



SP3200V/HEX5.1

Gas Sample Probe Series SP®

Versions SP3200V and SP3200 for sampling from Ex zone 2 or 22

Special Features

- **Approval according to ATEX and CSA for sampling from/mounting in Ex zone 2 or 22 and Class I Division 2, respectively**
- **Adaption to nearly all process conditions due to its compact and modular design**
- **Stainless steel filter element, ceramic optionally available**
- **Sealing material for filter housing lid: graphite or Viton®**
- **Easy installation and low maintenance**
- **Low dead volume**
- **Optionally: different valves available for back-purging, test gas feeding or sample gas outlet shut-off**

Application

The M&C sample probes versions SP3200V and SP3200 are used for continuous sampling of explosive gases (Ex zone 2 or 22) from dust-loaded, high temperature and/or humid processes. The probes can be mounted in Ex zone 2 or 22. The two versions only differ in the sealing material of the filter housing. Version SP3200V has a sealing out of FKM for types which are heated up to max. 185 °C [365 °F] and version SP3200 has a sealing out of graphite for all versions heated up to more than 185 °C [365 °F].

Description

The sample probes are designed for easy installation, reliable operation and user-friendly maintenance. They are versatile in application and depending on the task to be performed, various sample tubes and pre-filters series V12 or V20 with integrated volume displacer, optional with extension tubes that are not included in the scope of delivery can be simply screwed into the mounting flange (G 3/4") of the basic probe. The sample gas flow rate has to be observed externally for fault monitoring.

The M&C stainless steel or ceramic in-depth filter element with a large surface and high capacity is located in the external housing with low internal dead volume 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 using 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 SP3200(V) permits controlled heating of the complete filter housing, including the mounting flange. This ensures reliable operation preventing the temperature from falling below the dew point outside the process.

For M&C probe version SP3200(V), the heaters version HEX5-1.08 or HEX5-2.08 are available as options (see HEX5 data sheet).

Version HEX5-1.08 has a temperature controller integrated in the connection box of the probe and is suitable for ambient temperatures up to 50 °C [122 °F]. Version HEX 5-2.08 is equipped with a temperature controller in a wall-mount housing to be installed externally. When choosing this combination, the probe can be used at ambient temperatures up to 70 °C [158 °F] and the controller up to 50 °C [122 °F].

The probe can be operated with both heating versions in Ex zone 2 or 22 and Class I Division 2, Groups A/B/C/D, respectively.

