

*The first name in mechanical buoyancy level control  
for more than 90 years.*

# Magnetrol® Tough

## Float Chamber Design Guide

More instrumentation professionals trust their operation's safety and performance to Magnetrol, the market leader in unfailingly reliable mechanical buoyancy liquid level switches.

This guide details the design elements that give our external cages the structural integrity demanded of your toughest level control applications.



**MAGNETROL®**

**AMETEK®**

LEVEL MEASUREMENT  
SOLUTIONS

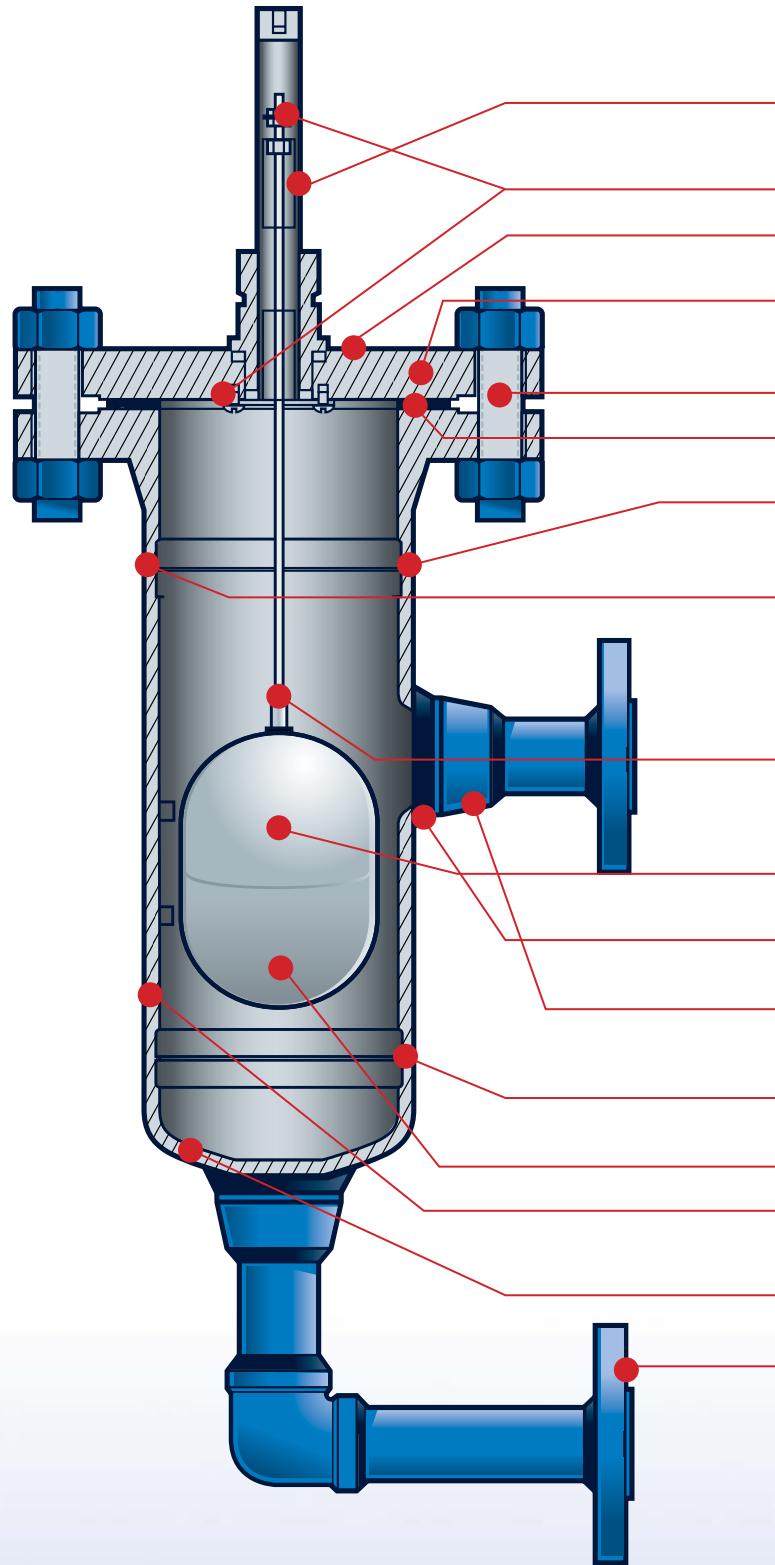
# Design Integrity in the Details

There's a reason Magnetrol-tough liquid level switches are the No. 1 brand of mechanical buoyancy instrumentation. The fact is, Magnetrol switches work. They work hard, they work tough, they work smart. And they keep on working, for decades and decades of safe, accurate, repeatable, reliable level detection.

Inside every Magnetrol float chamber, you'll find superior-quality craftsmanship and meticulous engineering that ensure trouble-free performance in even your most challenging applications.

