

A photograph of an onshore oil and gas separation facility. In the foreground, there is a large, vertical, dark-colored metal structure, possibly a separator or vent, with a control panel and valves at its base. To the right, there is a large, horizontal, yellow-colored cylindrical tank with various pipes and valves. Further right, there is a smaller, vertical yellow tank and a small, white, rectangular control building. The entire facility is situated on a gravel pad. In the background, there is a dense field of green corn plants under a blue sky with scattered white clouds.

**Improve production data, decrease
operating costs, and reduce your HSE risk**

Onshore Oil and Gas Separation

Proven automation solutions and local expertise to help you overcome your toughest challenges.





Sending personnel into the field for reactive maintenance increases operating costs and safety risks.

Tired of uncertain production data, high workover costs, and needless HSE risk?

In your line of work, you always have to do more with less—and faster. It's a problem with several causes. Well production dynamics are always in flux. You're usually missing timely production data that could give you a clear picture of reservoir performance while allowing you to correct well production problems. And all too often, you scramble to solve problems as they crop up—an inefficient approach that escalates health, safety, and environmental risks as you send people into the field.

“Technical professionals may be spending as much as 60 percent of their time managing data before they are able to focus on the more critical, ‘value-added’ work.”
– Krome, J., E&P Magazine, 2006.



In process industries, maintenance costs and related lost production can add up to an amount equal to 8–48 percent of revenue.
– Hägerby, M., Linköping Institute of Technology, 2002.



From 2003 to 2013, vehicles killed more oil and gas extraction workers than any other factor.
– Census of Fatal Occupational Injuries 2003–2013, U.S. Bureau of Labor Statistics.



Decisions without delays—for better production management

Test and production separators provide critical field-management information. With Emerson's separator solutions, you'll be able to reduce uncertainty when you have the right measurements, better control, more effective maintenance, and a clear, up-to-date view of the whole picture—from the reservoir to the point of sale.



Get reliable and immediate insight into your reservoir and wells

- Get representative production allocations
- Reduce measurement uncertainty from liquid carryover and gas carryunder
- Get production data you can act upon

“The new system gives me daily diagnostics into separator operations so I can catch issues before they become problems.”
– Measurement Foreman, global oil company in the Eagle Ford



Improve the health and performance of your well and separator

- Prevent equipment failures from deferring production
- Stop anomalies from triggering reactive troubleshooting
- Reduce maintenance-related well shut-ins

An oil producer with high sand production reduced annual maintenance costs by \$100,000 per year and improved measurement accuracy to $\pm 0.15\%$ with Emerson's flow technologies.



Meet your HSE performance and regulatory compliance goals

- Monitor and reduce fugitive emissions
- Cut down on trips to remote well sites
- Simplify regulatory reporting

Using Emerson level solutions, an energy company in Louisiana eliminated two yearly maintenance field trips for each separator, improving safety, reducing emissions by 35,000 cubic feet, and saving more than \$2 million annually.

With Emerson, you can overcome your separation challenges

Pressure Relief and Other Emission Sources

- Receive alerts when a pressure relief valve is activated. [Process ► p5](#)
- Log and report the duration of pressure relief emissions for rigorous regulatory compliance. [Process ► p5](#)
- Detect and halt stray emissions for better regulatory compliance and efficiency. [Process ► p5](#)

Liquid Levels and Interfaces

- Strictly control phase heights and dump cycles. [Level ► p9](#)
- Limit processing costs, losses, and environmental hazards related to gas and liquid contamination. [Level ► p9](#)
- Keep allocation measurements accurate. [Level ► p9](#)

Gas Outlet

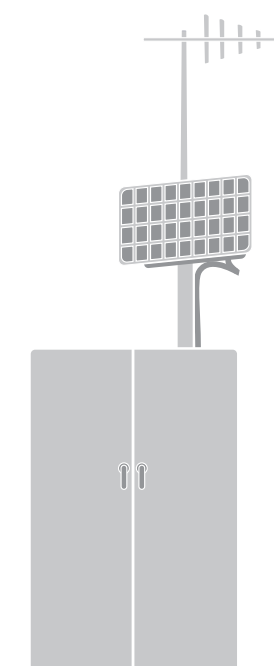
- Maximize production and curtail emissions by stabilizing pressure and reducing flares. [Pressure ► p7](#)
- Detect and prevent liquid carryover to maintain product quality and reduce costs. [Flow ► p11](#)
- Improve allocation measurement accuracy. [Flow ► p11](#)

