



SMART Solutions for Tank Monitoring

| Level | Temperature | Pressure |





Contents

Knowledge & Expertise	03
Rototherm & the LPG industry	04
SMARTReader	05
SMARTSolutions	07
SMARTLevel	10
Other SMARTSolutions: Temperature & Pressure	12
Telemetry	14
Services	15





Knowledge & Expertise

“With a heritage dating back to the 1840s, Rototherm Group is today a strong and dedicated partner providing world class process instrumentation solutions and services to a range of industries.”

The Rototherm Group provides Level, Temperature, Pressure, Density and Flow Instrumentation and Services throughout the world to a diverse range of markets.

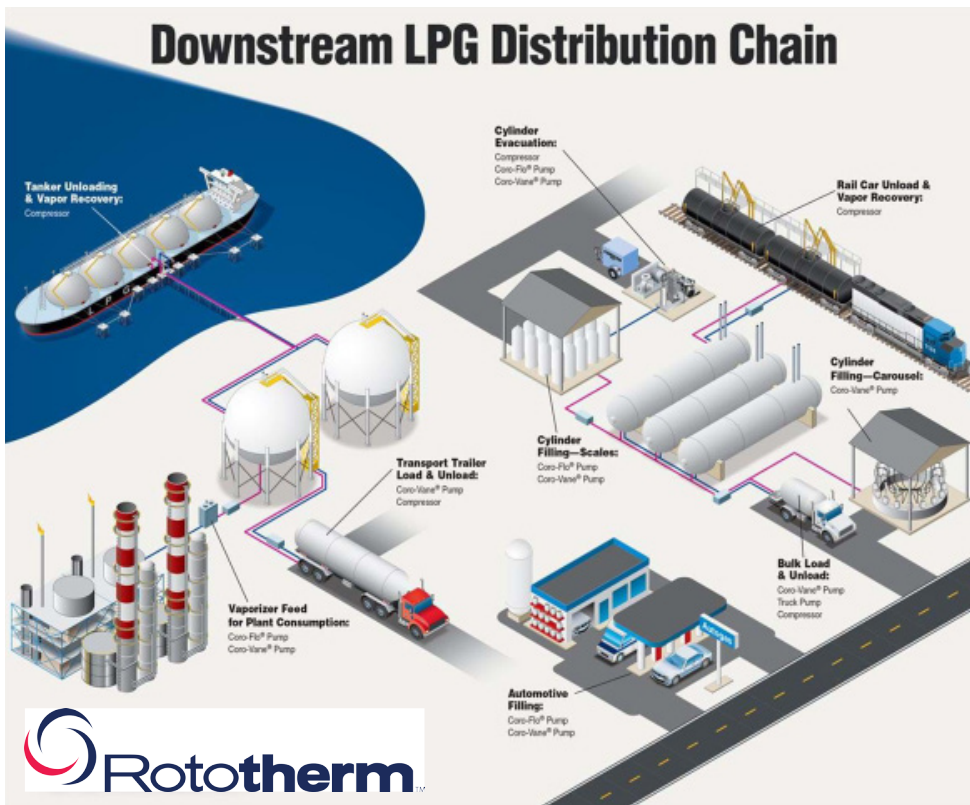
One of those markets is LPG. Rototherm has grown its reputation in this market by providing customer dedicated solutions. With more than 30 years of LPG experience our sales and engineering team provide our customers with knowledgeable instrumentation options. We enjoy working with our customers to find the right solutions for their specific process enquiries.

At Rototherm, we have a strong customer service focus and work closely with our customers to ensure their processes work efficiently, reliably and safely.

“EXCELLENCE THE WORLD CAN MEASURE”



Downstream LPG Distribution Chain



Rototherm & the LPG Industry

Every industry places very specific demands and requirements on the measurement technology it utilises. Rototherm has been providing instrumentation to the LPG industry for over 30 years. As we continue to expand our products, we make sure to deliver our customers world class instrumentation as well as the best customer service to support our products.

The LPG industry's critical safety requirements mean quality, reliability and approvals are principle requirements for any products applied in this environment. Rototherm's history within the petrochemical sector means its manufacturing and service quality have been founded on industry standards. As well as satisfying approval requirements, our quality focus ensures Rototherm instruments work reliably and effectively to the specifications of our customers and their respective industries.

