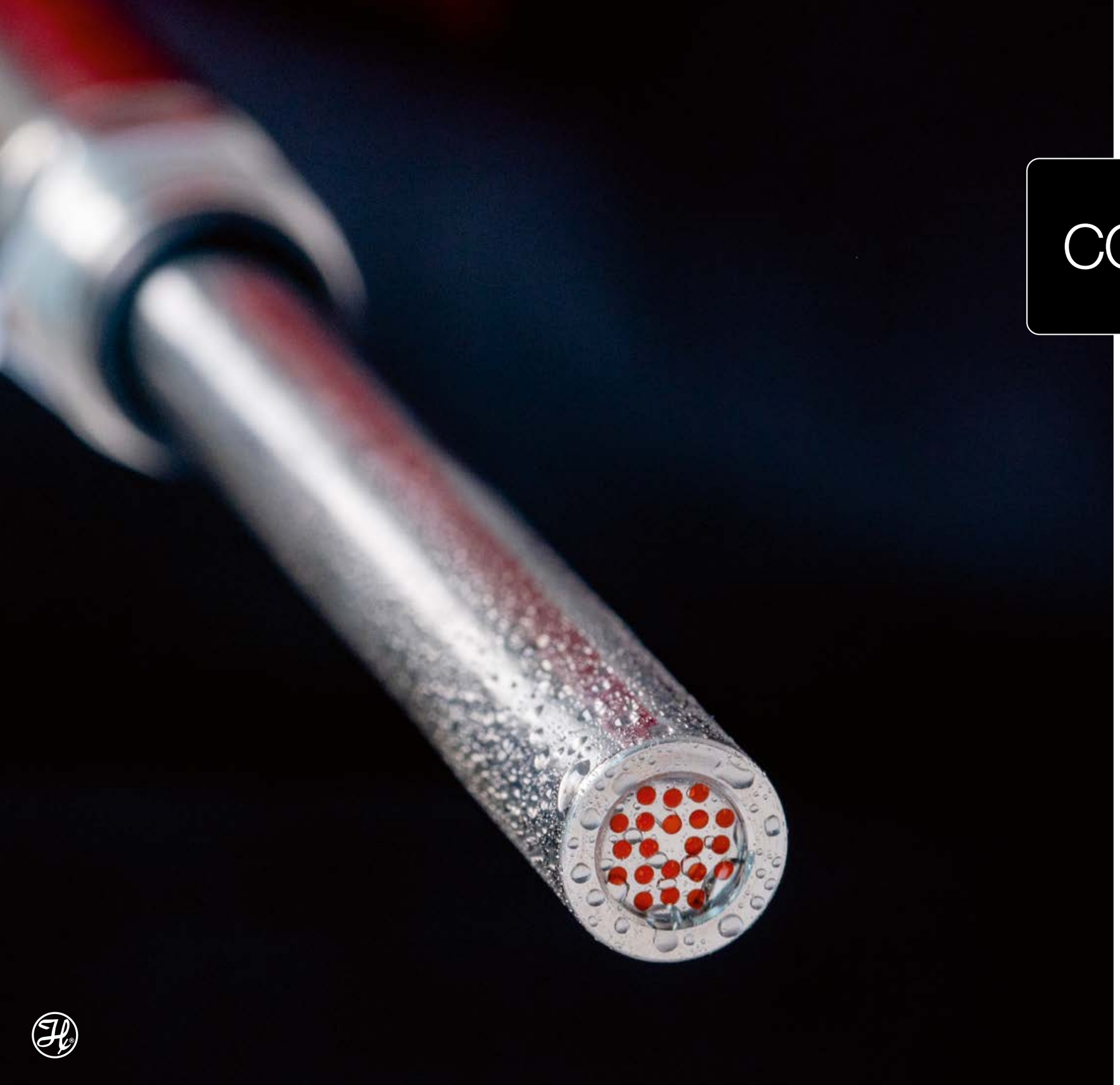


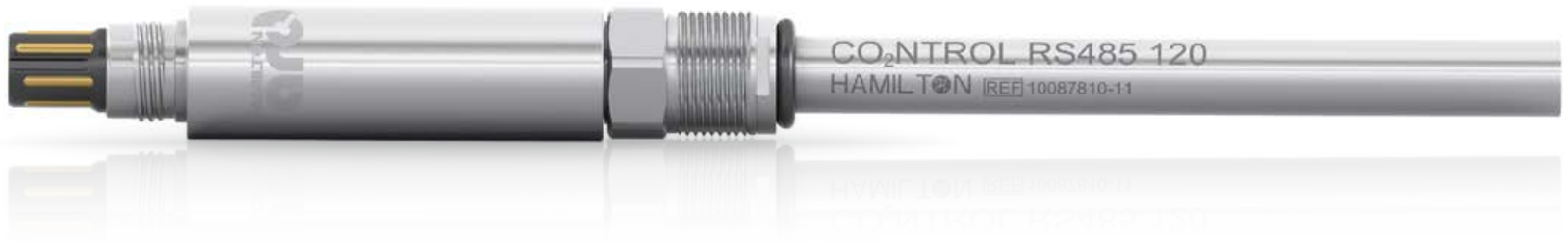
CO_2

Dissolved carbon dioxide (DCO_2) is a critical process parameter (CPP) in biopharma production processes according to PAT guidelines. By influencing other parameters such as extracellular and intracellular pH, it has an effect on different metabolic pathways which are involved in cell growth or in product formation and quality.

In the past, continuous in-line monitoring of DCO_2 has only been possible through electrochemical sensors that are based on the Severinghaus principle and measure the DCO_2 concentration indirectly. The result is significant maintenance effort and multiple sources of drift that must be compensated by time-consuming product calibration.

Now, Hamilton has introduced a completely new way to measure DCO_2: The new in-line sensor CO_2NTROL is a maintenance free, solid-state sensor that directly measures DCO_2 resulting in better measurement accuracy and lower cost of ownership.

CO_2NTROL new



CO_2NTROL is the newest member to Hamilton's Arc Intelligent Sensor line. The Solid State Sensor directly measures DCO_2 and provides maintenance free, real-time, and in-line control of this new critical process parameter.

Unlike traditional sensors that are based on the electrochemical Severinghaus principle, CO_2NTROL is a pure direct measurement in a solid state design: CO_2 molecules diffuse into a gas permeable membrane where the sensor measures the absorption of CO_2-specific Mid-IR wavelengths. This absorption correlates to the partial pressure of CO_2 in the media.

