



# Brewing & Distilling Technology

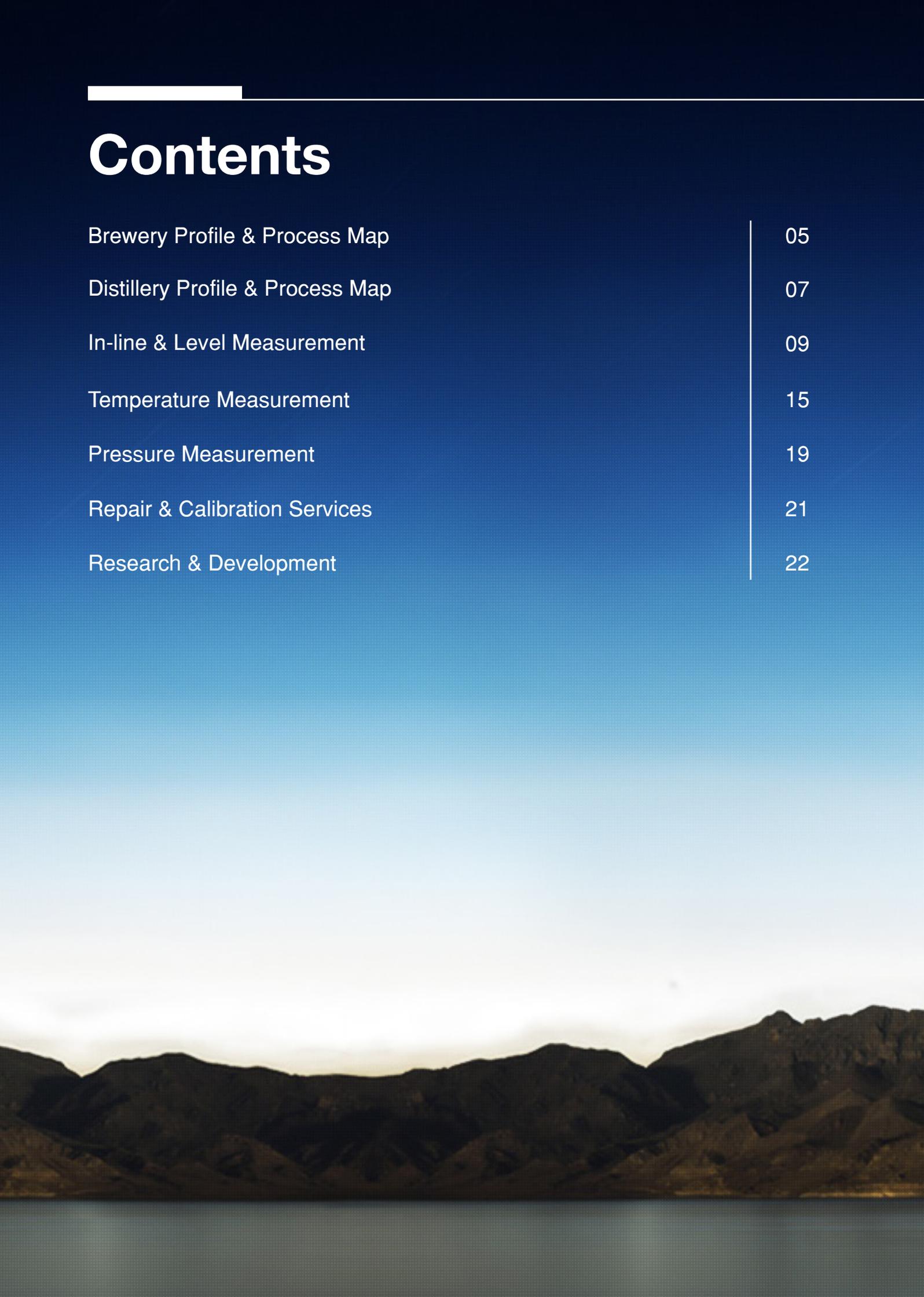
| Temperature | Pressure | Level | Liquid Concentration |





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# Knowledge & Expertise

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*“With roots originating from the technology laboratory of a brewery, our products have been developed and enhanced through knowledge and experience”*

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The Rototherm Group is a leading manufacturer of instrumentation measuring: Pressure, Temperature, Level, Flow, Liquid concentration, In-line Oxygen and Carbon Dioxide.

Our Beverage offering brand, Rototherm Canongate Technology, has been a leader and innovator working successfully with the Beverage industry for over 35 years. During this period we have continuously developed and enhanced our product through knowledge and experience.

Today, our products are present in leading beverage organisations plants throughout the world.

We enjoy working with our customers, enabling them to control their processes more efficiently with a partner they can trust.

At Rototherm, we have a strong customer service focus, and work closely with our customers to ensure they can get the best possible results.









