

eltherm[®]
innovations in heat tracing



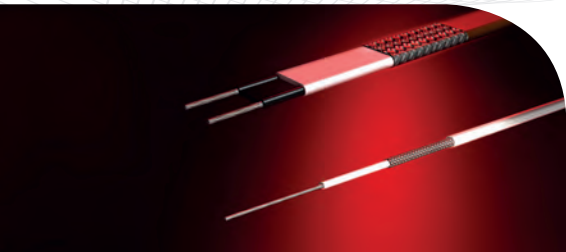
Heated Systems for Loading and Unloading

innovations in heat tracing



From A to Z.

Your One-Stop-Shop



Heating Cables and Tapes

Pre-assembled or cut-to-length, from frost protection to process temperatures up to 1000°C.



Heated Sample Lines

For temperature sensitive transport of liquids and gases up to 450°C.



Heated Mats and Jackets

Tailor-made and optimized for any application. up to 900°C.



Measurement and Controls

For trouble-free and cost-effective operation.



Custom-Engineered Solutions

Precision manufactured and supplied to specific requirements.



Accessories

From assembly tools to termination sets, from your one-stop-shop.



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Essentials at a Glance.

Portfolio Focus:

We provide a comprehensive range of electrical heat tracing products, systems and solutions – from A to Z. Made in Germany. 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 do only electrical heat tracing. Nothing else. We concentrate on our fields of expertise without compromise.

Global Focus:

We are a global engineering company with our own production facilities, serving international markets and projects from 11 locations on 4 continents – and with a staff force of 265.

eltherm eQ

**stands for expertise, intelligent solutions
quality and reliability in heat tracing.**



From Process to Product. The eltherm Story

Founded in 1991 in Burbach, Germany, eltherm has developed into a global engineering solution provider with its own production facilities and a one-stop-shop for electrical heat tracing products and systems „made in Germany“.

The company has attained worldwide acclaim as a turn-key partner for engineering, design, installation and commissioning of electrical heat tracing for complex industrial plants and facilities.

eltherm is part of the publicly listed INDUS Holding AG. In 2017, a staff force of around 9000 generated revenues of € 1.641 billion.

Keeps Gases and Fluids Flowing Safely. Your Processes in Reliable Hands.

eltherm is a world leader for heated transport systems and sample lines. They ensure safe transport of liquid and gaseous substances without temperature loss.

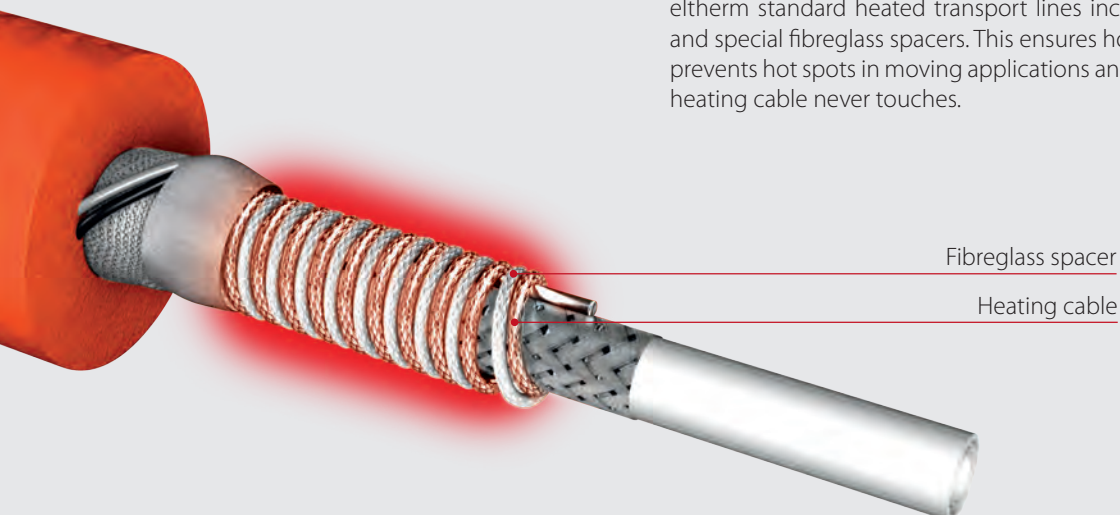
Applications for process temperatures up to 450°C:

