All at one sight

Our Product *for your Project*

SELF-LIMITING HEATING TAPES

FLUOROPOLYMER-INSULATED HEATING CABLE · MINERAL-INSULATED HEATING CABLE

CONTROL TECHNIQUE

KLÖPPER THERM

We focus on the projects you wish to realize. Electric Heating Systems made by Klöpper-Therm.

Our reputation as specialist for electrical heating systems is due to the functionality and high economic benefit of our products. We take pride in translating this into action for you and your project. Our experience is your advantage.

Everything must fit to each other: We offer all services under one roof, from developing and planning to manufacturing and commissioning. Located in Dortmund with a staff of more than 90 employees, we realise projects all around the world – and are therefore close to you, our customer.

We know about the requirements of our customers.
Take our word for it!

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Self-limiting Heating Tape Type KT-J

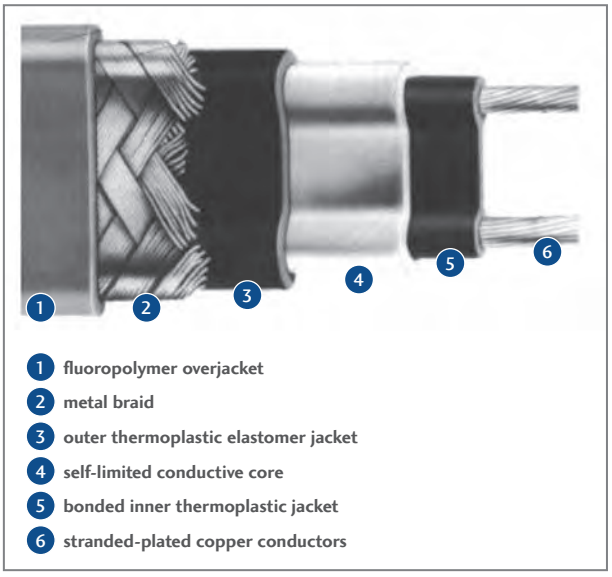
for Frost Protection and Process Temperatures up to max. 65 °C

Type	Power	Art.-No.
KT23J	9 W/m at +10 °C	101228
KT25J	15 W/m at +10 °C	101229
KT28J	25 W/m at +10 °C	101230
KT210J	32 W/m at +10 °C	101231

All heating tapes are tailored according to the specific requirements of our customers.

Description

The Klöpper-Therm heating tape type KT-J is a parallel heating cable with self-limiting characteristic. An irradiation cross-linked semiconductive polymer core material is extruded over the multi-stranded, tin-plated copper bus wires (1.22mm²). The semiconductive core material increases or decreases its heat output in response to temperature changes. Two jackets provide extra dielectric strength, moisture resistance and protection from impact and abrasion damage. The inner thermoplastic jacket is extruded over and bonded to the core material. A thermoplastic elastomer outer jacket is then extruded over the inner jacket. A tinned copper braid is installed over the second jacket, providing a continuous ground path. The braid is covered by a fluoropolymer overjacket, featuring an excellent chemical resistance. Thus, the heating tape provides an optimum protection against corrosive or chemical impacts.



1. fluoropolymer overjacket
2. metal braid
3. outer thermoplastic elastomer jacket
4. self-limited conductive core
5. bonded inner thermoplastic jacket
6. stranded-plated copper conductors

Principle of Operation

The parallel bus wires apply voltage along the entire length of the heating tape. The semiconductive core provides an infinite number of parallel conductive paths, permitting the heating tape to be cut to any length in the field with no dead or cold zones developing. The heating tape derives its self-limiting characteristic from the inherent properties of the semiconductive core material. As the core material temperature increases, the number of conductive paths in the core material decreases, automatically decreasing the heat output. As the temperature of the core material decreases, the number of conductive paths increases, causing the heat output to increase. This occurs at every point along the length of the heating tape, thus adjusting the power output to the varying conditions along the pipe. The self-limiting effect allows the heating tape to be overlapped without creating hot spots or burnout. Since the heating tape regulates its heat output itself, it provides an efficient use of power, producing heat only when and where it is needed and limiting the maximum sheath temperature at the same time.

Application

The Klöpper-Therm heating tape type KT-J is highly suitable in maintaining the fluid flow of a medium under low ambient temperatures. Frost protection systems and systems with low power density such as product pipelines, fire protection, process water, dust suppression systems, hot water and anti-icing (domestic technique) are typical applications for this product.

Rating Data of Heating Tapes

Type Designation	Watt/Meter at 10 °C	Service Voltage (V AC)	Maximum Length of Heating Tape (per Branch) (m)	Maximum Exposure Temperature Permanent (°C)	Maximum Exposure Temperature Temporary (°C)	Temperature Class (Gas Ex-Area)	Max. Surface Temperature (Dust Ex-Area)
KT23J	9	230	185	65	85	T6	T85 °C
KT25J	15	230	155	65	85	T6	T85 °C
KT28J	25	230	125	65	85	T5	T100 °C
KT210J	32	230	115	65	85	T5	T100 °C

*The temperature classification of electrical equipment is applied in hazardous areas and defines the surface temperature the electrical devices do not exceed during proper operation. Regarding the marking of electrical equipment you have to distinguish between gas explosion and dust explosion hazard areas.

The heating tapes have been certified for use in hazardous areas, endangered by gases and dusts, of zones 1 and 2 or 21 and 22 according to EC Type Examination Certificate No. KEMA 04 ATEX 2146U. Klöpper-Therm delivers a complete range of connection boxes, connection and end seal kits, certified together with the heating tapes under EC-Type Examination Certificate No. KEMA 05 ATEX 2102X.

Dimensions (nominal):	width 11.9 mm, thickness 6.0 mm
Weight:	130 g/m
Minimum assembly temperature:	-40 °C
Minimum bending radius:	12 mm at -40 °C

Circuit Breaker Selection (C-Characteristic)

Type Designation	Start-up Temperatur (°C)	Max. Recommended Heating Tape Length (in Meters) vs. Circuit / Breaker Size			
		16 A	20 A	25 A	32 A
KT23J	+10 -5 -20 -30	241** 192** 159 143	302** 240** 199** 179	377** 300** 249** 224**	482** 384** 319** 286**
KT25J	+10 -5 -20 -30	170** 135 112 101	213** 169** 140 126	266** 212** 175** 157**	341** 271** 225** 202**
KT28J	+10 -5 -20 -30	90 74 63 57	113 92 78 71	141** 116 98 89	180** 148** 125 114
KT210J	+10 -5 -20 -30	57 48 41 38	72 60 52 47	89 75 65 59	115 96 83 76

Remarks:

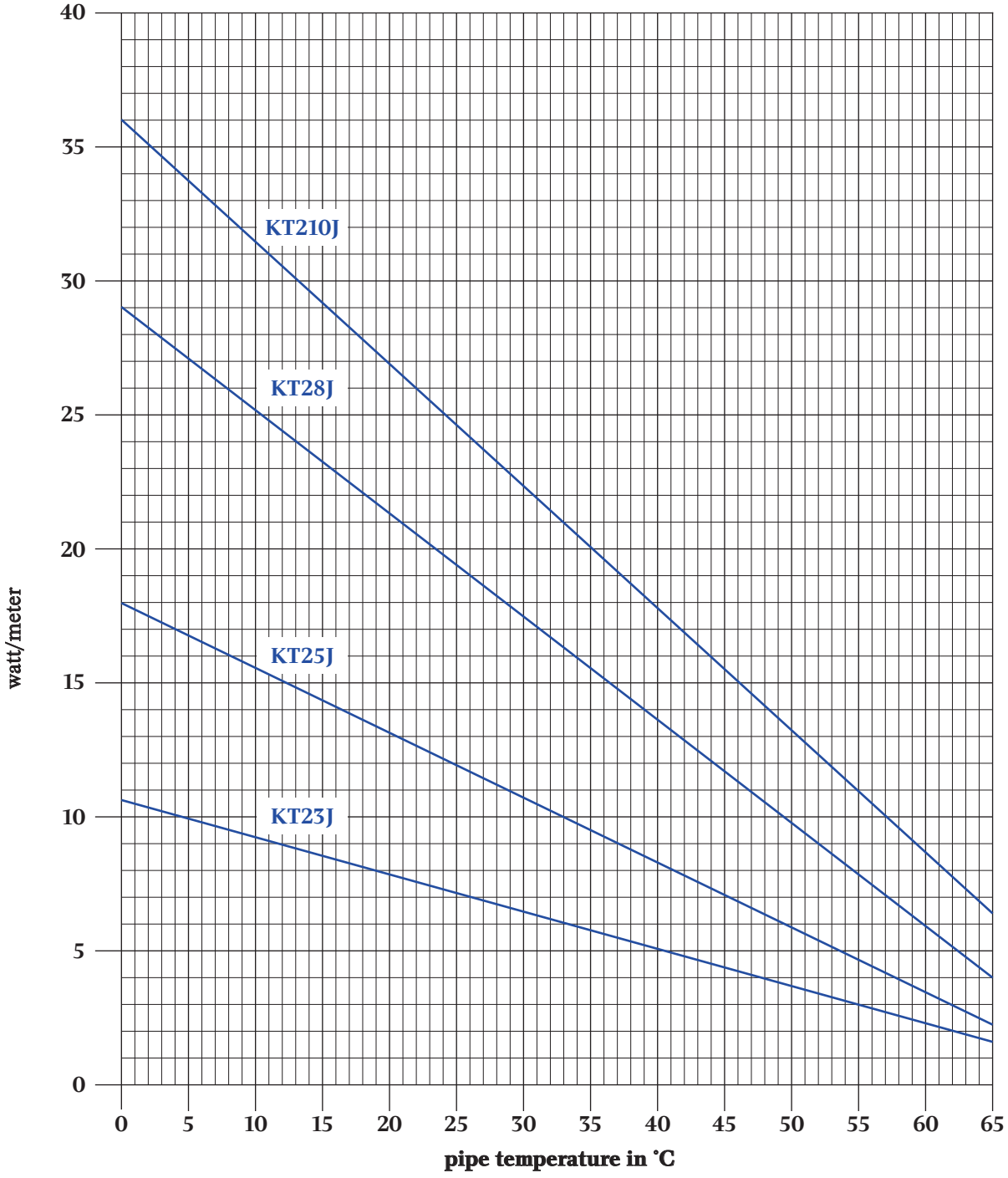
1. The circuit breaker size must be based on minimum start-up temperature, since the inrush current of the heating tapes increases with decreasing ambient temperature.

2. Do not exceed maximum recommended heating tape length per branch, indicated for each type of heating tape. The longer heating tape lengths marked with two stars (**) are only possible by parallel connection of two or several branches (each of these branches must not exceed the recommended heating tape length per branch!) on the breaker. Do not exceed max. recommended length of heating tape indicated in the table.

3. When connecting two or more different wattage heating tapes in parallel on the same breaker, please use the 16 amps column (16A) and divide 16 amps by the maximum heating tape length indicated with reference to the desired minimum start-up temperature. Thus you get an amps/meter value for each type of heating tape. Multiply the length of each heating tape with the derived amps/meter value. The single amp values calculated have to be added up. The added value must not exceed the amperage rating of the breaker.

4. For electrical heating systems, Klöpper-Therm stipulates the use of a residual current device with a residual current rating not exceeding 300 mA. Residual current devices with a residual current rating of 30 mA should be used preferably.

Power Output Rating at 230 V AC



Remark: The power rating is valid for applications on insulated steel pipes.

Self-limiting Heating Tape Type HKT-J

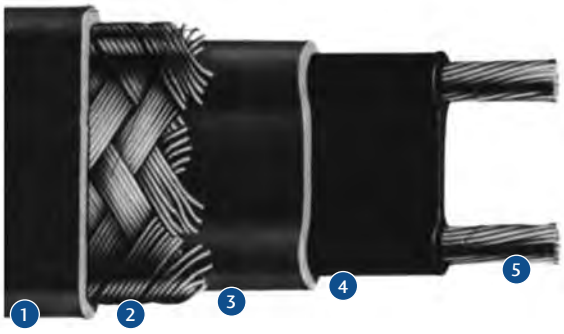
for Fost Protection and Process Temperatures up to max. 120°C, steam-cleaned resistant

Type	Power	Art.-No.
HKT25J	15 W/m at +10 °C	101237
HKT210J	31 W/m at +10 °C	101227
HKT215J	46 W/m at +10 °C	101240
HKT220J	63 W/m at +10 °C	101241

All heating tapes are tailored according to the specific requirements of our customers.

Description

The Klöpper-Therm heating tape type HKT-J is a parallel heating cable with self-limiting characteristic. An irradiation cross-linked semiconductive polymer core material is extruded over the multi-stranded, tinplated copper bus wires (1.22 mm²). The semiconductive core material increases or decreases its heat output in response to temperature changes. A fluoropolymer overjacket provides extra dielectric strength, moisture resistance and protection from impact and abrasion damage. A braid of tin-plated copper is installed over the fluoropolymer overjacket, providing a continuous ground path. The braid is covered by a fluoropolymer overjacket, featuring an excellent chemical resistance. Thus, the heating tape can be used in humid or corrosive environment.



1. fluoropolymer overjacket
2. metal braid
3. fluoropolymer jacket
4. self-limiting conductive core
5. stranded nickel-plated copper conductors

Principle of Operation

The parallel bus wires apply voltage along the entire length of heating tape. The semiconductive core provides a nearly infinite number of parallel conductive paths, permitting the heating tape to be cut to any length in the field with no dead or cold zones developing. The heating tape derives its self-limiting characteristic from the inherent properties of the semiconductive core material. As the core material temperature increases, the number of conductive paths in the core material decreases, automatically decreasing the heat output. As the temperature of core material decreases, the number of conductive paths increases, causing the heat output to increase. This occurs at every point along the length of the heating tape, thus adjusting the power output to the varying conditions along the pipe. The self-limiting effect allows the heating tape to be overlapped without creating hot spots or burnout. Since the heating tape regulates its heat output itself, it limits the maximum sheath temperature while providing useful power for process temperature maintenance.

Application

The Klöpper-Therm heating tape type HKT-J is highly suitable in maintaining the fluid flow of a medium over a wide range of operating temperatures. This product is used for frost protection systems of steam-cleaned pipes and temperature maintenance up to 120°C. Typical applications include hydrocarbon and chemical plant piping.

Rating Data of Heating Tapes

Type Designation	Watt/Meter at 10 °C	Service Voltage (V AC)	Max. Length of Heating Tape (per Branch) (m)	Max. Exposure Temperature Permanent (°C)	Max. Exposure Temperature Temporary (°C)	Temperature Class (Gas Ex-Area)	Max. Surface Temperature (Dust Ex-Area)*
HKT25J	15	230	155	120	190	T3	T200 °C
HKT210J	32	230	115	120	190	T3	T200 °C
HKT215J	46	230	95	120	190	T3	T200 °C
HKT220J	63	230	75	120	190	T3	T200 °C

*The temperature classification of electrical equipment is applied in hazardous areas and defines the surface temperature the electrical devices do not exceed during proper operation. Regarding the marking of electrical equipment you have to distinguish between gas explosion and dust explosion hazardous areas.

The heating tapes have been certified for use in hazardous areas, endangered by gases and dusts, of zones 1 and 2 or 21 and 22 according to EC Type Examination Certificate No. KEMA 04 ATEX 2146U. Klöpper-Therm delivers a complete range of connection boxes, connection and end seal kits, certified together with the heating tapes under EC-Type Examination Certificate No. KEMA 05 ATEX 2102X.

