

FOR SPECIALIZED TRADE AND PLANNERS

CONVINCING ANSWERS FOR
MODERN HOME COMFORT

PRODUCT INFORMATION 2016

EXCERPT:
FROST PROTECTION SYSTEMS

FROST PROTECTION- SYSTEMS OF AEG: SAFE ALL WINTER LONG

No matter what kind of surface you have, AEG products are always the first choice for keeping them frost-free. Our heating mats FFH 300 Twin for free surfaces are suitable for laying in screed, concrete, sand beds and with additional insulation for mastic asphalt (FFH 300 G) and stone chips too. The heating mats FFH 300 TH and heating cables DIC are approved to be laid in screed, concrete and sand beds and are designed for a power supply of 230 V. For more information about laying and connections, please phone +49 5531 702-0 or refer to the installation instructions for heating systems for free surfaces.

The benefits of the clever

AEG frost protection systems at a glance

- Zero-maintenance protection against frost damage to pipes, gutters, façades and free spaces
- Maximum safety on outdoor steps, paths and entrance ways
- No unsightly salt stains on valuable natural stone coverings
- No scratches to floor coverings caused by removing ice mechanically
- No harm to the environment (dogs, garden plants) from road salt
- None of the costs associated with time-consuming spreading and tidying up work

TIP FOR SAVING ENERGY



Self-limiting heating bands are not only great for keeping areas frost-free. The energy-hungry circulation pipe used in new builds to preheat the hot water pipe can also be replaced by pipe trace heating.

Using a timer, it provides the hot water pipe with just the amount of energy needed to reach the preheat temperature. Once the pipe is warm, power is automatically reduced by the self-limiting effect.



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Area of use

- The automatic electronic snow and ice melting system for keeping roads, drives, footpaths, ramps and steps free of snow and ice
- For private and commercial use

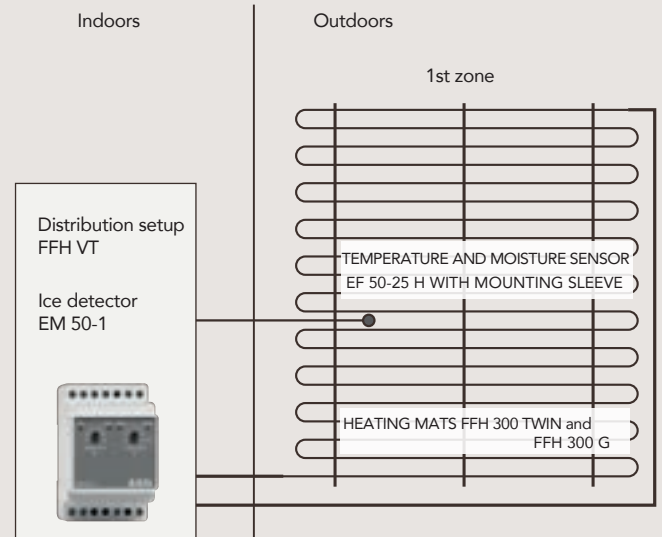
Components

- High-quality heating conductor with FEP insulation for laying in concrete, sand beds, screed or mastic asphalt
- Fully automatic, energy-saving operation using intelligent control systems which measure temperature and moisture

Installation

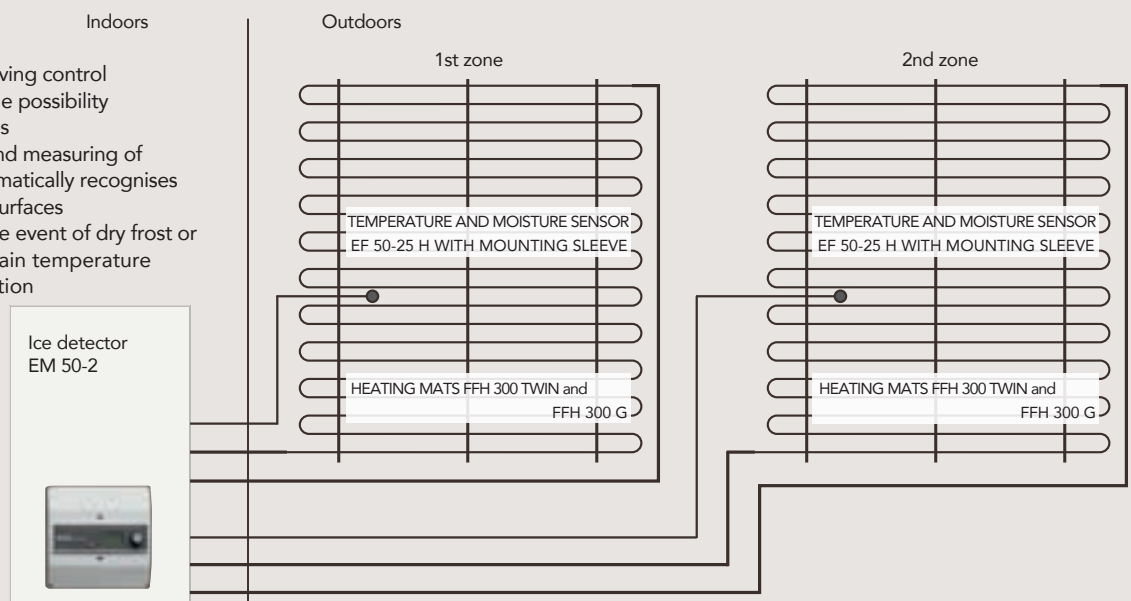
- Larger areas are fitted with FFH 300 heating mats. Smaller areas with lots of nooks and crannies or steps are fitted with the DIC heating conductor. Plastic bars help the heating cable maintain its shape
- The heating mats/cables are fitted directly under the surface to be heated
- The moisture and temperature sensors are fitted in sturdy stainless steel sleeves in the surface and are interchangeable
- Controllers that switch the heating mats are installed in an existing sub-distribution system or in a separate distribution panel

- Low-cost control of small setups for one zone
- Temperature- and moisture-dependent regulation for one zone
- The system is switched on automatically if there is a risk of snow or icy weather conditions



Snow and ice melting system – small setups, one zone

- Reliable and energy-saving control of larger setups with the possibility to control up to 2 zones
- Temperature control and measuring of moisture. System automatically recognises snowfall and freezing surfaces
- Doesn't switch on in the event of dry frost or moisture above a certain temperature
- Fully automatic operation



Snow and ice melting system – large setups, two zones

HEATING MATS FOR OUTDOOR FFH 300 W/m² TWIN – NEW –



FFH 300/3.0 Twin

- Heating mats for outdoor for laying in concrete, sand beds, screed or mastic asphalt
- High level of safety as heating conductor is clad with aluminium foil
- FFH 300 twin heating conductors: just one connection cable per heating mat to allow for particularly simple planning and routing
- High-quality heating cable structure
- Effective width 90 cm
- Power supply 2/PE~400 V 50 Hz
- Length of power cable (cold lead) approx. 12 m
- Low heating conductor load, 30 W/m
- Heating cable thickness approx. 9 mm

Model	FFH 300/3.0 Twin	FFH 300/4.5 Twin	FFH 300/6.0 Twin	FFH 300/9.0Twin	FFH 300/12.0 Twin	FFH 300/14.0 Twin
EAN	40 41056 03151 4	40 41056 03152 1	40 41056 03153 8	40 41056 03154 5	40 41056 03155 2	40 41056 03156 9
E-Number	234 533	234 534	234 535	234 536	234 537	234 538
Area m ²	3.0	4.5	6.0	9.0	12.0	14.0
Length m	3.3	5.0	6.6	10.0	13.3	15.5

Specific output 300 W/m², effective width: 90 cm, connection on 1 side · loop spacing: 100 mm

PROJECTION AID

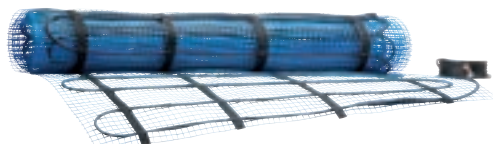
Calculation information

for FFH 300 W/m² Twin/G free area heating mats in the building development sector:

Model	FFH 300 Twin
E-Number	187 067
Specific output 300 W/m ² , effective width: 90 cm, connection on 1 side · loop spacing: 100 mm	

Model	FFH 300 G
E-Number	235 341
Specific output 300 W/m ² , effective width: 90 cm, connection on 2 sides · Loop spacing: approx. 80 mm	

