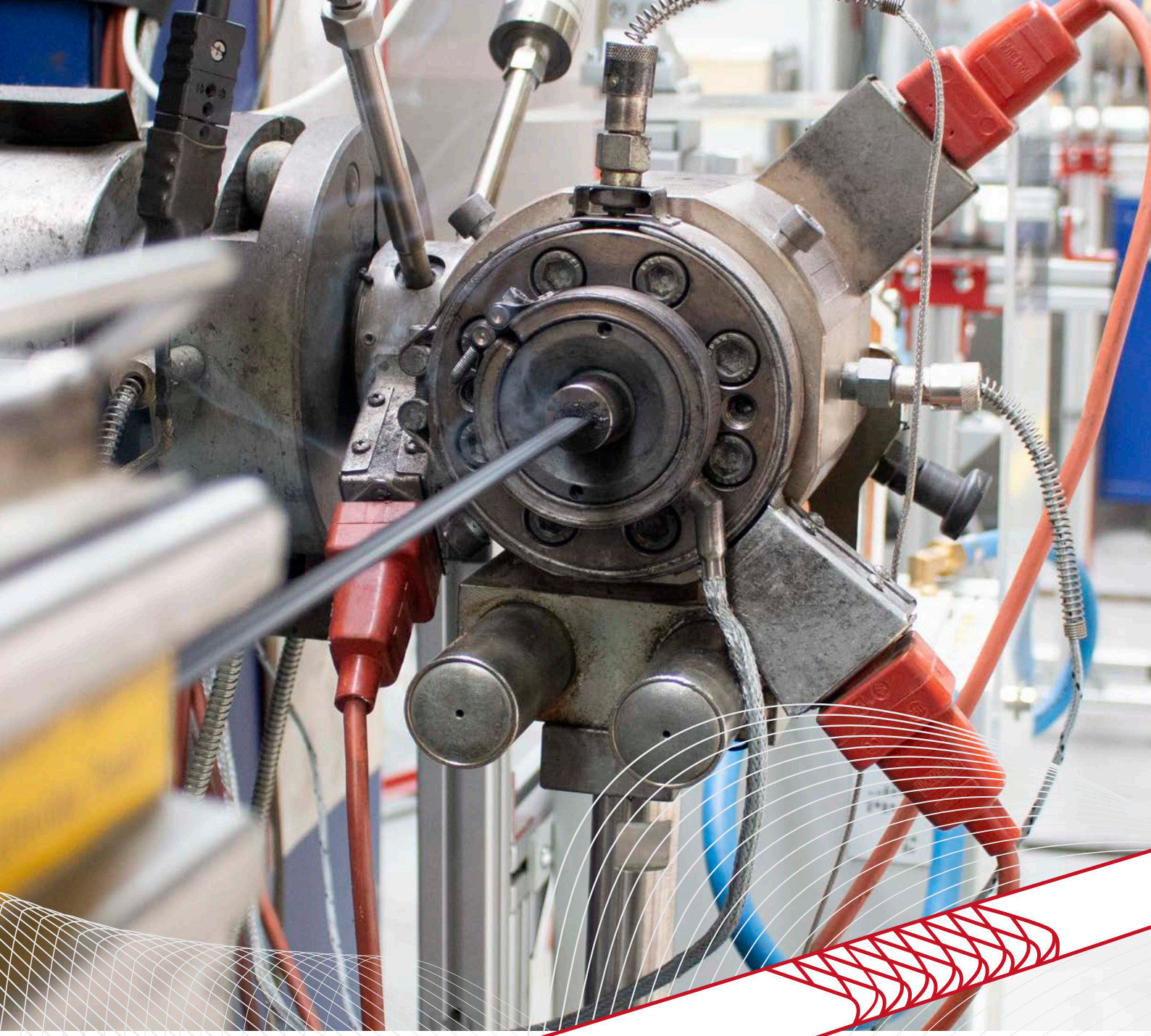


Self-Regulating Trace Heaters

eltherm®

+44 (0) 191 410 4292 hpsales@thorneandderrick.co.uk heatingandprocess.com

Content

„Understanding the application and finding the most efficient, reliable solution is our daily challenge“

+44 (0) 191 410 4292 hpsales@thorneandderrick.co.uk heatingandprocess.com

eltherm in Burbach, Germany

1. Production facility I
2. Administration, application engineering
3. R&D, international sales, eltherm Academy
4. Production facility II

From Process to Product
The eltherm Story

Founded in 1991 in Burbach, Germany, eltherm has developed into a global engineering solution provider with own production facilities and a one-stop-shop for electrical heat tracing products and systems. The company has attained worldwide recognition as a turn-key partner for engineering, design, installation and commissioning of electrical heat tracing for complex industrial plants and facilities.

With its own comprehensive production facilities for all types of heating cables and accessories eltherm has built up the engineering expertise to become one of the leading manufacturers of electrical heat tracing systems in the world.

Besides frost protection and temperature maintenance applications up to 900 °C, eltherm is the competent partner for complete system solutions like heating whole chemical or other industrial plants. eltherm proved its potential and expertise in different industries such as oil and gas, power plant, construction, automotive and food.

› Portfolio Focus
We provide a comprehensive range of electrical heat tracing products, systems and solutions from A to Z. Your One-Stop-Shop.

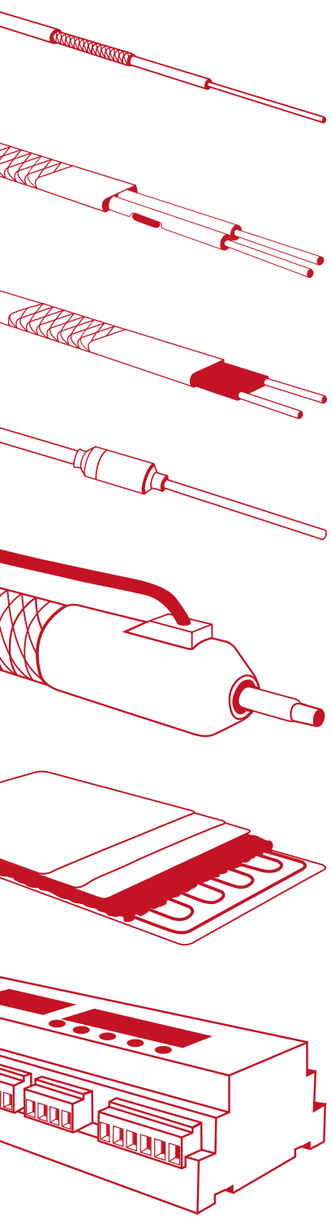
› Customer Focus
Our focus on the benefits to our clients sets us apart from competitors. We understand and solve our clients' needs with technological passion.

› Technical Focus
We specialise in electrical heat tracing. That is our core competence and inspiration.

› Global Focus
We are a global engineering company with our own production facilities, serving international markets and projects from 13 locations on 5 continents – and with a staff force of 270.

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

From A to Z
Your One-Stop-Shop



› Serial Resistance Trace Heaters
for freeze prevention and process temperatures in industrial plants and facilities.

› Parallel Resistance Trace Heaters
Parallel trace heaters with constant wattage output and a single end power input.
For applications in hazardous and non-hazardous locations.

› Self-Regulating Trace Heaters
for freeze prevention and temperature maintenance in industry and building & construction.
Applications up to 250 °C.

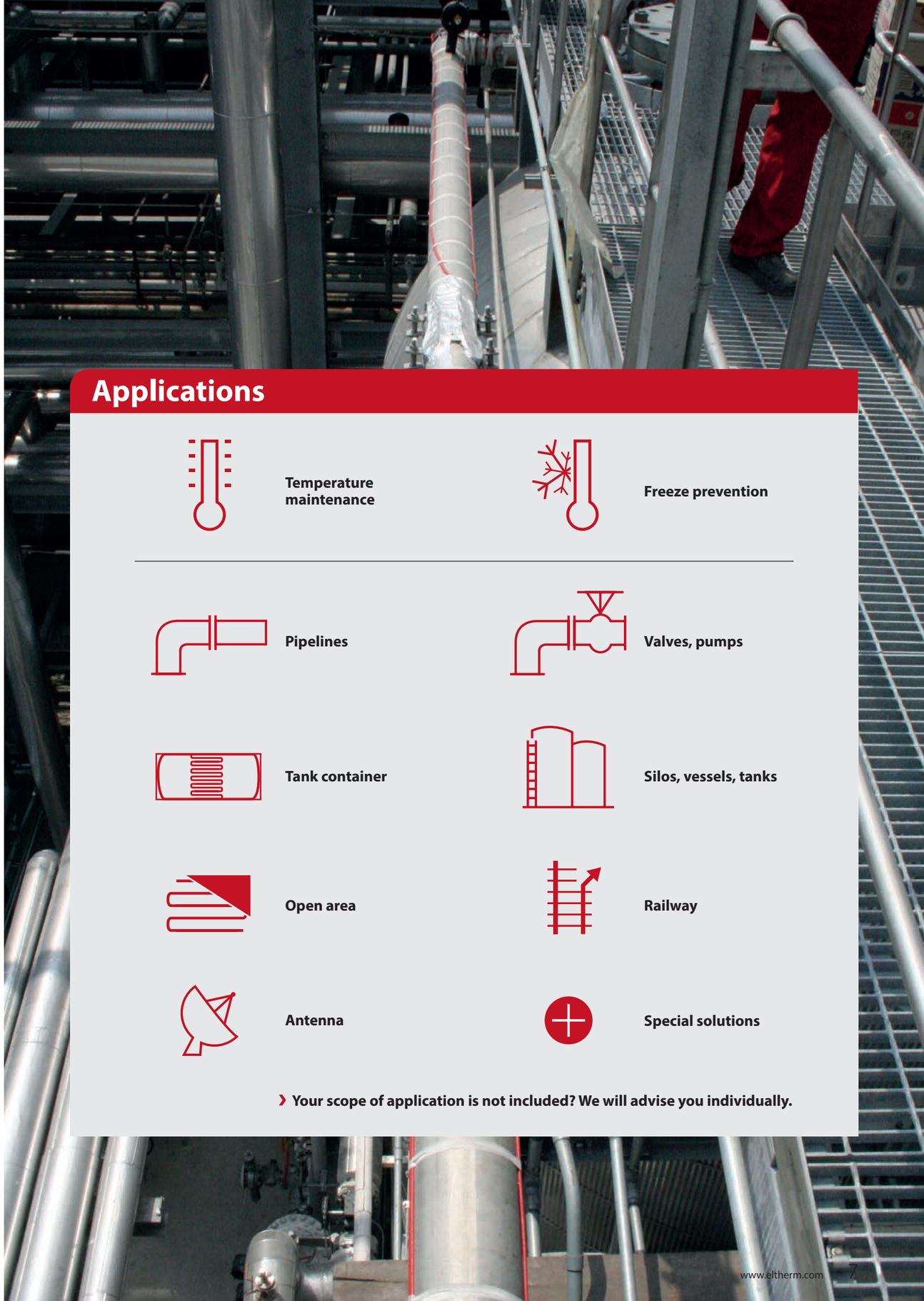
› Mineral-Insulated Trace Heaters
exclusively manufactured and finished from Alloy 825 or high-quality stainless steel. The unique "Clean Laser Seal" Technology (CLS) guarantees a homogenous, 100% stable system and reliable function up to 700 °C.

› Heated Analytic, Pressure and Loading Systems
for reliable and safe transport of pressurised or non-pressurised fluids and gases without temperature loss, up to 450 °C.

› Heating Mats and Jackets
custom-engineered and tailor-made, for heating valves, pumps, drums, barrels, hobbocks and flange covers, up to 450 °C.

› Power and Control Panels
including temperature sensors, display and operating devices, monitoring and controls plus accessories for reliable, safe functioning and complete control panels.

› Accessories
for safe and effective assembly and operation of complete heat tracing systems in facilities from small to large.



Applications

- **Temperature maintenance**
- **Freeze prevention**
- **Pipelines**
- **Valves, pumps**
- **Tank container**
- **Silos, vessels, tanks**
- **Open area**
- **Railway**
- **Antenna**
- **Special solutions**

› Your scope of application is not included? We will advise you individually.

At a Glance

Benefits

- Self-regulating with adaptable output
- Various temperature ranges
- Demand-orientated output grading
- High chemical resistance
- No temperature limitation required (Ex-area)
- Easy to install
- Can be cut to length off the roll
- Fast connection with EI-Clic

Design

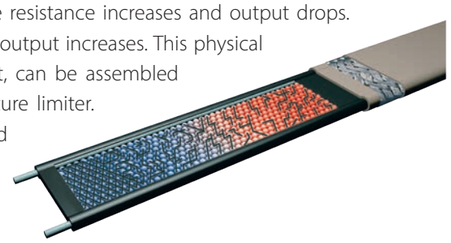
AO BO AF BF BOT

Approvals

- **Approvals for USA / Canada**
  Find more in our special product brochure

Self-Regulating Trace Heaters

Self-regulating trace heaters consist of two parallel bus wires embedded in a heating matrix doped with carbon particles. When the temperature rises in operation, molecular expansion increases the distance between the carbon particles. The resistance increases and output drops. When temperatures fall, this process is reversed and output increases. This physical property means that the heater will never overheat, can be assembled crosswise and can be operated without a temperature limiter. Moreover, selected ELSR heating cables are approved for use in hazardous areas.



Application

The ELSR (**el**therm-**s**elf-**r**egulating) trace heater is used for freeze prevention and temperature maintenance on vessels, pipes, valves, etc. It may be immersed in fluids. For use in aggressive environments (e.g. in chemical or petrochemical industry), the trace heater is coated with a special chemically resistant outer jacket (fluoropolymer), option "BOT".

