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ABB MEASUREMENT & ANALYTICS

# Measurement made easy for offshore oil and gas



# Expertise in measurement technology

## Delivering increased productivity

As a world leading supplier to the oil and gas industry, ABB provides customers with the measurement solutions to run operations safely, productively and profitably. As a true global supplier, ABB provides expertise wherever in the world it is needed. Customers investing in ABB's measurement products and solutions receive the best technology and application expertise 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.

Aztec

**Bailey**

**BOMEM**

Bush Beach Engineering  
Limited

**FISCHER  
& PORTER**

**Hartmann & Braun**

**K-TEK**

**Kent**

**[ L G R ]**  
Los Gatos Research  
A MEMBER OF THE ABB GROUP

**Pressductor®**

**SENSYCON**

Schoppe & Faeser

**Spirit**  
A MEMBER OF THE ABB GROUP

*Taylor*

**TBI-Bailey**

**TORBAR**  
FLOWMETERS LTD

**TOTALFLOW**  
MEASUREMENT & CONTROL SYSTEMS

# Trusted measurement solutions

## Serving the oil and gas industry

ABB supplies an unparalleled selection of measurement solutions for use throughout all the stages of oil and gas production. From topside instrumentation to subsea wellhead flowmeters, ABB's innovative products deliver cost-effective solutions that feature world-class performance.

The portfolio includes:

- Flow measurement
- Temperature measurement
- Pressure measurement
- Analytical measurement
- Level measurement
- Valve automation

ABB's measurement portfolio is used by the world's leading oil companies and features products with SIL 2 and SIL 3 certification, conformity to NACE and availability of ATEX, FM, FMC, IECeX, CSA, SAA, GOST and INMETRO certification.

### Did you know?

ABB has been successfully supporting customers in the oil and gas industry for many years, adhering to international industry standards, enabling utmost safety and environmental protection.



# A comprehensive product portfolio

## Covering offshore applications

ABB is a world-leading supplier to the oil and gas industry. With a comprehensive portfolio of trusted measurement products, the customer receives proven solutions for offshore applications. The toughest industrial environments in the world demand engineering excellence without compromise. Decades of engineering experience drive ABB's company and plant standards to offer the best solutions for one of the most demanding industries.

