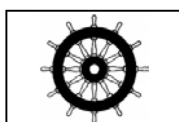


Thermoparamagnetic Oxygen Analyser for Marine Applications

Thermoparamagnetic Oxygen Analyser 8863

Certificate MED 149611CS

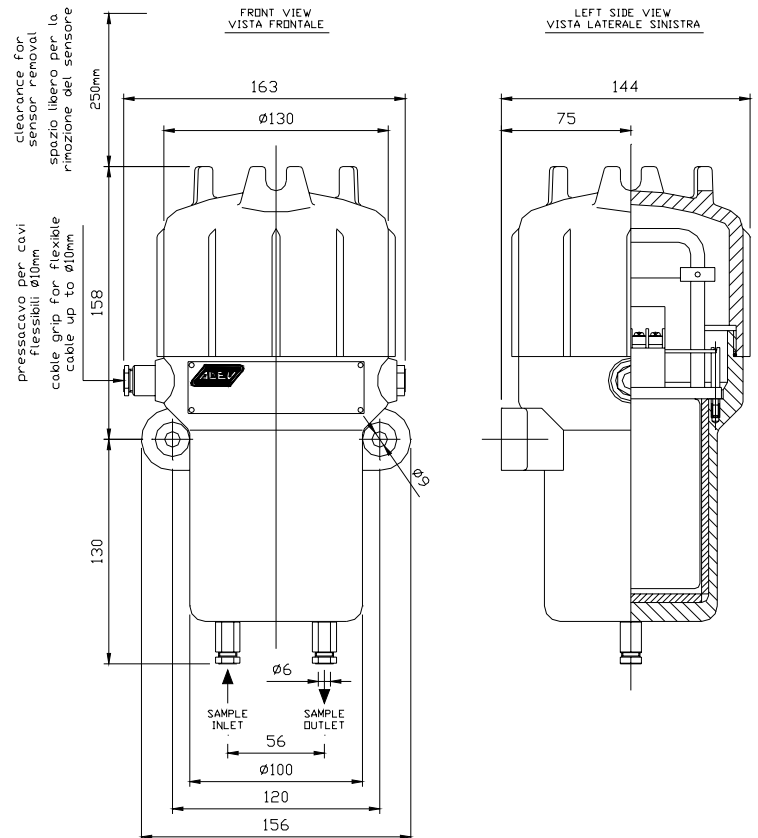


0474-13
M.E.D. 96/98/EC



8863

General Purpose Sensing Unit dimensional Layout



Applications

- Inert gas system control (main and back-up) on vessels
- Inerting control in all marine installations
- Vapor control system
- Oxygen measurements in chemical & petrochemical offshore installations
- Oxygen measurements in Nitrogen generators for Marine installations and on vessels
- Air separation
- Compressors
- and many others

Main Features

- Accuracy better than 1% of full scale
- Selected materials to resist the attack of aggressive substances
- Temperature controlled sensing unit
- Fast response time & excellent long term stability
- Extremely simple to use also for unskilled operators
- Extremely rugged construction: practically indestructible
- IP65 protection
- Versions for safe area or in Explosion-Proof housing for hazardous area Zone 1 / 21



Sensing Unit (Safe)



Control Unit (Safe)



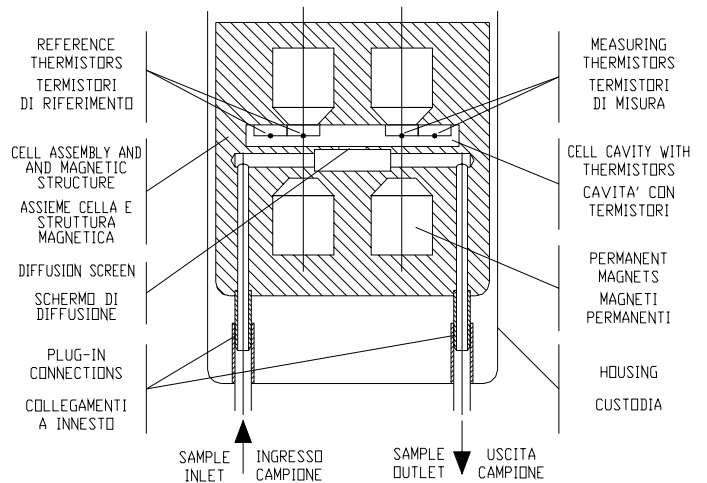
Sensing Unit (ATEX)



