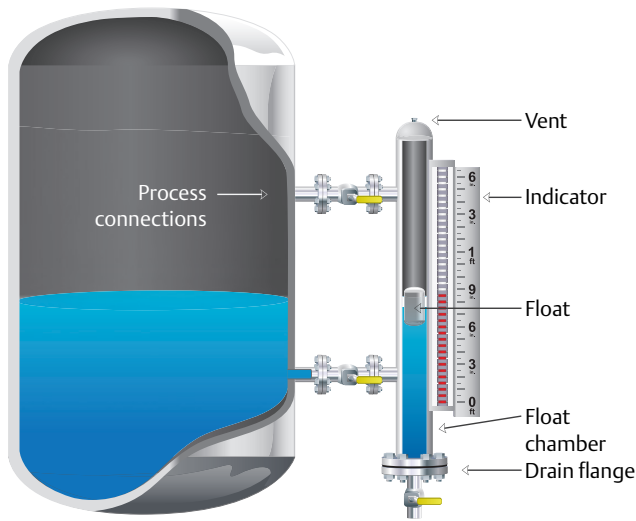


Magtech™ Magnetic Level Indicators



- Visual level indication to 100 ft. (30 m)
- Designed to ASME B31.3 Process Piping Code. ASME B31.1 Power Piping Code is available upon request
- Minimal leak points as compared to sight glasses
- No process liquid in contact with indicator glass
- Designed for both gas/liquid (top level) and/or liquid/liquid (interface) measurements
- Optional construction is available for cryogenic, high-temperature, high-pressure, and corrosive applications
- Dual chamber design optimized for use with the Rosemount™ 5300, 3308, and 3300 Guided Wave Radars also available

Overview



Measurement principle

Magnetic level indicators consist of a chamber, a magnet equipped float which rises and lowers with the fluid level, and an indicator mounted to the chamber.

The indicator houses a column of small flags, which indicate the level of the fluid in the chamber, based on the position of the float. As the fluid level rises and lowers, the float rises and lowers as well, and the flags are tripped from one orientation to the other; typically the red side indicates the liquid level and the silver side indicates the vapor space.

As the float rises and falls with the process level, tripping the flags, it also stimulates any attached transmitters and switches, providing a signal back to the control system.

Application Examples

- Turbulent tanks
- Heat exchangers
- Boiler applications
- Site glass replacement
- Separators
- Acid storage tanks

Test and inspection

All Magtech chambers can be hydrostatically tested to 1.5 times the specified flange/pressure rating prior to shipment to ensure pressure tolerance.

Additional testing and documentation, such as Material Traceability Reports (MTRs), radiography, hydrostatic pressure tests, Postive Material Identification (PMI), dye penetrant, NACE®, or witness testing are available.

Contents

Overview	2	Specifications	15
Ordering Information	3	Dimensional Drawings	17

Ordering Information

Magtech Magnetic Level Indicator (MLI)



Specification and selection of product materials, options, or components must be made by the purchaser of the equipment, see Magtech Level Indicator [Quick Data Sheet](#). For more information on Material Selection see [page 15](#)

Additional Information

Specifications: [page 15](#)

Dimensional Drawings: [page 17](#)

Table 1. Magtech Magnetic Level Indicators Ordering Information

Model	Product description					
L	Magnetic level indicator					
Measurement type⁽¹⁾						
0	Liquid level (gas/liquid interface)					
2	Submerged interface (liquid/liquid interface)					
4	Flashing application (consult factory for model selection)					
Float selection						
Liquid level (gas/liquid interface) applications, measurement type code 0						
	Float material	Minimum SG	Float max. operating pressure in psig (bar) at 100 °F (37.8 °C)	Chamber size and schedule	"A" Dimension in inches (mm)	
76	316 Stainless steel	0.76	125 (8.6)	2-in. S10	12.0-in. (305 mm)	
78	316 Stainless steel	0.78	285 (19.7)	2-in. S10	12.0-in. (305 mm)	
81	316 Stainless steel	0.81	500 (34.5)	2-in. S10	12.0-in. (305 mm)	
58	316 Stainless steel	0.58	75 (5.2)	2 1/2-in. S10	12.0-in. (305 mm)	
60	316 Stainless steel	0.60	135 (9.3)	2 1/2-in. S10	12.0-in. (305 mm)	
62	316 Stainless steel	0.62	220 (15.2)	2 1/2-in. S10	12.0-in. (305 mm)	
83	316 Stainless steel	0.83	285 (19.7)	2 1/2-in. S10	12.0-in. (305 mm)	
86	316 Stainless steel	0.86	740 (51.0)	2 1/2-in. S10	12.0-in. (305 mm)	
54	Titanium	0.54	125 (8.6)	2 1/2-in. S10	12.0-in. (305 mm)	
59	Titanium	0.59	285 (19.7)	2 1/2-in. S10	12.0-in. (305 mm)	
61	Titanium	0.61	740 (51.0)	2 1/2-in. S10	12.0-in. (305 mm)	
68	316 Stainless steel	0.68	115 (7.9)	2 1/2-in. S40	12.0-in. (305 mm)	
82	316 Stainless steel	0.82	175 (12.1)	2 1/2-in. S40	12.0-in. (305 mm)	
87	316 Stainless steel	0.87	285 (19.7)	2 1/2-in. S40	12.0-in. (305 mm)	
88	316 Stainless steel	0.88	740 (51.0)	2 1/2-in. S40	12.0-in. (305 mm)	

