BARTEC

HEATING TECHNOLOGY

HEATING TECHNOLOGY

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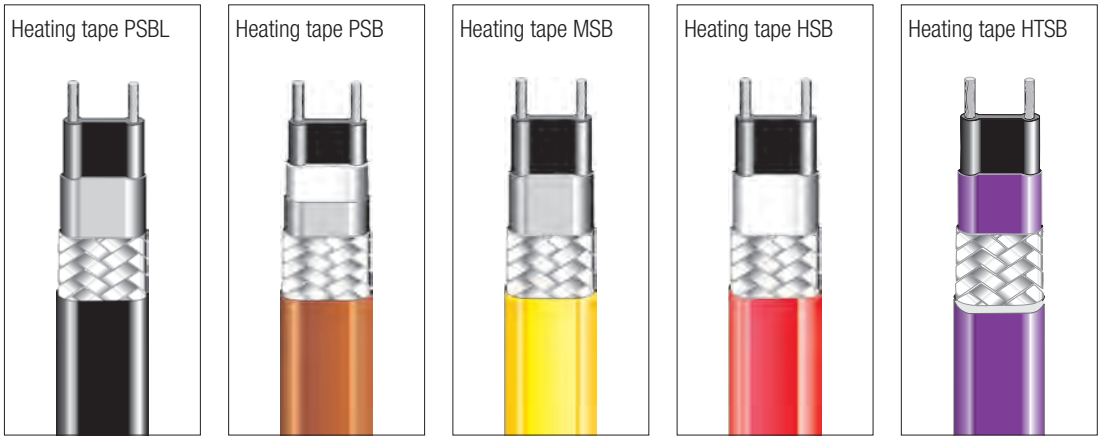


	System PSBL Self-limiting parallel heating tapes	**System PSB** Self-limiting parallel heating tapes	**System MSB** Self-limiting parallel heating tapes	**System HSB** Self-limiting parallel heating tapes	**System HTSB** Self-limiting parallel heating tapes
Explosion protection	yes	yes	yes	yes	yes
Technical data					
Heating power [1]	10 to 30 W/m	10 to 33 W/m	10 to 40 W/m	10 to 60 W/m	15 to 90 W/m
Max. operating temperature [2] heating tape energized (switched on)	+65 °C	+65 °C	+110 °C	+120 °C	+250 °C
Resistant to steam cleaning	-	-	-	yes	yes
Max. length of heating circuit [3] per power feeding point	154 m	205 m	235 m	235 m	154 m
Max. operating voltage	120 V/254 V	120 V/254 V	254 V	120 V/254 V	277 V
Suitable for corrosive atmospheres [4]	yes	yes	yes	yes	yes

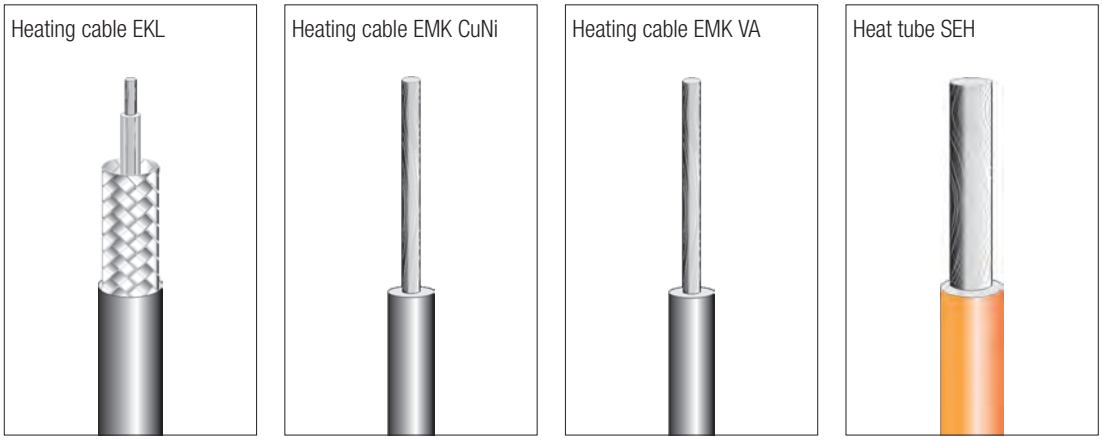
Technical data subject to change without notice.

[1] Different nominal powers available

[2] Reference value: each case will depend on conductor/surface temperature of the heating cable and the application itself

[3] Reference value: depending on application, depend on ambient temperature

[4] To be tested for individual cases



	System EKL Single-core plastic insulated heating cables	**System EMK CuNi** Mineral-insulated heating cables, Outer jacket CuNi	**System EMK VA** Mineral-insulated heating cables, Outer jacket VA or Incoloy	**System SEH** Heat tube
Explosion protection	yes	yes	yes	yes
Technical data				
Heating power	approx. 25/30 W/m	150 W/m	250 W/m	~ 200 W/m*
Max. operating temperature [2]	+260 °C	+500 °C	+1000 °C	+260 °C
Resistant to steam cleaning	yes	yes	yes	yes
Max. length of heating circuit [3] per power feeding point	3000 m	1000 m	1000 m	> 20 km
Max. operating voltage	500 V/750 V	500 V/750 V	500 V/750 V	5000 V
Suitable for corrosive atmospheres [4]	yes	yes	yes	no

Technical data subject to change without notice.

[1] Different nominal powers available

[2] Reference value: each case will depend on conductor/surface temperature of the heating cable and the application itself

[3] Reference value: depending on application, depend on ambient temperature

[4] To be tested for individual cases

* Multiple occupancy

Heating System Components - typical application		**PSBL**		**PSB**		**MSB**		**HSB**	
		Ex	M	Ex	M	Ex	M	Ex	M
Connection									
PLEXO TCS	Connection system	■	■	■	■	■	■	■	■
TWISTO-B	Connection system				■				
Heat shrink technology	Connection technology	■	■	■	■			■	■
Cold-applied technology	Connection technology	■	■	■	■	■	■	■	■
ECT for EKL medium/premium	Connection technology								
EMK “Ex“	Connection set								
EMK “Standard“	Connection set								
Control units									
STW II	Safety temperature monitor	■		■		■		■	
BSTW II	Safety temperature monitor	■		■		■		■	
BTB II/BSTB II	Safety temperature limiter								
DTW/DTB	Flame-proof resistant temperature controller/limiter	■		■		■		■	
MTE	Mini thermostat	■		■		■		■	
KTE	Cable thermostat	■		■		■		■	
KRM	Capillary tube thermostat		■		■		■		■
DEPU	Complete digital solution								
DPC III	Digital temperature controller	■[1]	■	■[1]	■	■[1]	■[1]	■[1]	■
DPC_{front}	Digital temperature controller (front panel)	■[1]	■	■[1]	■	■[1]	■[1]	■[1]	■
DTL III Ex	Digital temperature limiter								
DEC	Digital power controller								
MPC II/MPC^{net}	Multiplex controller	■[1]	■	■[1]	■	■	■	■[1]	■
Pt100 Ex	Resistance thermometer	■		■		■		■	
Pt100 M	Resistance thermometer		■		■		■		■
Mounting accessories									
Junction boxes for heating circuit		■	■	■	■	■	■	■	■
Junction box Pt100		■	■	■	■	■	■	■	■
Insulation entries		■	■	■	■	■	■	■	■
Adhesive aluminium tapes		■	■	■	■	■	■	■	■
Adhesive textile tapes		■	■	■	■				
Adhesive polyester tapes		■	■	■	■				
Adhesive glass fibre tapes		■	■	■	■	■	■	■	■
Caution Labels		■	■	■	■	■	■	■	■
Mounting plates and fixing brackets (S/S)		■	■	■	■	■	■	■	■
Mounting plates and fixing brackets (galv. steel)		■	■	■	■	■	■	■	■
Fixing strap and buckle for mounting rail		■	■	■	■	■	■	■	■
Polyester fixing strap and buckle		■	■	■	■	■	■	■	■
EKL spacing strips									
EMK spacing strips									
Wire mats, welding rods, spring lock washers		■	■	■	■	■	■	■	■
Stainless steel cable ties									
Nylon cable ties		■	■	■	■	■	■	■	■

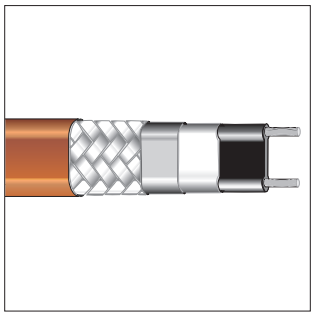
■[1] = Used outside the Ex area but acts on explosion-protected heating circuits in the Ex area.

Technical data subject to change without notice.

Heating System Components - typical application		**HTSB**		**EKL**		**EMK**		**SEH**	
Connection		Ex	M	Ex	M	Ex	M	Ex	M
PLEXO TCS	Connection system								
TWISTO-B	Connection system								
Heat shrink technology	Connection technology				■				
Cold-applied technology	Connection technology	■	■						
ECT for EKL medium/premium	Connection technology			■					
EMK “Ex“	Connection set					■			
EMK “Standard“	Connection set						■		
Control units									
STW II	Safety temperature monitor	■		■		■			
BSTW II	Safety temperature monitor	■		■		■			
BTB II/BSTB II	Safety temperature limiter			■		■			
DTW/DTB	Flame-proof resistant temperature controller/limiter	■		■		■			
MTE	Mini thermostat								
KTE	Cable thermostat								
KRM	Capillary tube thermostat		■		■		■		
DEPU	Complete digital solution			■		■			
DPC III	Digital temperature controller	■[1]	■	■[1]	■	■[1]	■		
DPC_{front}	Digital temperature controller (front panel)	■[1]	■	■[1]	■	■[1]	■		
DTL III Ex	Digital temperature limiter			■[1]	■	■[1]	■		
DEC	Digital power controller			■[1]	■	■[1]	■		
MPC II/MPC^{net}	Multiplex controller	■[1]	■	■[1]	■	■[1]	■		
Pt100 Ex	Resistance thermometer	■		■		■			
Pt100 M	Resistance thermometer		■		■		■		
Mounting accessories									
Junction boxes for heating circuit		■	■	■	■	■	■	■	■
Junction box Pt100		■	■	■	■	■	■	■	■
Insulation entries		■	■	■	■				
Adhesive aluminium tapes		■	■	■	■			■	■
Adhesive textile tapes									
Adhesive polyester tapes									
Adhesive glass fibre tapes		■	■	■	■				
Caution Labels		■	■	■	■	■	■	■	■
Mounting plates and fixing brackets (S/S)		■	■	■	■	■	■		
Mounting plates and fixing brackets (galv. steel)		■	■	■	■	■	■		
Fixing strap and buckle for mounting rail		■	■	■	■	■	■	■	■
Polyester fixing strap and buckle		■	■	■	■	■			
EKL spacing strips				■	■				
EMK spacing strips						■	■		
Wire mats, welding rods, spring lock washers		■	■	■	■	■	■		
Stainless steel cable ties						■	■		
Nylon cable ties		■	■	■	■				

■[1] = Used outside the Ex area but acts on explosion-protected heating circuits in the Ex area.

Technical data subject to change without notice.



- Self-limiting, without overheating while overlapping
- Easy installation due to on-site assembly
- Certificate for the system according to IEC/EN 60079-30-1

Explosion protection

Certification	
PSBL	KEMA 08 ATEX 0112 X IECEx KEM 09.0085X TC RU C-DE.ГБ06.B.00230
PSB	KEMA 08 ATEX 0111 X IECEx KEM 09.0084X TC RU C-DE.ГБ06.B.00230 CSA 1862457
MSB	KEMA 08 ATEX 0110 X IECEx KEM 09.0083X TC RU C-DE.ГБ06.B.00230
HSB	KEMA 08 ATEX 0110 X IECEx KEM 09.0083X TC RU C-DE.ГБ06.B.00230 CSA 1862457

Other approvals and certificates, see www.bartec.de

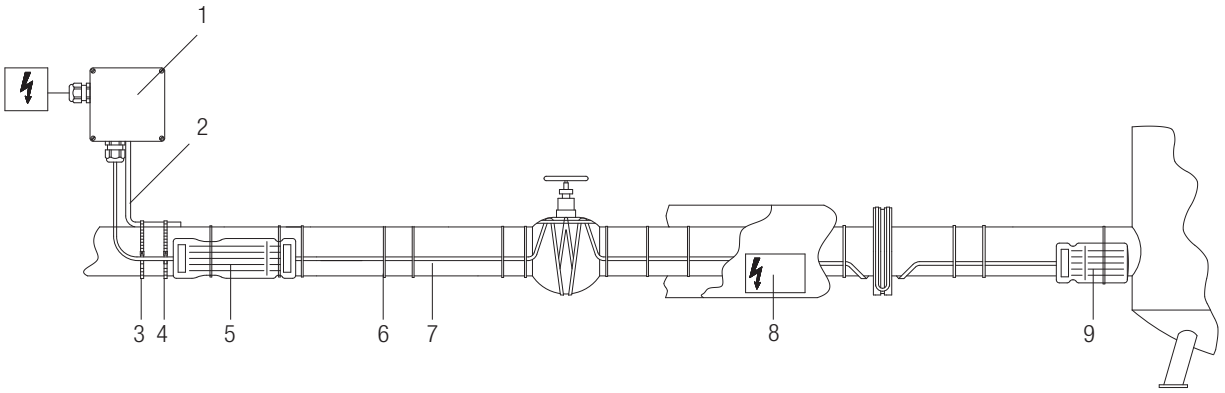
Technical data subject to change without notice.

Typical applications are frost protection, temperature maintenance and heating on pipes, tanks and containers, as well as for non-hazardous areas or areas with potentially explosive atmospheres in the process industry. The electrical heating system is the ideal solution for applications in Zones 1, 2, 21 and 22 and for Class I, II and III Div 2. Our self-limiting heating tapes have a heat output of between 10 and 60 W/m, depending on the model. Depending on the switch-on temperature or the model and the supply voltage, heating circuit lengths of over 200 m are possible. No limiter is required. The calculation and design software is available free of charge. The various combinations used to assemble the heating system can be found in the “Use of the system components in heating circuit systems” table.

System overview

- Self-limiting parallel heating tape PSBL, PSB, MSB or HSB
- PLEXO TCS
- Junction box made of polyester, stainless steel or aluminium with heat shrink or cold applied technology
- Optional: the mechanical control unit BSTW II, which can be used as junction box

Application example PSB heating system



1 Junction box or BSTW II optional
2 Installation rail/mounting plate
3 Fixing strap
4 Buckle for fixing strap
5 PLEXO TCS connection
6 Glass fibre self-adhesive tape
7 PSB heating tape
8 Caution label "Electrically Heated"
9 PLEXO TCS End termination

Use of the system components in the PSBL, PSB, MSB and HSB trace heating systems

	Connection of supply line to heating tape	Connection of heating tape to heating tape	End termination
Cold connection with junction box	Ex M	Ex M	Ex M
Cold connection without junction box			Ex M
Heat shrink method with junction box for PSBL, PSB and HSB systems	Ex M	Ex M	Ex M
Heat shrink method without junction box for PSBL, PSB and HSB systems	M	M	Ex M
PLEXO TCS	Ex M	Ex M	Ex M
TWISTO-B for the PSB system	M	M	M
BSTW II	Ex M		

Corresponding installation accessories can be found in the chapter on "Installation accessories for PSBL/PSB/MSB/HSB/HTSB/EKL/EMK"

- Can be cut to any length due to the parallel current supply
- Tinned copper braiding for electrical and mechanical protection
- Easy installation due to high level of flexibility

Around two parallel positioned copper wires with a cross-section of 1 mm² an irradiated electrically conducting polymer is extruded. This electrically conducting matrix responds to changes of the ambient temperature with an increase or decrease of the heating output. A flame-retardant, UV-resistant jacket protects the braiding against humidity and offers additional protection against mechanical stress. The heating system must be designed to ensure that the maximum operating temperature of 65 °C will not be exceeded when it is energized. When it is switched off, the heating tape can be exposed to a temperature of 85 °C, not more than 1,000 hours cumulated.

1. Conductors: stranded copper wire 1.0 mm², tinned
2. Self-limiting polymer heating element
3. Polyolefin electrical insulation jacket
4. Tinned copper braiding
5. Polyolefin or alternatively fluoropolymer protective jacket

Areas of application

The PSBL heating tape is suitable for electric trace heating for frost protection of pipelines and vessels. While the polyolefin protective jacket is used where there are aqueous, inorganic chemicals, the fluoropolymer protective jacket is suitable for organic chemicals. For questions regarding the chemical resistance please contact your BARTEC sales representative.

Explosion protection

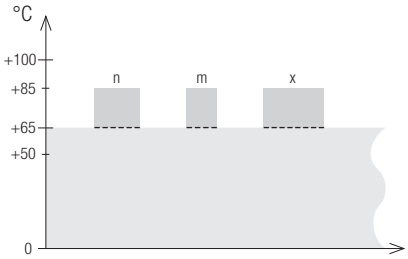
Marking	Ⓔx II 2G Ex e IIC T5 Gb Ⓔx II 2D Ex tb IIIC T95 °C Db
Certification System	KEMA 08 ATEX 0112 X IECEx KEM 09.0085X TC RU C-DE.ГБ06.B.00230
Certification Heating tape	KEMA 02 ATEX 2326 U IECEx KEM 07.0047 U DNV E-12874

Other approvals and certificates, see www.bartec.de

Technical data

Nominal voltage	AC 208 V to 254 V, AC 110 V to 120 V
Max. exposure temperature	switched on +65 °C switched off +85 °C
Min. installation temperature	-55 °C
Min. start-up temperature	-30 °C
Max. braid resistance	<18.2 Ω/km
Dimensions with braiding and jacket	10.5 x 6.0 mm with polyolefin protective jacket 10.3 x 5.8 mm with fluoropolymer protective jacket
Min. bending radius	25 mm

Maximum exposure temperature

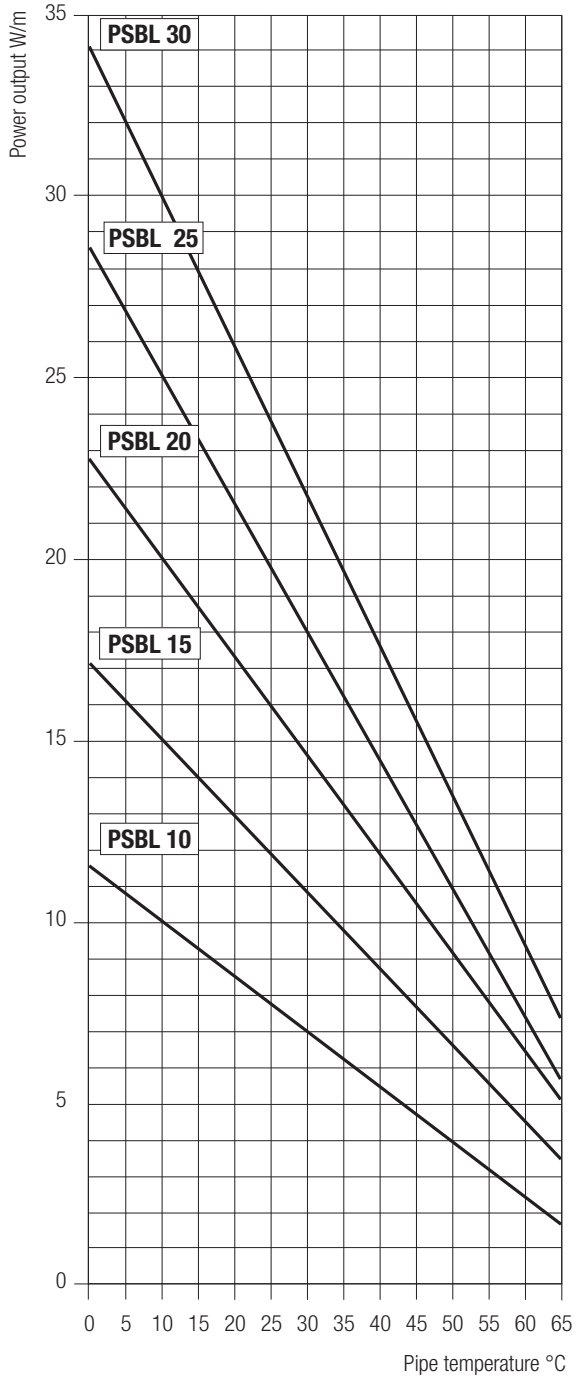


- Continuous operation, switched on heating tape
- Period of time in switched-off state , n + m + x ... ≤ 1000 h (n, m, x... ≤ 48 hours, breaks in between at least 4 weeks)

Power setting at +10 °C

Power output	PSBL 10	PSBL 15	PSBL 20	PSBL 25	PSBL 30
at AC 230 V	10 W/m	15 W/m	20 W/m	25 W/m	30 W/m
at AC 120 V	10 W/m	15 W/m	20 W/m	25 W/m	30 W/m

PSBL characteristics



Power output on insulated steel pipes at **230 V** under nominal conditions.

Max. length of heating circuit at AC 230 V for automatic circuit-breakers with C characteristic

Circuit breaker size	start-up temperature	PSBL 10	PSBL 15	PSBL 20	PSBL 25	PSBL 30
10 A	+10 °C	118 m	104 m	79 m	60 m	45 m
	-15 °C	90 m	69 m	49 m	39 m	24 m
	-30 °C	77 m	56 m	40 m	30 m	16 m
16 A	+10 °C	154 m	139 m	110 m	83 m	
	-15 °C	136 m	89 m	71 m	56 m	
	-30 °C	118 m	78 m	58 m	47 m	

Max. length of heating circuit at AC 120 V for automatic circuit-breakers with C characteristic

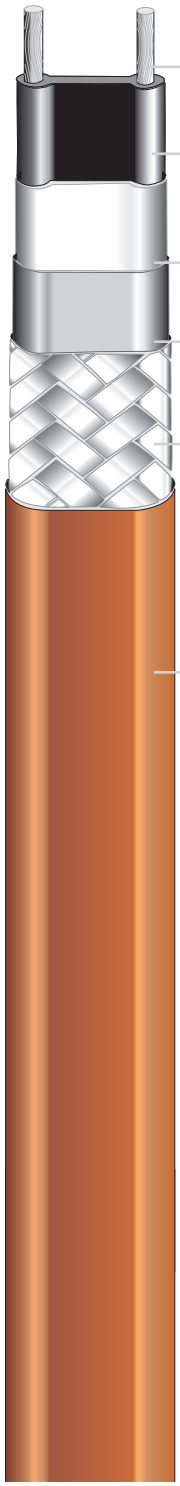
Circuit breaker size	start-up temperature	PSBL 10	PSBL 15	PSBL 20	PSBL 25
10 A	+10 °C	49 m	43 m	33 m	25 m
	-15 °C	45 m	35 m	25 m	20 m
	-30 °C	39 m	28 m	20 m	15 m
16 A	+10 °C	77 m	58 m	46 m	35 m
	-15 °C	68 m	45 m	36 m	28 m
	-30 °C	59 m	39 m	29 m	24 m

Ordering information

PSBL parallel heating tape	Protective jacket	Type	Order no.
AC 254 V self-limiting Ⓜ media protected tinned copper braiding	fluorpolymer	PSBL 10	**07-5807-2105**
		PSBL 15	**07-5807-2155**
		PSBL 20	**07-5807-2205**
		PSBL 25	**07-5807-2255**
		PSBL 30	**07-5807-2305**
	polyolefin	PSBL 10	**07-5807-2106**
		PSBL 15	**07-5807-2156**
		PSBL 20	**07-5807-2206**
		PSBL 25	**07-5807-2256**
		PSBL 30	**07-5807-2306**
AC 254 V self-limiting Ⓔx explosion protected tinned copper braiding Ex marked	fluorpolymer	PSBL 10	**07-5807-2108**
		PSBL 15	**07-5807-2158**
		PSBL 20	**07-5807-2208**
		PSBL 25	**07-5807-2258**
		PSBL 30	**07-5807-2308**
	polyolefin	PSBL 10	**07-5807-2109**
		PSBL 15	**07-5807-2159**
		PSBL 20	**07-5807-2209**
		PSBL 25	**07-5807-2259**
		PSBL 30	**07-5807-2309**
AC 120 V self-limiting Ⓔx explosion protected tinned copper braiding Ex marked	fluorpolymer	PSBL 10	**07-5807-1108**
		PSBL 15	**07-5807-1158**
		PSBL 20	**07-5807-1208**
		PSBL 25	**07-5807-1258**
	polyolefin	PSBL 10	**07-5807-1109**
		PSBL 15	**07-5807-1159**
		PSBL 20	**07-5807-1209**
		PSBL 25	**07-5807-1259**

Technical data subject to change without notice.

- Can be cut at random length thanks to its arallel current supply
- Electrically and mechanically protected by a tinned copper braiding
- Simple installation thanks to its high flexibility and favourable dimensions



1. Conductors: stranded copper wire 1.25 mm^2, tinned

2. Self-limiting polymer heating element

3. Inner polyolefin electrical insulation jacket thermally fused to the heating element (bonded jacket)

4. Outer polyolefin electrical insulation jacket

5. Tinned copper braiding

6. Polyolefin or fluoropolymer protective jacket

A temperature-dependant resistive element between two parallel copper conductors regulates and limits the heat output of the heating tape according to the ambient temperature. If the ambient temperature rises, the power output of the heating tape is reduced. This self-limiting property prevents overheating even when the tapes are crossed. A temperature limiter is not necessary (also not in hazardous areas). Thanks to the parallel design the heating tape can be cut and installed to any required length. The self-limiting heating tape is available with different power outputs and protective jackets. The protective outer jacket of either fluoropolymer or polyolefin protects the copper braiding from corrosion and chemical impact. Two jackets under the protective braiding provide electrical insulation. The inner one of the two jackets is thermally fused to the heating element (bonded jacket). The heating system must be designed to ensure that the maximum operating temperature of 65 °C will not be exceeded when it is energized. When it is switched off, the heating tape can be exposed to a temperature of 85 °C, not more than 1,000 hours cumulated.

Areas of application

The PSB heating tape is suitable for electric trace heating for frost protection of pipelines and vessels. While the polyolefin protective jacket is used where there are aqueous, inorganic chemicals, the fluoropolymer protective jacket is suitable for organic chemicals. For questions regarding the chemical resistance please contact your BARTEC sales representative.

Explosion protection

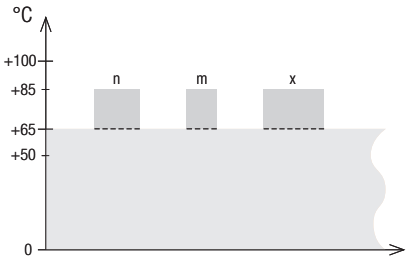
Marking	Ⓔx II 2G Ex e IIC T5, T6 Gb Ⓔx II 2D Ex tb IIIC T95 °C, T 80 °C Db
Certification System	KEMA 08 ATEX 0111 X IECEx KEM 09.0084X TC RU C-DE.ГБ06.B.00230 CSA 1862457
Certification Heating tape	KEMA 02 ATEX 2326 U IECEx KEM 07.0047 U DNV E-12874 VDE 128263

Other approvals and certificates, see www.bartec.de

Technical data

Nominal voltage	AC 208 V to 254 V, AC 110 V to 120 V
Max. exposure temperature	switched on +65 °C switched off +85 °C
Min. installation temperature	-55 °C
Min. start-up temperature	-40 °C
Max. braid resistance	<18.2 Ω/km
Dimensions with braiding and jacket	11.8 x 5.8 mm with polyolefin protective jacket 11.6 x 5.6 mm with fluoropolymer protective jacket
Min. bending radius	25 mm

Maximum exposure temperature

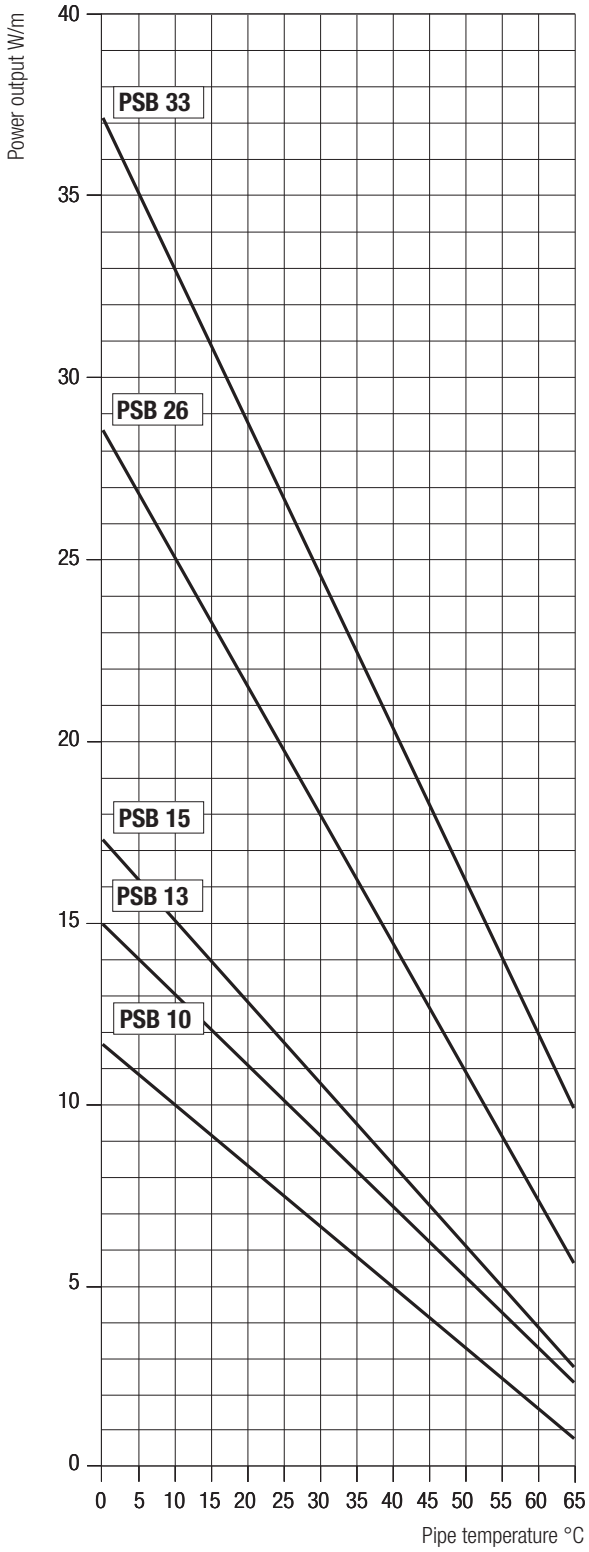


Continuous operation, switched on heating tape
Period of time in switched-off state , n + m + x ... ≤ 1000 h
(n, m, x... ≤ 48 hours, breaks in between at least 4 weeks)

Power setting at +10 °C

Power output	PSB 10	PSB 13	PSB 15	PSB 26	PSB 33
at AC 230 V	10 W/m	13 W/m	15 W/m	25 W/m	33 W/m
at AC 120 V	10 W/m	13 W/m	15 W/m	25 W/m	33 W/m

PSB characteristics



Power output on insulated steel pipes at **230 V** under nominal conditions.

Max. length of heating circuit at 254 V for automatic circuit-breakers with C characteristic

Circuit breaker size	start-up temperature	PSB 10	PSB 13	PSB 15	PSB 26	PSB 33
16 A	+10 °C	205 m	169 m	145 m	88 m	70 m
	-15 °C	139 m	111 m	93 m	58 m	49 m
	-30 °C	120 m	94 m	77 m	45 m	43 m
20 A	+10 °C	205 m	179 m	162 m	117 m	90 m
	-15 °C	186 m	149 m	125 m	75 m	64 m
	-30 °C	150 m	124 m	106 m	64 m	52 m
25 A	+10 °C	205 m	179 m	162 m	120 m	98 m
	-15 °C	190 m	160 m	142 m	95 m	80 m
	-30 °C	170 m	150 m	135 m	82 m	65 m
32 A	+10 °C	205 m	179 m	162 m	126 m	108 m
	-15 °C	195 m	174 m	160 m	117 m	95 m
	-30 °C	195 m	174 m	160 m	100 m	82 m

Max. length of heating circuit at 120 V for automatic circuit-breakers with C characteristic

Circuit breaker size	start-up temperature	PSB 10	PSB 13	PSB 15	PSB 26	PSB 33
16 A	+10 °C	95 m	78 m	67 m	43 m	33 m
	-15 °C	69 m	55 m	45 m	30 m	25 m
	-30 °C	58 m	47 m	39 m	26 m	21 m
20 A	+10 °C	95 m	86 m	80 m	58 m	45 m
	-15 °C	90 m	72 m	60 m	38 m	32 m
	-30 °C	75 m	59 m	49 m	31 m	26 m
25 A	+10 °C	95 m	86 m	80 m	60 m	50 m
	-15 °C	92 m	80 m	70 m	45 m	38 m
	-30 °C	85 m	72 m	65 m	42 m	34 m
32 A	+10 °C	95 m	86 m	80 m	63 m	54 m
	-15 °C	95 m	86 m	80 m	55 m	45 m
	-30 °C	95 m	86 m	80 m	53 m	43 m

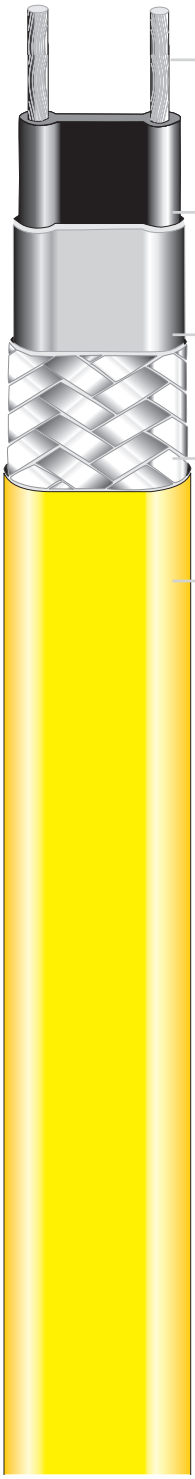
Ordering information

PSB parallel heating tape	Protective jacket	Type	Order no.
AC 254 V self-limiting Ⓔx explosion protected Ⓜ media protected	fluorpolymer	PSB 10	**07-5801-2105**
		PSB 13	**07-5801-2135**
		PSB 15	**07-5801-2155**
		PSB 26	**07-5801-2265**
		PSB 33	**07-5801-2335**
	polyolefin	PSB 10	**07-5801-2106**
		PSB 13	**07-5801-2136**
		PSB 15	**07-5801-2156**
		PSB 26	**07-5801-2266**
		PSB 33	**07-5801-2336**
AC 120 V self-limiting Ⓔx explosion protected Ⓜ media protected	fluorpolymer	PSB 10	**07-5801-1105**
		PSB 13	**07-5801-1135**
		PSB 15	**07-5801-1155**
		PSB 26	**07-5801-1265**
		PSB 33	**07-5801-1335**
	polyolefin	PSB 10	**07-5801-1106**
		PSB 13	**07-5801-1136**
		PSB 15	**07-5801-1156**
		PSB 26	**07-5801-1266**
		PSB 33	**07-5801-1336**

Technical data subject to change without notice.

- Can be cut to length at random thanks to its parallel current supply
- Resistant to chemical influences thanks to its protective TPC protective jacket
- Simple installation thanks to its high flexibility

A temperature-dependant resistive element between two parallel copper conductors regulates and limits the heat output of the heating tape. This output regulation is carried out automatically along the entire length of the heating tape according to the prevailing ambient temperature. If the ambient temperature rises, the power output of the tape is reduced. Thanks to the parallel design the heating tape can be cut to any required length. This feature considerably simplifies project planning and installation. The heating tape is cut and terminated directly on the construction site according to the circumstances. If the tape will be damaged, it is not necessary to replace the whole tape. BARTEC MSB is available with different power outputs. The heating system must be designed to ensure that the maximum operating temperature of +110 °C will not be exceeded when it is energized. When it is switched off, the heating tape can be exposed to a temperature of 130 °C, not more than 1,000 hours cumulated.



1. Conductors: stranded copper wire, 1.25 mm^2, nickel-plated

2. Self-limiting polymer heating element

3. TPC electrical insulation jacket

4. Tinned copper braiding

5. TPC protective jacket

Areas of application

The MSB heating tape is suitable for electric trace heating in the industrial area and can be exposed to a temperature of up to 130 °C (switched off). With the halogen-free protective jacket, the heating tape is resistant to oil, greases and most chemicals. For questions regarding the chemical resistance please contact your BARTEC sales representative.

Explosion protection

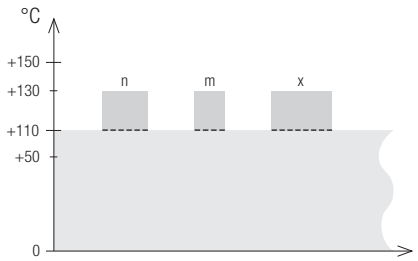
Marking	Ⓔx II 2G Ex e IIC T150 °C (T3), T4 Gb Ⓔx II 2D Ex tb IIIC T150 °C, T130 °C Db
Certification system	KEMA 08 ATEX 0110 X IECEx KEM 09.0083X
Certification heating tape	DEKRA 12 ATEX 0044 U IECEx DEK 12.0004 U DNV E-12874

Other approvals and certificates, see www.bartec.de

Technical data

Nominal voltage	AC 208 V to 254 V
Max. exposure temperature	switched on +110 °C switched off +130 °C
Min. installation temperature	-40 °C
Min. start-up temperature	-50 °C
Max. braid resistance	<18.2 Ω/km
Dimensions with braiding and jacket	10.2 mm x 4.8 mm with TPC jacket
Min. bending radius	25 mm

Maximum exposure temperature



Continuous operation, switched on heating tape
Period of time in switched-off state, n + m + x ... ≤ 1000 h
(n, m, x... ≤ 48 hours, breaks in between at least 4 weeks)

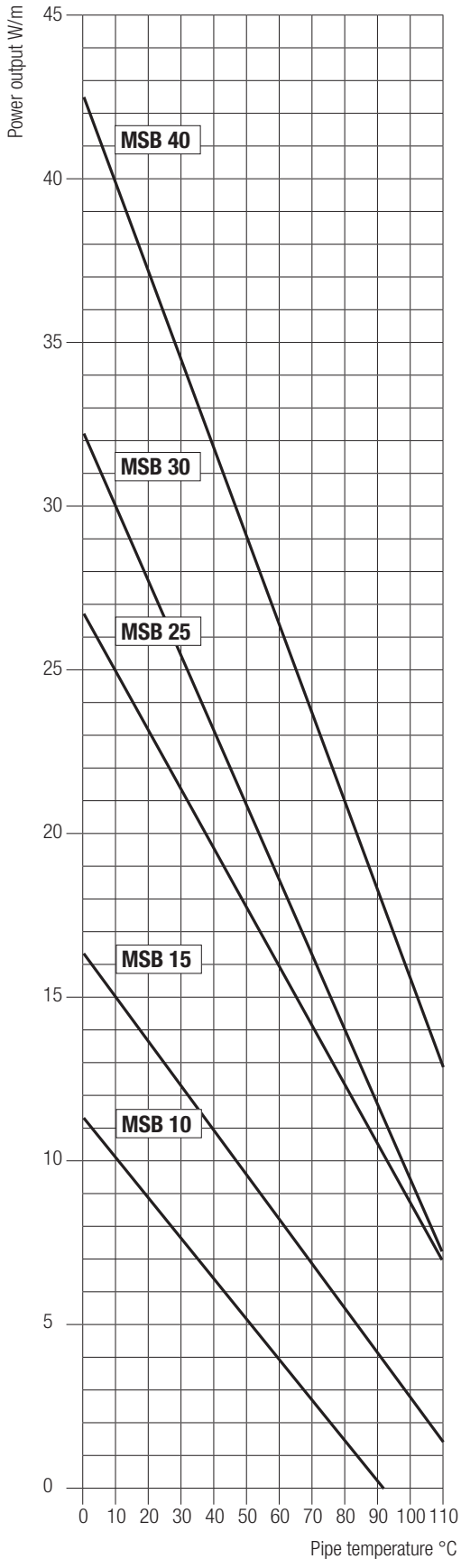
Power setting at +10 °C

Power output	MSB 10	MSB 15	MSB 25	MSB 30	MSB 40
at AC 230 V	10 W/m	15 W/m	25 W/m	30 W/m	40 W/m

Permissible ambient temperature for T class

Nominal voltage	Heating cable	max. workpiece temperature	T class
at AC 254 V	all	+110 °C	150 °C (T3)
	MSB 10	+100 °C	T4
	MSB 15	+90 °C	T4
	MSB 25	+80 °C	T4
	MSB 30	+70 °C	T4
	MSB 40	+60 °C	T4

MSB characteristics



Power output on insulated steel pipes at **230 V** under nominal conditions.

Max. length of heating circuit at ≤ 254 V for automatic circuit-breakers with C characteristic

Circuit breaker size	start-up temperature	MSB 10	MSB 15	MSB 25	MSB 30	MSB 40
16 A	+10 °C	200 m	165 m	120 m	85 m	70 m
	-25 °C	175 m	117 m	88 m	69 m	49 m
	-50 °C	165 m	110 m	80 m	65 m	45 m
20 A	+10 °C	235 m	189 m	140 m	114 m	82 m
	-25 °C	235 m	152 m	120 m	92 m	66 m
	-50 °C	225 m	144 m	114 m	86 m	62 m
32 A	+10 °C	235 m	189 m	140 m	114 m	82 m
	-25 °C	235 m	189 m	140 m	114 m	82 m
	-50 °C	235 m	189 m	136 m	110 m	78 m

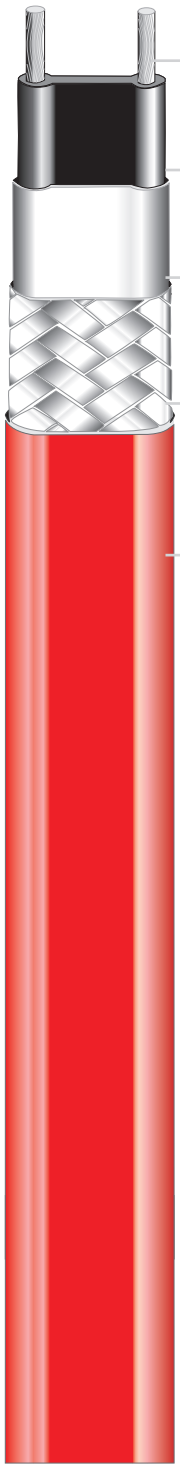
Ordering information

MSB parallel heating tape	Type	Heating output	Order no.
AC 254 V self-limiting Ⓔx explosion protected Ⓜ media protected	MSB 10	10 W/m	**07-5804-210Y**
	MSB 15	15 W/m	**07-5804-215Y**
	MSB 25	25 W/m	**07-5804-225Y**
	MSB 30	30 W/m	**07-5804-230Y**
	MSB 40	40 W/m	**07-5804-240Y**

Technical data subject to change without notice.

- Can be cut to length at random thanks to its parallel current supply
- Corrosion-proof and resistant to chemical attack thanks to its protective outer jacket of fluoropolymer
- Simple installation thanks favourable dimensions

A temperature-dependant resistive element between two parallel copper conductors regulates and limits the power output of the heating tape. This output regulation is carried out automatically along the entire length of the heating tape according to the prevailing ambient temperature. If the ambient temperature rises, the power output of the tape is reduced. This self-limiting property prevents overheating even when the tapes are crossed. Thanks to the parallel design the heating tape can be cut to any required length. This feature considerably simplifies project planning and installation. The heating tape is cut and terminated directly on the construction site according to the circumstances. The heating system must be designed to ensure that the maximum operating temperature of +120 °C will not be exceeded when it is energized. When switched off, the heating tape can be exposed to a temperature of 200 °C for a short time, not more than 1,000 hours cumulated.