Design

A wide selection of self-regulating heater designs to handle almost any application, including service in harsh conditions and corrosive environments.

AO Aluminium foil with a thermoplastic outer jacket. Trace heater for all low-temperature and medium-temperature applications, particularly easy to assemble.

BO Protective braid with a thermoplastic outer jacket. Trace heater with protective tin-plated copper braid for all low-temperature and medium-temperature applications.

BOT Protective braid with fluoropolymer outer jacket (Teflon). Trace heaters with fluoropolymer outer jacket for use in aggressive chemical, oil and fuel environments*.

AF Aluminium foil and outer jacket approved for potable water. Special trace heaters designed for use inside potable water lines in Freeze prevention (-M) applications.

BF Protective braid and outer jacket approved for potable water Special trace heaters with robust protective braid for water and drinking water lines.

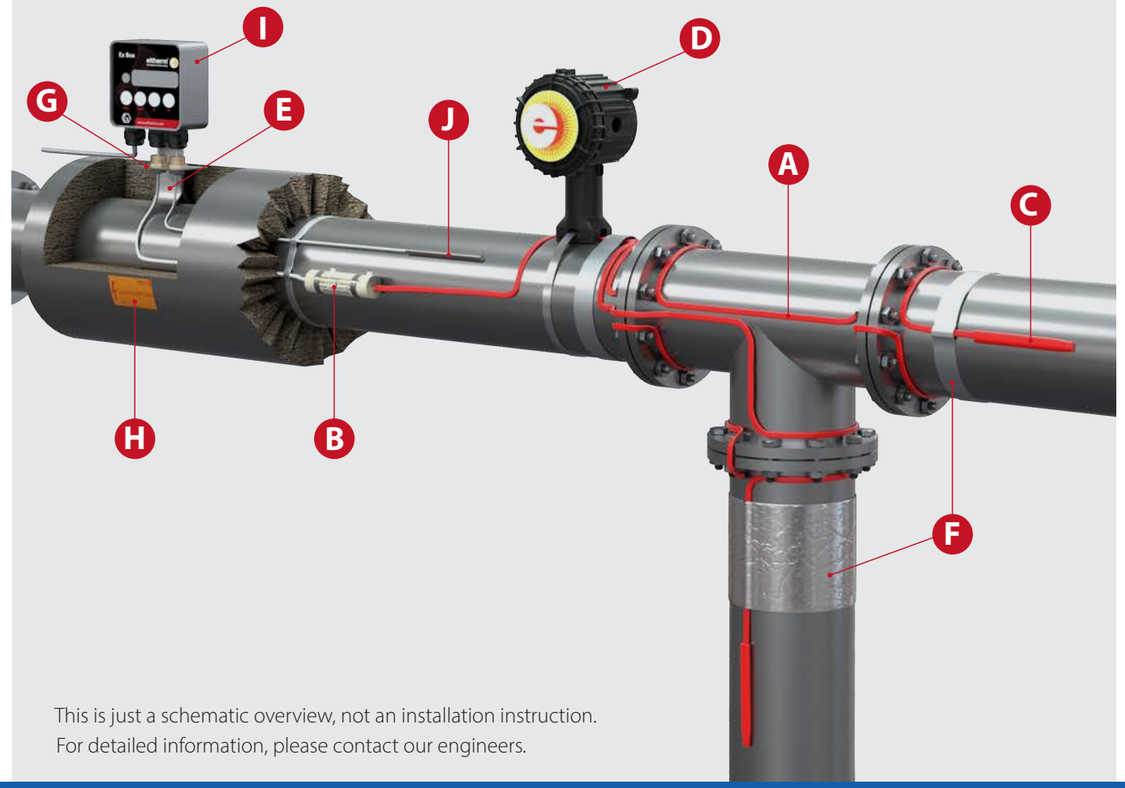
- ELSR-N...1... = Nominal voltage 110 V
- ELSR-N...2... = Nominal voltage 230 V

We also offer trace heaters with braid only, without outer jacket, upon request.
*A detailed list of chemical resistances is available online.

Checklist

The Self-Regulating Trace Heating System

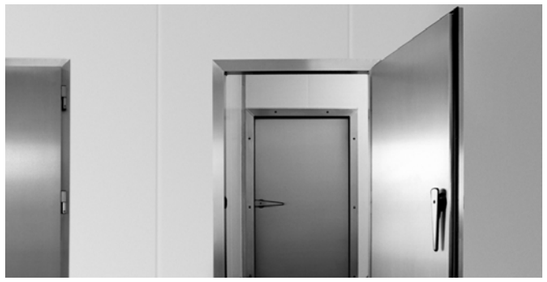
A	Trace Heater	**F**	Fasteners and Self-adhesive Tapes, Foils
B	Power Connection Kit	**G**	Insulation Bushing
C	End Termination Kit	**H**	Warning Sign
D	Junction Box	**I**	Temperature Controller
E	Pipe Mounting Bracket	**J**	Temperature Sensor



This is just a schematic overview, not an installation instruction.
For detailed information, please contact our engineers.

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

Selection Guide

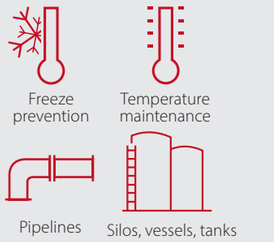
Type	Low Temperature ELSR-N	Low Temperature ELSR- LS	Low Temperature ELSR-M	Low Temperature ELSR-M-AF/BF	Low Temperature ELSR-R
					
Applications	Freeze prevention, Temperature maintenance, Pipelines, Valves, pumps, Silos, vessels, tanks			Freeze prevention, Pipelines	Freeze prevention, Special solutions
	Self-regulating trace heaters for freeze prevention and temperature maintenance in lower temperature ranges, predominantly in industrial applications. ELSR-N and -LS are approved for use in hazardous areas. The BOT version of ELSR-N is resistant to aggressive chemicals, oil and fuel. ELSR-M is very flexible and ideal where small heater dimensions are required.			ELSR-M-AF/BF is suited for freeze prevention in pipes and pipelines with seasonal exposure. Typical applications are water supply systems and sanitary facilities on building sites, outdoor events, winter markets etc.	The ELSR-R line is used where its round geometry facilitates installation in sealing and door profiles. Typical applications are doors and gateways to cold-storage facilities, cold water lines in beverage production and breweries.
Maximum maintain temperature	65 °C	65 °C	65 °C	65 °C	65 °C
Maximum exposure temperature (de-energized)	80 °C	80 °C	65 °C	65 °C	65 °C
Nominal output at 10°C	10 W/m, 20 W/m, 30 W/m, 40 W/m	10 W/m, 15 W/m, 25 W/m	10 W/m, 15 W/m	10 W/m	19 W/m, 27 W/m
Max. Heating circuit length at 10°C, 16 ampere, 230 V	177,0 m, 109,0 m, 83,0 m, 57,0 m	196.0 m, 160.5 m, 103.0 m	126.5 m, 105.5 m	89.5 m	102.0 m, 32.0 m
Hazardous Areas	•	•			
Page	14	16	18	20	22

Selection Guide

Type	Medium Temperature			High Temperature		
	ELSR-W	ELSR-Ramp	ELSR-FHP	ELSR-H	ELSR- SH	ELSR-SHH
						
Applications	Freeze prevention; Temperature maintenance; Pipelines; Silos, vessels, tanks; Open area			Freeze prevention; Temperature maintenance; Valves, pumps; Silos, vessels, tanks		
	ELSR-W is employed for temperature maintenance on hot water pipelines and fat disposal lines in canteens or commercial kitchens. It is also used for bacteria and legionella prevention in water lines. ELSR-Ramp for freeze prevention is specially designed for concrete ramps and outdoor surfaces. ELSR-FHP was specially developed for frost heave protection in foundations, for instance in LNG terminals.			The ELSR-H, -SH and -SHH high temperature trace heater range is designed for temperature maintenance in industrial processes and applications in hazardous areas. The trace heaters' high chemical resistance allows them to be installed in environments with exposure to aggressive influences.		
Maximum maintain temperature	80 °C	80 °C	65 °C (ELSR-FHP-23) 80 °C (ELSR-FHP-38)	120 °C	165 °C	250 °C
Maximum exposure temperature (de-energized)	100 °C	100 °C	80 °C (ELSR-FHP-23) 110 °C (ELSR-FHP-38)	210 °C	250 °C	250 °C
Nominal output at 10°C	water supply lines: 9 W/m at 55 °C; 13 W/m at 65 °C — fat/oil: 22 W/m at 40 °C	50 W/m at 10 °C; 110 W/m at 5 °C	23 W/m at 5 °C; 38 W/m at 5 °C	10 W/m; 15 W/m; 20 W/m; 30 W/m; 45 W/m; 60 W/m; 75 W/m	15 W/m; 35 W/m; 45 W/m; 75 W/m; 90 W/m	15 W/m; 30 W/m; 45 W/m; 60 W/m; 75 W/m
Max. Heating circuit length at 10°C, 16 ampere, 230 V	113.0 m; 73.5 m	at -10 °C: 28.0 m	at -5 °C: 48.5 m; at -5 °C: 36.5 m	193.0 m; 158.0 m; 122.0 m; 82.0 m; 55.0 m; 41.0 m; 33.0 m	172,0 m; 80,0 m; 58,0 m; 30,0 m; 27,0 m	76.0 m; 52.0 m; 38.0 m; 24.0 m; 14.0 m at 10 A
Hazardous Areas				•	•	•
Page	**24**	**26**	**28**	**30**	**32**	**34**

At a Glance

Applications



- Chemistry and Petrochemistry
- Maritime and offshore
- Food Processing Industry
- Water and sanitation utilities

Benefits

- Four nominal outputs
- UV-resistant
- Moisture proof
- Junction box for pipe mounting

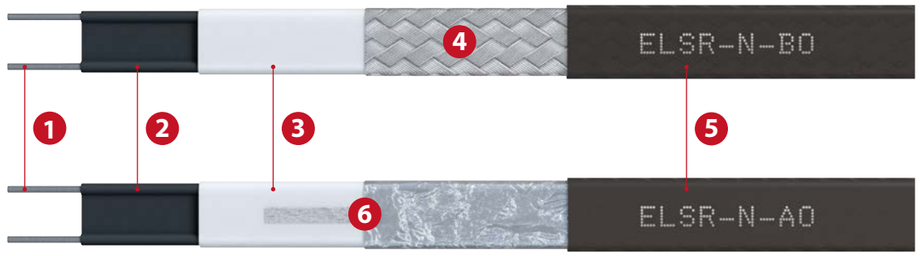
Design

AO BO BOT

Approvals

- Trace Heater classification
  II 2G Ex 60079-30-1 IIC Gb
  II 2D Ex 60079-30-1 IIIC Db
- System classification
  II 2G Ex 60079-30-1 eb IIC T6 Gb
  II 2D Ex 60079-30-1 tb IIIC T85°C Db
- Certification
  EPS IECEx 18.0064U
  EPS IECEx 19.007X
  EPS 18 ATEX 1133 U
  EPS 19 ATEX 1014 X
- Temperature class
  T6

Type ELSR-N
up to 80 °C



1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	
4	**Protection**	Protective braid (Cu, tin plated)
5	**Outer jacket**	
6	**Protective conductor connection**	see **4** or Cu, tin plated with aluminium foil

Checklist ELSR-N

B + C Power Connection & End Termination

ELVB-SRAN-Ex-20	Power connection, glued, Gland M20, brass, Ex d	0X81PND
EL-ECN-ex	Silicone termination cap black, glued, transparent with ex marking	0X81EN1
ELVB-SREx-25	Power connection, glued, Gland M25 x 1,5, PE, Ex e	0X81PA1
Ex-Con-SR	Ex connection sleeve Ø 36 x 210 mm 4J	0X81125
ELVB-SREx-IT	Power connection, glued, without gland	091AIT1
ELVB-SRA-25	Power connection, glued, Gland M25 x 1,5, PE	091A010
EL-ECN	Silicone termination cap, glued, transparent	09112N1
ELVB-SRV-N-L-W	Connection set, shrink-fit	0911116
El-Clic P/S	El-Clic P Fast connector with integrated cold lead El-Clic S Fast connector T-splice	09ClicP 09ClicS

D Junction Boxes

ELAK-Ex-2.00	110 x 75 x 57 mm, polyester, IP66, 1 Trace heater, 1 Power cable	0X85200
ELAK-Ex-4.01	122 x 120 x 90 mm, polyester, IP66, 1 - 3 Trace heaters, 1 Power cable	0X85401
Ex-it-R	ø 150 x 125 mm, 3 heaters, 1 Pt100 power supply lead, incl. mounting stand, IP 65	0X80070
ELAK-2	104 x 104 x 70 mm, polycarbonate, breakouts 7x M25, IP 66	0920030
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
ELAK-5.1	130 x 130 x 75 mm, polycarbonate, breakouts 9x M20/M25, IP 66	0920002
ELAK-RS-T	150 x 125 mm, twin Pt100, 3 heaters incl. mounting stand, IP 65	0920059

› Further accessories on pages 36 - 45.

