eltherm®
innovations in heat tracing

Heated hoses

Analytic hoses

innovations in heat tracing

eltherm GmbH

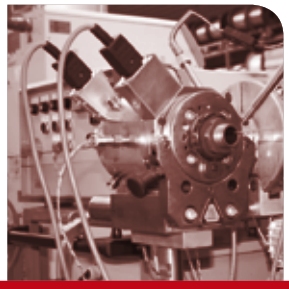
eltherm GmbH is an international operating company specializing in the field of electrical heat tracing systems. With more than 40 years of technological know-how and continuous demand for the highest quality and flexibility, this owner-managed company has grown significantly since its humble beginning. The clear commitment to the production site located in Germany strongly emphasizes the philosophy of eltherm, which is to supply its customers with electrical heat tracing system solutions individually tailored to their requirements on the highest levels. As a result of having its own production site for heating cables, heating hoses, heating mats and jackets, measurement and control systems and accessories, it has enhanced the engineering society within eltherm allowing it to become one of the worldwide leading manufacturers of electrical heat tracing systems.

Production in Burbach

The portfolio has been completed by the production of self-regulating heating cables. Due to its high-tech demand on the production of such cables, eltherm has now joined the premium league of heating cable manufacturers. Only about ten heating cable manufacturers worldwide have mastered the technology for manufacturing self-regulating heating cables, and eltherm is the only one located in Germany.

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

innovations in heat tracing



Solutions for your challenge!

Competent solutions

eltherm has an established in-house development area that goes beyond basic production. This is where innovative solutions are created and products are continuously improved to meet market demands. Along the way, our quality management system ensures that we ship out only high-quality and technically sound products.

In addition to complying with requirements such as EAC certification and VDE directives, eltherm also fulfils the strict demands of ATEX certification. Furthermore, eltherm has also been certified according to the standards of ISO 9001 and ISO 14001 for many years.

Table of Contents

Heated hoses

eltherm is one of Europe's leading suppliers of heated hoses and flexible, heated pipes. Heated pipes manufactured by eltherm ensure the transport of liquid and gaseous media without the loss of temperature.

Areas of application for eltherm heated hoses:

- Gas analysis where fixed heated hoses take flue gas samples from the chimney to the analyser system
- Industrial applications in mechanical and plant engineering
- In the chemical and petrochemical industry
- Food industry
- Automotive industry where, for example flexible system components are interconnected

Thus, standard frost protection and process temperatures up to 450 °C can be implemented without any issues.

What types of applications are available?

1. Analyser technology

Holding temperature / frost protection:	up to 450 °C
Typical nominal diameters:	4-10 mm

2. Industrial applications / heated pressure hoses

Holding temperature / frost protection:	up to 250 °C
Typical nominal diameters:	8 to 100 mm

All heated hoses made by eltherm are designed and produced specifically according to customer specifications. Our in-house development department is happy to develop a custom solution based on your requirements.

Of course, eltherm also provides flexible heated cables designed for use in explosion-prone areas.

Solutions for your areas of application

■ Gas analysis

■ Bitumen

■ Environmental and water technologies

■ Chemical industry / petrochemical industry

■ Food industry

■ Mechanical engineering

■ Automotive industry

■ Surface technology

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Heating hose product range: ELH…/ELSH…

Analytic heated hoses

- Controlled: a../ad../ai../adi../ae..
- Self-regulating: asb../adsb../aisb../adisb../aesb..

Heated pressure hoses

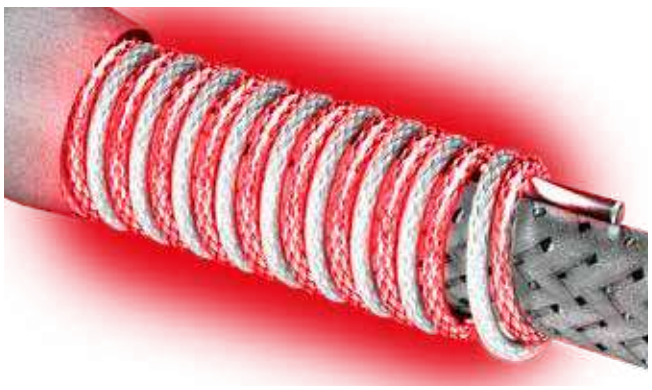
- Controlled: md../hd../shd..
- Self-regulating: mdsb../hdsb../shdsb..

eltherm hose design with spacer

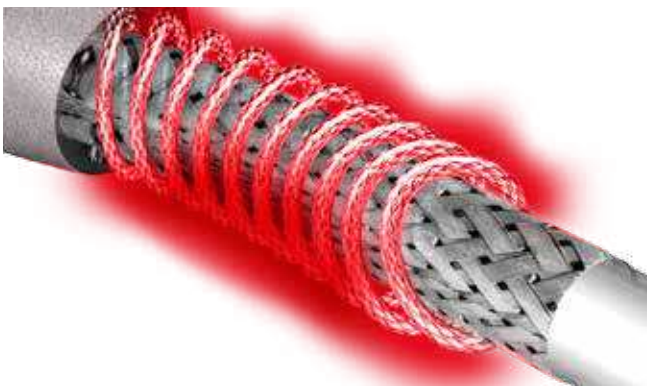
To meet the high quality standards eltherm has set for itself and to ensure optimum heating cable output on the carrier hose, our standard hoses are configured to include bifilar heating cables and special spacers. Creating spatial density in the hose that carries the heating cable ensures perfectly homogeneous heat distribution throughout the hose as well as optimum element loading. The additional glass-fibre spacer serves to prevent hot spots in moving applications with greater bending strain, as contact between the heating cables is avoided.

Advantages

- High power density resulting from tight winding of the heating cable with spacer
- Homogeneous and therefore optimal heat distribution
- Resistance to greater bending strain
- Longer service life and durability
- Very high quality standard
- Hot spot prevention



Homogeneous heat distribution with eltherm heating hose



Heat distribution with conventional heated hose configuration without spacer: risk of hot spots due to bending

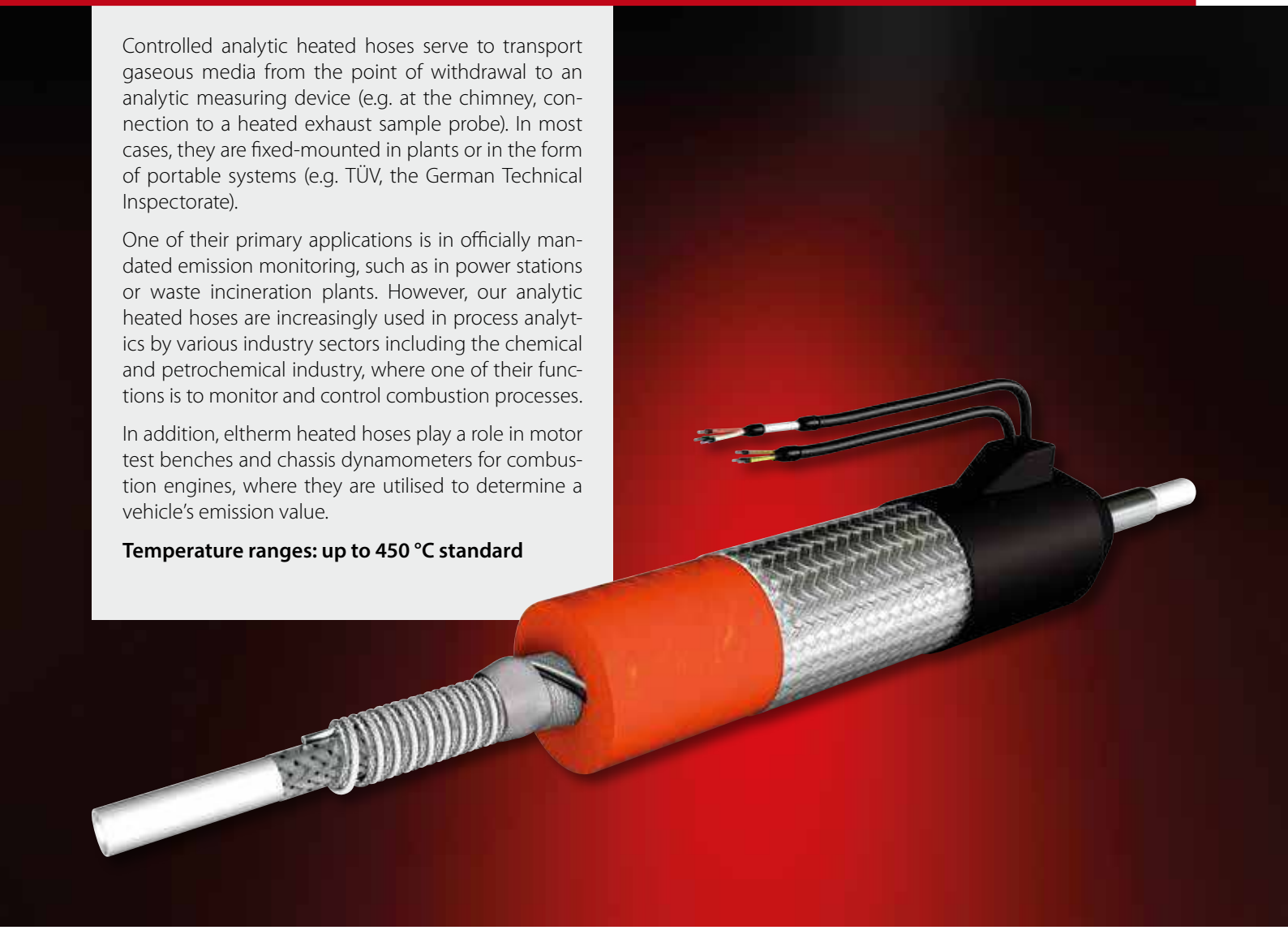
Controlled analytic heated hoses type ELHa…