Control Unit (ATEX)

8863

Thermoparamagnetic Cell Assembly



General Information

The Measure

The 8863 thermoparamagnetic Oxygen analyzer allows the selective analysis of the Oxygen concentration in process gases taking advantage of the evident Oxygen paramagnetic property that makes it attracted by a magnetic field. This particular feature of the Oxygen is the base of the selectivity of this measuring principle.

High Accuracy

The 8863 is an high accuracy analyzer (class of accuracy better than 1%). For this reason the inner sensing unit is temperature controlled in order to be completely insensitive to ambient temperature variations.

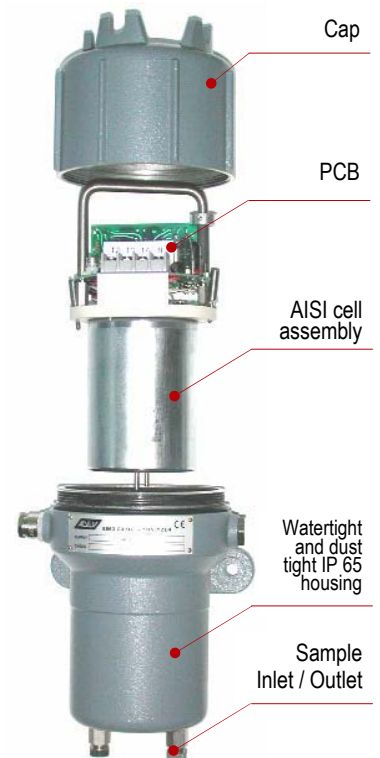
Extremely Rugged

The model 8863 is specifically designed for continuous measurements in the most heavy duty applications. The sensing unit of is housed in a rugged IP65 housings, configurable for safe or hazardous area with the highest protection mode:

There are no inner moving parts; **installation position and eventual vibrations don't alter the accuracy and stability of the measure.**

Very Easy Maintenance

Modular construction makes maintenance extremely easy. It's enough to unscrew the cap of the housing to have access to inner sensing unit that can be removed only by disconnecting 3 wires and unscrewing 2 screws.



Split of sensing unit

Cell Assembly

The Cell Block assembly is made of stainless steel and contains the cell cavity and pole pieces which produce two powerful magnetic fields in the cavity. Associated with each field is a thermistor pair, consisting of a measuring thermistor and reference thermistor. The measuring thermistor is mounted in the cavity within its respective magnetic zone; the corresponding reference thermistor is mounted in the cavity just outside its magnetic zone. A sample inlet port and a sample outlet port are arranged to permit a portion of the flowing sample to diffuse into the cavity, where it comes under the influence of thermal gradients and magnetic fields. The effect of the resulting thermo-magnetic action on the thermistors provides the measuring means.