Technical Information

Maximum maintain temperature	65 °C
Maximum exposure temperature (de-energized)	80 °C
Nominal voltage*	230 V
Bending radius, min.	25 mm
Installation temperature, min.	– 60 °C

* Further power inputs on request

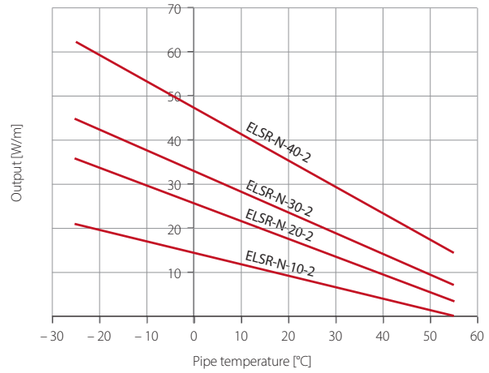
Heating circuit lengths on the following conditions

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

Switch-on temperature (°C)	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	128.0	68.0	52.0	36.0
	16	177.0	109.0	83.0	57.0
	20	177.0	129.0	104.0	71.0
	25	177.0	129.0	113.0	89.0
	32	177.0	129.0	113.0	94.0
0	10	106.0	57.0	45.0	31.0
	16	160.0	92.0	71.0	50.0
	20	160.0	115.0	89.0	62.0
	25	160.0	119.0	105.0	78.0
	32	160.0	119.0	105.0	88.0
-10	10	90.0	50.0	39.0	28.0
	16	144.0	79.0	63.0	44.0
	20	149.0	99.0	78.0	55.0
	25	149.0	111.0	98.0	69.0
	32	149.0	111.0	98.0	83.0
-20	10	78.0	44.0	35.0	25.0
	16	125.0	70.0	56.0	40.0
	20	139.0	87.0	69.0	50.0
	25	139.0	104.0	87.0	62.0
	32	139.0	104.0	87.0	78.0
-40	10	62.0	35.0	28.0	21.0
	16	99.0	56.0	45.0	33.0
	20	124.0	71.0	57.0	42.0
	25	124.0	88.0	71.0	52.0
	32	124.0	88.0	71.0	66.0

ELSR-N-…-2 output

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



Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Part 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

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

At a Glance

Applications


Freeze prevention


Temperature maintenance


Pipelines

- Chemistry and Petrochemistry
- Maritime and offshore
- Food Processing Industry
- Water and sanitation utilities

Benefits

- Three nominal outputs
- UV-resistant
- Moisture proof
- Small dimensions

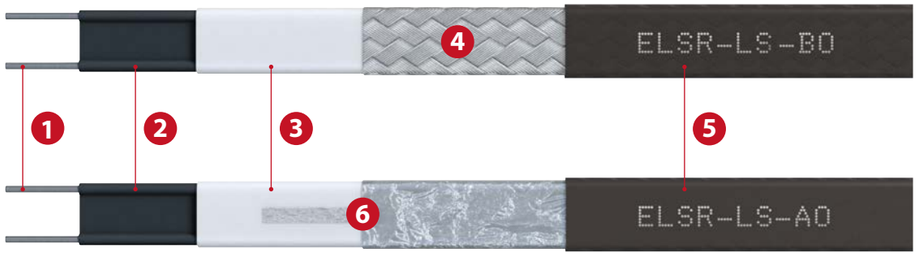
Design

AO BO

Approvals

- Trace Heater classification
  EPS II 2G Ex 60079-30-1 IIC Gb
  EPS II 2D Ex 60079-30-1 IIIC Db
- System classification
  IBExU II 2G Ex 60079-30-1 eb IIC T6 Gb
  II 2D Ex 60079-30-1 tb IIIC TX Db
- Certification
  EPS 19 ATEX 1 215 U
  IBExU 09 ATEX 1047 X
- Temperature class
  T6

Type ELSR-LS
up to 80 °C



1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	
4	**Protection**	Protective braid (Cu, tin plated)
5	**Outer jacket**	TPE-O
6	**Protective conductor connection**	see **4** or Cu, tin plated with aluminium foil

Checklist ELSR-LS

B + C Power Connection & End Termination

ELVB-SREx-25	Power connection, glued, Gland M25 x 1,5, PE, Ex e	0X81PA1
ELVB-SRAL-Ex-20	Power connection, glued, Gland M20, brass	0X81PLD
EL-ECL-ex	Silicone termination cap black, glued, transparent with ex marking	0X81EL1
Ex-Con-SR	Ex connection sleeve Ø 36 x 210 mm 4J	0X81125
ELVB-SRA-25	Power connection, glued, Gland M25 x 1,5, PE	091A010
ELVB-SRV-N-L-W	Connection set, shrink-fit	0911116
EL-ECL	Silicone termination cap, glued, transparent	09112L1
EI-Clic P/S	EI-Clic P Fast connector with integrated cold lead EI-Clic S Fast connector T-splice	09ClicP 09ClicS

D Junction Boxes

ELAK-Ex-2.00	110 x 75 x 57 mm, polyester, IP66, 1 Trace heater, 1 Power cable	0X85200
ELAK-Ex-4.01	122 x 120 x 90 mm, polyester, IP66, 1 - 3 Trace heaters, 1 Power cable	0X85401
ELAK-2	104 x 104 x 70 mm, polycarbonate, breakouts 7x M25, IP 66	0920030
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
ELAK-5.1	130 x 130 x 75 mm, polycarbonate, breakouts 9x M20/M25, IP 66	0920002
ELAK-RS-T	150 x 125 mm, twin Pt100, 3 heaters incl. mounting stand, IP 65	0920059

› Further accessories on pages 36 - 45.

Technical Information

Maximum maintain temperature	65 °C
Maximum exposure temperature (de-energized)	80 °C
Nominal voltage*	230 V
Bending radius, min.	25 mm
Installation temperature, min.	– 60 °C

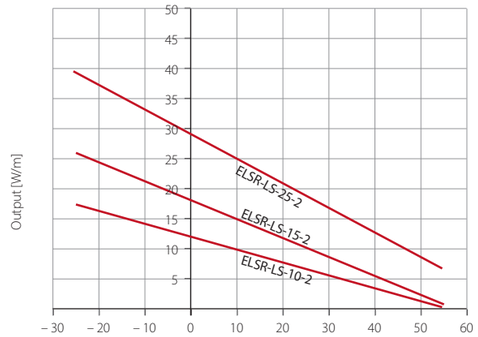
* Further power inputs on request

Heating circuit lengths on the following conditions

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

ELSR-LS-…-2 output

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



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
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	54.0
	16	188.5	134.0	87.0
	20	188.5	145.0	108.0
	25	188.5	145.0	116.0
-10	10	119.0	71.0	47.0
	16	173.5	114.0	75.0
	20	173.5	133.0	94.0
	25	173.5	133.0	107.5
-20	10	103.0	62.0	37.5
	16	161.0	99.0	60.0
	20	161.0	124.0	75.0
	25	161.0	124.0	94.0

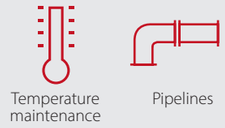
Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Part No.
ELSR-LS-10-2-BO	10 W/m at 10 °C	11,0 x 5,6	98	B0223102
ELSR-LS-10-2-AO	10 W/m at 10 °C	10,3 x 5,3	78	B0223104
ELSR-LS-15-2-BO	15 W/m at 10 °C	11,0 x 5,6	98	B0223152
ELSR-LS-15-2-AO	15 W/m at 10 °C	10,3 x 5,3	78	B0223154
ELSR-LS-25-2-BO	25 W/m at 10 °C	11,0 x 5,6	98	B0223252
ELSR-LS-25-2-AO	25 W/m at 10 °C	10,3 x 5,3	78	B0223254

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

eltherm®

At a Glance

Applications



- Food Processing Industry
- Water and sanitation utilities

Benefits

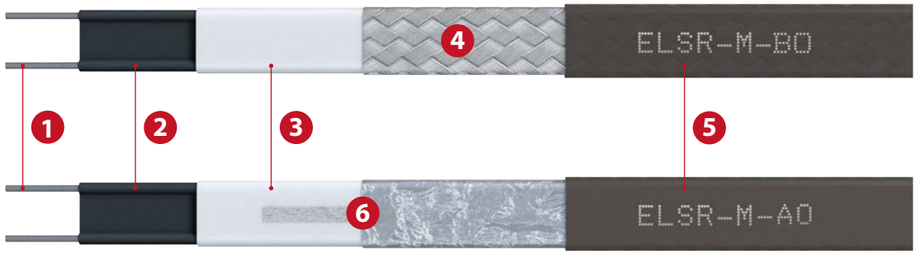
- Two nominal outputs
- UV-resistant
- Moisture proof
- Small dimensions

Design

AO BO

Approvals

Type ELSR-M
up to 65 °C



1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	
4	**Protection**	Protective braid (Cu, tin plated)
5	**Outer jacket**	TPE-O
6	**Protective conductor connection**	see **4** or Cu, tin plated with aluminium foil

Checklist ELSR-M

B + C Power Connection & End Termination

ELVB-SRAM-25	Power connection, shrink-fit, Gland M25 x 1,5, PE	091A015
EL-ECM	Silicone termination cap, glued, transparent	09112M1
ELVB-SRV-M	Connection set, shrink-fit	0911122

D Junction Boxes

ELAK-2	104 x 104 x 70 mm, polycarbonate, breakouts 7x M25, IP 66	0920030
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
ELAK-5.1	130 x 130 x 75 mm, polycarbonate, breakouts 9x M20/M25, IP 66	0920002

› Further accessories on pages 36 - 45.

Technical Information

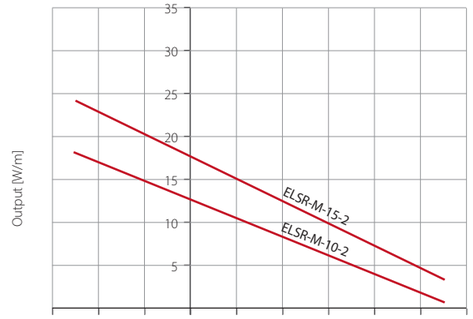
Maximum maintain temperature	65 °C
Maximum exposure temperature (de-energized)	65 °C
Nominal voltage	230 V
Bending radius, min.	25 mm
Installation temperature, min.	– 45 °C

Heating circuit lengths on the following conditions

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

ELSR-M-…-2 output

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



Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-M-10-2	Heating circuit length (m) for 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

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Part 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

At a Glance

Applications

Freeze prevention

Pipelines

- In-pipe trace heating approved for potable water pipes and flexible tubes

Benefits

- Officially approved
- Can be used in liquids
- Suitable for drinking water
- Small dimensions

Design

AF BF

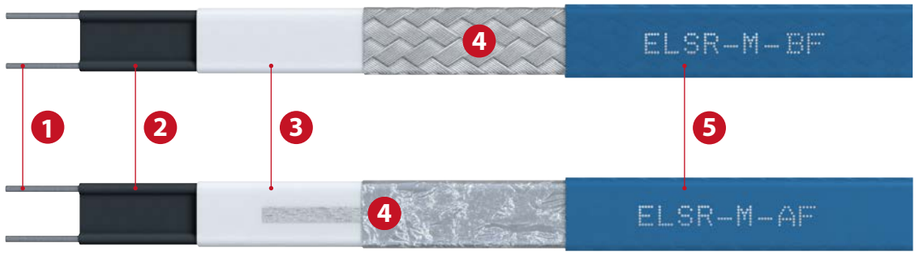
Approvals

*AF only

- Certification Report K-350842-21

Type ELSR-M-AF/BF

up to 65 °C



1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	
4	**Protection**	Protective braid (Cu, tin plated)
5	**Outer jacket**	TPE-O
6	**Protective conductor connection**	see **4** or Cu, tin plated with aluminium foil

Checklist ELSR-M-AF/BF

B + C Power Connection & End Termination

ELVB-70	Cable gland Ms 3/4", brass, approved for drinking water	0911703
ELVB-71	Y-connector 32 mm, brass, approved for drinking water	0911704
ELVB-SRAM-25	Power connection, shrink-fit, Gland M25 x 1,5, PE	091A015
EL-ECMF	Silicone termination cap, glued, transparent	09112MF
ELVB-SRV-M	Connection set, shrink-fit	0911122

D Junction Boxes

ELAK-2	104 x 104 x 70 mm, polycarbonate, breakouts 7x M25, IP 66	0920030
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
ELAK-5.1	130 x 130 x 75 mm, polycarbonate, breakouts 9x M20/M25, IP 66	0920002

› Further accessories on pages 36 - 45.

Technical Information

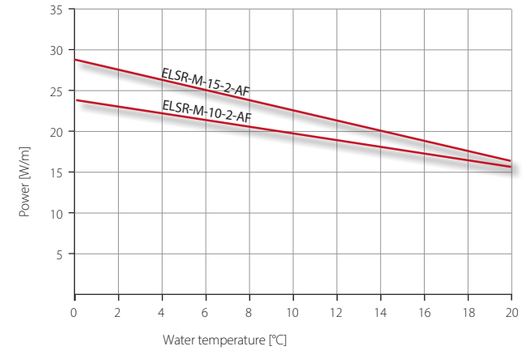
Maximum maintain temperature	65 °C
Maximum exposure temperature (de-energized)	65 °C
Nominal voltage	230 V
Bending radius, min.	25 mm
Installation temperature, min.	– 45 °C

Heating circuit lengths on the following conditions

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

ELSR-M-10-2-AF/BF output

(In ice water)



Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-M-10-2-AF/BF
10	10	74.0
	16	89.5
	20	89.5
0	10	61.5
	16	89.5
	20	89.5
-30	10	61.5
	16	89.5
	20	89.5

Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-M-15-2-AF
10	10	74.0
	16	89.0
	20	89.0
0	10	58.0
	16	71.0
	20	71.0
-30	10	58.0
	16	71.0
	20	71.0

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Part No.
ELSR-M-10-2-BF	10 W/m at 10 °C	7.5 x 4.9	62	B0225104
ELSR-M-10-2-AF	10 W/m at 10 °C	7.9 x 6.0	53	B0225105
ELSR-M-15-2-AF	15W/m at 10°C	7.9 x 6.0	53	B0225170

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

At a Glance

Applications

Freeze prevention

Special solutions

- Doors and seals of refrigerating chambers
- Profile Heating
- Boarding Bridges

Benefits

- Round design
- Moisture proof
- UV-resistant
- Ideal for profile installation

Design

BOT

Approvals

AVIS TECHNIQUE

Type ELSR-R
up to 65 °C

1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	
4	**Protection**	Protective braid (Cu, tin plated)
5	**Outer jacket**	Fluoropolymer

Checklist ELSR-R

B + C Power Connection & End Termination

ELVB-SRAR-25	Power connection, shrink-fit, Gland M25 x 1,5, PE	091A020
EL-ECM	Silicone termination cap, glued, transparent	09112M1
ELVB-SRV-M	Connection set, shrink-fit	0911122

D Junction Boxes

ELAK-2	104 x 104 x 70 mm, polycarbonate, breakouts 7x M25, IP 66	0920030
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
ELAK-5.1	130 x 130 x 75 mm, polycarbonate, breakouts 9x M20/M25, IP 66	0920002

› Further accessories on pages 36 - 45.