1. Conductors: stranded copper wire, 1.25 mm², nickel-plated

2. Self-limiting polymer heating element

3. Fluoropolymer electrical insulation jacket

4. Nickel-plated copper braiding

5. Fluoropolymer protective jacket

Areas of application

The HSB heating tape is suitable for frost protecting in industrial areas. The level of its maximum possible heating output allows the heating tape to be used for maintaining high process temperatures. For questions regarding the chemical resistance please contact your BARTEC sales representative.

Explosion protection

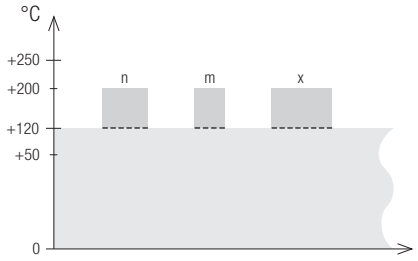
Marking	Ⓔx II 2G Ex e IIC 200 °C (T2), T3, T4 Gb Ⓔx II 2D Ex tb IIIC T200 °C, T195 °C, T130 °C Db
Certification System	KEMA 08 ATEX 0110 X IECEx KEM 09.0083X TC RU C-DE.ГБ06.B.00230 CSA 1862457
Certification Heating tape	KEMA 02 ATEX 2327 U IECEx KEM 07.0048 U DNV E-12874

Other approvals and certificates, see www.bartec.de

Technical data

Nominal voltage	AC 208 V to 254 V, AC 110 V to 120 V
Max. exposure temperature	switched on +120 °C switched off +200 °C
Min. installation temperature	-60 °C
Min. start-up temperature	-60 °C
Max. braid resistance	<18.2 Ω/km
Dimensions with braiding and jacket	10.2 mm x 4.8 mm with fluoropolymer protective jacket
Min. bending radius	25 mm

Maximum exposure temperature



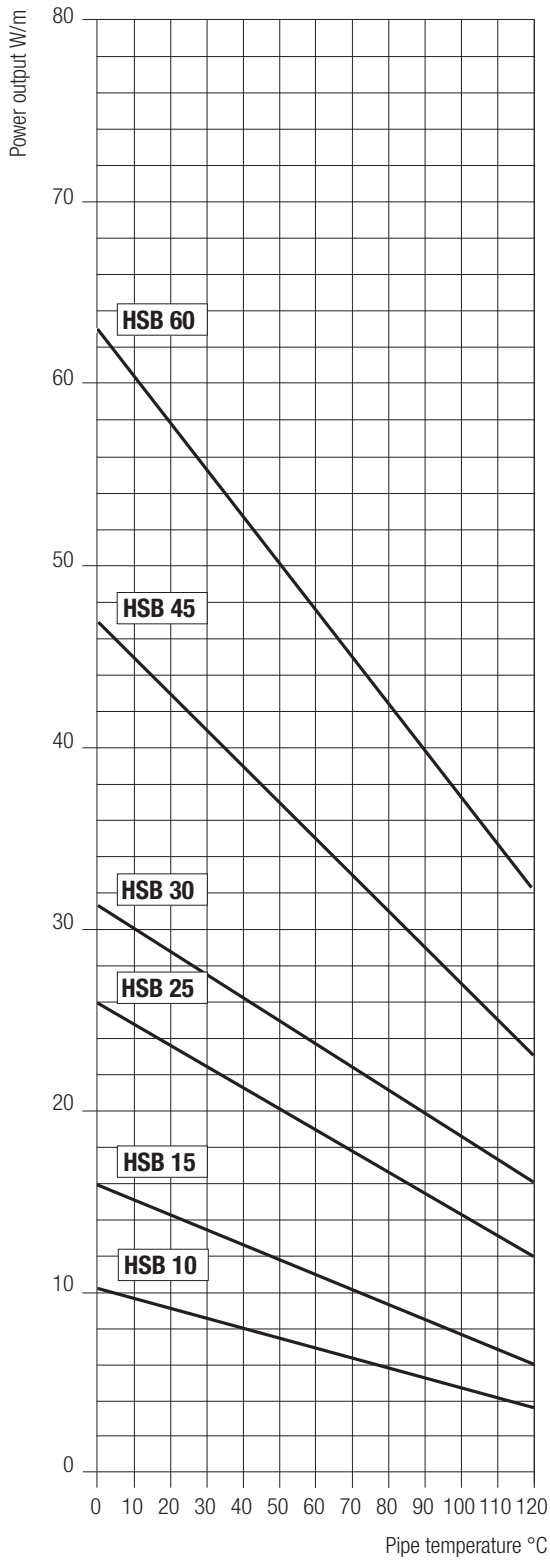
Continuous operation, switched on heating tape
Period of time in switched-off state , n + m + x ... ≤ 1000 h
(n, m, x... ≤ 48 hours, breaks in between at least 4 weeks)

Power setting at +10 °C

Power output	HSB 10	HSB 15	HSB 25
at AC 230 V	10 W/m	15 W/m	25 W/m
at AC 120 V	10 W/m	15 W/m	25 W/m

Power output	HSB 30	HSB 45	HSB 60
at AC 230 V	30 W/m	45 W/m	60 W/m
at AC 120 V	30 W/m	45 W/m	60 W/m

HSB characteristics



Power output on insulated steel pipes at **230 V** under nominal conditions.

Max. length of heating circuit at 254 V for automatic circuit-breakers with C characteristic

Circuit breaker size	start-up temperature	HSB 10	HSB 15	HSB 25	HSB 30	HSB 45	HSB 60
16 A	+10 °C	200 m	165 m	120 m	85 m	70 m	50 m
	-25 °C	175 m	117 m	88 m	69 m	49 m	38 m
	-60 °C	165 m	110 m	80 m	65 m	45 m	35 m
20 A	+10 °C	235 m	189 m	140 m	114 m	82 m	64 m
	-25 °C	235 m	152 m	120 m	92 m	66 m	52 m
	-60 °C	225 m	144 m	114 m	86 m	62 m	48 m
25 A	+10 °C	235 m	189 m	140 m	114 m	82 m	64 m
	-25 °C	235 m	170 m	130 m	100 m	75 m	58 m
	-60 °C	230 m	160 m	120 m	92 m	70 m	52 m
32 A	+10 °C	235 m	189 m	140 m	114 m	82 m	64 m
	-25 °C	235 m	189 m	140 m	114 m	82 m	64 m
	-60 °C	235 m	189 m	136 m	110 m	78 m	60 m

Max. length of heating circuit at 120 V for automatic circuit-breakers with C characteristic

Circuit breaker size	start-up temperature	HSB 10	HSB 15	HSB 25	HSB 30	HSB 45	HSB 60
16 A	+10 °C	100 m	80 m	60 m	44 m	35 m	25 m
	-25 °C	89 m	56 m	44 m	35 m	24 m	20 m
	-60 °C	82 m	52 m	40 m	32 m	22 m	17 m
20 A	+10 °C	120 m	95 m	69 m	58 m	41 m	32 m
	-25 °C	120 m	75 m	59 m	45 m	33 m	25 m
	-60 °C	120 m	75 m	55 m	41 m	26 m	21 m
25 A	+10 °C	120 m	95 m	69 m	58 m	41 m	32 m
	-25 °C	120 m	80 m	64 m	50 m	35 m	28 m
	-60 °C	120 m	80 m	60 m	45 m	32 m	26 m
32 A	+10 °C	120 m	95 m	69 m	58 m	41 m	32 m
	-25 °C	120 m	95 m	69 m	58 m	41 m	32 m
	-60 °C	120 m	95 m	69 m	58 m	41 m	32 m

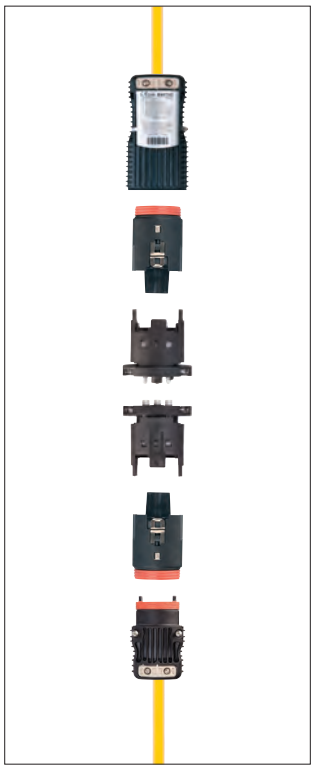
Ordering information

HSB parallel heating tape	Type	Order no.
AC 254 V, self-limiting, steam purging possible Ⓔx explosion protected Ⓜ media protected	HSB 10	**07-5803-210A**
	HSB 15	**07-5803-215A**
	HSB 25	**07-5803-225A**
	HSB 30	**07-5803-230A**
	HSB 45	**07-5803-245A**
	HSB 60	**07-5803-260A**
AC 120 V, self-limiting, steam purging possible Ⓔx explosion protected Ⓜ media protected	HSB 10	**07-5803-110A**
	HSB 15	**07-5803-115A**
	HSB 25	**07-5803-125A**
	HSB 30	**07-5803-130A**
	HSB 45	**07-5803-145A**
	HSB 60	**07-5803-160A**

Technical data subject to change without notice.

- Quick and easy installation, with standard tools
- Component of the PSBL, PSB, MSB and HSB system approval
- Own system approval with PSBL, PSB, MSB and HSB heating tape

The PLEXO TCS connection system can be used for BARTEC self-limiting heating tapes. The PLEXO TCS may be used both as an autonomous system with the heating tape or as part of the PSBL, PSB, MSB and HSB system. This modular connection technology enables the simple and reliable assembly of supply connections, splicing and remote-end terminations. PLEXO TCS is plugged and built up with a patented sealing and clamping technology. Maintenance work and later modifications on the heating circuit can be performed quickly and flexibly. The strands from the heating tape or the supply cable are fixed in place securely using the spring-loaded terminals in the internal clamping technology.



Explosion protection

Marking PLEXO TCS with heating tape PSBL	Ⓔx II 2G Ex e IIC T5 Gb Ⓔx II 2D Ex tb IIIC T95 °C Db
heating tape PSB	Ⓔx II 2G Ex e IIC T5, T6 Gb Ⓔx II 2D Ex tb IIIC T95 °C, T80 °C Db
heating tape MSB/HSB	Ⓔx II 2G Ex e IIC 150 °C (T3), T4 Gb Ⓔx II 2D Ex tb IIIC T150 °C, T130 °C Db
Certification PLEXO TCS with heating tapes	BVS 13 ATEX E 040 X IECEx BVS 13.0048X TC RU C-DE.ГБ06.B.00230

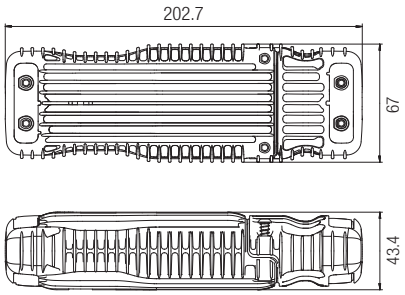
Please refer to the system chapter for the respective system approval.

Other approvals and certificates, see www.bartec.de

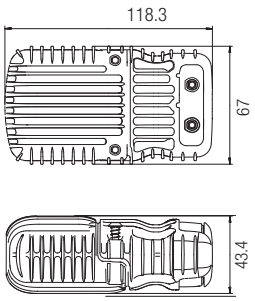
Technical data

Rated voltage	max. 254 V
Rated current	max. 16 A
Protection class	EN 60079-0 IP 65 EN 60529 IP 66/IP 68
Operating temperature range	Ex application -60 °C to +150 °C Non Ex application -60 °C to +150 °C
Rated cross-section of supply cable	max. 4 mm^2
Min. installation temperature	-55 °C
Sealing range supply cable	see ordering information

Dimensions (in mm)
Type 27-59P1-*0100000 and 27-59P2-01100000



Dimensions (in mm)
Type 27-59P3-00100000



Ordering information

Heating tape connection to supply cable with sealing range	
$8 < D_A \leq 10$ mm	**27-59P1-10100001**
$10 < D_A \leq 12$ mm	**27-59P1-20100001**
$12 < D_A \leq 14$ mm	**27-59P1-30100001**
$14 < D_A \leq 16$ mm	**27-59P1-40100001**
Heating tape splice with sealing range for PSBL, PSB, MSB and HSB	**27-59P2-01100001**
Heating tape remote-end termination with sealing range for PSBL, PSB, MSB and HSB	**27-59P3-00100001**

Connection cable	
Heat-resistant connection cable with silicone outer sheath (H05SS-F quality, EWKF outer sheath, -50 °C to +180 °C)	
Cross-section 3 x 1.5 mm² D_A = 8.5 mm	**02-4034-0008**
Cross-section 3 x 2.5 mm² D_A = 9.8 mm	**02-4034-0027**

Mounting bracket	**05-0105-0385**

Using the optional mounting bracket and spacer, the PLEXO TCS can be installed outside insulation up to an insulation thickness of 70 mm.

Corresponding installation accessories can be found in the chapter on “Installation accessories for PSBL/PSB/MSB/HSB/HTSB/EKL/EMK”

Technical data subject to change without notice.

- Cost savings because of the reduced assembly time
- High reliability of assembly because of few and simple installation steps

Simpler and safer to use, yet at the same time faster and thus cheaper, is how the major benefits of the TWISTO-B can be described. This method of connection is for use with BARTEC PSB heating tapes of series 07-5801-2.... All that is needed to assemble a heating circuit is a knife and diagonal cutter. This dispenses with the time-consuming work of exposing the two conductors, the laborious splicing and twisting of the protective braiding and then connecting to a terminal. Just a piece of the outer protective jacket is removed, a clamping sheet is fitted over a part of the exposed braiding, the remaining part is pulled back over the clamping sheet. The heating tape is then inserted into the clamp cutting fixture and by twisting together the two outer sleeves (one sleeve comes ready prepared with a 2 m long supply cable), the heating tape is contacted in the clamp cutting fixture. The end terminal consists of just one part, whereby the end of the heating tape is shortened and inserted into the terminal piece.

Media protected

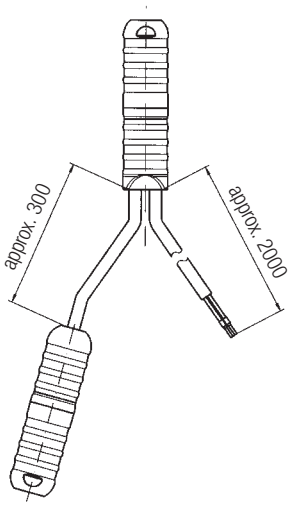
Certification system	TC RU C-DE.ML03.B.00062 VDE 40036171 DNV E-12875 CSA 1862457
Other approvals and certificates, see www.bartec.de	

Technical data

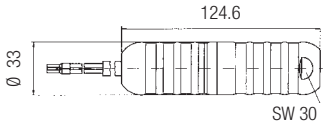
Nominal voltage	AC 250 V
Nominal current	16 A
Ambient temperature range	-20 °C to +85 °C
Protection class according to EN 60529	IP 66
Dimensions	Connection Diameter 33 x 125 (135) mm End termination 23 x 20 x 37.5 mm
Connection	with 2 m ready-prepared silicone connector cable (3 x 1.5 mm²)

Dimensions (mm)

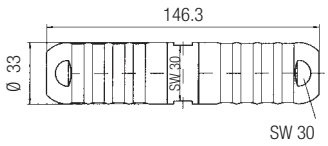
TWISTO B-TE2



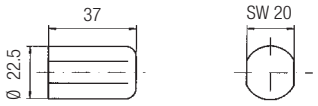
TWISTO B-A



TWISTO B-C



TWISTO B-E



Ordering information

Connection technology	Description	Short form title	Order no.
	Connection to supply cable and end termination as set	TWISTO-B-S	**27-56KK-DC22 0000**
	Connection to supply cable	TWISTO-B-A	**27-56KG-DC22 0000**
	End termination	TWISTO-B-E	**27-56KJ-DC00 0000**
	Heating tape connection	TWISTO-B-C	**27-56KH-DC00 0000**
	T-branch for 3 x heating tape 1 I/O	TWISTO-B-T	**27-56KL-DC00 0000**
	T-branch with power connection and 2 x heating tape 2 I/O	TWISTO-B-TE2	**27-56KM-DC22 0000**
	T-branch with power connection and 3 x heating tape 3 I/O	TWISTO-B-TE3	**27-56KN-DC22 0000**
	X-branch for 4 x heating tape 2 I/O	TWISTO-B-X	**27-56KP-DC00 0000**

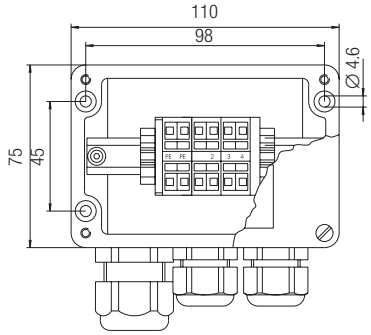
Technical data subject to change without notice.

Up to three TWISTO-B can be connected to the supply voltage with the polyester junction boxes. The enclosures have the appropriate number of terminals and the necessary cable glands resp. the threaded holes. Aluminium junction boxes are available on request.

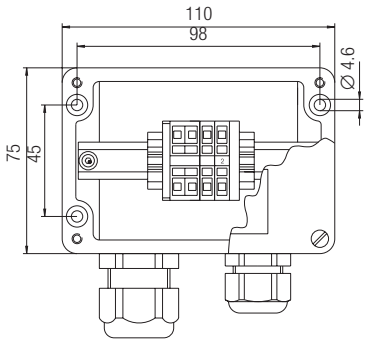
Technical data

Protection class according to EN 60529	Cover gasket IP 65 Cable gland for power supply cables IP 67
Supply voltage	max. AC 254 V
Rated cross-section of supply cable	see ordering information
Impact resistance	7 Joule
Material	polyester, glass-fibre reinforced
Gland size/cable diameter	M20 ∅ 6 to 13 mm M25 ∅ 7 to 12/17 mm

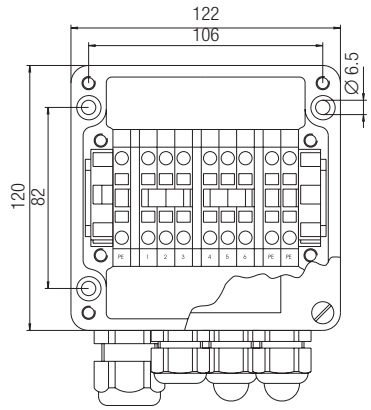
Junction box double



Junction box single



Junction box triple



Ordering information

Used for connection system	Junction box	Dimensions mm	Cable gland for power supply	Cable gland for heating circuit	Terminals mm^2	Order no.
TWISTO-B	single	110 x 75 x 55	1 x M25 (∅ 7 to 17 mm)	1 x M20	4 x 2.5; 4 x PE	**07-5177-9021**
	double	110 x 75 x 55	1 x M25 (∅ 7 to 17 mm)	2 x M20	8 x 2.5; 4 x PE	**07-5177-9022**
	triple	122 x 120 x 90	1 x M25 (∅ 7 to 17 mm)	3 x M20	12 x 6; 6 x PE	**07-5177-9023**

Corresponding installation accessories can be found in the chapter on “Installation accessories for PSBL/PSB/MSB/HSB/HTSB/EKL/EMK”

Technical data subject to change without notice.

- Can be combined with connection technology PLEXO, heat shrink and cold-applied technology
- Flame-retardant and Impact-resistant
- Component of the PSBL, PSB, MSB and HSB system approval

Inside the junction box up to three heating circuits can be connected to the supply voltage. As a component for the PSBL, PSB, MSB and HSB systems, it already has the right threaded holes for our cold applied and heat shrink technology.

Explosion protection

Marking System	
PSBL	Ⓔx II 2G Ex e IIC T5 Gb Ⓔx II 2D Ex tb IIIC T95 °C Db
PSB	Ⓔx II 2G Ex e IIC T5, T6 Gb Ⓔx II 2D Ex tb IIIC T95 °C, T80 °C Db
MSB	Ⓔx II 2G Ex e IIC 150 °C (T3), T4 Gb Ⓔx II 2D Ex tb IIIC T150 °C, T130 °C Db
HSB	Ⓔx II 2G Ex e IIC 180 °C (T3), T4 Gb Ⓔx II 2D Ex tb IIIC T180 °C, T130 °C Db

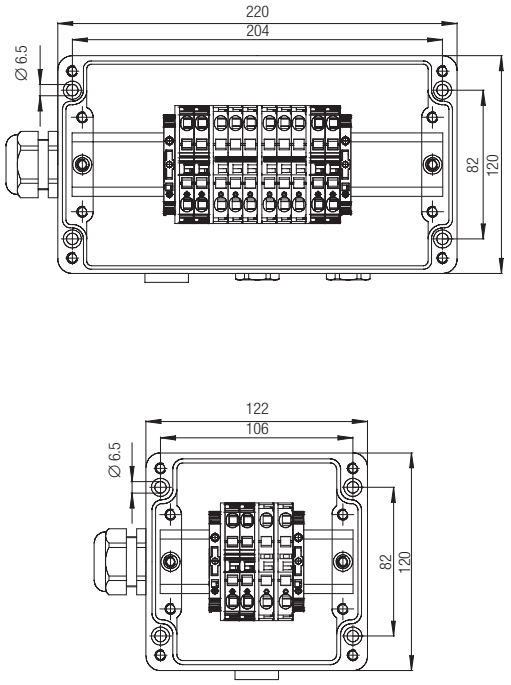
Please refer to the system chapter for the respective system approval.

Other approvals and certificates, see www.bartec.de

Technical data

Protection class according to EN 60079-0	seal of cover IP 66 cable gland IP 65
Ambient temperature	-55 °C to +55 °C
Dimensions	see ordering information
Material	Polyester, glass fibre reinforced; aluminium, stainless steel (AISI 316 or V4A)
Voltage	AC 254 V
Circuit protection	max. 16 A (dependant on the heating circuit length)
Cable gland supply voltage	M25 made of PA for feed with D_A 8 to 15 mm

Dimensions (polyester, aluminium)



Ordering information

Designation	Description		Dimensions (mm)	Terminals (mm²)	Order no.
Polyester	System 27-1.80-..10/....	for 1 heating circuit	122 x 120 x 90	4 x 6; 4 x PE	**27-5452-42111210**
		for 2/3 heating circuits	220 x 120 x 90	12 x 6; 8 x PE	**27-5452-44311210**
Aluminium	System 27-1.80-..10/....	for 1 heating circuit	122 x 120 x 90	4 x 6; 4 x PE	**27-5452-52111230**
		for 2/3 heating circuits	220 x 120 x 90	12 x 6; 8 x PE	**27-5452-54311230**
Stainless steel	System 27-1.80-..10/....	for 1 heating circuit	150 x 150 x 100	4 x 6; 4 x PE	**27-5452-67111230**
		for 2/3 heating circuits	200 x 200 x 120	12 x 6; 8 x PE	**27-5452-68311230**

Corresponding installation accessories can be found in the chapter on “Installation accessories for PSBL/PSB/MSB/HSB/HTSB/EKL/EMK”

Technical data subject to change without notice.

- UV resistant
- IP 66/IP 67/IP 69
- VDE tested

The AG-3G junction box is suitable for use indoors and protected installation outdoors. A cover retaining strap and external brackets are included for wall installation. The AG-3B junction box is also UV-resistant and rainwater-proof.

Installation instructions

Always connect the heating cable with wire end ferrules in the terminal.
Tightening torque: 0.7 Nm
The cover fasteners can be sealed without any accessories.

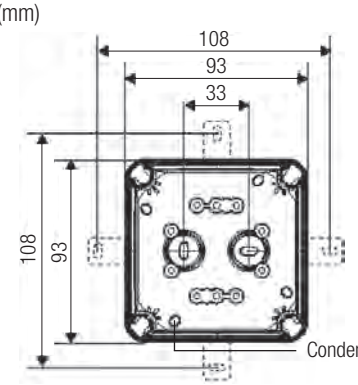
Measures to prevent condensate forming

1. Choose an installation location with care (avoid temperature differences).
2. Open the condensation membrane at the lowest point of the cable junction box.
3. IP55 protection class is achieved with wall or ceiling installation.

Technical data

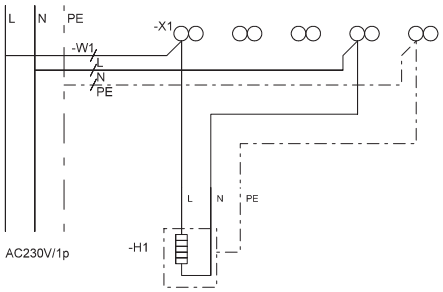
Dimensions		93 mm x 93 mm x 62 mm (without external mounting parts)
Protection class according to EN 60529	AG-3G AG-3B	IP 66/EN 60529/IK 07 IP 66/IP 67/IP 69, 1 m/15 min./IK 09 VDE-tested, DNV GL
Ambient temperature range	AG-3G AG-3B	-25 °C to +40 °C/V-2 -25 °C to +70 °C/V-0
Housing material	AG-3G AG-3B	PP (polypropylene) Glass fibre-reinforced polycarbonate
Cable gland		1 x M20
Terminal blocks		5 x 2 x 2.5 mm² for connecting from one to three heating cables, all terminals with two terminal connections per pole, use wire end ferrules
Rated isolation voltage		AC 400 V/20 A
Toxic properties		Halogen-free, silicone-free

Junction box (mm)

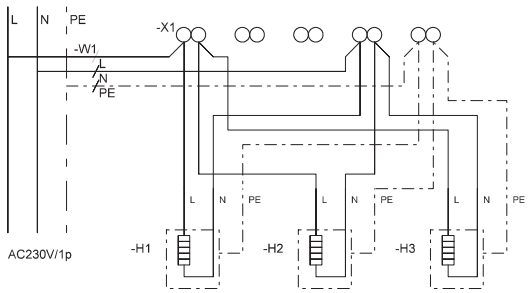


Circuit diagrams

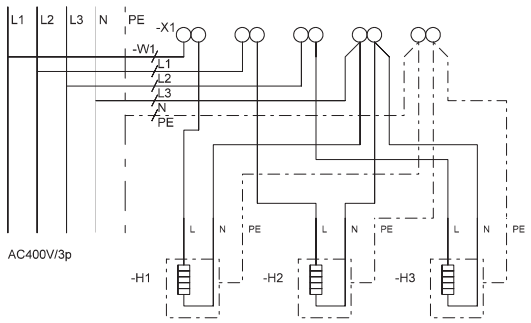
Example: One AC 230 V heater connected to one phase



Example: Three AC 230 V heaters connected to one phase



Example: Three AC 230 V heaters connected to three phases



Order information

AG-3G, grey	**05-0079-0049**
AG-3B, black, UV-resistant, rainwater-proof	**05-0079-0050**

Corresponding installation accessories can be found in the chapter on "Installation accessories for PSBL/PSB/MSB/HSB/HTSB/EKL/EMK"

Technical data subject to change without notice.

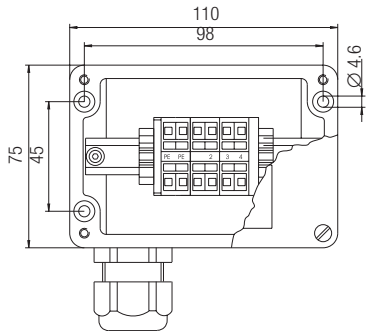
- Minimal installation space
- High protection class IP 65
- Easy installation

Up to three heating circuits can be connected to the supply voltage with the polyester junction boxes. The enclosures have the appropriate number of terminals and the necessary cable glands resp. the threaded holes. Aluminium junction boxes are available on request.

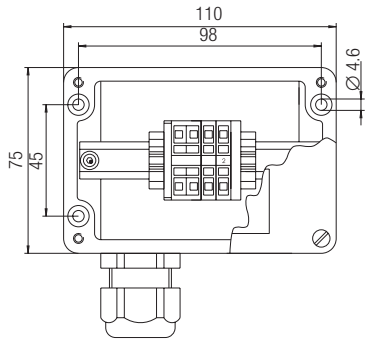
Technical data

Protection class according to EN 60529	Cover gasket IP 65 Cable gland for power supply cables IP 67
Supply voltage	max. AC 254 V
Rated cross-section of supply cable	see ordering information
Impact resistance	7 Joule
Material	polyester, glass-fibre reinforced
Gland size/cable diameter	M20 ∅ 10 to 14 mm

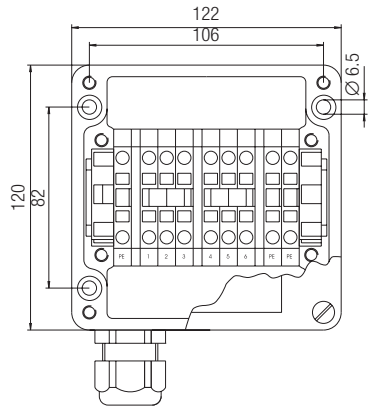
Junction box double



Junction box single



Junction box triple



Ordering information

Used for connection system	Junction box	Dimensions mm	Cable gland for power supply	Cable gland for heating circuit	Terminals mm^2	Order no.
Heat shrink or cold-applied technology	single	110 x 75 x 55	1 x M20 (∅ 10 to 14 mm)	1 x M20	4 x 2.5; 4 x PE	**07-5177-9024**
	double	110 x 75 x 55	1 x M20 (∅ 10 to 14 mm)	2 x M20	8 x 2.5; 4 x PE	**07-5177-9025**
	triple	122 x 120 x 90	1 x M20 (∅ 10 to 14 mm)	3 x M20	12 x 6; 6 x PE	**07-5177-9026**

Corresponding installation accessories can be found in the chapter on “Installation accessories for PSBL/PSB/MSB/HSB/HTSB/EKL/EMK”

Technical data subject to change without notice.

- Direct insertion of heating tape for our Ex e junction box
- Space-saving solution
- Easy installation with silicone adhesive

The cold applied technology is the ideal solution when connecting the PSBL, PSB, MSB and HSB heating tapes to the junction box. The end termination is achieved using a space-saving silicone end cap. The use of silicone parts and silicone adhesive enables the heating tape to be installed easily and quickly. In addition, no fire certificate is needed for installation in a potentially explosive atmosphere.

Explosion protection

Marking system	
PSBL	Ⓔx II 2G Ex e IIC T5 Gb Ⓔx II 2D Ex tb IIIC T95 °C Db
PSB	Ⓔx II 2G Ex e IIC T5, T6 Gb Ⓔx II 2D Ex tb IIIC T95 °C, T80 °C Db
MSB	Ⓔx II 2G Ex e IIC 150 °C (T3), T4 Gb Ⓔx II 2D Ex tb IIIC T150 °C, T130 °C Db
HSB	Ⓔx II 2G Ex e IIC 180 °C (T3), T4 Gb Ⓔx II 2D Ex tb IIIC T180 °C, T130 °C Db

Please refer to the system chapter for the respective system approval.

Other approvals and certificates, see www.bartec.de

Technical data explosion protected

Ambient temperature range	-55 °C to +55 °C
Max. operating temperature end cap	+200 °C
Cable gland material	Nickel-plated brass
Protection class in accordance with EN 60079-0	IP 65

Ordering information

Cold applied technology (connection and end termination), explosion protected

Heating tape, type	Set	Order no.
PSBL	set	**05-0091-0131**
PSBL	10 fold set	**05-0091-0137**
PSB	set	**05-0091-0130**
PSB	10 fold set	**05-0091-0136**
MSB	set	**05-0091-0129**
MSB	10 fold set	**05-0091-0135**
HSB	set	**05-0091-0129**
HSB	10 fold set	**05-0091-0135**

End termination, explosion protected

PSBL/PSB/MSB/HSB	10 fold set	**05-0091-013502**
PSBL/PSB/MSB/HSB	50 fold set	**05-0091-013504**

Technical data explosion protected

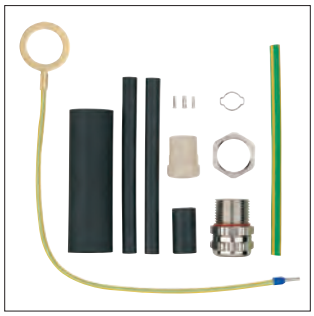
Ambient temperature range	-40 °C to +85 °C
Max. operating temperature end cap	+200 °C
Cable gland material	PA
Protection class in accordance with EN 60529	IP 65

Ordering information

Cold applied technology (connection and termination), media protected

Heating tape, type	Set	Order no.
PSBL	10 fold set	**05-0091-0139**
PSB	10 fold set	**05-0091-0140**

Technical data subject to change without notice.



- Direct insertion of heating tape for our Ex e junction box
- Space-saving solution
- Easy installation

The heat shrink method is a tried and tested technology for connecting heating tapes to the supply voltage or to other heating tapes. In the explosion protected area it is possible using the heat shrink method to insert the heating tapes into our junction box. In the media protection area, it is also possible to connect the heating tape to the supply voltage or to connect two heating tapes directly to each other. This is done using the butt connectors contained in the set. The end termination is also realised in all sets using heat shrink sleeves.

Explosion protection

Marking heating system	
PSBL	Ⓔx II 2G Ex e IIC T5 Gb [2)] Ⓔx II 2D Ex tb IIIC T95 °C Db [2)]
PSB	Ⓔx II 2G Ex e IIC T5, T6 Gb [2)] Ⓔx II 2D Ex tb IIIC T95 °C, T80 °C Db [2)]
MSB	Ⓔx II 2G Ex e IIC 150 °C (T3), T4 Gb [2)] Ⓔx II 2D Ex tb IIIC T150 °C, T130 °C Db [2)]
HSB	Ⓔx II 2G Ex e IIC 180 °C (T3), T4 Gb [2)] Ⓔx II 2D Ex tb IIIC T180 °C, T130 °C Db [2)]

Please refer to the system chapter for the respective system approval.

Other approvals and certificates, see www.bartec.de

Technical data explosion protected

Cable gland material	Nickel-plated brass
Protection class in accordance with EN 60079-0	IP 65

Ordering information

Heat shrink method (connection and end termination), explosion protected

Heating tape, type	Ambient temperature range	Max. operating temperature end cap	Order no.
PSBL	-30 °C to +55 °C	+85 °C	**05-0091-0198**
PSB	-40 °C to +55 °C	+85 °C	**05-0091-0097**
HSB	-40 °C to +55 °C	+185 °C	**05-0091-0096**

Ordering information Heat shrink method, media protected (protection class in accordance with EN 60529, IP 65)

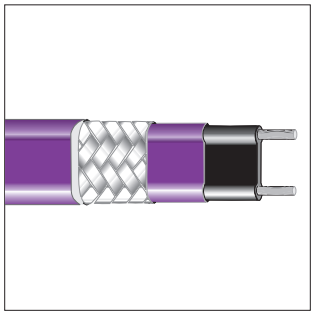
Heating tape, type	Set type	Cable gland material	Ambient temperature range	Max. operating temperature end cap	Order no.
PSBL	Connection and end termination (direct insertion into terminal box)	PA	-30 °C to +55 °C	+85 °C	**07-5807-00009910**
PSBL*	Connection and end termination (direct connection)	-	-30 °C to +55 °C	+85 °C	**07-5807-00009920**
PSBL	Connection of heating tape - heating tape (direct connection)	-	-30 °C to +55 °C	+85 °C	**07-5807-00009930**
PSB	Connection and end termination (direct insertion into terminal box)	PA	-20 °C to +85 °C	+85 °C	**07-5801-00009840**
PSB*	Connection of heating tape - heating tape (direct connection)	-	-20 °C to +85 °C	+85 °C	**07-5801-00009810**
PSB	Connection of heating tape - heating tape (direct connection)	-	-20 °C to +85 °C	+85 °C	**07-5801-00009560**
HSB	Connection and end termination (direct insertion into terminal box)	Nickel-plated brass	-60 °C to +180 °C	+185 °C	**07-5803-00009860**
HSB*	Direct connection of power supply - heating tape with end termination	-	-60 °C to +180 °C	+185 °C	**07-5803-00009820**
HSB	Direct connection of heating tape - heating tape	-	-60 °C to +180 °C	+185 °C	**07-5803-00009890**

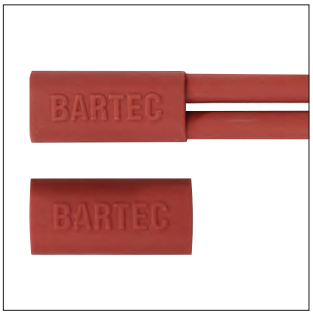
* We recommend our heat-resistant supply line (see accessories) when connecting the supply line - heating tape.

Ordering information Heat shrink method, accessories

Heat-resistant supply line (GY H05GG-F, 3G, 3 x 1.5 mm²), temperature range -25 °C to +110 °C	**02-4034-0009**
Heat-resistant supply line (GY H05GG-F, 3G, 3 x 2.5 mm²) temperature range -25 °C to +110 °C	**02-4034-0012**

Technical data subject to change without notice.





- Easy planning of heating circuits
- Simple installation on site
- Wide operating temperature range

The BARTEC HTSB heating system covers a wide range of applications in trace heating. Frost protection, no-flow heating system, temperature maintenance and also a combination of temperature increase and temperature maintenance is possible in Zone 1, 2, 21 and 22. The HTSB heating tape, which is a part of the HTSB system, can be supplied in power outputs between 15 W/m and 90 W/m at 10 °C. This makes it easy to adapt the output to the heat losses. The protective outer sheath of the cable is made of fluoropolymer plastic. A Limiter is not required. Direct entry in a junction box is possible.

Explosion protection

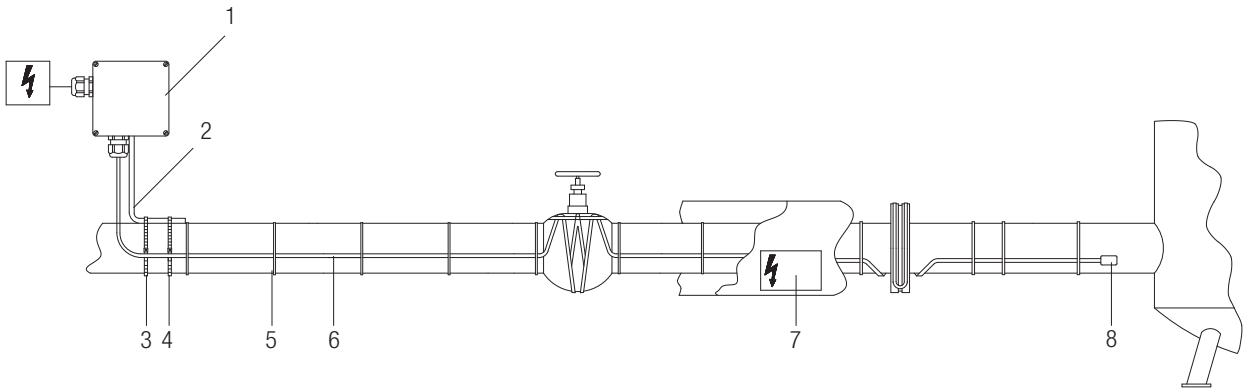
Certification	Sira 14 ATEX 3051 X IECEx SIR 14.0023X TC RU C-DE.ГБ06.B.00230

Other approvals and certificates, see www.bartec.de

System overview

- Self-limiting parallel heating tape HTSB
- Silicone cold applied technology for connection and terminating
- Optional: Junction box
- Optional: mechanical or electronic thermostats or control systems

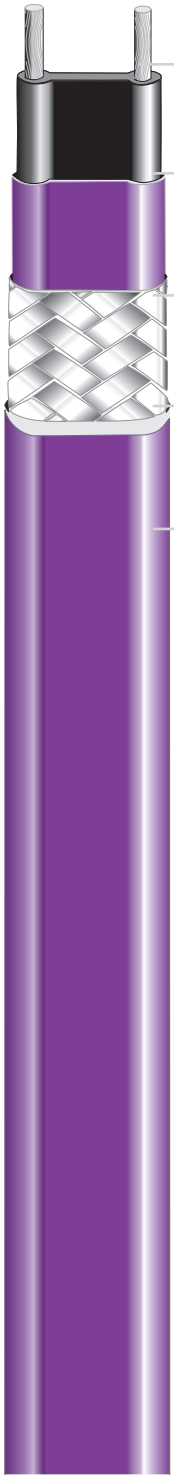
Application example HTSB heating system



1 Junction box
2 Mounting bracket/Mounting plate
3 Fixing strap
4 Buckle for fixing strap
5 Self adhesive glass fibre fixing tape
6 Heating tape HTSB
7 Caution label "Electrically Heated"
8 Cold applied technology end termination

- Steam purging possible
- Wide operating temperature range
- Can be used in explosive atmospheres without temperature limiter
- Simple installation thanks to its high flexibility
- Outer protective fluoropolymer jacket ensures resistance to corrosion and chemical influences

A temperature-dependent resistive element between the parallel copper conductors regulates and limits the power output of the heating tape. This output regulation is carried out automatically at every point of the heating tape depending on the prevailing ambient temperature. If the ambient temperature increases, the power output is reduced. The parallel design allows the heating tape to be cut to any length. This simplifies planning and installation. The heating tape is cut directly on the construction site according the local circumstances. The heating system must be designed to ensure that the maximum operating temperature of +250 °C will not be exceeded when it is energized. When switched off, the heating tape may be exposed to a temperature of 250 °C for a short time, not more than 1,000 hours cumulated.



1. Conductors: stranded copper wire 1.3 mm²

2. Self-limiting, irradiated polymer heating element

3. Fluoropolymer electrical insulation jacket

4. Nickel-plated copper braiding

5. Fluoropolymer protective jacket

Applications

The HTSB heating tape is the right solution for frost protection or temperature maintenance in pipelines or vessels in the industrial area. It is particularly suitable for applications with high ambient temperatures or aggressive chemicals. For questions regarding the chemical resistance please contact your BARTEC sales representative.

