ASCON TECNOLOGIC

EVERYTHING UNDER CONTROL

ASCOMB SERIES

COMBUSTION CONTROL

- ZIRCONIUM OXIDE PROBE ZO2-I/E
- COMBUSTION MONITOR OXM
- OXYGEN "TRIM" CONTROLLER OXR
- COMPLETE SYSTEMS

Combustion and monitoring systems with zirconium oxide probe, for the residual oxygen measurement in the flue gases of civil and industrial power plants.

- Energy saving;
- Norm compliance;
- Safety;
- Pollution reduction;
- Boilers lifetime increase;
- Quick installation;
- Low maintenance.

APPLICATION FIELDS

- CIVIL POWER PLANTS
- INDUSTRIAL POWER PLANTS
- COGENERATION
- BIOMASS POWER PLANTS
- DISTRICT HEATING PLANTS

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ENERGY SAVING

Starting from combustion theory...

In figure 1, it is possible to identify the optimal combustion zone where the high efficiency matches the minimum pollution values thanks to the correct air/flue ratio.

Modifying the boiler load, the air/fuel ratio is changed dynamically as shown in fig.2

Through the continuous oxygen content monitoring in the flue gases and boiler load, it is possible to keep the burner in the optimal combustion zone to ensure better performance and lower pollution levels.

Fig. 1 - Characteristics combustion curves

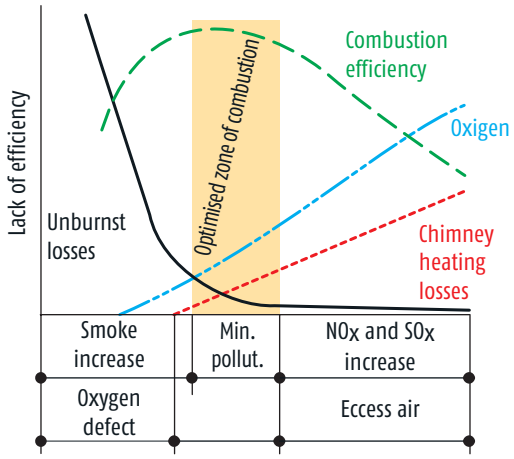
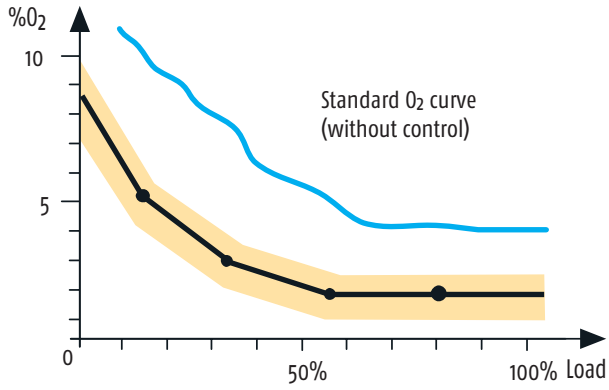