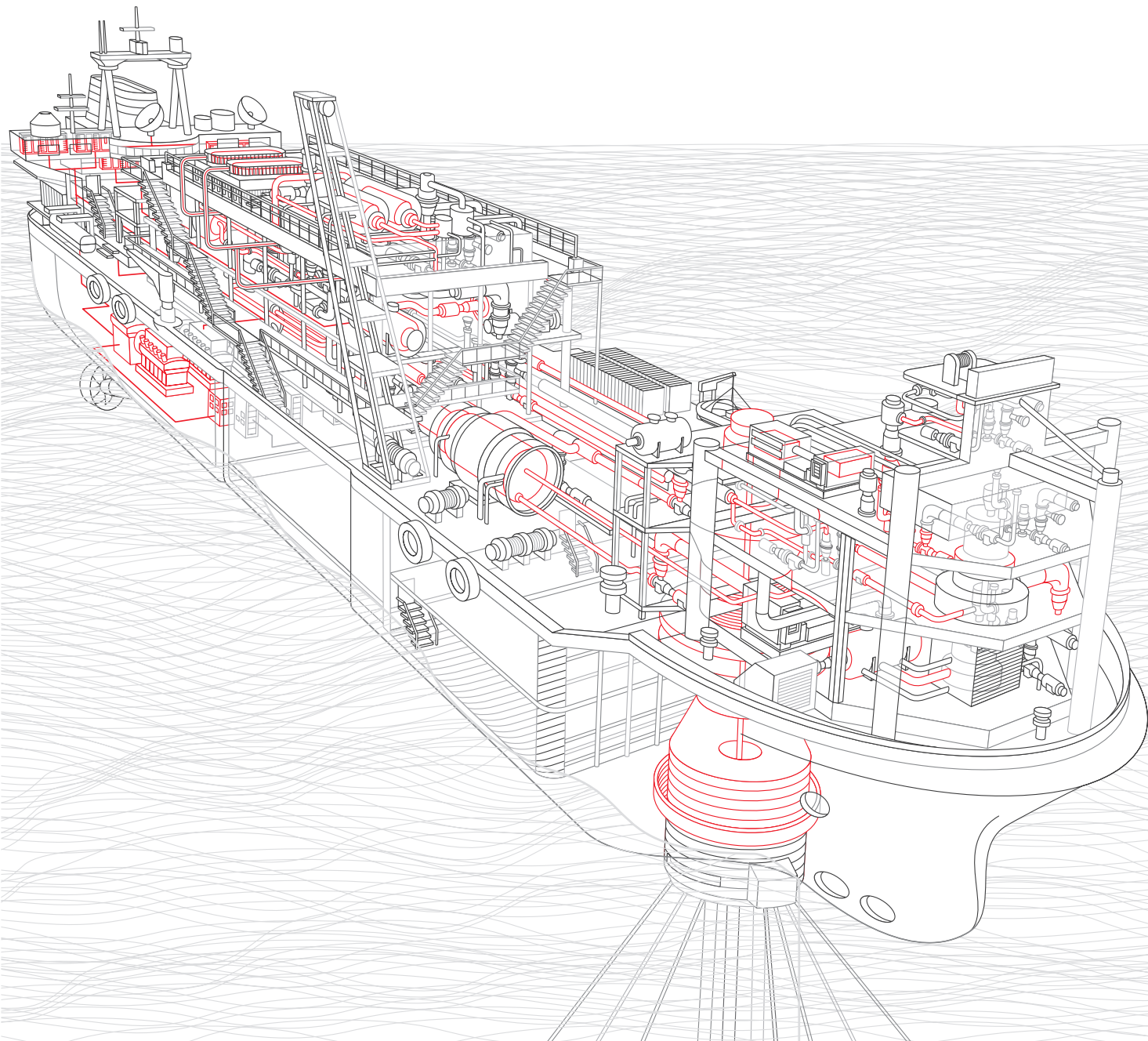
ABB's comprehensive portfolio for offshore applications								
Area of measurement and corresponding product line		Drilling	Wellhead & manifolds	Separators	Water treatment & injection	Gas lift	Compression	Utilities
<b>Flow</b>								
Diff. pressure	Venturi / VTC		●	●		●	●	
	Orifice / FPD5000		●	●	●	●	●	●
	Subsea Venturi		●		●	●		
	WedgeMaster / WMC		●	●	●	●	●	
Coriolis	CoriolisMaster / FCB300	●	●	●	●			●
EMF	ProcessMaster / FEP300	●		●	●			●
Vortex	FSV430			●	●	●		●
Swirl	FSS430			●	●	●		●
Variable area	VA Master / FAM540			●	●		●	●
<b>Temperature</b>								
Sensors		●	●	●	●	●	●	●
Transmitters	TTF300	●	●	●	●	●	●	●
	TTF350	●	●	●	●	●	●	●
<b>Pressure</b>								
Absolute	266ADH	●	●					
Gauge	266GDH	●	●	●	●	●	●	●
Differential	266DDH		●	●	●	●	●	●
<b>Analyzers</b>								
Hydrocarbons	NGC8200		●		●			
	PGC5000		●		●			
Water	TB82				●			●
	TB264				●			●
	TB56				●			●
<b>Level</b>								
Magnetic	KM26	●		●	●			●
Radar	MT5000	●		●	●			●
Laser	LM80							
	LM200							
<b>Valve automation</b>								
Positioners	TZIDC / EDP300	●	●	●	●	●	●	●
I/P Converters	TEIP11-PS	●	●	●	●	●	●	●

# Reliable, safe and easy to use

## Proven measurement solutions

Extensive experience with offshore applications throughout the world results in a partner that provides customers with the right solutions at the right time. From standard pressure, temperature and level measurement to subsea flowmeters, ABB offers proven solutions for the wellhead, drilling and production. ABB specializes in providing the customer with standalone

solutions for the toughest application or integrated solutions that combine instrumentation, control and electrical automation to improve operational efficiency. ABB helps customers operate safely while protecting the environment. Whether the need is located on a wellhead platform or an FPSO, ABB offers the measurement solution.



