



Measurement Products

## Level measurement

Proven level technologies providing reliable measurement solutions for process and utility applications

Power and productivity  
for a better world™



# Expertise in technology

## More than a century of experience

To operate any process efficiently, it is essential to measure, actuate, record and control. In selecting ABB you are choosing a partner who is offering the best measurement solution for your needs, enabling maximum return on your investment. When investing in ABB's measurement products and solutions you are receiving the best technology, reliability and service in the business.

Research and development is a vital source of ABB's technology leadership. ABB constantly builds on the foundation of existing technologies for new applications, and continues to develop the breakthrough technologies needed to meet the challenges of the future. ABB and its heritage companies have been leaders in innovation and technology for more than 100 years. We are proud to include the K-TEK level product line in the ABB family of measurement solutions.

Aztec

**Bailey**

**BOMEM**

Bush Beach Engineering  
Limited

**FISCHER  
PORTER** 

**Hartmann & Braun**

**K-TEK**

Kent

Pressductor®

 **SENSYCON**

Schoppe & Faeser

*Taylor*

**TBI-Bailey**



**TOTALFLOW**  
MEASUREMENT & CONTROL SYSTEMS



# Comprehensive measurement solutions

## Serving any industry

ABB measurement products provide world-class measurement solutions for any industry, utility or municipality. Latest innovations deliver technological solutions to make it easier for you to run your plant. ABB's measurement products are based on common technology, providing a common look and feel and method of operation. This results in products that are easy to configure, easy to integrate, and easy to maintain.

### ABB's measurement products portfolio:

- Analytical measurements
- Flow measurement
- Natural gas measurement
- Valve automation
- Pressure measurement
- Temperature measurement
- Recorders and controllers
- Level measurement
- Device management
- Force measurement
- Service

1 Water and waste water | 2 Power and industrial steam | 3 Chemical and petrochemical | 4 Oil and gas | 5 Pulp and paper | 6 Minerals | 7 Metals | 8 Food and beverage | 9 Pharmaceuticals

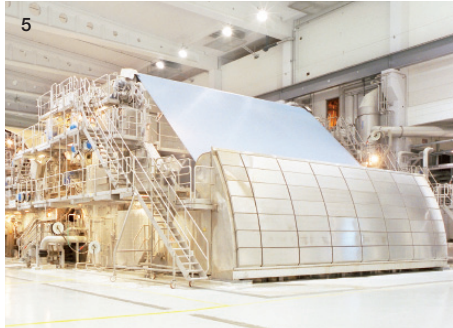




ABB offers the most complete level measurement product line in the world



Level measurement is a critical process parameter used in a variety of commercial and industrial applications around the world. ABB has the proven technology to provide solutions for the most difficult level applications for both liquids and solids.

From tall grain silos to high pressure boilers and process vessels, ABB offers a wide breadth of level technologies, certifications and approvals to meet the needs of the most demanding applications.

With the recent acquisition of K-TEK, a market leader in level detection, and ABB's existing hydrostatic level product lines, ABB now offers the most complete level measurement product line in the world.

Whether an application requires a cutting-edge solution, such as the non-contact laser or ultrasonic level transmitter, or ultra high pressure magnetic level gauges, transmitters and switches, ABB has the right technology for liquid or solids level detection needs.

**ABB provides reliable level solutions – no matter how difficult the application may be.**

- Precision engineered instruments built to specific customer requirements
- SIL2/3 certified transmitters
- Products that are easy to commission and calibrate, saving time and expense during a startup
- Largest selection of agency approved level switch technologies in the market
- Measurement solutions for both liquid and solids level applications

# Measure two fluids in the same vessel? Absolutely.

On and offshore oil and gas production facilities have some of the most challenging level measurement applications in the exploration industry. High pressure separators, for example, contain two separate fluids in the same vessel – as when oil floats on top of water. Both fluid levels need to be measured on a continuous basis without disrupting the operation of the oil and gas processing plant. To accurately accomplish this, a technology with interface capabilities is required.



## The ABB solution

The KM26 magnetic level gauge and AT200 magnetostrictive level transmitter utilize precision engineered floats that are specifically designed to float with half their volume in the upper fluid and half in the lower fluid. When accurate specifications of the fluids are provided, interface density differences as low as 0.04 specific gravity can be accurately measured. Since the vessel contents are totally contained within the float chamber, the same magnetic level float can be used to actuate limit switches or continuous level transmitting devices without disturbing existing piping or vessels. Installation and modification can be administered while the platform is on-line. This allows for easy integration of leveling technology into the distributed control systems (DCS).