Explosion protection

Marking	Ⓔx II 2G Ex e IIC T2, T3 Gb Ⓔx II 2D Ex t IIIC T200 °C, T300 °C IP 6x Db
Certification	Sira 10ATEX3268 TC RU C-DE.ГБ06.В.00230

Other approvals and certificates, see www.bartec.de

Technical data

Rated voltage	AC 208 V to 277 V
Max. exposure temperature	switched on +250 °C switched off +250 °C
Min. installation temperature	-40 °C
Min. start-up temperature	-40 °C
Max. braid resistance	<18.2 Ω/km
Dimensions with braiding and Fluoropolymer jacket	12.1 x 5.4 mm
Min. bending radius	35 mm

Power setting at +10 °C

Power output	HTSB 15	HTSB 30	HTSB 45
at AC 230 V	15 W/m	30 W/m	45 W/m

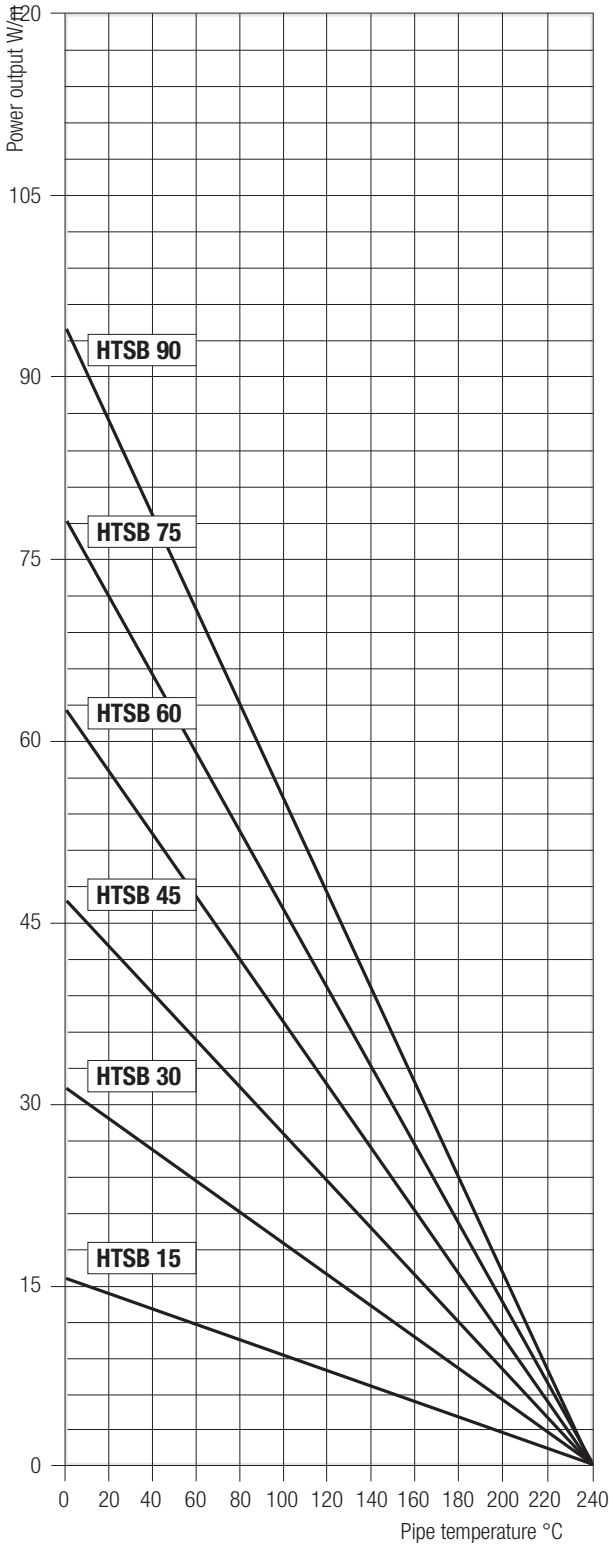
Power output	HTSB 60	HTSB 75	HTSB 90
at AC 230 V	60 W/m	75 W/m	90 W/m

Ordering information

HTSB parallel heating tape	Type	Heating output	Order no.
AC 277 V self-limiting steam purging possible Ⓔx explosion protected Ⓜ media protected	HTSB 15	15 W/m	**07-5819-7152**
	HTSB 30	30 W/m	**07-5819-7302**
	HTSB 45	45 W/m	**07-5819-7452**
	HTSB 60	60 W/m	**07-5819-7602**
	HTSB 75	75 W/m	**07-5819-7752**
	HTSB 90	90 W/m	**07-5819-7902**
AC 120 V self-limiting steam purging possible Ⓔx explosion protected Ⓜ media protected	HTSB 15	15 W/m	**07-5819-1152**
	HTSB 30	30 W/m	**07-5819-1302**
	HTSB 45	45 W/m	**07-5819-1452**
	HTSB 60	60 W/m	**07-5819-1602**
	HTSB 75	75 W/m	**07-5819-1752**
	HTSB 90	90 W/m	**07-5819-1902**

Technical data subject to change without notice.

HTSB characteristics



Power output on insulated steel pipes at **230 V** under nominal conditions.

Max. length of heating circuit at AC 230 V for automatic circuit-breakers with C characteristic

Circuit breaker size	start-up temperature	HTSB 15	HTSB 30	HTSB 45	HTSB 60	HTSB 75	HTSB 90
6 A	+10 °C	48 m	30 m	24 m	18 m	16 m	12 m
	0 °C	46 m	30 m	22 m	18 m	14 m	12 m
	-20 °C	40 m	26 m	20 m	16 m	14 m	10 m
10 A	+10 °C	78 m	52 m	38 m	30 m	26 m	22 m
	0 °C	76 m	48 m	36 m	30 m	24 m	20 m
	-20 °C	68 m	44 m	34 m	26 m	22 m	18 m
16 A	+10 °C	126 m	82 m	62 m	50 m	42 m	34 m
	0 °C	120 m	78 m	58 m	46 m	40 m	32 m
	-20 °C	108 m	70 m	52 m	42 m	36 m	30 m
20 A	+10 °C	154 m	102 m	78 m	62 m	52 m	42 m
	0 °C	150 m	96 m	74 m	58 m	48 m	40 m
	-20 °C	136 m	88 m	66 m	52 m	44 m	36 m
25 A	+10 °C	-	108 m	88 m	76 m	64 m	54 m
	0 °C	154 m	108 m	88 m	72 m	60 m	50 m
	-20 °C	154 m	108 m	82 m	66 m	54 m	46 m
32 A	+10 °C	-	-	-	-	82 m	68 m
	0 °C	-	-	-	76 m	78 m	64 m
	-20 °C	-	-	88 m	76 m	70 m	58 m

Max. length of heating circuit at AC 120 V for automatic circuit-breakers with C characteristic

Circuit breaker size	start-up temperature	HTSB 15	HTSB 30	HTSB 45	HTSB 60	HTSB 75	HTSB 90
6 A	+10 °C	24 m	15 m	12 m	9 m	8 m	6 m
	0 °C	23 m	15 m	11 m	9 m	7 m	6 m
	-20 °C	20 m	13 m	10 m	8 m	7 m	5 m
10 A	+10 °C	39 m	26 m	19 m	15 m	13 m	11 m
	0 °C	38 m	24 m	18 m	15 m	12 m	10 m
	-20 °C	34 m	22 m	17 m	13 m	11 m	9 m
16 A	+10 °C	63 m	41 m	31 m	25 m	21 m	17 m
	0 °C	60 m	39 m	29 m	23 m	20 m	16 m
	-20 °C	54 m	35 m	26 m	21 m	18 m	15 m
20 A	+10 °C	77 m	51 m	39 m	32 m	26 m	21 m
	0 °C	75 m	48 m	37 m	39 m	24 m	20 m
	-20 °C	68 m	44 m	33 m	26 m	22 m	18 m
25 A	+10 °C	-	54 m	44 m	38 m	32 m	27 m
	0 °C	77 m	54 m	44 m	36 m	30 m	25 m
	-20 °C	77 m	54 m	41 m	33 m	27 m	23 m
32 A	+10 °C	-	-	-	-	41 m	34 m
	0 °C	-	-	-	38 m	39 m	32 m
	-20 °C	-	-	41 m	38 m	35 m	29 m

- Direct entry of a heating tape into the junction box
- Connection and termination in one set
- Space-saving and economic solution
- Easy design and assembling with silicone cold-applied technology

The heating tape is connected directly in the junction box, the two supply conductors of the self-limiting heating tape HTSB (Type no. 07-8519-..) are insulated with silicone glue and a silicone hose. A green/yellow protective tube is pulled over the braiding. The end of the self-limiting heating tape is insulated with silicone glue and an end cap.

Explosion protection

Marking System	Ⓔx II 2GD IP 6X Ex e IIC T2 Gb Ex t IIIC T300 °C Db
Cable gland	Ⓔx II 2GD Ex e II Ex tD A21 IP 68
Certification	Sira 10 ATEX3268 Sira 01 ATEX1270 X

Other approvals and certificates, see www.bartec.de

Technical data

Ambient temperature range	-55 °C to +180 °C
Protection class in accordance with EN 60079-0	IP 66

Ordering information

Silicone cold applied technology set for HTSB heating tape with cable gland, grounding strap and nut, Set for cable connection and end termination	**05-0091-0150**

Technical data subject to change without notice.

Up to three heating circuits can be connected to the supply voltage with the polyester junction boxes. The enclosures are available with the necessary cable glands resp. the threaded holes.

Explosion protection

Marking	Ⓔx II 2G Ex e IIC T6 bzw. T5 Ⓔx II 2D Ex tD A21 IP 6x T95 °C Ⓔx II 2D Ex tD A21 IP 6x T80 °C
Certification	PTB 08 ATEX 1064 IECEx 00 ATEX 1081

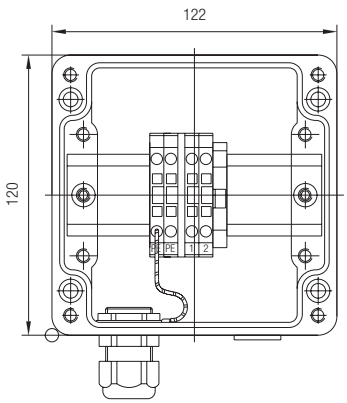
Other approvals and certificates, see www.bartec.de

Technical data

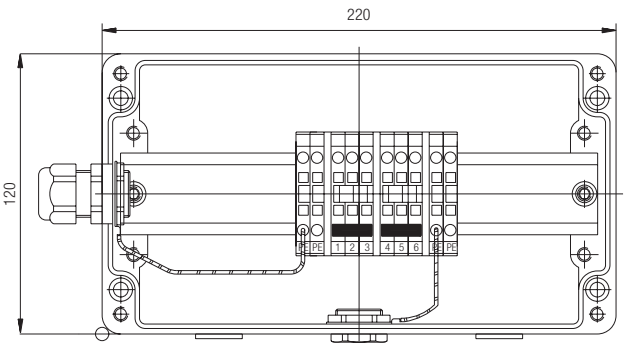
Ambient temperature range	-55 °C to +40 °C for T6 -55 °C to +55 °C for T5
Protection class according to EN 60529	Cover gasket IP 65
Supply voltage	max. AC 254 V
Thermal rated current*	recommended max. 20 A (at 254 V and T_a = +55 °C)
Supply cable, cross section	2.5 mm² to 6.0 mm²
Impact resistance	7 Joule
Material	Enclosure: polyester, glass-fibre reinforced Cable Gland: brass
Gland size cable diameter	M20 ∅ 6 to 12 mm
Seals	-55 °C to +100 °C

* not tested as a system

Junction box single



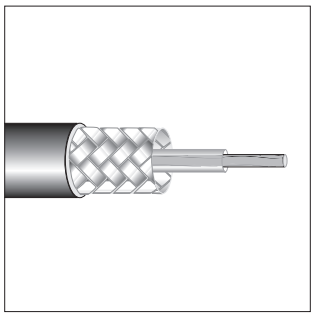
Junction box double, triple



Ordering information

Connection system	Description	Dimensions (mm)	Cable glands for power supply	Threaded hole for heating circuit	Terminals (mm²)	Order no.
Cold applied -50 °C to +55 °C	for 1 heating circuit	122 x 120 x 90	1 x M20 (∅ 6 to 12 mm)	1 x M20	4 x 6; 3 x PE	**07-5103-9213**
	for 2/3 heating circuits	220 x 120 x 90	1 x M20 (∅ 6 to 12 mm)	3 x M20	12 x 6; 6 x PE	**07-5103-9214**

Technical data subject to change without notice.



- Adjustable to customer requirements
- Complete systems from a single source
- Simple tailoring on site

The BARTEC EKL system helps you meet the most different requirements for electric trace heating systems regarding Frost protection, Temperature maintenance and Temperature increase. The great variety of systems allows the customer-specific project planning and installation of our electric trace heating systems.

You can choose between 3 different EKL heating cable systems:

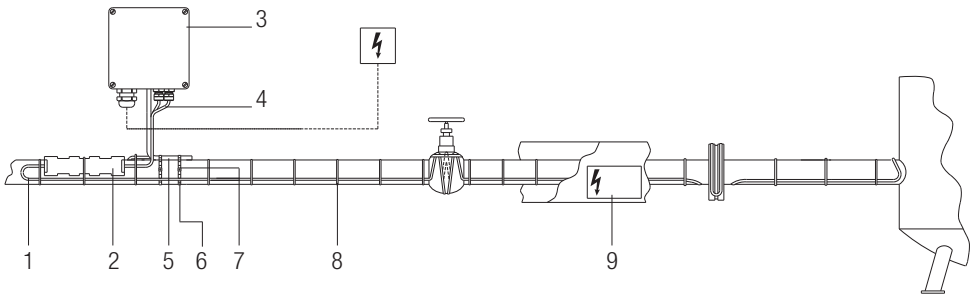
- **EKL light**
- **EKL medium** for use in hazardous areas
- **EKL premium** for use in hazardous areas for increased requirements

The BARTEC EKL system is characterised by its universal application possibilities. The use of high-quality, corrosion-proof material guarantees the application of the systems even under extreme conditions as, for example, prevail in the chemical industry, petrochemical industry and waste incineration plants. The EKL system can be perfectly adjusted to the customer specific requirements. The EKL systems EKL medium and EKL premium have been certified for the usage in hazardous areas where it offers an extraordinary ease of application. A temperature limiter makes sure that the maximum surface temperature allowed for the heating circuit is not exceeded.

System overview

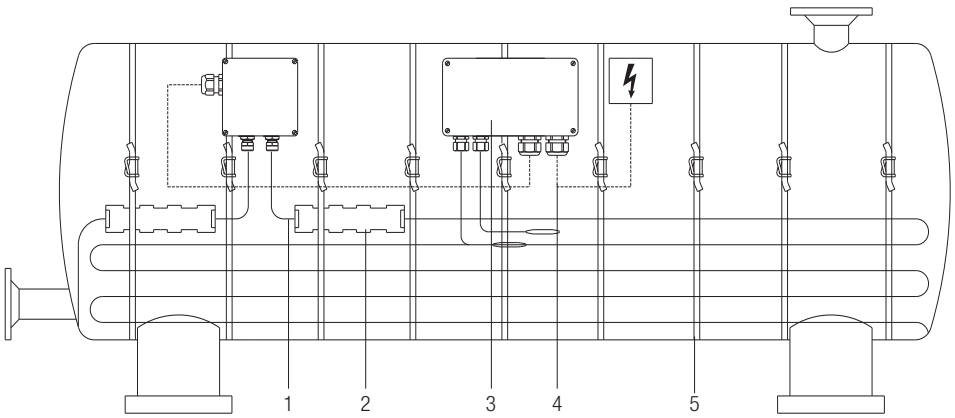
The EKL connection kits consist of the **EKL heating cable,** the **EKL connection set** with junction box, cold lead and connection system, the **Controller/ Limiter** and the **Accessories** (such as adhesive tapes, fixing brackets with mounting plates, insulation entry, labels).

Pipe trace heating



1 EKL heating cable
2 Connection system
3 Heating circuit terminal box
4 EKL cold lead
5 Mounting bracket
6 Buckle
7 Fixing strap
8 Adhesive tape
9 Caution label "Electrically Heated"

Container trace heating



1 EKL heating cable
2 Connection system
3 Heating circuit terminal box
4 EKL cold lead
5 EKL spacing ring

- Constant power output per meter
- Steam purging resistant, suitable for high temperatures up to +260 °C
- Easy installation, very flexible

EKL light is a serial resistant heating cable for use in industrial and commercial areas. It is suitable for frost protection applications and temperature maintenance on pipes and tanks and it is also extremely flexible. This makes EKL light easy to install, even on irregular shapes such as on pumps, valves and flanges. The PFA protective jacket gives the EKL light a high degree of chemical and mechanical resistance, even at high temperatures. In economical terms, EKL light is a genuine alternative to SLHBs when the latter's maximum heating circuit lengths are exceeded. With pre-assembled cold leads and our connection technology, complete heating circuits can be set up quickly and flexibly.

Technical data

Nominal voltage	500 V
Working temperature	-60 °C to +260 °C
Min. installation temperature	-60 °C
Min. bending radius	5 x external diameter
Min. installation spacing	20 mm
Mechanical strength	4 joules (in conformance to EN 62395-1)
Max. heating power	25 W/m
Resistance tolerance	-5 %/+10 %
Resistance of protective braid	< 18.2 Ω/km
Resistance values	0.8 Ω/km to 8000 Ω/km
Applied standards	Electrical safety EN 62395-1

Ordering information

Designation	Nominal resistance at 20 °C in Ω/km	Cross-section Heating conductor (mm²)	Outer diameter (mm)	Order no.
EKL light 00R8	0.8	25.00	10.10	**27-5821-5A6A00R8**
EKL light 01R1	1.1	16.00	9.10	**27-5821-5A6A01R1**
EKL light 01R8	1.8	10.00	7.20	**27-5821-5A6A01R8**
EKL light 02R9	2.9	6.00	6.40	**27-5821-5A6A02R9**
EKL light 04R4	4.4	4.00	5.60	**27-5821-5A6A04R4**
EKL light 0007	7	2.50	5.00	**27-5821-5A6A0007**
EKL light 0010	10	1.80	4.40	**27-5821-5A6A0010**
EKL light 11R7	11.7	1.50	4.30	**27-5821-5A6A11R7**
EKL light 0015	15	1.20	4.10	**27-5822-5A6A0015**
EKL light 17R8	17.8	1.00	4.00	**27-5822-5A6A17R8**
EKL light 0025	25	0.98	4.00	**27-5822-5A6A0025**
EKL light 31R5	31.5	1.54	4.30	**27-5822-5A6A31R5**
EKL light 0050	50	0.98	4.00	**27-5822-5A6A0050**
EKL light 0065	65	0.75	3.80	**27-5822-5A6A0065**
EKL light 0080	80	0.62	3.60	**27-5822-5A6A0080**
EKL light 0100	100	0.50	3.60	**27-5822-5A6A0100**
EKL light 0150	150	0.98	4.00	**27-5822-5A6A0150**
EKL light 0180	180	0.56	3.60	**27-5822-5A6A0180**
EKL light 0200	200	0.49	3.50	**27-5822-5A6A0200**
EKL light 0250	250	0.39	3.50	**27-5824-5A6A0250**
EKL light 0320	320	0.92	3.80	**27-5822-5A6A0320**
EKL light 0380	380	0.41	3.60	**27-5822-5A6A0380**
EKL light 0480	480	0.46	3.70	**27-5822-5A6A0480**
EKL light 0600	600	0.49	3.60	**27-5822-5A6A0600**
EKL light 0700	700	0.42	3.60	**27-5822-5A6A0700**
EKL light 0810	810	0.60	3.70	**27-5822-5A6A0810**
EKL light 1000	1000	0.48	3.70	**27-5822-5A6A1000**
EKL light 1440	1440	0.33	3.50	**27-5824-5A6A1440**
EKL light 1750	1750	0.28	3.40	**27-5824-5A6A1750**
EKL light 2000	2000	0.51	3.70	**27-5824-5A6A2000**
EKL light 3000	3000	0.35	3.50	**27-5824-5A6A3000**
EKL light 4000	4000	0.26	3.40	**27-5824-5A6A4000**
EKL light 4400	4400	0.24	3.30	**27-5824-5A6A4400**
EKL light 5160	5160	0.21	3.30	**27-5824-5A6A5160**
EKL light 5600	5600	0.19	3.30	**27-5824-5A6A5600**
EKL light 6000	6000	0.18	3.30	**27-5824-5A6A6000**
EKL light 7000	7000	0.15	3.30	**27-5824-5A6A7000**
EKL light 8000	8000	0.13	3.30	**27-5824-5A6A8000**

Recommended cold leads

Designation	Nominal resistance at 20 °C in Ω/km	Cross-section Heating conductor (mm²)	Outer diameter (mm)	Rated current [A] (1)
EKL light 0007(2)	7	2.50	5.00	32
EKL light 04R4	4.4	4.00	5.60	42
EKL light 02R9	2.9	6.00	6.40	54
EKL light 01R8	1.8	10.00	7.20	73
EKL light 01R1	1.1	16.00	9.10	98
EKL light 00R8	0.8	25.00	10.10	129

Note: not all resistance values of EKL light are available from stocks. Please consult BARTEC for delivery times.
(1) free in air, (2) available as pre-assembled cold lead (1.2 m).

Technical data subject to change without notice.

- Easy & quick installation thanks to the short shrinking times
- Space-saving dimensions
- Low storage, connection or splice
- High resistance to almost all industrial chemicals and solvents

The heat shrink technology is suitable for EKL light und EKL medium in the non-ex area. It can be used in industrial and commercial areas. The set serves to join two cold leads or to form two heating tape connections. The electrical connection of the heating conductor and protective braid is established by means of a crimp connection. The connection is sealed by the shrinkable tubes. With pre-assembled cold leads and our connection technology, heating circuits can be set up quickly and flexibly.

Technical data

Max. nominal voltage	750 V
Max. nominal current	25 A
Max. supply cable cross-section	2.5 mm^2
Operating temperature	-55 °C to + 200 °C
Mechanical strength	4 joules (in conformance to EN 62395-1)
Dimensions (length)	150 mm
Outer diameter of cable	2.9 mm to 6 mm
Applied standards	Electrical Safety EN 62395-1

Ordering information

Connection kit media-protected	**05-0091-0195**
Crimping set, crimping tools	**03-5545-0001**
Cold lead 2.5 mm^2, length 1.2 m, cable gland M20	**05-0020-0492**

Technical data subject to change without notice.

- Temperature-resistant
- Flame-retardant
- Absolutely corrosion-proof
- Seawater-proof

Polyester enclosures have proven their worth in many industrial plants. They offer safe protection even when they are used under extremely unfavorable conditions, on exposure to aggressive chemical media or hard mechanical conditions. The inside base of the enclosure has at its sides, threaded bushings for the fastening of mounting rails or panels. The enclosure is mounted by means of insulated screws outside of the lid seal.

Technical data

Material	glass-fiber reinforced polyester, EN 50014 surface resistance >10^{12} Ω
Colour	RAL 7000/RAL 7001, grey
Mechanical resistance	impact energy 7 Nm
Protection class according to EN 60529/IEC 60529	IP 66/IP 67
Cable gland	IP 65
Gland size	7 to 12/17 mm
Supply voltage	500 V
Standard seal	EPDM -20 °C to +100 °C Silikon -55 °C to +100 °C
Lid screws	Stainless steel cross slot (+ -)

Ordering information Enclosure

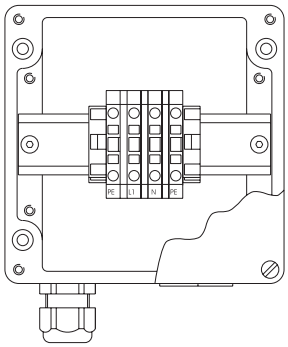
Short form title	Enclosure sizes (mm)	Qty/ Terminal sizes	Terminal identification	Qty/Earth terminals	Glands per enclosure	Terminal range	Order no.
300	160 x 160 x 90	2/6 mm²	L, N	2/6 mm²	1 x M25 2 x threaded M20	∅ 7 to 17 mm	**07-5177-9100**
400 S	160 x 160 x 90	3/6 mm²	L1; L2, L3	4/6 mm²	1 x M25 4 x threaded M20	∅ 7 to 17 mm	**07-5177-9098**
400 D	260 x 160 x 90	6/6 mm²	2 x L1; 2 x L2; 2 x L3	each 6/6 mm²	1 x M25 6 x threaded M20	∅ 7 to 17 mm	**07-5177-9099**

Ordering information Cold leads (cable length 1.2 m, gland M20)

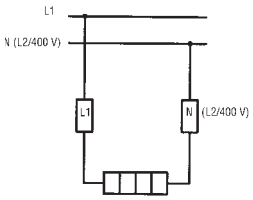
Cable cross section	Order no.
4 mm²	**05-0020-0491**
2.5 mm²	**05-0020-0492**

Technical data subject to change without notice.

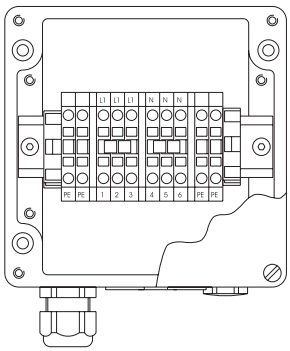
Junction box 300



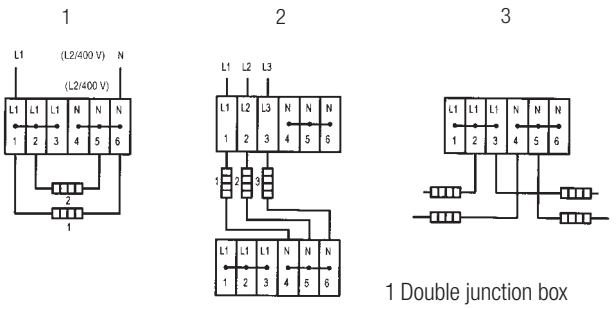
Connection diagramm for junction box 300



Junction/termination box 400 S

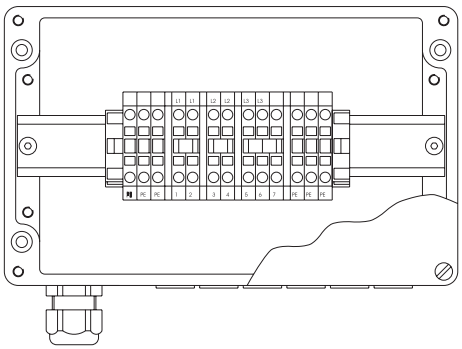


Connection diagramm for junction box 400 S

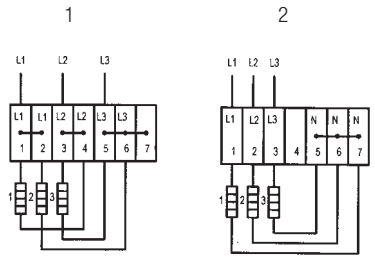


1 Double junction box
2 Star connection
3 Intermediate junction box

Heating circuit junction box 400 D



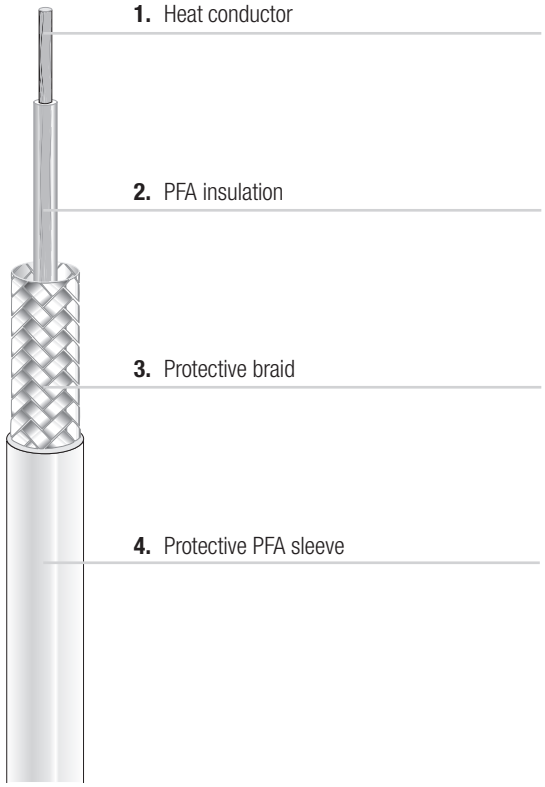
Connection diagramm for junction box 400 D



1 Delta connection
2 Star connection

- Constant power output per meter
- Steam purging resistant, high chemical resistance
- ATEX approved according to EN 60079
- Suitable for use in hazardous areas (4 J impact resistance)

EKL medium is an extremely flexible heating cable with a fixed specific resistance. Thanks to its small outer dimensions, the heating cable can be easily installed even on irregularly objects such as pumps, valves and flanges. The heating cable can be easily tailored on sites and made even easier by the imprinted metre markings.



Ordering information EKL premium

Description	Nominal resistance at 20 °C in Ω/km	Outside diameter (mm)	Order no.
1R08[1)]	1.08	10.20	**27-5821-756K1R08**
1R71[1)]	1.71	8.60	**27-5821-756K1R71**
02R9[1)]	2.9	7.60	**27-5821-756K02R9**
0004[1)]	4	6.55	**27-5821-756K0004**
04R4[1)]	4.4	6.70	**27-5821-756K04R4**
07R2	7.2	4.94	**27-5821-756G07R2**
0010	10	4.75	**27-5821-756G0010**
11R7	11.7	4.60	**27-5821-756G11R7**
0015	15	4.42	**27-5821-756G0015**
17R8	17.8	4.30	**27-5821-756G17R8**
0025	25	4.27	**27-5822-756G0025**
31R5	31.5	4.59	**27-5822-756G31R5**
0040	40	4.40	**27-5822-756G0040**
0050	50	4.27	**27-5822-756G0050**
0065	65	4.11	**27-5822-756G0065**
0080	80	4.01	**27-5822-756G0080**
0100	100	3.90	**27-5822-756G0100**

Explosion protection

Marking	Ⓔx II 2G Ex 60079-30-1 IIC Gb Ⓔx II 2D Ex 60079-30-1 IIIC Db
Certification	KEMA 10 ATEX 0035 U IECEx KEM 10.0011U

Other approvals and certificates, see www.bartec.de

Technical data

Nominal voltage (U_0/U)	450 V/750 V
Test voltage	2.5 kV (lead/braid)
Protective braid resistance	< 18.0 Ω/km
Operating temperature	-60 °C to +260 °C
Min. installation temperature	-60 °C
Min. bending radius	15 mm, 25 mm for 1R08 and 1R71
Shock resistance	4 J, (in conformance to EN 60079)

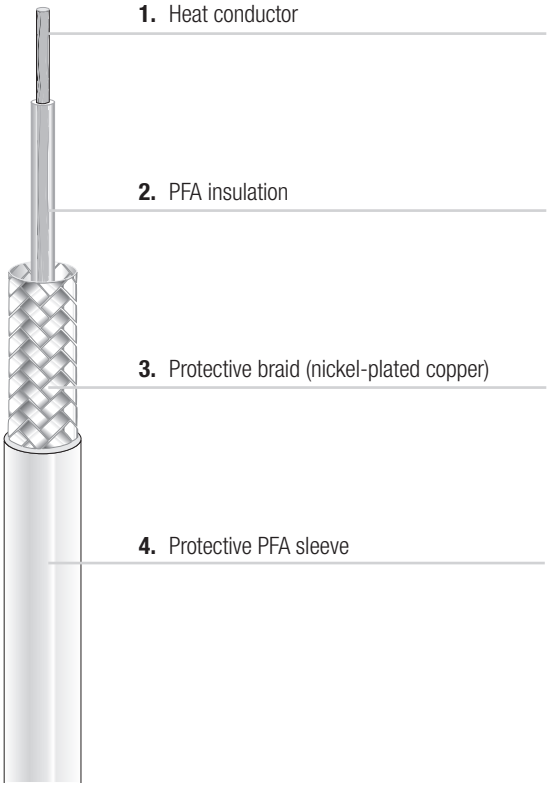
Ordering information EKL medium

Description	Nominal resistance at 20 °C in Ω/km	Outside diameter (mm)	Order no.
0150	150	4.27	**27-5822-756G0150**
0180	180	3.96	**27-5822-756G0180**
0200	200	4.10	**27-5822-756G0200**
0250	250	3.80	**27-5822-756G0250**
0320	320	4.23	**27-5826-756G0320**
0360	360	4.10	**27-5822-756G0360**
0380	380	4.06	**27-5826-756G0380**
0480	480	4.03	**27-5826-756G0480**
0600	600	3.99	**27-5826-756G0600**
0650	650	3.95	**27-5826-756G0650**
0700	700	3.92	**27-5826-756G0700**
0810	810	3.88	**27-5822-756G0810**
1000	1000	3.89	**27-5822-756G1000**
1440	1440	3.74	**27-5822-756G1440**
1750	1750	3.67	**27-5822-756G1750**
2000	2000	3.92	**27-5824-756G2000**
3000	3000	3.75	**27-5824-756G3000**
4000	4000	3.65	**27-5824-756G4000**
4400	4400	3.63	**27-5824-756G4400**
5160	5160	3.59	**27-5824-756G5160**
5600	5600	3.56	**27-5824-756G5600**
6000	6000	3.55	**27-5824-756G6000**
7000	7000	3.50	**27-5824-756G7000**
8000	8000	3.47	**27-5824-756G8000**

Technical data subject to change without notice.

- Constant power output per meter
- Steam purging resistant, high resistant to chemicals
- ATEX approved according to EN 60079
- Suitable for applications in hazardous area

EKL premium is a flexible heating cable with a fixed specific resistance. It's small external dimensions make the heating cable easy to install, even on irregularly shaped surfaces such as on pumps, valves and flanges. Assembly on sites is simple and made even easier by the imprinted metre markings. The reinforced structure facilitates applications of the EKL premium heating cable even under increased mechanical stress (7 Joule).



Ordering information EKL premium

Description	Nominal resistance at 20 °C in Ω/km	Outside diameter (mm)	Order no.
1R08	1.08	10.20	**27-5821-756K1R08**
1R71	1.71	8.60	**27-5821-756K1R71**
02R9	2.9	7.60	**27-5821-756K02R9**
0004	4	6.55	**27-5821-756K0004**
04R4	4.4	6.70	**27-5821-756K04R4**
07R2	7.2	5.54	**27-5821-756K07R2**
0010	10	5.35	**27-5821-756K0010**
11R7	11.7	5.20	**27-5821-756K11R7**
0015	15	5.02	**27-5821-756K0015**
17R8	17.8	4.90	**27-5821-756K17R8**
0025	25	4.87	**27-5822-756K0025**
31R5	31.5	5.19	**27-5822-756K31R5**
0040	40	5.00	**27-5822-756K0040**
0050	50	4.87	**27-5822-756K0050**
0065	65	4.71	**27-5822-756K0065**
0080	80	4.61	**27-5822-756K0080**
0100	100	5.16	**27-5822-756K0100**

Explosion protection

Marking	Ⓔx II 2G Ex 60079-30-1 IIC Gb Ⓔx II 2D Ex 60079-30-1 IIIC Db
Certification	KEMA 10 ATEX 0035 U IECEx KEM 10.0011U

Other approvals and certificates, see www.bartec.de

Technical data

Nominal voltage (U_0/U)	450 V/750 V
Test voltage	2.5 kV (lead/braid)
Protective braid resistance	< 18.2 Ω/km
Operating temperature	-60 °C to +260 °C
Min. installation temperature	-60 °C
Min. bending radius	15 mm, 25 mm for 1R08 and 1R71
Shock resistance	7 J/13.6 J (in conformance to EN 60079)

Ordering information EKL premium

Description	Nominal resistance at 20 °C in Ω/km	Outside diameter (mm)	Order no.
0150	150	4.84	**27-5822-756K0150**
0180	180	4.56	**27-5822-756K0180**
0200	200	4.70	**27-5822-756K0200**
0250	250	4.41	**27-5822-756K0250**
0320	320	4.83	**27-5826-756K0320**
0360	360	4.42	**27-5822-756K0360**
0380	380	4.73	**27-5826-756K0380**
0480	480	4.61	**27-5826-756K0480**
0600	600	4.50	**27-5826-756K0600**
0650	650	4.46	**27-5826-756K0650**
0700	700	4.43	**27-5826-756K0700**
0810	810	4.59	**27-5822-756K0810**
1000	1000	4.49	**27-5822-756K1000**
1440	1440	4.34	**27-5822-756K1440**
1750	1750	4.27	**27-5822-756K1750**
2000	2000	4.52	**27-5824-756K2000**
3000	3000	4.35	**27-5824-756K3000**
4000	4000	4.25	**27-5824-756K4000**
4400	4400	4.23	**27-5824-756K4400**
5160	5160	4.19	**27-5824-756K5160**
5600	5600	4.17	**27-5824-756K5600**
6000	6000	4.15	**27-5824-756K6000**
7000	7000	4.10	**27-5824-756K7000**
8000	8000	4.07	**27-5824-756K8000**

Technical data subject to change without notice.

- Simple and fast installation
- Low stock levels needed
  (because it can be used as terminal or connection)
- High chemical resistance, for almost all industrial chemicals and solvents

The **E**KL **C**onnection **T**echnology is a connection system for EKL medium and EKL premium for use in potentially explosive atmospheres. Depending on the design, the ECT connection technology may be used to connect a cold lead or to connect two heating cables. Butt connectors, which ensure a reliable and permanent connection, are used for the electrical connection of the heating wire and the protective braid. Using pre-assembled cold leads and our connection technology, complete heating circuits can be constructed quickly and flexibly.

Explosion protection

Marking	Ⓔx II 2G Ex eb IIC Gb Ⓔx II 2D Ex tb IIIC Db
Certification	BVS 16 ATEX E018 U IECEx BVS 16.0014 U

Other approvals and certificates, see www.bartec.de

Technical data

Max. nominal voltage	750 V
Service temperature	-60 °C to +200 °C
Protection	IP 66 (EN/IEC 60079-0)
Dimensions (length/Ø)	ECT35 176 mm/35 mm ECT45 212 mm/45 mm

Type	Max. rated current	Max. cable cross section
ECT35-32	32 A	2.5 mm²
ECT35-54	54 A	6 mm²
ECT45-73	73 A	10 mm²
ECT45-98	98 A	16 mm²
ECT45-129	129 A	25 mm²

Type	External diameter conductor
ECT35-32	3.2 mm to 6.3 mm
ECT35-54	3.2 mm to 7.9 mm
ECT45-73	4.6 mm to 9.4 mm
ECT45-98	6.2 mm to 11.0 mm
ECT45-129	6.2 mm to 12.4 mm

Ordering information

ECT35-32-xx	Heating cable connection and splice 7.2 Ω/km to 8000 Ω/km	**27-5A31-1222**
ECT35-54-xx	Heating cable connection and splice 2.9 Ω/km to 100 Ω/km	**27-5A32-1232**
ECT45-73-FD	Heating cable connection 1.71 Ω/km with 7.2 Ω/km	**27-5A33-FD00**
ECT45-73-FE	Heating cable connection 1.71 Ω/km with 4.4 or 2.9 Ω/km	**27-5A34-FE00**
ECT45-98-GE	Heating cable connection 1.08 Ω/km with 4.4 or 2.9 Ω/km	**27-5A36-GE00**
ECT45-98-GF	Heating cable connection 1.08 Ω/km with 1.71 Ω/km	**27-5A37-GF00**
ECT45-129-HE	Heating cable connection 0.8 Ω/km with 4.4 or 2.9 Ω/km	**27-5A3A-HE00**
ECT45-129-HF	Heating cable connection 0.8 Ω/km with 1.71 Ω/km	**27-5A3B-HF00**
ECT45-129-HG	Heating cable connection 0.8 Ω/km with 1.08 Ω/km	**27-5A3C-HG00**

Accessories

Spare parts box ECT35	Seals, butt connector, thrust washer	**05-0091-255**
Spare parts box ECT45	Seals, butt connector, thrust washer	**05-0091-256**
Crimp set EKL	Crimping tool with crimping dies 1.5 to 10 mm² and 16 to 25 mm²	**03-5545-0002**

Cold lead

2.5 mm²	Length 1.2 m, cable gland M20/max. 32 A	**05-0020-0530**
6 mm²	Length 1.2 m, cable gland M20/max. 54 A	**05-0020-0553**
10 mm²	Length 1.2 m, cable gland M20/max. 73 A	**05-0020-0556**
16 mm²	Length 1.2 m, cable gland M20/max. 98 A	**05-0020-0557**
25 mm²	Length 1.2 m, cable gland M20/max. 129 A	**on request**

Technical data subject to change without notice.

- Temperature-resistant
- Flame-retardant
- For use in hazardous areas with surface resistance < 10^9 Ω
- Absolutely corrosion-proof
- Seawater-proof

Polyester enclosures have proven their worth in many industrial plants. They offer safe protection even when they are used under extremely unfavorable conditions, on exposure to aggressive chemical media or hard mechanical conditions. The inside base of the enclosure has at its sides, threaded bushings for the fastening of mounting rails or panels. The enclosure is mounted by means of insulated screws outside of the lid seal.

Explosion protection

Marking	Ⓔx II 2G Ex e IIC T6, T5 Gb Ⓔx II 2D Ex tb IIIC T80 °C, T95 °C Db
Certification	PTB 08 ATEX 1064 IECEx PTB 09.0009X

Other approvals and certificates, see www.bartec.de

Technical data

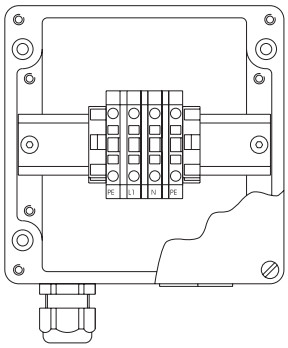
Material	glass-fiber reinforced polyester, surface resistance < 10^9 Ω
Colour	RAL 9005, black
Mechanical resistance	impact energy 7 Nm
Protection class (EN 60529/IEC 60529)	IP 66/67
Cable gland	IP 65
Supply voltage	500 V/690 V (depending on version)
Ambient temperature range	EPDM: -20 °C to +40 °C (T6) silicone: -55 °C to +40 °C (T6) or -55 °C to +55 °C (T5)
Lid screws	Stainless steel cross slot (+ -)

Ordering information Enclosure

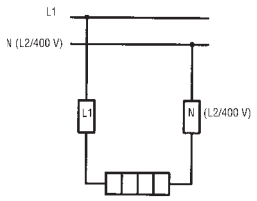
Short form title	Enclosure sizes (mm)	Qty/ Terminal sizes	Terminal identification	Qty/Earth terminals	Glands per enclosure	Terminal range	Order no.
Ex 300	160 x 160 x 90	2/6 mm^2	L, N	2/6 mm^2	1 x M25 2 x threaded M20	∅ 7 to 17 mm	**07-5103-9054**
Ex 400 S	160 x 160 x 90	3/6 mm^2	L1; L2, L3	4/6 mm^2	1 x M25 4 x threaded M20	∅ 7 to 17 mm	**07-5103-9055**
Ex 400 D	260 x 160 x 90	6/6 mm^2	2 x L1; 2 x L2; 2 x L3	je 6/6 mm^2	1 x M25 6 x threaded M20	∅ 7 to 17 mm	**07-5103-9056**
Ex 690	160 x 160 x 90	2/16 mm^2	L, N	2/16 mm^2	1 x M40 2 x threaded M20	∅ 17 to 28 mm	**07-5103-9219**
Ex 690 S/D	260 x 160 x 90	7/16 mm^2	2 x L1; 2 x L2; 2 x L3	6/16 mm^2	1 x M40 6 x threaded M20	∅ 17 to 28 mm	**07-5103-9220**

Technical data subject to change without notice.

