

Technical Data Combination Probe KS1 without Housing



Fig. 1-1 Combination Probe KS1 without housing

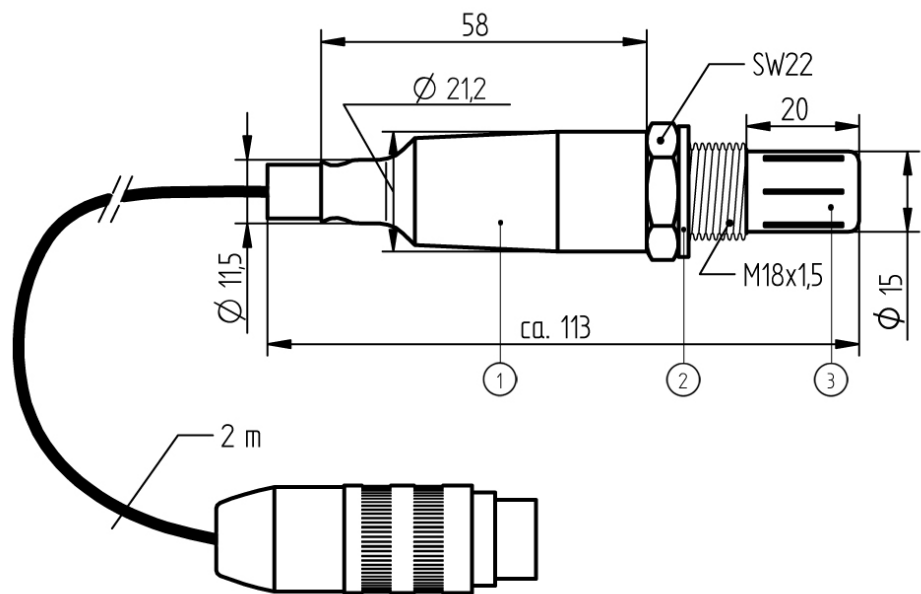


Fig. 1-2 Dimensional drawing KS1 combination probe without housing

No.	Description	Order no.
1	KS1 combination probe without housing	656R0010T
2	sealing washer	
3	probe head	

