

Product Group Heated Sample Lines.

Product Category Gas Transport.





4-5/30/50/80/100/120

Electrically Heated Sample Lines

Type 3/4/5/-5/30/50/80/100/120 (Ex)



Self-regulating, 3 types of tubes and 6 temperature versions from +5 to 120 °C [41 to 248 °F]

Special Features

- Self-regulating, without thermostat
- Complete assembly to fixed length at the factory
- Customer assembly if sold by meter
- Outer jacket: corrugated polyamide hose
- Type 3: PTFE tube, non-replaceable
- Type 4: PTFE tube, replaceable
- Type 5: stainless steel tube, non-replaceable
- Tube \varnothing DN 4/6 to 10/12
- 6 temperature ranges from +5 °C to 120 °C [41 to 248 °F]
- Holding temperature at -20 °C [-4 °F]
- Ex version for zones 1, 2, 21 and 22 according to ATEX

Application

The electrically heated self-regulating M&C sample lines 3/4/5/-5/30/50/80/100/120 (Ex) are used in gas analysis technology for the transport of sample gas from the sampling point to the gas conditioning system. They prevent measuring faults in the lower temperature ranges from +5 to +120 °C [41 to 248 °F] and serve as frost protection. Temperature monitoring of the total heated line is not possible due to the function as parallel heater band.

Description

The self-regulating M&C sample lines 3/4/5/-5/30/50/80/100/120 are supplied completely assembled to a fixed length at the factory or if sold by meter, at the customer's site.

3 types of tubes (3/4/5) and 6 versions of different temperature ranges (5/30/50/80/100/120) are available in DN 4, 6 or larger (4/6/8/10).

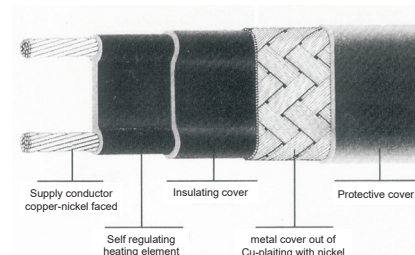
The robust design of the sample line consists of the inner medium tube, the parallel-installed self-regulating heating band, both wrapped in a heat-conducting aluminium foil, a thermal insulation designed according to the requirements and the black corrugated polyamide hose as outer jacket. The line assembly is completed by end caps out of temperature-resistant silicone.

The explosion-proof versions 3/4/5/-5/30/50/80/100/120 Ex for use in the hazardous area zones 1, 2, 21 and 22 are equipped with Ex proof self-limiting heater bands.

For the Ex-version, the factory-assembled sample lines have an axially exiting 1-m-long connection cable or heating band and a tube protrusion of 500 mm [\approx 19.7"] on both sides. Suitable accessories are available for on-site assembly.

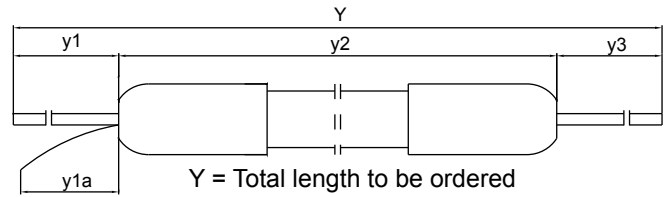
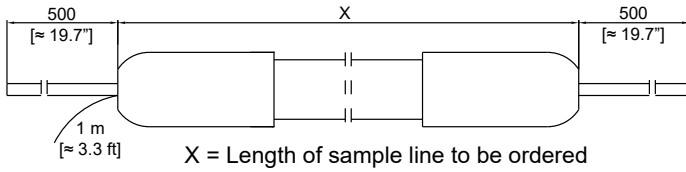
Description of Self-Regulating Heater Bands

The self-regulating parallel heater bands consist of two parallel supply conductors made of copper which are embedded in a cross-linked and carbon particle-doped plastic heating element with a positive temperature coefficient, i.e. the heating element changes its output depending on the ambient temperature. When the temperature increases, the plastic is expanding due to the molecular expansion, the compounds of the carbon particles break up, the resistance increases and, therefore, the capacity is decreasing. When cooling down, this process is reversed and the capacity increases. In this way, the heater band adjusts itself individually to the heat requirement at every point of the sample line.



Complete assembly of sample line at factory

Assembly of sample line at customer's site



For mounting the Ex version, a 2-pole residual-current device 300 mA is necessary (M&C recommends 30 mA).

Technical Data

Sample line type 3/4/5 DN 4 or 6	.../5-... [Ex]	.../30-... [Ex]	.../50-... [Ex]	.../80-... [Ex]	.../100-... [Ex]	.../120-... [Ex]
Inside tube	Type 3/4: PTFE, ø DN 4/6 or 6/8, type 3: non-replaceable, type 4: replaceable Type 5: stainless steel 316Ti, ø DN 4/6 or 6/8, non-replaceable, in case of factory assembly 500 mm [≈ 19.7"] protruding on both sides					
Holding temperature at -20 °C [-4 °F] ambient temperature	+5 °C [41 °F]	+30 °C [86 °F]	+50 °C [122 °F]	+80 °C [176 °F]	+100 °C [212 °F]	+120 °C [248 °F]
Version Ex temperature class	T6	T6	T3	T3	T3	T3
Power consumption, cold start at +10 °C [50 °F]	10 W/m	30 W/m	30 W/m	45 W/m	45 W/m	60 W/m
Max. length allowed for -20 °C [-4 °F] ambient temperature	109 m [≈ 357.6 ft]	52 m [≈ 170.6 ft]	65 m [≈ 213.3 ft]	55 m [≈ 180.5 ft]	55 m [≈ 180.5 ft]	40 m [≈ 131.2 ft]
Max. length of one piece	99 m [≈ 324.8 ft]	99 m [≈ 324.8 ft]	99 m [≈ 324.8 ft]	99 m [≈ 324.8 ft]	99 m [≈ 324.8 ft]	99 m [≈ 324.8 ft]
Max. operating temp. allowed when power supply ON	65 °C [149 °F]	65 °C [149 °F]	120 °C [248 °F]	120 °C [248 °F]	120 °C [248 °F]	120 °C [248 °F]
Max. operating temp. allowed when power supply OFF	85 °C [185 °F]	85 °C [185 °F]	180 °C [356 °F]	180 °C [356 °F]	180 °C [356 °F]	180 °C [356 °F]
Corrugated polyamide hose outer jacket, black	ø 42.5 mm O.D. [≈ ø 1.7" O.D.]					ø 55 mm O.D. [≈ ø 2.2" O.D.]
Ambient temperature allowed	Standard: -20 to +65 °C [-4 to 149 °F]					
Thermal insulation	Thermo fleece					
Operating pressure	Type 3/4: max. 3 bar g, type 5: max. 100 bar g					
Heater band	Self-limiting, to be cut to any length Version Ex: Type ELSR-N... ⚠ II 2 G Ex e II T6, (LCIE 01 ATEX6019X) resp. ⚠ II 2 G Ex e II and ⚠ II 2 D Ex tD A21 Tmax 80°C, (PTB08ATEX1014U) Type ..XTV2-CT, ⚠ II 2 G/D Ex e II T4/T3/T250°C (T2) IP66 T130°C/T195°C/T250°C, (PTB 98 ATEX1105X)					
Power supply	230 V 50 Hz* or 115 V/60 Hz, over-current release according to request, max. 25 A time-lag, characteristic C					
Power consumption	Depending on version and length of the line: W/m x length [m] = total W					
Electrical connection using type 3/4/5 DN 4 or 6	Directly on the heating band using crimping and shrinking methods; assembled at factory with 1 m [≈ 3.3 ft] connection cable of silicone 3 x 1.5 mm ² , heat-resistant					
Marking	⚠ II 2 GD Ex e II T... IP65 TX (temperature class, see type plate)					
Electrical connection using type 3/4/5 Ex DN 4 or 6	Lead out the heating band and place it in the Ex junction box; factory-assembled: 1 m [≈ 3.3 ft] heating band led out to EX-E terminal box, 122 x 120 x 90 mm, with 2 x M25 cable glands and blind plugs each, terminals: 6 x 2.5 mm ²					
Electrical standard	EN61010, EN60335-1/Version Ex: EN 60079-0:2006, EN 60079-30-1:2007, EN 61241-0:2006, EN 61241-1:2004, EN 50281-1-1:1998 + A1, EN 50014, EN 50019, EN 60519-1, EN 60519-2					
Degree of protection	IP64 EN 60529					
Weight	Approx. 0.9 kg [≈ 2.0 lbs] per meter, plus connection and end cap 1.1 kg [≈ 2.4 lbs]					
Application fields/smallest bending radius	Mobile and stationary, indoor and outdoor mounting/200 mm [≈ 7.9"]					