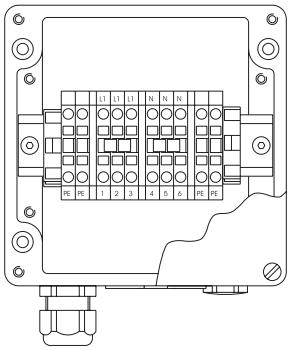
Junction box Ex 300



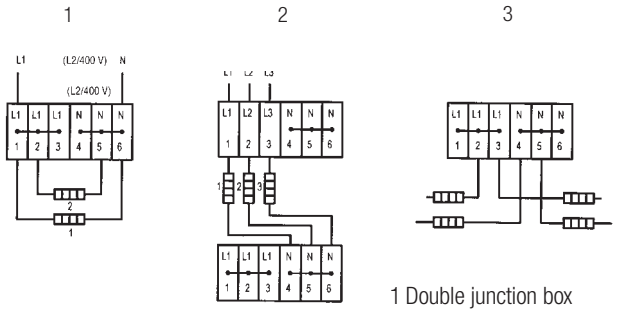
Connection diagram for junction box Ex 300



Junction box/terminal box Ex 400 S

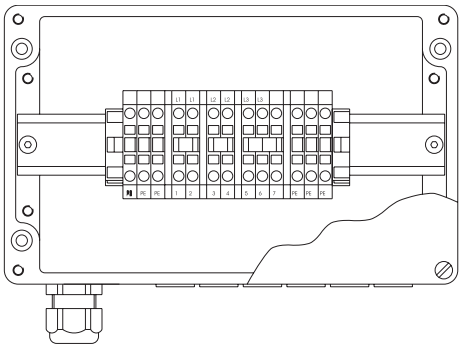


Connection diagram for junction box Ex 400 S

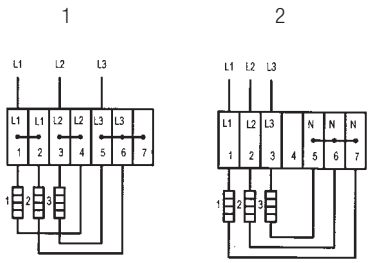


1 Double junction box
2 Star connection
3 Intermediate junction box

Junction box Ex 400 D

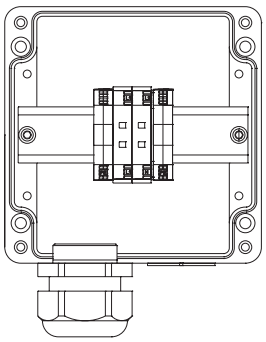


Connection diagram for junction box Ex 400 D

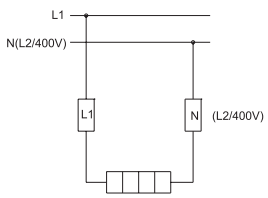


1 Delta connection
2 Star connection

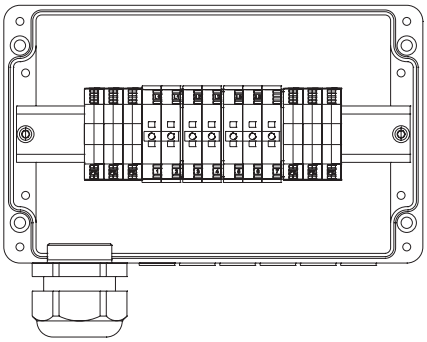
Junction box Ex 690



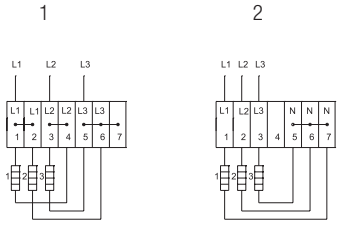
Connection diagram for junction box Ex 690



Junction box/terminal box Ex 690 S/D



Connection diagram for junction box Ex 690 S/D



1 Delta connection
2 Star connection

- High constant power output per metre
- Extremely high mechanical strength
- Highly resistant to chemicals

A distinguishing feature of our BARTEC EMK heating cables is that they are extremely robust and require no additional protection against mechanical influences.

Function

The application of a supply voltage to the resistance cable generates heat. The quantity of heat is dependent on the resistance value of the heating cable and the supply voltage.

Explosion protection

Marking	Ⓔx II 2G Ex e IIC T1 to T6 Gb
Certification	Sira 13 ATEX 3363
Other approvals and certificates, see www.bartec.de	

Technical data

Structure	heating element: copper, chromium nickel, constantan insulation: magnesium Oxide (MgO) outer jacket: stainless steel no. 1.4541 CuNi or Alloy 825/Inconel
Heating circle with EMK	Ex version: Type 27-3621-02../.... Type 27-3621-04../.... Standard version: Type 27-3623-02../.... Type 27-3623-04../....
Nominal voltage	up to 500 V
Test voltage	1.5 kV
Min. installation temperature	-20 °C
Bend radius	3 x OD (Standard version) 5 x OD (Ex version)
Weight	100 to 180 g/m²
Max. jacket withstand temperature	Alloy 825/Inconel +650 °C (on request) S/S no. 1.4541 +600 °C CuNi +400 °C

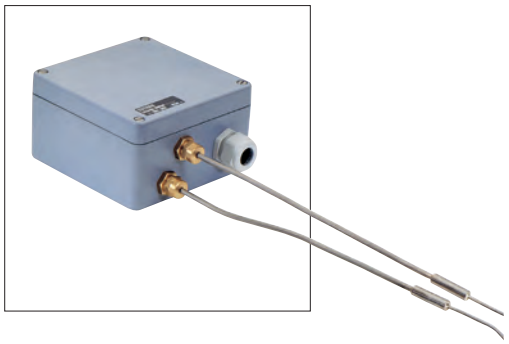
Ordering information CuNi

Short form title	Ω/km at +20 °C	Conductor material	Outer diameter (mm)	Outer jacket resistance Ω/km	Order no.
EMK CuNi 0011	11	Copper	4.9	58.30	**27-3833-20490011**
EMK CuNi 0017	17	Copper	4.6	65.60	**27-3833-20460017**
EMK CuNi 0063	25	Copper	3.7	93.30	**27-3833-20370025**
EMK CuNi 0025	40	Copper	3.4	107.60	**27-3833-20340040**
EMK CuNi 0040	63	Copper	3.2	121.00	**27-3833-20320063**
EMK CuNi 0160	160	Constantan	4.9	58.81	**27-3833-20490160**
EMK CuNi 0250	250	Constantan	4.4	71.99	**27-3833-20440250**
EMK CuNi 0400	400	Constantan	4.0	87.69	**27-3833-20400400**
EMK CuNi 0630	630	Constantan	3.7	103.10	**27-3833-20370630**
EMK CuNi 1000	1000	Constantan	3.4	123.00	**27-3833-20341000**
EMK CuNi 1600	1600	Constantan	3.2	139.60	**27-3833-20321600**

Ordering information VA No. 1.4541

Short form title	Ω/km at +20 °C	Conductor material	Outer diameter (mm)	Outer jacket resistance Ω/km	Order no.
EMK VA 0160	160	Chromium Nickel	6.5	92.38	**27-3834-20650160**
EMK VA 0250	250	Chromium Nickel	5.3	137.60	**27-3834-20530250**
EMK VA 0400	400	Chromium Nickel	4.7	173.70	**27-3834-20470400**
EMK VA 0630	630	Chromium Nickel	4.3	152.40	**27-3834-20430630**
EMK VA 1000	1000	Chromium Nickel	3.9	187.00	**27-3834-20391000**
EMK VA 1600	1600	Chromium Nickel	3.6	215.30	**27-3834-20361600**
EMK VA 2500	2500	Chromium Nickel	3.4	235.80	**27-3834-20342500**
EMK VA 4000	4000	Chromium Nickel	3.2	284.20	**27-3834-20324000**
EMK VA 6300	6300	Chromium Nickel	3.2	284.20	**27-3834-20326300**
EMK VA 10K0	10000	Chromium Nickel	3.2	284.20	**27-3834-203210K0**

Technical data subject to change without notice.



- Easy selection of the necessary components
- Large variant variety
- Quick to install

These connection kits have been specifically designed for EMK heating cables and their particular fields of application. There are two versions of the EMK connection kit available: **Standard version** and **Ex version** for use in hazardous areas. The EMK connection kits consist of: **Cold leads** in the required quantity, **hot to cold joints** in the required quantity, **pre-cut and factory terminated assembly** of the cold leads and hot to cold joints with EMK heating cable (heating cables must be ordered separately. See ordering information).

Ordering information Standard heating circuits, pre-assembled
(with cold lead 1.2 m; 2.5 mm², M20 brass)

Short form title CuNi	Code No.	Short form title VA	Code No.
EMK CuNi 0011	**03**	EMK VA 0160	**15**
EMK CuNi 0017	**04**	EMK VA 0250	**16**
EMK CuNi 0025	**05**	EMK VA 0400	**17**
EMK CuNi 0040	**06**	EMK VA 0630	**18**
EMK CuNi 0063	**07**	EMK VA 1000	**19**
EMK CuNi 0160	**08**	EMK VA 1600	**20**
EMK CuNi 0250	**10**	EMK VA 2500	**21**
EMK CuNi 0400	**11**	EMK VA 4000	**22**
EMK CuNi 0630	**12**	EMK VA 6300	**23**
EMK CuNi 1000	**13**	EMK VA 10K	**24**
EMK CuNi 1600	**14**		

27-3623-02 ☐☐ 0101 **27-3623-04 ☐☐ 0101**

Complete order no. Please insert correct code.
Technical data subject to change without notice.

Ordering information Ex heating circuits, pre-assembled
(with cold lead 1.2 m; 2.5 mm², M20 brass)

Short form title CuNi	Code No.	Short form title VA	Code No.
EMK CuNi 0011	**03**	EMK VA 0160	**15**
EMK CuNi 0017	**04**	EMK VA 0250	**16**
EMK CuNi 0025	**05**	EMK VA 0400	**17**
EMK CuNi 0040	**06**	EMK VA 0630	**18**
EMK CuNi 0063	**07**	EMK VA 1000	**19**
EMK CuNi 0160	**08**	EMK VA 1600	**20**
EMK CuNi 0250	**10**	EMK VA 2500	**21**
EMK CuNi 0400	**11**	EMK VA 4000	**22**
EMK CuNi 0630	**12**	EMK VA 6300	**23**
EMK CuNi 1000	**13**	EMK VA 10K	**24**
EMK CuNi 1600	**14**		

27-3621-02 ☐☐ 0101 **27-3621-04 ☐☐ 0101**

Complete order no. Please insert correct code.
Technical data subject to change without notice.

The “Standard” connection kits for EMK heating cables are available in 3 versions: EMK Standard 300, EMK Standard 400 S and EMK Standard 400 D. The necessary junction box must be ordered for each pre-assembled EMK heating circuit depending on the type of wiring (single-phase, two-phase, star connection, delta connection).

Technical data Junction box "Standard"

Material	Polyester, glass-fibre reinforced
Colour	grey, similar to RAL 7001
Surface resistance	> 10^{12} Ω
Protection class	IP 65
Cable gland	IP 54 to IP 65
Cover screws	stainless steel

Technical data Cold leads

Standard length	1.2 m
Rated resistance	7 Ω/km
Outer diameter	5.3 mm
Cross section	2.5 mm²
Conductor material	copper
Outer jacket material	CuNi, VA 1.4541
Bend radius	3 x external diameter
Gland, terminal connection	M20

Technical data Hot to cold connection joint

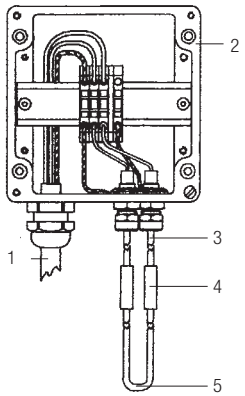
Material	SS 1.4401
Protection class	IP 65
Dimensions	L = 35 mm, ∅ = 10 mm

Ordering information Standard Junction box

Version Heating circuit	Supply voltage AC	Qty/ enclosure size (mm)	Qty/ terminal with 6 mm²	Terminal identification	Qty/ terminals	Qty/cold leads dry connections	Glands per enclosure	Terminal range	Order no.
300 CuNi 300 VA	up to 500 V	1 unit 160 x 160 x 90	each 2	L N (L1; L2)	2 with 6 mm²	2	1 x M25 2 x threaded M20	∅ 7 to 17 mm	**07-5177-9100**
400 S CuNi 400 S VA		2 unit 160 x 160 x 90	each 6	3 x L1; 3 x N; 1 - 6 (L2; L3)	4 with 6 mm²	6	1 x M25 4 x threaded M20		2 unit **07-5177-9098**
400 D CuNi 400 D VA		1 unit 260 x 160 x 90	each 6	2 x L1; 2 x L2; 2 x L3; 1 - 7	6 with 6 mm²	6	1 x M25 3 x threaded M20		**07-5177-9099**

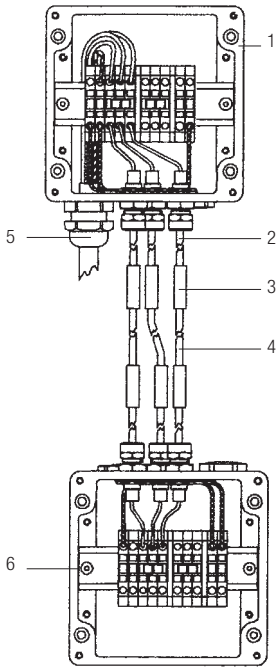
Technical data subject to change without notice.

Standard 300



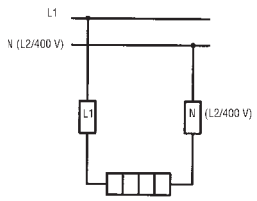
1 Mains supply
2 Heating circuit junction box
3 Cold lead
4 Hot to cold connection joint
5 Heating cable

Standard 400 S Typical star connection diagram



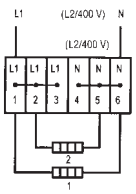
1 Heating circuit junction box
2 Cold lead
3 Hot to cold connection joint
4 Heating cable
5 Mains supply
6 EMK “Standard“ star connection enclosure

Connection diagram Standard 300

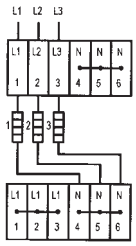


Connection diagram Standard 400 S

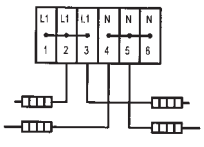
Double junction box



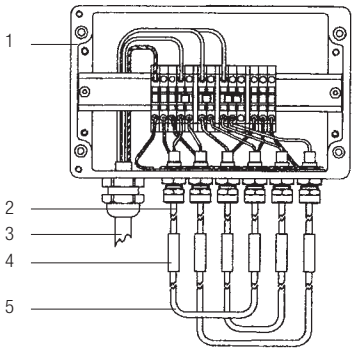
Star connection



Intermediate junction box



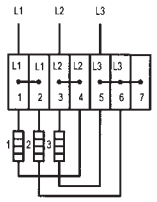
Standard 400 D Typical delta connection diagram



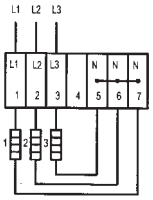
1 Heating circuit junction box
2 Cold lead
3 Mains supply
4 Hot to cold connection joint
5 Heating cable

Connection diagram Standard 400 D

Delta connection



Star connection



The ”Ex” connection kits for EMK heating cables are available in 3 versions: EMK Ex 300, EMK Ex 400 S and EMK Ex 400 D. The necessary junction box must be ordered for each pre-assembled EMK heating circuit depending on the type of wiring (single-phase, two-phase, star connection, delta connection).

Explosion protection Ex junction box

Marking	Ⓔx II 2G Ex e IIC T6, T5 Gb Ⓔx II 2D Ex tb IIIC, T80 °C, T95 °C Db
Certification	PTB 08 ATEX 1064 IECEx PTB 09.0009X

Other approvals and certificates, see www.bartec.de

Technical data

Material	Polyester, glass-fibre reinforced
Colour	black
Surface resistance	> 10^{12} Ω
Protection class	IP 65
Cable gland	IP 65
Cover screws	stainless steel

Technical data Cold leads

Standard length	1.2 m
Rated resistance	7 Ω/km
Outer diameter	5.3 mm
Cross section	2.5 mm²
Conductor material	Copper
Outer jacket material	CuNi, VA 1.4541
Bend radius	3 x external diameter
Gland, terminal connection	M20

Explosion protection Hot to cold connection joint

Ex protection type	Ⓔx II 2G Ex e IIC
Certification	SIRA 13 ATEX 3363

Other approvals and certificates, see www.bartec.de

Technical data

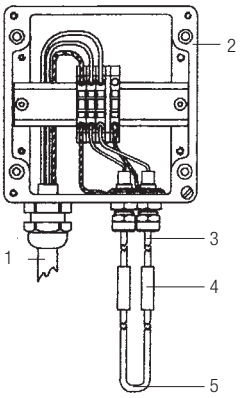
Material	SS 1.4401
Protection class	IP 65
Dimensions	L = 35 mm, ∅ = 10 mm

Ordering information Ex Junction boxes

Version Heating circuit	Supply voltage AC	Qty/ enclosure size (mm)	Qty/ terminal with 6 mm²	Terminal identification	Qty/ terminals	Qty/cold leads dry connections	Glands per enclosure	Terminal range	Order no.
300 CuNi 300 VA	up to 500 V	1 unit 160 x 160 x 90	each 2	L N (L1; L2)	2 with 6 mm²	2	1 x M25 2 x threaded M20	∅ 7 to 17 mm	**07-5103-9054**
400 S CuNi 400 S VA		2 unit 160 x 160 x 90	each 6	3 x L1; 3 x N; 1 - 6 (L2; L3)	4 with 6 mm²	6	1 x M25 4 x threaded M20		2 unit **07-5103-9055**
400 D CuNi 400 D VA		1 unit 260 x 160 x 90	each 6	2 x L1; 2 x L2; 2 x L3; 1 - 7	6 with 6 mm²	6	1 x M25 3 x threaded M20		**07-5103-9056**

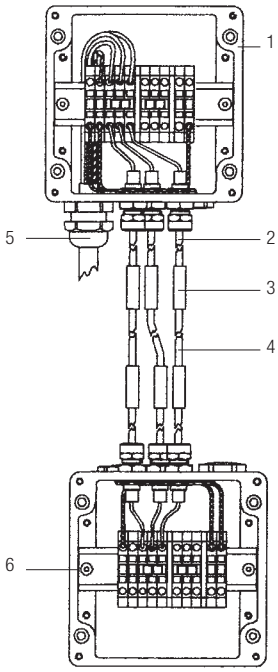
Technical data subject to change without notice.

Standard 300



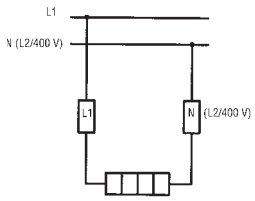
1 Mains supply
2 Heating circuit junction box
3 Cold lead
4 Hot to cold connection joint
5 Heating cable

Standard 400 S Typical star connection diagram



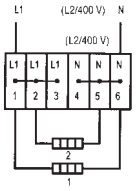
1 Heating circuit junction box
2 Cold lead
3 Hot to cold connection joint
4 Heating cable
5 Mains supply
6 EMK Standard star connection enclosure

Connection diagram Standard 300

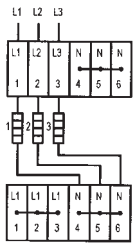


Connection diagram Standard 400 S

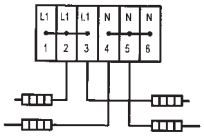
Double junction box



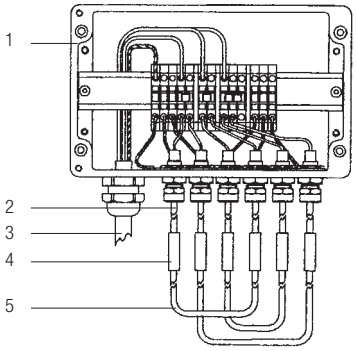
Star connection



Intermediate junction box



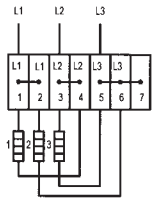
Standard 400 D Typical delta connection diagram



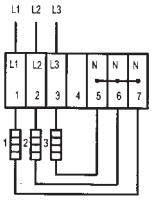
1 Heating circuit junction box
2 Cold lead
3 Mains supply
4 Hot to cold connection joint
5 Heating cable

Connection diagram Standard 400 D

Delta connection



Star connection



- High constant power output per meter
- Extremely high mechanical strength
- Highly resistant to chemicals

The BARTEC EMK heating circuits have the main characteristics that they are extremely robust and mechanical loadable. Additional advantages of the laser welded heating circuits are the suitability for highest operating temperatures and the good chemical resistance. Typical applications are frost protection, maintaining temperature and heat-up for example in pipes, tanks, pumps, valves and vessels.

Function

The application of a supply voltage to the resistance cable generates heat. The quantity of heat is dependent on the resistance value of the heating cable and the supply voltage.

Explosion protection

Marking	Ⓔx II 2G Ex e IIC Gb Ⓔx II 2D Ex tb IIIC Db
Certification	BVS 13 ATEX E 034 U IECEx BVS 13.0042U

Other approvals and certificates, see www.bartec.de

Technical data

Structure	Heating element: Copper (Cu), Copper nickel (CuNi), Nickel chromium (NiCr) Insulation: Magnesium oxide (MgO) Outer jacket: SS 1.4541 or SS 2.4816 (Inconel)*
Nominal voltage	500 V/750 V
Ambient temperature	-55 °C to +70 °C
Operating temperature Heating cable	
Version Ex	
Type 27-3641-4…	-70 °C to +600 °C
Type 27-3641-3…, Type 27-3641-7…*	-70 °C to +650 °C
Version M	
Type 27-3643-1…, Type 27-3643-2…	-70 °C to +500 °C
Type 27-3643-4…	-70 °C to +600 °C
Type 27-3643-3…	-70 °C to +800 °C
Type 27-3643-7…*	-70 °C to +1000 °C
Min. installation temperature	-20 °C
Max. Power output	
27-364.-1…; 27-364.-2…; 27-364.-4…	150 W/m
27-364.-3…; 27-364.-7…*	250 W/m
Bending radius	16 to 33 mm (depending on version)
Cross section cold lead	SS 2.5 mm^2 (SS 6.0 mm^2*)
Length cold lead	1 m (2 m*)
Material cable gland	M20 brass (stainless steel*) M25 brass* (stainless steel*)

* on request

Ordering information EMK heating circuits pre-assembled

Short form title	Ω/km at +20 °C	Conductor material	Outer diameter (mm)	Order no.
EMK VA 0011 Cu**	11	Cu	4.9	**27-3643-1 □ 31/00111000**
EMK VA 0017 Cu**	17	Cu	4.6	**27-3643-1 □ 31/00171000**
EMK VA 0025 Cu**	25	Cu	3.7	**27-3643-1 □ 31/00251000**
EMK VA 0040 CuNi**	40	CuNi 5	4.0	**27-3643-2 □ 31/00401000**
EMK VA 0063 Cu**	63	Cu	3.2	**27-3643-1 □ 31/00631000**
EMK VA 0160 CuNi	160	CuNi	4.9	**27-364 □ -4 □ 31/01601000**
EMK VA 0250 CuNi	250	CuNi	4.4	**27-364 □ -4 □ 31/02501000**
EMK VA 0400 CuNi	400	CuNi	4.0	**27-364 □ -4 □ 31/04001000**
EMK VA 0630 CuNi	630	CuNi	3.7	**27-364 □ -4 □ 31/06301000**
EMK VA 1000 CuNi	1000	CuNi	3.4	**27-364 □ -4 □ 31/10001000**
EMK VA 1600 CuNi	1600	CuNi	3.2	**27-364 □ -4 □ 31/16001000**
EMK VA 0160 NiCr	160	NiCr	6.5	**27-364 □ -3 □ 31/01601000**
EMK VA 0250 NiCr	250	NiCr	5.6	**27-364 □ -3 □ 31/02501000**
EMK VA 0400 NiCr	400	NiCr	5.0	**27-364 □ -3 □ 31/04001000**
EMK VA 0630 NiCr	630	NiCr	4.5	**27-364 □ -3 □ 31/06301000**
EMK VA 1000 NiCr	1000	NiCr	4.1	**27-364 □ -3 □ 31/10001000**
EMK VA 1600 NiCr	1600	NiCr	3.8	**27-364 □ -3 □ 31/16001000**
EMK VA 2500 NiCr	2500	NiCr	3.6	**27-364 □ -3 □ 31/25001000**
EMK VA 4000 NiCr	4000	NiCr	3.2	**27-364 □ -3 □ 31/40001000**
EMK VA 6300 NiCr	6300	NiCr	3.2	**27-364 □ -3 □ 31/63001000**
EMK VA 010K NiCr	10000	NiCr	3.2	**27-364 □ -3 □ 31/010K1000**

Version	Code no.
Ex	**1**
Non-Ex	**3**

Nominal voltage	Code no.
500 V	**2**
750 V**	**5**

Complete order no. Please insert correct code.
** Only available in version media protected.
Technical data subject to change without notice.

The ”Ex” connection kits for EMK heating cables are available in 3 versions: EMK Ex 300, EMK Ex 400 S and EMK Ex 400 D. The necessary junction box must be ordered for each pre-assembled EMK heating circuit depending on the type of wiring (single-phase, two-phase, star connection, delta connection).

Explosion protection Ex junction box

Marking	Ⓔx II 2G Ex e IIC T6, T5 Gb Ⓔx II 2D Ex tb IIIC, T80 °C, T95 °C Db
Certification	PTB 08 ATEX 1064 IECEx PTB 09.0009X

Other approvals and certificates, see www.bartec.de

Technical data

Material	Polyester, glass-fibre reinforced
Colour	black
Surface resistance	$\leq 10^9\ \Omega$
Protection class	IP 65
Cable gland	IP 65
Cover screws	stainless steel

Technical data Cold leads

Standard length	1.0 m
Outer diameter	4.9 mm
Cross section	2.5 mm²
Conductor material	Copper
Outer jacket material	VA 1.4541
Bend radius	25 mm
Gland, terminal connection	M20

Explosion protection Hot to cold connection joint

Marking	Ⓔx II 2G Ex e IIC Gb Ⓔx II 2D Ex tb IIIC Db
Certification	BVS 13 ATEX E 034 U IECEx BVS 13.0042U

Technical data

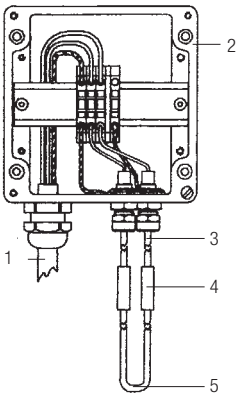
Material	SS 1.4541

Ordering information Ex Junction boxes

Version Heating circuit	Supply voltage AC	Qty/ enclosure size (mm)	Qty/ terminal with 6 mm²	Terminal identification	Qty/ terminals	Qty/cold leads dry connections	Glands per enclosure	Terminal range	Order no.
300 CuNi 300 VA	up to 500 V	1 unit 160 x 160 x 90	each 2	L N (L1; L2)	2 with 6 mm²	2	1 x M25 2 x threaded M20	Ø 7 to 17 mm	**07-5177-9100**
400 S CuNi 400 S VA		2 unit 160 x 160 x 90	each 6	3 x L1; 3 x N; 1 - 6 (L2; L3)	4 with 6 mm²	6	1 x M25 4 x threaded M20		2 unit **07-5177-9098**
400 D CuNi 400 D VA		1 unit 260 x 160 x 90	each 6	2 x L1; 2 x L2; 2 x L3; 1 - 7	6 with 6 mm²	6	1 x M25 3 x threaded M20		**07-5177-9099**

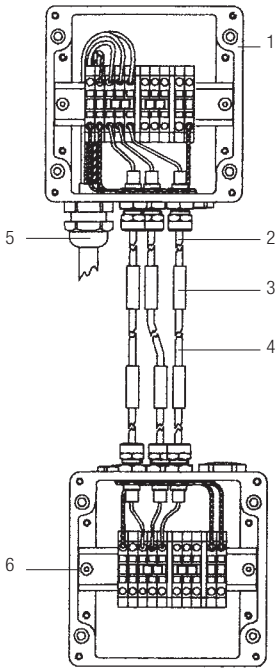
Technical data subject to change without notice.

Standard 300



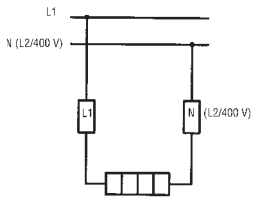
1 Mains supply
2 Heating circuit junction box
3 Cold lead
4 Hot to cold connection joint
5 Heating cable

Standard 400 S Typical star connection diagram



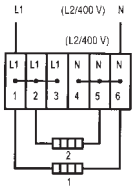
1 Heating circuit junction box
2 Cold lead
3 Hot to cold connection joint
4 Heating cable
5 Mains supply
6 EMK Standard star connection enclosure

Connection diagram Standard 300

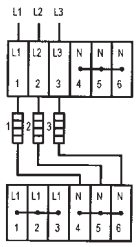


Connection diagram Standard 400 S

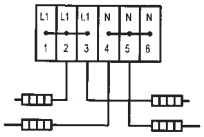
Double junction box



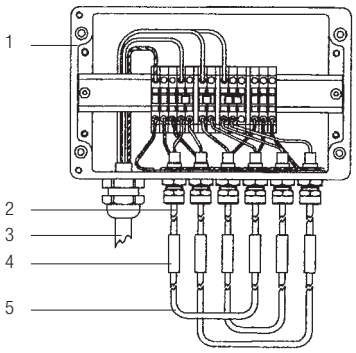
Star connection



Intermediate junction box



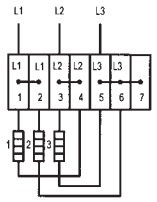
Standard 400 D Typical delta connection diagram



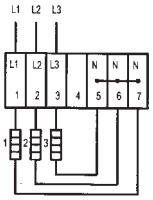
1 Heating circuit junction box
2 Cold lead
3 Mains supply
4 Hot to cold connection joint
5 Heating cable

Connection diagram Standard 400 D

Delta connection



Star connection



The “Standard” connection kits for EMK heating cables are available in 5 versions: EMK Standard 300, EMK Standard 400 S, EMK Standard 400 D, EMK Standard 690 and EMK Standard 690 S/D. The necessary junction box must be ordered for each pre-assembled EMK heating circuit depending on the required mains voltage and the type of wiring (single-phase, two-phase, star connection, delta connection).

Technical data Junction box Standard

Material	Polyester, glass-fibre reinforced
Colour	grey, black
Surface resistance	$> 10^{12}$ Ω
Protection class	IP 65
Cable gland	IP 54 to IP 65
Cover screws	stainless steel

Technical data Cold leads

Standard length	1.0 m
Outer diameter	4.9 mm
Cross section	2.5 mm²
Conductor material	Copper
Outer jacket material	SS 1.4541
Bend radius	25 mm
Gland, terminal connection	M20

Technical data Hot to cold connection joint

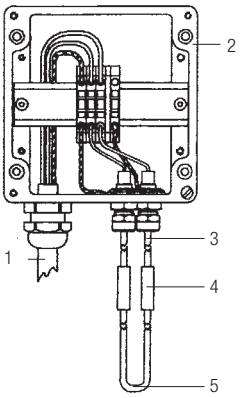
Material	SS 1.4541

Ordering information Standard Junction boxes

Version Heating circuit	Supply voltage AC	Qty/ enclosure size (mm)	Qty/ terminal	Terminal identification	Qty/ terminals	Qty/cold leads dry connections	Glands per enclosure	Terminal range	Order no.
300 CuNi 300 VA	up to 500 V	1 unit 160 x 160 x 90	each 2 with 6 mm²	L N (L1; L2)	2 with 6 mm²	2	1 x M25 2 x threaded M20	Ø 7 to 17 mm	**07-5177-9100**
400 S CuNi 400 S VA		2 unit 160 x 160 x 90	each 6 with 6 mm²	3 x L1; 3 x N; 1 - 6 (L2; L3)	4 with 6 mm²	6	1 x M25 4 x threaded M20		2 unit **07-5177-9098**
400 D CuNi 400 D VA		1 unit 260 x 160 x 90	each 6 with 6 mm²	2 x L1; 2 x L2; 2 x L3; 1 - 7	6 with 6 mm²	6	1 x M25 3 x threaded M20		**07-5177-9099**
690	up to 690 V	1 unit 160 x 160 x 90	each 2 with 16 mm²	L N (L1; L2)	2 with 16 mm²	2	1 x M40 2 x threaded M20	Ø 17 to 28 mm	**07-5103-9219**
690 S/D		1 unit 260 x 160 x 90	each 7 with 16 mm²	2 x L1; 2 x L2; 2 x L3; 1 - 7	6 with 16 mm²	6	1 x M40 6 x threaded M20		**07-5103-9220**

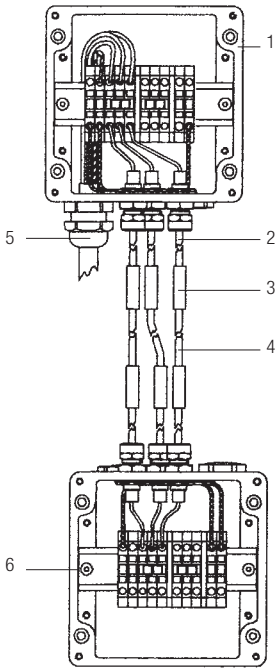
Technical data subject to change without notice.

Standard 300



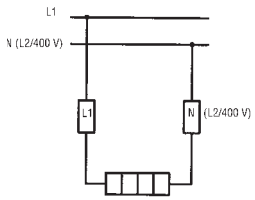
1 Mains supply
2 Heating circuit junction box
3 Cold lead
4 Hot to cold connection joint
5 Heating cable

Standard 400 S Typical star connection diagram



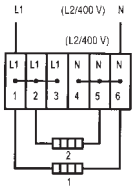
1 Heating circuit junction box
2 Cold lead
3 Hot to cold connection joint
4 Heating cable
5 Mains supply
6 EMK “Standard“ star connection enclosure

Connection diagram Standard 300

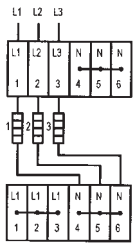


Connection diagram Standard 400 S

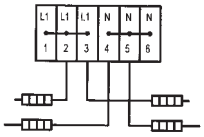
Double junction box



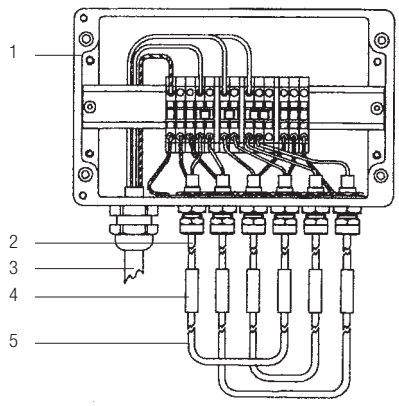
Star connection



Intermediate junction box



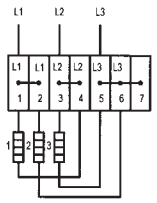
Standard 400 D Typical delta connection diagram



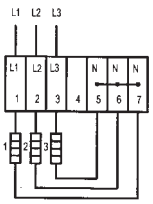
1 Heating circuit junction box
2 Cold lead
3 Mains supply
4 Hot to cold connection joint
5 Heating cable

Connection diagram Standard 400 D

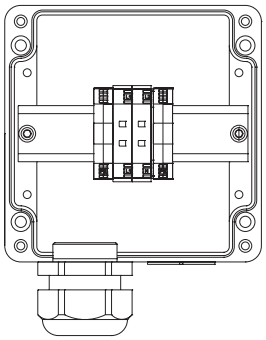
Delta connection



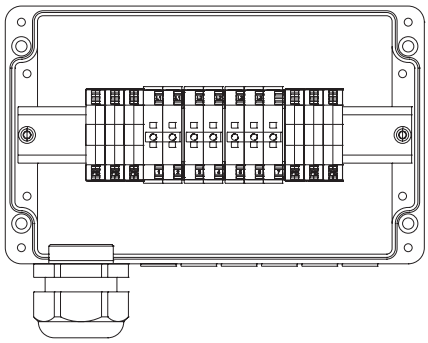
Star connection



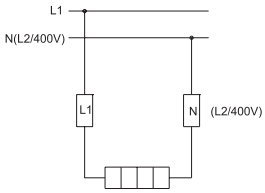
Junction box Ex 690



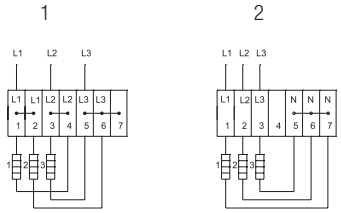
Junction box/terminal box Ex 690 S/D



Connection diagram for junction box Ex 690

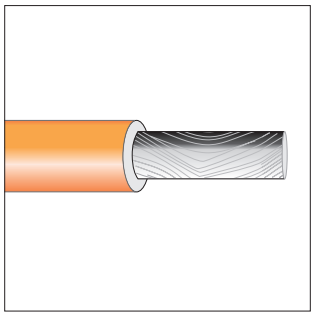


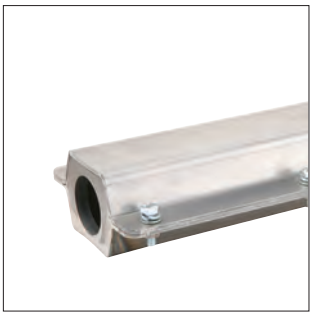
Connection diagram for junction box Ex 690 S/D

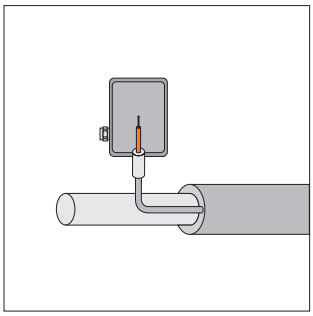


1 Delta connection

2 Star connection







- Most cost effective solution to maintain temperature at long or unlimited distance lengths with least number of feeding points
- Components with temperature resistance of up to 260 °C
- Design according to IEEE844 standard
- Wide ambient temperature range

The Skin Effect Heating system is an electrical heating system using the AC phenomenon with a remarkable effect on the inner surface of a ferromagnetic tube. The heating element is a plastic insulated conductor inside a ferromagnetic carbon steel tube. The heating circuit is to be designed to any needs by variation heat pipe size, electrical conductor size, supply voltage and insulation material. BARTEC provides the complete component range and a full package of documentation. The typical applications of SEH systems are temperature maintenance, frost protection and heating-up of long pipelines. All parts of the system are grounded providing additional electrical safety. Power feeding point equipment is designed and constructed customized, according to project requirements. When increased power output is necessary several runs can be installed.

Explosion protection

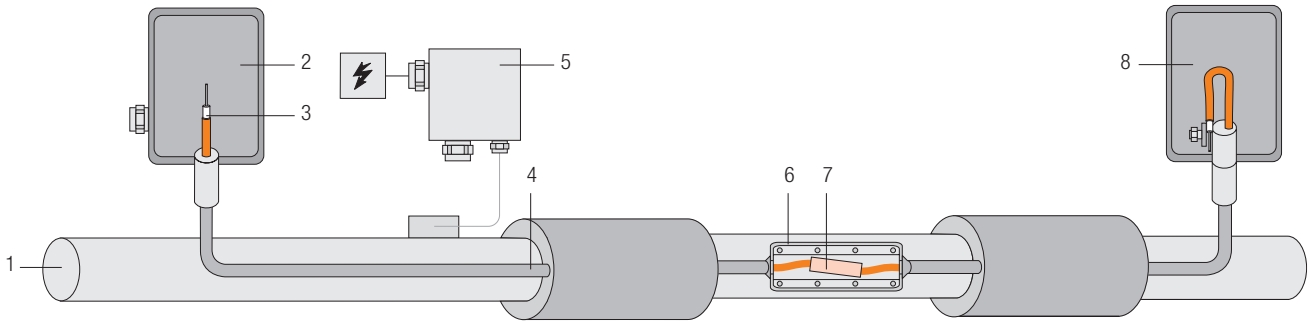
Marking	Ex II 2G Ex e IIC T3 or T4 Gb
Certification System	ITS11ATEX37350X IECEx ITS 14.0053X TC RU C-DE.BH02.B.00271

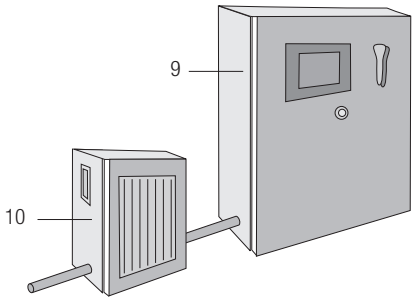
Other approvals and certificates, see www.bartec.de

System overview

- SEH heating cable (120 °C/260 °C) with connection equipment
- SEH feeding and end box (up to 5 kV) with connection equipment
- Pull & splice box
- Distribution panel, control equipment and transformer

Skin Effect Heating system components





1 Carrier pipe
2 Power feeding box
3 Heating cable
4 Heat tube
5 Thermostat
6 Pull & splice box
7 Splice set
8 Power end box
9 Control and distribution board SEH
10 Special transformer

For more information, please contact your local BARTEC sales representative.

Insulation entry bush

Designation	Description	PU	Order no.
PSB/PSBL	connecting cable (3 x 1.5 mm²; 3 x 2.5 mm²)	unit	**05-0020-0472**
MSB/HSB		unit	**05-0020-0091**
HTSB	metal screw	unit	**05-0020-0516**
Pt100 Ex	M25	unit	**05-0020-0261**
EKL	single/1 x Pt100 M (media-protected)	unit	**05-0020-0262**
EKL	double/2 x Pt100 M (media-protected)	unit	**05-0020-0343**

An insulation entry bush is used to prevent the heating cable being damaged where it passes through the thermal insulation outer cladding. The plate is made of stainless steel (1.4301).

Adhesive tapes

Designation	Description	PU	Order no.
Aluminium self-adhesive tape +80 °C*	50 m long, 50 mm wide Temp. up to +80 °C; weight 560 g	roll	**02-5500-0003**
Aluminium self-adhesive tape +150 °C*	55 m long, 50 mm wide Temp. up to +150 °C; weight 440 g	roll	**02-5500-0014**
Aluminium foil, 1 000/100 m	100 m long, 1000 mm wide; 0.05 mm thick	roll	**02-2430-0002**
Aluminium foil, 1 000/10 m	10 m long, 1000 mm wide; 0.05 mm thick	roll	**02-2430-0003**
Textile self-adhesive tape +90 °C	50 m long, 12 mm wide Temp. up to +80 °C; non-removable up to +90 °C, weight 180 g	roll	**02-5500-0001**
Polyester self-adhesive tape +100 °C	50 m long, 19 mm wide Temp. up to +70 °C; non-removable up to +100 °C, weight 150 g	roll	**02-5500-0005**
Glass-fibre self-adhesive tape +250 °C**	50 m long, 11 mm wide Temp. up to +180 °C continuous, short-term +250 °C; weight 120 g	roll	**02-5500-0047**

* The aluminium self-adhesive tape is recommended for improving thermal conductivity and is indispensable for heating plastic pipes.

** The glass-fibre self-adhesive tape is recommended for attaching heating cables onto stainless steel and smooth surfaces in the high-temperature range.