CO_2NTROL's hygienic design makes it compliant with requirements of biopharma applications. The sensor is EHEDG approved (EL Class I, test executed with Hamilton hygienic socket REF 242545) and is ready for GMP compliance. Embedded electronics convert the MIR CO_2 measurement into standard digital and analog signals that are easily integrated into your control strategy.

Arc Wi 2G Adapter BT (REF 243470) is required to output an analog 4-20 mA signal from the digital Modbus communication.

"Did you know…
Hamilton is the first and only supplier to bring the maintenance-free optical IR technology into a SIP/CIP compliant 12mm CO_2 sensor"

Benefits

- Maintenance-free
- Simple calibration
- Hygienic design: SIP/CIP compatible, autoclavable
- Inverted installation possible
- Direct measurement of CO_2 – no ammonia interference

Typical applications

- Biopharma Cell Cultures and Fermentations

Specifications

Measurement Principle	Optical – CO_2 Absorption in Middle Infrared (MIR)
Measuring Range	5 to 1000 mbar or 0.5 to 100 %-Vol or 7.5 to 1500 mg/L (in liquid phase at 101.3 kPa and 25 °C)
Diameter	12 mm
Process Connection	PG 13.5
Wetted Parts	Stainless Steel 1.4435, EPDM (Ethylene propylene elastomer), FDA compliant silicone
Surface Quality	R_a < 0.4 µm (N5)
Steam Sterilizable	Yes
Autoclavable	Yes
CIP	Yes
Operating temperature range	-10 to 60 °C

Ordering Information

	a-length	Arc
CO_2NTROL	120 mm	10087810-11
	160 mm	10087810-12
	225 mm*	10087810-13
	325 mm	10087810-14
	425 mm	10087810-15

*CO_2NTROL 225 have, in reality, a shaft length of 215 mm. This ensures optimal rinsing in replaceable armatures, such as Retractex.

Accessories

Calibration Station Ref 243575

Cables see page 112
Arc Accessories see page 116
Housings see page 127