For calibration gas feeding or back-purging, different options are possible: for example, the option RS with mounted buffer vessel triggered by an explosion-proof solenoid valve is available. The back-purge pressure has to be monitored externally and must be at least 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	SP3200V (up to 185 °C [365 °F])	SP3200 (more than 185 °C [365 °F])
Part No.	20S5705	20S5700
Weather protection shield	Yes	
Filter housing material	Stainless steel 316/316Ti	
Sealing materials	Graphite, FKM	Graphite
Probe flange sealing material	Graphite	
Pre-filters/sample tubes	Optional, see data sheets "Sample Tubes for Gas Sample Probes Series SP®" and "Pre-Filters for Gas Sample Probes Series SP®"	
Sample pressure max.	0.5 to 6 bar abs.	
Ambient temperature	-20 to +60 °C [-4 to +140 °F] depending on option selected	
Permissible process gas temperature	Depending on the temperature class, however max. 200 °C [392 °F] at the probe inlet	
Filter chamber volume	120 cm ³	
Filter element, porosity	F-3SS150= stainless steel*, 3 µm; S-2K150= ceramic**, 2 µm	
Sample gas outlet connection	1 x 1/4" NPT i for max. 8 mm tube connectors	
Connection gas outlet with option RS	6 mm Swagelok connector	
Mounting flange	DN 65 PN 6, FormB, SS316Ti* > DN or ANSI possible**	
Weight	7 kg [≈ 15.43 lbs]	
Option heating type HEX5	HEX5-1.08, internal controller	HEX5-2.08, external controller
Part No.	20S9650(a)	20S9655(a)
Mounting of controller	In Ex zones 2 and 22	
Control	Electronic	
Power supply	240 V 50/60 Hz or 120 V 50/60 Hz (a)	
Electrical connection	Cable gland, terminal range 6 to 12 mm, terminals max. 4 mm ²	
Marking for heater		II 3G Ex ec IIC T5-T2 Gc (see table p. 6), II 3D Ex tc IIIC T75°C - 235°C Dc CSA Class I, Div. 2, Groups A/B/C/D, T5 - T2B
Marking for controller		II 3G Ex ec nC IIC T2-T5 Gc (see table p. 6), II 3D Ex tc IIIC T75°C - 235°C Dc CSA Class I, Div. 2, Groups A/B/C/D, T5 - T2B
Marking for heater with internal controller	II 3G Ex ec nC IIC T5-T2 Gc (see table p. 6), II 3D Ex tc IIIC T75°C - 235°C Dc CSA Class I, Div. 2, Groups A/B/C/D, T5 - T2B	
Power	Max. 800 W (240 V), max. 830 W (120 V)	
Case protection	IP65; EN 60529	
Operating temperature	0 to max. 230 °C [+32 to max. +446 °F] according to temperature class	
Ambient temperature	0 to +50 °C [+32 to +122 °F]	Controller: 0 to +50 °C [+32 to +122 °F], heater: -20 to +70 °C [-4 to +158 °F]
Low temperature alarm contact	-5 °C [23 °F] to Tset potential-free closing contact with switching capacity 250 V 3 A AC, 0.25 A DC	
Option back-purge unit type RS	RS	
Part No.	20S5560(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 ²	
Marking	II 3GD T4, in combination with SP3200(V)	
Connection	G 1/2" i at the buffer vessel	
Max. back-purge pressure	6 bar abs.	
Volume buffer vessel	2 liters	
Ambient temperature	-20 to +55 °C [-4 to +131 °F]	
Option 2-way-ball valve in the probe inlet	/VA	
Part No.	20S9050	
Operating temperature	-20 up to +185 °C [-4 up to +365 °F]	
Option 2/3-way-ball valve in the probe inlet	/3VA	
Part No.	20S9325	
Backflush/test gas connection	6 mm tube	
Operating temperature	-20 up to +185 °C [-4 up to +365 °F]	
Option pneum. drive for ball valve /VA or /3VA	MS1	
Part No.	20S9055	
Connection control air	G 1/4" i	
Pressure control air	5 to 10 bar	
Option valve for blowback or calibration gas 1/4"	/R	
Part No.	20S9045	
Opening pressure	> 0.7 bar	
Connection	6 mm tube	
Maximum blowback pressure	6 bar abs.	
Maximum operating temperature	+185 [+365 °F]	

* Standard, ** optional

Gas sample probe type	SP3200V (up to 185 °C [365 °F])	SP3200 (more than 185 °C [365 °F])
Option high-performance blowback valve	/BB	/BBF
Part No.	20S9008	20S9006
Way of blowback gas	Via filter chamber	Via probe filter element
Check valve	High-performance check valve 3/8"	
Opening pressure	> 0.7 bar	
Connection	8 mm tube	
Maximum blowback pressure	6 bar abs.	
Maximum operating temperature	185 °C [365 °F]	
Option test gas valve/shut-off valve	/C + /I	
Part No.	20S9011 and 20S9009	
Way of test gas	Via sample gas outlet with shut-off to the process	
Check valve	Check valve 1/4"	
Opening pressure	> 0.7 bar	
Connection	6 mm tube	
Shut-off valve	Bellow-type valve with pneumatic drive	
Pressure control air	3 to 10 bar	
Connection control air	1/8" NPT i	
Option second sample gas outlet	/2X	
Part No.	20S9015	
Connection	1/4" NPT i	
Option-spun glass cartridge	/FW	
Part No.	20S9047	20S9046
Material	SS 316Ti, Novapress®	SS 316Ti, graphite

* Standard, ** Option
 Novapress® is a registered trademark for elastomer-bonded gasket material used by the German company Frenzelt GmbH.