- › Gas analytics, where emission samples are transported from chimneys to analytic systems
- › in machine and plant engineering
- › in the chemical and petrochemical industry
- › in food production
- › in the automobile industry, connecting moving machines and roboters to one another
- › in hazardous areas

eltherm heated transport lines are developed, designed and manufactured according to customer specifications. We are your single-source supplier for controlled heated analytic sample lines, heated sample lines with integrated filter, heated pressure lines and a range of specific solutions for complex industrial processes.

Homogeneous Heat Transfer

eltherm standard heated transport lines include bifilar heating cables and special fibreglass spacers. This ensures homogeneous heat transfer, prevents hot spots in moving applications and prevents failure since the heating cable never touches.





Typical Design of a Heated Loading System



Type ELH / ELSH md...

Maintain temperatures and enable loading/unloading of oil, fat, resins, paint, bitumen, adhesives, compounds and foods without temperature loss. Our speciality: flexible and yet robust design for pressures up to 50 bar and temperatures to 250°C. Diameters from 25 to 100mm allow large flow rates. eltherm loading/unloading systems are available with approval for hazardous areas.

Applications

- › Chemical industry
- › Food production
- › Pharmaceutical industry
- › PU foaming plants
- › Batching and dosing systems
- › Surface engineering
- › Coating and spraying plants
- › Adhesives and casting plants

Advantages

- › High performance through close, tight coiling of heating cable with spacer
- › Homogenous heat transfer
- › Longer lifespan and reliable operation
- › High quality standard
- › Safety against hot spots
- › Temperature range: 5°C to 250°C (standard design)
- › Diameters: 25 mm to 80 mm (standard design)
- › Voltage: 24 V to 500 V
- › Operating pressures: up to 50 bar
- › Heating performance optimised to application
- › Heaters from own production made in Germany

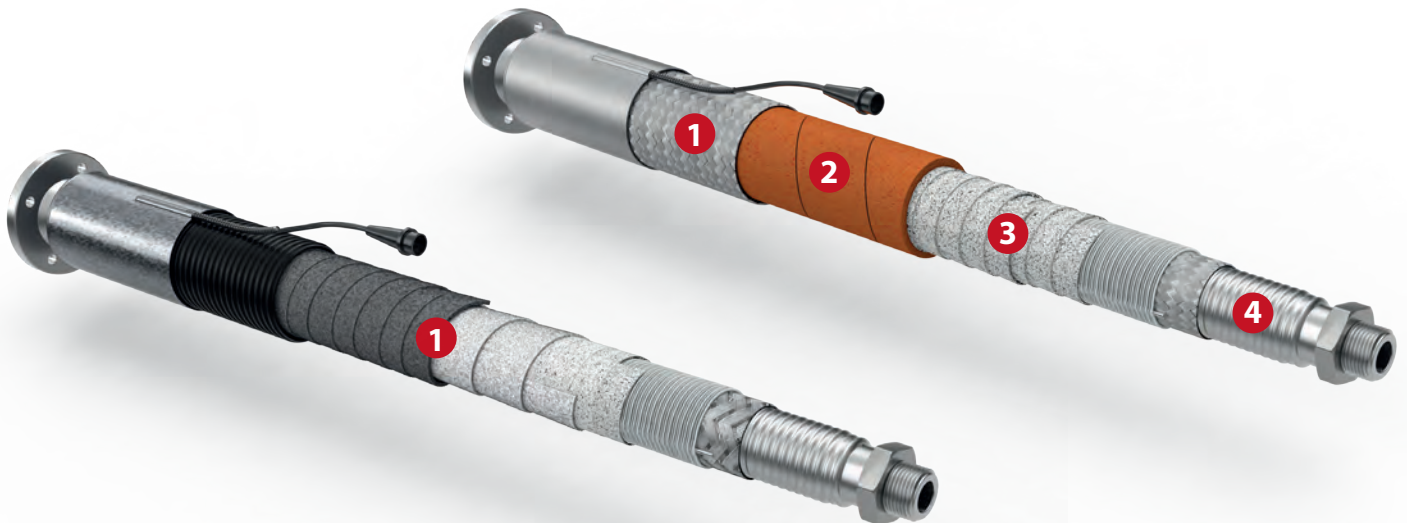
Standard Heated System for Loading and Unloading

