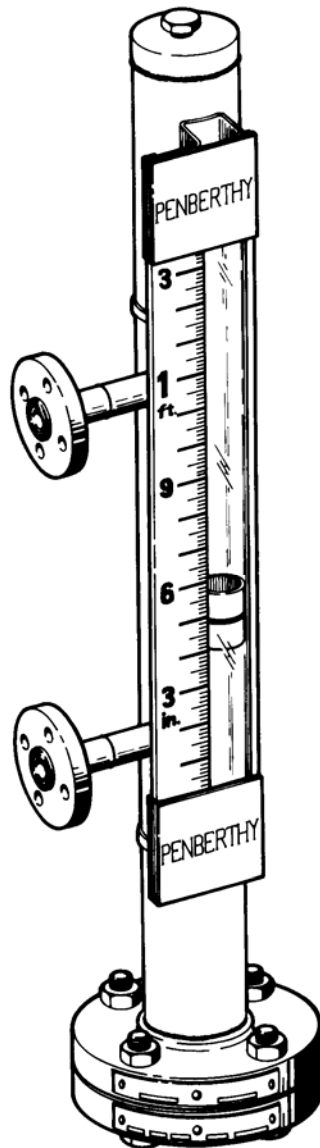


PENBERTHY®

MULTIVIEW™

Liquid Level Meter



Installation, Operation and Maintenance Instructions

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PRODUCT WARRANTY

Penberthy Inc., warrants its products as designed and manufactured by Penberthy to be free of defects in material and workmanship for a period of one year after the date of installation or eighteen months after date of manufacture, whichever is earliest. Penberthy will, at its option, replace or repair any products which fail during the warranty period due to defective material or workmanship.

Prior to submitting any claim for warranty service, the owner must submit proof of purchase to Penberthy and obtain written authorization to return the product. Thereafter, the product shall be returned to Penberthy in Prophetstown, Illinois, with freight prepaid.

This warranty shall not apply if the product has been disassembled, tampered with, repaired or altered outside of the Penberthy factory, or if it has been subjected to misuse, neglect or accident.

Penberthy's responsibility hereunder is limited to repairing or replacing the product at its expense. Penberthy shall not be liable for loss, damage, or expenses directly or indirectly related to the installation or use of its products, or from any other cause or for consequential damages. It is expressly understood that Penberthy is not responsible for damage or injury caused to other products, building, property or persons, by reason of the installation or use of its products.

THIS IS PENBERTHY'S SOLE WARRANTY AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED WHICH ARE HEREBY EXCLUDED, INCLUDING IN PARTICULAR ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This document and the warranty contained herein may not be modified and no other warranty, expressed or implied, shall be made by or on behalf of Penberthy unless modified or made in writing and signed by the President or a Vice President of Penberthy.

INSTALLATION, OPERATION and MAINTENANCE MANUAL FOR PENBERTHY MULTIVIEW™ LIQUID LEVEL METERS

1.0 Introduction

The Penberthy MULTIVIEW™ Magnetic Liquid Level Meter is designed especially for corrosive, toxic, or flammable materials that preclude the use of glass for visual indication.

1.1 Theory of Operation

The MULTIVIEW™ Magnetic Liquid Level Meter tracks the liquid level in a process vessel or tank by means of a float (containing a magnet) in a communicating chamber. The communicating chamber is connected to the process vessel. Each float is custom weighted for the specific gravity of the process media. The indicator, mounted on the outside of the communicating chamber, contains either a follower or series of flags magnetically coupled to the float. As the float rises and falls with the liquid level, the follower or flags mirror this movement and provide visual level indication.

Point level control and remote continuous level measurement are also available. This is achieved by attaching electronic switches and/or a 4-20 mA level transmitter to the exterior of the communicating chamber.

