Instrumentation for the oil and gas industries

Enhanced production performance, efficiency, reliability
ABB has more expertise in oil and gas applications globally than any other supplier. Based on this experience, we have refined and developed the performance of our portfolio of intelligent instrumentation products to ensure you get a solution that meets your precise production requirements every time.

Getting the best levels of efficiency from your oil and gas process calls for reliable, accurate instrumentation. Equally important is being able to count on access to an intelligent, informed support network that can assist you throughout all stages of your production, regardless of your location.

A heritage to be proud of

ABB Instrumentation’s ability to satisfy customers’ needs has never been greater, being built upon the leading names and brands in the automation world:

Industrial IT - Optimizing your instrumentation assets

To help you improve the efficiency of your entire business and production process, ABB is committed globally to Industrial IT. It involves the development of systems and products guaranteed to inter-operate and communicate using the same information standard within a single digital architecture. Industrial IT and Asset Optimization with ABB instruments provide features and benefits across the full scope of our offering. Intelligent field instruments not only provide highly accurate process measurement data, but process information is available at the click of a mouse for predictive maintenance, advanced trouble shooting, optimized spares handling, hence increased product availability and process security.

A range of fieldbus opportunities

ABB is actively involved in the development of fieldbus policy direction and technical standards and supports the major process automation protocols in widespread use throughout industry. With our wide experience and expertise, we can cater to a broad spectrum of fieldbus options, enabling us to meet your exact requirements. The current generation of ABB fieldbus devices and systems lets you choose both the most suitable devices available and the most appropriate system for your application, including PROFIBUS, FOUNDATION Fieldbus and HART.

Instrumentation Services

Our broad scope of services lay the foundation for end-to-end support for your enterprise. ABB Instrumentation Services delivers the knowledge and global experience required to keep your assets operating at peak reliability and accuracy. ABB provides a full scope of services from start-up and commissioning through lifecycle support.

- Installation and Commissioning
- Preventative Services
- Calibration Services
- Maintenance
- Consulting
- Training
- Migration/Upgrades
- Parts and Repair

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ABB supplies an unparalleled selection of instrumentation equipment and systems for use throughout all stages of the oil and gas process. Utilizing ABB's innovative products, you can create advanced systems that will help you ensure safe, reliable and economical performance of your plant facilities.
ABB Instrumentation products portfolio includes series compliant to SIL 2 certification, designed specifically for safety applications. A wide selection of standard and special material provides both conformity to NACE and suitability in harsh environments.

ABB instrumentation is suitable for use in an extensive range of environments from high temperature and pressure to low temperature conditions. The broad availability of ATEX, FM, CSA, SAA, GOST and INMETRO approvals for hazardous areas allows installation in extremely stringent production areas.

### Key product areas

- **Flow Measurement**
- **Temperature Measurement**
- **Pressure Measurement**
- **Analytical Instruments**
- **Recorders and Controllers**
- **Actuators and Positioners**

#### Pumping
- Coriolis Mass flow
- Primary flow
differential pressure (DP)
- Temperature
- Pressure
- Actuators and Positioners

#### Compression
- Vortex, Swirl flow
- Primary flow differential pressure (DP)
- Temperature
- Differential pressure
- Pressure
- Controllers and Recorders
- Actuators and Positioners

#### Fuel Gas
- Vortex flow
- Thermal Mass flow
- Primary flow differential pressure (DP)
- Temperature
- Pressure
- Hydrogen purity
- Zirconia oxygen
- Actuators and Positioners

#### Filtration
- Coriolis Mass flow
- Vortex, Swirl flow
- Primary flow differential pressure (DP)
- Temperature
- Differential pressure
- Actuators and Positioners

#### Cooling
- Vortex, Swirl flow
- Electromagnetic flow
- Variable area flow
- Primary flow differential pressure (DP)
- Temperature
- pH/ORP
- Conductivity
- Controllers and Recorders
- Actuators and Positioners
Pressure Measurement

**Pressure Transmitter 2600T**

This family covers all your requirements for the oil and gas industry, providing specific application design versions and a tailored selection of options as:

- Materials - stainless steel or copper-free aluminium dual compartment housing for marine atmosphere and exotic materials and wetted parts according to NACE MR0175
- Standard or vertical differential flanges
- Fast response for compressor and centrifugal machines
- High overload pressure transmitter
- All-welded remote seals meeting the needs of high temperature and full vacuum applications for hydrocarbon/oil separation and inlet to vacuum pump
- SIL 2 HFT1 certified (TÜV) instruments for safety critical applications
- Lowest cost of ownership with GeminiConfig - field replaceable electronics as well as upgrade capabilities for FOUNDATION Fieldbus and Proflbus PA
- Multivariable for compensated flow measurement in oil extraction, with Modbus communication for RTU/SCADA system

The 2600T pressure transmitter series offers one of the most complete ranges of pressure measurement equipment currently available.