Technical data only for 230 V/50 Hz, for 115 V/60 Hz on request
*standard

Type 3/4/5 (Ex) DN 4 or 6, length: 1 m [≈ 3.3 ft]	.../5-... (Ex)	.../30-... (Ex)	.../50-... (Ex)	.../80-... (Ex)	.../100-... (Ex)	.../120-... (Ex)	
Type 3	DN 4	01B6300	01B6305	01B6310	01B6315	01B6320	01B6325
	Ex DN 4	01B6300Ex	01B6305Ex	01B6310Ex	01B6315Ex	01B6320Ex	01B6325Ex
	DN 6	01B6350	01B6355	01B6360	01B6365	01B6370	01B6375
	Ex NW6	01B6350Ex	01B6355Ex	01B6360Ex	01B6365Ex	01B6370Ex	01B6375Ex
Type 4	DN 4	01B6400	01B6405	01B6410	01B6415	01B6420	01B6425
	Ex DN 4	01B6400Ex	01B6405Ex	01B6410Ex	01B6415Ex	01B6420Ex	01B6425Ex
	DN 6	01B6450	01B6455	01B6460	01B6465	01B6470	01B6475
	Ex DN 6	01B6450Ex	01B6455Ex	01B6460Ex	01B6465Ex	01B6470Ex	01B6475Ex
Type 5	DN 4	01B6500	01B6505	01B6510	01B6515	01B6520	01B6525
	Ex DN 4	01B6500Ex	01B6505Ex	01B6510Ex	01B6515Ex	01B6520Ex	01B6525Ex
	DN 6	01B6550	01B6555	01B6560	01B6565	01B6570	01B6575
	Ex DN6	01B6550Ex	01B6555Ex	01B6560Ex	01B6565Ex	01B6570Ex	01B6575Ex

Options for sample line 3/4/5 DN 4 or 6

Completely assembled for type 3-5 DN 4 or 6	01B7050	01B7050	01B7050	01B7055	01B7055	01B7060
Completely assembled for type 3-5 Ex DN 4 or 6	01B7050Ex	01B7050Ex	01B7065Ex	01B7055Ex	01B7055Ex	01B7060Ex
Accessories for assembling at customer's site for type 3-5 DN 4 or 6	Connection and end cap black silicone, 3,2 m [≈ 10.5 ft] connection cable out of silicone 3 x 1.5 mm ² , connectors, end splices, insulating and small parts, Part No. 01B7100					
Accessories for assembling at customer's site for type 3-5 Ex DN 4 or 6	Connection and end cap black silicone, end splices, shrinking, insulating and small parts, EX-E terminal box, 122 x 120 x 90 mm [≈ 4.8" x 4.7" x 3.54"], with 2 x M25 cable glands and blind plugs each, terminals 6 x 2.5 mm ² , Part No. 01B7100Ex					
Electrically heated sample line with 115 V AC instead of 230 V AC	03B9999					

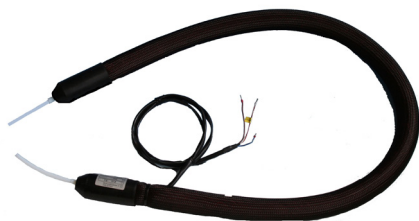
Power supply 115 V/60 Hz, please specify with order, 230 V/50 Hz is standard
Further accessories and other versions on request

To specify with order:

- Type (3/4/5)
- Power supply 230 V/50 Hz or 115 V/60 Hz
- Tube ø i/o (DN 4/6, 6/8, 8/10, 10/12)
- Factory standard assembly
- Accessories
- Temperature version (5, 30, 50, 80, 100, 120)
- Ex version (Ex)
- Length of sample line in meters X or Y
- Assembling at customer's site

For example:

6 x 01B6300 X = 6 m heated, self-regulating sample line version 3/5-4, ø DN 4/6, +5 °C [41 °F] holding temperature, with PTFE tube 4/6 non-replaceable, 230 V/50 Hz, 1 x 01B7050 factory standard assembly



Type 4M-S with connection type C/Y-S

Electrically Heated Sample Lines Type 3/4M-S for Permanent Installation

Type 3 with PTFE tube, non-replaceable

Type 4 with PTFE tube, replaceable

Special Features

- Regulation via external temperature controller
- Completely assembled
- Type 3: PTFE tube, non-replaceable
- Type 4: PTFE tube, replaceable
- Tube DN 4/6 or 6/8
- Temperature: M=200 °C [392 °F]

Application

The electrically heated M&C sample lines series 3/4M-S are used in gas analysis systems to prevent measuring faults and also as frost protection during the transport of the sample gas from the sampling point to the gas conditioning system or directly to a heated analyzer (above the dew point).

Description

The electrically heated M&C sample lines 3/4M-S are supplied completely assembled in fixed length according to customer requirements.

Several options that can be combined are available:

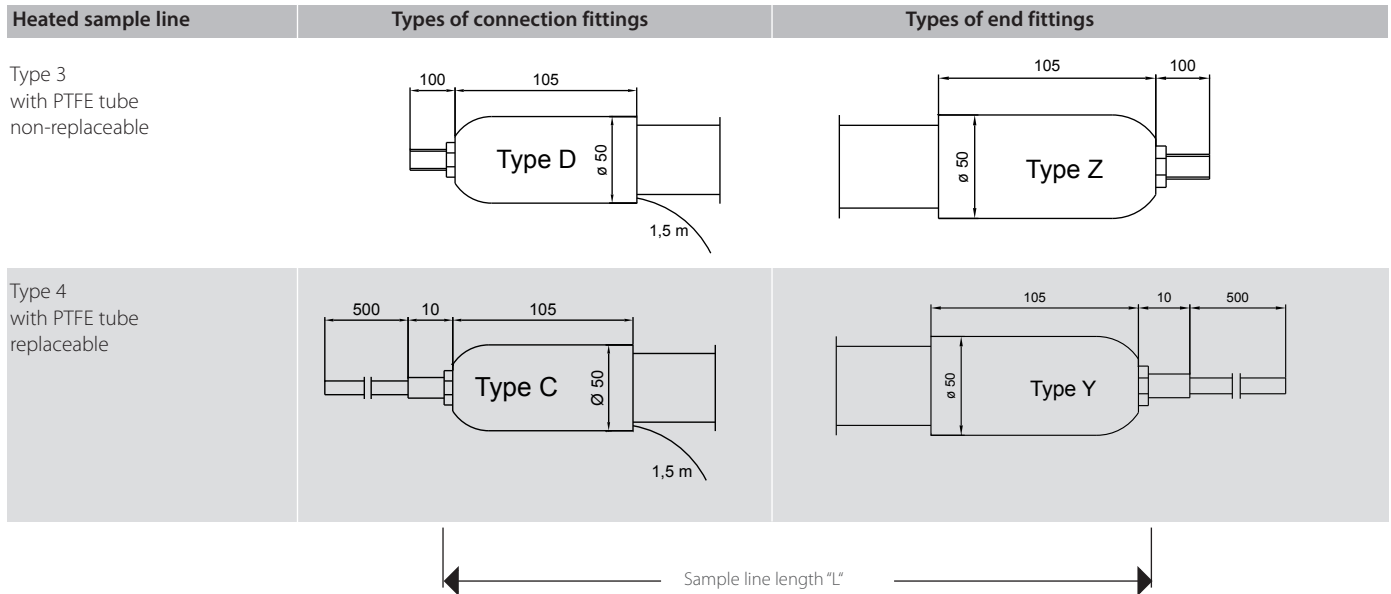
- Temperature: M=200 °C [392 °F],
- two tube versions (3/4) with either DN 4/6 or DN 6/8 each,
- as well as connection fittings and end fittings.

The robust design of the sample lines consists of the inner medium tube, a thermally conducting body, an axially coiled high-performance heating conductor and a two-layer thermal insulation. The outer jacket is an insulating tube made of silicone encased in nylon braiding.

The ends of the sample line are finished with heat-resistant silicone materials, and the entire design ensures that the complete sample line is properly heated, including the ends.

The sample line is equipped with a PT100 for temperature detection.

Types of the Heated Sample Lines and Possible Connections



Dimensions in mm

Technical Data

Heated sample lines	Type 3/4M-S
Operating temperature, max.	+200 °C [392 °F]
Power consumption using DN 4/6	100 W/m
Power consumption using DN 6/8	100 W/m
Pressure, max.	Type 3 = 5 bar g, Type 4 = 3 bar g
Ambient temperature, max.	-20 up to + 60 °C [-4 up to 140 °F]
Tube DN	Optional DN 4/6 or 6/8
Sample line connection and end fittings	See connections and end fittings
Electrical connections	1.5 m [≈ 4.9 ft] cable for power and PT100 sensor connection
Power supply	230 V AC standard, supplied via a temperature controller
PT100 sensor position	0.25 m [≈ 0.82 ft] from the power inlet connection - standard
Weight	First meter = 2 kg [≈ 4.4 lbs]/each additional meter = 0.9 kg [≈ 2 lbs] standard version
Sample line max. length	30 m [≈ 98.4 ft]
Sample line inlet and outlet seal connections	Type 3 = PTFE tube ø 6 or 8 mm, on request, 100 mm [≈ 0.3 ft] on both sides Type 4 = PTFE tube ø 6 or 8 mm, on request, 0.5 m [≈ 1.6 ft] on both sides
Thermal insulation	Silicone tube
Outer shell	Nylon plaiting
Application fields/smallest bending radius	Stationary, indoor and outdoor mounting/400 mm [≈ 1.3 ft]

