System Overview

CarboSen1.000K
CarboSen10.000K

Sensors and Systems
for Combustion Engineering

LAMTEC

1   Product description

1.1   General

CarboSen1.000K / CarboSen10.000K is a new development for applications of small and medium size in combustion plants. The new designed housing is heat-resistant up to 200 °C and unaffected of condensing humidity. This makes this type of sensor suitable particularly for condensing boilers and devices or in flue gases of fuel cells.

This new technology provides the opportunity to integrate the sensor in the housing in a most affordable way.

1.2   CarboSen1.000 Characteristic

As the graphic below shows, CarboSen has a logarithmic, characteristic curve for the range $\lambda > 1$. This allows the detection of smaller amounts of CO_e/H_2 concentration.

If the stoichiometric Lambda is smaller than 1, i. e. the media contains less oxygen as for a complete oxidation of CO_e/ H_2 is necessary, the sensor signal drops again and becomes negative in extreme cases. Beside the typic, sharp increasing edge, this falling edge of the characteristic may be used as a safety function for control strategies. The missing oxygen reference causes this falling edge, as it is known from YSZ-based sensors.

The characteristic depends on the sensor's temperature beside oxygen.
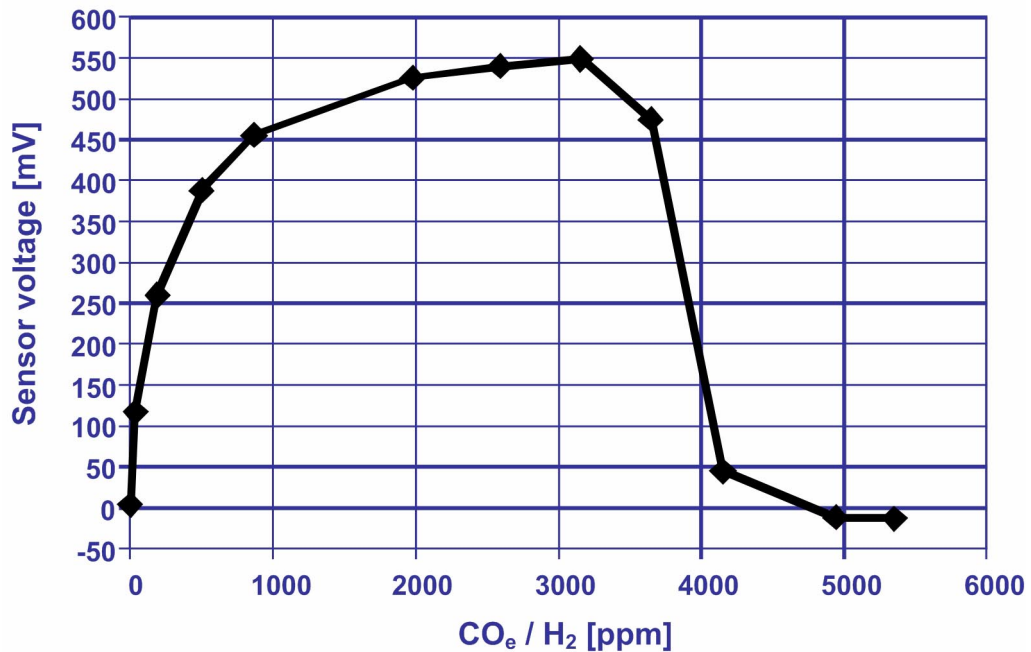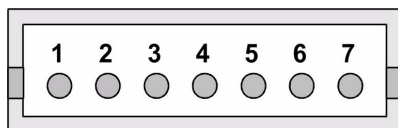

Fig. 1-1 CarboSen1.000 characteristic

CarboSen10.000's characteristic looks similar as the above shown characteristic.
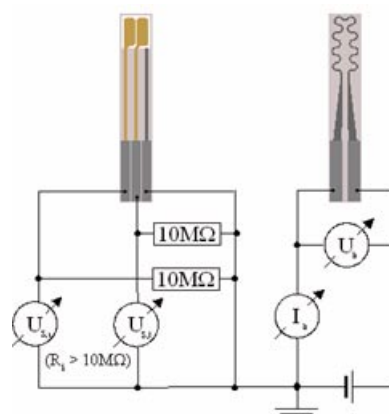
1.3   Connecting Diagram

The following figures show the connecting plug's terminal assignment and the sensor's symbolic circuit. Therefor we remark that four terminals are intended for heating to provide a 4-

1   Product description

wire measurement if needed.
This is not required.

1   (brown) heating contact 1
2   (blue) heating contact 1, 4-wire
3   (green) heating contact 2
4   (pink) heating contact 2, 4-wire
5   (yellow) measuring electrode 1
6   (grey) measuring electrode 2
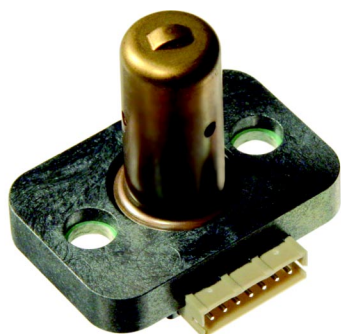7   (white) reference electrode

1.4   Technical Data

Fig. 1-2 Housing

Fig. 1-3 Sensor

Housing	
Dimensions [mm]	28 x 22 x 29
Mounting	2 screws M4
Material	Vectra /stainless steel
Temperature range	-20 ... +150 °C (short peaks up to 200 °C)
Connection	Plug-in connector, cable 7 x 0,14 mm^2

Sensor	
Measuring range	up to 3.000 ppm CO_e/H_2 (CarboSen1.000), perfect resolution up to 1.000 ppm up to 2 % CO_e/H_2 (CarboSen10.000), perfect resolution up to 1 %
Sensor voltage	-20 ... 700 V
Voltage tap	>10 MΩ
Power supply	12 V, PWM, reverse polarity
Consumption	3 W rated

2 Ordering Information

Description/Type	Order no.
CarboSen1.000K, measuring range up to 3.000 ppm CO_e/H_2, perfect resolution up to 1.000 ppm	658R0050
CarboSen10.000K, measuring range up to 2 % CO_e/H_2, perfect resolution up to 1 %	667R1320-1
Accessories/Spare Parts	
Connecting cable, 2m	658P0081
Sealing	658P0084
Sensor electronic	658R0107
Power pack 230 VAC – 24 VDC/1,5 A, 30 W, DIN-rail	658R0109
Programming unit for CarboSen (kit)	658R0932

The information in this publication is subject to technical changes.