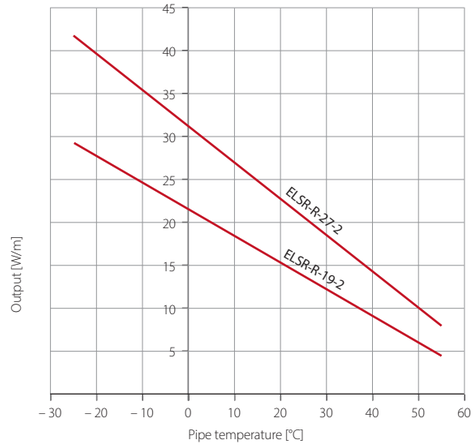
Technical Information

Maximum maintain temperature	65 °C
Maximum exposure temperature (de-energized)	65 °C
Nominal voltage	230 V
Bending radius, min.	30 mm
Installation temperature, min.	– 30 °C

Heating circuit lengths on the following conditions

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

ELSR-R-...-2-BOT output
(in a filled water pipeline)



Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-R-19-2	Heating circuit length (m) for 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

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Part 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.

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

At a Glance

Applications

Temperature maintenance

Silos, vessels, tanks

Pipelines

- Fat-containing wastewater pipes in canteens and large-scale kitchens
- Legionella prevention on hot water pipes

Benefits

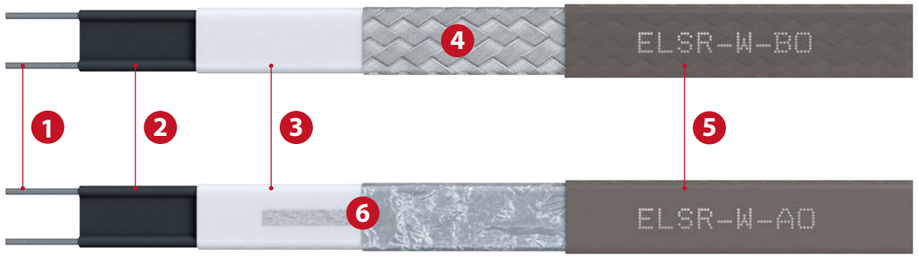
- Two nominal outputs
- Moisture proof

Design

AO BO

Approvals

Type ELSR-W
up to 100 °C



1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	
4	**Protection**	Protective braid (Cu, tin plated)
5	**Outer jacket**	TPE-O
6	**Protective conductor connection**	see **4** or Cu, tin plated with aluminium foil

Checklist ELSR-W

B + C Power Connection & End Termination

ELVB-SRA-25	Power connection, glued, Gland M25 x 1,5, PE	091A010
EL-ECW	Silicone termination cap, glued, transparent	09112W1
ELVB-SRV-N-L-W	Connection set, shrink-fit	0911116
El-Clic P/S	El-Clic P Fast connector with integrated cold lead El-Clic S Fast connector T-splice	09ClicP 09ClicS

D Junction Boxes

ELAK-2	104 x 104 x 70 mm, polycarbonate, breakouts 7x M25, IP 66	0920030
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
ELAK-5.1	130 x 130 x 75 mm, polycarbonate, breakouts 9x M20/M25, IP 66	0920002
ELAK-RS-T	150 x 125 mm, twin Pt100, 3 heaters incl. mounting stand, IP 65	0920059

› Further accessories on pages 36 - 45.

Technical Information

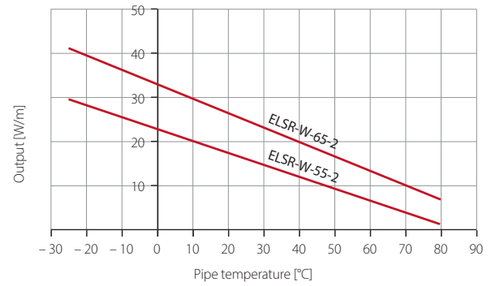
Maximum maintain temperature	80 °C
Maximum exposure temperature (de-energized)	100 °C
Nominal voltage	230 V
Bending radius, min.	20 mm
Installation temperature, min.	– 20 °C

Heating circuit lengths on the following conditions

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

ELSR-W-…-2 output

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



Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-W-55-2	Heating circuit length (m) for 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
	32	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
	32	117.0	95.0
-20	10	52.0	34.0
	16	83.0	55.0
	20	104.0	69.5
	25	112.0	86.0
	32	112.0	90.5
-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

Type	Nominal output used for *water supply lines*	Dimensions approx. (mm)	Weight approx. (g/m)	Part 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)	Part 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

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

At a Glance

Applications

- Parking garages entrances, exits
- Helicopter landing sites
- Concrete ramps
- Stairs and footpaths

Benefits

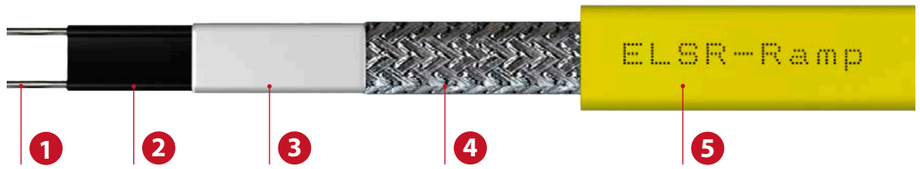
- Highly robust
- Suited for hardest installing conditions
- Flexible mounting
- Radially and longitudinally waterproof
- Outer jacket is strongly grouted with protective braid

Approvals

Note

- Not suited for use in asphalt

Type ELSR-Ramp
up to 100 °C



1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	
4	**Protection**	Protective braid (Cu, tin plated)
5	**Outer jacket**	TPE pressure-grouted with protective braid

Checklist ELSR-Ramp

B + C Power Connection & End Termination		
ELVB-SRV-Ramp	Connection set, shrink-fit	0911124
EL-ECRA	Silicone termination cap, glued, transparent	09112RA
D Junction Boxes		
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
ELAK-5.1	130 x 130 x 75 mm, polycarbonate, breakouts 9x M20/M25, IP 66	0920002

› Further accessories on pages 36 - 45.

Technical Information

Maximum maintain temperature	80 °C
Maximum exposure temperature (de-energized)	100 °C
Nominal voltage	230 V
Bending radius, min.	50 mm
Installation temperature, min.	– 20 °C

Heating circuit lengths on the following conditions

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

Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-Ramp
-10	10	18.0
	16	28.0
	20	36.0
	25	45.0
	32	55.0

Heating circuit lengths may vary in specific installation situations. Please contact our engineers for more details.

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Part No.
ELSR-Ramp	50 W/m at 10 °C	17,2 x 9,5	253	B02RAMP0
ELSR-Ramp	110 W/m at 5 °C in concrete	17,2 x 9,5	253	B02RAMP0

Electrical protection

Maximum heating circuit length

- According to local standards and regulations.
- Take into account the supply lead conductor size and max. permitted voltage drop.
- A higher voltage drop can occur at start-up of heating.

Power at start-up

- According to local standards and regulations.
- To determine the installed power with the electrical system designer, the nominal current of the series connected fuse or the current value at the system start-up temperature must be taken into account (e.g. 32 A for 55 m ELSR-Ramp (–10 °C).
- Residual current device (RCD) 30 mA required, max. 500 m heating cable per RCD.

Remark

- For the use of standard control cabinets, the maximum heating circuit length of 55 m at 32 A per heating circuit must not be exceeded.

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

At a Glance

Applications

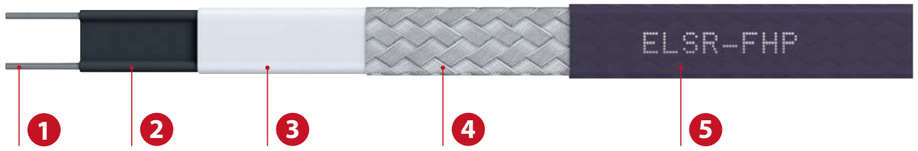
- Cryogenic Storage Tanks

Benefits

- Highly robust
- Suitable for harsh installed environment
- Flexible mounting
- Waterproof

Approvals

Type ELSR-FHP
up to 110 °C



1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	
4	**Protection**	Protective braid (Cu, tin plated)
5	**Outer jacket**	Fluoropolymer

Checklist ELSR-FHP

B + C Power Connection & End Termination		
EL-ECN	End termination kit for ELSR-FHP	09112N1
ELVB-SRA-25	Power connection, glued, Gland M25 x 1,5, PE	091A010
D Junction Boxes		
ELAK-2	104 x 104 x 70 mm, polycarbonate, breakouts 7x M25, IP 66	0920030
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
ELAK-5.1	130 x 130 x 75 mm, polycarbonate, breakouts 9x M20/M25, IP 66	0920002

› Further accessories on pages 36 - 45.

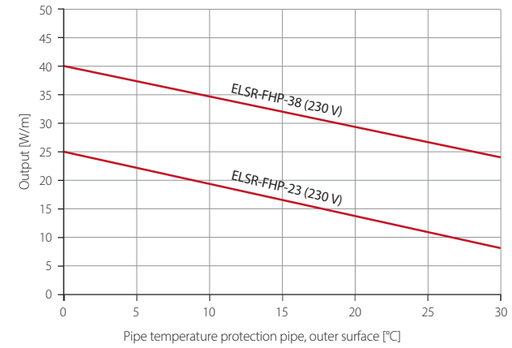
Technical Information

Maximum maintain temperature	80 °C (ELSR-FHP-38) 65 °C (ELSR-FHP-23)
Maximum exposure temperature (de-energized)	110 °C (ELSR-FHP-38) 80 °C (ELSR-FHP-23)
Nominal voltage	230 V
Bending radius, min.	50 mm
Installation temperature, min.	– 45 °C

Heating circuit lengths on the following conditions

- 230 V nominal voltage
- Delayed action circuit breakers (C-characteristic) with 80 % maximum load
- Maximum 10 % line voltage drop on heating cable bus wire
- Power connection to one heater end, in 25 mm/1" conduit

ELSR-FHP-...-2 output
(in empty metallic protection pipes 1")



Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-FHP-23	Heating circuit length (m) for ELSR-FHP-38
-5	10	30.0	23.0
	16	48.5	36.5
	20	60.5	45.5
	25	75.5	57.5
	32	97.0	72.5
	40	121.0	91.5
-15	10	23.0	21.5
	16	37.0	34.5
	20	46.0	43.0
	25	57.5	54.0
	32	74.5	68.5
	40	92.0	85.5

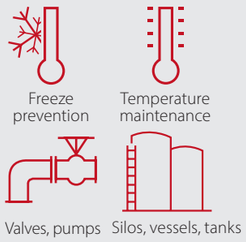
Heating circuit lengths may vary in specific installation situations. Please contact our engineers for more details.

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Part No.
ELSR-FHP-23	23 W/m at 5 °C	14,0 x 5,5	155	B02FHP23
ELSR-FHP-38	38 W/m at 5 °C	14,0 x 5,5	155	B02FHP38

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

At a Glance

Applications



- Chemistry and Petrochemistry
- Oil and Gas Industry
- Power plants
- Water and sanitation utilities

Benefits

- Seven nominal outputs
- Moisture proof
- Resistant to chemicals
- Use in hazardous areas

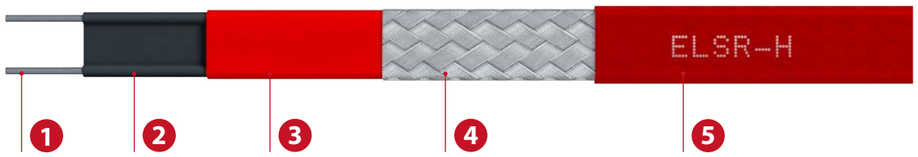
Design

BOT

Approvals

- Trace Heater classification
  II 2G Ex 60079-30-1 IIC Gb
  II 2D Ex 60079-30-1 IIIC Db
- System classification
  II 2G Ex 60079-30-1 eb IIC T3 Gb
  II 2D Ex 60079-30-1 tb IIIC T200°C Db
- Certification
  EPS IECEx 12.0004U
  EPS IECEx 19.0006X
  EPS 12 ATEX 1 429 U
  EPS 19 ATEX 1013 X
- Temperature class
  T6 to T3
- * Use in Ex areas is permitted up to 180 °C

Type ELSR-H
up to 210 °C*



1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	Fluoropolymer
4	**Protection**	Protective braid (Cu, tin plated)
5	**Outer jacket**	Fluoropolymer

Checklist ELSR-H

B + C Power Connection & End Termination

EL-ECSH-Ex	Silicone termination cap, red, glued, with ex marking	0X81EH2
Ex-Con-SR	Ex connection sleeve Ø 36 x 210 mm 4J	0X81125
ELVB-SREx-25	Power connection, glued, Gland M25 x 1,5, PE, Ex e	0X81PA1
ELVB-SREx-IT	Power connection, glued, without gland	091AIT1
ELVB-SRAH-Ex-20	Power connection, glued, Gland M20, brass	0X81PHD
ELVB-SRV-H	Connection set, shrink-fit	0911117
ELVB-SRAH-25	Power connection, glued, Gland M25 x 1,5, PE	091A040

D Junction Boxes

ELAK-Ex-2.00	110 x 75 x 57 mm, polyester, IP66, 1 Trace heater, 1 Power cable	0X85200
ELAK-Ex-4.01	122 x 120 x 90 mm, polyester, IP66, 1 - 3 Trace heaters, 1 Power cable	0X85401
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
Ex-it-R	ø 150 x 125 mm, 3 heaters, 1 Pt100 power supply lead, incl. mounting stand, IP 65	0X80070

› Further accessories on pages 36 - 45.