HEATING MATS FOR OUTDOOR FFH 300 W/m² G FOR MASTIC ASPHALT – NEW –



FFH 300/3.0 G

- Heating mats for outdoor for laying in concrete, sand beds, screed or mastic asphalt
- High level of safety as heating conductor is clad in copper mesh
- High-quality heating cable structure
- Effective width 90 cm
- Power supply 2/PE~400 V 50 Hz
- Length of power cable (cold lead) 2 x approx. 12 m
- Low heating conductor load, 25 W/m
- Heating conductor construction with reference to VDE DIN 0253
- Heating cable thickness approx. 6 mm

Model	FFH 300/3.0 G	FFH 300/4.5 G	FFH 300/6.0 G	FFH 300/9.0 G	FFH 300/12.0 G	FFH 300/14.0 G
EAN	40 41056 03247 4	40 41056 03248 1	40 41056 03249 8	40 41056 03250 4	40 41056 03251 1	40 41056 03252 8
E-Number	234 876	234 877	234 878	234 879	234 880	234 881
Area m ²	3.0	4.5	6.0	9.0	12.0	14.0
Length m	3.3	5.0	6.6	10.0	13.3	15.5

Specific output 300 W/m², effective width 90 cm, connection on 2 sides · loop spacing: approx. 80 mm

HEATING CABLE FOR OUTDOOR FFH 30 W/m² TWIN – NEW –

- Heating cable for outdoor for laying in concrete, sand beds or screed
- High level of safety as heating conductor is clad with aluminium foil
- Just one connection cable per heating cable to allow for particularly simple planning and routing
- High-quality heating cable structure
- Power supply 2/PE~400 V 50 Hz
- Length of power cable (cold lead) approx. 12 m
- Low heating conductor load, 30 W/m
- Heating cable thickness approx. 7 mm



FFH 30/L70

Model	FFH 30/L40	FFH 30/L70	FFH 30/L110	FFH 30/L140
EAN	40 41056 03267 2	40 41056 03268 9	40 41056 03269 6	40 41056 03270 2
E-Number	235 262	235 263	235 264	235 265
Length m	40	70	110	140

Specific output 30 W/m, connection on 1 side · recommended spacing approx. 100 mm

PTC RESISTOR EXTENSION AND CONNECTION KIT – NEW –

KLV Twin 2.5

- Shielded cold lead extensions. With connecting kit to properly extend the power cables of outdoor heating mats for laying in concrete, sand beds or screed
- 3 x 2.5 mm²; length 10 m
- Power supply: 2/PE~400 V 50 Hz

KLV G 2.5

- Shielded cold lead extensions.
- For FFH 300 G snow and ice melting system for laying in asphalt/mastic asphalt
- 3 x 2.5 mm²; length 10 m
- Power supply: 2/PE~400 V 50 Hz

VS Twin

- Connection kit for KLV Twin and KLV G

KLV Twin
similar to illustrationVS Twin
similar to illustration

Model	KLV Twin 2.5	KLV G 2.5	VS Twin
EAN	40 41056 03185 9	40 41056 03263 4	40 41056 03174 3
E-Number	234 716	235 170	234 705
Description	Shielded cold lead extensions for SDH, DIC, FFH 300 Twin, 2.5 mm ² , length 10 m	Shielded cold lead extensions for FFH G, 2.5 mm ² , length 10 m	Connection kit for shielded cold lead extensions SDH, DIC, FFH Twin, FFH G
Meterware	KLV Twin M (FFH)	KLV G M	
EAN	40 41056 03189 7	40 41056 03264 1	
E-Number	234 720	235 171	

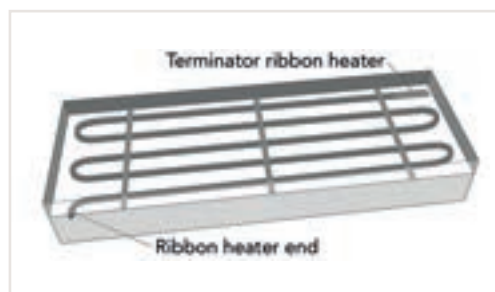
Model	KLV Twin 1.5	KLV G 1.5
EAN	40 41056 03173 6	40 41056 03262 7
E-Number	234 704	235 169
Description	Shielded cold lead extensions for SDH, DIC, 2.5 mm ² , length 10 m	Shielded cold lead extensions for FFH G, 1.5 mm ² , length 10 m



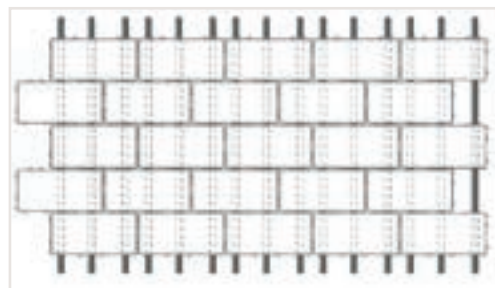
DIC 25/L8

HEATING CABLE DIC 25, WITH SINGLE-SIDED CONNECTION – NEW –

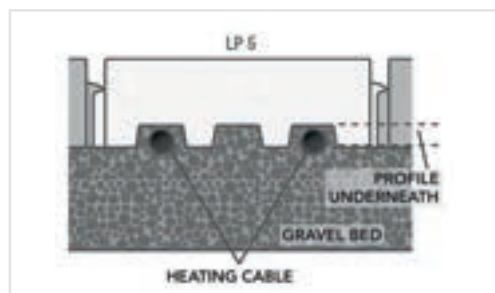
- Outdoor heating cable for laying in concrete, sand beds and screed (not for mastic asphalt)
- Heating cable for steps and angular areas where heating mats are unsuitable. The cable is secured with plastic clips (accessories)
- For gutters and pitched roof heating systems
- High grade cable structure with FEP insulation
- Twin heating conductors: only one power cable, therefore very easy design and installation
- Power supply 1/N/PE~230V 50 Hz
- UV-resistant
- Low heating conductor load, 30 W/m
- Length of power cable (cold lead) approx. 10 m
- Heating conductor construction with reference to VDE DIN 0253
- Heating cable thickness approx. 7 mm



DIC 25 heating cable routed through steps



DIC 25 heating cable below paving stones LP5 (Lithonplus)



Cross-section of heating cable DIC 25 below paving stones LP5 (Lithonplus)
heating conductor spacing 8 cm

Model	DIC 25/L4	DIC 25/L8	DIC 25/L12	DIC 25/L16	DIC 25/L20	DIC 25/L24
EAN	40 41056 03265 8	40 41056 03175 0	40 41056 03176 7	40 41056 03177 4	40 41056 03178 1	40 41056 03179 8
E-Number	235 172	234 706	234 707	234 708	234 709	234 710
Length m	4	8	12	16	20	24

Specific output 30 W/m, connection on 1 side

Model	DIC 25/L28	DIC 25/L34	DIC 25/L40	DIC 25/L60	DIC 25/L80	DIC 25/L100
EAN	40 41056 03266 5	40 41056 03180 4	40 41056 03181 1	40 41056 03182 8	40 41056 03183 5	40 41056 03184 2
E-Number	235 173	234 711	234 712	234 713	234 714	234 715
Length m	28	34	40	60	80	100

Specific output 30 W/m, connection on 1 side

SHEET STEEL INSTALLATION TAPE FOR STEP HEATING SYSTEMS

FFH MB 25

- Installation tape for fixing step heating systems

- Zinc-plated
- Spacing between cable retainers: 25 mm
- For fixing rawl plugs



FFH MB 25

Modell	FFH MB 25
EAN	40 41056 03190 3
E-Number	234 721
Description	10 m metre roll

PLASTIC BARS



DHZ ST



DHZ QST

DHZ ST / DHZ QST

- Plastic bars for fixing DIC heating cable
- The heating cable is clipped into the PE bars which allows the heating mats to take on any shape

- DHZ QST for fixing several DHZ ST

Model	DHZ ST	DHZ QST
EAN	40 14890 74826 9	40 41056 02265 9
E-Number	184 971	222 369
Description	Plastic bars, 5 x 1 m	PE cross bars, 5 x 1 m

ICE DETECTORS, WITH HIGH-PRECISION MEASUREMENT PROCEDURE



EM 50-2



EM 50-1



EF 50-25

EM 50-2:

- Ice detectors for safe and energy-saving operation of heating systems for outdoor,
- Up to 2 zones can be controlled individually
- Capture of temperature and moisture level
- Intuitive operation via turn & push selector
- Backlit LCD to indicate and configure an extensive range of system parameters
- Adjustable sensitivity to moisture, upper and lower temperature threshold, minimum heating time
- For top hat rail assembly, width: 9 modular spacings
- Switching capacity: up to 3 x 16 A

EM 50-1:

- Ice indicator for early warning of ice and snow
- Maintenance-free, safe and energy efficient operation
- Capture of temperature and moisture level
- Suitable for snow and ice melting systems
- Adjustable lower temperature limit and reheating time

- LED status indication for heating mode, set temperature undershoot, moisture detection and relay output
- For top hat rail assembly, width: 3 modular spacings
- Switching capacity: 16 A

EF 50-25 H:

- Moisture and temperature sensor for outdoor surfaces with 25 m power cable
- Sensor well, with cable exit to the side, designed for embedding in concrete outdoors
- Power cable may be extended up to 200 m
- Moisture capture by measuring the transition resistance
- Temperature capture via hot conductor (NTC)
- Ground sensor and sensor well made from stainless steel
- Sensor well is part of the standard deliver

Model	EM 50-2	EM 50-1	EF 50-25 H
EAN	40 41056 02810 1	40 41056 02811 8	40 41056 02812 5
E-Number	231 520	231 523	231 529
Description	Ice detector for 2 zones, with LC-Display	Ice detector for 1 zone	Moisture and temperature sensor

CONTROL DISTRIBUTION SETUPS FOR HEATING SYSTEMS FOR OUTDOOR



FFH VT 1

FFH VT

- Completely prewired control distribution setup, with automatic fuses and contactors for activating the heating circuits
- Prepared for installing the EM 50-2 or EM 50-1 ice detector
- Plastic housing with clear cover, Protection rating: IP 65

Control distribution setup for objects

- Control distribution setup up to 100 kW
FFH VT 6 - 10 of 40 - 100 KW available on request
- Special versions by request

Dimensions in mm:

- FFH VT 1 / VT 2 630 x 403 x 129 mm
- FFH VT 3 / VT 4 600 x 600 x 170 mm
- FFH VT 5 600 x 900 x 200 mm

Model	FFH VT 1	FFH VT 2	FFH VT 3	FFH VT 4	FFH VT 5
EAN	40 41056 02391 5	40 41056 02392 2	40 41056 02393 9	40 41056 02394 6	40 41056 02395 3
E-Number	223 291	223 292	223 293	223 294	223 295
Description	Control distribution setup for 1 heating circuit up to 4 kW	Control distribution setup for 2 heating circuits up to 8 kW	Control distribution setup for 4 heating circuits up to 16 kW	Control distribution setup for 6 heating circuits up to 24 kW	Control distribution setup for 8 heating circuits up to 32 kW

OUTSIDE TEMPERATURE CONTROLLERS

ATE 50:

- Weather-compensated control of frost protection applications, such as heating systems for small outdoor surfaces
- LED status display for heating mode
- Rotary selector for set temperature and variable hysteresis
- For top hat rail assembly, width: 2 modular spacings
- Switching capacity: 10 A

ATF 5:

- NTC outside temperature sensor with connection box for ATE 50 and FTE 400
- Easy wall mounting
- Recommended power cable (not part of standard delivery): 3 x 1.5 mm² (NYM-J)
- Protection rating: IP 54

FTE 400:

- Electronic temperature controller for top hat rail mounting
- Suitable for outdoor surface heating
- Large, easy to read backlit display
- Easy, logical operation
- Frost protection function
- Optimum operational safety with 2-pole shutdown
- Variable adjustment of switching hysteresis, lower and upper temperature limits
- With NTC outside temperature sensor Ø 5 mm, 3 m long
- Scale: Degree Celsius or numerical
- For top hat rail assembly, width: 3 modular spacings
- Switching capacity: 16 A
- Ambient temperature: -20 °C / +55 °C



ATE 50



ATF 5



FTE 400

Model	ATE 50	ATF 5	FTE 400
EAN	40 41056 02815 6	40 41056 02814 9	40 41056 02816 3
E-Number	231 532	231 531	231 533
Description	Outside temperature controller without digital display	Outside temperature controller for wall-mounting	Outside temperature controller with digital display

OUTSIDE TEMPERATURE CONTROLLERS WITH ALARM OUTPUT

ATE 30 T / ATF 3-4

- Outside-temperature-dependent control of snow and ice melting system, low-cost basic solution for small setups in the private sector
- The system must be switched on/off manually when the corresponding conditions apply
- Transistor alarm output
- Sensor failure / short circuit detection
- For top hat rail assembly, width: 3 modular spacings
- Operating voltage 1/N ~ 230 V 50 Hz

- **ATF 3-4:** NTC sensor Ø 10 mm, feed cable 4 m (not included in scope of supply)
- With 3 selectable setting ranges and digital display (-25 °C up to 99 °C)
- With alarm output



ATE 30 T

Model	ATE 30 T	ATF 3-4
EAN	40 41056 00422 8	40 41056 00439 6
E-Number	184 913	184 916
Description	Outside temperature controller with alarm output	NTC outside sensor, feed cable 4 m



Area of use

- The electronic pipe trace heating system protects pipes laid outdoors or in areas at risk of frost from freezing
- Special SLH ribbon with fluoropolymer insulation for installation on a bitumen roof.
- Gutter heating systems keep the gutters and downpipes free of ice, thereby preventing structural damage and the formation of dangerous icicles which may form when dew and rainwater accumulates

Components

- Two heating cables are available: self-limiting heating band, energy-saving operation with automatic temperature limitation or heating cable with fixed heating capacity, low-cost alternative with high-quality FEP heating conductor insulation
- Fully automatic, energy-saving operation of gutter heating system using intelligent control systems which measure temperature and moisture
- Pipe trace heating control with precise temperature controllers, with or without digital display

Installation

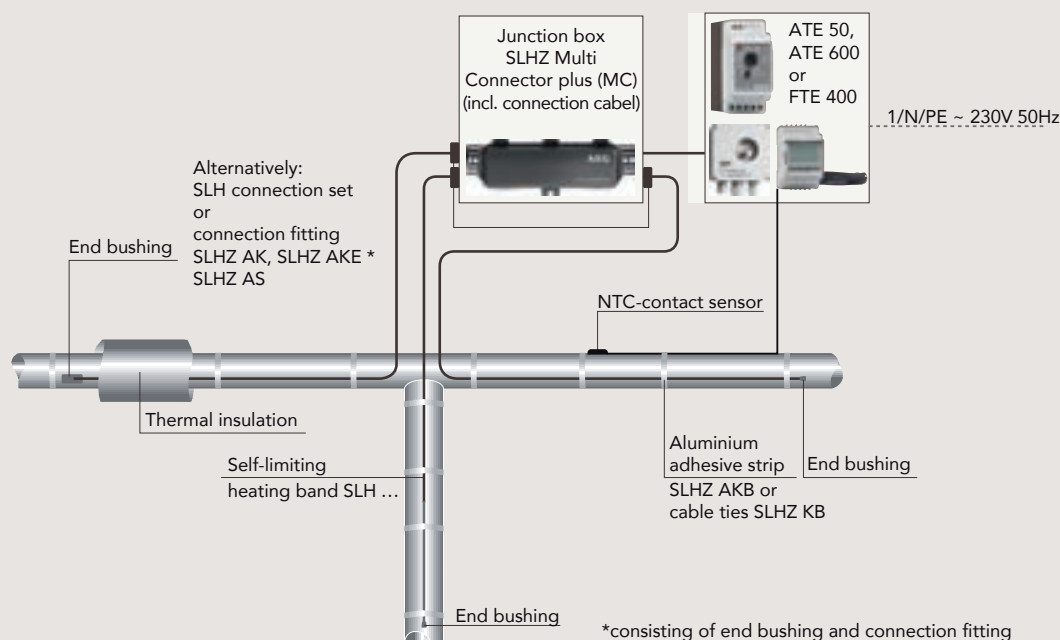
- For the pipe trace heating system, the heating cables are fitted directly on the pipe to be heated under the thermal insulation
- The heating for the gutters and pitched roof is laid in the inside, along the gutter. One heating loop is also fitted in the downpipe and protrudes around 1 m into the earth
- A wide range of installation accessories are available for installing the AEG pipe trace and gutter heating systems
- If necessary, the AEG Haustechnik technical supply team will assist with planning and installation