Over insulation caution labels

Designation	Description	PU	Order no.
Self-adhesive label*	"Elektrisch beheizt", weight: 4 g	unit	**05-2144-0046**
	"Electrically heated", weight: 4 g	unit	**05-2144-0047**
	"Traçage électrique", weight: 4 g	unit	**05-2144-0703**
	"Электрообогрев", weight: 4 g	unit	**05-2144-0860**

*other languages on request

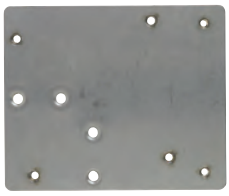
Connection cables

Designation	Description	PU	Order no.
Connection cables Heat-resistant	3 x 1.5 mm², Cross section D_A 8.5 mm (Quality HO5SS-F, outer jacket EWKF, -50 °C to +180 °C)	metre	**02-4034-0008**
	3 x 2.5 mm², Cross section D_A 9.8 mm (Quality HO5SS-F, outer jacket EWKF, -50 °C to +180 °C)	metre	**02-4034-0027**

Crimping Accessories

Designation	Description	PU	Order no.
Crimp-Set EKL	Crimping pliers in the boot and crimp insert 1.5 to 10 mm²	unit	**03-5545-0001**
	Butt Connectors Nickel 1.5 to 2.5 mm², 100 pieces	box	**03-7035-0008**

Mounting plates and brackets



Designation	Description	PU	Order no.
in stainless steel (1.4301) For securing enclosures and thermostats to pipework and vessels.	Mounting bracket MWG/MWU 270 stainless steel	unit	**05-0091-0051**
	Mounting plate SS 110 for polyester enclosure with dimensions 110 mm x 75 mm x 55 mm	unit	**05-0091-0010**
	Mounting plate SS 122 for polyester enclosure with dimensions 122 mm x 120 mm x 90 mm	unit	**05-0091-0011**
	Mounting plate SS 220 for polyester enclosure with dimensions 220 mm x 120 mm x 90 mm	unit	**05-0091-0012**
	Mounting plate SS 160 for polyester enclosure with dimensions 160 mm x 160 mm x 90 mm	unit	**05-0091-0013**
	Mounting plate SS 260 for polyester enclosure with dimensions 260 mm x 160 mm x 90 mm	unit	**05-0091-0014**
	Mounting plate SS 360 for polyester enclosure with dimensions 360 mm x 160 mm x 90 mm	unit	**05-0091-0015**
	Mounting plate SS 255 for polyester enclosure with dimensions 255 mm x 250 mm x 90 mm	unit	**05-0091-0016**
	Mounting plate SS 400 for polyester enclosure with dimensions 400 x mm 250 mm x 90 mm	unit	**05-0091-0017**
	Mounting plate SS for DTW/DTB	unit	**05-0091-0221**

Mounting plates and brackets

Designation	Description	PU	Order no.
in galvanised steel Each mounting bracket requires a mounting plate to fit the size of the enclosure.	Mounting bracket, twisted, mounting distance 200 mm	unit	**05-0105-0162**
	Mounting bracket, U-shaped, mounting distance 200 mm	unit	**05-0105-0163**
	Mounting plate for polyester enclosure, dimensions 110 mm x 75 mm x 55 mm	unit	**05-0005-0014**
	Mounting plate for polyester enclosure, dimensions 122 mm x 120 mm x 90 mm	unit	**05-0005-0015**
	Mounting plate for polyester enclosure, dimensions 220 mm x 120 mm x 90 mm	unit	**05-0005-0016**
	Mounting plate for polyester enclosure, dimensions 160 mm x 160 mm x 90 mm	unit	**05-0005-0017**
	Mounting plate for polyester enclosure, dimensions 260 mm x 160 mm x 90 mm	unit	**05-0005-0018**
	Mounting plate for DTW/DTB	unit	**05-0091-0222**
	Mounting plates for aluminium enclosures on request.		

Cable ties

Designation	Description	PU	Order no.
Tie installation tool		unit	**03-5510-0004**
Stainless steel cable ties (1.4301)	up to DN 15, length 127 mm, 100 unit	pack	**03-6510-0211**
	up to DN 40, length 201 mm, 100 unit	pack	**03-6510-0207**
	up to DN 80, length 362 mm, 100 unit	pack	**03-6510-0208**
	up to DN 150, length 679 mm, 100 unit	pack	**03-6510-0209**
	up to DN 300, length 1067 mm, 25 unit	pack	**03-6510-0210**
Nylon cable ties for fixing heating cables to wire mats (max. temperature +105 °C)	Length 92 mm, 1000 piece	box	**03-6500-0014**
	Length 200 mm, 1000 piece	box	**03-6500-0015**

Fixing straps

Designation	Description	PU	Order no.
Special fixing straps	for fixing mounting brackets on pipes, weight 55 g/m; width 14 mm, length 30 m	roll	**03-6510-0202**
	short length: indicate required length in plain text	metre	**03-6510-0227**
Buckle	for special fixing strap 14 mm, AF 8, weight 16 g, fastened with open-ended spanner	unit	**03-6515-0200**
SS fixing strap 3/8"	weight 60g/m; length 30 m	roll	**03-6510-0203**
SS buckle 3/8"	for SS fixing strap 3/8'', fix with tensioning tool, weight 15 g, box 100 pieces	box	**03-6515-0201**
SS fixing strap 3/4"	weight 110 g/m; length 30 m	roll	**03-6510-0204**
SS buckle 3/4"	for SS fixing strap 3/4'', fix with tensioning tool, weight 15 g, 2 pieces a corner; box 100 pieces	box	**03-6515-0202**
Tensioning tool	for SS fixing strap	unit	**03-5510-0003**
Polyester fixing strap	for fixing heating tapes to tanks/vessels width 16 mm, temp. up to +105 °C, weight: 20 g/m indicate required length in plain text	metre	**03-6500-0100**
Buckle	for polyester fixing strap width 16 mm, weight 13 g	unit	**03-6515-0203**
Wire mesh	width 1.0 m, length 25 m, zinc-coated, pitch 12 mm	roll	**02-2210-0002**
	width 1.0 m, length 25 m, stainless steel, pitch 16 mm	roll	**02-2210-0003**
Lacing wire	Diameter = 0.65 mm, zinc-coated	roll	**02-2310-0003**
	Diameter = 0.65 mm, stainless steel	roll	**02-2310-0002**
Securing pins	SS (1000/box), ∅ 2.1 mm, length 30 mm	box	**02-5470-0002**
	Cu zinc-coated (1000/box), ∅ 2.1 mm, length 32 mm	box	**02-5470-0001**
Self retaining washers	SS (1000/box), ∅ 30 mm for securing pins	box	**02-5479-0001**
	Cu zinc-coated (1000/box), ∅ 30 mm for securing pins	box	**02-5479-0002**
Spacing strips	EKL spacing strip; length 20 m	roll	**03-6510-0219**
	EKL spacing strip; length 50 m	roll	**03-6510-0200**
	EMK spacing strip, stainless steel, length 20 m	roll	**03-6510-0201**

Technical data subject to change without notice.

CLOSED- AND OPEN-LOOP CONTROL SYSTEM

	STW II Ex capillary tube thermostat	**BSTW II** Ex fail-safe temperature monitor	**BSTB II** Ex fail-safe temperature limiter	**DTW** Explosion proof temperature monitor
Explosion protection				
Marking	Ⓔx II 2G Ex de IIC T6 or T5	Ⓔx II 2G Ex de IIC T6, T5, T4, T3	Ⓔx II 2G Ex de IIC T6 or T5	Ⓔx II 2G Ex d IIC T6 Ⓔx II GD Ex tb IIIC T80 °C Db IP 6X T80 °C
Technical data				
Temperature display	-	-	-	-
Adjustable temperature range	-20 °C to +500 °C	-20 °C to +500 °C	-20 °C to +500 °C	-4 °C to +163 °C
Switching capacity	16 A/AC 250 V	25 A/AC 230 V 16 A/AC 400 V	25 A/AC 230 V 16 A/AC 400 V	22 A/AC 480 V
Electronic/mechanical	Mechanical (Capillary tube system)	Mechanical (Capillary tube system)	Mechanical (Capillary tube system)	Mechanical (Capillary tube system)
Contacts	1 x c/o [1]	1 x c/o [1]	1 x c/o [1]	1 x c/o [1]

	DTB Explosion proof temperature limiter	**MTE** Mini-thermostat	**KTE** Cable thermostat	**KRM** Capillary tube thermostat
Explosion protection				
Marking	Ⓔx II 2G Ex d IIC T6 Ⓔx II 2D Ex tD A21 IP 6X T80 °C	Ⓔx II 2G Ex d IIC T6 Gb Ⓔx II 2G Ex de IIC T6 Gb Ⓔx II 2D Ex tb IIIC T80 °C Db	Ⓔx II 2G Ex db IIC T6 Ⓔx II 2D Ex tb IIIC T85 °C Ⓔx II 2G EEx m IIC T6 Ⓔx II 2D IP 65 T80 °C	-
Technical data				
Temperature display	-	-	-	-
Adjustable temperature range	-4 °C to +163 °C	fixed	fixed	0 °C to +300 °C
Switching capacity	16 A/AC 250 V 15 A/AC 480 V	6 A/AC 230 V	10 A/AC 250 V	10 A/AC 400 V 16 A/AC 230 V
Electronic/mechanical	Mechanical (Capillary tube system)	Mechanical (Bimetallic system)	Mechanical (Bimetallic system)	Mechanical (Capillary tube system)
Contacts	1 x c/o [1]	1 x NO [1]	1 x NO [1]	1 x c/o [1]

[1] c/o = changeover contact, NC = normally closed contact, NO = normally open contact

	DEPU Complete digital solution controller - limiter - power setpoint	**DPC$_{front}$** Digital programmable controllertafelmon (front panel)	**DPC III** Digital e programmable controller (DIN rail mounting)
Explosion protection			
Marking	Ⓔx II 2G EEx m e ib [ib] IIC T4	mit Pt100 Ex Ⓔx II 2G Ex mb II T6 Ⓔx II 2D Ex mbD 21 T80 °C	mit Pt100 Ex Ⓔx II 2G Ex mb IIC T6 Ⓔx II 2D Ex mbD 21 T80 °C
Technical data			
Temperature display	yes	double	single
Adjustable temperature range	0 °C to +450 °C	diverse	diverse
Switching capacity	25 A/AC 230 V	5 A/8 A/AC 250 V + Logic output	8 A/16 A/AC 250 V
Electronic/mechanical	Electronic	Electronic	Electronic
Contacts	Thyristor	1 x NC [1]/2 x NC [1]	1 x NC [1]/1 x c/o [1]

	DTL III Ex Digital temperature limiter	**DEC** Digital energy controller	**MPC net** Decentral mulit-channel control system
Explosion protection			
Marking	Ⓔx II (2)G [Ex e II]	-	-
Technical data			
Temperature display	single	-	Touchscreen
Adjustable temperature range	-200 °C to +850 °C	-	-200 °C to +600 °C
Switching capacity	8 A/16 A/AC 250 V	20 A/AC 230 V	up to 80 A/AC 230 V
Electronic/mechanical	Electronic	Electronic	Electronic
Contacts	1 x NC/1 x c/o [1]	Thyristor	modularly expandable

[1] c/o = changeover contact, NC = normally closed contact, NO = normally open contact

STW II Capillary tube thermostat 16 A, fail-safe

- Small construction
- Can be mounted directly in Zone 1
- Temperature can be set in Zone 1

The STW II is a compact ON/OFF type capillary tube thermostat, housed in an Ex e certified polyester enclosure. Heaters, fans, motors and other equipment are energised and de-energised by means of this thermostat when specific temperature ranges are exceeded. This device can also be used to control the temperature in air or on various surfaces.

Explosion protection

Marking	Ⓔx II 2G Ex de IIC T6, T5
Certification	EPS 11 ATEX 1356 X
Other approvals and certificates, see www.bartec.de	

Technical data

Protection class	IP 65/EN 60529
Enclosure materia	polyester
Ambient temperature	-55 °C to +50 °C
Capillary tube	length: 1000 mm, up to 5000 mm on request OD sensor line: 1.5 mm min. bend radius: 5 mm Sensor bulb diameter: 4 to 6 mm Sensor material: stainless steel SS 1.4571
Dimensions (L x W x H)	120 mm x 122 mm x 90 mm
Weight	approx. 400 g
Terminals	4 x 2.5 mm^2 + 1 PE
Heating cable connections	1 x M25

Electrical data

Switching current at 230 V	open contact 16 A (AC-1) closed contact 2.5 A (AC-1)
Minimum contact load	AC/DC 24 V, 100 mA
Switching hysteresis	depending on type, ordering information
Switching accuracy	depending on type, ordering information

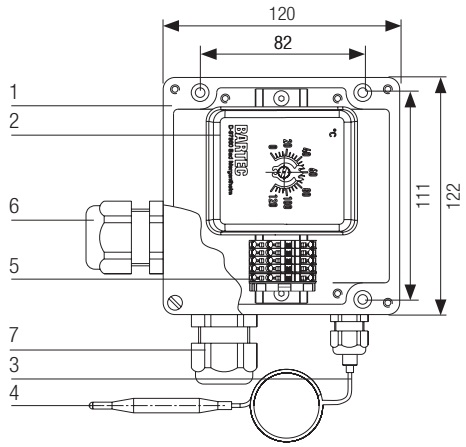
Function

Any change in temperature at the sensor bulb causes a change in the volume of fluid in the measuring system, which in turn results in a movement of the diaphragm membrane. This membrane is connected to a mechanical device that activates a microswitch. If the temperature at the sensor bulb exceeds the pre-set value, terminals 1 and 4 are opened. If there is a rupture or break in the sensor tube (leakage), then the switch remains permanently open (fail-safe). If the temperature falls below the minimum setting, the autocontrol opens the circuit but closes again on temperature rise.

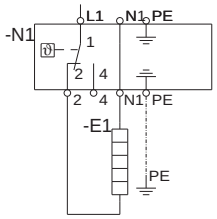
Application example

The STW II thermostat can directly switch temperature-dependent equipment loads (heaters etc.) of up to 16 A. Higher rated currents can be switched by means of a contactor; the STW II switches the contactor coil. If an interlock is installed by means of an additional relay (according to DIN VDE 0116), the STW II can also be used as a limiter.

Device for 1 heating circuit
(Heating cable connection direct via sheathed cable/PLEXO or cold lead)



1 Enclosure
2 Switch insert
3 Capillaries
4 Sensor
5 Rail-mounted terminals
6 Cable gland M25 with blind plug
7 Cable gland M25



Ordering information Easy device

Description	Switching temperature	Switching accuracy	Hysteresis	Order no.
STW II	-20 °C to +50 °C	+5 K/-0 K	5 K	**27-6DF2-5215/1200**
	+0 °C to +190 °C	+16 K/-0 K	14 K	**27-6DF2-5215/1C00**
	+60 °C to +300 °C	+36 K/-0 K	17 K	**27-6DF2-5215/1G00**

Unit for 2 heating circuits on request.

Technical data subject to change without notice.

- Switching voltage up to 400 V
- Minimum operating temperature -55 °C for all standard variants for use all over the world without restrictions
- Wide regulating range from -20 °C to +500 °C, depending on the switch insert

BSTW II
fail-safe safety temperature monitor

- Falling calibration to maintain the temperature during the process
- Turns on and off automatically whenever the temperature exceeds or drops below the setpoint value

BTB II
fail-safe temperature limiter

- Rising calibration to limit temperature during the process
- Switches off and remains switched off once the limit temperatures are reached

BSTB II
fail-safe safety temperature limiter

- The BSTB II functions in the same manner as the BTB II temperature limiter, whereby the setting range is limited here to 0 °C to 130 °C or 130 °C to 190 °C based on the temperature classes T3 and T4.

BSTW II temperature monitors and BTB II/BSTB II temperature limiters are ON/OFF thermostats in Ex e certified polyester enclosures. In addition to the use of conventional power cables, BSTW II and BTB II/BSTW II are approved for the direct connection of self-limiting BARTEC heating circuits in the enclosure terminals. A verification of thermal safety and a further approval by any third party authority is not necessary. The benefit to the customer is obvious. Any directly connected self-limiting heating circuit considerably reduces the number of junction boxes and installation cost. BSTW II and BTB II/BSTB II monitor ambient temperatures as well as different surface temperatures. In accordance with EN 60079-30-1, BTB II and BSTB II fail-safe temperature limiters are designed to switch off and remain switched off when the preset limit temperature is reached. The restart lockout requires manual resetting directly at the device.

Function
Any change in temperature in the sensor causes a change in the volume in the liquid-filled measuring system, which in turn results in a movement of the diaphragm membrane, which is connected to a transmission mechanism, and this opens a microswitch. If the sensor temperature exceeds the set value, the contacts 1 and 2 remain continuously open. The contacts in the BTB II/BSTB II remain continuously open until there is a manual intervention.

Explosion protection

Marking	Ⓔx II 2G Ex de IIC T6, T5, T4, T3
Certification	EPS 11 ATEX 1356 X

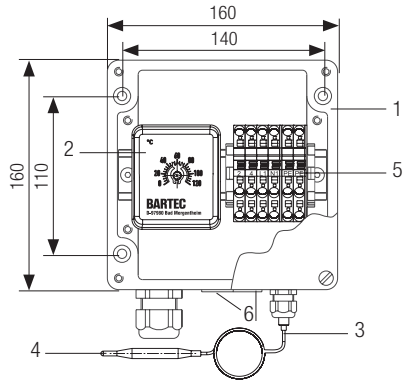
Other approvals and certificates, see www.bartec.de

Technical data

Protection class	IP 65/EN 60529
Min. ambient temperature	-55 °C (Standard)
Max. ambient temperature	depends on the type of heating cable connection
Storage temperature	-55 °C to +65 °C
Capillary tube	Length: 1000 mm, up to 5000 mm on request OD sensor line: 1.5 mm Min. bend radius: 5 mm Sensor bulb diameter: 6 mm Sensor material: SS 1.4571
Contacts 1 SPDT	Contact decks 1 to 2: AC 400 V/16 A, AC 230 V/25 A Contact decks 1 to 4: AC 400 V/6.3 A, AC 230 V/6.3 A
Switching hysteresis	depending on type, see ordering informations
Switching accuracy	depending on type, see ordering informations

Device for 1 heating circuit

(Heating cable connection direct via sheathed cable/Plexo or cold lead)

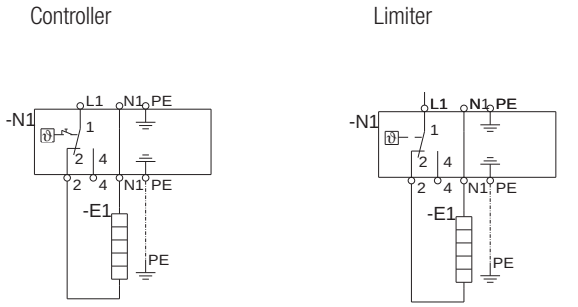


1 Enclosure
2 Switch insert
3 Capillaries
4 Sensor
5 Rail-mounted terminals
6 Blind plug M20

Technical data

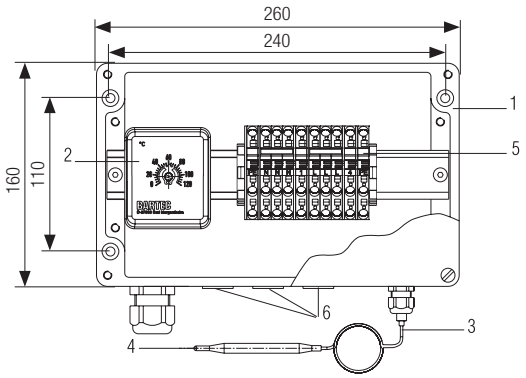
Dimensions	160 mm x 160 mm x 90 mm
Terminals	4 x 6 mm² + 2 x PE
Heating cable connections	2 x M20, closed with blind plug

Heating circuit connection



Device for 1 to 3 heating circuits

(Heating cable connection direct, via sheathed cable/Plexo or cold lead)

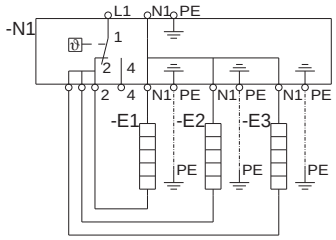


1 Enclosure
2 Switch insert
3 Capillaries
4 Sensor
5 Rail-mounted terminals
6 Blind plug M20

Technical data

Dimensions	260 mm x 160 mm x 90 mm
Terminals	8 x 6 mm² + 3 x PE
Heating cable connections	3 x M20, closed with blind plug

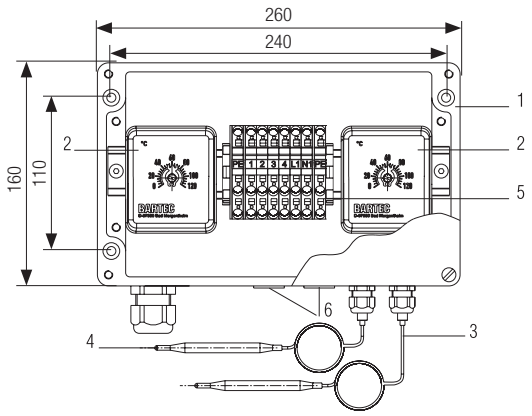
Heating circuit connection



System-dependent conditions

Load side connection variant heating circuits	Circuit breaker, (C characteristics)	Ambient temperature	Temperature class
PSBL system 27-1580-.910/....	1 x 16 A	-55 °C to +50 °C	T5
PSB system 27-1680-.910/....	1 x 25 A	-55 °C to +40 °C	T6
	1 x 25 A	-55 °C to +50 °C	T5
MSB system 27-1980-.910/....	1 x 25 A	-55 °C to +50 °C	T4
HSB system 27-1780-.910/....	1 x 25 A	-55 °C to +50 °C	T3
Sheathed cable/PLEXO or cold lead	1 x 16 A	-55 °C to +50 °C	T5
	1 x 20 A	-55 °C to +40 °C	T5
	1 x 25 A	-55 °C to +40 °C	T4

Combination unit Safety temperature monitor and limiter
(Heating cable connection direct via sheathed cable/Plexo or cold lead)

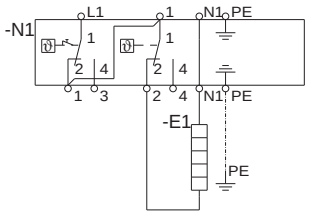


1 Enclosure
2 Switch insert
3 Capillaries
4 Sensor
5 Rail-mounted terminals
6 Blind plug M20

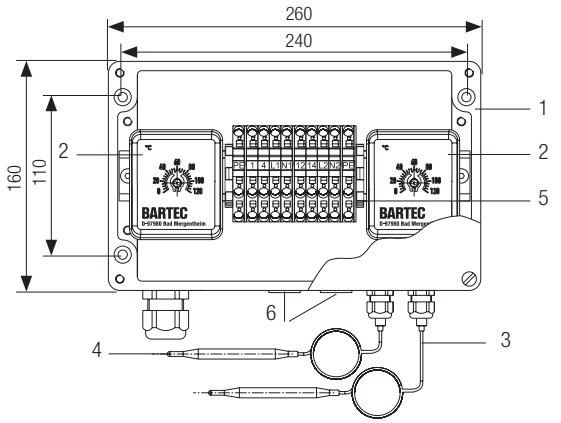
Technical data

Dimensions	260 mm x 160 mm x 90 mm
Terminals	6 x 6 mm² + 3 x PE
Heating cable connections	2 x M20, closed with blind plug

Heating circuit connection



Combination unit Safety temperature monitor
(Heating cable connection direct, via sheathed cable/Plexo or cold lead)



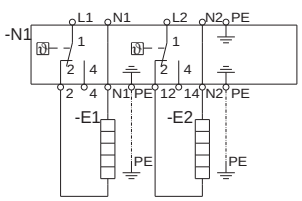
1 Enclosure
2 Switch insert
3 Capillaries
4 Sensor
5 Rail-mounted terminals
6 Blind plug M20

Technical data

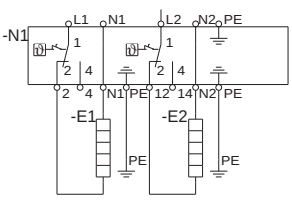
Dimensions	260 mm x 160 mm x 90 mm
Terminals	8 x 6 mm² + 3 x PE
Heating cable connections	2 x M20, closed with blind plug

Heating circuit connection

Controller



Limiter



System-dependent conditions

Load side connection variant heating circuits	Circuit breaker, (C characteristics)	Ambient temperature	Temperature class	Fuse (C characteristics)	Ambient temperature	Temperature class
PSBL system 27-1580-.910/....	1 x 16 A	-55 °C to +50 °C	T5	2 x 16 A	-55 °C to +50 °C	T5
PSB system 27-1680-.910/....	1 x 25 A	-55 °C to +40 °C	T6	2 x 25 A	-55 °C to +40 °C	T6
	1 x 25 A	-55 °C to +50 °C	T5	2 x 25 A	-55 °C to +40 °C	T5
MSB system 27-1980-.910/....	1 x 25 A	-55 °C to +50 °C	T4	2 x 25 A	-55 °C to +40 °C	T4
HSB system 27-1780-.910/....	1 x 25 A	-55 °C to +50 °C	T3	2 x 25 A	-55 °C to +40 °C	T3
Sheathed cable/PLEXO or cold lead	1 x 16 A	-55 °C to +50 °C	T5	2 x 16 A	-55 °C to +50 °C	T5
	1 x 20 A	-55 °C to +40 °C	T5	-	-	-
	1 x 25 A	-55 °C to +40 °C	T4	-	-	-

Ordering information Device for 1 heating circuit

Designation	Switching temperature	Switching point deviation	Hysteresis	Order no.
BSTW II	-20 °C to +50 °C	+5 K/-0 K	5 K	**27-6DF2-5232/1200**
	0 °C to +190 °C	+16 K/-0 K	14 K	**27-6DF2-5232/1C00**
	+60 °C to +300 °C	+36 K/-0 K	17 K	**27-6DF2-5232/1G00**
BTB II	+70 °C to +190 °C	+0 K/-16 K	14 K	**27-6DJ2-5232/1D00**
	+150 °C to +300 °C	+0 K/-36 K	17 K	**27-6DJ2-5232/1J00**

Ordering information Device for 3 heating circuits

Designation	Switching temperature	Switching point deviation	Hysteresis	Order no.
BSTW II	-20 °C to +50 °C	+5 K/-0 K	5 K	**27-6DF2-5243/1200**
	0 °C to +190 °C	+16 K/-0 K	14 K	**27-6DF2-5243/1C00**
	+60 °C to +300 °C	+36 K/-0 K	17 K	**27-6DF2-5243/1GG0**

Ordering information Combination unit

Designation	Switching temperature	Switching point deviation	Hysteresis	Order no.
BSTW II/BTB II	-20 °C to +50 °C	+5 K/-0 K +0 K/-5 K	5 K 5 K	**27-6DU2-5242/1220**
	0 °C to +190 °C +70 °C to +190 °C	+16 K/-0 K +0 K/-16 K	14 K 14 K	**27-6DU2-5242/1CD0**
	+60 °C to +300 °C +150 °C to +300 °C	+36 K/-0 K +0 K/-36 K	17 K	**27-6DU2-5242/1GJ0**
	-20 °C to +50 °C +150 °C to +300 °C	+5 K/-0 K +0 K/-36 K	5 K 17 K	**27-6DU2-5242/12J0**
	0 °C to +190 °C +150 °C to +300 °C	+16 K/-0 K +0 K/-36 K	14 K 17 K	**27-6DU2-5242/1CJ0**

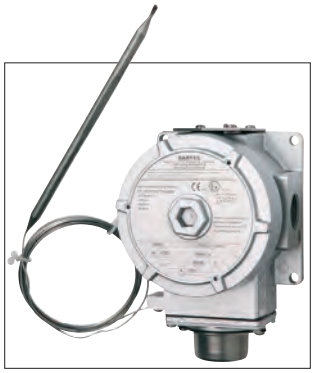
Ordering information Combination unit

Designation	Switching temperature	Switching point deviation	Hysteresis	Order no.
BSTW II/BSTW II	-20 °C to +50 °C	each +5 K/-0 K	5 K	**27-6DT2-5242/1220**
	0 °C to +190 °C	each +16 K/-0 K	14 K	**27-6DT2-5242/1CC0**

For mounting plates and mounting material, see assembly accessories.

Technical data subject to change without notice.

DTW/DTB Flame-proof temperature monitor/limiter



- 22 A switching capacity
- Flame-proof enclosure
- ATEX, UL, CSA, FM Approval

The flame-proof encapsulated temperature controllers/limiters (DTW/DTB) are designed for (trace)-heating applications in the Ex area. They can be used both for protection against frost and for maintenance temperature applications. Heating units and other operating equipment are switched on and off by means of the temperature controller when the temperature is too high or too low. The DTB temperature limiter is designed with resetting lockout; resetting (restarting) is only possible on the device. Can be used for monitoring temperature in the air or on surfaces.

Function

A change in temperature in the sensor causes a change in volume in the fluid filled in the measuring system, which in turn results in a movement of a membrane, which is connected to transmission mechanics and activates a microswitch. If the sensor temperature exceeds the pre-set level, the contact is actuated. The temperature limiter switches off permanently if the temperature is exceeded. Once the temperature drops, the temperature limiter can be unlocked manually. If there is a break in the measuring system (leakage), the circuit remains open permanently.

Application example

DTW and DTB switch temperature-dependent equipment (heating units) of up to 22/16 A directly. Higher switching currents or 3-phase applications are switched by means of a contactor.

Explosion protection

Marking	Ⓔx II 2G Ex d IIC T6 Ⓔx II GD Ex tb IIIC T80 °C Db
Certification	LCIE 08 ATEX 6073 X IECEx LCIE 14.0005 X

Other approvals and certificates, see www.bartec.de

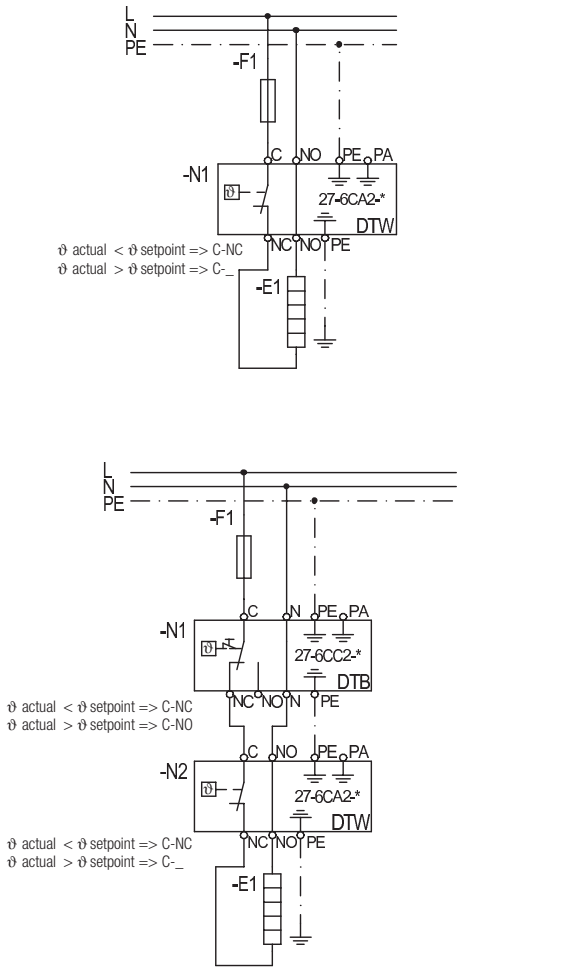
Technical data

Temperature setting range	-4 °C to +163 °C
Ambient temperature device	-40 °C to +60 °C
Operating temperature sensor	-40 °C to +215 °C
Storage temperature	-40 °C to +60 °C
Repeat accuracy	±1.7 K
Switching differential	temperature controller 5 K
Switching hysteresis	temperature limiter 10 K
Switching point	±4.5 K (accuracy at 50 °C sensor temperature and 21 °C ambient temperature (falling)
Capillary tube (made of stainless steel)	Length: 3000 mm Diameter: 2 mm Bending radius: 15 mm Operating temperature range: -50 °C to +215 °C
Sensor (made of stainless steel)	Length: 203 mm Diameter: 8 mm Operating temperature range: -50 °C to +215 °C
Weight	1.7 kg
Protection class	IP 65/NEMA 4, 7, 9
Terminals	Terminal screws 4/2.5 mm² AWG 10-14
Cable entries	2 x M25 threaded hole
Enclosure	Aluminium die-casting, coted, with internal lid seal

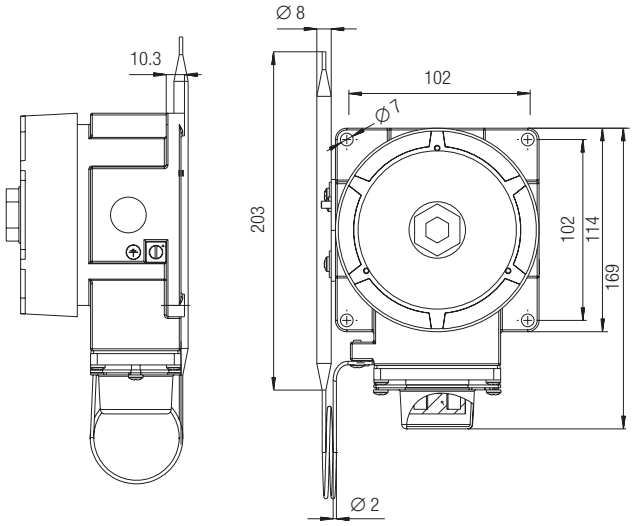
Electrical data

Rated voltage	AC 6/12/24/125/250/480 V, 50/60 Hz
Switching current	for monitor 22 A at AC 6/12/24/125/250/480 V for limiter 16 A at AC 6/12/24/125/250 V, 15 A at AC 480 V
Contact	1 SPDT, 100,000 switching cycles

Circuit diagram



Dimensions



Ordering information

DTW flame-proof temperature monitor	**27-6CA2-24112000**
DTB flame-proof temperature limiter	**27-6CC2-14112000**

Technical data subject to change without notice.

- Compact design
- High switching capacity
- Extremely adaptable to the surrounding conditions
- Protection class IP 65/66

This Mini-thermostat is used to monitor the ambient temperature of heating systems as well as for the control of internal temperatures inside protective transmitter boxes or control and switchgear cabinets. In addition, it can be used for the control (signalling) of too low or too high a temperature or as an alarm contact.

Structure

A temperature sensor is encapsulated in an explosion-proof metal tube. The standard version features an external M20 thread. You can choose either a version with a cast rubber cord or one that is directly mounted to an Ex terminal box. A special version is also available with a flange fixing.

Explosion protection

Marking	Ⓔx II 2G Ex d IIC T6 Gb Ⓔx II 2G Ex de IIC T6 Gb Ⓔx II 2D Ex tb IIIC T80 °C Db
Certification	EPS 14 ATEX 1 696
Other approvals and certificates, see www.bartec.de	

Technical data

Ambient temperature	-20 °C to +40 °C

Version with external thread or flange mounting

Protection class	IP 66/EN 60529
Supply cable	H05VV-F 3G 0.75 (AD 7.2 ± 0.8 mm) standard length 1 m
Enclosure material	nickel plated brass
Max. temperature at the connection	+70 °C

Electrical data

Switching capacity	AC 230 V/6 A
Switch contacts	1 normally closed contact as standard version (opens as the temperature rises) alternative configurations on request

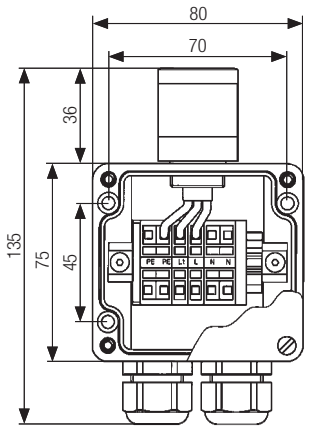
Version with junction box

Supply cable cross section	2.5 mm²
Material	junction box of polyester, black, glass-fibre reinforced
Protection class	IP 65/EN 60529

Electrical data

Temperature switch tolerances	14 °C ± 5 K 4 °C ± 3 K 25 °C ± 3.5 K 15 °C ± 3.5 K

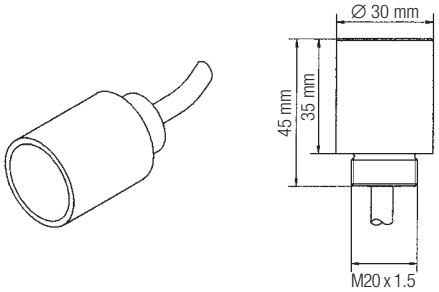
Dimensions



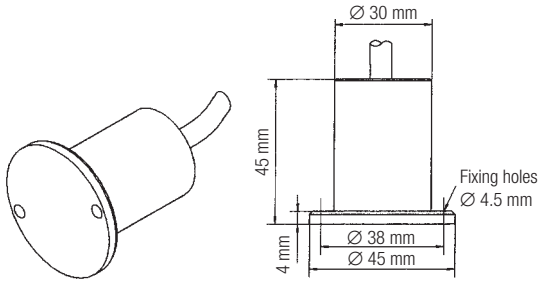
2 x cable entries M20 x 1.5
cable diameter D = 6 to 12 mm

Dimensions

with external thread

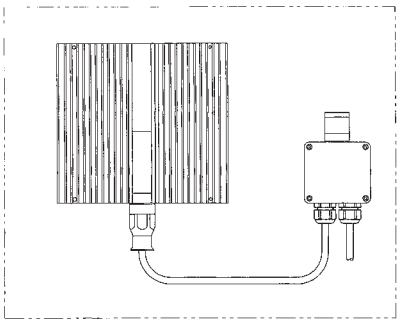


flange mounted

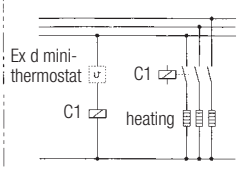


Typical application

Temperature sensor for Ex heating system in a control panel/enclosure



Frost control in an Ex area



Ordering information Simple device

Version	Switch-off temperature	Switch-on temperature	Code no.
with external thread M20	14 °C	4 °C	**07-6111-9425**
	25 °C	15 °C	**07-6111-9426**
with EEx e terminal box	14 °C	4 °C	**07-6111-9427**
	25 °C	15 °C	**07-6111-9428**
with flange mounting (special version)	14 °C	4 °C	**07-6111-9413**
	25 °C	15 °C	**07-6111-9414**

Technical data subject to change without notice.

- Very small construction
- ATEX gas and dust approval
- High switching current
- Wide operating temperature range
- Ready for connection, maintenance-free

The extremely compact BARTEC bimetallic thermostat integrated in a cable is mostly used in hazardous (potentially explosive) areas for applications in which devices are to be protected against frost. This thermostat can be used to regulate internal temperatures of switch and control cabinets, transmitter protection boxes, measuring equipment etc.. It can also be used to monitor (indicate) excessively high or low temperatures or also as an alarm contact. The application assures the greatest possible reliability because of the conformance to the required minimum temperatures.

Structure

The thermostat is built into a casting element and can be mounted either over the borehole in the mounting sheet or suspended freely in the air.

Function

The ambient temperature is measured through the surface of the thermostat. The integrated, explosion-proof bimetallic thermostat switches the connected heating in accordance with this ambient temperature.

Explosion protection

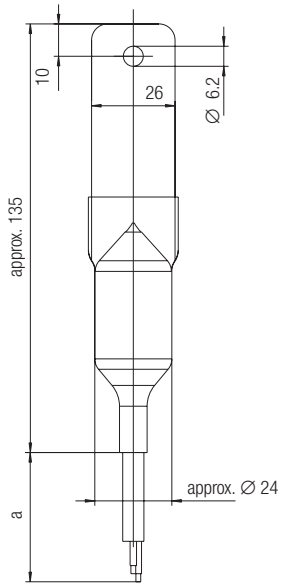
Marking	Ⓔx II 2G EEx m II T6 Ⓔx II 2D IP 65 T80 °C
Certification	PTB 04 ATEX 2113 X
Other approvals and certificates, see www.bartec.de	

Technical data

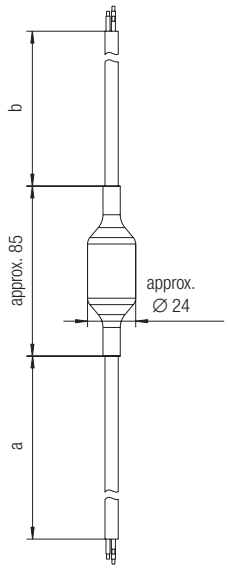
Thermostat connection points	10 °C ON/18 °C OFF (+/-3 ° K) (others on request)
Operating temperature range	-50 °C to +80 °C
Ambient temperature range	-50 °C to +80 °C
Switching voltage	max. AC 230 V (others on request)
Switching current	AC 10 A
Connection	Flexible cable EWKF 2 x 1.5 mm^2; ∅ 8.1 mm
Mounting	Through hole d = 6.2 mm at fixing plate resp. loose
Material	Casting cylinder, shrink fitting
Protection class	IP 65

Dimensions KTE-m (mm)

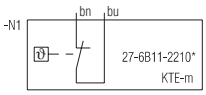
Picture 1



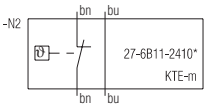
Picture 2



Circuit diagram



ϑ actual < ϑ setpoint => NC
ϑ actual > ϑ setpoint => NO



ϑ actual < ϑ setpoint => NC
ϑ actual > ϑ setpoint => NO

Ordering information

Type	Illustration	Switch-off temperature	Switch-on temperature	Cable length a/b	Mounting	Weight (netto)	Order no.
KTE-m 10	Picture 1	18 °C	10 °C	1 m	Fixing plate/ through hole d = 6 mm	0.2 kg	**27-6B11-2210/BZ00**
KTE-m 10	Picture 2	18 °C	10 °C	2 x 1 m	freely in the air	0.2 kg	**27-6B11-2410/BZ10**

Technical data subject to change without notice.

- Very small construction
- ATEX gas and dust approval
- High switching current
- Wide operating temperature range
- Ready for connection, maintenance-free

The compact BARTEC bimetallic thermostat integrated in a cable is mostly used in hazardous (potentially explosive) areas for applications in which devices are to be protected against frost. This thermostat can be inserted both for the outside temperature monitoring and for the regulation of interior temperatures of switch and control cabinets, transmitter protection boxes, measuring equipment etc. It can also be used to monitor (indicate) excessively high or low temperatures or also as an alarm contact. The application assures the greatest possible reliability because of the conformance to the required minimum temperatures.

Structure

The thermostat is built into an aluminum body. The thermostat can be installed either over the mounting hole with M6 thread or with the M20 connecting thread.

Function

The ambient temperature is measured through the surface of the thermostat. The integrated, explosion-proof bimetallic thermostat switches the connected heating in accordance with this ambient temperature.

Explosion protection

Marking	Ⓔx II 2G Ex db IIC T6 Ⓔx II 2D Ex tb IIIC T80 °C
Certification	PTB 04 ATEX 1064 X IECEx PTB 14.0016

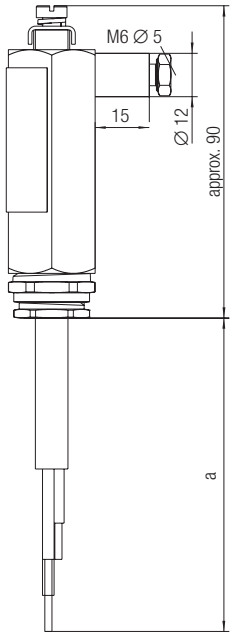
Other approvals and certificates, see www.bartec.de

Technical data

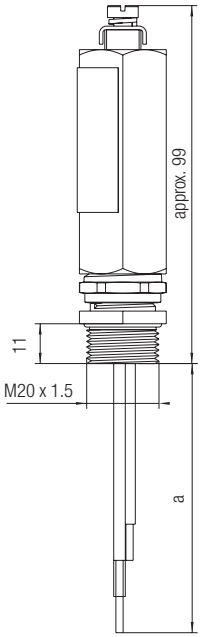
Thermostat connection points	10 °C ON/18 °C OFF (+/- 3 ° K) (others on request)
Operating temperature range	-50 °C to +180 °C
Ambient temperature range	-50 °C to +60 °C
Switching voltage	max. AC 250 V (others on request)
Switching current	AC 10 A
Connection	Flexible cable EWKF 3 x 1.5 mm²; ∅ 8.1 mm or single cores
Mounting	M6 internal thread/through hole d = 5 mm or M20 connection thread
Material	black anodised aluminium, seawater proof
Protection class	IP 68

Dimensions KTE-d

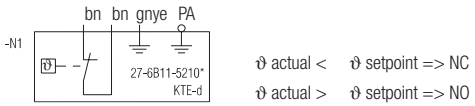
Picture 1



Picture 2



Circuit diagram



Ordering information

Type	Illustration	Switch-off temperature	Switch-on temperature	Cable length a/b	Mounting	Weight (netto)	Order no.
KTE-d 10	Picture 1	18 °C	10 °C	1 m	M6 internal thread/ through hole d = 5 mm	0.2 kg	**27-6B11-5210/BZ00**
KTE-d 10 M20	Picture 2	18 °C	10 °C (single core)	0.1 m	M20 external thread	0.1 kg	**27-6B11-5201/BZ000001**

Technical data subject to change without notice.

