Measurement Products - Measurement made easy

Magnetic Level Gauges
K-TEK Products

Power and productivity
for a better world™

ABB

Contents

KM26 Magnetic Level Gauge

Custom engineered, highly visible, non-contact, level indication - safe, with low or no maintenance, designed to meet extreme process conditions

With over 300,000 installations worldwide, the KM26 Magnetic Level Gauge has provided custom engineered solutions to liquid level applications in industries such as: oil and gas, refinery, chemical, petrochemical, power generation and many more. The KM26 Magnetic Level Gauge has proven itself to be a safe, reliable and maintenance free solution for total and/or interface level detection in toxic, corrosive, high pressure and high temperature processes.

ABB offers the standard KM26 Magnetic Level Gauge with a chamber of virtually any non-magnetic material, extruded process connections, a custom engineered float and all accessories with 316 stainless steel construction. ABB also offers a dual chamber redundant level system, which has a proven record in power plants around the world. The MagWave dual chamber magnetic level gauge combines a highly visible magnetic level indicator with the precise level measurement of a guided wave radar transmitter. Redundant level control can be achieved by adding a magnetostrictive transmitter or switch to the float chamber providing independent technologies in one package.

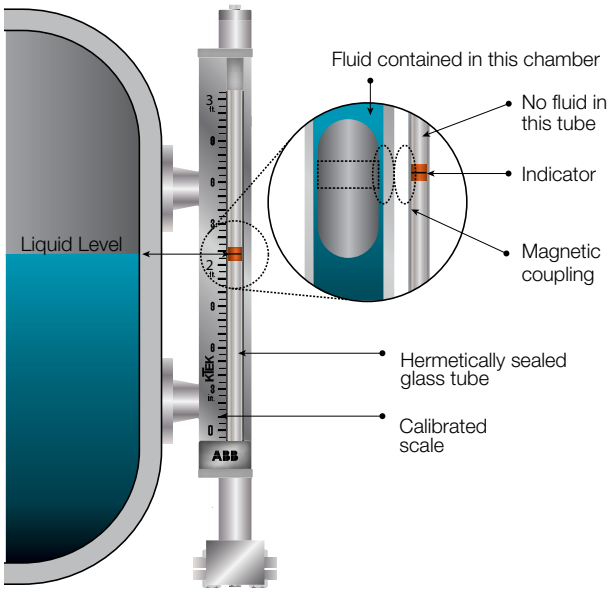
Customer benefits

- Lowest installation, maintenance and engineering cost
- High visibility
- Safe installation and operation
- 5 year warranty on chamber, float and indication assembly
- Extruded outlet process connections
- Custom engineered floats ensure accurate indication and reliability
- All magnetic level gauges are designed to ASME or PED standards
- All welding is performed by code certified welders
- Optional magnetostrictive transmitters provide continuous level transmission

KM26 Magnetic Level Gauge
Manufactured to suit specific process requirements

Principle of operation

A hermetically sealed float with an internal magnetic ring is housed in a non-magnetic float chamber. The float will move up and down in the chamber as level rises or falls in the vessel on which it is attached. ABB floats are designed and weighted so that the center of the magnet assembly is at the true fluid level for absolute accuracy. Coating, plating, fouling, fugitive emissions and leaks of hazardous material problems are eliminated.



Float design and construction

Our floats are individually engineered for each application with the following:

- Minimum positive buoyancy of 75 grams
- Magnetic ring placed at liquid level
- Indicated level is the true level
- Hermetically sealed, no vents
- 360° magnetic ring
- Coated floats (Halar, Tefzel, TEFLON®-S*)

***TEFLON® is a registered trademark of DuPont**

360° magnetic ring **TEFLON®-S* coated**

Extruded process connections

ABB offers extruded outlets for the process connections on most chambers. The extruson process benefits include:

- Stronger connections
- Eliminates the need of post weld straightening
- Provides full bore process connection
- Eliminates “sink-in” distortion that interferes with float movement
- Improves quality, operation and reliability
- Additional connections can be extruded for level switches, pressure switches, pressure transmitters, etc.
- Meets ANSI B31.1, B31.3, and section VIII - Div. 1
- The weld does not protrude into the chamber
- Available in a variety of materials including:
  - All stainless steel
  - Alloy 20
  - Hastelloy
  - Extrusion dependent on material and size

