O2 / CO2 - Module

ACE-DXmed

ultra rapid, long-lived, self-calibrating

- Synchronous O2 and CO2 signals
- Integrated pump with controled pump rate
- Easy integration into you products
- Reliable and accurate even under changing ambient conditions
- RoHS-conform
- Calibration with ambient air
- Low cost over life time

AREA OF USE

The ACE-DXmed is a sensor module with a response time of a few milliseconds, used to measure the oxygen concentration and the carbon dioxide concentration in the side stream. This system is then ideal for use in devices

- for cardiopulmonary stress tests in cardiology, occupational medicine and sports medicine,
- to monitor breathing and respiration of adults and neonates,
- for metabolism analysis / calorimetry (e.g. for intensive care patients) and
- to monitor breathing gas of circulation systems.

STATUS QUO

There are many applications requiring breath-by-breath analysis of the oxygen and the carbon dioxide concentration simultaneously. The integration of the different sensor components needed are challenging in many respects:

- Regard of different dependencies on pressure, temperature and humidity
- Regular exchange of exhausted sensor elements (e.g. electrochemical cell for oxygen measuring)
- Different calibration requirements (specific calibration gases)
- Synchronisation of differing sensor signals and response times
- Rate and stability of volume flow
- Array of sensor components and lay-out of tubing

High costs are the consequence out of it - not only to develop and re-engineer the system from time to time (e.g. if a supplier of sensors has to be replaced) but also for materials logistics, the manufacturing and the quality management. In addition high running costs have to be taken into account as consumptive sensors and calibration gas bottles have to be replaced periodically.

OUR SOLUTION

The O_2 / CO_2 module ACE-DXmed consists of the approved oxygen sensor ACE-Xmed® and of an ultrasonic sensor to measure
carbon dioxide. The oxygen concentration is detected electrochemically by a heated solid state electrolyte (zirconium) whereas the ultrasonic sensor determines the molar mass of the breath.

On this basis the carbon dioxide concentration is calculated precisely and reliably. The integrated, electronically controlled and adjustable pump provides a constant exhaustion. Influences of temperature , pressure and humidity are eliminated reliably. The system can be calibrated with ambient air. Reference gas is also supported.

The very rapid and synchronised response time of the ACE-DXmed permits a precise and reliable resolution of each breath. This is an essential precondition for achieving accurate measurements especially of persons being stress tested with a high respiratory volume and a high breathing rate.

ACE-DXmed contains standard interfaces, so that it can be easily integrated into exsisting systems. For quality surveillance central sensor parameters can be retrieved. At any time the system might be calibrated with ambient air. Due to the simple calibration and the avoidance of consumable sensors the ACE-DXmed module affords a very economical operation of the device.

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ADVANTAGES

- Synchronised breath-by-breath measuring values for O_2 and CO_2
- Simple calibration with ambient air
- Reliability and precision because of selected and tuned components
- Simple integration in devices due to standard interfaces
- Integrated pump with adjustable and controlled exhaustion rate
- Compensation of humidity, pressure and temperature
- RoHS-conform
- No periodical replacement of sensor elements necessary

BENEFIT

As a result of all these advantages, ACE-DXmed is the measuring module which is preordained for use in a new generation of instruments for measurement and diagnosis in medicine and sports. Reduce the vertical range of manufacture and thus benefit from the advantages:

- Use always „state-of-the-art“ sensor technology
- Speed up the product development of new devices
- Save costs for development of a comparable module
- Devote expensive and short engineering resources for more value generating tasks
- Reduce costs for materials management and procurement
- Speed up your manufacturing time and reduce manufacturing costs as many tasks for quality assurance and manufacturing do not apply
- Simplify especially your international business as sensor elements do not have to be replaced regularly
- Enhance customer satisfaction as the repeatable procurement of expensive calibration gases can be omitted (reduce operation costs)

CHARACTERISTICS

	Model: ACE-DXmed1	
	Measuring	O_2 + CO_2 sidestream (sucked off gas sample)
O_2	Measuring Principle Measuring Range Signal Noise Humidity Range	solid state, electrolyte amperometric 10-21 Vol% <0.025 Vol.% 0-100% (even condensing)
CO_2	Measuring Principle Measuring Range Signal Noise Humidity Range	ultra sonic 0-10 Vol% <0.1Vol.% 0-95% (not condensing)
Gas Sampling	Monitoring Range Suction Rate Adjustable Accuracy Resolution Stability Humidity Range	0-500ml/min 200-500ml/min <5% 5ml/min <2% / 1y 0-95% (not condensing)
System	Response Time T_{10-90} Accuracy Gas Measuring Resolution Gas Measuring Linearity Gas Measuring Stability Gas Measuring Temperature Range Pressure Range Lifetime Gas Sensors Lifetime Gas Pump Time till ready-to-use	<100ms <0.1Vol% <0.01% <0.05 Vol% <0.2Vol% / 8h 0-50°C 750-1100 hPa non-consumptive > 2000 Operating Hours approx. 3min
Peripherals	Dimensions (DxWxH) Weight Effective dead space Housing Temperature Data Interface Power Consumption Voltage Supply	100x184x42mm 483g approx. 50Pl max. 50° C RS232, TTL <5W 12V
Delivery	Measuring Module ACE-DXmed1 (item# 20012)	sensors, electronics, pump, mounted on baseplate
	Evaluation Kit ACE-DXmed1 (item# 20013)	sensors, electronics, pump on alu-baseplate, nafion tube, evaluation software, cable, manual

(only for gas mixtures O_2/N_2/CO_2; not to be used with flammable gases / anaesthetic gases)

ORDERING ACE-DXMED

Contact Information	Standard Evaluation-Kit	20012 20013
	Information Detail Phone Fax Mail Internet	 specification / manual +49(0)911-477527-0 +49(0)911-477527-99 info@ACEOS.com www.ACEOS.com

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