- Very small construction
- Frost-protection

This mini-thermostat is used both for monitoring the temperature outside the heating systems and also for regulating the temperature inside transmitter protection boxes or switch and control cabinets. It can also be used for monitoring (indicating) temperatures that are too high or too low and it can serve as an alarm contact.

Technical data

Protection class	IP 66/EN 60529
Connection strands	2 x H07G-K 1.5 mm; 0.5 m long
Enclosure material	Polyamide
Max. temperature at the site of utilisation	+70 °C
Min. storage temperature	-20 °C

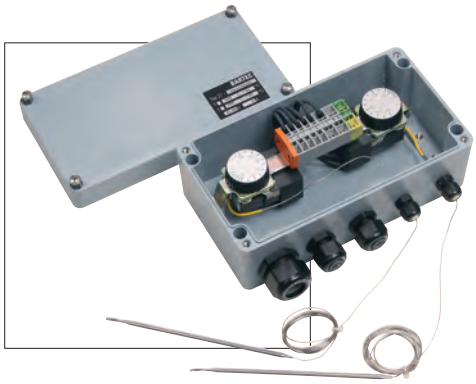
Electrical data

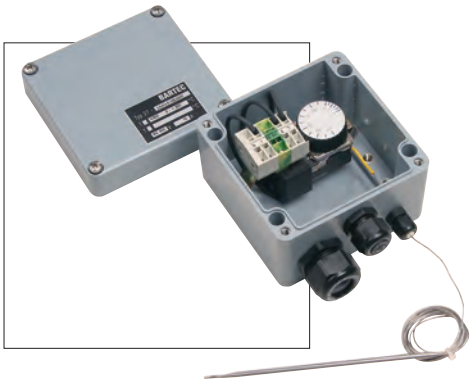
Switching capacity	AC 230 V/6 A
Contact element	N/C contact (opens when temperature increases)
Tolerance for switching points	14 °C ± 5 K 4 °C ± 3 K 25 °C ± 3.5 K 15 °C ± 3.5 K

Ordering information Temperature switching points

+4 °C to +14 °C	**05-0060-0087**
+15 °C to +25 °C	**05-0060-0088**

Technical data subject to change without notice.





- 16 A switching capacity
- Compact enclosure
- Double units are standard

The weather-proof capillary tube thermostat, KRM, is a mechanical change-over controller housed in a polyester enclosure. Heaters, fans, motors and other equipment are energised and de-energised when temperatures fall below or rise above certain limits. It can also be used to control the temperature in air, liquids and on various surfaces.

Function

Any change in temperature at the sensor causes a change in the volume of fluid in the measuring system, which in turn results in a movement of the diaphragm membrane. This membrane is connected to a mechanical device that activates a microswitch. If the temperature at the sensor bulb exceeds the pre-set value, terminals 1 and 2 are opened. If the temperature falls below the minimum setting, the contacts automatically close.

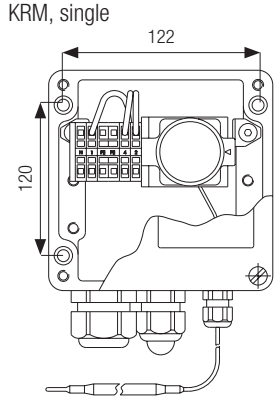
Application example

The KRM thermostat can directly switch temperature-dependent equipment loads (heaters etc.) of up to 16 A. Higher switching currents of 3-phase applications are switched by means of a contactor.

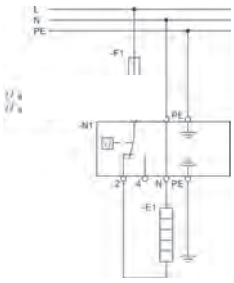
Technical data

Temperature setting range	0 °C to +100 °C	0 °C to +300 °C
Rated voltage	AC 400 V/50 Hz	AC 400 V/50 Hz
Switching capacity	AC 230 V/16 A AC 400 V/10 A	AC 230 V/16 A AC 400 V/10 A
Supply cable, cross section	2.5 mm^2	2.5 mm^2
Protective earth terminal	4 x 2.5 mm^2	4 x 2.5 mm^2
Switching differential	approx. 3 K	approx. 8 K
Protection class according to EN 60529	IP 65	IP 65
Capillary tube length	1600 mm	1600 mm
Min. bend radius	20 mm	20 mm
Max. sensor temperature	+115 °C	+345 °C
Min. sensor temperature	-40 °C	-15 °C
Sensor diameter	6 mm	4 mm
Sensor length	140 mm	165 mm
Sensor material	SS	SS
Cable glands	1 x M25, clamping range 9 to 16 mm 1 x M20, clamping range 6 to 12 mm	
Cable glands KRM, single	1 x M25, 1 x M20	1 x M25, 1 x M20
KRM combination	1 x M25, 2 x M20 (2 x M20 blanking plug included)	1 x M25, 2 x M20 (2 x M20 blanking plug included)

Dimensions (mm)
KRM, single

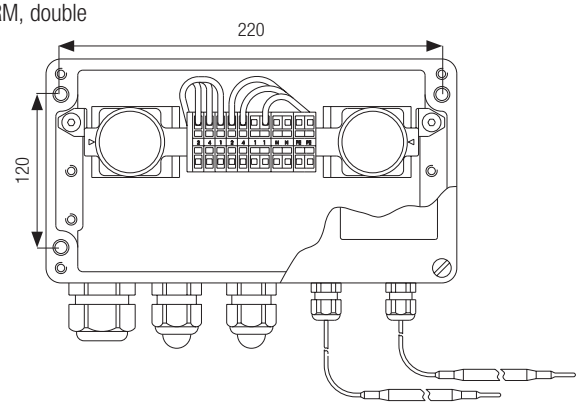


Circuit diagram

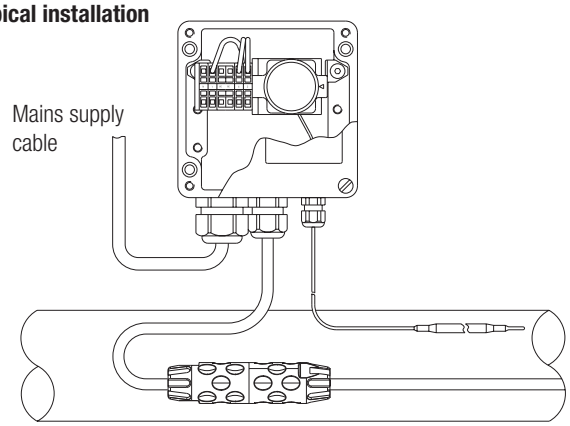


ϑ actual < ϑ setpoint => NC 1 - 4
ϑ actual > ϑ setpoint => NO 1 - 2

Dimensions (mm)
KRM, double



Typical installation



Ordering information

Designation	Dimensions (mm)	Temperature setting range	Order no.
1 thermostat in polyester enclosure GRP	122 x 120 x 90	0 °C to +100 °C	**27-6AA3-61522000**
1 thermostat in polyester enclosure GRP	122 x 120 x 90	0 °C to +300 °C	**27-6AA3-615B2000**
2 thermostats in polyester enclosure GRP	220 x 120 x 90	2 x 0 °C to +100 °C	**27-6AK3-61622000**
2 thermostats in polyester enclosure GRP	220 x 120 x 90	2 x 0 °C to +300 °C	**27-6AK3-616B2000**
2 thermostats in polyester enclosure GRP	220 x 120 x 90	1 x 0 °C to +100 °C 1 x 0 °C to +300 °C	**27-6AK3-61602P2B**

Technical data subject to change without notice.

DEPU serves as complete solution for pipe heating and provides temperature control, limitation and power output control in one device. DEPU is ATEX-certified and approved for use in potentially explosive areas.

- Complete solution for trace heating: controller, limiter and power setpoint adjustment all in one unit
- Alteration of adjusting parameters also possible in potentially explosive areas
- Current carrying capacity 25 A
- Fault-free full wave control
- Sensor input, intrinsically safe
- Allows easy output adaptation to heating circuit changes

Structure
All functional units are integrated in a standard Ex e aluminium enclosure. Connection to mains is established through 6 mm² tension clamp terminals.

Function
The controller is designed as a ON/OFF controller and measures the temperature through RTD sensor inputs. The limiter works as an independent system and measures the temperature at the hot spot with its own sensor. If the temperature exceeds the limit value the limiter interrupts the heating circuit permanently from mains and a fault alarm signal is given.

The power output controller works in interference free full wave control mode by means of a semi-conductor relay. Two 7-segment displays guarantee good readability of the controller and limiter temperature values through the lid's window.

Explosion protection

Marking	Ⓔx II 2G EEx m e ib [ib] IIC T4
Certification	TÜV 03 ATEX 2088
Other approvals and certificates, see www.bartec.de	

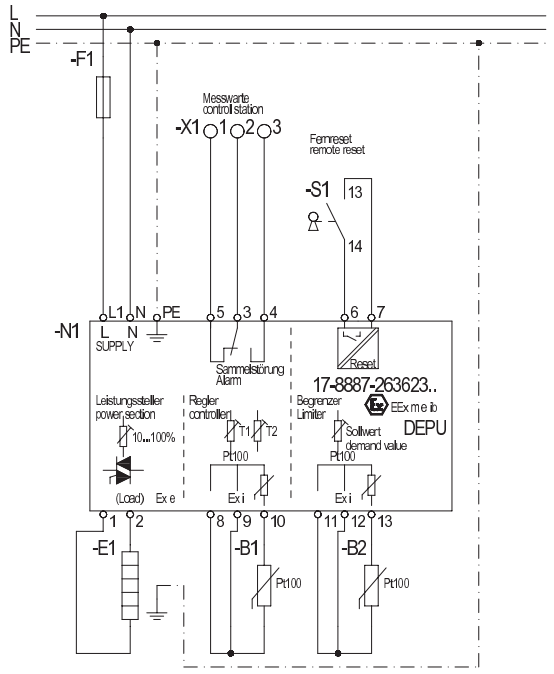
Technical data

Enclosure	Standard enclosure of aluminium, grey
Protection class	IP 65
Terminals	Wago cage clamp
Cable entries	Mains supply line 1 x M25 (M32 opt.) Heating cable/cold end 1 x M20 Fault alarm 1 x M20 Remote reset 1 x M20 Sensor 2 x M16
Storage temperature	-30 °C to +70 °C
Ambient temperature	-20 °C to +40 °C
Weight	6 kg
Guidelines	Directive 94/9/EG, NAMUR NE 21, EN 50020, EN 50019, EN 50028, EN 50014

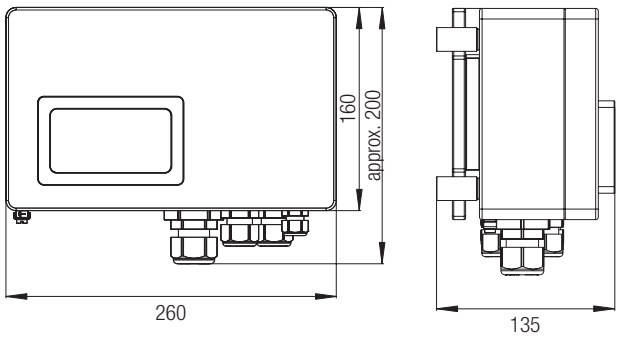
Electrical data

Supply voltage	AC 230 V +10 %/-15 % (50 to 60 Hz) (special voltage 254 V on request)
Rated current - power setpoint adjuster	max. 25 A
Power consumption	no load P = 11 VA full load P_{max} = 5.7 kVA
Relay outputs	Master fault control-1 changeover contact, 250 V/5 A
Measuring input (intrinsically safe)	Pt100 (2 or 3 conductors)
Measuring range Pt100	0 °C to +450 °C
Resolution/measuring accuracy	1 K

Circuit diagram



Dimensions (mm)



Ordering information

DEPU	**17-8887-2636/2300**
3-wire Pt100 up to 200 °C	**03-9040-0006**
3-wire Pt100 up to 400 °C	**03-9040-0016**

Technical data subject to change without notice.

- Universal power supply
- Sensor monitoring
- Can be used in conjunction with Pt100 Ex, for temperature regulation in explosion-protected heating circuits

The DPC$_{front}$ temperature control device series con-sists of three standardised temperature control de-vices that are adapted to the (trace) heating applications. Having two 7-segment displays, the operator can read both set- and measured temperature at first sight. By pressing a single button, the controllers power output is displayed, allowing an evaluate of the heating circuits quality. The control devices can act as ON/OFF or PID control devices. If desired, the autotuning function will automatically determine the optimum (PID) adjusting parameters for the control path. In all models the regulation can be switched off for maintenance work by pressing a single button. On account of the wide-range voltage input the devices can be used almost everywhere in the world.

DPC$_{front}$ Standard	Pre-parameterisation as ON/OFF controller
	Also usable as a PID controller
	Pt100, mV standard signals, thermocouples
DPC$_{front}$ Komfort	Pre-parameterisation as a PID controller
	Also usable as ON/OFF controller
	Pt100, mV standard signals, thermocouples
	Process-value feedback through 4 to 20 mA analog output
DPC$_{front}$ Monitor	Pre-parameterisation as a PID controller
	Heating current monitoring
	Universal measuring input
	Process-value feedback through 4 to 20 mA analog output
	RS485 interface/Modbus RTU

Assembly

The control device is mounted into the front panel. The compact dimensions of the front (48 x 48 mm) allow a space-saving control cabinet design. The electrical connection is set up through terminal screws on the rear.

Function

Temperature alterations in the sensor are evaluated in the DPC$_{front}$ and shown as temperature readings on the top LED display. If the reading falls short of or exceeds the temperature value that can be seen in the bottom LED display, the output being used will automatically switch itself on or off to set the manipulated variable to the required value. To monitor the temperature, a high & low alarm function is pre-programmed. The devices detect malfunctioning at the sensor and in the control circuit and report these as faults. Each type of alarm is signalled as a group alarm via a relay.

Technical data

Operating temperature range	0 °C to +50 °C
Storage temperature	-10 °C to +60 °C
Dimensions (L x W x D)	48 mm x 48 mm x 108 mm
Installation	Front panel (Cut-out 45.5 mm x 45.5 mm)
Weight	180 g
Protection class	IP 54 or IP 65 with installation sealing
Terminals	Terminal screws 2 x 1.5 mm^2
Enclosure material	Plastic UL 94 V0

Electrical data

Nominal voltage	AC 100 V to AC 240 V +/- 10 % 50/60 Hz

- Pre-defined parameters for two-position control
- Can also be used as PID control devices
- Easy Setup

Basic control device that can be used in the factory setting as ON/OFF control device with two relay outputs for regulation and alarm signalling for normal applications. Due to the factory basic setting only the setpoint and the alarm value(s) need to be set. The Easy Start-up function makes this extremely user-friendly. As an alternative, the same device can also be used as a control device with PID control characteristics and an external semi-conductor relay.

Technical data

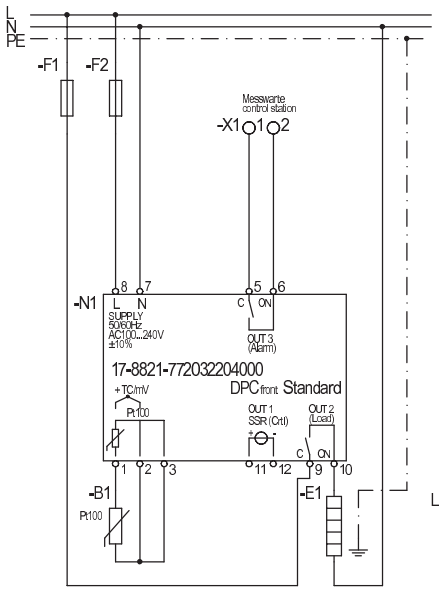
Control characteristics	ON/OFF or PID
Sensor input	Pt100, mV standard signals, thermocouple J,K,S
Input impedance	at mV: 1 MΩ
Measuring ranges	depending on the sensor version
Measuring accuracy in resistance thermometers	±0.5 % of the actual value or ±1 °C; the higher value applies ±1 digit
in thermocouples	±0.5 % of actual value or ±1 °C; the higher value applies ±1 digit (see also reference junction accuracy)
in standard signals	(±0.5 % of actual value) ±1 digit
Accuracy of the reference junction in thermocouple measurements	0.04 °C for each °C operating temperature of the control device (after 20 min. operating time of the control device)
Sampling frequency at the sensor input	7.5 Hz
Output 1	Logic output for SSR control (DC 11 V/20 mA)
Output 2	Relay output 1 normally open contact (8 A - AC 1, 250 V)
Output 3	Relay output 1 normally open contact (5 A - AC 1, 250 V)
Electrical service life of the relay outputs	at least 100.000 switching cycles
Protection class	II
Power consumption	max. 5 VA (depending on connection of outputs)
Weight	0.2 kg

Ordering information

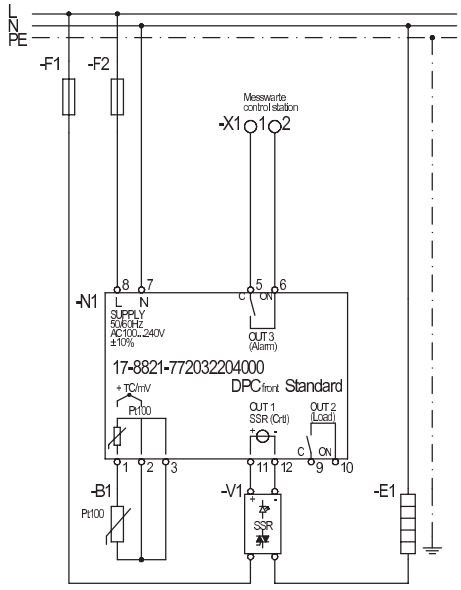
DPC$_{front}$ Standard	**17-8821-7720/32204000**

Technical data subject to change without notice.

Circuit diagram DPC$_{front}$ Standard as ON/OFF control device



Circuit diagram DPC$_{front}$ Standard as PID control device



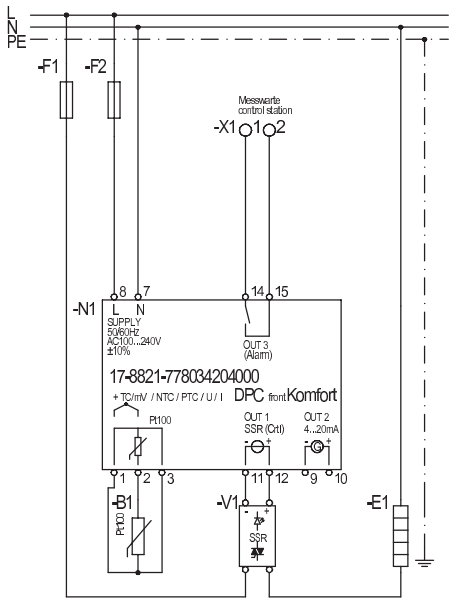
- Process-value feedback by 4 to 20 mA analog output
- Logic output for SSR
- Universal measuring input
- Very good measuring accuracy

The DPC$_{front}$ Komfort temperature control device is designed with extra convenient features. In the factory setting it works as a PID Control device with a logic output and a relay output. As an alternative, the same device can also be used as a ON/OFF controller. For regulation the device uses a logic output for solid state relays. The relay output is used for alarm signalling. The high and low alarm function, sensor monitoring and heating circuit monitoring offer additional safety for the temperature regulation. When using the device with the factory setting, a simple setup with just a few buttons is used to start operation for the first time. It is only necessary to set the setpoint, analog output limits, low alarm, and if required, high alarm.

Technical data

Control characteristics	PID or ON/OFF
Sensor input	Pt100, NTC, PTC Standard signals 4 to 20 mA; 0/1 to 5 V, 0/2 to 10 V Standard signals 0 to 50 mV, 0 to 60 mV, 12 to 60 mV Thermocouple J, K, S (etc.)
Input impedance	at 4 to 20 mA 51 Ω, at mV 1 MΩ
Measuring ranges	depending on the sensor version
Measuring accuracy with resistance thermometers	± 0.15 % of actual value or ± 1 °C; (the higher value applies) ± 1 digit
with thermocouples	± 0.15 % of actual value or ± 1 °C; (the higher value applies) ± 1 digit (see in addition reference junction accuracy
with standard signals	± 0.15 % of actual value ± 1 digit
Accuracy of reference junction with thermocouple measurements	0.04 °C for each °C of the control device's operating temperature (after 20 min. of the control device's operating time)
Sampling frequency at the sensor input	7.5 Hz
Output 1	Logic output for SSR control (DC 20 V/20 mA)
Output 2	Analog output 4 to 20 mA, maximum load: 300 Ω
Output 3	Relay output 1 normally open contact (5 A - AC 1, 250 V)
Output auxiliary supply	DC 12 V/max. 20 mA
Electrical service life of the relay outputs	at least 100.000 witching cycles
Protection class	II
Power consumption	max. 5 VA (depending on connection of outputs)
Weight	0.2 kg

Circuit diagram



Ordering information

DPC$_{front}$ Komfort	**17-8821-7780/34204000**

Technical data subject to change without notice.

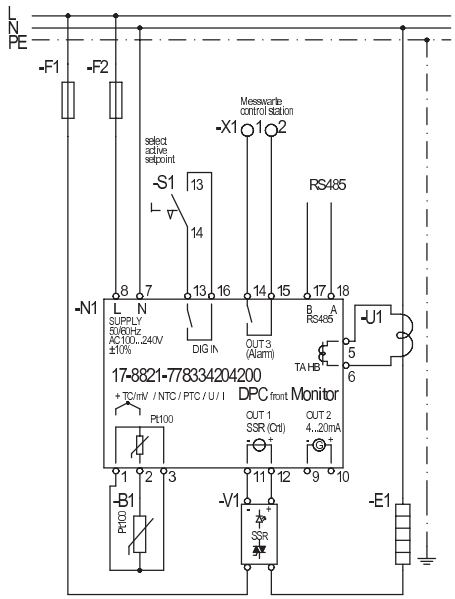
- Process-value feedback by 4 to 20 mA analog output
- Logic output for SSR
- Universal measuring input
- Modbus RTU
- Very good measuring accuracy

The DPC$_{front}$ Monitor temperature control device is designed as a control device with special functions: heating current monitoring, external setpoint switching and communication through RS 485. It works in the factory setting as a PID control device with a logic output and a relay output. As an alternative, the same device can also be used as a ON/OFF control device. The device is used to regulate a logic output for solid state relays. The relay output is used for alarm signalling. In addition a digital input can be used to choose between different setpoints. The high and low alarm function, sensor monitoring, heating circuit monitoring and heating current monitoring offer additional safety for temperature regulation. When using the device with the factory setting, a simple setup is used for putting into operation for the first time. For example the setpoint, analog output limits, heating currents, low alarm, and if desired, the high alarm must be set.

Technical data

Control characteristics	PID or ON/OFF
Sensor input	Pt 100, NTC, PTC Standard signals 4 to 20 mA; 0/1 to 5 V, 0/2 to 10 V Standard signals 0 to 50 mV, 0 to 60 mV, 12 to 60 mV Thermocouple J, K, S (etc.)
Input impedance	at 4 to 20 mA 51 Ω, at mV 1 MΩ
Input impedance	depending on the sensor version
Measuring accuracy with resistance thermometers	± 0.15 % of actual value or ± 1 °C, the higher value applies ± 1 digit
with thermocouples	± 0.15 % of actual value or ± 1°C, the higher value applies ± 1 digit (see in addition reference junction accuracy)
at standard signals	± 0.15 % of actual value ± 1 digit
Accuracy of reference junction with thermocouple measurements	0.04 °C for each °C of the control device's operating temperature (20 min. of the control device's operating time)
Sampling frequency at the sensor input	7.5 Hz
Current transformer input	max. 50 mA
Digital input	on-floating, i. e. floating contact required
Output 1	Logic output for SSR control (DC 20 V/20 mA)
Output 2	Analog output 4 to 20 mA, maximum load: 300 Ω
Output 3	Relay output 1 normally open contact (5 A - AC 1, 250 V)
Output auxiliary supply	DC 12 V/max. 20 mA
Electrical service life of the relay outputs	At least 100.000 switching cycles
Interface	RS485 (optically isolated)
Communikation protocol	Modbus RTU
Transmission speed	1200 to 38400 bauds
Protection class	II
Power consumption	max. 9 VA (depending on connection of outputs)
Weight	0.2 kg

Circuit diagram



Ordering information

DPC$_{front}$ Monitor	**17-8821-7783/34204200**

Technical data subject to change without notice.

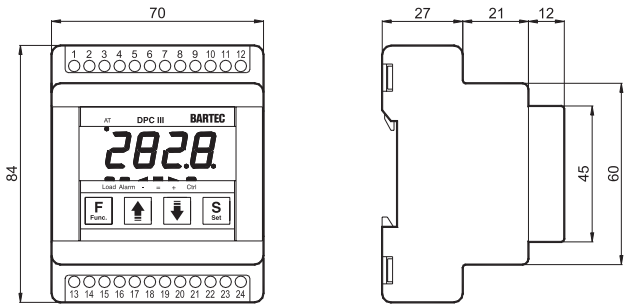
DPC III Standard

DPC III Monitor

The DPC III temperature controller series consists of two standardised temperature controllers which are suited to (trace) heating applications. The digital controller monitors measuring circuits for sensor failures, interruption or short circuit and under-range and over-range measurements in order to ensure process reliability. The DPC III can be used universally as an ON/OFF or PID controller. The integrated wide-range voltage input allows the devices to be used practically anywhere in the world.

- Optimised for trace heating applications
- Universal power supply
- Sensor monitoring
- Programmable with CodeKey
- Can be used in conjunction with Pt100 Ex for temperature regulation in explosion-protected heating circuits

Dimensions (mm)



Assembly

The DPC III is integrated in a snap-on housing for TS 35 DIN rail mounting. Pt100 resistance thermometers and thermocouples are connected at the measuring input. The controller is equipped with a 16 A load relay for ON/OFF control, an 8 A group error message relay, a logical voltage output for the PID control and two programmable digital inputs. The voltage for the controller is supplied through an integrated power pack with universal power supply. The electrical connection is established with terminal screws operating on the screw cage clamp principle.

Function

Changes in temperature at the Pt100 sensor are evaluated in the DPC III and are visible as temperature readings on the LED display. If a deviation from the preset level is detected, the device regulates the heating circuit of the trace heating in accordance with the pre-selected control characteristic (ON/OFF or PID). An auto-tuning function, available for the PID control, analyses the control path (heating circuit) and automatically determines and saves the PID control parameters. The control's output power can be displayed at the touch of a button. One of the benefits of this function is the possibility of evaluating the quality of the heating circuit. In addition to the control parameters, customized high- and low-temperature alarms can be set by the operators. For servicing purposes, the heating circuit can be switched off on the device or through digital input.The temperature alarms can also be disabled. The process reliability is further enhanced by the control circuit's additional monitoring functions and the connected measurement sensor. The programming interface allows the device parameters to be read out with a code key and transferred to other controllers. For effective parameter protection a multi-stage password management system can be activated. Furthermore, the manual control or soft start functions can be activated for the system start-up.

- Pre-defined parameters for two-position controller
- Easy setup, fast commissioning
- Load relay/alarm relay/logic output for semi-conductor relay

The DPC III Standard Temperature Controller is a basic controller, which in the factory setting can be used as a two-position controller with two-relay outputs for control and alarm signalling for standard applications. Due to the default basic setting only the setpoint and the alarm level(s) need to be set. The easy start-up function makes this extremely user-friendly. As an alternative, the same device can also be used as a controller with PID control characteristics and an external semi-conductor relay.

Technical data

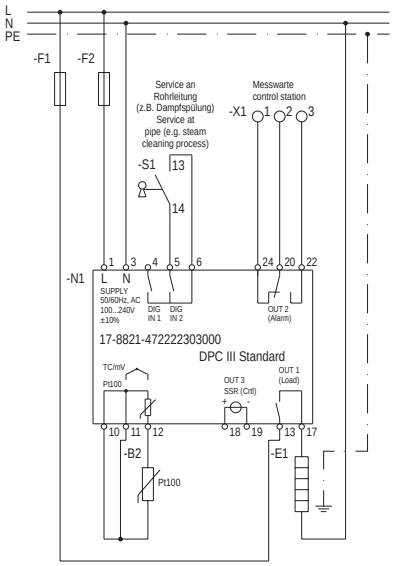
Control characteristic	ON/OFF, PID
Sensor input	Pt100, mV Standard signals Thermocouple J, K, S
Inputs impedance	at mV: 1 MΩ
Measuring ranges	depending on the sensor version
Measuring accuracy with resistance thermometers	(±0.5 % of the actual level or ±1 °C; the higher level applies) ±1 digit
with thermocouples	(±0.5 % of the actual level or ±1 °C; the higher level applies) ±1 digit (see additional reference junction accuracy)
Accuracy of the reference junction with thermocouple measurement	0.04 °C for each °C of the controller's operating temperature (after 20 min. of controller operating time)
Sampling frequency at the sensor input	7.5 Hz
Ambient temperature range	0 °C to +50 °C
Weight	0.2 kg
Digital input	two, non-floating, i. e. floating contact(s) required (contact loadability minimum 5 V, 5 mA)
Output 1	Relay output 1 normally open contact (16 A - AC 1, 250 V)
Output 2	Relay output 1 change-over contact (8 A - AC 1, 250 V)
Output 3	Logic output for SSR control (DC 11 V/20 mA)
Electrical service life of the relay outputs	At least 100,000 switching cycles
Protection class	II
Power consumption	max. 5 VA (depending on the output connection)

Ordering information

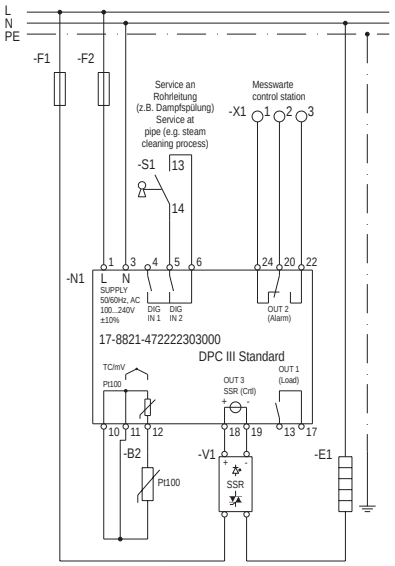
Supply voltage	Order no.
AC 100 to 240 V	**17-8821-4722/22303000**
AC/DC 24 V	**17-8821-4C22/22303000**

Technical data subject to change without notice.

Circuit diagram DPC III Standard as two-position controller



Circuit diagram DPC III Standard as PID controller



2

- Pre-defined parameters for two-position controller
- Easy setup, fast commissioning
- Load relay/alarm relay/logic output for semi-conductor relay
- RS 485 Modbus

The DPC III Monitor Temperature Controller is a basic controller which in the factory setting can be used as a ON/OFF controller with two relay outputs for control and alarm signalling for standard applications. Due to the default basic setting only the setpoint and the alarm level(s) need to be set. The easy start-up function makes this extremely user-friendly. As an alternative, the same device can also be used as a controller with PID control characteristics and an external semi-conductor relay. The monitor version is equipped with an RS485 interface and MODBUS protocol.

Technical data

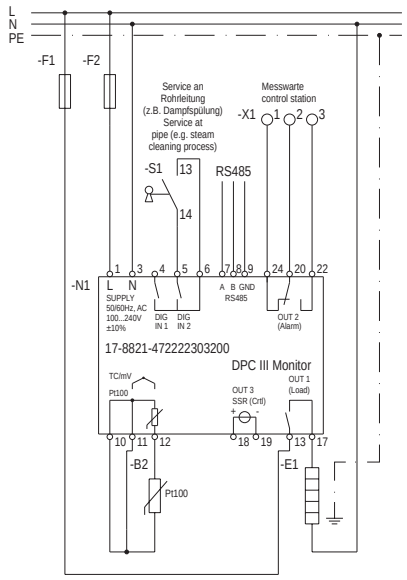
Control characteristic	ON/OFF, PID
Sensor input	Pt100, mV Standard signals Thermocouple J, K, S
Inputs impedance	at mV: 1 MΩ
Measuring ranges	depending on the sensor version
Measuring accuracy at resistance thermometers	(± 0.5 % of the actual level or ± 1 °C; the higher level applies) ± 1 digit
with thermocouples	(± 0.5 % of the actual level or ± 1 °C; the higher level applies) ± 1 digit (see additional reference junction accuracy)
Accuracy of the reference junction with thermocouple measuring	0.04 °C for each °C of the controller's operating temperature (after 20 min. of controller operating time)
Sampling frequency at the sensor input	7.5 Hz
Ambient temperature	0 °C to +50 °C
Weight	0.2 kg
Digital input	two, non-floating, i. e. floating contact(s) required (Contact loadability at least 5 V, 5 mA)
Output 1	Relay output 1 normally open contact (16 A - AC 1, 250 V)
Output 2	Relay output 1 change-over contact (8 A - AC 1, 250 V)
Output 3	Logic output for SSR control (DC 11 V/20 mA)
Electrical service life of the relay outputs	At least 100,000 switching cycles
Protection class	II
Power consumption	Max. 5 VA (depending on the connection of the outputs)
Interface	RS485 (optically isolated)
Communication protocol	Modbus RTU
Transmission speed	1200 to 38400 bauds

Ordering information

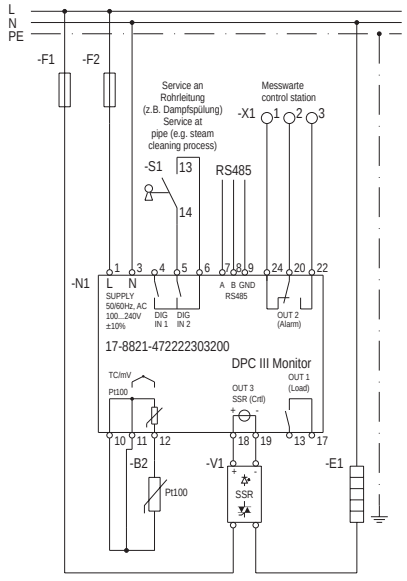
Supply voltage	Order no.
AC 100 to 240 V	**17-8821-4722/22303200**
AC/DC 24 V	**17-8821-4C22/22303200**

Technical data subject to change without notice.

Circuit diagram DPC III Monitor as two-position controller



Circuit diagram DPC III Monitor as PID Controller



- ATEX approved limiter
- Optimised for trace heating applications (with service contact)
- In conjunction with Pt100 Ex, it can be used for monitoring temperature in explosion-protected heating circuits

The DTL III Ex digital temperature limiter, which is adapted to (trace) heating applications, serves to monitor heating and heating circuits. The device is installed in the non-hazardous area. The heating or heating circuits can be installed both in media-protected and also in hazardous areas. Thanks to their integrated power supply unit with wide-range voltage, the devices can be used almost everywhere in the world.

Explosion protection

Marking	Ⓔx II (2)GD [Ex e II]
Certification	TÜV 08 ATEX 554871
Other approvals and certificates, see www.bartec.de	

Technical data

Mode of Operation	limiting function
Sensor input	Pt100
Measuring range	-200 °C to +850 °C
Measuring accuracy	(± 0.5 % of the actual value or ± 1 °C; the higher level applies) ± digit
Sampling frequency at the sensor input	7.5 Hz
Ambient temperature range	0 °C to +50 °C
Weight	0.2 kg
Digital inputs	Input 1 - remote RESET Input 2 - SERVICE Non-floating, i. e. floating contact(s) required (contact loadability minimum 5 V, 5 mA)
Output 1 (load output)	Relay output 1 normally open contact (AC 250 V, 16 A - cos φ = 1)
Output 2 (alarm output)	Relay output 1 change-over contact (AC 250 V, 8 A - cos φ = 1)
Electrical service life of the relay outputs	Minimum of 100,000 switching cycles
Protection class	II
Power consumption	Max. 4 VA

Ordering information

Supply voltage	Order no.
AC 100 to 240 V	**17-8865-4722/22003000**
AC/DC 24 V	**17-8865-4C22/22003000**

Technical data subject to change without notice.

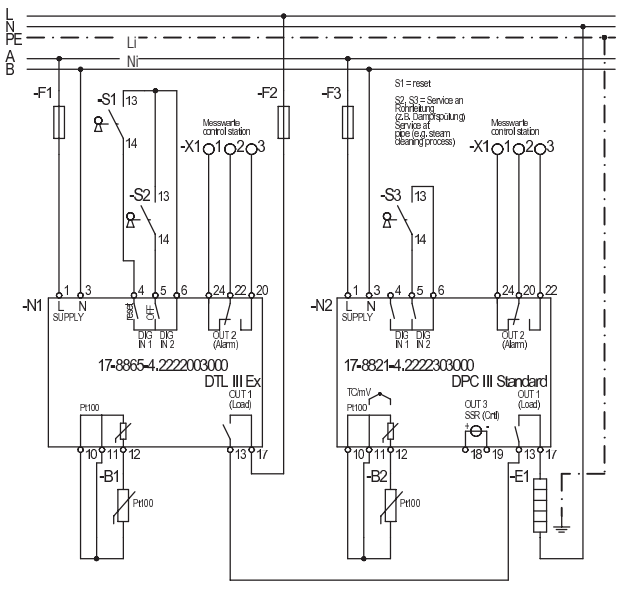
Function

If the temperature at the Pt100 exceeds the set limit value, the DTL III Ex permanently interrupts the normally closed 16 A switch contact. This situation is detected by a volt-free alarm contact (change-over contact) and passes on the signal to the control panel. After a temperature drop of 5 K below the limit set point, or after a fault has been remedied, the limiter can be re-activated by means of a re-set button on the device itself or via a remote re-set control. The DTL will also interrupt the switch contact in the event of a sensor open or short circuit. Process reliability is increased by additional monitoring functions such as supply voltage monitoring, pre-alarm, measuring circuit monitoring for sensor break, interruption and short-circuit as well as undershooting/overshooting of the measuring range. A multi-stage password management is available for effective parameter protection. When doing service work on the heating circuit, the load output can be turned off by means of a digital input and the temperature alarms can be disabled. Using the programming interface, the device parameters can be read out with a programming key and transmitted to other devices.

Structure

The DTL III Ex is integrated in a latch-on enclosure for TS 35 mounting rails. The alarm relay is produced as a change-over contact and the limit relay as a normally open contact. The voltage is supplied to the control device through an integrated power supply unit with wide-range voltage. The electrical connection is established with terminal screws operating on the screw cage clamp principle, ensuring a safe connection that is gentle on conductors.

Circuit diagram



- Easy programming of DPC devices
- Operation independent of voltage supply
- SMART converter function USB/RS485

The DPC CodeKey makes it easier to set parameters for the DPC device family. Once a reference device has been successfully programmed, the operating parameters are available in a device-memory read-out. The parameters filed in the CodeKey can be copied into other devices any number of times. This reduces the programming work to a minimum. In addition, the CodeKey can be used as an interface converter between the USB and RS485.

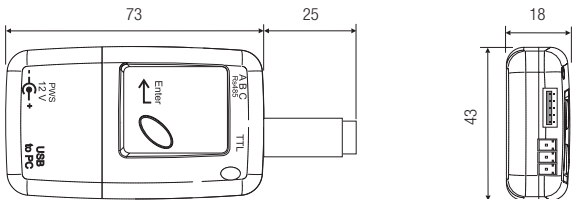
Technical data

Voltage supply (external, optional)	DC 9 V to 12 V via 1.3 mm jack
Operating temperature	0 °C to +50 °C
Storage temperature	-20 °C to +70 °C
Air humidity	20 % to 80 % relative humidity
Degree of contamination	2
Interfaces	RS 485 not insulated, Phoenix MC 1.5/3-G-3.5 3 m max. cable length Baud rate: 1200 to 38400 baud TTL not insulated, JST S 5B-PH-KL - 2 mm 3 m max. cable length baud rate: 1200 to 38400 baud

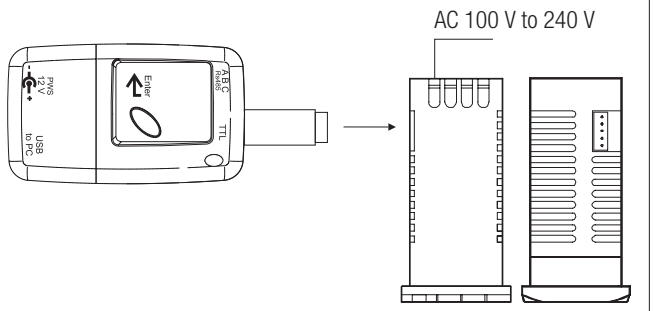
Mode of Operation

A DIP switch can be used to select the device function required. The DPC$_{front}$ and DPC III have at the side or under the display cover a 5-pin interface into which the CodeKey is inserted. The transmission is started at the press of a button. Once done, a status LED flashes. Voltage is supplied to the CodeKey through the interface.

Dimensions (in mm)



Connection example with DPC$_{front}$



Ordering information

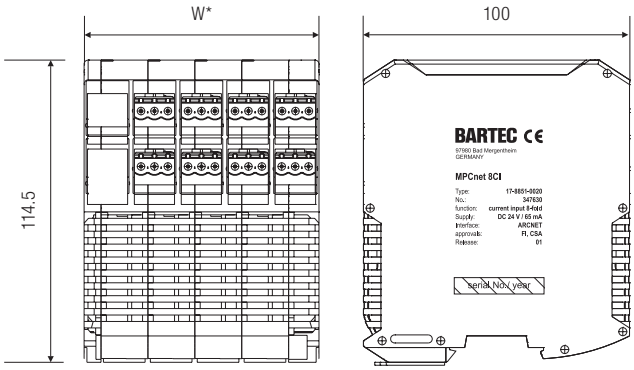
for DPC III, DTL III Ex and DPC$_{front}$ Standard	**05-0089-0074**
for DPC$_{front}$ Komfort and DPC$_{front}$ Monitor	**05-0089-0075**

Technical data subject to change without notice.

MPC[net] is a versatile and flexible system for controlling and monitoring electric trace heating applications. The construction of the control system is based on standard I/O bus systems and was developed specially to meet the demands of electric trace heating. The system is modular and can be adapted to the respective application's specific requirements by combining individual modules. MPC[net] enables solutions extending from simple temperature recording systems to centrally controlled temperature regulation, limitation and monitoring. The system is easy to plan and configure. PLC programming skills are not necessary. The software and touch panel make it simple for the operator to set parameters for the individual heating circuits.

