



Documentation
Self – regulating Heating Cable
Type: ELSR

innovations in heat tracing

05.01.2018 K. Folkerts



Content

1. Data sheet
2. Installation instructions
3. Declarations of conformity

innovations in heat tracing

05.01.2018 K. Folkerts



1

innovations in heat tracing

05.01.2018 K. Folkerts

Heating Cable

Self-regulating



The versatile self-regulating heating cable ELSR-N is suited for frost protection and temperature maintenance in the low temperature range of industrial applications. Likewise it is approved for use in hazardous areas. The BOT version of this heating cable even withstands aggressive chemicals, oil and fuel and, thanks to this high chemical resistance, stands out for a long lifetime.

Advantages:

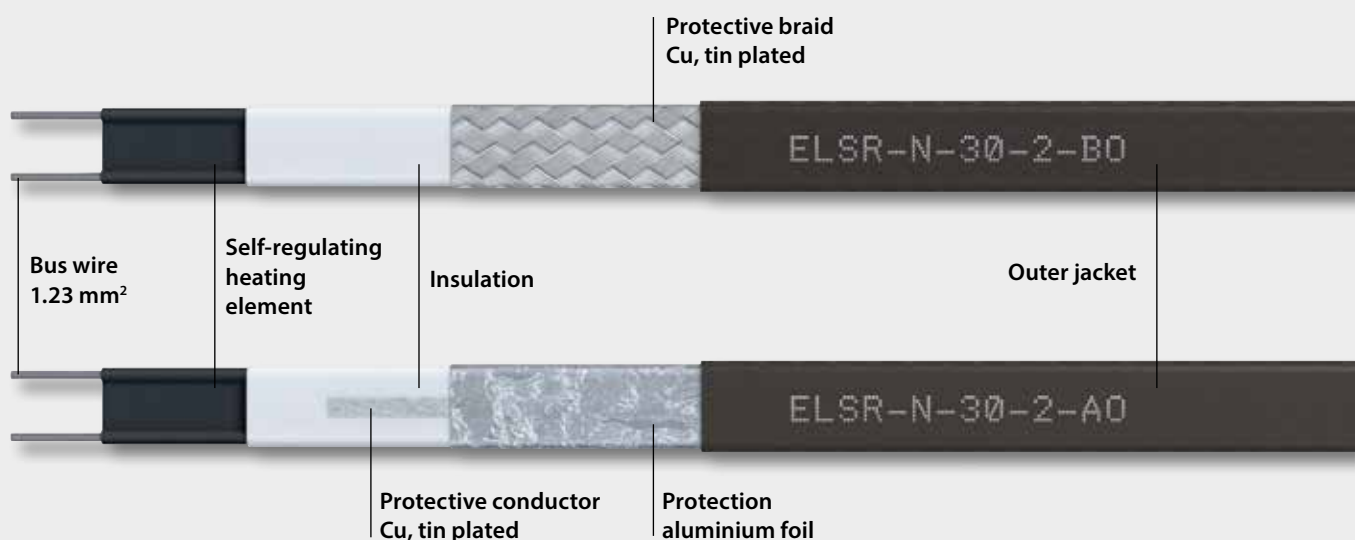
- Self-regulating
- Four nominal outputs
- Can be cut to length off the roll
- Moisture proof
- UV-resistant
- Approved for use in hazardous areas

Applications:

- Frost protection
- Heat tracing on level indicators
- Chemical & petrochemical industries
- Tank bottom heating of LNG storage tanks
- Pipe heat tracing
- Vessels and tanks
- Automotive
- Food processing industry



Type ELSR-N up to 80 °C





Technical Information

Type ELSR-N up to 80 °C

Data

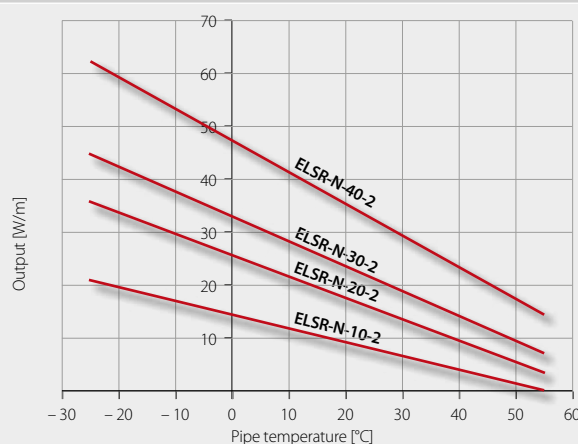
Outer jacket	TPE-O
Bus wire	Nickel plated copper
Maximum maintain temperature, energized	65 °C
Maximum maintain temperature, de-energized	80 °C
Nominal voltage	230 V
Bending radius, min.	25 mm
Installation temperature, min.	-45 °C
Classification system	IBExU II 2G Ex e IIC T6 Gb II 2D Ex tb IIIC TX Db
Classification cable	EPS II 2G Ex e IIC Gb II 2D Ex tb IIIC Db
Certificates	12ATEX1431U IECEX EPS 12.0006U

Design

- BO Protective braid and a thermoplastic outer jacket
- AO Aluminium foil and a thermoplastic outer jacket
- BOT Protective braid and a fluoropolymer outer jacket

ELSR-N-...-2 output

(on insulated metallic pipes in accordance with EN 62395-1)



Heating circuit lengths ELSR-N-...-2 on the following conditions:

- 230 V nominal voltage
- Delayed action circuit breakers (C-characteristic) with 80 % maximum load
- Maximum 10 % line voltage drop on the heating cable bus wire
- Power connection to one (1) heater end

Switch-on temperature	Nominal cutout value (A)	Heating circuit length (m) for			
		ELSR-N-10-2	ELSR-N-20-2	ELSR-N-30-2	ELSR-N-40-2
10	10	128	68	52	36
	16	177	109	83	57
	20	177	129	104	71
	25	177	129	113	89
	32	177	129	113	94
0	10	106	57	45	31
	16	160	92	71	50
	20	160	115	89	62
	25	160	119	105	78
	32	160	119	105	88
-10	10	90	50	39	28
	16	144	79	63	44
	20	149	99	78	55
	25	149	111	98	69
	32	149	111	98	83
-20	10	78	44	35	25
	16	125	70	56	40
	20	139	87	69	50
	25	139	104	87	62
	32	139	104	87	78
-40	10	62	35	28	21
	16	99	56	45	33
	20	124	71	57	42
	25	124	88	71	52
	32	124	88	71	66

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Art. No.
ELSR-N-10-2-AO	10 W/m at 10 °C	13.6 x 5.5	91	B0200130
ELSR-N-10-2-BO	10 W/m at 10 °C	14.1 x 5.8	108	B0200110
ELSR-N-10-2-BOT	10 W/m at 10 °C	13.8 x 5.6	108	B0200119
ELSR-N-20-2-AO	20 W/m at 10 °C	13.6 x 5.5	91	B0200230
ELSR-N-20-2-BO	20 W/m at 10 °C	14.1 x 5.8	108	B0200210
ELSR-N-20-2-BOT	20 W/m at 10 °C	13.8 x 5.6	108	B0200219
ELSR-N-30-2-AO	30 W/m at 10 °C	13.6 x 5.5	91	B0200330
ELSR-N-30-2-BO	30 W/m at 10 °C	14.1 x 5.8	108	B0200310
ELSR-N-30-2-BOT	30 W/m at 10 °C	13.8 x 5.6	108	B0200319
ELSR-N-40-2-AO	40 W/m at 10 °C	13.6 x 5.5	91	B0200430
ELSR-N-40-2-BO	40 W/m at 10 °C	14.1 x 5.8	108	B0200410
ELSR-N-40-2-BOT	40 W/m at 10 °C	13.8 x 5.6	108	B0200419

Heating Cable Light 'Super' Self-regulating



The versatile self-regulating heating cable ELSR-LS is our 'light' version for temperatures up to 80 °C. This heating cable is also suited and approved for use in hazardous areas. Since eltherm® self-regulating cables can be cut off the roll to the desired length, the application cable is highly flexible to match our customer's needs. Its long life span guarantees for the efficient use in many industrial sectors.