1.2 System Description

The Penberthy MULTIVIEW™ unit consists of three major sections:

Communicating Chamber

The standard chamber consists of 2 ½" Schedule 10 or Schedule 40 pipe constructed of 304/304L STS, 316/316L STS, Alloy 20®, Monel®, Hastelloy C®, PVC, CPVC, PVDF or Halar® lined. Other chamber materials such as Inconel® 625 and Titanium may also be used.

Float

The float is constructed of 316L STS, Titanium, Alloy 20®, Monel®, Hastelloy C®, PVC, CPVC, PVDF or Halar® coated. It is specifically weighted for the specific gravity of the process media.

Indicator

You have three indicator options available. The type you receive was determined at the time of purchase.

A. Follower style with stainless steel housing.

This indicator consists of a hermetically sealed borosilicate tube contained in stainless steel housing. A gold colored follower is located inside the tube.

The scale assembly is an integral part of the stainless steel housing. The scale can be specified to indicate any unit of measure.

B. Follower style with extruded aluminum housing

This indicator consists of a hermetically sealed borosilicate tube contained in extruded aluminum housing. A gold colored follower is located inside the tube.

The scale assembly is a separate aluminum extrusion attached to the indicator. It is possible to receive an indicator with no scale attached. If a scale is specified, it can indicate any unit of measure and be mounted on either side of the indicator.

C. Flag style

This indicator consists of a series of magnetically interlocked flags. The flags are black on one side and gold colored on the other. As the float rises the flags rotate, turning from black to gold. The flag assembly is sealed within extruded aluminum housing.

The scale assembly is a separate aluminum extrusion attached to the indicator. It is possible to receive an indicator with no scale attached. If a scale is specified, it can indicate any unit of measure and be mounted on either side of the indicator.

2.0 Specifications

2.1 General Length:

		Overall	Vessel Centers
Side Connection	Minimum	20 7/16" [519 mm]	4 1/4" [108 mm]
	Maximum	258 15/16" [6577 mm]	236" [5994 mm]
End Connection	Minimum	20 7/16" [519 mm]	4 1/4" [108 mm]
	Maximum	258 15/16" [6577 mm]	236" [5994 mm]

Table 1

Calibrated Scale:

ft./in. (standard)
 m/cm (optional)
 Custom scales are also available as an option.

Operating Temperature: (subject to float limitations)

Metallic Chambers: -325°F to 750°F (-198°C to 399°C)
 PVC Chamber: -20°F to 140°F (-29°C to 60°C)
 CPVC Chamber: -20°F to 200°F (-29°C to 93°C)
 PVDF Chamber: -20°F to 250°F (-29°C to 121°C)

Electronic Switches / Transmitter:

Refer to the corresponding Installation/Operation/Maintenance manual for that item.

Operating Pressure: (float limited)

Float Material	Minimum Pressure psig [kPaG]	Maximum Pressure psig [kPaG]
316 Stainless Steel	Full Vacuum	2160 [14890]
Titanium		1800 [12410]
Monel®		1800 [12410]
Alloy 20®		1800 [12410]
Hastelloy C®		2250 [15510]
PVC		150 [1030]
CPVC		150 [1030]
PVDF		150 [1030]

Maximum pressure rating is based upon 100°F (38°C)

Table 2

2.2 Floats

See Table 5 for Standard Floats. See Table 6 for Extended Length Floats. The magnet system is located in the upper portion of the float.

PRESSURE EQUALIZING (Vented) FLOATS

Nominal ANSI Rating	Float Diameter	Material	Pressure / Temperature Rating					Maximum Pressure Rating
			100°F [38°C]	300°F [149°C]	500°F [260°C]	700°F [371°C]	750°F [399°C]	
Vented	2.25" / 2.50" [57 mm / 64 mm]	316 STS	Pressure change rate (ΔP) no greater than 300 psig / 3 sec [2070 kPaG / 3 sec] for standard length float					Limited by the Standpipe
		Titanium						
		Monel®						
		Alloy 20®						
		Hastelloy C®						