Fig. 2 - %O_2 correction curve as function of boiler load



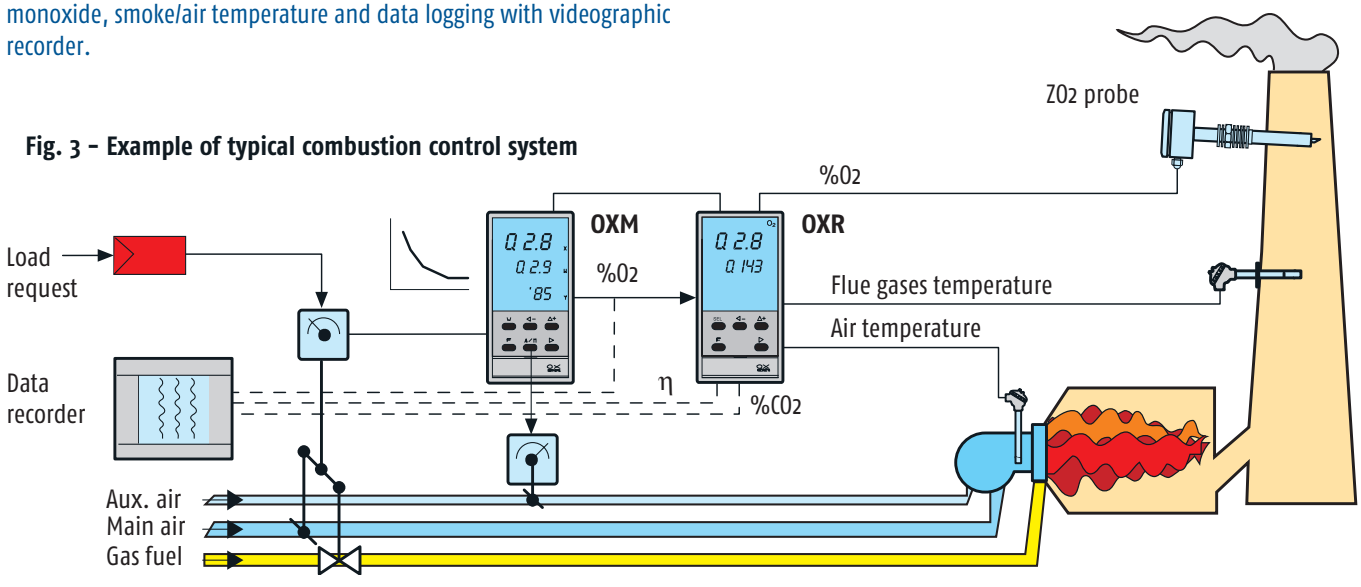
... to systems

The ASCOMB systems check minute by minute the combustion process with simple solutions that require minimal maintenance, and provide a rapid return on investment.

Available solutions ensure versatility including measures of carbon monoxide, smoke/air temperature and data logging with videographic recorder.

Ascon Tecnologic has a qualified staff for commissioning, after-sales and maintenance service.

Fig. 3 - Example of typical combustion control system



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LAWS AND REGULATIONS

Various pollution control standards have been developed over the years.

The environmental conservation directives regulate the flue gas emissions that civil and industrial plants generate into the atmosphere.

The flue gas oxygen content has always been an important reference parameter.

This is the main measurement of ASCOMB systems for combustion monitoring and control. In addition, the systems may measure and record other combustion parameters such as carbon monoxide and flue gases temperature.

Therefore, the ASCOMB systems may be useful to make your plant compliant to environmental regulations.

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COMPONENTS

Oxigen measurement

ZO2-I-300/500 In-situ zirconium oxide probe with integrated electronics;
ZO2-E-300/500 In-situ zirconium oxide probe with external electronics;
ZO2-E-C100 Extractive zirconium oxide probe with external electronics.

Monitoring and Control units

OXM Oxygen monitor for efficiency, air excess and CO2%;
OXR Oxygen "Trim"controller for flue gases oxygen content according to the load changes.

Measurement of air/flue gases temperature

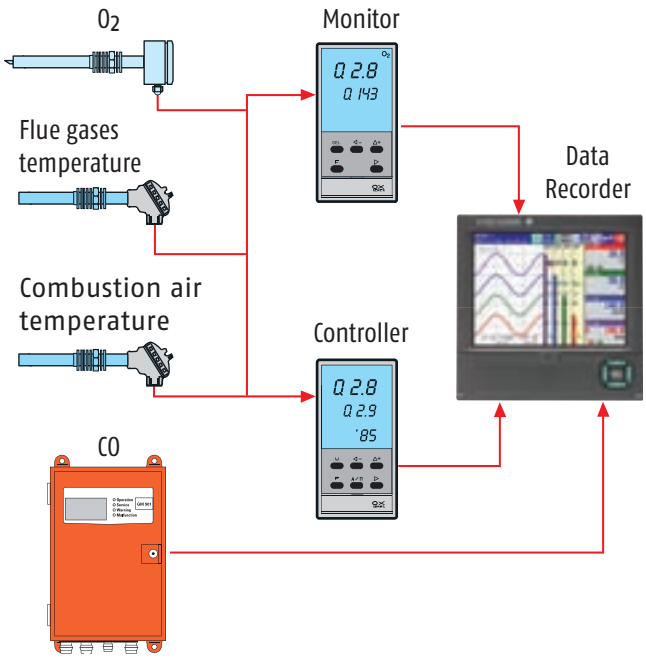
RF1 PT100 Probe for measuring the flue gas temperature;
RF1 PT100 Probe for measuring the combustion air temperatur.

Carbon monoxide measuremet

ZCO Infrared NDIR analyzer for in-situ carbon monoxide measurement.

Data recording

RX Multi-channel paperless recorder.



INTEGRATED SYSTEMS

Ascon Tecnologic offers a wide range of solutions for single or multiple boilers.

The systems are already assembled turn-key solutions for easy installation. They consist of a control panel and probes to be installed in field integrating the functions of display and data recording.

ADVANTAGES

- Single ordering code;
- Simple installation;
- Quick start up;
- Efficient after-sales assistance;
- Planned maintenance.