Description Sample Lines per Meter	Type	DN in mm	Part No
Electrically heated sample line type 3 with non-replaceable PTFE tube, max. 200 °C [392 °F]	3M-S	4/6	04B3010
Electrically heated sample line type 3 with non-replaceable PTFE tube, max. 200 °C [392 °F]	3M-S	6/8	04B3040
Electrically heated sample line type 4 with replaceable PTFE tube, max. 200 °C [392 °F]	4M-S	4/6	04B4010
Electrically heated sample line type 4 with replaceable PTFE tube, max. 200 °C [392 °F]	4M-S	6/8	04B4040
Connection fittings and end fittings for DN 4/6 or 6/8 incl. PT100 and 1.5 m [≈ 4.9 ft] cable:			
Connection fitting type D and end fitting type Z for electrically heated sample line type 3M-S	D/Z-S	4/6	04B1000
Connection fitting type D and end fitting type Z for electrically heated sample line type 3M-S	D/Z-S	6/8	04B1010
Connection fitting type C and end fitting type Y for electrically heated sample line type 4M-S	C/Y-S	4/6	04B1100
Connection fitting type C and end fitting type Y for electrically heated sample line type 4M-S	C/Y-S	6/8	04B1110
Option			
Electrically heated sample line with 115 V AC power supply instead of 230 V AC			03B9999

Other versions on request

Please specify with order:

- Line type (3, 4)
- Line length in meter
- Connection fitting and end fitting D/Z-S or C/Y-S
- Temperature range (N, M)
- Tube dimension DN (4/6, 6/8)
- 1x temperature controller

For example:

6 x 04B4010: 6 m electrically heated sample line, 4M-S 4/6, max. 200 °C [392 °F] with replaceable PTFE tube DN 4/6, 1 x 04B110 connection fitting and end fitting C/Y-S

– Temperature controller see data sheet 4.1, 4.2 and 4.3 –



4M4/6 EX with C/EX and Y/EX

Regulated, Explosion-Proof, Electrically Heated Sample Lines Type 3/4/5-N/M EX



Type 3 with PTFE tube non-replaceable
Type 4 with PTFE tube replaceable
Type 5 with stainless steel tube non-replaceable

Special Features

- Approval according to ATEX for mounting in explosion zones 1, 2, 21 and 22
- Regulation via external temperature controller
- Completely assembled
- Type 3: PTFE tube non-replaceable
- Type 4: PTFE tube replaceable
- Type 5: stainless steel tube non-replaceable
- Hose/tube \varnothing DN 4/6, 6/8 or 8/10
- 2 temperature ranges:
N = 100 °C [212 °F], M = 200 °C [392 °F]

Application

The explosion-proof electrically heated M&C sample lines 3/4/5-N/M EX are used in gas analysis systems to prevent measuring errors and at the same time as frost protection during the transport of sample gas from the sampling point to the gas conditioning system or directly to a heated analyzer (above the dew point).

Description

The explosion-proof electrically heated M&C sample lines 3/4/5-N/M EX are supplied completely assembled in fixed length according to customer requirements.

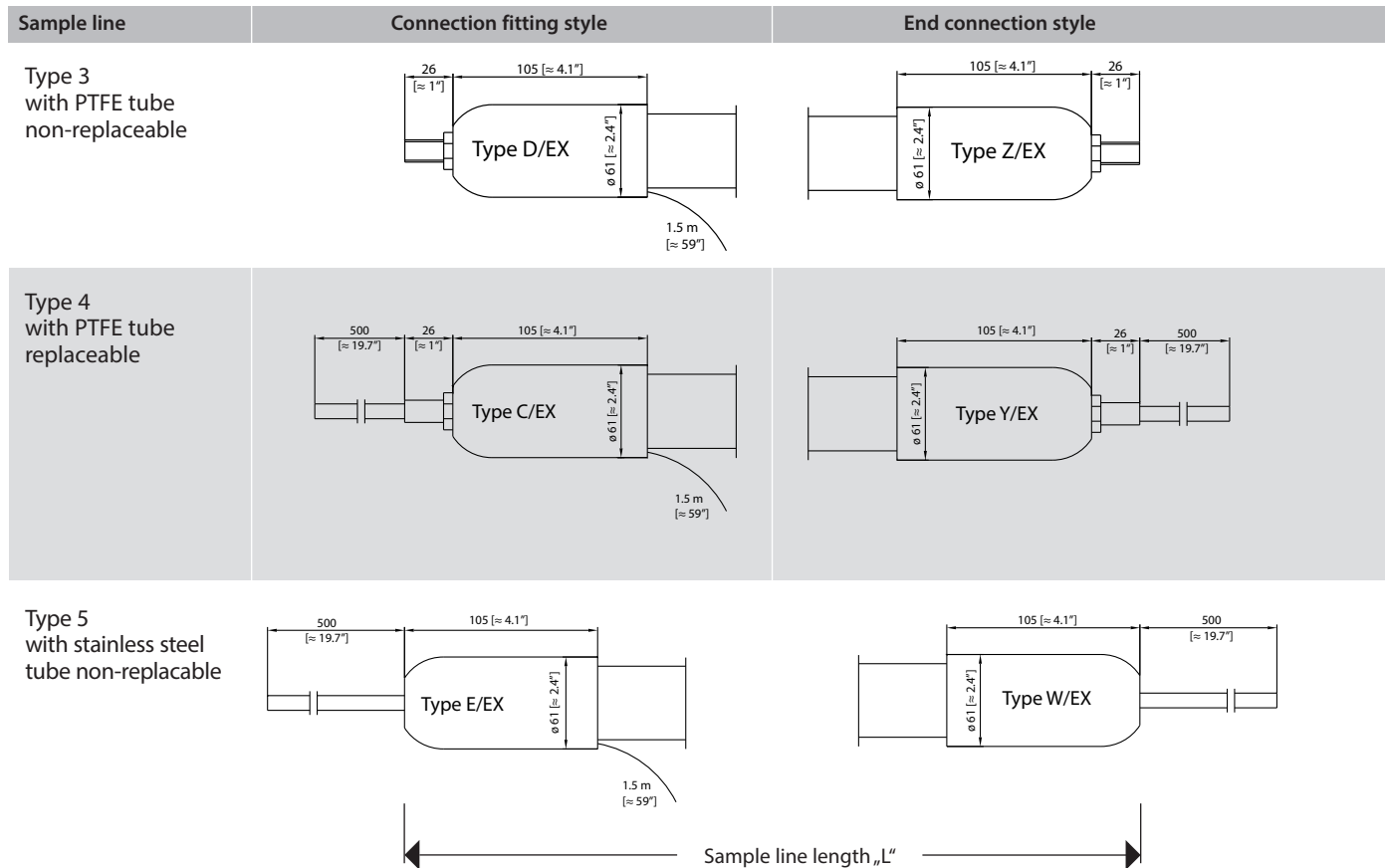
Several options that can be supplied are available:

- 2 different temperature versions (N = 100 °C [212 °F], M = 200 °C [392 °F]), EX T3
- 3 hose/tube versions (type 3, 4, 5) with either DN 4/6, 6/8 or DN 8/10 each as well as
- 3 connection fittings (C, D, E) and
- 3 end fittings (W, Y, Z).

The robust design of the sample lines consists of the inner medium tube, a thermally conducting and supporting body made of braided stainless steel tubing, the axially coiled high-performance heating conductor and a two-layer thermal insulation. The outer jacket is an antistatic corrugated hose out of polyamide.

The ends of the sample line are made of heat-resistant silicone materials, and the entire construction ensures that the complete sample line is properly heated, including the ends.

The explosion-proof sample lines are equipped with two Ex-PT100 intrinsically safe 2GD according to ATEX for temperature detection.



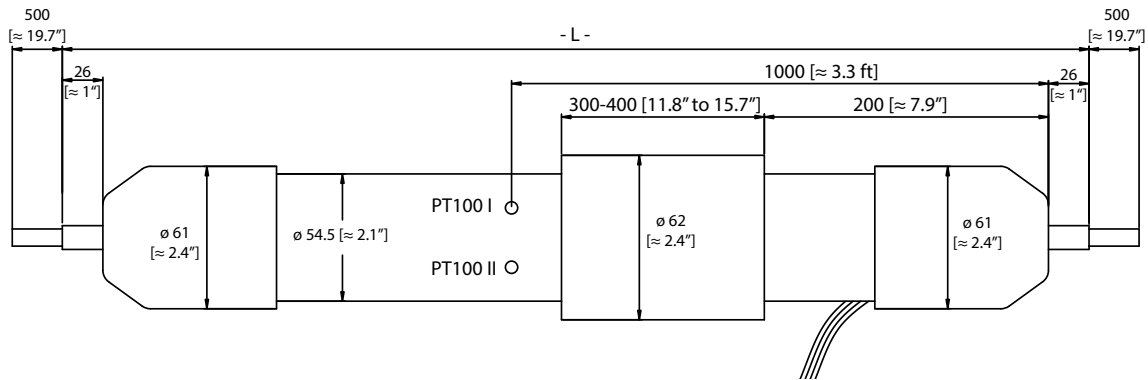
Dimensions in mm [Inches]