Dimensions (nominal):	width 10.5 mm, thickness 5.1 mm
Weight:	112 g/m
Minimum assembly temperature:	-40 °C
Minimum bending radius:	25 mm at -40 °C

Circuit Breaker Selection (C-Characteristic):

Type Designation	Start-up Temperature (°C)	Max. Recommended Heating Tape Length (in Meters) vs. Circuit / Breaker Size			
		16 A	20 A	25 A	32 A
HKT25J	+10 -5 -20 -30	174** 161** 149 143	218** 201** 187** 178**	272** 251** 234** 223**	348** 322** 299** 286**
HKT210J	+10 -5 -20 -30	99 93 87 83	124** 116** 108 104	155** 145** 135** 130**	199** 185** 173** 166**
HKT215J	+10 -5 -20 -30	70 65 61 59	87 81 77 74	109** 102** 96** 92**	139** 130** 123** 118**
HKT220J	+10 -5 -20 -30	53 51 48 47	66 63 60 58	83** 79** 75 73	106** 101** 96** 93**

Remarks:

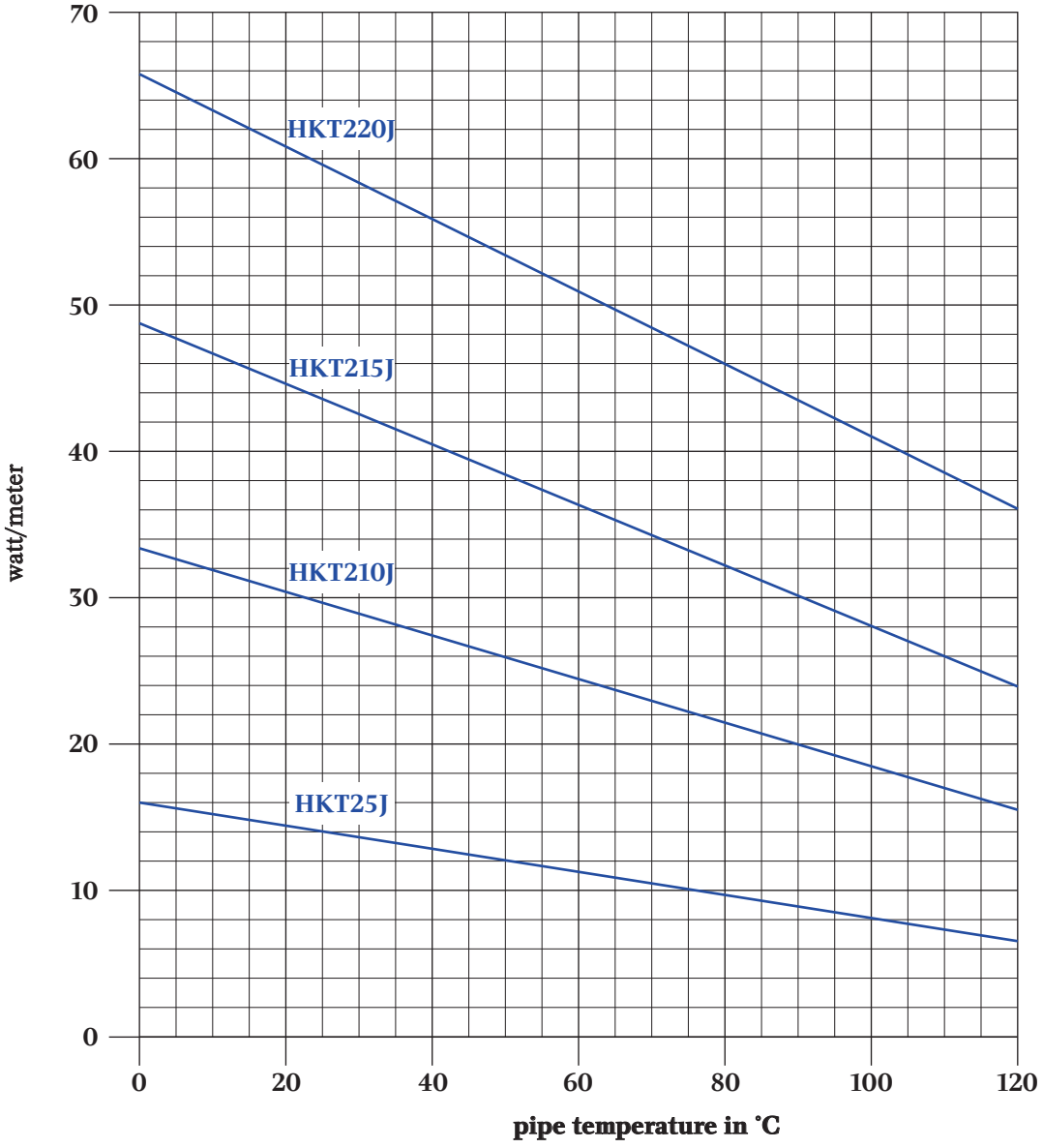
1. The circuit breaker size must be based on minimum start-up temperature, since the inrush current of the heating tapes increases with decreasing ambient temperature.

2. Do not exceed maximum recommended heating tape length per branch, indicated for each type of heating tape. The longer heating tape lengths marked with two stars (**) are only possible by parallel connection of two or several branches (each of these branches must not exceed the recommended heating tape length per branch!) on the breaker. Do not exceed max. recommended length of heating tape indicated in the table.

3. When connecting two or more different wattage heating tapes in parallel on the same breaker, please use the 16 amps column (16A) and divide 16 amps by the maximum heating tape length indicated with reference to the desired minimum start-up temperature. Thus, you get an amps/meter value for each type of heating tape. Multiply the length of each heating tape with the derived amps/meter value. The single amp values calculated have to be added up. The added value must not exceed the amperage rating of the breaker.

4. For electrical heating systems, Klöpper-Therm stipulates the use of a residual current device with a residual current rating not exceeding 300 mA. Residual current devices with a residual current rating of 30 mA should be used preferably.

Power Output Rating at 230 V AC



Remark: The power rating is valid for applications on insulated steel pipes.

PSO-CS-1

Connection and End Seal Kit

for inserting **one** self-limiting heating tape by a stand-off in an EEX e junction box consisting of:
stand-off and adapter M25 made of plastic, gasket and lock-nut M25, sealing grommet for 1 heating tape, 1 connection and 1 end seal, 1 tube of silicone green/yellow insulation hose for metal braid wire end sleeves marking label for connection box

article no.: 101245

PSO-CS-2

Connection and End Seal Kit

for inserting two self-limiting heating tapes by a stand-off in an EEx e junction box consisting of:
stand-off and adapter M25 made of plastic, gasket and locknut M25, sealing grommet for 2 heating tape, 2 connections and 2 end seals, 1 tube of silicone, green/yellow insulation hose for metal braid, wire end sleeves, marking label for junction box

article no.: 101246

ASO-CS-1

Connection and End Seal Kit

for inserting **one** self-limiting heating tape by a stand-off in an EEx e junction box consisting of:
stand-off and adapter M25 made of aluminium, gasket and locknut M25, sealing grommet for 1 heating tape,
1 connection and 1 end seal, 1 tube of silicone, green/yellow insulation hose for metal braid, wire end sleeves, marking label for junction box

article no.: 101247

ASO-CS-2

Connection and End Seal Kit

for inserting **two** self-limiting heating tapes by a stand-off in an EEx e junction box consisting of:
stand-off and adapter M25 made of aluminium, gasket and locknut M25, sealing grommet for 2 heating tapes, 2 connections and 2 end seals, 1 tube of silicone, green/yellow insulation hose for metal braid, wire end sleeves, marking label for junction box

article no.: 101248

CS-1G-KT

Connection and End Seal Kit

for direct entry of **one** self-limiting heating tape type KT in an EExe junction box consisting of:
EExe gland M25 with sealing grommet for KT-heating tape, gasket and locknut, 1 connection and 1 end seal, 1 tube of silicone, green/yellow insulation hose for metal braid, wire end sleeve, marking label for junction box

article no.: 101250

CS-1G-HKT

Connection and End Seal Kit

for direct entry of one self-limiting heating tape type HKT in an EExe junction box consisting of:
EExe gland M25 with sealing grommet for HKT-heating tape, gasket and locknut, 1 connection and 1 end seal, 1 tube of silicone, green/yellow insulation hose for metal braid, wire end sleeves, marking label for junction box

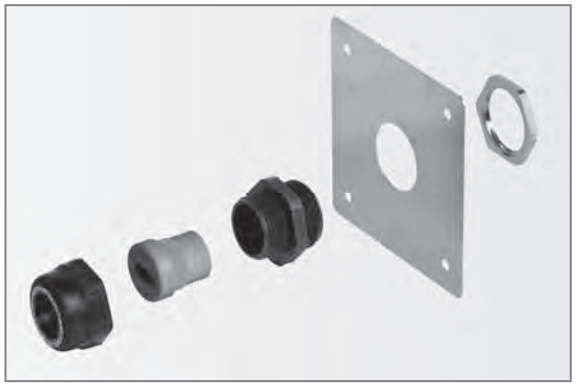
article no.: 101251

CS-1

Connection and End Seal Kit

for one heating tape consisting of:
1 connection and 1 end seal, 1 tube of silicone, green/yellow insulation hose for metal braid, wire end sleeves

article no.: 101249

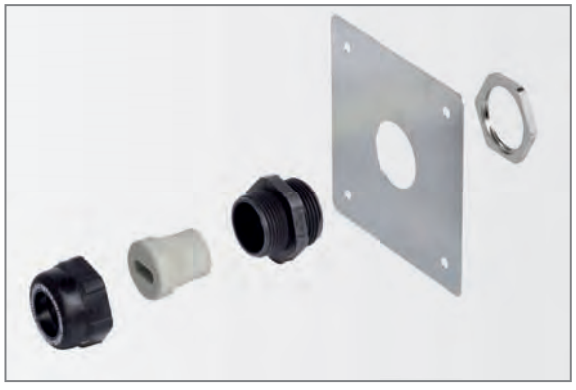


IS-KT

Insulation Entry for one Heating Tape Type KT

consisting of:
1 EEx e gland M25 with sealing grommet for KT-heating tape and locknut, 1 aluminium sheet 0.6 mm with hole M25

article no.: 101252



IS-HKT

Insulation Entry for one Heating Tape Type HKT

consisting of:
1 EEx e gland M25 with sealing grommet for HKT-heating tape and locknut, 1 aluminium sheet 0.6 mm with hole M25

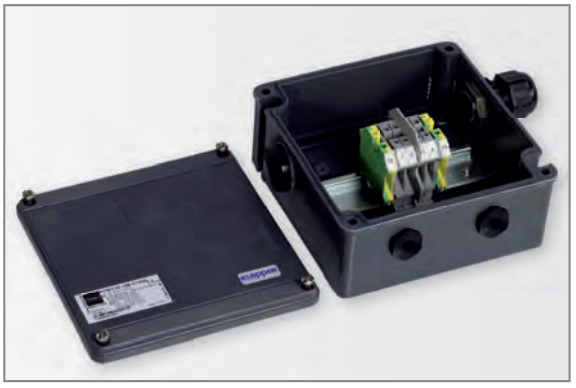
article no.: 101253

AK-P132-2HZB-1xM25 -1V25-1B25

Connection Box EEx e for Heating Tape

polyester in combination with connection kit PSO and ASO, type of protection IP 66, dim. 145x145x71 mm, 4 sheath terminals up to 6 mm², 1 x EEx e Gland M25, 1 x EEx e blind plug M25, 1 x hole M25 for stand-off PSO/ASO

article no.: 101634



AK-P132-2HZB-1xM25-1V25-2B25-EX e

Connection Box EEx e for Heating Tape

for connecting up to 3 heating tapes via glands, polyester, type of protection IP 66, dim. 145x145x71 mm, 4 terminal blocks up to 6 mm², 1 x 44x e gland M25, 2 x EEx e blind plug M25, 1 x hole M25

article no.: 101633

BS-110

Box Support for Connection Box CB-3G

made of stainless steel, 3-piece, consisting of: supporting plate 145x145 mm, stand-off 110 mm, screw set M12

stand-off article no.: 101688
supporting plate article no.: 101674
screw set article no.: 101691

BS-160

Box Support for Connection Box CB-3G

made of stainless steel, 3-piece consisting of: supporting plate 145 x 145 mm, stand-off 160 mm, screw set M12

stand-off article no.: 101689
supporting plate article no.: 101674
screw set article no.: 101691

KH2-2

Fixation Tape 0.5 m Length

1 threaded clamp with lock

article no.: 101821

KH3-2

Fixation Tape 1.0 m Length

1 threaded clamp with lock

article no.: 101822

KH5-8

Fixation Tape 1.0 m Length

1 stainless steel cable tie with lock 5/8“
(clamping tool required)

article no.: 101820

HS 1-1

Warning Sign German
'Achtung Elektrische Begleitheizung'

dimensions: 170 x 80 mm

article no.: 100172

HS 1-2

Warning Sign English/French
'Attention Electrical Tracing'
'Tracage Electrique'

dimensions: 150 x 70 mm

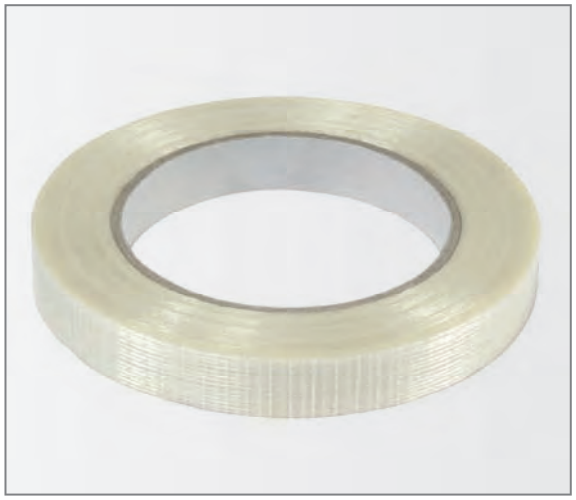
article no.: 100174

HS 1-3

Warning Sign Russian
'ОСТОРОЖНО! ЭЛЕКТРИЧЕСКИЙ КАБЕЛЬНЫЙ НАГРЕВ'

dimensions: 150 x 70 mm

article no.: 100173



FT 70

Filament Tape

glass fibre reinforced, chloride-free, up to 70 °C
50 m per roll, 15 mm width

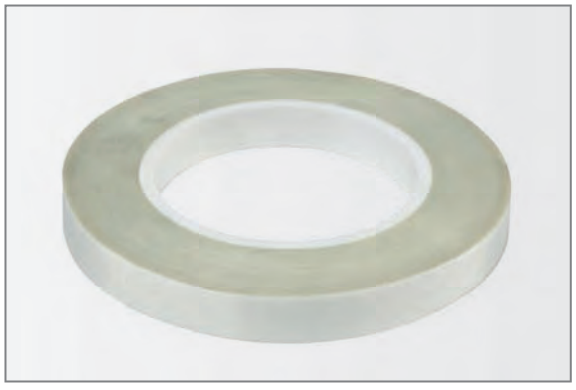
article no.: 101818

FT 130

Filament Tape

glass fibre reinforced, chloride-free, up to 130 °C
50 m per roll, 15 mm width

article no.: 101819

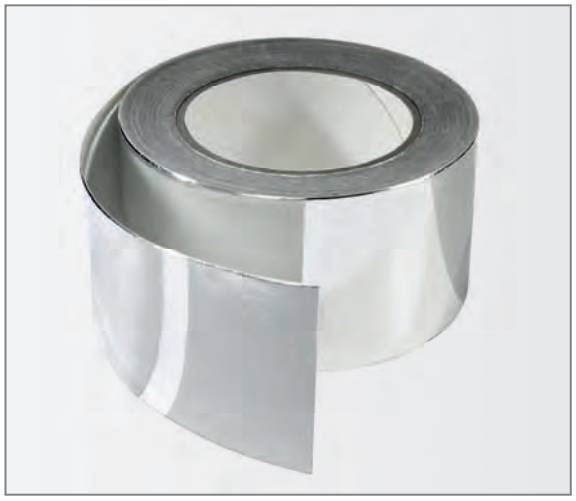


GT 180

Glass Silk Tape

chloride-free, up to 180°C
50 m per roll, 15 mm width

article no.: 101814



AT 120

Aluminium Adhesive Foil

50 µm strong, up to 120°C, chloride-free,
50 m per roll, 100 mm width

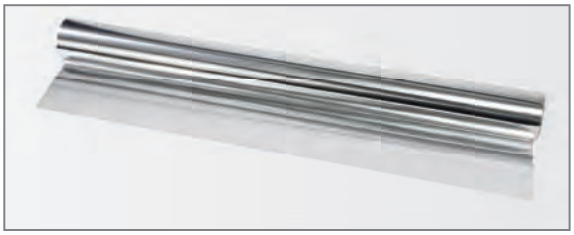
article no.: 101802

AT 150

Aluminium Adhesive Foil

100 µm strong, up to 150°C, chloride-free,
50 m per roll, 65 mm width

article no.: 101803

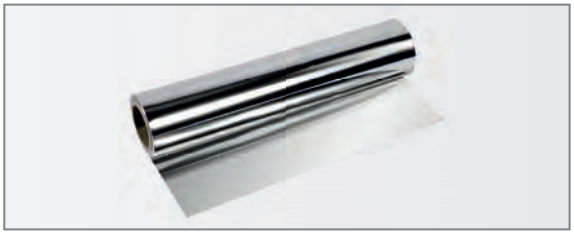


AF 1000

Aluminium Foil

50 µm strong, 25 m per roll, 1000 mm width

article no.: 101800



AF 500

Aluminium Foil

50 µm strong, 50 m per roll, 500 mm width

article no.: 101799

AF 333

Aluminium Foil

50 µm strong, 50 m per roll, 333 mm width

article no.: 101798

AF 167

Aluminium Foil

50 µm strong, 50 m per roll, 167 mm width

article no.: 101797

Self-limiting Heating Tape Type KT-JT

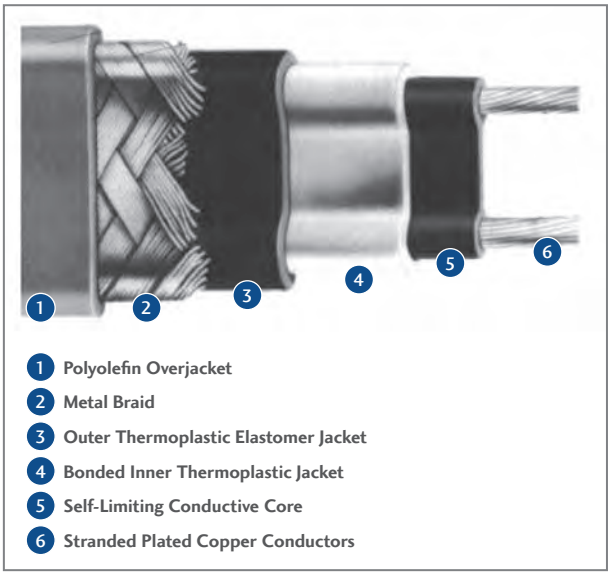
for Frost Protection and Process Temperatures up to max. 65 °C

Type	Power	Art.-No.
KT23JT	9 W/m at +10 °C	101232
KT25JT	15 W/m at +10 °C	101233
KT28JT	25 W/m at +10 °C	101234
KT210JT	32 W/m at +10 °C	101235

All heating tapes are tailored according to the specific requirements of our customers.