Technical Information

Maximum maintain temperature	120 °C
Maximum exposure temperature (de-energized)	210 °C (max. 1000 h)
Nominal voltage**	230 V
Bending radius, min.	25 mm
Installation temperature, min.	– 60 °C

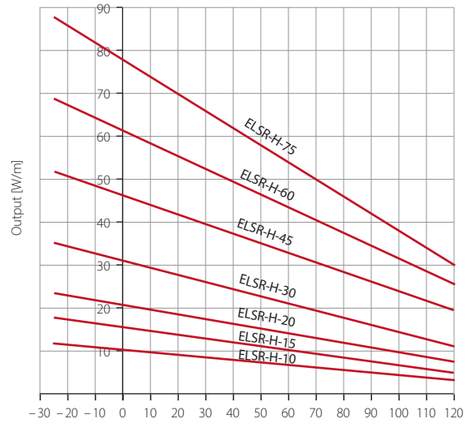
** Further power inputs on request

Heating circuit lengths on the following conditions

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

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Part 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-30-2-BOT	30 W/m at 10 °C	12.4 x 5.0	120	B0221303
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

ELSR-H-...-2-BOT output
(on insulated metallic pipes according to 62395-1)



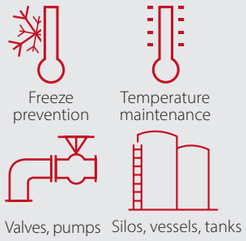
Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-H-10-2	ELSR-H-15-2	ELSR-H-20-2	ELSR-H-30-2
10	16	193.0	158.0	122.0	82.0
	20	193.0	158.0	136.0	102.0
	25	193.0	158.0	136.0	111.0
	32	193.0	158.0	136.0	111.0
0	16	189.0	153.0	116.0	77.0
	20	189.0	153.0	132.0	97.0
	25	189.0	153.0	132.0	108.0
	32	189.0	153.0	132.0	108.0
-10	16	184.0	146.0	110.0	73.0
	20	1840.	148.5	129.0	92.0
	25	1840.	148.5	129.0	105.5
	32	184.0	148.5	129.0	105.5
-20	16	180.0	139.0	104.0	70.0
	20	180.0	145.0	125.5	87.0
	25	180.0	145.0	125.5	103.0
	32	180.0	145.0	125.5	103.0
-40	16	173.0	126.0	95.0	64.0
	20	173.0	138.0	119.0	80.0
	25	173.0	138.0	120.0	98.0
	32	173.0	138.0	120.0	98.0

Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-H-45-2	ELSR-H-60-2	ELSR-H-75-2
10	16	55.0	41.0	33.0
	20	68.0	51.0	41.5
	25	85.0	64.0	51.5
	32	91.0	79.0	66.0
0	16	52.0	39.0	30.0
	20	65.0	49.0	37.5
	25	81.0	61.0	47.0
	32	88.5	77.0	60.0
-10	16	50.0	37.0	28.5
	20	62.0	46.0	35.5
	25	77.0	58.0	44.5
	32	86.5	70.0	57.0
-20	16	47.0	36.0	26.5
	20	59.0	44.0	33.5
	25	74.0	56.0	41.5
	32	84.5	67.0	53.5
-40	16	43.0	33.0	23.5
	20	54.0	41.0	29.0
	25	68.0	51.0	36.5
	32	81.0	61.0	46.5

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

At a Glance

Applications



- Chemistry and Petrochemistry
- Oil and Gas Industry
- Power plants

Benefits

- Temperature classification T3*
- Five nominal outputs
- Moisture proof
- Resistant to chemicals
- Use in hazardous areas

*Except for 90 W/m: T2

Design

BOT

Approvals

- Trace Heater classification
  II 2G Ex 60079-30-1 IIC Gb
  II 2D Ex 60079-30-1 IIIC Db
- System classification
  II 2G Ex 60079-30-1 eb IIC T2 Gb
  II 2D Ex 60079-30-1 tb IIIC T220°C Db
- Certification
  EPS IECEx 18.0019U
  EPS IECEx 18.0014X
  EPS 18 ATEX 1 028 U
  EPS 18 ATEX 1 020 X
- Temperature class
  T3/T2

Type ELSR-SH
up to 250 °C

1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	Fluoropolymer
4	**Protection**	Protective braid (Nickel plated copper)
5	**Outer jacket**	Fluoropolymer

Checklist ELSR-SH

B + C Power Connection & End Termination

ELVB-SREx-25	Power connection, glued, Gland M25 x 1,5, PE, Ex e	0X81PA1
ELVB-SREx-IT	Power connection, glued, without gland	091AIT1
EL-ECSH-Ex	Silicone termination cap, red, glued, with ex marking	0X81EH2
ELVB-SRASH-Ex-20	Power connection, glued, Gland M20, Ex d	0X81PSD
ELVB-SRAH-25	Power connection, glued, Gland M25 x 1,5, PE	091A040

D Junction Boxes

ELAK-Ex-2.00	110 x 75 x 57 mm, polyester, IP66, 1 Trace heater, 1 Power cable	0X85200
ELAK-Ex-4.01	122 x 120 x 90 mm, polyester, IP66, 1 - 3 Trace heaters, 1 Power cable	0X85401
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
Ex-it-R	ø 150 x 125 mm, 3 heaters, 1 Pt100 power supply lead, incl. mounting stand, IP 65	0X80070

› Further accessories on pages 36 - 45.

Technical Information

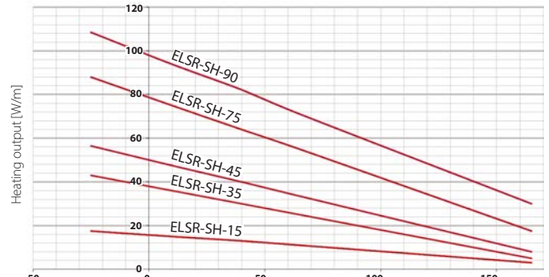
Maximum maintain temperature	165 °C
Maximum exposure temperature (de-energized)	250 °C
Nominal voltage	230 V
Bending radius, min.	25 mm
Installation temperature, min.	– 60 °C

Heating circuit lengths on the following conditions

- 230 V nominal voltage
- Delayed action circuit breakers (C-characteristic) with 100 % load
- Maximum 10 % line voltage drop on heating cable bus wire
- Power connection to one heater end

Type	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Part No.
ELSR-SH-15-2-BOT	15 W/m at 10 °C	14 x 5,4	146	B0226153
ELSR-SH-35-2-BOT	35 W/m at 10 °C	14 x 5,4	146	B0226353
ELSR-SH-45-2-BOT	45 W/m at 10 °C	14 x 5,4	146	B0226453
ELSR-SH-75-2-BOT	75 W/m at 10 °C	14 x 5,4	146	B0226753
ELSR-SH-90-2-BOT	90 W/m at 10 °C	14 x 5,4	146	B0226903

ELSR-SH-...-2-BOT output
(on insulated metallic pipes according to 62395-1)



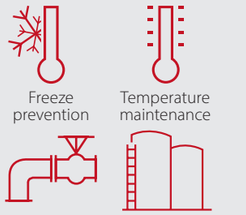
Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-SH 15-2 BOT	35-2 BOT	45-2 BOT	75-2 BOT	90-2 BOT
10	10	113	50.0	36.25	18.75	17.0
	16	172	80.0	58.0	30.0	27.0
	20	172	99.0	72.5	37.5	34.0
	25	172	107.5	90.625	47.0	42.5
	32	172	107.5	98.0	60.0	54.0
	40	172	107.5	98.0	73.0	68.0
0	10	106	47.0	34.5	17.75	16.0
	16	169	75.0	55.0	28.5	26.0
	20	172	94.0	69.0	35.5	32.0
	25	172	107.5	86.25	44.5	40.0
	32	172	107.5	98.0	57.0	52.0
	40	172	107.5	98.0	71.0	64.0
-10	10	99	44.0	32.5	16.5	15.5
	16	159	71.0	52.0	26.5	25.0
	20	172	89.0	65.0	33.0	31.0
	25	172	107.5	81.25	41.25	38.75
	32	172	107.5	98.0	53.0	50.0
	40	172	107.5	98.0	66.0	62.0

Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for ELSR-SH 15-2 BOT	35-2 BOT	45-2 BOT	75-2 BOT	90-2 BOT
-20	10	94	42.0	30.0	15.5	15.0
	16	150	67.0	48.0	25.0	24.0
	20	172	84.0	60.0	31.0	30.0
	25	172	105.0	75.0	38.75	37.5
	32	172	107.5	96.0	50.0	48.0
	40	172	107.5	98.0	62.0	60.0
-30	10	89	40.0	27.5	15.0	14.5
	16	142.5	64.0	44.0	24.0	23.0
	20	172	80.0	55.0	30.0	29.0
	25	172	100.0	68.75	37.5	36.25
	32	172	107.5	88.0	48.0	46.0
	40	172	107.5	98.0	60.0	58.0
-40	10	84	38.0	25.0	14.0	14.0
	16	135	61.0	40.0	22.5	22.0
	20	169	76.0	50.0	28.0	28.0
	25	172	95.0	62.5	35.0	35.0
	32	172	107.5	80.0	45.0	44.0
	40	172	107.5	98.0	56.0	56.0

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

At a Glance

Applications



- Chemistry and Petrochemistry
- Oil and Gas Industry
- Power plants

Benefits

- Temperature classification T3*
- Five nominal outputs
- Moisture proof
- Resistant to chemicals
- Use in hazardous areas
  *Except for 75 W/m: T2

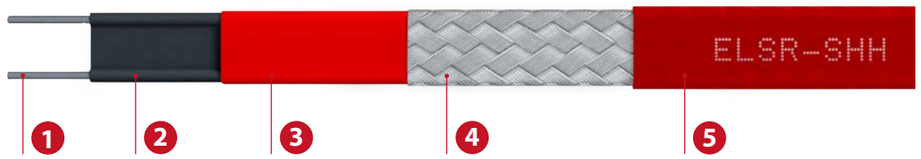
Design

BOT

Approvals

- Trace Heater classification
  II 2G Ex 60079-30-1 IIC Gb
  II 2D Ex 60079-30-1 IIIC Db
- System classification
  II 2G Ex eb IIC T3 Gb
  II 2D Ex tb IIIC T200°C Db
- Certification
  EPS 17 ATEX 1 169 X
  EPS IECEx 17.0064X
  CML20ATEX3171
- Temperature class
  T3/T2

Type ELSR-SHH
up to 250 °C



1	**Bus wire**	Nickel plated copper
2	**Self-regulating heating element**	
3	**Insulation**	
4	**Protection**	Protective braid (Nickel plated copper)
5	**Outer jacket**	Fluoropolymer

Checklist ELSR-SHH

B + C Power Connection & End Termination

ELVB-SREx-25	Power connection, glued, Gland M25 x 1,5, PE, Ex e	0X81PA1
EL-ECSH-Ex	Silicone termination cap, red, glued, with ex marking	0X81EH2

D Junction Boxes

ELAK-Ex-2.00	110 x 75 x 57 mm, polyester, IP66, 1 Trace heater, 1 Power cable	0X85200
ELAK-Ex-4.01	122 x 120 x 90 mm, polyester, IP66, 1 - 3 Trace heaters, 1 Power cable	0X85401
ELAK-5	122 x 120 x 90 mm, polyester, 3 breakouts M25, IP 66	0920013
Ex-it-R	ø 150 x 125 mm, 3 heaters, 1 Pt100 power supply lead, incl. mounting stand, IP 65	0X80070

› Further accessories on pages 36 - 45.