Technical Data

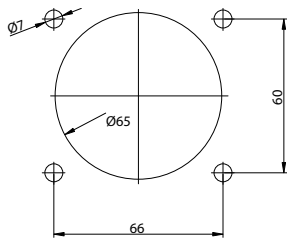
Sample lines type 3/4/5-N/M EX	N	M
Operating temperature, max.	+100 °C [212 °F]	+200 °C [392 °F]
Power consumption	100 W/m	
Pressure, max.	Type 3 = 5 bar g, Type 4 = 3 bar g, Type 5 = 100 bar g	
Ambient temperature, max.	-20 to +65 °C [-4 to 149 °F]	
Tube DN	Optional DN 4/6, 6/8 or 8/10	
Sample line inlet and end connections	See connection and end fittings C, D, E and W, Y, Z	
Electrical connections	1.5 m cable for power and 2 x PT100 sensor connection with cable gland M12 x 1.5 Ex	
Electrical standard	II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	
Power supply	230 V AC standard, supplied via a temperature controller	
PT100 sensor position	1 m [≈ 3.3 ft] from the power connection fitting	
Weight	Max 1.5 kg/m [≈ 2.2 lbs/m]	
Sample line with one heating circuit max. length	230 V: 30 m [≈ 98.4 ft]	
For longer lines, an addit. heating circuit is required	115 V: 13 m [≈ 42.7 ft]	
Sample line connections	Type 3 = stainless steel 316Ti tube nipple ø 6, 8 or 10 mm, on request, 26 mm [≈ 1.02"] long Type 4 = PTFE tube ø 6, 8 or 10 mm on request, 0.5 m [≈ 1.6 ft] on both sides Type 5 = stainless steel 316Ti tube ø 6, 8 or 10 mm on request, 0.5 m [≈ 1.6 ft] on both sides	
Thermal insulation	High-temperature polyester fleece	
Outer jacket	Corrugated tube out of polyamide black	
Application fields	Mobile and stationary, indoor and outdoor mounting	
Smallest bending radius	500 mm [≈ 19.7"]	

Description	Type	DN	Part No.
Regulated, explosion-proof, electrically heated sample line type 3 with non-replaceable PTFE tube, max. 100 °C [212 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	3N EX	4/6	03B3500W
Regulated, explosion-proof, electrically heated sample line type 3 with non-replaceable PTFE tube, max. 200 °C [392 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	3M EX	4/6	03B3510W
Regulated, explosion-proof, electrically heated sample line type 3 with non-replaceable PTFE tube, max. 100 °C [212 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	3N EX	6/8	03B3530W
Regulated, explosion-proof, electrically heated sample line type 3 with non-replaceable PTFE tube, max. 200 °C [392 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	3M EX	6/8	03B3540W
Regulated, explosion-proof, electrically heated sample line type 3 with non-replaceable PTFE tube, max. 200 °C [392 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	3M EX	8/10	03B3570W
Regulated, explosion-proof, electrically heated sample line type 4 with replaceable PTFE tube, max. 100 °C [212 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	4N EX	4/6	03B4500W
Regulated, explosion-proof, electrically heated sample line type 4 with replaceable PTFE tube, max. 200 °C [392 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	4M EX	4/6	03B4510W
Regulated, explosion-proof, electrically heated sample line type 4 with replaceable PTFE tube, max. 100 °C [212 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	4N EX	6/8	03B4530W
Regulated, explosion-proof, electrically heated sample line type 4 with replaceable PTFE tube, max. 200 °C [392 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	4M EX	6/8	03B4540W
Regulated, explosion-proof, electrically heated sample line type 4 with replaceable PTFE tube, max. 200 °C, 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	4M EX	8/10	03B4570W
Regulated, explosion-proof, electrically heated sample line type 5 with non-replaceable stainless steel 316Ti tube, max. 200 °C [392 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	5M EX	4/6	03B5510W
Regulated, explosion-proof, electrically heated sample line type 5 with non-replaceable stainless steel 316Ti tube, max. 200 °C [392 °F], 230 V/50 Hz, II 2 G Ex e II T3, II 2 D Ex tD A21 IP65 TX	5M EX	6/8	03B5540W
Connection fittings C, D and E for DN 4/6, 6/8 and 8/10 incl. 2 x PT100 and 1.5 m cable			
Connection fitting with tube stub type C/EX, for heated sample line type 4, DN 4/6, ex version, incl. 2 x PT100 intrinsically safe 2GD according to ATEX	C/EX	4/6	03B1520
Connection fitting with tube stub type D/EX, for heated sample line type 3, DN 4/6, ex version, incl. 2 x PT100 intrinsically safe 2GD according to ATEX	D/EX	4/6	03B1530
Connection fitting with tube stub type E/EX, for heated sample line type 5, DN 4/6, ex version, incl. 2 x PT100 intrinsically safe 2GD according to ATEX	E/EX	4/6	03B1540
Connection fitting with tube stub type C/EX, for heated sample line type 4, DN 6/8, ex version, incl. 2 x PT100 intrinsically safe 2GD according to ATEX	C/EX	6/8	03B1570
Connection fitting with tube stub type D/EX, for heated sample line type 3, DN 6/8, ex version, incl. 2 x PT100 intrinsically safe 2GD according to ATEX.	D/EX	6/8	03B1580
Connection fitting with tube stub type E/EX, for heated sample line type 5, DN 6/8, ex version, incl. 2 x PT100 intrinsically safe 2GD according to ATEX	E/EX	6/8	03B1590
Connection fitting with tube stub type C/EX, for heated sample line type 4, DN 8/10, ex version, incl. 2 x PT100 intrinsically safe 2GD according to ATEX	C/EX	8/10	03B1575
Connection fitting with tube stub type D/EX, for heated sample line type 3, DN 8/10, ex version, incl. 2 x PT100 intrinsically safe 2GD according to ATEX	D/EX	8/10	03B1585
End fittings W, Y and Z for DN 4/6, 6/8 and 8/10			
End fitting type W/EX for heated sample line type 5, DN 4/6, ex version	W/EX	4/6	03B2530
End fitting with tube stub type Y/EX for heated sample line type 4, DN 4/6, ex version	Y/EX	4/6	03B2510
End fitting with tube stub type Z/EX for heated sample line type 3, DN 4/6, ex version	Z/EX	4/6	03B2520
End fitting type W/EX for heated sample line type 5, DN 6/8, ex version	W/EX	6/8	03B2570
End fitting with tube stub type Y/EX for heated sample line type 4, DN 6/8, ex version	Y/EX	6/8	03B2550
End fitting with tube stub type Z/EX for heated sample line type 3, DN 6/8, ex version	Z/EX	6/8	03B2560
End fitting with tube stub type Y/EX for heated sample line type 4, DN 8/10, ex version	Y/EX	8/10	03B2555
End fitting with tube stub type Z/EX for heated sample line type 3, DN 8/10, ex version	Z/EX	8/10	03B2565
Options			
Electrically heated sample line with power 115 V AC instead of 230 V AC			03B9999
Extra charge for additional heating circuit for regulated explosion-proof heated sample line, incl. 2 x PT100 intrinsically safe 2GD acc. to ATEX.			90B0019
Explosion-proof temperature controller			
Temperature controller and temperature limiter with external control panel, explosion-proof version for ex zones 1 and 21, protection class according to ATEX: for controller and limiter II 2 G Ex emb(ib) IIC T4, II 2 D Ex tD A21 IP65 T100°C, for controller unit II 2 G Ex ib IIC T4, II 2 D Ex tD A21 IP65 T100°C, for heated ex sample line with 2 x PT100 sensor, PT100 input intrinsically safe, reset for limiter via the external control unit, measure and control range: -40 up to 300 °C [-33.8 up to 572 °F], capacity: 16 A, power: 230 V/50 Hz, ambient temperature: -32 up to 65 °C [-25.6 up to 149 °F].			03B8000
Temperature controller as spare for combination item No. 03B8000, explosion-proof version for ex zones 1 and 21, protection class according to ATEX: II 2 GD E Ex em IIC T4 IP65 T100, measure and control range: -40 up to 300 °C [-33.8 up to 572 °F], capacity: 16 A, power: 230 V/50 Hz, ambient temperature: -32 up to 65 °C [-25.6 up to 149 °F]			03B8010
Temperature limiter as spare for combination item No. 03B8000, explosion-proof version for ex zones 1 and 21, protection class according to ATEX: II 2 GD E Ex em IIC T4 IP65 T100, measure and control range: -40 up to 300 °C [-33.8 up to 572 °F], capacity: 16 A, power: 230 V/50 Hz, ambient temperature: -32 up to 65 °C [-25.6 up to 149 °F]			03B8020
External control panel as spare for combination Item No. 03B8000 Explosion-proofed version for Ex-Zone 1 and 21 protection class according to ATEX: II 2 GD E Ex ib IIC T4 IP65 T100			03B8030

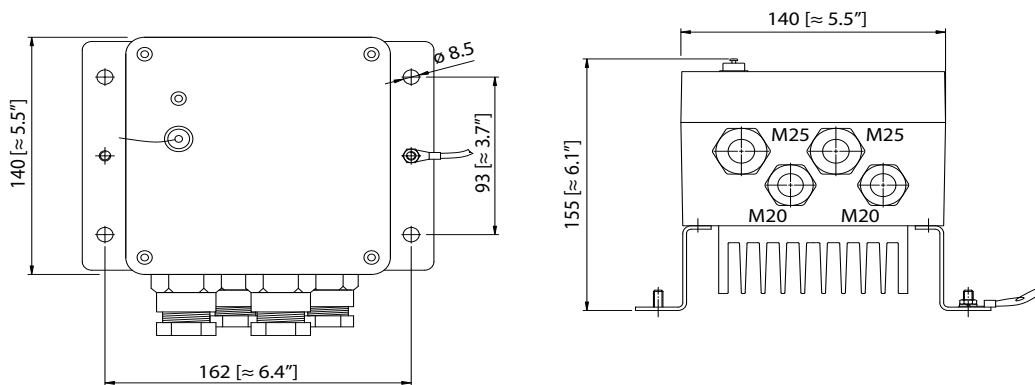
Other versions on request.