Table 1. Magtech Magnetic Level Indicators Ordering Information

	Float material	Minimum SG	Float max. operating pressure in psig (bar)	Chamber size and schedule	"A" Dimension in inches (mm)	
40	316 Stainless steel	0.40	50 (3.5)	3-in. S10	18-in. (457 mm)	
69	Titanium	0.69	2300 (158.6)	2 1/2-in. S40	16-in. (406 mm)	
63	Titanium	0.63	2300 (158.6)	2 1/2-in. S40	20-in. (508 mm)	
45	Titanium	0.45	2100 (144.8)	3-in. S10	20-in. (508 mm)	
55	Titanium	0.55	2100 (144.8)	3-in. S40	14-in. (356 mm)	
49	Titanium	0.49	2100 (144.8)	3-in. S40	17-in. (432 mm)	
46	Titanium	0.46	2100 (144.8)	3-in. S40	20-in. (508 mm)	
41	Titanium	0.41	2100 (144.8)	3-in. S40	25-in. (635 mm)	
74	Titanium	0.74	3400 (234.4)	3-in. S80	20-in. (508 mm)	
67	Titanium	0.67	3400 (234.4)	3-in. S80	25-in. (635 mm)	
85	Titanium	0.85	3400 (234.4)	3-in. S160	16-in. (406 mm)	
73	Titanium	0.73	3400 (234.4)	3-in. S160	20-in. (508 mm)	
64	Alloy 400	0.64	90 (6.2)	3-in. S10	12-in. (305 mm)	
80	C-276	0.80	135 (9.3)	2-in. S10	12-in. (305 mm)	
89	C-276	0.89	425 (29.3)	2-in. S10	12-in. (305 mm)	
Submerged interface (liquid/liquid interface) measurement type code 2						
	Float material	Minimum delta SG	Float max. operating pressure in psig (bar) at 100 °F (37.8 °C)	Chamber diameter and schedule	"A" Dimension in inches (mm)	
37	316 Stainless steel	0.37	450 (31.0)	2-in. S10	12-in. (305 mm)	
21	316 Stainless steel	0.21	740 (51.0)	2 1/2-in. S10	12-in. (305 mm)	
23	316 Stainless steel	0.23	175 (12.1)	2 1/2-in. S40	12-in. (305 mm)	
10	316 Stainless steel	0.10	50 (3.5)	3-in. S10	12-in. (305 mm)	
28	Titanium	0.28	2300 (158.6)	2 1/2-in. S40	12-in. (305 mm)	
20	Titanium	0.20	2300 (158.6)	2 1/2-in. S40	12-in. (305 mm)	
15	Titanium	0.15	2100 (144.8)	3-in. S10	12-in. (305 mm)	
14	Titanium	0.14	2100 (144.8)	3-in. S40	12-in. (305 mm)	
11	Titanium	0.11	2100 (144.8)	3-in. S40	12-in. (305 mm)	
30	Titanium	0.30	3400 (234.4)	3-in. S80	12-in. (305 mm)	
29	Titanium	0.29	3400 (234.4)	3-in. S160	12-in. (305 mm)	
38	C-276	0.38	135 (9.3)	2-in. S10	12-in. (305 mm)	
13	Alloy 400	0.13	90 (6.2)	3-in. S10	12-in. (305 mm)	

Table 1. Magtech Magnetic Level Indicators Ordering Information

Mounting style (see Figure 1 for mounting options or consult factory for custom mounting)		
A	Style A - Flanged top and bottom, with stop plates, no side process connection	
B	Style B - Access flange on top and bottom with side process connections	
C	Style C - Access flange on bottom, flanged bottom with side(s) process connection	
D	Style D - Access flange on top, flanged top, closed bottom with side(s) process connection	
L	Style L - No float access flanges, with or without side(s) process connection	
Instrument rating		
AA	ANSI/ASME B16.5 Class 150	
AB	ANSI/ASME B16.5 Class 300	
AC	ANSI/ASME B16.5 Class 600	
AD	ANSI/ASME B16.5 Class 900	
AE	ANSI/ASME B16.5 Class 1500	
AF	ANSI/ASME B16.5 Class 2500	
Access flange type		
0	Not applicable (Style L only)	
1	Raised Face (RF) Weld Neck	
2	RF Slip-On	
3	RF Socket Weld	
4	Ring Type Joint (RTJ) Weld Neck	
5	RTJ Slip-ON	
6	RTJ Socket Weld	
Indicator scale unit of measure		
E	Imperial (English), inches	
M	Metric, millimeters	
Mounting dimension (center-to-center for style B, C, D, L and top-to-bottom for style A)⁽²⁾		
XXXXX	XXX.XX inches or XXXXX mm	04863 = 48.63 inches or 4863 mm
Chamber material		
S	316/316L Stainless steel (standard)	
1	317 Stainless steel	
2	321 Stainless steel	
7	347 Stainless steel	
X	Special (consult factory)	