Controlled analytic heated hoses serve to transport gaseous media from the point of withdrawal to an analytic measuring device (e.g. at the chimney, connection to a heated exhaust sample probe). In most cases, they are fixed-mounted in plants or in the form of portable systems (e.g. TÜV, the German Technical Inspectorate).

One of their primary applications is in officially mandated emission monitoring, such as in power stations or waste incineration plants. However, our analytic heated hoses are increasingly used in process analytics by various industry sectors including the chemical and petrochemical industry, where one of their functions is to monitor and control combustion processes.

In addition, eltherm heated hoses play a role in motor test benches and chassis dynamometers for combustion engines, where they are utilised to determine a vehicle's emission value.

Temperature ranges: up to 450 °C standard

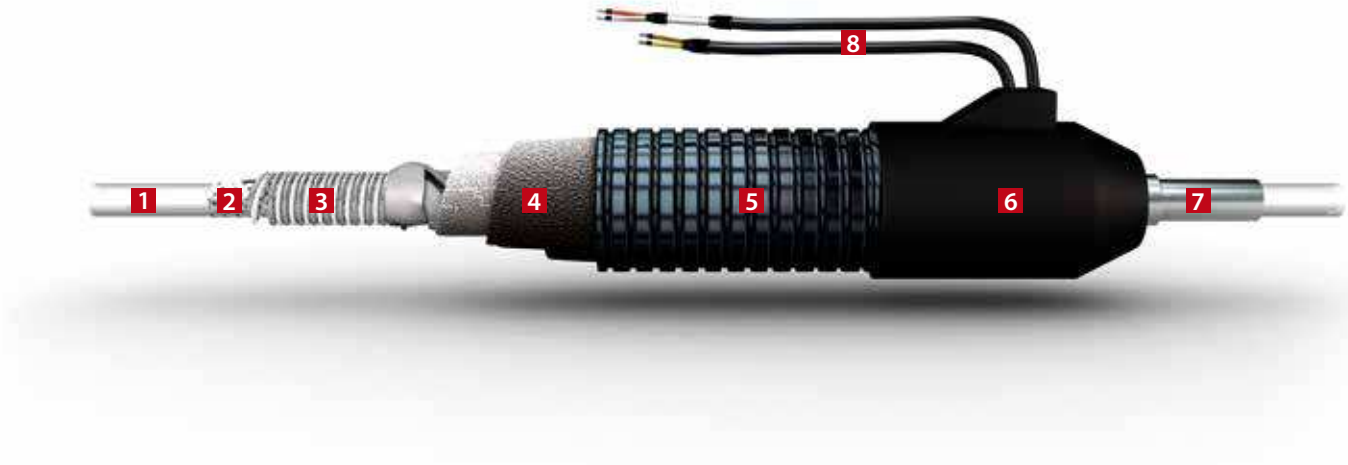


Application background

- Prevention of condensate formation
- Lower deviation of dew point
- Keeping gas temperature constant

Advantages

- Transport of gaseous media without temperature loss
- Operating temperature: 5 °C to 450 °C
- Nominal widths: 2 mm to 12 mm
- Length: 0.3 m to 150.0 m
- Voltage: 12 V to 400 V
- Heat output optimised for application
- Great heating circuit lengths
- Heating cables produced in-house



1 **Inner liners:** see types of inner liner

2 **Sensor:** a temperature sensor is mounted between inner liner and heating cable for temperature control. Additional sensors can be mounted in any position for further temperature detection. We use PT-100 sensors in 2-wire technology as a standard. In addition, it is possible to integrate nearly any customary temperature sensor (e.g. thermocouple type K / J, PT-1000, etc.).

3a **Heating cable:** the resistance heating cable, the basic element is produced in-house. eltherm uses only heating cables insulated with fluorpolymer. As a standard, we use our ELKM-AE heating cable up to max. 250 °C.

3b **Spacer:** the spacer made of braided glass-fibre provides reliable protection for the heating cable against damage and hot spots in the event of bending strain.

4 **Insulation:** insulation depends on max. operating temperature and selection of outer jacket (see hose configuration, pages 10 ff). As a rule, special thermal fleece materials and foam hoses are used (up to 100 °C elastomer foam hose, up to 250 °C silicone foam hoses).

5 **Outer jacket:** outer jacket selection is determined by application, bending radius and ambient temperatures. The outer jacket provides heated hoses with reliable protection from humidity, weather, external environmental impact and mechanical strain.

6 **End caps:** end caps seal off heated hoses at both ends. The integrated strain relief provides reliable relief for the connecting cable. End caps are silicone by default and available in EPDM, plastic (polyamide) and galvanised metal.

7 **Connecting fitting:** connection to analyser or probe

8 **Connecting cables:** by default, the connecting cable is led out separately. (sensor cable and tracer cable). Default length of the connection cables is 1.5 m each. Upon request, any customary plug can be mounted to the connection cable.

Hose configuration type ELHa… / w / T / GSi to 250 °C

1 Inner liner

200 °C

ELH/a: fixed PTFE or PFA core

200 °C

ELH/ai: fixed PTFE core
replaceable PTFE or PFA core

Note: temperatures provided below refer to max. operating temperatures of the inner liners.

Max. operating temperature of heated hoses depends on type of heated hose.

Additional inner liners on request.

250 °C

ELH/ad: fixed PTFE core
with VA braiding and RSL pipe stubs

250 °C

ELH/adi: fixed PTFE core
with VA braiding and RSL pipe stubs
replaceable PTFE or PFA core

250 °C

ELH/adi-SP: fixed PTFE core
with VA braiding and RSL pipe stubs
replaceable PTFE or PFA core

600 °C

ELH/ae: fixed stainless steel pipe

6 End caps

Silicone end cap
with anti-kink protection

Silicone end cap

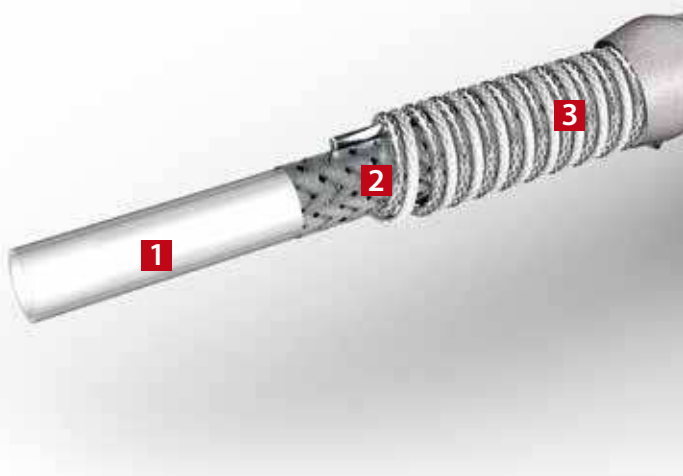
Plastic end cap

Plastic end cap
with terminal housing

Metal end cap

4 Insulation

multi-layered thermal fleece



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5 Outer jackets

Corrugated PA hose (PA-11/12)
Standard

Corrugated TPRI-B hose
highly flexible at high ambient temperatures

Corrugated PA hose (PA-12)
for robotic applications

Corrugated metal hose stainless steel
Tread-resistant, robust design, highly corrosion-resistant (Mat. ANSI-304)
Only for indoor use IP 40

Corrugated metal hose, galvanised steel
Tread-resistant, robust design
Only for indoor use IP 40

Corrugated hose with PVC outer jacket / ANACONDA
Tread-resistant, robust design
Can also be used outdoors

Silicone outer jacket, red
Flexible design, e.g. for heated mini hoses
With requirement for limited space

2 Sensor

stationary-mounted temperature sensor

3 Heating cable

with spacer

Hose configuration type ELH/a… / N / SS / Fe / Si to 250 °C

1 Inner liner

200 °C

ELH/a: fixed PTFE or PFA core

200 °C

ELH/ai: fixed PTFE core
replaceable PTFE or PFA core

Note: temperatures provided below refer to max. operating temperatures of the inner liners.