Oil Outlet

- Reduce costs and environmental risks by detecting entrained gas and other process upsets. [Flow ► p11](#)
- Improve allocation measurement accuracy and reservoir modeling. [Flow ► p11](#)
- For two-phase separators, quantify oil and water cuts. [Process ► p5](#)

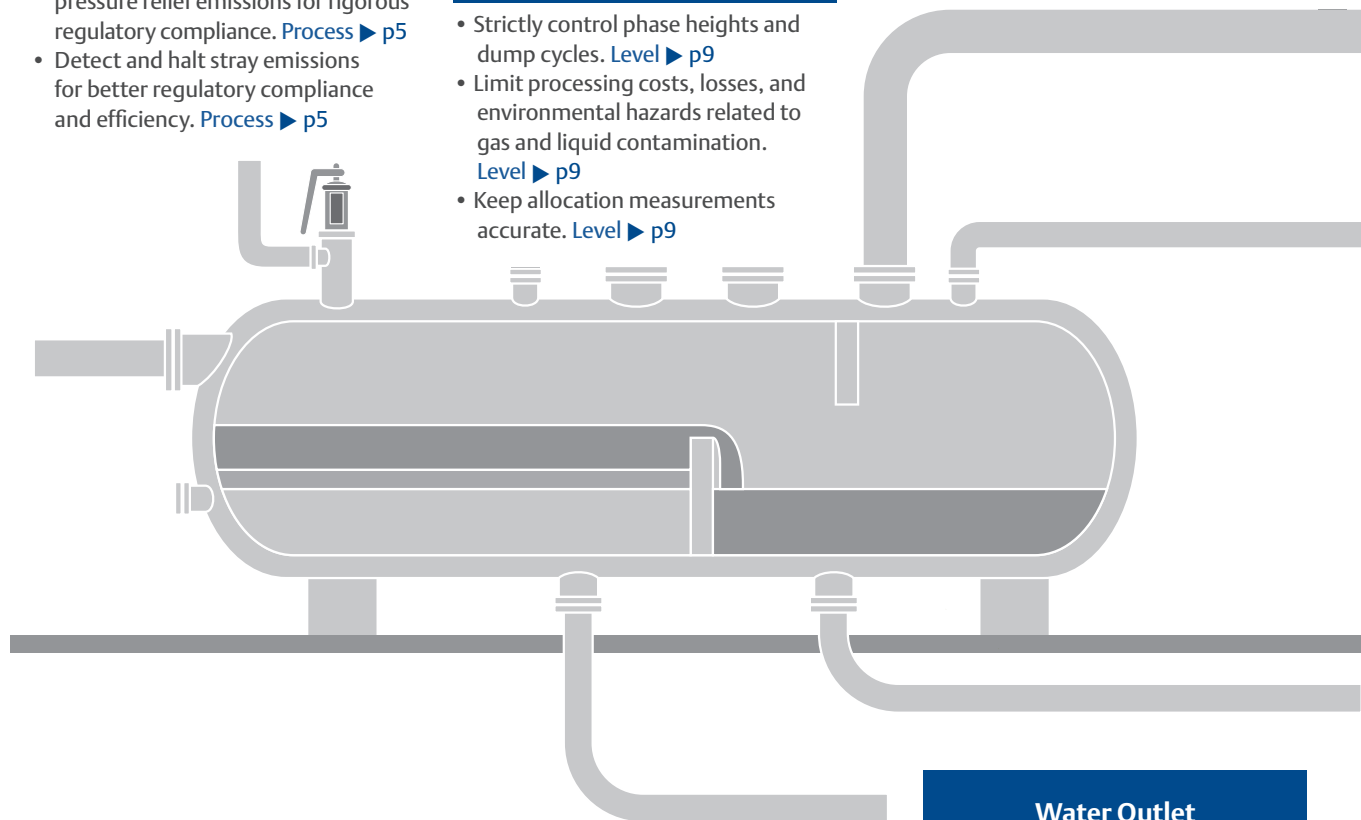
Water Outlet

- Reduce costs and environmental risks by detecting oil contamination and entrained gas. [Flow ► p11](#)
- Improve reservoir modeling and allocation measurement accuracy. [Flow ► p11](#)