Basic circuitry for trace pipe heating system

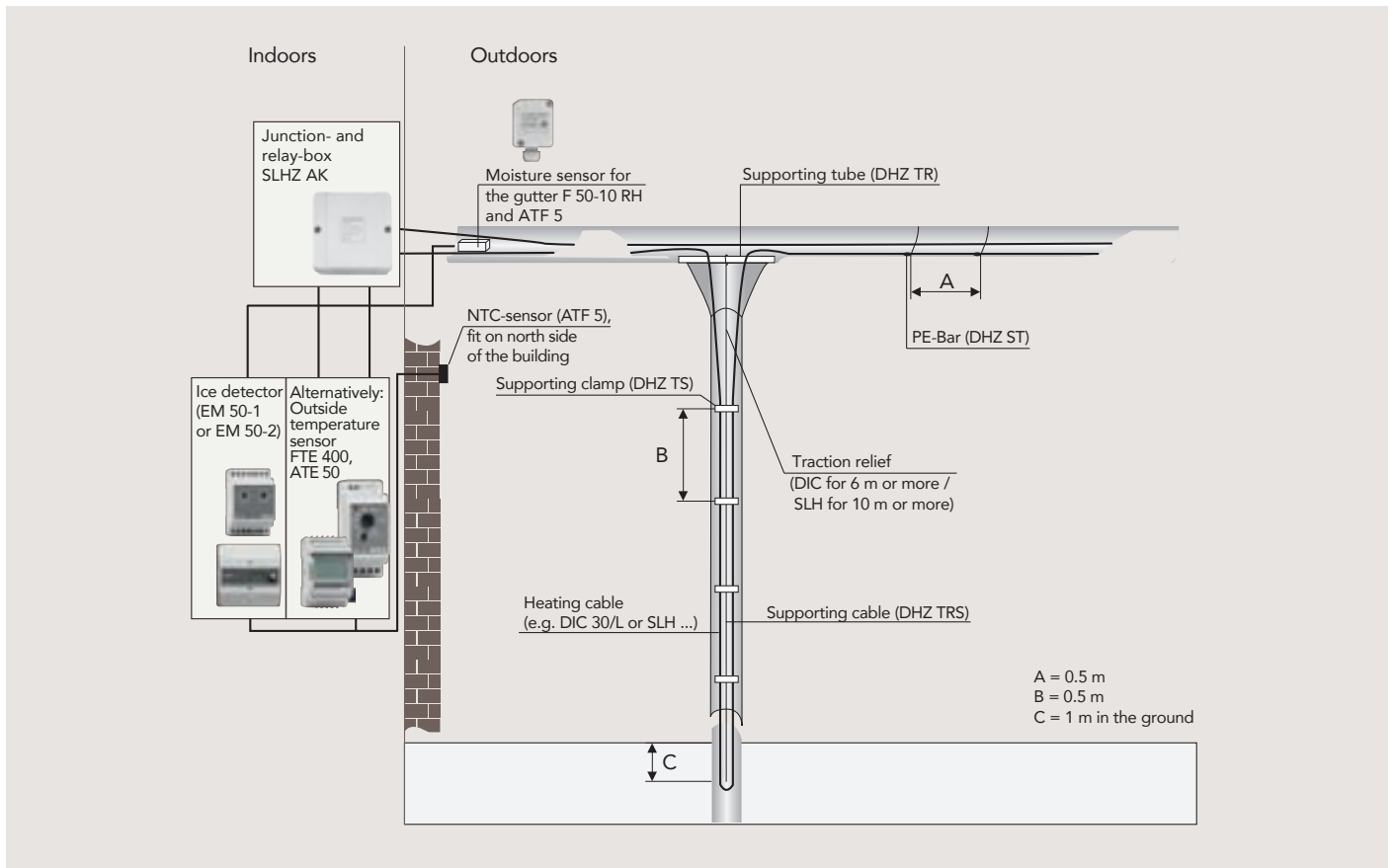
- Installation of heating cable under thermal insulation
- A temperature controller which specifies the limit temperature value must also be provided for self-limiting heating bands

Basic circuitry for gutter and pitched roof heating

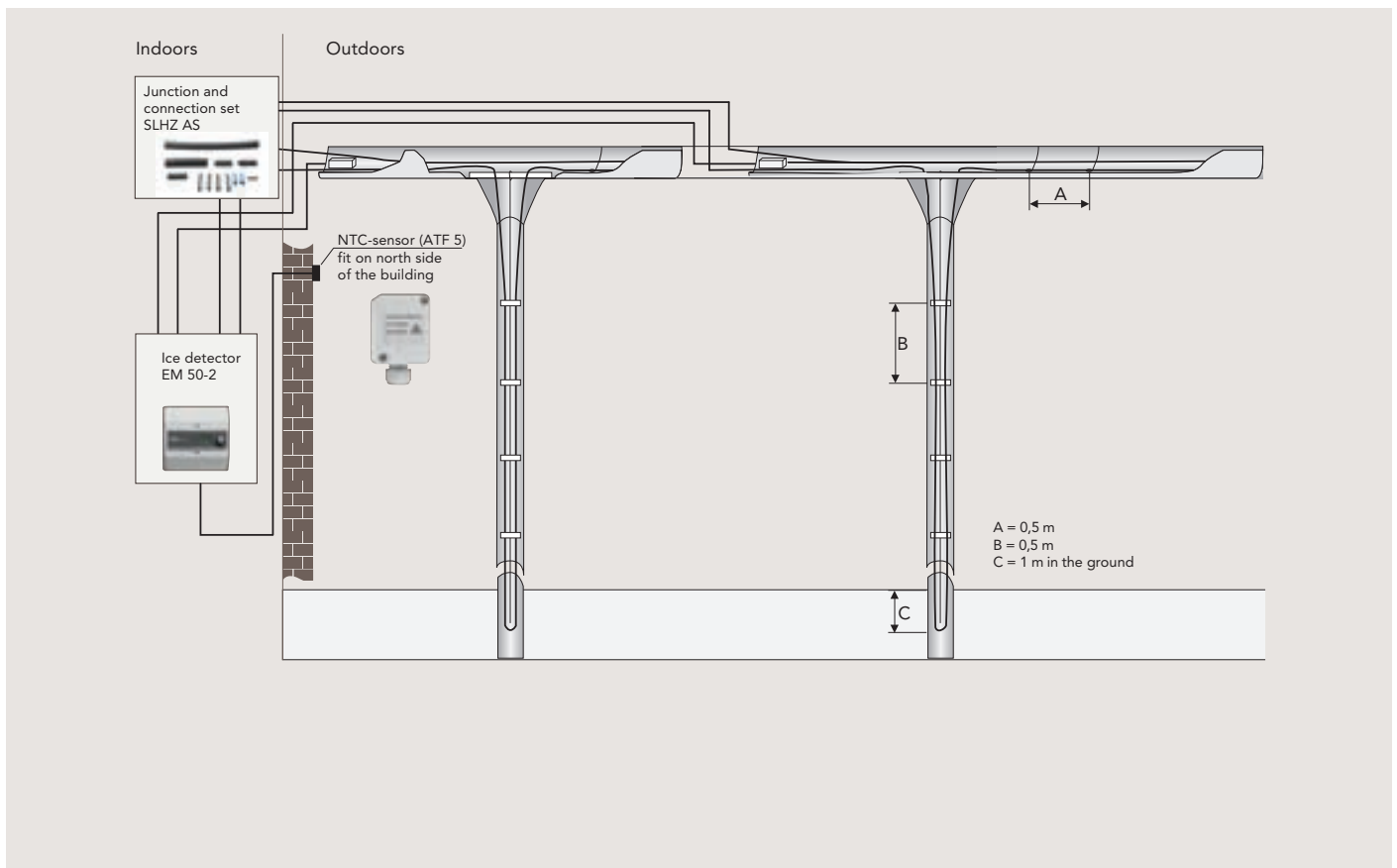
- Use plastic bars to fix heating cable in gutter
- Traction relief should be provided in the downpipe (DIC > 6 m and SLH > 25 m)
- Position moisture and temperature sensor in gutter
- If necessary, a leaf trap should be fitted to prevent foliage from accumulating



Block diagram for pipe trace heating systems



Block diagram for gutter heating system, one zone



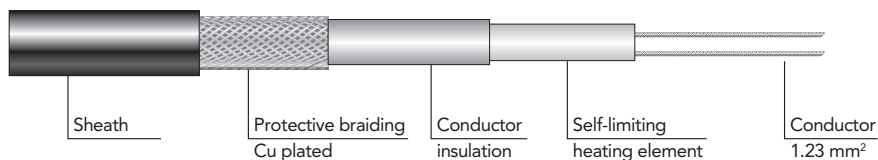
Block diagram for gutter heating system, two zones