Table 1. Magtech Magnetic Level Indicators Ordering Information

Side process connection design		
D	Drill (1/2-in. hole)	
F	Drill (full bore) ⁽²⁾	
E	Extrusion (limited to chamber size S10 or S40 with 1 1/2-in. or 2-in. NPS process connection size) ⁽²⁾	
T	Buttweld Tee (ASME B16.9)	
N	None (Style A)	
X	Special (consult factory)	
Process connection size (NPS)		
0	Same diameter as chamber (Style A only)	
8	1/2-in.	
9	3/4-in.	
1	1-in.	
5	1 1/4-in.	
6	1 1/2-in.	
2	2-in.	
7	2 1/2-in.	
3	3-in.	
4	4-in.	
X	Special (consult factory)	
Process connection rating		Process connection type
ZZ	Same as instrument rating (Style A only)	Z
AA	ANSI/ASME B16.5 Class 150	1, 2, 3, 4, Y
AB	ANSI/ASME B16.5 Class 300	1, 2, 3, 4, Y
AC	ANSI/ASME B16.5 Class 600	1, 2, 3, 4, Y
AD	ANSI/ASME B16.5 Class 900	1, 2, 3, 4, Y
AE	ANSI/ASME B16.5 Class 1500	1, 2, 3, 4, Y
AF	ANSI/ASME B16.5 Class 2500	1, 2, 3, 4, Y
FA	ANSI/ASME B16.11 Class 3000	A, C, E, G, H, K, L
FB	ANSI/ASME B16.11 Class 6000	A, C, E, G, H, K, L
FC	ANSI/ASME B16.11 Class 9000	A, C, E, G, H, K, L
SA	ANSI/ASME B16.9 STD	M, P, N
SB	ANSI/ASME B16.9 XS	M, P, N
SC	ANSI/ASME B16.9 XXS	M, P, N

Table 1. Magtech Magnetic Level Indicators Ordering Information

Process connection type		Process connection rating	
Z	Same as access flange (Style A only)	ZZ	
1	RF Weld neck	AA, AB, AC, AD, AE, AF	
2	RF Slip-on	AA, AB, AC, AD, AE, AF	
3	RF Socket weld	AA, AB, AC, AD, AE, AF	
4	RTJ Weld neck	AA, AB, AC, AD, AE, AF	
5	RTJ Slip-on	AA, AB, AC, AD, AE, AF	
6	RTJ Socket weld	AA, AB, AC, AD, AE, AF	
Y	Raised face lap joint (RFLJ)	AA, AB, AC, AD, AE, AF	
A	Nipple - Plain end	FA, FB, FC	
C	Nipple - Male NPT	FA, FB, FC	
E	Coupling - Female NPT	FA, FB, FC	
G	Coupling - SW	FA, FB, FC	
H	Fitting	FA, FB, FC	
K	Fitting	FA, FB, FC	
L	Fitting	FA, FB, FC	
M	Fitting - Plain End	SA, SB, SC	
P	Fitting - Beveled End (37.5°)	SA, SB, SC	
N	Fitting - Male NPT	SA, SB, SC	
Process connection schedule ⁽³⁾			
0	Same schedule as chamber (Style A only)		
1	S10		
4	S40		
8	S80		
6	S160		
Process connection material			
0	Same Material as Chamber		
S	316/316L Stainless steel (standard)		
2	321 Stainless steel		
7	347 Stainless steel		
4	304/304L Stainless steel		
1	317 Stainless steel		
C	Carbon steel		
X	Special (consult factory)		

Table 1. Magtech Magnetic Level Indicators Ordering Information

Top of the chamber	
B	Blind flange
D	Dome cap
F	Flat cap
Z	Open flange with stop plate
X	Special (consult factory)
Top vent size	
0	No top vent
8	1/2-in.
9	3/4-in.
1	1-in.
X	Special (consult factory)
Top vent type	
Z	No top vent
A	NPT tap only with Plug
C	SW tap only
D	Flanged
F	Coupling - FNPT with Plug
H	Coupling - SW
K	Fitting - Plain End
M	Fitting- Male NPT End
X	Special (consult factory)
Top vent schedule or rating	
Z ⁽⁴⁾	No top vent
1	S10
4	S40
8	S80
6	S160
3	Class 3000
5	Class 6000
Bottom of the chamber	
B	Blind flange
D	Dome cap
F	Flat cap

Table 1. Magtech Magnetic Level Indicators Ordering Information

Z	Open flange with stop plate		
X	Special (Consult Factory)		
Bottom drain size			
0	No bottom drain		
8	1/2-in.		
9	3/4-in.		
1	1-in.		
Bottom drain type			
Z	No bottom drain		
A	NPT tap only with plug		
C	SW tap only		
D	Flanged		
F	Coupling - FNPT with plug		
H	Coupling - SW		
K	Fitting- Plain end		
M	Fitting- Male NPT end		
X	Special (consult factory)		
Bottom drain schedule or rating			
Z	No bottom drain		
1	S10		
4	S40		
8	S80		
6	S160		
3	Class 3000		
5	Class 6000		
Indicator			
F	Flag		
B	Follower (birdie/shuttle)		
Measuring range⁽⁵⁾			
XXXXX	XXX.XX inches or XXXXX mm	04863 = 48.63 inches or 4863 mm	
Scale units			
Z	Feet and inches (1/2-in. increments)		
A	Metric (5 mm increments)		
B	Percentage (custom increments)		

