



Process Instruments by Centec GmbH

Product Sensors Fluid Measuring Technology



ppb
Oxygen
WFI
acids
FDA
Hastelloy
CIP
water
density
CO₂ g/l
316L
%W/W
%V/V
O₂ ppb
syrup
beer
Oleum
ppm
Hygienic
KOH
DAL
%Alcohol
oils
%W/W
ATEX
HCL
milk
SIP
H₂SO₄
alkali
°Brix
±0.002%
Monel 400
Density
Oxygen
concentrate
cider
%extract

Precision Sensors and Instrumentation for Process Applications

- **'Oxtrans M'**

Rechargeable handheld Oxygen monitor with Li-ion battery and data-recorder.

- **'Oxtrans TR'**

In-line Oxygen content measuring equipment for liquids and gases.

- **'Sonatec TR'**

In-line ultrasound velocity monitor to determine the Concentration of liquids.

- **'Sonatec HW'**

Vessel mounted ultrasound velocity sensor to measure fluid Concentration.

- **'Rhotec TR'**

In-line sensing equipment to measure Product Density.

- **'Combitec TR'**

Combined Product Density measurement and ultrasound velocity monitor to determine various direct and derived physical characteristics of complex fluids.

- **'Carbotec TR'**

Dissolved gas content measuring equipment for carbonated beverages.

- **'TR Transmitters'**

Standalone sensor control units and local data display units

Centec GmbH are a market leading international German designer and manufacturer of product measuring instruments and process system technology.

Primary markets, hygienic, sterile and clean applications within the brewed beverage, soft drinks, pharmaceutical, bio-pharm, personal care, food, dairy, chemical manufacturing, power generation, micro-electronics and general industry.

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Oxytrans M

Portable Instrument to Accurately Measure Oxygen Content of Liquids and Gases

'Oxytrans' sensors use the principle of quenched optical luminescence to detect the precise level of oxygen dissolved in liquids or in mixed gases. A simplified explanation is that a special sensitised 'window' which has been implanted with indicator molecules is in contact with the product. From the opposite side, the 'window' is illuminated by light at a specific frequency and for a set time. In the absence of oxygen the 'window' fluoresces to produce red light for a known period. As the level of oxygen increases the resultant fluorescence changes in colour, spectrum, intensity, duration and polarity. The optical sensor inside the 'Oxytrans' unit detects these subtle changes. Hence the precise oxygen level is calculated and displayed. The inbuilt data-recorder can store ca. 5000 values.

Oxygen content measurement range - Dissolved in Liquids and in Gases:

Type I - Liquids: 1 ppb – 2 ppm (+/-1 ppb); **Gases:** 0 – 4.2% (+/-0.002%)

Type II - Liquids: 30 ppb – 35 ppm (+/-50 ppb); **Gases:** 0 – 50% (+/-0.03 %)

Response time: T90 < 10s **Temp. compensation:** PT100

Operating Temp. Standard: -5°C to +55°C. **High Temp.:** -5°C to +98°C

Maximum Temp.: up to max. 130°C **Pressure range:** max. 12 bar g.

Product contact materials: 316L/1.4404 ss, Silicone (FDA), PTFE (FDA)

Sensing interval: Selectable 5 to 600 sec. Manual and Automatic operation

Datalog capacity: ca. 5000 measured values

Datalog interface: USB to PC with 'Centec Viewer' Software (included)

Enclosure: IP65 **Battery:** Lithium Ion (ca. 20 hours use per charge)

Weight: 1.7 kg; **Dims.:** 280x 100 x 65 mm

Carry case, leads, software and international/UK charger

Benefits of 'Oxytrans M'

- Portable, Robust, Professional Device
- Sensitive and High Accuracy
- Fast response with Liquids and Gases
- Measures at high, low and zero flows
- Long Life, Stable, Low Drift
- Pressure shock resistant
- High quality Li-Ion battery
- Automatic datalogger, ideal for fault finding
- Easy re-calibration when required
- No electrolyte or membranes



Oxytrans TR

In-Line Instrument to Accurately Measure Oxygen Content in Process Liquids and Gases

'**Oxytrans TR**' is a pipeline mounted instrument which uses the same principle as the portable hand-held '**Oxytrans M**' instrument. Differing levels of oxygen dissolved in a liquid or in a mixture of gases causes the resultant fluorescence of special sensing 'window' to change colour, duration and intensity. These changes are used to precisely calculate the oxygen level from 1 ppb to 30 ppm. **Oxytrans** process instruments are robust and stable, with low maintenance requirements. They are highly sensitive to any changes in oxygen level, with an accuracy of +/-0.002% being achievable for gases. Optional Centec TR type transmitters is very adaptable, offering 'stand-alone' operation or various types of I/O for remote control or complete process system integration.