Advantages:

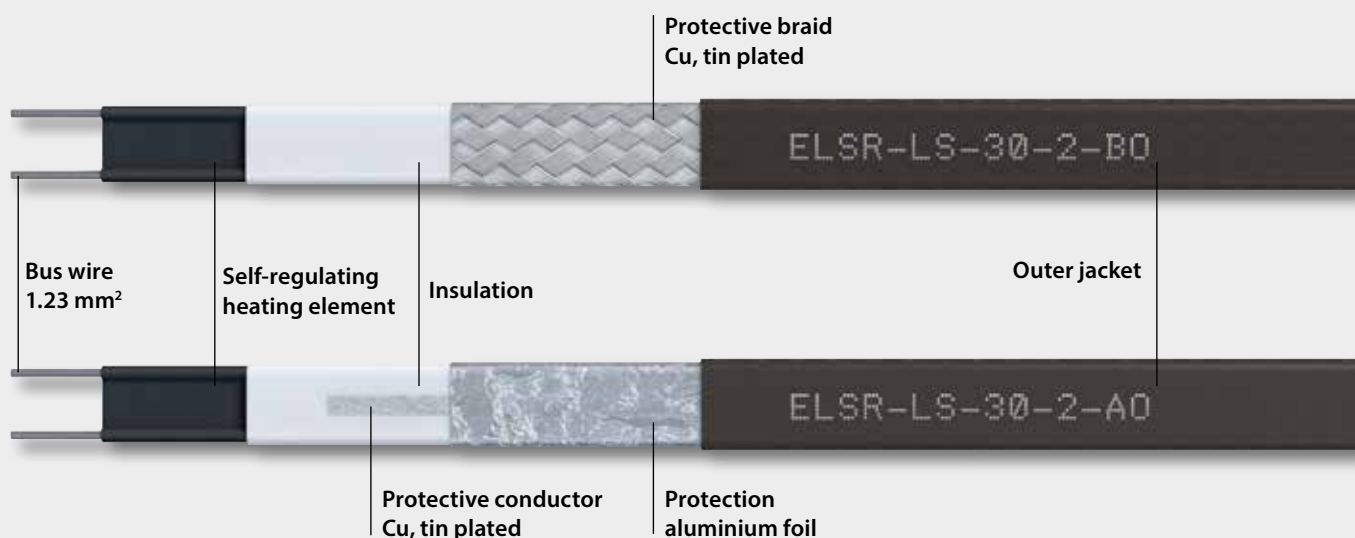
- Self-regulating
- Four nominal outputs
- Can be cut to length off the roll
- Moisture proof
- UV-resistant
- Small dimensions

Applications:

- Pipe heat tracing
- Frost protection for industrial applications
- Temperature maintenance for pipes and vessels
- Chemical & petrochemical industries
- Paints & varnishes
- Automotive
- Food processing industry



Type **ELSR- LS up to 80 °C**





Technical Information

Type ELSR-LS up to 80 °C

Data

■ Outer jacket	TPE-O
■ Bus wire	1,23 mm ² nickel plated copper
■ Maximum maintain temperature, energized	65 °C
■ Maximum maintain temperature, de-energized	80 °C
■ Nominal voltage	230 V
■ Bending radius, min.	25 mm
■ Installation temperature, min.	-50 °C
■ Classification system	IBExU II 2G Ex e IIC T6 Gb II 2D Ex tb IIIC TX Db
■ Classification cable	EPS II 2G Ex e IIC Gb II 2D Ex tb IIIC Db
■ Certificates	12ATEX1431U IECEX EPS 12.0006U

Design

- BO Protective braid and a thermoplastic outer jacket
- AO Aluminium foil and a thermoplastic outer jacket

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Art. No.
ELSR-LS-10-2-AO	10 W/m at 10 °C	10.3 x 5.5	78	B0223104
ELSR-LS-10-2-BO	10 W/m at 10 °C	10.8 x 5.6	98	B0223102
ELSR-LS-15-2-AO	15 W/m at 10 °C	10.3 x 5.5	78	B0223154
ELSR-LS-15-2-BO	15 W/m at 10 °C	10.8 x 5.6	98	B0223152
ELSR-LS-25-2-AO	25 W/m at 10 °C	10.3 x 5.5	78	B0223254
ELSR-LS-25-2-BO	25 W/m at 10 °C	10.8 x 5.6	98	B0223252
ELSR-LS-30-2-AO	30 W/m at 10 °C	10.3 x 5.5	78	B0223304
ELSR-LS-30-2-BO	30 W/m at 10 °C	10.8 x 5.6	98	B0223302

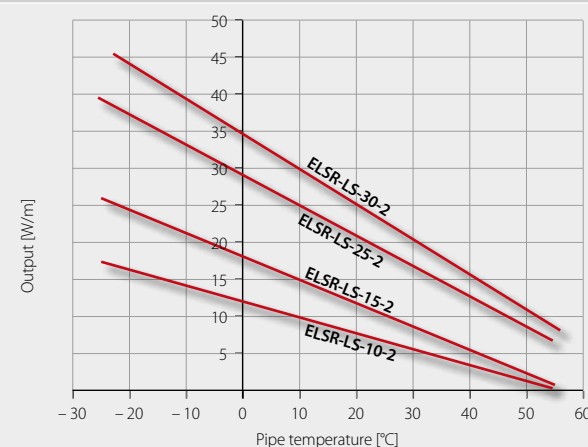
Heating circuit lengths ELSR-LS-...-2 on the following conditions

- 230 V nominal voltage
- Delayed action circuit breakers (C-characteristic) with 80 % maximum load
- Maximum 10 % line voltage drop on the heating cable bus wire
- Power connection to one (1) heater end

Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for			
		ELSR-LS-10-2	ELSR-LS-15-2	ELSR-LS-25-2	ELSR-LS-30-2
10	10	152.0	103.0	64.0	49.0
	16	196.0	160.5	103.0	78.0
	20	196.0	160.5	126.0	97.5
	25	196.0	160.5	126.0	112.5
0	10	141.0	84.0	54.0	44.0
	16	188.5	134.0	87.0	70.0
	20	188.5	145.0	108.0	87.5
	25	188.5	145.0	116.0	104.0
-10	10	119.0	71.0	47.0	38.0
	16	173.5	114.0	75.0	61.0
	20	173.5	133.0	94.0	76.0
	25	173.5	133.0	107.5	95.0
-20	10	103.0	62.0	37.5	33.0
	16	161.0	99.0	60.0	53.0
	20	161.0	124.0	75.0	66.0
	25	161.0	124.0	94.0	83.0

ELSR-LS-...-2 output

(on insulated metallic pipes in accordance with EN 62395-1)



Heating Cable Micro

Self-regulating

The heating cable ELSR-M is very flexible and is used for special applications where installation dimensions are needed to be kept small. It is particularly suited for short heating circuits. This heating cable can be used for frost protection and temperature maintenance up to 65 °C.

Advantages:

- Self-regulating
- Two nominal outputs
- Can be cut to length off the roll
- Moisture proof
- UV-resistant
- Small dimensions

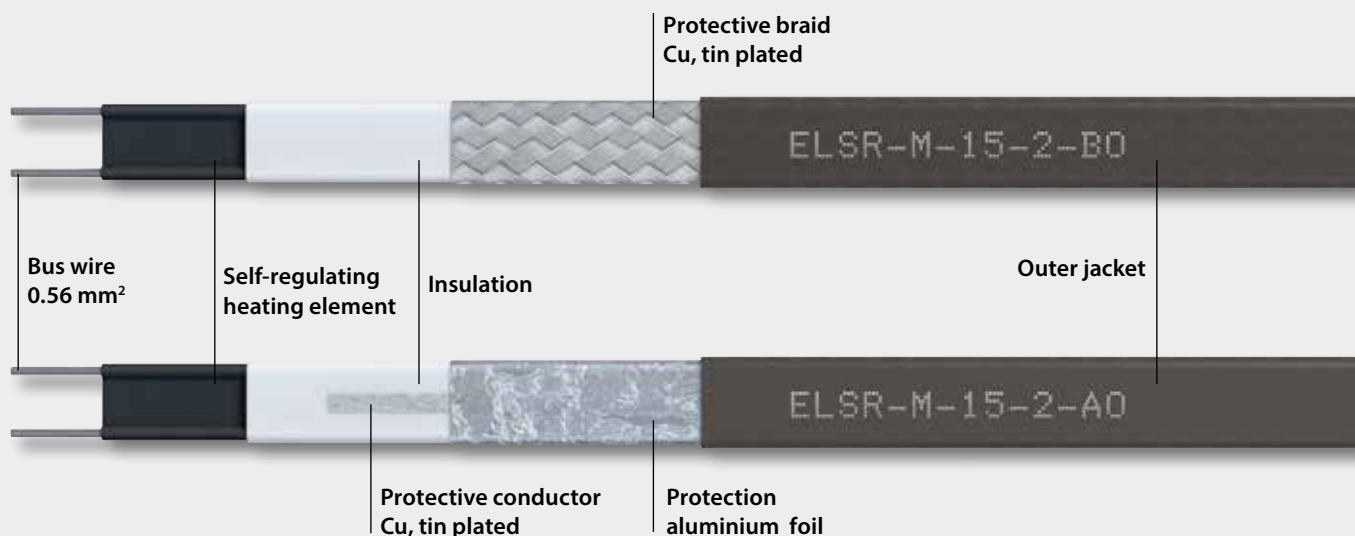
Applications:

- Heat tracing on pipes, pumps and valves
- Food processing industry
- Automotive
- Heating of tube bundle cables for water analysis
- Heat tracing on vessels

CSTB



Type **ELSR-M** up to 65 °C





Technical Information

Type ELSR-M up to 65 °C

Data

■ Outer jacket	TPE-O
■ Bus wire	Nickel plated copper
■ Maximum maintain temperature, energized	65 °C
■ Maximum maintain temperature, de-energized	65 °C
■ Nominal voltage	230 V
■ Bending radius, min.	25 mm
■ Installation temperature, min.	– 45 °C

Design

■ BO	Protective braid and a thermoplastic outer jacket
■ AO	Aluminium foil and a thermoplastic outer jacket