SELF-LIMITING HEATING BAND FOR PIPE TRACE HEATING AND GUTTER HEATING

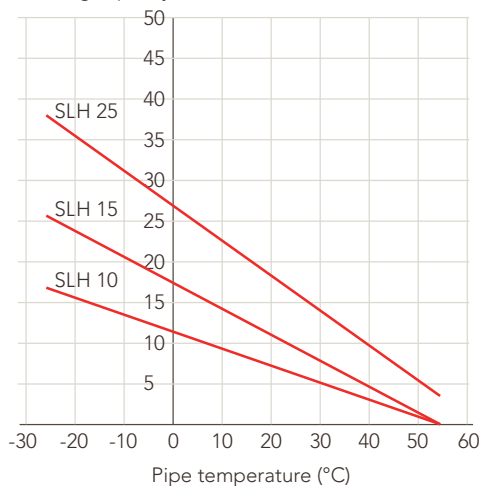


SLH 10/L300

- Heating band – an energy-saving way of keeping piping and gutters frost-free
- Self-limiting heating band with 2 parallel copper conductors, separated from one another by a special plastic semiconductor element.
- Supplied without end bushing and connection cable
- The connection kit SLHZ Multi Connector and the connection cable SLHZ KL are needed for installation
- Power supply 1/N/PE~230V 50Hz
- UV-resistant and halogen-free
- High quality and "Made in Germany"
- VDE approved



Heating capacity (W/m)



SLH capacity
(on insulated metal pipes to EN 62395-1)

Start temperature °C	Fuse/MCB rated value	Heating circuit length (m) for		
		SLH 10	SLH 15	SLH 25
10	10	152.0	103.0	64.0
	16	196.0	160.5	103.0
	20	196.0	160.5	126.0
	25	196.0	160.5	126.0
0	10	141.0	84.0	44.0
	16	188.5	134.0	70.0
	20	188.5	145.0	87.5
	25	188.5	145.0	104.0
-10	10	119.0	71.0	38.0
	16	173.5	114.0	61.0
	20	173.5	133.0	76.0
	25	173.5	133.0	95.0
-20	10	103.0	62.0	33.0
	16	161.0	99.0	53.0
	20	161.0	124.0	66.0
	25	161.0	124.0	83.0

Model	SLH 10/L30	SLH 10/L100	SLH 10/L300	SLH 10/L500
EAN	40 41056 02887 3	40 41056 02888 0	40 41056 02889 7	40 41056 02890 3
E-Number	232 541	232 542	232 543	232 544
Length m	30	100	300	500

Self-limiting heating band, specific longitudinal loading 10 W/m

Model	SLH 15/L30	SLH 15/L100	SLH 15/L300	SLH 15/L500
EAN	40 41056 02891 0	40 41056 02892 7	40 41056 02893 4	40 41056 02894 1
E-Number	232 545	232 546	232 547	232 548
Length m	30	100	300	500

Self-limiting heating band, specific longitudinal loading 15 W/m

Model	SLH 25/L30	SLH 25/L100	SLH 25/L300	SLH 25/L500
EAN	40 41056 02895 8	40 41056 02896 5	40 41056 02897 2	40 41056 02898 9
E-Number	232 549	232 550	232 551	232 552
Length m	30	100	300	500

Self-limiting heating band, specific longitudinal loading 25 W/m

SELF-LIMITING HEATING BAND, INDIVIDUAL LENGTHS

- Heating band – an energy-saving way of keeping piping and gutters frost-free
- Self-limiting heating band with 2 parallel copper conductors, separated from one another by a special plastic semiconductor element.
- Supplied without end bushing and connection cable
- The connection kit SLHZ Multi Connector (Plus) or SLHZ AS and the connection cable SLHZ KL are needed for installation
- Power supply 1/N/PE~230V 50Hz
- UV-resistant
- High quality and "Made in Germany"
- VDE approbated
- For SLH 10/15/25: individual lengths of 15 m or more can be supplied, price per metre



SLH 25



Model	SLH 10	SLH 15	SLH 25
EAN	40 41056 02899 6	40 41056 02900 9	40 41056 02901 6
E-Number	232 553	232 554	232 555
Output W/m	10	15	25

Self-limiting heating band, individual lengths assembled on request

SELF-LIMITING HEATING BAND, FOR BITUMEN ROOFS, INDIVIDUAL LENGTHS

- Ribbon heater for energy efficient frost protection for bitumen roofs.
- Self-limiting heating band with 2 parallel copper conductors, separated from one another by a special plastic semiconductor element.
- Supplied without end bushing and connection cable
- The connection kit SLHZ Multi Connector (Plus) or SLHZ AS and the connection cable SLHZ KL are needed for installation
- Power supply 1/N/PE~230V 50Hz
- UV-resistant
- High quality and "Made in Germany"
- VDE approbated
- Resistant to oil, petrol and chemical attack
- Fluoropolymer sheath
- Suitable for installation on bitumen roofs
- External insulation FP



SLH 25 FP



Model SLH	SLH 25 FP
EAN	40 41056 02902 3
E-Number	232 556
Output W/m	25

Self-limiting heating band, individual lengths assembled on request

CONNECTION CABLE (PTC RESISTOR) FOR SELF-LIMITING HEATING BAND

SLHZ KL

- PTC resistor for correct connection of the self-limiting ribbon heater
- Length of the feed cable (PTC resistor) 10 metres
- Specific lengths by request
- Cable type: H 07 RN-F; power cable with oil-resistant rubber sheathing
- UV-resistant
- Cable cross-section: 3 x 1.5 mm²
- VDE approbated
- Suitable: -30 °C / +60 °C



SLHZ KL

Model	SLHZ KL
EAN	40 41056 02913 9
E-Number	232 567
Description	High quality PTC resistor for SLH, length 10 m

IP 67



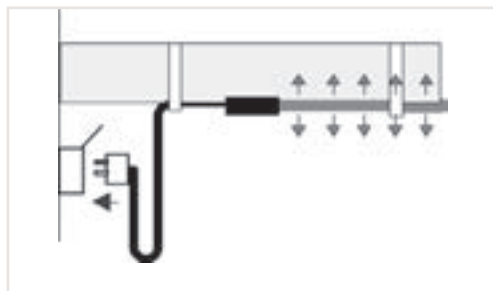
SLH 25/L5 ST

PLUG-IN ASSEMBLED PIPE TRACE HEATING SYSTEM WITH THERMOSTAT – AN ENERGY-SAVING WAY OF KEEPING PIPING FROST-FREE

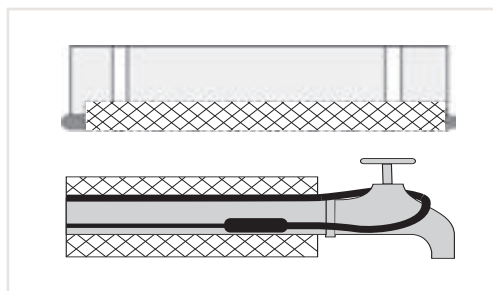
- Plug-in assembled, self-limiting heating band with shaped plug. Length of connection cable approx. 2.5 m
- Specific rating 25 W/m at 10 °C
- With integrated thermostat
- UV-resistant
- Can be individually cut to length, the end of the cable can be professionally resealed with the enclosed end cap
- Protection rating: IP 67
- Heating cable VDE approbated
- ON: around 3 °C
- OFF: around 12 °C
- High Quality "Made in Germany"
- AC voltage 230 V 50 Hz

Model	SLH 25/L5 ST	SLH 25/L10 ST	SLH 25/L15 ST	SLH 25/L20 ST	SLH 25/L25 ST	SLH 25/L30 ST
EAN	40 41056 02905 4	40 41056 02906 1	40 41056 02907 8	40 41056 02908 5	40 41056 02909 2	40 41056 02910 8
E-Number	232 559	232 560	232 561	232 562	232 563	232 564
Length	m 5	10	15	20	25	30
Self-limiting heating band, plug-in assembled						

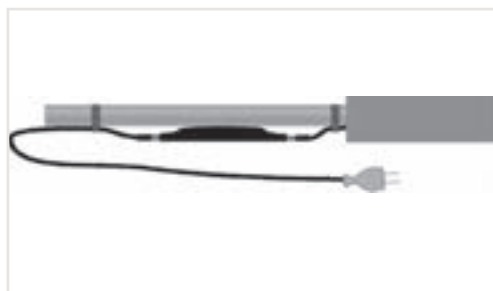
INSTALLATION EXAMPLES FOR PLUG-IN ASSEMBLED PIPE TRACE HEATING AND GUTTER HEATING SYSTEMS



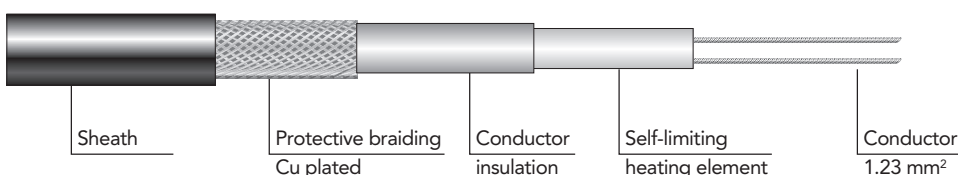
With the mains cable, create a "drip loop" prior to connection to the mains socket