Oxygen content measurement range Dissolved in Liquids and in Gases:

Type I - Liquids: 1 ppb – 2 ppm (+/-1 ppb); **Gases:** 0 – 4.2% (+/-0.002%)

Type II - Liquids: 30 ppb – 35 ppm (+/-50 ppb); **Gases:** 0 – 50% (+/-0.03 %)

Response time: T90 < 10s **Temp. compensation:** PT100

Operating Temp. Standard: -5°C to +55°C. **High Temp.:** -5°C to +98°C

Maximum Temp.: up to max. 130°C **Pressure range:** max. 12 bar g.

Product contact materials: 316L/1.4404 ss, Silicone (FDA), PTFE (FDA)

Wetted finish - Standard: 0.8µm Ra or on request 0.5µm Ra & EP.

Process union: DN65 Varivent©, or many others, DN40(1.5") to DN150(6")

I/O - Inputs: 2x digital (24v DC), **Outputs:** 3x digital (24v DC), 2x 4-20 mA

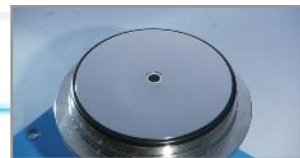
Power supply: 24v DC. **Enclosure:** IP65 (epoxy powder coated aluminium)

Options: Profibus DP or other BUS networks; All stainless steel construction

Manual or pneumatic retractable sensing window for NaClO sanitizing

Benefits of 'Oxytrans TR'

- Robust, Easy to Use, Process Instrument
- Sensitive and High Accuracy
- Suitable for most standard CIP and SIP
- Fast response in Liquids and Gases
- US FDA certified product contact materials
- Measures at high, low and zero flows
- Long Life, Stable, Low Drift
- Pressure shock resistant
- No electrolyte or membranes
- Low maintenance and easy re-calibration



Sonatec TR

In-Line Sensor to Accurately Measure the Velocity of Ultrasound through Liquids, from which Product Concentration can be derived

'Sonatec' sensors use high frequency ultrasound, which is transmitted through the product between two static forks mounted in the fluid stream. An increase in product concentration proportionally impedes the ultrasound and reduces its velocity. The change in speed is used to determine the product's characteristics. This deceptively simple device provides highly accurate and reliable data. It is robust and has no moving parts. The various material options include 316L, 316Ti, Hastelloy, Tantalum and other alloys to suit a very wide range of liquids from milk, wort, cell broths or detergents to through high reactive chemicals, acids and alkalis. **Sonatec** is easily cleaned using CIP and is suitable for SIP.

Measurement range: (Displays: m/s, Mass%, Volume%, °Brix, %Extract)

Sound velocity: 400 - 3000 m/s (+/- 0.05 m/s); **Reproducibility:** +/- 0.01 m/s

Response time: <= 1 sec **Temp. compensation:** PT1000

Operating Temp.: -25°C to +125°C. **Pressure range:** max. 16 bar g.

Product contact materials: 316L / 1.4404 ss (various alternative options)

Wetted finish - Standard: 0.8µm Ra or on request 0.5µm Ra & EP.

