Technical Data Combination Probe KS1D-KAF

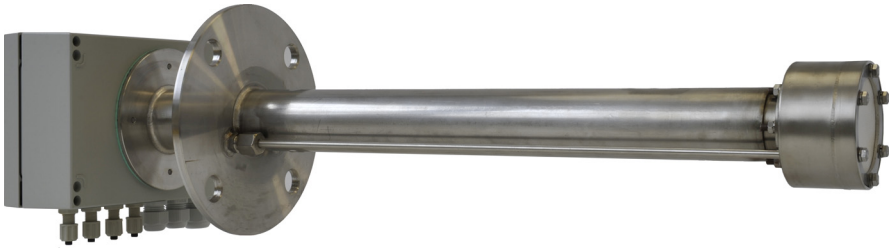

Fig. 1 Combination Probe KS1D-KAF

The hose connections for calibration (air or test gas) for semi-automatic calibration.

Installation depth X	**KS1D-KAF**	**LS2-KAF**
500 mm / 19.69 " in	Type 656R2130 (AF)	Type 650R2130 (AF)
1,000 mm / 39.37 " in	Type 656R2131 (AF)	Type 650R2131 (AF)
1,500 mm / 59.06 " in	Type 656R2132 (AF)	Type 650R2132 (AF)

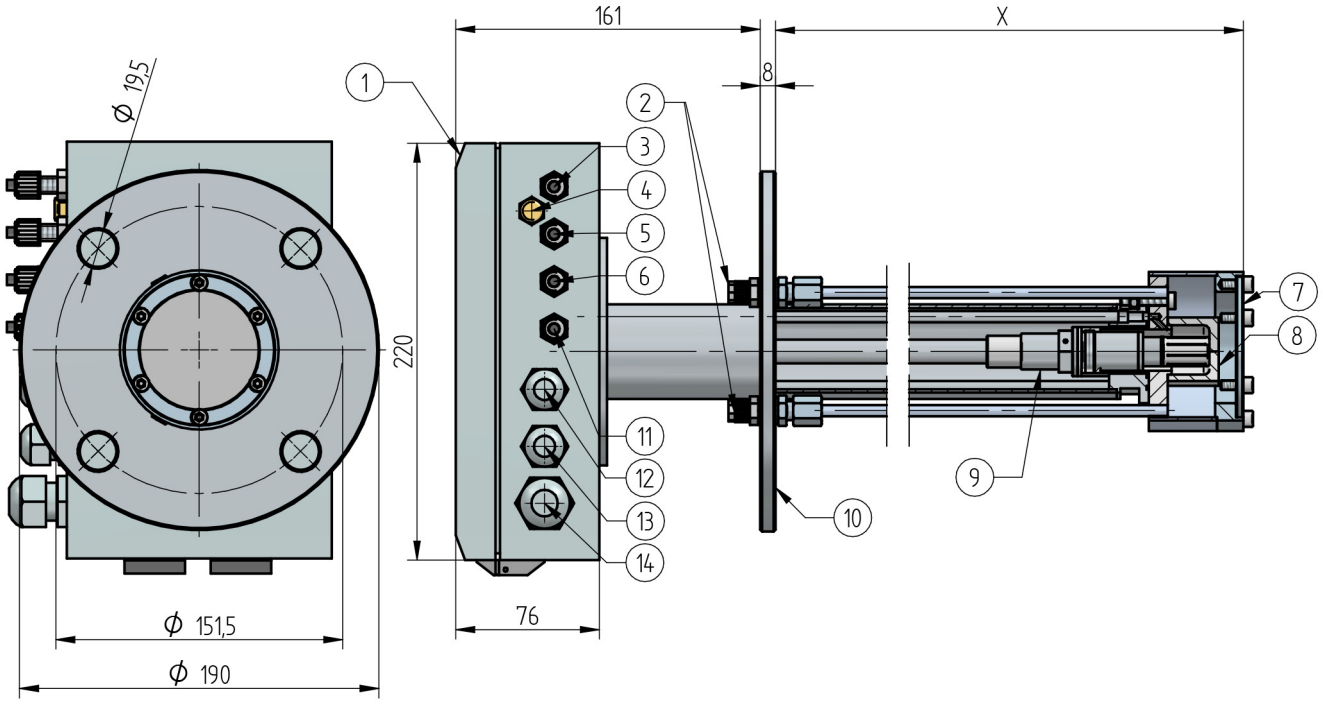

Fig. 2 KAF Probe with purge unit

No.	Description
1	Probe connection box (PCB)
2	Hose connection 4/6 mm / 0.16/0.24 " in "Purge filter outside" from solenoid valve unit – Instrument air (pre-pressure 6 bar)
3	Hose connection 4/6 mm / 0.16/0.24 " in „calibration gas" (pre-pressure 0.3 bar) Instrument air for offset calibration or test gas (example 2 Vol.% O_2 in N_2)
4	Outlet of reference air
5	Hose connection 4/6 mm „reference air" from solenoid valve unit – Instrument air (pre-pressure 0.3 bar) – Air consumption approx. 10 l/h
6	Hose connection 4/6 mm / 0.16/0.24 " in „Purge filter internal side" from solenoid valve unit – Instrument air (pre-pressure 3 bar)
7	Filter fleece
8	Filter resolution 20 µm
9	Sensor
10	Flange DN80PN6 (Deviant flange thickness 8 mm)
11	Hose connection 4/6 mm / 0.16/0.24 " in „pressure sensor" from solenoid valve unit
12	Cable gland input M16 – Reserve
13	Cable gland input M16 – Probe heating
14	Cable gland input M20 - Absolute pressure sensor, differential pressure sensor probe signals