Description

The Klöpper-Therm heating tape type KT-JT is a parallel heating cable with self-limiting characteristic. An irradiation cross-linked semiconductive polymer core material is extruded over the multi-stranded, tinplated copper bus wires (1.22 mm²). The semiconductive core material increases or decreases its heat output in response to temperature changes. Two jackets provide extra dielectric strength, moisture resistance and protection from impact and abrasion damage. The inner thermoplastic jacket is extruded over and bonded to the core material. A thermoplastic elastomer outer jacket is then extruded over the inner jacket. A tinned copper braid is installed over the second jacket, providing a continuous ground path. The braid is covered by an UV-stabilized polyolefin overjacket, highly suitable for applications in humid or chemically low aggressive atmosphere.



Principle of Operation

The parallel bus wires apply voltage along the entire length of the heating tape. The semiconductive core provides an infinite number of parallel conductive paths, permitting the heating tape to be cut to any length in the field with no dead or cold zones developing. The heating tape derives its self-limiting characteristic from the inherent properties of the semiconductive core material. As the core material temperature increases, the number of conductive paths in the core material decreases, automatically decreasing the heat output. As the temperature of the core material decreases, the number of conductive paths increases, causing the heat output to increase. This occurs at every point along the length of the heating tape, thus adjusting the power output to the varying conditions along the pipe. The self-limiting effect allows the heating tape to be overlapped without creating hot spots or burnout. Since the heating tape regulates its heat output itself, it provides an efficient use of power, producing heat only when and where it is needed and limiting the maximum sheath temperature at the same time.

Application

The Klöpper-Therm heating tape type KT-JT is highly suitable in maintaining the fluid flow of a medium under low ambient temperatures. Frost protection systems and systems with low power density such as product pipelines, fire protection, process water, dust suppression systems, hot water and anti-icing (domestic technique) are typical applications for this product.

Rating Data of Heating Tapes

Type Designation	Watt/Meter at 10 °C	Service Voltage (V AC)	Maximum Length of Heating Tape (per Branch) (m)	Maximum Exposure Temperature Permanent (°C)	Maximum Exposure Temperature Temporary (°C)
KT23JT	9	230	185	65	85
KT25JT	15	230	155	65	85
KT28JT	25	230	125	65	85
KT210JT	32	230	115	65	85

dimensions (nominal):	width 12.0 mm, thickness 5.8 mm
weight:	130 g/m
minimum assembly temperature:	-40 °C
minimum bending radius:	12 mm at -40 °C

Klöpper-Therm delivers a complete program of terminal boxes, connection and end seal kits for the self-limiting heating tapes type KT-JT.

Circuit Breaker Selection (C-Characteristic):

Type Designation	Start-up Temperatur (°C)	Max. Recommended Heating Tape Length (in Meters) vs. Circuit Breaker Size			
		16 A	20 A	25 A	32 A
KT23JT	+10 -5 -20 -30	241** 192** 159 143	302** 240** 199** 179	377** 300** 249** 224**	482** 384** 319** 286**
KT25JT	+10 -5 -20 -30	170** 135 112 101	213** 169** 140 126	266** 212** 175** 157**	341** 271** 225** 202**
KT28JT	+10 -5 -20 -30	90 74 63 57	113 92 78 71	141** 116 98 89	180** 148** 125 114
KT210JT	+10 -5 -20 -30	57 48 41 38	72 60 52 47	89 75 65 59	115 96 83 76

Remarks:

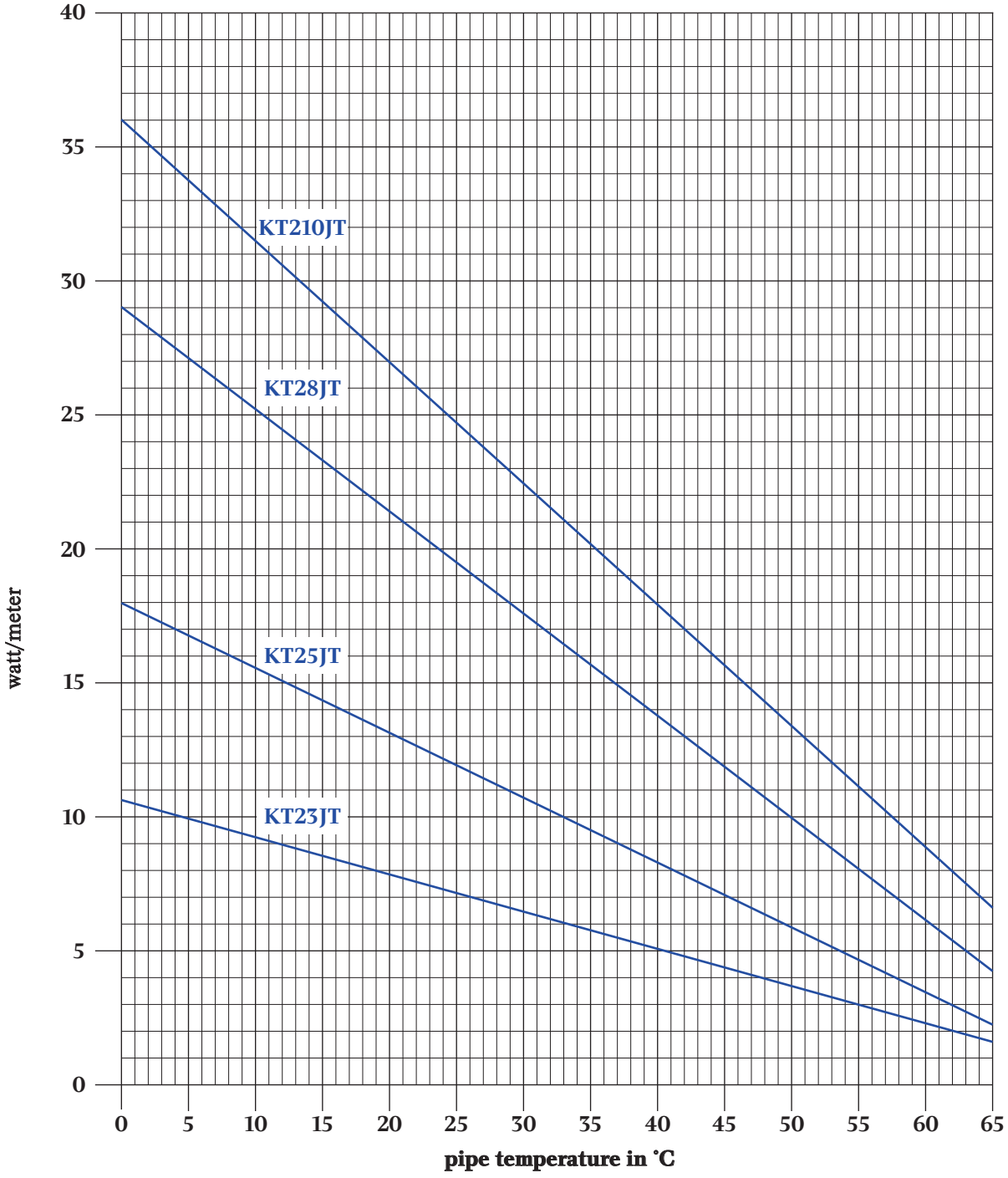
1. The circuit breaker size must be based on minimum start-up temperature, since the inrush current of the heating tapes increases with decreasing ambient temperature.

2. Do not exceed maximum recommended heating tape length per branch, indicated for each type of heating tape. The longer heating tape lengths marked with two stars (**) are only possible by parallel connection of two or several branches (each of these branches must not exceed the recommended heating tape length per branch!) on the breaker. Do not exceed max. recommended length of heating tape indicated in the table.

3. When connecting two or more different wattage heating tapes in parallel on the same breaker, please use the 16 amps column (16A) and divide 16 amps by the maximum heating tape length indicated with reference to the desired minimum start-up temperature. Thus you get an amps/meter value for each type of heating tape. Multiply the length of each heating tape with the derived amps/meter value. The single amp values calculated have to be added up. The added value must not exceed the amperage rating of the breaker.

4. For electrical heating systems, Klöpper-Therm stipulates the use of a residual current device with a residual current rating not exceeding 300 mA. Residual current devices with a residual current rating of 30 mA should be used preferably.

Power Output Rating at 230 V AC



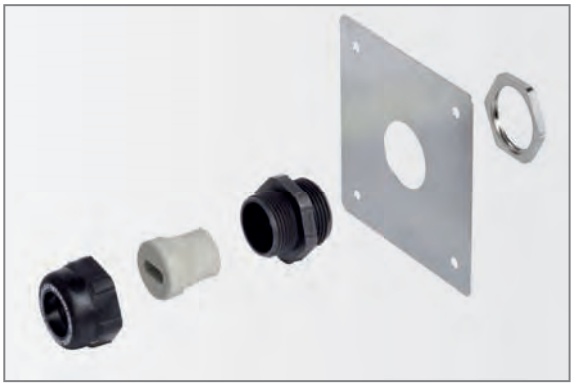
Remark: The power rating is valid for applications on insulated steel pipes.

CS-1G-KT

Connection and End Seal Kit

for direct entry of a self-limiting heating tape type KT in a connection box consisting of:
gland M25 with sealing grommet for KT-heating tape, gasket and locknut, 1 connection and 1 end seal, 1 tube of silicone, green/yellow insulation hose for metal braid, wire end sleeves

article no.: 101250

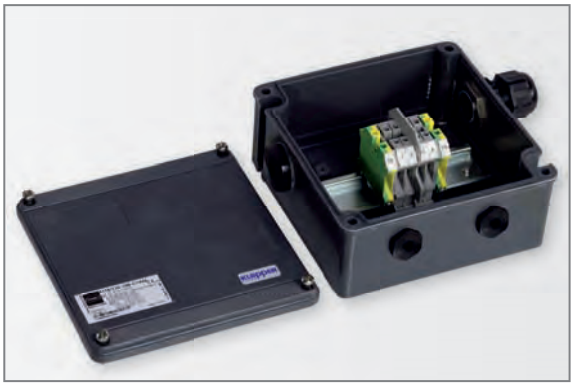


IS-KT

Insulation Entry for Heating Tape Type KT

consisting of:
gland M25 with sealing grommet for KT-heating tape and locknut, aluminium plate 0.6mm with hole M25

article no.: 101252



AK-P132-2HZB-1xM25-1V25-2B25-Ex e (CB-3G)

Connection Box for Heating Tape

for connecting up to 3 heating tapes via glands type of protection IP 66, polyester, dim. 145x145x71 mm, 8 terminal blocks up to 6mm², 1 x gland M25, 2 x blind plugs M25, 1 x hole M25

article no.: 101633

AK-PC1111-7 3HZB

Connection Box for Heating Tape

for connecting up to 3 heating tapes type of protection IP 66, polycarbonate, dim. 110x110x66 mm, 4 series terminals and 2 PE-terminals 4mm², 7 pre-embossments M25/M20

article no.: 101626

BS-110

Box Support for Connection Box CB-3G

made of stainless steel, 3-piece, consisting of:
supporting plate 145 x 145 mm, stand-off 110 mm,
screw set M12

stand-off article no.: 101688
supporting plate article no.: 101674
screw set article no.: 101691

KH2-2

Fixation Tape 0.5 m length

1 threaded clamp with lock

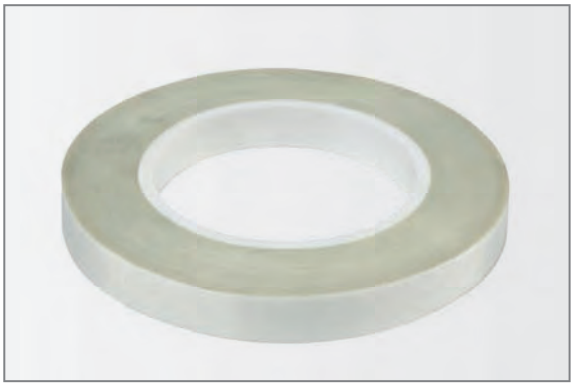
article no.: 101821

KH3-2

Fixation Tape 1.0 m length

1 threaded clamp with lock

article no.: 101822

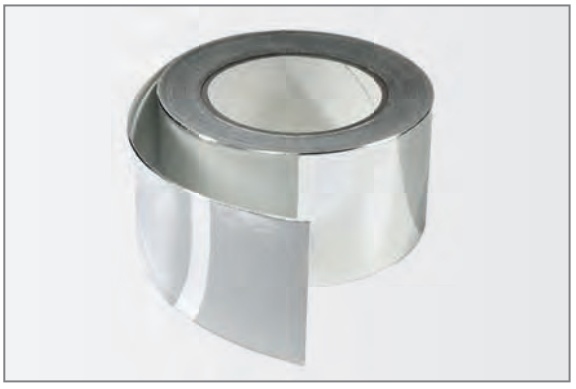


FT 70

Filament Tape

glass fibre reinforced, chloride-free, up to 70 °C
50 m per roll, 15 mm width

article no.: 101818



AT120

Aluminium Adhesive Foil

50 µm strong, up to 120 °C, chloride-free
50 m per roll, 100 mm width

article no.: 101802

HS 1-1

Warning Sign German
'Achtung Elektrische Begleitheizung'

dimensions: 170 x 80 mm

article no.: 100172

Single Wire Plastic Heating Cable Type TCTEX-H-/TCTEX-L-

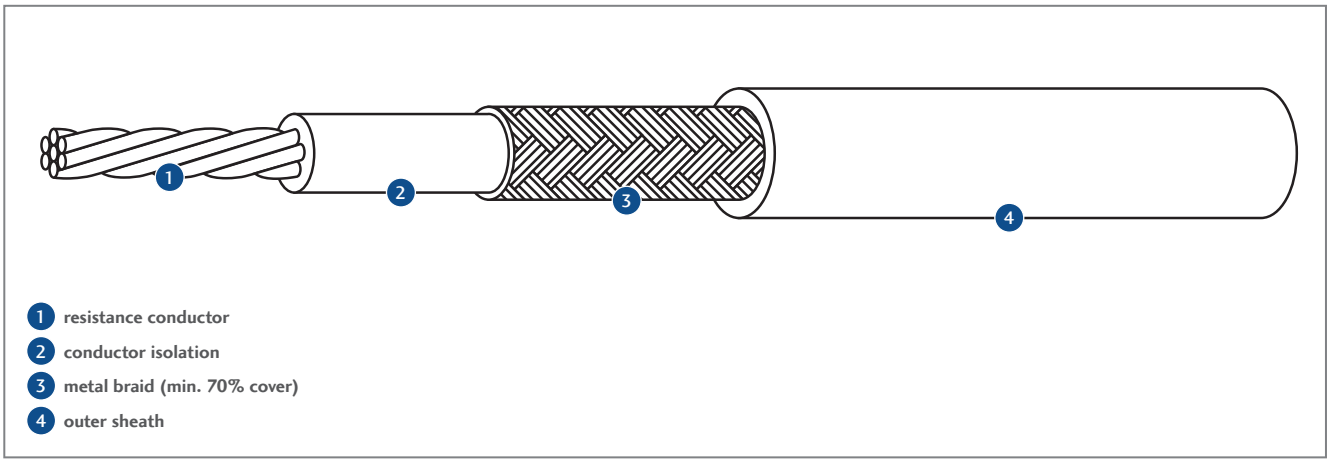
Description

The fluoropolymer-insulated plastic heating cable TCTEX-H-/TCTEX-L has been certified for use in hazardous areas under EC-Type Examination Certificate No. KEMA 10ATEX 0013U and, in combination with the connection components certified for this purpose, it fulfils all requirements according to EN 60079-30-1 as electric operating equipment for electric heating systems.

Marking: II 2G Ex e II
II 2D Ex tD A21

All heating cables are tailored according to the specific requirements of our customers.