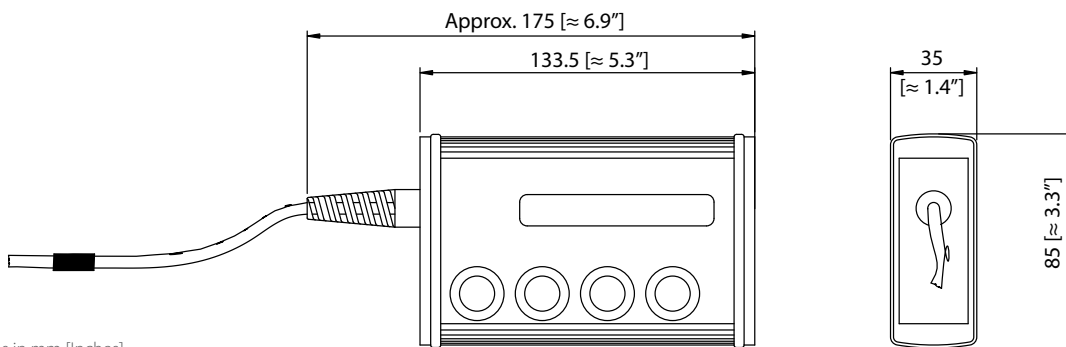
Mounting Holes for Two-part Cabinet-bushing for Line Diameter 62 mm



Dimensions of Temperature controller, Limiter and Control Panel



Temperature controller and limiter are two components that look identical from the outside.



Dimensions in mm [Inches]

Please specify with order:

- Line type (3, 4, 5)
- Line length in meter
- 1 x connection fitting (C, D, E)
- Temperature range (N, M)
- Tube dimension DN (4/6, 6/8, 8/10)
- 1 x end fitting (W, Y, Z)
- 1x temperature controller

For example:

- 6 x 03B4510W: 6 m electrically heated sample line, 4M4/6 EX, max. 200 °C with replaceable PTFE tube DN 4/6
- 1 x 03B1520: connection fitting C/EX
- 1 x 03B2510: end fitting Y/EX
- 1 x 03B8000: explosion-proof temperature controller



PSP4000-H /C /T

Portable Gas Sample Probe

PSP4000-H/C/T

Special Features

- **Lightweight design, easy to handle and compact construction**
- **Electrically heated – adjustable from 100 to 180 °C [212 to 356 °F]**
- **With integrated microfilter**
- **Variable sample tube and connection technique**
- **Integrated temperature measurement**
- **Gas sampling also with heated sample tube**

Application

Previously, gas sample probes designed for stationary applications had to be used for inspection measurements at different locations. The weight and bulkiness of such units often caused problems for technicians conducting mobile measurements.

Now the light, handy and heated gas sample probe PSP4000-H has been developed as a logical complement to the portable M&C sample gas conditioning systems. Despite its compact design, the unit guarantees a full range of functions. Optionally, the process temperature at the end of the sample tube can be measured by an integrated temperature sensor parallel to the gas sampling. To prevent the temperature from falling below the dew point in the sampling area, a heated sample tube SP34-H (see data sheet "Electrically Heated Sample Probe Tube Series SP®, Version SP34-H for portable gas sample probe PSP4000-H") is available.

With the PSP4000-H/C/T version, temperature measurement during gas sampling is performed by an integrated temperature sensor Fe-CuNi that is adjustable in length.

In combination with the gas sample probe PSP4000-H, a specially assembled heated sample line PSP4M4/6 with replaceable PTFE tube or PSP4M4/6-W with additionally smaller outer diameter is offered. The electrical supply of the probe is then ensured via the power line integrated into the sample line. An aluminium-framed case is optionally available for the safe transport of the probe and the up to 5 m long PSP4M4/6 or the up to 8 m [≈ 26.25 ft] long PSP4M4/6-W heated sample line.

Description

The portable gas sample probe PSP4000-H is electrically heated. Temperature controlling is ensured by an integrated capillary sensor thermostat, adjustable from 100 to 180 °C [212 to 356 °F]. When the operating temperature is reached, an indicator light extinguishes and then flashes during the temperature control cycle. The thermally insulated housing is equipped with a carrying handle and a chain for in-situ attachment. The integrated ultrafine filter element with 2 µm filter porosity reliably retains the contamination of solid particles and is easy to change in just a few simple steps. For heavy-oil furnace measurements, a stainless steel filter wool receptacle FW is optionally available.

The wide and versatile range of sample tubes with diameters from 6 to 12 mm, adapters and thread fittings allows adaptation to the most varied local circumstances.

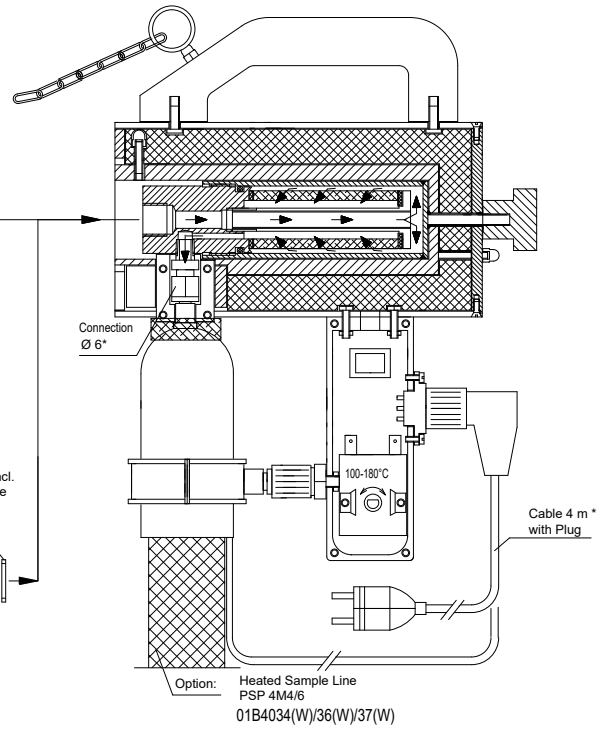
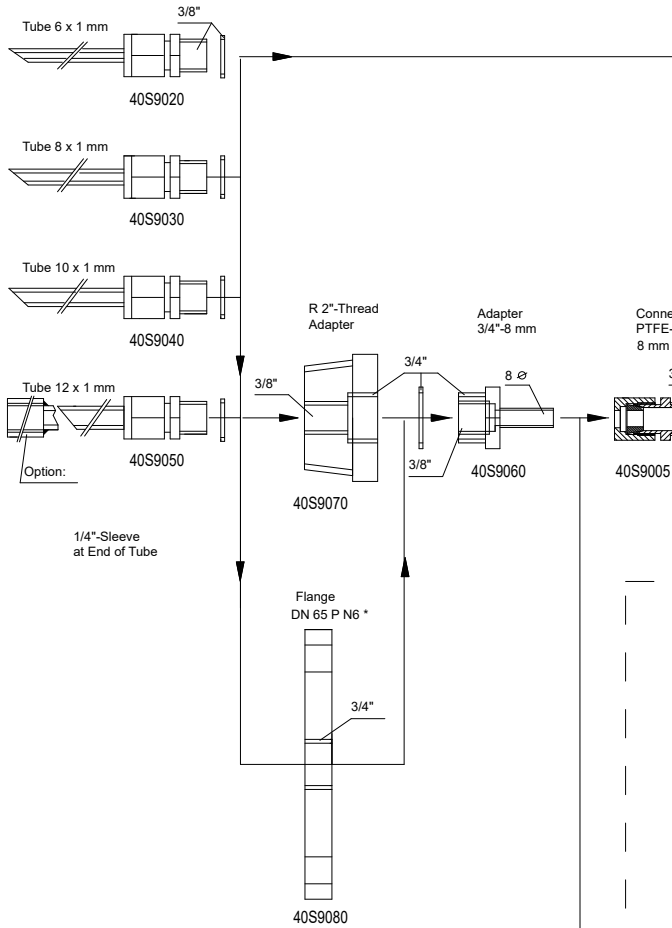
The version PSP4000-H/C allows calibration gas feeding into the probe without dismantling the probe.