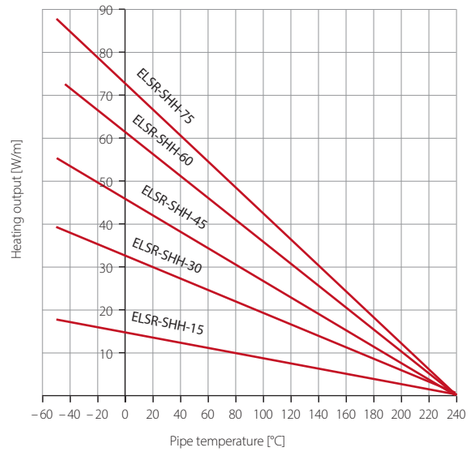
Technical Information

Maximum maintain temperature	250 °C
Maximum exposure temperature (de-energized)	250 °C
Nominal voltage	230 V
Bending radius, min.	35 mm
Installation temperature, min.	– 40 °C

Heating circuit lengths on the following conditions

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

ELSR-SHH-...-2-BOT output
(on insulated metallic pipes according to 62395-1)



Switch-on temperature (°C)	Nominal cutout value (A)	Heating circuit length (m) for 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	Nominal output	Dimensions approx. (mm)	Weight approx. (g/m)	Part No.
ELSR-SHH-15-2-BOT	15 W/m at 10 °C	12,1 x 5,4	146	B0HH1153
ELSR-SHH-30-2-BOT	30 W/m at 10 °C	12,1 x 5,4	146	B0HH1303
ELSR-SHH-45-2-BOT	45 W/m at 10 °C	12,1 x 5,4	146	B0HH1453
ELSR-SHH-60-2-BOT	60 W/m at 10 °C	12,1 x 5,4	146	B0HH1603
ELSR-SHH-75-2-BOT	75 W/m at 10 °C	12,1 x 5,4	146	B0HH1753

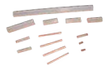
+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

Accessories
Self-Regulating Trace Heater System

B* – Power Connection Kits

	Type	suitable for ELSR	Ex	Description	Ambient temperature	Part No.
	EI-Clic P	**-N, -LS, -W**		Fast connector with integrated cold lead	-40 °C to +100 °C	09ClicP
	EI-Clic S	**-N, -LS, -W**		Fast connector T-splice	-40 °C to +100 °C	09ClicS
	ELVB-SRA-25	**-N, -LS, -W, -FHP**		Power connection, glued, Gland M25 x 1,5, PE	+65 °C	091A010
	ELVB-SRAH-25	**-H, -SH**		Power connection, glued, Gland M25 x 1,5, PE	+165 °C	091A040
	ELVB-SRAM-25	**-M**		Power connection, shrink-fit, Gland M25 x 1,5, PE	+65 °C	091A015
	ELVB-SRAR-25	**-R**		Power connection, shrink-fit, Gland M25 x 1,5, PE	+65 °C	091A020
	ELVB-SRAN-Ex-20	**-N, -FHP**	●	Power connection, glued, Gland M20, brass, Ex d	-60 °C to +180 °C	0X81PND
	ELVB-SRAL-Ex-20	**-LS**	●	Power connection, glued, Gland M20, brass	-60 °C to +180 °C	0X81PLD
	ELVB-SRAH-Ex-20	**-H, -SH, -SHH**	●	Power connection, glued, Gland M20, brass	-60 °C to +180 °C	0X81PHD
	ELVB-SRASH-Ex-20	**-SH**	●	Power connection, glued, Gland M20, Ex d	-60 °C to +180 °C	0X81PSD
	ELVB-SREx-25	**-N, -LS, -H, -FHP**	●	Power connection, glued, Gland M25 x 1,5, PE, Ex e	-25 °C to +70 °C	0X81PA1
	ELVB-SREx-IT	**-N, -H**	●	Power connection, glued, without gland	-60 °C to +180 °C	091AIT1
	ELVB-SRV-N-L-W	**-N, -LS, -W**		Connection set, shrink-fit	+65 °C	0911116
	ELVB-SRV-M	**-M, -R**		Connection set, shrink-fit	+65 °C	0911122

B* – Power Connection Kits

	Type	suitable for ELSR	Ex	Description	Ambient temperature	Part No.
	ELVB-SRV-H	**-H, -SH, -SHH**		Connection set, shrink-fit	+100 °C	0911117
	ELVB-SRV-Ramp	**-Ramp**		Connection set, shrink-fit	+100 °C	0911124
	Ex-Con-SR	**-N, -LS, -H, -SH, -SHH**	●	Ex connection sleeve Ø 36 x 210 mm 4J	-32 °C to +200 °C	0X81125
	ELVB-70	**-M-AF/BF**		Cable gland MS 3/4", brass, approved for drinking water	+65 °C	0911703
	ELVB-71	**-M-AF/BF**		Y-connector 32 mm, brass, approved for drinking water	+65 °C	0911704
	M20	**-N, -H**	●	Ex-d cable gland, brass, fits Y-connector	-60 to +180 °C	2572020003

C* – End Termination Kits

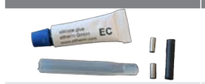
	Type	suitable for ELSR	Ex	Description	Ambient temperature	Part No.
	EL-ECSH-ex	**-H, -SH, -SHH**	●	Silicone termination cap red, glued, with ex marking	-60 °C to +250 °C	0X81EH2
	EL-ECL	**-LS**		Silicone termination cap transparent, glued	-45 °C to +85 °C	09112L1
	EL-ECL-ex	**-LS**	●	Silicone termination cap black, glued, with ex marking	-60 °C to +135 °C	0X81EL1
	EL-ECN-ex	**-N**	●	Silicone termination cap black, glued, with ex marking	-60 °C to +135 °C	0X81EN1
	EL-ECN	**-N, -FHP**		Silicone termination cap transparent, glued	-45 °C to +85 °C	09112N1
	EL-ECM	**-M, -R**		Silicone termination cap transparent, glued	-45 °C to +85 °C	09112M1

*Category letters refer to the Checklists on p. 9 and the respective datasheet.

+44 (0) 191 410 4292 hpsales@thorneandderrick.co.uk heatingandprocess.com

Accessories
Self-Regulating Trace Heater System

C* – End Termination Kits

	Type	suitable for ELSR	Ex	Description	Ambient temperature	Part No.
	EL-ECMF	**-M-AF/BF**		Silicone termination cap transparent, glued, potable water	-45 °C to +85 °C	09112MF
	EL-ECW	**-W**		Silicone termination cap transparent, glued	-45 °C to +85 °C	09112W1
	EL-ECRA	**-Ramp**		Silicone termination cap transparent, glued	-45 °C to +85 °C	09112RA
	Ex-It-S	**-N, -LS, -H**	●	Heating circuit extension with blind cap, IP65	-60 °C to +55 °C	0X8ITS0
	Ex-It-L	**-N, -LS, -H**	●	Heating circuit termination with LED signal light, IP65	-60 °C to +55 °C	0X8ITLG
	ELHKV-E1-1	**all**		Heating circuit manifold, 1 circuit		0640001
	ELHKV-E1-2	**all**		Heating circuit manifold, 2 circuits		0640002
	ELHKV-St-3	**all**		Heating circuit manifold, 3 circuits		0640003
	ELHKV-St-6	**all**		Heating circuit manifold, 6 circuits		0640006
	ELHKV-St-9	**all**		Heating circuit manifold, 9 circuits		0640009
	ELHKV-St-12	**all**		Heating circuit manifold, 12 circuits		0640012

D* – Junction Boxes

	Type	suitable for ELSR	Ex	Description	Ambient temperature	Part No.
	ELAK-2	**all**		104 x 104 x 70 mm, polycarbonate, IP 66, up to 3 heaters, cable gland 1x M25, stamp 7x M20/M25	-40 °C to +70 °C	0920030
	ELAK-5	**all**		122 x 120 x 90 mm, polyester, IP 66, up to 2 heaters, cable gland 3x M25	-40 °C to +90 °C	0920013
	ELAK-5.1	**all**		130 x 130 x 75 mm, polycarbonate, IP 66, up to 3 heaters, stamp 9x M20/M25	-35 °C to +80 °C	0920002
	ELAK-5.7	**all**		122 x 120 x 90 mm, polyester, grey, IP 65, up to 3 heaters, cable gland 1x M25, holes 3x M25	-40 °C to +90 °C	0920014

*Category letters refer to the Checklists on p. 9 and the respective datasheet.

D* – Junction Boxes

	Type	suitable for ELSR	Ex	Description	Ambient temperature	Part No.
	ELAK-5.8	**all Pt100 temperature sensors**		122 x 120 x 90 mm, polyester, grey, IP 65, cable gland 2x M25 1x M16, holes 1x M16	-40 °C to +90 °C	0920015
	ELAK-Ex-2.00	**all**	●	110 x 75 x 57 mm, polyester, IP66, 1 Trace heater, 1 Power cable	-40 °C to 50/55/60 °C	0X85200
	ELAK-Ex-4.01	**all**	●	122 x 120 x 90 mm, polyester, IP66, 1 - 3 Trace heaters, 1 Power cable	-40 °C to 50/55/60 °C	0X85401
	ELAK-Ex-3.8	**all Pt100 temperature sensors**	●	122 x 120 x 90, 1-2 Pt100, max. 2,5 mm², IP66, cable gland 1x M25 2x M12	-40 °C to +60 °C	0X80058
	ELAK-Ex-R5	**all**	●	ø 150 x 125 mm, 1 heater, IP 65, cable gland 1x M25, 1x M20, holes 1x M25, 1x M16	-40 °C to +60 °C	0X80075
	ELAK-Ex-R7	**-N, -LS, -H, -SH, -SHH**	●	ø 150 x 125 mm, 1-3 heaters, power supply lead max. 6 mm², IP 65, cable gland 1x M25, holes 3x M25	-40 °C to +50 °C	0X80077
	ELAK-Ex-R8	**all Pt100 temperature sensors**	●	ø 150 x 125 mm, 1-2 Pt100, max. 2,5 mm², IP 65, cable gland 1x M25 2x M12	-40 °C to +50 °C	0X80078
	Ex-it-R	**-N, -LS, -H, -SH, -SHH**	●	ø 150 x 125 mm, 3 heaters, 1 Pt100 power supply lead, incl. mounting stand, IP 65, cable gland 1x M25	-20 °C to +50 °C	0X80070
	Ex-it-R-T	**-N, -LS, -H, -SH, -SHH**	●	ø 150 x 125 mm, 3 heaters, incl. mounting stand, IP 65, cable gland 1x M25	-20 °C to +50 °C	0X80082
	Ex-it-R-ELTF	**all Pt100 temperature sensors**	●	150 x 125 mm, 1 Pt100, 1 sensor cable, incl. mounting stand, IP 65, cable gland 1x M20	-20 °C to +50 °C	0X80092
	ELAK-RS-T	**-N, -LS, -W, -H**		150 x 125 mm, twin Pt100, 3 heaters incl. mounting stand, IP 65, cable gland 1x M25	-45 °C to +50 °C	0920059
	ELAK-RS	**-N, -LS, -W, -H, -SH, -SHH**		150 x 125 mm, incl. mounting stand, IP 65, cable gland 1x M25, holes 1x M25 1x M20	-45 °C to +50 °C	0920050

Accessories
Self-Regulating Trace Heater System

E* – Pipe Mounting Bracket

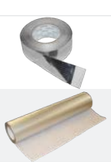
	Type	suitable for ELSR	Ex	Description	Part No.
	ELB-13V1	**all**	●	Tightening strap, threaded, 11 mm, 30 m, Mat. 1.4301	2723001010
	ELB-13V2	**all**	●	Turnbuckle 1.4301 (selling unit 10 pieces), Mat. 1.4301	0930042
	ELB-15.04	**all**	●	Hose clamp, 25 - 40 mm, Mat. 1.4301	2723001025
	ELB-15.06	**all**	●	Hose clamp, 40 - 60mm, Mat. 1.4301	2723001040
	ELB-15.09	**all**	●	Hose clamp 40 - 90 mm (DN 25-65), Mat. 1.4301	2723040090
	ELB-15.11	**all**	●	Hose clamp, 50 - 110 mm, Mat. 1.4301	2723050110
	ELB-15.288	**all**	●	Hose clamp, 60 - 288 mm, Mat. 1.4301	2723060288
	ELB-15.650	**all**	●	Hose clamp, 60 - 650 mm, Mat. 1.4301	2723060650
	ELB-18	**all**	●	Assembly and fastening plate for gutters, 290 x 30 x 1,5 mm, Mat. 1.4301	0930040
	ELB-20	**all**	●	Mounting bracket 90° for downpipes, Mat. 1.4301	0930043
	ELB-21	**all**	●	Mounting profile for gutters, Mat. 1.4301, 290 mm long	0930044
	ELB-22	**all**	●	PE mounting profile for trace heaters, spacing 25 mm	0942000
	ELMW-6	**ELAK-2**	●	Support bracket, 85 x 85 mm, Mat. 1.4301	0941006
	ELMW-Ex-Box	**Ex-Box REG / Ex-Box-LIM**	●	Support bracket, 185 x 185 mm, Mat. 1.4301	0941072

*Category letters refer to the Checklists on p. 9 and the respective datasheet.

