



Oxygen Measuring Systems

Measuring Head MF 420-O

The Powerful System for Industrial Applications

Self Regulating and Error Protected

The measuring head MF 420-O was developed for use in insitu measurement, control and monitoring systems. The measuring technique of the sensor is self regulating and error protected and therefore perfectly suited for applications where the sensor is not easily accessible and maintenance is costly.

Fields of applications include:

- Furnaces
- Industrial heating facilities
- Industrial combustion facilities
- Garbage incinerating plants
- Devices for the measurement of efficiency of combustion processes
- Industrial process control systems
- Farming (in silos)
- Medicine
- Compost formulation plants
- Biotechnology

Advantages and benefits:

- Linear output signals
- Very high measuring precision
- Low energy consumption
- Independent of temperature
- Does not depend on the mixture of the gas to be measured
- Very high life expectancy
- Flexible in use
- Adaptable to client specifications



Functionality of Oxygen Measuring System

The dynamic sensor measures oxygen without using a reference gas. The sensor is comprised of two zirconium dioxide discs which are covered at both sides with a platinum ring. An additional Al_2O_3 coating protects the sensor from environmental influence and increases its life expectancy. The chamber is filled with a gas with unknown partial pressure of oxygen.

One disc is connected with a reversible source of current. It is used as an electrochemical oxygen pump. Via the opposite disc the partial pressure of oxygen is detected by measuring the induced Nernst potential.

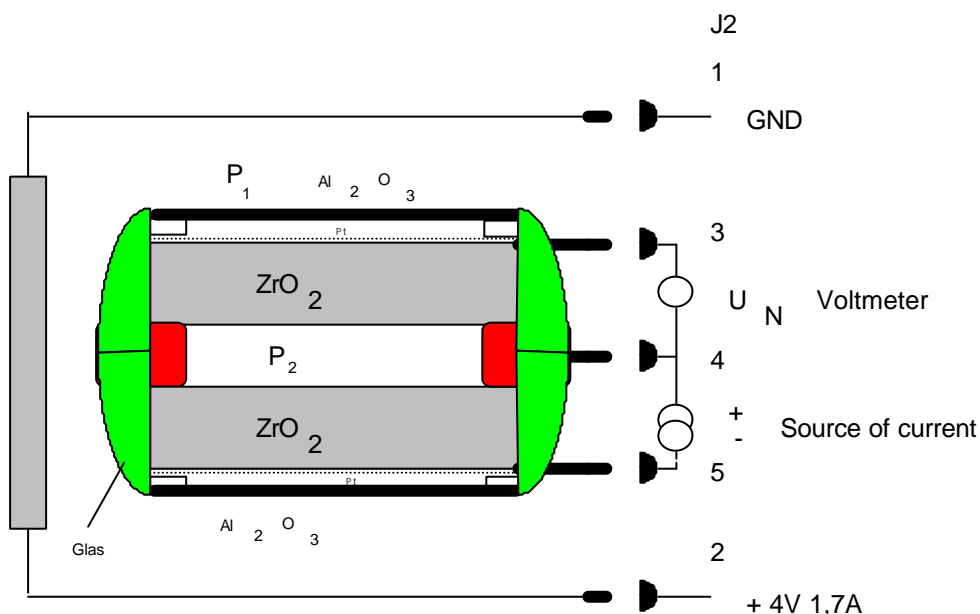


Figure 1: Oxygen sensor

Via the source of electrical current the chamber is evacuated. The partial pressure P_2 will then change linear with the transported electrical charge. This increases the electric potential at the opposite disc. When the electric potential reaches a certain threshold the polarity changes. Oxygen ions are subsequently pumped back into the chamber and partial pressure P_2 increases. After reaching a certain threshold the polarity changes again. This process is repeated periodically. The time for one period is linearly proportional to the partial pressure of oxygen. This principle enables a permanent control of the sensor. Therefore the sensor is error protected.

