OxyTrend

Electrochemical Oxygen Analyser for extractive applications in safe area and in hazardous area, ATEX classified (Zone 1 / 21).

OxyTrend

Simple and cost-effective Electrochemical Analyser for extractive applications

OxyTrend is an easy to use device, configurable for Trace, Percent or Purity applications.

The wide display allows the user to have clear indication of reading and the microprocessor allows all the digital functions.

The multi-language firmware (Italian, English, French, German, Spanish) combined with an intuitive menu allows the operator to make all settings and calibrations in a very easy and quick manner.

The menu is operated by thought-the-glass optical buttons. These buttons allows complete functionality in hazardous areas without opening the housing.

OxyTrend is designed for indoor and outdoor installations. Electronics is housed in a aluminum enclosure while the sensor housing is in SS 316 and it can be flow-through type or with optional KF-40 connection.

The analyser can integrate several type of high performance electrochemical cells, making this instrument suitable for a variety of applications.

OxyTrend comes with 18 field settable ranges for Trace or Percent, plus it gives the possibility to set a freely configurable range starting from 1 ppm FS and up to 100% FS.

OxyTrend can be a 2-wire loop powered transmitter. In addition, connecting further 2 or wires,, it also have a serial interface RS485 ModBus RTU that can be used in SLAVE mode (to be connected to the customer Master device) or in MASTER mode (for driving external ADEV I/O board and implement the number of relays outputs and digital inputs, when necessary).

Oxygen Analyser

for O2 measurement in ppm and % range

Key Applications

- Trace O2 in pure gases, Natural Gas & Biogas
- Electrolyzers
- Chemical & Petrochemical
- Nitrogen & Hydrogen generators
- Pure gaseous hydrocarbons streams
- Steel & Metal processing
- Air separators
- Galvanizing and Annealing furnaces
- Reducing processes
- Inerting control
- Semiconductor wafer machines
- Glove box purge and leak detection
- Heat treatments
- Welding gases

Main Features

- Two-wire, loop powered 4-20 mA transmitter
- Four-wire connection (only serial RS485) or five-wire connection (analog 4-20 mA + serial RS485)
- ModBus RTU Master or Slave selectable by menu
- Connectable with one of the external I/O boards by RS485 to have 8 relays output and 4 digital inputs
- Unique hardware for all wiring connection types
- Optical through-the-glass buttons allowing menu operation without opening the housing
- Graphical LCD Display with visualization in Auto-Range and possibility to switch to trend visualization
- Use friendly menu and intuitive interface
- High Accuracy Galvanic Sensors
- User selectable range
- Hazardous area version is Ex-Proof design: no Zener barrier required in non-hazardous location
- Low Maintenance
- Sensor lifetime indication
- NAMUR error indication

European Directive Compliance

Low Voltage Directive 2014/35/EU
EMC Directive 2014/30/EU
ATEX Directive 2014/34/EU

Multi-Language Menu

OxyTrend menu language can be selected between the 5 most popular ones:

ATEX Marking

ATEX certification for Zone 1 / Zone 21 with protection mode:

II 2 G D   Ex db IIC T6 Gb
Ex tb IIIC T70°C Db
IP65

ATEX Certificate Number **CESI 20 ATEX 010 X**

Technical Specification

Electrochemical Analyser OxyTrend

Performance Specifications

Model	OxyTrend
Accuracy	± 1% of FS (at constant conditions)
Repeatability	± 1% of FS (at constant conditions)
Linearity	± 1% of FS (at constant conditions)
Response Time	Depends on cell type; typically < 13 sec. @ T90
Recovery Time	(only for cells for ppm): if a cell is exposed for 60 sec. in Air, 1 hour of N2 purging is necessary to go back again < 10 ppm O2
Compensation	Integrated temperature compensation
Pressure Influence	± 0.1% of reading per mbar
Cell Life	Depends on cell type; refer to table in the next pages