# Offshore measurement solutions

## ABB's expertise

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01 ABB pressure transmitters are designed for most arduous installations

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02 Oil and gas multipoint with type K thermocouples

### Reliable pressure transmitters

ABB pressure transmitters have been designed for the most arduous installations in the oil and gas industry. The products are available with hazardous area certification to meet IEC, ATEX, FM and GOST requirements. The standard 316 stainless steel electronics housings enable use for saline and weatherproof construction in all environments.

### Maintenance free operation for years

Best in class performance and stability lead to maintenance free operation. The unique "Through The Glass" indicator and configurator allows rapid commissioning and configuration without removing the instrument's cover. This is a particular advantage in explosion-proof areas and also prevents accidental ingress of water and salt into the housing. Wellhead and Christmas Tree pressure measurement up to 15,000 psi (1,034 bar) meets the safety requirements of IEC 61508/61511 SIL 3 applications. The standard PILD (Plugged Impulse Line Diagnostics), available on all 266 pressure series transmitters, detects blocking of transmitter impulse lines for critical liquid or gas flow applications.

### Compact size, low weight, saline resistance

Corrosion resistant diaphragm seal materials, e.g. Inconel 625 and Superduplex combined with the time-proven "all welded" design of ABB diaphragm seals, help to enhance separator efficiency and to reduce downtime in high temperature high vacuum applications. Where compact size, low weight and saline resistance are essential, ABB's series of transmitters provides an excellent solution for these most difficult installations.

### Complete temperature solutions

ABB engineers help customers to solve the most demanding temperature measurement challenges. All products are engineered to meet the needs of the industry, legislation and codes for plant integrity.

### Engineering, Manufacturing and Documentation

Temperature measurement systems for the oil and gas industry are engineered, manufactured and documented by ABB engineers. Traceability is maintained at all times for both materials and processes. All wetted material can be traced from the mill to the finished product.

### Wake frequency design assurance

In high flow installations, unsupported thermowells can produce wake vibrations that could approach their resonant frequency leading to serious cracking and even destruction of the thermowell. ABB engineers know where potential problems could occur and will recommend available options.

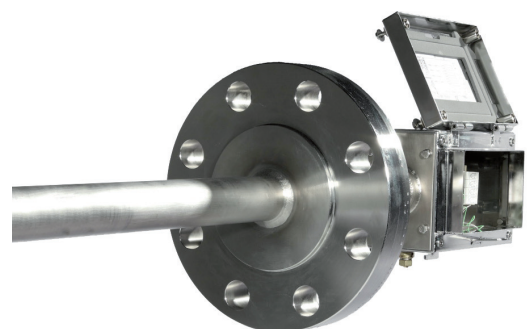
### Thermowells, sensors, cables and transmitters – all manufactured by ABB

A key component of ABB's quality confidence comes from the use of ABB's own cables, components, thermowells and transmitters. The control of quality and materials is maintained at every critical stage. From sensors that are laser welded to thermowells manufactured on dedicated machines, temperature solutions from ABB are safe, tough and reliable.

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03 Gas chromatograph  
installation

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04 Magnetic level gauge  
on an offshore platform

### The widest analytical portfolio

ABB offers the widest and most comprehensive analytical instruments portfolio available in the market today. With a product offering ranging from pH and conductivity instruments, through continuous gas analyzers to process gas chromatographs, FT-NIR instruments and laser-absorption gas analyzers, ABB meets customers requirements for robust measurements in the harshest environments, with suitably certified instruments to meet safety requirements.

### Robust measurement in harshest environments

Important measurements such as BTU/CV can be accurately and effectively achieved using the latest generation of smart analyzers. ABB's market leading instruments provide flexibility through scalable product platforms, ease of installation and use through distributed architecture options, small form factor and the latest graphical user interfaces. ABB offers a broad range of communication protocols, which also allow remote diagnostics and maintenance while at the same time minimizing site utility requirements.

With its system integration expertise, ABB is able to supply completely integrated analytical solutions utilizing expertise in system design and engineering.

In addition, ABB also offers the largest factory certified field service capability available globally to support customers requirements with expertise and experience in their local region.

### Precision level measurement

The ABB K-TEK KM26 magnetic level gauge is ideally suited to separator applications. Expertise in this field of measurement is proven in over 180,000 installations. The KM26 has become the industry standard for magnetic level gauges. In the oil and gas industry, this proven technology has been repeatedly specified by offshore platform operators as the level measurement solution for high pressure and low pressure separator systems.