# Brewery Profile & Process Map

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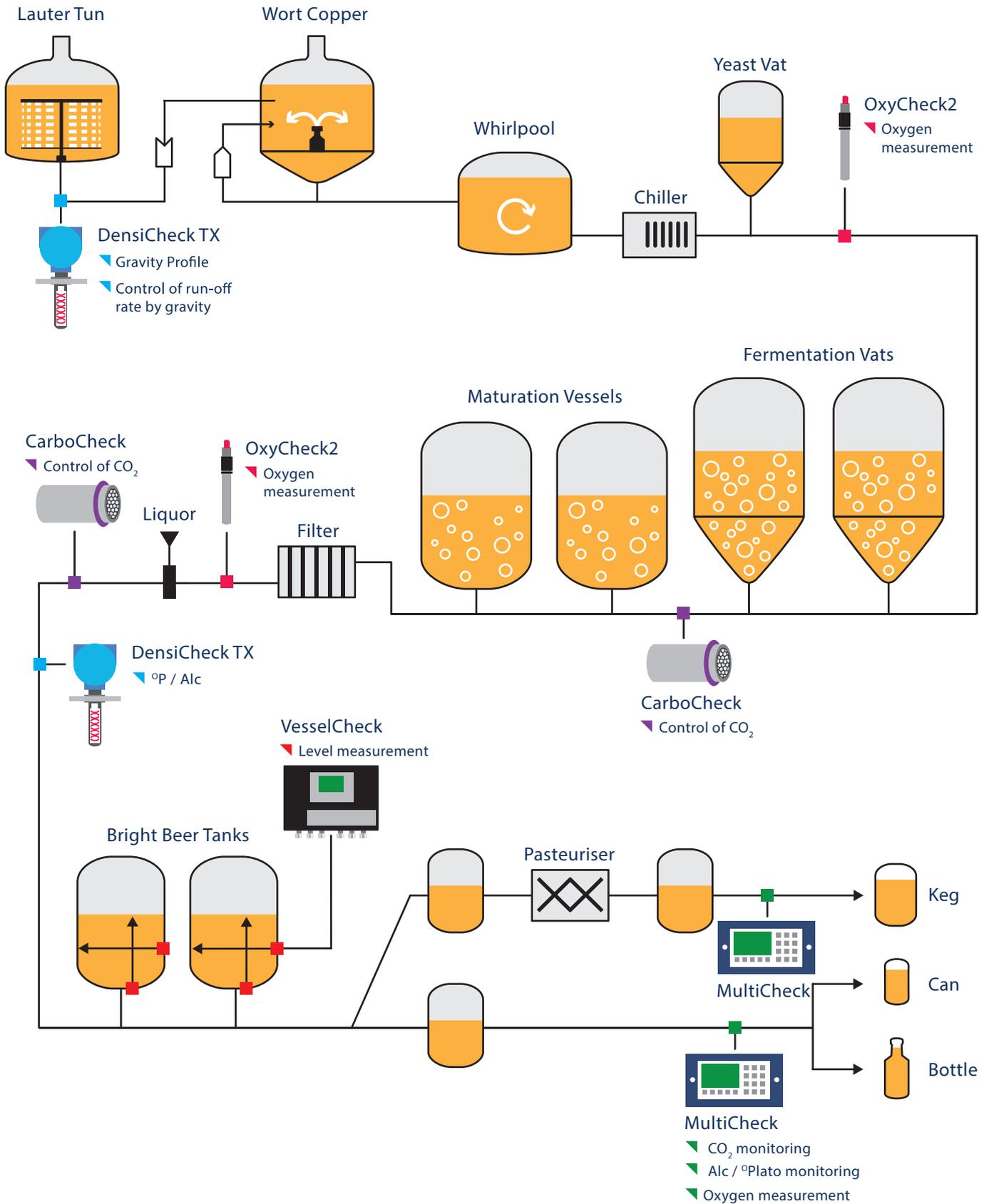
Rototherm Canongate Technology's history is firmly rooted within the Brewing industry originating as the technology division of Scottish & Newcastle Breweries. With over 35 years' experience within the sector, the technical process knowledge and experience developed provides the foundation to our new product development.

With the ever growing stricter regulatory standards, instrumentation needs to be reliable, accurate and quality manufactured.

Our instrumentation is used in the quality and process control for making some of the world's most renowned beers. From Miller, Coors, Budweiser and Boston Beer, in the United States and Canada; to Estrella, Heineken, Becks, and Carlsberg, in Europe.



# Brewery Profile & Process Map





# Distillery Profile & Process Map

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Following application success within the Beer segment, the Distilling industry was a natural progression for our portfolio of products. Today, Rototherm Canongate's DensiCheck assists around 70% of Scottish distilleries with their in-line alcohol control. It is responsible for very important cutting points in the spirit run; contributing to the classic tastes of some of Scotland's most sought after whiskeys. With established relationships with Diageo, Pernod Ricard, William Grants and several independent companies, Rototherm Canongate has a firm connection across all Scotch Whiskey distilleries and is a well-respected and trusted instrumentation partner, with a strong reputation for quality and product support.

In addition to the Scotch Whiskey Distilleries, Rototherm Canongate also has instrumentation within distilleries producing Gin, Vodka, and other spirits. Several products are conducive for use within distilleries, although Densicheck is the leading application, VesselCheck, SpotCheck, along with a host of core Rototherm instrumentation, including pressure/temperature gauges and switches, are all used within distilleries.