8863

Explosion Proof Sensing Unit dimensional Layout

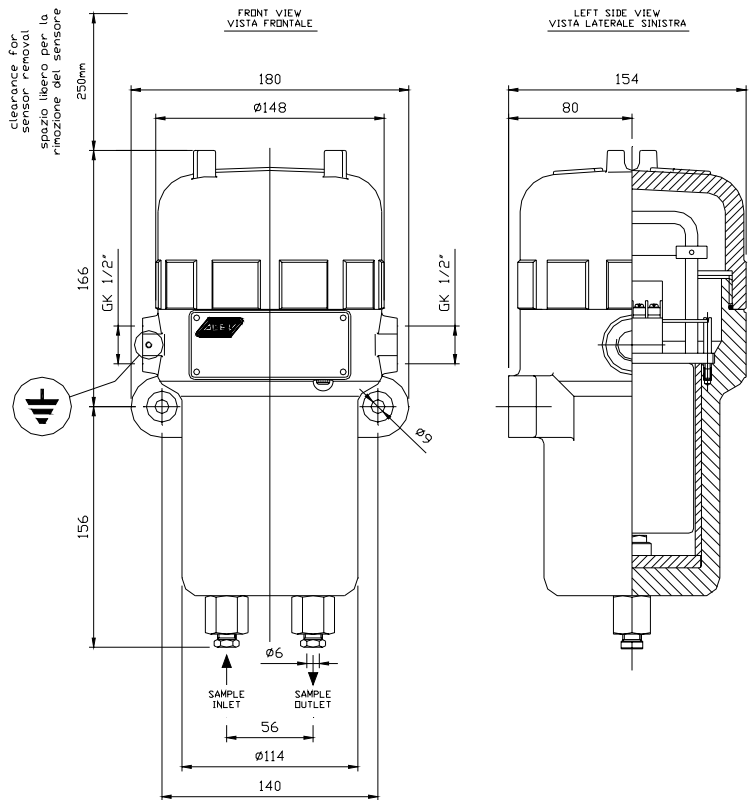
Designed in accordance to directive ATEX 94 / 9 / EC

Certificate number: **CESI 03 ATEX 130**

ATEX Marking

 II 2 G EEx-d IIC T6

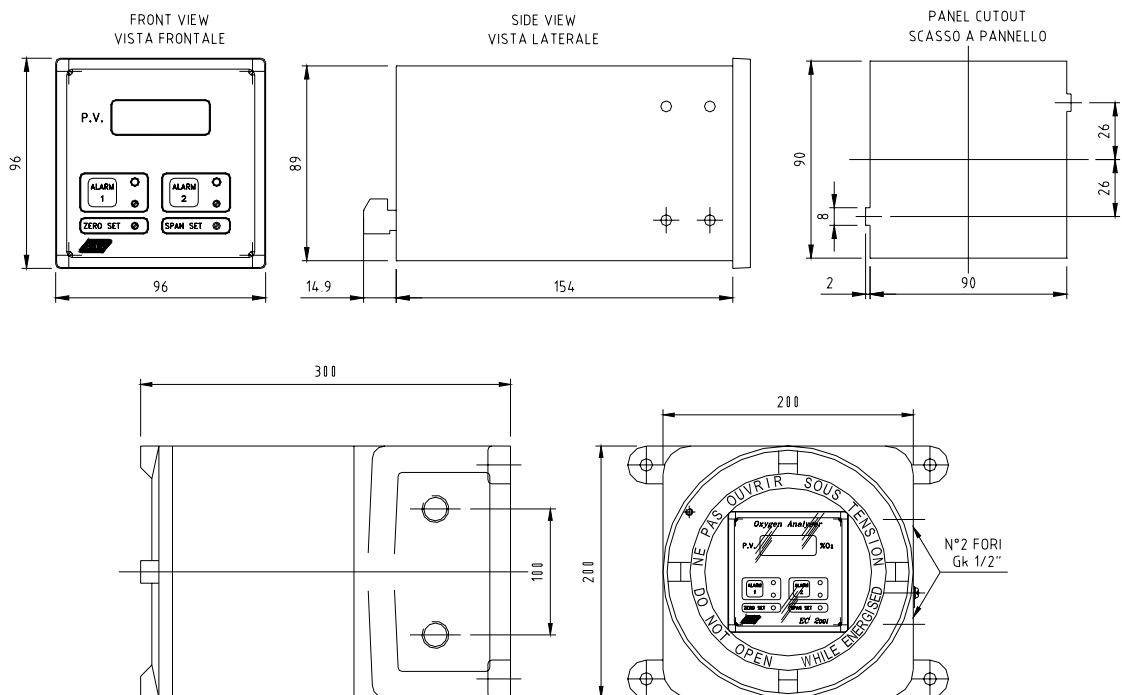
 II 2 GD EEx-d IIC T6 IP65



EC2001 Control Unit

The EC2001 control unit integrates an advanced electronic that receives the output from the sensing unit and retransmit it, calibrated and linearized as 4-20 mA current output. Read out is clearly shown by an high resolution 4 ½ equivalent digits LCD display, thanks to a special configuration in mobile virgule that allows to have a resolution from 0.01 O₂ to 100% O₂. The instrument front panel is immediately clear for the operator, with very intuitive touch switches and adjusting. The isolated current output and two alarm thresholds with SPDT isolated contacts, working in fail safe condition, make the analyser ideal for all control and regulation applications.