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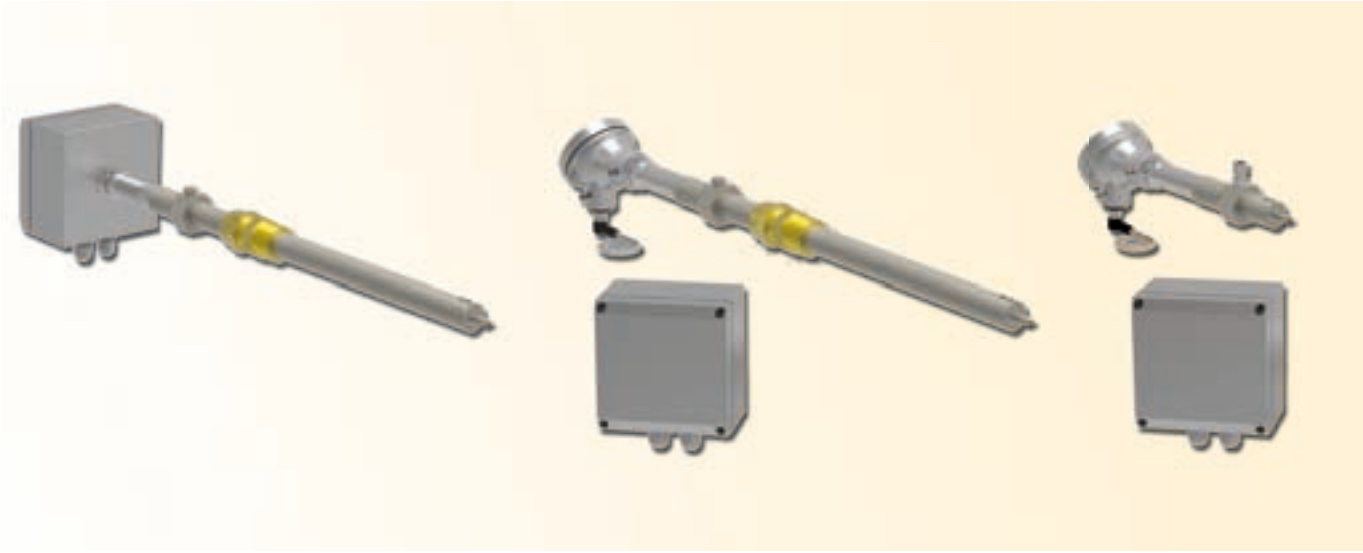
ZO2 PROBES



TECHNICAL DATA

Measurement type	Direct and continuous oxygen content measurement in wet flue gases	
Sensor		Heated zirconium oxide ZrO2
Flue gases temperature	Up to 600°C	
Probe material	AISI 316	Stainless Steel AISI 316
Process connection	1" NPT	With 1" NPT sliding nipple
Head protection degree	IP66	
Ambient temperature	-20... +55°C	
Weight	2... 3 kg	
Power supply	24VDC ±5%	
Current consumption	1.2 A max.	
Output	4... 20mA	Active or passive output, non isolated. Adjustable with jumpers
Measuring range O2%	0.3... 25%	
Accuracy	±2%	
Output range 4... 20mA	0... 20.9% 0... 25%	Adjustable with keys
Response time	<5 seconds	
Heating Up time	15 minutes	Standard heating time
Calibration 2-points	1... 20.9%	Procedure of calibration with keys
Calibration Interval	12 months	
Error indicator	Relay DPST, NC+NO	Red LED lit (on the electronic board) and relay intervention when: • Oxigen % <0.3% • Probe disconnected • Probe failure • Heater failure • Power supply failure
Sensor heating up time	<15s	Automatic temperature control
Pluggable screw connectors		Power supply 0... 24V Output 4... 20mA Failure contacts Probe cabling (5 wires)
Operator interface		2 LEDs (green and red) + 3 buttons
Remote probe connection (ZO2-E, ZO2-E-C100)		With supplied cable (3 mt.)

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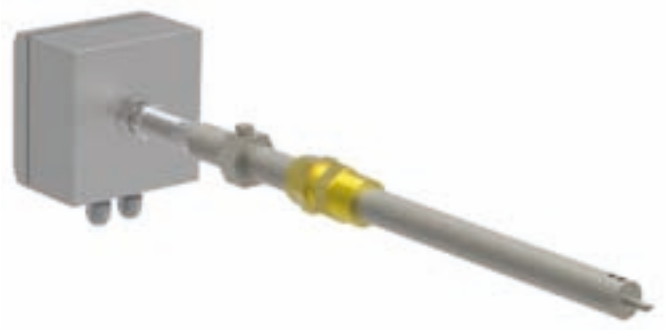
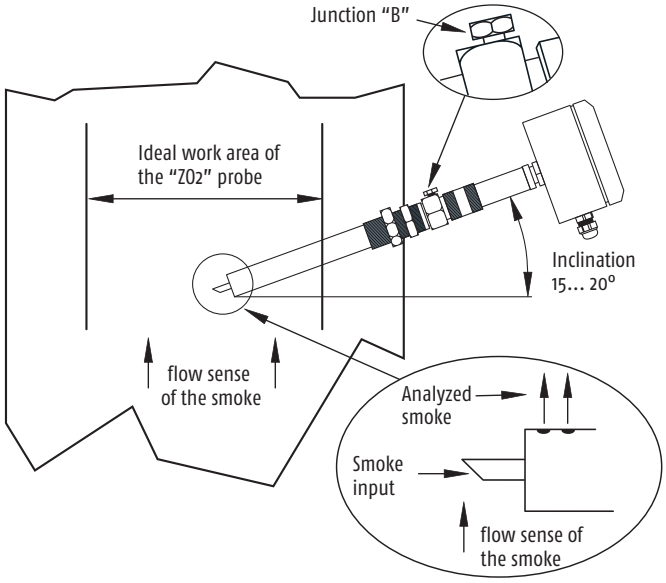
ZO2-I PROBE