Operative Specifications

Model	OxyTrend
Sample Flow Rate	General purpose safe area version: 500-1000 cc/min. Ex-Proof version: max. recommended 500 cc/min.
Sample Pressure	Vent to atmosphere
Relative Humidity	0…90% RH non condensing
Operative Temperature	0°C….+50°C (with cells for non-acid stream) ; -20°C….+50°C (with cells for acid stream)
Power Supply	16,5 ÷ 30 VDC; max current: 23 mA
Load Resistance	Max. Load Resistance (R_L) depends on applied voltage **[note 1]**
Pneumatic Connections	Standard: 1/8" NPT-F. Optional: 1/8" or 1/4" or 6 mm compression tube fittings in SS316 Available KF40 connection (only safe area)
Connection Ports	N°2 threaded holes 1/2" NPT-F
Wiring Connections	Removable screw terminals pace 5.08 mm (on inner PCB). Max conductor section: 2.5 mmq

Physical Specifications

Model	OxyTrend
Housing Material	Die casting Aluminum. RAL 9006 (back) / RAL 3020 (window cover). O-ring in VQM rubber
Wet Parts Materials	Cell holder: SS 316; Pins: gold-plated; O-ring: NBR **[note 2]**
Mounting	Wall / plate mounting
Protection	IP65
Dimensions	Refer to dimensional layout
Weight	~ 2.5 kg (general purpose version) ; ~ 3 kg (Ex-Proof version)

Notes

[**Note 1**]
Max. R_L can be calculated with the following ratio:

$$R_L \text{ max} = [(VDC - 16,5) / 23] * 1000$$

Where VDC is the applied Voltage. Example:

R_L max @ 20V = ~ 152 Ω
R_L max @ 24V = ~ 325 Ω
R_L max @ 30V = ~ 587 Ω

[**Note 2**]
Standard O-ring in NBR. If required by the stream gas composition, the O-ring can be Viton, EPDM, HNBR, FFKM, VMQ.

# Technical Specification

Electrochemical Analyser OxyTrend

Model	OxyTrend
Range	1 ppm ÷ 100% FS (user settable)
Output	Loop 4-20 mA (two-wires) RS485 ModBus RTU (four-wires) Loop 4-20 mA + RS485 (five-wires)
Serial Interface	RS485 ModBus RTU (Master / Slave). 2-wires connection Impedance: 120 ohm Speed: 4800....115200 bps Parity: NONE, ODD, EVEN, MARK, SPACE Isolation: 1.5k VAC (1 min) Max No. of Nodes: 256 Default Settings: Speed 38400; Parity NONE; ModBus address 1
Additional I/O	N°8 relays SPDT + N°4 digital inputs PNP type (on external boards)
Display	2.5" backlit graphic LCD display. Visualization in ppm, % or auto-range (menu settable)
Resolution	0.005 ppm on 0-10 ppm range 0.01 ppm or percent on other ranges
Buttons	Optical through-the-glass buttons allowing menu operation without opening the housing
Diagnostics	Alarm / diagnostic indications on Display