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Art. No.
ELSR-M-10-2-AO	10 W/m at 10 °C	8.0 x 5.5	53	B0225110
ELSR-M-10-2-BO	10 W/m at 10 °C	8.5 x 5.8	62	B0225102
ELSR-M-15-2-AO	15 W/m at 10 °C	8.0 x 5.5	53	B0225160
ELSR-M-15-2-BO	15 W/m at 10 °C	8.5 x 5.8	62	B0225152

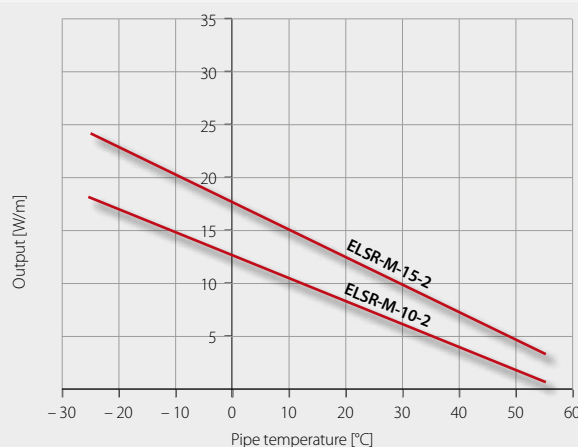
Heating circuit lengths ELSR-M-...-2:

- 230 V nominal voltage
- Delayed action circuit breakers (C-characteristic) with 80 % maximum load
- Maximum 10 % line voltage drop on the heating cable bus wire
- Power connection to one (1) heater end

Switch-on temperature	Nominal cutout value (A)	Heating circuit length (m) for	
		ELSR-M-10-2	ELSR-M-15-2
10	10	126.5	98.0
	16	126.5	105.5
	20	126.5	105.5
0	10	115.5	83.0
	16	115.5	97.5
	20	115.5	97.5
-10	10	100.0	72.0
	16	106.5	91.0
	20	106.5	91.0
-20	10	87.0	64.0
	16	99.5	85.5
	20	99.5	85.5
-40	10	69.0	52.0
	16	88.5	77.0
	20	88.5	77.0

ELSR-M-...-2 output

(on insulated metallic pipes in accordance with EN 62395-1)



Heating Cable Round

Self-regulating

The 'R' in the name of our self-regulating heating cable ELSR-R is an abbreviation for 'round'. This heating cable was specially developed to protect the doors and seals of refrigerating chambers against frost as well as for all applications requiring a round heating cable.

It is also often used in cooling water lines of breweries and drinks manufacturers (as frost protection). The maximum exposure temperature is 65 °C.

Advantages:

- Round design
- Self-regulating
- Can be cut to length off the roll
- Moisture proof
- UV-resistant
- Perfectly suited for installation with sections thanks to round shape

Applications:

- Frost protection for doors and seals of refrigerating chambers
- Usage in cooling water lines of breweries and drink manufacturers



Type **ELSR-R** up to 65 °C





Technical Information

Type ELSR-R up to 65 °C

Data

■ Outer jacket	Fluoropolymer
■ Bus wire	Nickel plated copper
■ Maximum maintain temperature, energized	65 °C
■ Maximum maintain temperature, de-energized	65 °C
■ Nominal voltage	230 V
■ Bending radius, min.	30 mm
■ Installation temperature, min.	- 30 °C

Design

- BOT Protective braid and a fluoropolymer outer jacket

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Art. No.
ELSR-R-19-2-BOT	19 W/m at 10 °C	7.3	77	B0200507
ELSR-R-27-2-BOT	27 W/m at 10 °C	7.3	74	B0200605

Other versions are available upon request.

This heating cable has specially been developed for the use with doors of refrigerating chambers. Please contact our engineers for more details on our ELSR-R.

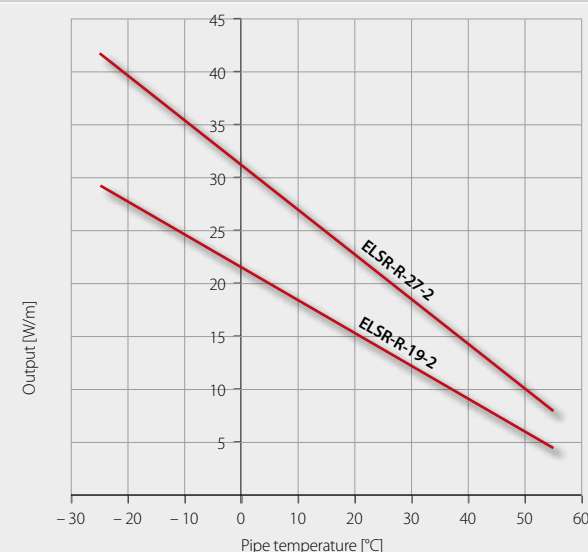
Heating circuit lengths ELSR-R-...-2-BOT on the following conditions:

- 230 V nominal voltage
- Delayed action circuit breakers (C-characteristic) with 80 % maximum load
- Maximum 10 % line voltage drop on the heating cable bus wire
- Power connection to one (1) heater end

Switch-on temperature	Nominal cutout value (A)	Heating circuit length (m) for	
		ELSR-R-19-2	ELSR-R-27-2
10	10	75.0	20.0
	16	102.0	32.0
	20	102.0	40.0
0	10	62.0	16.5
	16	94.0	26.5
	20	94.0	33.0
-10	10	51.0	13.5
	16	81.5	21.5
	20	88.0	27.0
-20	10	41.0	11.0
	16	65.5	17.5
	20	82.0	22.0
-40	10	30.0	7.5
	16	48.0	12.0
	20	60.0	15.0

ELSR-R-...-2-BOT output

(on insulated metallic pipes in accordance with EN 62395-1)



Heating Cable Hot Water Self-regulating

The self-regulating heating cable ELSR-W (hot water) is used for vessels, pipes, valves and several other applications with processing temperatures between 30 °C and 80 °C approximately (power on) and 100°C (power off). The ELSR-W self-regulating heating cables are frequently used to heat oil and fat lines, for example in the food processing industry. But likewise its use for drainage lines in canteens and (large scale) kitchens makes good sense, avoiding fat and oil deposits by heating. Used for hot water supplies, it serves for frost protection, temperature maintenance and prevention of Legionella formation.

Advantages:

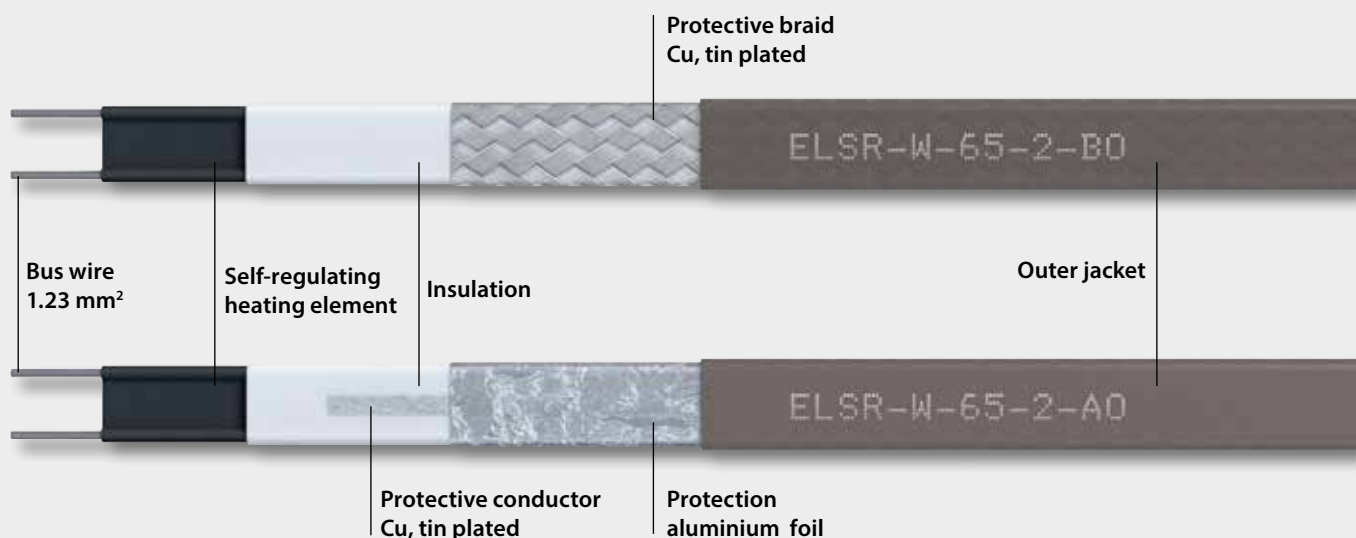
- Self-regulating
- Two nominal outputs
- Can be cut to length off the roll
- Moisture proof

Applications:

- Food processing industry
- Heat tracing on fat lines
- Drainage lines in canteens and large-scale kitchens
- Frost protection for heating lines
- Installation on hot water supplies to prevent Legionella formation