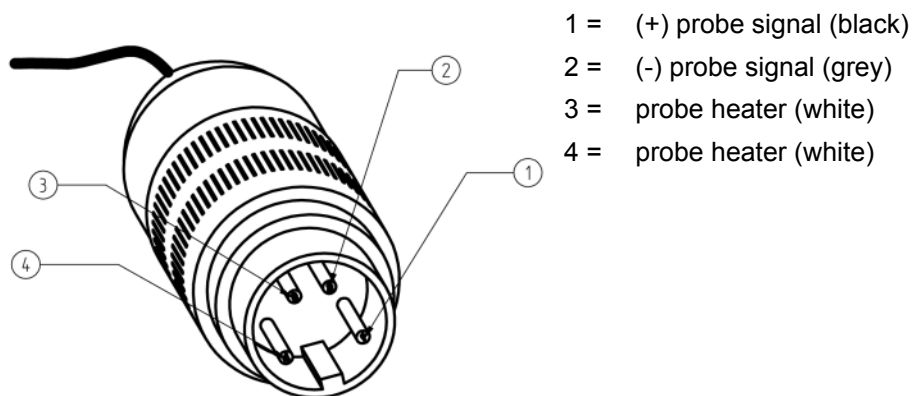


Fig. 1-3 Terminal assignment plug

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Technical Data *	
Measuring range	0 ... 10.000 ppm
Measuring precision	± 25 % of measured value- not better than ± 20 ppm after prior calibration under operating conditions with a CO reference measurement In measuring range ≤ 100 ppm: ± 10 ppm
Sensor signal	-30 ... + 800 mV
Response time	t ₆₀ : < 9 s (unfiltered < 3 s) t ₉₀ : < 13 s (unfiltered < 4 s)
Relaxation time (measurement readiness after over-load)	t ₉₀ : < 9 s
Offset to environment	< 2 ppm
Hysteresis	< 1,5 % from measured value
Linearity	< 9 % from measured value
Repeating precision	< 0,7 % deviation from measured value
Ambient pressure dependency	< 16 % from measured value (of normal pressure at sea level in comparison with pressure at altitude of 200 m, i.e., op = -200 mbar)
Differential pressure dependency	< - 0,17 mV U _{COe} per 100 mbar overpressure in the measuring chamber in comparison with environment
Drift	< 18,4 % from measured value (after 1000 h of operation in EL light fuel oil and 1004 switching cycles on/off)
Cross sensitivity ***	to CO ₂ (15 Vol. %) < 26 ppm to O ₂ (1 Vol. %) < 38 ppm
Moisture	< 9,1 from measured value
Influence of the installation position	None if KS1 is installed according to the information in the operating instructions.
Influence of the mains voltage	None if KS1 is operated according to the information in the operating instructions.
Influence of leakage	None if KS1 is operated according to the information in the operating instructions.
Influence of the measuring gas	Change -1,6 mV/100 mbar
Internal resistance of probe	15 ... 25 Ω (ZrO ₂ measuring cell in the air in case of 22 W heating output)
Heating consumption	10 ... 25 W (according to design, measuring gas temperature, and measuring speed)
Supply voltage for heating	AC/DC At P _H 18 VA → 11,4 V At P _H 20 VA → 12,34 V At P _H 25 VA → 14,8 V
Heating current at P _H 20 VA	Approx. 1,6 A Approx. 5 A short term during heating PTC characteristic
Insulation resistance	< 30 MΩ (between heating and probe connection)
Lifetime	> 3 years (in case of light fuel oil and natural gas)
Weight	320 g
Material of probe housing	Stainless steel
Material of connecting line	Nickel-plated copper strand FEP insulation

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Technical Data *	
Operating temperature of the measuring cell (sensor) at 13 V heating voltage in the air (20 °C) (68 °F)	650 °C (1,202 °F)
Measuring principle	Zirconium dioxide cell (ZrO ₂) potentiometric (voltage probe)
Heating time	10 min until operating temperature is reached

* Information according to EN 16340:2014 D

** Test report LTC-14-IB-09-V1.0 upon request

*** CO_e: Information assumes an operating gas composition of 5 Vol. % O₂, 333 ppm CO_e, rest is N₂
(333 ppm CO_e = 166,5 ppm H₂ + 166,5 ppm CO)

Operating condition	
Mounting / measuring gas extraction device	Directly in exhaust gas channel / in situ
Seal tightness	$q_L \leq 100 \text{ cm}^3/\text{h}^*$
Mounting position	Horizontal to vertical
Permissible fuels	Residue-free, gaseous hydrocarbons, light fuel oil, lignite and coal, biomass (according to design)** direct measurements in fuel gases are not possible
Permissible exhaust gas temperature on probe head	< 450 °C (842 °F)
Permissible operating temperature	< 300 °C (572 °F) on hexagon of probe housing < 200 °C (392 °F) on cable lead < 150 °C (302 °F) on connecting cable
Permissible storage temperature	-20 ... +70 °C (-4 ... +158 °F)
Permissible measuring gas speed	< 2 m/s
Protection class acc. to	IP42

* According to DIN V 18160-1:2006-01 seal tightness towards environment through housing and fastening.

** EN 16340:2014 D approval (in connection with LT3-F) only with gaseous and liquid fuels

Order Information

Combination Probe KS1 for detection of unburnt residue (CO/H₂), in flue gas up to gas temperatures of 450 °C (842 °F) with connection cable and plug

Description/Type	Order No.
Combination Probe KS1, without housing, with FEP-connecting cable up to 450 °C (842 °F), IP42, cable length 2 m/6.56 ft**	656R0010T

Probe Installation Fitting (PIF)

Description/Type	Order No.
PIF screw-in adapter M18x1,5i / 3/4" a for KS1 without housing	655R1013

NOTICE

Use Combination Probe KS1 only in combination with LAMTEC CO/O₂ control.
For CO control use Combination Probe KS1D.

The information in this publication is subject to technical changes.

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