Dimensional Layout
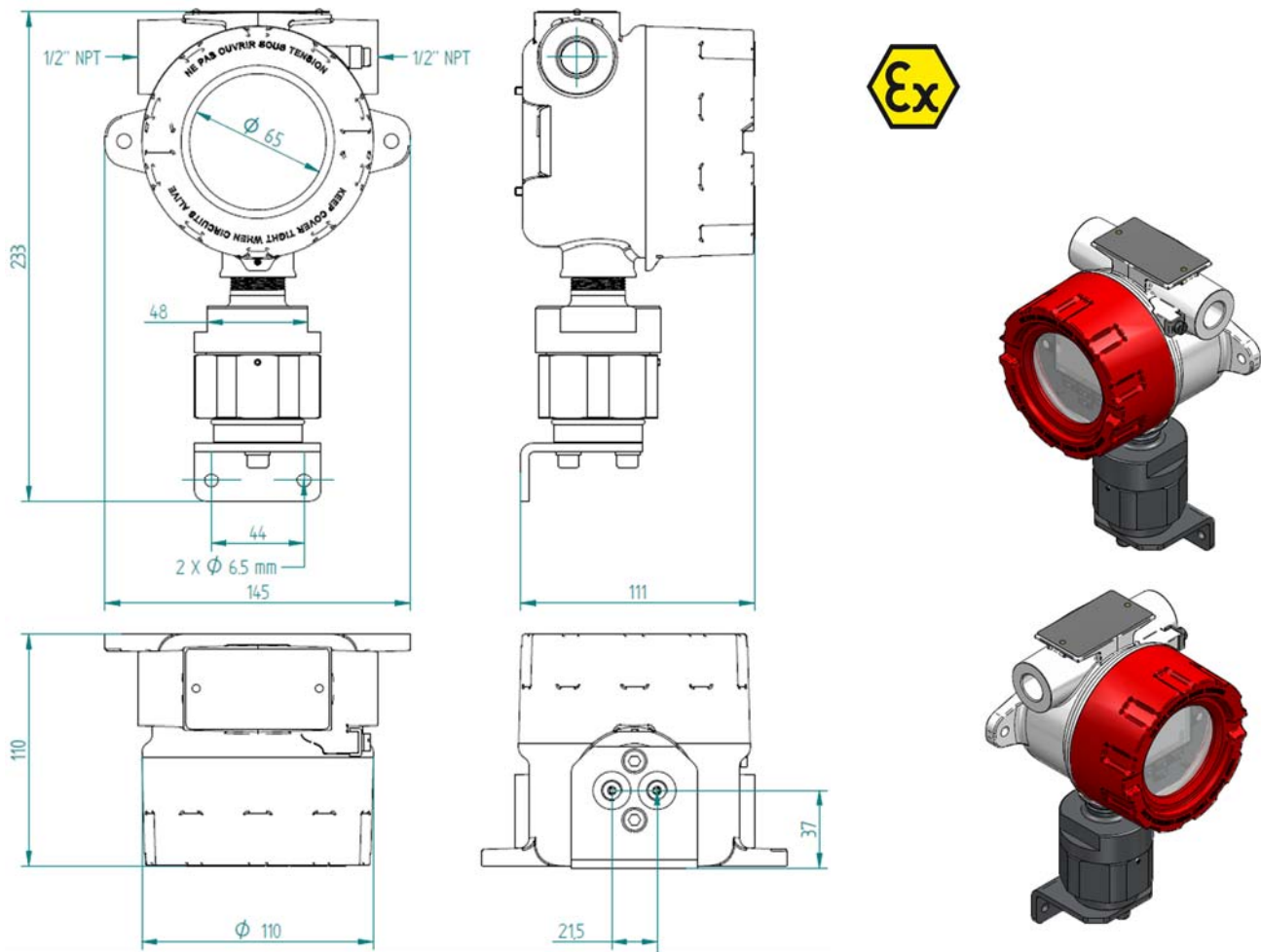
OxyTrend General Purpose Version
