



## PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

MODELS MG/MG2/MGVB/TMMG

Multiview™ products offer a superior solution to liquid level monitoring and a viable alternative to glass level gauges, float switches, displacers and other mechanical and electronic level technologies



### FEATURES

- Hermetically sealed indicator with 316 SS housing.
- Optional gold anodized flags and followers.
- Standard and concentric magnet design for superior coupling.
- Custom weighted magnetic float.
- Chamber designed to ASME B31.3 and B31.1.
- Easy installation and virtually maintenance-free.
- Optional magnetically coupled clamp on transmitters and switches available for the magnetic liquid level gauge.
- Model MGVB (vapor bypass) provides superior solution to process flashing.

### GENERAL APPLICATION

The Multiview™ product line offers an extensive range of models and accessories to meet the needs of both simple and stringent level measurement applications in petrochemical processing, refining, compressors, water treatment, storage tanks and oil water separators.

### TECHNICAL DATA

Materials:	304/304L SS, 316/316L SS, Alloy 20Cb3, Hastelloy® C276, Monel®, PVC, CPVC, PVDF, Tefzel® lined, Halar® lined
Pressures	
Floats:	Up to ASME Class 900
Standpipes:	Up to 3100 psig (213.8 barg)
Minimum specific gravity:	0.37
Temperature range:	-325°F to 750°F (-198°C to 399°C)

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## MULTIVIEW INDICATORS

### MULTIVIEW™ FOLLOWER-TYPE AND FLAG-TYPE INDICATORS



#### FOLLOWER-TYPE INDICATION

These units consist of a hermetically sealed tube in a protective view housing. Within this tube is a gold [other colors are available] anodized aluminum follower which will mirror level changes in the process tank. This entire assembly is attached to the standpipe, where the follower is coupled magnetically with the float.

Because the follower and float are linked magnetically, liquid level changes in the process tank will cause the float and the follower to rise and fall in unison resulting in a precise indication of liquid level within the vessel. The anodized gold follower is designed to withstand extreme heat up to 800°F (427°C) without adverse wear and discoloration.

Follower-type monitoring is suitable for most applications, except where violent changes in level or high vibration can cause the follower to decouple from the float. Flag-type indication is recommended for these applications.

#### ALUMINUM FLAG-TYPE INDICATION

MG flag-type models provide an enhanced secure link between the indicator and float. The view housing is sealed and consists of a single-column assembly of aluminum flags within an extruded aluminum channel. These flags are anodized with black on one side and gold on the other. Each flag houses a small magnet and is assembled on an individual axle.

As the float in the standpipe rises and falls, the magnetic interaction between the float and flag magnets causes the flags to rotate 180°. These changes are shown through contrasting colors - black above and gold below the liquid level. To ensure trouble-free operation, our flags are interlocked magnetically and utilize mechanical stops to prevent over-rotation.

The redundant axle system helps prevent binding, with each flag allowed to rotate on the axle and each axle free to rotate in the channel. This method of indication is accurate regardless of the speed of process level change or vibration.

#### HERMETICALLY-SEALED FLAG-TYPE INDICATION

MG hermetically-sealed flag-type models comprise magnetic polymer ferrite composite flags assembled in an extruded aluminum tray which is encased in an evacuated and 100% fused glass tube. This provides a true hermetic seal which eliminates visibility problems due to condensation from humid environments or wash-downs. A 316 stainless steel housing protects the glass tube and provides corrosion-resistance in harsh environments.

Penberthy hermetically sealed flag indicators incorporate patent pending triple anti-rotation protection features to ensure proper alignment of the flags with the magnetic float. These models feature magnetically interlocking flags and utilize 180 degree mechanical stops to prevent over rotation. The result is reliable magnetic coupling even under vibration conditions.

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## MODELS MG AND MG2

### MG AND MG2 MODELS

The standard MG2 model utilizes an NPS 2 Schedule 10 pipe with a conventional corrugated magnetic-ring float design for pressure ratings up to ASME Class 150. The MG can utilize an NPS 2½ Schedule 10 or Schedule 40 pipe with a concentric magnetic float design for applications in higher vibration environments. The MG float design also provides increased internal support for higher-pressure applications. Also available are interface floats designed so that 50% of the float's length rides in the heavier of the two liquids and 50% in the lighter liquid. At least 0.2 difference in specific gravity is required. All metallic standpipes are designed in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, ASME B31.1 and B31.3. This makes them ideal for use in all kinds of storage and pressure vessel applications, including those in the most extreme-duty conditions. In addition, polymer versions constructed of NPS 2 Schedule 40 pipe are offered for low-pressure applications, where cost control and corrosion resistance are required.

### FEATURES AND BENEFITS

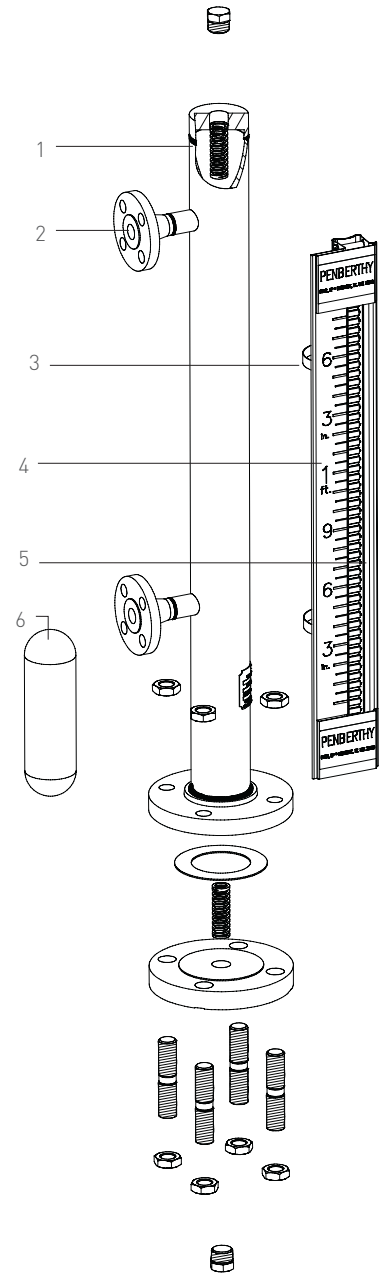
- **Connection versatility** - A wide variety of connections are available: weld neck flanges, lap-joint flanges, weldolets, threadolets, sockolets, NPT threads and other plumbing options. Extruded tee allows for full-penetration welding on all side connections for Schedule 10 pipe.
- **Process compatibility** - A wide variety of material or lining options to meet most process applications.
- **Code design** - Meets the design requirements of ASME B&PV Code, Section VIII, Division 1, ASME B31.1 and B31.3. ASME 'U' Stamp and Pressure Equipment Directive 97/23/EC Certificate of Conformity available.
- **Remote control and indication** - A wide variety of switches and transmitters are available for mounting on the standpipe.

### Construction materials

- 304 / 304L SS
- 316 / 316L SS
- Alloy-20 Cb3
- Hastelloy® C 276
- Monel®
- PVC
- CPVC
- PVDF
- Tefzel® lined
- Halar® lined

### Illustration key

- 1 Standpipe
- 2 Vessel connection
- 3 Clamp
- 4 Indicator scale
- 5 Follower or flag indicator
- 6 Magnetic float



# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## MODELS MG AND MG2

### TEMPERATURE RANGES

Float/standpipe material	Minimum temperature °F (°C)	Maximum temperature °F (°C)
Metallic	-325°F (-198°C)	750°F (399°C)
PVC	-20°F (-28°C)	140°F (60°C)
CPVC	-20°F (-28°C)	200°F (93°C)

### FLOAT MINIMUM SPECIFIC GRAVITY

Float material	Minimum specific gravity
316 / 316L SS	0.49
Titanium	0.37
Monel®	0.51
Alloy-20Cb3	0.47
Hastelloy®-C276	0.53
PVC	0.79
CPVC	0.86
Other	Consult Sales

### NOTE

Stated specific gravity is for NPS 2½ ASME Class 150 schedule 10 extended length float, except for polymers.

### STANDARD STANDPIPE LENGTHS

		Overall (mm)	Vessel centers (mm)
Side connection	Minimum	20 <sup>7</sup> / <sub>16</sub> " [519]	4 <sup>1</sup> / <sub>4</sub> " [108]
	Maximum	259 <sup>15</sup> / <sub>16</sub> " [6577]	236" [5994]
End connection	Minimum	20 <sup>7</sup> / <sub>16</sub> " [519]	4 <sup>1</sup> / <sub>4</sub> " [108]
	Maximum	254 <sup>15</sup> / <sub>16</sub> " [6475]	236" [5994]

### NOTE

Consult your sales representative for lengths outside of stated maximum or minimum.

### PRESSURE RATINGS (float limited)

Float/standpipe material	Standpipe schedule 10	Standpipe schedule 40	Float at 100°F ASME / psig
	psig at 100°F (kPag at 38°C)	psig at 100°F (kPag at 38°C)	
316 / 316L SS	1600 (11034)	2800 (19310)	Class 900 / 2160
Titanium	915 (6310)	1590 (10966)	Class 900 / 1800
Monel®	1500 (10345)	2600 (17931)	Class 900 / 1800
Alloy-20Cb3	1400 (9655)	2500 (17241)	Class 900 / 1800
Hastelloy®-C276	1800 (12414)	3100 (21379)	Class 900 / 2250
PVC	-	250 (1724)	150 psig
CPVC	-	250 (1724)	150 psig
Other	Consult Sales	Consult Sales	Consult Sales

### NOTES

Specification may change without notice.

Metallic standpipe based on  $P = \frac{2SEt}{D-2yt}$

Stresses from ASME B31.1 or ASME section IID.

These pressure ratings assume that all fittings are equal to or exceed the standpipe ratings.

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## MODEL MGVB

### MGVB (VAPOR BYPASS) MODEL

The Multiview™ Vapor Bypass is an innovation in magnetic level gauge design and addresses processes where flashing may occur, which can cause many other magnetic gauges to fail. When flashing occurs, the vapor build-up beneath the float cannot escape quickly enough due to the limited clearance between the float and the chamber wall. This causes the float to rocket to the top of the chamber where it is crushed or damaged. The Multiview™ Vapor Bypass features a large chamber - a unique cage system which confines the float to one side of the chamber. This allows the maximum area for vapor to by-pass the float, ensuring proper magnetic coupling to the indicator.