Field Management

- Get clear, up-to-date process information, including sand accumulation, temperature, pressure, and emissions. [Process ► p5](#)
- Maximize production with reliable data on reservoir production. [Process ► p5](#)
- Improve separator performance and maintenance efficiency. [Process ► p5](#)



Process Monitoring and Data Management

With the right monitoring devices and data management, you can minimize HSE risks and burdens while improving efficiency throughout the site. [Learn more. ► p5](#)

Pressure Monitoring and Control

For faster, cleaner production that keeps HSE risks low, you need responsive, reliable pressure monitoring and control. [Learn more. ► p7](#)

Level Measurement and Control

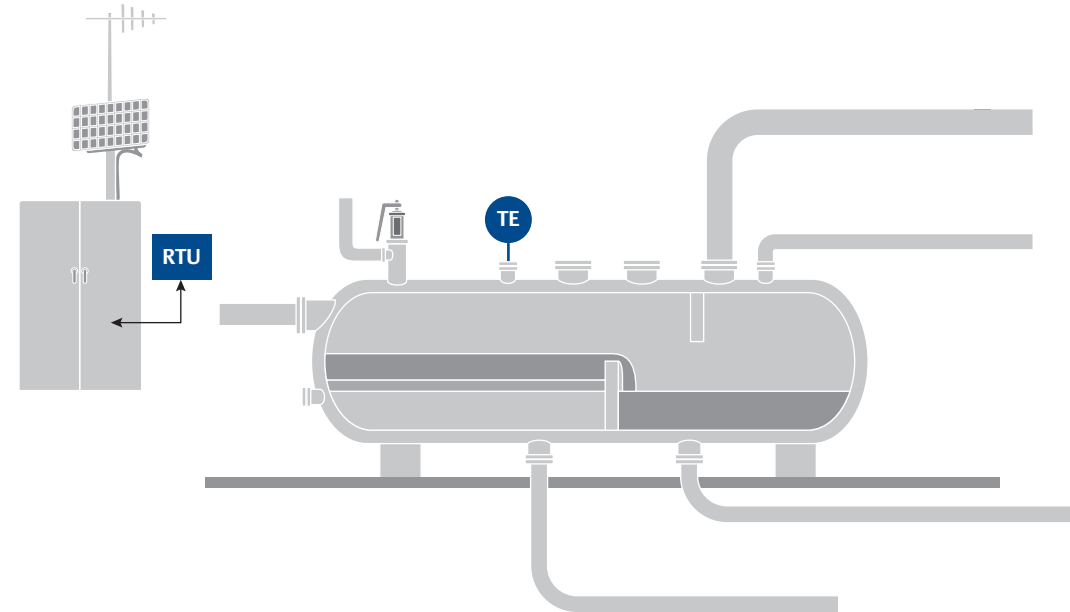
Accurate, reliable level measurement and control are crucial for separator efficiency. Your choice of solutions can have a major effect on later emissions and maintenance. [Learn more. ► p9](#)

Flow Metering

With well-suited flow meters, you can create useful reservoir models for optimal recovery while appropriately accounting for contamination. [Learn more. ► p11](#)

Process Monitoring and Data Management

Process control devices—such as remote operations controllers linked to a SCADA system—keep your separators working efficiently while relaying up-to-date data to you about reservoir and well dynamics. Properly tuned devices and appropriate control logic help to keep your separator online and efficient, even as well production changes. At the same time, process and production data play central roles in improving HSE monitoring and regulatory compliance. With preconfigured Remote Terminal Units (RTUs), specialized monitoring, and other Emerson solutions, you can consistently run your operation at its peak.



