



SP2000-H

- **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**

Gas Sample Probe Series SP[®]

Version SP2000, SP2000-H, SP2300-H, SP2400-H

Application

The **M&C** sample probes version **SP2000...**, **SP2300-H** and **SP2400-H** are used for continuous extraction of gases from dust laden, high temperature and/or humid processes.

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 sample tubes or pre-filters (see data sheet **2-1.1.0.6** and **2-1.1.0.8**), not included in the scale of delivery, can be simply screwed into the probe (G 3/4" thread).

The filter element (ceramic is standard, others optional) with a large surface area and high capacity is located in the external housing.

The design offers little or no stagnant space external to the process. The probes are designed so that changing a filter element does not involve the use of tools. In this operation neither the sample probe tube nor sample line need to be removed, thus avoiding contamination of the clean gas path and maintaining the integrity of the system.

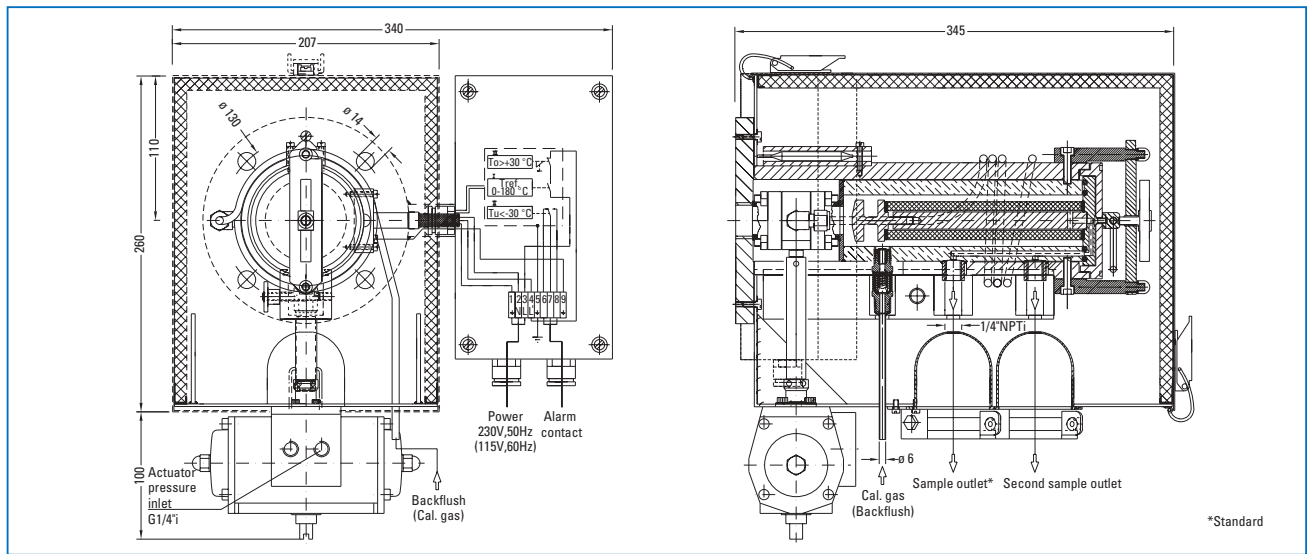
The sample tube can be cleaned, washed or rodded-out from outside the process. The special design of the heating element of the **SP2000/2300/2400-H** (with protective hood) permits controlled heating of the complete filter housing, including the mounting flange up to 180 °C (Version /H320 up to 320 °C). This ensures reliable operation external to the process preventing the temperature falling below the dew-point.

The temperature of the standard probe is controlled by an integral compact design capillary sensor thermostat with an excess temperature limit switch and an alarm function for temperature failure. The probe can be provided with test and reference gas facilities.

Depending on the gas composition, it is possible that the standard material of the probe body (stainless steel 316) will not be sufficiently corrosion resistant. In this case probe **SP2300-H** made of PTFE or **SP2400-H** made of Titanium should be used.

Dimensions

SP2000-H basic version with options (Examples)