How to order

ZO2-I-300	Zirconium oxide probe with integrated electronics Probe length = 300 mm
ZO2-I-500	Zirconium oxide probe with integrated electronics Probe length = 500 mm

Usage

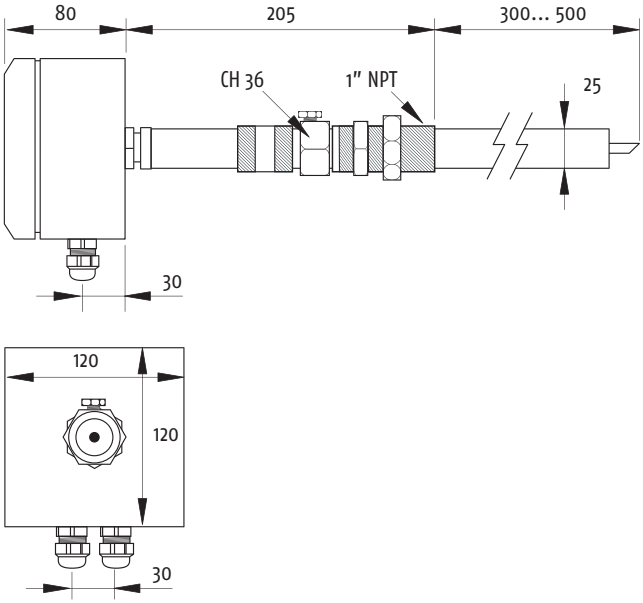


In-situ zirconium oxide probe for direct and continuous measurement of residual oxygen percentage in the flue gas.
Equipped with integrated electronic, generates directly a linear 4... 20 mA output with active or passive output selectable by jumpers.

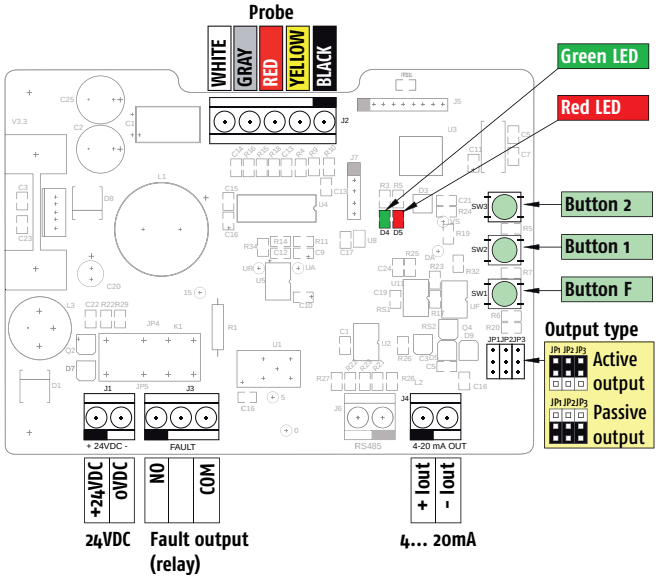
Main functions of electronic card are:

- Management of the sensor and the built in heater;
- Range settings;
- Calibration;
- Signal output adjustment.

Dimensions (mm)



Electrical connections



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ZO2-E PROBE

In-situ zirconium oxide probe for direct and continuous measurement of residual oxygen percentage in the flue gas within harsh environments where high temperatures and /or vibrations can damage on-board electronics.

Equipped with external electronic, generates directly a linear 4... 20 mA output with active or passive output selectable by jumpers.

