

M & M Quality

GAUGE & VALVE



**MAGNETIC LIQUID LEVEL
GAUGES AND CONTROLS**

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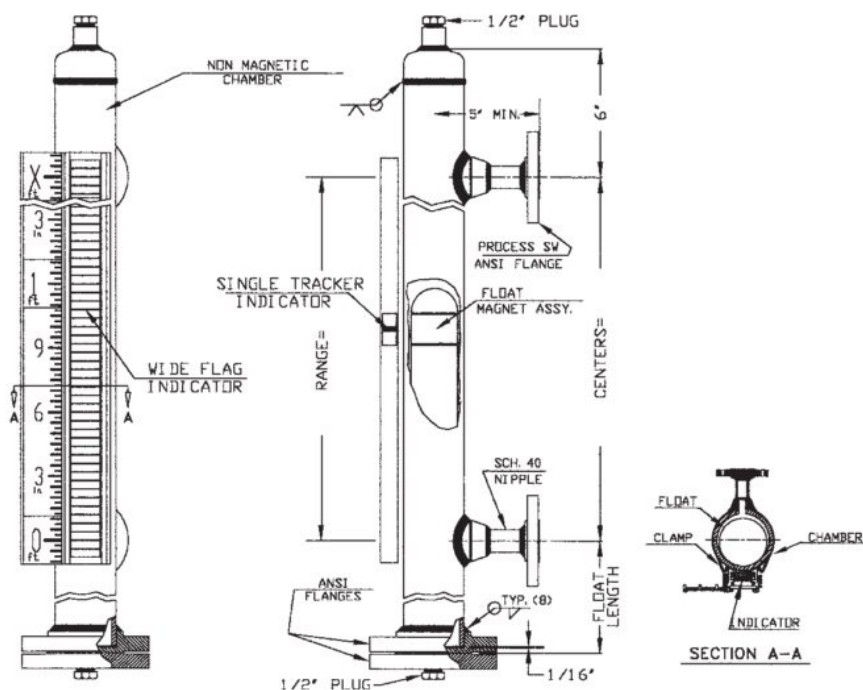


The Quality magnetic gauge is a proven method to measure liquid levels. The magnetic gauge is one of the safest and most economical ways to measure and control you level requirements. It can be installed on almost any shape, size or type of vessel in the industry. In applications of extreme pressure, temperature, vibration and highly corrosive or hazardous material, the magnetic gauge will perform where others fail.

PRINCIPLES OF OPERATION

The chamber is constructed of non-magnetic materials, and process connections to mate with those of the tank, vessel or other equipment where the level is to be measured.

The float is engineered and located inside the chamber. It is sized and weighed to the specific gravity of the process fluid to be measured. The float contains a 360° magnetic assembly which generates a strong uniform magnetic circuit. The indicator and the float are interlocked by the magnetic flux lines generated by the magnets. The hermetically sealed indicator, the wide flag or wide tracker styles, both contain its own magnetic assemblies which interlock with the float through the chamber, providing a strong and reliable design. As the float moves with the changes in the liquid level, the magnetic attraction between the indicator and the float will ensure that the indicator will track the position of the float exactly and the liquid level is measured precisely.



INDICATORS



Wide Tracker Style



Wide Flag Style

Wide tracker

- Extra-large rectangular indicator
- 1.40" Wide X 1.50" long
- Bright yellow (other colors available)
- Dual magnetic coupling

Wide Flag

- Easy to read 1.40" wide flag (visible from 200+ feet)
- Patented solid one piece ceramic magnetic flag
- 180 degree rotation
- Temperatures from -350° F to 1100° F
- High contrast yellow (liquid) & black (vapour)
- Other color combinations available.

Available enclosures:

Anodized Aluminum or 316 Stainless Steel

SCALES

- Scales can be customized to any increments (ft/in, gallons, percent, metric, ect.)
- All scales are photo etched into stainless steel – no rusting, fading or stickers falling off.
- Large, easy to read markings that allow measurement to be taken from a safe distance

Scales available in:

- Feet/inch standard
- Metric
- % scale
- Tenths scale
- Wide acrylic scale
- Gallon scale
- +/- scale
- Inch only scale



POINT LEVEL SWITCHES

MGS-200EX and MGS-200EX/2	
TYPE:	Electrical
VOLTS:	150 VAC / VDC
CURRENT:	1.0 Amps
POWER:	25 Watts
CONTACTS:	SPDT or DPDT
DEADBAND:	1/2 inch
MAWT:	(-40) °F to 800 °F
ENCLOSURE:	NEMA 4X
CONNECTION:	3/4" FNPT