Process union: DN65 Varivent®, DIN 11851, Flanges and others on request

I/O - Inputs: 6x digital (24v DC), **Outputs:** 3x digital (24v DC), 2x 4-20 mA

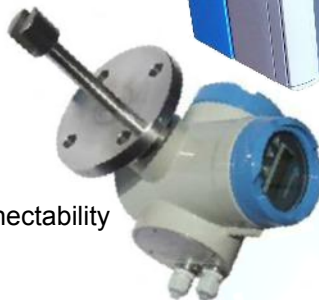
Power supply: 24v DC. **Enclosure:** IP65 (epoxy powder coated aluminium)

Options:

- Materials in product contact: s/s 316Ti (1.4571), Hastelloy C276, Monel 400, Incoloy 825, Tantalum and others
- Profibus DP or other BUS networks; ATEX Ex II 2G Eex d IIC T6
- All stainless steel transmitter housing;
- Different length and connections

Benefits of 'Sonatec TR'

- Selectable velocity for best accuracy
- Wide temperature range
- No moving parts
- Virtually maintenance free
- Superb corrosion resistance
- Robust, simple design
- Suitable for CIP and SIP
- Flexible design options
- TR transmitter for great connectivity



Sonatec HW

Tank Mounted Sensors for Accurate Ultrasound Velocity (concentration) Measurement for Liquids in Evaporators, Vessels and Boiling Kettles

'**Sonatec HW**' operates on the same principle as '**Sonatec TR**', except that '**Sonatec HW**' is designed for mounting into vessels, especially evaporators, reactors and process kettles. A piezo-ceramic transmitter generates a high frequency ultrasound pulse which passes through the product, the rate of deceleration through the liquid is used to monitor changes in fluid concentration. To suit a very wide range of liquids, many materials are available from standard 316L, to Tantalum, Monel and others. The 'open fork' design of '**Sonatec HW**' has no moving parts which makes 'in tank' CIP highly effective. For products that tend to deposit on metal surfaces, such as wort during evaporation, a special cleaning nozzle is available to ensure the sensor remains clean and accurate. A sampling point is also provided. '**Sonatec HW**' is ideal for accurately monitoring evaporation processes, for example in breweries and sugar processing.

Measurement range: (Displays: m/s, Mass%, Volume%, °Brix, %Extract, °Plato)

Sound velocity: 400 - 3000 m/s (+/- 0.05 m/s); **Reproducibility:** +/- 0.01 m/s

Response time: <= 1 sec **Temp. compensation:** PT1000

Operating Temp.: -25°C to +125°C. **Pressure range:** max. 16 bar g.

Product contact materials: 316L /1.4404 ss (various alternative options)

Wetted finish - Standard: 0.8µm Ra, on request 0.5µm Ra and Electropolish

Mounting: Flanges DN100 DIN2633, EN1092-1, ANSI, ASME and others

I/O - Inputs: 6x digital (24v DC), **Outputs:** 3x digital (24v DC), 2x 4-20 mA

Power supply: 24v DC. **Enclosure:** IP65 (epoxy powder coated aluminium)

Options:

- Materials s/s 316Ti (1.4571), Hastelloy C276, Monel 400, Incoloy 825, Tantalum and others
- Profibus DP or other networks
- All stainless steel transmitter housing

Benefits of '**Sonatec HW**'

- Wide velocity range for best set-up
- Wide temperature range
- Virtually maintenance free
- Superb corrosion resistance
- Robust, simple design
- No moving parts, suits CIP and SIP
- Flexible design options
- ATEX certified



Rhotec TR

High Accuracy Liquid Density Monitors

'Rhotec' uses a special electro-magnetic transmitter to vibrate a U tube at a specific frequency and amplitude. The product being measured passes through the U tube. Fluids of different densities cause changes in the vibration of the tube. A receiving unit further round the U tube measures the output oscillation. The variance between the input and output oscillations is used to determine the product density. This system is highly effective, especially because the oscillation frequency used has been carefully chosen to ensure a large number of datapoints, for accurate results. 'Rhotec' can be installed in several ways to ensure product flow through the internal U tube: 1) On a by-pass loop; 2) In parallel with a pump; 3) Using a Centec In-line ΔP device. The wide choice of materials means 'Rhotec' can be used for a large range of fluids from water, milk, sugar, through aggressive acids and alkalis. Products with viscosities up to 70000 cps can be handled, which requires a feed pump. Solid particles should be avoided.



Measurement range: (Displays: w/w%, v/v%, °Brix, %Extract, %Alcohol)

Density range: 0 - 3 kg/litre. **Accuracy:** +/- 0.0001 kg/litre

Reproducibility: +/- 0.00001 kg/litre

Response time: ≤ 1 sec **Temp. compensation:** PT1000

Operating Temp.: -25°C to +125°C.

Pressure range: max. 50 bar g.