### FEATURES

- Larger chamber and unique internal float cage
- Magnetically interlocked flag-type indication
- Custom-weighted magnetic float
- Designed in accordance with ASME B31.3
- Easy installation
- Virtually maintenance-free
- Optional transmitter or switches

### TYPICAL APPLICATIONS

- Light hydrocarbons
- Liquid nitrogen
- Propane
- Methane
- Carbon dioxide
- Anhydrous ammonia  
(or any pressure-liquified gas)

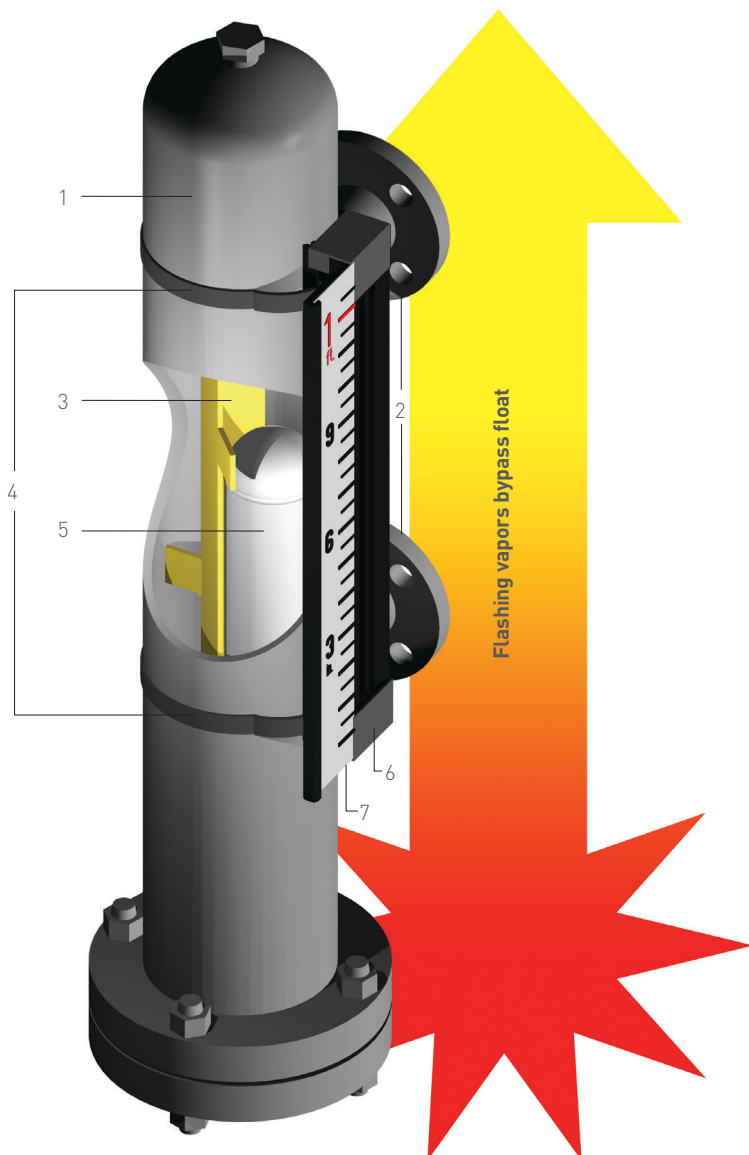
### TECHNICAL DATA

Standpipe material: NPS 4 Schedule 40 pipe  
Size range: Vessel centers are 4.25" to 236" (108 mm to 5994 mm)  
Minimum specific gravity: 0.47  
Pressure rating: Up to ASME Class 300  
Temperature range: -325°F to 750°F (-198°C to 399°C)

Refer to previous pages for other features shared with the standard Multiview™.

### Illustration key

- 1 Standpipe
- 2 Vessel connections
- 3 Internal guide cage
- 4 Clamp
- 5 Magnetic float
- 6 Flag indicator
- 7 Indicator scale



# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## MODEL TMMG

### TMMG (TOP-MOUNT MAGNETIC GAUGE) MODEL

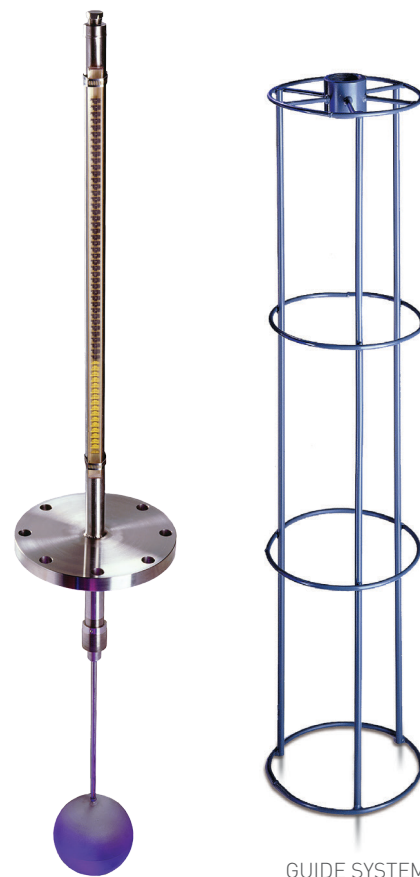
The Multiview™ TMMG is the ideal solution when side-mounted level monitoring is not feasible. It features the same trouble-free method of operation as a standard Multiview™ magnetic liquid level gauge. A stilling well is recommended to help protect both the float and the tube from damage, the primary cause of top-mount failure. In vessels where large particulates can become trapped between float and stilling well, our unique guide system limits the contact area, virtually eliminating the possibility of particulates clogging and hindering the float.

#### FEATURES

The TMMG float is located in the containment vessel, while the magnet assembly is at the opposite end of a tube in the standpipe. As the float level changes, so does the magnetic position. The level change is visually conveyed to the operator via the indicator mounted to the standpipe.

#### OPTIONS

- Both point-level and continuous electronic level indication can be added by using third-party approved switches and transmitters.
- An optional stilling well can be installed for additional protection of both float and tube.
- Unique guide system can be added to help minimize the risk of particulate matter/crystallization affecting float operation.



TMMG

GUIDE SYSTEM

#### FLOAT MINIMUM SPECIFIC GRAVITY

Float diameter inches NPS (mm)	Minimum specific gravity
3.5 (89)	0.50
4.5 (114)	0.32
6 (152)	0.21
8 (203)	0.20
10 (254)	0.15

Specific gravities are based upon multiple ASME Class 150 Titanium floats. The actual minimum specific gravity will be application-based.

#### CONSTRUCTION MATERIAL

	Standpipe	Float
304 / 304L SS	•	•
316 / 316L SS	•	•
Titanium	•	•
Monel®	•	•
Alloy-20Cb3	•	•
Hastelloy®-C276	•	•
Other	Consult Sales	

#### MINIMUM VESSEL - OPENING REQUIREMENTS

Float diameter inches (mm)	Minimum flange connection required NPS
3.5 (89)	4
4.5 (114)	6
6 (152)	6
8 (203)	8
10 (254)	10

Minimum connection sizes assume the use of a Schedule 10 stilling well equal to the flange size. If a higher schedule or Penberthy's guide system is used, consult your sales representative.

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## SWITCHES AND TRANSMITTERS

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### SWITCHES AND TRANSMITTER OPTIONS

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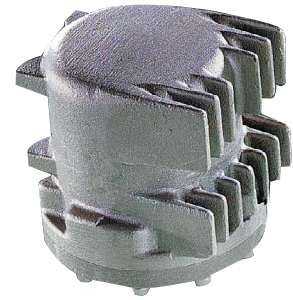
Both point-level control and/or continuous level measurement are available with the Multiview™. These options can be ordered with your magnetic gauge or can be added to existing units.

**MGS Switches** provide non-intrusive, point-level control.

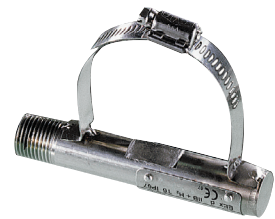
- MGS-314: SPDT (Form C) 5A service.
- MGS-314D: DPDT (2x Form C) 10A service.
- MGS-314L: SPDT (Form C) 1A service used with Standard Multiview™.

**MGT Transmitters** provide continuous level indication to remote locations via a 4 to 20 mA loop-powered transmitter, HART® Protocol or Foundation™ Fieldbus.

- MGT-362: a reed switch-based unit available in integral and remote mounting styles.
- MGT-367: a magnetostrictive transmitter available with HART® Protocol or Foundation™ Fieldbus and optional local LCD push button display.



MGS-314/D SWITCH



MGS-314L



MGT-367 - with optional LCD display



MGT-362 TRANSMITTER

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## SWITCH / TRANSMITTER OPTIONS AND SPECIFICATIONS

### MGS-314 SWITCH SPECIFICATIONS

	MGS-314 / 314D	MGS-314L
CSA-Certified Ex d Explosion-proof	Division 1, 2 Class I: Groups B, C, D Class II: Groups E, F, G Class III, Type 4 When installed in accordance with Penberthy drawing #7E741-009	Division 1,2 Class I: Groups A, B, C, D When installed in accordance with Penberthy drawing #7E741-008
CSA-Certified Ex ia Intrinsically safe	Division 1, 2 Class I: Groups A, B, C, D Class II: Groups E, F, G Class III, Type 4 When installed in accordance with Penberthy drawing #7E742-009	Division 1, 2 Class I: Groups A, B, C, D When installed in accordance with Penberthy drawing #7E742-008
Enclosures	Watertight (Type 4), explosion-proof cast aluminum	Watertight (Type 4), SS
Output	MGS-314: SPDT (Form C) 5A at 125 / 250 / 277 V AC Non-inductive load	MGS-314D: DPDT (2x Form C) 10A at 125 / 250 V AC Non-inductive load
SPDT (Form C)		SPDT (Form C) 1A at 130 V AC/DC Non-inductive load
Repeatability	Better than 0.032 inches	Better than 0.032 inches
Response time	<100 milliseconds	<100 milliseconds
Deadband	0.5 inches	0.5 inches
Operating temperature	-40°F to 365°F (-40°C to 185°C) with third-party approvals -260°F to 645°F (-162°C to 340°C) without third-party approvals	-40°F to 225°F (-40°C to 107°C)

### MGT-362 Transmitter specifications

CSA-Certified Ex d Explosion-proof	Division 1, 2 Class I: Groups B, C, D Class II: Groups E, F, G Class III, Type 4 When installed in accordance with Penberthy drawing #18F51-009
CSA-Certified Ex ia Intrinsically safe	Division 1, 2 Class I: Groups A, B, C, D Class II: Groups E, F, G Class III, Type 4 When installed in accordance with Penberthy drawing #18F52-009
Enclosures	Watertight (Type 4), explosion-proof cast aluminum
Loop voltage	11 to 30 V DC
Output	4 to 20 mA continuous; 22 mA failure indication
Resolution	0.375 inches
Response time	<30 milliseconds
Operating temperature	-40°F to 160°F (-40°C to 70°C) transmitter -260°F to 257°F (-162°C to 125°C) sensor (unprotected)

#### NOTE

Contact factory for model numbers pertaining to agency approvals.  
Specification data subject to change without notice.

### MGT-367 Transmitter specifications

Explosion proof/flame proof	
FM 3615	Class I, Division 1, Groups B, C and D*
C22.2 No. 30	Class II, Division 1, Groups E, F and G* Class III, Type 4X, T4
IECEx (60079)	IECEx FMG 13.0019X Ex d IIB T4 Ga/Gb IP66
ATEX (60079)	FM13ATEX0050X Ex II 1/2 G Ex d IIB T4 Ga/Gb IP66
No. 2013-54	Ex d IIB T4 Ga/Gb
No. 2013-55	TUV 14.0935
IEC (60069)	Ex d IIB T4 Ga/Gb IP66
Intrinsically safe	
C22.2 No. 157	Class I, Division 1, Groups B, C and D Class II, Division 1, Groups E, F and G Class III, Type 4X, T4
ATEX (60079)	PTB 10 ATEX 2011 X Ex II 1/2 G bzw. II 2 G EX ia IIA T4 bzw. Ex ia IIB T4**
FM 3610	Class I, Division 1, Groups C and D order length < 300 inches Class I, Division 1, Group D order length > 300 inches Class II, Division 1, Groups E, F and G Class III, Type 4X, T4
GB3836.4	Ex ia IIB T4 Ga/Gb GYJ14.1051X
Enclosures	Watertight (Type 4X) explosion-proof cast aluminum with optional LCD push button display
Loop voltage	10.5 to 36.1 V DC
Output	4 to 20 mA continuous
Repeatability	0.01% F.S. or 0.015 inches***
Communications protocol	Base HART® command capability or Foundation™ Fieldbus
Operating temperature	-30°F to 160°F (-34°C to 70°C) electronics -30°F to 300°F (-34°C to 149°C) sensor

#### NOTES

- \* Explosion proof housing required
- \*\* Contact factory for model numbers
- \*\*\* Whichever is greater



# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## ACCESSORIES

### Insulation blankets

Insulation blankets can withstand temperatures ranging from -300°F to 750°F (-184°C to 399°C). Flexible blankets are available in thicknesses of ½", 1" or 2". Materials available include fiberglass cloth coated with either PTFE or silicone rubber. Rigid blankets in thicknesses of 4" to 12" are available in other materials on request.