What's your opportunity?

- Cost-effectively connect all the wells in a wide area using wireless RTUs that pass through HART process data.
- Carefully manage separator dynamics automatically and constantly to reduce the need for maintenance and other resources.

Get more reliable data and improve your operational flexibility. Connect with an Emerson expert.

Getting accurate, timely data from your RTU and control management systems is important. Transforming that data into a strategy that gives you more operational flexibility and efficiency is even more critical. Emerson experts can help.



Services offered...

- Global and local support during commissioning, startup, and post-startup phases
- Comprehensive, 24/7 on-demand technical support
- User training
- Custom process control software programming

Featured process monitoring and data management solutions

Remote Automation Solutions SmartProcess Oil & Gas Application Suite



- Improve operational efficiency with field management for a broad range of applications.
- Easy to configure and integrate with SCADA software
 - Automates cyclic test well separators of up to 64 wells
 - Ensures consistent well operation

Remote Automation Solutions ROC and FloBoss Flow Computers



- Measure and control liquid or gas flow to support fiscal measurement, custody transfer, batch loading, and more.
- Distributed RTU network capabilities for widely dispersed wells
 - Configurable systems minimize custom programming
 - Intuitive applications software
 - Low power consumption

Rosemount™ 708 Wireless Acoustic Transmitter



- Detect and report pressure-relief valve activation.
- Reports acoustic and temperature data, as well as device and event status
 - Simple non-intrusive installation works for any application
 - IEC 62591 (WirelessHART®) output with >99% data reliability
 - More than 10 years of power-module life
 - Improves energy efficiency and environmental compliance

Related products

Remote Automation Solutions OpenEnterprise™ SCADA Software



- Remotely monitor and control wells, field devices, and equipment.
- Open-standards interfaces provide business systems access to real-time historical and configuration data
 - Integrates seamlessly with ROC and FloBoss RTUs
 - Powerful reporting and trending tools
 - Alarm and event manager, with text messaging and email support

Rosemount Temperature Transmitters



- Monitor separator temperature to allow for better process control.
- Hot Backup® feature allows transmitter to switch from a failed sensor to a redundant sensor without signal loss
 - Alert signals when sensor measurement drift requires maintenance attention
 - Dual-compartment housing protects against high-amplitude electrical noise and other environmental effects
 - Transmitter-sensor matching for more accurate measurement

Roxar™ Watercut Meter



- Measure the proportion of water in oil—in real time—for test-separator process control, fiscal metering, and more.
- Accurate on two-phase separators
 - Real-time identification of process upsets
 - Optional features adjust for changing salinity and dry oil densities

Additional products

- Bettis™ Multiport Flow Selector
- Incus Ultrasonic Gas Leak Detector
- Fisher™ 4320 Wireless Position Monitor
- TopWorx™ 4310 Wireless Position Monitor
- Roxar Multiphase Meter
- Roxar Sand Monitor
- Syncade™ Suite