Table 3

NON-METALLIC FLOATS

Material	Float Diameter	Minimum Specific Gravity	Pressure / Temperature Rating
PVC	1.90" [48 mm]	0.79	150 psig [1030 kPaG] at 100°F [38°C] 50 psig [340 kPaG] at 140°F [60°C]
CPVC	1.90" [48 mm]	0.86	150 psig [1030 kPaG] at 100°F [38°C] 50 psig [340 kPaG] at 200°F [93°C]
PVDF	1.97" [50 mm]	0.93	150 psig [1030 kPaG] at 100°F [38°C] 40 psig [280 kPaG] at 250°F [121°C]

Table 4

STANDARD FLOATS (ANSI Classified)

NOMINAL PRESSURE RATING	FLOAT DIAMETER	MATERIAL	MINIMUM SPECIFIC GRAVITY	PRESSURE RATING psig [kPaG]					FLOAT TEST PRESSURE psig at 100°F [kPaG at 38°C]
				100°F (38°C)	300°F (149°C)	500°F (260°C)	700°F (371°C)	750°F (399°C)	
150# ANSI	2.25" [57 mm] Sch 40 Standpipe	316 STS	0.78	275 [1900]	215 [1480]	170 [1170]	110 [760]	95 [660]	350 [2410]
		Titanium	0.53	230 [1590]	215 [1480]	210 [1450]	195 [1340]	190 [1310]	300 [2070]
		Monel®	0.9	230 [1590]	190 [1310]	170 [1170]	110 [760]	95 [660]	300 [2070]
		Alloy 20®	0.82	230 [1590]	200 [1380]	170 [1170]	110 [760]	95 [660]	300 [2070]
		Hastelloy C®	0.91	290 [2000]	230 [1590]	170 [1170]	110 [760]	95 [660]	375 [2590]
	2.50" [64 mm] Sch 10 Standpipe	316 STS	0.53	275 [1900]	215 [1480]	170 [1170]	110 [760]	95 [660]	350 [2410]
		Titanium	0.41	230 [1590]	215 [1480]	210 [1450]	195 [1340]	190 [1310]	300 [2070]
		Monel®	0.56	230 [1590]	190 [1310]	170 [1170]	110 [760]	95 [660]	300 [2070]
		Alloy 20®	0.52	230 [1590]	200 [1380]	170 [1170]	110 [760]	95 [660]	300 [2070]
		Hastelloy C®	0.58	290 [2000]	230 [1590]	170 [1170]	110 [760]	95 [660]	375 [2590]
300# ANSI	2.25" [57 mm] Sch 40 Standpipe	316 STS	0.8	720 [4960]	560 [3860]	480 [3310]	430 [2960]	425 [2930]	900 [6210]
		Titanium	0.56	600 [4140]	545 [3760]	545 [3760]	510 [3520]	500 [3450]	750 [5170]
		Monel®	0.92	600 [4140]	495 [3410]	475 [3280]	475 [3280]	470 [3240]	750 [5170]
		Alloy 20®	0.84	600 [4140]	525 [3620]	470 [3240]	445 [3070]	440 [3030]	750 [5170]
600# ANSI	(57 mm) Sch 40 Standpipe	316 STS	0.89	1440 [9930]	1120 [7720]	955 [6580]	865 [5960]	845 [5830]	1800 [12410]
		Titanium	0.62	1200 [8270]	1130 [7790]	1085 [7480]	1020 [7030]	1000 [6890]	1500 [10340]
		Monel®	0.96	1200 [8270]	990 [6830]	950 [6550]	950 [6550]	935 [6450]	1500 [10340]
		Alloy 20®	0.88	1200 [8270]	1045 [7210]	935 [6450]	890 [6140]	880 [6070]	1500 [10340]
		Hastelloy C®	0.98	1500 [10340]	1455 [10030]	1330 [9170]	1135 [7830]	1065 [7340]	1875 [12930]
900# ANSI	(57 mm) Sch 40 Standpipe	316 STS	0.98	2160 [14890]	1680 [11580]	1435 [9890]	1295 [8930]	1270 [8760]	2700 [18620]
		Titanium	0.68	1800 [12410]	1680 [11580]	1435 [9890]	1295 [8930]	1270 [8760]	2250 [15510]
		Monel®	1.01	1800 [12410]	1485 [10240]	1435 [9890]	1435 [9890]	1405 [9690]	2250 [15510]
		Alloy 20®	0.94	1800 [12410]	1570 [10820]	1405 [9690]	1335 [9200]	1320 [9100]	2250 [15510]
		Hastelloy C®	1.06	2250 [15510]	2185 [15070]	1995 [13760]	1705 [11760]	1595 [20000]	2825 [19480]