Combinations of options

Option No.	1	2	3	4	5	6a	6b	7	8	9
	/RS	/VA	/3VA	/MS1	/R	/BB	/BBF	/C/I	/2X	/FW
/RS		X						X	X	
/VA	X			X	X	X	X	X		X
/3VA				X				X	X	
/MS1		X	X							
/R		X								
/BB		X						X	X	
/BBF		X						X		
/C/I	X	X	X			X	X			X
/2X	X	X	X			X	X			X

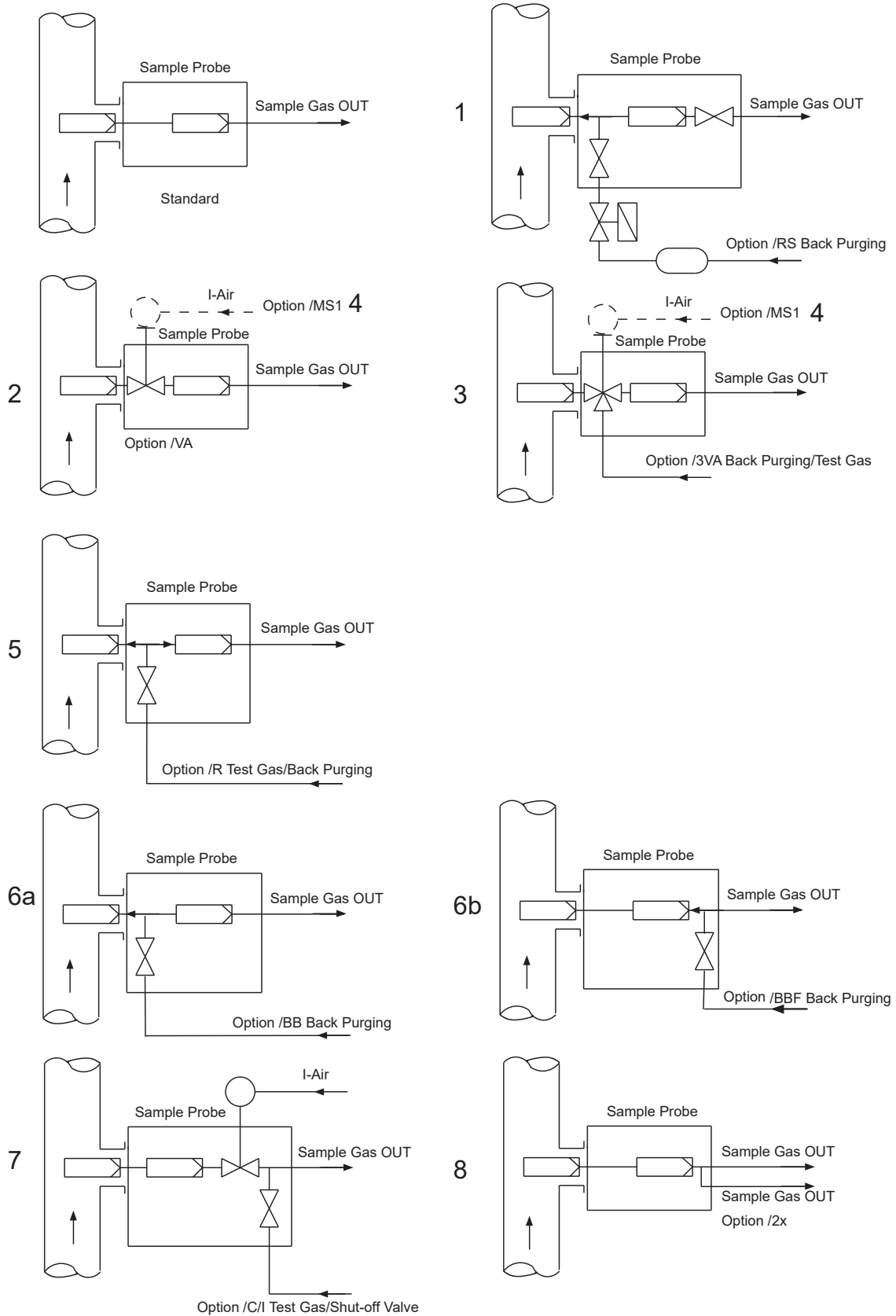
X = possible combinations
 X = recommended combinations

