insulation blanket
FS = Flipper scale
RJ = Ring joint flange
WN = Weld neck flange
FX = Fixed flanges (RFSO)
PI = Polycarbonate indicator
BV = Blocking valve (specify type)
VV = Vent Valve (specify type)
DV = Drain valve (specify type)
X = Special options (spell out description)

Scale Options
Feet & Inches **(standard)**
Inches only
Negative/Positive
Metric (mm&cm)
Decimal Feet (0.1 ft. or 0.01 ft. divisions)
Offset zero (plus and minus scale divisions)
Percent (0-100)

Specifications subject to change without notice

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BABBITT INTERNATIONAL
P.O. BOX 70094
Houston, Texas 77270
(713) 467-4438
www.babbittlevel.com