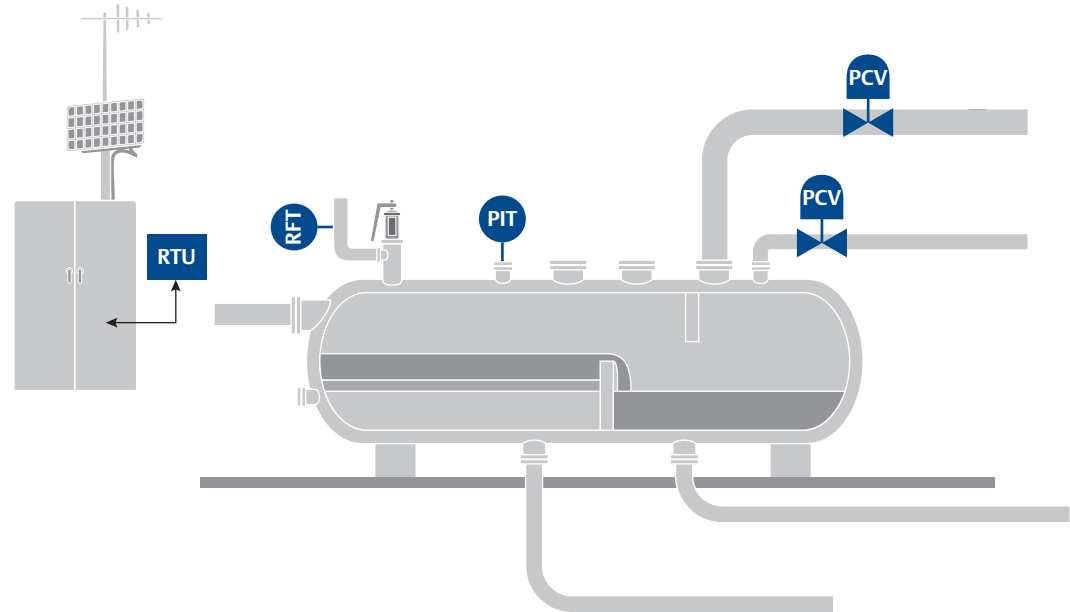


Pressure Monitoring and Control

Regulators—or gas valves with pneumatic controllers—keep separator pressure in the best range for optimal production. At the same time, pressure relief valves provide protection by venting excess pressure to defuse dangerous conditions. With Emerson’s pressure transmitters, regulators, control valves, and monitoring devices, you’ll have the ability to optimize production while improving safety and environmental regulatory compliance.

What’s your opportunity?

- Prevent contamination in liquid and gas outflows by keeping pressure in the ideal range—even with dirty fluids.
- Reduce emissions for regulatory compliance.



Protect your process and people. Connect with a pressure and control expert now.

You need to know whether you’re getting maximum safety and performance from your pressure-control instruments. Get in touch with a local expert now.



Services offered...

- On-site visits
- Commissioning, configuration, and device testing
- Verification of mechanical and electrical device installations
- Spare parts

Featured pressure monitoring solution

Rosemount 3051S Transmitter



- Measure pressure accurately and consistently for stable separator control.
- Robust, all-welded hermetic design for consistent performance in dynamic environments
 - Maintenance-free performance for over a decade, with 15-year stability and 15-year limited warranty
 - IEC 62591 (WirelessHART®) technology allows extended and affordable monitoring
 - Advanced diagnostics technology for proactively monitoring process health and electrical loop integrity

Featured pressure control solution

Fisher Backpressure Regulators



- Control separator backpressure at a tight setpoint over large flow ranges.
- Precise pressure control and instant response to pressure changes
 - Low pressure build-up helps improve separation and increase production
 - Self-contained design provides simple installation, startup, and maintenance
 - Zero emissions and no external pneumatic or electric power required

Related products

Fisher Wireless Position Monitor



- Monitor pressure-relief valves and on/off control valves for better process control.
- Non-contacting
 - Wireless feedback signal indicates equipment position, reporting percent of span, as well as on/off status
 - Sensing design provides accurate monitoring and eliminates physical wear

Fisher Pressure-Reducing Regulators



- Ensure proper pressure of fuel gas or pressure supply for field instrumentation.
- Field-proven robust design for long service life
 - Engineered for performance and reliability
 - Self-contained design provides simple installation, startup, and maintenance
 - Zero emissions and no external pneumatic or electric power required

Fisher Pneumatic Backpressure Control Valves



- Manage separator backpressure for stable operation.
- Ideal for throttling gritty or sticky gases or liquids
 - Live-loaded packing system reduces fugitive emissions
 - Optional tungsten carbide trim for erosive applications
 - U.S. “Quad-O” compliant

Fisher Pneumatic Pressure Controllers



- Maintain separator pressure at a set-point value using pneumatic communication with a control valve.
- Low gas consumption
 - High output and easy tuning
 - U.S. “Quad-O” compliant
 - Works well with Fisher control valves