- Range of options – available in multivariable, high static working pressure, draft range and safety versions
- High accuracy – 0.04% to 0.075%
- Available in 4-20mA, HART, PROFIBUS PA and FOUNDATION Fieldbus versions
- Reduced downtime – high long term stability
- Complete family of remote seals plus a choice of materials and fill fluids
Primary Flow Differential Pressure (DP) Products

ABB is at the forefront of DP engineered solutions for the oil and gas industry - for onshore, offshore and even sub-sea installations.

- Full range of meters - Venturi tubes, Wedge meter, Orifice assemblies, multi-port averaging Pitot flowmeter, precision meter runs
- Unique wedgemeter ideal for oil measurement where solids are present due to its resistance to build-up and wear
- Specialist solutions for sub-sea applications
- Flow straightener - for more accurate measurements in non-ideal installations
- True mass flow measurement - in combination with multivariable transmitter

Coriolis Mass Flowmeter

Highest accuracy for flow measurement with even higher reproducibility is provided by ABB’s Coriolis flowmeters. It’s direct mass flow measurement combined with no conductivity requirements and independence of the flow pattern makes it the ideal choice for the oil & gas industry. ABB’s FCM2000 comes with many additional benefits:

- Certifications: ATEX incl. Zone 0 (Group 1), and FM Class 1, Div. 1
- NACE MR0175 conformity
- Special coating for the meter housing
- Net-Oil computing
- DN1.5 (1/16”) up to DN150 (6”)
- DSP processing technology for vibration immunity
- HART, PROFIBUS PA and FOUNDATION Fieldbus
Flow Measurement

**Variable Area Flowmeter**

ABB’s broad line of variable area flowmeters have universal applicability in oil and gas production. From simple glass sight indicators to high pressure metal tube rotameters with HART communications, the variable area flowmeters can be used for liquids, gases and even steam.

- Certifications: ATEX intrinsic safety, explosion proof and FM Class I, Div. 1/Div.2
- NACE MR0175 conformity
- Special coating for offshore applications
- Meter sizes from DN15 (1/2") up to DN100 (4")
- Pressure ratings up to class 2500lb

**Vortex and Swirl Flowmeter**

Highest flexibility for installation requirements combined with excellent price performance ratio is provided by ABB’s Vortex and Swirl series, for low viscose liquids, gases and steam.

- Certifications: ATEX intrinsic safety, explosion proof and FM Class I, Div. 1
- NACE MR0175 conformity
- Special coating for offshore applications
- Meter sizes from DN15 (1/2") up to DN300 (12")
- Pressure ratings up to class 900 (PN160)
- HART, PROFIBUS PA and FOUNDATION Fieldbus

**Electromagnetic Flowmeter**

ABB’s electromagnetic flowmeters provide measurement of conductive liquids in continuous or non continuous flow applications. The meters are ideal for all standard measurements and are available with stainless steel or coated housings, and remote or integral transmitters.

- Certifications: ATEX zone 1 intrinsic safety, increased safety and FM Class I, Div. 1
- NACE MR0175 conformity
- Cost effective and versatile design
- Multiple coil drive frequencies provide the proper flow meter for the right application
- DN 1 (1/25") up to DN 2400 (96")
- 4 - 20 mA / HART, PROFIBUS PA/DP and FOUNDATION Fieldbus communication

**Thermal Mass Flowmeter**

ABB’s thermal mass flowmeters for gases provide direct flow readings in mass flow or standard volume flow units without pressure and temperature compensation.

- Remote and compact versions with zone 0 approval
- Wide measuring range with excellent accuracy
- No moving parts, no wear, maintenance-free
- 4 - 20 mA / HART, PROFIBUS DP communication
- Standardized pipe components allow simple installation and maximum repeatability

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- NACE MR0175 conformity
- Special coating for offshore applications
- Meter sizes from DN15 (1/2") up to DN100 (4")
- Pressure ratings up to class 2500lb
pH, Redox (ORP), Conductivity Analyzers TB82

Transmitters feature robust housings designed for extreme conditions while providing an intuitive user-interface along with an industry leading set of digital communications options.

- Rugged, industrial housing
- Reduced maintenance with diagnostics
- Digital communications: HART, PROFIBUS PA, FOUNDATION Fieldbus
- Simple, intuitive operator interface
- Conformal coated circuit boards for protection from humidity
- ATEX, FM, CSA, Intrinsically Safe and Non-Incendive approvals

Oxygen and Combustibles Analyzer SMA90

The SMA90 is an industrial grade combustion analyzer that continuously samples and analyzes flue gases (oxygen only or optional oxygen and combustibles). It is designed for gas, oil or coal-fired combustion processes and has a high temperature operating range.