Max. operating temperature of heated hoses depends on type of heated hose.

Additional inner liners on request.

250 °C

ELH/ad: fixed PTFE core
with VA braiding and RSL pipe stubs

250 °C

ELH/adi: fixed PTFE core
with VA braiding and RSL pipe stubs
replaceable PTFE or PFA core

250 °C

ELH/adi-SP: fixed PTFE core
with VA braiding and RSL pipe stubs
replaceable PTFE or PFA core

600 °C

ELH/ae: fixed stainless steel pipe

6 End caps

Silicone end cap
with anti-kink protection

Silicone end cap

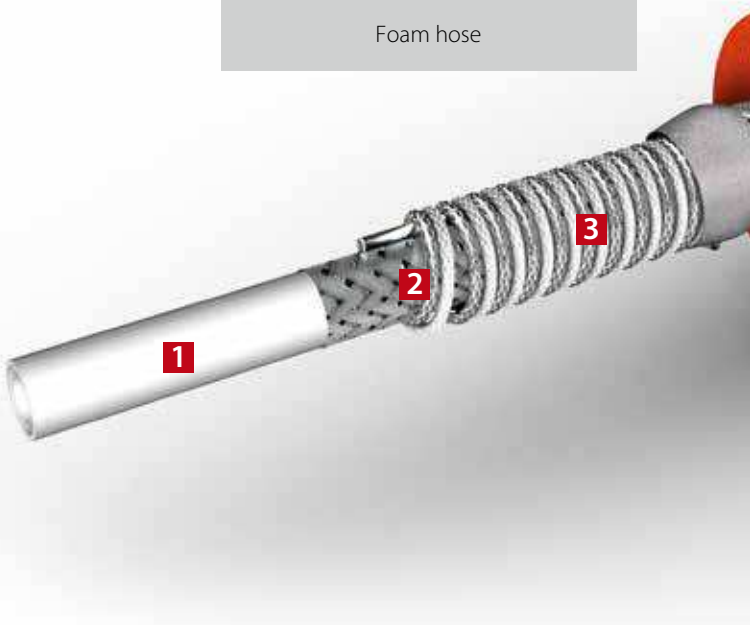
Plastic end cap

Plastic end cap
with terminal housing

Metal end cap

4 Insulation

Foam hose



5 Outer jackets

Nylon braiding / polyamide braiding
Standard design, highly flexible,
smallest bending radii possible

Stainless steel braiding
Mat. 1.4301
highly corrosion-resistant

galvanised iron braiding

Silicone outer jacket, black
Highly flexible, easy to clean,
especially suited for mobile use,
lengths up to 20 m max.

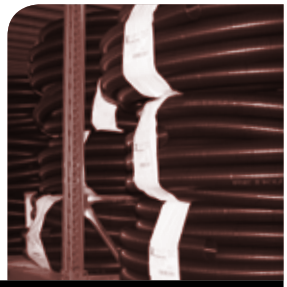
2 Sensor

stationary-mounted temperature sensor

3 Heating cable

with spacer





Technical data

Heat output / heating circuit lengths

Power tolerances: < 200 W: +/-10 % > 200 W +5/-10 % acc. to VDE /
values applicable with ambient temperatures from -20 °C to +45 °C

to 100 °C Type ELH/a/ad/ae with **fixed inner liner**

DN	4	6	8	10
Output in W/m	80		90	
Max. heating circuit lengths in m				
115 V	23		20	
230 V	50		45	
400 V	65		60	

to 200 °C Type ELH/a/ad/ae with **fixed inner liner**

DN	4	6	8	10
Output in W/m	100		110	
Max. heating circuit lengths in m				
115 V	18		18	
230 V	40		38	
400 V	58		55	

to 250 °C Type ELH/ad/ae with **fixed inner liner**

DN	4	6	8	10
Output in W/m	110		120	
Max. heating circuit lengths in m				
115 V	18		18	
230 V	40		35	
400 V	58		50	

to 350 °C Type ELH/ae with **fixed inner liner**

DN	4	6	8	10
Output in W/m	130		140	
Max. heating circuit lengths in m				
115 V	18		15	
230 V	40		35	

to 100 °C	Type ELH/ai/adi with **replaceable inner liner**			
DN	**4**	**6**	**8**	**10**
Output in W/m	90		100	
Max. heating circuit lengths in m				
115 V	20		18	
230 V	45		40	
400 V	60		55	

to 200 °C	Type ELH/ai/adi with **replaceable inner liner**			
DN	**4**	**6**	**8**	**10**
Output in W/m	100		120	
Max. heating circuit lengths in m				
115 V	18		18	
230 V	40		35	
400 V	55		50	

to 250 °C	Typ ELH/adi mit **replaceable inner liner**			
DN	**4**	**6**	**8**	**10**
Output in W/m	120		130	
Max. heating circuit lengths in m				
115 V	18		15	
230 V	35		32	
400 V	50		46	

Technical data

Outer diameter / bending radius

Note: bending radii are applicable to static condition / bending radius. Please request a custom quote for dynamic condition.

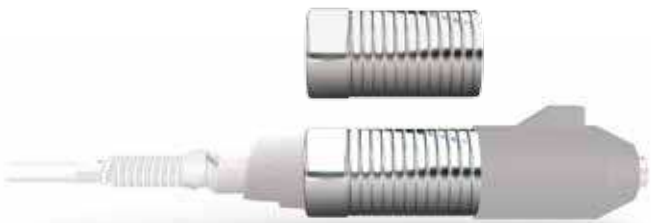
Outer diameters are designed for standard configuration at -20 °C.

to 200 °C	Outer jacket: **nylon braiding / silicone foam hose/ stainless steel braiding / galvanised braiding**				
Type	**Dimensions**	**DN**			
		4	**6**	**8**	**10**
ELH/ad	min. bending radius in mm	170		220	
	Outer ø in mm	45		45	
ELH/a	min. bending radius in mm	220		250	
	Outer ø in mm	45		45	
ELH/ai	min. Biegeradius in mm	250		280	
	Outer ø in mm	45			49
ELH/adi	min. bending radius in mm	250		280	
	Outer ø in mm	45			49
ELH/ae	min. bending radius in mm	260		280	
	Outer ø in mm	45			

to 250 °C	Outer jacket: **nylon braiding / silicone foam hose/ stainless steel braiding / galvanised braiding**				
ELH/ad	min. bending radius in mm	170		250	
	Outer ø in mm	45	49		55
ELH/adi	min. bending radius in mm	250		300	
	Outer ø in mm	45	49	55	55
ELH/ae	min. bending radius in mm	260		300	
	Outer ø in mm	45	49		55

to 200 °C	Outer jacket: **corrugated PA hose / TPRI-B / corrugated PA hose, robotic design**				
Type	**Dimensions**	**DN**			
		4	**6**	**8**	**10**
ELH/ad..w	min. bending radius in mm	200		250	
	Outer ø in mm	43			
ELH/a..w	min. bending radius in mm	210		250	
	Outer ø in mm	43			
ELH/ai..w	min. bending radius in mm	260		280	
	Outer ø in mm	43			
ELH/adi..w	min. bending radius in mm	260		300	
	Outer ø in mm	43			55
ELH/ae..w	min. bending radius in mm	280		320	
	Outer ø in mm	43			

to 250 °C	Outer jacket: **corrugated PA hose / TPRI-B / corrugated PA hose, robotic design**				
ELH/ad..w	min. bending radius in mm	200		280	
	Outer ø in mm	43		55	
ELH/adi..w	min. bending radius in mm	300		320	
	Outer ø in mm	55			63
ELH/ae..w	min. bending radius in mm	280		320	
	Outer ø in mm	45		55	



to 200 °C	Outer jacket: **corrugated metal hose, galvanised corrugated metal hose stainless steel**				
Type	**Dimensions**	**DN**			
		4	**6**	**8**	**10**
ELH/ad..T	min. bending radius in mm	280		320	
	Outer ø in mm	39		45	
ELH/a..T	min. bending radius in mm	300		330	
	Outer ø in mm	39		45	
ELH/ai..T	min. bending radius in mm	310	340		
	Outer ø in mm	39	45		
ELH/adi..T	min. bending radius in mm	300		350	
	Outer ø in mm	39	45		56
ELH/ae..T	min. bending radius in mm	290		320	
	Outer ø in mm	39		45	

to 250 °C	Outer jacket: **corrugated metal hose, galvanised corrugated metal hose stainless steel**			
ELH/ad..T	min. bending radius in mm	330	350	
	Outer ø in mm	45	56	
ELH/adi..T	min. bending radius in mm	360		on
	Outer ø in mm	56		request
ELH/ae..T	min. bending radius in mm	330	350	
	Outer ø in mm	45	56	