### Drum level Indicator

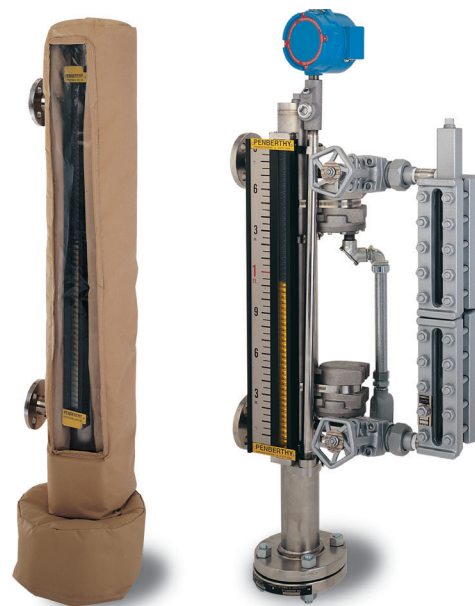
Combining Multiview magnetic gauge with an integrally mounted armored gage, Penberthy's drum level indicator offers improved safety, convenience, and versatility, meeting ASME Boiler and Pressure Vessel Code, Section I, PG-60 requirements for water level indicators. By adding the MGS-314 switch and MGT-362 transmitter, remote level measurement transmission and precise control capability is possible.

### Thermal tracing

Multiview™ magnetic liquid level meters can be equipped with electrical heat tracing or piped for either refrigerant or steam use. To determine the temperature differential, subtract the minimum expected ambient temperature from the desired maintenance temperature. An insulation blanket is highly recommended in these cases.

### Frost-free extensions

Frost-free extensions should be used in super-frigid applications such as liquid nitrogen or liquified ethylene. Aluminum flag and follower monitoring systems can be equipped with PMMA frost-free features. Due to low thermal conductivity, this material resists frost build-up to maintain clear visibility. With widths ranging from 2" to 12", these extensions can be paired with virtually any thickness of insulation blanket.



Insulation blankets

Drum level indicator



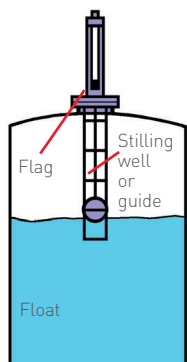
Frost-free extensions



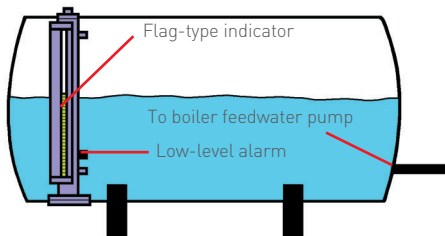
Indicator pointer

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

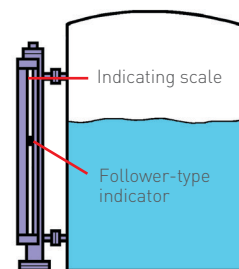
## TYPICAL TANK CONFIGURATIONS



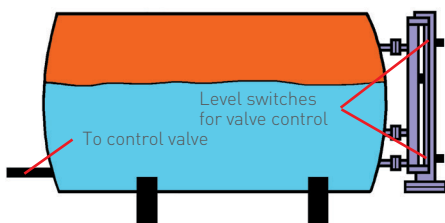
Top-mounted indicator



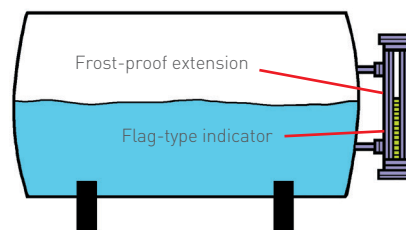
Boiler feedwater tank



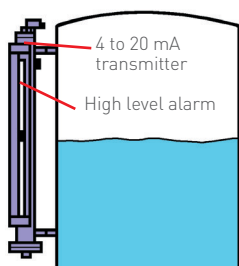
Sodium hypochlorite



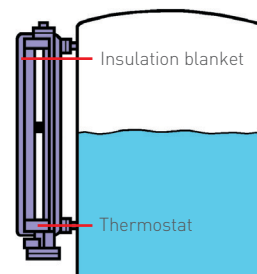
Oil/water separator



Liquid nitrogen



Hydrochloric acid



Sodium hydroxide

### Typical process applications

- Sodium hypochlorite
- Boiler feedwater tank
- Hydrochloric acid
- Stop oil
- LPG
- Interface
- Dowtherm®
- Sulfuric acid
- Hydrogen sulfide
- Oil/water separator
- Sodium hydroxide
- Liquid nitrogen
- Flare drums
- Phosgene

- Ammonia
- Butane
- Seal oil pots
- Black liquor
- Drip pot
- Boiler steam drums
- Glycol
- Propane
- Hydraulic oil
- Feedwater heaters
- Extreme flashing
- Hydrazine
- Caustic chemicals
- Fuel oil
- Hydrofluoric acid

- Jet fuel
- Molten sulfur
- Sour oil
- Diesel fuel
- Deionized water
- Sumps
- Freon®
- Liquid ethylene
- Water
- Underground storage
- Benzene
- Asphalt settler
- Acetic acid
- Liquids and slurries

# PENBERTHY MODELS MAGNETIC LIQUID LEVEL GAUGES

## TECHNICAL DATA

### MULTIVIEW™ LIQUID LEVEL METER - standard length float

ASME pressure rating	Float diameter	Material	Min. specific gravity	Pressure rating										Float test pressure	
				psig at 100°F	kPa g at 37.8°C	psig at 300°F	kPa g at 149°C	psig at 500°F	kPa g at 260°C	psig at 700°F	kPa g at 371°C	psig at 750°F	kPa g at 399°C	psig at 100°F	kPa g at 37.8°C
Class 150	2.0" (51 mm)	316 SS	0.70	275	1896	215	1482	170	1172	110	758	95	655	350	2413
	Sch 10														
	Standpipe														
Class 150	2.25" (57 mm)	316 SS	0.78	275	1896	215	1482	170	1172	110	758	95	655	350	2413
		Titanium	0.53	230	1586	215	1482	210	1448	195	1344	190	1310	300	2068
	Sch 40	Monel	0.90	230	1586	190	1310	170	1172	110	758	95	655	300	2068
	Standpipe	Alloy-20	0.82	230	1586	200	1379	170	1172	110	758	95	655	300	2068
Class 150		Hast-C	0.91	290	1999	230	1586	170	1172	110	758	95	655	375	2586
	2.50" (63.5 mm)	316 SS	0.53	275	1896	215	1482	170	1172	110	758	95	655	350	2413
		Titanium	0.41	230	1586	215	1482	210	1448	195	1344	190	1310	300	2068
	Sch 10	Monel	0.56	230	1586	190	1310	170	1172	110	758	95	655	300	2068
Class 150	Standpipe	Alloy-20	0.52	230	1586	200	1379	170	1172	110	758	95	655	300	2068
		Hast-C	0.58	290	1999	230	1586	170	1172	110	758	95	655	375	2586
Class 300	2.25" (57 mm)	316 SS	0.80	720	4964	560	3861	480	3310	430	2965	425	2930	900	6205
		Titanium	0.56	600	4137	545	3758	545	3758	510	3516	500	3447	750	5171
	Sch 40	Monel	0.92	600	4137	495	3413	475	3275	475	3275	470	3241	750	5171
	Standpipe	Alloy-20	0.84	600	4137	525	3620	470	3241	445	3068	440	3034	750	5171
Class 300		Hast-C	0.93	750	5171	730	5033	665	4585	570	3930	530	3654	950	6550
	2.25" (57 mm)	316 SS	0.89	1440	9929	1120	7722	955	6585	865	5964	845	5826	1800	12411
		Titanium	0.62	1200	8274	1130	7791	1085	7481	1020	7033	1000	6895	1500	10342
	Sch 40	Monel	0.96	1200	8274	990	6826	950	6550	950	6550	935	6447	1500	10342
Class 300	Standpipe	Alloy-20	0.88	1200	8274	1045	7205	935	6447	890	6136	880	6067	1500	10342
		Hast-C	0.98	1500	10342	1455	10032	1330	9170	1135	7826	1065	7343	1875	12928
Class 600	2.25" (57 mm)	316 SS	0.98	2160	14893	1680	11583	1435	9894	1295	8929	1270	8756	2700	18616
		Titanium	0.68	1800	12411	1680	11583	1435	9894	1295	8929	1270	8756	2250	15513
	Sch 40	Monel	1.01	1800	12411	1485	10239	1435	9894	1435	9894	1405	9687	2250	15513
	Standpipe	Alloy-20	0.94	1800	12411	1570	10825	1405	9687	1335	9205	1320	9101	2250	15513
Class 600		Hast-C	1.06	2250	15513	2185	15065	1995	13755	1705	11756	1595	10997	2825	19478

#### NOTE

Consult factory for the minimum specific gravity for Halar® or Tefzel® coated floats

Consult factory for information regarding floats for interface service

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## TECHNICAL DATA

### MULTIVIEW™ LIQUID LEVEL METER - extended length float

ASME pressure rating	Float diameter	Material	Min. specific gravity	Pressure rating										Float test pressure	
				psig at 100°F	kPa g at 37.8°C	psig at 300°F	kPa g at 149°C	psig at 500°F	kPa g at 260°C	psig at 700°F	kPa g at 371°C	psig at 750°F	kPa g at 399°C	psig at 100°F	kPa g at 37.8°C
Class 150	2.25" (57 mm)	316 SS	0.74	275	1896	215	1482	170	1172	110	758	95	655	350	2413
	Sch 40	Monel	0.47	230	1586	215	1482	210	1448	195	1344	190	1310	300	2068
	Standpipe	Alloy-20	0.84	230	1586	190	1310	170	1172	110	758	95	655	300	2068
		Hast-C	0.76	230	1586	200	1379	170	1172	110	758	95	655	300	2068
Class 150	2.50" (63.5 mm)	316 SS	0.84	290	1999	230	1586	170	1172	110	758	95	655	375	2586
		Titanium	0.49	275	1896	215	1482	170	1172	110	758	95	655	350	2413
	Sch 10	Monel	0.37	230	1586	215	1482	210	1448	195	1344	190	1310	300	2068
	Standpipe	Alloy-20	0.51	230	1586	190	1310	170	1172	110	758	95	655	300	2068
		Hast-C	0.47	230	1586	200	1379	170	1172	110	758	95	655	300	2068
Class 300	2.25" (57 mm)	316 SS	0.53	290	1999	230	1586	170	1172	110	758	95	655	375	2586
		Titanium	0.76	720	4964	560	3861	480	3310	430	2965	425	2930	900	6205
	Sch 40	Monel	0.51	600	4137	545	3758	545	3758	510	3516	500	3447	750	5171
	Standpipe	Alloy-20	0.86	600	4137	495	3413	475	3275	475	3275	470	3241	750	5171
Hast-C		0.78	600	4137	525	3620	470	3241	445	3068	440	3034	750	5171	
Class 600	2.25" (57 mm)	316 SS	0.87	750	5171	730	5033	665	4585	570	3930	530	3654	950	6550
		Titanium	0.84	1440	9929	1120	7722	955	6585	865	5964	845	5826	1800	12411
	Sch 40	Monel	0.57	1200	8274	1130	7791	1085	7481	1020	7033	1000	6895	1500	10342
	Standpipe	Alloy-20	0.90	1200	8274	990	6826	950	6550	950	6550	935	6447	1500	10342
Hast-C		0.83	1200	8274	1045	7205	935	6447	890	6136	880	6067	1500	10342	
Class 900	2.25" (57 mm)	316 SS	0.92	1500	10342	1455	10032	1330	9170	1135	7826	1065	7343	1875	12928
		Titanium	0.90	2160	14893	1680	11583	1435	9894	1295	8929	1270	8756	2700	18616
	Sch 40	Monel	0.64	1800	12411	1680	11583	1435	9894	1295	8929	1270	8756	2250	15513
	Standpipe	Alloy-20	0.95	1800	12411	1485	10239	1435	9894	1435	9894	1405	9687	2250	15513
Hast-C		0.88	1800	12411	1570	10825	1405	9687	1335	9205	1320	9101	2250	15513	
			1.00	2250	15513	2185	15065	1995	13755	1705	11756	1595	10997	2825	19478