MGS-500EX and MGS-500EX/2	
TYPE:	Electrical
VOLTS:	500 VAC/VDC
CURRENT:	3.0 Amps
POWER:	100 Watts
CONTACTS:	SPDT or DPDT
DEADBAND:	1/2 inch
MAWT:	(-40) °F to 600 °F
ENCLOSURE:	NEMA 4X
CONNECTION:	3/4" FNPT



MGS-700EX and MGS-700EX/2	
TYPE:	Electrical
VOLTS:	125/250 VAC
CURRENT:	10.0 Amps
POWER:	2500 Watts
CONTACTS:	SPDT or DPDT
DEADBAND:	1/2 inch
MAWT:	(-40) °F to 600 °F
ENCLOSURE:	NEMA 4X
CONNECTION:	3/4" FNPT

MGS-900EX and MGS-900EX/2	
TYPE:	Electrical
VOLTS:	125/250 VAC
CURRENT:	15.0 Amps
POWER:	3750 Watts
CONTACTS:	SPDT or DPDT
DEADBAND:	1/2 inch
MAWT:	(-40) °F to 600 °F
ENCLOSURE:	NEMA 4X
CONNECTION:	3/4" FNPT

Stainless Steel Enclosures Available For All Switches

Electrical Area Classification: Class I, Division I, Groups B, C, D

MGS-100	
Non Bleed Pneumatic Switch	
TYPE:	Non Bleed Pneumatic Switch
SUPPLY PRESSURE:	30-200 PSIG
DEADBAND:	1/2 inch
MAWT:	0 °F to 200 °F
ENCLOSURE:	316 SS
CONNECTION:	1/4" FNPT



FLOATS

- All floats are engineered to specific operating conditions of each application
- Shell is constructed of stainless steel, titanium, hasteloy, monel, CPVC, PVDF (Kynar), or any other non-magnetic material.
- Magnetic circuit is made of a series of Alnico magnets to provide a light yet effective connection.
- We can handle the highest pressures in the industry with NO oversized, pressurized or vented floats. Pressurized floats can be a safety concern and can leak over time.
- We use solid engineering to conquer the demands of high pressure low gravities.



STANDARD STAINLESS STEEL FLOAT



CVPC FLOAT



KYNAR FLOAT



TITANIUM HIGH PRESSURE FLOAT



HIGH PRESSURE INTERFACE FLOAT WITH FIELD ADJUSTABLE WEIGHT



COATED FLOATS FOR CORROSIVE PROCESSES

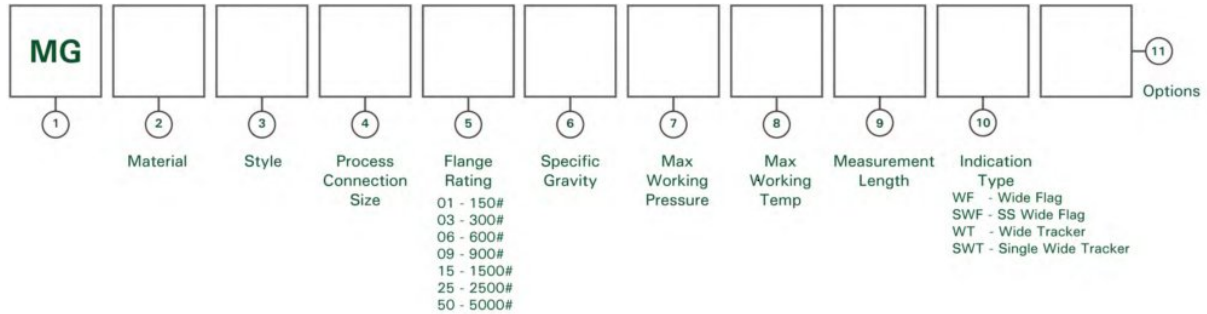


CARBON FIBER FLOAT

A Quality Magnetic Circuit

When designing the magnetic circuit between the float and indicator there are many considerations other than just how strong the magnets are in the float. These magnetic level gauges have undergone extensive testing to produce a rigid and high performance design. With their unique construction the indication performs under the most demanding conditions such as high/low temperatures, vibrations, even schedule 160 chambers. Our patented solid magnet wide flag design not only provides highly visible indication, but provides a powerful connection with the float. The reliability and repeatability of the magnetic gauge float and indicator is unmatched.