Table 5

EXTENDED LENGTH FLOATS (ANSI Classified)

NOMINAL PRESSURE RATING	FLOAT DIAMETER	MATERIAL	MINIMUM SPECIFIC GRAVITY	PRESSURE RATING psig [kPaG]					FLOAT TEST PRESSURE psig at 100°F [kPaG at 38°C]
				100°F (38°C)	300°F (149°C)	500°F (260°C)	700°F (371°C)	750°F (399°C)	
150# ANSI	2.25" (57 mm) Sch 40 Standpipe	316 STS	0.74	275 [1900]	215 [1480]	170 [1170]	110 [760]	95 [660]	350 [2410]
		Titanium	0.47	230 [1590]	215 [1480]	210 [1450]	195 [1340]	190 [1310]	300 [2070]
		Monel®	0.84	230 [1590]	190 [1310]	170 [1170]	110 [760]	95 [660]	300 [2070]
		Alloy 20®	0.76	230 [1590]	200 [1380]	170 [1170]	110 [760]	95 [660]	300 [2070]
		Hastelloy C®	0.84	290 [2000]	230 [1590]	170 [1170]	110 [760]	95 [660]	375 [2590]
	2.50" (64 mm) Sch 10 Standpipe	316 STS	0.49	275 [1900]	215 [1480]	170 [1170]	110 [760]	95 [660]	350 [2410]
		Titanium	0.37	230 [1590]	215 [1480]	210 [1450]	195 [1340]	190 [1310]	300 [2070]
		Monel®	0.51	230 [1590]	190 [1310]	170 [1170]	110 [760]	95 [660]	300 [2070]
		Alloy 20®	0.47	230 [1590]	200 [1380]	170 [1170]	110 [760]	95 [660]	300 [2070]
		Hastelloy C®	0.53	290 [2000]	230 [1590]	170 [1170]	110 [760]	95 [660]	375 [2590]
300# ANSI	2.25" (57 mm) Sch 40 Standpipe	316 STS	0.76	720 [4960]	560 [3860]	480 [3310]	430 [2960]	425 [2930]	900 [6210]
		Titanium	0.51	600 [4140]	545 [3760]	545 [3760]	510 [3520]	500 [3450]	750 [5170]
		Monel®	0.86	600 [4140]	495 [3410]	475 [3280]	475 [3280]	470 [3240]	750 [5170]
		Alloy 20®	0.78	600 [4140]	525 [3620]	470 [3240]	445 [3070]	440 [3030]	750 [5170]
		Hastelloy C®	0.87	750 [5170]	730 [5030]	665 [4590]	570 [3930]	530 [3650]	950 [6550]
600# ANSI	2.25" (57 mm) Sch 40 Standpipe	316 STS	0.84	1440 [9930]	1120 [7720]	955 [6580]	865 [5960]	845 [5830]	1800 [12410]
		Titanium	0.57	1200 [8270]	1130 [7790]	1085 [7480]	1020 [7030]	1000 [6890]	1500 [10340]
		Monel®	0.90	1200 [8270]	990 [6830]	950 [6550]	950 [6550]	935 [6450]	1500 [10340]
		Alloy 20®	0.83	1200 [8270]	1045 [7210]	935 [6450]	890 [6140]	880 [6070]	1500 [10340]
		Hastelloy C®	0.92	1500 [10340]	1455 [10030]	1330 [9170]	1135 [7830]	1065 [7340]	1875 [12930]
900# ANSI	2.25" (57 mm) Sch 40 Standpipe	316 STS	0.90	2160 [14890]	1680 [11580]	1435 [9890]	1295 [8930]	1270 [8760]	2700 [18620]
		Titanium	0.64	1800 [12410]	1680 [11580]	1435 [9890]	1295 [8930]	1270 [8760]	2250 [15510]
		Monel®	0.95	1800 [12410]	1485 [10240]	1435 [9890]	1435 [9890]	1405 [9690]	2250 [15510]
		Alloy 20®	0.88	1800 [12410]	1570 [10820]	1405 [9690]	1335 [9200]	1320 [9100]	2250 [15510]
		Hastelloy C®	1.00	2250 [15510]	2185 [15070]	1995 [13760]	1705 [11760]	1595 [20000]	2825 [19480]

