



SP3000V/RS/HEX4-135 resp. 180

## Gas Sample Probe Series SP®



Version SP3000 for sampling from zones with explosive dust

### 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 or 21, 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

### 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 or 21, 22.

### 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, 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 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 (194 °F) resp. 120 °C (248 °F), the max. temperature is 120 °C (248 °F) resp. 160 °C (320 °F).

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.**

## Technical Data

<b>Gas sample probe type</b>	<b>SP3000</b>	
Part No.	20 S 5500	
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 (about -4 °F to +140 °F)	
Permissible process gas temperature	depending on the temperature class, however max. 200 °C (392 °F) at the probe entry	
Filter chamber volume	120 cm <sup>3</sup> (7.32 in <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. 8 mm (0.315") tube connectors	
Connection gas outlet at option RS	6 mm (0.236") Swagelok connector	
Mounting flange	DN65 PN6, FormB, SS316Ti* >DN or ANSI possible**	
Weight	7 kg (15.43 lbs)	
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	
<b>Option back purge unit type RS</b>	<b>RS</b>	
Part No.	20 S 5560 (a)	
Power supply	230 V 50/60 Hz 9 W or 115 V 50/60 Hz 9 W (a)	
Electrical connection	cable 3 x 1 mm <sup>2</sup> (3 x 0.00155 in <sup>2</sup> )	
Marking	II 2GD Ex m II 135°C, in combination with SP3000	
Connection	G1/2" at the buffer vessel	
Max. back purge pressure	6 bar abs.	
Volume buffer vessel	2 liters (0.528 gal)	
Ambient temperature	-20 °C to 60 °C (-4 °F to +140 °F)	
<b>Option heating type HEX4</b>	<b>HEX4-135</b>	<b>HEX4-180</b>
Part No.	20 S 5510	20 S 5520
Control	self-regulating	
Power supply	115 V - 230 V 50/60 Hz	
Electrical connection	cable gland, terminal range 7 - 12 mm (0.276" - 0.472"), terminals max. 4 mm <sup>2</sup> (0.0062 in <sup>2</sup> )	
Marking	II 2G Ex e mb IIC T4...T3 Gb /  II 2D Ex tb IIIC 135°C...180°C Db EXAM BVS 04 ATEX E 253 / IECEx BVS 15.0060	
Power	400 W	
Case protection	IP66; EN60529	
Max. temperature	120 °C (248 °F)	160 °C (320 °F)
Min. temperature	90 °C (194 °F)	120 °C (248 °F)
Ambient temperature	-20 °C to +60 °C (about -4 °F to +140 °F)	
Low temperature alarm contact	<60 °C (140 °F), 1 contact MC-NO, 230 V 1.5 A AC, 0.5 A DC	<100 °C (212 °F), 1 contact MC-NO, 230 V 1.5 A AC, 0.5 A DC
<b>Option 2-way-ball valve in the probe entrance</b>	<b>/VA</b>	
Part No.	20 S 9050	
Operating temperature	-20 °C up to +185 °C (about -4 °F up to +365 °F)	
<b>Option 2/3-way-ball valve in the probe entrance</b>	<b>/3VA</b>	
Part No.	20 S 9325	
Backflush / Test gas connection	6 mm (0.236") tube	
Operating temperature	-20 °C up to +185 °C (about -4 °F up to +365 °F)	
<b>Option pneum. drive for ball valve /VA o. /3VA</b>	<b>MS1</b>	
Part No.	20 S 9055	
Connection control air	G1/4" i	
Pressure control air	5-10 bar	
Temperature class	T4	
<b>Option second sample gas outlet</b>	<b>/2X</b>	
Part No.	20 S 9015	
Connection	1/4" NPT i	