ORDER SPECIFICATIONS



STANDARD SPECIFICATIONS

- Non-magnetic Chamber Material
- All Flanges, Fittings & Pipe meet ASME/ANSI Standard
- Fabricated/Welded to B31.1/B31.3 Code

FLOAT CHAMBER

- 2"-3" Pipe with RF Flanges – SCH.40
- ½" FNPT Vent & Drain Connections
- All Flanges & Fittings Rated for Process
- Connections: ½" thru 8" plus
- Pressure ratings up to 5000 PSIG
- Temperature Ratings : -350deg F to 1100deg F
- Specific Gravity Range: 0.28 and up
- Lengths from 4.0" to 50 feet

SCALE

- Feet & Inches, ¼" Divisions
- Photo Etched and Backfilled on Stainless Steel
- Metric, Percentage or Volumetric Available
- Optional 3-1/2" Acrylic Scales

INDICATOR

- Bright Colored
- Can be seen from 200 ft or more
- ¼" wide
- Hermetically sealed

MATERIAL

- 4S = 304/304L SS
- 4C = 304 SS / CS
- 6S = 316/316L SS
- 6C = 316 SS / CS
- 2S = 321 SS
- 4T = TEFLON LINED 304 SS
- 4H = HALAR COATED 304 SS
- NS = NON-STICK COATING
- AL = ALUMINUM
- A2 = ALLOY 20
- MO = MONEL
- TT = TITANIUM
- HB = HASTELLOY B
- HC = HASTELLOY C
- ZR = ZIRCONIUM
- CP = CPVC
- PV = PVC
- KY = KYNAR
- PP = POLYPROPYLENE
- CM = OTHER MATERIAL

FLANGE RATING

- 01 = 150#
- 03 = 300#
- 06 = 600#
- 09 = 900#
- 15 = 1500#
- 25 = 2500#
- 50 = 5000#

OPTIONS

CHAMBER

- WN = WELD NECK FLANGES
- LJ = LAP JOINT FLANGES
- RJ = RING JOINT FLANGES
- BW = ALL BUTT WELD CONSTRUCTION
- NM = NACE

INDICATOR & SCALE

- WF = WIDE FLAG
- WT = WIDE TRACKER
- MS = METRIC SCALE
- PS = PERCENT SCALE
- AS = 3-1/2" ACRYLIC SCALE
- FE = NON FROST EXTENSION
- DI = DUAL INDICATION
- IF = INTERFACE INDICATION
- AR = LEVEL ARROW INDICATORS
- IL = ILLUMINATOR
- IG = INDICATOR GUARD
- HDC = HEAVY DUTY MOUNTING CLAMPS

TEMPERATURE CONTROL

- CI = LOW TEMP. CRYOGENIC INSULATION
- IB = HIGH TEMP. INSULATION BLANKET
- EH = ELECTRICAL HEAT TRACING
- FB = FREEZE PROTECTION
- ST = STEAM TRACING
- FE = FROST EXTENSION