Table 1. Magtech Magnetic Level Indicators Ordering Information

C	Inches only (1/2-in. increments)	
D	+/- (custom increments)	
E	Dual (feet and inches, percent)	
F	Dual (metric, percent)	
Indicator enclosure material		
0	Anodized aluminum housing with glass	
1	Anodized aluminum housing with polycarbonate	
2	Anodized aluminum housing with acrylic frost extension	
3	Stainless steel housing with glass	
4	Stainless steel housing with polycarbonate	
5	Stainless steel channel with glass tube	
6	Stainless steel channel with polycarbonate tube	
Indicator indicator color		
Z	Red and silver flags	
A	Red and white flags	
C	Yellow and black flags	
B	Red follower	
D	Green follower	
Indicator mounting (see Figure 2)		
Z	Standard orientation (180° from process connections)	
R	Right mount	
L	Left mount	
C	Customer specified	
Typical model number: L 0 76 C AA 1 E 03600 S E 6 AA 1 1 S D 8 Z Z B 8 Z Z F 03600 Z 0 Z Z		

1. For flashing applications please consult factory.
2. Maximum mounting dimension per single unit is 20 ft. (6 m) for Style A and 18 ft. (5.5 m) for Style B/C/D.
3. Process connection schedule needs to be equal or greater than the chamber schedule.
4. Must select for Top Vent type Z Option Z.
5. Should be equal to or smaller than the Mounting dimension. Please provide datum offset using Magtech Level Indicator [Quick Data Sheet](#).

Order options - must be specified at time of order

Test and inspection

- Hydrostatic pressure test
- Weld inspection
- NDE (non-destructive examination)

Documentation

- Approval and as-built drawings
- Weld procedures and welder qualifications
- Quality control plans
- Material Traceability Record (MTR)
- Float curves

Accessories

- Valves (vent and drain)
- Insulation blanket
- Steam trace
- Heat trace
- Hard shell cryogenic insulation with frost protection
- Chamber support clips

Associated products

- Dual chamber unit with Guided Wave Radar
- Switches
- Magnetostrictive transmitter

Table 2. Process Connection Rating

Process connection style	ANSI/ASME B16.5						ANSI/ASME B16.11			ANSI/ASME B16.9		
	150	300	600	900	1500	2500	3000	6000	9000	STD	XS	XXS
RF Weld Neck	X	X	X	X	X	X						
RF Slip-on	X	X	X	X	X	X						
RF Socket Weld	X	X	X	X	X	X						
RTJ Weld Neck	X	X	X	X	X	X						
RF Lap Joint (RFLJ)	X	X	X	X	X	X						
Fitting - Plain End							X	X	X			
Fitting - Male NPT							X	X	X			
Coupling - Female NPT							X	X	X			
Coupling - SW							X	X	X			
Fitting							X	X	X			
Fitting							X	X	X			
Fitting							X	X	X			
Fitting - Plain End										X	X	X
Fitting - Beveled End (37.5)										X	X	X
Fitting - Male NPT										X	X	X