#### NOTE

Consult factory for the minimum specific gravity for Halar® or Tefzel® coated floats

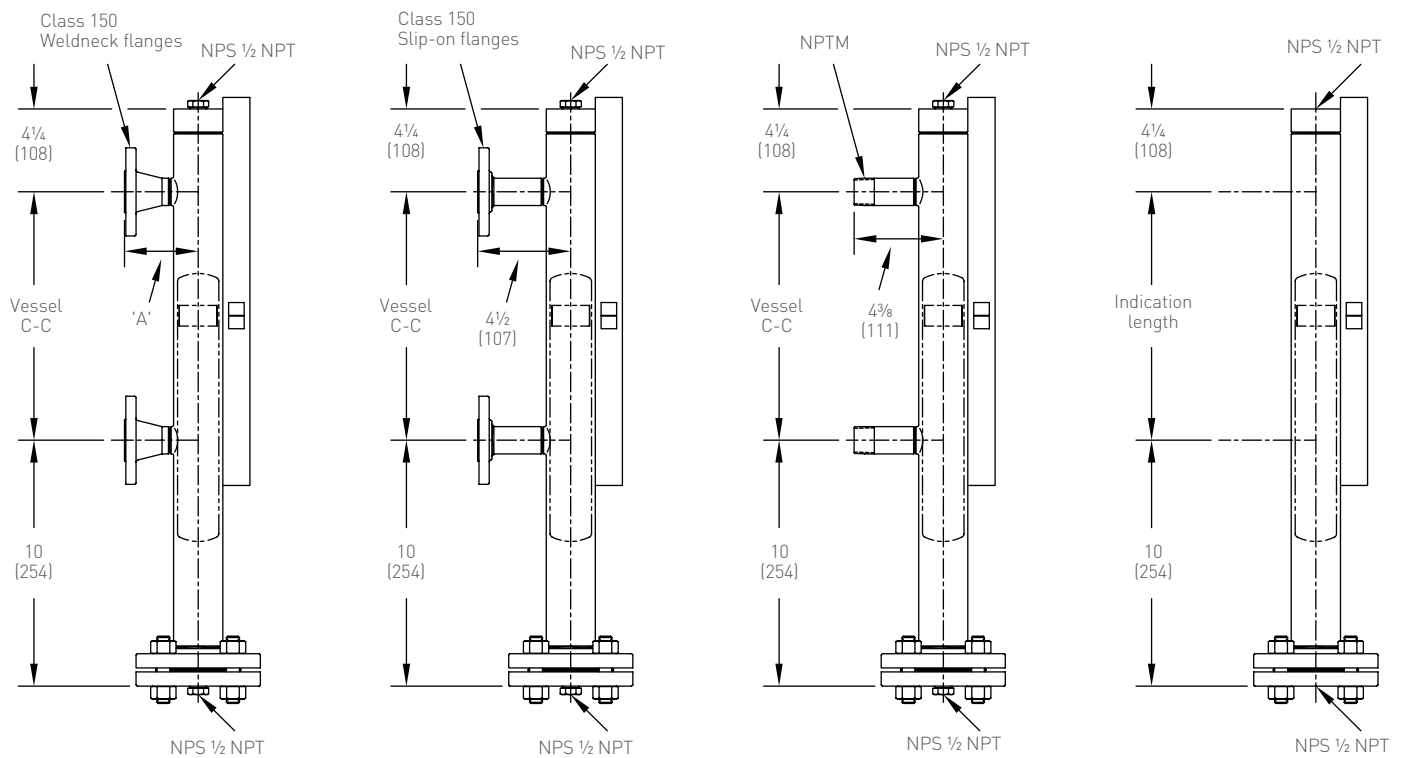
Consult factory for information regarding floats for interface service

### MULTIVIEW™ LIQUID LEVEL METER - PVC, CPVC, PVDF/non-metallic floats

Material	Float diameter		Minimum specific gravity	Pressure/temperature rating psig (kPa g)
	inches	mm		
PVC	1.90	48	0.83	150 psig at 100°F (1034 kPa g at 38°C)
				50 psig at 140°F (345 kPa g at 60°C)
CPVC	1.90	48	0.87	150 psig at 100°F (1034 kPa g at 38°C)
				50 psig at 200°F (345 kPa g at 93°C)
PVDF (Kynar)	1.97	50	0.93	150 psig at 100°F (1034 kPa g at 38°C)
				50 psig at 250°F (345 kPa g at 121°C)

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## DIMENSIONS MG2 CLASS 150



### DIMENSIONS MODEL MG2, NPT threaded and ASME Class 150 flanged

Connection size NPS (side)	Minimum C-C		Dimension A	
	inches	mm	inches	mm
1/2 NPTM	4 1/4	108	-	-
3/4 NPTM	5 1/8	130	-	-
1 NPTM	8 3/4	222	-	-
1/2 Flanged	4 1/4	108	3 1/4	83
3/4 Flanged	5 1/8	130	3 7/16	87
1 Flanged	8 3/4	222	3 7/16	91
1 1/2 Flanged*	8 3/4	222	3 13/16	97
2 Flanged*	8 3/4	222	3 7/8	98
2 1/2 Flanged*	8 3/4	222	4	102
3 Flanged*	8 3/4	222	4 1/16	103

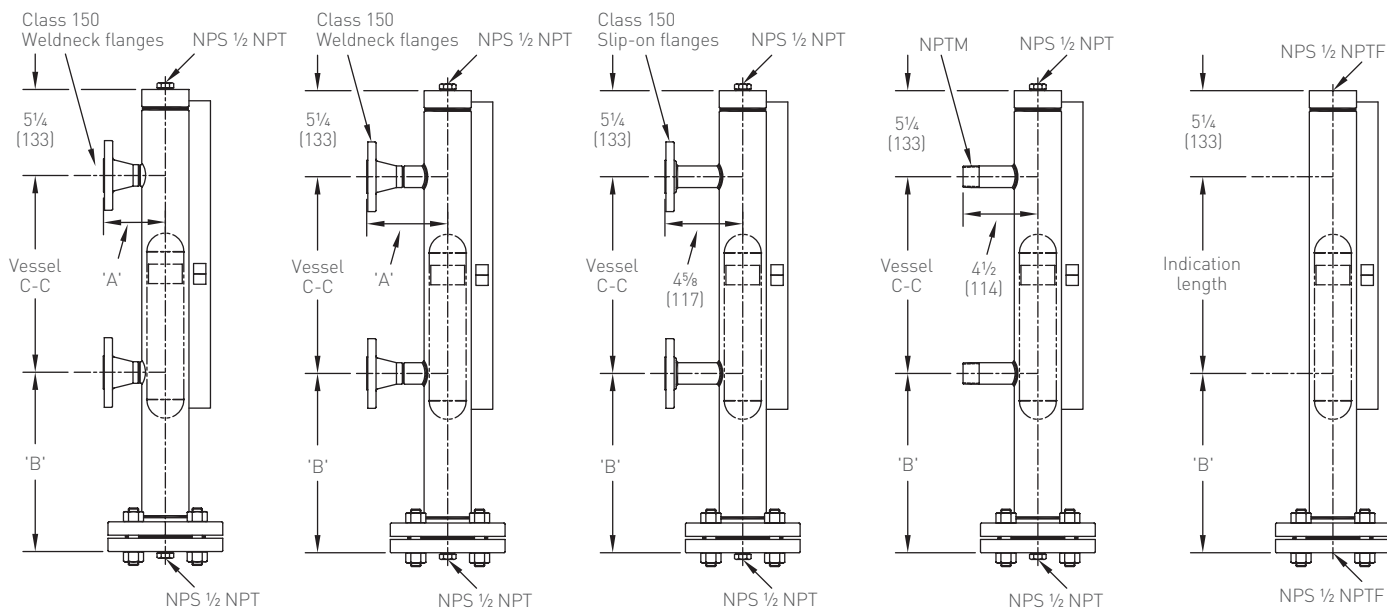
\*All flange connections larger than NPS 1 will be reducing flanges for non-extruded branch connections

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## DIMENSIONS MG CLASS 150

Schedule 10 pipe

Schedule 40 pipe



### DIMENSIONS MODEL MG - NPT threaded and ASME Class 150 flanged

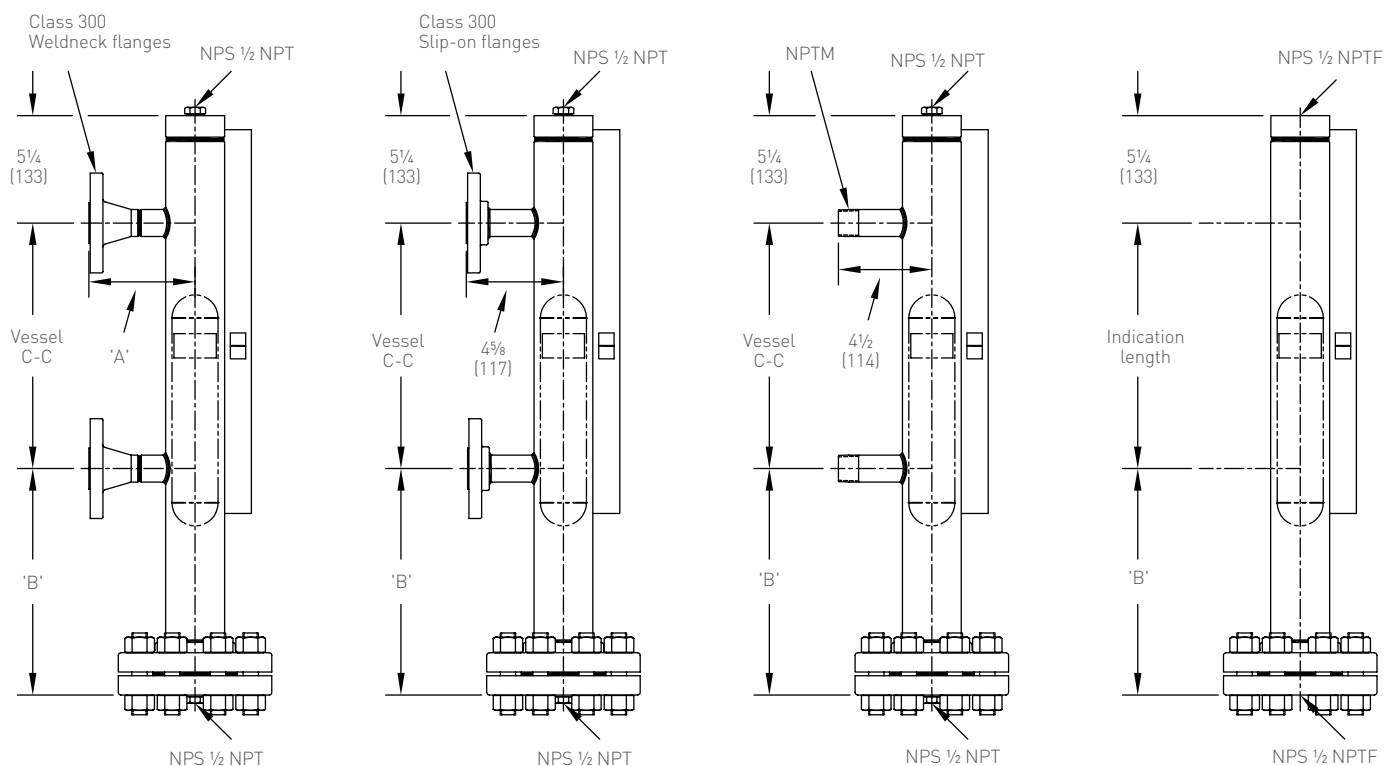
Connection size NPS (side)	Minimum C-C		Dimension A for schedule 10 standpipe		Dimension A for schedule 40 standpipe	
	inches	mm	inches	mm	inches	mm
1/2 NPTM	4 1/4	108	-	-	-	-
3/4 NPTM	5 1/8	130	-	-	-	-
1 NPTM	8 3/4	222	-	-	-	-
1/2 Flanged	4 1/4	108	3 1/2	89	4 5/8	117
3/4 Flanged	5 1/8	130	3 11/16	94	4 13/16	122
1 Flanged	8 3/4	222	3 13/16	97	4 15/16	125
1 1/2 Flanged*	8 3/4	222	4 1/16	103	5 1/16	129
2 Flanged*	8 3/4	222	4 7/8	105	5 1/8	130
2 1/2 Flanged*	8 3/4	222	4 7/8	105	5 1/4	133
3 Flanged*	8 3/4	222	4 3/16	106	5 5/16	135