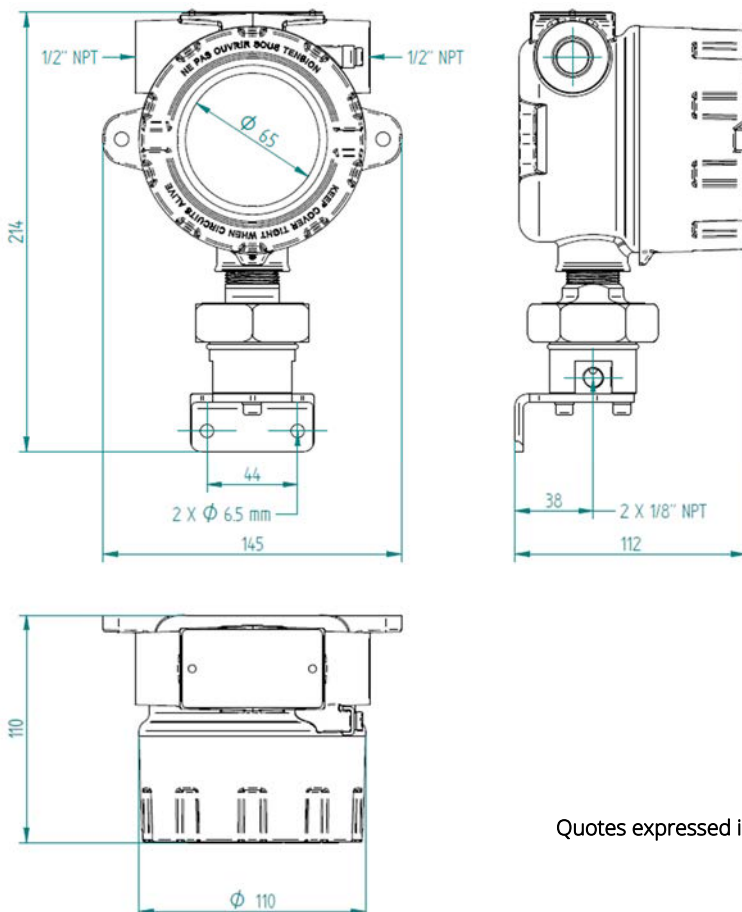
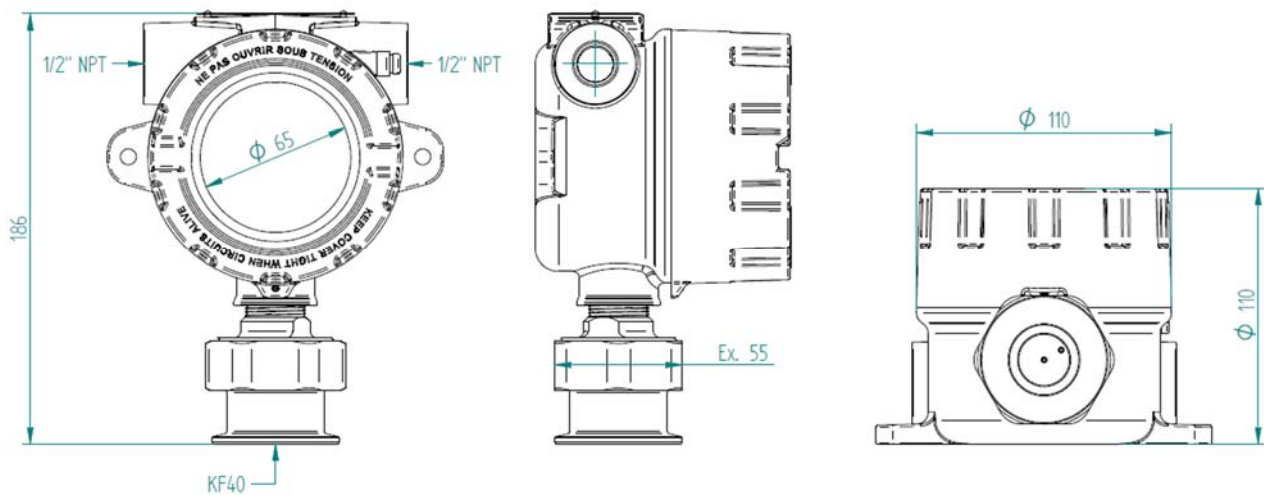Quotes expressed in mm
