



SP3000RS/HEX4-135 bzw. 180

## Gas Sample Probe Series SP®



Version SP3000 for sampling from zones with explosive dust

2-1.3.6 10.04/06.06

### Special Features

Approval according to ATEX for sampling from Ex-zone 20, 21 and 22

Approval according to ATEX for mounting in Ex-zone 1, 2, 21 and 22

Optimum operational reliability

Universal applicability

Adaption to nearly all process conditions due to its compact and modular design

Easy mounting and maintenance

Small volume, fast response time

Patented construction

### M&C® Application

The M&C sample probes version SP3000 are used for continuous extraction of explosive gases (Ex-zone 20, 21 and 22) from dust laden, high temperature and/or humid processes. The probes can be mounted in Ex-zone 1, 2, 21 and 22.

### M&C® Description

The sample probes are designed for easy installation, reliable operation and trouble-free maintenance. They are versatile in application and depending on the task to be performed, various pre-filters series V12/V20 with integrated volume displacer and optional with extension tubes (see page 4 and data sheet 2-1.1.0.8), not included in the scale of delivery, can be simply screwed into the mounting flange of the basic probe. These process-internal M&C pre-filters are necessary for a valid Ex-approval of the M&C-probes type SP3000. For error control of the pre-filter the sample gas flow rate has to be monitored externally.

The probe-internal M&C stainless steel filter element with a large surface and high capacity is located in the external housing. The design offers little or no stagnant space outside the process. The probe housing is covered with a protection shield which is part of the Ex-approval.

The probes are designed in such a way that changing the filter element is possible without the use of tools. In this operation, neither the sample probe tube nor the sample line need to be removed, thus avoiding contamination of the clean gas path and maintaining the integrity of the system.

The special design of the optional heating of the M&C-probes version SP3000 permits controlled heating of the complete filter housing, including the mounting flange. This ensures reliable operation external to the process preventing the temperature falling below the dew-point.

The temperature of the M&C-probes version SP3000 is controlled by a self-regulated heater version HEX4-135 or HEX4-180 (see data sheet 2-3.2) for Ex-zone 1 and 21, temperature class T4 resp. T3 and for gas sampling from zone 0, 1 or 2. In dependence of the ambient temperature and the heater version, the min. temperature in the probe is 90°C resp. 120°C, the max. temperature is 120°C resp. 160°C.

For back-purging the M&C pre-filter, the option RS is available with mounted buffer vessel triggered by an explosion-proof solenoid valve. With the mounted option for back-purging type RS, gas can be sampled from zone 20, 21 and 22. The back-purge pressure has to be monitored externally and has to be min. 1 bar higher than the process pressure. For the pressure control while back-purging a corresponding special valve is mounted in the sample gas outlet. Thus an additional solenoid valve to shut off the sample gas outlet is not necessary. The back-purge inlet is shut off by a check valve.