Type ELSR-W up to 100 °C





Technical Information

Type ELSR-W up to 100 °C

Data

■ Outer jacket	TPE-O
■ Bus wire	Nickel plated copper
■ Maximum maintain temperature, energized	80 °C
■ Maximum maintain temperature, de-energized	100 °C
■ Nominal voltage	230 V
■ Bending radius, min.	20 mm
■ Installation temperature, min.	- 20 °C

Design

- BO Protective braid and a thermoplastic outer jacket
- AO Aluminium foil and a thermoplastic outer jacket

Type	Nominal output used for water supply lines	Dimensions approx. (mm)	Weight approx. (g/m)	Art. No.
ELSR-W-55-2-AO	9 W/m at 55 °C	12.9 x 5.0	86	B0200360
ELSR-W-55-2-BO	9 W/m at 55 °C	12.9 x 5.0	105	B0200350
ELSR-W-65-2-AO	13 W/m at 65 °C	12.9 x 5.0	86	B0200455
ELSR-W-65-2-BO	13 W/m at 65 °C	12.9 x 5.0	105	B0200450

Type	Nominal output used with fat/oil lines	Dimensions approx. (mm)	Weight approx. (g/m)	Art. No.
ELSR-W-65-2-AO	22 W/m at 40 °C	12.9 x 5.0	86	B0200455
ELSR-W-65-2-BO	22 W/m at 40 °C	12.9 x 5.0	105	B0200450

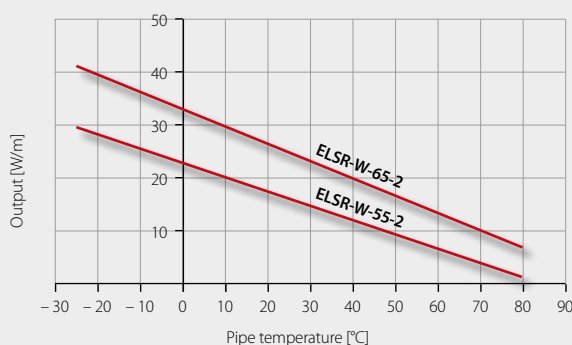
Heating circuit lengths ELSR-W-...-2-... on the following conditions:

- 230 V nominal voltage
- Delayed action circuit breakers (C-characteristic) with 80 % maximum load
- Maximum 10 % line voltage drop on the heating cable bus wire
- Power connection to one (1) heater end

Switch-on temperature	Nominal cutout value (A)	Heating circuit length (m) for	
		ELSR-W-55-2	ELSR-W-65-2
10	10	70.0	45.5
	16	113.0	73.5
	20	131.0	92.0
	25	131.0	106.0
	32	131.0	106.0
0	10	63.0	41.5
	16	101.0	66.0
	20	123.5	83.0
	25	123.5	99.5
-10	10	57.0	37.5
	16	91.0	60.0
	20	113.5	75.0
	25	117.0	94.0
-20	10	52.0	34.0
	16	83.0	55.0
	20	104.0	69.5
	25	112.0	86.0
-40	10	44.0	29.5
	16	70.0	48.0
	20	88.0	59.0
	25	103.0	74.0
	32	103.0	83.5

ELSR-W-...-2-... output

(on insulated metallic pipes in accordance with EN 62395-1)



Heating Cable High Temperature, Self-regulating



The versatile self-regulating heating cable ELSR-H is for high temperatures up to 210 °C in a large number of industrial applications. It is also suited and approved for use in hazardous areas. The BOT version of this heating cable even withstands aggressive chemicals, oil and fuel and, thanks to this high chemical resistance, stands out for a long life span.

Advantages:

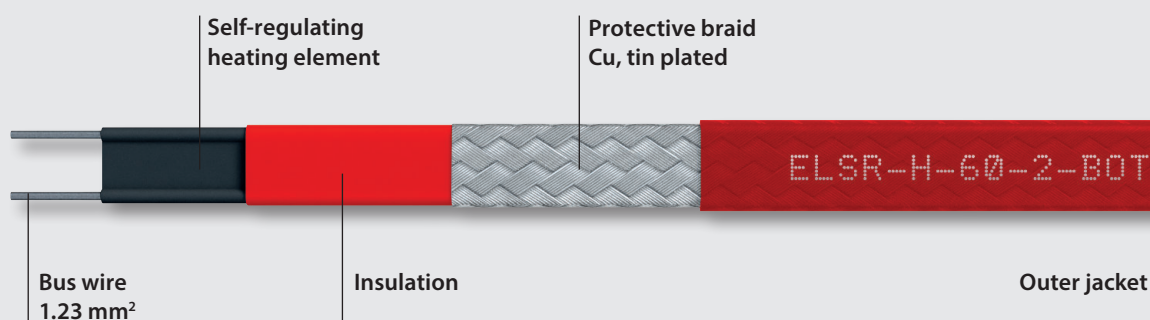
- Up to 120 °C/210 °C
- Self-regulating
- Six nominal outputs
- Can be cut to length off the roll
- Moisture proof
- Resistant to chemicals
- Approved for use in hazardous areas

Applications:

- Chemical & petrochemical industries
- Oil & gas industry
- Power plants
- Ex-areas
- Frost protection
- Water & sanitation utilities
- Temperature maintenance on vessels, pipes & valves



Type ELSR-H up to 210 °C





Technical Information

Type ELSR-H up to 210 °C

Data

■ Outer jacket	TPE-O Fluoropolymer
■ Bus wire	Nickel plated copper
■ Maximum maintain temperature, energized	120 °C
■ Maximum maintain temperature, de-energized	210 °C
■ Nominal voltage	230 V / (120 V, 277 V)*
■ Bending radius, min.	25 mm
■ Installation temperature, min.	- 45 °C
■ Classification system	IBExU II 2G Ex e IIC T3 Gb II 2D Ex tb IIIC TX Db IBExU II 2G Ex e IIC T4...T6 Gb II 2D Ex tb IIIC TX Db (stabilized design)
■ Classification cable	EPS II 2G Ex e IIC Gb II 2D Ex tb IIIC Db
■ Certificates	12ATEX1429U IECEX EPS 12.0004U

*upon request

Design

- BOT Protective braid and a fluoropolymer outer jacket

Type	Nominal output	Dimen- sions approx. (mm)	Weight approx. (g/m)	Art. No.
ELSR-H-10-2-BOT	10 W/m at 10 °C	12.4 x 5.0	120	B0221103
ELSR-H-15-2-BOT	15 W/m at 10 °C	12.4 x 5.0	120	B0221153
ELSR-H-20-2-BOT	20 W/m at 10 °C	12.4 x 5.0	120	B0221203
ELSR-H-45-2-BOT	45 W/m at 10 °C	12.4 x 5.0	120	B0221453
ELSR-H-60-2-BOT	60 W/m at 10 °C	12.4 x 5.0	120	B0221603
ELSR-H-75-2-BOT	75 W/m at 10 °C	12.4 x 5.0	120	B0221753

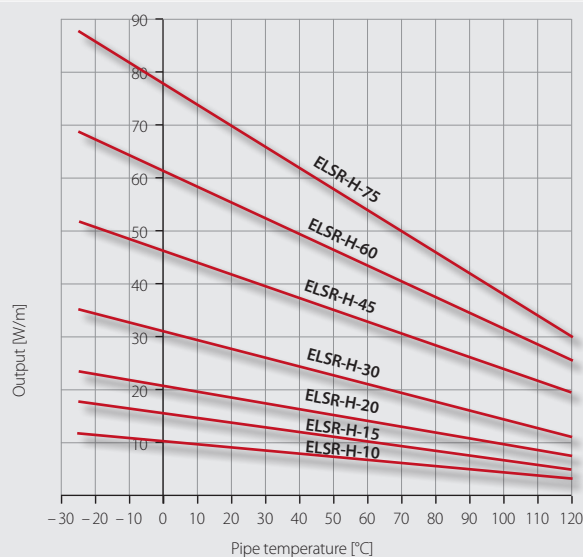
Heating circuit lengths ELSR-H-...-2-BOT on the following conditions:

- 230 V nominal voltage
- Delayed action circuit breakers (C-characteristic) with 80 % maximum load
- Maximum 10 % line voltage drop on the heating cable bus wire
- Power connection to one (1) heater end

Switch-on tempera- ture	Nominal cutout value (A)	Heating circuit length (m) for ELSR-H-						
		10-2	15-2	20-2	30-2	45-2	60-2	75-2
10	16	193.0	158.0	122.0	82.0	55.0	41.0	33.0
	20	193.0	158.0	136.0	102.0	68.0	51.0	41.5
	25	193.0	158.0	136.0	111.0	85.0	64.0	51.5
	32	193.0	158.0	136.0	111.0	91.0	79.0	66.0
0	16	189.0	153.0	116.0	77.0	52.0	39.0	30.0
	20	189.0	153.0	132.0	97.0	65.0	49.0	37.5
	25	189.0	153.0	132.0	108.0	81.0	61.0	47.0
	32	189.0	153.0	132.0	108.0	88.5	77.0	60.0
-10	16	184.0	146.0	110.0	73.0	50.0	37.0	28.5
	20	184.0	148.5	129.0	92.0	62.0	46.0	35.5
	25	184.0	148.5	129.0	105.5	77.0	58.0	44.5
	32	184.0	148.5	129.0	105.5	86.5	70.0	57.0
-20	16	180.0	139.0	104.0	70.0	47.0	36.0	26.5
	20	180.0	145.0	125.5	87.0	59.0	44.0	33.5
	25	180.0	145.0	125.5	103.0	74.0	56.0	41.5
	32	180.0	145.0	125.5	103.0	84.5	67.0	53.5
-40	16	173.0	126.0	95.0	64.0	43.0	33.0	23.5
	20	173.0	138.0	119.0	80.0	54.0	41.0	29.0
	25	173.0	138.0	120.0	98.0	68.0	51.0	36.5
	32	173.0	138.0	120.0	98.0	81.0	61.0	46.5

ELSR-H-...-2-BOT output

(on insulated metallic pipes in accordance with EN 62395-1)



Super High Temperature Self-Regulating **Trace Heater**



The versatile self-regulating heating cable ELSR-SH is for high temperatures up to 250 °C in industrial applications. It is also suited and approved for use in hazardous areas. This trace heater withstands aggressive chemicals, oil and fuel and, thanks to its high chemical resistance, ensures a long life span.