up to 250°C

Type ELH / ELSH md... **Technical Data**

Length	depends on application
Process temperature	up to 250°C
Voltage	25 – 500 V
Heater	eltherm resistance heating cable ELKM-AE / ELKM-AG-N
Operating pressure	depends on temperature, inner tube, and connecting fitting

Diameters	Performance at 200 °C (standard)	Outer diameter (stainless steel braid)
D 25	300 w/m	75 mm
D 32	360 w/m	85 mm
D 40	400 w/m	90 mm
D 50	480 w/m	100 mm
D 65	580 w/m	130 mm
D 80	650 w/m	145 mm
D 100	on request	on request



Design with series resistance heating cable and non-woven thermo fabric insulation

1 Insulation: multi-layer thermofleece

Design with series resistance heating cable and foam insulation

1 Outer jacket: stainless steel braid

2 Insulation: foam stripes

3 Insulation: non-woven thermo fabric

4 Inner tube: corrugated stainless steel tube



Standard Heated System for Loading and Unloading up to 250°C

Type ELH / ELSH md... **Designs and Options**

Outer jacket

- › PU corrugated tube
- › TPE corrugated tube
- › Industrial fabric tube
- › Stainless steel braid
- › Galvanized steel braid
- › Nylon braid
(refer to page 16)

Insulation

- › Multi-layer thermofleece
- › Thermofleece with foam tube

Inner tube

- › Corrugated stainless steel tube
- › PTFE corrugated tube
- › Universal FEP tube for chemicals
- › Provided by customer

Connecting fittings

all common fittings

Sensors

- › PT-100 / 2 wire
- › PT-100 / 3 wire
- › PT-100 / 4 wire
- › PT-1000
- › Thermo couples Type Fe Cu-Ni (Type J) and Ni Cr-Ni (Type K)

Endkappen

- › Shrinked end caps
- › Metall end caps (aluminium / stainless steel)
- › Silicone end caps

Connecting lead

Standard: 1,5 m in silicone protective tube with multiple pole plug (4 pole + PE / 6 pole + PE) suitable for eltherm eltherm controller

Options

- › Reinforced connecting lead in PA corrugated tube
- › Reinforced silicone cable with stainless steel braid jacket
- › Without multiple pole plug or with plug to customer specifications

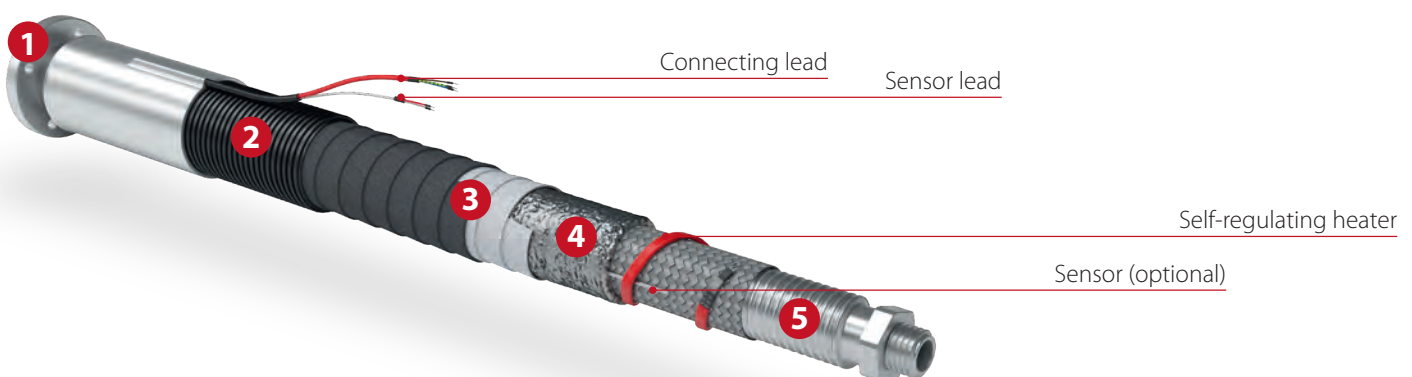
Heated Loading and Unloading System with Self-Regulating Heater