## Compare our level switches to competitive devices. Magnetrol switches are built to last.

- We don't cut corners. You'll find intelligent design, durable construction and robust materials throughout every Magnetrol switch, for long-lasting, maintenance-free dependability.
- Some competitors construct their float chambers "to the intent" of ASME standards. Magnetrol chambers are designed to ASME B31.1, ASME B31.3, NACE MR0175 and MR0103, or to rugged industrial requirements – meeting the toughest industry specifications.



# Best-in-Class Float Chamber Design

Feature	Benefit	Construction Specification			
		NACE MR0175 and MR0103	ASME B31.3	ASME B31.1	Magnetrol Industrial
Magnetic attraction sleeve	No magnet in process to attract ferrous particles	X	X	Reinforced to minimize likelihood of damage during pressure surges	X
All stainless steel trim parts	Corrosion resistant	All 300 series SS	X	X	X
Spiral wound e-tube gasket	Suitable for high pressures, temperatures and steam service	X	X	X	X
Designed for high pressure	Suitable for the toughest conditions	+2240 psi (+154 bar) @ +100°F (+38°C), +1200°F (+649°C) max	+2240 psi (+154 bar) @ +100°F (+38°C), +1200°F (+649°C) max	+3700 psi (+255 bar) @ +100°F (+38°C), +1200°F (+649°C) max	+5000 psi (+345 bar) @ +100°F (+38°C), +1200°F (+649°C) max
Bolting per ANSI 16.5	ANSI compliance	X	X	X	As required
Spiral wound head flange gasket	Suitable for high pressures, temperatures and steam service	X	X	X	As required
ASME Section IX welding performed by qualified welders to qualified procedures	Documented and traceable	X	x	x	x
Weld examination per ASME B31 including visual inspection, radiography and liquid penetrant testing as required	Documented and traceable	Visual inspection for size, profile and penetration	100% visual inspection for full penetration, 5% radiography of circumferential body welds and 100% liquid penetrant testing of branch welds.	100% visual inspection for full penetration, over 750°F, 100% radiography of circumferential body welds and 100% liquid penetrant testing of branch welds.	Visual inspection for size, profile and penetration
Welded float and stem assembly	Durability	X	X	Welded float and reinforced stem to minimize likelihood of damage during pressure surges.	X
Hydrostatic tested at 1.5 times the rated pressure, including float	Verify pressure boundary with safety margin	1 minute	10 minutes	10 minutes	1 minute
Full penetration chamber branch welds	High strength weld	X	X	X	As required
Integrally reinforced forged branch outlet (Bonney-Forge style) couplings	Allows full penetration welds	X	X	X	As required
Full penetration circumferential chamber welds	High strength weld	X	X	X	As required
Low SG floats and displacers	Suitable for most applications	0.33	0.33	0.41	0.32
ASTM listed pressure boundary parts procured with certificate of conformance	ASME compliance	NACE and ASME listed materials	X	X	All pressure boundary parts procured with certificate of conformance
Designed with allowable stresses per ASME B31	ASME compliance	X	X	X	Not applicable
Flanges ANSI 16.5 compliant	ANSI compliance	X	X	X	As required
Welds and HAZ hardness tested	Ensures hardness levels compliant with NACE standards	Maximum hardness of 22 Rockwell for A-106 carbon steel and 300 series stainless steels, 187 brinell for A-105 in base metal, HAZ and weld material	Not applicable	Not applicable	Not applicable
Post weld heat treatment of all welded carbon steel components	Ensures hardness levels meet NACE requirements		Not applicable	Not applicable	Not applicable
Solution annealing of stainless steel parts as required to meet NACE hardness requirements	Ensures hardness levels meet NACE requirements		Not applicable	Not applicable	Not applicable



## Make Sure It's A Magnetrol.

Mechanical buoyancy level instrumentation remains one of the most reliable level detection technologies available to the process control industry. Magnetrol's extensive offering of vertical and horizontal float and displacer switch and transmitter devices represents the industry standard for highly reliable, highly repeatable performance.

### Applications

**ASME B31.1 Construction for use on boilers and in power plants:**

- Feedwater Heaters
- Steam Drums
- Condensate Drip Pots
- Flash Tanks
- Deaerators
- Hot Wells

**ASME B31.3 construction for use in refineries and petrochemical plants:**

- Gas/Oil Separators
- Knockout Drums
- Crude/Salt Water Separators
- Receivers
- Flare Pots
- Accumulators

### ***Not Pretty. Just Pretty Tough.***

*Long-lasting Magnetrol level switches have been known to deliver maintenance-free performance in the field for as long as 50 years!*



**For more information on the most trusted buoyancy instrumentation available, contact your Magnetrol representative.**



705 Enterprise Street • Aurora, Illinois • 60504-8149 USA • Phone: 630-969-4000  
[magnetrol.com](http://magnetrol.com) • [info.magnetrol@ametek.com](mailto:info.magnetrol@ametek.com)