TESTING

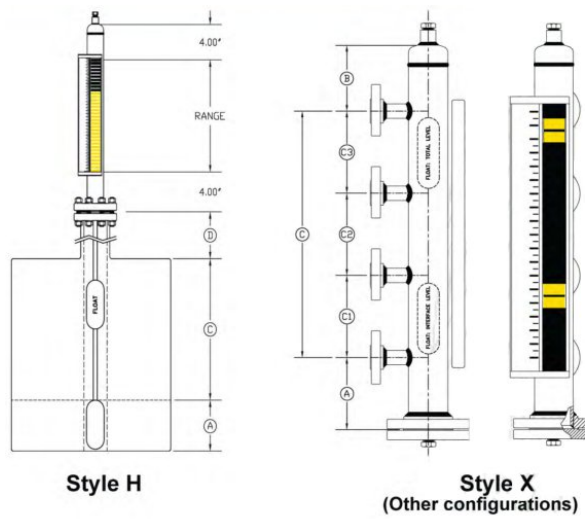
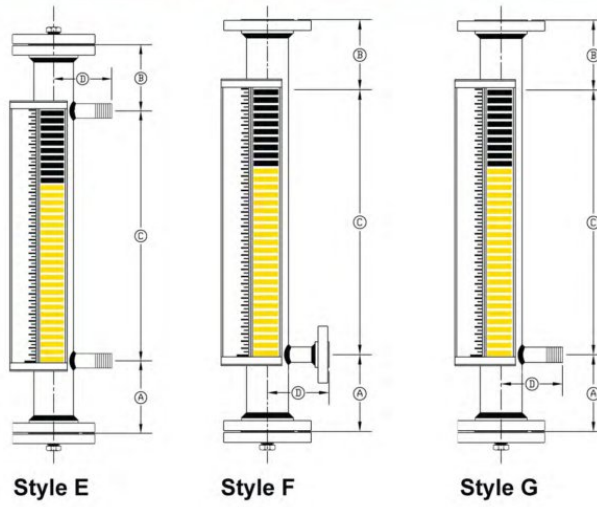
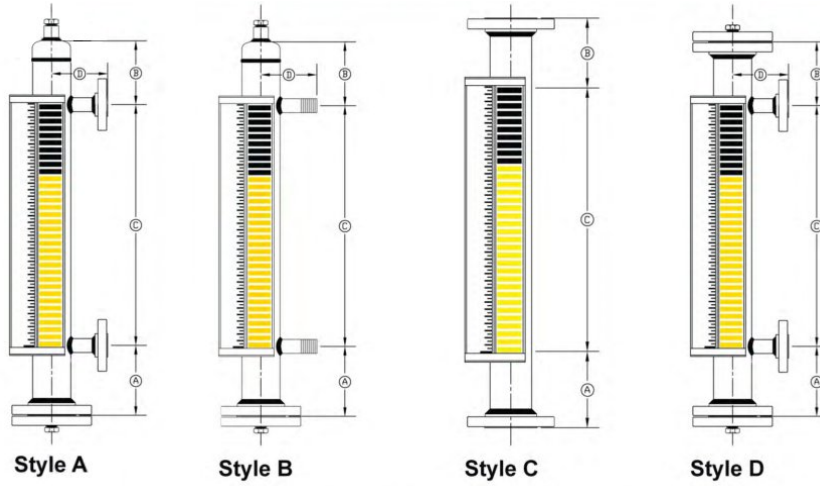
- HY = HYDROSTATIC
- NDE = 100% NON-DESTRUCTIVE TESTING
- PMI = POSITIVE MATERIAL IDENTIFICATION

VALVES

- GV = GATE VALVES
- VD = VENT & DRAIN VALVES

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TRANSMITTERS

Non-Invasive

Magnetostrictive Level Transmitter – MGT-6000

The MGT-6000 series level transmitter is the latest development in Magnetostrictive level sensing technology that is designed exclusively for magnetic level gauges. The MGT-6000 contains a low profile waveguide that is mounted away from the level gauge chamber. This durable slim design isolated the dual sealed waveguide from excessive vibration and temperature. From enhanced sensor technology, the output signal is fast and extremely accurate.

Standard features:



- Two wire, loop powered, 24 VDC nominal
- 4-20mA, inches/metric and/or percent output signal
- Scrolling LCD display in 4-20 mA, in/cm or percent
- Local and remote detecting for total or interface level elevations
- HART protocol field communication
- Local programmability allows for quick and easy setup
- No recalibration necessary, set it and forget it
- Non-wetted, dual sealed low profile waveguide design, 316SS
- Isolated from excessive thermal and vibration effects
- Top, bottom or remote transmitter head mountings
- Accurate to within 0.01% of total span selected
- Durable design with a strong, noise free signal output
- State of the art sensor and transmitter electronics
- Unique transmitter puck design
- Simple retrofit to most magnetic level gauge chambers
- Explosion proof housing, NEMA type 4X
- Class 1, division 1, groups B,C,D
- Class 11, division 1, groups E,F,G
- Class 111

WAVE GUIDED RADAR

Wave Guided Radar Specifications

- Independent of density
- Free of maintenance
- Equal process connections available
- Equal electrical interface
- Measuring range
 - up to 45m (148ft)
- Temperature range
 - -196°C to 450°C (-321°F to 842°F)
- Pressure range
 - 1 to 400 bar (-14.5 to 5800 psi)
- Dielectric constant
 - 1.6 (rod probe, rope probe)
 - 1.4 (coax probe)
- Probes
 - Rod probe
 - Rope probe
 - Coax probe



Rod Probes:

- Measuring ranges up to 13ft (4m)
- Independent from turbulent surface
- Very low influence by obstacles, fixtures and fittings, if the distance is $\geq 1\text{ft}$ (30cm)



Hygienic Process Connections

- With clamp and universal adapter
- Surface roughness $\leq 0,8 \mu$
- 3A and EHEDG approved



Rope Probes:

- Measuring ranges up to 148ft (4500 cm)
- narrow installation conditions, e.g. at low ceiling space.