Structure of Plastic-insulated Heating Cable Type TCTEX-H-



Resistance conductor:	see table next page
Conductor isolation:	PFA, wall thickn. 0.80 mm (1) 1.00 mm)
Metal braid:	Cu-nickel-plated 16 x 5 x 0.15, cross section 1.41 mm²
Min. 70% cover:	2) 16 x 5 x 0.20, cross section 2.51 mm²
	3) 16 x 6 x 0.20, cross section 3.01 mm²
Outer sheath:	PFA, wall thickn.: 0.60 mm (4) 0.70 mm) (5) 0.80 mm)

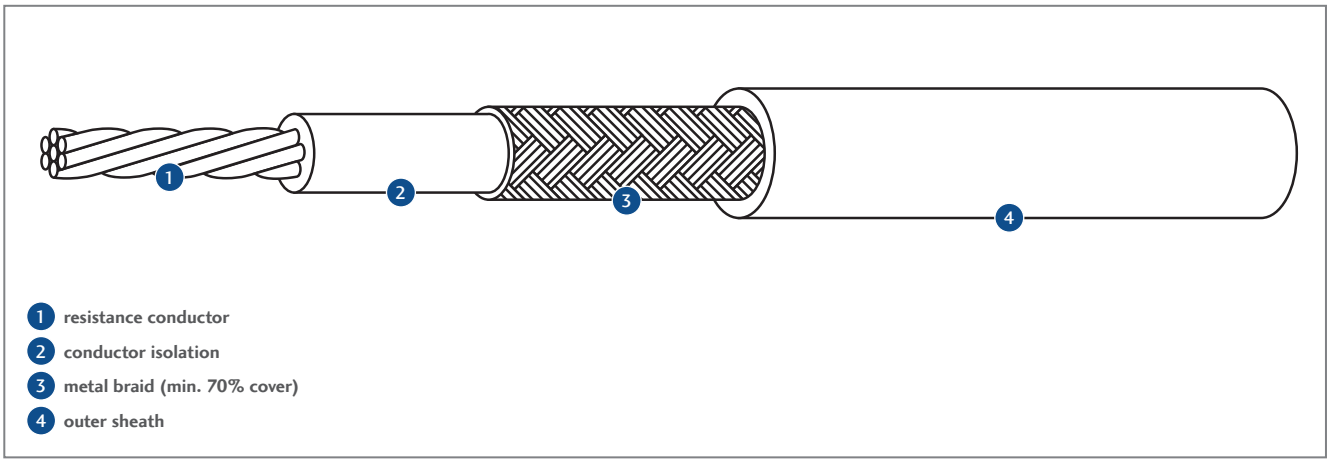
General Characteristics

Resistance at +20 °C:	see table next page
Temperature range:	-60 °C / +260 °C
Power output:	max. 30 W/m (actual value accord. to application)
Test voltage (U_{eff}):	2,50 kV (core/braid)
Nominal voltage (U_0/U):	450 V / 750 V
Mechanical stability:	7 Joule, design accord. to EN 60079-30-1
Bending radius minimum:	1.08 Ω/km up to 1.71 Ω/km, 25 mm
	2.9 Ω/km up to 8.000 Ω/km, 15 mm
Min. assembly temperature:	-60 °C

Technical Data and Type Overview

Article Designation	Resistance at +20 °C Ohm/km	Alloy of Conductor	Structure of Conductor Number x Diameter	Diameter Heating Conductor mm²	Cross Section Heating Conductor mm²	Outer Diameter Heating Cable mm	Temperature Coefficient of Electric Resistance 10^{-6}/K
TCTEX-H -1.08 [1) 3) 4)]	1.08	Cu-nickel-pltd.	126 x 0.404	5.800	16.00	10.20 +0.2	+4300
TCTEX-H -1.71 [3) 4)]	1.71	Cu-nickel-pltd.	80 x 0.404	4.600	10.00	8.60 +0.2	+4300
TCTEX-H -2.9 [2) 4)]	2.9	Cu-nickel-pltd.	84 x 0.300	3.600	6.00	7.60 +0.2	+4300
TCTEX-H -4 [2)]	4.0	Cu-nickel-pltd.	63 x 0.300	2.750	4.45	6.55 +0.2	+4300
TCTEX-H -4.4 [2)]	4.4	Cu-nickel-pltd.	56 x 0.300	2.900	4.00	6.70 +0.2	+4300
TCTEX-H -7.2	7.2	Cu-nickel-pltd.	50 x 0.250	1.940	2.50	5.54 +0.2	+4300
TCTEX-H -10	10	Cu-nickel-pltd.	56 x 0.203	1.750	1.81	5.35 +0.2	+4300
TCTEX-H -11.7	11.7	Cu-nickel-pltd.	30 x 0.250	1.600	1.47	5.20 +0.2	+4300
TCTEX-H -15	15	Cu-nickel-pltd.	37 x 0.200	1.420	1.16	5.02 +0.2	+4300
TCTEX-H -17.8	17.8	Cu-nickel-pltd.	32 x 0.200	1.300	1.00	4.90 +0.2	+4300
TCTEX-H -25	25	CuNi 1	7 x 0.423	1.269	0.98	4.87 +0.2	+3000
TCTEX-H -31.5	31.5	CuNi 2	7 x 0.530	1.590	1.54	5.19 +0.2	+1000 up to +1600
TCTEX-H -50	50	CuNi 2	7 x 0.423	1.269	0.98	4.87 +0.2	+1000 up to +1600
TCTEX-H -50	50	CuNi 2	15 x 0.289	1.33	0.98	4.93 +0.2	+1000 up to +1600
TCTEX-H -65	65	CuNi 2	7 x 0.370	1.110	0.75	4.71 +0.2	+1000 up to +1600
TCTEX-H -80	80	CuNi 2	7 x 0.335	1.010	0.62	4.61 +0.2	+1000 up to +1600
TCTEX-H -100	100	CuNi 10	7 x 0.520	1.560	1.48	5.16 +0.2	+350 up to +450
TCTEX-H -100	100	CuNi 2	7 x 0.3	0.90	0.49	4.50 +0.2	+1000 up to +1600
TCTEX-H -150	150	CuNi 10	7 x 0.423	1.269	0.98	4.87 +0.2	+350 up to +450
TCTEX-H -180	180	CuNi 6	7 x 0.32	0.96	0.56	4.56 +0.2	+500 up to +900
TCTEX-H -200	200	CuNi 10	7 x 0.366	1.098	0.73	4.70 +0.2	+350 up to +450
TCTEX-H -320	320	CuNi23Mn	7 x 0.410	1.230	0.92	4.83 +0.2	+180
TCTEX-H -360	360	CuNi 10	7 x 0.273	0.819	0.41	4.42 +0.2	+350 up to +450
TCTEX-H -380	380	CuNi23Mn	7 x 0.376	1.128	0.77	4.73 +0.2	+180
TCTEX-H -480	480	CuNi23Mn	7 x 0.335	1.010	0.62	4.61 +0.2	+180
TCTEX-H -600	600	CuNi23Mn	7 x 0.300	0.900	0.49	4.50 +0.2	+180
TCTEX-H -650	650	CuNi23Mn	7 x 0.288	0.864	0.46	4.46 +0.2	+180
TCTEX-H -700	700	CuNi23Mn	7 x 0.277	0.831	0.42	4.43 +0.2	+180
TCTEX-H -810	810	CuNi 44	7 x 0.329	0.987	0.59	4.59 +0.2	-80 up to +40
TCTEX-H -1000	1000	CuNi 44	7 x 0.296	0.888	0.48	4.49 +0.2	-80 up to +40
TCTEX-H -1440	1440	CuNi 44	7 x 0.246	0.738	0.33	4.34 +0.2	-80 up to +40
TCTEX-H -1750	1750	CuNi 44	9 x 0.200	0.700	0.28	4.40 +0.2	-80 up to +40
TCTEX-H -1750	1750	CuNi 44	7 x 0.224	0.672	0.28	4.27 +0.2	-80 up to +40
TCTEX-H -2000	2000	NiCr30/20	7 x 0.305	0.915	0.51	4.52 +0.2	+300 up to +400
TCTEX-H -3000	3000	NiCr30/20	7 x 0.249	0.747	0.34	4.35 +0.2	+300 up to +400
TCTEX-H -8000	8000	NiCr80/20	7 x 0.155	0.465	0.13	4.07 +0.2	+50 up to +150

Structure of Plastic-insulated Heating Cable Type TCTEX-L-



Resistance conductor:	see table next page
Conductor isolation:	PFA, wall thickn. 0.90 mm (1) 1.00 mm)
Metal braid:	Cu-nickel-plated 16 x 5 x 0.15, cross section 1.41 mm²
Outer sheath:	PFA, wall thickn.: 0.40 mm (4) 0.70 mm) (5) 0.80 mm)

2

General Characteristics

Resistance at +20˚C:	see table next page
Temperature range:	-60 ˚C / +260 ˚C
Power output:	max. 30 W/m (actual value accord. to application)
Test voltage (U_{eff}):	2,50 kV (core/braid)
Nominal voltage (U_0/U):	450 V / 750 V
Mechanical stability:	4 Joule, design accord. to EN 60079-30-1
Bending radius minimum:	15 mm
Min. assembly temperature:	-60 ˚C

Technical Data and Type Overview

Article Designation	Resistance at +20 °C *Ohm/km	Alloy of Conductor	Structure of Conductor Number x Diameter	Diameter Heating Conductor mm²	Cross Section Heating Conductor mm²	Outer Diameter Heating Cable mm	Temperature Coefficient of Electric Resistance 10^{-6}/K
TCTEX-L -7.2	7.2	Cu-nickel-pltd.	50 x 0.250	1.940	2.50	4.94 +0.2	+4300
TCTEX-L -10	10	Cu-nickel-pltd.	56 x 0.203	1.750	1.81	4.75 +0.2	+4300
TCTEX-L -11.7	11.7	Cu-nickel-pltd.	30 x 0.250	1.600	1.47	4.60 +0.2	+4300
TCTEX-L -15	15	Cu-nickel-pltd.	37 x 0.200	1.420	1.16	4.42 +0.2	+4300
TCTEX-L -17.8	17.8	Cu-nickel-pltd.	32 x 0.200	1.300	1.00	4.30 +0.2	+4300
TCTEX-L -25	25	CuNi 1	7 x 0.423	1.269	0.98	4.27 +0.2	+3000
TCTEX-L -31.5	31.5	CuNi 2	7 x 0.530	1.590	1.54	4.95 +0.2	+1000 up to +1600
TCTEX-L -50	50	CuNi 2	7 x 0.423	1.269	0.98	4.27 +0.2	+1000 up to +1600
TCTEX-L -50	50	CuNi 2	15 x 0.289	1.33	0.98	4.33 +0.2	+1000 up to +1600
TCTEX-L -65	65	CuNi 2	7 x 0.370	1.110	0.75	4.11 +0.2	+1000 up to +1600
TCTEX-L -80	80	CuNi 2	7 x 0.335	1.010	0.62	4.01 +0.2	+1000 up to +1600
TCTEX-L -100	100	CuNi 10	7 x 0.520	1.560	1.48	4.56 +0.2	+350 up to +450
TCTEX-L -100	100	CuNi 2	7 x 0.3	0.90	0.49	3.90 +0.2	+1000 up to +1600
TCTEX-L -150	150	CuNi 10	7 x 0.423	1.269	0.98	4.27 +0.2	+350 up to +450
TCTEX-L -180	180	CuNi 6	7 x 0.32	0.96	0.56	3.96 +0.2	+500 up to +900
TCTEX-L -200	200	CuNi 10	7 x 0.366	1.098	0.73	4.10 +0.2	+350 up to +450
TCTEX-L -320	320	CuNi23Mn	7 x 0.410	1.230	0.92	4.23 +0.2	+180
TCTEX-L -360	360	CuNi 10	7 x 0.273	0.819	0.41	3.82 +0.2	+350 up to +450
TCTEX-L -380	380	CuNi23Mn	7 x 0.376	1.128	0.77	4.13 +0.2	+180
TCTEX-L -480	480	CuNi23Mn	7 x 0.335	1.010	0.62	4.01 +0.2	+180
TCTEX-L -600	600	CuNi23Mn	7 x 0.300	0.900	0.49	3.90 +0.2	+180
TCTEX-L -650	650	CuNi23Mn	7 x 0.288	0.864	0.46	3.87 +0.2	+180
TCTEX-L -700	700	CuNi23Mn	7 x 0.277	0.831	0.42	3.83 +0.2	+180
TCTEX-L -810	810	CuNi 44	7 x 0.329	0.987	0.59	3.99 +0.2	-80 up to +40
TCTEX-L -1000	1000	CuNi 44	7 x 0.296	0.888	0.48	3.89 +0.2	-80 up to +40
TCTEX-L -1440	1440	CuNi 44	7 x 0.246	0.738	0.33	3.74 +0.2	-80 up to +40
TCTEX-L -1750	1750	CuNi 44	9 x 0.200	0.700	0.28	3.70 +0.2	-80 up to +40
TCTEX-L -1750	1750	CuNi 44	7 x 0.224	0.672	0.28	3.76 +0.2	-80 up to +40
TCTEX-L -2000	2000	NiCr30/20	7 x 0.305	0.915	0.51	3.92 +0.2	+300 up to +400
TCTEX-L -3000	3000	NiCr30/20	7 x 0.249	0.747	0.34	3.75 +0.2	+300 up to +400
TCTEX-L -8000	8000	NiCr30/20	7 x 0.155	0.465	0.13	3.47 +0.2	+50 up to +150

Ex-Connection Sleeve Type PTFE Ex 7025

2

EC – Type Examination Certificate BVS 05 ATEX E 031 X

- Universal, that means to be used independently from manufacturer for EC-type-examined single-core polymer-insulated heating cables with a conductor cross section of max. 2.5 mm²
- Usable as Ex-connection sleeve for connecting heating cable with cold cable or as Ex-transition sleeve for connecting heating cable with heating cable
- Connection of conductors and braids via crimp connections by using nickel-plated parallel connectors
- Inside silicone seal plugs preventing intrusion of water and dust
- Heating cable diameter: max. 6.4 mm, min. 3.8 mm
- Temperature range: -40 °C up to +200 °C
- Rated voltage: max. 750 V
- Rated current: max. 32 A
- Type of protection: IP67
- Materials: sleeve body: PTFE, seal plugs: silicone, locking rings: stainless steel
- Dimensions: Ø 30.5 mm, length 132 mm
- Marking: II 2G Ex e II –40 °C ≤ T_p ≤ +200 °C
  II 2D Ex tD A21 IP67 –40 °C ≤ T_p ≤ +200 °C

article no.: 100967

Ex-Connection Sleeve Type PTFE Ex 7160

EC – Type Examination Certificate BVS 05 ATEX E 031X

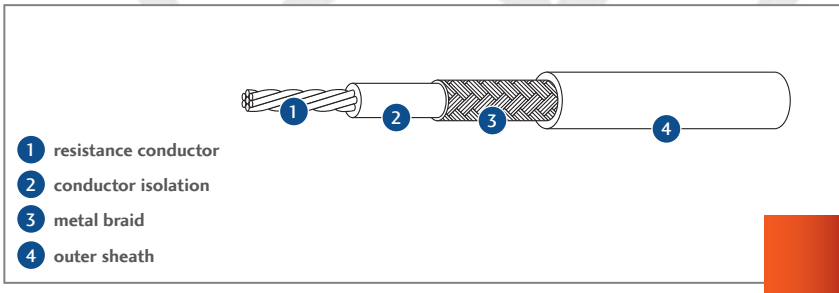
- Universal, that means to be used independently from manufacturer for EC-type-examined single-core polymer-insulated heating cables with a conductor cross section of max. 16 mm²
- Usable as Ex-connection sleeve for connecting heating cable with cold cable or as Ex-transition sleeve for connecting heating cable with heating cable
- Connection of conductors and braids via crimp connections by using nickel-plated parallel connectors
- Inside silicone seal plugs preventing intrusion of water and dust
- Heating cable diameter: max. 11.4 mm, min. 4.5 mm
- Temperature range: -40 °C up to +200 °C
- Rated voltage: max. 750 V
- Rated current: max. 98 A
- Type of protection: IP67
- Materials: sleeve body: PTFE, seal plugs: silicone, locking rings: stainless steel
- Dimensions: Ø 39.4 mm, length 163 mm
- Marking: Ex II 2G/D EEx e II –40 °C ≤ T_p ≤ +200 °C

article no.: 100968

Fluoropolymer-insulated Heating Cable

for Frost Protection and Process Temperatures

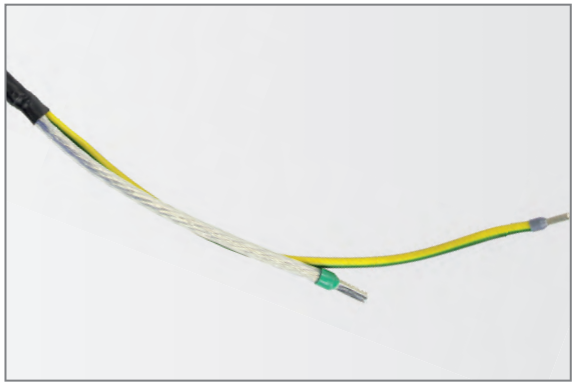
conductor isolation:	PFA >= 0,7mm
outer sheath:	PFA >= 0,5mm
temperature range:	up to 250 °C / max. 30 W/m
nominal voltage:	450 / 750V



Type	Resistance	Art.-No.
TCTEX-H-8000	8.00 Ω/m	100912
TCTEX-H-3000	3.00 Ω/m	100911
TCTEX-H-2000	2.00 Ω/m	100910
TCTEX-H-1750*	1.75 Ω/m	100907
TCTEX-H-1440	1.44 Ω/m	100906
TCTEX-H-1000	1.00 Ω/m	100905
TCTEX-H-810	0.81 Ω/m	100904
TCTEX-H-700	0.70 Ω/m	100903
TCTEX-H-650*	0.65 Ω/m	100902
TCTEX-H-600*	0.60 Ω/m	100901
TCTEX-H-480	0.48 Ω/m	100900
TCTEX-H-380	0.38 Ω/m	100899
TCTEX-H-360	0.36 Ω/m	100898
TCTEX-H-320	0.32 Ω/m	100897
TCTEX-H-200	0.20 Ω/m	100896
TCTEX-H-180*	0.18 Ω/m	100895
TCTEX-H-150	0.15 Ω/m	100894