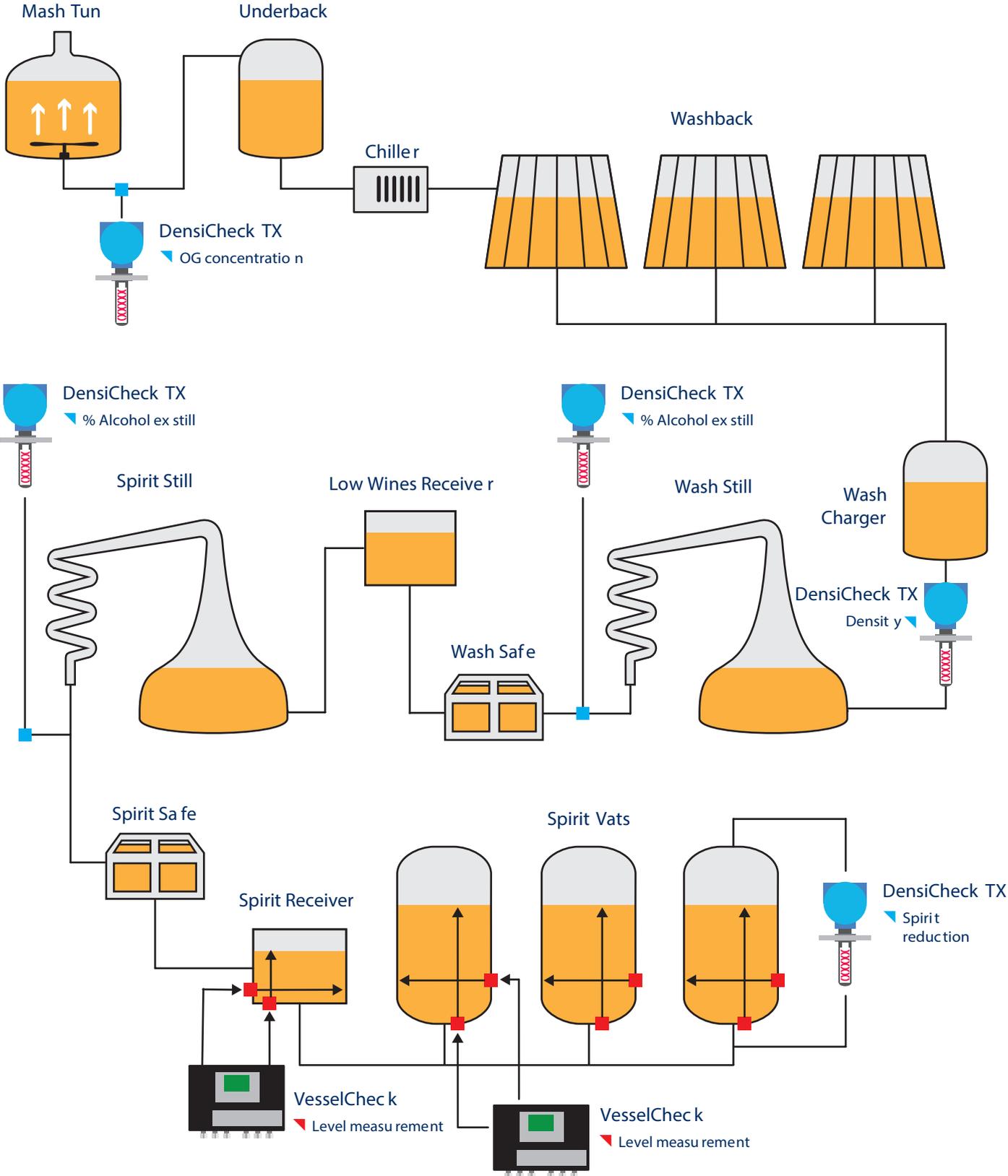
**WILLIAM GRANT & SONS**  
INDEPENDENT FAMILY DISTILLERS SINCE 1887

**DIAGEO**



**Pernod Ricard**

# Distillery Profile & Process Map





# In-Line & Level Measurement

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*“Our unique non-invasive ultrasonic technology has been developed and built upon over the last 35 years, and is proven throughout the world across a vast number of installations”*

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## **Talk to the experts...**

- Ultrasonic technology with wide ranging and unique applications for several industries
- Heritage deeply rooted in the brewing and distilling industry, with an illustrious reputation across the Scotch Distilleries market
- 100% non-invasive liquid level measurement:
  - Zero modifications to your vessels
  - No downtime for installation and commissioning

## **Industries & Applications:**

### **Beverage:**

- CO<sub>2</sub> control/monitoring in beer & sparkling wine
- Alcohol strength measurement
- Beer, water, spirit vat level measurement

### **Petrochemical:**

- Chemical treatment process automation
- Acid bath strength, level and batching
- Chemical manufacture/production

### **Oil & Gas:**

- Fuel storage tank level measurement (LPG, gasoline, diesel, kerosene...)
- Liquid level/interface detection in oil processing

### **Transport:**

- Truck cargo monitoring
- Offloading fuel identification systems
- Fuel tank theft prevention



## In-Line Measurement

### Liquid Concentration Sensor & Transmitter

#### DensiCheck TX

- Economic measurement of liquid concentration and density through use of ultrasound technology
- Available as non-invasive and invasive formats
- ATEX hazardous area approved
- No moving parts
- Lower installation and maintenance costs
- Increased process efficiency
- Improved quality monitoring
- High accuracy and repeatability



For use in the Food & Beverage industry, this instrument is capable of measuring Beer, Wort, Ethanol (Alcohol), Sucrose and soft drinks.