ILLUMINATED MAGNETIC GAUGE

The illuminated magnetic gauge is a bi-color magnetic gauge with illuminated indicator and tracker in one design. As the float rises in the magnetic level gauge chamber the illuminator will change from white to yellow. White, being the vapor space and yellow the liquid being measured. The illuminated magnetic gauge consists of a series of bi-color LED lights, as the magnetic field in the float passes a Hall Effect sensor it will change the color of the led. There are no moving or mechanical parts.



Specifications

- Input voltage 12 vdc – 50vcd
- Optional: 120 VAC
- Power consumption: 1 amp max
- Ambient temperature: -40° F to 120° F
- Process temperature: up to 780° F
- Electrical connection: 3/4" FNPT
- Electrical class: class 1 div 2 groups B,C and D
- Estimated life: 250,000 hours (continuous)
- Colors
 - Clear vapour
 - Yellow liquid
 - Optional color combinations available



Typical Customized Magnetic Gauges



Sanitary Magnetic Gauge
(Tri-colored Flags)



Drum Level Indicator
Meets ASME Boiler
Code for water level
indicators on Boiler Drum



High Temperature Insulation
Shown with Red/White
WF indicator option

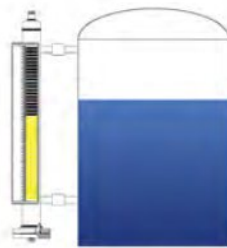


Cryogenic Insulation
With MGT-6000 transmitter

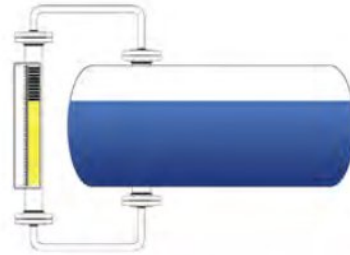
Typical Magnetic Gauge Tank Installations



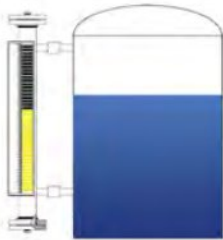
Style A



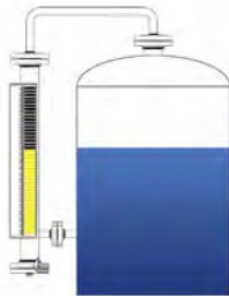
Style B



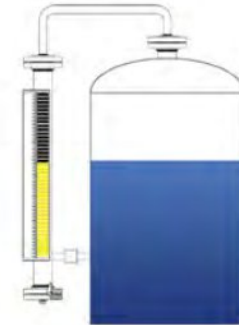
Style C



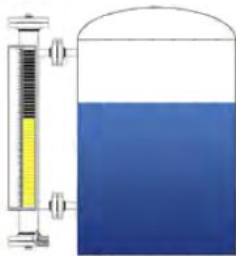
Style E



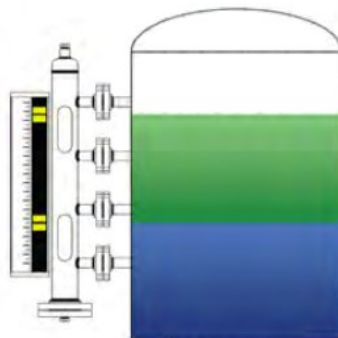
Style F



Style G



Style D



Style X



Style H

Applications

Acetic Acid
Ammonia
Asphalt Settler
Benzene
Blow Case
Boiler Steam Drum
Butane
Caustics
Cooling Towers
Deionized Water
Dow Therm
Drip Pot
Feedwater Heaters

Flare Drums
Freon
Glycol
Hydraulic Oil
Hydrazine
Hydrochloric Acid
Hydrofluoric Acid
Hydrogen Sulfide
Jet Fuel
LPG
Liquid Carbon Dioxide
Liquid Ethylene
Molten Sulfur

Phosgene
Propylene
Propane
Seal Oil Pots
Slop Oil
Sour Oil
Sump Tank
Underground Storage
And more !

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