up to 100°C

Type ELH / ELSH mdsb... **Technical Data**

Length	depends on application
Process temperature	5 to 100°C
Voltage	230 / 120 V
Heater	eltherm self-regulating heaters ELSR-N / ELSR-H
Operating pressure	depends on temperature, inner tube, and connecting fitting

Diameters	Performance	Outer diameter (stainless steel braid)
D 25	Specific to application	75 mm
D 32		85 mm
D 40		90 mm
D 50		100 mm
D 65		130 mm
D 80		145 mm
D 100		on request



Design with self-regulating heater and non-woven insulation fabric

- 1 Connection fitting, e.g. loose flange
- 2 Outer jacket: PU corrugated tube
- 3 Insulation: multiple layer thermofleece
- 4 Aluminium foil
- 5 Inner tube: corrugated stainless steel tube

Heated system for fixed applications, not suitable for automatic batching plants, roboter applications or applications with frequently changing bending strain.



Heated Loading and Unloading System with Self-Regulating Heater up to 100°C

Type ELH / ELSH mdsb... **Designs and Options**

Outer jacket

- › PU corrugated tube
- › TPE corrugated tube
- › Industrial fabric tube
- › Stainless steel braid
- › Galvanized steel braid
- › Nylon braid
(refer to page 16)

Insulation

- › Multi-layer non-woven fabric

Inner tube

- › Corrugated stainless steel tube
- › PTFE corrugated tube
- › Universal FEP tube for chemicals
- › Provided by customer

Connecting fittings

all common fittings

Sensors

- › PT-100 / 2 wire
- › PT-100 / 3 wire
- › PT-100 / 4 wire
- › PT-1000
- › Thermo couples Type Fe Cu-Ni (Type J) and Ni Cr-Ni (Type K)

End caps

- › Shrinked end caps
- › Metall end caps (aluminium / stainless steel)
- › Silicone end caps

Connecting lead

1,5 m silicone cable 3 x 1 mm², without plug

Options

- › Thicker connecting lead in PA corrugated tube
- › Silicone cable with VA braid jacket
- › With plug to customer specifications

Also suitable for hazardous areas.

Heated System for Loading and Unloading with Vulcanized Outer Jacket

up to 200°C / 180°C

Type ELH / ELSH mdR... (Ex) Technical Data

Length	depends on application
Process temperature	max. 180°C (T3)
Limiter setting	max. 192°C (T3)
Voltage	24 – 500 V
Heater	eltherm resistance heating cable ELKM-AE / ELKM-AG-N eltherm self-regulating heater ELSR-H
Operating pressure	depends on temperature, inner tube, and connecting fitting

Diameters	Performance at 200 °C (standard)	Outer diameter
D 25	300 w/m	75 mm
D 32	360 w/m	85 mm
D 40	400 w/m	90 mm
D 50	480 w/m	100 mm
D 65	580 w/m	130 mm
D 80	650 w/m	145 mm
D 100	on request	on request



New: With vulcanized outer jacket and series resistance heating cable

- 1 Outer jacket: vulcanized EPDM
- 2 Insulation: multiple layer thermofleece

Heated system for fixed applications, not suitable for automatic batching plants, roboter applications or applications with frequently changing bending strain.