## OxyCheck2 – Non sampling in-line O<sub>2</sub> Measurement

OxyCheck2 has been designed specifically for hygienic applications where the need is for reliable and accurate measurement of Dissolved Oxygen content (DO<sub>2</sub>). The OxyCheck2 is a self-contained oxygen measurement instrument in a standard 12 mm format, the sensor shaft incorporates: high temperature resistant optical electronics, microprocessor, 4 to 20mA analogue output, RS485 serial communications with Modbus RTU protocol. The device is configured and calibrated using the OC2Setup program via the serial bus.

### Oxygen Measurement

#### OxyCheck 2

- Designed for hygienic applications to measure dissolved oxygen content (DO<sub>2</sub>) reliably and accurately
- Uses photodiode technology
- Measurement range from 4ppb to 25ppm
- Low maintenance required
- Electrolyte free and no fragile membrane
- Quick response and not affected by flow rate
- Integrated RS485 Modbus RTU interface



## CarboCheck – Non Sampling in-line CO<sub>2</sub> Measurement

As a world leading CO<sub>2</sub> monitor and control system, CarboCheck uses the well-known saturation pressure / temperature technique for accurate, non-sampling measurement. CarboCheck can be used as a stand-alone or configured to work with a control system. The measuring system comprises the analyser / control unit, CO<sub>2</sub> sensor assembly, resistance thermometer and vacuum exhauster.

The CarboCheck sensor features a silicone rubber membrane, through which the dissolved CO<sub>2</sub> permeates into a sealed, evacuated chamber. The partial pressure of the gas is then measured and CO<sub>2</sub> content is displayed on the control unit. This system incorporates a vacuum exhauster to regularly evacuate the sensor, providing continual, accurate measurement of dissolved CO<sub>2</sub>. The analyser / control unit can be linked to a carbonation system to enable fully integrated CO<sub>2</sub> measurement, injection and control.

### Carbon Dioxide Measurement

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#### CarboCheck

- Accurate monitoring and control of dissolved CO<sub>2</sub> levels in carbonated beverages
- +/-0.02 CO<sub>2</sub> (+/-0.04 g/l)
- Hygienic fitting, can be cleaned in-place
- No sampling or product by-pass lines
- Available as single/ dual channel controller
- Low maintenance requirement
- Improved 'right first time' carbonation figures in-line or in-tank
- More efficient process control



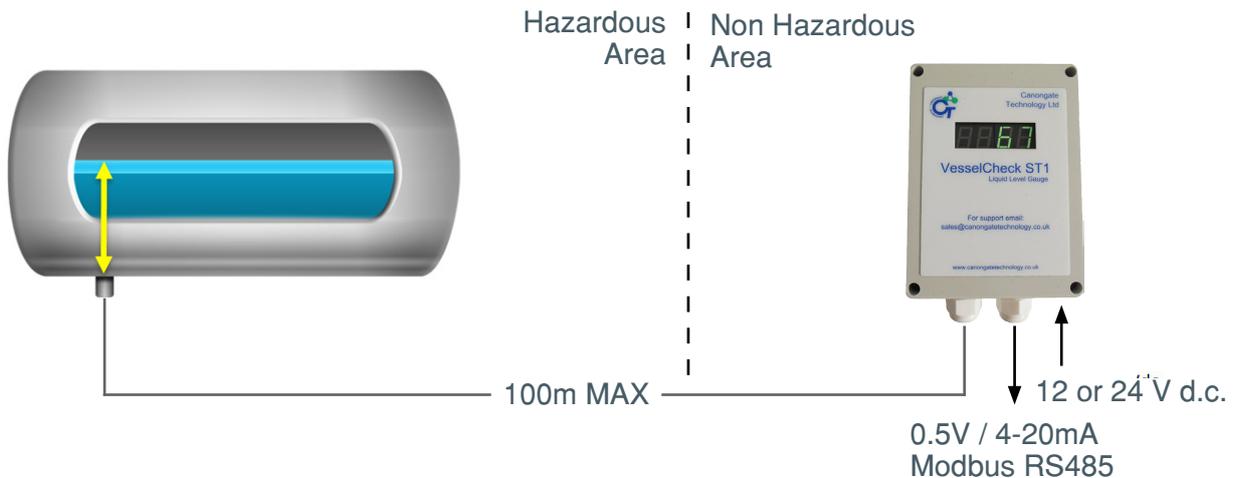
### Level Measurement

Rototherm has a series of Level Measurement systems, suiting a number of process needs. Made up of the VesselCheck ST1 (one sensor, one tank), ST2 (two sensors, 1-2 tanks), and ST4 (4+ tanks, one sensor per tank). Working within the Brewing & Distilling industry all these systems can be used, dependant on the need of the customer. Having this range, means that we can meet the demand of the each customer, ranging from a small microbrewery to some of the world's largest Bright Beer Tanks or Spirit Vats. As long as the liquid within the tank is conducive to the instrument, we have the ability to measure it. The systems can measure all liquids which do not contain any pulp, solids or intrusions (e.g. agitators, etc.).