Product contact materials include: Hastelloy C276, Monel 400, Incoloy 825, Stainless 1.4571, Tantalum and others

Connections: 3/8" male threads; In-line fittings DN40-150 Varivent®, Clamp, Flanges, etc, others on request

Power supply: 24v DC. **I/O - Inputs:** 6x digital (24v DC),

Outputs: 3x digital (24v DC), 2x 4-20 mA

Enclosure: IP65 (epoxy powder coated aluminium)

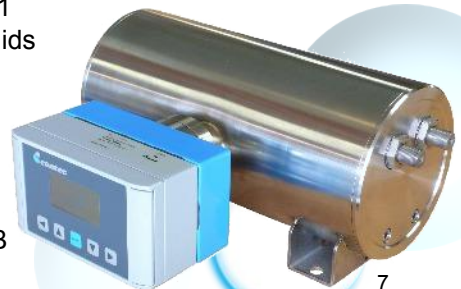
Options: ATEX to Ex II 2G Eex d IIC T6

Profibus DP or other BUS networks



Benefits of 'Rhotec TR'

- High accuracy, measuring SG to +/-0.0001
- Precise monitoring, even of aggressive fluids
- Very robust, High pressure design
- Virtually maintenance free
- Excellent corrosion resistance
- Suitable for CIP and SIP
- ATEX Certified for Ex. Environments
- 'Alcohol Tax' Certified by the German PTB



Combitec SD

High Accuracy Liquid Density + Concentration Monitors

As the name suggests, '**Combitec**' is a combined sensor which measures both product density and sound velocity (concentration). This instrument uses the oscillating U tube principle of '**Rhotec**' and marries it with the ultrasound velocity/concentration measurement system in '**Sonatec**'. All of which is enhanced by parallel PT1000 temperature compensation.

'**Combitec**' is a compact and highly accurate device to measure, derive and record a whole host of fluid specific physical variables; this is essential data for precise process control, enhancing product quality while reducing production costs and waste. '**Combitec SD**' is ideally suited for closely monitoring processes such as fermentation in breweries and other biotech production systems, multi-ingredient products and complex fluid processes

Measurement range:

*Please see pages on '**Rhotec TR**' and '**Sonatec TR**'*

Response time: ≤ 1 sec

Temp. compensation: PT1000

Operating Temp.: -25°C to +125°C.

Pressure range: max. 16 bar g.

Product contact materials include: Stainless Steel 1.4404 + Hastelloy C276

Connections: DN40-150 Varivent© clamp or others, on a plain end body.

I/O - Inputs: 10x digital (24v DC), 2x 4-20 mA;

Outputs: 5x digital (24v DC), 4x 4-20 mA

Power supply: 24v DC.

Enclosure: IP65 (epoxy powder coated aluminium)

Options: Profibus DP or other BUS networks

Stainless Steel Transmitter Housing

Installation with trace heating

Benefits of '**Combitec SD**'

- Compact multi-function device
- High accuracy, Very robust
- Virtually maintenance free
- Suitable for CIP and SIP
- Provides comprehensive data
- Ample digital & analogue I/O



Carbotec TR

Dissolved Gas Monitor for Carbonated Drinks

'Carbotec' is primarily used to measure the amount of carbon dioxide gas dissolved in carbonated beverages such as soft drinks, soda, sparkling water, beer, cider, etc. The operating principle used in 'Carbotec' involves the instantaneous decompression of a 25 ml product sample to a partial vacuum condition. The volumes and product pressures before and after decompression are compared with known values for a non-carbonated liquid. From this data 'Carbotec' calculates the amount of gas dissolved in the product. After each sample has been evaluated it is returned to the process line, no product is lost and fluid security is maintained. 'Carbotec' conducts the test every 20 seconds. A PTFE bellows is used instead of wiper seals, a leak detection system is available.

'Carbotec' measures CO₂ in carbonated drinks

Measurement range: 0 - 10 g of CO₂ per litre of liquid

Accuracy: +/- 0.05 g/litre

Reproducibility: +/- 0.01 g/litre

Response time: <= 20 sec

Temp. compensation: PT100

Operating Temp.: -10°C to +100°C

Pressure range: max. 10 bar g.