Advantages:

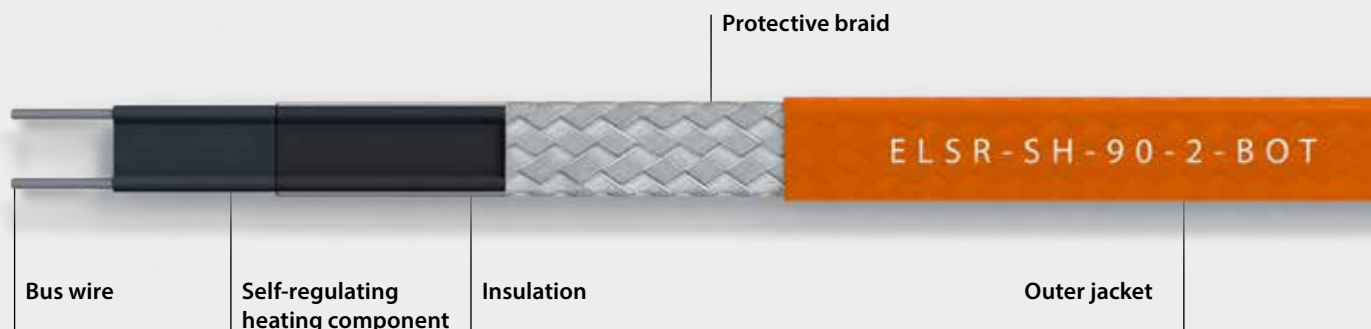
- Up to 250 °C
- Self-regulating
- Three nominal outputs
- Cut to length off the drum
- Moisture-proof
- Resistant to chemicals
- Approved for use in hazardous areas

Applications:

- Chemical & petrochemical industries
- Oil & gas industry
- Power plants
- Ex-areas
- Frost protection
- Water and sewage facilities
- Temperature maintenance on vessels, pipes & valves



Type ELSR-SH up to 250 °C





Technical Information

Data

Outer jacket	Fluoropolymer
Bus wire	Nickel-plated copper
Maximum process temperature (power off)	250 °C
Maximum maintenance temperature (power on)	165 °C
Nominal voltage	230 VAC*
Bending radius, min.	25 mm
Installation temperature, min.	-60 °C
Temperature classification	T2
Cable classification	II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db
System classification	II 2G Ex eb IIC T2 Gb II 2D Ex tb IIIC T210°C Db
Certification	IECEx EPS 18.0019U IECEx EPS 18.0014X EPS 18 ATEX 1 028 U EPS 18 ATEX 1 020 X

* Data for 277 VAC on request

Data

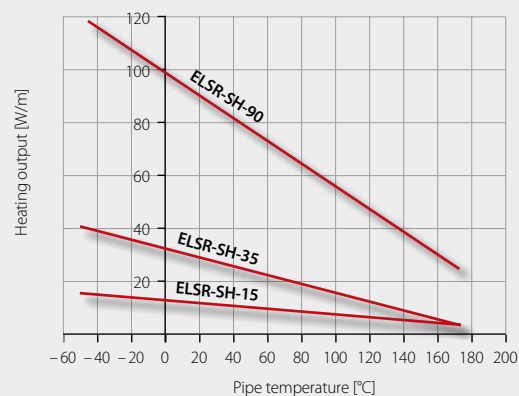
Switch-on temperature (°C)	Nom. cutout value (A)	Heating circuit length (m) ELSR-SH-		
		15-2 BOT	35-2 BOT	90-2 BOT
10	10	128	52	17
	16	172	84	27
	20	172	104	34
	25	172	107,5	42,5
	32	172	107,5	54,5
0	40	172	107,5	62,5
	10	123	50	16
	16	172	80	26
	20	172	100	32
	25	172	107,5	40
-10	32	172	107,5	51
	40	172	107,5	62,5
	10	118	48	15,5
	16	172	76	25
	20	172	95	31
-20	25	172	107,5	39
	32	172	107,5	49,5
	40	172	107,5	62
	10	112	46	15
	16	172	73	24
-30	20	172	91	30
	25	172	107,5	37,5
	32	172	107,5	48
	40	172	107,5	60
	10	107	44	14,5
-40	16	171,5	70	23
	20	172	87,5	29
	25	172	107,5	36
	32	172	107,5	46,5
	40	172	107,5	58
	10	102	42	14
	16	164	67	22
	20	172	84	28
	25	172	105	35
	32	172	107,5	45
	40	172	107,5	56

Design

BOT Protective braid and a fluoropolymer outer jacket

ELSR-SH-...-2-BOT output

(on insulated metallic pipes in accordance with EN 62395-1)



Type ELSR-SH-	Nom. output	Dimensions approx. (mm)	Weight approx. (g/m)	Ref.-No.
15-2-BOT	15 W/m bei 10 °C	14 x 5,4	146	B0226153
35-2-BOT	35 W/m bei 10 °C	14 x 5,4	146	B0226353
90-2-BOT	90 W/m bei 10 °C	14 x 5,4	146	B0226903

Heating Circuits

Heating circuit lengths ELSR-H-...-2-BOT on the following conditions:

- 230 V nominal voltage
- Delayed action circuit breakers (C-characteristic) with 80 % max. load
- Maximum 10 % line voltage drop on the heating cable bus wire
- Power connection to one (1) heater end

Accessories

Connection & termination kits

	Ref. No.	Description
	OX81PA1	ELVB-SREx-25 connection kit
	OX81EH2	EL-ECSH-ex termination kit

Super High Temperature Self-Regulating **Trace Heater**



The versatile self-regulating trace heater ELSR-SHH is for high temperatures up to 250 °C in industrial applications. It is also suited and approved for use in hazardous areas. This trace heater withstands aggressive chemicals, oil and fuel and, thanks to this high chemical resistance, stands out for a long life span.

Advantages:

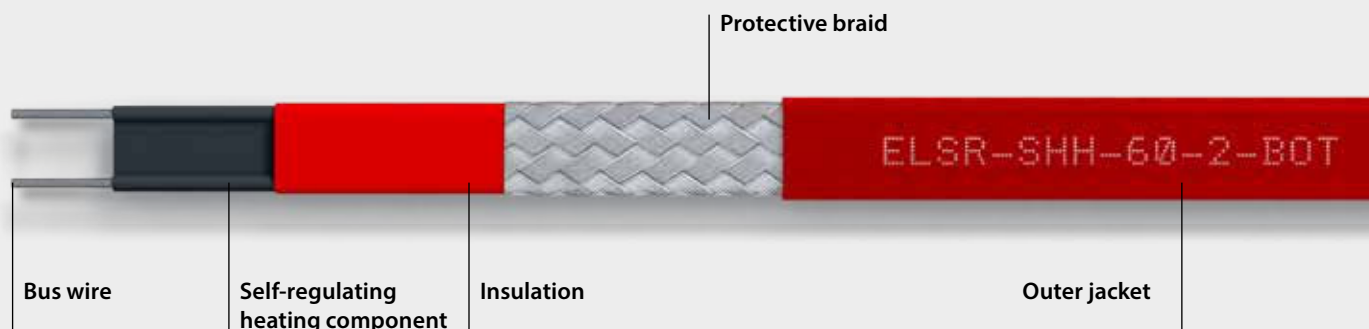
- Up to 250 °C
- Self-regulating
- Five nominal outputs
- Cut to length off the drum
- Moisture-proof
- Resistant to chemicals
- Approved for use in hazardous areas

Applications:

- Chemical & petrochemical industries
- Oil & gas industry
- Power plants
- Ex-areas
- Frost protection
- Water and sewage facilities
- Temperature maintenance on vessels, pipes & valves



Type ELSR-SHH up to 250 °C





Technical Information

Data

Outer jacket	Fluoropolymer
Bus wire	Nickel-plated copper
Maximum exposure temperature (power off)	250 °C
Maximum exposure temperature (power on)	250 °C
Nominal voltage	230 VAC*
Bending radius, min.	35 mm
Installation temperature, min.	-40 °C
Temperature classification	T3 to 277 V max.
Cable classification	II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db
System classification	II 2G Ex eb IIC T3 Gb II 2D Ex tb IIIC T200°C Db
Certification	EPS17ATEX1169X IECEx EPS 17.0064X SIRA16ATEX3353