Dimensions in mm

Technical Data

Gas Sample Probe Version	SP2000	SP2000-H	SP2300-H	SP2400-H
Part No.	20S1000	20S2000	20S3000	20S3500
Protective cover	no	yes	yes	yes
Degree of protection	IP54 EN60529			
Filter housing material	Stainless steel 316*		PTFE	Titanium
Sealing materials	FPM* /7aT** = PTFE /H320** = graphite			
Probe flange sealing material	Novapress			
Insitu probe tube/prefilter	Optional			
Sample pressure max.	0,4-6 bar* abs., /7aT**= 2 bar abs., /HP** = 25 bar abs.		2 bar abs.	0,4-6 bar abs.
Ambient temperature	20 °C to +180 °C		-20 °C to +60 °C*** /PT100, /Fe-CuNi, /Ni-CrNi** = -20°C to +80°C	
Filter chamber volume	120 cm ³			
Filter element, porosity	S-2K150= Ceramic*, 2micron, /F-0, 1GF150= Glass fibre**, 0,1 micron, /FW= Spun glass**			
Thermostat, Temperature adjustment	0-180°C* /H320**= 0-320°C /PT100** /Fe-CuNi** /Ni-CrNi**			
Ready for operation	after 40min /H320** = after 60min			
Low temperature alarm contact*	Contact rating: 250V, 3A~, 0,25A= Alarm point: ΔT 30°C			
Sample gas outlet connection	1x 1/4" NPTi* tube connectors ø 6, 8 or 10 mm** /H320**= 6 mm			
Backflush/Test gas connection	1/4" NPTi* /R**, /H320**= tube ø 6 mm			
Power supply	230V 50/60 Hz, 800W /115V** = 115V 60Hz, 800W (fuse protection 10A)			
Electrical connections	Terminals max. 4mm ² , 2x PG 13,5 cable gland			
Electrical equipment standard	EN 61010, EN 60519-1			
Mounting flange	DN65 PN6-B, SS316Ti* >DN or ANSI possible** /HP** = DN50 PN25			
Weight	7 kg*	15,4 kg*	15,4kg*	14,5kg*

* Standard

** Options

*** In case of higher ambient temperatures use option PT100 (Part No. 20S9025) or thermocouple Fe-CuNi respectively Ni-CrNi (Part No. 20S9027 resp. 20S9028) instead of the thermostate controller. Then, an additional electronic temperature controller (see data sheet 2-5.1) is necessary.

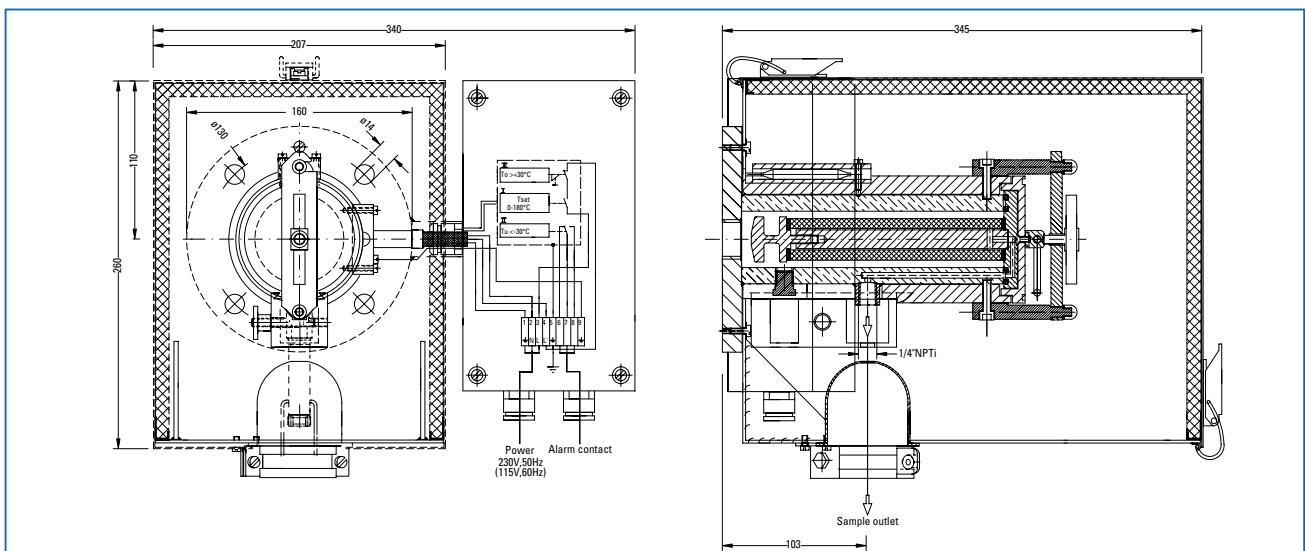
Differential pressure and T₉₀-time

ΔP and T ₉₀ at flow of:	100	200	500	1000	1500	3000 (only /HF)	Nl/hr
ΔP with new filter element S-2K150/GF150	0,007	0,005	0,02	0,058	0,135	0,240/0,225	bar
T ₉₀ -time for SP2000-H without tube	6	3,5	1	<0,5	<0,5	<0,5	s

Basic versions and options (choice)