The unit can be housed in a compact DIN case for panel mounting (standard), in a IP 65 case with clear front door for wall mounting or in explosion proof housing for mounting in classified area.



8863

Specification

Performance Specification

Versions:	Sensing unit: safe area (suffix G=1); hazardous area Zone 1/21 (suffix G=2) Control unit: safe area (suffix I2=1); hazardous area Zone 1/21 (suffix I2=3)
Accuracy:	± 1% of span (output signal).
Linearity:	within ± 2% of span for most of the ranges. Error can be corrected using the table at paragraph 5.5.
Repeatability:	± 0.3% of span (short term).
Reproducibility:	24 hours: ± 1% of span.
Response Time:	with max. 2000 cc/min. flow rate: → Initial, less than 1 sec.; 90% of step-change: less than 45 sec.
Warm-up time:	30 min. max.
Stabilization Time:	40 min. max.
Drift:	Zero: max. ± 1% of span per week Span: max ± 1% of span per week (without autocalibration).
Ambient Temp. Influence:	between -10°C and +50°C: ± 0.002% O ₂ per °C or ± 0.07% of measure per °C, whichever is worst between +50°C and +55°C: - 1% of measure per °C (max.)
Atm. Pressure Influence:	± 0.18 % of reading per hPa
Sample Flow Rate Influence:	less than 0.5% of span over flow range of 250 to 1000 cc/min.
Line Voltage Influence:	max. 0.02% of span, for each 1% change of power voltage.
Gas Interference:	less than ± 0.01% O ₂ reading per 1% CO ₂ (up to 50% CO ₂ , max.); less than ± 0.07% O ₂ reading per 1% H ₂ (up to 10% H ₂ , max.); less than ± 0.007% O ₂ reading per 1% H ₂ O; less than ± 0.01% O ₂ reading per 1% SO ₂ (up to 50% SO ₂ , max.).
Display:	3 ½ digits LCD display with 14 mm high characters and mobile virgule
Alarms:	2 alarms with SPDT contact ratings: 50 Vdc / 250 Vac; 0,5-4 A, 60 W / 1000 VA Fault alarm shared with low concentration alarm Alarms in fail safe conditions (de-energized in alarm); they commutate when thresholds is exceeded Set alarm thresholds within measuring range
Resolution:	0.1% above 10.00% O ₂ . 0.01% O ₂ below 10.00% O ₂ .

8863

Specification

Operative Specification

Sample Requirements:	Sample Flow Rate: 250 ÷ 1000 cc/min. Max flow rate: 2000 cc/min. Sample Pressure: 3000 Pa minimum (with filter and flow meter) with free vent Operative pressure: atmospheric ±0,5 bar
Range:	see suffix C on the ordering information
Output (from control unit):	4-20 mA proportional to ordered range on max. load of 500 Ω (or 350 Ω if a galvanically insulated module is used).
Relative Humidity:	90% maximum.
Operation Temperature:	Sensing unit: -10 ÷ +55°C Control unit: -10 ÷ +55°C
Temperature controlled:	at 50°C
Storage Temperature:	-10 ÷ +70°C; relative humidity 90% max.
Shelf-life	Unlimited
Power Requirements:	Sensing Unit: 24 Vdc, ±10%, 40 VA max Control Unit: 24 Vdc, 5 W max. It's suggested the use of a dedicated power supplier as per detailed diagrams
Pneumatic Connections:	¼" or 6 mm OD tubing (compression fittings supplied)
Wiring Connections:	Sensing unit in general purpose housing: 2 openings for G 3/8" (PG 13 cable grip). Sensing unit in explosion proof housing: 2 openings for GK 1/2" (cable grip or conduit). Control unit in general purpose housing: terminal board on back panel Control unit in explosion proof housing: 2 openings for GK 1/2" (cable grip or conduit).
Mounting:	Vertical

