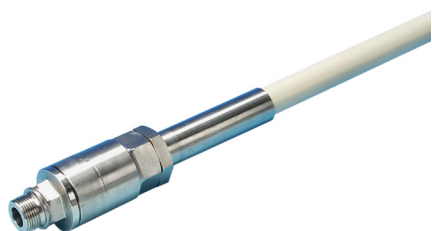


Product Group Gas Sample Tubes.

Product Category Gas Sampling.





Sample tubes for series SP®

Sample Tubes for Gas Sample Probes Series SP®

with G 3/4" connection thread

Special Features

- For dust levels up to 2 g/m³
- Point-selective sampling
- Sampling downstream wet scrubber up to 90 °C [194 °F]
- Sampling temperature up to max. 1800 °C [3272 °F]
- Different lengths
- Great variety of materials
- Easy mounting

Application

The M&C sample tubes are used in combination with the M&C gas sample probes series SP® for point-selective continuous gas sampling in processes with low dust levels.

Description

The M&C probe sample tubes SP210/SS and SP2000 are selected according to the specific applications. Influencing process parameters are the gas composition, dust content, water vapor saturation, temperature, pressure and gas velocity.

In addition to the standard length 'L1', other lengths up to 'L max' are available on request.

For applications with low sample gas flow, sample tubes SP2000/SS-Vm are equipped with volume displacers to decrease the downtime.

Gas sampling downstream a wet scrubber with a high content of water is carried out with the M&C sample tube SP32 equipped with an integrated demister for droplet separation.

Depending on the selected material, the M&C sample tubes are equipped with a welded thread adapter or a support adapter. They are partially made out of different materials than the tubes, depending on manufacturing. See table below.

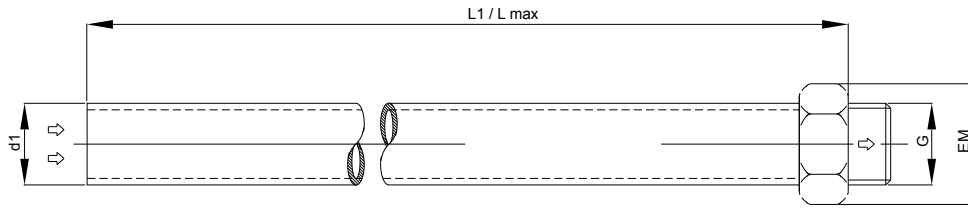
The connection thread enables easy mounting into the mounting flange of the M&C gas sample probes.

Further sampling accessories:

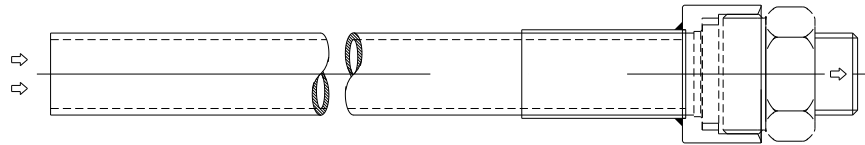
For a high dust load: pre-filter V20, V12

For lower deviation of dew point on process side: heated sample tubes SP30, SP35

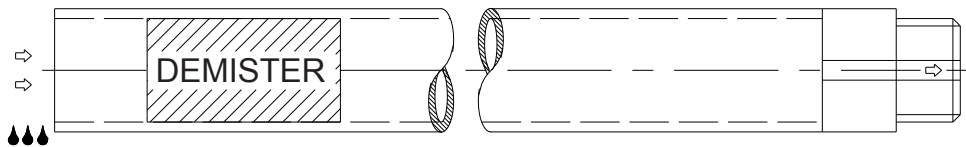
Sample tube SP210SS / SP2000... / CR-N with welded thread connection