Sampling Options

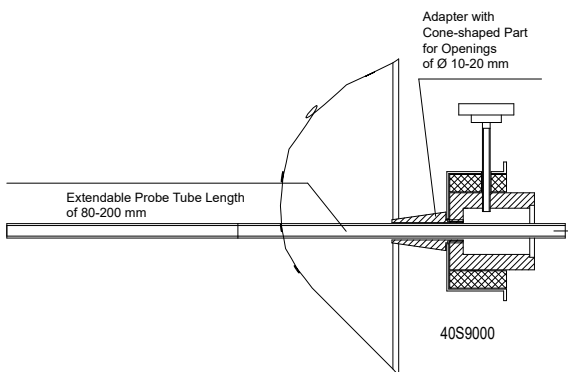
Basic Version PSP4000-H

40S1000

Sample Tubes incl. Connector
Length: 1 m *
Material: SS316



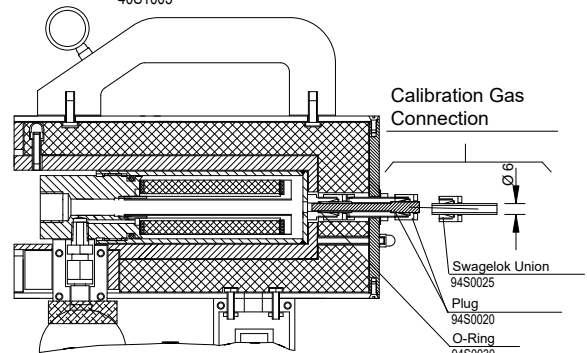
Adapter for Extensible Probe Length
Tube 8 x 1 mm, Material: SS316



* Standard

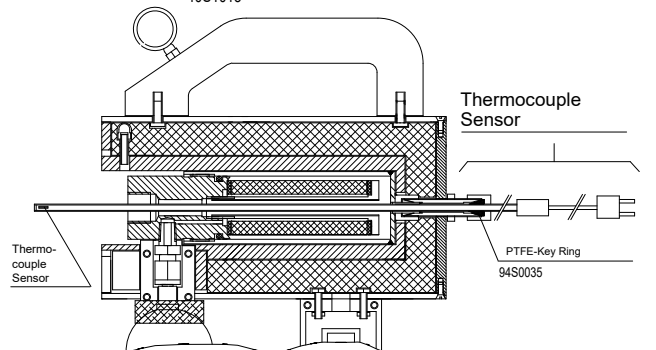
PSP4000-H/C

40S1005



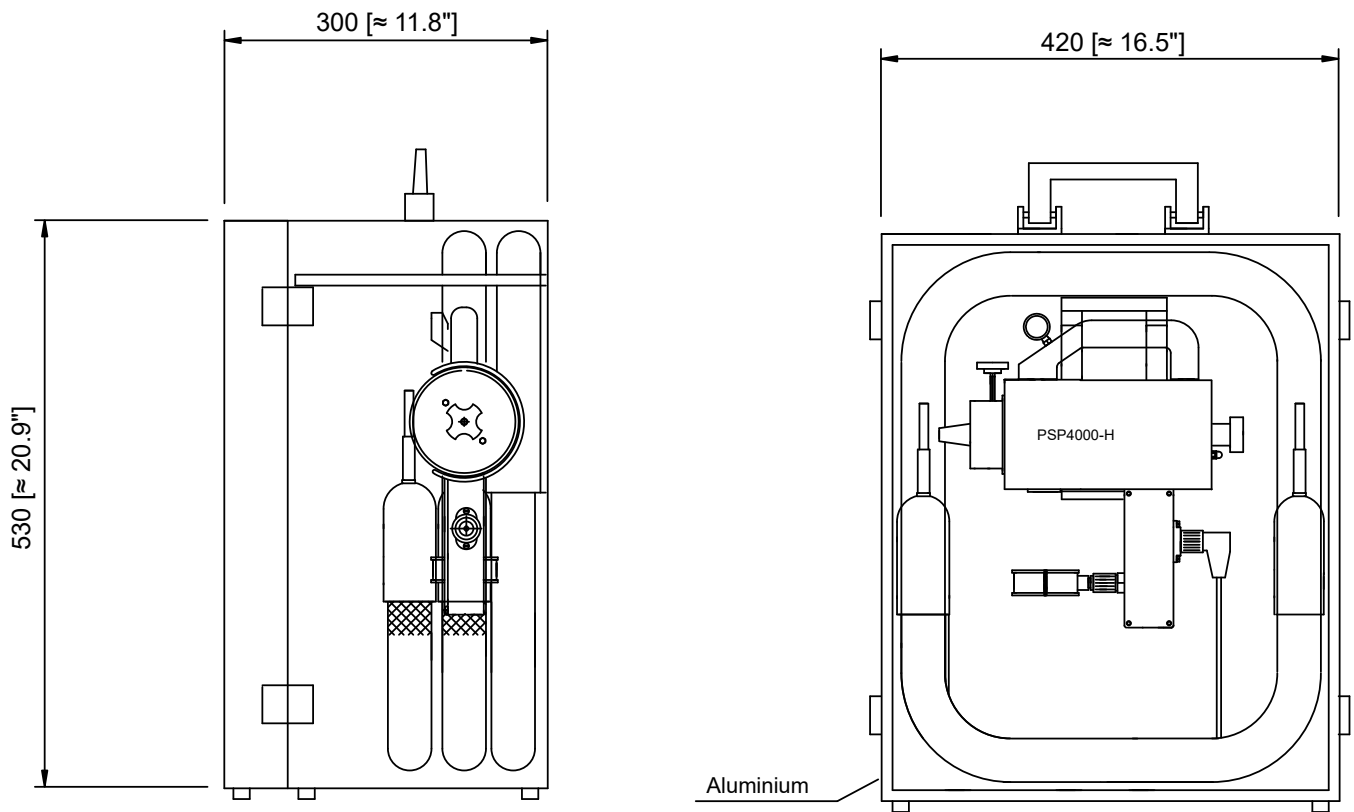
PSP4000-H/C/T

40S1015



Probe Series SP® Portable Version PSP4000	PSP4000-H	PSP4000-H/C	PSP4000-H/C/T
Part No. 230 V	40S1000	40S1005	40S1015
Part No. 115 V	40S1000a	40S1005a	40S1015a
Sample temperature	Max. 600 °C [1112 °F] *standard		
Sampling pressure	Max. 1 bar		
Ambient temperature	-20 to +60 °C [-4 to 140 °F]		
Filter chamber volume	40 cm ³		
Filter element	S-2K ceramic, 2 µm		
Probe temperature	Adjustable between 100 to 180 °C [212 to 356 °F], pre-set at works to 180 °C [356 °F]		
Ready for operation	After approximately 30 minutes		
Gas inlet	Basic connection G 3/8" i, sample tubes optional		
Gas outlet	1/8" NPT + tube connector 6 mm (8 mm optional) and tube clamp to attach the heated sample line		
Electrical power supply	220-240 V, 50/60 Hz, 200 W or 115 V, 60 Hz		
Electrical connection	Plug and socket connector 7-pole with 4-meter [≈ 13.1 ft] connection cable		
Electrical equipment standard	EN 61010, EN 60519-1		
Type of housing protection	IP40 EN 60529 (starting from Part No. 1907XXX IP42, EN 60529)		
Material	Stainless steel 316Ti, ceramic, FKM		
Weight	3.5 kg [≈ 2.2 lbs]		
Calibration gas connection for SS tube/plastic tube ø 6 mm	No	Yes	Yes
Temperature measurement with thermocouple sensor FeCuNi, length: 600 mm [≈ 23.6"], with 4 m [≈ 13.1 ft] connection cable and standard plug	No	No	Yes

Dimensions



Dimensions in mm [Inches]