Differential pressure and T₉₀ time

ΔP and T ₉₀ at a flow rate of:	100	200	500	1000	1500	NI/h
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 ₉₀ time for SP3200 without tube	6	3.5	1	< 0.5	< 0.5	s

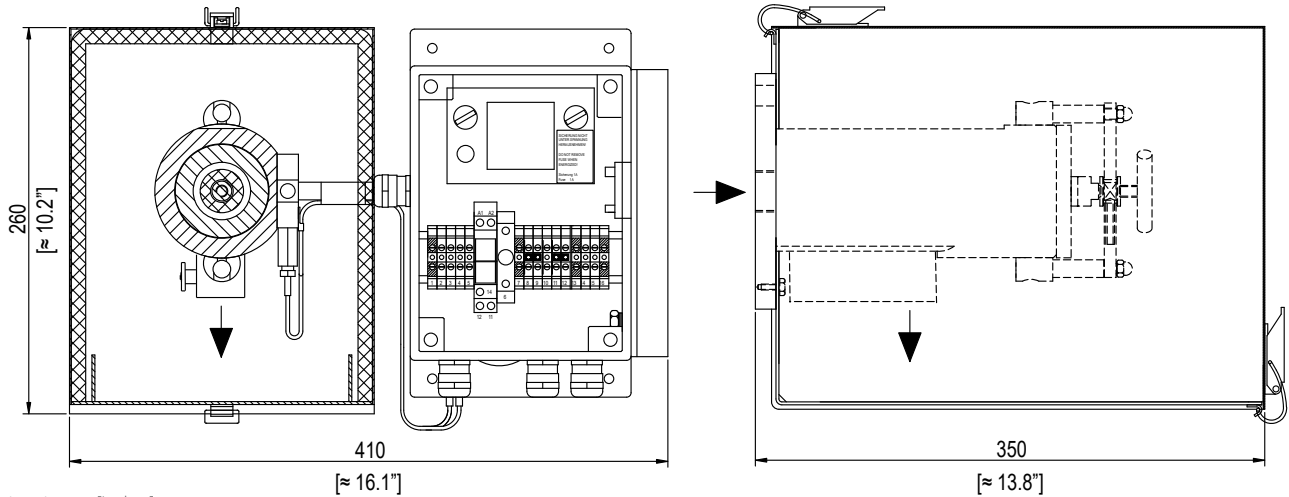
Please note: NI/h and NI/min refer to the German standard DIN 1343 and are based on these standard conditions: 0 °C [32 °F], 1013 mbar.

Functional diagram of options 1 to 8



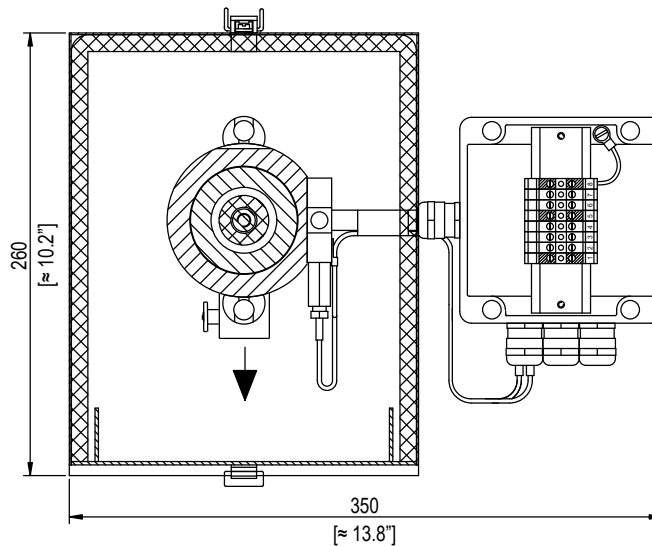
Possible combinations of options, see table page 3