## Other suitable technologies for the oil and gas industry

- MT series guided wave radar level transmitters
- MW05 MagWave level system
- AT series magnetostrictive level transmitters
- Vibrating fork level switches
- Gauge and differential pressure level transmitters
- LM7100 LevelMaster liquid level sensor

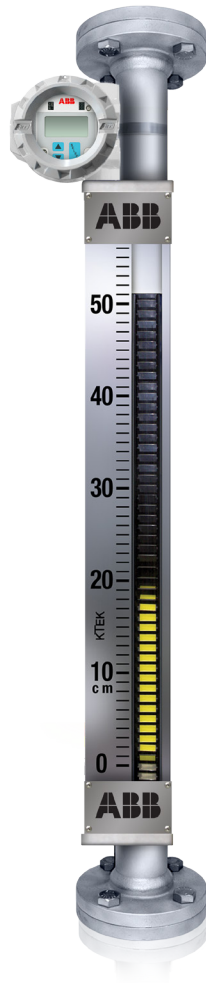
KM26 magnetic level gauge installed on a separator





# “Smart“ level gauge beyond the sight glass

In today's global chemical industry, process optimization and waste reduction is crucial. Continuous and point level measurement instrumentation provide the accuracy and reliability needed by chemical manufacturers worldwide. From radar and magnetostrictive, to non-contact ultrasonic and laser technologies, ABB has the solution for the toughest level application.



## The ABB solution

The KM26 magnetic level gauge provides safe, reliable liquid level measurement with the added ability of optional transmitters and switches to make the KM26 a truly "smart" level gauge. With limited leak paths, no glass in contact with the process and ultra high pressure and temperature ratings, the magnetic level gauge addresses many of the traditional challenges faced by older technology sight glass gauges. ASME code manufacturing standards ensure long lasting performance with little or no maintenance.

## Other suitable technologies for the chemical industry

- MT series guided wave radar level transmitters
- AT series magnetostrictive level transmitters
- RS80 vibrating fork level switch
- Gauge and differential pressure level transmitters

KM26/AT200 installed on a chemical storage tank



# A new level of safety for the refining industry

In the hazardous refining industry environment, plant operators require reliable level measurement solutions to manage high pressure and temperature applications. Because of the inherent danger found in refineries, critical issues of overflow prevention and maintaining level measurement accuracy is crucial. Instrumentation designed for Safety Instrumented Systems (SIS) are ideal to maintain the margin of safety and reliability required. Only ABB offers certified guided wave radar and magnetostrictive level transmitters to the exacting IEC 61508 safety standard.



## The ABB solution

The ABB MT series of guided wave radars and AT series of magnetostrictive transmitters are the only level transmitters in the world to be IEC 61508 certified for operation in SIL2 (Safety Integrity Level 2) environments and are SIL3 approved with redundancy. The guided wave radar's self-monitoring capability continually checks for any faults that could cause device failures or false indications, and the magnetostrictive transmitter's strong electrical return pulse provides highly reliable measurements. These two technologies offer the best in safety and reliable communication, even in the harshest environments.

## Other suitable technologies for the refining industry

- KM26 magnetic level gauge
- RS80 vibrating fork level switches
- TX thermal dispersion level/flow switches
- Gauge and differential pressure level transmitters

The only level transmitters to receive IEC 61508 certification for operation in SIL2 environments





# The power to improve plant efficiency

The ability to produce safe, efficient power is essential to a modern society. ABB offers advanced level measurement technologies for both liquids and solids that accurately and consistently provide process level measurement and control in power plant environments. In an effort to improve plant heat-rate and overall system efficiencies, power generating facilities around the globe are rapidly upgrading antiquated level instruments with ABB technology. Power plants often have high pressure and temperature applications where accuracy is critical.



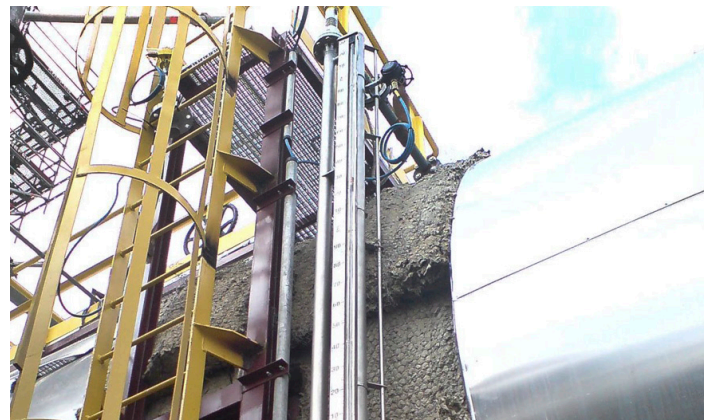
## The ABB solution

The K-TEK MagWave dual chamber redundant level system has a proven record of improving feedwater heater reliability in power plants around the world. The MagWave combines a highly visible magnetic level indicator with the precise level measurement of a guided wave radar transmitter. Featuring a single probe transmitter in a standard 1.5 inch secondary chamber, the MagWave provides the measurement capabilities of a coaxial probe without the potential for fouling. Redundant level control can be achieved by adding a magnetostrictive transmitter or switch to the float chamber.