Part No.	
40S9130	Extra charge for PSP4000-H with \varnothing 8 mm tube connector in the sample gas outlet
40S9100	Extra charge for PSP4000-H/FW with stainless steel filter wool receptacle including glass wool filling, filter S-2K not included, connection M 12, material: SS 316Ti
Sample adapter with variable sample tube length:	
40S9005	Adapter fitting 3/8" with gasket and 8 mm PTFE sealing ring
40S9000	Adapter with cone transition for openings of \varnothing 10 to 20 mm and \varnothing 8 mm sample tube out of SS 316Ti, extendable from 80 to 200 mm. [\approx 3.1" to 7.9"]
40S9010	Sample tube \varnothing 8 mm with position mark, for extendable probe length from 190 to 300 mm [\approx 7.5" to 11.8"]
Fixed sample tubes for PSP4000 with male connector G 3/8", length: 1 m [\approx 3.3 ft]:	
40S9020	Material: stainless steel SS 316Ti, \varnothing 6 mm OD, max. 600 °C [1112 °F]
40S9030	Material: stainless steel SS 316Ti, \varnothing 8 mm OD, max. 600 °C [1112 °F]
40S9040	Material: stainless steel SS 316Ti, \varnothing 10 mm OD, max. 600 °C [1112 °F]
40S9050	Material: stainless steel SS 316Ti, \varnothing 12 mm OD, max. 600 °C [1112 °F]
40S9108	Material: Titanium, \varnothing 6 mm OD, max. 400 °C [752 °F]
40S9109	Material: Hastelloy® C, \varnothing 6/8 mm OD, max. 900 °C [1652 °F]
40S9112	Material: Inconel® 625, \varnothing 12 mm OD, max. 1200 °C [2192 °F]
40S9106	Material: Kanthal®, \varnothing 15 mm OD, max. 1300 °C [2372 °F]
40S9113	Material: Silicon nitride-ceramic, \varnothing 12.5 mm OD, max. 1400 °C [2552 °F]
40S9110	Material: Ceramic, aluminium oxid ¹⁾ , \varnothing DN 12/8, max. 1800 °C [3272 °F], for mounting tube adapter PSP4000H/AO, Part No. 40S9111 is necessary
40S9111	Support tube adapter PSP4000H/AO, with 3 O-rings and 1 gasket, material: stainless steel SS 316Ti
Heated sample tubes SP34-H (data sheet 2.19):	
40S9115	Heated sample tube SP34-H with integrated thermostat
40S9120	Heated sample tube SP34-H1.1 with thermocouple sensor FeCuNi
40S9125	Heated sample tube SP34-H2 with PT100 sensor
Pre-filter SP1	
04S5000	Pre-filter SP1/SS3, OD: 30 mm, length: 150 mm [\approx 5.9"], filter porosity: 3 μ m, material: SS 316/316Ti, connection 1/4" NPT o
04S5010	Pre-filter SP1/SS20, OD: 30 mm, length: 150 mm [\approx 5.9"], filter porosity: 20 μ m, material: SS 316/316Ti, connection 1/4" NPT o
40S9054	Screw-on connector with female thread for sample tube 12 mm for mounting SP1, material: SS 316Ti, max. 600 °C [1112 °F]
Accessories made of SS 316Ti for stationary probe installation:	
40S9060	Intermediate connection adapter G 3/4"o - G 3/8" i, \varnothing 8 mm, for further adaptation possibilities, with gasket 3/4"
40S9070	Thread nipple R2" with G 3/4" i and G 3/8" i for mounting the probe in R2" thread adapter, material: SS 316Ti
40S9080	Flange DN 65 PN 6 B with thread connection G 3/4" for mounting the probe to the flange nozzle (other flange sizes on request)
90S2075	Flange gasket set for DN 65 PN 6 B, consisting of gasket (67) and screw set M 12 x 60
Heated sample line PSP4M4/6 specially designed for probe PSP4000H:	
01B4034	Connection fitting type I for heated sample line PSP4M4/6 with 1.5 m [\approx 4.9 ft] connection cable and 7-pole plug with integrated power supply for PSP 4000
01B4037	End fitting type K for heated sample line PSP4M4/6 with tube stub on the probe side and 0.5 m [\approx 1.6 ft] connection cable axial to the rear, with 7 pole-plug
01B4036	Electrically heated sample line PSP4M4/6 with replaceable PTFE tube DN 4/6, 230 V/50 Hz, SS tube stub on the probe side, max. temperature: 200 °C [392°F], price per meter
01B4034W	Connection fitting type I for sample line PSP4M4/6-W with corrugated hose for replaceable PTFE tube DN 4/6, power: 230 V/50 Hz, 110 W/m, and 1.5 m [\approx 4.9 ft] connection cable with 7-pole plug, integrated power supply for PSP4000
01B4037W	End fitting type K for sample line PSP4M4/6-W with corrugated hose for replaceable PTFE tube DN 4/6, tube stub on the probe side, 0.5 m [\approx 1.6 ft] connection cable axial to the rear, with 7-pole plug
01B4036W	Electrically heated sample line PSP4M4/6-W with replaceable PTFE tube DN 4/6, 230 V/50 Hz, tube stub out of stainless steel on the probe side, outer jacket: corrugated hose, max. temperature: 200 °C [392°F], price per meter
40S9090	Aluminium-framed case for portable gas sample probe PSP4000H and max. 5 m [\approx 16.4 ft] heated sample line PSP4M4/6 or max. 8 m [\approx 26.2 ft] PSP4M4/6-W, dimensions: (H x W x D): 530 x 420 x 300 mm [\approx 20.9" x 16.5" x 11.8"]

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

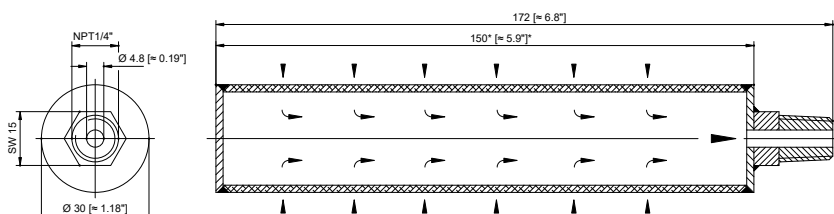
Temperature controller: see data sheets "Electronic Temperature Controller plug-in system, Version TRD-H1, Version TRD-H3", "Electronic Temperature Controller 701" and "Microprocessor-Controlled Temperature Controller Type 70304"; portable gas conditioning system: see data sheets, "Portable Gas Conditioning Unit Series PSS" for PSS5, PSS5/3, PSS5C, PSS5C/2, PSS5C/3 and PSS-10/1; portable oxygen analyzer: see data sheets "Oxygen Analyzer Series PMA" for PMA10 and PMA10S.

Hastelloy® is a registered trademark for a nickel-chromium-molybdenum alloy by Haynes International, USA.

Inconel® is a registered trademark for a nickel-based alloy by Special Metals Corporation, USA.

Kanthal® is a registered trademark for an iron-chromium-aluminium alloy by the Sandvik Group, Sweden.

Pre-filter SP1





Type M4/6 with A and Y

Electrically Heated Sample Lines

Type 3/4/5-N/M/H

Type 3 with PTFE tube, non-replaceable

Type 4 with PTFE tube, replaceable

Type 5 with stainless steel tube, non-replaceable

Special Features

- Regulation via external temperature controller
- Completely assembled
- Type 3: PTFE tube, non-replaceable,
- Type 4: PTFE tube, replaceable
- Type 5: stainless steel tube, non-replaceable
- Tube Ø DN 4/6 or 6/8
- 3 temperature ranges:
N = 100 °C [212 °F],
M = 200 °C [392 °F],
H = 250 °C [482 °F]

Application

The electrically heated, plug-in M&C sample lines 3/4/5-N/M/H are used in gas analysis systems to prevent measuring errors and also as frost protection during the transport of sample gas from the sampling point to the gas conditioning system or directly to the heated analyzer (above the dew point).

Description

The electrically heated M&C sample lines 3/4/5-N/M/H are supplied completely assembled in fixed length according to customer requirements.

Several options that can be combined are available:

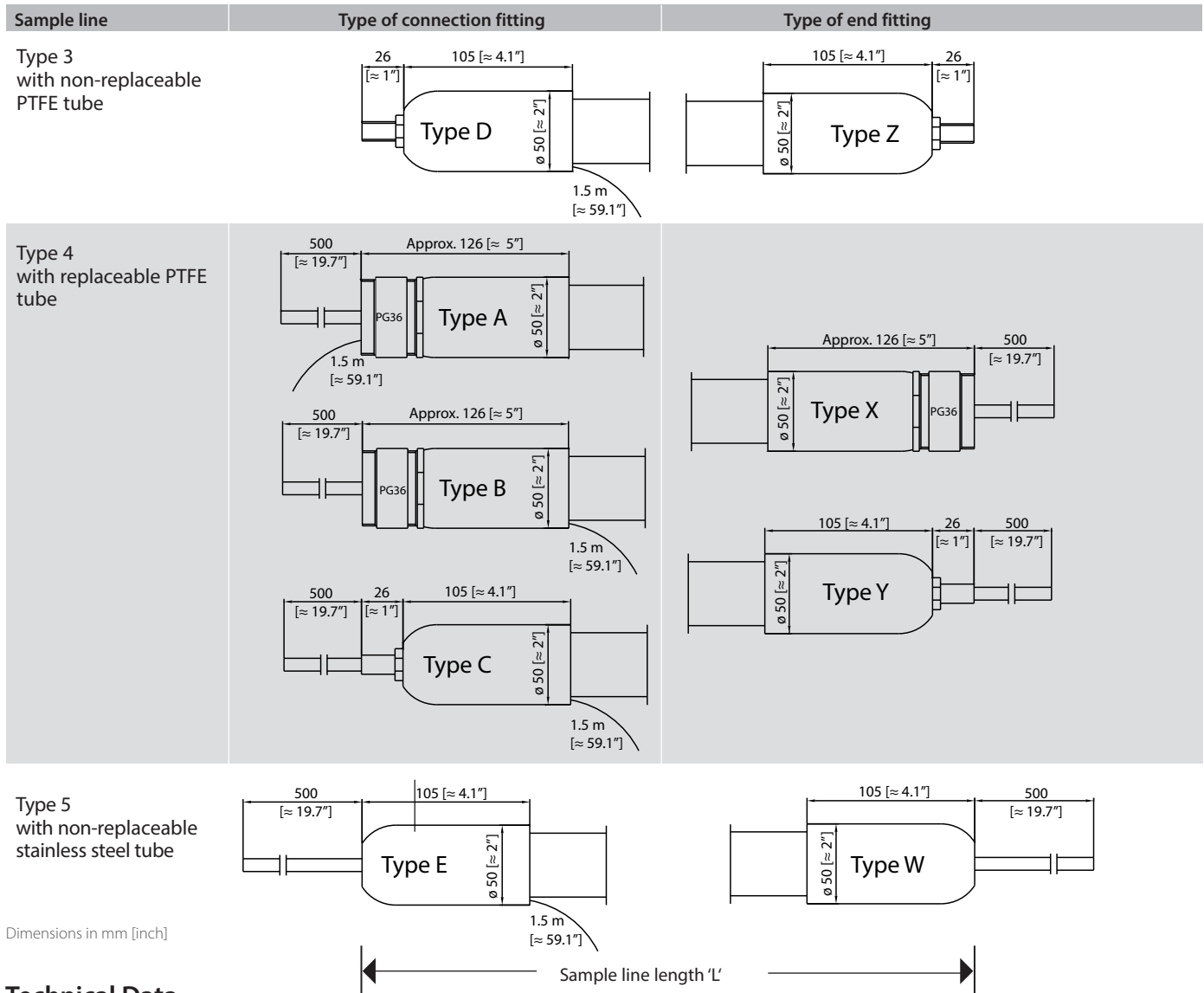
- three (3) different temperature versions (N = 100 °C [212 °F], M = 200 °C [392 °F], H = 250 °C [482 °F]),
- three (3) hose/tube versions (3, 4, 5) with either DN 4/6 or 6/8 as well as
- five (5) connection fittings (A, B, C, D, E) and
- four (4) end fittings (W, X, Y, Z).

