



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

## Electrically heated sample lines type 3/4/5/-5/30/50/80/100/120 (Ex)



Self regulated, 3 type tubes and 6 temperature versions from +5 °C to +120 °C (41 °F to 248 °F)

### Special Features

- Self regulated, without thermostat
- Completely assembled
- Yard ware treated externally
- Outer shell corrugated tube of Polyamide
- PTFE tube non interchangeable type 3/
- PTFE tube interchangeable type 4/
- Stainless steel tube non interchangeable type 5/
- Tube ø4/6-10/12 mm DN ..
- 6 temperature ranges from +5 °C to +120 °C (41 °F to 248 °F)
- Holding temperature at -20 °C (~-4 °F)
- Ex-version for zone 1, 2, 21 and 22 according to ATEX

### Application

The electrically heated self regulated M&C-sample lines 3/4/5/-5/30/50/80/100/120 (Ex) are used in gas analysis technique for transportation of the sample gas from the sample point to the gas conditioning system. They prevent measurement faults in the lower temperature ranges from +5 °C to +120 °C (41 °F to 248 °F) and protect the system against freeze. A temperature monitoring of the total heated line is not possible due to the function as parallel heater band.

### Description

The self regulated M&C-sample lines 3/4/5/-5/30/50/80/100/120 are supplied according to clients requirements completely assembled in the factory with connections and endings in a fixed length or as yard ware for treatment by the customer.

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

The robust manufacture of the sample line consists of an inner tube/pipe and a self regulated parallel heater band, both covered with thermoconducting aluminium as well as a further thermal insulation and the black coloured corrugated Polyamide-tube outside.

The endings of the completely assembled execution are sealed connections out of silicone.

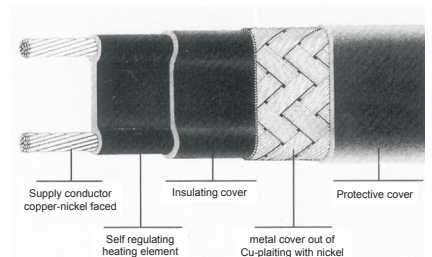
The explosion-proof versions 3/4/5/-5/30/50/80/100/120 Ex for use in hazardous area zone 1, 2, 21 and 22 are equipped with Ex proved self delimited heater bands. The sample lines assembled in our works have got a connection cable respectively a heater band for the Ex versions of 1 meter leaving the line axially. On both sides, the tube or pipe is jutting out by 500 mm (approx. 19.69").

For assembling at the customers' side, the respective accessories are available.

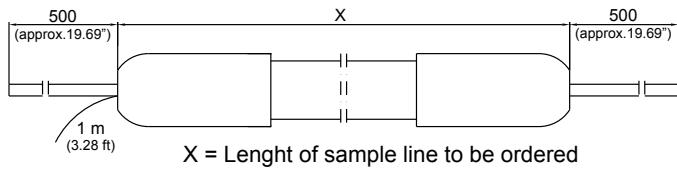
The operating temperature (guaranteed minimum temperature) of the self regulated heated sample lines of M&C is related to an ambient temperature of -20 °C (~-4 °F). It is not necessary to use an external thermostat.

### Description of the self regulated heater bands

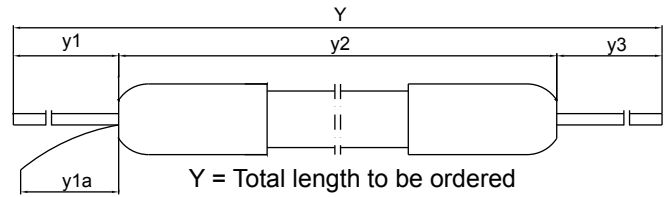
The self regulated parallel heater bands consist of two parallel supply conductors of copper which are embedded in a cross-linked and with particles of carbon doped plastic heater element with a positive temperature coefficient. The heater element changes its capacity in relation to the ambient temperature. 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. Thus, the heater band is adapting its temperature everywhere in the sample line according to individual temperature requirement.