Figure 1. Mounting Styles

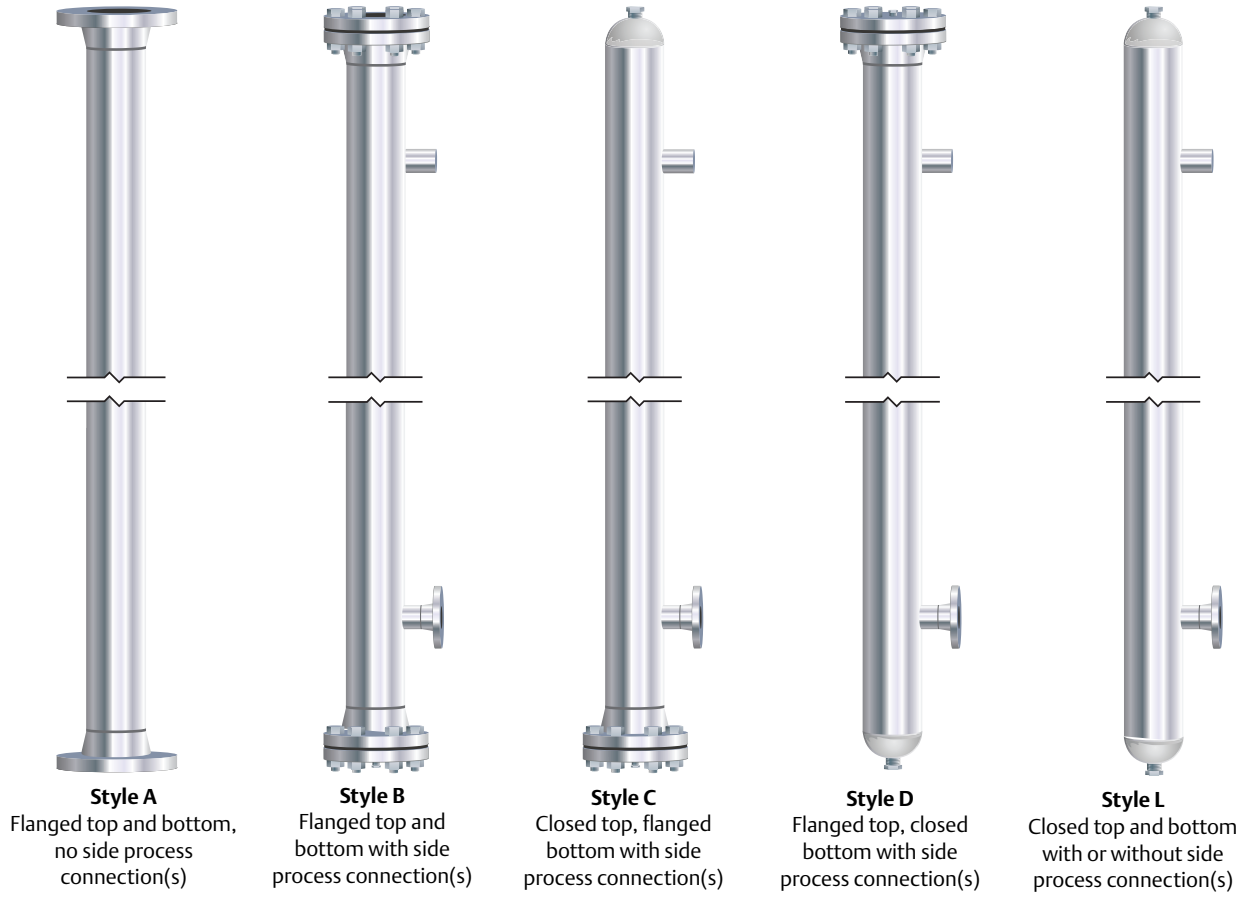
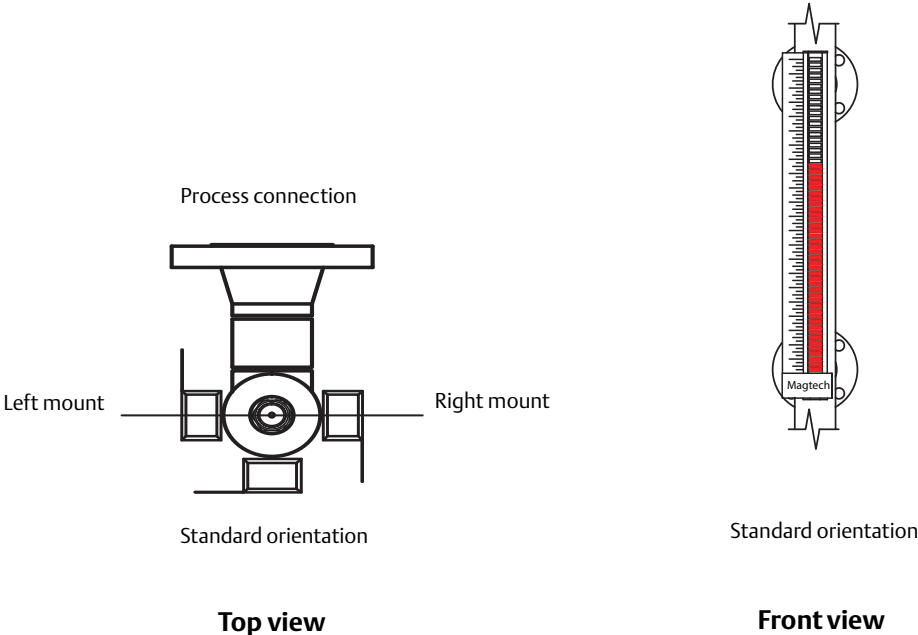


Figure 2. Indicator/Scale Orientation



Specifications

Performance specifications

Resolution

Approximately 1/4 -inch resolution

Measuring range

Maximum mounting dimension per single unit is 20 ft. (6 m) for Style A and 18 ft. (5.5 m) for Style B/C/D.

Maximum viscosity

2000 cP

Minimum Specific Gravity (SG)

0.40 (consult factory for lower specific gravities)

Minimum delta SG

0.11

Functional specifications

Temperature rating

850 °F (454 °C)

Float Pressure rating

Up to 4000 psig (275.8 bar) at 100 °F (38 °C)

Visual indicator

Visible from 100 ft (30 m)

Indicator options

- Flag (standard)
- Follower (optional)

Physical specifications

Material selection

Emerson™ provides a variety of products with various options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options and components for the particular application. Emerson is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.

Chamber design options

Designed to ASME B31.1 or B31.3, or CRN (all provinces). Welding and welder qualification in accordance with ASME Section IX.

- ASME B31.3
- ASME B31.1
- CRN Registration (all provinces)

Note

Welding and welder qualifications in accordance with ASME Section IX.

Process connection sizes

1/2-in. to 4-in.

Materials of construction

Chamber

- 300 Series stainless steel (standard 316/316L)
- Optional: Other non-ferrous materials that do not exhibit ferro-magnetic properties such as Alloy C-276, CB20, Alloy 600, Alloy 400, T-321 stainless steel, CPVC, and Kynar.

Float

- 316 stainless steel
- Titanium
- Alloy 400
- Alloy C-276
- Special options: Kynar, CPVC, PTFE coating

