

ZrO₂-Probes for Flue gas measurement

For the measurement of oxygen concentrations in flue gases, ISATEC offers an extensive range of probes, for standard to extreme applications and rough ambient conditions.

ISATEC 3211-500 Standard in-line probe for temperatures up to 500 °C, immersion depth up to 3000 mm

The standard in-line probe ISATEC 3211-500 is equipped with a ZrO₂ sensor, located in the tip of the probe. The probe can be used in applications with solid, liquid and gaseous fuels. In applications with solid fuels and biomass the probe ISATEC 3211-500 is equipped additionally with a protective tube to avoid abrasion. For applications in corrosive gases all gas wetted parts are made of INCONEL 600. The standard in-line probe ISATEC 3211-500 is designed for flue gas temperature up to 500 °C.

ISATEC 3211-600 Semi-extractive high temperature probe up to 1700 °C, immersion depth up to 1000 mm

The ZrO₂ flue gas probe ISATEC 3211-600 is designed for process applications with temperatures of up to 1700 °C. To protect the ZrO₂ sensor against the influence of the high temperature the sensor is located in the flange of the probe. With an integrated pneumatic pump, the process gas is fed to the sensor. This kind of construction guarantees easy service since the probe does not have to be dismantled to replace the ZrO₂ sensor.

ISATEC 3211-700 for high-purity gases Semi-extractive high temperature probe up to 1100 °C, immersion depth up to 2000 mm

The ZrO₂ flue gas probe ISATEC 3211-700 is designed for process applications with temperatures of up to 1400 °C in combination with a dust load of less than 2 g/m³. A pitot tube feeds the process gas to the ZrO₂ sensor which is built into the flange of the probe ISATEC 3211-700. A bore hole in the head of the probe provides ambient air as reference air for the sensor. Due to this unique construction the high temperature probe ISATEC 3211-700 does not require instrument air during the measurement.

ISATEC 3211-860/150 Ex Zone 1 ISATEC 3210-860/150 Ex Zone 2 ATEX-certified in-line probe for temperatures up to 500 °C, immersion depth up to 860 mm

The in-line flue gas probe ISATEC 3211-860/150 Ex zone 1 is equipped with a ZrO₂ sensor located in the tip of the probe.

The flue gas probe ISATEC 3211-860/150 Ex can be used for the measurement of oxygen in flue gases from gaseous, liquid and solid fuels and biomass in Ex zone 1.

For applications with solid fuels and biomass the in-line flue gas probe ISATEC 3211-860/150 Ex is equipped with an additional stainless-steel tube, to protect the probe against abrasion.

ISATEC 3210-860/150 Ex zone 2 is designed for use in Ex zone 2.1

Features:

- ⇒ Longer life expectancy of the ZrO₂ sensor due to the reduced thermal load
- ⇒ Fast and easy sensor replacement
- ⇒ Flanges are available in DIN or ANSI sizes



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TECHNICAL SPECIFICATIONS

Measuring principle	ZrO ₂ sensor with P-t electrodes
Application	Residual oxygen in glue gas
Flue gas temp. max	ISATEC 3211-500 : 500°C ISATEC 3211-600 : 1700°C ISATEC 3211-700 : 1400°C ISATEC 3211-860/150 : 500°C ISATEC 3210-860/150 : 500°C
Dust content (flue gas)	ISATEC 3211-500/600/860 + 3210-860/150 : max. 5 Gram/Nm ³ ISATEC 3211-700 : max. 2 Gram/Nm ³
Flue gas velocity	ISATEC 3211-500/600/860 + 3210-860/150 : 20m/sec ISATEC 3211-700 : 0.5m/sec
Time for pre-heating	~ 10 minutes
T-90 Time	ca. 10/20 Seconds
Reaction Time	ca. 2/5 Seconds
Probe length	ISATEC 3211-500 : 150-3000mm ISATEC 3211-600 : 150-1000mm ISATEC 3211-700 : 300-2000mm ISATEC 3211-860/150 : 150-860mm ISATEC 3210-860/150 : 150-860mm
Connection flanges	ISATEC 3211-500 : DN 65 PN 16, DN 80 PN 16 ISATEC 3211-600/700 : DN 80 PN 16, DN 100 PN 16 ISATEC 3211-860/150 + 3210-860/150 : DN 80 PN 40
Material	ISATEC 3211-500/860 + 3210-860/150: Stainless Steel ISATEC 3211-600: Ceramic, Kanthal ISATEC 3211-700: Kanthal
Reference air supply	ISATEC 3211-500/600/860 + 3210-860/150: by separate pneumatic unit ISATEC 3211-700: by diffusion of ambient air to the sensor through a hole in the probe head
Calibration gas supply	by separate pneumatic unit
Protection class	IP65
Weight	ISATEC 3211-500/600/700 : ca. 6,5Kg ISATEC 3211-860/150 + 3210-860/150 : ca. 10,5Kg