* Data for 277 VAC on request

Heating circuit lengths ELSR-SHH-...-2-BOT on the following conditions:

- 230 V nominal voltage
- Delayed action circuit breakers (C-characteristic) with 80 % max. load
- Maximum 10 % line voltage drop on the heating cable bus wire
- Power connection to one (1) heater end

Heating Circuits

Switch-on temperature (°C)	Nominal output (A)	Heating circuit length for (m) ELSR-SHH-				
		15-2	30-2	45-2	60-2	75-2
10	10	76,0	52,0	38,0	24,0	14,0
	16	122,0	82,0	62,0	38,0	24,0
	20	154,0	102,0	76,0	46,0	28,0
	32	154,0	108,0	88,0	76,0	46,0
0	10	70,0	46,0	32,0	18,0	12,0
	16	112,0	74,0	52,0	30,0	18,0
	20	140,0	92,0	66,0	36,0	22,0
	32	146,0	104,0	84,0	58,0	36,0
-20	10	62,0	40,0	24,0	12,0	8,0
	16	98,5	66,0	38,0	20,0	12,0
	20	122,5	82,0	46,0	26,0	16,0
	32	138,5	98,0	76,0	42,0	24,0
-40	10	52,0	30,0	14,0	8,0	4,0
	16	82,0	50,0	24,0	12,0	8,0
	20	102,0	62,0	28,0	16,0	10,0
	32	126,0	88,0	46,0	24,0	14,0

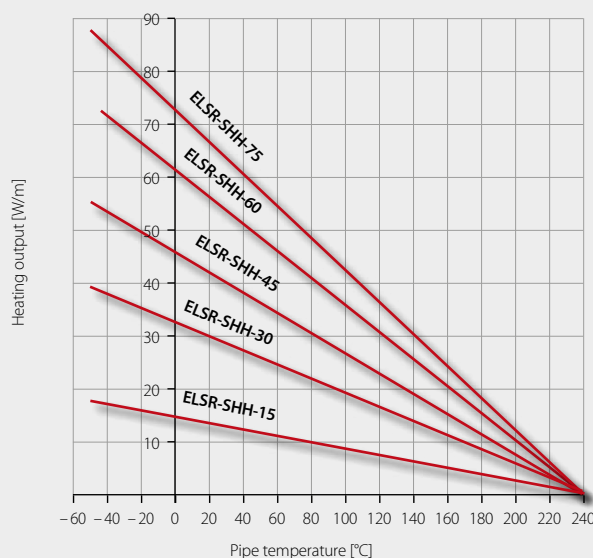
Type ELSR-SHH to 250 °C

Design

BOT Protective braid and a fluoropolymer outer jacket

ELSR-SHH-...-2-BOT output

(on insulated metallic pipes in accordance with EN 62395-1)



Nominal Output

Type	Nominal Output	Dimensions approx. (mm)	Weight approx. (g/m)	Art.-Nr.
ELSR-SHH-15-2-BOT	15 W/m bei 10 °C	12,1 x 5,4	146	B0HH1153
ELSR-SHH-30-2-BOT	30 W/m bei 10 °C	12,1 x 5,4	146	B0HH1303
ELSR-SHH-45-2-BOT	45 W/m bei 10 °C	12,1 x 5,4	146	B0HH1453
ELSR-SHH-60-2-BOT	60 W/m bei 10 °C	12,1 x 5,4	146	B0HH1603
ELSR-SHH-75-2-BOT	75 W/m bei 10 °C	12,1 x 5,4	146	B0HH1753

Accessories

Connection & termination kits

	Ref. No.	Description
	OX81PA1	ELVB-SREx-25 connection kit
	OX81EH2	EL-ECSh-ex termination kit



2

innovations in heat tracing

05.01.2018 K. Folkerts

QAA - 023 Installation of Parallel Heating Tapes

Types ELSR, ELP

1. Receipt of Goods

After receipt of the goods check the tape and the accessories and compare with the data on the delivery note to ensure that the correct material was supplied.

It is recommended that the insulation resistance of the heater be checked (see 6. “Test and Commissioning”)

Attention: Ensure that the data sheet has been supplied. The data sheet is necessary for a correct installation. The installation is not to be done without presence of the data sheet.

Hazardous Area applications: Ensure that the corresponding approval certificates are supplied. The number of the certificate must be according to the number printed on the heating tape.

2. Storage

The goods have to be stored in a dry place at an ambient temperature of $-20 \dots +60^{\circ}\text{C}$. If a dry storage is impossible, the heating tape has to be closed with an end termination set. This is also necessary if a heating circuit cannot be finished at the end of a shift.

3. Length of Heating Circuit

The max. allowable length of a heating circuit (according to the corresponding data sheet) for unilateral feed depends on the admissible voltage drop (we recommend not to exceed a voltage drop of 10%) and the utilisation of the circuit Breaker (recommended: 16 A CB with “C” characterisation, utilisation 80%)

QAA - 023 Installation of Parallel Heating Tapes

4. Protective Measures

- Prior to installation and maintenance work the relevant heating circuits and plant sections need to be de-energised!
- Prior to accessing plant sections (pipelines, vessels etc.) ensure sufficient cooling down to avoid burns.
- Design and installation of heating circuits is to be made compliant to the standards EN 60519-10 and EN 62395-2 as well as to any other locally applicable codes and standards
- Trace heaters ELP should only be operated with a controller. A controlled or stabilised mode of operation as per EN 62395-2 is to be implemented
- Suitable positioning of the temperature sensors will avoid overheating of pipeline / tank, medium and trace heater. Make sure the sensors are properly attached.
- We highly recommend to use a ground fault protection device (30mA) with the installed heating circuits.

For use of the cable as trace heater according to IEC EN 62395-1 and IEC EN 60519-10 as well as for use in **Hazardous Areas**, installation of a residual current device (30mA) is mandatory!

- When using the heating tapes on metal surfaces, they also have to be protected against indirect contact acc. to DIN VDE 100, part 410 (or equivalent standards) before operation of the system.
- The metallic screen (protective braid or aluminium foil with embedded earth wires), this has to be connected to the potential earth.

QAA - 023 Installation of Parallel Heating Tapes

5. Installation Instructions

- Work is only to be done by personnel that has been trained for installation of trace heaters (if applicable: in hazardous areas)
- Heaters and sensors need to be placed on the designated pipes / tanks in the planned positions in order to avoid overheating of equipment as well as insufficient temperature maintenance
- Remove any sharp objects on the surface to be heated
- Clean and degrease the surface
- The installation of a heating circuit has to be carried out using original eltherm accessories acc. to the eltherm installation instructions.

Attention: Do not use adhesive tape with emollients (i.e. PVC)!

Attention: Install according to the min. bending radius and installation temperature stated on the data sheet.

ELP- types:

Attention: Make sure the tapes will not have contact to each other or cross after installation, for this may lead to overheating and damage of the heating tapes and nearby placed objects!.

ELSR types:

An overlapping or contacting installation of the heating tape does not cause overheating due to the self-regulating heating characteristic.

- The heating tape is to be fully covered (the entire length) with aluminium foil in order to prevent insulation material slipping between the tape and surface to be heated. If the insulation is covered with a metal cladding, an insulation entry kit has to be used to avoid mechanical damage of the heating tape.

QAA - 023

Installation of Parallel Heating Tapes

- The connection and end termination of a heating circuit has to be carried out using original eltherm accessories acc. to the eltherm termination instructions. Deviations will void the guarantee

Attention: To avoid short circuit, do not connect the two bus wires of the heating tape to each other. Under all circumstances observe the termination and maintenance instructions for the connection and termination of the heating tapes.

Hazardous Area applications: Only termination material approved by a notified body may be used with the corresponding heating tape. The required air gap and creeping distances are to be followed according to the corresponding termination instructions.

Hazardous Area applications: The free cable end is to be connected either outside the Hazardous Area or to a connection box which is approved according to a standardized type of protection.

- make sure to attach the trace heater – especially the area next to the electrical connection - to its surroundings in a proper way to avoid pulling stress or torsion on the electrical connection.
- To save energy and to keep process temperatures constant, the application of superior control units are recommended. Please ask our project engineers when in doubt.

Hazardous Area applications: An approved safety temperature limiter is to be used to limit the sheath temperature of the heating tape when

- ELP- trace heater is used
- an T3 rated ELSR heater is used in a T4-T6 hazardous area

Heaters ELP may only be used as a component within a certified system (certification to be initiated by customer).

- **Attention:** Make sure that the trace heaters are never used at or exposed to temperatures above the nominal exposure temperature ratings.
- Upon completion of the installation, the heating circuit needs to be marked by fitting an appropriate label to the associated junction box or to the trace heater close to the junction box. The label shall be weatherproof and bear relevant information of the installed system including the Ex marking.

QAA - 023

Installation of Parallel Heating Tapes

- Electrically heated parts have to be identified in reasonable distances with warning labels “Electrical Heating” on the thermal insulation (approx. 5 m distance between each label on pipelines or at least 1 warning label per pipe-branch respectively).