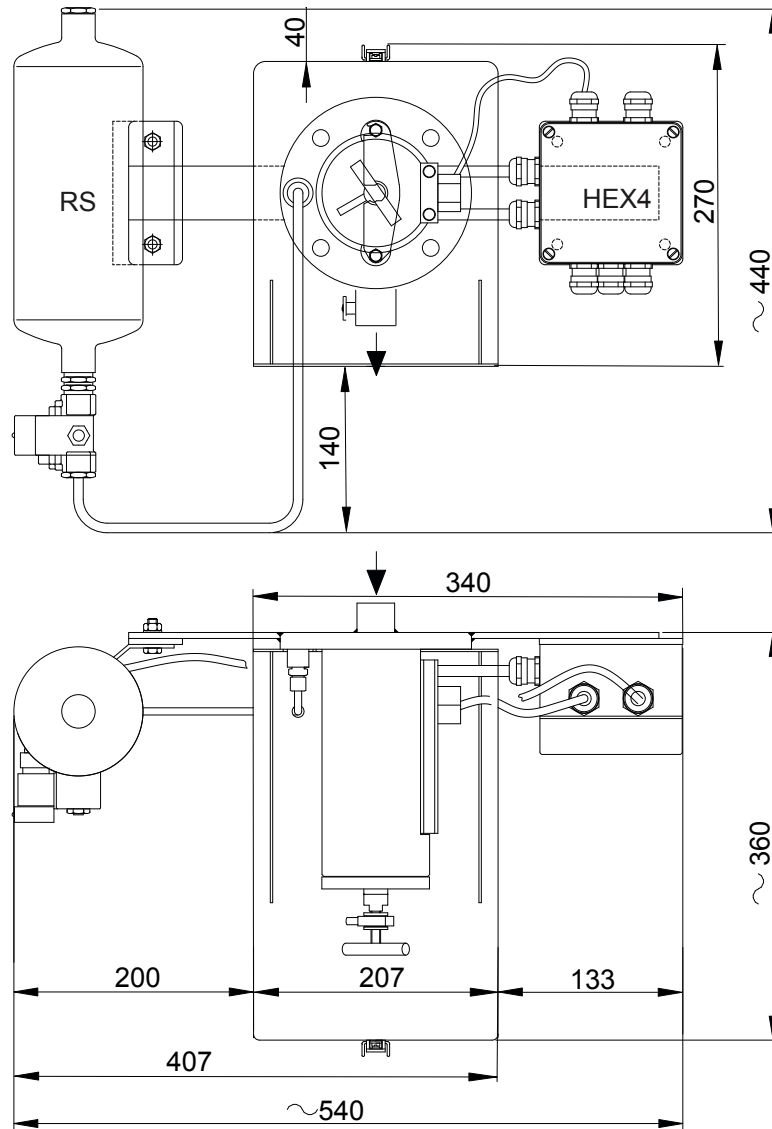
\* Standard, \*\* optional

## Differential pressure and T<sub>90</sub>-time

<b>ΔP and T90 at flow of:</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>1000</b>	<b>1500</b>	<b>NI/h</b>
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
T90-time for SP3000 without tube	6	3,5	1	<0,5	<0,5	s

## Dimensions

### SP3000 basic version with option back purging type RS and heating type HEX4



Dimensions in mm

## Options pre-filter\* and extension tubes

Optionen	Version	Artikel-Nr.
Pre-filter, stainless steel filter with volume displacer. Length: 220 mm (8.66"), 46 mm OD (1.811"). Filter porosity: 2 µm, temperature: max. 600 °C (1112 °F). Connection: G3/4". Material: SS316 / SS316Ti	V20-0	20 S 9105
Pre-filter, Hastelloy filter with volume displacer. Length: 220 mm (8.66"), 46 mm OD (1.811"). Filter porosity: 2 µm, temperature: max. 900 °C (1652 °F). Connection: G3/4". Material: Hastelloy X	V20-0/HC	20 S 9115
Pre-filter, stainless steel filter with volume displacer. Length: 520 mm (20.47"), 60 mm OD (2.36"). Filter porosity: 2 µm, temperature: max. 600 °C (1112 °F). Connection: G3/4". Material: SS316 / SS316Ti	V20-1	20 S 9145
Pre-filter, Hastelloy filter with volume displacer. Length: 520 mm (20.47"), 60 mm OD (2.36"). Filter porosity: 2 µm, temperature: max. 900 °C (1652 °F). Connection: G3/4". Material: Hastelloy X	V20-1/HC	20 S 9155
Pre-filter, Hastelloy filter with volume displacer. Length: 520 mm (20.47"), 60 mm OD (2.36"). Filter porosity: 0.5 µm, temperature: max. 900 °C (1652 °F). Connection: G3/4". Material: Hastelloy X	V20-1/HC	20 S 9156
Pre-filter, stainless steel filter with volume displacer. Length: 300 mm (11.81"), 31 mm OD (1.22"). Filter porosity: 2 µm, temperature: max. 600 °C (1112 °F). Connection: G3/4". Material: SS316 / SS316Ti.	V20-3	20 S 9300
Extra charge for extension of insitu stainless steel filter V20-3 or V20-4 for each 100 mm (3.937") further length (from standard length 300 mm (11.81") to .... mm), max. 1000 mm (3.28 ft) total filter length. material: SS316 / SS316Ti	V20-3	20 S 9310
Pre-filter, backflushable hose pre-filter with internal support tube. Length: 400 mm (15.75"), 40 mm OD (1.575") . Filter porosity: 3 µm. temperature: max. 200 °C (392 °F). Connection: G3/4". Material: PTFE, SS316Ti.	V20-T	20 S 9315
Ceramic filter cartridge, double jacketed, with integrated volume reduction, length 500 mm (19.685"), ext. diameter 40 mm (1.575"), filter porosity 1µm, max. temp. 1100 °C (2012 °F), material ceramic, SS316Ti, with a G3/4" connector	V12-1A-1	20 S 9559
Extension tube for V20..., 500 mm (19.685"), G 3/4" male, int. volume displacer, incl. gasket set. Temperature: max. 600 °C (1112 °F). Material: SS316Ti	Vm500	20 S 9165
Extension tube for V20..., 1000 mm (3.28 ft), G 3/4" male, int. volume displacer, incl. gasket set. Temperature: max. 600 °C (1112 °F). Material: SS316Ti	Vm1000	20 S 9170
Extension tube for V20..., 1500 mm (4.92 ft), G 3/4" male, int. volume displacer, incl. gasket set. Temperature: max. 600 °C (1112 °F). Material: SS316Ti	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 2.17 as well

## 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 (≤ 176 °F)	80 (176 °F)
SP3000		II 1 D / 2 GD	T5	≤ 95 (≤ 203 °F)	95 (203 °F)
SP3000	/RS, /HEX4-135	II 1 D / 2 GD	T4	≤ 130 (≤ 266 °F)	135 (266 °F)
SP3000	/RS, /HEX4-180	II 1 D / 2 GD	T3	≤ 195 (≤ 383 °F)	195 (383 °F)
SP3000	/RS	II 1 D / 2 GD	T2	≤ 200 (≤ 392 °F)	200 (392 °F)