SP3200(V) with heating type HEX5-1.08



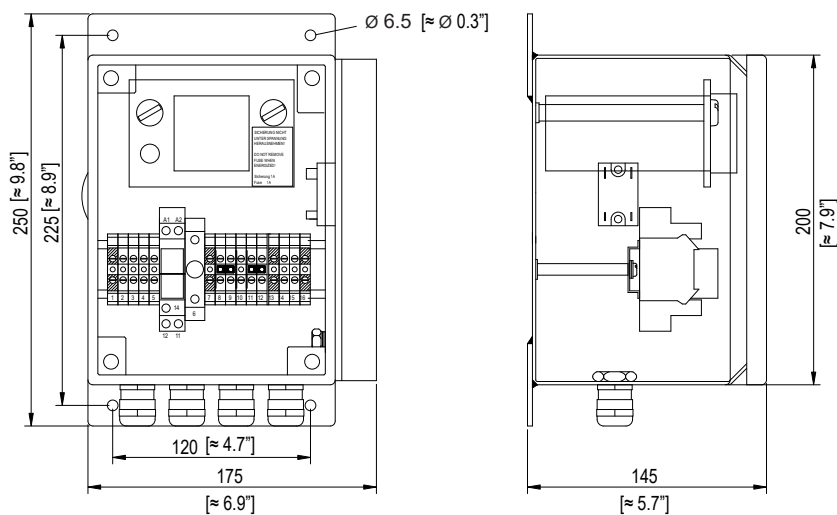
Dimensions in mm [Inches]

SP3200(V) with heating type HEX5-2.08



Dimensions in mm [Inches]

External controller for heating HEX5-2.08



Dimensions in mm [Inches]

Options	Version	Part No.
Pre-filter type V20-0 for SP probes, internal stainless steel pre-filter with volume displacer inside, length: 220 mm [≈ 8.7"], 46 mm OD, filter porosity: 2 µm, temperature: max. 600 °C [1112 °F], connection: G 3/4", material: SS 316L/316Ti	V20-0	20S9105
Pre-filter type V20-0/HC for SP probes, internal Hastelloy® pre-filter with volume displacer inside, length: 220 mm [≈ 8.7"], 46 mm OD, filter porosity: 2 µm, temperature: max. 900 °C [1652 °F], connection: G 3/4", material: Hastelloy® X	V20-0/HC	20S9115
Pre-filter type V20-1 for SP probes, internal stainless steel pre-filter with volume displacer inside, length: 520 mm [≈ 20.5"], 60 mm OD, filter porosity: 2 µm, temperature: max. 600 °C [1112 °F], connection: G 3/4", material: SS 316L/316Ti	V20-1	20S9145
Pre-filter type V20-1/HC for SP probes, internal Hastelloy® pre-filter with volume displacer inside, length: 520 mm [≈ 20.5"], 60 mm OD, filter porosity: 2 µm, temperature: max. 900 °C [1652 °F], connection: G 3/4", material: Hastelloy®-X	V20-1/HC	20S9155
Pre-filter type V20-1/HC for SP probes, internal Hastelloy® pre-filter with volume displacer inside, length: 520 mm [≈ 20.5"], 60 mm OD, filter porosity: 0.5 µm, temperature: max. 900 °C [1652 °F], connection: G 3/4", material: Hastelloy®-X	V20-1/HC	20S9156
Pre-filter type V20-3 for SP probes, internal stainless steel pre-filter with volume displacer inside, length: 300 mm [≈ 11.8"], 31 mm OD, filter porosity: 2 µm, temperature: max. 600 °C [1112 °F], connection: G 3/4", material: SS 316L/316Ti	V20-3	20S9300
Extra charge for extension of in-situ stainless steel pre-filter V20-3 or V20-4 for each 100 mm [≈ 3.9"] additional length (from standard length 300 mm [≈ 11.8"] to ... mm), max. 1000 mm [≈ 3.3 ft] total filter length, material: SS 316L/316Ti	V20-3	20S9310
Pre-filter type V20-T for SP probes, backflushable internal hose pre-filter with support tube, length: 400 mm [≈ 15.8"], 40 mm OD, filter porosity: 3 µm, temperature: max. 200 °C [392 °F], connection: G 3/4", material: PTFE, SS 316Ti	V20-T	20S9315
Extension tube Vm 500 mm for pre-filters at SP probes, with G 3/4" male connection and internal volume displacer, length: 500 mm [≈ 19.7"], incl. gasket set, sampling temperature: max. 600 °C [1112 °F], material: SS 316 Ti (for pre-filters V20)	Vm500	20S9165
Extension tube Vm1000 mm for pre-filters at SP probes, with G 3/4" male connection and internal volume displacer, length: 1000 mm [≈ 3.3 ft], incl. gasket set, sampling temperature: max. 600 °C [1112 °F], material: SS 316 (for pre-filters V20)	Vm1000	20S9170
Extension tube Vm1500 mm for pre-filters at SP probes with G 3/4" male connection and internal volume displacer, length: 1500 mm [≈ 4.9 ft], incl. gasket set, temperature: max. 600 °C [1112 °F], material: SS 316Ti (for pre-filters V20)	Vm1500	20S9175