Currently, Rototherm instruments are present worldwide in over 100 countries. Whether you need to manage your LPG inventory, reduce customer service visits or want to explore safety automation, Rototherm can help.

SMARTReader

“Does your tank have a Rochester R3D gauge? Connect it to our SMARTReader to access your data remotely.”

SMARTReader offers customers a competitive edge by providing cost-effective remote fuel level monitoring. Fuel level information is essential to effectively manage inventory, improve delivery efficiency and ensure there is enough fuel for continuous generator operation during power outages. The device is powered from a dual supply to ensure it never goes offline.

The SMARTReader reads an analogue voltage from the Rochester R3D remote ready dial and Hall Effect module and scales it into a percentage volume measurement. The information is transmitted along with current GPS location and system diagnostics to our secure SMARTData Portal platform.

Please see table on page 6 with compatible R3D gauges.



Industries:

- Industrial
- Commercial
- Residential
- Telecommunications

Applications:

- Commercial & Industrial Standby Generators
- Cellular Towers

The SMARTReader allows customers to have an economical solution that is based off the R3D dial on the tank. SMARTReader has some unique features, such as dual voltage inputs made specifically for generator applications. Cellular data telemetry allows SMARTReader to be an economical remote tank monitor for different applications.

Non-Invasive Level Sensor for R3D gauges

SMARTReader

- Suitable for tanks \geq 250 gallons
- Dual supply voltage inputs
- Integrated GPS module
- 3G or 4G
- Compilable multiple R3D gauges
- Connects to our SMARTData Portal
- Simple to install



R3D Remote Ready Dial Compatible Chart

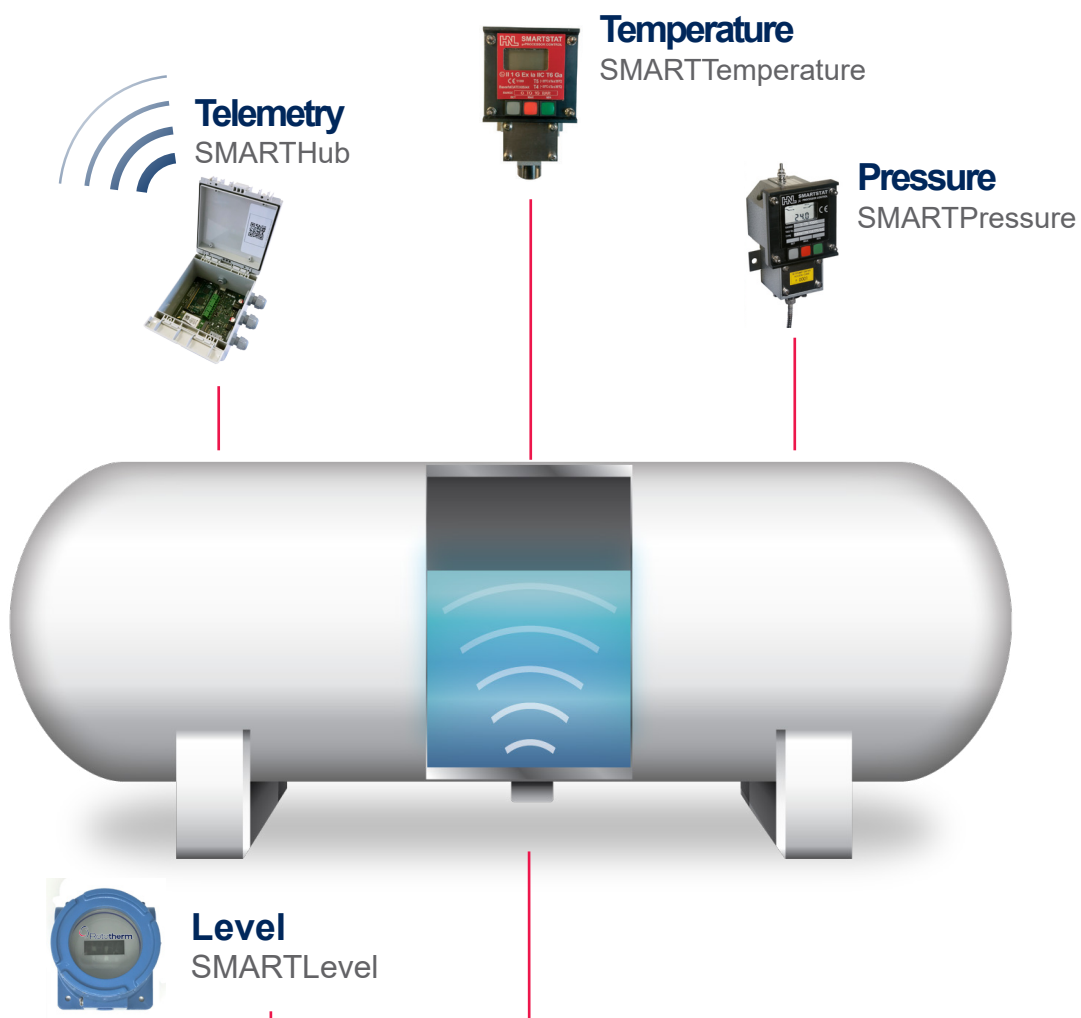
Gauge Construction		Orientation	Gauge Series	Dial
Senior 4-Bolt	Above Ground	Top	6280	5986S02733
	Below Ground	Top	6280	5986S02799
	Vertical Cylinder	Top	6280	5986S02772
	Above ground	Angle	6283	5986S02772
	Above Ground	End/Center	6283	5986S02772
Junior 4-Bolt	Above Ground	Top	6281	5909S02733
	Below Ground	Top	6281	5909S08799
	Vertical Cylinder	Top	6281	5986S02772
	Above Ground	Angle	6284	5909S02733
	Above Ground	End/Center	6284	5909S02733
Junior 1 1/4" NPT	Above Ground	Top	7281	5909S02733
	Above Ground	Angle	7284	5909S02733
	Above Ground	End/Center	7284	5909S02733
Junior 1" NPT	Above Ground	Top	8981	5909S02733
	Vertical Cylinder	Top	8981	5986S02772