### Ideally suited to separator applications

Historically, this interface application could be difficult to measure; however, the KM26 magnetic level gauge utilizes 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 differences as low as 0.04 SG 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 online. This allows for easy integration of leveling technology into the distributed control systems (DCS).

Customers benefit from low installation costs as well as low maintenance costs with no sight glasses to clean. The level chamber option allows for high integrity measurement.

Laser level transmitters can be used to solve a variety of non-contact measurement problems on offshore platforms.

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# Wet gas and multiphase metering

## Meeting measuring demands

### Multi-Phase Flow Metering

Providing accurate, real-time production rates is crucial for well assessment and management in the upstream oil and gas sector. ABB's VIS multiphase flowmeter is the ideal solution for monitoring the flow rates of produced oil, gas and water just close to the wellhead. VIS provides the same accuracy of conventional test separators in a product-sized  $\gamma$ -free device.

### No gamma source involved

Unlike most of the other products available on the market, VIS is radioactive-free. This is of paramount importance when dealing with shipping, handling, commissioning and decommissioning procedures, when applying for import/export per-mits and at any maintenance action performed on the device. More safety + less delays + less paperwork = improved bottom line

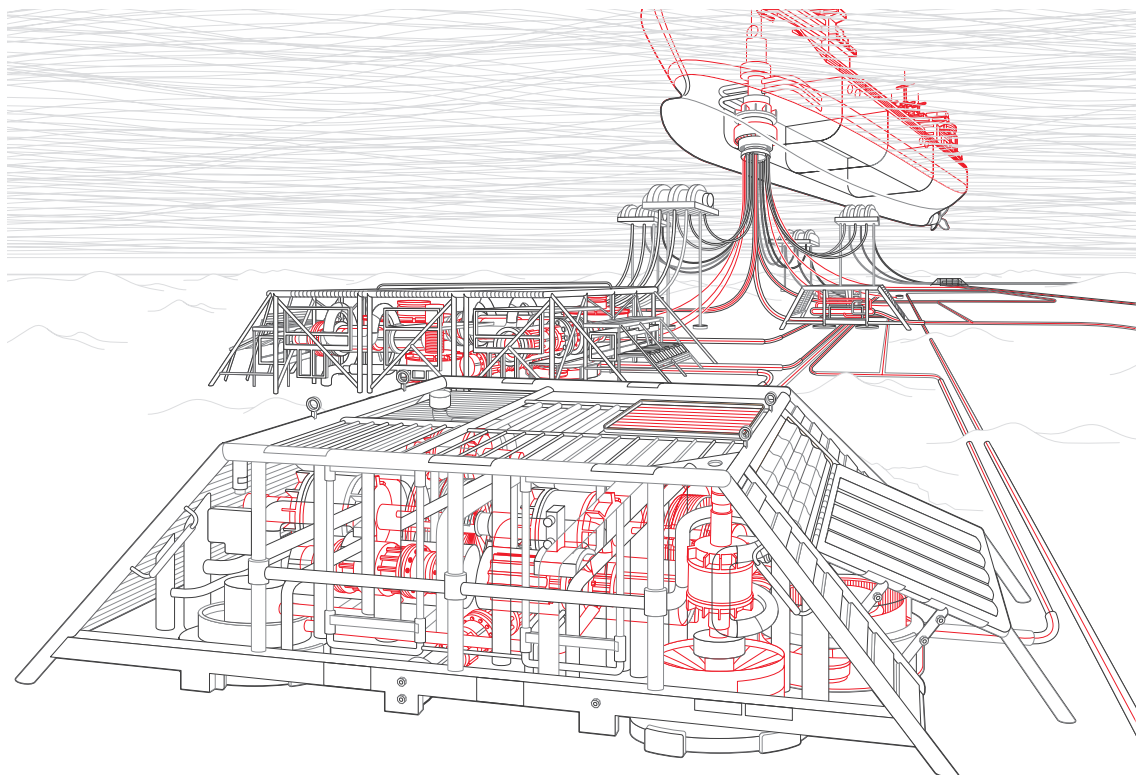
### Protect Your Investment

Aging reservoirs are characterized by progressively reducing liquid flow and increasing water and gas fraction. As the gas volume factor (GVF) moves higher only a multiphase flowmeter

designed to work at such extreme conditions will be able to protect your investment. VIS is tailored for very high gas content applications, its operating range allows managing the aging of reservoirs, when the gas fraction increases above 99%. VIS is also the perfect solution for oil wells subject to gas-lift operation where large amounts of gas are extracted together with the liquid phase.