For choosing the adequate pre-filter, see also data sheet "Pre-Filters for Gas Sample Probes Series SP®, Version SP2000/V20 with G 3/4" connection, SP2000/V12 with flange connection, Version SP2000/20SS 150 with tube connection"
Hastelloy® is a registered trademark by Haynes International, USA.

Options sample tubes

Options	Version	Part No.
Sample tube SP 2000/SS, length: 1 m [≈ 3.3 ft], connection: G 3/4 o, temperature: max. 600 °C [1112 °F], material: SS 316Ti	SP2000/SS	20S9065
Sample tube SP 2000/SS-Vm, length: 1 m [≈ 3.3 ft], with volume displacer, connection: G 3/4 o, temperature: max. 600 °C [1112 °F], material: SS 316Ti	SP2000/SS-Vm	20S9067
Sample tube SP 2000/HC, length: 1 m [≈ 3.3 ft], connection: G 3/4 o, temperature: max.: 900 °C [1652 °F], material: Hastelloy®-C	SP2000/HC	20S9090
Sample tube SP2000/KA, length: 1 m [≈ 3.3 ft], connection: G 3/4 o, temperature: max. 1300 °C [2372 °F], material: Kanthal®	SP2000/KA	20S9080
Sample tube SP2000/IN, length: 1 m [≈ 3.3 ft], connection G 3/4 o, temperature: max. 1100 °C [2012 °F], material: Inconel®	SP2000/IN	20S9077
Sample tube SP2000/HR, length: 1 m [≈ 3.3 ft], connection G 3/4 o, temperature: max. 1200 °C [2192 °F], material: HR-160® Alloy	SP2000/HR160	20S9103

For choosing the adequate sample tube, see also data sheet "Sample Tubes for Gas Sample Probes Series SP® with G 3/4" connection thread"
Hastelloy® and HR-160® Alloy are registered trademarks by Haynes International, USA .
Kanthal® is a registered trademark by Sandvik Intellectual Property AB, Schweden.
Inconel® is a registered trademark by Special Metals Corporation, USA.

Temperature classes (Please indicate the required temperature class in your order)

Part number	T-Class ATEX Cenelec/IEC/NEC 505	T-Class CSA NEC 500	Operating temperature °C	Limiter °C
20S9608	T2	T2	230 [446 °F]	235 [455 °F]
20S9609		T2A	215 [419 °F]	220 [428 °F]
20S9610	T3	T2B	185 [365 °F]	190 [374 °F]
20S9611		T2C	175 [347 °F]	180 [356 °F]
20S9612		T2D	160 [320 °F]	165 [329 °F]
20S9613		T3	150 [302 °F]	155 [311 °F]
20S9614		T3A	135 [275 °F]	140 [284 °F]
20S9615	T4	T3C	120 [248 °F]	125 [257 °F]
20S9616		T4	95 [203 °F]	100 [212 °F]
20S9617	T5	T4A	85 [185 °F]	90 [194 °F]
20S9618		T5	70 [158 °F]	75 [167 °F]

The programming and closing of the controller are performed at works in accordance with the specifications in your order.