

Accurate and Reliable Measurements for Natural Gas Processing

Utilize **safe**, and **robust** solutions for measurements in natural gas processing vessels



Common measurement challenges

Natural gas processing involves many steps before the final product can be utilized and sold. Establishing reliable and accurate level measurements can be difficult to achieve in challenging applications. Products may be corrosive, cause coating, be layered and require interface measurements, or have low reflectivity to radar signals. Process vessels may also be turbulent.

Radar and vibrating fork technologies are less affected by vessel conditions compared to displacers. Accurate measurements can be achieved independent of density, product build-up, pressure and temperature variations. Emerson provides non-contacting, guided wave radar (wired and wireless options), point level- and differential pressure solutions, which help you operate at full capacity. See guidance on the next page.

Less maintenance and optimized plant performance

With no moving parts in contact with the media, and all electronics protected within the transmitter head outside the tank atmosphere, radar technology provides a robust solution involving minimal maintenance. If needed, a replacement is easy.



Rosemount 3308

Rosemount 5300

“The **guided wave** radar transmitters have been running for 14 years without any **maintenance**, and we totally rely on them for the **future** too.”

BP Amoco.

Rosemount 2140



Rosemount 3051S

Rosemount 5408



Innovative solutions improve safety and ease of use

Interface level between two products can be tricky to measure. Rosemount™ guided wave radar devices provide accurate measurements on very thin layers e.g. for separation of oil, and water. As a complement, a Rosemount 2140 switch can be utilized for sand detection.

The Rosemount 5300 Radar Level Transmitter with a large coaxial probe can easily be placed in any existing chamber since it enables measurements all the way to the top of the nozzle without any dead zone.

Some fluids have low reflectivity for radar signals, especially in turbulent conditions. This has been solved with a sophisticated Rosemount 5300 measurement compensation feature.

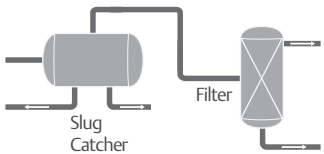
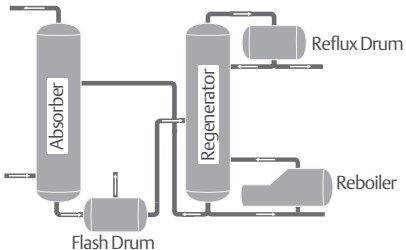
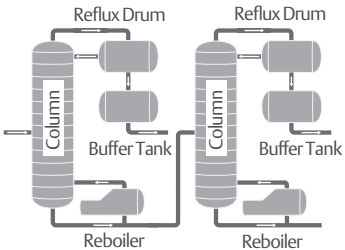
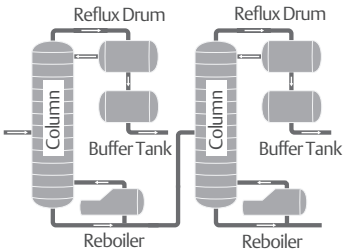
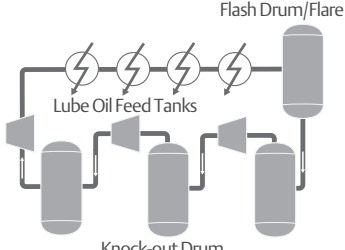
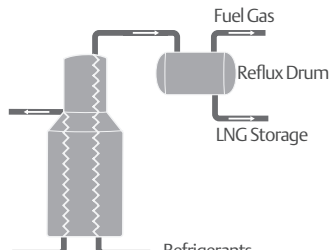
Rosemount level devices have the best safety figures on the market, and include features enabling easy proof-testing from the control room which make them well suited for use in SIS applications.

Installation is facilitated with plug-and-play guidance – no threshold settings or calibration are needed.

Key Benefits

- + Avoid problems with corrosive liquids, impact from turbulence, pressure shocks etc
- + Reduce maintenance and cleaning
- + Measure thin interface layers accurately
- + Use measurement compensation for turbulent, low reflectivity fluids
- + Measure within full range in chambers
- + Comply with the latest safety standards e.g. IEC 61511 and API 2350
- + Only one penetration/nozzle is required for a new tank installation