### Did you know?

ABB's world leading expertise in engineering and welding in exotic materials, coupled with comprehensive material traceability, certification and documentation, mean that this is the solution for wet gas and multiphase metering.





# A comprehensive portfolio

## Efficient exploration and production

- 01 Flow measurement
- 02 Level measurement
- 03 Pressure measurement
- 04 Valve automation
- 05 Temperature measurement
- 06 Analytical measurement

From subsea to topside applications, ABB offers measurement products and solutions needed for the tough environment of the oil and gas industry.

The comprehensive portfolio includes subsea venturi flowmeters that measure thousands of feet down on the sea bed. ABB offers temperature measurement solutions that are safe as well as reliable and include traceability of materials maintained at all times. Pressure transmitters specifically designed with explosion-proof protection and saline resistant material are available, as well as a wide variety of analytical products for continuous gas analysis and isotope ratio measurements on the oil and gas platforms. A wide range of level measurement solutions for high pressure and low pressure separator systems which are field-proven on offshore platforms complete the portfolio.

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# Services for measurement products

## Performance optimization solutions

Dedicated to optimizing productivity and performance, ABB's certified services enable improved utilization and performance of automation equipment, processes and personnel. ABB provides support from the planning phase through to commissioning and full lifecycle servicing, according to international industry standards, enabling utmost safety and environmental protection.

ABB's performance optimization services:

### Productized life cycle services

- Start-up: dimensioning, installation, commissioning
- Operate and maintain: maintenance, calibration,
- Spare parts and repairs, support and remote services, training and eLearning
- Rebuild or replace: retrofits, upgrades,
- Migration planning, replace and recycling

### Service agreements

- Flexible service agreements
- Globally supported, locally delivered
- Tailored from basic service agreements to Full Service® contracts according to customers needs

### Did you know?

ABB is one of the largest automation service companies in the world offering a full range of services to help support the customer.



# Offering integrated automation

## Delivering value added solutions

ABB minimizes customers risks by providing integrated products and solutions as the Main Automation Contractor (MAC) and the Main Electrical Contractor (MEC). Solutions for upstream automation include a full range of instruments and field devices, combined with applications such as pump optimization, emergency shutdown (ESD), compressor efficiency monitoring, automated well testing, enhanced oil production and abnormal situation management.

- Reduced expediting and inspection due to a single source supplier
- Faster processes: engineering, commissioning and start-up time reduced
- Best use of technology: truly integrated solutions for long-term benefits

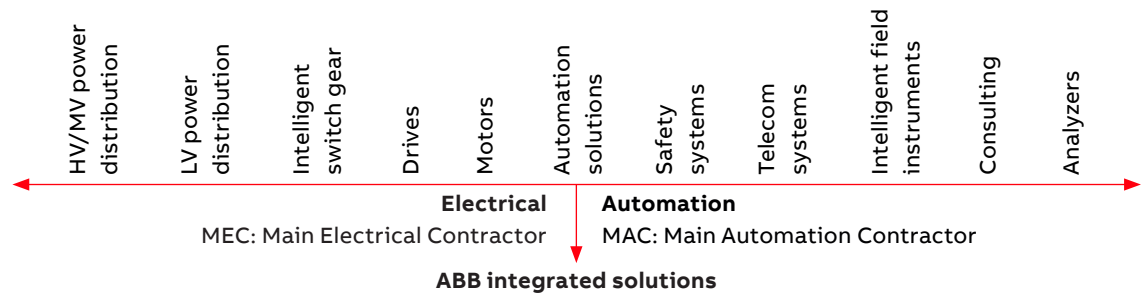
### Benefit from ABB's integrated automation offering

- Lower costs: 20% project cost saving potentials due to reduced spending on engineering, start-up and maintenance
- Lower project risk due to a single integrated team with global reach and resource

### Did you know?

Many oil and gas companies have chosen ABB because they offer state-of-the-art technical solutions at competitive prices within short delivery times.

### ABB's integrated automation solutions



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**ABB Measurement & Analytics**

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