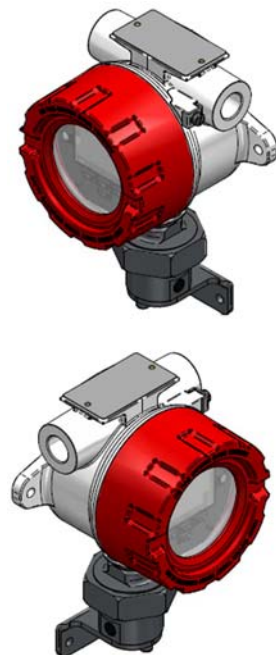
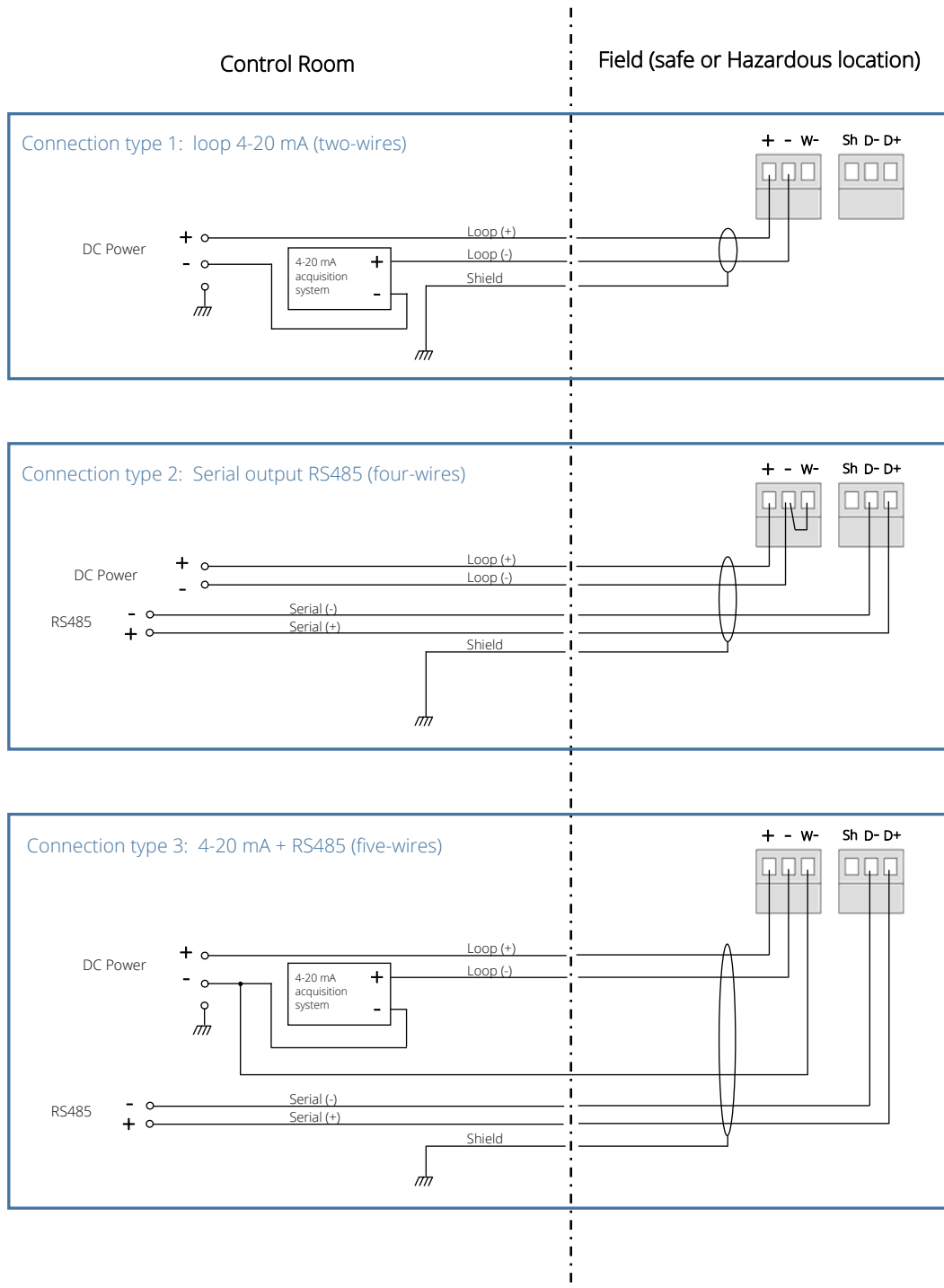# Dimensional Layout