Sample tube SP2000/ CR-2(20) /AO for >1300 C with support adapter



Sample tube SP32 with demister for gas sampling behind wet scrubber



Technical Data

M&C Probe sample tube Type	Part. No.	Temperature max. °C [°F]	Material Tube/connection part	Length 'L1' ¹⁾ mm [inch]	Length 'L max' mm [inch]	Connection thread 'G'	Tube ø o/i 'd1' mm	Connection ø o 'EM' mm
SP2000/PV	20S9070	90 [194 °F]	PVDF/PTFE-fiber glass-reinforced	1000 [≈ 39.4"]	1500 [≈ 59.1"]	G 3/4" o	25/21	50
SP32	20S9280	90 [194 °F]	PVDF/PTFE-fiber glass-reinforced	800 [≈ 31.5"]	800 [≈ 31.5"]	G 3/4" o	50/44	50
SP2000/T	20S9083	160 [320 °F]	PTFE/PTFE-fiber glass-reinforced	500 [≈ 19.7"]	500 [≈ 19.7"]	G 3/4" o	25/15	33
SP2000/Ti	20S9075	400 [752 °F]	Titan	1000 [≈ 39.4"]	2500 [≈ 98.4"]	G 3/4" o	25/22	37
SP210/SS	02S9200	600 [1112 °F]	Stainl. steel 316Ti	1000 [≈ 39.4"]	2000 [≈ 78.7"]	G 3/4" o	12/10	37
SP2000/SS	20S9065	600 [1112 °F]	Stainl. steel 316Ti	1000 [≈ 39.4"]	2500 [≈ 98.4"]	G 3/4" o	25/22	37
SP2000/SS-Vm	20S9067	600 [1112 °F]	Stainl. steel 316Ti	1000 [≈ 39.4"]	2500 [≈ 98.4"]	G 3/4" o	25/06	37
SP2000/HC	20S9090	900 [1652 °F]	Hastelloy® C4	1000 [≈ 39.4"]	2500 [≈ 98.4"]	G 3/4" o	25/22	37
SP2000/KA	20S9080	1300 [2372 °F]	Kanthal®/SS 316Ti	1000 [≈ 39.4"]	1500 [≈ 59.1"]	G 3/4" o	27/20	37
SP2000/IN	20S9077	1100 [2012 °F]	Inconel®	1100 [≈ 43.3"]	2500 [≈ 98.4"]	G 3/4" o	25/22	37
SP2000/HR160	20S9103	1200 [2192 °F]	Alloy HR160®,	1000 [≈ 39.4"]	2000 [≈ 78.7"]	G 3/4" o	27/21	37
SP2000/CR-2*	20S9098	1400 [2552 °F]	Cr AL ₂ O ₃ /Hastelloy® C4	900 [≈ 35.4"]	900 [≈ 35.4"]	G 3/4" o	22,5/13	50
SP2000/CR-20*	20S9099	1400 [2552 °F]	Cr AL ₂ O ₃ /Hastelloy® C4	1200 [≈ 47.2"]	1200 [≈ 47.2"]	G 3/4" o	22,5/13	50
SP2000/CR-N	20S9086	1400 [2552 °F]	Silicon nitride-ceramic/ Stainl. steel 316Ti	1000 [≈ 39.4"]	on request	G 3/4" o	29/22	50
SP2000/AO w/o connection part/adapter	20S9385	1800 [3272 °F]	Aluminiumoxyde ²⁾ /	1000 [≈ 39.4"]	1500 [≈ 59.1"]		24/18	
Adapter for SP2000/AO	20S9395	(600 [1112 °F])	/Stainless steel 316Ti			G 3/4" o		50
Adapter for SP2000/AO	20S9397	(900 [1652 °F])	/Hastelloy® C4			G 3/4" o		50

* Sample tube with support adapter. Max. temperature around the support adapter on approx. 200 mm [≈ 7.9"] length depending on material: 600/900 °C [1112/1652 °F].

¹⁾ Standard

²⁾ Please pay attention to the characteristic feature of ceramic in case of high and changing temperatures!

Other materials or designs on request.

For further technical information, see Sample Probes SP 210/2100/2000.