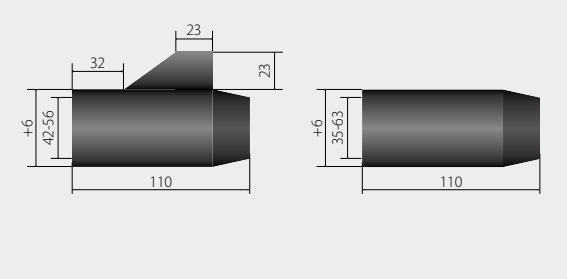
to 200 °C	Outer jacket: **corrugated metal hose with PVC outer jacket / Anaconda**				
Type	**Dimensions**	**DN**			
		4	**6**	**8**	**10**
ELH/ad..T	min. bending radius in mm	290			330
	Outer ø in mm	42			48
ELH/a..T	min. bending radius in mm	340			
	Outer ø in mm	42			
ELH/ai..T	min. bending radius in mm	320		350	
	Outer ø in mm	42		48	
ELH/adi..T	min. bending radius in mm	320	380		
	Outer ø in mm	42	48		
ELH/ae..T	min. bending radius in mm	330			
	Outer ø in mm	42			

to 250 °C	Outer jacket: **corrugated metal hose with PVC outer jacket / Anaconda**			
ELH/ad..T	min. bending radius in mm	350	390	
	Outer ø in mm	48	60	
ELH/adi..T	min. bending radius in mm	390		on
	Outer ø in mm	60		request
ELH/ae..T	min. bending radius in mm	350	390	
	Outer ø in mm	45	56	

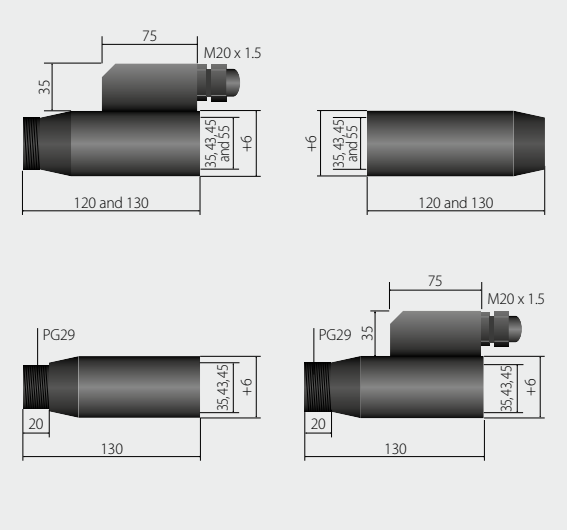
Technical data

End caps

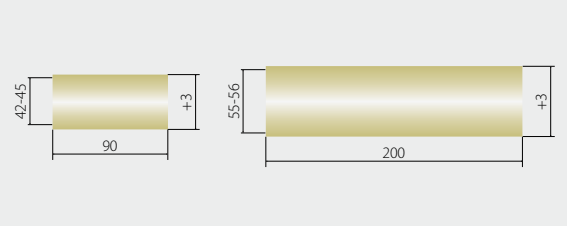
Type	Material	Max. op. temp.	Application
Silicon cap with anti-kink protection	Silicone Black	200 °C	Standard cap for universal application. The end cap is bonded firmly to the outer jacket using special adhesives thus ensuring a high degree of protection.
Silicone end cap without anti-kink protection			



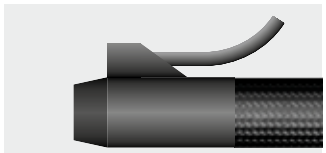
Type	Material	Max. op. temp.	Application
Plastic end cap with terminal housing	Polyamide	100 °C	Plastic end caps are used where the area of the end cap has to be reinforced. Upon customer request, connecting cables can also be replaced by terminal strips in the terminal housing. The end cap is best used in conjunction with a corrugated PA hose.
Plastic end cap			
Plastic end cap with PC 29 thread			
Plastic end cap with PC 29 thread and terminal housing			The PG thread can be used to feed the cable into an analysis cabinet (see also cabinet entries) or a probe.



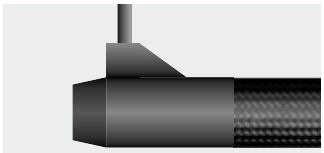
Type	Material	Max. op. temp.	Application
Metal end cap	Bichromated steel, available in stainless steel on request	350 °C	Used with high ambient temperatures in conjunction with a corrugated metal hose to serve as an outer jacket.



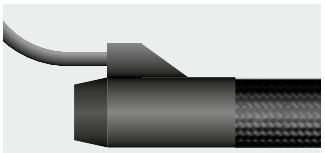
Cable exit



Silicone
Standard, returned

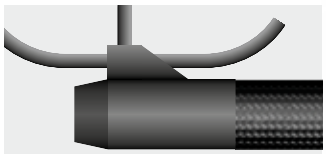


Silicone
on the side



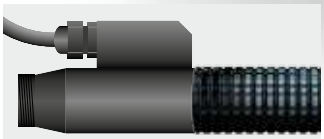
Silicone
to the front

Silicone
on the hose or front side

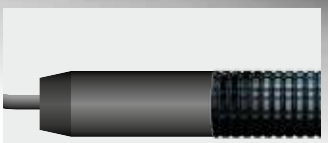


Silicone
combination

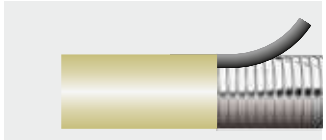
Plastic
Standard, returned



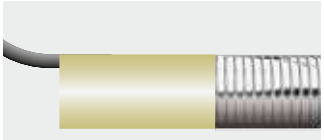
Plastic
to the front



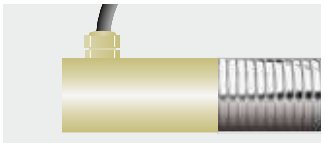
Plastic
on the hose or front side



Metal
Standard, returned



Metal
to the front side



Metal
on the side

Technical data

Temperature sensors

Temperature detection and over temperature protection

- PT 100, 2-, 3- and 4-wire
- Thermocouple Fe-CuNi
- Thermocouple NiCr-Ni
- PTC
- Temperature switch (break contact/make contact) 80... 200 °C

Option:

- 2nd sensor
- Sensor and/or switch replaceable

PT 100, 2-, 3- and 4-wire

Thermocouple Fe-CuNi

Thermocouple NiCr-Ni

Temperature switch (break contact/make contact)

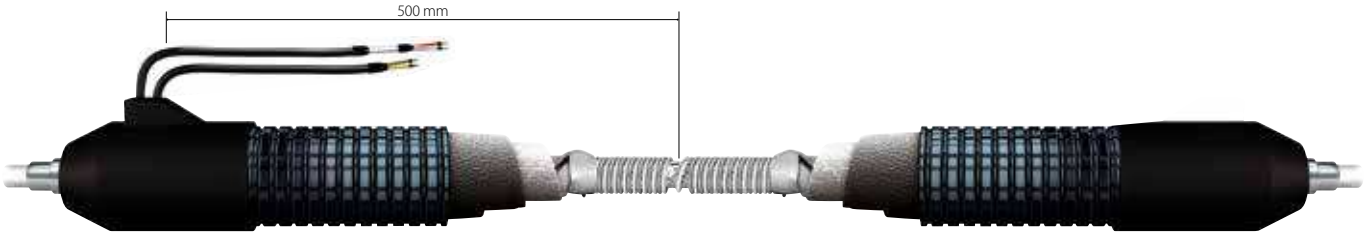
Sensor positioning:

By default, the temperature sensor(s) is/are mounted 500 mm upstream of the power connection.

In general, the temperature tracer can be mounted in almost any position within the heated area of the heated hose.