SMARTSolutions for all your remote monitoring needs







“Can your tank alert you if the pressure or temperature is too high? With SMARTSolutions, you take tank monitoring to the next level.”

Tank monitoring is much more than just measuring liquid level. There are many other parameters that are important to measure in order to obtain all the data required for remote tank monitoring. At Rototherm, we are making this possible with our SMARTSolutions, which provide a complete SMART tank monitoring experience mainly focused on the LPG industry.



SMARTSolutions

Our SMARTSolutions are available for all types of tanks:

Tank Type	Level	Temperature	Pressure
Spheres 	✓	✓	✓
Vertical 	✓	✓	✓
Horizontal 	✓	✓	✓
Small 	✓	✗	✗
Bobtails 	✓	✗	✗
Transport 	✓	✗	✗

SMARTSolutions

We know that options are good to have. Our goal is to allow our customers the ability to configure their SMART Tank Monitoring System according to their needs. Configure your own SMARTSolutions with our matrix below:

Power

12 / 24 Vdc



Solar Panel



Instrumentation

Level



Temperature



Pressure



Display

Local Display



PLC / Scada



SMARTData Portal



Communications

Mobile/Cellular
Data



Modbus



Monitoring Plan

Real Time



Scheduled



SMARTData Portal

Data & Reports



Analytics



SMARTLevel Solutions

“Our unique non-invasive ultrasonic technology has been developed and built upon over the last 30 years, and is proven throughout the world across a vast number of installations.”

Rototherm offers truly non-invasive level measurement, meaning it can be installed and commissioned without the need to take the tank out of service. Our SMARTLevel provides real time liquid level measurements and are rated ATEX/IECEX ensuring the highest safety standards in the industry.

With a new generation of customer demand for higher accuracy and low maintenance products, our SMARTLevel is ideally suited to meet the critical demands of LPG applications.

Our SMARTLevel offers accuracy levels better than 1% and requires virtually no maintenance or calibration. This means we are highly competitive against costly invasive radar or top-down ultrasonic alternatives.



Industries:

- Industrial
- Commercial
- Residential
- Telecommunications

Tank Types

(from 1000 to 50,000+ gallons):

- Residential
- Vertical
- Horizontal
- Bobtails
- Transport
- Spheres

Applications

(by product):

- Propane
- Butane
- Methane
- Propylene
- Ammonia
- Mercaptan

Level Measurement

Our non-invasive ultrasonic sensors are easily bonded to the outside of the tank and require no down-time, no tank flaring or annual maintenance. Our systems are easy to install, reliable and provide accurate liquid level measurements (+/-1%) for years.