Hastelloy® is the brand name of a nickel-based alloy from Haynes International.

Kanthal® is a trademark of the Sandvik Group for various electrical heating products.

Inconel® is a Special Metals Corporation brand name for a range of corrosion-resistant nickel-based alloys.

Alloy HR160® is a trademark of Haynes International, USA.



SP30-H1.1

Electrically Heated Sample Probe Tube Series SP®

Versions SP30-H, SP30-H1.1-V, SP35-H
for the stationary gas sample probe SP2000-H

Special Features

- Completely heated sample tubes
- Different lengths
- Non-heated pre-filters or extensions possible
- Simultaneously heated pre-filters possible
- Easy installation
- Two temperature sensor versions

Application

The electrically heated sample tube SP30/35-H is used wherever cooling down or falling below the dew point is to be avoided during gas extraction from the sampling point to the heated gas sample probe SP2000-H.

In dust-loaded processes which tend to fall below the dew point in the sampling area during operation or when the plant is at a standstill, it may be advisable to use the electrically heated sample tube SP30-H1.1-V with heated in-situ pre-filter V20-2/30. This prevents premature clogging or destruction.

The sample tubes are available with temperature sensors for max. 320 °C [608 °F] or 200 °C [392 °F] operating temperature.

Description

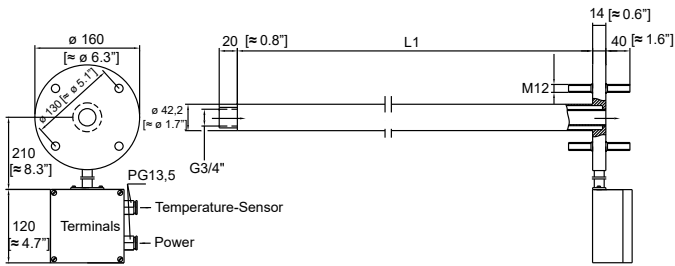
The electrically heated M&C double-jacket sample tube SP30-H is available in lengths of 0.6/1.0/1.5/2.0/2.5 m [≈ 2.0/3.3/4.9/6.6/8.2 ft] and the SP35-H in 0.175 m [≈ 0.6 ft]. The standard lengths of the pre-filter version SP30-H1.1-V are 0.6/1.0 m [≈ 2/3.3 ft].

The sample tubes SP30-H/-V and SP35-H are equipped with a mounting flange with 4 threaded bolts welded on both sides for easy fixing at the sampling nozzle and for mounting the gas sample probe SP2000-H. At the end of the double-jacket tube of the SP30-H/SP35-H versions, there is a G 3/4" connection into which a non-heated sample tube or a pre-filter can be screwed as required.

The electrical heating is process-protected in the double jacket of the sample tubes SP30-H/-V and SP35-H. In the version SP30-H1.1-V, the large screw-on large pre-filter V20-2/30 is also heated by the sample tube.

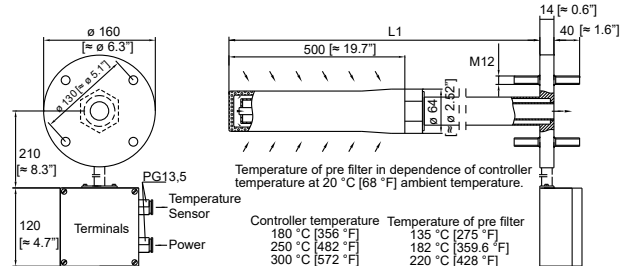
The setpoint of the sample tube's temperature controller must be set accordingly high in line with the process conditions (see table). The sample tubes of versions SP30-H and SP35-H have an inner tube of \varnothing 22 mm. The version SP30-H1.1-V is equipped with an inner tube of \varnothing 6 mm in order to reduce the internal dead volume.