Table 6

3.0 Installation

3.1 Unpacking

Upon receipt of your MULTIVIEW™ unit, check all components carefully for damage incurred in shipping. If damage is evident or suspected, do not attempt installation. Notify the carrier immediately and request a damage inspection. Check each item against the packing list.

The float is not in the communicating chamber when shipped. Make sure that you do not throw the float away with the packing materials. The float should not be installed until the communicating chamber has been mounted to the process vessel.

To install the float, remove the bottom flange from the communicating chamber. Insert the float top first. That end of the float has been identified with a piece of removable orange tape and the word "top" etched into the float. Place the gasket over the spring on the bottom flange and reinstall.

3.2 Mounting

1. To operate properly, the magnetic liquid level meter must be vertical.
2. Check the vessel connections with a plumb line to verify alignment. The vessel must be free from dirt and debris to avoid malfunction of the level indicator.
3. A minimum distance of 8" (203 mm) should be maintained from the centerline of the communicating chamber to the nearest source of ferromagnetic material.

4. Special handling and installation precautions must be used with long magnetic level gages. This applies to any magnetic gage 10 feet (3 meters) or more in length. Do not attempt to handle or move with single point suspension or by both end suspension (such as two people picking up a gage by the ends). The standpipe must be supported along its entire length.

"Whipping" is highly probable unless the standpipe is supported along its entire length during handling/installation. Raising a long standpipe from the horizontal (shipping) to vertical (installation) plane will cause elastic bending unless additional support is provided.

Suggestion

Leave the standpipe supported in its shipping container until in the vertical installation plane.

Support elements

Installation should be planned to include support elements at least every 6 feet (2 meters) (4 feet [122 cm] for polymer standpipes) to prevent vibrational whip, wind load bending, etc.

Typical damages to the visual indicators caused by mishandling

Follower style

The glass tube can be stressed beyond its tensional limits and break or shatter if the standpipe is allowed to whip or bend.

Flag style

The component parts of this indicator have close tolerances. If the standpipe is allowed to whip or bend during handling and/or installation, there is an extremely high probability that certain flags will 'hang up' (not rotate properly) thereby providing incorrect indication.

5. PVC, CPVC & PVDF magnetic liquid level meters are shipped without the indicator attached. This is done to prevent damage to the indicator. **DO NOT attempt to install the communicating chamber with the indicator attached.**

Follow the installation procedures outlined in step 4 above. If the communicating chamber is greater than 60 inches (1524 mm) in length you may need to support it during installation.

Attach the indicator to the communicating chamber. Follow the procedure in Section 3.3 to align the indicator.

6. It is strongly recommended that shutoff devices (gagecocks, sliders, cocks) be installed between the vessel and the communicating chamber to allow the magnetic gage to be isolated for cleaning.
7. Before start-up verify that the communicating chamber is free of any particles.