6. Test and Commissioning

After the completion of a heating circuit and prior to the installation of the thermal insulation, the following steps have to be taken:

- A visual check of the heating tape regarding possible mechanical damages and/or incorrect installation.
- Insulation resistance test
 - The insulation resistance of each heating circuit is to be measured between each single bus wire and the metal sheath (protection braiding). The measurement values are to be noted. Test voltage: min 500 VDC, preferably 2500 VDC
 - Independent of the heating circuit length, the insulation resistance must not be lower than 20 MOhm. In case of a lower insulation resistance, the source of defect has to be determined and eliminated.
- Check of the function of the heat circuit (monitor the trace heater temperature to avoid any overheating).
- Possible damages have to be fixed immediately. Short trace heaters may be replaced. Longer trace heaters may be repaired by cutting off the defective part and insert a new piece (refer to Connection Kit Instructions)
- Make sure heating circuit label is in place and information is legible
- All testing procedures have to be repeated after the thermal insulation has been applied.

QAA - 023

Installation of Parallel Heating Tapes

7. Operation and Maintenance:

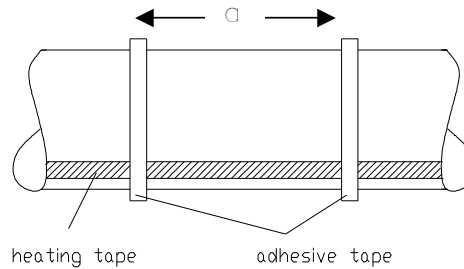
- During operation of the system, local laws and regulations for the use of electrical trace heaters in hazardous areas as well as all other applicable standards and safety regulations are to be followed
- The permissible operating conditions as stated on the label, print or in the data sheets (i.e. voltage, amperage, exposure temp., operating temp., IP protection classification) are to be followed accordingly
- The maximum operating temperature given on the label must not be exceeded
- Trace heaters ELSR- ... and ELP-... generally operate maintenance free. However, it is recommended that the system be checked by qualified personnel in regular intervals for visual damages and insulation resistance.
- Lids and cable entries of junction boxes, thermostats splices etc. to which trace heaters are connected need to be closed and sealed as per manufacturers instructions.
- The opening of controllers, junction boxes and terminations is permitted only when the heating system is not energised
- Installed trace heater has to be protected against damages that may occur during repair work on heated components
- After completion of the repair, the heating circuit will once again need to be tested as shown in paragraph 6 “Testing”
- Damaged heating circuits shall not be operated. This is the case when:
 - heater or attached leads show damage or deformation
 - the circuit is electrically defective (open circuit, high leakage current)
 - after thermal or mechanical overstress
 - after failure of temperature controls
 - after damage to the workpiece to which the heater is installed
- Temperature control units and control devices are to be checked at least annually by trained workers or authorized persons

QAA - 023 Installation of Parallel Heating Tapes

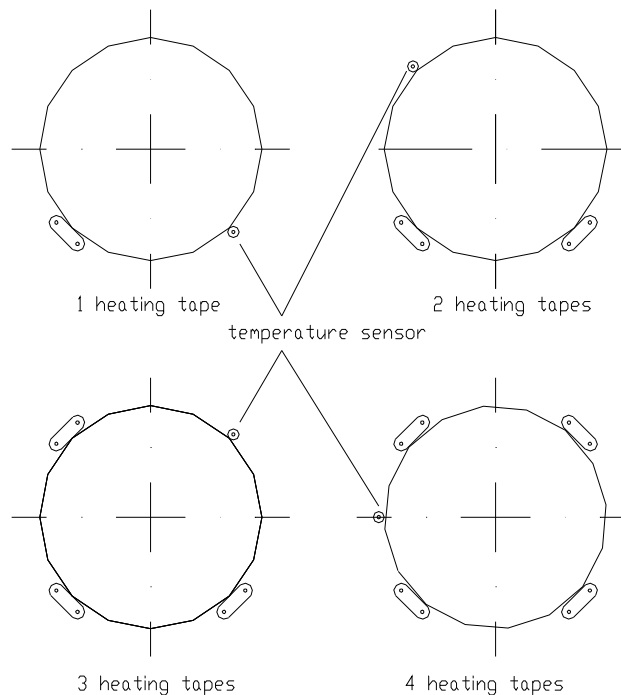
Installation of Heating Tapes on Pipes

The heating tape is traced and fixed parallel to the pipe axis.

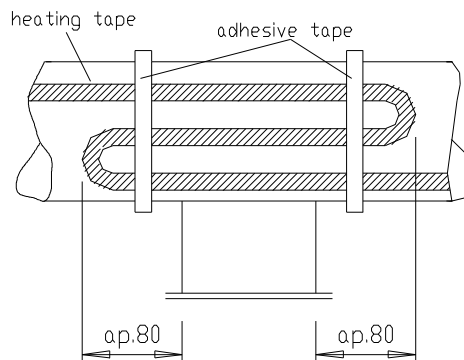
Hazardous Area: a max. 300mm



For multiple tracing please follow the drawing.

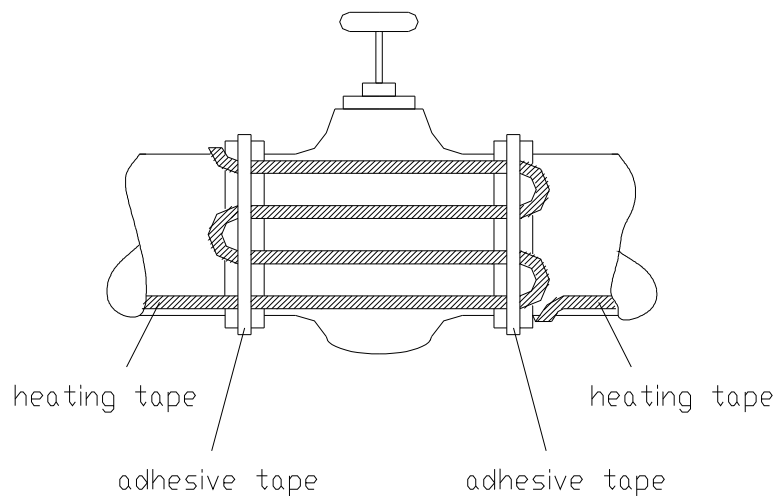


Installation of heating tapes on pipe supports

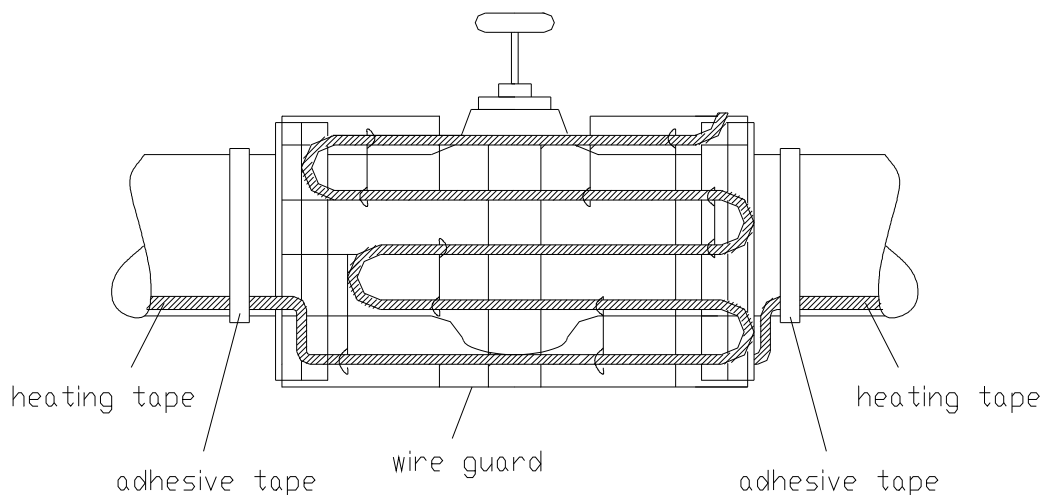


QAA - 023 **Installation of Parallel Heating Tapes**

Installation of Heating Tapes on Valves

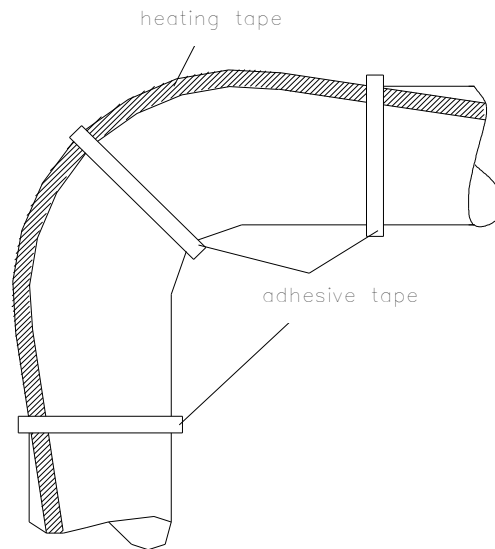


Installation of heating tapes on valves by means of a wire guard for a quick disassembly and re-assembly of the heating during maintenance work at the valve