Basic executions	Data sheet	Version	Part-No.
Basic execution, non-heated, without weather protection shield, material SS 316Ti		SP2000	20 S 1000
Basic execution, heated to 0-180 °C, with weather protection shield, material SS 316Ti	2-1.1.1	SP2000-H	20 S 2000
Basic execution, heated to 0-180 °C, with weather protection shield, material PTFE	2-1.1.1/2-1.1.3	SP2300-H	20 S 3000
Basic execution, heated to 0-180 °C, with weather protection shield, material Titanium	2-1.1.1	SP2400-H	20 S 3500
Options (Extract)			
Execution with power supply 115V/60Hz	2-1.1.1	/115V	20 S 9030
Execution with top of filter case with PTFE-rings and seals of PTFE	2-1.1.2	/7aT	20 S 9010
Execution with second outlet for sample gas 1/4" NPTi	2-1.1.1	/2x	20 S 9015
Execution with back purge/calibration gas valve, opening pressure 0,7 bar, pipe 6 mm	2-1.1.1	/R	20 S 9045
Execution with back purge/calibration gas valve for SP2400-H, opening pressure 0,7 bar, 1/4" NPTi	2-1.1.1	/R-Ti	20 S 9048
Execution with fiber glass filter element 0,1GF150, filter porosity 0,1 µm, sealing PTFE	2-1.1.2	/GF150	20 S 9020
Execution with spec. filter housing lid and unscrewed cartridge incl. spun glass filling, sealing FPM, Novapress	2-1.1.2	/FW	20 S 9047
Execution with spec. filter housing lid and unscrewed cartridge incl. spun glass filling for 320 °C, sealing graphit	2-1.1.2	/FW 320	20 S 9046
Execution with electrical heating of the external filter to 0-320 °C	2-1.2.8	/H320	20 S 9021
Execution for max. 25 bar operating pressure, mounting flange DN50 PN25		/HP	20 S 9017
Execution with gas pre-heater GVW1, material SS304	2-1.2.5	/GVW1	20 S 9058
Execution with connection of the gas pre-heater to valve "R" and to gas inlet	2-1.2.5	/GVW	20 S 9062
Execution with with PT00 sensor instead of the thermostat, without temp. controller		/PT100	20 S 9025
Execution with thermoelement FE-CuNi (type J) instead of thermostat, without temp. controller		/Fe-CuNi	20 S 9027
Execution with thermoelement Ni-CrNi (type K) instead of thermostat, without temp. controller		/Ni-CrNi	20 S 9028
Execution with second PT100 sensor		/2-PT100	20 S 9026
Execution with electrical safety separation according VDE106T101 in connection with thermostat		/ST	20 S 9031
Execution with steam heating, without controller and valves	2-1.2.10	/D	20 S 9033
Execution with adapter flange size DN..PN6 or ANSI..150 lbs		/DN	20 S 9004
Execution with thread mounting fitting R2"a or 2"-NPTa instead of the mounting flange		/SO1	20 S 9005
Execution with integrated 2-way ball valve with lock function in the inlet	2-1.3.6/2-1.4.5	/VA	20 S 9050
Execution with integrated 3-way ball valve with T-function in the inlet	2-1.3.6/2-1.4.5	/3VA	20 S 9325
Execution with integrated 2-way ball valve with lock function in the inlet, up to 320 °C	2-1.3.6/2-1.4.5	/VA320	20 S 9053
Execution with integrated 3-way ball valve with T-function in the inlet, up to 320 °C	2-1.3.6/2-1.4.5	/3VA320	20 S 9330
Execution with pneumatic drive for ball valves VA and 3VA, 2 operating states	2-1.3.6/2-1.4.5	/MS1	20 S 9055
Execution with pneumatic drive for valves VA 320°C and 3VA 320 °C, 2 operating states	2-1.3.6/2-1.4.5	/MS3	20 S 9056
Execution with electrical actuating drive for ball valves VA and 3VA, 2 operating states, 230V 50Hz	2-1.4.10	/EA230	20 S 9342
Execution with electrical actuating drive for ball valves VA and 3VA, 2 operating states, 115V 60Hz	2-1.4.10	/EA115	20 S 9342a
Execution with electrical actuating drive for ball valves VA and 3VA, 2 operating states, 24V dc	2-1.4.10	/EA24	20 S 9342d
Execution with filter housing lid for high flowrate with filter element 0,1GF		/HF	20 S 9016

Basic version



Options for basic versions

Short term	SP2000	SP2000-H	SP2300-H	SP2400-H
/115V	–	X	X	X
/7aT	X	X	–	–
/2x	X	X	X	X
/R	X	X	X	X
/R-Ti	X	X	X	X
/GF150	X	X	X	X
/FW	X	X	–	X
/FW 320	–	X	–	X
/H320	–	X	–	X
/HP	X	X	–	–
/GVW1	–	X	X	X
/GVW	–	X	X	X
/PT100	–	X	X	X
/FeCuNi	–	X	X	X
/Ni-CrNi	–	X	X	X
/2-PT100	–	X	X	X
/ST	–	X	X	X
/D	–	X	X	X
/DN	X	X	–	–
/S01	X	X	–	X
/VA	X	X	–	–
/3VA	X	X	–	–
/VA320	–	X	–	–
/3VA320	–	X	–	–
/MS1	X	X	–	–
/MS3	X	X	–	–
/EA230	X	X	–	–
/EA115	X	X	–	–
/EA24	X	X	–	–
/HF	X	X	–	–

– not possible

X possible

The above table does only indicate the possible options for the different probe types. This is no statement about the possible combinations of these options with each other in a probe model. In case you are looking for several options to be combined, please ask our sales team for technical advice.