## Complete treatment of sample line in factory



## Assembling of sample line at customers' side



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

## Technical Data

Sample line type 3/4/5... DN4 or 6	../5-.. (Ex)	../30-.. (Ex)	../50-.. (Ex)	../80-.. (Ex)	../100-.. (Ex)	../120-.. (Ex)
Inside tube	type 3/ 4/...: PTFE, ø4/6 mm or 6/8 mm, type 3/... non interchangeable, type 4/... interchangeable type 5/...: stainless steel 316, ø4/6 mm or 6/8 mm, non interchangeable when assembled in the factory, tube 500 mm (approx. 19.69") jutting out 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 -20 °C (~-4 °F)	16 W/m	45 W/m	45 W/m	54 W/m	54 W/m	71 W/m
cold start at 0 °C (32 °F)	13 W/m	37 W/m	40 W/m	49,5 W/m	49,5 W/m	66 W/m
cold start at +10 °C (50 °F)	9,2 W/m	30 W/m	38 W/m	47 W/m	47 W/m	63 W/m
with operating temperature	11,5 W/m	20 W/m	28 W/m	30,5 W/m	26 W/m	35 W/m
Max. length allowed for -20 °C (~-4 °F) ambient temperature	109 m (approx. 357.61ft)	52 m (approx. 170.6 ft)	65 m (approx. 213.25 ft)	55 m (approx. 180.45 ft)	55 m (approx. 180.45 ft)	40 m (approx. 131.23 ft)
Max. length of one piece	99 m (approx. 324.8 ft)	99 m (approx. 324.8 ft)	99 m (approx. 324.8 ft)	99 m (approx. 324.8 ft)	99 m (approx. 324.8 ft)	99 m (approx. 324.8 ft)
Max. operating temp. allowed when current 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 current 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-tube outside, black	ø 42.5 mm o.d. (approx. ø1.67" o.d.)					ø 55 mm o.d. (approx. ø2.17" o.d.)
Ambient temperature allowed	standard: -20 °C to +65 °C (~-4 °F to 149 °F)					
Thermal isolation	glass fibre					
Operating pressure	type 3/ 4/...: max. 3 bar g, type 5/...: max. 100 bar g					
Heater band	Self-limiting, to be cut into any length you like Version Ex: Type ELSR-N... ⚠ II 2 G Ex e II T6, (LCIE 01 ATEX6019X) resp. ⚠ II 2G Ex e II and ⚠ II 2D 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)=..W totally					
Electrical connection at type 3/4/5/... DN4 or DN6	direct on the heater band by means of shrinkdown technique; prepared in factory with 1 m (approx. 3.28 ft) connection cable of silicone 3 x 1.5 mm <sup>2</sup> , heat resistant					
Electrical connection at type 3/4/5/... Ex DN4 or DN6	lead through the heater band and put into Ex-connection box; prepared in factory: 1 m (approx. 3.28 ft) heater band lead out on Ex e connection box, 122 x 120 x 90 mm (4.8" x 4.7" x 3.54"), with 2 x M25 cable gland and blind plug each, terminals 6 x 2.5 mm <sup>2</sup>					
Marking	⚠ II 2 GD EEx e II T... IP65 TX (temperature class see type plate)					
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					
Protection	IP64 EN60529					
Weight	approx. 0.9 kg (1.98 lb) per meter plus 1.1 kg (2.43 lbs) for beginning and end connection					
Application fields / smallest bending radius	mobile and stationary, moutage inside and outside / 200 mm (approx. 7.87")					