**When sampling from Ex-zones, back purging is only allowed with a gas suitable for the sampling point.**

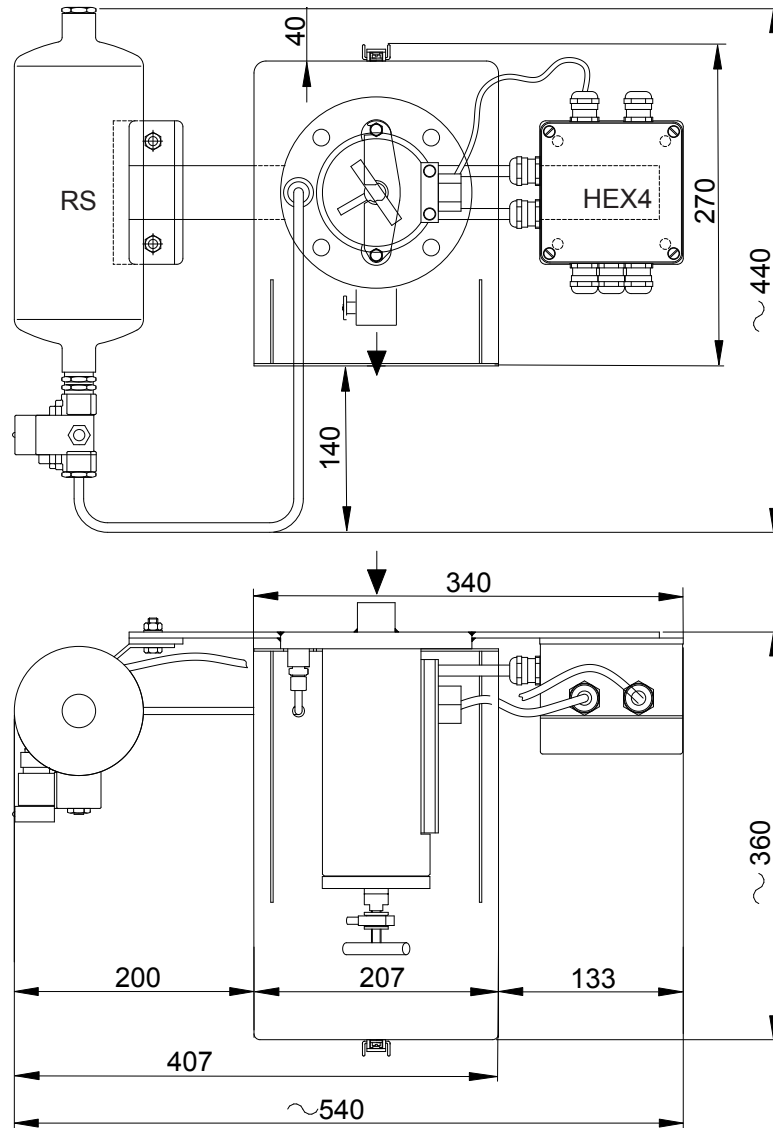
Gas sample probe type	SP3000	
Part No.	20S5500	
Weather protection shield	yes	
Filter housing material	Stainless steel 316 / 316Ti	
Sealing materials	Graphite	
Probe flange sealing material	Graphite	
Pre-filter	optional, for a valid Ex-approval according to ATEX the probe SP3000 has to be operated with a pre-filter from page 4	
Sample pressure max.	0,5-6 bar abs.	
Ambient temperature	-20 °C to +60 °C	
Permissible process gas temperature	depending on the temperature class, however max. 200°C at the probe entry	
Filter chamber volume	120 cm <sup>3</sup>	
Filter element, porosity	F-3SS150= stainless steel*, 3 micron S-2K150= ceramic**, 2 micron,	
Sample gas outlet connection	1x 1/4" NPTi for max. 8mm-tube connectors	
Connection gas outlet at option RS	6 mm Swagelok connector	
Mounting flange	DN65 PN6, FormB, SS316Ti* >DN or ANSI possible**	
Weight	7 kg	
Marking	II 1D/2GD -20°C ≤ Ta ≤ +60°C EXAM BVS 04 ATEX H 045X	
Marking with option RS	II 1D/2GD -20°C ≤ Ta ≤ +60°C EXAM BVS 04 ATEX H 045X	
Option back purge unit type RS	RS	
Part No.	20S5560 (a)	
Power supply	230V 50/60Hz 9W or 115V 50/60Hz 9W (a)	
Electrical connection	cable 3x1mm <sup>2</sup>	
Marking	II 2GD EEx m II 135°C	
Connection	G1/2" at the buffer vessel	
Max. back purge pressure	6 bar abs.	
Volume buffer vessel	2 liters	
Ambient temperature	-20°C to 60°C	
Option heating type HEX4	HEX4-135	HEX4-180
Part No.	20S5510	20S5520
Control	self-regulating	
Power supply	115V - 230V 50/60Hz	
Electrical connection	cable gland, terminal range 7 - 12mm, terminals max. 4mm <sup>2</sup>	
Marking	II 2G EEx em T4 /  II 2D IP66 135°C EXAM BVS 04 ATEX E 253	II 2G EEx em T3 /  II 2D IP66 180°C EXAM BVS 04 ATEX E 253
Power	400W	
Case protection	IP66; EN60529	
Max. temperature	120 °C	160 °C
Min. temperature	90 °C	120 °C
Ambient temperature	-20 °C to +60 °C	
Low temperature alarm contact	<60°C, 1 contact MC-NO, 230V 1,5A AC, 0,5ADC	<100°C, 1 contact MC-NO, 230V 1,5A AC, 0,5ADC

