



System overview

Lambda transmitter LT3-Ex
Lambda probe LS2-Ex
Combination probe KS1D-Ex

Sensors and systems for combustion engineering



www.lamtec.de

LAMTEC Measuring System LT3-Ex KS1D-Ex.

The explosion-proof package solution for simultaneous CO/O₂ measurement or pure O₂ measurement.

With the LT3-Ex lambda transmitter, LAMTEC provides customers with a simple device for the simultaneous measurement of oxygen (O₂) and oxidising gas components (CO_e) in an explosion-protected (Ex) design.

The LAMTEC Lambda Transmitter LT3-Ex in combination with the Lambda Probe LS2-Ex or the Combi Probe KS1D-Ex is a universally applicable microprocessor-based measuring device. Both the transmitter and the probes are designed in the ignition protection type „flameproof enclosure“ (Ex d), so that the use of the entire system in hazardous areas of zone 1 or 2 is possible. This transmitter was specially developed for the simultaneous measurement and detection of the O₂ concentration and oxidising gas components CO_e (CO/H₂) in flue gases of combustion plants in the superstoichiometric range ($\lambda > 1$). The measured value CO_e (e = equivalent) represents a sum signal of all oxidising exhaust gas components such as CO and H₂. Alternatively, the LAMTEC probe LS2 can be used for pure oxygen measurement (O₂).

Advantages:

- Direct (in situ) measurement of oxygen (O₂) and detection of oxidising exhaust gas components CO_e (CO/H₂) in crude gas up to 1,400 °C
- O₂ measurement range: 0 - 21 vol. %
- CO_e measurement range: 0 - 1,000 ppm
- Not affected by false air (CO_e)
- No gas preparation required, measurement directly in the moist flue gas
- Adjustment time to 60%/90% value
(T₆₀): O₂ ca. 50 s, CO_e ca. 60 s
(T₉₀): O₂ ca. 130 s, CO_e ca. 140 s
- Low-maintenance



Operation with pen

The LT3-Ex evaluates the voltage values of two measurement electrodes U_{O₂} (oxygen characteristic) and the mixed potential (U_{O₂} + U_{CO/H₂}). The KS1D's outputs for O₂ and CO_e measurement are dynamic with fast responses. This makes simultaneous measurement and detection of CO_e (CO/H₂) and O₂ using the LAMTEC Transmitter LT3-Ex is therefore superior against O₂ measurement alone in insensitivity and reaction time and provides firstclass basic for control of fuel and air afterwards.

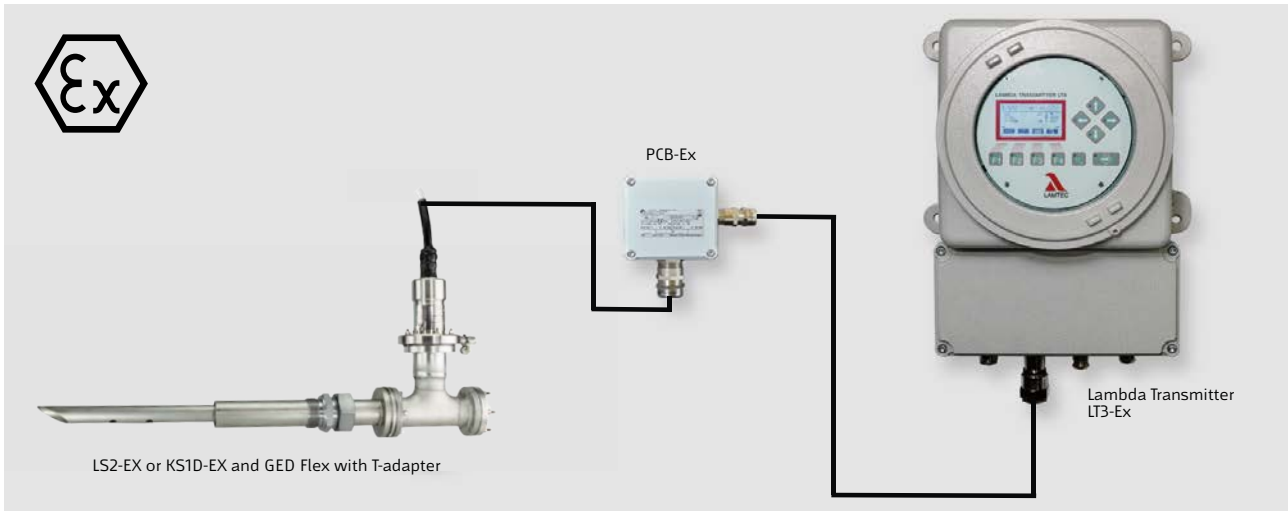
Measurement principle for LS2-Ex / KS1D-Ex :