- Simple system design
- Predictive maintenance
- Stepless power setpoint adjustment from 10 % to 100 %
- Cuttable to specific lengths: EKL and EMK, similar to BARTEC's SLHBs
- Programming skills not nessesary

Dimensions (in mm)



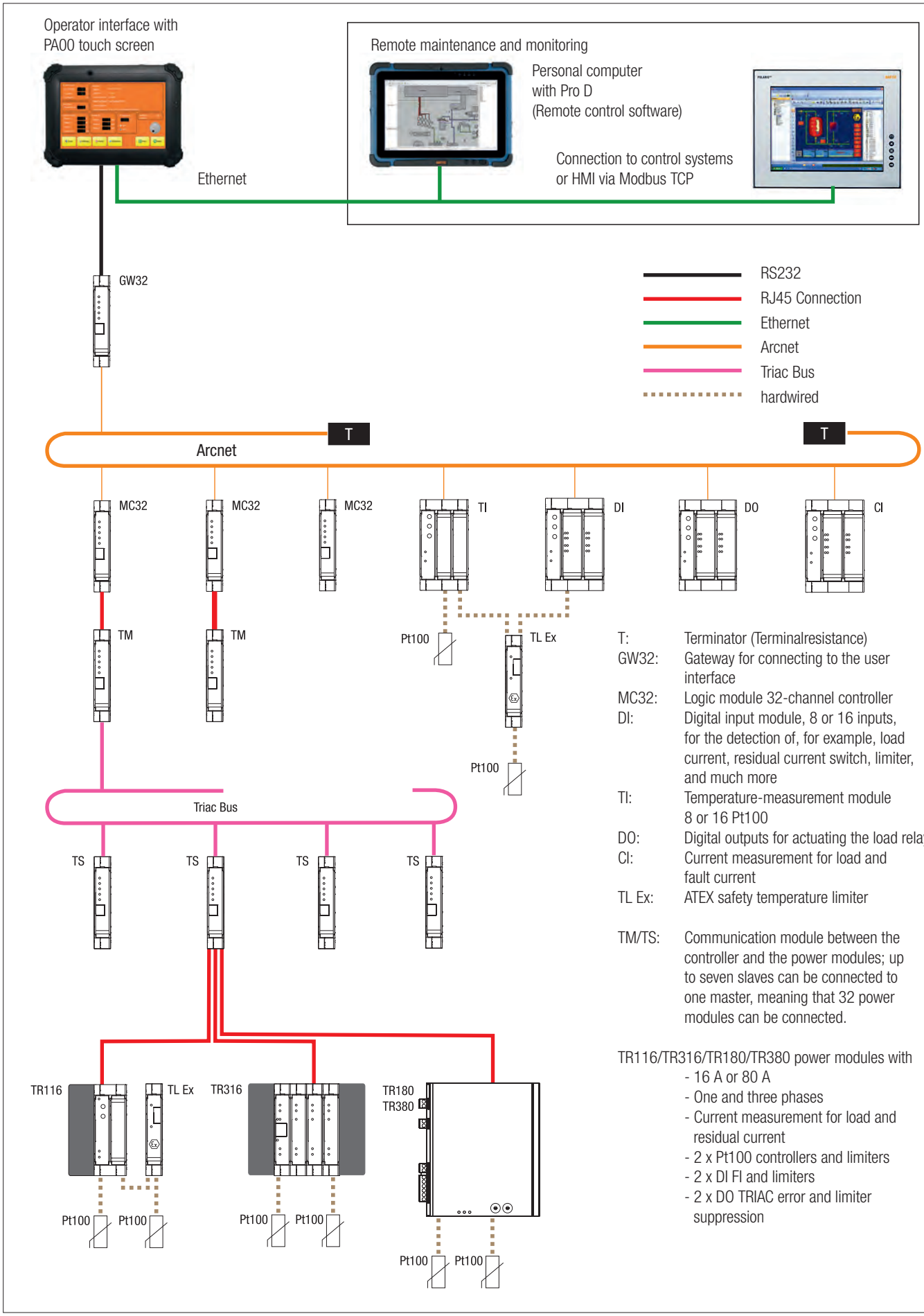
* = Please refer to the data sheets for the modules

Construction

The system is modular in construction and can therefore be adapted flexibly to the respective requirements of the plant or equipment. Diverse function modules are available to allow its operation as a two-state controller. They register temperature, load and residual current and diverse control signals, e.g. output signals from limiters. Output module provides floating contacts to emit alarms. It is also used to actuate the external contactor for switching the heating circuits. Independent complete modules are available for each heating circuit to allow its operation as a proportional controller. These regulate the outputted heating power as well as the holding temperature. The load and residual current are registered for that purpose. The heating circuits are activated through an integrated triac then. The MC32 controller module accesses the various modules through the system bus. A controller module provides up to 32 heating circuits. This number can be increased by adding more modules to the bus. An optional gateway ensures communication to the higher-ranking control system and to the touch panel. The parameters for the modules can be set by means of software or a touch panel.

Function

The load and residual current monitor constantly checks the entire heating system and ensures that the heating cables and temperature sensors always function reliably. Alarms are given if values exceed or fall below the pre-defined load or leakage-current limits. The MPC[net] Process Designer software can be adapted individually to the user's requirements and constantly show the state of the heating system. Statistical data on the current and energy consumption are determined by means of the integrated data logger. This provides information on the condition and ageing status of the material that is being used.



T: Terminator (Terminalresistance)
GW32: Gateway for connecting to the user interface
MC32: Logic module 32-channel controller
DI: Digital input module, 8 or 16 inputs, for the detection of, for example, load current, residual current switch, limiter, and much more
TI: Temperature-measurement module 8 or 16 Pt100
DO: Digital outputs for actuating the load relay
CI: Current measurement for load and fault current
TL Ex: ATEX safety temperature limiter

TM/TS: Communication module between the controller and the power modules; up to seven slaves can be connected to one master, meaning that 32 power modules can be connected.

TR116/TR316/TR180/TR380 power modules with
- 16 A or 80 A
- One and three phases
- Current measurement for load and residual current
- 2 x Pt100 controllers and limiters
- 2 x DI FI and limiters
- 2 x DO TRIAC error and limiter suppression

GW32 Gateway

The GW32 gateway connects the MC32 modules, which operate independently of each other, into a complete system. It serves as an interface between the controller hardware and the MPC[net] ProcessDesigner software. The PA00 touch panel also accesses the control system's parameters through the gateway. The physical connection is established by means of the RS232 interface. In conjunction with the PA00 touch panel, the GW32 also establishes communication between a higher-ranking control system and the MPC[net]. The PA00 touch panel serves as the interface here. See the system description for the Installation Instructions.

Ordering information

MPC[net] GW32 Gateway, B = 17.5 mm	**17-8851-0002**

Technical data subject to change without notice.

MC32 Controller module

The MC32 Controller module regulates and monitors up to 32 heating circuits. It flexibly accesses the individual I/O modules by means of the bus system integrated in the DIN rail. By inserting more MC32 modules into the bus, the number of heating circuits to be monitored can be increased at will. Two setpoint values can be assigned to each heating circuit and changed by means of an external switching contact. The MC32 monitors parameters, such as temperature, overheating, load current, residual current, and external status signals such as rccb auxiliary contacts, limiter alarms, manual switches etc. for each of the 32 heating circuits individually. Up to three temperature sensors per circuit are monitored, whereby the controlled variable is fixed in relation to one sensor. The other sensors serve to monitor a high and a low alarm value. Individual upper and lower limits can be assigned to each monitored value and individual alarms emitted by means of the MPC[net] control system's digital outputs. In addition, all individual alarms can be emitted through the MC32 module's group alarm contact to an indicator light or suchlike. The bus status signals and alarms are also indicated by means of LEDs. Connecting the GW32 gateway and PA00 touch-panel allows a transfer not only of the setpoint and actual values but also of all alarms into a higher ranking control. All of the control system's parameters and alarms can be altered or acknowledged from the control centre. See system description for the Installation Instructions.

Ordering information

MPC[net] MC32 Controller module, W = 17.5 mm	**17-8851-0001**

Technical data subject to change without notice.

Remote I/O-Module 8TI/16TI

The 8TI and 16TI temperature registering modules are suitable for the direct connection of 3-wire Pt100 temperature sensors. They are operated and supplied by means of the MC32 controller. The internal, galvanically isolated bus connection is established by simply joining the modules. The modules feature open-circuit/short-circuit detection. LEDs display the bus status messages and fault signals. See system description for the Installation Instructions.

Ordering information

Remote I/O module MPC[net] 8TI, W = 54.0 mm	**17-8851-0010**
Remote I/O module MPC[net] 16TI, W = 88.0 mm	**17-8851-0011**
Accessories: Pt100 Ex	**27-71-13..**

Technical data subject to change without notice.

Remote 8DO and 16DO I/O modules

The 8DO and 16DO output modules are suitable for indirectly switching heating cables by means of a power contactor. In addition, the individually adjustable alarms can be outputted through the digital outputs. They are operated and supplied with the aid of the MC32 controller. The internal, galvanically isolated bus connection is established by simply joining the modules together. LEDs display the bus status signals and the status signals per channel. See system description for Installation Instructions.

Ordering information

Remote I/O module MPCnet 8DO, W = 41.0 mm	**17-8851-0016**
Remote I/O module MPCnet 16DO, W = 63.5 mm	**17-8851-0017**

Technical data subject to change without notice.

Remote I/O module 8DI/16DI

The 8DI and 16DI digital input modules register and monitor diverse status signals. The inputs are floating, and this means that non-floating contacts are required for transmitting signals. They are operated and supplied through the MC32 controller. The internal, galvanically isolated bus connection is established by simply joining the modules together. LEDs display the bus status messages and other status messages per channel. See the system description for the Installation Instructions.

Ordering information

Remote I/O module MPCnet 8DI, W = 41.00 mm	**17-8851-0013**
Remote I/O module MPCnet 16DI, W = 63.5 mm	**17-8851-0014**

Technical data subject to change without notice.

Remote I/O module 8CI/16CI

The 8CI and 16CI current measuring modules register load and residual currents in conjunction with the LoaC and LeaC measuring transducers. Up to three phases and the total current can be monitored for each heating circuit. The individual inputs are assigned and configured either by means of the MPCnet ProcessDesigner software or by the touch panel. The modules are operated and supplied through the MC32 controller. The internal, galvanically isolated bus connection is established by simply joining the modules together. See the system description for the Installation Instructions.

Ordering information

Remote I/O module MPCnet 8CI, W = 41.0 mm	**17-8851-0020**
Remote I/O module MPCnet 16CI, W = 63.5 mm	**17-8851-0021**
Accessories	
MPCnet LoaC load current transformer	**17-8851-0023**
MPCnet LeaC total current transformer	**17-8851-0024**

Technical data subject to change without notice.

Communication modules TM04/TS04

The TR16, TR26 and TR38 power modules are integrated into the MPCnet network architecture by means of the TM04 and TS04 communication modules, whereby up to 4 power modules can be connected to each communication module. The communication between the individual power modules and the MC32 controller is established by means of the TM04 master module. By inserting more TS04 communication modules into the bus, the number of connectable power modules can be extended to 32. See system description for the Installation Instructions.

Ordering information

MPCnet communication master module TM04, W = 17.5 mm	**17-8851-0004**
MPCnet communication slave module, W = 17.5 mm	**17-8851-0005**

Technical data subject to change without notice.

Power modules TR116/TR316

The TR116 and TR316 power modules combine the functions of all MPCnet I/O modules in one single module. Each module has two Pt100 inputs and digital inputs for monitoring RCCBs and limiters. For each heating circuit the heating power can be adjusted steplessly between 10 % and 100 % for up to three phases, whereby the load and total current are monitored. The modules are operated and supplied via the TM04 or TS04 power module controllers. The set point value is determined by the MC32 controller. The internal, galvanically isolated bus connection is established by simply joining the modules together by means of RJ-45 plug connectors.

Ordering information

MPCnet TR116 power module, W = 62.5 mm	**17-8851-0006**
MPCnet TR316 power module, W = 126 mm	**17-8851-0007**
Power modules with 40 A and 80 A available on request.	

Technical data subject to change without notice.

PA00 HMI touch panel

The HMI touch panel is used as a central operating unit on which all parameters for the entire control system can be set and monitored.

Ordering information

PA00 HMI Touchpanel	**17-8851-0003**

Technical data subject to change without notice.

Ordering information Accessories

CHD: Hand-held unit for setting up on-site and for extended maintenance and settings in the system	**on request**
Arcnet repeater	**on request**
Triac Bus repeater	**on request**
Termination set (Two terminators/one connection terminal and end terminal each)	**on request**
Expansion and Triac Bus connection set (one connection terminal and end terminal each)	**on request**
GW32 connection adapter to PA00	**on request**

Technical data subject to change without notice.

- ATEX approval
- Optimised for trace heating applications (with service contact)
- Fault monitoring
- In conjunction with Pt100 Ex, it can be used for monitoring temperature in explosion-protected heating circuits

The TL Ex safety temperature limiter is a constituent part of the MPC[net] system and is used to monitor heatings and heating circuits. The device is for installation in non-hazardous areas. The heatings or heating circuits can be installed both in media-protected and also in hazardous (potentially explosive) areas.

Explosion protection

Marking	Ⓔx II (2)G [Ex e]
Certification	VTT 13 ATEX 043X
Other approvals and certificates, see www.bartec.de	

Technical data

Enclosure material	Polyamide PA
Protection class (EN 60529)	IP 20
Electrical connections	plug-in screw-type terminals, 3-pole Clamping range 0.2 to 2.5 mm²
Attachment onto mounting rail	TH 35-15 DIN EN 60715 (metal)
Dimensions (W x H x D)	22.5 mm x 100 mm x 114.5 mm
Weight	156 g
Storage and transport temperature	-40 °C to +70 °C
Operating temperature	-20 °C to +40 °C
Degree of contamination	2
SIL Level	SIL 1

Electrical data

Voltage supply	DC 24 V
Current consumption	105 mA, maximum 2.7 W
Input	temperature 3-wire Pt100 alarm suppression AC 70 to 230 V
Contact loadability	direct switching 8 A - AC 1, 250 V by means of power contactor 0.7 A - AC 15, 250 V
Measurement	accuracy +/-1°C measuring range -50 °C to +600 °C hysteresis < 2 K

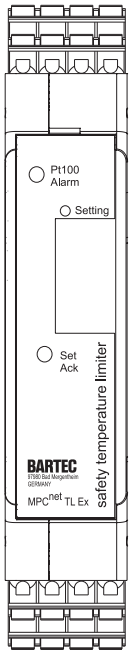
Function

If the temperature at the Pt100 sensor exceeds the set limit value, the TL Ex disconnects the load output permanently. At the same time a floating alarm contact is triggered. The alarm contact status is detected and processed by means of the digital inputs in the 8DI and 16DI modules and the digital input in the TR16, TR36 and TR38 power modules in the MPC[net]. Once the temperature drops by 2 K below the switch-off point or after a fault has been remedied, the limiter can be reactivated by means of a reset button on the device. The TL Ex can transmit the temperature detected at the measuring input to the MPC[net] by means of an integrated sequential system with a signal that is proportional to the actual value measured. This allows the temperature at the limiter to be evaluated in the control system also. The limiter function can be suppressed by a digital input when carrying out servicing work on the heating circuit, e.g. steam cleaning.

Construction

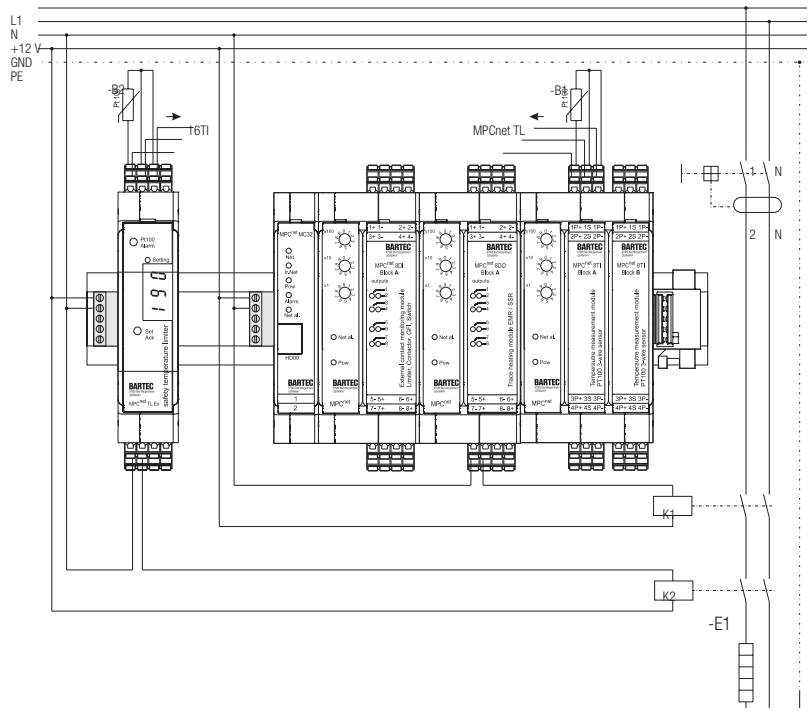
The TL Ex is installed in a clip-on enclosure for TS35 mounting rails. The alarm relay and the limit relay are produced as change-over contacts. The DC 24 V voltage is supplied through the use of a top-hat rail on the underside. The electrical connection is established by means of screw-type terminals operating on the screw cage clamp principle, which ensures a reliable connection and is also gentle on conductors.

Terminal assignment



Terminal block	Terminal	Description
TL_out	1	not assigned
	2	Supply +
	3	Signal
	4	Supply -
TL_in	5	not assigned
	6	Supply +
	7	Signal
	8	Supply -
Alarm blocking	9	N/signal
	10	L/signal
	11	not assigned
	12	not assigned
Alarm	13	COM
	14	NO contact
	15	NC contact
	16	not assigned
Control	17	COM
	18	NO contact
	19	NC contact
	20	not assigned

Wiring diagram



Ordering information

MPC^{net} TL Ex	**17-8851-0030/0000**

Technical data subject to change without notice.

- AC 230 V control/supply voltage
- Can be snaped on DIN rail
- Switching capacity AC 230 V, 20 A
- Display: supply voltage, heating on

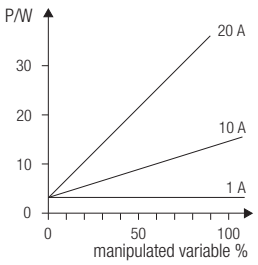
The DEC is an adjustable energy controller. It allows perfect adaption of the power output from 10 % to 100 % in 10 %-steps. Combined with the DPC-Family, the DTL III Ex and Pt100 Ex, the DEC can also be used to control heating systems in hazardous (potentially explosive) areas.

Technical data

Protection class	IP 20
Min. ambient temperature	0 °C
Max. ambient temperature	+40 °C
LED displays	Supply voltage ON Heating ON
Mounting	snaps onto TS 35 (DIN rail)
Enclosure material	ABS plastic
Dimensions (without heat-sink)	L x W x D (105 mm) 164 mm x 90 mm x 59 mm
Weight	520 g

Electrical data

Rated voltage	AC 230 V/50 Hz
Switching capacity	max. switched current AC 20 A max. voltage AC 250 V min. AC 230 V min. 50 mA
Control	AC 230 V
Adjustable power output	from 10 % up to 100 % in steps of 10
Terminals	2.5 mm² solid or 1.5 mm² stranded with sleeve
Power dissipation	dependent of the manipulated variable



Structure

The DEC case can be snapped onto a DIN rail allowing quick and easy installation. The energy controller is energised via 230 V mains supply voltage. The terminals can accommodate conductors with a cross section of up to 2.5 mm². DEC control via AC 230 V. The front fascia of the case provides a 10-step switch for the power adaption from 10 % to 100 %. An LED on the front fascia indicates whether supply voltage is applied to the DEC. A second LED signals an active/non active DEC output.

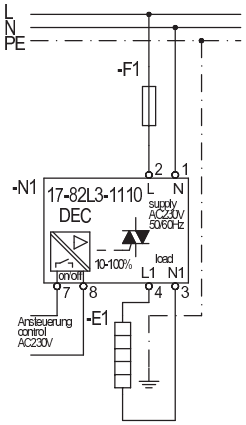
Function

The DEC is controlled via a AC 230 V supply periodic group control is activated via a 10-step switch and the output power of the DEC adjusted from 10 % to 100 %.

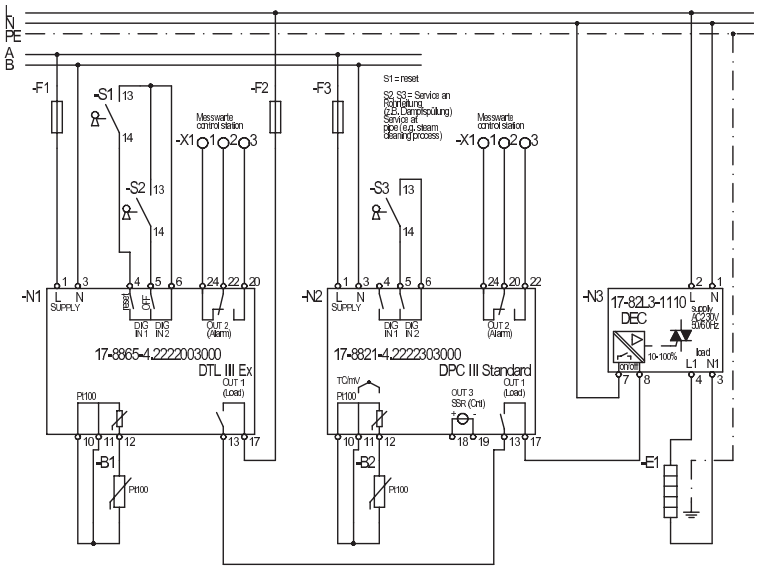
Additional products

DPC III, Digital programmable controller, Type 17-8821-4.22/22303.00
DTL III Ex, Digital temperature limiter, Type 17-8865-4.22/22003000
Pt100 Ex, explosion protected, Type 27-71..-13.....

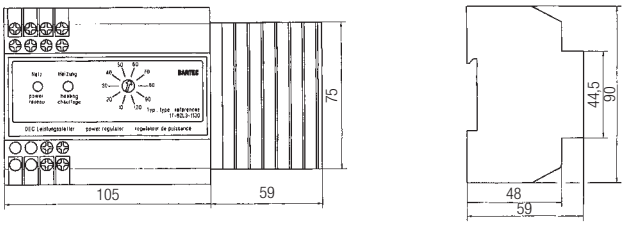
Circuit diagram



System circuit diagram



Dimensions (mm)



Ordering information

Digital energy controller DEC	**17-82L3-1110**

Technical data subject to change without notice.

Pt100 Ex Resistance thermometer

- Very fast response time
- Compact dimensions, compact design
- Wide temperature range

This Pt100 Ex sheathed resistance thermometer has been particularly designed for use in potentially explosive areas. As it meets the requirements of the Ex m type of protection, intrinsically safe circuits can be dispensed with. Thanks to the pliable part of the resistance thermometer, the device is excellently suitable for application areas requiring a high degree of flexibility and replaceability (e.g. chemical and power plants).

Explosion protection

Marking	Ⓔx II 2G Ex mb II T6 Ⓔx II 2D Ex mb IIIC T80 °C
Certification	PTB 03 ATEX 2152 X IECEx PTB 16.0010X
Other approvals and certificates, see www.bartec.de	

Technical data

Transducer	in 3-wire circuit
Temperature range	-50 °C to +600 °C or -200 °C to +600 °C tolerancen: class B (EN 60751)
Ambient temperature range	-20 °C to +60 °C or -50 °C to +70 °C
Dimensions	sensor tube diameter 3 mm sensor length 280 resp. 980 mm active sensor length 50 mm flexible part 230 resp. 930 mm bending radius min. 20 mm
Sheath material	stainless steel 1.4541
Connection cable	Rubber or silicone hose 4 x 0.75 mm²
Protection class	IP 65/EN 60529

Electrical data

Operating voltage	max. AC/DC 60 V
Signal circuit	max. AC/DC 6 V max. AC/DC 10 mA max. AC/DC 60 mW

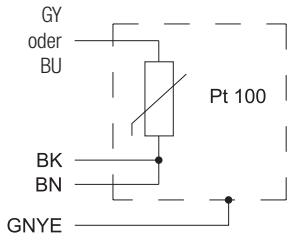
Structure

The resistance thermometer is made of a 3 mm mineral insulated cable with different lengths. This light mineral insulated cable is filled with magnesium oxide. The pliable part of the resistance thermometer starts after 50 mm. Via a transition gland, the connection to a flexible supply cable is created.

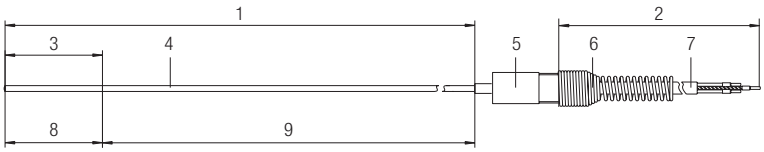
Function

Metals increase the electrical resistance with rising temperatures. The platinum element of the resistance thermometer has a resistance of 100 Ω at 0 °C. This characteristic is used for this type of resistance thermometers to get an image of the temperature. The resistance changes of the Pt100 Ex are converted into a temperature value and displayed by a control unit.

Electrical connection 3-wire



Structure



1 NL-20
2 AL
3 Length 50 mm
4 Sheathed cable
5 Transition gland
6 Anti-kink protection
7 connection cable
8 rigid
9 flexible

2

Ordering information

Measurement range	Ambient temperature range	Nominal length NL	Connecting cable AL Length	Connecting cable Version	Order no.
-50 °C to +600 °C	-20 °C to +60 °C	300 mm	2 m	rubber	**27-7125-13330220**
-50 °C to +600 °C	-20 °C to +60 °C	300 mm	5 m	rubber	**27-7125-13330520**
-200 °C to +600 °C	-20 °C to +60 °C	300 mm	2 m	rubber	**27-7128-13330220**
-50 °C to +600 °C	-50 °C to +70 °C	300 mm	2 m	silicone	**27-7125-13330250**
-50 °C to +600 °C	-50 °C to +70 °C	300 mm	5 m	silicone	**27-7125-13330550**
-200 °C to +600 °C	-50 °C to +70 °C	300 mm	2 m	silicone	**27-7128-13330250**
-200 °C to +600 °C	-50 °C to +70 °C	1000 mm	2 m	silicone	**27-7128-13130250**

Technical data subject to change without notice.

The Pt100 Ex junction boxes allow one or more two-wire or three-wire Pt100 resistance thermometers to be connected to the signal line. The enclosures have the appropriate terminals and the required cable glands. Aluminium junction boxes are available upon request.

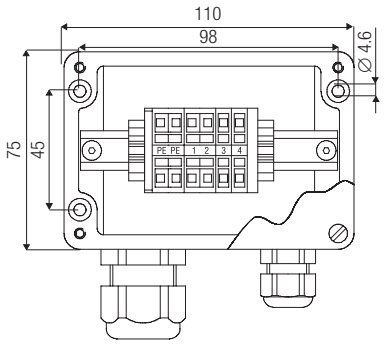
Explosion protection

Marking	Ⓔx II 2G Ex e ia IIC T6 or T5 Gb Ⓔx II 2D Ex tb IIIC T80 °C, T95 °C
Certification	PTB 08 ATEX 1064 IECEx PTB 09.0009
Other approvals and certificates, see www.bartec.de	

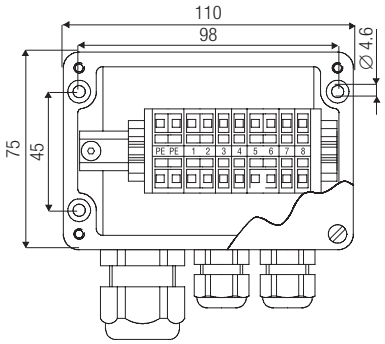
Technical data

Protection class according to EN 60529	Cover gasket IP 65 Cable gland for power supply cables IP 67
Nominal voltage	max. AC 60 V
Supply cable, cross section	2.5 mm²
Impact resistance	7 Nm
Material	polyester, glass-fibre reinforced
Ambient temperature range	-20 °C to +40 °C T6 -20 °C to +55 °C T5

Junction box single



Junction box double



Ordering information

Used for Pt100 Ex	Junction box	Dimensions mm	Cable gland for the signal line	Cable gland Pt100	Terminals mm²	Order no.
Ex e	single	110 x 75 x 55	1 x M25 (∅ 7 to 17 mm)	1 x M16 (∅ 4 to 9 mm)	8 x 2.5; 4 x PE	**07-5103-9024**
	double			2 x M16 (∅ 4 to 9 mm)	16 x 2.5; 4 x PE	**07-5103-9025**
Ex i	single			1 x M16 (∅ 3 to 6 mm)	8 x 2.5	**07-5107-9003**
	double			2 x M16 (∅ 3 to 6 mm)	16 x 2.5	**07-5107-9004**

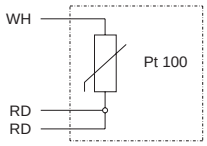
Technical data subject to change without notice.

For applications in non-hazardous areas, the Pt100 resistance-measuring sensor is also available as an industrial version. We also supply different versions to suit various temperature requirements. For the different temperature areas you can choose between several versions in three-wire-connection.

Structure
The Pt100 M sensor is embedded in a stainless steel sleeve. A temperature-resistant supply cable runs into the sleeve. We offer three sleeve versions with different temperature ranges.

- Fast response time
- Flexible connection cable for easy installation
- Compact dimensions, compact design

Circuit diagram



Compensation line

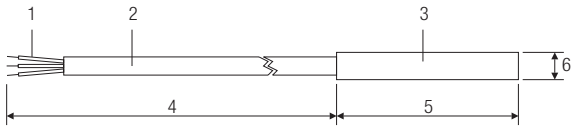
Technical data

Transducer	in 3-wire circuit
Measuring tolerance	Class B in conformance to EN 60751

Electrical data

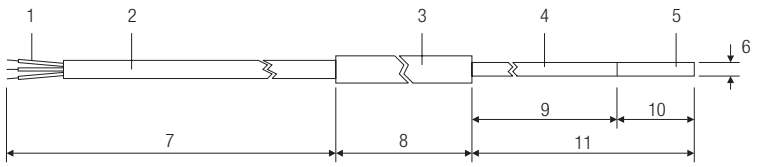
Capacity (silicone cable)	≤ 50 pF/m
Inductance (silicone cable)	≤ 2 µH/m

Structure -50 °C to +200 °C/-50 °C to +400 °C



1 Free leads
2 Connecting cable
3 Protected sleeve
4 Connecting cable length
5 Sensor length
6 Sensor diameter

Structure -50 °C to +500 °C



1 Free leads
2 Connection cable
3 Connection sleeve
4 Sheated cable
5 Protected sleeve
6 Diameter
7 Connection cable length
8 Connection sleeve, length 35 mm
9 Sheated cable, flexible 970 mm
10 Protected sleeve, rigid 30 mm
11 Sensor length

Ordering information

Measuring range	Sensor Length	Connection cable					Protection class	Order no.
		∅	Material	Length	Version	Operating temperature		
-50 °C to +200 °C	40 mm	6 mm	stainless steel	1,50 m	silicone	-50 °C to +200 °C	IP 65	**27-7125-13330220**
-50 °C to +200 °C	40 mm	6 mm		5,00 m	silicone	-50 °C to +200 °C	IP 65	**27-7125-13330520**
-50 °C to +400 °C	50 mm	6 mm		1,50 m	stainless steel braid	-50 °C to +400 °C	IP 40	**27-7128-13330220**
-50 °C to +500 °C	1000 mm	3 mm		1,50 m	silicone	-50 °C to +200 °C	IP 54	**27-7125-13330250**

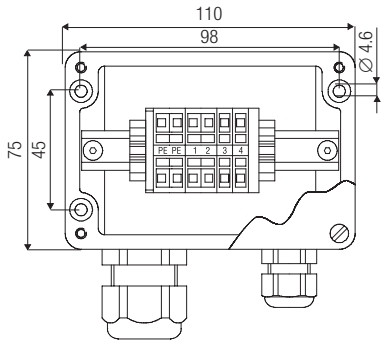
Technical data subject to change without notice.

The polyester junction boxes allow one or more two-wire or three-wire Pt100 M resistance thermometers to be connected to the signal line. The enclosures have the appropriate terminals and the required cable glands. Aluminium junction boxes are available upon request.

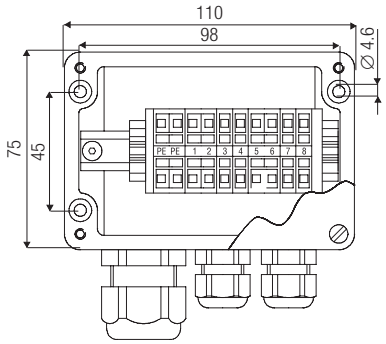
Technical data

Protection class according to EN 60529	Cover gasket IP 65 Cable gland for power supply cables IP 67
Nominal voltage	max. AC 60 V
Supply cable, cross section	2.5 mm²
Impact resistance	7 Nm
Material	polyester, glass-fibre reinforced
Ambient temperature range	-20 °C to +70 °C

Junction box single



Junction box double



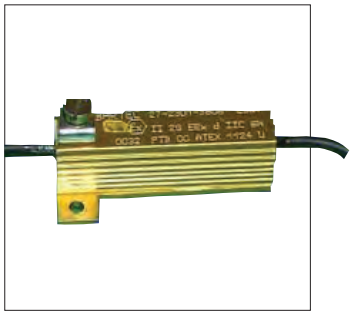
Ordering information

Used for	Junction box	Dimensions mm	Cable gland for the signal line	Cable gland Pt100	Terminals mm²	Order no.
Pt100 media-protected	single	110 x 75 x 55	1 x M25 (∅ 8 to 15 mm)	1 x M16 (∅ 2 to 6 mm)	8 x 2.5	**07-5177-9082**
	double			2 x M16 (∅ 2 to 6 mm)	16 x 2.5	**07-5177-9083**

Technical data subject to change without notice.

HEATERS

Mini-heater



- Small, compact structure
- No temperature control necessary
- Available in different voltages
- Easy wiring

The Mini-heater protects from frost and prevents the formation of condensation water inside enclosures and small electrical control panels. The explosion-proof version can be mounted in Ex-enclosures according to EN 60079-7.

Installation instructions for use in Ex areas
The temperature class can be specified:

- via a routine thermal test and approval by an authorised Ex inspector
- via a prototype test, e.g. together with other equipment based on presentation by a recognised testing agency

Installation exclusively in Ex enclosures according to EN 60079-7.

Explosion protection

Marking	Ⓔx II 2G Ex d IIC
Certification	PTB 00 ATEX 1124 U
Other approvals and certificates, see www.bartec.de	

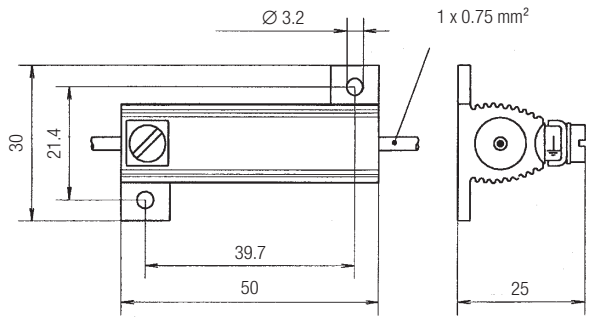
Technical data

Nominal voltage	230 V, special voltages (6 to 400 V) available on request
Nominal output	6 W
Max. permissible surface temperature	+95 °C
Enclosure material	anodised aluminium
Connection leads	H07G-K or N4GAF - 0.75 mm² standard length 0.5 m each side
Fixing details	2 fixing holes, ∅ 3.2 mm
Weight	approx. 46 g

Structure
A heating resistor is flameproof encapsulated in an anodised aluminium enclosure. The terminal leads integrated on both sides make the device a ready-to-connect heater. The heater is mounted by means of two fixing holes of ∅ 3.2 mm. A heater of similar dimensions and power output is available for use in safe areas. This version is supplied without the earth connection.

Function
The Mini-heater can be used without a temperature limiter in hazardous areas providing the installation instructions are carefully adhered to. Attaching the Mini-heater to a metal body can reduce the surface temperature.

Dimensions



Ordering information

Mini-heater, explosion-protected	**27-2301-3806**
Mini-heater, media-protected	**27-2302-3806**

Technical data subject to change without notice.

- High heating capacity
- Integrated antifreezing protection device in the connection cable
- Large, black anodized convector surface

BARTEC compact radiators are used as anti-freezing and anticondensate heaters in potentially explosive areas. Their use guarantees maximum operating safety, since temperature fluctuations are effectively prevented or the required minimum temperatures are maintained. They reliably ensure that no malfunctioning through leakage current in electrical components, or other disturbances through corrosion formation on mechanical installation parts, can occur. The radiators are ready for connection and they are maintenance-free. Places of use include switch and control cabinets, transmitter protective boxes, measuring equipment, analytical cabinets for sample preparation etc..

Function

The thermostat located in the connection cable keeps the inside temperature in the required range and reliably prevents overshooting the permissible ambient temperature of the heater. In order to prevent accumulation of heat the specified fitting distances must be observed. Do not cover the fins, in order that free convection is not hindered. For applications involving higher holding temperatures, please contact us.

Construction,

The radiators are fitted with a constant ohmic resistance. Through the special construction of the aluminium profile a chimney effect is produced which gives a uniform temperature distribution in the interior of enclosures and cabinets. In case of overheating, the heaters are permanently isolated from the mains supply, since the heat source is coupled with a temperature safety fuse.

Technical data

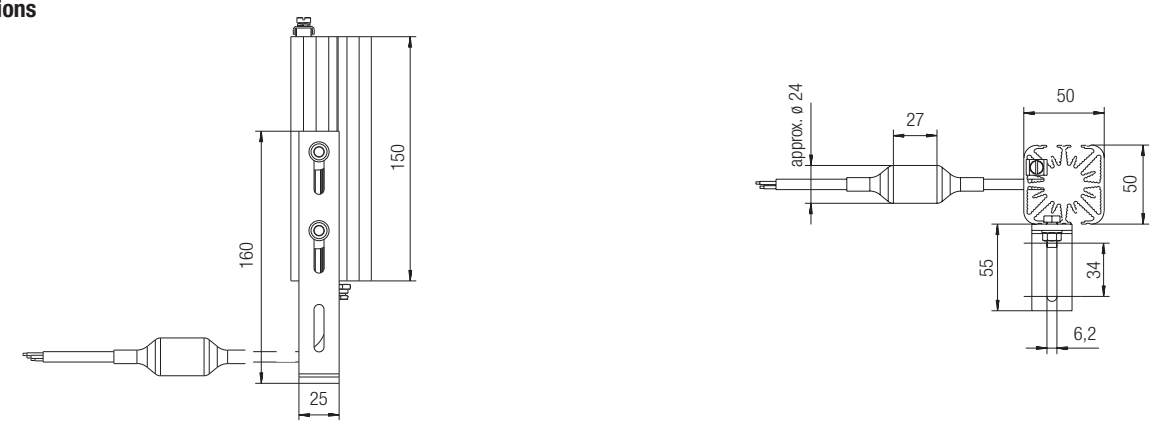
Protection class	IP 65, NEMA 4
Application temperature range	-50 °C to +80 °C
Ambient temperature range	-50 °C to +60 °C
Nominal voltage	AC 230 V
Connection	Hose line, EWKF 3 x 1.5 mm²; ∅ 8.1 mm; length 3 m
Mounting position	Vertical flow through fins
Material	black anodized aluminium resistant to sea water

Explosion protection

Marking	Ⓔx II 2G Ex db IIC T4 Ⓔx II 2D Ex tb IIIC T135 °C
Certification	PTB 03 ATEX 1139 X

Other approvals and certificates, see www.bartec.de

Dimensions



Ordering information

Designation	Nominal power	Version with antifreezing protective device	Dimensions (l x w x h), mm	Temperature class	Order no.
HCS 40-T4-10-3	40 W	+10 °C ON +18 °C OFF	52 x 50 x 155	T4	**27-2063-3704/B300**

Technical data subject to change without notice.

- High heating capacity
- Integrated antifreezing protection device in the connection cable
- Large, black anodized convector surface

BARTEC compact radiators are used as anti-freezing and anticondensate heaters in potentially explosive areas. Their use guarantees maximum operating safety, since temperature fluctuations are effectively prevented or the required minimum temperatures are maintained. They reliably ensure that no malfunctioning through leakage current in electrical components, or other disturbances through corrosion formation on mechanical installation parts, can occur. The radiators are ready for connection and they are maintenance-free. Places of use include switch and control cabinets, transmitter protective boxes, measuring equipment, analytical cabinets for sample preparation etc..

Function

The thermostat located in the connection cable keeps the inside temperature in the required range and reliably prevents overshooting the permissible ambient temperature of the heater. In order to prevent accumulation of heat the specified fitting distances must be observed. Do not cover the fins, in order that free convection is not hindered. For applications involving higher holding temperatures, please contact us.

Construction

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Technical data

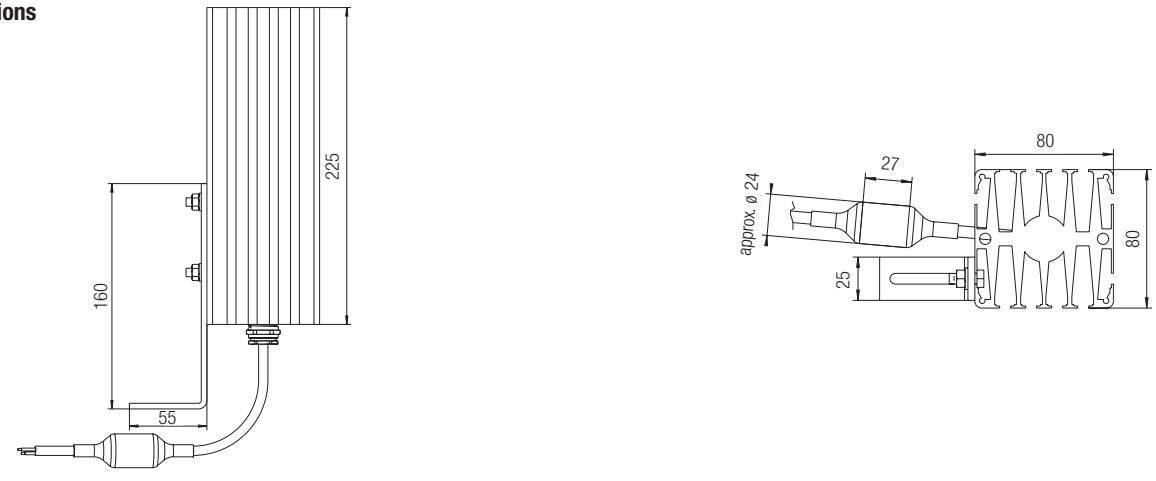
Protection class	IP 65, NEMA 4
Application temperature range	-50 °C to +80 °C
Ambient temperature range	-50 °C to +60 °C
Nominal voltage	AC 230 V
Connection	Hose line; EWKF 3 x 1.5 mm²; ∅ 8.1 mm; length 3 m
Mounting position	Vertical flow through fins
Material	black anodized aluminium resistant to sea water

Explosion protection

Marking	Ⓔx II 2G Ex db IIC T4, T3 Ⓔx II 2D Ex tb IIIC T135 °C, T200 °C
Certification	PTB 03 ATEX 1139 X

Other approvals and certificates, see www.bartec.de

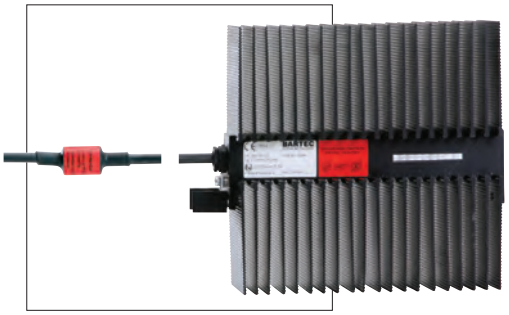
Dimensions



Ordering information

Designation	Nominal power	Version with antifreezing protective device	Dimensions (l x w x h)	Temperature class	Order no
HCM 100-T4-10-3	100 W	+10 °C ON +18 °C OFF	80 mm x 80 mm x 225 mm	T4	**27-2163-5710/B300**
HCM 250-T3-10-3	250 W		80 mm x 80 mm x 225 mm	T3	**27-2161-5725/B300**

Technical data subject to change without notice.



- High heating capacity
- Integrated antifreezing protection device in the connection cable
- Large, black anodized convector surface

BARTEC compact radiators are used as anti-freezing and anticondensate heaters in potentially explosive areas. Their use guarantees maximum operating safety, since temperature fluctuations are effectively prevented or the required minimum temperatures are maintained. They reliably ensure that no malfunctioning through leakage current in electrical components, or other disturbances through corrosion formation on mechanical installation parts, can occur. The radiators are ready for connection and they are maintenance-free. Places of use include switch and control cabinets, transmitter protective boxes, measuring equipment, analytical cabinets for sample preparation etc..