Additional products

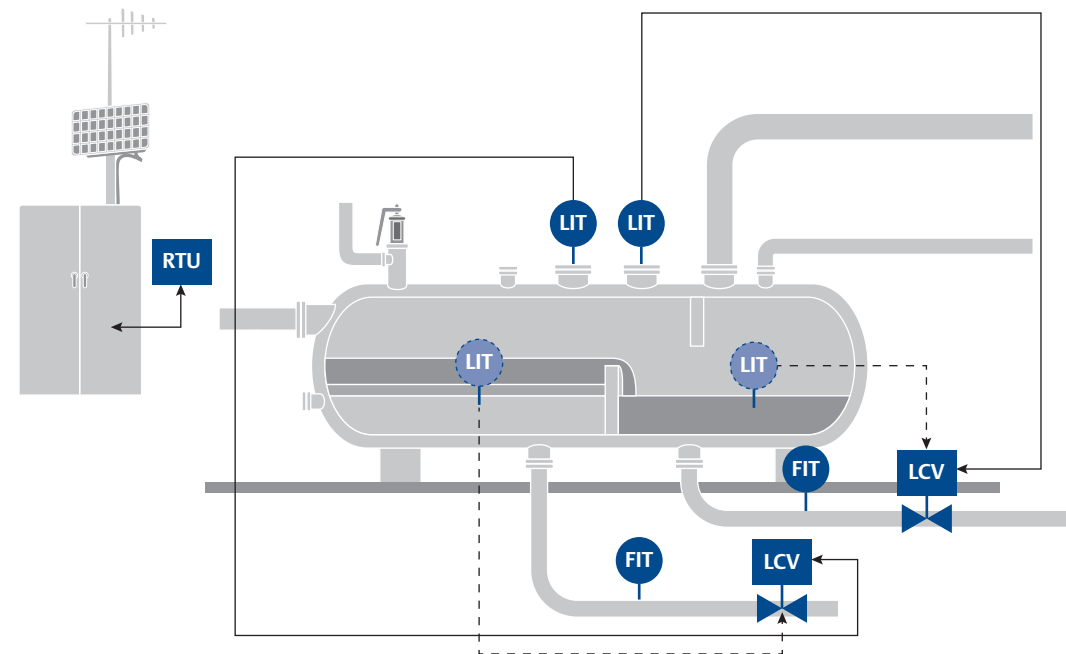
- Rosemount Wireless Acoustic Transmitter
- Incus Ultrasonic Gas Leak Detector

Level Measurement and Control

With accurate level measurement, your separators can precisely regulate liquid volumes, encouraging proper phase separation and outflow control. With the right choice of Emerson level controllers, level transmitters, and dump valves, you'll be able to keep processing costs down while maintaining hydrocarbon quality, reducing lost production, and preventing overspills.

What's your opportunity?

- Measure liquids and interfaces and independently of density or flow-rate changes.
- Extend the life of your equipment with reliable control valves designed for harsh oil field environments.



Tune level control for optimal retention time and reliability. Connect with a local expert.

For the most reliable level measurement and control, you need to select the most appropriate technology. Emerson level experts can help you choose from our comprehensive portfolio of level devices to identify the best solution for your level application.



Services offered...

- On-site field services
- Diagnostic testing, calibration, loop checks, and valve tuning
- Recommended spares
- As-built serial card
- Diagnostic reports
- Emergency equipment

Featured level measurement and control solutions

Rosemount Guided Wave Radar



Measure separator interface levels accurately and reliably.

- Cost-effective
- No moving parts—virtually maintenance-free
- Unaffected by changes in oil density, conductivity, temperature, pressure, pH, or viscosity
- Advanced diagnostics and Verification Reflector function check transmitter integrity simply and safely

Fisher Electric Liquid Dump Valves



Control separator outflow with low-power, electrically actuated valves and flexible control-signal interface.

- Remote monitoring and configuration
- Failure mode upon loss of signal
- U.S. "Quad-O" compliant (packing less than 500 ppm)

Fisher L2e Level Controller



Monitor liquid levels and controls dump cycles through a control valve.

- All electric operation
- Zero bleed
- Simple zeroing and span tuning for fast and easy setup
- U.S. "Quad-O" compliant

Related products

Rosemount Vibrating Fork Level Switch



Monitor separator liquid levels and controls dump cycles through a control valve.