Correct sensor positioning is crucial especially when laying the heated hose across different temperature zones.

Contact us and we will be happy to help.



Standard connecting plugs and connecting couplings

- Type **6-pole + PE plug** and **6-pole + PE coupling**

Electrical data	
Design voltage	250 V
Design withstanding voltage	4000 V
Power rating	10 A

Technical data	
Min./max. operating temp.	-40 °C to +100 °C
Protection	IP65
Contact surface	silver-coated

Plugs and coupling 7-pole

- Type **4-pole + PE plug** and **6-pole + PE coupling**

Electrical data	
Design voltage	400 V
Design withstanding voltage	6000 V
Power rating	20 A

Technical data	
Min./max. operating temp.	-40 °C to +100 °C
Protection	IP65
Contact surface	silver-coated

Additional connecting plugs and couplings upon request

Plugs and coupling 5-pole

Additional options: additional wires / connecting plugs and calibration gas lines

1 Integrated calibration gas line, heated and unheated

2 Integrated additional wires with open cable ends

2a Integrated additional wires with open cable ends and reinforced connection wires

3 Integrated additional wires with plug connections, plug and coupling

Additional options:

Integrated additional wires:

- As an option, all analytic heated hoses can be equipped with additional wires.
- For example, they can be used to control solenoid valves or to supply probes.
- Additional wires can be supplied with open cable ends or with plug connections (plug and coupling) as requested by the customer.
- When there is great mechanical strain, we offer the option of using reinforced connecting wires in corrugated PA hoses.

Additional types of inner liner:

- As an option, additional heated or unheated inner liners can also be integrated into all analytic heated hoses, e.g. for the purpose of calibration.

Advantages of integrated additional wires and inner liners

- There is no need for laying additional hose lines and/or signal or power cables from the measuring point to the analyser. As a result, the installation expenditure is reduced as only one line needs to be laid.
- To protect against damage and environmental impact, additional wires and inner liners are incorporated into the heated hose.

Self-regulating analytic heat hoses type ELHa…sb

Self-regulating analytic heat hoses serve to transport gaseous media from the point of withdrawal to an analytic measuring device (e.g. at the chimney, connection to a heated probe).

Self-regulating sample gas line of type ELH/a..sb are used in the range from low (frost protection) to medium temperature (up to 120 °C max.).

This includes applications in technological areas such as environmental measurement, emission measurement and process analysis.

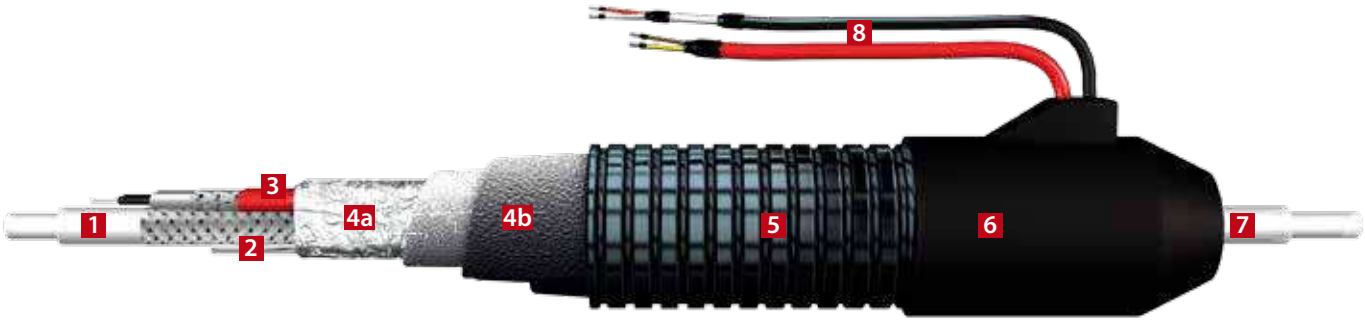
Temperature maintenance: up to 120 °C standard

Application background

- Condensation in gas must be avoided. This will lead to sludge formation and blockage and generate acid drops as a result.
- Gas temperature deviations along the transport route distort measurement results.
- Prevention of lower dew point deviation, especially with combustion gases.
- Frost protection for measurement gas
- Frost protection for chemical liquids and waste water
- in the area of process metrology
- Frost protection in water analysis

Advantages

- Transport of gaseous media without temperature loss
- Operating temperature: 5 °C to 120 °C
- Nominal widths: 2 mm to 12 mm
- Length: 0.3 m to 130.0 m
- Can be shortened on site
- No adjustment required
- Output adjusts to the ambient temperature
- Heat output optimised for application
- Long heating circuit lengths
- Heating cables produced in-house



1 **Inner liners:** see types of inner liner

2 **Sensor:** for precise temperature control, an optional temperature sensor can be mounted between the inner liner and heating cable. Additional sensors can be mounted in any position for further temperature detection. We use PT-100 sensors in 2-wire technology as a standard. In addition, it is possible to integrate nearly any customary temperature sensor (e.g. thermocouple type K / J, PT-1000, etc.).

3 **Self-regulating heating cable:** the self-regulated heating cable is produced in-house. These heating cables consist of two parallel supply wires embedded in a networked plastic heating element doped with carbon particles. If the temperature increases during operation, the plastic will expand as a result of molecular expansion and the distances between the carbon particles will increase. This will cause resistance to increase and output to drop. This process is reversed during cool-down and the output will increase.

4a **Aluminium foil:** for improved heat distribution

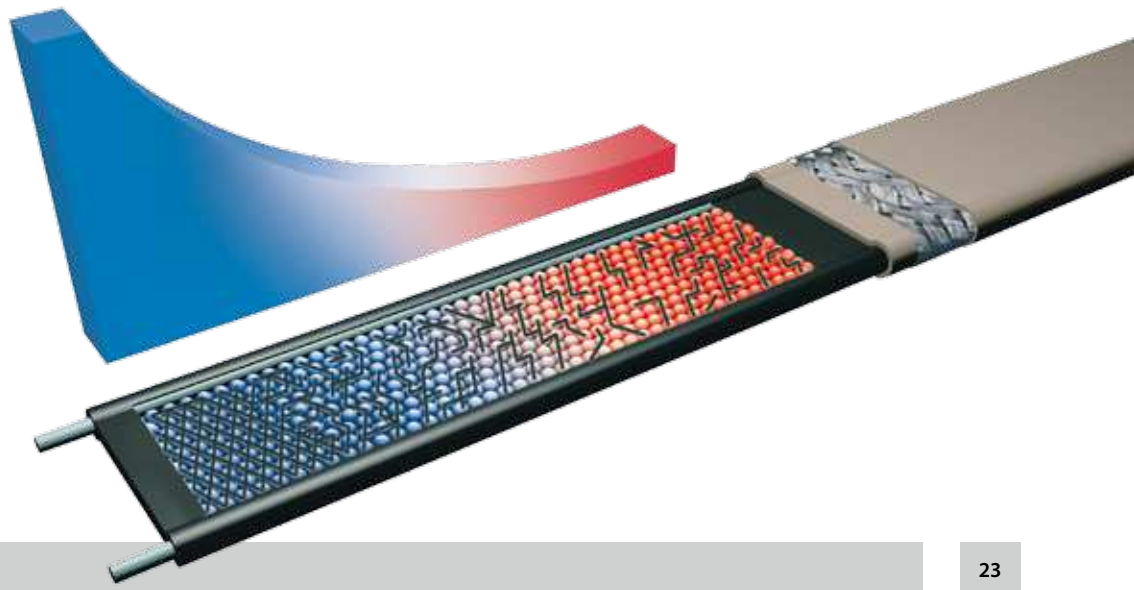
4b **Insulation:** insulation depends on max. operating temperature and selection of outer jacket (see hose configuration page) As a rule, special thermal fleece materials and foam hoses are used (up to 100 °C elastomer foam hose, up to 250 °C silicone foam hoses).

5 **Outer jacket:** outer jacket selection is determined by application, bending radius and ambient temperatures. The outer jacket provides heated hoses with reliable protection from humidity, weather, external environmental impact and mechanical strain.

6 **End caps:** end caps seal off heated hoses at both ends. The integrated strain relief provides reliable relief for the connecting cable. End caps are silicone by default and available in EPDM, plastic (polyamide) and galvanised metal.

7 **Connecting fitting:** connection to analyser or probe

8 **Connecting cables:** by default, the connecting cable is led out separately. (sensor cable and tracer cable). Default length of the connection cables is 1.5 m each. Upon request, any customary plug can be mounted to the connection cable.