3.3 Indicator Alignment

To change the direction the indicator is facing, loosen the clamps holding the indicating to the communicating chamber, rotate the indicator to the position desired, and tighten the clamps. To align the indicator use the following procedure:

Follower Style

1. Loosen the clamps holding the indicator to the communicating chamber. Move the indicator down as far as it will go.
2. Lower the liquid level in the communicating chamber until:
 - a. Side Connection
the liquid is at the bottom feed level.
 - b. End Connection
the indicator stops moving. Then add liquid to the chamber until the float just becomes buoyant (the indicator will start to move upward).
3. Move the indicator so that the centerline on the magnetic follower is aligned with "zero" on the calibrated scale. If you do not have a scale the bottom of the follower should just touch the cushion in the bottom of the hermetically sealed tube.
4. Tighten the clamps.

Flag Style

1. Loosen the clamps holding the indicator to the communicating chamber. Move the indicator down as far as it will go.
2. Lower the liquid level in the communicating chamber until:
 - a. Side Connection
the liquid is at the bottom feed level.
 - b. End Connection
the indicator stops moving. Then add liquid to the chamber until the float just becomes buoyant (the indicator will start to move upward).
3. Move the indicator until the last visible gold flag has rotated to black. This will be the third flag from the bottom. (two flags are hidden behind the nameplate) Be careful not to raise the indicator too far.
4. Tighten the clamps.

4.0 Start-Up

1. Check the connections between the communicating chamber and the vessel to insure proper mating.
2. Close the drain plug (or drain cock if applicable).
3. Open the shut off valve at the top connection.
4. Slowly open the shutoff valve at the bottom connection to allow for a gradual equalization of level in the communicating chamber.
5. Check for any leaks at the connections. If none are observed, the unit is ready for use.

5.0 Periodic Maintenance

Your Penberthy Magnetic Level Meter is designed to give you years of reliable service. However, equipment failure can occur. Sound maintenance practices require periodic inspection of the gage to ensure it is in good working order.

The end user must determine the appropriate maintenance schedule based upon his or her experience for the specific application. Realistic maintenance schedules can only be determined with full knowledge of the services and applications involved.



Do not proceed with any maintenance if the magnetic gage is still at operating pressure or temperature. Relieve the unit of pressure or vacuum, allow it to reach ambient temperature, and purge or drain it of all fluids. Failure to follow instructions could result in severe personal injury or property damage.

If the process liquid is dirty or contains deposits, it is recommended to flush the instrument periodically.

To flush the communicating chamber, close the shutoff valves, open the drain plug (or drain cock), and flush. If the float requires cleaning, the bottom flange must be removed after the shutoff devices are closed.

6.0 Troubleshooting

Problem	Cause	Solution
Loss of indication. Even though there is liquid in the vessel and the float is moving freely, the indicator fails to register a level.	Loss of magnetic strength in the float*	Return the float to the factory to be remagnetized.
	The float is installed incorrectly	Drain the gage, remove the float and install it correctly.
	If it is a follower style indicator you may be experiencing volatile level changes or high levels of vibration.	Change to a flag style indicator. Due to its design it will not decouple from the float.
Float is stationary when level changes occur.	Deposits in the process liquid have lodged between the float and the inside wall of the communicating chamber	Drain and flush the communicating chamber. Remove and clean the float.
	There is a source of ferromagnetic material within 8" [203 mm] of the centerline of the communicating chamber.	Remove the source of the ferromagnetic material or shield it from the magnetic gage.

Table 7

*All magnets will lose strength over time. The rate of loss is normally very gradual and will vary with the application. Higher operating temperatures and excessive vibration can increase the rate of loss.

7.0 Disposal at End of Useful Life

Penberthy meters are used in a variety of fluid applications. By following the appropriate federal and industry regulations, the user must determine the extent of preparation and treatment the valve must incur before its disposal. A Material Safety Data Sheet (MSDS) may be required before disposal services accept certain components.

Metal, glass and polymers should be recycled whenever possible. Refer to order and TV&C - Prophetstown Material Specification sheets for materials of construction.