\*All flange connections larger than NPS 1 will be reducing flanges for non-extruded branch connections

Float length	Dimension B	
	inches	mm
Standard	10 15/16	278
Extended	15 15/16	405

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## DIMENSIONS MG CLASS 300



### DIMENSIONS MODEL MG - NPT threaded and ASME Class 300 flanged

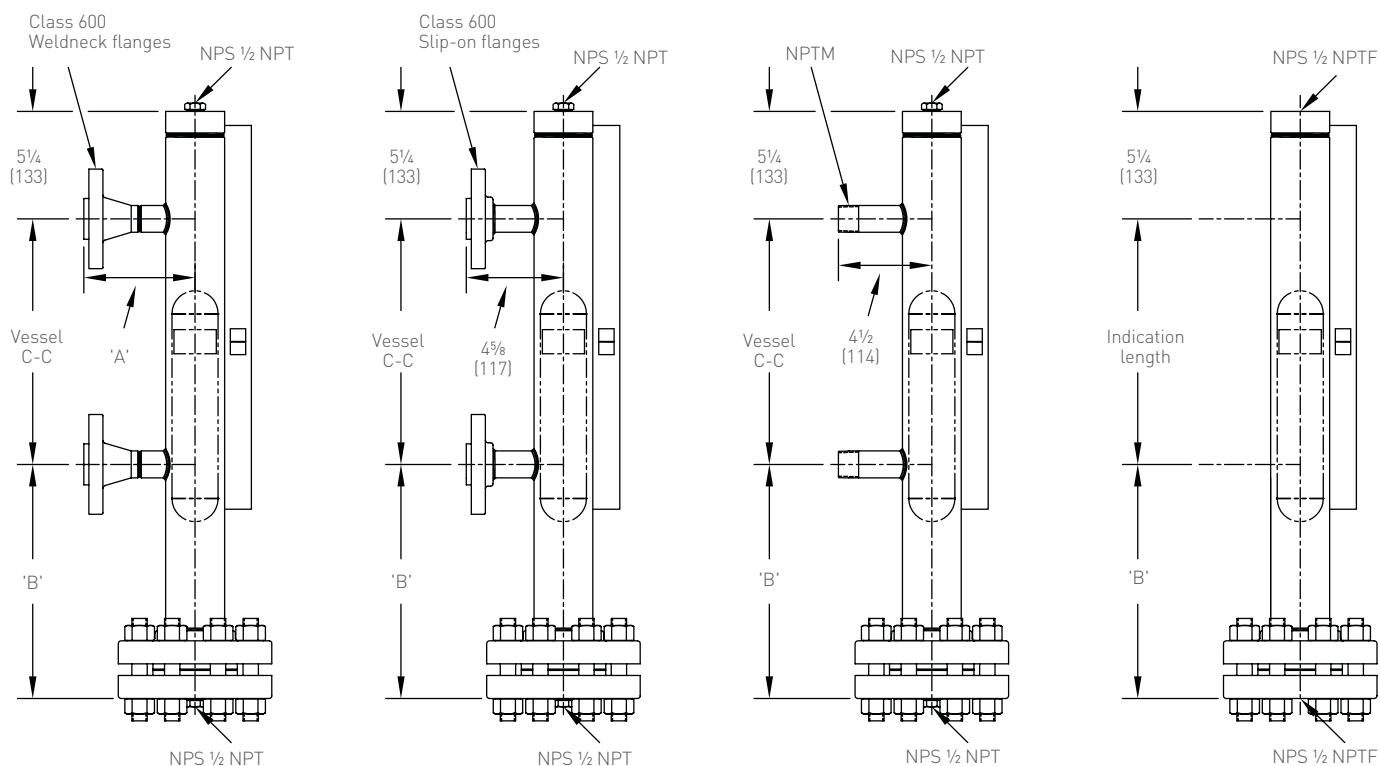
Connection size NPS (side)	Minimum C-C		Dimension A	
	inches	mm	inches	mm
1/2 NPTM	4 1/4	108	-	-
3/4 NPTM	5 1/8	130	-	-
1 NPTM	8 3/4	222	-	-
1/2 Flanged	4 1/4	108	4 13/16	122
3/4 Flanged	5 1/8	130	5	127
1 Flanged	8 3/4	222	5 3/16	132
1 1/2 Flanged*	8 3/4	222	5 5/16	135
2 Flanged*	8 3/4	222	5 3/8	136
2 1/2 Flanged*	8 3/4	222	5 1/2	140
3 Flanged*	8 3/4	222	5 5/8	143

\*All flange connections larger than NPS 1 will be reducing flanges

Float length	Dimension B	
	inches	mm
Standard	11 1/16	281
Extended	16 1/16	408

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## DIMENSIONS MG CLASS 600



### DIMENSIONS MODEL MG - NPT threaded and ASME Class 600 flanged

Connection size NPS (side)	Minimum C-C		Dimension A	
	inches	mm	inches	mm
1/2 NPTM	4 1/4	108	-	-
3/4 NPTM	5 1/8	130	-	-
1 NPTM	8 3/4	222	-	-
1/2 Flanged	4 1/4	108	5 1/16	129
3/4 Flanged	5 1/8	130	5 1/4	133
1 Flanged	8 3/4	222	5 7/16	138
1 1/2 Flanged*	8 3/4	222	5 5/8	143
2 Flanged*	8 3/4	222	5 3/4	146
2 1/2 Flanged*	8 3/4	222	5 5/8	149
3 Flanged*	8 3/4	222	6	152

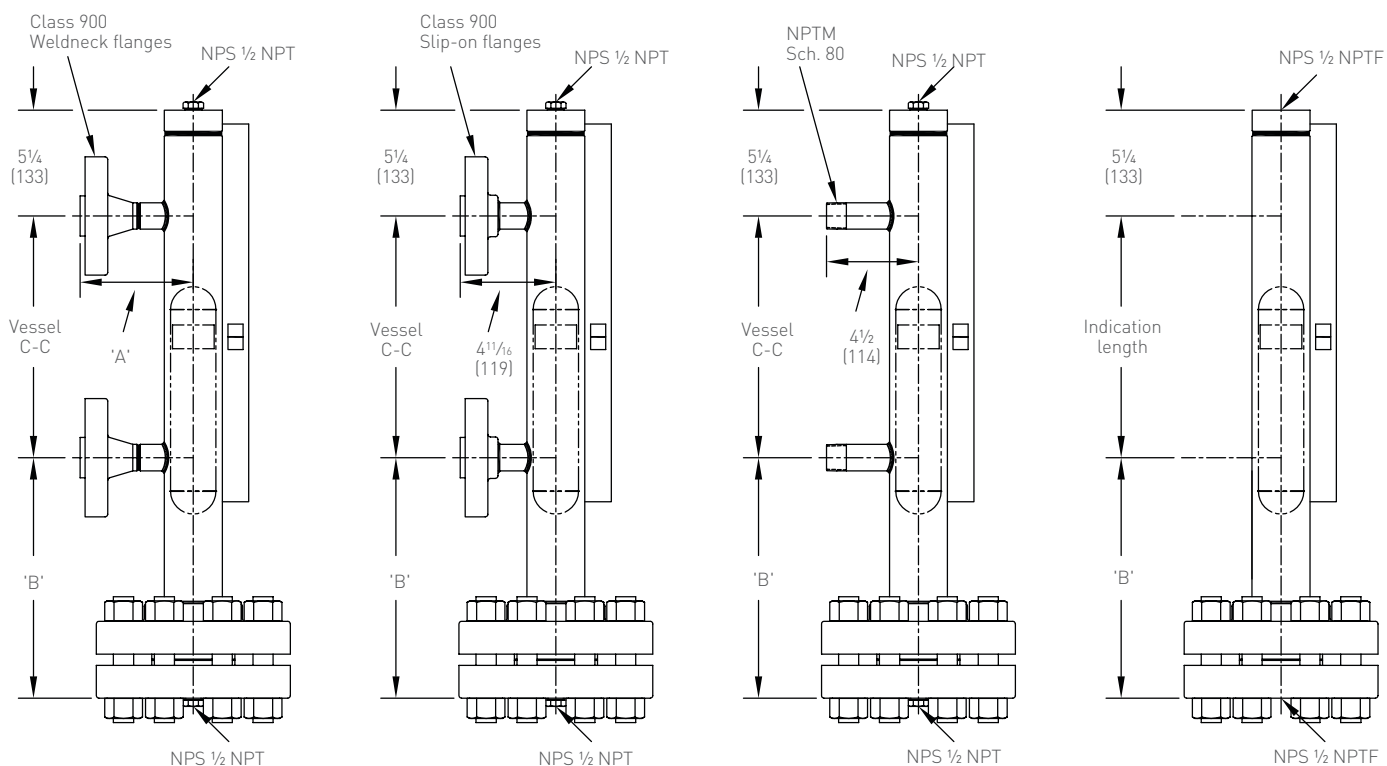
\*All flange connections larger than NPS 1 will be reducing flanges