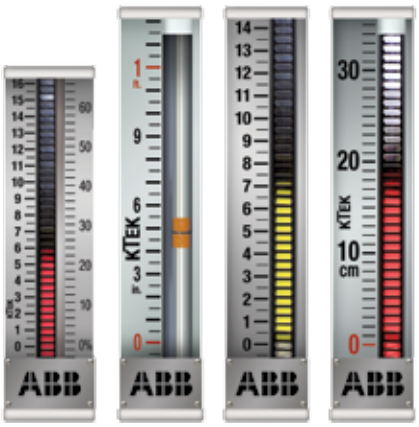
Competitor standard (additional weld required)

ABB standard

Indicators

A magnetic, highly visible “shuttle” or bar graph indicator, encapsulated in a hermetically sealed glass tube, is attached in a scale housing to the outside of the float chamber. It indicates the liquid or interface level without being in contact with the process fluid. Problems with colorless or dirty fluids are solved since the indicator is non-contact. No gauge glasses to clean. No leaks to repair. Shuttle and bar graph indicators are available with the following:

- Process temp to 1000°F/538°C
- Hermetically sealed tube
- Shuttle indicator
- Magnetically interlocked bar graph indicator for vibration resistance
- Standard or custom rulers in stainless steel or plastic
- Metric, English or custom units
- Field replaceable
- Optional polycarbonate tube available



Dual bar graph indicator

Shuttle indicator

Single bar graph indicators available in:

- **Yellow/Black**
- **Red/White**
- **Red/Green**
- **Red/Black**

Industries and applications
The leader in level detection

Typical industries:
- Oil and gas production
- Petrochemical
- Chemical
- Power generation
- Water and wastewater treatment
- Food and beverage
- Pharmaceutical
- Pulp and paper
- Biotech
- Semiconductor

Typical applications:
- Oil
- Water
- High and low pressure separators
- Oil and water interface
- Acids - hydrofluoric, hydrochloric, nitric, sulfuric, etc.
- Refined petrochemical - gasoline, propane, butane, ethylene, etc.
- Solvents - acetone, toluene, xylene, naphtha
- Gas condensate
- Heat transfer fluids - dowtherm, therminol and glycol
- Black, green and red liquor
- Refrigerants
- Alcohols
- Caustics
- Chlorine
- Steam condensate - boiler feedwater heater boiler drum level control
- Bitumen
- Vacuum tower bottoms
- Ammonia
- Liquid sulphur
- Most liquid to liquid interfaces

Specifications
KM26 Magnetic Level Gauge

KM26 Magnetic Level Gauge for liquid applications

- Highly visible level indication with no process fluid in contact with the glass sealed indicator
- All construction in-house by code certified welders
- Float designed and weighted for maximum accuracy
- Transmitter and switch options, which can be installed, adjusted and maintained externally with no process interruption
- Safe for corrosive, flammable, toxic, high-temperature and high-pressure applications
- Rugged design - low or no maintenance

Process capabilities	
Pressure	Full vacuum to 5000 PSI (316 kg/cm^2)
Temperature	-320 to 1000°F/-195 to 538°C
Specific gravity	0.25
Viscosity	Most liquid viscosities
Interface	As low as .03Δspecific gravity

Available materials:

- Stainless steel - 304/304L, 316/316L, 321, 347, 904L
- Alloy 20
- Hastelloy - B3, C-276
- Incoloy 600, 825
- Aluminum
- Titanium
- Teflon coated stainless steel
- Fiberglass - epoxy or vinyl ester resin
- PVC and CPVC
- Kynar
- Polypropylene
- Zirconium
- For other materials, consult factory

Testing and documentation:

- Radiographic examination
- Liquid dye penetrant examination
- Hydrostatic examination
- PMI (Positive Material Identification) material certification
- ASME “U,” “UM,” or “S” stamp
- Material Certificates
- ANSI/ASME B31.1, B31.3
- PED certification*
- NACE MR0103, NACE MR0175
- Canadian registration number (CRN)
- Marine and industrial type approval for high-pressure boilers (New Zealand)