New: with vulcanized antistatic outer jacket

- 1 Outer jacket: vulcanized, deflective EPDM
- 2 Protective braid
- 3 Insulation: thermofleece
- 4 Inner tube: corrugated stainless steel tube



Classification II 2G Ex eb IIC T6 - T3 Gb II 2D Ex tb IIIC TX Db

Certificates > IBExU04ATEX1004X
> IBExU13ATEX1124X



Heated System for Loading and Unloading with Vulcanized Outer Jacket up to 200°C / 180°C

Type ELH / ELSH mdR... (Ex) **Designs and Options**

Outer jacket

- › Non Ex: vulcanized EPDM, black, fabric texture
- › Ex: vulcanized EPDM, electrically deflective

Insulation

- › Multiple layer thermofleece

Inner tube

- › Corrugated stainless steel tube
- › PTFE corrugated tube
- › provided by customer (temperature resistant to min. 160 °C)

Connecting fittings

all common fittings

Sensors

- › Non Ex: PT-100 / 2 wire, PT-100 / 3 wire, PT-100 / 4 wire, PT-1000, Thermo couples Type Fe Cu-Ni (Type J) and NiCr- Ni (Type K)
- › Ex: 2 x Ex- PT-100 / 3 wire / 4 wire; position 1,00 m in front of E connection

End caps

- › Shrinked end caps
- › Metall end caps (aluminium / stainless steel)
- › Silicone end caps

Connecting lead

- › Non Ex: 1,5 m in silicone protective tube with multiple pole plug (4 pole + PE / 6 pole + PE) suitable for eltherm controller
- › Ex: Standard 1,5 m PTFE insulated

The Vulcanized Outer Jacket

This newly developed outer jacket design for heated systems is particularly resistant to abrasion, chemically stable and easy to clean. In the electrically deflective design it is also suitable for use in hazardous areas.

Benefits

- › high chemical stability
- › resistant to abrasion
- › flexibility
- › insulation variable and can be optimised depending on application
- › smooth, easy-to-clean surface



Heated System for Loading and Unloading in Hazardous Areas

up to 180°C

Type ELH / ELSH md..w..SS..FE-EX **Technical Data**

Length	depending on application
Process temperature	180°C (T3)
Limiter setting	192°C (T3)
Voltage	24 – 500 V
Heater	eltherm resistance heating cable ELKM-AE / ELKM-AG-N eltherm self-regulating heater ELSR-H
Operating pressure	depends on temperature, inner tube, and connecting fitting

Diameters	Performance at 200 °C (standard)	Outer diameter
D 25	300 w/m	75 mm
D 32	360 w/m	85 mm
D 40	400 w/m	90 mm
D 50	480 w/m	100 mm
D 65	580 w/m	130 mm
D 80	650 w/m	145 mm
D 100	on request	on request



Design with thermofleece insulation

- 1 Insulation: thermofleece
- 2 Outer jacket: PU corrugated tube



Design with foam insulation

- 1 Connecting lead: PTFE insulated
- 2 Outer jacket: stainless steel braid or galvanized braid
- 3 Insulation: foam stripes
- 4 Insulation: multiple layer thermofleece
- 5 Inner tube: corrugated stainless steel tube (refer to p.17)



Classification II 2G Ex eb IIC T6 - T3 Gb II 2D Ex tb IIIC TX Db

Certification > IBExU04ATEX1004X
> IBExU13ATEX1124X



Heated Loading/Unloading System in Hazardous Areas up to 180°C

Type ELH / ELSH md..w..SS..FE-EX **Designs and Options**

Outer jacket

- › Stainless steel braid
- › Galvanized iron braid
- › Antistatic PU corrugated tube
(refer to page 16)

Insulation

- › Multiple layer thermofleece
- › Thermofleece with foam tube

Inner tube

- › Corrugated stainless steel tube
- › PTFE corrugated tube
- › Universal FEP tube for chemicals
- › Provided by customer
(temperature resistance min. 160°C)

Connecting fittings

all common fittings

Sensors

2x EX- PT-100 / 3 wire / 4 wire, position 1,00 m in front of E connection

End caps

- › Shrinked end cap
- › Metal end cap (aluminium / stainless steel)
- › Silicon end caps

Connecting lead

Standard 1,50 m PTFE insulated

Designs and Options

Heated Loading/Unloading Systems

Outer Jackets

Insulation with thermofleece



-40 – 150 °C

TPE corrugated tube

Flexible, light corrugated tube coated with TPE/TPK and scoring protection on the wire spiral.