Float length	Dimension B	
	inches	mm
Standard	11 7/16	291
Extended	16 7/16	418



# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## DIMENSIONS MG CLASS 900



### DIMENSIONS MODEL MG - NPT threaded and ASME Class 900 flanged

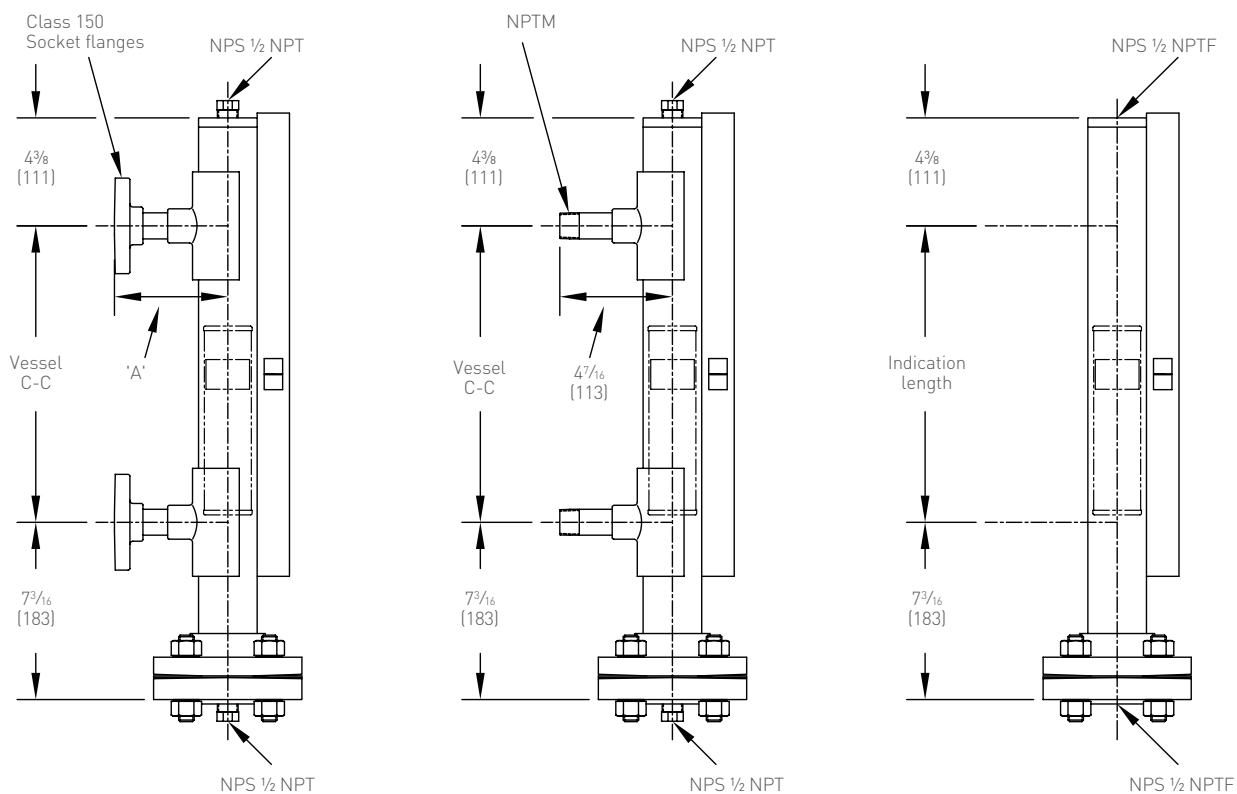
Connection size NPS (side)	Minimum C-C		Dimension A	
	inches	mm	inches	mm
1/2 NPTM	4 1/4	108	-	-
3/4 NPTM	5 1/8	130	-	-
1 NPTM	8 3/4	222	-	-
1/2 Flanged	4 1/4	108	5 3/8	137
3/4 Flanged	5 1/8	130	5 3/4	146
1 Flanged	8 3/4	222	5 7/8	149
1 1/2 Flanged*	8 3/4	222	6	152
2 Flanged*	8 3/4	222	6 1/4	159
2 1/2 Flanged*	8 3/4	222	6 3/8	162
3 Flanged*	8 3/4	222	6 5/8	168

\*All flange connections larger than NPS 1 will be reducing flanges

Float length	Dimension B	
	inches	mm
Standard	11 15/16	303
Extended	16 15/16	430

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## DIMENSIONS MG PVC / CPVC



### DIMENSIONS MODEL MG - PVC and CPVC

Connection size NPS (side)	Minimum C-C		Dimension A for schedule 40 standpipe	
	inches	mm	inches	mm
$\frac{1}{2}$ NPTM	$4\frac{1}{4}$	108	-	-
$\frac{3}{4}$ NPTM	$5\frac{1}{8}$	130	-	-
1 NPTM	$8\frac{3}{4}$	222	-	-
$\frac{1}{2}$ Flanged	$4\frac{1}{4}$	108	$4\frac{5}{8}$	118
$\frac{3}{4}$ Flanged	$5\frac{1}{8}$	130	$4\frac{5}{8}$	118
1 Flanged	$8\frac{3}{4}$	222	$4\frac{5}{8}$	118
$1\frac{1}{2}$ Flanged*	$8\frac{3}{4}$	222	$5\frac{1}{8}$	130
2 Flanged*	$8\frac{3}{4}$	222	$5\frac{1}{4}$	133
$2\frac{1}{2}$ Flanged*	$8\frac{3}{4}$	222	$5\frac{1}{2}$	140
3 Flanged*	$8\frac{3}{4}$	222	6	152

\*All flange connections larger than NPS 1 will be reducing flanges

Float length  $7\frac{3}{8}$  inches (194 mm)

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## MATERIAL SPECIFICATION

### MULTIVIEW™ LIQUID LEVEL GAUGE - Standpipe and float

Part	Standard materials	Optional materials
Chamber (standpipe)	316/316L SS ASTM A312 gr TP 316/316L	304/304L SS ASTM A 312 gr TP 304/304L Hastelloy-C276 ASTM B619 Monel ASTM B165 Alloy-20Cb3 ASTM B464 PVC ASTM D1785 CPVC ASTM F-441 Consult factory
Stud	STL, Zinc Plated ASTM A193 gr B7	304 SS ASTM A193 gr B8 Class 2 Consult factory
Nut	STL, Zinc plated ASTM A193 gr2 or 2H Zinc plate ASTM A153 Class D	304 SS ASTM A194 gr 8 Consult factory
Gasket	Grafoil® gr GHR w/316 STS insert	Consult factory
Float	316/316L SS ASTM A269 gr TP 316/316L	Titanium ASTM B265 gr 5 Hastelloy-C276 ASTM B575 Monel ASTM B127 Alloy-20Cb3 ASTM B463 PVC ASTM D1785 CPVC ASTM F-441 Consult factory
Flange (vessel connection)	316/316L SS ASTM A182 gr F316/316L	304/304L SS ASTM A182 gr F304/304L Carbon steel ASTM A105 Hastelloy-C276 ASTM B564 Monel ASTM B564 Alloy-20Cb3 ASTM B462 PVC Class 12454-B CPVC Class 23447-B Consult factory
Flange (end)	316/316L SS ASTM A182 gr F316/316L	304/304L SS ASTM A182 gr F304/304L Carbon steel ASTM A105 Hastelloy-C276 ASTM B564 Monel ASTM B564 Alloy-20Cb3 ASTM B462 PVC Class 12454-B CPVC Class 23447-B Consult factory

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## MATERIAL SPECIFICATION

### MULTIVIEW™ LIQUID LEVEL GAUGE - INDICATORS

Part	Standard materials	Optional materials
<b>Hermetically sealed flag</b>		
Clamp	Stainless steel	None
Indicator housing	316 SS	304 SS
Flags	Magnetic polymer ferrite composite	None
Flag tray	Aluminum	None
Indicator tube	Borosilicate glass	None
Scale	316 SS	304 SS
<b>Aluminum flag</b>		
Clamp	Stainless steel	None
Indicator housing	Aluminum ASTM B210	None
Flags	Aluminum	None
Pin	316 SS	None
Scale	316 SS	None
Scale bracket	Aluminum ASTM B210	None
Protector	PMMA	Borosilicate glass Polycarbonate
Cap	316 SS	None
<b>Aluminum follower</b>		
Clamp	Stainless steel	None
Indicator housing	Aluminum ASTM B210	None
Indicator tube	Borosilicate glass	None
Follower	Aluminum	None
Scale	316 SS	None
Scale bracket	Aluminum	None
Protector	PMMA	Borosilicate glass Polycarbonate
Cap	316 SS	None
<b>Stainless steel follower</b>		
Clamp	Stainless steel	None
Indicator housing	Stainless steel	None
Indicator tube	Borosilicate glass	None
Follower	Aluminum	None
Scale	316 SS	None

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## MATERIAL SPECIFICATION

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### MULTIVIEW™ TOP MOUNTED MAGNETIC GAUGE - TMMG Standpipe and float

Part	Standard materials	Optional materials
Chamber (standpipe)	316/316L SS ASTM A312 gr. TP 316/316L	304/304L SS ASTM A312 gr TP 304/304L Hastelloy-C276 ASTM B619 Monel ASTM B165 Alloy-20Cb3 ASTM B464 Consult factory
Float	316/316L SS ASTM A666 gr. 316/316L	Titanium ASTM B265 gr 5 Hastelloy-C276 ASTM B575 Monel ASTM B127 Alloy-20Cb3 ASTM B463 Consult factory
Float tube	316/316L SS ASTM A269 gr. TP 316/316L	Titanium ASTM B265 gr 5 Consult factory
Float guide	316/316L SS ASTM A276	Consult factory
Flange (vessel connection)	316/316L SS ASTM A182 gr. F316/316L	304/304L SS ASTM A182 gr F304/304L Hastelloy-C276 ASTM B564 Monel ASTM B564 Alloy-20Cb3 ASTM B462 Consult factory

#### NOTE

For top mounted magnetic gauge flag indicator refer to flag indicators material specification on page 21.

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## ORDERING INFORMATION MG2 / MG PART 1

### SELECTION GUIDE

<b>Example:</b>	<b>MG2</b>	<b>1</b>	<b>S</b>	<b>1</b>	<b>02400</b>	<b>F</b>	<b>A</b>
<b>Magnetic gauge model</b>							
<b>MG2</b>	NPS 2						
<b>MG</b>	NPS 2.5						
<b>Mounting style</b>							
<b>1</b>	Side connection C-C						
<b>2</b>	Top side, bottom end C-E						
<b>3</b>	Bottom side, top end E-C						
<b>4</b>	End connection E-E						
<b>Material (note 1, 2)</b>							
<b>S</b>	316/316L STS (Sch 10)						
<b>F</b>	304/304L STS (Sch 10)						
<b>C</b>	316/316L STS (Sch 10) - CS flanges						
<b>D</b>	304/304L STS (Sch 10) - CS flanges						
<b>E</b>	316/316L STS (Sch 40) (MG only)						
<b>G</b>	304/304L STS (Sch 40) (MG only)						
<b>H</b>	316/316L STS (Sch 40) - CS flanges (MG only)						
<b>J</b>	304/304L STS (Sch 40) - CS flanges (MG only)						
<b>Flange rating</b>							
<b>1</b>	ANSI CL150						
<b>3</b>	ANSI CL300 (MG only)						
<b>6</b>	ANSI CL600 (MG only)						
<b>9</b>	ANSI CL900 (MG only)						
<b>Visibility or C-C length</b>							
<b>M0000</b>	Millimeters (to the nearest whole number)						
<b>00000</b>	Inches (first 3 digits = number of whole inches, last 2 digits = fraction of an inch in hundredths)						
<b>Vessel connection size</b>							
<b>A</b>	½" (NPT, socketweld or flanged)						
<b>B</b>	¾" (NPT, socketweld or flanged)						
<b>C</b>	1" (NPT, socketweld or flanged)						
<b>D</b>	1-¼" (flanged only)						
<b>E</b>	1-½" (flanged only)						
<b>F</b>	2" (flanged only)						
<b>G</b>	2-½" (flanged only)						
<b>H</b>	3" (flanged only)						
<b>Stand pipe top end configuration</b>							
<b>A</b>	Welded end cap with NPT-F vent and plug (default top end connection)						
<b>B</b>	Welded end cap and NPT-F connection						
<b>C</b>	Welded end cap and female socket weld connection						
<b>D</b>	Welded end cap, socket weld nipple and weldneck flange						
<b>E</b>	Welded end cap, socket weld nipple and NPT-M connection						
<b>F</b>	Welded end cap, socket weld nipple and male socket weld connection						
<b>G</b>	Slip on flange with blind flange, NPT-F vent and plug						
<b>H</b>	Slip on flange with blind flange and NPT-F connection						
<b>I</b>	Slip on flange with blind flange and female socket weld connection						
<b>J</b>	Slip on flange with blind flange, socket weld nipple and weldneck flange						
<b>K</b>	Slip on flange with blind flange, socket weld nipple and NPT-M connection						
<b>L</b>	Slip on flange with blind flange, socket weld nipple and male socket weld connection						
<b>M</b>	Weld neck flange with blind flange, NPT-F vent and plug						
<b>O</b>	Weld neck flange with blind flange and NPT-F connection						
<b>P</b>	Weld neck flange with blind flange and female socket weld connection						
<b>Q</b>	Weld neck flange with blind flange, socket weld nipple and weldneck flange						
<b>R</b>	Weld neck flange with blind flange, socket weld nipple and NPT-M connection						
<b>S</b>	Weld neck flange with blind flange, socket weld nipple and male socket weld connection						
<b>W</b>	Welded end cap, socket weld nipple and slip on flange						
<b>Z</b>	Slip on flange with blind flange, socket weld nipple and slip on flange						
<b>Y</b>	Weld neck flange with blind flange, socket weld nipple and slip on flange						