## Non-Invasive Tank Level Gauge

### VesselCheck ST1

- Used extensively within the Beverage industry
- Truly non-invasive
- Sensors bonded to outside of tank
- Fits tank of most shapes and sizes
- Output to Telemetry system – various options
- Low cost, reliable & accurate tank gauging
- Not affected by pressure
- Easy installation – no tank break-in
- Simple retrofit to existing tanks
- No down-time during installation
- No moving parts – no maintenance
- Temperature integrated sensors available



## Hazardous Area Non-Invasive Tank Level Gauge

### VesselCheck ST1AD

- Approved for hazardous area
- Used extensively within the Beverage industry
- Truly non-invasive
- Transceiver bonds to outside of tank
- No tank break-in
- Easy installation
- Ambient temperature compensated
- No down-time during installation
- Suitable for tanks of most shapes and materials
- Not affected by pressure
- No moving parts – no maintenance
- Low cost & reliable tank gauging



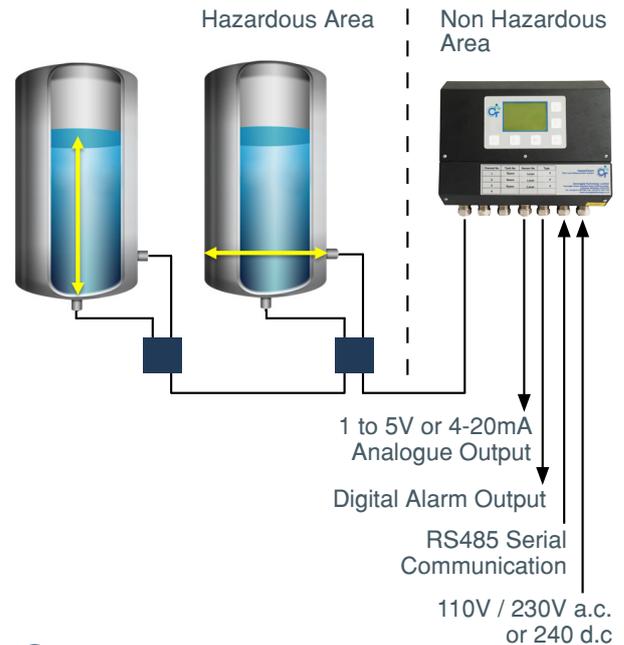
# VesselCheck ST2

The ST2 uses two small ultrasonic sensors bonded or clamped to the outside walls of the vessel - one on the bottom of the vessel and the other on the side, to compensate for variations in sonic velocity and temperature. Signals from the transducers are fed into the processor and displayed locally and/or output to the plant control system. The system calculates the height and volume of the liquid in the tank from the time taken for the signal to be received from the liquid surface.

## Non-Invasive Tank Level Measurement System

### VesselCheck ST2

- Level measurement for 2 tanks
- Truly non-invasive technique
- Sensors bonded to outside of tank base and side wall
- 20 point calibration table
- Optional 0.4 - 20mA / 1.5 V analogue outputs
- RS485 / 232 Modbus serial communications
- ATEX/ IECEx approved sensors for hazardous areas available
- Optional local display keypad
- Fast, reliable and accurate tank contents measurement
- Easy installation – no tank break-in
- Easy retrofit to existing tanks
- No down-time during installation
- No moving parts – little or no maintenance required

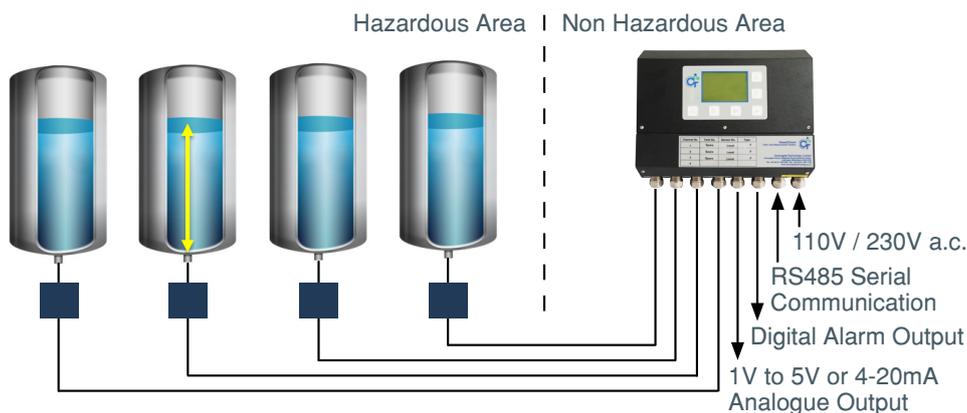


## Non-Invasive Tank Level Measurement System

### VesselCheck ST4

- Level measurement for up to 4 tanks
- Truly non-invasive technique
- Sensors bonded to outside of tank base and side wall
- 20 point calibration table
- Optional 0.4 - 20mA/ 1 - 5V analogue outputs
- RS485 / 232 Modbus serial communications
- ATEX / IECEx approved sensors for

- hazardous areas available
- Optional local display & keypad
- Fast, reliable and accurate tank contents measurement
- Easy installation – no tank break-in, easy retrofit to existing tanks
- No down-time during installation
- No moving parts - little or no maintenance required



## Level Detection

SpotCheck is a liquid level switch for use in applications where avoiding contact is vital. The sensor is clamped externally to the wall of the pipe or vessel. The method of measurement is suitable for steel, plastic or glass up to 50 mm thick. SpotCheck is easy to install and set-up. Simply push the calibrate button when the sensor is uncovered. A red / green / amber LED gives an indication of status.

The Series 1000 SpotCheck is powered by 24Vdc and includes a single relay output for wet or dry indication.