## Other suitable technologies for the power industry

- KM26 magnetic level gauge
- AT series magnetostrictive level transmitters
- MT series guided wave radar level transmitters
- Gauge and differential pressure level transmitters

MW05 MagWave level system installed at a solar power plant



# A level solution for open channel flow measurement

Reliable water level measurement in the treatment unit of any industrial plant or utilities can present challenges to level measurement instrumentation. Often the chemical and physical properties of the processed water can change drastically with composition from different acids, flocculants, surfactants or other water treatment processes. These constant changes in water makeup prevent many traditional level technologies from working accurately. Also, traditional contact level methods often mandate the usage of special metals or coatings. Customer preferences are shifting to non-contact level measurement. With global privatization of the water industry, highly accurate measurements and solutions will continue to be required.

## The ABB solution

ABB's non-contact ultrasonic level transmitters and transducers provide the accuracy needed for surface foam conditions of many water and wastewater industry applications. Along with traditional level measurement, ultrasonic technology has sophisticated electronics and software that allow for flow measurement of flumes or weirs.

## Other suitable technologies for the water and wastewater industries

- LM80 laser level transmitter
- KCAP series RF capacitance switches
- SP60 vibrating fork level switch



K10C ultrasonic transducer installed at a wastewater facility.



# Pioneering new process controls for sustainability

Safety and process control are among the primary concerns when working in a mining environment. The variety of different level applications in mining requires unique, proven technologies. ABB offers a comprehensive selection of level measurement technologies and products used in the mining industry for both liquids and solids.

## The ABB solution

Inventory levels in ore passes, which can reach up to 200 ft./60 m in depth with only 16 ft./5 m diameter, represent one of the most difficult and extreme level applications in an underground mine. The harsh environment and physical constraints of the ore passes prevent the use of most level technologies. The ABB family of laser level transmitters, LM200 and LM80, provide the solution. The LM200's focused, near infrared laser beam can effectively reach the bottom of the narrow ore pass, providing continuous level measurement to ensure production efficiency and safety. The LM80 provides unique and reliable level measurement solution for a variety of mining level measurement applications such as crusher level control, inventory measurement in silos, bins and detection of plugged chutes.

## Other suitable technologies for the mining industry

- Vibrating fork level switches
- AT series magnetostrictive level transmitters
- Ultrasonic transmitters
- Blocked chute detection



LM80 laser installed on ore surge bin





## Level Switch Technologies

Level switches, both mechanical and electronic, are an important part of a well designed process level control system. Their ability to accurately and repeatedly detect level is crucial and is often the last warning before a major upset or catastrophic failure. The ability to offer the best switch technology for a given application sets ABB apart from other manufacturers.

ABB level switches are categorized into two groups: magnetic/float based and electronic. Both groups offer inherent features and benefits that provide the proven reliability required by our global customers.

### ABB level switch technologies

- Buoyancy
- Magnetically-coupled
- Thermal dispersion
- Vibrating fork
- RF Capacitance
- Rotary paddle
- Ultrasonic



## Field Indicators & Controllers

As a comprehensive provider of level measurement products, ABB offers a variety of indicators and controllers that complement field instrumentation to provide customers with total level solutions. When a complete level measurement system is designed with the right combination of field indicators and controllers, the highest degree of level detection and control can be achieved.

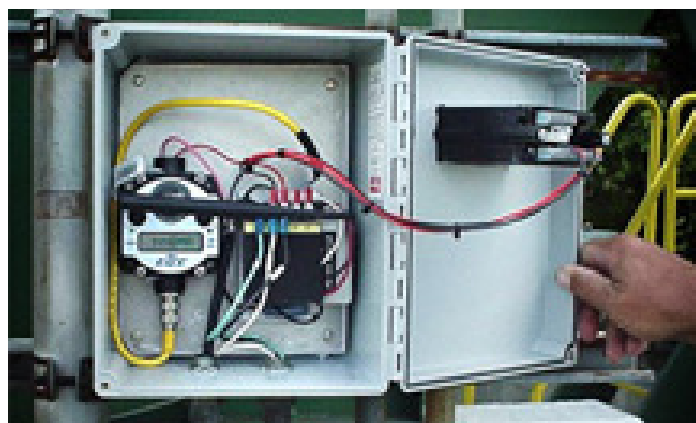
### ABB field indicators and controllers for level

- Quad channel controllers
- Wireless communication transmitter
- Loop powered digital indicator
- Digital process monitors
- External relays

TX thermal dispersion installed for a flow/level application



WT8000 wireless communication transmitter node at base of caustic tank







## Gauge and differential pressure level transmitters

The chemical processing industry has a variety of extreme level measurement challenges such as open and closed tank applications in hazardous areas where the process media is highly corrosive, viscous or has a tendency to crystallize or solidify.