\* Standard

\*\* optional

**M&C** | Differential pressure and T<sub>90</sub>-time

ΔP and T <sub>90</sub> at flow of:	100	200	500	1000	1500	NI/hr
ΔP with new filter element F-3SS150	0,006	0,012	0,040	0,110	0,215	bar
ΔP with new filter element S-2K150	0,003	0,005	0,02	0,058	0,135	bar
T <sub>90</sub> -time for SP3000 without sample tube and pre-filter	6	3,5	1	<0,5	<0,5	s








Dimensions in mm

**M&C** | Options pre-filter\* and extension tubes

Optionen	Version	Artikel-Nr.
Stainless steel pre-filter with volume displacer, length 220mm, 46mm o.d., filter porosity 2µm, temperature max. 600°C, material SS316	V20-0	20 S 9105
Hastelloy pre-filter with volume displacer, length 220mm, 46mm o.d., filter porosity 2µm, temperature max. 900°C, material Hastelloy-C	V20-0/HC	20 S 9115
Stainless steel pre-filter with volume displacer, length 520mm, 60mm o.d., filter porosity 2µm, temperature max. 600°C, material SS316	V20-1	20 S 9145
Hastelloy pre-filter with volume displacer, length 520mm, 60mm o.d., filter porosity 2µm, temperature max. 900°C, material Hastelloy-C	V20-1/HC	20 S 9155
Hastelloy pre-filter with volume displacer, length 520mm, 60mm o.d., filter porosity 0,5µm, temperature max. 900°C, material Hastelloy-C	V20-1/HC	20 S 9156
Stainless steel pre-filter with volume displacer, length 300mm, 31mm o.d., filter porosity 2µm, temperature max. 600°C, material SS316	V20-3	20 S 9300
Extra charge for extension of insitu stainless steel filter V20-3 or V20-4 for each 100 mm further length (from standard length 300mm to .... mm), max. 1000 mm total filter length, material: SS316	V20-3	20 S 9310
Backflushable hose pre-filter with internal support tube, length: 400mm, 40mm o.D., filter porosity 15µm, temperature max. 200°C, material PTFE, SS316	V20-T	20 S 9315
Insitu ceramic filter tube in double-layer version for high blow back efficiency, with volume displacer, length 500mm, 40mm o.d., filter porosity 1µm, temperature max. 1000°C, material ceramic, SS316, connection G3/4"	V12-1A-1	20 S 9559
Extension tube for V20.. with internal volume displacer , length 500mm, temperature max. 600°C, material SS316	Vm500	20 S 9165
Extension tube for V20.. with internal volume displacer , length 1000mm, temperature max. 600°C, material SS316	Vm1000	20 S 9170
Extension tube for V20.. with internal volume displacer , length 1500mm, temperature max. 600°C, material SS316	Vm1500	20 S 9175

\* For a valid Ex-approval according to ATEX, only operate the probe SP3000 with one of the above listed pre-filters  
For choosing the adequate pre-filter see data sheet 2-1.1.0.8 as well

**M&C** | Temperature classes for sampling from Ex-zone 20, 21 or 22

Type	Possible Options	Marking	Temperature class	Max. process gas temp. (°C) at probe entry	Max. surface temperature (°C)
SP3000		 II 1 D / 2 GD	T6	≤ 80	80
SP3000		 II 1 D / 2 GD	T5	≤ 95	95
SP3000	/RS, /HEX4-135	 II 1 D / 2 GD	T4	≤ 130	135
SP3000	/RS, /HEX4-180	 II 1 D / 2 GD	T3	≤ 195	195
SP3000	/RS	 II 1 D / 2 GD	T2	≤ 200	200