Non-Invasive Level Sensor

SMARTLevel ST1AD (Horizontal tanks/Transport) or ST1A (Bobtails)

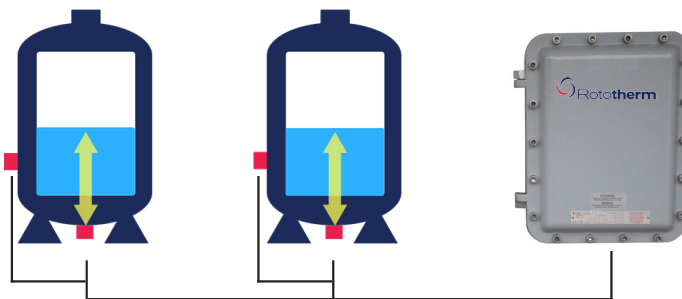
- Suitable for tanks up to 4m diameter
- Integrated temperature sensor
- Displays contents in 100% volume
- ATEX & IECEx Approved
- RS485 Modbus interface
- 4..20mA & 0..5V output
- Local Display



Non-Invasive Level Sensor for up to 2 tanks

SMARTLevel ST2AD (only for Vertical tanks)

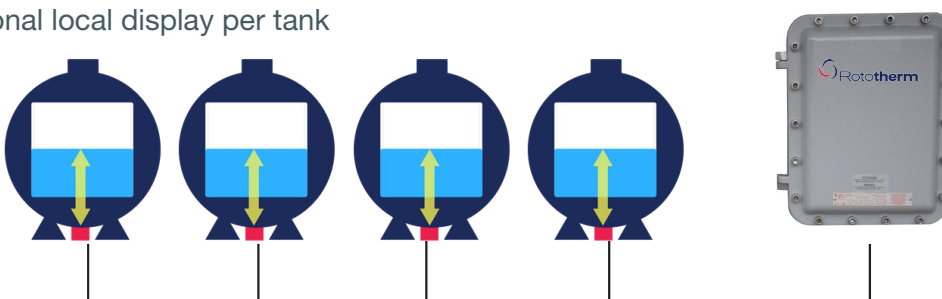
- Suitable for tanks up to 14m in height
- Higher accuracy
- Compensates for changes in LPG mixtures
- Compensates for temperature changes
- Optional local display per tank
- RS485 Modbus interface
- 4..20mA & 1..5V output
- ATEX & IECEx approved



Non-Invasive Level Sensor for up to 4 tanks

SMARTLevel ST4AD (only for Sphere tanks)

- Suitable for tanks up to 14m in height
- Up to 4 tanks per system
- Integrated temperature sensor
- Optional local display per tank
- RS485 Modbus interface
- 4..20mA & 1..5V output
- ATEX & IECEx approved





Other SMARTSolutions: Temperature & Pressure

“Thanks to Rototherm SMARTSolutions, you can now obtain all the important data to monitor your tank remotely.”

Talk to the experts...

With over 170 years of experience in process measurement, we understand that a small change in measurement accuracy can have a big impact on profitability. That’s why Rototherm Group is committed to helping our customers measure and control efficiently and accurately.

Our Pressure and Temperature products, can also be used in the following industries and applications:

Industries:

- LPG
- Oil & Gas
- Food & Beverage
- Heat Treatment
- Chemical/Petrochemical
- Nuclear
- Power
- Water & Wastewater
- HVAC
- Automotive
- Transport

Applications:

Temperature & Pressure monitoring for all applications including:

- LPG tanks
- Wellhead Control Panels
- Construction Equipment
- Dry Gas Seal
- Lube Oil Systems
- Generators & Transformers & Engines
- Pumps & Compressors & Turbines
- Pipelines

Temperature & Pressure Measurement

The Series 800 SMARTStat is a microprocessor controlled switch, transmitter and indicator, which enables several instruments to be replaced with a single device producing cost savings due to reduced equipment costs, documentation, installation, calibration and ongoing maintenance.