KM26 Magnetic Level Gauge series
The ultimate level measurement system

KM26S Side Mounted Magnetic Level Gauge
- Highly visible level indication with no process fluid in contact with the glass
- All construction in house by code certified welders
- Float designed and weighted for maximum accuracy
- Transmitter and switch options which can be installed, adjusted and maintained with no process interruption
- Safe for corrosive, flammable, toxic, high-temperature and high- pressure applications
- Rugged design- low or no maintenance
- Monel and Hastelloy (for corrosive applications)

KM26T Top Mount Magnetic Level Gauge
- Magnets above float connected with rod
- Slug catcher level
- Optional stilling wells
- Total or interface level measurement
- Underground tanks and sumps
- Fluids with magnetic particles
- Can be used with transmitters and switches

KM26 High Pressure Top Mount Magnetic Level Gauge
- Flange ratings to 2,500# ANSI

KM26 Corrosive/Lightweight Magnetic Level Gauge
- PVC, CPVC, Polypropylene or Kynar (PVDF) construction (for lightweight MLGs)

KM26 Heat Traced and High Temperature Insulation Magnetic Level Gauge
- Electrical or steam heat tracing
- Removable insulation

KM26 Cryogenic Temperature Insulation Magnetic Level Gauge
- Temperatures to -320°F/-195°C
- Lexan frost extensions available (required for cryogenic units)


KM26S Side Mount


KM26T Top Mount


KM26 High Pressure


KM26 Corrosive/ Lightweight


KM26 with High Temperature Insulation


KM26 with Cryogenic Temperature Insulation

Magnetostrictive Level Transmitters

The AT200 and AT600 Magnetostrictive Level Transmitters are highly accurate devices designed to be used with the KM26 magnetic liquid level gauge series or any other magnetic level gauge. It provides continuous level indication and transmission of an analog and/or digital communication protocol for monitoring or control. The unique magnetostrictive design allows increased level sensing resolution, which is more than 100 times greater than a conventional reed switch type sensing device.

AT200 Non-contact Magnetostrictive Level Transmitter

- SIL 2 & SIL 3 certified IEC 61508
- High accuracy: .01% of full scale
- Superior piezo ceramic sensor (Patent # 5,473,245)
- Local indication with LCD display
- Never requires recalibration: set it & forget it
- 4-20 mA, HART, Foundation Fieldbus

AT600 Compact Magnetostrictive Level Transmitter

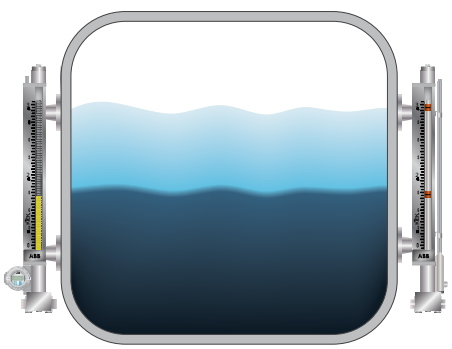
- High resolution 4-20 mA output
- Simple mounting and installation
- No process piping or valve required
- Calibrates without opening enclosure
- Stainless steel enclosure
- Superior piezo ceramic sensor (patent #5, 473, 245)

MagWave

The MagWave is a level measurement system which combines a highly visible magnetic level indication with an output from a guided wave radar transmitter. The MagWave features two separate close-coupled chambers for the level indicator float and the Guided Wave Radar antenna, which allows the float to travel unobstructed throughout the range of measurement.

- Redundant level measurement (Guided Wave Radar Transmitter and Magnetostrictive Transmitter)
- Low cost of ownership
- Safe and simple installation
- 5 year warranty
- High visibility
- Optional vent, drain and isolation valves
- Insulation for high and low temperature applications

