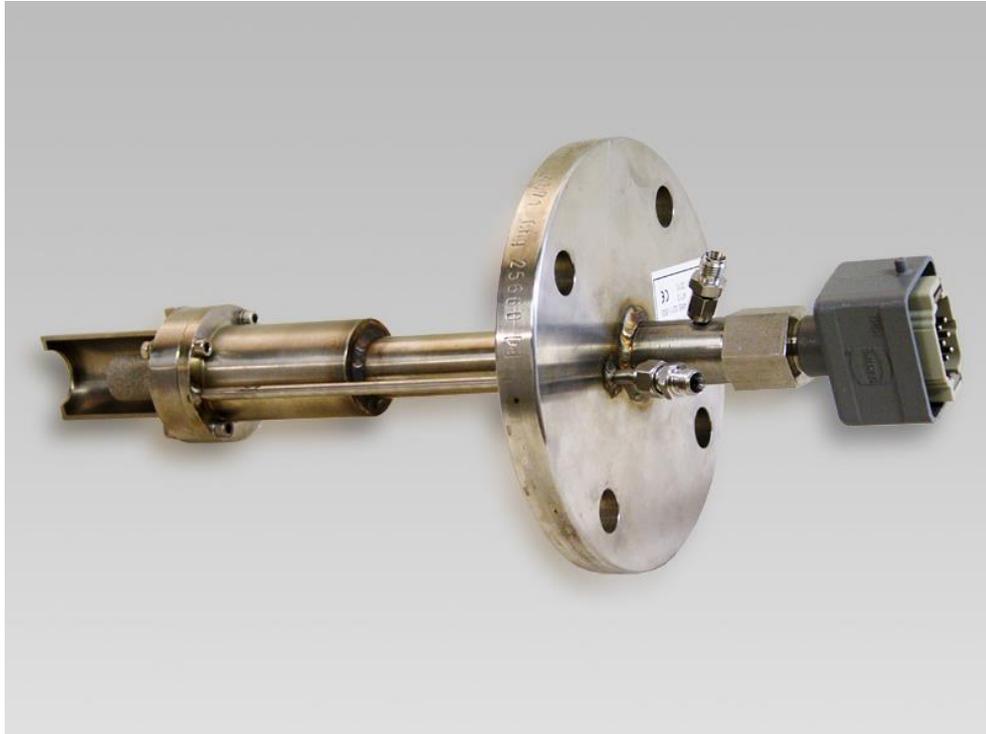


O₂ + CO_e In-Line Flue gas probe AMS 3211-1500



The Application:

Complex combustion systems and processes require besides a fast In-Situ O₂- 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_e In-Line Flue gas probe AMS 3211-1500 with a dual sensor which allows the measurement of **O₂ and unburnt Hydrocarbons**. The unburnt Hydrocarbons are measured as CO equivalent (CO_e). Due to the fast response of the dual sensor the plant control can make use of the additional control value CO_e. The CO_e In-Line Flue gas probe AMS 3211-1500 can be operated with the Transmitter AMS 5200. The Transmitters is available as Twin-Version to supply separate signals for O₂ and CO_e.

The Measuring principle:

The Sensor of the CO_e 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:

- O₂-sensitive Platinum electrode
- CO / H₂-sensitive electrode made of Platinum / Precious metal alloy
- Platinum reference electrode

The measurement of CO_e with the CO_e 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 H₂. The result of the measurement is displayed as CO_e. In applications with a known fuel at a constant composition the true CO concentration can be determined within limits. The CO_e In-Line Flue gas

probe AMS 3211-1500 can be used for the measurement of O₂ and CO_e in Natural gas, Fuel Oil # 4, Lignite and Hard coal. The measuring range of the component CO_e is 3000 ppm. 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 O₂ and CO_e 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_e In-Line Flue gas probe AMS 3211-1500 both components O₂ and CO have to be verified against a certified standard gas.

Technical Data

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| ZrO2 probe | AMS 3211-1500 |
| Measuring principle | O2-COe-Sensor |
| Application | Residual oxygen in flue gas |
| Construction | ZrO2-COe-Sensor installed in the tip of the probe with stainless steel sintermetalfilter screwed on |
| Flue gas temp., max. | ≤ 500 °C, short time to 550 °C |
| Dust content (flue gas) | max. 5 Gram / Nm3, 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 |
| T90-Time | < 10 Seconds |
| Reaction time | < 2 Seconds |
| Probe length | 150 – 3000 mm |
| Material | Stainless steel 1.4541, Option: Inconel 600 |
| Installation in the stack | pointing downward |
| Connecting flanges | DN 65 PN 16, DN 80 PN 16 (other 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 Pneumatic unit | AMS 5200 TWIN in housing IP 65 GRP housing, Dimensions: 600 x 600 x 200 mm Back purge, Auto-calibration |
| Version: AMS 3211-1500 E V-2021-08 | |

Specifications subject to change.