E* – Pipe Mounting Bracket

	Type	suitable for ELSR	Ex	Description	Part No.
	ELMW-CT	**EL-CT...**	●	Support bracket, Mat. 1.4301	0941025
	ELMW-GP1	**ELT-GP 1**	●	Support bracket 175 x 125 mm, Mat. 1.4301	0941020
	EL-VSB 300	**all**	●	Variable support bracket, height adjustable from 180 - 300 mm, Mat. 1.4301	0941085
	EL-VSB 400	**all**	●	Variable support bracket, height adjustable from 280 - 400 mm, Mat. 1.4301	0941086

F* – Fasteners and Self-Adhesive Tapes, Foils

	Type	suitable for ELSR	Ex	Description	max. Operating temperature	Part No.
	ELB-02A	**all**	●	Adhesive tape, glass silk 30 m x 12 mm	+180 °C	2486800126
	ELB-02B	**all**	●	Adhesive tape, glass silk 50 m x 12 mm	+180 °C	2486800130
	ELB-06	**all**	●	Aluminium foil, 50 m x 75 mm, self-adhesive	-40 °C to +140 °C	0942200
	ELB-06D	**all**	●	Aluminium foil 100 m x 75 mm, self-adhesive	-40 °C to +140 °C	2701900076
	ELB-06C	**all**	●	Aluminium foil 50 m x 50 mm, reinforcement grid, -40 ... +80 °C	-40 °C to +130 °C	2701900051
	ELB-06E	**all**	●	Aluminium foil 50 m x 536 mm, self-adhesive	+150 °C	2701900500
	ELB-16.10	**all**	●	Plastic tightening straps 100 x 2,5 mm, black, UV resistant, selling unit = 100 pcs.	+85 °C	2796000001
	ELB-16.20	**all**	●	Plastic tightening straps 200 x 3,6 mm, black, UV resistant, selling unit = 100 pcs.	+85 °C	2796000002
	ELB-16.36	**all**	●	Plastic tightening straps 360 x 4,8 mm, black, UV resistant, selling unit = 100 pcs.	+85 °C	2796000003

Accessories
Self-Regulating Trace Heater System

G* – Insulation Bushing

	Type	suitable for ELSR	Ex	Description	Part No.
	ELISD-1.12	**all temperature sensors**	●	Cover plate aluminium, 70 x 70 mm, Ø seal area 3,5 - 7 mm, 1 x M12 x 1,5	0921011
	ELISD-1.16	**all temperature sensors**	●	Cover plate aluminium, 70 x 70 mm, Ø seal area 4,5 - 10 mm, 1 x M16	0921015
	ELISD-1.20	**all connections**	●	Cover plate aluminium, 70 x 70 mm, Ø seal area 7 - 13 mm, 1 x M20	0921019
	ELISD-1.25	**all connections**	●	Cover plate aluminium, 70 x 70 mm, Ø seal area 9 - 17 mm, 1 x M25	0921023
	ELISD-R1	**-N, -LS, -W, -SH**	●	Cover plate aluminium, 70 x 70 mm	0921035
	ELISD-R5	**-M, -R**	●	Cover plate aluminium, 70 x 70 mm	0921101
	ELISD-R4	**-H, -SHH**	●	Cover plate aluminium, 70 x 70 mm	0921047

H* – Warning Signs

	Type	suitable for ELSR	Ex	Description	Part No.
	EL-WS01D	**all**	●	German "Elektrische Begleitheizung"	2986900002
	EL-WS01E	**all**	●	English "Electrical Heat Tracing"	2986900012
	EL-WS01F	**all**	●	French "Traçage Electrique"	2986900032
	EL-WS01R	**all**	●	Russian "Electrical Heat Tracing"	2986900013
	EL-WS01I	**all**	●	Italian "Electrical Heat Tracing"	2986900089

I* – Temperature Controllers

	Type	suitable for ELSR	Ex	Description	Operating temperature	Part No.
	ELTC 05	**all**		Electronic temperature controller, Frostcontrol, 1 relay	-30 °C to +50 °C	0610002
	ELTC-14	**all**		Electronic temperature controller with display	-25 °C to +55 °C	0620000
	ELTC-14P	**all**		Proportional electronic temperature controller with display	-30 °C to +60 °C	0620010
	ELTC-15	**all**		Electronic temperature controller with display and ramp mode	-25 °C to +55 °C	0621500
	ELTC-21	**all**		Electronic temperature controller with display, on rail	-25 °C to +55 °C	0610093
	ELTC-22	**all**		Electronic temperature controller with display, on rail	-25 °C to +55 °C	0610094
	ELTC-24P	**all**		Proportional electronic temperature controller with display	-30 °C to +60 °C	0620011
	ELTC-41	**all**		Micro-processor temperature cont-roller with display, front installation	-25 °C to +55 °C	0620041
	ELTC-42	**all**		Micro-processor temperature cont-roller with display, front installation	-25 °C to +55 °C	0620042
	ELTC-W	**-W**		Water Comfort System, power controller	-25 °C to +65 °C	0630000
	ELTC-MV2	**all**		Electronic temperature controller Moduvise, Top-hat rail	-25 °C to + 55 °C	0611135
	Ex-Box REG/DIS	**all**	●	Electronic temperature controller with display	-30 °C to +60 °C	0X60020
	Ex-Box REG/LED	**all**	●	Electronic temperature controller with LED	-30 °C to +60 °C	0X60021
	Ex-Box LIM/LED	**all**	●	Electronic temperature limiter with LED	-30 °C to +60 °C	0X60023
	Ex-Box LIM/DIS	**all**	●	Electronic temperature limiter with display	-30 °C to +60 °C	0X60024

Accessories
Self-Regulating Trace Heater System

I* – Temperature Controllers

	Type	suitable for ELSR	Ex	Description	Operating temperature	Part No.
	ISD-1	all		Ice and snow sensor for gutters, including sensor devices	-10 °C to +50 °C	0620623
	ISD-1.1	all		Ice and snow sensor for gutters, including sensor devices	-10 °C to +50 °C	0620624
	EL-CT 50	all	●	Capillary thermostat	0 °C to +50 °C	0X63050
	EL-CT 30	all	●	Capillary thermostat	-50 °C to +30 °C	0X63030
	Ex-TC/A-It	alle	●	Temperature Controller with Alarm Function, pipe mounting	-40 °C to +50 °C	0X60101
	Ex-TC/A-W	all	●	Temperature Controller with Alarm Function, wall mounting	-40 °C to +50 °C	0X60103
	Ex-TC/AL-It	all	●	Temperature Controller and Limiter with Alarm Function, pipe mounting	-40 °C to +50 °C	0X60121
	Ex-TC/AL-W	all	●	Temperature Controller and Limiter with Alarm Function, wall mounting	-40 °C to +50 °C	0X60123
	Ex-TC/M-It	all	●	Temperature Controller with Mod-bus communication, pipe mounting	-40 °C to +50 °C	0X60131
	Ex-TC/M-W	all	●	Temperature Controller with Mod-bus communication, wall mounting	-40 °C to +50 °C	0X60133

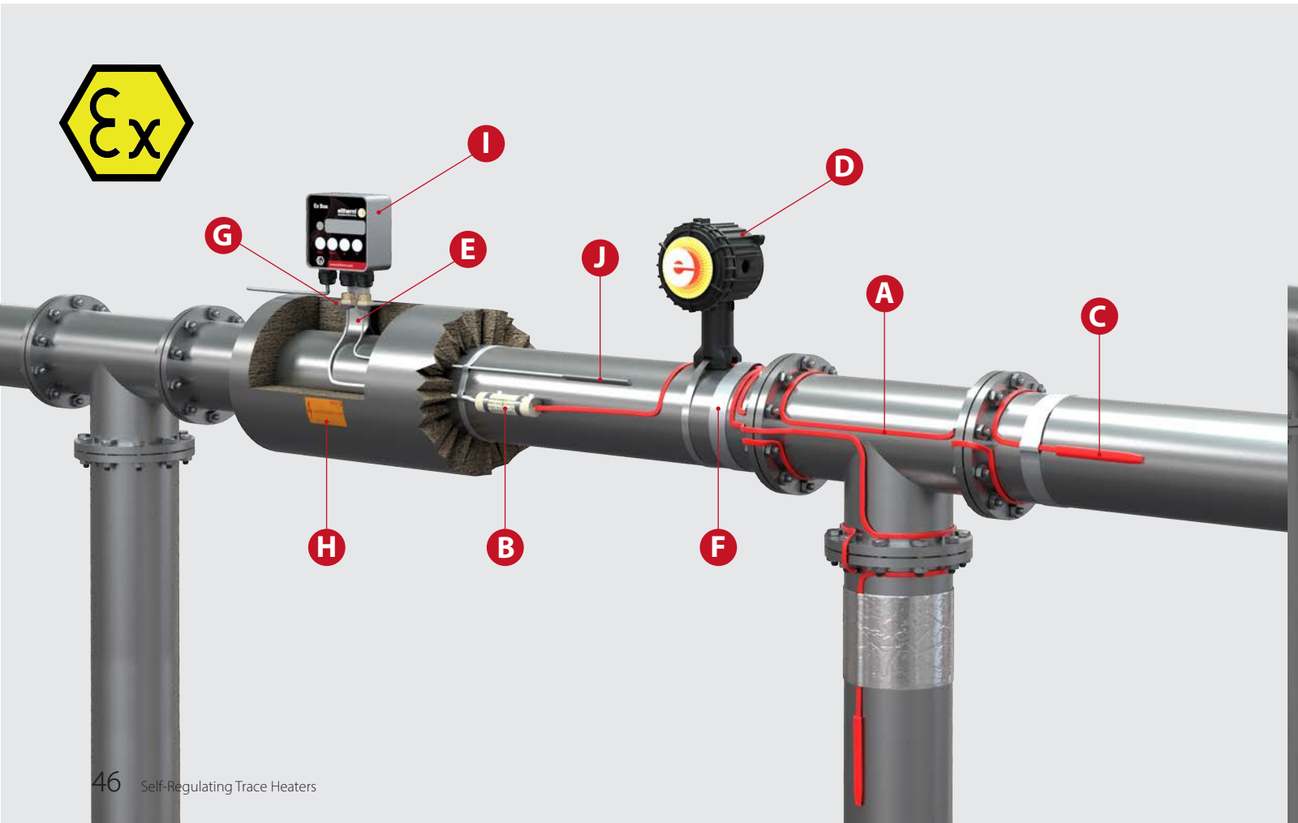
J* – Temperature Sensors

	Type	suitable for ELSR	Ex	Description	Operating temperature	Part No.
	ELTF-PT.1	all		Pt100, 5 x 50 mm PVC 5 m	-30 °C to +80 °C	0650001
	ELTF-PT.15	all		Pt100, 3-Leiter, 5x50 mm, PTFE 3,0 m, IP67	-50 °C to +260 °C	0650070
	ELTF-PT.2	all		Doppel-Pt100, 3-Leiter, 5x50 mm, PFA 3,0 m, IP65	-50 °C to +260 °C	0650072
	ELTF-PT.3	all		Pt100, 2 conductors, 5 x 50 mm, 3 m PTFE cable	-50 °C to +250 °C	0650003
	ELTF-PT.3.1	all		Pt100, 3 conductors, 5 x 50 mm, 3 m PFA cable	-50 °C to +250 °C	0650002
	ELTF-PTEx.2	all	●	Pt100, 4 conductors, 3 m PTFE cable	-45 °C to +235 °C	0X70002
	ELTF-PTEx.4	all	●	2x Pt100, 3 conductors, 3 m cold lead	-45 °C to +235 °C	0X70030
	ISD-STH	all		Temperature- / moisture sensor for gutters	-40 °C to +85 °C	TBC0001

Exemplary presentation
Self-Regulating Trace Heaters

in Hazardous Areas

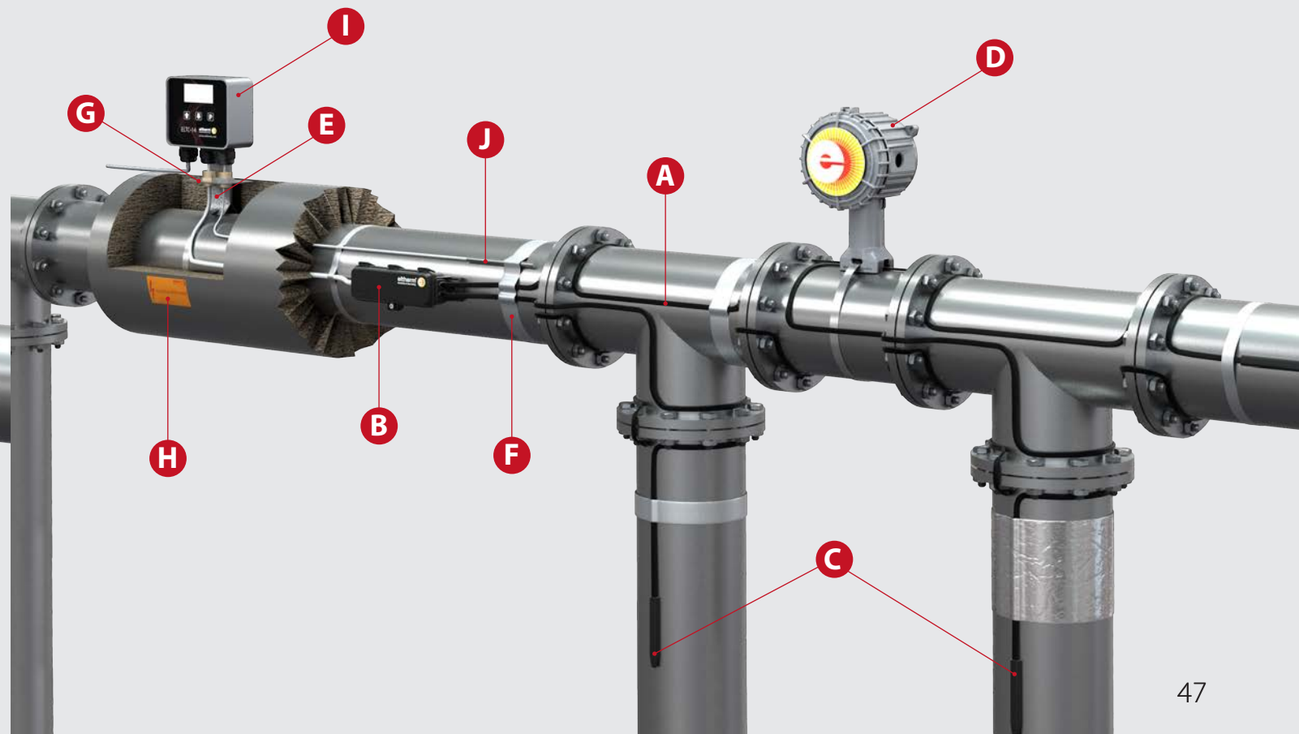
A	**Trace Heater**	ELSR-N, -LS, -H, -SH, -SHH
B	**Connection Kit**	e. g. Ex-Con-SR (or ELVB...Ex...)
C	**End Termination Kit**	EL-EC...ex
D	**Junction Box**	e. g. Ex-it-R (or ELAK-Ex-...)
E	**Pipe Mounting Fitting**	ELMW-..., ELB-...
F	**Fasteners and Self-adhesive Tapes, Foils**	ELB-...
G	**Insulation Bushing**	ELISD-...
H	**Warning Sign**	EL-WS...
I	**Temperature Controller**	e. g. Ex-Box Temperature Controller
J	**Temperature Sensor**	



in Non-Hazardous Areas

A	**Trace Heater**	ELSR-N, -LS, - M, -M-AF/BF, -R, -W, - Ramp, -FHP, -H, -SH, SHH
B	**Connection Kit**	e. g. El-Clic-P (or ELVB-...)
C	**End Termination Kit**	EL-EC...
D	**Junction Box**	e. g. ELAK-RS
E	**Pipe Mounting Fitting**	ELMW-..., ELB-...
F	**Fasteners and Self-adhesive Tapes, Foils**	ELB-...
G	**Insulation Bushing**	ELISD-...
H	**Warning Sign**	e. g. ELTC-14 Temperature Controller
I	**Temperature Controller**	ELTF-...
J	**Temperature Sensor**	

This is just a schematic overview, not an installation instruction. For detailed information, please contact our engineers.