- Quick response time with "fast drip" fork design
- Unaffected by flow disturbances
- Requires no calibration
- No moving parts or crevices—virtually maintenance-free

Fisher Pneumatic Liquid Dump Valves



Control separator liquid outflow.

- Ideal for throttling gritty or sticky gases or liquids
- Live-loaded packing system minimizes gas loss
- Tungsten carbide trim option for erosive applications, such as shale oil and gas production

Fisher Pneumatic Level Controllers



Monitor liquid levels and control dump cycles through control valves.

- Snap-acting or throttling control
- Dependable control performance
- U.S. "Quad-O" compliant

Additional products

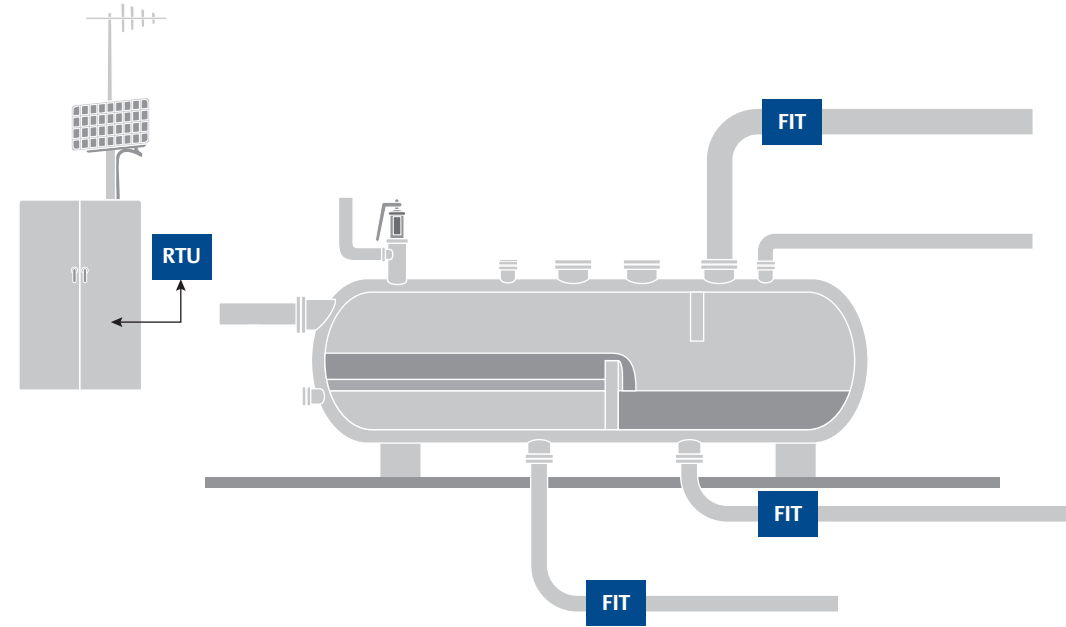
- Fisher DLC3000 Digital Level Controller
- Fisher 2100/2100e Hi-Lo Liquid Level Switch
- TopWorx D-series discrete valve controller

Flow Metering

Flow meters installed on individual separator outlets measure gas, water, and oil, providing data that helps you manage reservoirs. Meters can also flag gas and liquid contamination resulting from inefficient separation. With Emerson's versatile line of accurate flow metering technologies, you can properly allocate revenue, reduce reprocessing, and optimize recovery throughout a reservoir's lifetime.

What's your opportunity?

- Expand accurate measurement to a wide range of fluid flow rates—even while saving on maintenance and installed costs.
- Detect contamination—such as liquid carryover or gas carry-under—immediately for quick correction.



Ensure your flow measurement accuracy. Connect with a local expert.

With a global network of Flow Service Centers, Emerson delivers a complete range of services that keep you running at your peak, while helping you get the most out of your process and people.



Services offered...