Total and interface level capabilities



Magnetic Level Gauge Switches
Electric and pneumatic

	LMS100	MS40/EX	PS35	PS45	MS41
					
Switch type	Electric		Pneumatic		Electric
Hazardous area rating	FM, ATEX/IEC, FMC	FM/CSA	ATEX		FM/CSA/ATEX
Enclosure	NEMA 4x/IP67 Explosion proof 1/2 FNPT Cable Comn.	MS40: stainless steel, NEMA 4x/IP56, 3/4“ FNPT MS40EX: stainless steel/ explosion proof, NEMA 4x/IP56, 3/4“ FNPT	Stainless steel, NEMA 4x/IP56, 1/8“ MNPT		Stainless steel, dual compartment, hermetically sealed, explosion proof, NEMA 4x/IP65, 1/2“ MNPT
Switching mechanism	Reed switch, AC/DC 1 amp, 1/8“ deadband, SPDT	Cam driven, snap-action; AC: 10 amp, DC: 1/2 amp, 13/16“ deadband, DPDT	1“ deadband Pneumatic signal		Cam driven, snap-action; AC: 10amp, DC: 2.6 amp
Pressure	-	-	15 - 100 psig	1 - 100 psig	-
Process temperature	Max 600°F/316°C with IP option	Min. -60°F/-51°C; Max. 300°F/149°C, 600°F/316°C with IP option	Min. 0°F/-18°C; Max. 180°F/82°C, 450°F/232°C with IP option		Min. -320°F/-195°C with option Max. 300°F/149°C, 1000°F/538°C with IP option
Application	-	-	High-corrosive, Hazardous area		High temperature, vibration and high-corrosive

Accessories

ABB offers a variety of accessory products to compliment the KM26 Magnetic Level Gauge providing customers with a total level measurement package

Steam jackets
– Used to uniformly heat or cool process fluid

Magnetic traps
– Keeps magnetic particles out of float chamber
– Fits in line with process connection
– Also available in integral configuration

Vibration Isolator Connections
– Absorbs large amounts of vibration
– Eliminates signal distortion
– Recommended for use with AT200 on compressor and pump skids

Oversized chambers
Used to uniformly heat or cool process fluid allows vapors to pass floats when a fluid is close to vapor pressure and can be used in fluids with small suspended particles. Also used in conjuction with Teflon S coating for non-stick.

High temperature insulation
For extreme temperature environments, the KM26 magnetic level gauge is factory furnished/fabricated to offer high temperature insulation.

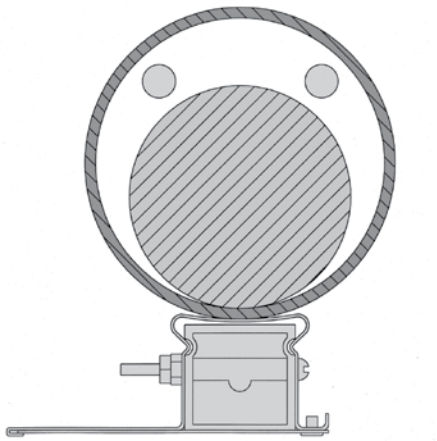
– Communicates magnetically through insulation
– Range for switches and transmitters to 800°F/427°C
– Provides instrument and personnel protection
– Electrical or steam heat tracing available

Steam jacket

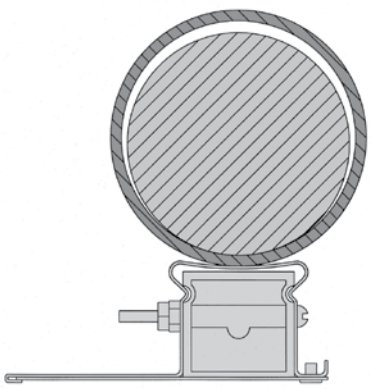
Magnetic trap

Vibration isolator connections

High temperature insulation



Oversized chamber with guide rods



Standard chamber

Contact us

ABB Inc.
18321 Swamp Road
Prairieville, LA 70769 USA
Phone: +1 225 673 6100
Service: +1 225 677 5836
Fax: +1 225 673 2525
E-mail: quotes.ktek@us.abb.com
Service e-mail: ktek-service@us.abb.com

ABB Engineering (Shanghai) Ltd.
No. 5, Lane 369, Chuangye Road
Kangqiao Town, Pudong District
Shanghai, 201319, P.R. China
Phone: +86 10 64231407
Service: +86 21 61056421
Fax: +86 10 64371913
E-mail: shan.li@cn.abb.com
Service e-mail: rola.li@cn.abb.com

www.abb.com/level

PB/KM26-EN_Rev. A 06.2015