Hose configuration Type ELH/a…sb… / w / T to 120 °C

1 Inner liner

200 °C

ELH/a: fixed PTFE or PFA core

200 °C

ELH/ai: fixed PTFE core
replaceable PTFE or PFA core

Note: temperatures provided below refer to max. operating temperatures of the inner liners. Max. operational temperature of the heated hose type ELH/a…sb…is 120 °C max. when switched on / 190 °C when switched off.

Additional inner liners on request.

250 °C

ELH/ad: fixed PTFE core
with VA braiding and RSL pipe stubs

250 °C

ELH/adi: fixed PTFE core
with VA braiding and RSL pipe stubs
replaceable PTFE or PFA core

250 °C

ELH/adi-SP: fixed PTFE core
with VA braiding and RSL pipe stubs
replaceable PTFE or PFA core

600 °C

ELH/ae: fixed stainless steel pipe

6 End caps

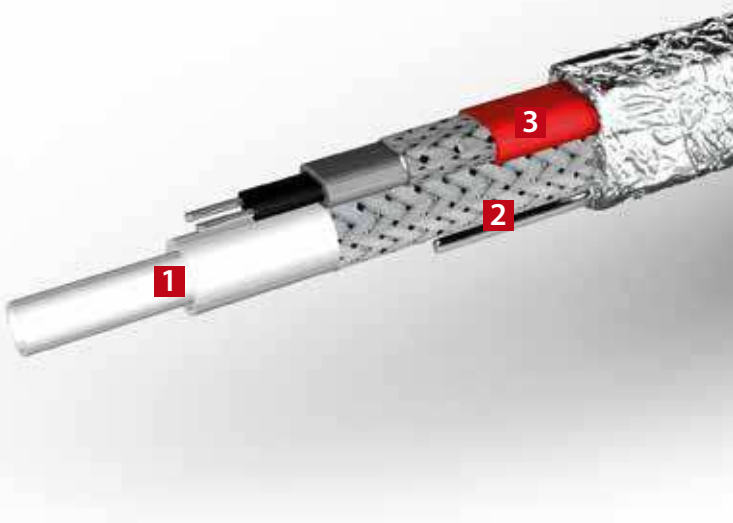
Silicone end cap
with anti-kink protection

Silicone end cap

Plastic end cap

Plastic end cap
with terminal housing

Metal end cap



eltherm®
innovations in heat tracing

5 Outer jackets

Corrugated PA hose (PA-11/12)
Standard

Corrugated TPRI-B hose
highly flexible at high ambient temperatures

Corrugated hose with PVC outer jacket / ANACONDA
Tread-resistant, robust design.
Can also be used outdoors

4 Insulation

multi-layered thermal fleece

2 Sensor: optional

stationary-mounted temperature sensor

3 Heating cable

self-regulating

Hose configuration type ELH/a…sb… / N / SS / Fe to 120 °C

1 Inner liner

200 °C

ELH/a: fixed PTFE or PFA core

200 °C

ELH/ai: fixed PTFE core
replaceable PTFE or PFA core

Note: temperatures provided below refer to max. operating temperatures of the inner liners. Max. operational temperature of the heated hose type ELH/a…sb…is 120 °C max. when switched on / 190 °C when switched off.

Additional inner liners on request.

250 °C

ELH/ad: fixed PTFE core
with VA braiding and RSL pipe stubs

250 °C

ELH/adi: fixed PTFE core
with VA braiding and RSL pipe stubs
replaceable PTFE or PFA core

250 °C

ELH/adi-SP: fixed PTFE core
with VA braiding and RSL pipe stubs
replaceable PTFE or PFA core

600 °C

ELH/ae: fixed stainless steel pipe

6 End caps

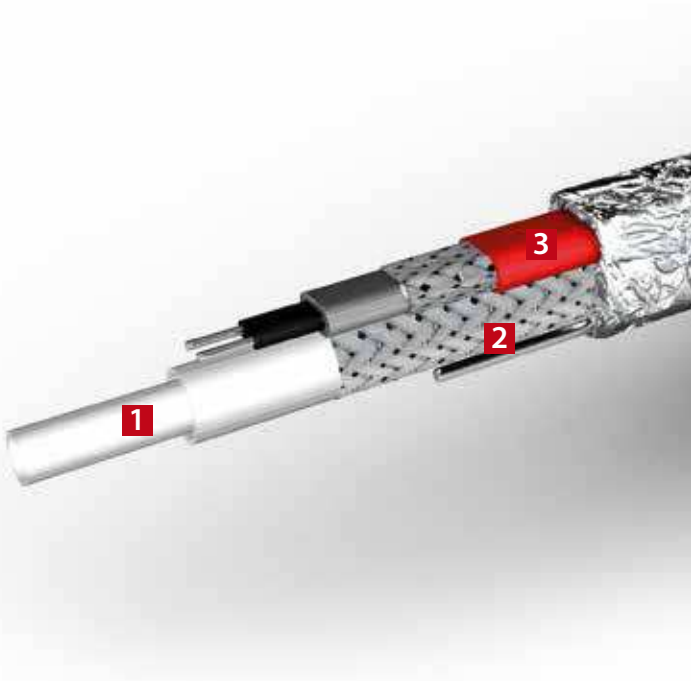
Silicone end cap
with anti-kink protection

Silicone end cap

Plastic end cap

Plastic end cap
with terminal housing

Metal end cap



5 Outer jackets

Nylon braiding / polyamide braiding
Standard configuration, highly flexible, smallest possible bending radii

Stainless steel braiding
Mat. 1.4301
highly corrosion-resistant

galvanised iron braiding

4 Insulation

foam hose

2 Sensor: optional

stationary-mounted temperature sensor

3 Heating cable

self-regulating



Technical data

Heat output / heating circuit lengths

Self-regulating analytic cable, designed for min. ambient temperature of -20 °C
Connected voltage: 230 V / 115 V upon request
Max. heating circuit lengths at -20 °C with 16 A fuse characteristic C

to 120 °C ELH/adsb, ELH/asb, ELH/adisb, ELH/aisb with **nominal widths 4-10 mm**

Holding temp. in °C	Rated output in W/mat +10 °C	Type of heating cable used	Max. temp in °C allowed		max. heating circuit length
			switched on	switched off	
5	10	ELSR-N...	65	85	110
30	30				50
50	30	ELSR-H...	120	190	65
80	45				45
100	45				45
120	60				35

Assembly set

Assembly set for on-site packaging of the heated hoses
types ELH/asb…/aisb…& aesb..w/N/SS/Fe

Type	Nominal widths	Holding temp. in °C	Design	Material	Item no.
ELH/ SBA2-30 °C	4 to 10	5-30	Bonding techn.	Silicon end caps	5X3C000
ELH/ SBA2-100 °C	4 to 10	50-100	Bonding techn.	Silicon end caps	5X3C001
ELH/ SBA2-120 °C	4 to 10	120	Bonding techn.	Silicon end caps	5X3C002
ELH/ ZUMAT	4 to 10	5-120	Bonding techn.	Additional material is required for each SBA2 set. Sufficient for 5 connections and terminations	5X3A007
ELH/ SBA3-30 °C	4 to 10	5-30	Screwing techn.	Plastic end caps	5X3C003
ELH/ SBA3-30 °C	4 to 10	50-100	Screwing techn.	Plastic end caps	5X3C004
ELH/ SBA3-120 °C	4 to 10	120	Screwing techn.	Plastic end caps	5X3C005

Temperature tracers

Temperature tracers for integration into heated hoses on site
types ELH/asb…/aisb…& aesb..w/N/SS/Fe

Type	Connection length in mm	Holding temp. in °C	Design	Connecting cable insulation	Item no.
ELTF-PT.3	3.0	5-120	PT-100/ 2-wire	PTFE	0650003
ELTF-PT.3.1	3.0	5-120	PT-100/ 3-wire	PTFE	0650002

Technical data

Outer diameter / bending radii

Note: bending radii are applicable to static condition. Please request a custom quote for dynamic condition. Outer diameters are designed for standard configuration at -20 °C.

to 120 °C	Bending radii in mm: corrugated PA hose (W), corrugated TPE hose (W)					
Type	Holding temp. in °C	DN				Outer diameter in mm
		4	6	8	10	
ELH/asb, ELH/adsb	5-100	220		270		43
	120	230		280		55
ELH/aesb	5-100	290		330		43
	120	300		340		55
ELH/aisb, ELH/adisb	5-100	270		320		43
	120	280		330		55