Physical Specification

Material Contacting Sample Gas:	AISI 316, AISI 303, Chromel, Platinum-Iridium, Teflon, Viton (Buna, others), Glass. Optional Hastelloy® C276
Materials of control unit:	Glass fibre reinforced Noryl case, PVC front plate
Dimensions:	Sensing: 150 x 150 x 290 mm (general purpose housing); 180 x 155 x 325 mm (ex-proof housing) Control Unit general purpose: 96 x 96 x 154 mm (+15 mm for customer terminal board) Control Unit in ex-proof housing: 200 x 200 x 300 mm
Weight:	Sensing: 7 kg in general purpose housing ; 8,5 Kg. in explosion proof housing Control: 1 Kg.in general purpose housing ; 10 Kg. in explosion proof housing
Finish:	Epoxy grey textured enamel
Sensing Unit Protection:	IP 65 (watertight and dust tight)
Control Unit Protection:	Standard IP 20 Increasesable to IP 65 when mounted on cut out with clear front door

8863

Ordering Information

Suffix A - Line voltage

0 24 Vdc

Suffix B - Stream composition

- 1 Standard background gases (N2, combustion gases)
- 2 Corrosive background gases (cell and housing in Hastelloy® C276)
- 9 On specification

Suffix C - Range

- 002 0-2%
- 005 0-5%
- 007 0-7,5%
- 010 0-10%
- 015 0-15%
- 025 0-25%
- 999 On specification

Suffix D1 - Alarm threshold

- 3 1 high alarm + 1 low alarm
- 9 On specification

Suffix D2 - Fault alarm

- 1 Fault alarm (wire interrupted) shared with an alarm threshold

Suffix E - Alarm contacts

- 1 SPDT contacts

Suffix F - Serial output

- 0 NO

Suffix G - Sensing unit

- 1 IP65 housing for sensing unit (standard)
- 2 Explosion-proof housing for sensing unit
- 9 On specification

Suffix H - Autocalibration

- 0 NO

Suffix I1 - Control unit

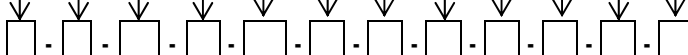
- 2 EC2001

Suffix I2 - Control unit configuration

- 0 Not used
- 1 Provided for mounting in a cut-out 89,5x90,5 mm
- 2 Mounted & wired in IP65 housing (power supplier included)
- 3 Mounted & wired in Ex housing (power supplier included)
- 9 On specification

Suffix L - Options

- 0 None
- 1 IP65 clear front door to be mounted on front panel of control unit
- 9 On specification

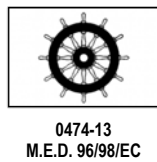


8863

Certification and Directives

European Directive Conformity

Directives:	Marine Equipment Directive (MED) 96 / 98 /EC as modified by Directive 2011/75 /EU ATEX Directive 94 /9 / EC Low Voltage directive 2006 /95 / EC EMC directive 2004 / 108 / EC - EN 61000-6-2 - EN 61000-6-3 - EN 50270
Certificates:	ATEX Certificate Number CESI 03 ATEX 130 MED Certificate Number MED 149611CS
Testing Standards:	EN 50104 (2002) Including A.1 2004; EN 60945 (2002) including IEC 60945 Corrigendum 1 (2008); IEC 60052-504 : 2001; IEC 60533:1999 RINA Rules for the classification of ships—Part C—Machinery, Systems and fire protection—Ch.3 Sect.6, Tab.1
Reference Standards::	SOLAS reg. II-2/4, Reg. VI/3, IMO Res. MSC.98(73)-(FSS Code) 15



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All specifications are subjected to variations for products improvement without notice.