Within the brewing and distilling industry the SpotCheck is most commonly used as a high/low level alarm and pump run dry protection. The SpotCheck, like most other Rototherm Canongate instrumentation, is again truly non-invasive and this holds tremendous advantage for the user, as no production has to be altered or even slowed to fit and commission this instrument. Thus, making it a reliable, accurate, convenient instrument.

### Non-Invasive Point Level Detector for Tanks & Pipes (Hi-Lo Alarm)

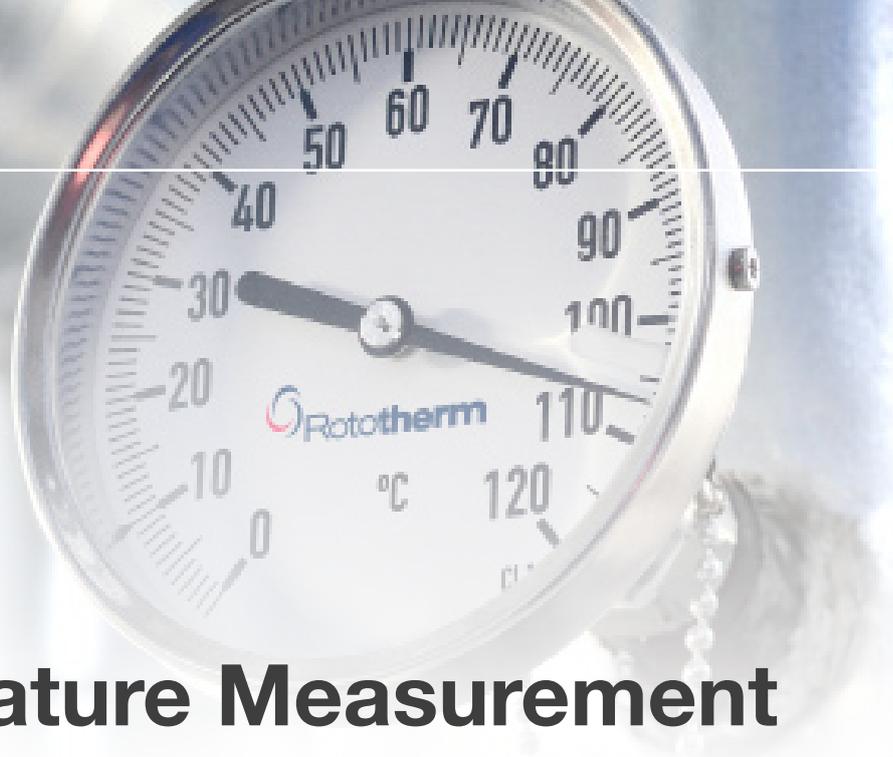
SpotCheck 1000/4000

- Non-invasive liquid level switch for use in applications where avoiding contact is vital
- Uses ultrasonic “footprint” to determine presence or absence of liquids inside a tank or pipe
- Sensor is clamped externally to the wall of the pipe or vessel
- Enables tank high / low level alarm
- Response time of 1 second

Applications include:

- Pump run dry protection
- Pig detection
- Tanker off-load pump control
- Overfill alarm
- Hygienic level switch for foodstuffs, liquids, pharmaceuticals and chemicals





# Temperature Measurement

*“We provide expertise and a wide range of solutions to meet your temperature sensing needs. We invented the bi-metallic thermometer in 1924 and continue to build on this culture of innovation.”*

## **Talk to the experts...**

- Advanced machine shop with CAD/CAM functionality
- In-house machining, testing and welding
- Bespoke designs to meet your requirements
- Fully traceable certification for high quality materials, testing and inspection
- In-house testing equipment
- Extensive documentation packages
- Compliance to International Standard IEC 60751:2008 and BS EN 60584/2
- ATEX approval for specific applications

## **Industries:**

- Food & beverage
- HVAC
- Oil & gas/Offshore
- Chemical/petrochemical
- Hydraulics & pneumatics
- Medical
- Pumps & compressors
- Water & Wastewater
- Paper mills
- Agriculture plants
- Power generation
- Injection Molding Machines
- Automotive

## **Applications:**

Temperature & Pressure monitoring for all processes, commercial and industrial applications including:

- Generators & Transformers & Engines
- Pumps & Compressors & Turbines
- Pipeline systems
- Exhaust gas systems
- Distillation columns
- Steam drums
- Extraction vessels
- Tank farms
- Surfaces
- Chemical distillation
- Hygienic processes
- Leak detection

## Probes

### General Purpose Probes

1RPT, 1PRS, 1RIP, 1TPT, 1TPS, 1TIP



- RTD probes for stable, repeatable measurements and excellent performance in high levels of shock/vibration - Sensor PT100 class A, B, AA, 1/5, 1/10 DIN
- Thermocouple probes for wider temperature ranges - sensor inputs type K, J, T and N
- Field bendable, Inconel or stainless steel sheath
- Measuring range minimum -200 C to +1200 C

### Fast Response Probes

1RFR, 1TFR



- Fast response probe with low mass element to react quickly to temperature changes
- Sensor PT100 class A, B, AA, 1/5, 1/10 DIN. Thermocouple inputs type K, J, T and N
- Measuring range dependant on sensor selection minimum -200 C to +1200 C

### Spring Loaded Probes

1RSP, 1TSP



- Spring loaded, tip sensitive RTD and thermocouple probes
- Sensor PT100 class A, B, AA, 1/5, 1/10 DIN. Thermocouple inputs type K, J, T and N
- Measuring range dependant on sensor selection minimum -200 C to +1200 C
- Insulated or bonded junction hot end and a selection of cold end seals and terminal blocks to suit application