Probe tube SP30-H1.1/H2, SP35-H1.1/H2



Dimensions in mm [Inches]

Probe tube with pre-filter SP30-H1.1-V



Technical Data

Series SP [*] Type	Version SP35		Version SP30		
	H1.1	H2	H1.1	H2	H1.1-V
Temperature sensor	Fe-CuNi	PT100 2-wire	Fe-CuNi	PT100 2-wire	Fe-CuNi
Temperature controller	Optional, external				
Probe tube length L1	175 mm [≈ 0.6 ft]		Max. 2 m [≈ 6.6 ft]		Max. 1 m [≈ 3.3 ft]
Sample temperature max.	550 °C [1022 °F]				
Operating temperature max.	320 °C [608 °F]	200 °C [392 °F]	320 °C [608 °F]	200 °C [392 °F]	320 °C [608 °F]
Pre-filter length: 520 mm, ø 60 mm, filter porosity: 2 µm, integrated and heated					V20-2/30
Sample gas inlet connection	G 3/4" i DIN ISO 228/1				Pre-filter with G1 1/2" i DIN ISO 228/1
Dust load	Max. 2 g/m ³				> 2 g/m ³
Internal dead volume	380 ml/m				420 ml/m
Sample pressure max.	5 bar g				
Ambient temperature	-20 to +80 °C [-4 to 176 °F]				
Storage temperature	-30 to +90 °C [-22 to 194 °F]				
Ready for operation	After 2 hours				
Power supply	230 V AC, (115 V optional)		230/115V AC - switchable,		
Heating capacity	200 W		0.6 m: 600 W, 1 m: 800 W, 1.5 m: 1200 W, 2 m: 1200 W		
Electrical connections	Terminals, max. 2.5 mm ² , 2 x PG 13.5 cable gland				
Electrical standard	EN 61010, EN 60519-1				
Degree of protection	IP54 EN 60529				
Mounting flange	DN 65 PN 6, Form B with mounting bolts on both sides M 12 x 40 mm				
Material of parts in contact with the sample	Stainless steel SS 904L, Version SP30-H1.1/HC: Hastelloy® X				SS 904L, 316Ti/316

Pressure difference and T90 time

ΔP and T ₉₀ at a flow rate of:	100	200	500	1000	NI/h
ΔP pressure loss SP30-H, length 1 m [≈ 3.3 ft]	< 1	< 1	< 1	< 1	mbar
ΔP pressure loss SP30-H-V, length 1 m [≈ 3.3 ft] with new pre-filter V20-2/30	< 1	< 1	1.5	4	mbar
T ₉₀ time	14	7	< 3	< 2	sec

Part number and weight

	Version SP35	Version SP30				Type:
Length "L1"	175 mm [≈ 0.6 ft]	0.6 m [≈ 2 ft]	1.0 m [≈ 3.3 ft]	1.5 m [≈ 4.9 ft]	2.0 m [≈ 6.6 ft]	2.5 m [≈ 8.2 ft]
Part number	20S9320	02S9023	02S9025	02S9026	02S9024	02S9022
		02S9096	02S9092	02S9093	02S9094	02S9095
	20S9322	02S9023p	02S9025p	02S9026p	02S9024p	
Weight	4.8 kg [≈ 10.6 lbs]	5 kg [≈ 14.1 lbs]	8.0 kg [≈ 17.6 lbs]	9.8 kg [≈ 21.6 lbs]	11.6 kg [≈ 25.6 lbs]	
Part number		02S9037	02S9038			H1.1-V
Weight		9.0 kg [≈ 19.8 lbs]	10.6 kg [≈ 23.4 lbs]			
	+ 02S9036	Standard, switchable				115 V AC

The corresponding temperature controller has to be ordered and mounted separately. See datasheet "Microprocessor-Controlled Temperature Controller Type 70304"

Hastelloy® is a registered trademark used by Haynes International, USA.