8.0 Telephone Assistance

If you are having difficulty with your MULTIVIEW™ Magnetic Liquid Level Meter, notify your local Penberthy representative, or call the factory direct (815) 537-2311 and ask for an applications engineer.

To help us to assist you more effectively, please have as much of the following information as possible when you call:

- Standpipe Part
- Float Part Number
- Name of the company from whom you purchased the meter
- Invoice Number and Date
- Process Material
- Specific Gravity
- Operating Temperature
- Operating Pressure
- Brief description of the problem

If attempts to solve your problem fail, you may be requested to return your instrument to the factory for intensive testing. You must obtain a Return Authorization (R. A.) number from Penberthy prior to returning your unit. Failure to do so will result in the unit being returned to you, without being tested, freight collect. To obtain an R. A. number, gather the following additional information:

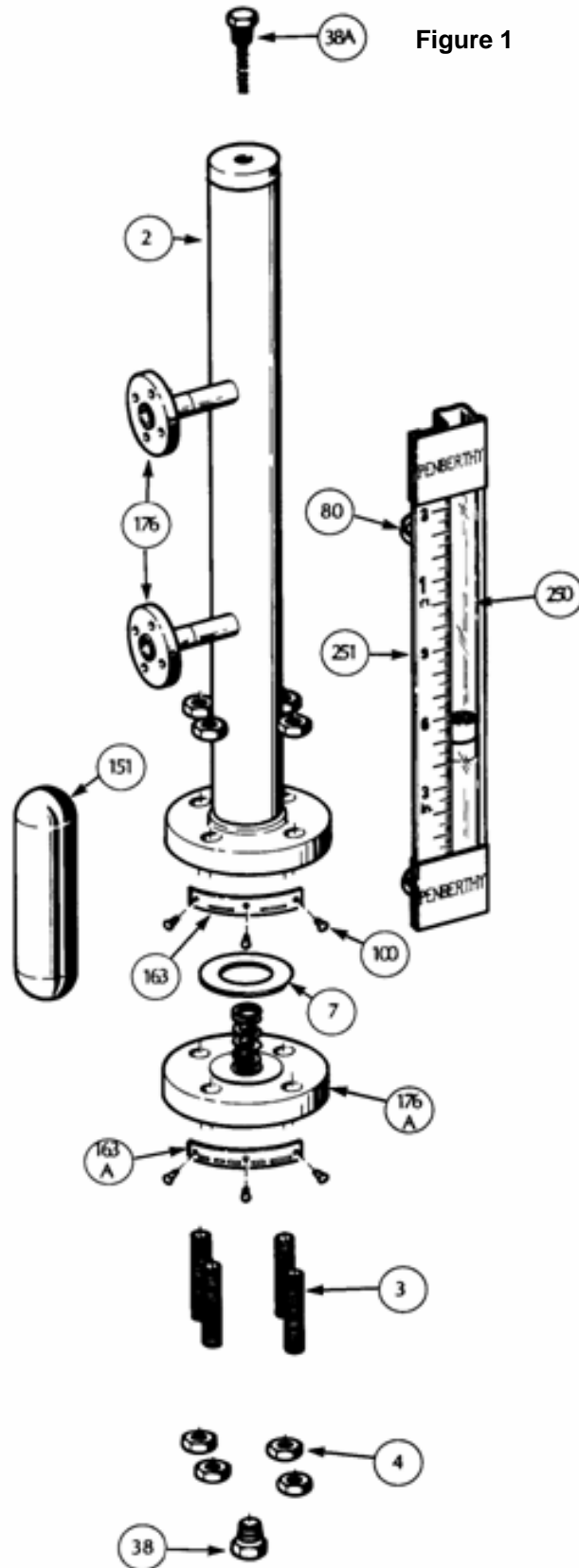
- Reason for Return
- Person to contact at your company
- "Ship-To" address

We recommend that you return the entire unit for testing. There will be a minimum charge applied for evaluation of non-warranty units. You will be contacted before we repair the unit if there will be any additional charges in excess of the minimum. If you return a unit that is covered by the warranty, but is not defective, the minimum charge will apply.