Our application solutions

	Inlet Facility	Acid Gas Removal	Dehydration	Natural Gas Fractionation	Refrigeration/Compressor Train	Liquefaction
	 <p>--> To oil storage <-- To water storage</p>					
Process Challenges & Solutions	<p>This is the first step of cleaning gas arriving from pipeline. Separation of condensate, water and liquid hydrocarbons from the natural gas, and removal of sediment are challenging actions which can be done using guided wave radar and sand detection solutions.</p> <p>Medium</p> <p>Natural gas, oil, water, and sand</p>	<p>Gas becomes corrosive in the presence of water. Acidic gases e.g. H₂S and CO₂ need to be removed from the natural gas to avoid heat exchanger corrosion, solidification and plugging problems. Absorbing amines are added, and re-used. This requires level measurements and safety measures to prevent overflow and losses.</p> <p>Medium</p> <p>Natural gas, and amines</p>	<p>Good dehydration is critical to meet gas specifications for water content, and to prevent corrosion in next steps of processing. Absorbing glycol is added, and re-used. Level and safety measurements are required to prevent overflow and losses.</p> <p>Medium</p> <p>Natural gas, and glycol</p>	<p>Different NGLs need to be separated from the gas through fractionation. Lighter condensates are removed first, e.g. methane which is used for LNG. Liquids have low reflectivity for radar signals, there will be density changes across the fractionation column, and condensing vapors. Reliable level measurements unaffected by challenging vessel conditions are a must, and safety measurements are needed.</p> <p>Medium</p> <p>Natural Gas Liquids (NGL)</p>	<p>Efficient pre-cooling and cooling of the natural gas is crucial to achieve high throughput and maximize capacity utilization. Reliable level measurements can be a challenge in extreme cryogenic temperatures, and it can be hard to achieve process stability. Radar level technology is ideal for challenging vessel conditions, especially if combined with an innovative probe option to stabilize measurements.</p> <p>Medium</p> <p>Mixed refrigerants/propane/ethylene</p>	<p>Last step of a liquefaction process in which the natural gas is cooled to a liquid. It involves a main cryogenic heat exchanger tower or a "cold box". Low temperature requirements require robust solutions. Count on reliable radar technology measurement solutions requiring minimum maintenance.</p> <p>Medium</p> <p>NGL and LNG</p>
Recommended Products	<p>Slug catcher, and slop oil tanks: Rosemount 5300, preferably with large coaxial probe for level and interface measurements</p> <p>Sand detection: Rosemount 2140 Level Detector</p> <p>Water tanks: Rosemount 5300 or 5408 Radar Level Transmitter</p>	<p>Amine contactor/glycol contactor/absorber: Rosemount 3051S Differential Pressure Transmitter (Electronic Remote Sensor System)</p> <p>Stripper/regenerator: Rosemount 5300 for level and Rosemount 2140 for overflow prevention</p> <p>Reflux drum: Rosemount 5300 Radar Level Transmitter and 2140 Level Detector for high/low level alarm</p> <p>Flash drum: Rosemount 5300 Radar Level Transmitter</p> <p>Reboiler: Rosemount 5300 Radar Level Transmitter with large coaxial probe and 2140 Level Detector for overflow prevention</p>	<p>Column: Rosemount 5300 for level and overflow prevention, 3051S Differential Pressure Transmitter (Electronic Remote Sensor System), and 2140 for high/low level alarm</p> <p>Reflux drum & Reboiler: Rosemount 5300 Radar Level Transmitter and 2140 Level Detector for high/low level alarm</p> <p>Buffer tank: Rosemount 5300 Radar Level Transmitter and 2130 Level Switch for overflow/dry-run pump protection</p>	<p>Flash drum: Rosemount 5300</p> <p>Lube oil feed tank: Rosemount 5300 with large coaxial probe and 2160 for overflow prevention and dry-run protection</p> <p>Knock-out drum: Rosemount 5300 Radar Level Transmitter (with Probe End Projection, PEP, option) and 2140 Level Detector for overflow prevention</p>	<p>Reflux drum & Reboiler: Rosemount 5300</p> <p>LNG storage:</p> <p>Full Containment Tanks: Rosemount 5900S for level and 2240S with 566 and 614 sensors for multiple point temperature</p> <p>Pressurized storage tanks: Rosemount 5900S (bigger tanks) or 5408 (smaller vessels) for level and 644 with 214 sensor for single point temperature</p> <p>Intermediate storage: Rosemount 5408 or 3308 Radar Level Transmitter</p> <p>Rosemount TankMaster is suitable for inventory management control.</p>	

Note: Process vessels may be equipped with a Magtech™ chamber if measurements need to be isolated.

Emerson Automation Solutions
 6021 Innovation Boulevard
 Shakopee, MN 55379 USA
 T (U.S.) +1 800 999 9307
 T (International) +1 952 906 8888

 [LinkedIn.com/company/Emerson-Automation-Solutions](https://www.linkedin.com/company/Emerson-Automation-Solutions)
 [Twitter.com/Rosemount_News](https://twitter.com/Rosemount_News)
 [Facebook.com/Rosemount](https://www.facebook.com/Rosemount)
 [YouTube.com/user/RosemountMeasurement](https://www.youtube.com/user/RosemountMeasurement)

Standard Terms and Conditions of Sale can be found at: www.Emerson.com/en-us/Terms-of-Use
 The Emerson logo is a trademark and service mark of Emerson.
 Rosemount and the Rosemount logotype are trademarks of Emerson.
 © 2020 Emerson. All rights reserved.

00807-0200-6149, Rev AA 04/20