OxyTrend Ex-Proof Version

OxyTrend General Purpose Version with KF Connection

Quotes expressed in mm

Wide Possibility of Connection

Unique hardware, three possible connections

Control Room | Field (safe or Hazardous location)

Connection type 1: loop 4-20 mA (two-wires)

+ – W– Sh D– D+

DC Power
+
–
4-20 mA acquisition system
Loop (+)
Loop (-)
Shield

Connection type 2: Serial output RS485 (four-wires)

+ – W– Sh D– D+

DC Power
+
–
Loop (+)
Loop (-)

RS485
–
+
Serial (-)
Serial (+)
Shield

Connection type 3: 4-20 mA + RS485 (five-wires)

+ – W– Sh D– D+

DC Power
+
–
4-20 mA acquisition system
Loop (+)
Loop (-)

RS485
–
+
Serial (-)
Serial (+)
Shield

Transmitter Version and I/O Expansion Boards

OxyTrend can use as a 2-wires loop powered transmitter. In alternative, using the serial RS485, OxyTrend can drive one of the external I/O boards to have 8 relays output for alarm, diagnostics and range indication and 4 digital inputs for remote range selection.

Technical Specification

Expansion Modules and I/O Boards

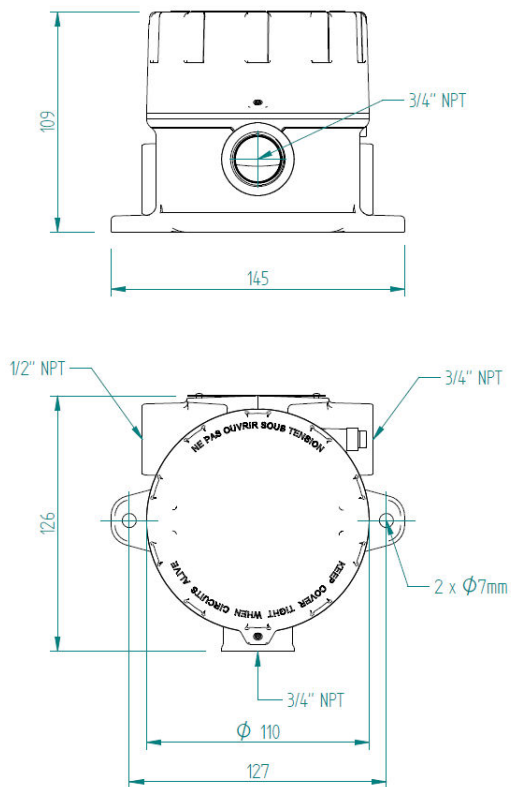| ADV8RO4DI	ADV84RD	ADV84RD-X
P.N. A50045	P.N. A44114	P.N. A44116
I/O module for DIN rail Mounting in safe area	I/O board in die casting IP65 Aluminum housing for installation in safe area	I/O board in Ex-Proof die casting IP65 Aluminum housing for installation in Zone 1 / Zone 21