Product contact materials: Stainless Steel 316L/1.4404,
Seals and bellows in EPDM (FDA) and PTFE (FDA)

Process connection: DN65 - DN150 Varivent© housing

Power supply: 24v DC.

I/O - Inputs: 6x digital (24v DC),

Outputs: 3x digital (24v DC), 2x 4-20 mA

Enclosure: IP65 (epoxy powder coated aluminium)

Options: Profibus DP or other BUS networks

Benefits of 'Carbotec TR'

- Accurate measurement of dissolved gas
- Cleanable by standard CIP procedures
- Robust construction with IP65 protection
- 'TR Transmitter' and local display options
- Conductivity leak detector
- Wetted parts in 316L stainless + FDA materials



'TR Transmitters'

Integrated Sensor Control & I/O Transmitter

Centec product sensors are available with choice of different transmitter options. **'TR Transmitters'** make Centec sensors into robust stand-alone devices. They only require a 24 v DC power supply. From this a local display can operate, and both analogue and digital I/O can be connected for either simple operations or highly complex large I/O networks. **'TR Transmitters'** have been very popular with customers, reducing complexity and avoiding the additional costs of separate controllers.



'TR Transmitters' have IP65 epoxy powder coated aluminium housings. As an option, housings can be supplied in polished 304 stainless steel, ideal for operation in 'high-clean' locations where paint and surface coatings are forbidden. Optional ATEX Ex II 2G certified transmitters are available with Sonatec and Rhotec for explosion risk environments



Depending on the sensor model, **'TR Transmitters'** I/O typically includes 2 - 6 digital inputs (24v DC), 3 - 5 digital outputs (24v DC) and 2 - 4 analogue outputs (4 - 20 mA). Profibus DP and many other network cards can be normally incorporated on request.



In addition to **'TR Transmitters'**, Centec offer a full range of options to suit almost every customer requirement. Including **i) MCM series controllers** which can be used with many different types of sensors and transducers; **ii) Custom designed sensor systems** to suit specific requirements; **iii) Right through to complete product processing skids** designed and constructed by Centec's process engineering team.



Centec make process systems too...



Centec engineers deploy their decades of knowledge and experience with sensor technology to design & build skid mounted process systems. From 3D CAD, stainless steel fabrication and vessels, to mechanical equipment, software, controls & automation and electrical cabinets. As a result, Centec are now a well established global ISO 9001 registered Process Engineering Company with an enviable reputation for innovation, flexibility, quality of construction, cost effectiveness and speed of response. Centec process systems includes:



*Water & Liquid Deaeration
Water Decarbonation*

*Carbonation of Beverages
Nitrogenation of Liquids
Oxygenation for Fermentation
High Gravity Blending
Yeast Pitching/Dosing
Flash Pasteurisation
Dealcoholization*



*Continuous Product Mixing
Oil-in-Water Emulsion units
Precision Additions Dosing*



*Electro-deionisation of water
Reverse Osmosis Filtration
Ultra and Nano-Filtration*



Pure Steam Generation

WFI production & distribution

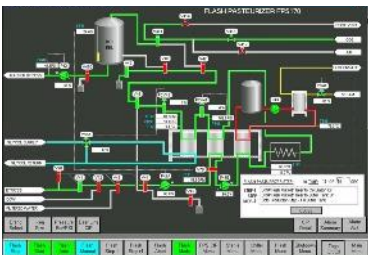


CIP Systems, small to large

Containerised Production Units

pH Correction of waste water

*Waste water aeration
and more.. **please ask!***



centec UK

**Tel: 01206 211921
also: 0161 408 4336**

**Fax: 01206 211 916
info@centec-uk.com
www.centec-uk.com**

Distributor for Centec sensors
UK & Ireland

Protecnica Solutions Ltd

Tel: 01206 211921
info@protecnica.co.uk
www.centec-sensors.co.uk

Precision Sensors and Fluid Process Technology

Head Office:
Centec GmbH
Wilhelm-Röntgen-Str. 10
D-63477 Maintal/Frankfurt
Germany

Tel.: +49 (0)6181 1878 0
Fax: +49 (0)6181 1878 50
info@centec.de - www.centec.de

Other members of the Centec Group:
Czech: Centec spol. & Centec Automatika, Prague
Serbia: Centec Predstavništvo, Belgrade
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