Type	Resistance	Art.-No.
TCTEX-H-100	0.10 Ω/m	100892
TCTEX-H-80	0.080 Ω/m	100891
TCTEX-H-65	0.065 Ω/m	100890
TCTEX-H-50	0.050 Ω/m	100888
TCTEX-H-31.5	0.0315 Ω/m	100887
TCTEX-H-25	0.025 Ω/m	100886
TCTEX-H-17.8	0.0178 Ω/m	100885
TCTEX-H-15	0.015 Ω/m	100884
TCTEX-H-11.7*	0.0117 Ω/m	100883
TCTEX-H-10	0.010 Ω/m	100882
TCTEX-H-7.2	0.0072 Ω/m	100881
TCTEX-H-4.4	0.0044 Ω/m	100880
TCTEX-H-4.0*	0.0040 Ω/m	100879
TCTEX-H-2.9	0.0029 Ω/m	100878
TCTEX-H-1.71*	0.00171 Ω/m	100877
TCTEX-H-1.08*	0.00171 Ω/m	100876

* only on request



TCT-Ex Cold Cable

Fluoropolymer-insulated

TCT-Ex-H-7,2-100, 2.5 mm², 1 m length
article no.: 100926

TCT-Ex-H-7,2-100, 2.5 mm², 2 m length
article no.: 100927

TCT-Ex-H-2,9-150, 6 mm², 1.5 m length
article no.: 100925

TCT-Ex-1,71-150, 10 mm², 1.5 m length
article no.: 112918

other lengths and cross sections possible

PTFE Ex 7025

Ex-connection Sleeve for ATEX

certified polymer-insulated heating cable
up to 2.5 mm², 32 A max

article no.: 100967

PTFE Ex 7160

Ex-connection Sleeve for ATEX

certified polymer-insulated heating cable
up to 16 mm², max. 98 A

article no.: 100968

CSL 20025

Connection Sleeve for Non-hazardous Area

in shrinking technique
temperature range up to 200 °C

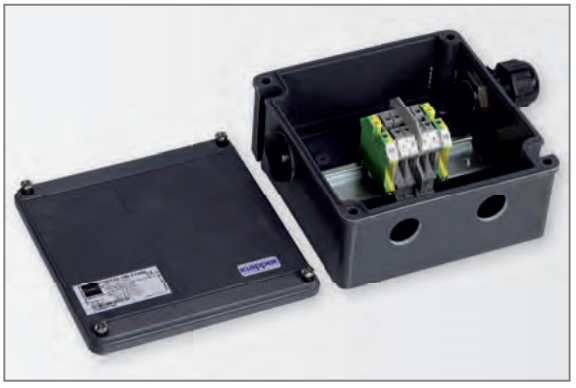
article no.: 100929

CSL 8025

Connection Sleeve for Non-hazardous Area

in shrinking technique
temperature range up to 80 °C

article no.: 100928

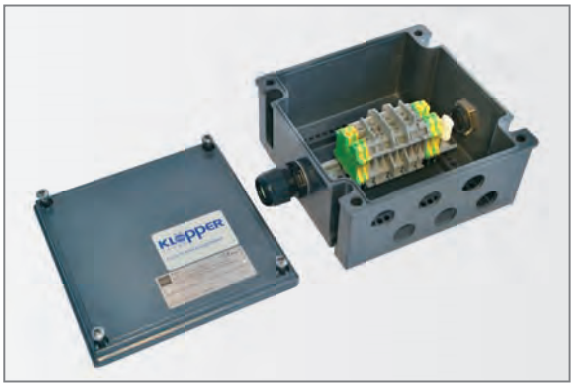


AK-P132-2TCT-2VM16-1VM25-1BM25-Ex e

Connection Box EEx e

for connecting a TCT-Ex-heating loop, polyester, type of protection IP66, dim. 145 x 145 x 71 mm, 6 terminal blocks up to 6 mm², 1 x EEx e gland M25, 1 x EEx e seal plug M25, 2 x gland M16

article no.: 101636



AK-P051-6TCT-6V16-1V25-1B25-Ex e

Connection Box EEx e

for connecting up to 3 TCT-Ex-heating loops, polyester, type of protection IP66, dim. 170 x 170 x 91 mm, 8 terminal blocks + 4 PE-terminals 4 mm², 1 x EEx e gland M25, 1 x EEx e seal plug M25, 6 x gland M16

article no.: 116907

Remark: Other box sizes and equipment as well as design for industrial application possible.

BS-110

Box Support for Connection Box CB-TCT-Ex-1L

made of stainless steel, 3-piece, consisting of:
supporting plate 145 x 145 mm, stand-off 110 mm,
screw set M12

stand-off article no.: 101688
supporting plate article no.: 101674
screw set article no.: 101691

BS-170

Box Support for Connection Box CB-TCT-Ex-3L

made of stainless steel, 3-piece, consisting of:
supporting plate 170 x 170 mm, stand-off 110 mm,
screw set M12

stand-off article no.: 101677
supporting plate article no.: 101674
screw set article no.: 101691

KH2-2

Fixation Tape 0.5 m Length

1 threaded clamp with lock

article no.: 101821

KH3-2

Fixation Tape 1.0 m Length

1 threaded clamp with lock

article no.: 101822

KH5-8

Fixation Tape 1.0 m Length

1 stainless steel tightening strap with lock 5/8“
(tightening tool required)

article no.: 101820

HS 1-1

Warning Sign German
'Achtung Elektrische Begleitheizung'

dimensions: 170 x 80 mm

article no.: 100172

HS 1-2

Warning Sign English / French
'Attention Electrical Tracing'
'Attention Tracage Électrique'

dimensions: 150 x 70 mm

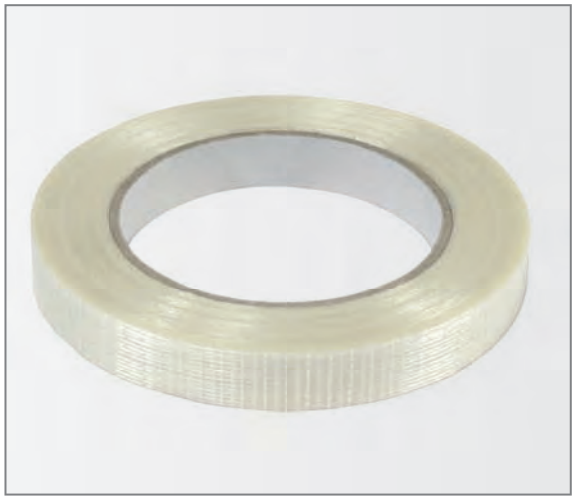
article no.: 100174

HS 1-3

Warning Sign Russian
'ОСТОРОЖНО! ЭЛЕКТРИЧЕСКИЙ КАБЕЛЬНЫЙ НАГРЕВ'

dimensions: 150 x 70 mm

article no.: 100173



FT 70

Filament Tape

glass fibre reinforced, chloride-free, up to 70 °C
50 m per roll, 15 mm width

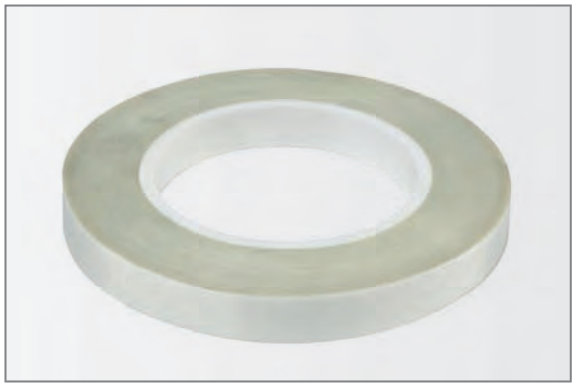
article no.: 101818

FT 130

Filament Tape

glass fibre reinforced, chloride-free, up to 130 °C
50 m per roll, 15 mm width

article no.: 101819

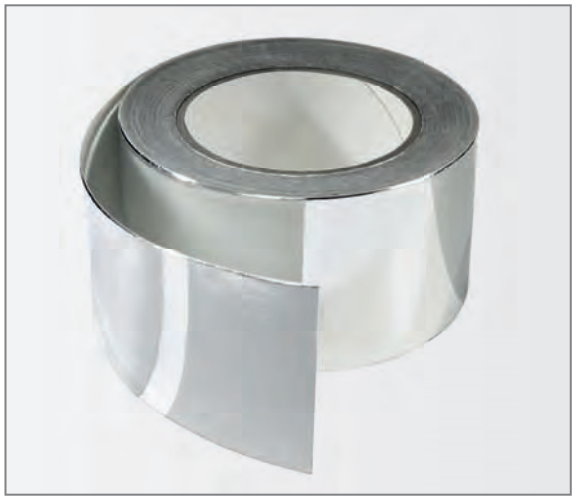


GT 180

Glass fibre Tape

chloride-free, up to 180 °C
50 m per roll, 15 mm width

article no.: 101814



AT120

Aluminium Adhesive Foil

50 µm strong, up to120 °C, chloride-free
50 m per roll, 100 mm width

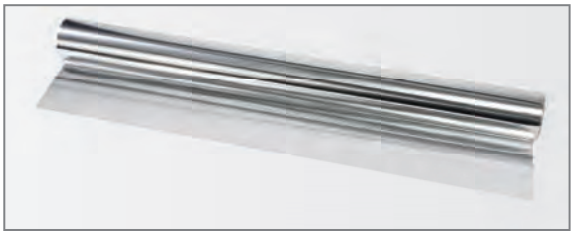
article no.: 101802

AT150

Aluminium Adhesive Foil

100 µm strong, up to 150 °C, chloride-free
50 m per roll, 65 mm width

article no.: 101803

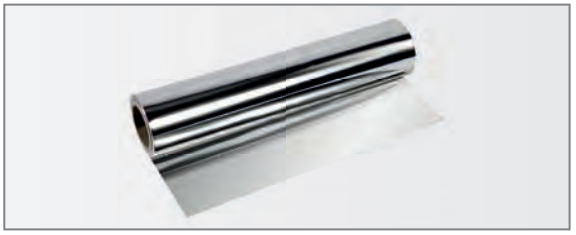


AF 1000

Aluminium Foil

50 µm strong, 25 m per roll, 1,000 mm width

article no.: 101800



AF 500

Aluminium Foil

50 µm strong, 25 m per roll, 500 mm width

article no.: 101799

AF 333

Aluminium Foil

50 µm strong, 50 m per roll, 333 mm width

article no.: 101798

AF 167

Aluminium Foil

50 µm strong, 50 m per roll, 167 mm width

article no.: 101797

Mineral-insulted Heating Cables
Type KT * *** *x* *

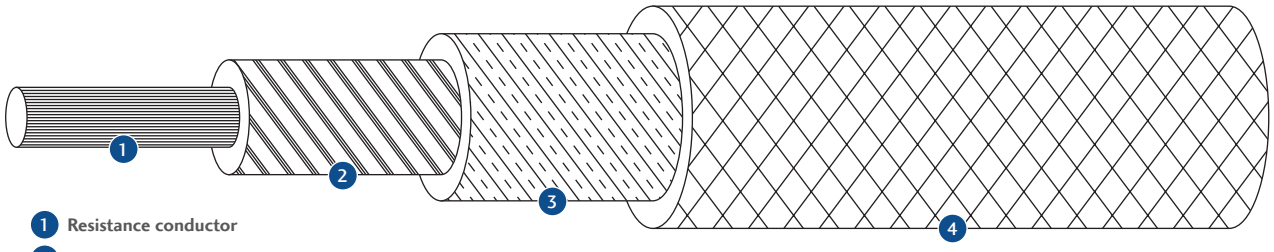
Description

The mineral-insulated heating cables type KT * *** * x * * have been certified under type examination certificate no. BVS 05 ATEX E 158 U for use in hazardous area, created by gases and dusts and, in combination with the connection components certified, they fulfil all requirements according to EN 60079-0:2006, EN 60079-30-1:2007, EN 61241-0:2006 and EN 61241-1:2004 as electric operating equipment for electric heating systems. The electric heating systems are subject to the EC-type examination certificate no. BVS 05 ATEX E 161 X.

Mineral-insulated heating cables are also offered as sleeve joint ex works. This offers the advantage to use highly temperature-resistant, welded sleeves

All our heating cables are tailored according to the specific requirements of our customers.

Structure of MI-Heating Cables



1 Resistance conductor
2 Isolation
3 Sheath material
4 Coating (Optional)

Resistance conductor:	see table next pages
Isolation:	magnesium oxide MgO
Sheath material:	copper-nickel, max. operating temperature 400 °C stainless steel in different material quality grades with max. operating temperatures up to 850 °C
Coating (optional):	different plastic coatings (corrosion protection), coating thickness from 0.5 to 1.5 mm

General Characteristics

Resistance at +20 °C:	see attachment of datasheet MI-heating cable
Installation temperature:	min. -40 °C
Temperature range:	min. -60 °C up to 850 °C max. (see pos 5.)
Test voltage (U_{eff}):	2U + 1000 volt (core/braid)
Rated voltage (U):	300 V or 400 V see following pages (between outer sheath and conductor)
Mechanical stability:	7 joule, design according to EN 60079-30-1:2007
Bending radius minimum:	5fold outer diameter
Power output:	max. 200 W/m (actual value according to application)

Type Overview

Klöpper-Therm types of heating cable for mineral-insulated metal-sheathed heating cables with and without plastic coating

Type key

KT * * * * * X * *

Outer diameter across metal sheath in mm

Core material:

- C = copper
- K = constantan
- N = nickel
- V = chrom-nickel

Sheath material:

- CN = cupro-nickel
- I = 1.4541
- M = 1.4571
- S = 2.4816 Inconel 600
- R = 1.4404
- A = 1.4306
- B = 1.4841
- Y = 2.4858 Alloy 825

Coating:

- P = HDPE
- FEP = FEP
- PFA = PFA
- PV = PVC

Core number:

Core diameter in decimillimeter

Resistance in Ohm/meter (at +20 °C)

Technical Data and Type Overview

Type Family	Conductor Material	Sheath Material	Operating Temperature (° C)	Outer Diameter Sheath (mm)	Heating Conductor Resistance (Ohm/m at + 20 °C)	Rated Voltage U (Volt)
KCN	constantan	cupro-nickel	≤ 400	3.2 - 4.0	1.60 - 0.40	300
				4.4 - 4.9	0.25 - 0.16	400
CCN	copper	cupro-nickel	≤ 350	3.2 - 3.7	0.063 - 0.025	300
				4.6 - 8.3	0.0170 - 0.0015	400
KI	constantan	DIN 1.4541	≤ 600	3.2 - 4.0	1.60 - 0.40	300
				4.4 - 4.9	0.25 - 0.16	400
VI	chrome-nickel	DIN 1.4541	≤ 600	3.2 - 3.9	10.0 - 1.00	300
				4.1 - 6.5	1.00 - 0.16	400
CI	copper	DIN 1.4541	≤ 350	- -	- -	- -
				5.3 - 7.2	0.007 - 0.0018	400
NA	nickel	DIN 1.306	≤ 800	- -	- -	- -
				6.4	0.010	400
VS	chrome-nickel	Iconel 600 DIN 2.4816	≤ 850	3.2 - 3.9	10.0 - 1.00	300
				4.1 - 6.5	1.00 - 0.16	400
CS	copper	Iconel 600 DIN 2.4816	≤ 350	- -	- -	- -
				5.3	0.007	400
VM	chrome-nickel	DIN 1.4571	≤ 600	3.2 - 3.9	10.0 - 1.00	300
				4.1 - 6.5	1.00 - 0.16	400
VR	chrome-nickel	DIN 1.4404	≤ 600	3.2 - 3.9	10.0 - 1.00	300
				4.1 - 6.5	1.00 - 0.16	400
VB	chrome-nickel	DIN 1.4841	≤ 600	3.2 - 3.9	10.0 - 1.00	300
				4.1 - 6.5	1.00 - 0.16	400
VY	chrome-nickel	Alloy 825 DIN 2.4858	≤ 600	3.2 - 3.9	10.0 - 1.00	300
				4.1 - 6.5	1.00 - 0.16	400

[1] see column 3 in table „Operating Temperatures of Coating"

Operating Temperatures of Coating

P = HDPE max. operating temperature permitted: 80 °C
FEP = FEP max. operating temperature permitted: 200 °C
PFA = PFA max. operating temperature permitted: 250 °C
PV = PVC max. operating temperature permitted: 80 °C

Mineral-insulated Heating Cable

for Frost Protection and Process Temperatures

with CuNi-outer sheath

(operating temperature up to 400 °C)

Type	Resistance	Art.-No.
KT 3,2 CCN 1 x 6	0.063 Ω/m	101016
KT 3,4 CCN 1 x 7	0.04 Ω/m	101017
KT 3,7 CCN 1 x 9	0.025 Ω/m	101018
KT 4,6 CCN 1 x 11	0.017 Ω/m	116897
KT 4,9 CCN 1 x 14	0.011 Ω/m	101020
KT 5,3 CCN 1 x 18	0.007 Ω/m	101021
KT 5,9 CCN 1 x 23	0.004 Ω/m	116898

with stainless steel outer sheath DIN 1.4541

(operating temperature up to 600 °C)

