THERMAL CONDUCTIVITY CARBON DIOXIDE SENSOR

CARBOTEC TC

Precise · robust · easy to maintain

A thermal-conductivity sensor for continuous CO_2 measurement in dissolved and gaseous phases. Designed for demanding process environments, CARBOTEC TC combines a robust stainless-steel construction with a wide measuring range and straightforward calibration.



316L STAINLESS

0-15 g/kg	0-10 bar	20 s	IP65
DISSOLVED RANGE	PARTIAL PRESSURE	CYCLE TIME	ENCLOSURE

Features & Benefits

Continuous CO_2 measurement

- Measures dissolved and gaseous CO_2 continuously.
- Suitable from process-level concentrations up to saturation.

Precise

- Thermal-conductivity measurement with low drift.
- Other gases in the environment do not affect the measurement.

Low maintenance

- Only one annual maintenance is typically required.
- Resistant to high temperature and cleaning in place.

Easy calibration

- Simple air calibration process.

Fast measurement cycle

- A new measurement cycle is completed every 20 seconds.

Hygienic & robust

- 316L stainless-steel construction.
- Designed for harsh chemistry and process pressures up to 20 bar.

Applications

BEVERAGE · POWER & STEAM · PHARMACEUTICAL

In-line & package analysis | Dissolved & gaseous applications | Beverage production | Power-steam industry | Pharmaceutical industry

Key Technical Data

WEIGHT	PROCESS PRESSURE	TEMP. COMP.	CIP/SIP	ENCLOSURE
0.6 kg	0-20 bar	0 to +50 °C	120 °C	IP65

Technical Specifications

Range dissolved CO_2	**0-15 g/kg**	Temperature compensation	**0 to +50 °C**
CO_2 partial-pressure range	**0-10 bar**	Temperature resistance	**CIP/SIP 120 °C**
Linear flow rate	**50 cm/s**	Process pressure	**0-20 bar**
Cycle time	**20 s**	Weight	**0.6 kg**
Purge gas	**N_2 or air**	Enclosure	**IP65**
Accuracy	**± 1% of reading***	Wetted materials	**316L stainless steel, PFA or Tefzel**
Sensor cable	**3 m standard; optional extension up to 1000 m**	Measurement principle	**Thermal conductivity with semi-permeable membrane**

* 1% of the measured value or lowest value, whichever is greater. Technical data refer to the documented CO_2 sensor configuration; project-specific configuration may vary.

Measurement Principle & Use

The gas to be measured diffuses through a semi-permeable membrane into a small measuring volume inside the sensor. A thermal-conductivity detector measures the temperature and the change in thermal conductivity caused by CO_2. Successive measurements generate conductivity curves whose average slope is used to determine the gas concentration.

Between measurements, the measuring volume is purged with a gas that differs from the sample gas - typically N_2 or air for CO_2 measurement. After each purge, CO_2 diffuses through the membrane again and a new measurement cycle begins. The design supports continuous process monitoring in beverage, power-steam and pharmaceutical applications.

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