Indicator viewing window

Glass or polycarbonate

Gasket

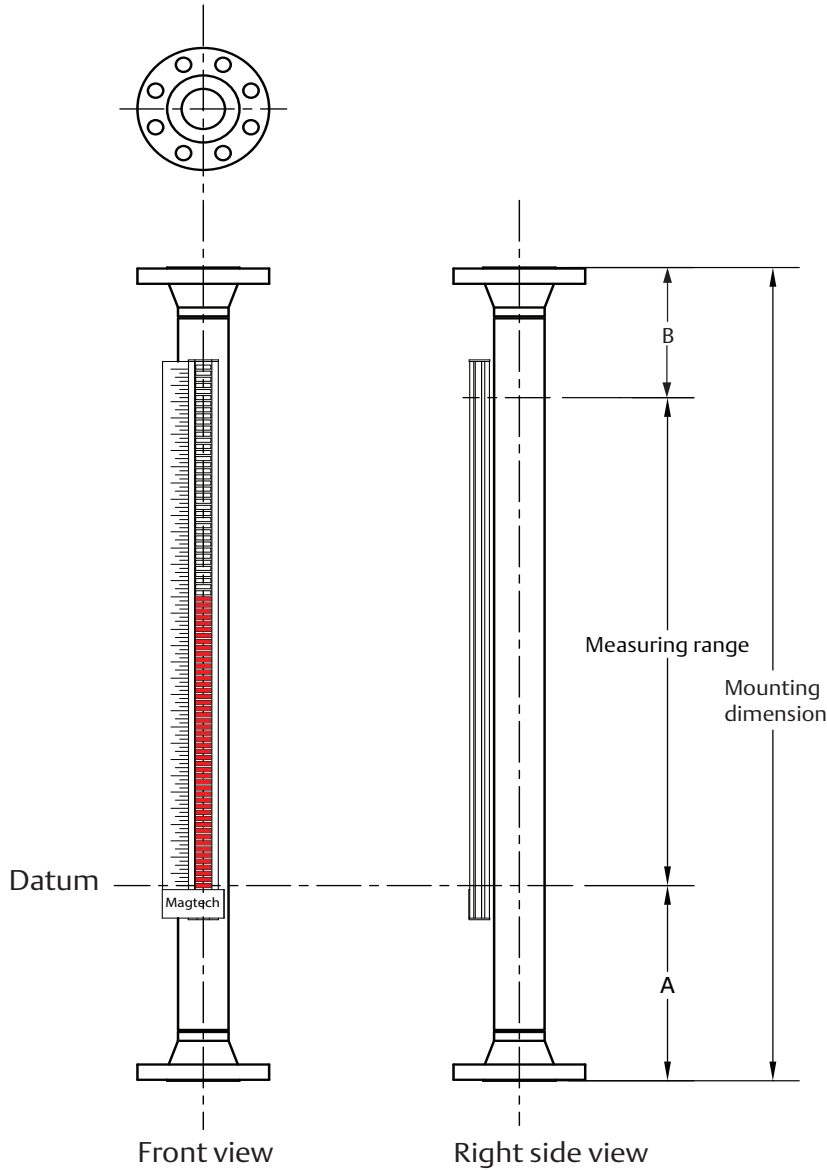
All gauges are shipped complete with 0.125-in. composition gaskets for protection of flanges. Customer is responsible for process compatible gaskets for protection of flanges.

Note

If composition gaskets are not compatible with your process conditions, appropriate gaskets should be used in place of those shipped with the gauge.