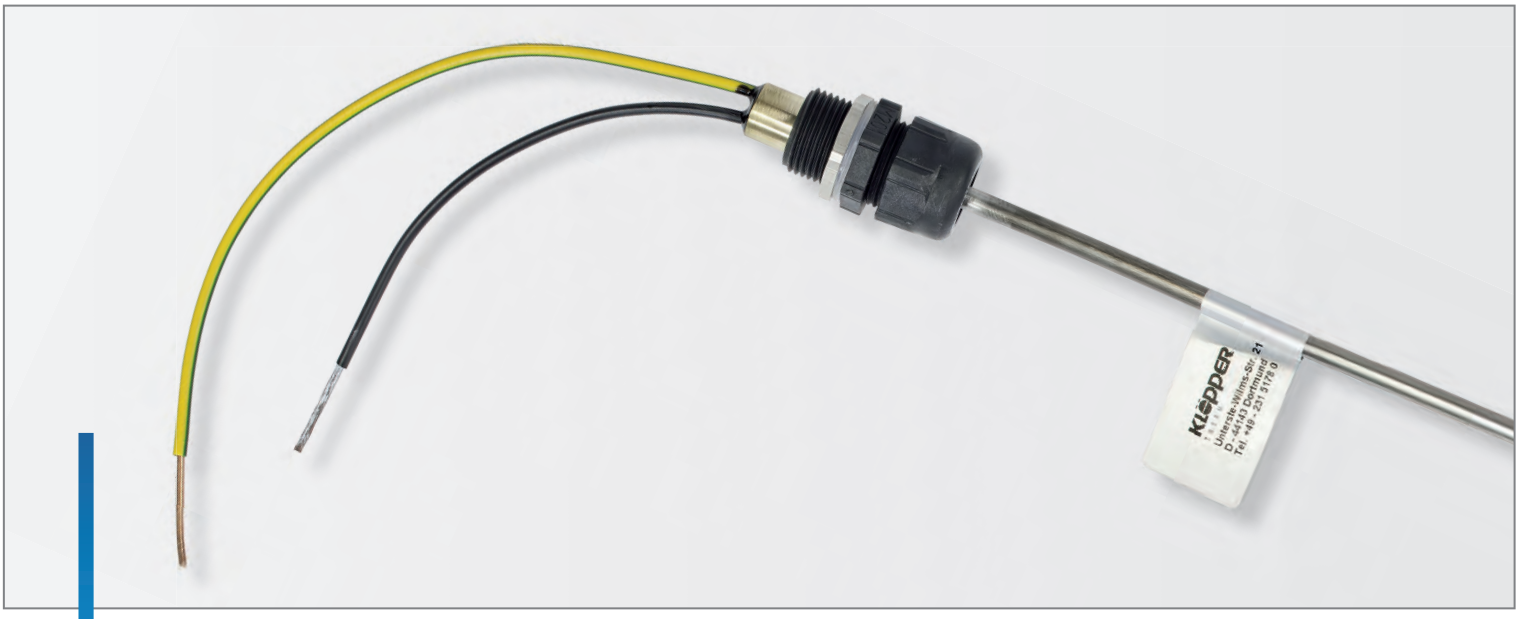
Heating Conductor Constantan

Type	Resistance	Art.-No.
KT 3,2 KI 1 x 6	1.60 Ω/m	101051
KT 3,4 KI 1 x 8	1.00 Ω/m	101052
KT 3,7 KI 1 x 10	0.63 Ω/m	101053
KT 4,0 KI 1 x 12	0.40 Ω/m	101054
KT 4,4 KI 1 x 16	0.25 Ω/m	101055
KT 4,9 KI 1 x 18	0.16 Ω/m	101056

Heating Conductor – NiCr

Type	Resistance	Art.-No.
KT 3,2 VI 1 x 4	10.0 Ω/m	101031
KT 3,2 VI 1 x 5	6.30 Ω/m	101032
KT 3,2 VI 1 x 6	4.00 Ω/m	101033
KT 3,4 VI 1 x 8	2.50 Ω/m	101034
KT 3,6 VI 1 x 10	1.60 Ω/m	101036
KT 3,9 VI 1 x 12	1.00 Ω/m	101038
KT 4,3 VI 1 x 15	0.63 Ω/m	101041
KT 4,7 VI 1 x 15	0.40 Ω/m	101043
KT 5,3 VI 1 x 24	0.25 Ω/m	101046
KT 6,5 VI 1 x 30	0.16 Ω/m	101048

Other cable types/outer sheaths on request.



Mineral-insulated Cold Cable

KT 5,3 CC 1x18, 2.5 mm², 1 m length including connection, gland M20

outer sheath: CU

article no.: 101180

KT 6,4 CC 1x28.6 mm², 1 m length including connection, gland M20

outer sheath: CU

article no.: 101181

KT 5,3 CI 1x18, 2.5 mm², 1 m length including connection, gland M20

outer sheath: stainless steel

article no.: 101189

KT 5,3 CI 1x18, 2.5 mm², 2 m length including connection, gland M20

outer sheath: stainless steel

article no.: 101190

Connection Sleeves

Ex-connection sleeve 3-piece

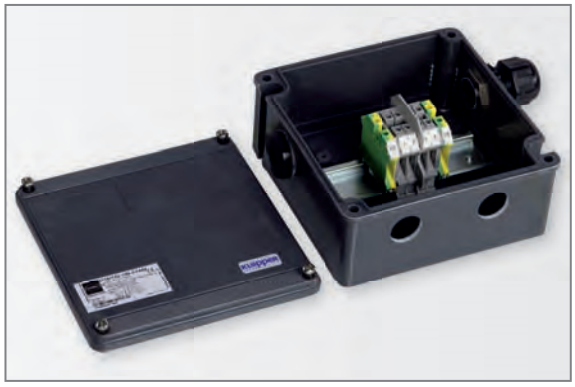
for mineral-insulated heating cable stainless steel, adapted to the particular cross section of heating and cold cable application temperature 300 °C

article no.: 1010xxx - 1011xxx
different cable sizes on request.

Ex-connection sleeve 1-piece

for mineral-insulated heating cable CU, adapted to the particular cross section of heating and cold cable

article no.: 101084 (for transition sleeves)



AK-P132-2MI-2xM20-1VM25-1BM25-EX e (CB-MI-Ex-1L)

Connection Box EEx e

for connecting a TCT-Ex-heating loop polyester, type of protection IP66, dim. 145x145x71 mm, 6 terminal blocks up to 6 mm², 1 x EEx e gland M25, 1 x EEx e blind plug M25, 2 x hole M20

article no.: 101635

AK-P051-6MI-1V25-6B20-1S25-EX e (CB-MI-Ex-3L)

Connection Box EEx e

for connecting up to 3 MI-Ex-heating loops polyester, type of protection IP66, dim. 170x170x91 mm, 8 terminal blocks + 4 PE-terminals 4 mm², 1 x EEx e gland M25, 1 x EEx e blind plug M25, 6 x hole M20

article no.: 116909

Other box sizes and equipment as well as design for industrial application possible.

BS-110

Box Support for Connection Box CB-MI-Ex-1L

made of stainless steel, 3-piece, consisting of:
supporting plate 145x145 mm, stand-off 110 mm,
screw set M12

stand-off article no.: 101688
supporting plate article no.: 101674
screw set article no.: 101691

BS-160

Box Support for Connection Box CB-TCT-Ex-3L

made of stainless steel, 3-piece, consisting of:
supporting plate 145 x 145 mm, stand-off 160 mm,
screw set M12

stand-off article no.: 101689
supporting plate article no.: 101674
screw set article no.: 101691

KH2-2

Fixation Tape 0.5 m length

1 threaded clamp with lock

article no.: 101821

KH3-2

Fixation Tape 1.0 m length

1 threaded clamp with lock

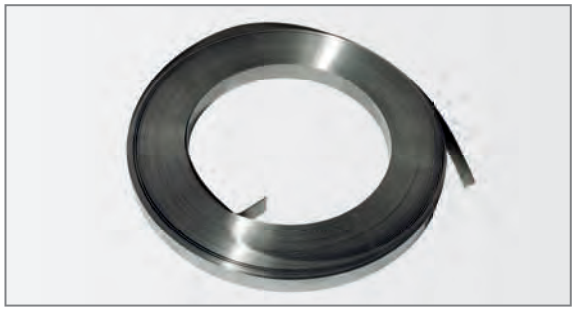
article no.: 101822

KH5-8

Fixation Tape 1.0 m length

1 stainless steel tightening strap with lock 5/8“
(tightening tool required)

article no.: 101820



FT 3-8

Stainless Steel Tightening Strap 3/8“, 90 m/rl.
for fixation of heating cables

article no.: 101808

FT 5-8

Stainless Steel Tightening Strap 5/8“, 30 m/rl.
for fixation of heating cables

article no.: 101809

FL 3-8

Stainless Steel Tightening Strap 3/8“, 100 pcs./PE.
for fixation of heating cables

article no.: 101810

FL 5-8

Stainless Steel Tightening Strap 5/8“, 100 pcs./PE.
for fixation of heating cables

article no.: 101811

MT 5-8

Stainless Steel Assembly Tape 5/8“ 20 m/rl.
strap distance 40 mm, for fixation of heating cables

article no.: 101825

WHA 001

Tightening Tool
for FT/MT

article no.: 103758

HS 1-1

Warning Sign German
'Achtung Elektrische Begleitheizung'

dimensions: 170 x 80 mm

article no.: 100172

HS 1-2

Warning Sign English / French
'Attention Electrical Tracing'

Dimension: 150 x 70 mm

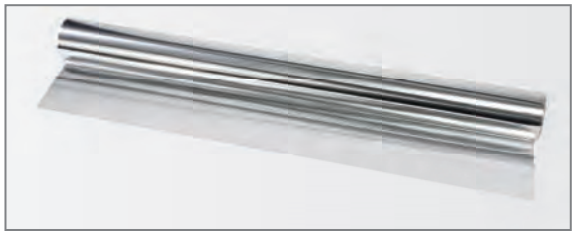
article no.: 100174

HS 1-3

Warning Sign Russian
'ОСТОРОЖНО! ЭЛЕКТРИЧЕСКИЙ КАБЕЛЬНЫЙ НАГРЕВ'

Dimension: 150 x 70 mm

article no.: 100173



AF 1000

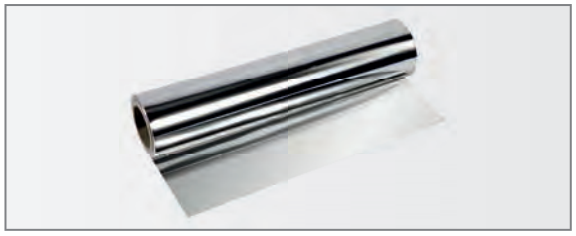
Aluminium Foil
50 µm strong, 25 m per roll, 1,000 mm width

article no.: 101800

AF 500

Aluminium Foil
50 µm strong, 50 m per roll, 500 mm width

article no.: 101799



AF 333

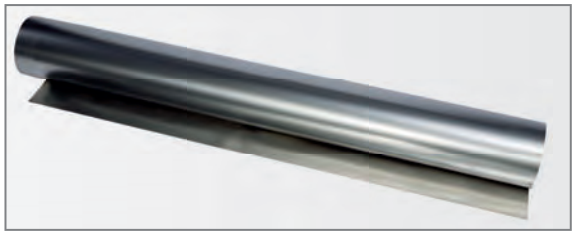
Aluminium Foil
50 µm strong, 50 m per roll, 333 mm width

article no.: 101798

AF 167

Aluminium Foil
50 µm strong, 50 m per roll, 167 mm width

article no.: 101797



SF 1000

Stainless Steel Foil Material 1.4301,
1,000 mm width, 25 m per roll

article no.: 101805

SF 100

Stainless Steel Foil Material 1.4301
100 mm width, 25 m per roll

article no.: 101806

SF 200

Stainless Steel Foil Material 1.4301
200 mm width, 25 m per roll

article no.: 101807

UNIPLEX III – Powerful control for heating systems

The latest release of the Klöpper-Therm heating controller UNIPLEX again convinces by development competence and trendsetting technology within one device. Especially designed for the control and monitoring of electric heating systems, several function modules have been combined in one device. Temperature controller, safety temperature limiter and current controller have been placed on a space-saving 19"-rack mounting in Eurocard size.

The main features:

- high safeness by safety temperature limiter (STB), certified according to ATEX and classified as Safety Integrity Level SIL 2
- configurable as PI- or two-position controller
- continuous control of heating circuits by driving a solid state relay (SSR)
- integrated current controller (pulse-width-modulation) for adjusting the desired heating current (reduces the number of heating cable types or resistance types used)
- customized adaption of heating current to variable maintenance temperatures
- large display indicating nominal, actual and control value (control value as bar graph)
- comfortable operating menu in different languages (language selection)
- serial RS-485 interface and Ethernet interface for connection to higher control systems
- front USB connection for diagnosis/configuration
- password-protected access on three levels
- reset of limiter by tool/code entry
- various limit value monitoring for temperature and current
- automatic self-testing
- extended application possibilities by additional controller sensor and limiter sensor
- connection of 4–20 mA sensor or set point encoder

article no.: 113143

UNIPLEX III – Technical Data

Dimensions

- 19"-rack mounting

Front panel	8 HP (40.64 mm) wide, 3 HE (133.35 mm) high
Printed Circuit Board	Eurocard size 100 x 160 mm
Connector	48-pin female in model F

Ambient conditions

- Ambient temperature: 0 °C to +50 °C in operation, -20 °C to +70 °C during storage
- Relative humidity: < 95 % at 30 °C, non-condensing

Power supply

The power supply takes place via a switch mode converter with a transformer, which ensures the electrical decoupling of the assembly.

- Voltage supply: 24 V DC ± 20 %, ripple max. 1 V_{PP}
- Power consumption: typically 3 W
- Mains failure bridging: > 20 ms, otherwise automatic reset

Input for temperature measuring sensor Pt100 in 3-wire circuit

- Measuring range: -200 °C to +650 °C
- Resolution: 1 K in the range -200 °C to +650 °C
- Measuring tolerance: ±1 K up to +300 °C, ±3 K up to +650 °C
- Sensor current: 1 mA (kept constant via current source)

Input for current converter

The input is electrically decoupled by means of a magnetic measuring transformer.

- Measuring range: 0 mA to 100 mA
- Conversion factor: 1 : 10 up to 1 : 1000 freely adjustable
- Input resistance (burden): 50 ohms
- maximum permissible input voltage: ±7 V_{PP}
- True-RMS measurement: approx. 1000 samples/s

Control output for heating contactor and solid state relay

- connected output voltage: 24 V DC against GND
- maximum current load: approx. 1000 mA, self-limiting

Relay outputs for software-selectable messages

- 1-pin NO contact, closed circuit principle
- Switching capacity: 24 V DC, 1 A, 30 W bzw. 24 V AC, 1 A, 30 VA

Potential-free inputs for software-selectable signals

External voltage signal, voltage present = input active

- max. permissible input voltage: 24 V DC
- min. necessary input current: 10 mA

Temperature Controller

- On-off controller (contact) and P-controller (output to current controller)
- Supervision regarding low and excess temperature
- Sensor connection Pt 100 in three-wire connection
- Supervision of the temperature sensor regarding cable break and short circuit
- Current measuring input for connecting an external current transformer
- Real measurement of current-effective value
- Signal output for triggering a solid state relay according to the full wave switch mode
- Supervision of the load circuit regarding under- and overcurrent incl. signalling
- Error message via potential-free contacts
- Memory of the error status even in case of a decline in voltage.
- Controller to be switched off by keyboard entry or by an external signal, the limiter continues operation with all functions.
- Processing of an external limiter signal for triggering off the internal limiter and for switching off the output signals of the controller.
- Standstill control
- Suppression of low temperature message in case of start-up operations
- Switching off the controller after internal/external limiter has triggered off, sensor fault and overcurrent.

LCD-Display and Keyboard

LCD-display for plain text output of:

- parameter names
- parameter values
- error messages in 'plain text'
- controller/limiter actual value
- controller/limiter setpoint
- current actual value
- current setpoint - adjustment of HC number (HC heating circuit)
- adjustments hardware address

Keyboard for:

- entry of setpoints
- parameter setting of controller
- selection of display

Password-protected parameter entry

Indication of operating and error status via light-emitting diodes

Serial Interface:

- Connection via serial data bus to a PC (RS485 norm) or via Ethernet TCP/IP interface to a network. In addition the UNIPLEX can be attached to nearly all process control systems by a separate Profibus-coupler.
- Adjustment of all setpoints at the PC possible.
- Transfer of all measuring values, parameter, error messages and the controller state to the PC.
- Mutual locking for operating from the PC or the front panel of the UNIPLEX II card.
- Password locking for changing the parameter and acknowledging errors.
- Detailed and comfortable parameter and status recording at the PC.
- Connection length up to approx. 800 m (standard RS485) or connection to a network available (Ethernet TCP/IP or Profibus).
- Installation of the UNIPLEX II- cards in the decentralised switchgear, operation and display in the central control station at the PC.