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Characteristics	
Measuring range	**O_2**: 0 ... 21 % O_2
	CO_e: 0 ... 1.000 ppm CO_e (0 … 10.000 ppm upon request)
Measurement accuracy	**O_2**: ± 5 % of measured value - not better than ± 0,3 Vol.%
	CO_e: ± 25 % of measured value- not better than ± 20 ppm after prior calibration under operating conditions with a CO reference measurement in measuring range 0 ... 100 ppm
Sensor signal	**O_2:** -30 ... +150 mV
	CO_e: -30 ... +800 mV
Response time	**O_2: t_{60}:** ≤ 10 s
	CO_e: t_{60}: ≤ 5 s
Relaxation time (measurement readiness after overload)	**O_2:** t_{90}: < 8 s
	CO_e: t_{90}: < 9 s
Offset to environment	**O_2**: < 0.3 vol. %
	CO_e: < 2 ppm
Repeating precision	**O_2**: < 0.1 % deviation from measured value
	CO_e: < 0.7 % deviation from measured value
Drift	**O_2**: < 1.7 % from measured value (after 1000 h of operation in EL light fuel oil and 1004 switching cycles ON/OFF)
	CO_e: < 18.4 % from measured value (after 1000 h of operation in EL light fuel oil and 1004 switching cycles ON/OFF)
Cross sensitivity**	to SO_2, NH_3, NO, propane and aromatic hydrocarbons
Heating consumption	10 ... 25 W (at T_{gas} 350 °C / 662 °F approx. 18 W) (according to design, measuring gas temperature, and measuring speed)
Durability	≥ 2 years by using fuel and natural gas
Weight	6.5 kg at 500 mm length / 14.33 lb at 19.69" in length
Material of probe housing	1.4571
Material of connection housing	EN AC-44300
Material of connecting line	nickel-plated copper strand FEP insulation
Operating temperature of measuring cell (sensor) on 13 V heating voltage to air (20 °C / 68 °F)	650 °C / 1,202 °F
Measurement principle	zirconium dioxide cell (ZrO_2) potentiometric (voltage probe)
Heating-up time	20 min. up to operating temperature

* Information according to EN 16340:2014 D

** O_2: Information assumes an operating gas composition of 5 vol. % O_2, rest is N_2
CO_e: Information assumes an operating gas composition of 5 vol. % O_2, 333 ppm CO_e, rest is N_2
(333 ppm CO_e = 166.5 ppm H_2 + 166.5 ppm CO)

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Operating condition	
Mounting / measuring gas extraction device	directly in exhaust gas channel / in situ
Seal tightness	$q_L \leq 100\ cm^3/h$*
Mounting position	horizontal to vertical
Permissible fuels	gaseous hydrocarbons, light fuel oil, lignite and coal, wood. Direct measurements in fuel gases are not possible
Ideal measuring gas speed	1 m/s ≤ X ≤ 16 m/s (Higher measuring gas speed increases the measurement error. Measured at measuring gas temperature 25 °C / 77 °F. In case of smaller measuring gas temperatures it might be necessary to protect the probe from the incident flow.)
Reference air supply	via reference pump 657R1060 (option LT2) alternative via instrument air on site 0,3 bar max. 100 l/h
Flange adapter	DN80PN6 with pipe socket DN125, flange type 657R3506/657R3507

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

Environmental conditions		
Probe head	permissible flue gas temperature	≤ 450 °C / 842 °F
Operation	permissible temperature	< 100 °C / 212 °F at the cable gland < 100 °C / 212 °F at the connecting cable
Transport	permissible temperature	-20 ... +60 °C / -4 ... +140 °F
Storage	permissible temperature	-20 ... +60 °C / -4 ... +140 °F
Degree of protection	DIN EN 40050	IP65

NOTICE

The limits of the technical data must be strictly adhered to.

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Order Information

Combination Probe KS1D-KAF for simultaneous measurement of oxygen (O_2) and unburnt residue (CO/H_2).

- Application for high dust loads up to 2,000 mg/m^3
- For semi automatic calibration
- Incl. hose connectors for testgas and purge operation
- Electronic connection on screw terminals, IP65
- Flue gas temperature max. 450 °C / 842 °F

Description / Type	Order No.
Combination Probe KS1D-KAF, semi automatically calibration and purging, incl. filter fleece (filter disk), immersion depth from flange 500 mm / 19.69" in	656R2130/AF
Combination Probe KS1D-KAF, semi automatically calibration and purging, incl. filter fleece (filter disk), immersion depth from flange 1,000 mm / 39.37" in	656R2131/AF
Combination Probe KS1D-KAF semi automatically calibration and purging, incl. filter fleece (filter disk), immersion depth from flange 1,500 mm / 59.06" in	656R2132/AF

Additional required:

Lambda-Transmitter LT2, configured for KS1D in application "semi automatically calibration and purge operation"
Order no. 657R102 / KS1D / 4KA /…

Counter flange, order no. 657R3506 / R3507

Flange gasket, order no. 657R3542

Pneumatic box 24 VDC for controlling of the purge device, order no. 650R2080
Cyclic control is performed by LT2 (can be set by parameter).

The information in this publication is subject to technical changes.

LAMTEC Meß- und Regeltechnik für Feuerungen GmbH & Co. KG
Josef-Reiert-Straße 26
D-69190 Walldorf
Telefon: +49 (0) 6227 6052-0
Telefax: +49 (0) 6227 6052-57
info@lamtec.de
www.lamtec.de

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