Монитор оксида углерода COSAMS

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COSAMS

by ANALOX

Carbon Monoxide Submarine Atmosphere Monitoring System

The COSAMS (Carbon Monoxide Submarine Atmosphere Monitoring System) has been designed for use on submerged submarines to support life, where crew can be living and working for up to 90 days.

Carbon monoxide can be generated on a submarine in several ways, **from cooking and fire, to the incomplete combustion of diesel fuel and chlorate candles**. The COSAMS unit offers continuous real-time monitoring CO.

Two COSAMS units should be fitted in a submarine, one mounted to the fore, in the accommodation area, and the other aft, in the engine room. Each COSAMS indicates the local CO concentration on a colour LCD and transmits a corresponding 4-20mA signal to the submarine's Central Air Monitoring System. The COSAMS user interface permits calibration of the sensor and may be used to provide a local visual alarm, if desired.

The submarine environment poses a number of problems to standard off the shelf CO sensors. The common electrochemical cell, is extremely cross sensitive to hydrogen, making it unsuitable for use in a submarine environment, where hydrogen is constantly produced during charging of the submarine batteries, thus providing a constant background level. Most toxic gas electrochemical cells also suffer the added limitation of being very sensitive to changes in pressure. When you add the operating environment into the equation, you need equipment that can operate across a range of temperatures and humidity levels as well as through pressure changes.

Gases Detected

Carbon Monoxide (CO)

Analox understands the technology challenges associated with using IR sensing techniques over dynamic pressure ranges and are able to correct for these effects to produce accurate sensors. The COSAMS unit uses an infra-red sensor which uses a gas correlation filter to minimise cross sensitivity to interfering gases in the environment.

The COSAMS unit consists of a single enclosure which contains all sensors, pneumatic fittings and display components. The user interface and display are presented on the front face of the enclosure. The enclosure is intended to be wall mounted using suitable shock-proof mounts. A gas sample is drawn from the submarine atmosphere around the enclosure, using the internal sample pump. The gas sample is analysed before being exhausted to atmosphere. The unit offers two adjustable audio and visual alarms, a 4 to 20mA output and up to 90 day's continuous data logging. Maintenance and calibration is designed to be carried out on board and in the dockyard.

Features

- Real-time continuous monitoring, with 90 days data logging
- Uses an infrared rather than electrochemical cell - no cross sensitivity to hydrogen or water vapour
- Easy to maintain - can be maintained on the boat or in the dockyard, limiting downtime
- Built in auto-zero function to ensure stability
- Hardwearing - can withstand 22g shock and can withstand temperatures up to 45°C

COSAMS

Specifications

Mechanical	
Nominal cabinet dimensions (exc mounting lugs)	479 x 280 x 176 mm (h x w x d)
Nominal cabinet dimensions (inc mounting lugs)	479 x 360 x 200 mm (h x w x d)
Cabinet weight	11.6 kg
Cabinet material	Aluminium

Electrical	
Electrical supply	115 V AC 60 Hz
Max power consumption	90 W
Fuse rating (F1, F2)	20 mm, 2.5A anti-surge
Signal output	4-20 mA
EMC compliance	MIL-STD-461F
ESD compliance	EN 61000-4-2

Environmental	
Operating temperature range	0 to +45°C
Storage temperature	–40 to +70°C
Operating pressure range	800 to 1400 hPa
Extended pressure range	600 to 800 hPa (Degraded performance over this pressure range)
Storage/transport pressure range	300 to 1400 hPa
Operating humidity range	0 to 80 %RH
Extended humidity range (up to 1 hour)	80 to 100 %RH
Storage humidity range	0 to 80 %RH (temporary max. 100 %RH)
Max. roll angle	15° (constant) 45° (temporary)
Max. pitch angle	10° (constant) 30° (temporary)
Shock	tested at 22g, 20ms (half sine) without shock isolation
Vibration	NATO STANAG 4138

Performance	
CO measuring range	0 to 200 ppm
Repeatability, measured at RTP	± (1 ppm CO + 1 display count)
Accuracy across normal operating environmental envelope	±5% full scale (equivalent to ± 10 ppm)
Cross-sensitivity to hydrogen	2%vol H_2 < 1 ppm CO
Cross-sensitivity to CO_2	5%vol CO_2 < 1 ppm CO
Response time	T90 <60s

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