Ethernet TCP/IP- Interface:

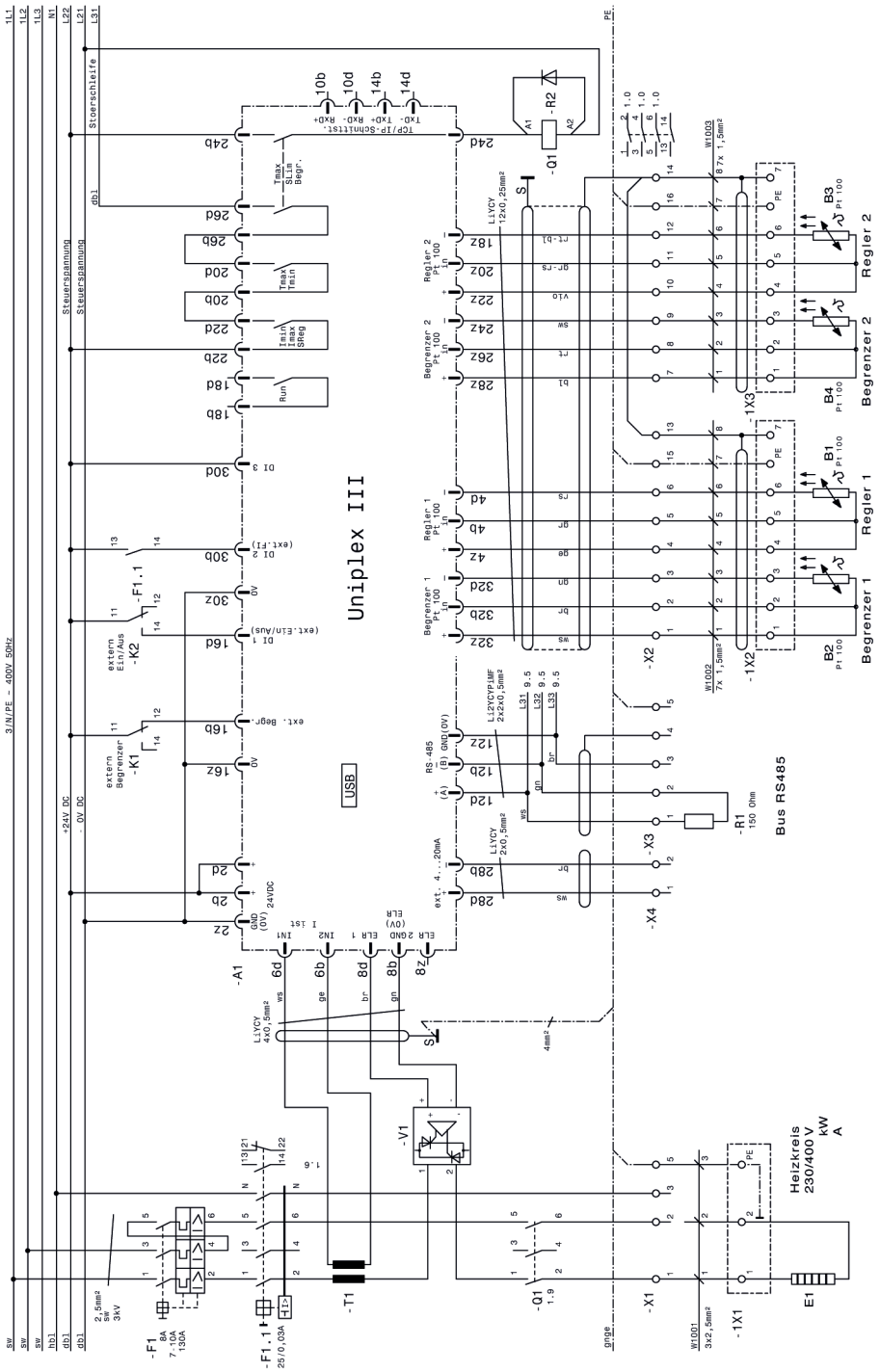
- Connection via an Ethernet network to a PC, TCP/IP report, 10Mbit/s.
- Adjustment of all setpoints at the PC possible, transfer of all measuring values, parameter, error messages and controller states to the PC.
- 'Control' for the data transfer to a visualisation system (OPC- Control) available (for each UNIPLEX II one 'Control' has to be installed).
- 'Control' for the direct communication of a PC with a UNIPLEX II available.

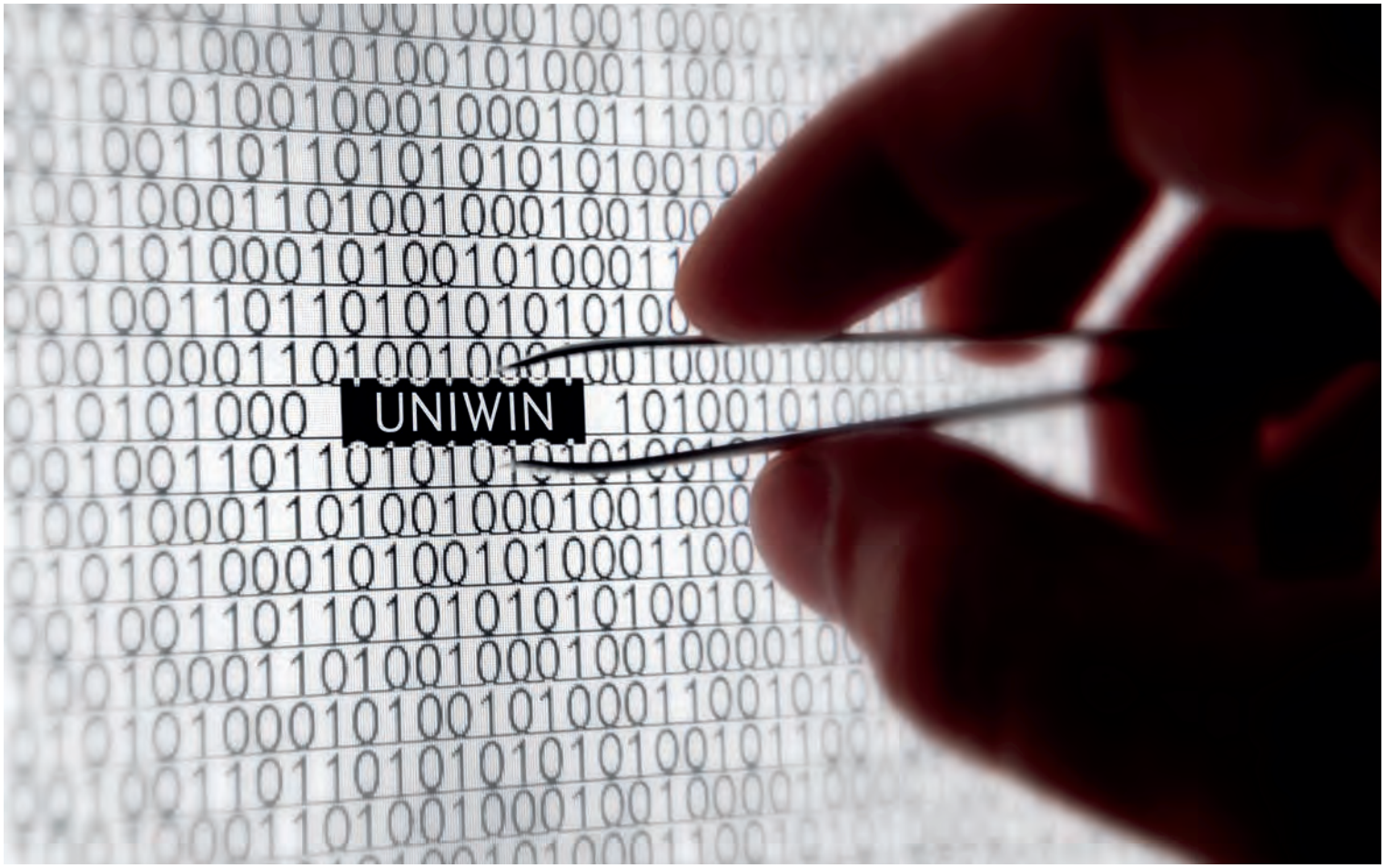
Connection of Measuring Sensor:

- Pt100 measuring sensor, EEx d or EEx e; three-wire connection in hazardous area
- Pt100 measuring sensor, EEx i via process signal isolator, three-wire connection in hazardous area.
- Pt100 standard measuring sensor in 2- or 3-wire connection for all other applications in non-hazardous area.

Sample Wiring Diagram UNIPLEX II

Braided cables have to be used, a one-sided earthing of the braid is necessary!





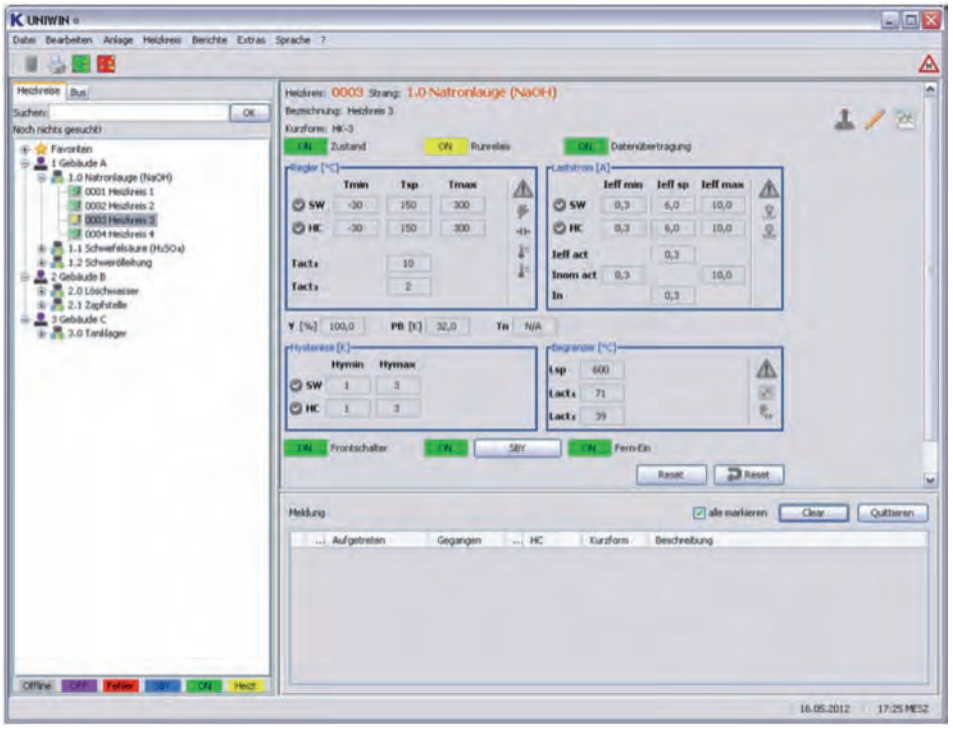
VISUALISIERUNG

UNIWIN – The convenient software cockpit for heating controllers

The UNIWIN visualisation software guarantees the clear display and convenient operation of the UNIPLEX III heating controllers and offers access to the current status of the heating circuits within the system. Electrical heating plants that consist of a number of individual electrical heating systems can be configured into logical process-engineering groups using the UNIWIN software. The plant structure can be assigned to these groups. For a perfect overview, all important heating circuit and plant data, the status overview, and a message archive with various sorting and selection functions are always available for access on the computer.

The most important features:

- Clear display of the heating circuits and heating circuit groups (buses) due to the folder structure on the left side of the screen
- Status overview of the individual heating circuits and heating circuit groups (trains)
- Detailed overview of the individual heating circuit data
- Trend curves for temperatures and currents
- Reset of the alarm messages of the heating controller
- Various user levels with assigned permissions
- Extensive alarm and message archive (the current messages are always visible at the bottom of the screen for the heating circuit)
- Newly arrived messages are signalled in the status overview by flashing
- Selection of several menu languages possible
- Plant documentation through the storage of images and circuit diagrams, isometrics, etc. in *.csv, *.jpg, *.png, and *.pdf format
- Integrated search functions (heating circuits, trains, train groups)
- Software based on Java™
- Can be run under all modern operating systems like Windows or Linux
- Storage of all data in a database



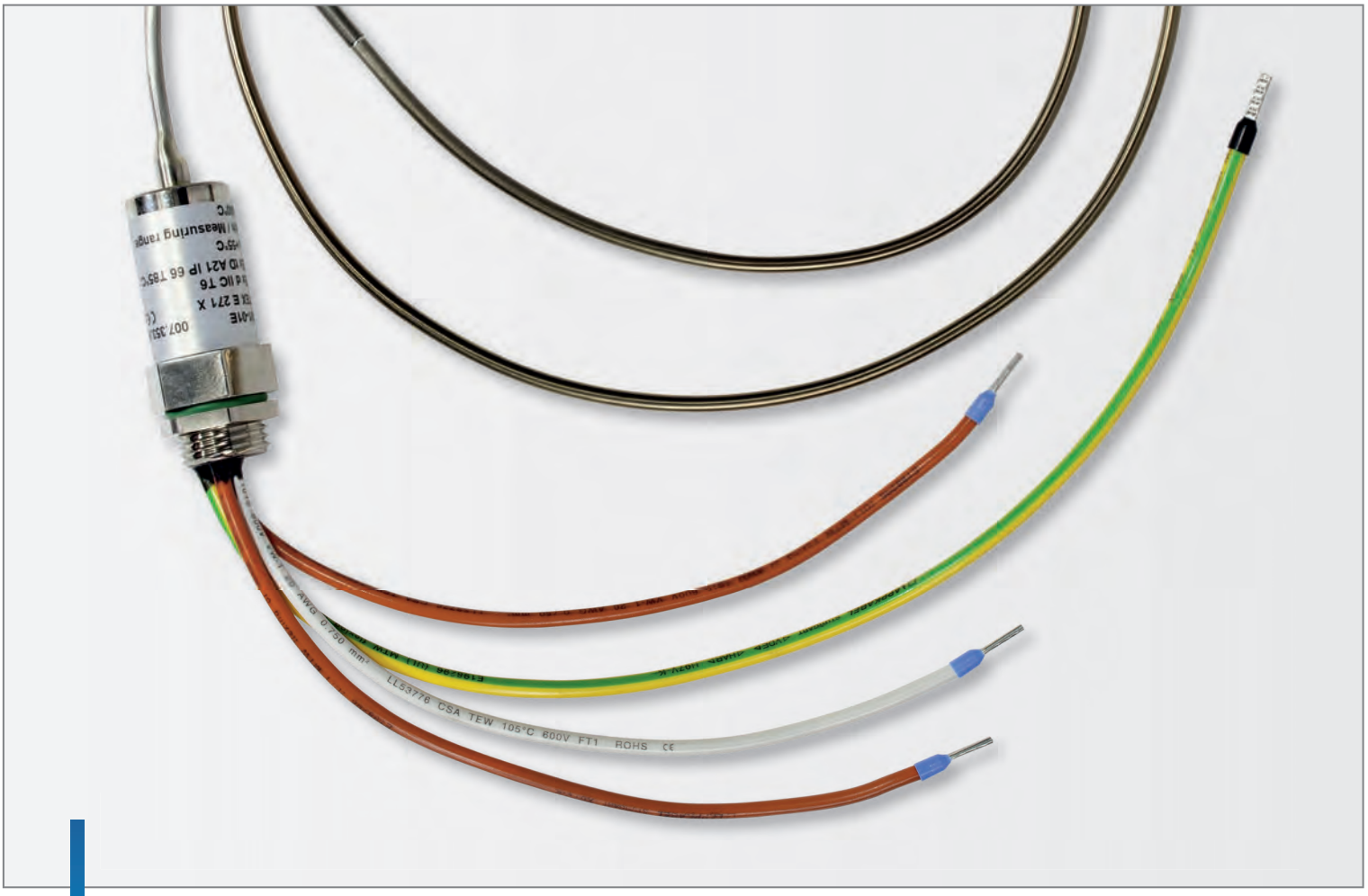
4

Profibus Gateway KT Unigate®

RS485 – ProfibusDP

The sub-rack KT UNIGATE has been designed for adapting the serial interface of the UNIPLEX-controller to the ProfibusDP according to EN 50 170. It functions as gateway and works as ProfibusDP Slave. It can be operated by any master in conformity with the norms. According to the ISO/OSI-model, a communication can be divided into seven layers, layer 1 up to layer 7. The gateway converts layers 1 and 2 from the UNIPLEX bus system (RS485) into the profibus system. Layer 3 up to 6 are empty, layer 7 contains a specific adaptation to the UNIPLEX system.

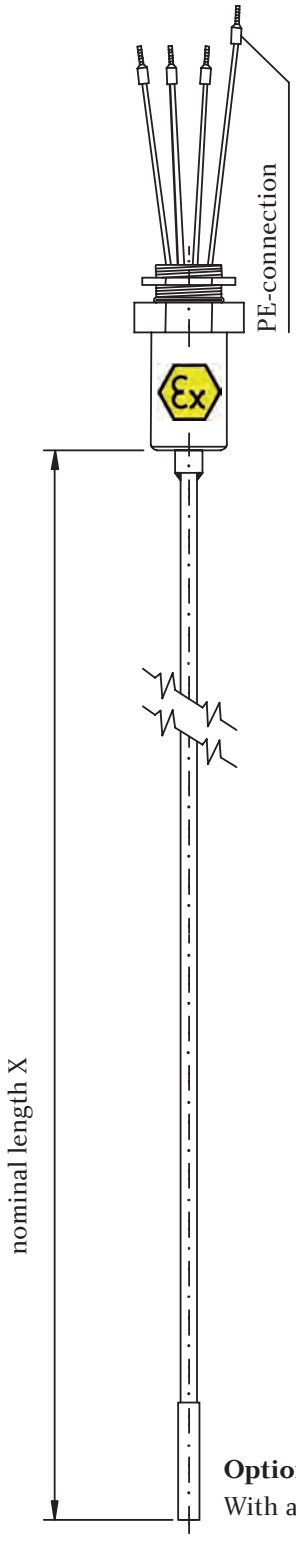
The gateway has been equipped with interface RS485. Thus, the profibus gateway makes an access to all devices connected to RS485-bus possible via a single profibus address. Up to thirty UNIPLEX-controllers can be operated at one gateway. The number of gateways in the profibus only depends on the maximum number of participants permitted and the cycle time of the control system. The profibus master transmits the output data cyclically to the gateway. In the gateway, the data received by the master are transmitted to the UNIPLEX-controllers. The UNIPLEX-controllers respond according to the recorded conventions. The gateway records the data received by the UNIPLEX-controllers into the internal RAM. During the next poll cycle with the gateway the updated data will then be transmitted. The data exchange via the RS485-interface is parameterized on a cyclical transmission. All data are transmitted consistently from the gateway in both directions.