- Certified repair
- Accredited calibration
- Critical spares
- Quick turnaround

Featured gas flow solution

Daniel™ Senior Dual-Chamber Orifice Fitting



- Measure compensated flow over a wide range, with a low installed cost.
- Easily changeable orifice plate allows a broad range of flow measurements
 - Meets strict ASTM specifications and the latest API and AGA recommendations
 - Allows plate changes under pressure without interrupting flow, preventing unscheduled shutdowns
 - Concentrically aligned orifice plate carrier minimizes uncertainty
 - Low-maintenance design easily integrates with new or existing flow computers

Rosemount Differential Pressure Flowmeter



- Calculate flow rate using differential pressure measurements across an orifice plate, measure static pressure, process temperature, and more.
- Patented shape of Annubar flowmeter's primary element improves performance, flexibility, and reliability
 - Conditioning Orifice Flowmeters eliminate the need for long straight pipe runs
 - Easy installation and lower energy costs with Annubar flowmeters
 - For small line sizes (½ in. to 1½ in.), get highly accurate measurement and easy installation while eliminating error sources using Integral Orifice flowmeters

Featured liquid flow solution

Micro Motion™ Coriolis Flow Meters



- Measure density and flow with high accuracy; detect gas or liquid contamination.
- Corrects for entrained gas volume for high oil production measurement accuracy
 - Highly reliable, with no internal moving parts
 - Smart Meter Verification diagnostic ensures meter performance meets specifications

Related products

Daniel Ultrasonic Flow Meters



- Measure oil and gas flow with highly accurate ultrasonic technology.
- High rangeability for anticipated production rates
 - Minimal pressure drop
 - Ideal for line sizes larger than four inches
 - Flow-profile and speed-of-sound diagnostics detect upstream blockages, gas carry-under in oil, and liquid carryover in gas

Rosemount Magnetic Flow Meters



- Measure liquid flow with high reliability, verifiability, and low maintenance requirements.
- Accurate water production measurements
 - No moving parts
 - Smart Meter Verification and electrode coating diagnostics ensure proper performance
 - Low power consumption option available for solar-powered sites

Rosemount Vortex Flow Meters



- Accurately measure gas and liquid flows using a vibration-immune, gasket-free design.
- Water production measurement suited to longer dump cycles and medium flows
 - SMART fluid diagnostic detects stuck dump valves
 - High turndown gas production measurement
 - Allows replacements without shut-ins
 - Non-clog design for reliable performance in dirty fluids

Daniel Liquid Turbine Meter with Rosemount 705 Pulse Transmitter



- Accurately, reliably measure liquid flow during secondary-recovery waterflooding with a low cost of ownership.
- Engineered and built for small-line applications
 - Well-suited for high-pressure applications
 - Tungsten carbide journal bearings for long life
 - Totalizer wirelessly transmits data

Additional products

- Bettis Multiport Flow Selector
- Net Oil Computer
- Roxar Watercut Meter



For more information, visit EmersonProcess.com/Onshore

Enhance your field's lifetime performance with expert support

With Emerson Lifecycle Services, you'll have the support you need for setting up and sustaining efficient and reliable onshore production, while minimizing risks to health, safety, and the environment.

With our broad network of local service centers, you'll have quick access to experts who can help you plan, commission, and maintain an automation strategy that enhances your insight into field operations and minimizes trips to the field. You'll be able to keep your investments performing at their best—throughout the life of your field.



Plan & Design

- Wireless site surveys
- Design and engineering services
- Project management



Implement & Build

- SCADA systems integration
- Instrumentation startup and commissioning
- Valve startup and commissioning



Operate & Maintain

- Instrument calibration
- Uncertainty analysis and meter proving
- Valve diagnostic services



Improve & Modernize

- Optimization services
- Modernization and migration planning
- Local repair and refurbishments



With locations all over the world we're always nearby to help you solve your problems—no matter where you are. Contact us today!

Get started



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Emerson Process Management delivers time-tested and innovative separator solutions designed to help you improve the performance, reliability and safety of your overall operations. Contact us now for world-class technologies, expertise, and services that can maximize your production return and process availability. Getting started is easy. Visit [EmersonProcess.com/Separator](https://www.emersonprocess.com/Separator)

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