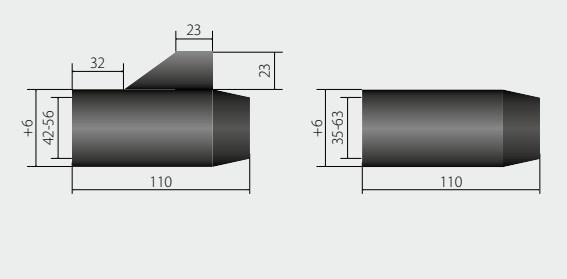
to 120 °C	Bending radii in mm: Anaconda corrugated metal hose (T)					
Type	Holding temp. in °C	DN				Outer diameter in mm
		4	6	8	10	
ELH/asb, ELH/adsb	5-100	330		340		42
	120	340		350		48
ELH/aesb	5-100	350		340		42
	120	360		350		48
ELH/aisb, ELH/adisb	5-100	340		340		42
	120	350		350		48

to 120 °C	Bending radii in mm: nylon braiding (N), stainless steel braiding (SS), galv. iron braiding (FE)					
Type	Holding temp. in °C	DN				Outer diameter in mm
		4	6	8	10	
ELH/asb, ELH/adsb	5-100	200		260		45
	120	210		270		55
ELH/aesb	5-100	270		290		45
	120	280		300		55
ELH/aisb, ELH/adisb	5-100	260		290		45
	120	270		300		55

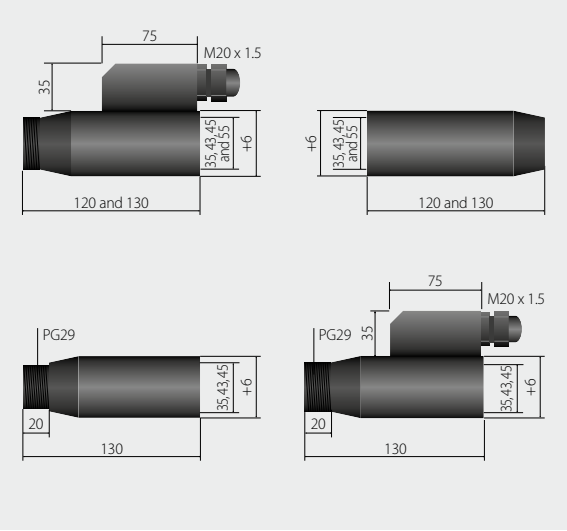
Technical data

End caps

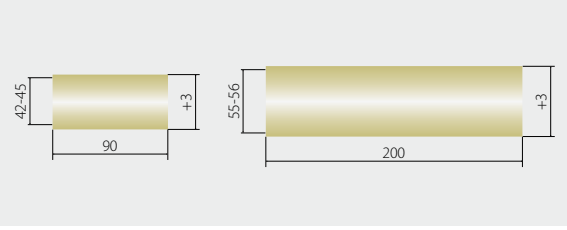
Type	Material	Max. op. temp.	Application
Silicon cap with anti-kink protection	Silicone Black	200 °C	Standard cap for universal application. The end cap is bonded firmly to the outer jacket using special adhesives thus ensuring a high degree of protection.
Silicone end cap without anti-kink protection			



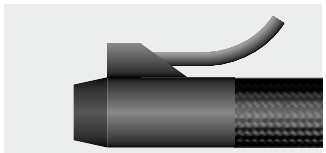
Type	Material	Max. op. temp.	Application
Plastic end cap with terminal housing	Polyamide	100 °C	Plastic end caps are used where the area of the end cap has to be reinforced. Upon customer request, connecting cables can also be replaced by terminal strips in the terminal housing. The end cap is best used in conjunction with a corrugated PA hose.
Plastic end cap			
Plastic end cap with PC 29 thread			
Plastic end cap with PC 29 thread and terminal housing			The PG thread can be used to feed the cable into an analysis cabinet (see also cabinet entries) or a probe.



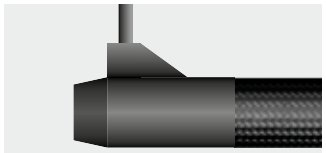
Type	Material	Max. op. temp.	Application
Metal end cap	Bichromated steel, available in stainless steel on request	350 °C	Used with high ambient temperatures in conjunction with a corrugated metal hose to serve as an outer jacket.