Model	ADV8RO4DI P.N. A50045	ADV84RD P.N. A44114	ADV84RD-X P.N. A44116
Installation	Safe area	Safe area	Hazardous area Zone 1 / 21 Protection Mode: II 2 G D Ex db IIC T6 Gb Ex tb IIIC T70°C Db IP65
Operative Temperature	-20°C....+70°C	-20°C....+60°C	-20°C....+60°C
Storage Temperature	-20°C....+70°C	-20°C....+60°C	-20°C....+60°C
Holes	Terminal strips	N°2 threaded holes 3/4" NPT-F N°1 threaded hole 1/2" NPT-F	
Housing Material	ABS auto-extinguishing	Standard: die casting Aluminum. RAL 9006 (back) / RAL 9010 (window cover). On request: in SS316	
Seal Material	No O-ring	VQM rubber	
Mounting	Din rail with spring	Wall / plate mounting	
Protection	IP20	IP65	
Weight	~ 150 gg	~ 3 kg	
Relays	N°8 relays SPDT. Contact rating: 0.25A @ 250 VAC ; 1A @ 30 VDC Default relay status: NOT triggered when in alarm 3 terminals for each relay allows the N.O. / N.C. connection (on customer preference)		
Digital Inputs	N°4 PNP type, 5...30 VDC		
Serial Interface	RS485 ModBus RTU (Master / Slave). 2-wires connection Impedance: 120 ohm Speed: 4800....115200 bps Parity: NONE, ODD, EVEN, MARK, SPACE Isolation: 1.5k VAC (1 min) from all stages Max No. of Nodes: 256 Default Settings: Speed 38400; Parity NONE; ModBus address 1		
Relative Humidity	0....95% RH non condensing		
Power Supply	9....30 VDC / 11....25 VAC, < 2,6W		
Wiring Connections	Removable screw terminals pace 5.08 mm (on the inner PCB). Max conductor section: 2.5 mmq		
Dimensions	Refer to dimensional layout		
Low Voltage	Directive 2014/35/EU		
EMC	Directive 2014/30/EU		
ATEX	Directive 2014/34/EU (only for Ex-Proof version)		

Dimensional Layout

DIN Rail I/O Expansion Module P.N. A50045

120

21

Guida DIN

111
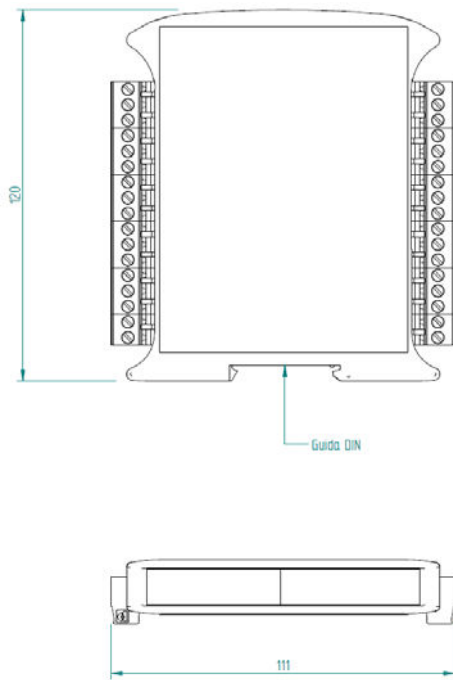
I/O Expansion Boards P.N. A44114 / A44116

109

145

3/4" NPT

1/2" NPT

1/2" NPT

3/4" NPT

Ex

126

2 x Φ7mm

3/4" NPT

Φ 110

127

Quotes expressed in mm

9 Different Sensors

Electrochemical Analyser OxyTrend

Type	Code	Application	Expected Life	Operative Temperature	Response Time T90
Trace (PPM)	A59014	0-10 ppm low range, used in most industrial applications	24 months (note 1)	0 ÷ 50°C	13 sec.
Trace (PPM)	A59013	0-10 ppm low range, used when acid gases are present (CO_2 > 0.1%, etc.)	24 months (note 1)	-20 ÷ 50°C	13 sec.
Trace (PPM)	A59002	Optimized for extra low traces, 0-1 ppm low range	24 months (note 1)	0 ÷ 50°C	7 sec.
Trace (PPM)	A59003	Optimized for extra low traces, 0-1 ppm low range when acid gases are present (CO_2 > 0.1%, etc.)	24 months (note 1)	-20 ÷ 50°C	7 sec.
Percent	A59021	General purpose O2 Measurement. LDL 1000 ppm, used mainly for long life percent applications	60 months (note 2)	0 ÷ 50°C	7 sec.
Percent	A59022	General purpose O2 Measurement. LDL 1000 ppm, used when acid gases are present (CO_2 > 0.1%, etc.)	24 months (note 2)	-20 ÷ 50°C	13 sec.
Hybrid	A59023	For measuring from 40 ppm to 25% with regular exposure to ambient air	12/15 months (note 1)	0 ÷ 50°C	13 sec.
Purity	A59025	Designed for measuring elevated O2 (21.0% - 100%)	120 months (note 2)	0 ÷ 50°C	13 sec.
Trace (PPM)	A59031	0-1 ppm extra low range, optimized for Natural gas applications (stream with H2S up to 500 ppm)	15 months (note 1)	-20 ÷ 50°C	7 sec.