-40 – 100 °C

PU Corrugated tube

Flexible, light corrugated tube made of polyurethane, reinforced with spring steel spiral.

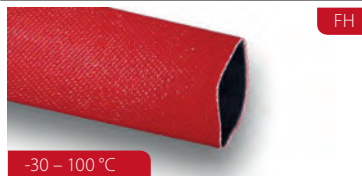


-40 – 100 °C

PU corrugated tube, defective



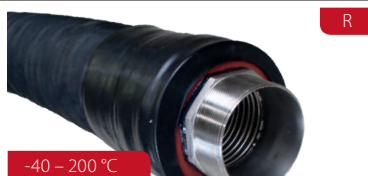
Flexible, corrugated tube made of electrically defective polyurethane, reinforced with spring steel spiral. For use in hazardous areas.



-30 – 100 °C

Industrial fabric tube, red or white

Robust and light. Mechanically resistant to abrasion. Limited dynamic capacity.



-40 – 200 °C

Vulcanized EPDM



Particularly resistant to abrasion, chemically very stable and very easy to clean. Suitable for use in hazardous areas in its defective version.

Foam Insulation



-30 – 150 °C

Nylon braid / polyamide braid

Flexible for tight bending radii. Available up to diameter 50.



-45 – 200 °C

Stainless steel braid (Mat. 14301)

Highly corrosion resistant, available to diameter 100. Approved for hazardous areas.



-45 – 200 °C

Galvanized iron braid

Available up to diameter 65. Approved for use in hazardous areas.





Designs and Options Heated Loading/Unloading Systems

Inner Tubes



FEP- or PTFE universal tube for chemicals

Inner tube made of transparent, seamlessly extruded FEP or PTFE, electrically conductive. Reinforcement with woven fabric inlays and galvanized steel wire helix.

Applications:

For loading/unloading processes at up to 100 °C. In the chemical, petrochemical, cosmetics and pharmaceutical industries.

Benefits:

- Chemical stability
- Can be steam cleaned up to 30 min / 150 °C
- Fulfills DIN EN 12115
- Fulfills TRbF 131.2
- Inner tube conductive
- FDA conformity
- Suitable for drinking water (KfW recommendation)
- Improved diffusion resistance
- Smooth surface with low friction coefficient
- Fittings attached via hose clamp or stainless steel press sheath



PTFE corrugated tube

with reinforcement layer. Designs with, for example

- Vacuum supporting spiral
- Fibreglass reinforcement
- Black PTFE, antistatic
- Smooth tube (smooth inside, corrugated on the outside)

Applications:

In the chemical, petrochemical, cosmetics and pharmaceutical industries. The basic material is FDA approved. For batching, dosing, filling and sealing processes.

Benefits:

- Chemical stability
- Suited for suction and vacuum applications with pressure clamps
- High flexibility
- Inner tube conductive
- FDA conformity
- Smooth surface with low friction coefficient
- Suited for roboter applications with fibreglass reinforcement
- Optimised for frequently changing bending strain



Corrugated stainless steel tube

with stainless steel wire reinforcement inlay

Applications:

In the chemical, petrochemical and bitumen industries, machine and plant engineering.

Benefits:

- Universally suited for fluids and gases
- Absolutely diffusion resistant
- For temperatures above 250 °C
- Highly flexible thanks to bend profile

Other materials and designs available on request

Not suited for use with roboters or frequently changing bend strain.

Designs and Options

Heated Loading/Unloading Systems

Fittings



Flange fitting (loose, fixed or threaded)

Designs

According to DIN 2501,
According to EN 1092-1
Pressure levels: PN6-PN40
according to ANSI150 lbs or
300 lbs

Material:

Stainless steel 1.4571 or 1.4404.
On request: galvanized steel

Sizes:

D 25 - D 100



Tri-Clamp

Designs:

According to DIN 32676
Outer diameter Tri- Clamp
50,5 - 119 mm

Material:

Stainless steel
1.4571 oder 1.4404

Sizes:

D 25 - D 100



Outer side thread

Designs:

Flat sealing with cylindrical thread
in inches according to ISO 228-1
Screw sealing with conical thread
according to DIN EN 10226 ISO
7-1

Material:

Stainless steel 1.4571 or 1.4404.
On request: galvanized steel

Sizes:

G-1" - G3"
R 1" - R4"



Designs and Options Heated Loading/Unloading Systems

Fittings



Tanker couplings

Kamlock coupling

Fittings for the food industry

Designs:

Tanker coupling (male/female) according to EN 14420-6 / DIN 28450.

