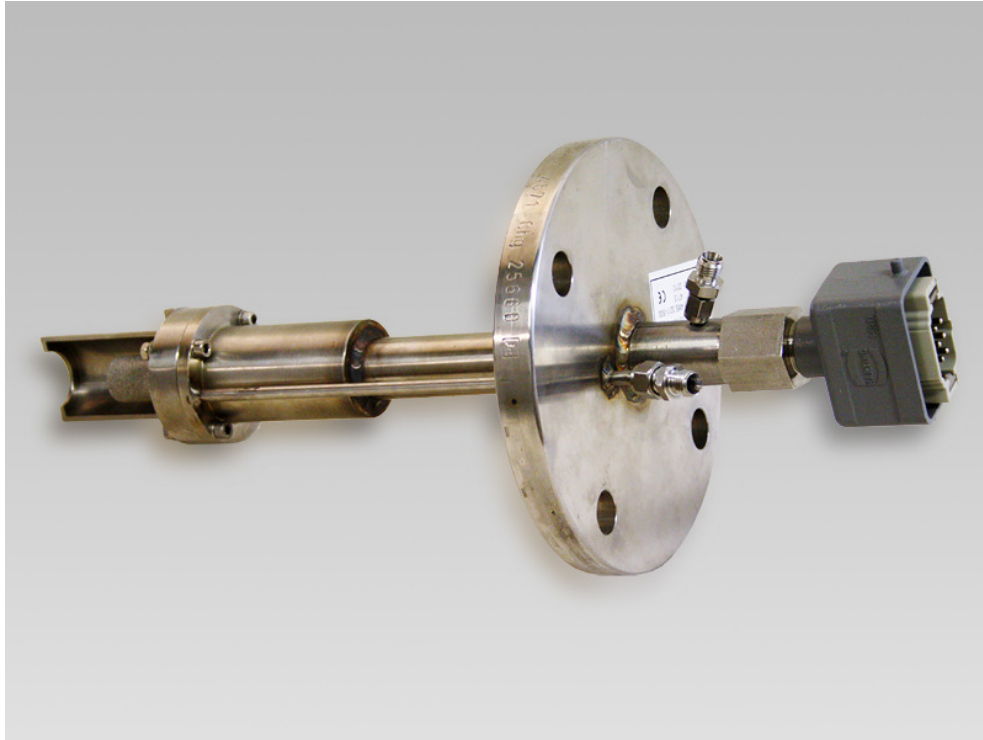


## **O<sub>2</sub> + CO<sub>e</sub> In-Line Flue gas probe AMS 3211-1500**



### **The Application:**

Complex combustion systems and processes require besides a fast In-Situ O<sub>2</sub>- measurement to control the combustion, a quality measurement to adjust the combustion system at a level which avoids the generation of CO. The control level around the point of CO generation is the optimum of the combustion. AMS offers for this application the CO<sub>e</sub> In-Line Flue gas probe AMS 3211-1500 with a dual sensor which allows the measurement of O<sub>2</sub> and unburnt Hydrocarbons. The unburnt Hydrocarbons are measured as CO equivalent (CO<sub>e</sub>). Due to the fast response of the dual sensor the plant control can make use of the additional control value CO<sub>e</sub>. The CO<sub>e</sub> In-Line Flue gas probe AMS 3211-1500 can be operated with the Transmitter AMS 3220. The Transmitters is available as Twin-Version to supply separate signals for O<sub>2</sub> and CO<sub>e</sub>.

### **The Measuring principle:**

The Sensor of the CO<sub>e</sub> In-Line Flue gas probe AMS 3211-1500 is made of a electrochemical solid electrolyte sensor of partially stabilised Zircon dioxide ceramic. The sensor has three electrodes:

- O<sub>2</sub>-sensitive Platinum electrode
- CO / H<sub>2</sub>-sensitive electrode made of Platinum / Precious metal alloy
- Platinum reference electrode

The measurement of CO<sub>e</sub> with the CO<sub>e</sub> In-Line Flue gas probe AMS 3211-1500 is not a CO measurement in the classical sense. The Flue gas probe AMS 3211-1500 measures in-situ the concentration of the sum of all combustible (oxidising) flue gas components such as CO and H<sub>2</sub>. The result of the measurement is displayed as CO<sub>e</sub>. In applications with a known fuel at a constant composition the true CO concentration can be determined within limits. The CO<sub>e</sub> In-Line Flue gas

probe AMS 3211-1500 can be used for the measurement of O<sub>2</sub> and CO<sub>e</sub> in Natural gas, Fuel Oil # 4, Lignite and Hard coal. The measuring range of the component CO<sub>e</sub> is 1000 PPMv. For a quality measurement this range is quite sufficient, since the main purpose of the measurement is to avoid the generation of Carbon Monoxide. Due to the physical dimensions the sensor for measurement of O<sub>2</sub> and CO<sub>e</sub> can also be utilised with all other flue gas probes of AMS.

## **The measuring system:**

Typically continuous Oxygen measuring systems are consisting of a Flue gas probe with built in Zircon dioxide sensor, a Transmitter and a Pneumatic unit. The Pneumatic unit supplies continuously instrument air to the Zircon dioxide sensor which serves as Reference air. Via a second gas inlet port at the probe flange the Zircon dioxide sensor can be supplied with calibration gas to verify and correct the calibration of the sensor in regular intervals. The Pneumatic unit and the Flue gas probe are connected by two high pressure pneumatic hoses. A multi wire, protected cable connects the Transmitter to the Flue gas probe electronically. To calibrate the CO<sub>e</sub> In-Line Flue gas probe AMS 3211-1500 both components O<sub>2</sub> and CO have to be verified against a certified standard gas.

## Technical Data

ZrO <sub>2</sub> probe	<b>AMS 3211-1500</b>
Measuring principle	O <sub>2</sub> -CO <sub>e</sub> -Sensor
Application	Residual oxygen in flue gas
Construction	ZrO <sub>2</sub> -CO <sub>e</sub> -Sensor installed in the tip of the probe with stainless steel sintermetalfilter screwed on
Flue gas temp., max.	≤ 400 °C, short time to 450 °C
Dust content (flue gas)	max. 5 Gram / Nm <sup>3</sup> , if higher : shield to protect against abrasion or separate protecting tube
Flue gas velocity	max. 20 m/Sec., if higher shielded to protect against abrasion or separate protecting tube
Time for pre-heating	~ 10 Minutes
T <sub>90</sub> -Time	< 10 Seconds
Reaction time	< 2 Seconds
Probe length	150 – 3000 mm
Material	Stainless steel 1.4541, Inconel 600
Installation in the stack	pointing downward
Connecting flanges	DN 65 PN 16, DN 80 PN 16 (larger on request)
Protection	IP65
Reference air supply	by separate pneumatic unit
Calibration gas supply	by separate pneumatic unit
Weight	ca. 6,5 kg
Accessories	
Transmitter	AMS 3220 in housing IP 65 Transmitter in twin-configuration
Pneumatic unit	GRP housing, Dimensions: 800 x 600 x 300 mm Back purge, Auto-calibration
Version: AMS 3211-1500 E V-2013-07	

Specifications subject to change.