SP34-H

Electrically Heated Sample Probe Tube Series SP®

Version SP34-H for portable gas sample probe PSP4000-H

Special Features

- **Completely heated sample tube**
- **Non-heated pre-filters or extensions possible**
- **Easy mounting**
- **Standard: with thermostat controller**
- **Optionally: thermocouple Fe-CuNi or PT100**

Application

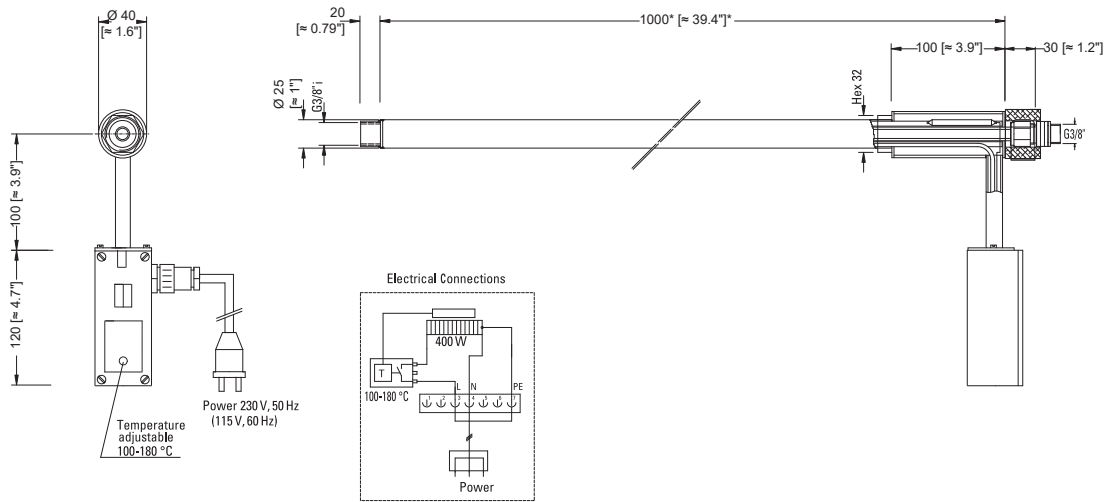
The electrically heated M&C sample tube SP34-H is used in portable sampling systems wherever cooling down of the temperature or falling below the dew point is to be avoided during gas sampling from the sampling point to the heated gas sample probe PSP4000-H.

Description

The standard length of the heated M&C double-jacket tube SP34 is 1000 mm [3.3 ft]. Other tube lengths are available on request.

The sample tube is screwed into the inlet of the gas sample probe PSP4000-H with a G 3/8" male thread connection. At the other end of the double-jacket sample tube, there is a G 3/8" female connection into which a non-heated sample tube or a pre-filter can be screwed as required. The electrical heating of the sample tube SP34-H is separated from the process in a double-jacket tube

An adjustable capillary thermostat for temperature control ranging from 100 to 180 °C [212 to 356 °F] is provided in the attached terminal box of the standard version. In this case, an external temperature controller is not needed. The versions with thermocouple or PT100 require an external temperature controller.



Dimensions in mm

Technical Data

	SP 34-H	SP 34-H1.1	SP 34-H2
Part No.	40S9115	40S9120	40S9125
Temperature sensor	Capillary sensor	Fe-CuNi	PT100
Temperature controller	Capillary thermostat	Optional, external	
Tube length	1 m [≈ 3.3 ft] standard		
Connections	IN G 3/8" female thread, OUT G 3/8" male thread, DIN ISO 228/T		
Material	Stainless steel SS 316Ti		
Controller temperature max.	180 °C [356 °F]		
Sample temperature max.	400 °C [752°F]		
Ambient temperature (controller)	-20 to +60 °C [-4 to 140 °F]		
Power supply	230 V 50 Hz 400 W, with 4 m [≈ 13.1 ft] cable / 115 V 60 Hz		
Degree of protection/electrical equipment standard	IP54 EN 60529/EN 61010, EN 60519-1		
Option			
Part No. 02S9036	Extra charge for SP34-H with power supply 115 V 60 Hz		