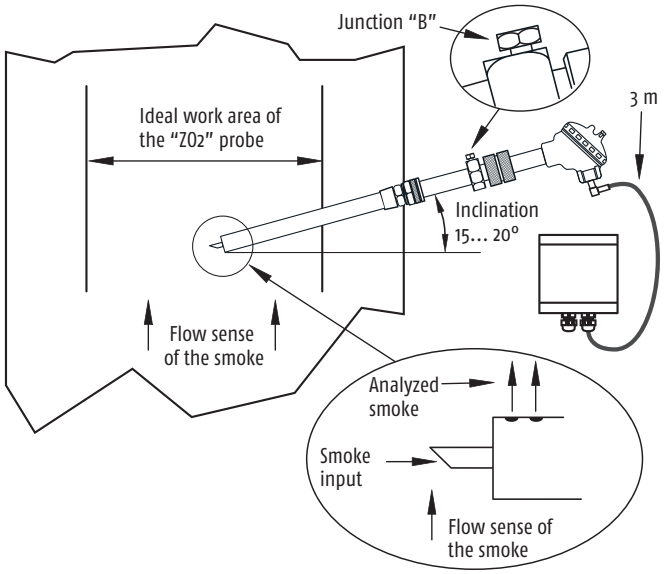
Main functions of electronic card are:

- Management of the sensor and the built in heater;
- Range settings;
- Calibration;
- Signal output adjustment.

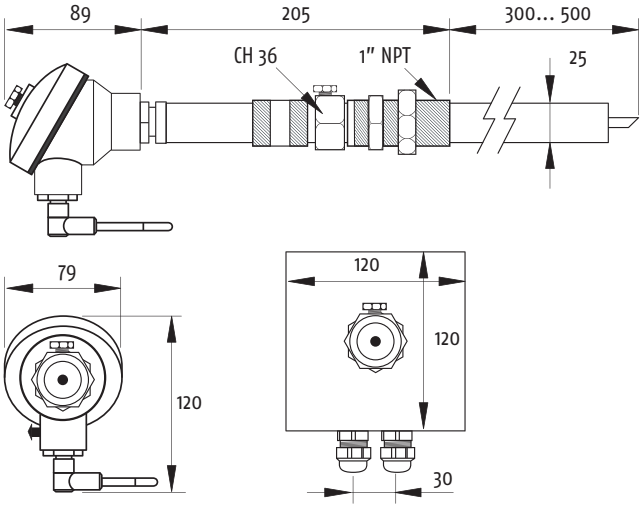
How to order

ZO2-E-300	Zirconium oxide probe with external electronics Probe length = 300 mm
ZO2-E-500	Zirconium oxide probe with external electronics Probe length = 500 mm

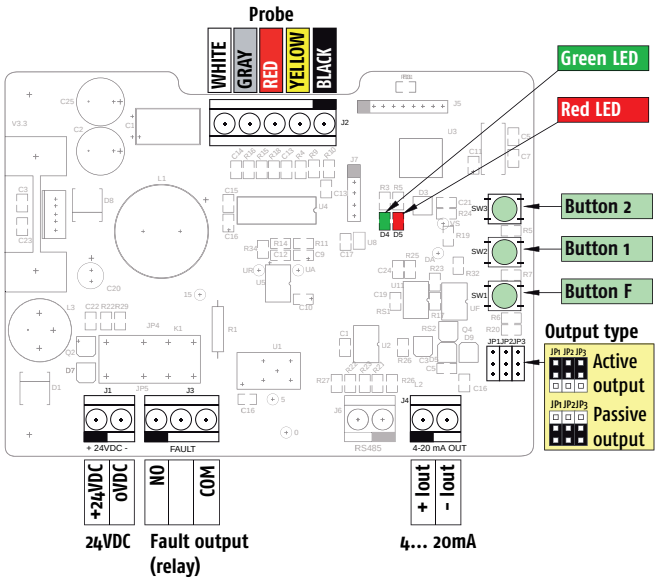
Usage



Dimensions (mm)



Electrical connections



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Z02-E-C100 PROBE

Extractive zirconium oxide probe for direct and continuous residual oxygen percentage measurement in the flue gas under critical process conditions.

Equipped with external electronic, generates directly a linear 4... 20 mA output with active or passive output selectable by jumpers.

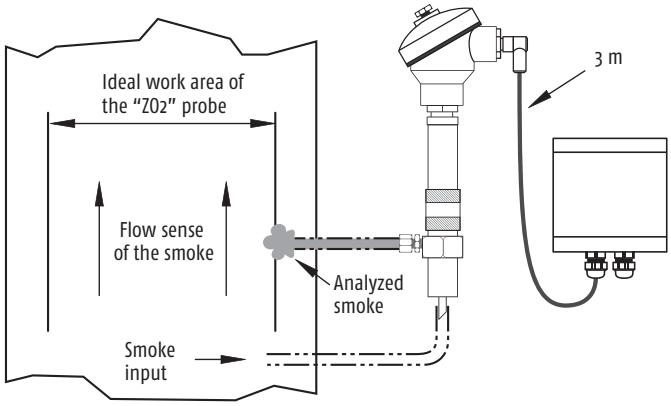
Main functions of electronic card are:

- Management of the sensor and the built in heater;
- Range settings;
- Calibration;
- Signal output adjustment.