The LAMTEC KS1D Combination Probe is based on a heated electrochemical measuring cell made from zirconium dioxide ceramic (ZrO₂).

It has 3 electrodes:

- O₂ electrode (platinum)
- CO_e electrode (platinum/noble metal)
- Reference electrode (platinum)

The probe is a zirconium dioxide ceramic tube that is sealed on one side. It protrudes into the combustion system's emission channel and divides the reference gas compartment (surrounding area) and the measuring gas compartment (emission channel) so that it is hermetically sealed.



Functional overview LT3-Ex with KS1D-Ex, as well as optional probe connection box PCB for extension.

Basic system.

Lambda Transmitter LT3-Ex

Specification:

Ex d IIC T5 Gb (-20°C <Ta< + 55°C) | LCIE 13 ATEX 3066 X



Lambda Transmitter LT3-Ex with PCB and main switch

The device is operated using a magnetic pin with the housing closed so that no special measures are required during operation in explosive atmospheres.

The magnetic panel has the following functions:

- Reading of O₂ and CO measured values
- Information on the probe and fuel, warnings and faults, software version, CRC and serial number
- Adjustment of the measurement
- Settings for maintenance, filter time, analogue output, probe exchange, display, other function and parameter settings.

On the underside of the unit there are cable bushings for the following connections:

- Supply voltage
- Probe connection KS1D (probe signal/probe heating)
- External LSB connection for PC (use of LSB remote software)
- Cable bushing for connection of LAMTEC SYSTEM BUS
- Cable bushing for connection of LSB modules

Probes



Lambda probe LS2-Ex or combination probe KS1D-Ex.



Lambda probe LS2-Ex or combination probe KS1D-Ex with GED FLEX.

Combination Probe KS1D-Ex

Specification:

II2G Ex d II2B+H2 T3 (Ta: -20 °C bis 60 °C)
LCIE 13 ATEX 3045X IECEx LCIE 13.0027X



The LAMTEC probes support both O₂ measurement (LS2 Lambda Probe) and simultaneous measurement (KS1D Combination Probe) of O₂ concentration and combustible oxidising gas components (CO/H₂), displayed as CO_e (CO equivalent).

Lambda Probe LS2-Ex /

Combination Probe KS1D-Ex with GED FLEX

Specification

- Ideal flue gas velocity: 0.1 - 30 m/s
- Flue gas temperature depending on material: ≤ 1400 °C
- Dust concentration: ≤ 1000 mg/m³
- Adjustment possible during operation by means of test gas.
- The immersion depth can be adjusted variably.
- The GED FLEX can be blown out or fitted with an ejector using a suitable T-adapter.
- Protection class IP65.
- ATEX: Ex II 2 G Ex d IIB+H2 T3 Gb(-20 to +60 °C).

Areas of application:

- Natural gas, EL heating oil, S heating oil, coal, special fuels.

Optional components.

PCB probe connection box

Specification:



II 2GD Ex e IIC T5 Gb (-20°C < Ta < + 55°C)
Ex tb IIIC T100 Gb IP66
CESI 03 ATEX 333

The LAMTEC PCB probe connection box is designed to bridge longer distances between LT3-Ex and probe without an extension cable (> 2 metres).



PCB probe connection box

ATEX connection cable/extension for Lambda probe LS2-Ex and combi probe KS1D-Ex

For the connection between the Lambda Special LS2-Ex or the combiprobe KS1D-Ex and the probe connection box PCB, an additional connection cable/extension is available.



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