Technical Data

Transmitter		
Power supply J1	Connector	09-0107-80-03
	Socket	09-5106-15-03
	Voltage	24 V DC
	Current	650 mA
Sensor J2	Connector	09-5117-15-05
	Socket	09-0116-90-05
Output signal J3	Connector	09-5613-15-05
	Socket	09-0120-80-05
	1	Impulse
	2	GND
	3	GND
	4	0-10 V, linear, Impedance 1.8 k
	5	4-20 mA, linear
Resolution	12 bit	
Temperature	-10 to +50°C	
Housing protection	IP 54	
Weight	1,2 Kg	
Housing	Aluminium	
Size	152 x 85 x 65 mm	
Sensor		
Heating-up time	approx. 5 min	
Measuring range	0.1 to 25 % Vol O ₂ *	
Accuracy	± 1 % O ₂	
Repeatability	<± 1 %	
Temperature	up to +450°C	
Exhaust gas velocity	up to 10 m/s	
Reaction time	approx. 3 s	
Tube	Length	380 mm, 780 mm, 1500 mm
		Please state with order
	Diameter	12 mm
	Material	V2A
Sensor protection	IP 40	

* Other ranges of request.

Ordering code: e.g.

MF 420-O-450-380

Temperature

Probe length

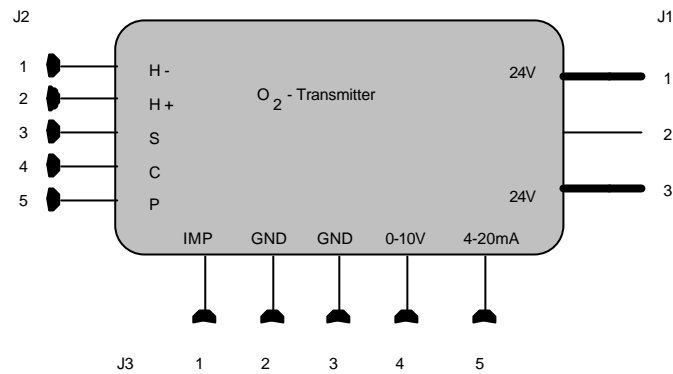


Figure 2: Oxygen transmitter

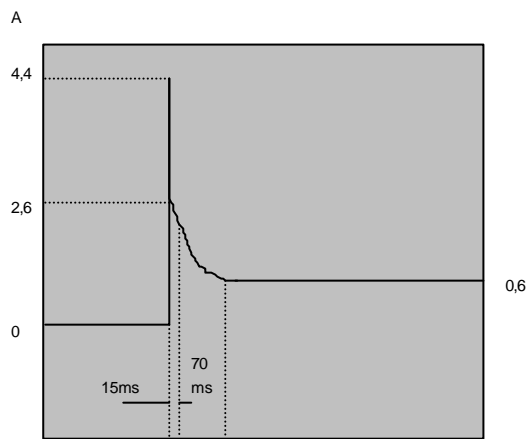


Figure 3: Switching on current

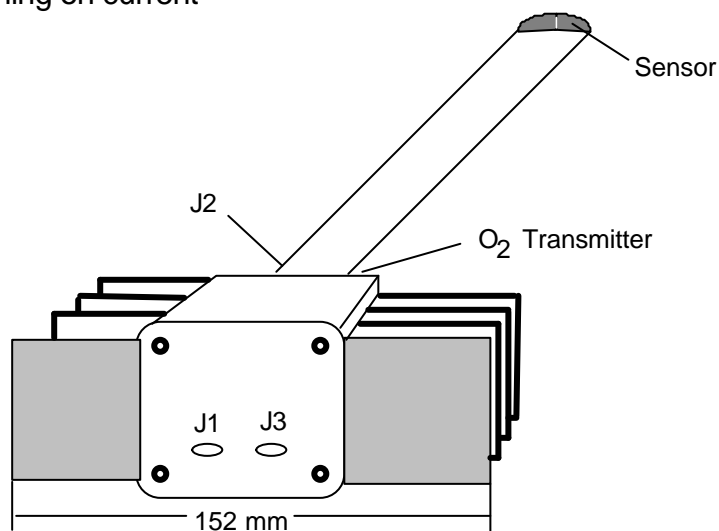


Figure 4: Oxygen measuring system

Technical details subject to change

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