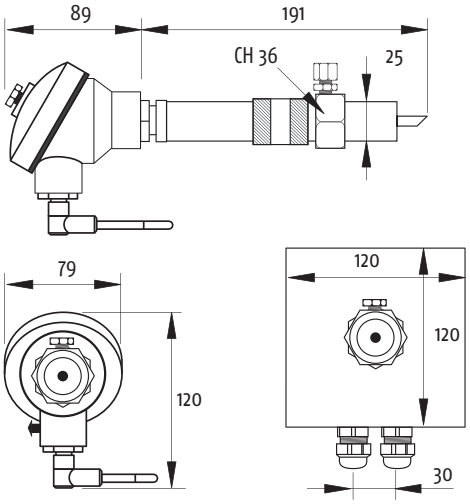
How to order

Z02-E-C100	Extractive zirconium oxide probe with external electronics

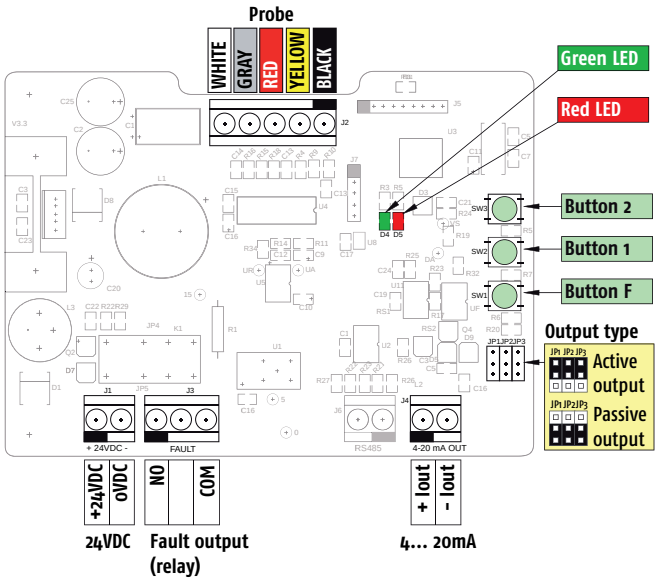
Usage



Dimensions (mm)



Electrical connections



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EVERYTHING UNDER CONTROL

OX SERIES MONITOR AND CONTROLLER

TECHNICAL DATA

	OXM	OXR
Main analogue input	mV from the ZO2 probe (0.2 % ±1 digit) or 4... 20 mA linearised with range 0.0... 20.9%	
Auxiliary analogue inputs	2 x 4... 20 mA from air and flue gases temperature	4... 20 mA boiler load
Main analogue output	4... 20 mA/0... 10 V settable for: O2%, fgT, Air temp, CO2%, η, λ	4... 20 mA/0... 10 V uscita di regolazione
Auxiliary analogue output		4... 20 mA/0... 10 V per O2%
Digital inputs and related functions	3 digital inputs: Hold, Fail, fuel switching	4 configurable digital outputs: Hold, Fail, fuel switching, stored SP recall, Auto/man
Alarm outputs	2 NO relay, 250 Vac/5 A configurable	3 NO relay, 250 Vac/5 A configurable 1 NO relay, 250 Vac/5 A (failure)
Serial communications (optional)	RS485 (2 wires) Modbus, J Bus, BaudRate 9600 max.	
Power supply	100... 240 Vac, 50/60 Hz or 16... 28 Vac, 50/60Hz and 20...30 Vdc	
Current consuption	4 VA	
Ambient temperature	0... 50°C	
Ambient humidity	35... 85% RH	
EMC	IEC801-2, 801-3, 801-4: level 4	
Mounting	Front panel mounting	
Front panel protection degree	IP 54 Standard (IP65 with optional kit)	
Dimensions	48 x 96 x 150 mm	

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EVERYTHING UNDER CONTROL

OXM COMBUSTION MONITOR

How to order

Model
OXM -= Combustion Monitor

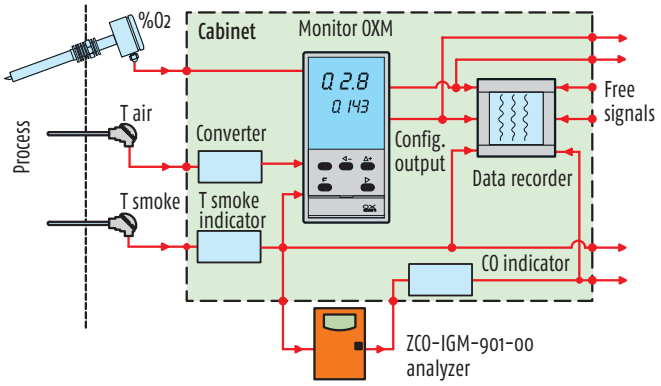
Power supply
3 = 100... 240 VAC
5 = 24 VAC/DC