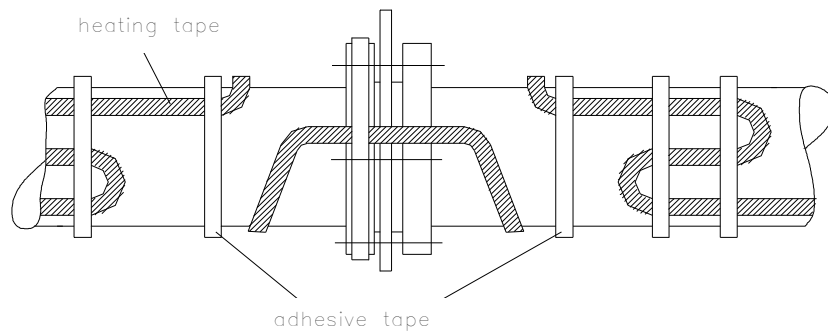
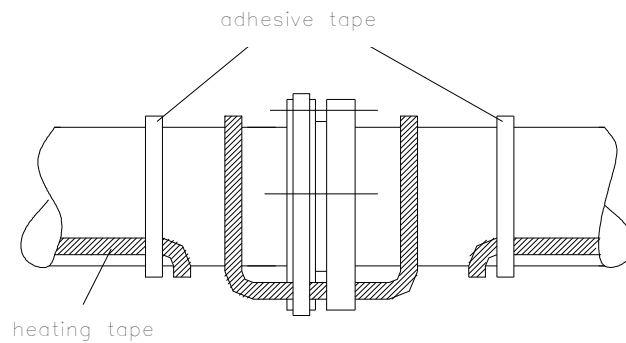


QAA - 023 Installation of Parallel Heating Tapes

Installation on elbows



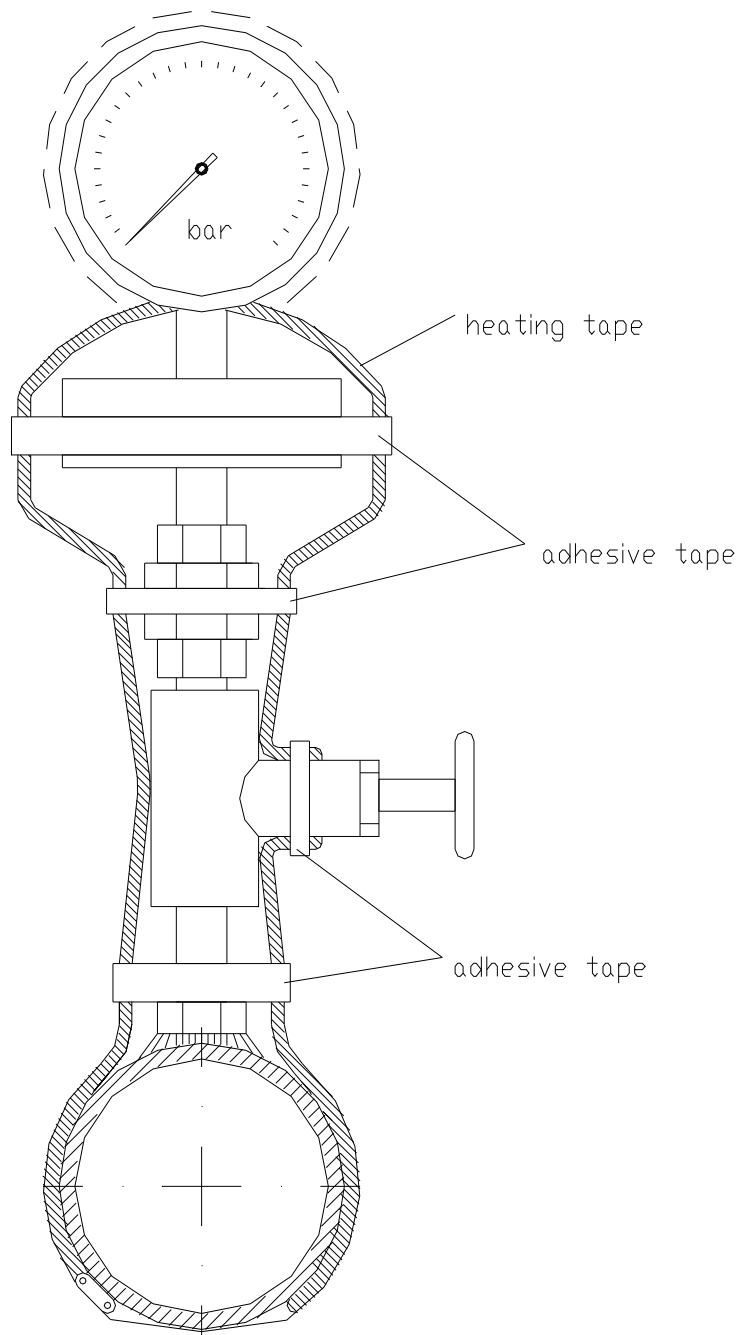
Installation on flanges





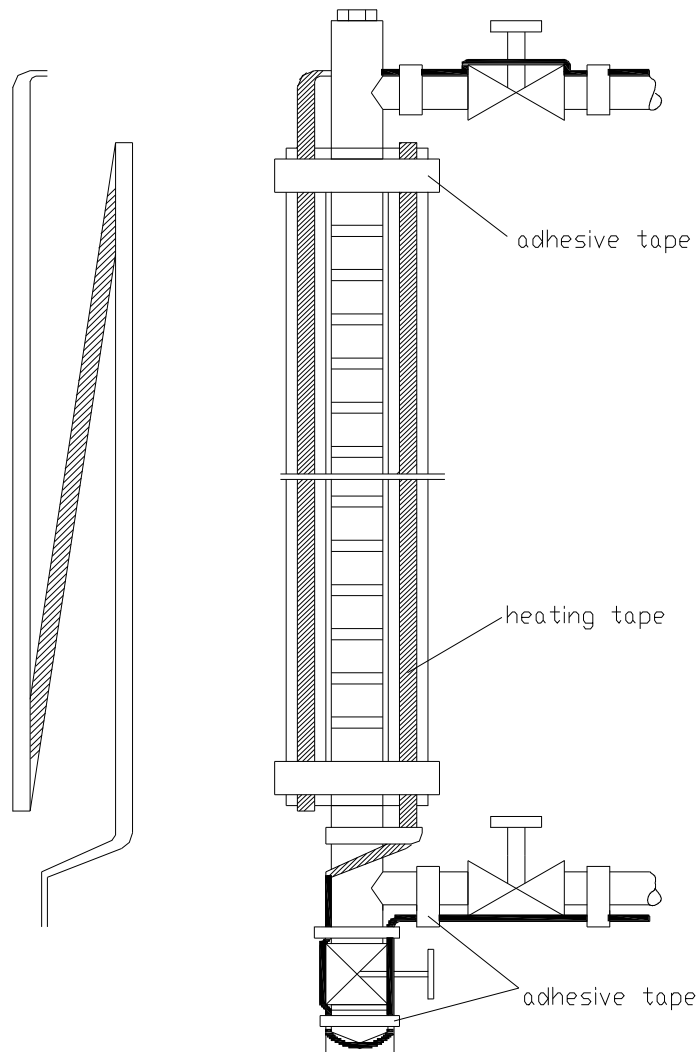
QAA - 023 **Installation of Parallel Heating Tapes**

Installation of Heating Tape on Fittings & Valves



QAA - 023 **Installation of Parallel Heating Tapes**

Installation of Heating Tapes on Level Indicators



Remark: Attach heating tape with self-adhesive aluminium tape



3

innovations in heat tracing

05.01.2018 K. Folkerts



EU-Konformitätserklärung
EU Declaration of Conformity
UE Déclaration de Conformité

Produkt / *Product* / *Produit*:
selbstregulierende Heizleitung / *self regulating heating cable* / *câble chauffant autorégulant*

Typen / *Types*:
ELSR-...-FHP, -H, -HA, -LS, -M, -MA, -N, -NA, -R, -Ramp, -W, -WA

Das bezeichnete Produkt stimmt mit den Vorschriften der folgenden europäischen Richtlinien überein /
The designated product is in conformity with the European Directives / *Le produit désigné est conforme aux Directives Européennes*:

- 2014/35/EU (Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt)
2014/35/EU (harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits)
2014/35/UE (harmonisation des législations des États membres concernant la mise à disposition sur le marché du matériel électrique destiné à être employé dans certaines limites de tension).
- 2011/65/EU inkl. 2015/863/EU (Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten)
2011/65/EU incl. 2015/863/EU (restriction of the use of certain hazardous substances in electrical and electronic equipment)
2011/65/UE incl. 2015/863/EU (limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques)

Angewendete harmonisierte Normen / *Applied harmonized Standards* / *Normes harmonisées applicables*:
EN 62395-1:2013, EN 60519-10:2013

Ort, Datum / *Place, Date* / *Ville, Date*: 57299 Burbach, 15.05.2018

Name / *Name* / *Nom*:
Position:

P. Schmidt
Leiter Entwicklung
R&D Manager
Responsable R&D

Unterschrift / *Signature*:

i.V. 