The robust design of the sample lines consists of the inner medium tube, a thermally conducting and supporting body made of braided stainless steel tubing, the axially coiled high-performance heating conductor and a thermal insulation. The outer jacket is a corrugated polyamide hose.

The ends of the sample line are finished with heat-resistant silicone materials, and the entire construction ensures that the complete sample line is properly heated, including the ends.

The sample line is equipped with a PT100 for temperature detection.

Possible Connections and Types of the Heated Sample Lines



Dimensions in mm [inch]

Technical Data

Sample lines Type 3/4/5-N/M/H	N	M	H
Operating temperature, max.	+100 °C [212 °F]	+200 °C [392 °F]	+250 °C [482 °F]
Power consumption using DN 4/6	85 W/m	110 W/m	120 W/m
Power consumption using DN 6/8	100 W/m	110 W/m	130 W/m
Pressure, max.	Type 3 = 5 bar g, type 4 = 3 bar g, type 5 = 100 bar g, *standard		
Ambient temperature, max.	-20 up to +60 °C [-4 up to 140 °F]		
Tube DN	Optional DN 4/6 or 6/8		
Sample line connections and end fittings	See connection fittings and end fittings A, B, C, D, E and W, X, Y, Z		
Electrical connections*	1.5 m [≈ 4.9 ft] cable with 7 pin-plug for max. 10 A or 5 pin-plug for max. 20 A according to the necessary power consumption*, for power and PT100 sensor connection		
Power supply	230 V AC *standard, supplied via a temperature controller, see data sheet 4.1		
PT100 sensor position	0.25 m [≈ 9.8"] from the power inlet connection -* standard		
Weight	First meter = 2 kg [≈ 4.4 lbs]/each additional meter = 0.9 kg [≈ 2.0 lbs] standard version		
Sample line max. length	30 m [≈ 98.4 ft]		
7 pin-plug 10 A at connection fitting A, B, C, D, E up to max. length of	23 m [≈ 75.5 ft]		18 m [≈ 59.1 ft]
5 pin-plug 20 A at connection fitting A, B, C, D, E from to max. length of	23.1 to 30 m [≈ 75.8 to 98.4 ft]		18.1 to 30 m [≈ 59.4 to 98.4 ft]
Sample gas connection	Type 3 = SS 316Ti tube nipple ø 6 or 8 mm, on request, 26 mm [≈ 1.0"] long Type 4 = PTFE tube ø 6 or 8 mm on request, 0.5 m [≈ 1.6 ft] on both sides Type 5 = SS 316Ti tube ø 6 or 8 mm on request, 0.5 m [≈ 1.6 ft] on both sides		
Thermal insulating material	High-temperature polyester fleece		Glass fiber and thermal fleece materials
Outer jacket	Corrugated hose out of polyamide, black		
Application fields	Mobile and stationary, indoor and outdoor mounting		
Smallest bending radius	320 mm [≈ 12.6"]		

*The plugs are selected according to the required power and are assembled at the factory. On request, it is also possible to assemble the 5-pole plug with max. 20 A switching capacity at the factory, even with lower power consumption. When ordering, please indicate whether the cable should be assembled with the 5-pole plug regardless of the power consumption.

Description sample lines per meter	Type	DN in mm	Part number
Electrically heated sample line type 3 with PTFE tube, non-replaceable, max. 100 °C [212 °F]	3N	4/6	03B3000W
Electrically heated sample line type 3 with PTFE tube, non-replaceable, max. 200 °C [392 °F]	3M	4/6	03B3010W
Electrically heated sample line type 3 with PTFE tube, non-replaceable, max. 250 °C [482 °F]	3H	4/6	03B3020W
Electrically heated sample line type 3 with PTFE tube, non-replaceable, max. 100 °C [212 °F]	3N	6/8	03B3030W
Electrically heated sample line type 3 with PTFE tube, non-replaceable, max. 200 °C [392 °F]	3H	6/8	03B3040W
Electrically heated sample line type 3 with PTFE tube, non-replaceable, max. 250 °C [482 °F]	3H	6/8	03B3050W
Electrically heated sample line type 4 with PTFE tube, replaceable, max. 100 °C [212 °F]	4N	4/6	03B4000W
Electrically heated sample line type 4 with PTFE tube, replaceable, max. 200 °C [392 °F]	4M	4/6	03B4010W
Electrically heated sample line type 4 with PTFE tube, replaceable, max. 250 °C [482 °F]	4H	4/6	03B4020W
Electrically heated sample line type 4 with PTFE tube, replaceable, max. 100 °C [212 °F]	4N	6/8	03B4030W
Electrically heated sample line type 4 with PTFE tube, replaceable, max. 200 °C [392 °F]	4M	6/8	03B4040W
Electrically heated sample line type 4 with PTFE tube, replaceable, max. 250 °C [482 °F]	4H	6/8	03B4050W
Electrically heated sample line type 5 with SS 316Ti tube, non-replaceable, max. 100 °C [212 °F]	5N	4/6	03B5000W
Electrically heated sample line type 5 with SS 316Ti tube, non-replaceable, max. 200 °C [392 °F]	5M	4/6	03B5010W
Electrically heated sample line type 5 with SS 316Ti tube, non-replaceable, max. 250 °C [482 °F]	5H	4/6	03B5020W
Electrically heated sample line type 5 with SS 316Ti tube, non-replaceable, max. 100 °C [212 °F]	5N	6/8	03B5030W
Electrically heated sample line type 5 with SS 316Ti tube, non-replaceable, max. 200 °C [392 °F]	5M	6/8	03B5040W
Electrically heated sample line type 5 with SS 316Ti tube, non-replaceable, max. 250 °C [482 °F]	5H	6/8	03B5050W
Connection fittings type A, B, C, D, E for DN 4/6 or DN 6/8 incl. PT100 and 1.5 m [≈ 4.9 ft] cable with plug*:			
Connection fitting with PG36, for replaceable tube, extension cable axial at the front	A	4/6	03B1000
Connection fitting with PG36, for replaceable tube, extension cable axial to the rear	B	4/6	03B1010
Connection fitting with tube stub, for replaceable tube, extension cable axial to the rear	C	4/6	03B1020
Connection fitting with tube stub, for non-replaceable tube, extension cable axial to the rear	D	4/6	03B1030
Connection fitting for SS 316Ti tube, extension cable axial to the rear	E	4/6	03B1040
Connection fitting with PG36, for replaceable tube, extension cable axial at the front	A	6/8	03B1050
Connection fitting with PG36, for replaceable tube, extension cable axial to the rear	B	6/8	03B1060
Connection fitting with tube stub, for replaceable tube, extension cable axial to the rear	C	6/8	03B1070
Connection fitting with tube stub, for non-replaceable tube, extension cable axial to the rear	D	6/8	03B1080
Connection fitting for stainless steel tube, extension cable axial to the rear	E	6/8	03B1090
End fittings type W, X, Y, Z for DN 4/6 or DN 6/8 :			
End fitting with PG36, for replaceable tube	X	4/6	03B2000
End fitting with tube stub, for replaceable tube	Y	4/6	03B2010
End fitting with tube stub, for non-replaceable tube	Z	4/6	03B2020
End fitting for SS 316Ti tube	W	4/6	03B2030
End fitting with PG36, for replaceable tube	X	6/8	03B2040
End fitting with tube stub, for replaceable tube	Y	6/8	03B2050
End fitting with tube stub, for non-replaceable tube	Z	6/8	03B2060
End fitting for stainless steel tube	W	6/8	03B2070
Option			
Electrically heated sample line with power 115 V AC instead of 230 V AC			03B9999
Temperature controller TRD-H1 with 7 pin-socket, max. 10 A switching capacity, for electrically heated sample lines with max. 230 V, 10 A, 2300 W or 115 V, 10 A, 1150 W			03B7100
Temperature controller TRD-H3 with 5 pin-socket, max. 20 A switching capacity, for electrically heated sample lines with max. 230 V, 20 A, 4600 W or 115 V, 20 A, 2300 W			03B7110

*see previous page: Technical Data - electrical connection
Other versions on request

Please specify with order:

- Line type (3, 4, 5)
- Line length in meter
- 1 x connection fitting (A, B, C, D, E)
- Temperature range (N, M, H)
- Hose/tube dimension DN (4/6, 6/8)
- 1 x end fitting (W, X, Y, Z)
- 1 x temperature controller (TRD-H1, TRD-H3)

For example:

6 x 03B4010W: 6 m electrically heated sample line, 4M4/6, max. 200 °C [392 °F] with replaceable PTFE tube DN 4/6,
1 x 03B1020: connection fitting C,
1 x 03B2010: end fitting Y,
1 x 03B7100: Temperature controller TRD-H1 (for more information about temperature controllers see data sheet 4.1).