### Bayonet Mount Probes

1RBM, 1TBM, 1RBF, 1TBF



- Easy and inexpensive spring loaded installation of probes in solids
- Lock cap and spring for twist-and-release spring loading
- Thermocouple or RTD probes options
- Accurate sensing from -50 C to +260 C

### Bearing RTD

1RBS, 1RBO



- High precision RTDs for fast, stable, repeatable measurements where there are space limitations
- RTD sensor Pt100 Class, B, A, AA, 1/10 DIN
- Measuring range of -200 C to +260 C
- Field bendable
- Moisture proof and oil seepage proof

### Conduit Style

1RSD, 1RBS, 1 RBC, 1TSD, 1TBC



- Armoured cable protects the leads of thermocouples types E, J, K, N & T
- Well suited for industrial environments where unprotected probes may be cut or broken
- Metal sheaths made to your required length

# Bi-metallic Thermometers

## Light Duty Bi-metallic Thermometers

BL1



- Nominal size: 50mm & 63mm
- All stainless steel construction
- Scale range -30...+60 to 0 to 400 C
- Wide range of temperature ranges available
- Models available with thermowells suitable for pipelines
- Models available for use on ovens, sterilizers, cabinets

## Surface Temperature Thermometers

BL3



- Nominal size: 63mm
- Spring fixing suitable for mounting to pipes (Model BL301)
- Magnetic fixing suitable for mounting to horizontal or vertical surfaces
- Stainless steel case and bezel
- Scale range -30...+60 to 0 to 400 C

## Heavy Duty Fixed Stem Thermometers

BH2



- Nominal size: 63mm, 100mm & 160mm
- Stainless steel construction
- Scale range -70...+70 to 0 to 600 C
- External zero adjustment
- No contaminants - ideal and safe for food applications
- Can be supplied with a wide range of Rotothem thermowells
- Can be fitted with electrical contact heads (100mm & 160mm sizes only)
- Available with maximum or minimum value and index pointers

## Heavy Duty Any Angle Thermometers

BH3



- Nominal size: 100mm, 130mm & 160 mm
- Stainless steel construction
- Scale range -70...+70 to 0 to 600 C
- External zero adjustment Silicone filling available
- No contaminants - ideal and safe for food applications
- Can be supplied with a wide range of Rotothem thermowells

# Digital Thermometers

## Digital Thermometers

DT1 & DT2

- Thermocouple (DT1) or RTD (DT2)
- Direct reading rigid stem or remote reading capillary versions available
- Choice of cable materials and protections
- 4 to 20mA retransmission option MAX/ MIN reading options
- 2 years continuous operation from 2 x AA cells





## Other Solutions

### Manifolds

#### Aluminium Air Manifolds

Series 900 Manifolds



- Replaces complex assemblies of valves and fittings
- 5, 10 or 20 outlets
- Corrosion resistant
- Available for distribution of gaseous and liquid media also
- Ideal for use in panels and confined spaces

#### SS Distribution Manifolds

Series 900 Manifolds



- Replaces complex assemblies of valves and fittings
- 5, 10 or 20 outlets
- Reduction in space / costs
- Available for distribution of gaseous and liquid media
- Ideal for use in panels and confined spaces

#### Applications:

When multiple air supplies are required in a local area of a process plant.

For example: Supplies for solenoid valves (for operation of spring return valves); Positioners (for operation double acting positioners); 3/2 valves (for manual operation of spring return valves)

## Pressure Switches

#### Compact Switch

Series 100



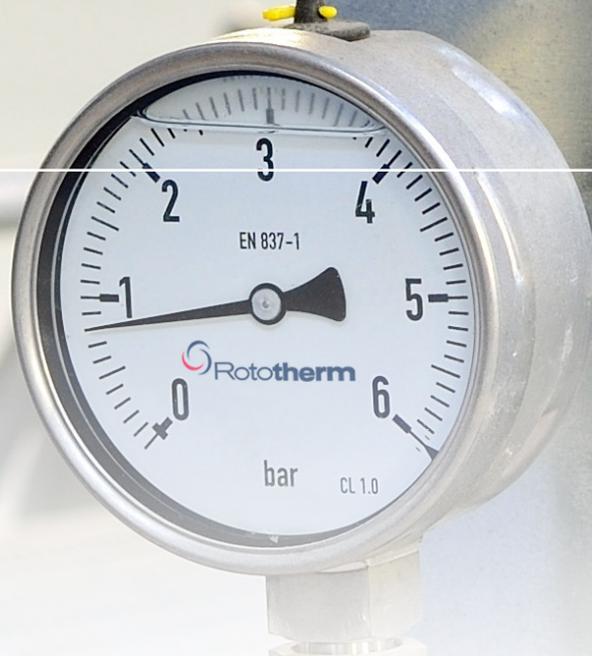
- Non-bleed in either switched state
- Configurable for N.O. or N.C. output
- Scale range: 0.1 to 100bar
- Aluminium or stainless steel construction
- Accuracy class: 0.1%
- Designed for use on monitoring systems associated with natural gas transmission
- Used to protect a system or pipeline from an abnormally high or low pressure which might result in the discharge of gas