Temperature Electronic Switch & Transmitter

SMARTTemperature (SMARTStat Temperature Series 800)

- Temperature Range: -40°C to 400°C
- Direct and remote mounting with conduit
- Wide range of bulb and capillary lengths
- 24Vdc 4- 20mA loop powered
- High accuracy and repeatability
- Display of max/min pressures and mA output
- Programmable 2 x SPDT relay switching points
- IP65 Ingress Protection
- EEx ia IIC T4/T5/T6 certification available



Pressure & Differential Pressure Electronic Switch & Transmitter

SMARTPressure (SMARTStat Pressure Series 800)

- Pressure Range: -1 to 1000 bar
- Differential Pressure Range: 15 mbar to 4 bar
- 24Vdc 4-20 mA loop powered
- High accuracy and repeatability
- Display of max/min pressures and mA output
- Programmable 2 x SPDT relay switching points
- IP65 Ingress Protection
- EEx ia IIC T4/T5/T6 certification available



Telemetry

The 21st century has seen the evolution of mobile technologies. If your needs require data to be accessed on your computer and/or mobile device, Rototherm can offer IoT solutions to match your needs.

We offer **fully integrated telemetry solutions** for businesses across the globe. Our web based hosting platform provides scheduled, bespoke reports using data transmitted from our central and secure database.

The SMARTData Portal offers the following business benefits:

- Total control and visibility over all areas of your business
- Help monitoring costs, energy usage and much more
- Improved stock management and procurement
- More efficient logistics management
- Cost effective data hosting
- Saving on energy and resources
- Reduce health and safety risks associated with pollution incidents (overfilling tanks). Our data provides highly accurate measures of quantities required.
- Instant alerts when your equipment fails or there is unauthorised use or theft stock. Choose to receive alerts via text or email.

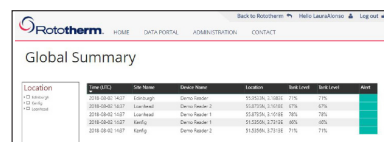
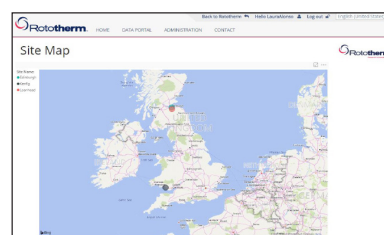
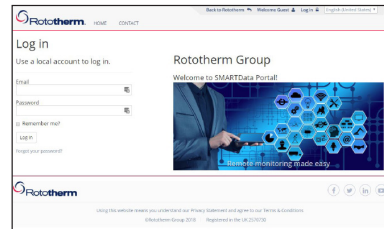
SMARTData Portal

SMARTData Portal is our state of the art secure online remote monitoring data portal that gathers all your data from your instrumentation and lets you monitor all your sites remotely 24/7/365.

SMARTData lets you keep track of the level of your tanks remotely, saving you from checking this information on site.

You can check your measurements from the office or on the road by just logging into our online SMARTData Portal, ensuring that any issues are picked up as early as possible, giving the client a total piece of mind.

Our SMARTData Portal shows current and previous readings of all your sites and information can be filtered by location, date, etc. You can also create personalised reports, export data and create customer alarm triggers for multiple accounts and configure your sensors.



Services

Rototherm Group is committed to support the customers with excellent pre- and after-sales service and to guarantee the function of our products by delivering high quality instruments.

Our services include:

- Customer Service
- Warranty
- Commissioning

Customer Service

Rototherm Group, together with our offices and distributors established worldwide, aim to provide excellent customer service 24/7/365.

Service excellence is our mission, the critical element for maintaining life-long, valuable relationships with our customers. We strive to not only meet our commitments and client expectations, but to exceed them on every level and deliver exceptional value.

Warranty

At the centre of everything we do, Rototherm's high quality and performance is guaranteed by an uncompromising approach to quality. Rototherm's policy has always been to maintain a consistently high level of quality and reliability throughout its product range and service to customers, confirmed by formal approval to Quality Assurance standard ISO9001:2015.

However, whenever things go wrong, our products are covered by a 12 month warranty from date of invoice.

Commissioning

Our service team will be available to commission your Rototherm products onsite whenever required. We can offer a wide range of services, from one off calibrations to complete customer solutions and commissioning. Our UKAS traceable calibration certificates show before and after adjustment readings, which are issued for each instrument or sensor tested. These certificates can be customised to suit the customer's specific requirements.



Rototherm



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- Rototherm facility
- Distributor

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