### PART 2 - PAGE 24

**A G A B**



### PART 3 - PAGE 25

**0 0 S 1 115 H F N 00**

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## ORDERING INFORMATION MG2 / MG PART 2

PART 1 - PAGE 23

SELECTION GUIDE - PART 2

PART 3 - PAGE 25

MG2	1	S	1	02400	F	A	Example:	A	G	A	B	A	0	0	S	1	115	H	F	00	
							<b>Vent size</b>														
							<b>N</b>	None (for E-C or E-E configurations only)													
							<b>A</b>	1/2" (NPT, socketweld or flanged)													
							<b>B</b>	3/4" (NPT, socketweld or flanged)													
							<b>C</b>	1" (NPT, socketweld or flanged)													
							<b>D</b>	1-1/4" (flanged only)													
							<b>E</b>	1-1/2" (flanged only)													
							<b>F</b>	2" (flanged only)													
							<b>G</b>	2-1/2" (flanged only)													
							<b>H</b>	3" (flanged only)													
							<b>Stand pipe bottom end configuration</b>														
							<b>A</b>	Welded end cap with NPT-F drain and plug													
							<b>B</b>	Welded end cap and NPT-F connection													
							<b>C</b>	Welded end cap and female socket weld connection													
							<b>D</b>	Welded end cap, socket weld nipple and weldneck flange													
							<b>E</b>	Welded end cap, socket weld nipple and NPT-M connection													
							<b>F</b>	Welded end cap, socket weld nipple and male socket weld connection													
							<b>G</b>	Slip on flange w/blind flange, NPT-F drain and plug (default bottom end connection)													
							<b>H</b>	Slip on flange with blind flange and NPT-F connection													
							<b>I</b>	Slip on flange with blind flange and female socket weld connection													
							<b>J</b>	Slip on flange with blind flange, socket weld nipple and weldneck flange													
							<b>K</b>	Slip on flange with blind flange, socket weld nipple and NPT-M connection													
							<b>L</b>	Slip on flange with blind flange, socket weld nipple and male socket weld connection													
							<b>M</b>	Weld neck flange with blind flange, NPT-F drain and plug													
							<b>O</b>	Weld neck flange with blind flange and NPT-F connection													
							<b>P</b>	Weld neck flange with blind flange and female socket weld connection													
							<b>Q</b>	Weld neck flange with blind flange, socket weld nipple and weldneck flange													
							<b>R</b>	Weld neck flange with blind flange, socket weld nipple and NPT-M connection													
							<b>S</b>	Weld neck flange with blind flange, socket weld nipple and male socket weld connection													
							<b>W</b>	Welded end cap, socket weld nipple and slip on flange													
							<b>Z</b>	Slip on flange with blind flange, socket weld nipple and slip on flange													
							<b>Y</b>	Weld neck flange with blind flange, socket weld nipple and slip on flange													
							<b>Drain size</b>														
							<b>N</b>	None (for C-E or E-E configurations only)													
							<b>A</b>	1/2" (NPT, socketweld or flanged)													
							<b>B</b>	3/4" (NPT, socketweld or flanged)													
							<b>C</b>	1" (NPT, socketweld or flanged)													
							<b>D</b>	1-1/4" (flanged only)													
							<b>E</b>	1-1/2" (flanged only)													
							<b>F</b>	2" (flanged only)													
							<b>G</b>	2-1/2" (flanged only)													
							<b>H</b>	3" (flanged only)													
							<b>Stand pipe top side and bottom side configuration</b>														
							<b>N</b>	None (for E-E configurations only)													
							<b>A</b>	NPT-M with extruded outlet, full penetration weld at standpipe (SCH 10 only)													
							<b>B</b>	Weld neck flange with extruded outlet, full penetration weld at standpipe (SCH 10 only)													
							<b>C</b>	Male socket weld with extruded outlet, full penetration weld at standpipe (SCH 10 only)													
							<b>D</b>	Slip on flange with extruded outlet, full penetration weld at standpipe (SCH 10 only)													
							<b>E</b>	NPT-M full penetration weld at standpipe													
							<b>F</b>	Weld neck flange, full penetration weld at standpipe													
							<b>G</b>	Male socket weld, full penetration weld at standpipe													
							<b>H</b>	Slip on flange, full penetration weld at standpipe													

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## ORDERING INFORMATION MG2 / MG PART 3

### PART 1 - PAGE 23

MG2 1 S 1 02400 F A

### PART 2 - PAGE 24

A G A B

### SELECTION GUIDE - PART 3

**Example:** A 0 0 S 1 115 H F N 00

#### Gasket

- A** Graphite ribbon w/316STS insert (default)
- B** Spiralwound 304SS
- C** Spiralwound 316SS
- D** Garlock 3300
- E** Top Chem 2000
- F** Gylon 3504
- X** CUSTOM option for specials

#### NACE

- 0** Not applicable
- 1** Less than 50 PPM chlorides MR0175/ISO 15156-3 corrigendum 2, MR0103
- 2** More than 50 PPM chlorides MR0175/ISO 15156-3 corrigendum 2

#### Support bracket QTY - orientation

- 0** 0 - None (Default)
- A** QTY1 - Angle 0° (centered within the visible length)
- B** QTY2 - Angle 0° (centered within the visible length)
- C** QTY3 - Angle 0° (centered within the visible length)
- D** QTY4 - Angle 0° (centered within the visible length)
- X** CUSTOM option for specials

#### Float material (note 1)

- S** 316/316L STS
- T** Titanium (MG only)

#### Float style

- 1** Standard length
- 2** Extended length (MG only)
- 3** Interface (MG only)
- 4** Special (MG only)

#### Process fluid specific gravity

**'000** First digit is the whole number, last 2 digits are number of hundredths (example: for a specific gravity of 1.15 use 115)

#### Indicator style and protector (Note 5)

- F** Flag (aluminum housing) with glass protector (black/gold flags)
- G** Flag (aluminum housing) with PMMA protector (black/gold flags)
- H** Flag (stainless steel housing) hermetically sealed (black/yellow flags)
- A** Follower (aluminum housing), no protector
- B** Follower (aluminum housing) with PMMA protector
- C** Follower (aluminum housing) with glass protector
- S** Follower (SS housing)

#### Indicator - scale type

- F** Feet/inch (default)
- M** Meter/centimeter
- X** CUSTOM option for specials

#### Frost proof extension

- 1** 2" (50 mm) to -30°F (-35°C)
- 2** 4" (100 mm) to -94°F (-70°C)
- 3** 6" (150 mm) to -148°F (-100°C)
- 4** 8" (200 mm) to -211°F (-135°C)
- 5** 10" (250 mm) to -274°F (-170°C)
- 6** 12" (300 mm) to -328°F (-200°C)
- N** None (default)

#### Options

- 00** None
- MT** Magnetic trap
- DV** FNPT 316SS needle/globe drain valve
- VV** FNPT 316SS needle/globe vent valve
- XX** CUSTOM option for specials

### NOTES

1. Optional materials, Hastelloy C276, Alloy 20Cb3, Monel, PVC, CPVC, PVDF available (for MG only), consult factory.
2. Standard for CL150 standpipe rating is SCH 10, standard for CL300, CL600 and CL900 standpipe rating is SCH 40.
3. Other flag colors available, consult factory.



# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## ORDERING INFORMATION TMMG PART 1

### SELECTION GUIDE

PART 2 - PAGE 27

Example:	TMMG	1	S	1	02400	A	A	A	S	A	S	03650	0	F	F	N	00
<b>Magnetic gauge model</b>																	
<b>TMMG</b>	NPS 1																
<b>Mounting style</b>																	
<b>1</b>	Top mounted																
<b>Material</b>																	
<b>S</b>	316/316L STS (Sch 10)																
<b>F</b>	304/304L STS (Sch 10)																
<b>Flange rating</b>																	
<b>1</b>	ANSI CL150																
<b>3</b>	ANSI CL 300																
<b>Visible length</b>																	
<b>M0000</b>	Millimeters (to the nearest whole number)																
<b>00000</b>	Inches (first 3 digits = number of whole inches, last 2 digits = fraction of an inch in hundreths)																
<b>Vessel connection size</b>																	
<b>A</b>	4" (flanged only)																
<b>B</b>	6" (flanged only)																
<b>C</b>	8" (flanged only)																
<b>D</b>	10" (flanged only)																
<b>E</b>	12" (flanged only)																
<b>X</b>	Special																
<b>Stand pipe vent configuration</b>																	
<b>A</b>	Welded end cap with NPT-F vent and plug (default top end connection)																
<b>B</b>	Welded end cap and NPT-F connection																
<b>C</b>	Welded end cap and female socket weld connection																
<b>D</b>	Welded end cap, socket weld nipple and weldneck flange																
<b>E</b>	Welded end cap, socket weld nipple and NPT-M connection																
<b>F</b>	Welded end cap, socket weld nipple and male socket weld connection																
<b>Vent size</b>																	
<b>A</b>	1/2"																
<b>Float material</b>																	
<b>S</b>	316/316L STS																
<b>T</b>	Titanium																

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## ORDERING INFORMATION TMMG PART 2

### PART 1 - PAGE 26

### SELECTION GUIDE - PART 2

TMMG	1	S	1	02400	A	A	A	S	Example:	A	S	03650	0	F	F	N	0
<b>Float diameter</b>																	
<b>A</b>									3.5"								
<b>B</b>									4.5"								
<b>C</b>									6"								
<b>D</b>									8"								
<b>E</b>									10"								
<b>X</b>									Special								
<b>Float guide</b>																	
<b>P</b>									Penberthy guide system								
<b>S</b>									Customer supplied stilling well								
<b>N</b>									None (not recommended)								
<b>Overall nozzle offset</b>																	
<b>M0000</b>									Millimeters (to the nearest whole number)								
<b>00000</b>									Inches (first 3 digits = number of whole inches, last 2 digits = fraction of an inch in hundredths)								
<b>NACE</b>																	
<b>0</b>									Not applicable								
<b>1</b>									Less than 50 PPM chlorides MR0175/ISO 15156-3 corrigendum 2, MR0103								
<b>2</b>									More than 50 PPM chlorides MR0175/ISO 15156-3 corrigendum 2								
<b>Indicator style and protector</b>																	
<b>F</b>									Flag (aluminum housing) with glass protector (black/gold flags)								
<b>G</b>									Flag (aluminum housing) with PMMA protector (black/gold flags)								
<b>Indicator - scale type</b>																	
<b>F</b>									Feet/inch (default)								
<b>M</b>									Meter/centimeter								
<b>X</b>									CUSTOM option for specials								
<b>Frost proof extension</b>																	
<b>1</b>									2" (50 mm) to -30°F (-35°C)								
<b>2</b>									4" (100 mm) to -94°F (-70°C)								
<b>3</b>									6" (150 mm) to -148°F (-100°C)								
<b>4</b>									8" (200 mm) to -211°F (-135°C)								
<b>5</b>									10" (250 mm) to -274°F (-170°C)								
<b>6</b>									12" (300 mm) to -328°F (-200°C)								
<b>N</b>									None (default)								
<b>Options</b>																	
<b>00</b>									None								

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## ORDERING INFORMATION MGVB PART 1