Designs:

Male or female

Designs:

Cone socket with cap nut or with threaded socket SC according to DIN 11851 / DIN 405-1

Material:

Stainless steel 1.4404, brass.
Hypalon, PTFE, NBR sealing rings

Material:

Stainless steel 1.4404, Aluminium
BUNA N, PTFE, NBR, Silicone or
EPDM sealing rings

Material:

Stainless steel 1.4404 / cap nut
made of 1.4301
HYPALON or PTFE sealing rings

Sizes:

D 25 - D 100
Rd 52x 1/6" - Rd 130x 1/4"

Sizes:

1" - 4"

Sizes:

D 25 - D 100
Rd 52 x 1/6" - Rd 130 x 1/4"

Other fittings or materials on request.

Controllers

Temperature Controllers (from eltherm Product Portfolio)

Electronic Temperature Controller

ELTC/H-14



with digital display for wall mounting. The temperature is measured by a Pt100 sensor, processed by the microcontroller and displayed. After comparing actual and preset values, the output relays are switched. The controller is equipped with a socket. The unit is supplied in a weather proof plastic enclosure and a transparent cover.

Benefits:

- › LED display works to -25 °C
- › Programmable 0 °C to +390 °C
- › 20 A resistive load with hybrid relay
- › Signaling contact (can be set as alarm or release contact)
- › Suitable for Pt100 with 2 or 3 wires
- › Operating voltage: 90 - 260 VAC / 50/60 Hz

ELTC-21 / ELTC-22



with digital display for top-hat rail mounting. The temperature is measured by a Pt100 sensor, processed by the microcontroller and displayed. After comparing actual and preset values, the appropriate output relays are switched.

Benefits:

- › LED display works to -25 °C
- › Programmable -50 °C - +400 °C
- › 16 A resistive load alarm contact
- › Pt100 with 2 or 3 wires

For additional controllers refer to the brochure Temperature Control and Monitoring.

Application Examples



ELSH/mdw up to 200°C, D 80

Application:
Loading adhesives in the chemical industry

Inner tube:
Provided by the customer

Maintain temperature:
120 – 150°C

Outer jacket:
TPE corrugated tube



ELH/mdR up to 100°C, D40

Application:
Transport of fats and oil from a heated vessel to a dosing unit in the cosmetics industry

Inner tube:
Special PTFE corrugated tube

Maintain temperature:
80 – 100°C

Outer jacket:
vulcanized EPDM

In Practice

Customized Solutions



Type ELH/mdw to 200°C

Heated system for loading and unloading D 80

Inner tube: corr. stainless steel
Maintain temperature: 150°C - 200°C
Outer jacket: Corr. TPE tube
Application: Bitumen transport



Type ELH/mdw to 200°C

Heated system for loading and unloading D 50 with two-part loose flange

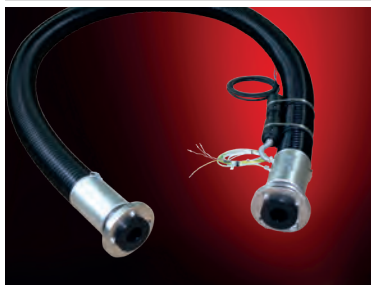
Inner tube: corr. stainless steel
Maintain temperature: 180°C - 200°C
Outer jacket: Corr. TPE tube
Application: Bitumen dispensing



Type ELH/mdw to 200°C

Heated system for loading and unloading D 50

Inner tube: corr. stainless steel
Maintain temperature: 200°C
Outer jacket: stainless steel braid
Application: chemical industry