- 20 ppm resolution combustibles sensor
- Diagnostics and alarming
- Patented close-coupled sample system
- Standard combustion efficiency calculation
- Automatic sensor calibration standard
- Optional filter blowback
- Optional dual filtration system

Liquid and Combustion Analyzers

ABB offers a wide range of instrumentation solutions covering a broad range of measurement parameters for liquid and combustion analysis for process.

Solutions provide process control, optimization and enable compliance with regulatory requirements.

- Dissolved oxygen analyzers feature simple replacement cartridge sensors
- ppb sensitivity and low reagent consumption
- In-situ and closed coupled extractive O2 and O2/CO2 flue gas analyzers
- ExFG and ExGP Zirconia oxygen systems for hazardous oil and gas applications
- Monitor silica, phosphate, low level dissolved oxygen, sodium, pH, conductivity and other parameters

Complete Water/Steam Cycle Sampling Analysis Systems

For water/steam cycles and cogeneration systems, available rack mounted or housed in self-contained monitoring shelters.

- Extended plant availability through reduced corrosion related breakdowns
- Reduced chemical usage and extended plant life
- Custom built to client specifications
- Rapid installation with minimal on-site costs
Temperature Measurement

Temperature Transmitters

ABB’s temperature transmitters provide the interface from the temperature sensor to the PLC and offer excellent long-term stability with enhanced self-diagnostic capability.

- 4-20mA, HART, PROFIBUS PA and FOUNDATION Fieldbus versions
- Range of mounting options: head-mounted, DIN-Rail or on rack with field housing (IP 66/67, NEMA 4X)
- Digital display module available

Temperature Sensors

ABB has a large experience in temperature measurement in the oil and gas industry including harsh environments. Sensors are manufactured from a wide range of materials using highly qualified and experienced welders and comprehensive calibration facilities.

- Certified calibration and test laboratories
- Standard program – suitable for a wide range of applications
- Customized programs – designed for individual customer needs
- Available with direct sensor output in 4-20mA, HART, PROFIBUS PA and FOUNDATION Fieldbus versions
- Full package of documentation including material traceability and velocity calculations for thermowell design
- Multi-point assemblies over 30m length
- High temperature applications up to 1800°C
- Engineering of complete solutions and expert advice to customer

Recorders and Controllers

SM Series Advanced Videographic Recorders

ABB’s range of videographic recorders delivers the latest in electronic data recording technology for oil and gas industry applications.

- Comprehensive range offering from 6 to 36 channels
- Remote supervision and data access solutions provided via Ethernet communications
- High capacity Compact Flash and Smart Media memory card options greatly reduce the need for operator intervention

Process Controllers

ABB’s range of process controllers set the highest standards in industrial instrumentation. From simple single loop to advanced control options (including feed forward, cascade and ratio control), a controller is available to match any application.

- Available in different DIN sizes (1/4, 1/8, etc.)
- In-built 2 wire transmitter power supply
- Links to central PLC or SCADA systems via Modbus
- Front plate rated to IP 66/NEMA 4X protection
- Windows™ based PC Configuration Software
**UP Actuator with AV Positioner**

The UP range of pneumatic rotary actuators are used to control dampers, lever operated valves and other final control elements. A wide range of torque ratings are available from 122–6237 Nm (90–4600 ft. lb) in six actuator sizes.

- Easy installation with linkage connection
- Suitable for high temperature environments
- Fail-in-place or fail safe option available
- Easy manual control override function
- Fast travel time due to pneumatic operator

**Electrical Actuators Contrac**

The range of Contrac electrical actuators offer excellent accuracy and reliability for high-level control applications.

- Continuous modulating actuation principle guarantees hysteresis-free process control
- Robust and compact design provides proven reliability even in the harshest environments
- Modular concept includes integrated and remote electronic installation options
- Choice of HART, RS 232 and PROFIBUS PA communications

**Intelligent Positioners**

The TZIDC intelligent positioner series provides flexible and cost effective valve management and control. Features include:

- Modular design
- Built-in self-diagnostics and continuous self-monitoring
- Local or remote control via HART
- Automatic self-commissioning and valve tuning program
- Able to withstand severe shock/vibration
- EMC-compliant. Protected to IP 65/ NEMA 4X with certified explosion protection for intrinsically safe operation
- HART, PROFIBUS PA and FOUNDATION Fieldbus communication

**I/P Converters**

I/P converters are designed to be flexible, tough and immune to shock and vibration. They can be mounted in a variety of configurations.

- More than one million units in use
- Compact design, low weight
- Shock and vibration immune to 10g
- Various signal ranges available
- Wide operating temperature range
- Explosion protection certificates
- Field, direct and DIN rail mounting
ABB is a leader in power and automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 102,000 people.

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