Installation example of pipe trace heating



Optimal position of heating cable at the pipe



SLH (structure of heating conductor)

ICE DETECTORS, WITH HIGH-PRECISION MEASUREMENT PROCEDURE

EM 50-2:

- Ice detectors for safe and energy-saving operation of gutter heating systems
- Up to 2 zones can be controlled individually
- Capture of temperature and moisture level
- Intuitive operation via turn & push selector
- Backlit LCD to indicate and configure an extensive range of system parameters
- Adjustable sensitivity to moisture, upper and lower temperature threshold, minimum heating time
- For top hat rail assembly, width: 9 modular spacings
- Switching capacity: up to 3 x 16 A

EM 50-1:

- Ice indicator for early warning of ice and snow
- Maintenance-free, safe and energy efficient operation
- Capture of temperature and moisture level
- Suitable for snow and ice melting systems
- Adjustable lower temperature limit and reheating time
- LED status indication for heating mode, set temperature undershoot, moisture detection and relay output
- For top hat rail assembly, width: 3 modular spacings
- Switching capacity: 16 A

F 50-10 RH:

- Moisture sensor for gutters, with 10 m lead
- Moisture capture via transition resistance
- Lead may be extended to 200 m
- Brass casing
- Operation with ATF 5 outside temperature sensor

ATF 5:

- NTC outside temperature sensor with connection box
- Easy wall mounting
- Recommended power cable (not part of standard delivery): 3 x 1.5 mm² (NYM-J)
- Protection rating: IP 54



EM 50-1



EM 50-2



F 50-10 RH



ATF 5

Model	EM 50-2	EM 50-1	F 50-10 RH	ATF 5
EAN	40 41056 02810 1	40 41056 02811 8	40 41056 02813 2	40 41056 02814 9
E-Number	231 520	231 523	231 530	231 531
Description	Ice detector with LC-Display	Ice detector	Moisture sensor for gutter	Outside temperature controller for wall-mounting

OUTSIDE TEMPERATURE CONTROLLERS



ATE 50



AF 5-2.5



FTE 400



ATF 5

ATE 50:

- Weather-compensated control of frost protection applications, such as pipe trace and gutter heating systems
- LED status display for heating mode
- Rotary selector for set temperature and variable hysteresis
- For top hat rail assembly, width: 2 modular spacings
- Switching capacity: 10 A

ATF 5:

- NTC outside temperature sensor with connection box
- Easy wall mounting
- Recommended power cable (not part of standard delivery): 3 x 1.5 mm² (NYM-J)
- Protection rating: IP 54

FTE 400:

- Electronic temperature controller for top hat rail mounting
- Suitable for pipe trace and gutter heating systems
- Large, easy to read backlit display
- Easy, logical operation
- Frost protection function
- Optimum operational safety with 2-pole shutdown
- Variable adjustment of switching hysteresis, lower and upper temperature limits
- With NTC outside temperature sensor Ø 5 mm, 3 m long
- Scale: Degree Celsius or numerical
- For top hat rail assembly, width: 3 modular spacings
- Switching capacity: 16 A
- Ambient temperature: -20 °C/+55 °C

AF 5-2.5:

- NTC contact sensor, feed cable 2.5 m, for ATE 50 and FTE 400

Model	ATE 50	ATF 5	FTE 400	AF 5-2.5
EAN	40 41056 02815 6	40 41056 02814 9	40 41056 02816 3	40 41056 02817 0
E-Number	231 532	231 531	231 533	231 534
Description	Outside temperature controller without digital display	Outside temperature controller for wall-mounting	Outside temperature controller with digital display	Contact sensor with feed cable

ELECTRONIC FROST STAT FOR OUTDOOR INSTALLATION, IP 65

ATE 600:

- 2-point controller for frost protection applications (pipework ribbon heater, outdoor surface and gutter heating)
- For outside installation, IP 65
- Sensor lead may be extended to 100 m
- 16 A delay fuse
- Sensor monitoring for sensor lead break or sensor short circuit
- Temperature range between 0 °C and +60 °C
- Can be used with outdoor and indoor setting
- Hysteresis adjustable between +/- 0.5...5 K.
- Operating voltage AC 230 V
- Operating temperature -20 °C / + 40 °C



ATE 600

Model	ATE 600
EAN	40 41056 02946 7
E-Number	232 840
Description	Electronic frost stat for outdoor installation

OUTSIDE TEMPERATURE CONTROLLER WITH ALARM OUTPUT

- Control for gutter heating systems independent of outside temperature, affordable standard solution for small domestic systems
- The system must be switched on/off manually when the corresponding conditions apply
- Transistor alarm output
- Sensor failure / short circuit detection
- For top hat rail assembly, width: 3 modular spacings
- Operation voltage 1/N ~ 230 V 50 Hz
- **ATF 3-4:** For gutter heating systems, NTC sensor Ø 10 mm, feed cable 4 m (not included in scope of supply)
- **AF 3-2:** NTC sensor, feed cable 2 m (not included in scope of supply)



ATE 30 T

Model	ATE 30 T	ATF 3-4	AF 3-2
EAN	40 41056 00422 8	40 41056 00439 6	40 41056 00440 2
E-Number	184 913	184 916	184 917
Description	Outside temperature controller with digital display	NTC outside sensor for gutter heating systems	NTC contact sensor, feed cable 2 m for pipe trace heating systems



SLHZ Multi Connector

CONNECTION SET SLHZ FOR SELF-LIMITING HEATING BAND

- "All-in-one" SLH quick-fit connection for all applications
- Reliable, quick and correct connection guaranteed
- Optional connection of up to 3 ribbon heaters and one cold lead
- Integral support feet, ideal for wrapping around pipework
- Three terminators included
- Protection rating: IP 65
- VDE tested

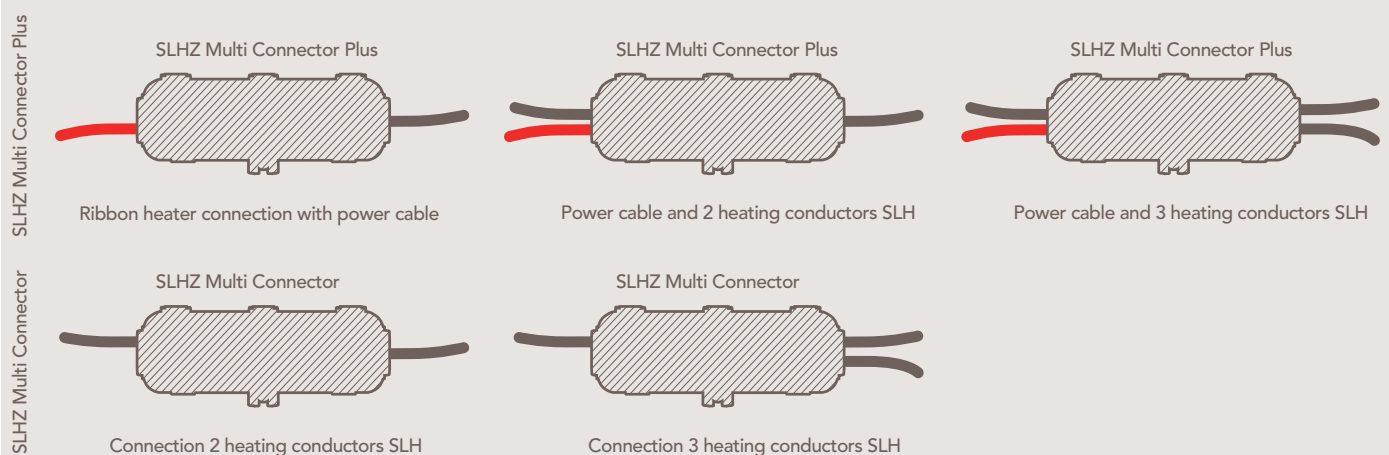


SLHZ Multi Connector Plus

SLHZ MULTI CONNECTOR / PLUS

- "All-in-one" SLH quick-fit connection for all applications
- Reliable, quick and correct connection guaranteed
- Optional connection of up to 3 ribbon heaters and one cold lead
- Integral support feet, ideal for wrapping around pipework
- Three terminators included
- Protection rating: IP 65
- VDE tested
- Heat-resistant silicone connecting lead Type H05 SS-F 3 x 1.5 mm²
- UV-resistant
- With connection cable 1.5 m

All connection options possible with the AEG Multi Connector. Quick and reliable.