Serial communications
0 = None
3 = RS485 Modbus

Output Y1
1 = 4... 20 mA
2 = 0... 10 V

Output Y2
1 = 4... 20 mA
2 = 0... 10 V

Application example



Acquiring the measurement of residual oxygen in the flue gas, the monitor calculates:

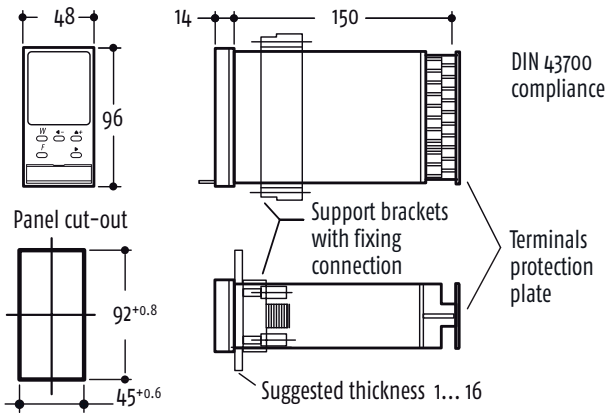
h Efficiency;

l Air excess;

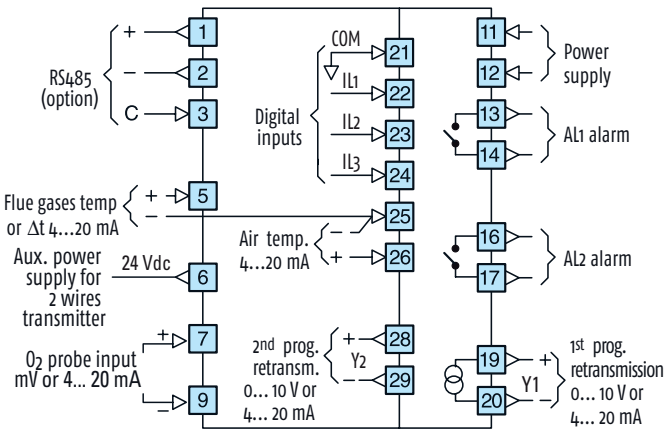
%CO2 Carbon dioxide.

It is possible calculate continuously the combustion process in terms of safety and energy saving.

Dimensions (mm)



Electrical connections



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COMBUSTION CONTROL

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EVERYTHING UNDER CONTROL

OXM OXIGEN "TRIM" CONTROLLER

How to order

Model
OXR = Oxigen "TRIM" controller

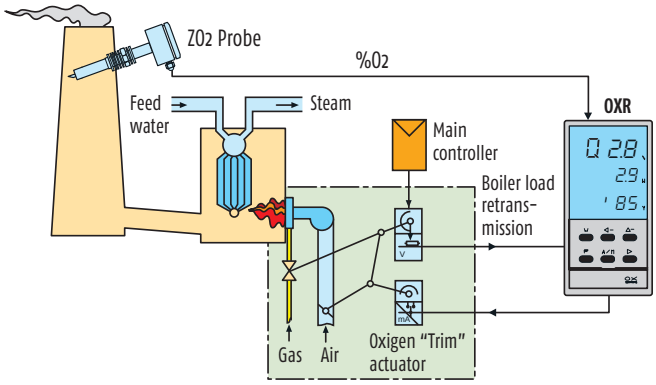
Power supply
3 = 100... 240 VAC
5 = 24 VAC/DC

Serial communications
0 = None
3 = RS485 Modbus

Output Y1
1 = 4... 20 mA
2 = 0... 10 V

Output Y2
1 = 4... 20 mA
2 = 0... 10 V

Application example

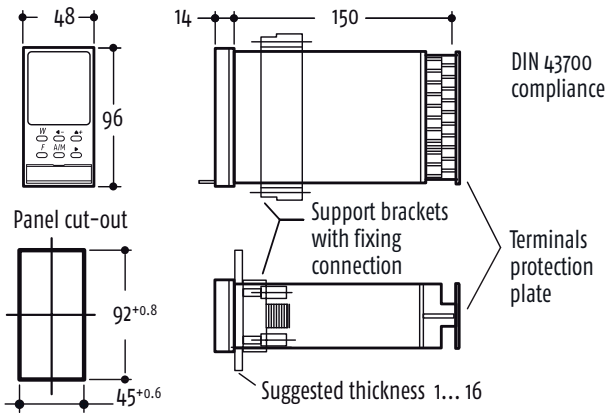


The oxygen "trim"controller continuously optimizes the air/fuel ratio acting on the air quantity adjustment according to load.
This optimization is related to the oxygen content in the flue gases.