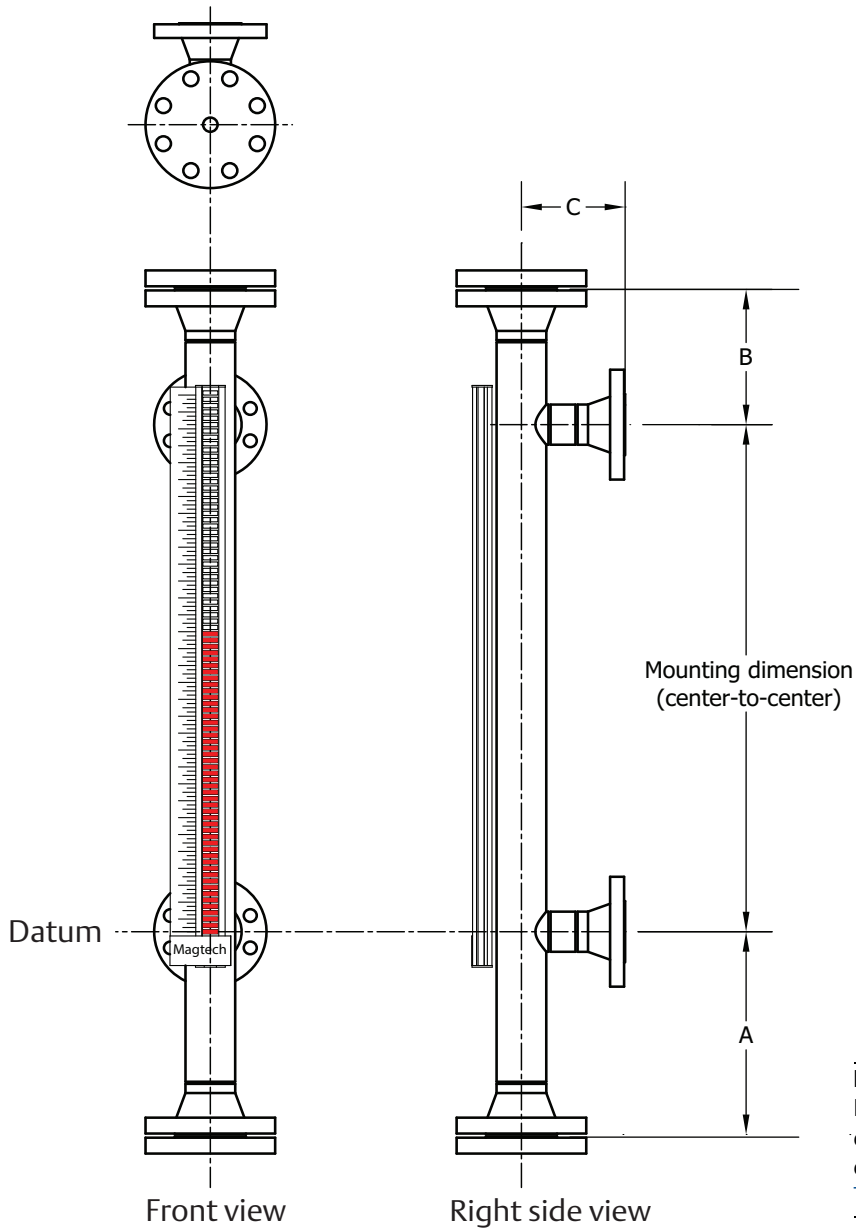
Dimensional Drawings

Figure 3. Standard MLI - style A



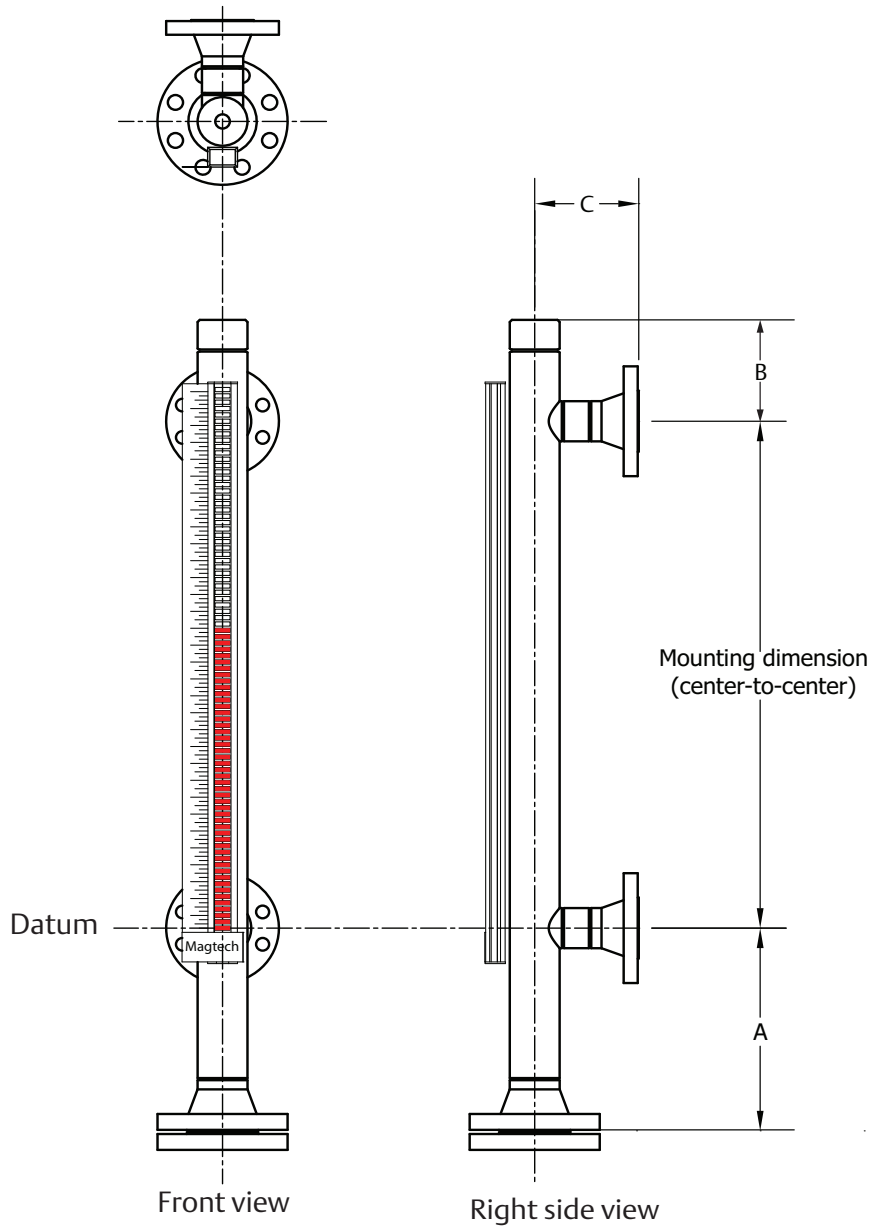
Note
For reference use only. Do not use for construction purposes or as built unless certified by Magtech. Drawing is generic - see [Table 1](#) for detailed options.