#### Heavy Duty Explosive

Series 700 Explosive



- Exd, ExnC, Exia, I.S.
- Ranges from 16 mBar to 600 Bar
- High overload ratings
- Simple maintenance
- Safety vent ring
- For switches fitted with metallic diaphragms, a PTFE ring is incorporated on some ranges to provide additional sealing



# Pressure Measurement

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*“Rototherm is proud of its pressure gauge heritage, it designed and built the first ever steam gauge back in 1847”*

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## **Talk to the experts...**

- Great heritage in pressure
- Wide variety of ranges, materials, sizes, connections, etc.
- Pressure gauges available to NACE standard MR-0175 for corrosive environments
- Accurate, reliable and durable gauges for all types of industries and applications

## **Industries:**

- HVAC
- Food & beverage
- Oil & gas/Offshore
- Chemical/petrochemical
- Hydraulics & pneumatics
- Medical
- Pumps & compressors
- Water & Wastewater
- Paper mills
- Agriculture plants
- Power generation
- Injection Molding Machines
- Automotive

## **Applications:**

Temperature & Pressure monitoring for all processes, commercial and industrial applications including:

- Generators & Transformers & Engines
- Pumps & Compressors & Turbines
- Pipeline systems
- Exhaust gas systems
- Distillation columns
- Steam drums
- Extraction vessels
- Tank farms
- Surfaces
- Chemical distillation
- Hygienic processes
- Leak detection

## Process Gauges

### Process Gauge (SS)

RPG, RCG (Stainless Steel)



- Nominal Size: 63 - 150mm
- Adjustable micrometer pointer as standard (not 63mm)
- Liquid fillable
- Low range capsule pressure
- Class 1 Accuracy to EN837
- Scale Range: -1 to 600 bar; 30"Hg VAC to 10,000 psi

### Safety Pattern (Al)

SPGA (Aluminium Case)



- Nominal Size: 63 - 300mm
- Low range capsule pressure
- Class 1 Accuracy to EN837 (63mm dial Class 1.6)
- Simple installation and low maintenance
- Scale Range: -1 to 600 bar; 30"Hg VAC to 10,000 psi
- Solid front / Blow-out back

### Safety Pattern (SS)

SPG (Full Stainless Steel)



- Nominal size 100-150mm
- Stainless Steel full safety pattern
- Class 1 accuracy to EN837
- Low range capsule pressure
- Scale range: -1 to 1000 bar
- Available with stainless steel or monel wetted parts
- Solid front / Blow-out back
- Liquid fillable

### Digital Pressure Gauge

DG1

- Nominal Size: 100mm
- High Accuracy  $\pm 0.2\%$  full scale
- Stainless steel IP67 case
- Long battery life – 1 year continuous operation from 2AA batteries
- Wide selection of pressure ranges from vacuum to 400 bar
- 4 to 20mA output option available
- Intrinsically safe versions available
- Supplied with calibration certificate traceable to National Standards
- Available with MAX and MIN pressure readings
- Transmitter version available (DG1-TX)

## Digital Pressure Gauges

### Certified Digital Pressure Gauge

DG1 - I.S.

- Approved to EEx ia IIC T4 (-20 C <math>T\_a</math> <math>< 60 C</math>) certification
- ATEX version



## Differential Pressure Gauges

### Heavy Duty DP Gauge

DP360, DP370, DP362

- Nominal Size: 100mm & 150mm
- Full safety pattern option to EN837 – solid front and blow-out back
- Accuracy class 1.6% FSD ( 1.0% option)
- Scale Range: 0 to 160mbar; 0 to 25 bar
- Switching options
- Wetted parts in Stainless Steel or Monel
- Multiple process connections





# Repair & Calibration Services

*“We have a team of qualified, experienced engineers who can assist in the repair and calibration of your measurement equipment”*

Rotothem offers repair and calibration services. It is **available to all our customers globally** and we can also offer these services for third party products.

Our services range from one off calibrations to complete customer solutions. 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.

Rotothem’s repair division, with its own dedicated workshop, ensures rapid customer solutions, which include not only current products, but also obsolete instruments. We keep large stocks and spares **for our own manufactured products and also for our other Rotothem products**. All repairs and calibration services, undertaken either on-site or workshop based, are controlled under our BS EN ISO 9001:2000 accredited Quality Procedures.



## **To Book Your Service & Calibration**

Contact our **Service Department**

**Telephone** +44 (0) 1656 740 551

**Email** [services@rotothem.co.uk](mailto:services@rotothem.co.uk)



# Rototherm™

## Research & Development

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*“UK supplier of choice for instrumentation solutions since 1840s. We apply our heritage to the latest technology.”*

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The Rototherm Group R&D division build upon our vision and culture of innovation and development. We believe in constantly developing our current instruments for the benefit of our customers, ensuring they have the best instrument to suit their needs.

Rototherm Group has worked and participated in a variety of highly technical research and development collaboration projects with leading Universities and High Education institutions with reputations for their pioneering work in the field of Brewing and Distilling. Collaboration partners include The International Centre for Brewing and Distilling (ICBD) at Heriot-Watt University and Swansea University.

In addition, we work closely with a number of Global businesses whereby we test and trial our products in the field in-line in the process to ensure the very best results from our development activities.



- Rototherm offices
- Rototherm facility
- Distributor

[www.rotothermgroup.com](http://www.rotothermgroup.com)

Follow us on **LinkedIn**

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