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

## Part numbers

Sample line type 3/4/5... DN4 or 6	../5-.. (Ex)	../30-.. (Ex)	../50-.. (Ex)	../80-.. (Ex)	../100-.. (Ex)	../120-.. (Ex)
Part No. type 3/... DN4, length 1 m (approx. 3.28 ft)	01 B 6300	01 B 6305	01 B 6310	01 B 6315	01 B 6320	01 B 6325
Part No. type 3/... Ex DN4, length 1 m (approx. 3.28 ft)	01 B 6300Ex	01 B 6305Ex	01 B 6310Ex	01 B 6315Ex	01 B 6320Ex	01 B 6325Ex
Part No. type 3/... DN6, length 1 m (approx. 3.28 ft)	01 B 6350	01 B 6355	01 B 6360	01 B 6365	01 B 6370	01 B 6375
Part No. type 3/... Ex DN6, length 1 m (approx. 3.28 ft)	01 B 6350Ex	01 B 6355Ex	01 B 6360Ex	01 B 6365Ex	01 B 6370Ex	01 B 6375Ex
Part No. type 4/... DN4, length 1 m (approx. 3.28 ft)	01 B 6400	01 B 6405	01 B 6410	01 B 6415	01 B 6420	01 B 6425
Part No. type 4/... Ex DN4, length 1 m (approx. 3.28 ft)	01 B 6400Ex	01 B 6405Ex	01 B 6410Ex	01 B 6415Ex	01 B 6420Ex	01 B 6425Ex
Part No. type 4/... DN6, length 1 m (approx. 3.28 ft)	01 B 6450	01 B 6455	01 B 6460	01 B 6465	01 B 6470	01 B 6475
Part No. type 4/... Ex DN6, length 1 m (approx. 3.28 ft)	01 B 6450Ex	01 B 6455Ex	01 B 6460Ex	01 B 6465Ex	01 B 6470Ex	01 B 6475Ex
Part No. type 5/... DN4, length 1 m (approx. 3.28 ft)	01 B 6500	01 B 6505	01 B 6510	01 B 6515	01 B 6520	01 B 6525
Part No. type 5/... Ex DN4, length 1 m (approx. 3.28 ft)	01 B 6500Ex	01 B 6505Ex	01 B 6510Ex	01 B 6515Ex	01 B 6520Ex	01 B 6525Ex
Part No. type 5/... DN6, length 1 m (approx. 3.28 ft)	01 B 6550	01 B 6555	01 B 6560	01 B 6565	01 B 6570	01 B 6575
Part No. type 5/... Ex DN6, length 1 m (approx. 3.28 ft)	01 B 6550Ex	01 B 6555Ex	01 B 6560Ex	01 B 6565Ex	01 B 6570Ex	01 B 6575Ex
<b>Options for sample line 3/4/5... DN4 or 6</b>						
Completely assembled for type 3-5/... DN4 or 6	01 B 7050	01 B 7050	01 B 7050	01 B 7055	01 B 7055	01 B 7060
Completely assembled for type 3-5/... Ex DN4 or 6	01 B 7050Ex	01 B 7050Ex	01 B 7065Ex	01 B 7055Ex	01 B 7055Ex	01 B 7060Ex
Accessories for assembling at customers' side for type 3-5/... DN4 or 6	beginning and end connection-black, 3.2 m (approx. 10.5 ft) connection cable of silicone 3 x 1.5 mm <sup>2</sup> , end splices, Isolating and small parts, Part-No. 01 B 7100					
Accessories for assembling at customers' side for type 3-5/... Ex DN4 or 6	beginning and end connection-black, end splices, shrinking, isolating and small parts, Ex e connecting 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 <sup>2</sup> , Part-No. 01 B 7100Ex					
Electrically heated sample line with power 115 VAC instead of 230 VAC	03 B 9999					

Current 115 V / 60 Hz please specify with order, 230 V / 50 Hz is standard  
Further accessories and other executions on request.

## To specify with order:

- Type (3/4/5/)
- Current 230 V / 50 Hz or 115 V / 60 Hz
- Tube- $\phi$  i/o (-4/6, 6/8, 8/10, 10/12 mm)
- Standard assembling at factory
- Accessories
- Temperature version (5, 30, 50, 80, 100, 120)
- EX version (Ex)
- Length of sample line in meters X or Y
- Assembling at customers' side

### For example:

6 x 01 B 6300 X = 6 m heated, self-regulated sample line version 3/5-4,  $\phi$ 4/6 mm, +5 °C (41 °F) holding temperature, with PTFE-tube 4/6 non interchangeable, 230 V / 50 Hz. 1 x 01 B 7050 ready-for-use ex factory.