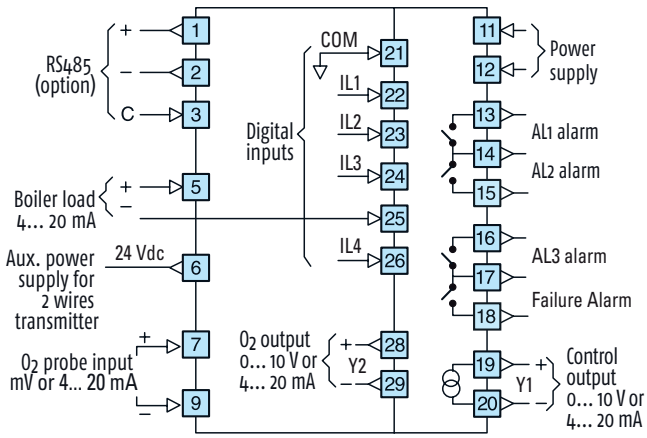
This enable to save fuel consumption reducing the chimney flue heat loss and to guarantee more energy transfer in the combustion chamber.

It is possible to select, up to 2 curves of 4 segments each (depending on fuel characteristics) to perform a corrective action during the load changes.

Dimensions (mm)



Electrical connections



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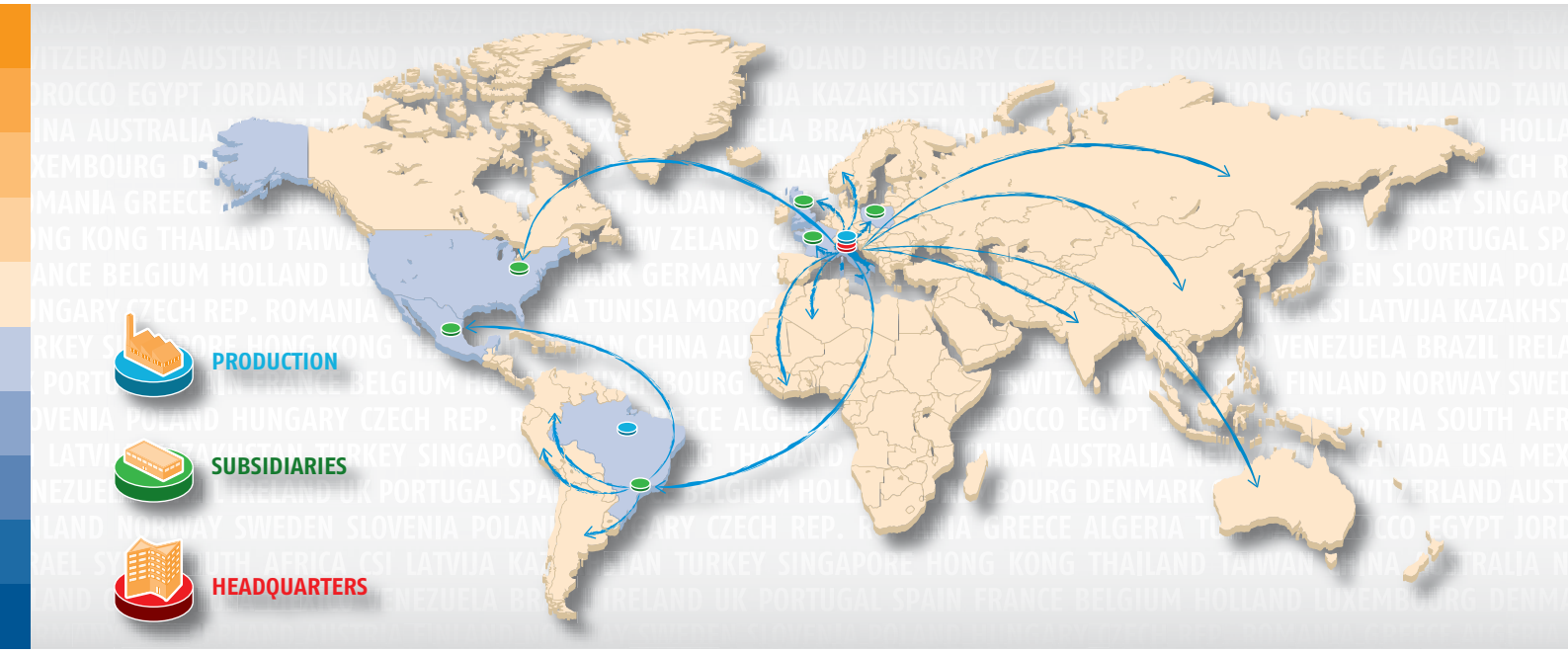

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