Design Guide
Self-Regulating Trace Heater System

Table 1: Design guide freeze prevention +5 °C for self-regulating trace heaters, type series ELSR-N-10…40-2-BO(T)

Pipe size	Inches: DN	1/2 15	3/4 20	1 25	1 1/4 32	1 1/2 40	2 50	2 1/2 65	3 80	4 100	5 125	6 150	7 175	8 200	9 225	10 250	12 300
Insulation thickness (mm)	Ambient temperature, min. (°C)	Heating cable Type ELSR-N-10...40-2-BO(T)															
10	– 15	10	10	20	20	20	30	30	30	40	2x30	2x30	2x40	2x40	2x40	3x30	3x40
	– 20	10	20	20	20	30	30	40	40	2x30	2x30	2x40	2x40	3x30	3x40	3x40	4x40
	– 25	10	20	20	30	30	40	40	2x30	2x30	2x40	2x40	3x40	3x40	3x40	4x40	4x40
20	– 15	10	10	10	10	10	20	20	20	30	30	30	40	40	40	2x30	2x30
	– 20	10	10	10	10	20	20	20	30	30	30	40	2x30	2x30	2x30	2x30	2x40
	– 25	10	10	20	20	30	30	30	30	40	40	2x30	2x30	2x30	2x30	2x40	2x40
30	– 15	10	10	10	10	10	10	10	20	20	20	20	30	30	30	40	40
	– 20	10	10	10	10	10	20	20	20	20	20	20	30	40	40	40	2x30
	– 25	10	10	10	10	20	20	30	20	30	30	30	40	40	2x30	2x30	2x30
40	– 15	10	10	10	10	10	10	10	10	20	20	20	20	20	30	30	30
	– 20	10	10	10	10	10	10	20	20	20	20	20	30	30	30	30	40
	– 25	10	10	10	10	10	20	20	20	20	20	20	30	30	40	40	2x30
50	– 15	10	10	10	10	10	10	10	10	10	20	20	20	20	20	20	30
	– 20	10	10	10	10	10	10	10	10	20	20	20	20	30	30	30	30
	– 25	10	10	10	10	10	10	20	20	20	20	20	30	30	30	30	40
60	– 15	10	10	10	10	10	10	10	10	10	10	20	20	20	20	20	20
	– 20	10	10	10	10	10	10	10	10	20	20	20	20	20	20	30	30
	– 25	10	10	10	10	10	10	10	20	20	20	20	20	30	30	30	30
80	– 15	10	10	10	10	10	10	10	10	10	10	10	20	20	20	20	20
	– 20	10	10	10	10	10	10	10	10	10	10	20	20	20	20	20	20
	– 25	10	10	10	10	10	10	10	10	20	20	20	20	20	20	20	30
100	– 15	10	10	10	10	10	10	10	10	10	10	10	10	10	20	20	20
	– 20	10	10	10	10	10	10	10	10	10	10	10	20	20	20	20	20
	– 25	10	10	10	10	10	10	10	10	10	20	20	20	20	20	20	20

Basis: Thermal conductivity of the insulation 0.04 W/mK; increased factor of safety 20 %

Table 2: Trace heater additions (m) for

DN	15	20	25	32	40	50	65	80	100	125	150	175	200	225	1250	300
Pair of flanges	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8
Flanged fitting	0.4	0.4	0.4	0.55	0.55	0.55	0.55	0.55	1.5	2.0	2.4	2.4	2.4	2.4	2.4	2.4
Pumps	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	5.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0

For non-insulated pipe supports: Heating pipe allowance = **4 x support width**. Per heating pipe connection in the terminal box / thermostat: Heating pipe allowance **approx. 0.5 m**. **Attention:** If there is multiple laying of the heating pipes, the allowances above must be correspondingly multiplied.

eltherm designer
Request the design software via our website!

Table 3: Heat loss of pipelines in W/m at 10 °K temperature difference

Pipe size	Inches: DN	1/2 15	3/4 20	1 25	1 1/4 32	1 1/2 40	2 50	2 1/2 65	3 80	4 100	5 125	6 150	7 175	8 200	9 225	10 250	12 300
Insulation thickness (mm)	DELTA T																
10	10	4.4	5.2	6.1	7.8	8.7	10.5	12.9	14.8	18.6	22.3	26.6	30.3	34.1	37.8	41.9	49.3
20	10	2.9	3.3	3.7	4.5	5.0	5.9	7.1	8.1	10.0	11.9	14.1	16	17.8	19.7	21.9	25.6
30	10	2.2	2.6	2.9	3.4	3.7	4.2	5.2	5.8	7.1	8.4	9.8	11.1	12.4	13.7	15.1	17.6
40	10	1.9	2.2	2.5	2.8	3.1	3.5	4.2	4.7	5.7	6.6	7.7	8.7	9.6	10.6	11.7	13.6
50	10	1.7	2.0	2.2	2.5	2.7	3.0	3.6	4.0	4.8	5.6	6.4	7.2	8.0	8.8	9.6	11.2
60	10	1.6	1.8	2.0	2.2	2.4	2.7	3.2	3.6	4.2	4.9	5.6	6.2	6.9	7.5	8.2	9.5
80	10	1.4	1.6	1.7	1.9	2.1	2.3	2.7	3.0	3.4	3.9	4.5	5.0	5.5	6.0	6.5	7.5
100	10	1.3	1.4	1.5	1.7	1.8	2.0	2.4	2.6	3.0	3.4	3.8	4.2	4.6	5.1	5.5	6.3
120	10	1.2	1.3	1.4	1.6	1.7	1.9	2.2	2.3	2.7	3.0	3.4	3.7	4.1	4.4	4.8	5.4

Basis: Thermal conductivity of the insulation 0.04 W/mK; increased factor of safety 20 %.
If there are other thermal conductivity figures, the values must be multiplied by a corresponding factor.

Example:	**Thermal conductivity of the insulation 0.045 W/mK**	**0,045 W/mK / 0,040 W/mK**	**= 1,125**

Example 1

Task: Frost protection for a DN 100, 25 m long pipeline with 2 pairs of flanges, 1 fitting, 1 pump, 4 supports 0.1 m wide; at an ambient temperature of – 25 °C and with a 50 mm thick heat insulation, 230 V.

Design:	from table 1:	Heating cable type ELSR-N-20-BO, single laying	
		Pipeline length 25 m single laying = m	= 25.0 m
	from table 2:	Pair of flanges 2 x 0,6 m	= 1.2 m
	Fitting	1 off x 1.5 m	= 1.5 m
	Pump	1 off x 5.0 m	= 5.0 m
	Pipe support	4 off x 0.1 m x 4	= 1.6 m
	Connection	1 off x 0.5 m	= 0.5 m
			= 34.8 m = order 35 m ELSR-N-20-2-BO

Example 2:

Task: Temperature maintenance for 15 m DN 50 pipeline at 20 °C (caustic soda solution) at minimum ambient temperatures of -10 °C (total DELTA-T of 30 K) and a 40 mm thick heat insulation. Installations: 2 pairs of flanges, 2 fittings, 230V.

If the heating is designed using type ELSR-N self-regulating heating cables, please proceed as follows to select the correct nominal output: Design (from table 3): DELTA-T 10 K heat loss = 3.5 W/m. As total DELTA-T is 30 K (that is to say is 3x higher than DELTA-T in the table), the value found is multiplied by 3: 3.5 W/m x a factor of 3 = 10.5 W/m.
In the temperature output diagram on the ELSR-N datasheet, the intersection of the two lines heating output W/m = 10.5 and temperature +20 °C is between the curves (ELSR-N-10) and (ELSR-N-20). Select the heating cable with the next highest power output (ELSR-N-20). You can now proceed with the heating pipe allowance for the installations as in Example 1.

+44 (0) 191 410 4292 hpsales@thorneandderrick.co.uk heatingandprocess.com

Questionnaire

Electrical Trace Heating on Pipes

eltherm®

Customer Data

Company*		**Contact***	
Street, Code/City*		**E-Mail***	
Website		**Phone***	

Project Details

Application	☐ Freeze prevention ☐ Temperature maintenance ☐ Heating up & temperature maintenance
Supply voltage*	
Maintain temperature*	℃
Product temperature	℃
Min. ambient temperature*	℃
Max. ambient temperature*	℃
Removable Trace heater	☐ Yes (Drawing necessary) ☐ No
Production according to	☐ Provision ☐ Drawing

Details of the Pipes

Length	mm
Nominal diameter	mm
Material	
Spec. heat capacity (pipe material)	kj/kg*K
**Density (pipe material) ** **	kg/m³
Weight per meter (of pipe)	kg/m
**Wall thickness ** **	mm
Quantity of	Valves: Flanges: Supports: Pumps/filters: Tee connections:
Location	☐ Indoors ☐ Outdoors
Exposure to moisture?	☐ Yes ☐ No

Thermal Insulation Details

Material	
Thickness*	mm
Heat conductivity	W/(m-K)
Density	kg/m³
Max. temperature limit of insulation	℃

Process Data

**Product ** **	
**Density ** **	kg/m³
**Spec. heat capacity ** **	kj/kg*K
**Spec. melting heat ** **	J/kg
Phase transition temperature (if applicable) **	℃
Switch-on temperature	℃
**Initial temperature ** **	℃
**End temperature ** **	℃
Max. operating temperature (energized)	℃
Max. temperature (for a short time) e.g. steam-rinsing (de-energized)	℃
**Desired heat-up time ** **	h

Temperature Control

Control	☐ Provided by customer ☐ Pluggable ☐ Capillary tube thermostat ☐ Complete control cabinet ☐ Electronic temperature controller
Temperature sensor (Electronic temperature controller)	☐ NiCrNi ☐ FeCuNi ☐ Pt-100 ☐ 2-wire ☐ 3-wire ☐ 4-wire
Installation (Electronic temperature controller)	☐ T-rail ☐ Wall mounting ☐ Door installation ☐ Mounting bracket / Pipe mounting

Hazardous Area

Installation in hazardous areas	☐ Yes ☐ No EX-Zone:
Temperature class	☐ T1 ☐ T2 ☐ T3 ☐ T4 ☐ T5 ☐ T6
Certification in accordance w.	

Installation information

Installation by eltherm	☐ Yes ☐ No
Installation location	

*** Please fill in all required fields**

**** Information only required for heating up**

Please enclose technical illustration as attachment!

» Please find the interactive form on our Website!

ES NOTES

+44 (0) 191 410 4292 hpsales@thorneandderrick.co.uk heatingandprocess.com

75.000 km

of trace heaters spanning twice the circumference of the globe in the course of a decade are used in a wide range of industries.

500 bar

and process temperatures up to 450 °C is what eltherm's heated pressure hose systems are built for in industrial applications.

5 Continents
13 Locations

270 Staff Members

work for eltherm all over the world. And for you and your heat tracing challenges.

2.777 Football Fields

is the ground space covered by the solar power plant NOOR in Morocco. Electrical heat tracing performs vital functions there.

Eight Engineering Hubs

provide engineering solutions for turnkey projects and EPC requirements all over the world.

Twenty-three Nations

The eltherm team is multinational. We are natives of a total of 23 nationalities.

550 °C

Molten salts must be kept at this temperature to keep them flowable. They store the sun's energy in concentrated solar power plants.

eltherm®

project ecology

A contribution to sustainability and climate protection: The eltherm fleet operation was rated carbon-neutral in 2018. To achieve this objective, 143 t CO_2 emissions were compensated by supporting global climate protection projects.

+44 (0) 191 410 4292
hpsales@thorneandderrick.co.uk
heatingandprocess.com

At Your Service
eltherm globally

86100136 - GB - 09/2021 - PDF - Technical alterations reserved.

+44 (0) 191 410 4292 hpsales@thorneandderrick.co.uk heatingandprocess.com