Halar® is a registered trademark of Ausimont
Hastelloy C® is a registered trademark of Haynes International, Inc.
Alloy 20® is a registered trademark of Carpenter Technologies, Inc.
Inconel® and Monel® are registered trademarks of Inco Alloys International, Inc.

9.0 Exploded Parts View

- 2 Chamber
- 3 Stud
- 4 Nut
- 7 Gasket
- 38 Plug
- 38A Plug
- 80 Clamp
- 100 Screw
- 151 Float
- 163 Nameplate
- 163A Nameplate
- 176 Flange
- 176A Flange
- 250 Indicator Tube
- 251 Indicator Frame



PENBERTHY

DECLARATION of CONFORMITY


In conformance with ISO/IEC Guide 22 - 96
MLG.DC r C

Manufacturer's Name: Tyco Valves & Controls
Manufacturer's Address: 320 Locust Street
Prophetstown, IL 61277-1147 U.S.A.
Product:
Type of Equipment: Pressure Vessel - Magnetic Liquid Level Meter
Equipment Class: Industrial Instrumentation - Hazardous Area
Model Designations: MG, TMMG, MMG, MGVB

The product described above is in conformity with:

92/59/EEC	General product safety	1992
87/404/EEC	Simple pressure vessel	1987
89/392/EEC	Machinery	1989
ISO 7-1	Pipe threads where pressure-tight joints are made	1996
BS 10	Flanges and bolting for pipes, valves and fittings	1962
BS 21	Pipe threads for tubes and fittings where pressure-tight	1985
BS 970 Part 1	Wrought steels for mechanical and allied engineering	1996
BS 1506	Carbon, low alloy and stainless steel bars and billets	1990
BS 1560	Circular flanges for pipes, valves and fittings	1989
BS 1640 Part 1	Steel butt-welding pipe fittings	1962
BS 1640 Part 2	Steel butt-welding pipe fittings	1962
BS 1965	Butt-welding pipe fittings	1963
BS 3076	Nickel and nickel alloys: bar	1989
BS 3602 Part 1	Steel pipes and tubes for pressure purposes	1987
BS 3605	Austenitic stainless steel pipes and tubes	1991
BS 3643	ISO metric screw threads	1981
BS 3799	Steel pipe fittings, screwed and socket-welding	1974
BS 4504	Circular flanges for pipes, valves and fittings	1989
ASME B&PV Code Sections I and VIII	Rules for const. of power boilers and pressure vessel	1995
ANSI/ASME B1.1	Unified screw inch threads un and unr thread form	1982
ANSI/ASME B1.20.1	Pipe threads, general purpose (inch)	1983
ANSI/ASME B16.5	Pipe flanges and flanged fittings	1988
ANSI/ASME B16.9	Factory-made wrought steel butt-welding fittings	1993
ANSI/ASME B16.21	Nonmetallic flat gaskets for pipe flanges	1978
ANSI/ASME B18.2.1	Square and hex nuts and screw inch series	1981
ANSI/ASME B18.2.2	Square and hex nuts	1972
ANSI/ASME B18.6.3	Machine screws and machine screw nuts	1972
ANSI/ASME B31.1	Power piping	1995
ANSI/ASME B31.3	Process piping	1996

Date: 12 December 2004
Prophetstown, IL U.S.A.

Signature: 
Name: David J. Williams, C.Q.E.
Position: Quality Assurance Manager

Technical Construction File is available at stated address. Signatory is contact person.

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& Controls**

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Tyco Valves & Controls, L.P. Prophetstown
320 Locust St., Prophetstown, Illinois 61277
Phone: 815-537-2311
FAX: 815-537-5764
Printed in USA
Part No. 17665-009

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