Figure 4. Standard MLI - style B



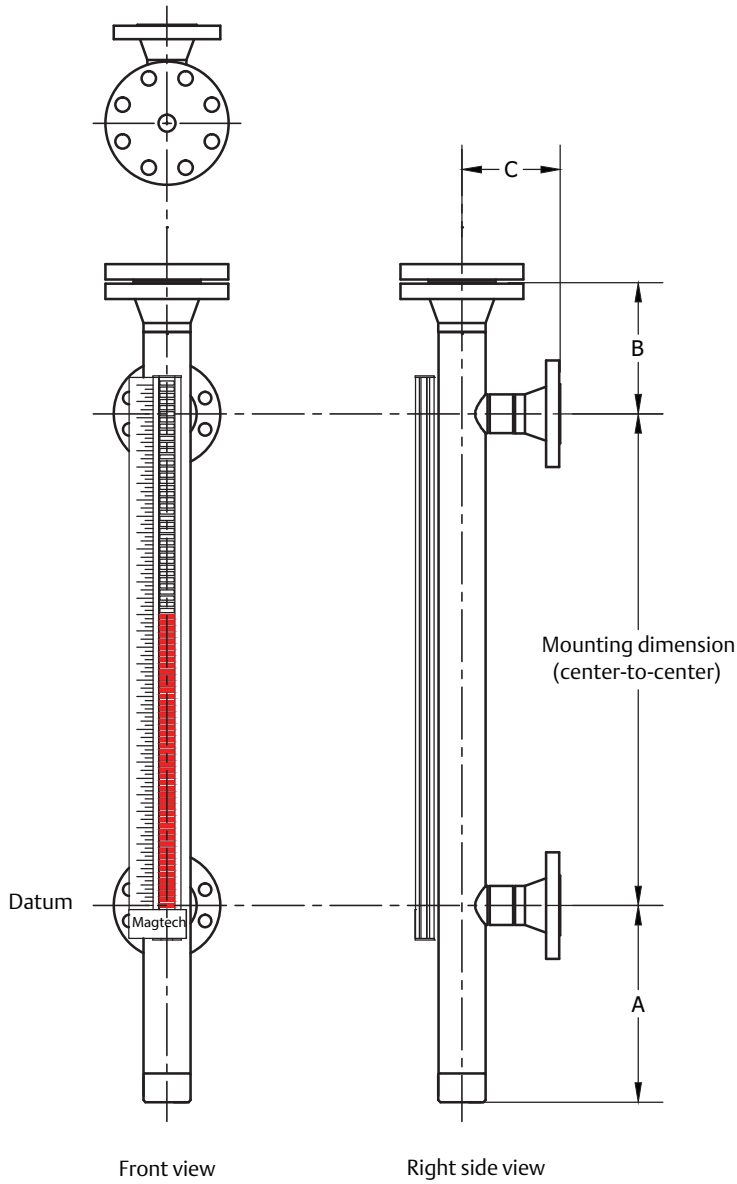
Note
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Figure 5. Standard MLI - style C



Note
For reference use only. Do not use for construction purposes or as built unless certified by Magtech. Drawing is generic - see [Table 1](#) for detailed options.

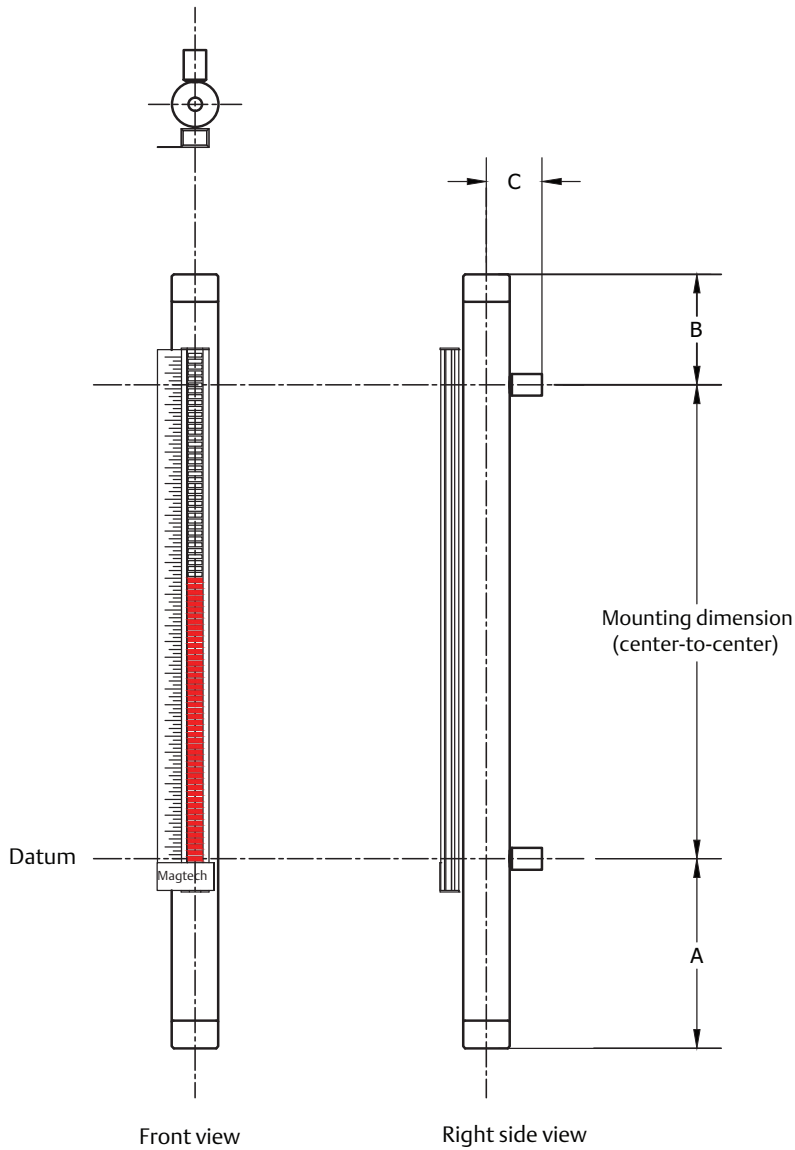
Figure 6. Standard MLI - style D



Note

For reference use only. Do not use for construction purposes or as built unless certified by Magtech. Drawing is generic - see [Table 1](#) for detailed options.

Figure 7. Standard MLI - style L



Note
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