VAISALA www.vaisala.com

Vaisala CARBOCAP® Carbon Dioxide Probe GMP231 for CO_2 Incubators

The Vaisala CARBOCAP® Carbon Dioxide Probe GMP231 withstands high temperature sterilization.

Features/Benefits

- Probe durable during heat sterilization up to +180 °C (+356 °F)
- Incubator can be sterilized with probe in place – saving time and reducing risk of cross-contamination
- Heat durability and superior long-term stability with next generation CARBOCAP® sensor
- Designed for OEM use in CO_2 incubators – installation options available
- CO_2 sensor measurement optimized for 5 %CO_2, measurement range up to 20 %CO_2
- 4-point NIST traceable calibration (certificate included) for CO_2
- Internal pressure and temperature measurement improves accuracy and stability
- Full temperature and pressure compensations available
- Sensor head heating for condensation prevention

The Vaisala CARBOCAP® Carbon Dioxide Probe GMP231 is designed to provide incubator manufacturers with accurate and reliable carbon dioxide measurements and sterilization durability at high temperatures. The probe is based on Vaisala's patented CARBOCAP® technology and a new type of infrared (IR) light source. These technologies allow for sterilization temperatures of up to 180 °C, enabling easier and more complete sterilization without the risk of cross contamination.

The probe is installed through the incubator wall, ensuring that only the IR sensor and optical components are exposed to the incubation environment. This allows the incubator to be sterilized with the probe in place, removing the need to decontaminate the probe separately. This saves time and reduces the risk of contamination.

The probe's sensor performance is optimized at 5 % CO_2 but the sensor measures CO_2 up to 20 % with high accuracy. In addition, the GMP231 can measure pressure and temperature for CO_2 measurement compensation purposes, ensuring the product remains stable and accurate in all CO_2 incubation conditions. The sensor is made of highly durable materials to achieve outstanding stability over both time and temperature. Since water vapor, dust, and most chemicals do not affect measurements, the GMP231 module is ideal for CO_2 incubator environments.

Technical Data

Performance

Measurement range	0 ... 20 %CO_2
Accuracy at 37 °C, 1013 hPa:	
Repeatability at	
0 ... 8 %CO_2	±0.1 %CO_2
8 ... 12 %CO_2	±0.2 %CO_2
12 ... 20 %CO_2	±0.4 %CO_2
Non-linearity at 0 ... 20 %CO_2	±0.1 %CO_2
Calibration uncertainty at 5 %CO_2	±0.1 %CO_2
Temperature dependence	
with compensation at	
3 ... 12 %CO_2, 20 ... 60 °C	±0.1 %CO_2
without compensation (typical)	-0.4 % of reading / °C
Pressure dependence	
with compensation at	
3 ... 12 %CO_2, 700 ... 1100 hPa	±0.015 % of reading / hPa
without compensation (typical)	+0.15 % of reading / hPa
Humidity dependence	
with compensation at	
0 ... 20 %CO_2, 0 ... 100 %RH	±0.9 % of reading (at 37 °C)
without compensation (typical)	+0.05 % of reading / %RH
O_2 dependence	
with compensation at	
0 ... 20 %CO_2, 0 ... 90 %O_2	±0.6 % of reading
without compensation (typical)	-0.08 % of reading / %O_2
Start-up time	10 s
Warm-up time for full spec.	1 min
Response time	
T63	< 30 s
T90	< 50 s
Long-term stability	
0 ... 8 %CO_2	<±0.2 %CO_2 / year
8 % ... 12 %CO_2	<±0.5 %CO_2 / year
12 % ... 20 %CO_2	<±1.0 %CO_2 / year

Operating Environment

Operating temperature for CO_2 measurement	0 ... 70 °C
Max. temperature durability in standby-mode (sensor head only)	up to +195 °C
Heat sterilization +180 °C durability	at least 120 cycles
Storage temperature	-40 ... +75 °C
Pressure (compensated)	500 ... 1100 hPa
operating	<1500 hPa
Humidity	0 ... 100 %, non-condensing
Condensation prevention	sensor head heating, when power on
Chemical tolerance	
DMSO	
IPA (70 % isopropyl alcohol, 30 % water)	
H_2O_2 (2000 ppm), non-condensing	
Ethanol	
Acetic acid	
Electromagnetic compatibility	EN61326-1, Generic Environment

Inputs and Outputs

Operating voltage	11 ... 30 VDC
when analog output in use	20 ... 30 VDC
Digital outputs	I^2C 5 V, RS-485 (2-wire with Vaisala industrial protocol)
Analog output	0 ... 20 mA (scalable) max. load 600 Ω
Power consumption	< 1 W (pulsed)

Mechanics

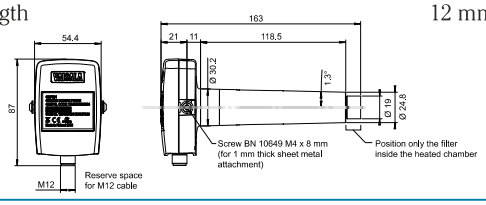
Probe housing material	
Housing	Metal coated plastic ABS+PC
Inner tube	Aluminum
Probe tube	PPSU
Filter	PTFE
Housing classifications	
sensor head	IP54
electronics housing	IP20
Connector	M12 / 8 pin
Weight	
probe (without cable)	150 g
probe (with cable	200 g

Accessories

M12 Connection Cable 0.9m w/ open ends	DRW240977SP
M12 Connection Cable 0.6m w/ Milli-Grid connector	ASM210903SP
Service cable for MI70	221801
Silicone plug	DRW240015SP
Attachment Bracket	DRW240247SP
PTFE filter	DRW240494SP
USB PC connection cable	DRW240494SP
Calibration adapter for GMP231	239523

Dimensions

Probe tube max. diameter	30.2 mm
Probe tube min. diameter	24.8 mm
Probe tube length	118.5 mm
Sensor filter diameter	19 mm
Sensor filter length	12 mm



VAISALA

Please contact us at
www.vaisala.com/requestinfo

www.vaisala.com

Scan the code for more information

Ref. B211312EN-B ©Vaisala 2014
This material is subject to copyright protection, with all copyrights retained by Vaisala and its individual partners. All rights reserved. Any logos and/or product names are trademarks of Vaisala or its individual partners. The reproduction, transfer, distribution or storage of information contained in this brochure in any form without the prior written consent of Vaisala is strictly prohibited. All specifications — technical included — are subject to change without notice.

CE