### The ABB solution

The 2600T series gauge and differential pressure transmitters are an ideal solution for these types of level applications. With standard all-welded diaphragm seal construction, the 2600T provides lasting reliable measurement even in vacuum, high temperature conditions. A wide variety of system fill fluids allow ABB 2600T transmitters to operate with process media temperature ranging from -100°C/-150°F or up to 375°C/700°F. With HART, PROFIBUS, FOUNDATION Fieldbus and wireless HART connectivity, the 2600T can be connected to any host. When safety is paramount, the 2600T is the right choice. Certified to IEC61508 for SIS loops up to SIL3 (1002D), the 2600T will add performance and reliability to any Safety level measurement system. A complete range of process connections, such as tees, wafer, flange mounting, threaded union, welded bushing, pulp and paper connections, sanitary and aseptic connections in compliance with 3-A sanitary standards allowing a trouble-free application fit. An extensive range of wetted process materials provides long lasting reliability for even the most difficult applications. Exotic materials, including Hastelloy C-2000, Super Duplex, Inconel 625 in addition to reliable treatments such as gold plating, anti-abrasion, anti-stick Diaflex and Teflon coated wetted parts are available. ABB can also offer special seals to meet individual process requirements.

266T differential pressure transmitter installed for a digester level application



## Liquid level sensors for tank level measurement

The LevelMaster combines the industry's most innovative hardware and software to address the unique custody-measurement and operational needs of tank-level management. The LevelMaster provides not only an accurate level gauge, but also an accurate measurement of the oil and water interface, for trustworthy oil sales.

Unlike other level-sensing technologies, LevelMaster provides precise levels without having to continuously adjust for changes in the unpredictable properties of storage tank liquids. LevelMaster floats can measure oil, water and emulsion levels up to 25 ft./7.6 m deep, with a standard relative accuracy of 0.1 in./2.5 mm or optional high precision relative accuracy of 0.05 in./1.25 mm. Floats can be installed to measure only the top surface level (single float) or both surface and interface levels (dual floats). In addition to measuring the liquid levels, an RTD measures the liquid temperature at the load line.

LevelMaster installed on oil tank batteries










# Reliable level solutions

## A comprehensive offering by industry

Magnetic Level Gauges	Magnetostrictive Level Transmitters	Guided Wave Radar Level Transmitters	Laser Level Transmitters	Ultrasonic Level Transmitters & Switches	Magnetic Level Gauge Switches	Buoyancy Level Switches
KM26	AT100 AT200 AT500 AT600	MT5000 MT5100 MT5200	LM80 LM200 SS140XP	KSONIK/III KSONIK MICRO KSONIK MICRO LP Transducers	MS30/MS40 MS41 PS35/45	LS Series MS10/MS50 MS8D/MS8F
						

Industries	Magnetic Level Gauges	Magnetostrictive Level Transmitters	Guided Wave Radar Level Transmitters	Laser Level Transmitters	Ultrasonic Level Transmitters & Switches	Magnetic Level Gauge Switches	Buoyancy Level Switches
Oil and gas	X	X	X		X	X	X
Refining	X	X	X		X	X	
Chemical	X	X	X	X	X	X	
Power generation	X	X	X	X	X	X	X
Pharmaceutical & biotech	X	X	X	X	X	X	
Transportation (railcars)		X					
Food & beverage	X	X	X	X	X	X	
Wastewater	X	X	X	X	X	X	
Mining		X	X	X	X		
Rock, sand and gravel				X	X		
Pulp & paper	X	X	X	X	X	X	
Marine		X	X				
Agriculture		X	X	X	X		
Steel		X	X	X	X		
Defense/military		X			X		
Plastics		X	X	X	X		

Thermal Dispersion Level Switches	Vibrating Fork Level Switches	Specialty Level Switches	Field Indicators & Controllers	RF Level Controls	Gauge and Differential Pressure Level Transmitters	Liquid Level Sensors
TX TS	RS85 GP50/SP60	A22, CP2 AT200VP AT500MD Chute Master ST95	KVIEW10/100 DPM100 LPM200 IR/PP10	KCAP300/400 A75 A02	2600T Series	LevelMaster 7100
						
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