Model	SLHZ Multi Connector	SLHZ Multi Connector Plus
EAN	40 41056 02911 5	40 41056 03023 4
E-Number	232 565	233 577
Description	"All-in-one" SLH quick-fit connection	"All-in-one" SLH quick-fit connection with connection cable

JUNCTION- AND CONNECTION-SET FOR SELF-LIMITING HEATING BAND (SLH)

- For correctly connecting heating band and heating band as well as heating band and service pipe
- With shrink-fit hoses and crimp connectors, end cap included
- Protection rating: IP 66
- Max. operating temperature.: +85 °C



SLHZ AS

Model	SLHZ AS
EAN	40 41056 02912 2
E-Number	232 566
Description	Junction- and connection-set

JUNCTION BOXES

- **SLHZ AK:** Junction box for connecting up to 3 ribbon heaters and one cold lead
- Casing material: halogen-free thermoplastic
- Knock-outs: 7 x M 25
- Ambient temperature: - 40 °C to + 70 °C
- Protection rating: IP 66
- Type of connection: Terminal strip
- Clamping area.: 3 ~ 1.5 - 4 mm²



SLHZ AK

- **SLHZ AKE:** Connection and terminator set for SLHZ AK junction box
- Protection rating: IP 66 in conjunction with SLHZ AK junction box
- Incl. terminator
- Oval gasket for ribbon heater



SLHZ AKE

- **SLHZ AKF:** Stainless steel mounting bracket for the SLHZ AK junction box for fitting to pipework
- Dimensions: L 85 mm, W 85 mm, Support height: 100 mm
- Material: Stainless steel



SLHZ AKF

Model	SLHZ AK	SLHZ AKE	SLHZ AKF
EAN	40 41056 02915 3	40 41056 02916 0	40 41056 02917 7
E-Number	232 569	232 570	232 571
Description	Junction box for for outdoor installation, IP 66	Connection and terminator set for junction box, IP 66	Stainless steel mounting bracket for junction box

TEMPERATURE- AND UV-RESISTANT CABLE TIES



SLHZ KB

- Cable tie for fixing heating band to pipe, temperature- and UV-resistant
- Use of up to DN 100
- Material: Polyamid, halogen- and silicone-free and UV-resistant
- Packaging unit of 100 items
- Length: 360 x 4.8 mm

Model	SLHZ KB
EAN	40 41056 02914 6
E-Number	232 568
Description	Cable ties of up to DN 100



SLHZ ID

INSULATION GROMMET FOR SELF-LIMITING HEATING BAND

- Special insulation grommet for heating band
- Threaded fitting: M 25 with oval seal for SLH band
- Dimension ground plate: 70 x 70 mm

Model	SLHZ ID
EAN	40 41056 02918 4
E-Number	232 572
Description	Insulation grommet for SLH heating band



SLHZ AKB

ALUMINIUM ADHESIVE STRIP

- Special aluminium adhesive strip for fixing the heating band to the pipe,
- Good heat transfer properties, especially suited to plastic pipes
- Installation at -10 °C to 40 °C
- Width: 75 mm

Model	SLHZ AKB
EAN	40 41056 02919 1
E-Number	232 573
Description	Aluminium adhesive strip, 50 m

STICKER – ELECTRICALLY HEATED



SLHZ Sticker

- Sticker for identifying electrically heated areas
- Temperature range: -20 °C to 70 °C
- Fire characteristics: Self-extinguishing to ISO 3795
- Use labels every 5 metres
- Packaging unit: 10 items

Model	SLHZ Sticker
EAN	40 41056 02920 7
E-Number	232 574
Description	SLH sticker for electrically heated areas, packaging unit: 10 items

SUPPORT CABLE

- 20 m for traction relief of heating cable in the downpipe



DHZ TRS

SUPPORTING TUBE

- To secure supporting cable over the downpipe



DHZ TR

SUPPORTING CLAMP

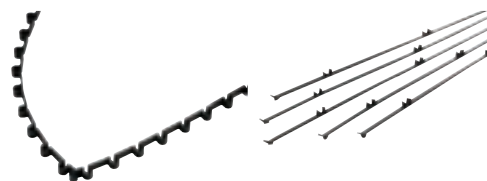
- For securing heating cable to supporting cable at intervals of 50 cm
- Material enamelled



DHZ TS

PLASTIC BARS

- PE plastic bars, UV-resistant, to fix spacing in the gutter. Contains 5 x 1 m each
- DHZ QST to fix several DHZ ST, for easy installation on smaller areas, such as flat roofs



DHZ ST

DHZ QST

EDGE PROTECTION

- For securing the ribbon heater in the gutter
- For securing to and guiding along snow guards
- As spacers in box gutters and as edge protection in downpipes
- Included in standard delivery are 2 temperature and UV-resistant cable ties for securing the ribbon heater
- Simple installation thanks to predefined holes
- Stainless steel for a long service life.



DHZ KS

Model	DHZ TRS	DHZ TR	DHZ TS	DHZ ST	DHZ QST	DHZ KS
EAN	40 14890 74828 3	40 14890 74824 5	40 14890 74825 2	40 14890 74826 9	40 41056 02265 9	40 41056 03038 8
E-Number	184 991	184 969	184 970	184 971	222 369	233 909
Description	Support cable	Supporting pipe	Supporting clamp	Plastic bars	PE cross bars	Edge protection

1. Applicability

- 1.1. All our supplies – also in the future – exclusively take place on the basis of these Terms and Conditions of Delivery and Payment. They are accepted by the Customer at the latest with placing the order however with the acceptance of the first supply, and shall apply for the entire duration of the business relationship. We hereby expressly contradict to any opposing business and purchasing conditions of the Customer. Deviations from our terms/conditions shall be effective only if confirmed by us in writing.
- 1.2. General terms and conditions of the customer apply only to that extent, when we agreed them expressly in writing. This written-form requirement cannot be waived.

2. Prices, packaging, terms of payment, sett-off, right of retention

- 2.1. Our offers are non-binding. The agreement is formed only through our written confirmation or through delivery.
- 2.2. The invoice for orders for which no individual fixed price is agreed on is issued on the basis of the list prices applicable on the day of delivery.
- 2.3. Prices and discounts quoted verbally shall be effective only if confirmed by us in writing.
- 2.4. All prices are understood free carrier (FCA) our factories in Holzminden, Eschwege, Poprad, Ayut-thaya and Tianjin including cardboard packaging, or free on board (FOB) at a German port (Incoterms 2010). Should the need for special packaging arise, we reserve the right to charge for this separately and additionally.
- 2.5. Unless otherwise agreed in writing, our invoices shall be paid against prepayment in the currency indicated in the invoice. Unless otherwise agreed in writing, payment in Euros shall be deemed agreed on.
- 2.6. If the products are exported, the Customer will comply with the German export rules and regulations, and point out to its buyers that German export rules and regulations are applicable in the case of an exportation of products. The Customer undertakes to provide the information necessary to obtain an (import) export permit already when the Customer places the order. If at the Customer's request deliveries are passed on without customs clearance, the Customer shall be liable for any additional or extra payments demanded by the German customs authorities. If the exportation of the goods is prohibited or not permitted by the German authorities although such a permit is required, the Customer cannot derive any claims against us from this. The same shall apply if, for reasons that we are not responsible for, the importation of the goods into the country of destination is prevented or delayed by the authorities there.
- 2.7. The Customer is entitled to set off or retain claims only if they are undisputed or have been ascertained legally binding. The Customer shall have a right of retention only if its counterclaims are based on the same contractual relationship.

3. Delivery/acceptance/impossibility performance/delay/take-back

- 3.1. A delivery period specified in the order shall be binding only if confirmed by us in writing. Delivery shall be deemed to have been made within an agreed delivery period if the goods to be delivered have left our plant before the end of the delivery period, or if the Customer is obliged to notify us prior to delivery of his readiness to collect or take delivery of the goods, but has not done so, and we notify the Customer of our readiness to make shipment. In the latter case, delivery shall be deemed to be made when the written notification of readiness to make shipment is mailed by us.
- 3.2. The delivery period shall be extended in a reasonable way if the Customer subsequently requests changes or additions. The same shall apply in the event of the occurrence of unforeseen difficulties

beyond our control, e.g. force majeure, lawful labour disputes, disruptions of business affecting us or our suppliers.