[**Note 1**]
Calculated with O2 < 1000 ppm @ 25°C, sea level

[**Note 2**]
Calculated with O2 < 20,9% @ 25°C, sea level

ADEV has a wide experience in process and can provide the **OxyTrend** combined with a sample and condition system designed for the specific application requirements.

Contact ADEV for details

Sensor Technology

ADEV Oxygen Sensors provide high levels of accuracy, reliability and linearity throughout theirs measurement ranges.

The Oxygen sensor is based on the galvanic electrochemical fuel cell principle and is manufactured under a strict quality procedure.

The sensors are self contained and minimal maintenance is required – no need to clean electrodes or add electrolyte. The precision sensors offer excellent performance, accuracy and stability while maximizing the expected life.

Depending on the type of sensor, they are capable of measuring Oxygen from 0.01 parts-per-million up to 100.0%.

Ordering

Electrochemical Analyser OxyTrend

Oxygen Analyser	OxyTrend	...	...
Version			
General purpose IP65 safe area version	G		
Explosion Proof (ATEX) version	X		
Gas Connection			
1/8" NPT-F (standard)	A		
1/8" Tube fittings in SS316	B		
1/4" Tube fittings in SS316	C		
6 mm Tube fittings in SS316	D		
KF40 connection	E		
Special	9		

Expansion I/O Boards

Code	Description	Image
A50045	I/O module for DIN rail mounting in safe area	
A44114	I/O board in die casting IP65 Aluminum housing for installation in safe area	
A44116	I/O board in Ex-Proof die casting IP65 Aluminum housing for installation in Zone 1 / Zone 21	

Included Accessories

Code	Description	Material	Image
A46016	Pen to operate on optical keys	SS 316	
A48180	Mounting bracket for safe area version	SS 304	
A48176	Mounting bracket for ATEX version	SS 316	
A23159	Clamp (for KF-40 mounting)	SS 316	
A36610	O-ring clamp (for KF-40 mounting)	NBR	

These accessories can be provided as spare parts, but they are always included in the brand-new analyser of the ordered type.

Optional Accessories

Code	Description	Diameter	Image
A37518	ATEX plug with ½" NPT thread	N.A.	
A37612	ATEX plug with ¾" NPT thread	N.A.	
A37522	General purpose cable gland for safe area. Thread ½" NPT	7 ÷ 10,5 mm	
A37520	Resinable cable gland (ATEX) for armored cable. Thread ½" NPT	5,5 ÷ 13 mm	
A37521	Non-resinable cable gland (ATEX) for armored cable. Thread ½" NPT	5,5 ÷ 13 mm	
A37494	Resinable cable gland (ATEX) for non-armored cable. Thread ½" NPT	5,5 ÷ 13 mm	
A37389	Non-resinable cable gland (ATEX) for non-armored cable. Thread ½" NPT	5,5 ÷ 13 mm	
A37453	General purpose cable gland for safe area. Thread ¾" NPT	7 ÷ 10,5 mm	
A37614	Resinable cable gland (ATEX) for armored cable. Thread ¾" NPT	5,5 ÷ 13 mm	
A37598	Non-resinable cable gland (ATEX) for armored cable. Thread ¾" NPT	5,5 ÷ 13 mm	
A37418	Resinable cable gland (ATEX) for non-armored cable. Thread ¾" NPT	5,5 ÷ 13 mm	
A37599	Non-resinable cable gland (ATEX) for non-armored cable. Thread ¾" NPT	5,5 ÷ 13 mm	

Contacts

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