### SELECTION GUIDE

<b>Example:</b>	<b>MGVB</b>	<b>1</b>	<b>E</b>	<b>1</b>	<b>02400</b>	<b>F</b>	<b>A</b>
<b>Magnetic gauge model</b>							
<b>MGVB</b>	NPS 4 (Vapor bypass)						
<b>Mounting style</b>							
<b>1</b>	Side connection C-C						
<b>2</b>	Top side, bottom end C-E						
<b>3</b>	Bottom side, top end E-C						
<b>4</b>	End connection E-E						
<b>Material (note 1)</b>							
<b>E</b>	316/316L STS						
<b>G</b>	304/304L STS						
<b>H</b>	316/316L STS - CS flanges						
<b>J</b>	304/304L STS - CS flanges						
<b>Flange rating</b>							
<b>1</b>	ANSI CL150						
<b>3</b>	ANSI CL300						
<b>Visibility or C-C length</b>							
<b>M0000</b>	Millimeters (to the nearest whole number)						
<b>00000</b>	Inches (first 3 digits = number of whole inches, last 2 digits = fraction of an inch in hundredths)						
<b>Vessel connection size</b>							
<b>A</b>	½" (NPT, socketweld or flanged)						
<b>B</b>	¾" (NPT, socketweld or flanged)						
<b>C</b>	1" (NPT, socketweld or flanged)						
<b>D</b>	1-¼" (flanged only)						
<b>E</b>	1-½" (flanged only)						
<b>F</b>	2" (flanged only)						
<b>G</b>	2-½" (flanged only)						
<b>H</b>	3" (flanged only)						

### PART 2 - PAGE 29

**A G A B A**

### PART 3 - PAGE 30

**0 0 S 1 115 H F A N 00**

### Stand pipe top end configuration

<b>A</b>	Welded end cap with NPT-F vent and plug (default top end connection)
<b>B</b>	Welded end cap and NPT-F connection
<b>C</b>	Welded end cap and female socket weld connection
<b>D</b>	Welded end cap, socket weld nipple and weldneck flange
<b>E</b>	Welded end cap, socket weld nipple and NPT-M connection
<b>F</b>	Welded end cap, socket weld nipple and male socket weld connection
<b>G</b>	Slip on flange with blind flange, NPT-F vent and plug
<b>H</b>	Slip on flange with blind flange and NPT-F connection
<b>I</b>	Slip on flange with blind flange and female socket weld connection
<b>J</b>	Slip on flange with blind flange, socket weld nipple and weldneck flange
<b>K</b>	Slip on flange with blind flange, socket weld nipple and NPT-M connection
<b>L</b>	Slip on flange with blind flange, socket weld nipple and male socket weld connection
<b>M</b>	Weld neck flange with blind flange, NPT-F vent and plug
<b>O</b>	Weld neck flange with blind flange and NPT-F connection
<b>P</b>	Weld neck flange with blind flange and female socket weld connection
<b>Q</b>	Weld neck flange with blind flange, socket weld nipple and weldneck flange
<b>R</b>	Weld neck flange with blind flange, socket weld nipple and NPT-M connection
<b>S</b>	Weld neck flange with blind flange, socket weld nipple and male socket weld connection
<b>W</b>	Welded end cap, socket weld nipple and slip on flange
<b>Z</b>	Slip on flange with blind flange, socket weld nipple and slip on flange
<b>Y</b>	Weld neck flange with blind flange, socket weld nipple and slip on flange

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## ORDERING INFORMATION MGVB PART 2

PART 1 - PAGE 28

SELECTION GUIDE - PART 2

PART 3 - PAGE 30

MGVB	1	E	1	02400	F	A	A	G	A	B	A	0	0	S	1	115	H	F	A	N	00				
<b>Example:</b>																									
<b>Vent size</b>																									
<b>N</b> None (for E-C or E-E configurations only)																									
<b>A</b> 1/2" (NPT, socketweld or flanged)																									
<b>B</b> 3/4" (NPT, socketweld or flanged)																									
<b>C</b> 1" (NPT, socketweld or flanged)																									
<b>D</b> 1-1/4" (flanged only)																									
<b>E</b> 1-1/2" (flanged only)																									
<b>F</b> 2" (flanged only)																									
<b>G</b> 2-1/2" (flanged only)																									
<b>H</b> 3" (flanged only)																									
<b>Stand pipe bottom end configuration</b>																									
<b>A</b> Welded end cap with NPT-F drain and plug																									
<b>B</b> Welded end cap and NPT-F connection																									
<b>C</b> Welded end cap and female socket weld connection																									
<b>D</b> Welded end cap, socket weld nipple and weldneck flange																									
<b>E</b> Welded end cap, socket weld nipple and NPT-M connection																									
<b>F</b> Welded end cap, socket weld nipple and male socket weld connection																									
<b>G</b> Slip on flange with blind flange, NPT-F drain and plug (default bottom end connection)																									
<b>H</b> Slip on flange with blind flange and NPT-F connection																									
<b>I</b> Slip on flange with blind flange and female socket weld connection																									
<b>J</b> Slip on flange with blind flange, socket weld nipple and weldneck flange																									
<b>K</b> Slip on flange with blind flange, socket weld nipple and NPT-M connection																									
<b>L</b> Slip on flange with blind flange, socket weld nipple and male socket weld connection																									
<b>M</b> Weld neck flange with blind flange, NPT-F drain and plug																									
<b>O</b> Weld neck flange with blind flange and NPT-F connection																									
<b>P</b> Weld neck flange with blind flange and female socket weld connection																									
<b>Q</b> Weld neck flange with blind flange, socket weld nipple and weldneck flange																									
<b>R</b> Weld neck flange with blind flange, socket weld nipple and NPT-M connection																									
<b>S</b> Weld neck flange with blind flange, socket weld nipple and male socket weld connection																									
<b>W</b> Welded end cap, socket weld nipple and slip on flange																									
<b>Z</b> Slip on flange with blind flange, socket weld nipple and slip on flange																									
<b>Y</b> Weld neck flange with blind flange, socket weld nipple and slip on flange																									
<b>Drain size</b>																									
<b>N</b> None (For C-E or E-E configurations only)																									
<b>A</b> 1/2" (NPT, socketweld or flanged)																									
<b>B</b> 3/4" (NPT, socketweld or flanged)																									
<b>C</b> 1" (NPT, socketweld or flanged)																									
<b>D</b> 1-1/4" (flanged only)																									
<b>E</b> 1-1/2" (flanged only)																									
<b>F</b> 2" (flanged only)																									
<b>G</b> 2-1/2" (flanged only)																									
<b>H</b> 3" (flanged only)																									
<b>Stand pipe top side and bottom side configuration</b>																									
<b>N</b> None (for E-E Configurations only)																									
<b>A</b> NPT-M with extruded outlet, full penetration weld at standpipe																									
<b>B</b> Weld neck flange with extruded outlet, full penetration weld at standpipe																									
<b>C</b> Male socket weld with extruded outlet, full penetration weld at standpipe																									
<b>D</b> Slip on flange with extruded outlet, full penetration weld at standpipe																									
<b>Gasket</b>																									
<b>A</b> Graphite ribbon w/316STS insert (default)																									
<b>B</b> Spiralwound 304SS																									
<b>C</b> Spiralwound 316SS																									
<b>D</b> Garlock 3300																									
<b>E</b> Top Chem 2000																									
<b>F</b> Gylon 3504																									
<b>X</b> CUSTOM option for specials																									

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## ORDERING INFORMATION MGVB PART 3

### PART 1 - PAGE 28

MGVB 1 E 1 '02400 F A



### PART 2 - PAGE 29

A G A B

### SELECTION GUIDE - PART 3

**Example:** 0 0 S 1 115 H F A N 00

#### NACE

- 0 Not applicable
- 1 Less than 50 PPM chlorides MR0175/ISO 15156-3 corrigendum 2, MR0103
- 2 More than 50 PPM chlorides MR0175/ISO 15156-3 corrigendum 2

#### Support bracket QTY - orientation

- 0 0 - None (default)
- A QTY1 - Angle 0° (centered within the visible length)
- B QTY2 - Angle 0° (centered within the visible length)
- C QTY3 - Angle 0° (centered within the visible length)
- D QTY4 - Angle 0° (centered within the visible length)
- X CUSTOM option for specials

#### Float material (note 1)

- S 316/316L STS
- T Titanium

#### Float style

- 1 Standard length
- 2 Extended length
- 3 Interface
- 4 Special

#### Process fluid specific gravity

'000 First digit is the whole number, last 2 digits are number of hundredths (example: for a specific gravity of 1.15 use 115)

#### Indicator style and protector (Note 2)

- F Flag (aluminum housing) with glass protector (black/gold flags)
- G Flag (aluminum housing) with PMMA protector (black/gold flags)
- H Flag (stainless steel housing) hermetically sealed (black/yellow flags)

#### Indicator - scale type

- F Feet/inch (default)
- M Meter/centimeter
- X CUSTOM option for specials

#### Vessel connection orientation

- N None (For E-E configurations only)
- A Left (of indicator)
- B Back (of indicator)
- C Right (of indicator)
- X Other

#### Frost proof extension

- 1 2" (50 mm) to -30°F (-35°C)
- 2 4" (100 mm) to -94°F (-70°C)
- 3 6" (150 mm) to -148°F (-100°C)
- 4 8" (200 mm) to -211°F (-135°C)
- 5 10" (250 mm) to -274°F (-170°C)
- 6 12" (300 mm) to -328°F (-200°C)
- N None (default)

#### Options

- 00 None
- MT Magnetic trap
- DV FNPT 316SS needle/globe drain valve
- VV FNPT 316SS needle/globe vent valve
- XX CUSTOM option for specials

### NOTES

1. Optional materials, Hastelloy C276, Alloy 20CB2, Monel, available, consult factory.
2. Other flag colors available, consult factory.

# PENBERTHY MAGNETIC LIQUID LEVEL GAUGES

## ORDERING INFORMATION MGT / MGS

### SELECTION GUIDE

Example:	MGT	362	I	A	C	02400	-00
<b>Magnetic gauge model</b>							
MGT	Magnetic gauge transmitter						
<b>Sensor style</b>							
362	Reed chain						
367	Magnetostrictive						
<b>Electronics mounting style</b>							
I	Integral						
R	Remote (MGT 362 only)						
<b>Output</b>							
A	4-20mA (MGT 362 only)						
B	4-20mA with HART protocol (MGT 367 only)						
C	4-20mA with HART protocol and LCD display (MGT 367 only)						
F	4-20mA with Foundation Fieldbus (MGT 367 only)						
<b>Agency approval</b>							
F	FM (XP and IS, MGT-367 only)						
C	CSA (XP and IS)						
A	ATEX Ex ia IIA (MGT-367 only)						
B	ATEX Ex ia IIB (MGT-367 only)						
D	Flameproof IIB (MGT-367 only)						
<b>Calibration length</b>							
M0000	Millimeters (to the nearest whole number)						
00000	Inches (first 3 digits = number of whole inches, last 2 digits = fraction of an inch in hundredths)						
<b>Options</b>							
00	None						
01	Transmitter housing with 90 degree elbow (MGT 362 only)						
02	Bottom mounted electronics housing (MGT 367 only)						
03	Sensor with bend (for use when top or bottom flange on magnetic gage standpipe causes interference with transmitter head, MGT 367 only)						

### SELECTION GUIDE

Example:	MGS	314	-00
<b>Magnetic gauge model</b>			
MGS	Magnetic gauge switch		
<b>Style</b>			
314	SPDT snap action (5 Amp)		
314D	DPDT snap action (10 Amp)		
314L	SPDT reed switch (1 Amp)		
<b>Options</b>			
00	None		
01	Epoxy coated (MGS 314 and MGS 314D only)		
02	For 1" pipe mounting (MGS 314 and MGS 314D only)		
03	For 4" pipe mounting (MGS 314 and MGS 314D only)		



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