Resistance Thermometer
Pt 100 100/E/Ex d and PT 100/M/Ex de

Resistance Thermometer Pt 100/E/Ex d

EC-Type Examination Certificate DMT 02 ATEX E 271 X



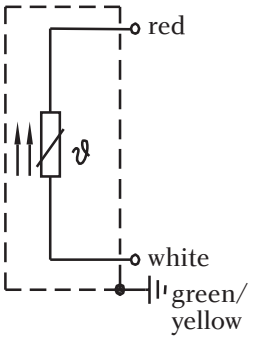
- short response time by low-mass, all-metal design
- connection ends with approx. 160 mm length, designed with wire end sleeves 0.75-1.5 mm²
- Ex d sealing end Ø 18 mm, 52 mm length with thread M16 x 1.5 and locknut for installation in Ex e terminal box (for gases) or terminal box of category 2D (for dusts) incl. through-hole
- measuring range: -60 °C up to +600 °C
- Min./max. temperature permitted at sealing end: -40 °C/+70 °C
- metal-sheathed cable: Ø 3mm
  material: 1.4571
  bending radius: ≥ 15 mm
  standard nominal length: x = 1,000 mm, other nominal lengths on request
- measuring point: Ø 3.5 mm, 18 mm length (standard)
  Ø 6.0 mm, 55 mm length (optional)
- material: 1.4571

not bendable to 30 or 65 mm!

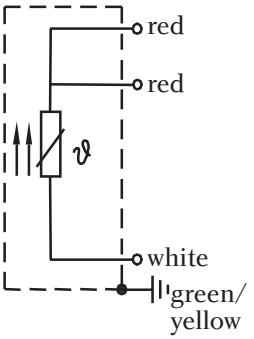
- measuring resistance PT 100 Ohm DIN EN 60751 / class B
- marking: II 2 G Ex d IIC T6
  II 2 D Ex tD A21 IP66 T85 °C

Wiring

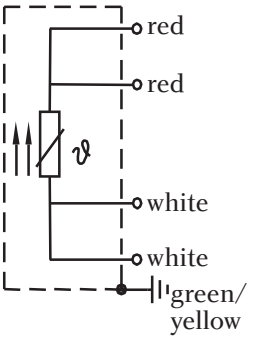
2-wire-connection (optional)



3-wire-connection (standard)



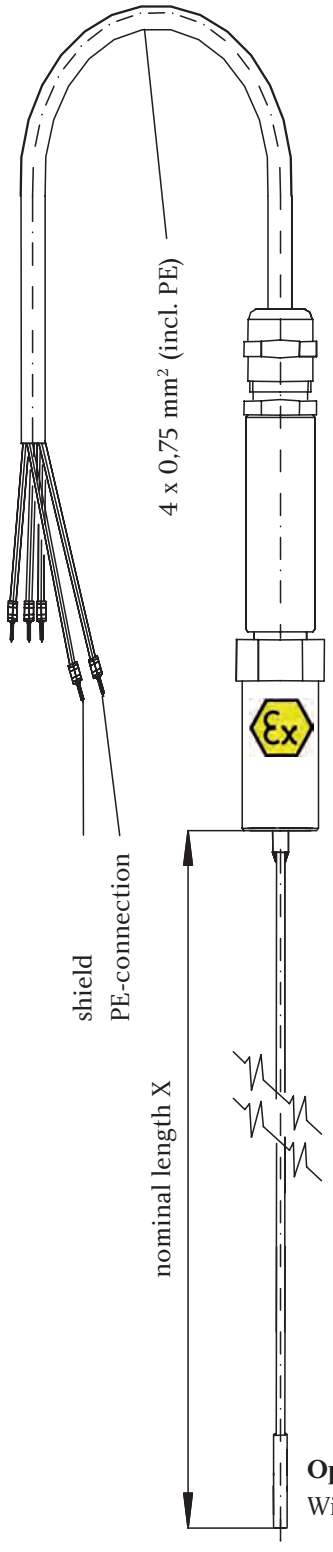
4-wire-connection (optional)



Optional
With additional reinforcing sleeve 6 x 55 mm above measuring point

Resistance Thermometer Pt 100/M/Ex d

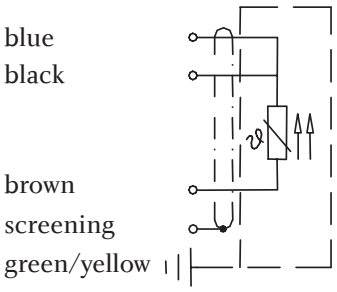
EC – Type Examination Certificate DMT 02 ATEX E 271 X



- short response time by low-mass, all-metal design
- connection cable 4 x 0.75 mm² (incl. PE), Ø 7 mm approx., incl. shielding and TPE-sheath
  Please indicate required cable length!
- connection ends with approx. 100 mm length, designed with wire end sleeves 0.75/2.5 mm²
- Ex de transition sleeve Ø 18 mm, 100 mm length
- measuring range: -60 °C up to +600 °C
- min./max. temperature permitted at transition sleeve: -40 °C/+70 °C
- metal-sheathed cable: Ø 3 mm
  material: 1.4571
  bending radius: ≥ 15 mm
  standard nominal length: x = 1,000 mm, other nominal lengths on request
- measuring point: Ø 3.5 mm, 18 mm length (standard)
  Ø 6.0 mm, 55 mm length (optional)
- material: 1.4571
  not bendable to 30 or 65 mm!
- measuring resistance PT 100 Ohm DIN EN 60751 / class B
- marking: II 2 G Ex d IIC T6
  II 2 D Ex tD A21 IP66 T85 °C

Wiring

3-wire-connection

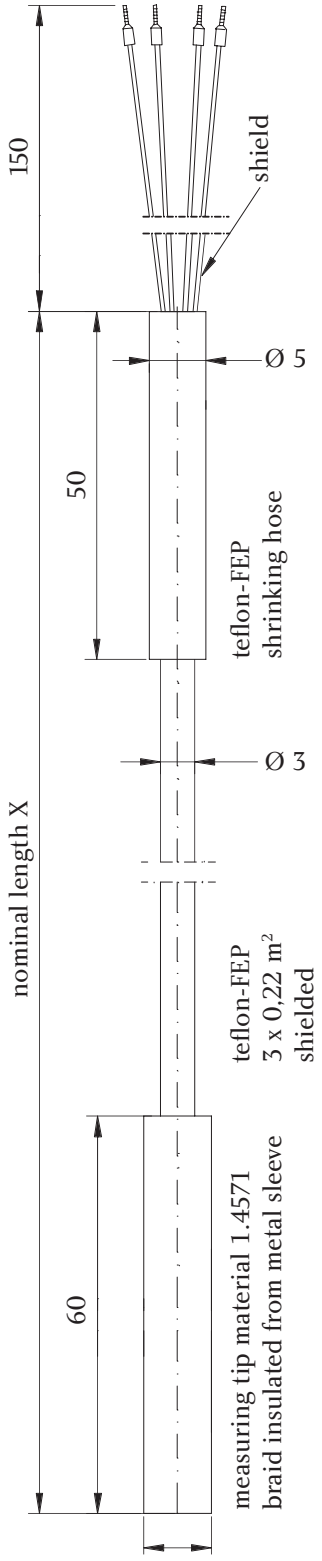


Optional
With additional reinforcing sleeve 6 x 55 mm above measuring point.

4

Resistance Thermometer Pt 100

in 3-wire-connection

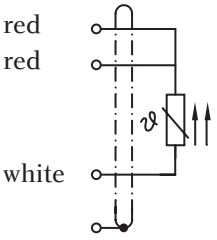


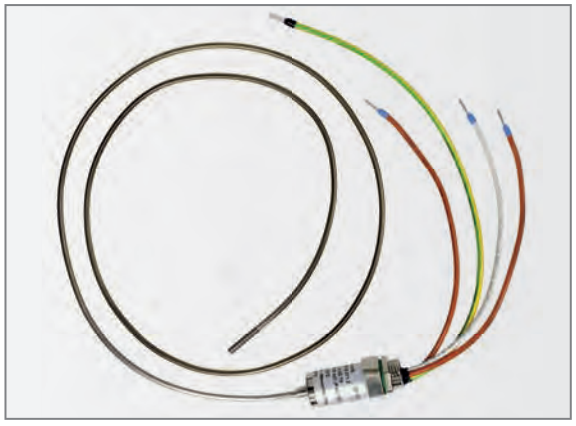
- short response time
- connection ends with 150 mm length (Cu-wire, silver-plated), designed with wire end sleeves
- connection cable with braid and fluoropolymer outer sheath
- braid insulated from metal sleeve: -70 °C up to +200 °C
- measuring range: Ø 3 mm, 3 x 0,22 mm²

  sheath material: Teflon-FEP
  single wire insulation: Teflon-FEP
  bending radius: ≥ 20 mm
  standard nominal length: x = 3,000 mm, other nominal lengths on request
- measuring tip: Ø 6 mm, 60 mm length
  material: 1.4571
  The measuring tip must not be deformed!
- measuring resistance PT 100 Ohm DIN EN 60751 / class B

Wiring

3-wire-connection





Measuring Sensor Pt-100 / E / EEx-d

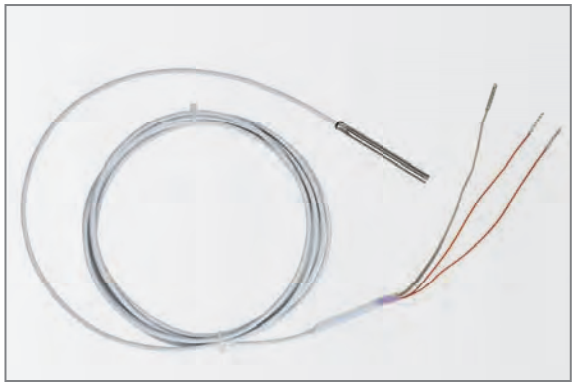
EEx-d Design (DMT 02 ATEX E 271 X)

measuring range: -60 °C … 600 °C
sheathed cable Ø 3 mm , stainless steel material 1.4571
measuring tip Ø 3.5 mm (optional: 6 mm)
measuring resistance PT 100 DIN EN 60 751 / class B
sealing end with thread M16 x 1,5

nominal length: 1 m in 3-wire-connection
article no.: 101738

nominal length: 3 m in 3-wire-connection
article no.: 101741
Other nominal lengths as well as
2- and 4-wire-connection optional

nominal length: 1 m plus 3 m connection cable
article no.: 101744
Other nominal lengths as well as
2- and 4-wire-connection optional



Measuring Sensor Pt-100

measuring range: -70 °C … 200 °C
measuring tip Ø 6 mm, 60 mm length
measuring resistance PT-100 DIN EN 60 751 / class B
in 3-wire-connection
connection cable 3 m Teflon-FEP-cable 3 x 0.22 mm²

article no.: 101746

AK-P051-6MI-1V25-6B20-1S25-Ex e

Connection box EEx e for
max. 2 PT-100 Measuring Sensors

polyester, type of protection IP66, dim. 145x145x71 mm
7 terminal blocks up to 6 mm², 1 EEx e gland M25,
2 x hole M16

article no.: 101638

BS-110

Box Support for Connection Box CB-2S

made of stainless steel, 3-piece, consisting of:
supporting plate 145 x 145 mm, stand-off 110 mm,
screw set M12

stand-off article no.: 101688
supporting plate article no.: 101674
screw set article no.: 101691

Control Box AKR-P061-1K25-1B25-2S25-1JW2001-UT4-Ex (CB-1C)

connection box EEx e with thermostat EEx d for temperature control, setting range 0 - 120 °C, switching capacity 16 A at 250V, 1 change-over contact, measuring sensor: stainless steel, capillary length 3 m, polyester, type of protection IP66, dim. 227 x 170 x 91 mm

article no.: 119175

Control Box ARK-P061-1TCT-1R200-1SI200 (CB-1C-1L)

connection box EEx e with: thermostat EEx d for temperaturecontrol, setting range 0 – 120°C, thermostat EEx d for temperature limitation, setting range 50 – 300 °C, measuring sensor: stainless steel, capillary length 3 m, switching capacity 16 A at 250 V, 1 change-over contact, polyester, type of protection IP 66, dim. 227 x 170 x 91 mm

article no.: 115032

Control Box RK-P041-1R200 (CB-Ind-1C)

Connection Box

with thermostat for temperature control, setting range 0 – 50 °C or 0 – 200 °C, switching capacity 16 A at 250 V, 1 change-over contact, measuring sensor: stainless steel, capillary length 3 m, polyester, type of protection IP 66, dim. 170 x 170 x 91 mm

article no.: 112738

Control Box RK-P051-1R200-1SI200 (CB-Ind-1C-1SC)

Connection Box

with thermostat for temperature control, setting range 0 – 50°C or 0 – 200°C, switching capacity 16 A at 250 V, 1 change-over contact, thermostat as overheating protection, setting range 0 – 200 °C or 20 – 500 °C, switching capacity 16 A at 250 V, 1 change-over contact, measuring sensor: stainless steel, capillary length 3 m, polyester, type of protection IP 66, dim. 227x 170 x 91 mm

article no.: 112628

Further combinations of different thermostats possible also as combined boxes (feeding and control) for connecting several heating systems.

Inquiry Form

for Project Planning of Heat Tracing Systems

On the following pages you can find our inquiry form for project planning of heat tracing systems. Please fill in this form and scan the inquiry. You can send us your inquiry by fax, mail or e-mail, we will contact you as quickly as possible.

Should you have any questions or require assistance please do not hesitate to contact us. You can find our contact details on page 71. We are looking forward to your inquiry.

FOR THE PLANNING OF ELECTRICAL HEAT TRACING FOR PIPES / TANKS

Company:		Project:	
Inquiry no.:		Plant:	
Cont. pers.:		Phone:	
eMail:		Fax:	

1.00 Electrical Heat Tracing for maintaining the medium temperature, covering the heat loss of pipes / tanks

1.01	Pipe lengths and nominal widths of the pipelines or tanks to be heated *)	[-]	
1.02	Material of pipelines or tanks	[-]	
1.03	Number and dimensions of the valves and fittings installed in the piping system or tank	[pce/DN]	
1.04	Number of flanges in the piping system	[pce]	
1.05	Number and sort of supports	[pce]	
1.06	Necessary medium temperature (temp. to be maintained)	[°C]	
1.07	Maximum permitted medium temperature	[°C]	
1.08	Maximum possible medium temperature	[°C]	
1.09	Deepest ambient temperature	[°C]	
1.10	Planned insulation material	[-]	
1.11	Existing insulation strength	[mm]	
1.12	Supply voltage/frequency available	[V/Hz]	
1.13	Temperature class (for use in hazardous area)	[-]	
1.14	Requirements conc. control, capillary thermostate or resistance thermometer Pt100 (Ex(i) or Ex(d))	[.-.]	
1.15	Control accuracy, controller reaction (2 point or continuous)	[-]	
1.16	Ambient conditions (dry, humid, aggressive, windy, etc.)	[-]	

2.00 Electrical Heat Tracing for maintaining the medium temperature including heating up of pipe or tank within scheduled time

2.01	Heating-up of pipe/tank - pipe/tank + medium	[°C]	from ____ °C to ____ °C
2.02	Heating-up period requested in hours	[h]	
2.03	Mass of pipe/tank	[kg/m]	
2.04	Specific heating capacity of pipe/tank material	[kJ/kg K]	
2.05	Mass of flanges and fittings	[kg]	
2.06	Medium	[-]	
2.07	Melting temperature of the medium	[°C]	
2.08	Latent heat of the medium	[kJ/kg]	
2.09	Density of the medium	[kg/m³]	
2.10	Specific heating capacity of the medium	[kJ/kg K]	
2.11	Dynamic viscosity of the medium	[Pas]	

Remarks:

***) If available please add the following documents:**

- Outline of piping plan incl. branches
- Information concerning installation of pipe (e.g. tube bridges, building, burried installation etc.)
- Drawings/sketches of the tank and information about tank connections/links
- Isometries, R&I's, list of tube lines, tank list, plans of pumps, valves, fittings etc.
- Information conc. the location of electrical distributors (possibilities regarding electrical supply of the heating circuits)

Will you please send outlines and questions mentionning the inquiry no., hereto.

Our Product *for your Project*

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