- 3.3. All delivery obligations are subject to timely and proper delivery to us, also of suppliers' parts, if delivery is impossible within the agreed delivery period because of such circumstances or, if no such delivery period is agreed on, within three months of receipt of the order, we can cancel the agreement. The Customer shall not have any claims against us whatsoever in any of these cases, especially no claims to compensation for default damage and no damage claims.
- 3.4. Compensation for any default damage can be demanded by the Customer only in the event of wilful act or gross negligence on our part. This shall not apply if we commit to a binding delivery date in the confirmation of order and culpably fail to deliver on or before such date. In any case of default, our liability shall be limited to the foreseeable loss which typically arises, unless we intentionally violate the agreement or such breach of contract is attributable to us. The foreseeable loss which typically arises will generally not exceed the double amount of the order value affected by default.
- 3.5. In the event of default, we shall have the right to fix a reasonable deadline for the Customer to declare whether he wishes to cancel the agreement and/or demand damages instead of performance. If the Customer does not make a statement within that deadline, his right to cancel the agreement or to demand damages instead of performance shall lapse.
- 3.6. Goods are always shipped for the Customer's account and at the Customer's risk. All risks shall pass over to the Customer as soon as the goods are handed over to the carrier or leave our warehouse for shipment. In all other respects, the Incoterms 2010 shall be applicable.
- 3.7. The fulfilment of this contract has the reservation that no obstacle in form of German, US-American or other applicable national, EU or international provisions of foreign trade legislation and no embargos or sanctions are in force.
- 3.8. If the ordering party has the desire to return defect-free and correctly delivered goods, the ordering party can apply for a take-back. It is in our free discretion to take back or not to take-back the goods in question, especially after verification of age (not older than 6 months) and condition, against a markdown of at least 20% of the value of the goods. The ordering party has to bear all costs related to the take-back

4. Customer's obligation to complain, liability for defects

- 4.1. Our Customer shall not have any claims because of defects of the goods unless the Customer properly performed all of his obligations to inspect the goods and to complain of defects pursuant to sec. 377 HGB (German Commercial Code).
- 4.2. Any transportation or shipping damage is to be reported in writing by the Customer to the carrier immediately upon receipt of the goods. In addition, we are to be informed without undue delay about the damage, if possible by telefax. The Customer shall bear any damage or any loss of rights incurred by the carrier or by us in consequence of failure to make an immediate report.
- 4.3. If a defect which we are responsible for existed already at the time of the passing of the risk, we shall be obliged to remedy the

defect or, at our option, to make substitute delivery. If we are not prepared or able to do so, in particular if this is delayed unreasonably for reasons that we are responsible for, or if remedial action/substitute delivery fails in some other way, the Customer shall have the right – subject to clause 5 of these General Terms of Payment and Delivery – to assert the rights otherwise provided for by law in the event of a defect.

- 4.4. If we remedy a defect, our obligation also includes payment of all expenses to remedy the defect, especially transportation, forwarding, labour and material costs, unless they are increased due to the fact that the defective goods were taken to a different place than the place of performance.
- 4.5. The limitation period for all rights pertaining to defects shall be two years but for use in commercial companies, craft businesses, industrial companies or comparable activities the limitation period shall be one year; in other respects, the statutory provisions shall apply. Any other more extensive statutory warranty rights shall be unaffected by this.
- 4.6. However, the Customer shall have rights of recourse only to the extent that he did not make any agreement with his buyer which goes beyond the statutory rights in the event of a defect

5. Damages

For damage which is not caused to the actual object of delivery itself, we shall be liable on whatever legal basis only:

1. in the full amount of the damage in the case of wilful intent and the case of gross negligence on the part of management and/or executive staff, and also
2. subject to subparagraph 4 in any case of culpable violation of essential contractual obligations and
3. outside such obligations and subject to subparagraph 4 also for gross negligence on the part of persons employed by us for the performance of our contractual obligations, unless we can exonerate ourselves by virtue of trade customs,
4. in the two cases of subparagraph 2 and 3 above, limited to the amount of damage foreseeable and typical for the contract in question,
5. for defects of the goods which were maliciously concealed by us or whose absence was guaranteed by us,
6. for defects of the goods to the extent that the Product Liability Act provides for liability for personal injury or damage to privately used things,
7. in case of any liability based on an injury of life, body or health.

Further claims shall be excluded.

6. Retention of title

- 6.1. We retain title to all goods delivered until all of our current and future claims against the Customer have been discharged.
- 6.2. Any processing or transformation by the Customer of the goods delivered shall always be done for us. If the goods are processed with other things not belonging to us, we acquire co-ownership of the new thing in the proportion of the value of the goods delivered and transformed or processed (final invoice amount including VAT) to the other processed things at the time of processing. In all other respects, the same shall apply to the thing created through processing as to the object of purchase delivered subject to retention of title.

6.3. If the goods delivered are mixed inseparably with other things not belonging to us, we shall acquire co-ownership to the new thing in the proportion of the value of the object of the purchase (final invoice amount including VAT) to the other mixed things at the time of intermixture. If intermixture takes place in such a way that the Customer's thing is to be regarded as the main thing, it is agreed that the Customer shall transfer co-ownership to us on a pro rate basis. The Customer shall safekeep for us the sole ownership or co-ownership thus created.

The Customer assigns to us by way of security especially also those claims which he obtains against a third party through the combination of the goods delivered with a piece of real estate. This claim shall be subject analogously to the above provisions.

6.4. Any pledge and any transfer of title by way of security is inadmissible as long as we retain title. The Customer must inform us promptly of any pledge or other thirdparty seizure of the goods title to which is retained by us or of the assigned claims, and must assist us in every way in the intervention.

6.5. The customer may sell the goods title to which we retain, in the ordinary course of business, but only for immediate payment on delivery or subject to retention of title. The claims arising from the resale or from any other legal reason (insurance, tort, etc.) with respect to the goods title to which we retain (including all claims to payment of the balance on a current account) are hereby assigned already by the Customer with all ancillary claims to us.

6.6. The Customer is obliged at our request to inform the buyers in writing of the assignment and to give us all information necessary to assert our rights against the buyers, to provide documents and to hand over bills of exchange. For this purpose the Customer must allow us to inspect his records in this respect, if necessary.

6.7. The Customer shall have the right until further notice to collect the claims assigned to us. Any assignment or pledge of these claims is admissible only with our written consent. In the event of the discontinuation of payments, failure to honour a check or a bill of exchange made out by the Customer, an application for the institution of insolvency proceedings, or the institution of such proceedings, or in the case of a foreign customer if proceedings similar to insolvency proceedings or judicial or out-of-court composition proceedings are opened, the right to resell the goods and to collect the assigned claims shall end.

6.8. Under any of the circumstances described in clause 6.7, the Customer must give us access to the goods still in his possession, send us an exact list of the goods, separate the goods and hand over the goods to us. We also have the right to demand the assignment of the Customer's claims for possession against third parties or to cancel the agreement. In either case, whether we take back the goods or assert our rights of retention, we need not cancel the agreement. Neither any of these acts nor a pledge of the goods title to which is retained shall constitute a cancellation of the agreement unless this is expressly declared by us.

6.9. If the value of the security existing for us exceeds our total claims by more than 20%, we will at the Customer's written request release an appropriate part of such security at our option.

6.10. The costs for the performance of the co-operation duties set out in clause 6.4 and clause 6.6 in connection with all rights arising from the retention of title and all costs for preserving and storing the goods shall be borne by the customer

7. Labelling of goods, patent guarantee, redemption and environment friendly disposal of electronic devices

Any change in the goods, the removal of device numbers and type designations as well as labels which constitute a designation of origin for the Customer or a third party or could create the impression that the product is a special product are inadmissible unless expressly agreed on in writing by the parties.

Per the EU guideline 2002/96/EC dated January 27, 2003 (Directive of the European Parliament and of the Council on Waste Electrical and Electronic Equipment) and the county-specific regulations released due to this regulation the purchaser as importer / manufacturer according to law inside the member States of the European Union is obliged to disposal or to let disposal the devices, stated in EU-Guideline and in the country-specific regulations, at his own expenses.

8. Place of performance/jurisdiction

The place of jurisdiction and of performance for all mutual services is Holzminden. However, we also have the right to sue at the Customer's domicile. German law is applicable. The applicability of the provisions of the United Nations Convention on the International Sale of Goods (CISG) is expressly excluded

Stiebel Eltron International GmbH,
Limited Liability Company
Registered Office: Holzminden
Register Court: Hildesheim HRB 110397
Management Board:
Rudolf Sonnemann, Karlheinz Reitze,
Dr. Marc-Jan Schutte

Version: 04/2012

www.aeg-haustechnik.com

The current terms and conditions of sale and delivery (domestic) apply.

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