Construction

The radiators are fitted with a constant ohmic resistance. Through the special construction of the aluminium profile a chimney effect is produced which gives a uniform temperature distribution in the interior of enclosures and cabinets. In case of overheating, the heaters are permanently isolated from the mains supply, since the heat source is coupled with a temperature safety fuse.

Function

The thermostat located in the connection cable keeps the inside temperature in the required range and reliably prevents overshooting the permissible ambient temperature of the heater. In order to prevent accumulation of heat the specified fitting distances must be observed. Do not cover the fins, in order that free convection is not hindered. For applications involving higher holding temperatures, please contact us.

Technical data

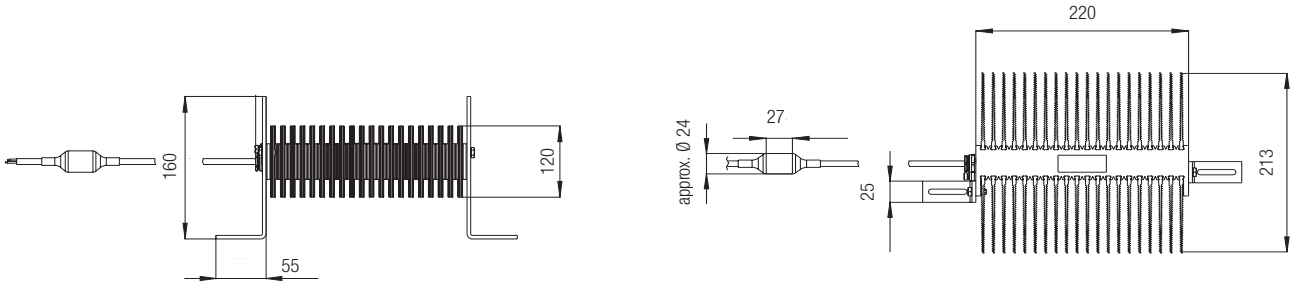
Protection class	IP 65, NEMA 4
Application temperature range	-50 °C to +80 °C
Ambient temperature range	-50 °C to +60 °C
Nominal voltage	AC 230 V
Connection	Hose line; EWKF 3 x 1.5 mm²; ∅ 8.1 mm; length 3 m
Mounting position	Vertical flow through fins
Material	black anodized aluminium resistant to sea water

Explosion protection

Marking	⟨Ex⟩ II 2G Ex db IIC T4, T3 ⟨Ex⟩ II 2D Ex tb IIIC T135 °C, T200 °C
Certification	PTB 03 ATEX 1139 X

Other approvals and certificates, see www.bartec.de

Dimensions



Ordering information

Designation	Nominal power	Version with antifreezing protective device	Dimensions (l x w x h)	Temperature class	Order no
HCL 300-T4-10-3	300 W	+10 °C ON +18 °C OFF	220 x 213 x 120	T4	**27-2269-4730/B312**
HCL 600-T3-10-3	600 W		220 x 213 x 120	T3	**27-2261-4760/B312**

Technical data subject to change without notice.

HSF 300

HSF 120/HSF 200

HSF 50/HSF 100

- Self-limiting characteristic
- Random mounting position
- Extremely flat design
- ATEX gas and dust application approval
- Wide rated voltage range
- Large, black, anodized convector surface

The extremely flat BARTEC HSF heater plates are mainly used in potentially explosive areas for applications, which require the maintenance of a specific temperature. The use of these heater plates guarantees a maximum degree of operational safety, as temperature fluctuations can be efficiently avoided and, yet, the required minimum temperatures can be maintained. The heater plates reliably protect electrical installations against function failures due to creepage currents and also offer protection against other failures caused by corrosion formation at mechanical system components. The radiators are ready for connection and they are maintenance-free. The application areas of these heaters comprise switch and control cabinets, transmitter protection boxes, measuring equipment, analyzer cabinets for sample preparation, and many more.

Construction

The HSF heater plates are based on a PTC (positive temperature coefficient) heating element. The special design of the aluminum profile facilitates an even temperature distribution in the interior of housings and cabinets. For an optimum free convection, the fins should not be covered.

Function

The PTC heating elements increase their electrical resistance as the temperatures rises. A high resistance results in a low heating output. At high temperatures, the heating capacity is reduced to a minimum heating output, which ensures that the limit temperature of the respective temperature class cannot be exceeded. Moreover, these heating elements regulate their resistance in dependence of the voltage. Therefore, the HSF heating plates can be applied in a wide supply voltage range. Should you require further information on the detailed layout of the heating capacity in holding temperature applications, please contact us.

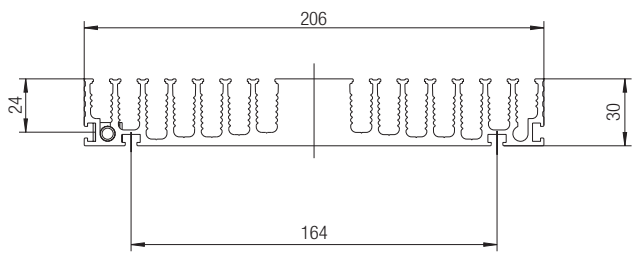
Explosion protection

Marking	Ⓔx II 2G Ex db IIC T4, T3 Ⓔx II 2D Ex tb IIIC T135 °C/T200 °C
Certification	PTB 03 ATEX 1221 X
Other approvals and certificates, see www.bartec.de	

Technical data

Protection class	IP 68, NEMA 4X
Application temperature range	-50 °C to +180 °C
Ambient temperature range	-50 °C to +60 °C
Rated voltage	AC/DC 120 to 240 V
Nominal power	50, 100, 120, 200 and 300 W (at 0 °C application temperature)
Connection	Hose line EWKF 3 x 1.5 mm^2; ∅ 8.1 mm
Mounting position	random
Material	black, anodized aluminum, resistant to sea water

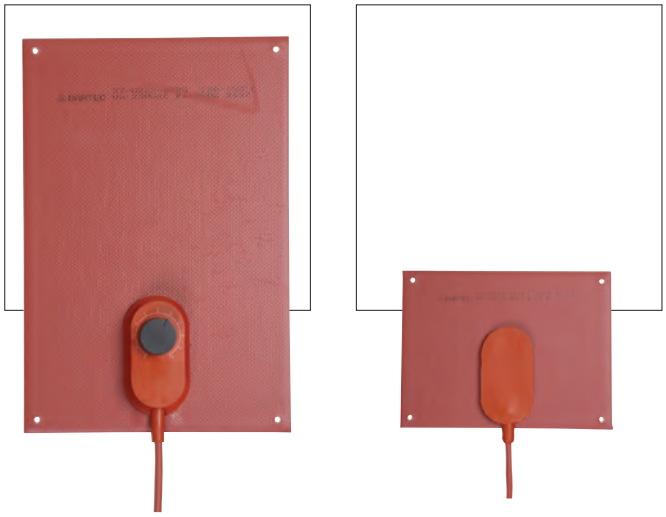
Dimensions



Ordering information

Designation	Nominal power	Cable length	Weight (netto)	Dimensions in mm (L x W x H)	Temperature class	Order no.
HSF 50 T4-1	50 W	1 m	0.9 kg	105 x 206 x 30	T4	**27-2C54-7054110Z1000**
HSF 50-T4-5	50 W	5 m	1.3 kg	105 x 206 x 30	T4	**27-2C54-7054110Z5000**
HSF 100-T3-1	100 W	1 m	0.9 kg	105 x 206 x 30	T3	**27-2A53-7104110Z1000**
HSF 100-T3-5	100 W	5 m	1.3 kg	105 x 206 x 30	T3	**27-2A53-7104110Z5000**
HSF 120-T4-1	120 W	1 m	1.8 kg	225 x 206 x 30	T4	**27-2B54-7124150Z1000**
HSF 120-T4-5	120 W	5 m	2.2 kg	225 x 206 x 30	T4	**27-2B54-7124150Z5000**
HSF 200-T3-1	200 W	1 m	1.8 kg	225 x 206 x 30	T3	**27-2B53-7204150Z1000**
HSF 200-T3-5	200 W	5 m	2.2 kg	225 x 206 x 30	T3	**27-2B53-7204150Z5000**
HSF 300-T3-1	300 W	1 m	2.5 kg	325 x 206 x 30	T3	**27-2J53-7304170Z1000**
HSF 300-T3-5	300 W	5 m	2.9 kg	325 x 206 x 30	T3	**27-2J53-7304170Z5000**

Technical data subject to change without notice.



The SSM heater plate can be used for frost protection and as an anti-condensation heater. Its application ensures complete operational safety as the plates prevent malfunctions often due to leakage currents on electrical installations or the corrosion of metal components. Typical applications are switchgear and controlgear cabinets, instrument housings, analyser cases, glove boxes and other enclosures.

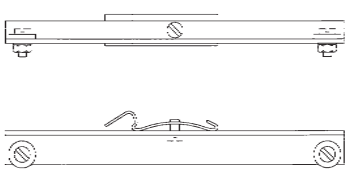
Technical data

VDE certificate	License no. 101109
Norms	EN 60335-1
Min. ambient temperature	-60 °C
Max. ambient temperature	+80 °C (at Type 27-0222)
Plate temperature	+70 °C (pre-set value) adjustable from +30 °C to +150 °C
Fixing details	with 4 x M4 screws, with a special glue, with mounting rails
Materials	baseplate - aluminium sheet, anodised 1.0 or 1.5 mm thick Insulation - silicone rubber approx. 1.5 mm thick heating element - CrNi or constantan wire supply cable - of silicone 2 x 0.75 mm^2, 0.5 m long
Protection class	Type 27-0212-... IP 53 Type 27-0222-... IP 51

Electrical data

Heat output	40 W/100 W/250 W
Nominal voltage	AC 230 V/50 Hz
Di-electric strength	up to 12 KV/mm

Dimensions Snap-on rail mounting TS 35



Structure

The heater plate consists of a thin, anodised aluminium baseplate, vulcanised with silicone-impregnated glass-fibre mats with an embedded heating coil. A bimetallic switch integrated in the terminal block limits the surface temperature of the heater approx. +70 °C. An alternative version is available for adjusting the surface temperature from +30 °C to +150 °C.

Additional products

Thanks to the unusual structure of silicone heaters, it is possible to manufacture different versions for every application.

The following **parameters** can be altered for individual applications:

Geometry/Shape
Flexible large-area heaters up to a size of 2.5 m x 1.2 m and about 2.5 mm thick can be achieved. Cutouts, threads etc. can be provided at random. Heaters for cylindrical bodies (5 to 200 mm diameters) are preformed according to the required radius as a sleeve.

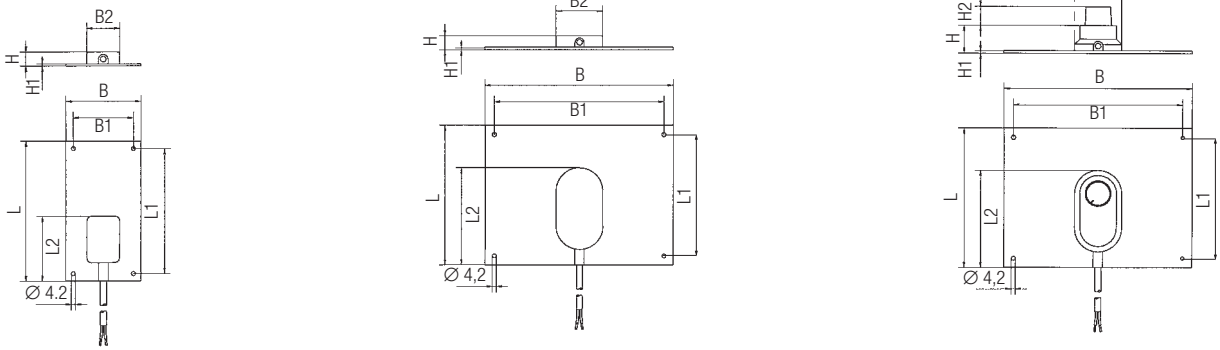
Fixing method
Large-area heaters can be installed with self-adhesive tape, with a special glue, by means of a clamping plate or tension springs.

Nominal voltage
6 V to 230 V; 3 N AC 100 V to 3 N AC 400 V are possible.

Power density
approx. 0.65 W/cm^2 for self-stabilisation; up to 2.0 W/cm^2 if limited by a thermostat.

Temperature control
The surface temperature of the heater is influenced by the particular power density W/cm^2, temperature sensors for the control and limitation can be directly integrated in the heating system, sensor receptacles for external temperature sensors can be provided on the heater surface. The direct contact and large area format result in a very favourable heat flow in the desired direction. This means lower temperature differences between heater and object (medium).

Dimensions Silicone heater



Ordering information Dimensions in mm

L	L1	L2	B	B1	B2	H	H1	H2	Order no.
150	134	70	80	64	35	15	2,5	without	**27-0212-1704**
150	130	105	200	180	50	15	3	without	**27-0212-2710**
150	130	105	200	180	50	30	3	20	**27-0222-2710**
300	280	105	200	180	50	15	3	without	**27-0212-3725**
300	280	105	200	180	50	30	3	20	**27-0222-3725**

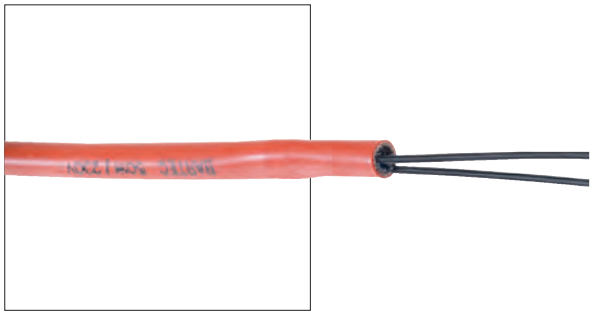
Ordering information Heater plate

Heat output	Plate temperature	Order no.
40 Watt	+70 °C pre-set	**27-0212-1704**
100 Watt		**27-0212-2710**
250 Watt		**27-0212-3725**
40 Watt	adjustable from +30 °C to +150 °C	**-**
100 Watt		**27-0222-2710**
250 Watt		**27-0222-3725**

Ordering information Fixing bracket for TS 35

Installation sizes L x B	Order no.
for heater 150 x 80 mm, 150 x 200 mm	**05-0010-0056**
for heater 300 x 200 mm	**05-0010-0057**

Technical data subject to change without notice.



This highly flexible heating cable is used as an anti-condensation heater for electric motors and generators. The device offers added protection against corrosion damage that usually results in machine breakdowns by effectively preventing the formation of condensation water even under extreme climatic conditions.

Structure

MSH ant-condensation heaters are pre-wired, ready-to-use parallel heating cables with cold lead ends. Consisting of two parallel flexible copper leads with silicone glass-fibre insulation, the heating element of CuNi or NiCr alloy is wound around the cable. The 0.37 m long cold lead ends of FEP insulated stranded copper flex terminate the heating cable. The outer jacket consists of glass-fibre, covered with silicone rubber. Both ends of the heating cable are sealed with silicone rubber.

Function

The heating cables are integrated directly into the windings, i.e. built around the winding armature. Heat transfer is improved dramatically since the windings during the impregnation process.

- Easy to connect thanks to its parallel structure
- High watts density power output
- Extremely flexible in a temperature range -50 °C to +180 °C with high di-electric strength

Special versions on request

- Differing supply voltage
- Differing heating cables
- Special heating cable length

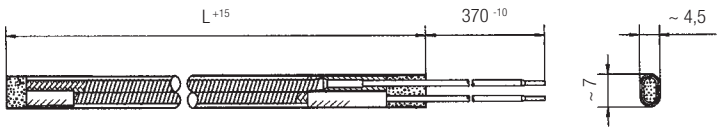
Technical data

Material	Heating elements - CuNi or NiCr Insulation - alkali-free glass-fibre with silicone rubber Connection leads - 2 x FEP-insulated stranded copper flex, 0.5 mm² with crimped sleeve
Bending radius	≥ 25 mm

Electrical data

Heat output	12.5 W, 25 W, 50 W, 75 W, 100 W
Watts density	50 W/m at nominal voltage
Nominal voltage	standard 230 V (special 110 V, others on request)
Permissible excess voltage	1.2 x nominal voltage
Test voltage	2000 V to earth
Temperature resistance class	H = +180 °C
Temperature range	-50 °C to +180 °C

Dimensions



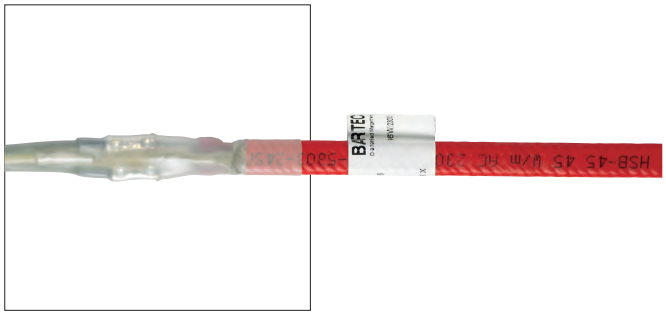
Ordering information

Operating voltage	Code no.	Heating output	Cable length	Code no.
110 V	**6**	12.5 W	250 mm	**012**
		25 W	500 mm	**025**
230 V	**7**	50 W	1000 mm	**050**
		75 W	1500 mm	**075**
Special voltage	**9**	100 W	2000 mm	**100**

Complete order no.

Please enter code number: **27-1811-** ☐☐☐☐

Technical data subject to change without notice.



- Silicone-free
- Self-limiting
- Other lengths on request

This flexible heating tape is used in explosive atmospheres to heat electric motors and generators at standstill. It provides reliable protection against corrosion damage and the associated mechanical breakdowns because it effectively prevents condensation from forming, even under extreme conditions. The heater is supplied ready to connect, which is done via an M20 screwed cable connection fed into an Ex e distributor, or is directly clamped to terminals in an Ex room without a screwed connection. As these heating tapes are self-limiting, overheating is prevented, even if they are laid on top of each other. An additional temperature limiter is not required.

Structure of the heating tape

- Copper power conductor wire 1.2 mm², nickel-plated
- Self-limiting plastic heating element
- Insulation sleeve made of FEP
- Tin-plated copper braiding
- Protective sleeve made of FEP

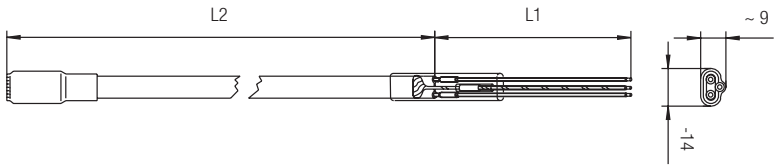
Technical data

Max. temperatures at place of use	switched-on permanently -40 °C to +120 °C switched-off -40 °C to +170 °C
Nominal voltage	208 V to 254 V or 110 V to 120 V
Heating output at 10 °C	12 W, 24 W, 48 W and 96 W at a specific heating output of 45 W/m
Insulation testing	AC 1500 V for 1 minute
Terminal wires with FEP isolation	fine-stranded with tin-plated copper wires 1.5 mm², green and yellow protective earth conductor 2.5 mm²
Heat conuctor closing	shrink-fit hose made of PTFE/FEP
Min. bending radius	25 mm
Size of heating tape diameter	10.2 mm x 4.8 mm

Explosion protection

Marking	Ⓔx II 2G Ex e IIC 200 °C (T2), T3 Gb
Certification	KEMA 08 ATEX 0109 IECEx KEM 09.0082
Other approvals and certificates, see www.bartec.de	
Thermal safety	EN 60519-2; Section 13, class 0
Temperature class	Version 110 V, T2, T3 on request Version 230 V, T3

Dimensions

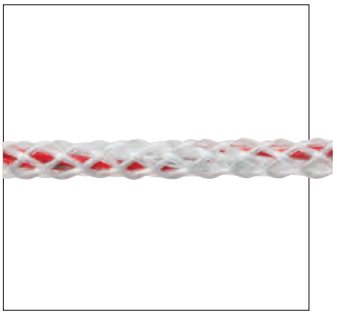


Ordering information HSB heating cable Type 45

Heating output	Strand length L1 (mm)	Heating cable length L2 (mm)	Nominal voltage	Order no.
12 W	300	270	110 V	**27-1776-60300012**
12 W	300	270	230 V	**27-1776-70300012**
24 W	300	540	110 V	**27-1776-60300024**
24 W	300	540	230 V	**27-1776-70300024**
48 W	1000	1070	110 V	**27-1776-61000048**
48 W	1000	1070	230 V	**27-1776-71000048**
96 W	1000	2140	110 V	**27-1776-61000096**
96 W	1000	2140	230 V	**27-1776-71000096**

Technical data subject to change without notice.

WATER DETECTION



- Easy and quick installation, modular principle
- Visual and acoustic alarm signal, galvanically isolated indicator relay
- Durable and reliable

Water leak monitoring in buildings with sensitive electric and electronic equipment or valuables is today an elementary part of building supervision and guarding. If the recommendations in the “IT-Grundschutz” (information security) catalogue are followed, server rooms can be monitored reliably for the detection of water leaks in the cooling systems. The BARTEC water leakage detection systems are used for the surveillance of rooms, piping and individual items. Each leakage is detected with metre accuracy and reported directly in the building surveillance. This ensures that the location of the leakage can be found quickly so that countermeasures can be introduced immediately. The sensor cable and point sensors can be combined at will. The monitoring electronics are available with or without locating. System calibration is not required. In addition, a line-break monitoring is integrated into each system.

Fields of application

Computer centres, telephone exchanges, libraries, museums, archives, book stores, clean air rooms, air-conditioning and heating centres, etc.

- Surfaces
  double floors above or below computer equipment
- Piping
  heating cables, process cables
- Individual
  items drip pans

System components

- Sensor
  SCR sensor cable, PS, PSO+ and PSO Point Sensor
- Monitoring
  RLW **with locating** as a wall-mounted enclosure
  RLA^{net} **with locating** for installation in the control cabinet or as a wall-mounted enclosure
  RDW 03 **without locating** as a wall-mounted enclosure
  RDA 01 **without locating** for installation in the control cabinet

Conductive measurement principle

The BARTEC water leakage detection systems detect leakages of electrically conductive liquids quickly and reliably. The measuring circuits work with AC voltage, which allows a permanent avoidance of galvanic processes at the electrodes.

Optical measurement principle

The PSO+ and PSO Point Sensor detect also electrically non-conductive liquids.

- Individual connection lengths with easy and quick installation
- Series connection, up to 50 point sensors are possible
- Locating possible

The point sensor is used to detect electrically conductive liquids such as e. g. water. With this point sensor the location of the leak can be detected quickly.

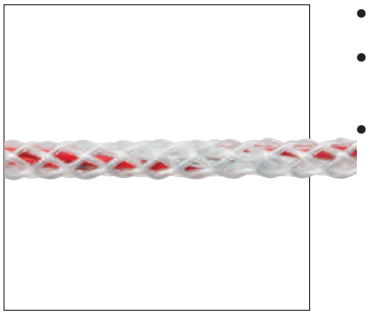
Technical data

Sensors	2 stainless steel plates, Rated resistance: 60 Ω (≙ 10 m on RLW) as area separation at the output
Model	flat point sensor with cable gland and waterproof terminal area IPX4/X7 (to immerse 1 m, max. 12 h)
Dimensions	∅ 80 mm x 26 mm height
Cable gland	M12 x 1.5 terminal area 3 to 6.5 mm
Enclosure material	PVC
Temperature resistance	-10 °C to +50 °C
Leakage alarm	as of 3 mm water level
Connecting terminals	terminal screws at the input and output
Miscellaneous	integrated end resistor 220 kΩ on terminals; is removed with series connection

Ordering information

PS point sensor	**17-85M1-3832/0A00**
PS point sensor with wall mount	**17-85M1-3832/0A10**

Technical data subject to change without notice.



- Simple and quick installation
- Highly flexible; supplied in running metres
- Can be combined with PS point sensor

The SCR sensor cable is used for detecting electrically conductive liquids such as water, acids and alkalis. This sensor cable can detect the location of the leak precisely. The SCR is a 4-core flexible round cable with protective braiding.

Technical data

Sensors	2 x 0.25 mm², stainless steel, protected by partially permeable PTFE insulation Colour: red, white Rated resistance: 6 Ω/m
Return conductor	2 x 0.25 mm², copper, with FEP insulation Colour: red, white
Protective braiding	made of FEP Colour: natural
Cable diameter	5 mm
Minimum bending radius	6 x cable diameter
Tensile strength	210 N
Temperature resistance	-50 °C to +180 °C
Fire protection	V0 according to fire protection standard UL 1581

Ordering information

Sensor cable SCR, supplied by the metres	**17-85M1-1761**

Technical data subject to change without notice.

- Fast detection of the leak location
- Central and decentral voltage supply possible
- Can be combined with SCR and PS

The PSO+ point sensor and the PSO point sensor are used to detect electrically non-conductive liquids such as oil, enabling the location of the leak to be detected quickly. Thanks to the special optics, the PSO+/PSO can operate reliably also when facing metallic surfaces (e.g. oil catch pan made of sheet steel). The integrated load relay can operate actuators, such as a check valve, directly on site. A second change-over contact reports the circuit state to the monitoring electronics. The point sensor can be supplied centrally with DC 24 V via the signal cable. It is similarly possible to provide voltage decentrally by means of a commercially available plug-in power supply unit. With its additional terminal block, the PSO+ can be combined with the SCR and PS sensors as required. The monitoring electronics RLW, RLA^{net}, RDW03 and RDA01 as well as corresponding accessories (see catalogue) are also part of the BARTEC water detection system.

Technical data

Rated voltage	DC 24 V ±10 %, 0.4 W
Measuring method	Optical, sensitivity: very small amounts, detection height adjustable using screw feet, pre-set to 2 mm
Outputs	Group alarm relay, 2 change-over contacts DC-13: 1 A, 12 V to 48 V Fail-save, relay is activated, Change-over contact: if leak is detected, terminals NO – C opens
Display	Internal LED green: voltage ON LED red: relay activated, no leak
Ambient temperature	-25 °C to +50 °C at 5 % to 95 % air humidity (non-condensing) Optics und screw feet (leak liquid) -25 °C to +80 °C -40 °C to +125 °C (on request)
Storage temperature	-30 °C to +60 °C
Protection class	IP 65/67
Material	Enclosure: PVC, polysulfone[1)] Screw feet: stainless steel (1.4301)/brass, nickel-plated
Fixing	Free-standing, floor installation
Dimensions	Ø 80 x 70 mm (D x H) without cable glands
PSO+ terminals	Screw terminals, for series connection (via installation cable, e.g. LIYY): Terminal 1 (e.g. white) - terminal 5 Terminal 2 (e.g. brown) - terminal 6 Terminal 3 (e.g. green) - terminal 7 Terminal 4 (e.g. yellow) - terminal 8 Integrated terminal resistor 220 kΩ on terminals 5 and 7; to be removed for connection in series
PSO+ and PSO terminals	Voltage supply and floating changeover contacts: Terminal + (e.g. white) - DC 24 V Terminal - (e.g. brown) - 0 V Terminal 1/4 NO (e. g. green) contact Terminal 2/5 NC contact Terminal 3/6 C (e.g. yellow) - root

[1)] good resistance to acids and lyes, mineral lubricants and alcohols; not resistant to petrol; the optics material Trogamid is available on request

Ordering information

PSO+ point sensor	**17-85M6-1102/1A00**
PSO point sensor	**17-85M6-1102/0A00**

Technical data subject to change without notice.

- Quick and precise localisation of the leakage location
- Monitoring lengths to 3,000 m
- No system calibration required

The RLW monitoring electronics can be easily integrated into the building surveillance. System calibration is not necessary. To safeguard the system, the software is password-protected. RLW can be combined both with the sensor cable and also with the point sensor. The system status appears as a plain text report. The menu texts in the display are stored in three languages, German, English and French. The front membrane texts are in three languages as standard. The location of the leakage appears in the display quickly and precisely. This ensures that the location of the leakage can be found rapidly and countermeasures introduced immediately. The max. monitoring length is 3,000 m and can be displayed in metres or feet. For each measuring channel up to 1,500 m of sensor cable can be connected. The monitoring length can be divided into 50 zones per measuring channel.

Technical data

Model	plastic wall-mounted enclosure with transparent protective cover, terminal connection chamber and cable glands
Dimensions (W x H x D)	284 mm x 217 mm x 143 mm; (dimension H without cable glands)
Inputs	power supply (standard) AC 230 V or AC 115 V/50 to 60 Hz/8 VA or DC 12 V or DC 24 V/7 W sensor connection
Outputs	two floating change-over contacts for leakage report: per measuring channel (3 A at AC 230 V) two floating change-over contacts for fault (fail-safe) power failure surveillance: 3 A at AC 230 V RS232 interface (standard) and RS485 (option) block-oriented, secured single-master protocol for connecting to the building management system
Event logger	storage of the last 20 events with date, time and plain text
Measuring accuracy	±0.1 % of the measurement range end level
Measurement method	conductive (conductive liquids > 30 µS/cm)
Self-monitoring	sensor rupture and power failure
Date/time	automatic switch-over from summer/winter time
Operating elements	membrane keyboard, operation of all functions including the plain text inputs
Signal	optical: LED displays; operation/leakage/rupture/fault acoustic: piezoelectric buzzer (can be switched on and off)
Ambient temperature	0 °C to +50 °C
Protection class	IP 65

Ordering information

RLW single-channel	**17-85G1-2121**
RLW dual-channel	**17-85G1-2221**
RLW and RS485, single-channel	**17-85G1-2122**
RLW and RS485, dual-channel	**17-85G1-2222**

Technical data subject to change without notice.

- Quick and precise localization of the leakage location
- Modbus RTU integration into the building surveillance
- Can be combined with sensor and point sensor

The monitoring unit RLA[net] is a component of the BARTEC Water leakage detection system. It is operating with the sensor cable SCR and/or the point sensor PS. Further components of the BARTEC Water leakage detection system are the monitoring units RLW, RDW 03 and RDA 01, also the accessories. The system detects minor liquid leakages fast and reliable. An optical and acoustic signal arises. Simultaneously the potential-free contact switches. This can be used for signalling to PLC or to a building control unit. The leakage is being localized exact by 1 meter and get visualized on the 4-digit display. Thus a leakage will be found by a service person quick and true.

Technical data

Power supply	DC 12 V to 24 V ±10 %; 3 W
Method of measurement	conductive (conductive liquids > 30 µS/cm) accuracy: ±1 %
Inputs	Sensor via 4-wire cable Sensor cable length: max. 500 m Point sensors: max. 50 pieces Sensitivity: adjustable
Outputs	Collective message alarm relay, 1 floating change-over contact AC 12: 0.5 A, 125 V DC 13: 1 A, 24 V RS485, Modbus RTU, for process visualization and parametrization
Memory	Alarm-/Break storage, last 32 happenings
Signal optical	Power LED red, relay de-energized Leak LED green, relay energized Service LED green, relay energized
Signal acoustic	Piezoelectric buzzer quit by pressing button on front panel
Ambient temperature	-20 °C to +50 °C at 5 % to 95 % air humidity (non-condensing)
Storage temperature	-40 °C to +60 °C
Protection class	IP 20
Housing material	Thermoplastic
Mounting	Clip-on enclosure for mounting rail TS 35
Dimensions (W x H x D)	70 mm x 86 mm x 53 mm
SCR sensor cable	Terminal 13, white, perforated Terminal 14, white, insulated Terminal 15, red, perforated Terminal 16, red, insulated
Point sensor PS terminal via installation cable	Terminal 13, 1 (e.g. white LIYY) Terminal 14, 2 (e.g. brown LIYY) Terminal 15, 3 (e.g. green LIYY) Terminal 16, 4 (e.g. yellow LIYY)

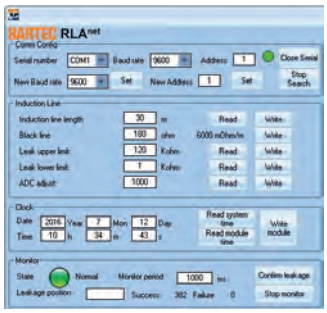
Visualization

The service-software (for WINDOWS-PC) calls the system status via RS485 in real-time. The data is available in MODBUS RTU protocol. Up to 250 MODBUS addresses will be handled. The typical application parametrization will also be managed by using this service-software.

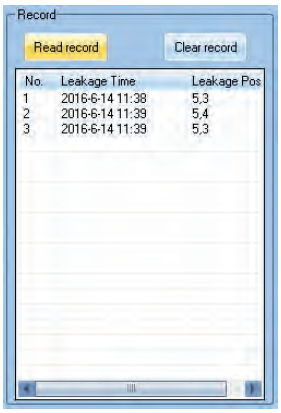
Download the service software and the extended manual below:
www.bartec.de

Service-Software

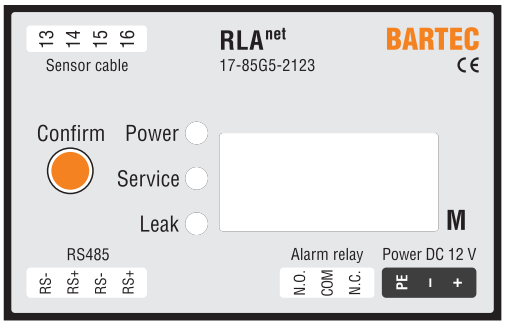
Parametrization



Memory display



Front panel



Ordering information

Monitoring unit RLA[net]	**17-85G5-21230000**

Technical data subject to change without notice.

- Rapid detection of leakages
- No system calibration required
- Can be combined with sensor cable and point sensor

The RDW 03 monitoring electronics can be easily integrated into the building surveillance.The system detects even small liquid leakages quickly and reliably. There is an optical and acoustic alarm signal. At the same time floating contacts are set for signals to the building services management and control tasks. The max. monitoring length is 1,000 m.

Technical data

Model	Wall-mounted enclosure with membrane keyboard and separate terminal area
Dimensions (W x H x D)	166 mm x 160 mm x 84 mm
Inputs	power supply AC 230 V/50 to 60 Hz/8 VA or DC 24 V/7 W as standard sensor via two-wire lead, sensor cable length max. 1000 m point sensors max. quantity of 50 pcs
Outputs	alarm relay, two separate change-over contacts (6 A at AC 230 V/6 A at DC 24 V) rupture/power failure relay, one change-over contact in fail safe function (6 A at AC 230 V/6 A at DC 24 V)
Memory	alarm/rupture relay memory
Measurement method	conductive (conductive liquids > 2 µS/cm)
Response sensitivity	adjustable
Self-monitoring	sensor rupture and power failure
Operating elements	two-stage confirm button (stage 1: buzzer off); on/off button
Signal	optical: LED displays operation/alarm/rupture acoustic: piezoelectric buzzer
Ambient temperature	0 °C to +60 °C
Protection class	IP 54

Ordering information

RDW 03	**17-85F3-8322**

Technical data subject to change without notice.

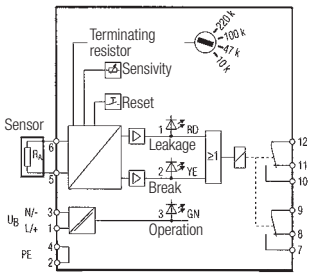
- Rapid detection of leakages
- No system calibration required
- Can be combined with sensor cable and point sensor

The RDA monitoring electronics can be easily integrated into the building surveillance. The system detects quickly and reliably even small quantities of liquid leaks. An optical and acoustic alarm signal is given. At the same time floating contacts are set for signals to the building services management and control tasks. The messages are saved until the reset via a push button or voltage disconnection. If the leak continues, the messages are reset. The max. monitoring length is 1,000 m.

Technical data

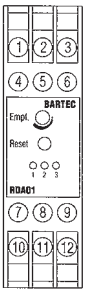
Model	clip-on enclosure for mounting rail TS 35
Dimensions (W x H x D)	22.5 mm x 82 mm x 101 mm
Inputs	Voltage supply Type 2322: AC 230 V/50 to 60 Hz/1.2 VA Type 2422: DC 24 V/0.8 W Sensor via two-wire lead Sensor cable length: max. 1,000 m Point sensors: max. 50 pcs
Outputs	Group alarm relay, two change-over contacts 0.25 A at AC 230 V/1 A at DC 24 V
Memory	Alarm/rupture relay memory
Measurement method	conductive (conductive liquids > 2 µS/cm)
Self-monitoring	sensor rupture and power failure
Operating elements	reset button
Signal	optical: LED displays; operation/alarm/rupture acoustic: piezoelectric buzzer
Ambient temperature	-25 °C to +60 °C
Protection class	IP 20
Signal	alarm: LED red (1), break: LED yellow (2), operation: LED green (3)

Connection/Function



Pictured state: operation/no leakage

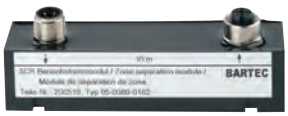
Terminal assignment



Ordering information

RDA, AC 230 V	**17-85F4-2322**
RDA, DC 24 V	**17-85F4-2422**

Technical data subject to change without notice.

Description	Order No.
 **Connection cable** LIYY 4 x 0.5 mm²	**02-4042-0011**
Colour code in acc. with DIN 47100	wh, bn, gn, ye
Temperature range	-30 °C to +80 °C fixed installation
Dimensions	∅ = 5.8 mm
Conductor loop resistance	R = approx. 2 x 3 Ω/100 m (100 m [approx. 6 Ω] represent 1 m sensor cable for devices with detection)
 **SCR terminal connector** for RLW	**05-0080-0161**
Temperature range	40 °C to +85 °C
Dimensions	∅ = 20 mm; L = 60 mm
Material	PA
Flammability in acc. with UL-94	V-2
Clamping area	0.25 mm to 0.75 mm
Internal wiring	Jumper between terminal 1 - 2 and 3 - 4
 **SCR final resistance** 220 kΩ for RDA, RDW	**05-0080-0164**
Temperature range	-40 °C to +85 °C
Dimensions	∅ = 20 mm; L = 60 mm
Material	PA
Flammability in acc. with UL-94	V-2
Clamping area	0.25 mm to 0.75 mm
Internal wiring	Jumper between terminal 1 - 2 and 3 - 4; Final resistance 220 kΩ between terminal 1 - 3
 **SCR separating module**	**05-0080-0162**
Temperature range	-40 °C to +85 °C
Dimensions (L x W x H)	103 mm x 22 mm x 37 mm
Internal wiring	Resistance R = 62 Ω between connector X1 and bushing X3 (62 Ω represent 10 m sensor cable for devices with detection)
 **SCR T-splitter**	**17-85Z4-3200**
Temperature range	-40 °C to +85 °C
Dimensions (L x W x H)	103 mm x 22 mm x 37 mm
Internal wiring	Resistance R = 62 Ω between connector X1 and bushing X2 and between bushing X2 and bushing X3 (62 Ω represent 10 m sensor cable for devices with detection)

Description		Order No.
Mounting tape		**05-0091-0045**
Temperature range	-30 °C to +100 °C	
Dimensions (L x W)	100 mm x 50 mm	
VPE	50 pieces	

Identification label „Sensitive sensor cable“		**05-2144-0777**
Temperature range	-40 °C to +85 °C, do not stick on below 0 °C	
Dimensions (L x W)	100 mm x 50 mm	

SCR connector installation kit		**05-0091-0054**
Temperature range	-40 °C to +85 °C	
Dimensions	∅ = 20 mm; L = 60 mm	
Material	PA	
Flammability in acc. with UL-94	V-2	
Clamping area	0.25 mm to 0.75 mm	

SCR bushing installation kit		**05-0091-0055**
Temperature range	-40 °C to +85 °C	
Dimensions	∅ = 20 mm; L = 60 mm	
Material	PA	
Flammability in acc. with UL-94	V-2	
Clamping area	0.25 mm to 0.75 mm	

Technical data subject to change without notice.

PROJECT PLANNING INFORMATION

Project Planning Information for Pipes Electric Trace Heating Systems

Company | Web site

Street | Contact person

Post code/Town | E-mail

Country | Phone

Application of Electrical Trace Heating System

Frost protection ☐

Temperature maintenance ☐

Heating up and temperature maintenance ☐

Piping information

Length m

Nominal bore mm

Pipe material

Specific heat of the pipe material* J/(kg·K)

Pipe weight per meter* kg/m

Wall thickness* mm

Density of the pipe material* kg/m³

Number of valves pcs.

Number of flanges pcs.

Number of supports pcs.

Number of pumps/filters pcs.

Number of drains/vents pcs.

Location indoor ☐ outdoors ☐ buried ☐

Thermal insulation information

Material

Thickness mm

Thermal conductivity W/(m·K) at mean temperature °C

Density* kg/m³

Specific heat* J/(kg·K)

Upper limit temperature of thermal insulation material °C

*required for heating up applications

Product information

Medium

Density* kg/m³

Specific heat* J/(kg·K)

Phase change temperature* (if undergo) °C

Specific heat of fusion* J/kg

Process data

Initial temperature* °C

Final temperature* °C

Required heat up period* h

Maintain temperature °C

Max. allowed temperature of the product °C

Min. ambient temperature °C

Max. ambient temperature °C

Startup temperature °C

Temperature limitations

Max. operating pipe temperature (continuously, trace heater energized) °C

Max. exposure heater temperature (intermittently, trace heater de-energized) °C

Electrical data, area classification, approvals/certifications

Supply voltage V AC Frequency 50 Hz ☐ 60 Hz ☐

Installation in potentially explosive atmospheres Yes ☐ No ☐

Temperature class

ATEX ☐ IECEx ☐ CSA ☐ EAC ☐

INMETRO ☐ KOSHA ☐

Company | Web site

Street | Contact person

Post code/Town | E-mail

Country | Phone

Application of Electrical Trace Heating System

Frost protection ☐

Temperature maintenance ☐

Heating up and temperature maintenance ☐

Vessel properties (please attach drawings)

Body ☐ cylindrical ☐ rectangular

Type ☐ horizontal ☐ vertical

Bottom (for vertical vessel) ☐ Flat ☐ Dome

Top (for vertical vessel) ☐ Flat ☐ Dome

Sides (for horizontal vessel) ☐ Flat ☐ Dome

For vertical vessel Height m ø m

For horizontal vessel Length m ø m

For rectangular vessel (H x W x L) x x m

Supports ☐ Feet ☐ Slab ☐ Saddle

Number of supports pcs.

Specific heat of the vessel material J/(kg·K)

Wall thickness* mm

Density of the vessel material* kg/m³

Location

☐ indoor ☐ outdoor

Thermal insulation material

Thickness mm

Thermal conductivity W/(m·K) at mean temperature °C

Density* kg/m³

Specific heat* J/(kg·K)

Upper limit temperature of thermal insulation material °C

*required for heating up applications

Product information

Medium

Density* kg/m³

Specific heat* J/(kg·K)

Phase change temperature* (if undergo) °C

Specific heat of fusion* J/kg

Process data

Initial temperature* °C

Final temperature* °C

Required heat up period* h

Maintain temperature °C

Max. allowed temperature of the product °C

Min. ambient temperature °C

Max. ambient temperature °C

Startup temperature °C

Temperature limitations

Max. operating vessel temperature (continuously, trace heater energized) °C

Max. exposure heater temperature (intermittently, trace heater de-energized) °C

Electrical data, area classification, approvals/certifications

Supply voltage V AC Frequency 50 Hz ☐ 60 Hz ☐

Installation in potentially explosive atmospheres Yes ☐ No ☐

Temperature class

ATEX ☐ IECEx ☐ CSA ☐ EAC ☐

INMETRO ☐ KOSHA ☐

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Reservation

Technical data subject to change without notice. No claims for damages arising from alterations, errors or misprints shall be allowed. Attention is drawn to the applicable standards and regulations on safety components and systems together with the relevant operating and installation instructions.

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