Type ELH/mdsbw to 80°C

Heated system for loading and unloading D 50

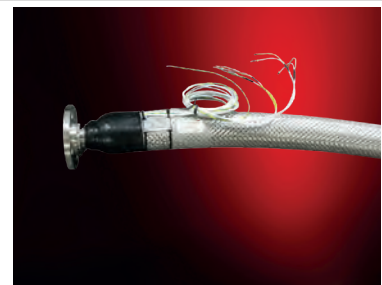
Inner tube: special corrugated antistatic PTFE tube, fittings lined with PTFE
Maintain temperature: 80°C
Outer jacket: corrugated PU tube, electrically deflective
Application: chemical industry, transport of phenolic resin in hazardous areas



Type ELH/mdsbw to 30°C

Heated system for loading and unloading D 50 with built-on Ex termination box

Inner tube: corrugated stainless steel tube
Maintain temperature: freeze protection to 30°C
Outer jacket: corrugated PU tube, electrically deflective
Application: petrochemical industry, hazardous areas



Type ELH/mdw to 100°C

Heated system for loading and unloading D 50

Inner tube: corrugated PTFE tube
Maintain temperature: 50°C
Outer jacket: stainless steel braid
Application: Chemical industry, hazardous areas





Configurator

Company: _____ Contact: _____

Street: _____ Code/city: _____

Tel.: _____ E-mail: _____

Hazardous Areas		ATEX Zone:	Temperature class:
<input type="checkbox"/> yes	<input type="checkbox"/> no		

Number: _____

Inner tube D: _____ mm

Material inner tube or pipe		
<input type="checkbox"/> Corrugated PTFE	<input type="checkbox"/> Corrugated stainless steel	<input type="checkbox"/> Universal FFP tube for chemicals
<input type="checkbox"/> Provided by customer, type:		<input type="checkbox"/> Special:
Outer diameter: _____		

Length: _____ mm

Operating temperature: _____ °C

Maintain temperature: _____ °C

Voltage: _____ V

Ambient temperature	
<input type="checkbox"/> Standard (-20 °C)	<input type="checkbox"/> Special °C

Operating pressure	
bar, at	°C

Negative pressure	
bar, at	°C

Substance: _____

Application			
Moving	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> outside
			<input type="checkbox"/> inside

Outer jacket						
<input type="checkbox"/> corrugated TPE tube	<input type="checkbox"/> corrugated PU tube	<input type="checkbox"/> industrial fabric tube	<input type="checkbox"/> vulcanized EPDM	<input type="checkbox"/> braid, galvanized	<input type="checkbox"/> stainless steel braid	<input type="checkbox"/> special

Sensors Number:			
<input type="checkbox"/> PT-100 / 2 wire	<input type="checkbox"/> Ex-protected PT-100 / 3 wire	<input type="checkbox"/> Thermocouple Type NiCr-Ni	<input type="checkbox"/> Special:
<input type="checkbox"/> PT-100 / 3 wire	<input type="checkbox"/> Ex-protected PT-100 / 4 wire	<input type="checkbox"/> Thermocouple Type FeCu-Ni	
Sensor position:	<input type="checkbox"/> Standard (500 mm from E connection)	<input type="checkbox"/> Special:	mm from E connection

Fittings (refer to p. 40-43)			
E connection (Type)		End termination	
Material:	<input type="checkbox"/> machining steel	<input type="checkbox"/> stainless steel(1.4571/1.4404)	<input type="checkbox"/> Special:

Connecting lead exit	
<input type="checkbox"/> to the back (on tube side)	<input type="checkbox"/> front

Controllers	
<input type="checkbox"/> provided by customer	<input type="checkbox"/> with ELTC-14
<input type="checkbox"/> fixed, with ELTC-21	<input type="checkbox"/> with ELTC-22

Connecting line length: _____ mm

Connecting plug	
<input type="checkbox"/> without	<input type="checkbox"/> with plug type:

Comments: _____



eltherm[®]
innovations in heat tracing



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eltherm Spain, S.L.U.
eltherm South Africa (Pty) Ltd.
eltherm UK Ltd.

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Shanghai/China
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