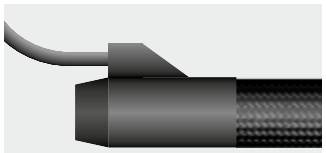
Cable exit



Silicone
Standard, returned

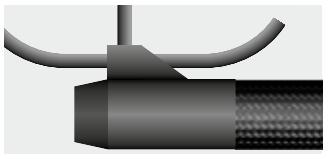


Silicone
on the side

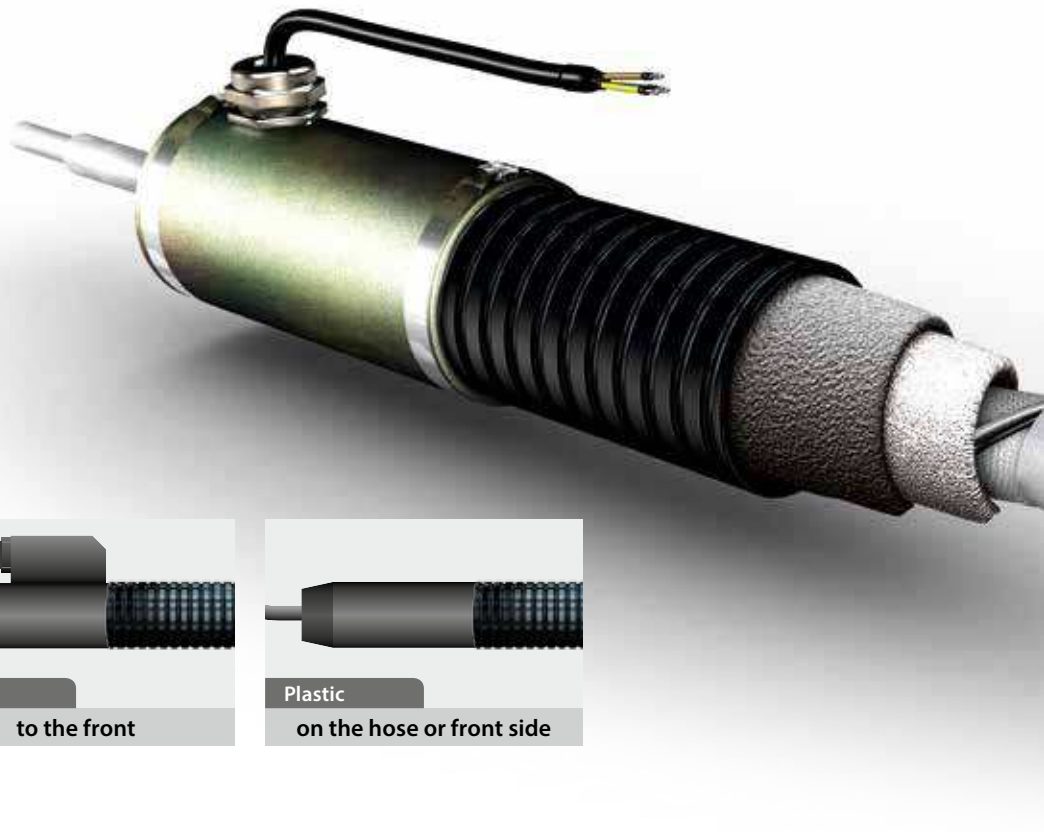


Silicone
to the front

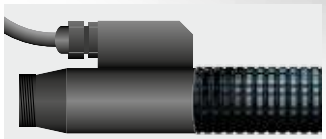
Silicone
on the hose or front side



Silicone
combination

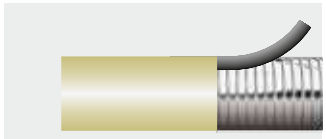


Plastic
Standard, returned

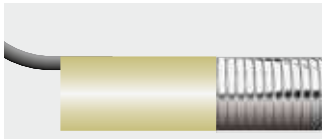


Plastic
to the front

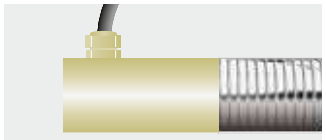
Plastic
on the hose or front side



Metal
Standard, returned



Metal
to the front side



Metal
on the side

Technical data

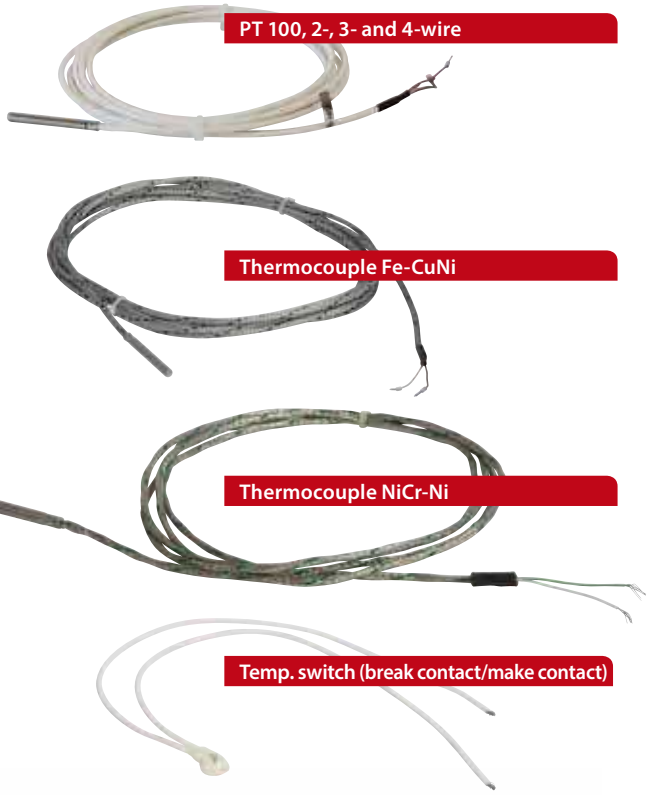
Temperature sensors

Temperature detection and over temperature protection

- PT 100, 2-, 3- and 4-wire
- Thermocouple Fe-CuNi
- Thermocouple NiCr-Ni
- PTC
- Temperature switch (break contact/make contact) 80... 200 °C

Option:

- 2nd sensor
- Sensor and/or switch replaceable



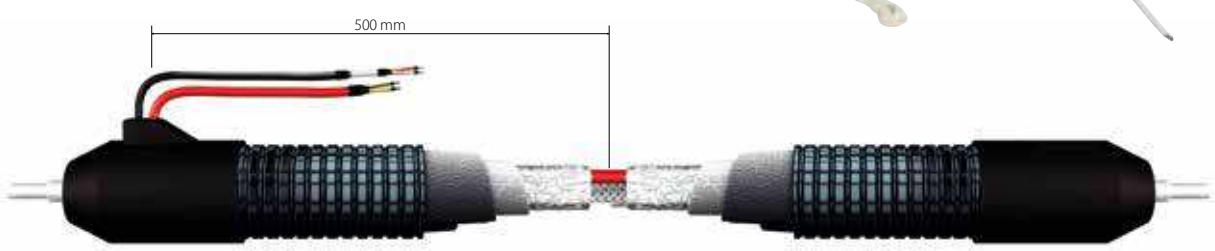
Sensor positioning:

By default, the temperature sensor(s) is/are mounted 500 mm upstream of the power connection.

In general, the temperature tracer can be mounted in almost any position within the heated area of the heated hose.

Correct sensor positioning is crucial especially when laying the heated hose across different temperature zones.

Contact us and we will be happy to help.



Standard connecting plugs and connecting couplings

- Type **6-pole + PE plug** and **6-pole + PE coupling**

Electrical data	
Design voltage	250 V
Design withstanding voltage	4000 V
Power rating	10 A

Technical data	
Min./max. operating temp.	-40 °C to +100 °C
Protection	IP65
Contact surface	silver-coated

Plugs and coupling 7-pole

- Type **4-pole + PE plug** and **6-pole + PE coupling**

Electrical data	
Design voltage	400 V
Design withstanding voltage	6000 V
Power rating	20 A

Technical data	
Min./max. operating temp.	-40 °C to +100 °C
Protection	IP65
Contact surface	silver-coated

Plugs and coupling 5-pole

Additional connecting plugs and couplings upon request

Additional options: additional wires / connecting plugs and calibration gas lines

1 Integrated calibration gas line, heated and unheated

2 Integrated additional wires with open cable ends

2a Integrated additional wires with open cable ends and reinforced connection wires

3 Integrated additional wires with plug connections, plug and coupling

Additional options:

Integrated additional wires:

- As an option, all analytic heated hoses can be equipped with additional wires.
- For example, they can be used to control solenoid valves or to supply probes.
- Additional wires can be supplied with open cable ends or with plug connections (plug and coupling) as requested by the customer.
- When there is great mechanical strain, we offer the option of using reinforced connecting wires in corrugated PA hoses.

Additional types of inner liner:

- As an option, additional heated or unheated inner liners can also be integrated into all analytic heated hoses, e.g. for the purpose of calibration.

Advantages of integrated additional wires and inner liners

- There is no need for laying additional hose lines and/or signal or power cables from the measuring point to the analyser. As a result, the installation expenditure is reduced as only one line needs to be laid.
- To protect against damage and environmental impact, additional wires and inner liners are incorporated into the heated hose.

Analytic heated hoses for Ex-area

Ex-proof analytic heated hoses made by eltherm are used for transporting gaseous and liquid media from the point of withdrawal to the analytic measuring device without loss of temperature.

They are certified for application in explosion-prone areas of zones 1 + 2 (gas) and zones 21 + 22 (dust). The process temperatures range from +5 °C / frost protection (temperature class T6) to +200 °C (temperature class T3). Each heated hose is configured according to customer specifications. The entire system is certified by way of a CE declaration of conformity. Only EC type-tested individual components are selected.

Our antistatic outer jackets are used in the chemical, petrochemical and pharmaceutical sectors as well as machinery and plant engineering, power stations and the cement industry. Areas of application include process control and control systems, monitoring of ventilation and air-conditioning, emission monitoring, prevention of condensation and lower dew point deviation.


IBExU Institut für Sicherheitstechnik GmbH

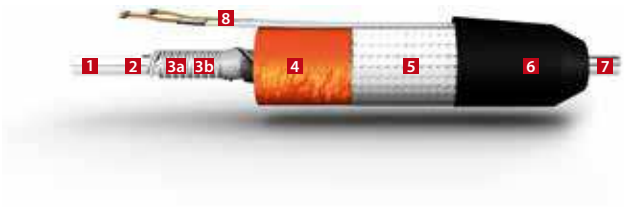
Heated analytic heated hoses for Ex-area

As an ATEX-certified company (IBExU09ATEX Q006), eltherm GmbH meets the requirements of an increased safety standard in accordance with the most recent 94/4/EG (ATEX 100a) Ex Protection Directives.

Owing to our ATEX-certified heating components, such as heating cables, heating tapes, connecting fittings, temperature tracers, etc., we are able to supply heated analytic heating hoses certified for Ex-area use.

In addition to heated analytic heating hoses, eltherm also offers the required accessories, such as temperature controllers, temperature regulators and corresponding junction boxes for the Ex-area.

Configuration ELH/a..w...-Ex



Configuration ELH/a..sb .w..-Ex

1 **Inner liners:** see types of inner liner

2 **Sensor:** two temperature sensors are mounted between inner liner and heating cable to provide control and limit the temperature to the level required. Our standard devices include either ex-proof PT-100 temperature sensors in 3- or 4-wire technology or PT-100 sensors for intrinsic safety control.

3a **Heating cable:** the resistance heating cable, the basic element is produced in-house. eltherm uses only heating cables insulated with fluorpolymer. We also focus on the highest possible power density with the result of excellent homogeneous heat distribution. All our controlled Ex-analytic heated hoses come standard with our type ELKM-AG heating cable.

3b **Spacer:** the spacer made of braided glass-fibre provides reliable protection for the heating cable against damage and hot spots in the event of bending strain.

3c **Self-regulating heating cable:**
the self-regulated heating cable component is produced in-house. Self-regulating heating cables consist of two parallel supply wires embedded in a networked plastic heating element doped with carbon particles. If the temperature increases during operation, the plastic will expand as a result of molecular expansion and the distance between the carbon particles will increase. This will cause an increase in resistance, which causes output to drop. This process is reversed during cool-down and the output will increase. The advantage for use in the Ex-area is that the heating cable is self-regulating as described above. There is no need for a thermal cut-out. Depending on application, a controller is not mandatory.

4 **Insulation:** insulation depends on max. operating temperature and selection of outer jacket (see hose configuration page) As a rule, special thermal fleece materials and foam hoses are used (up to 100 °C elastomer foam hose, up to 200 °C silicone foam hoses).

4a **Aluminium foil:** provides improved heat distribution

5 **Outer jacket:** the selection of the outer jacket is determined by application, bending radius and ambient temperature. The outer jacket provides heated hoses with reliable protection against humidity, weather, external environmental impact and mechanical strain. In accordance with Ex Protection Directives 94/4/EG (ATEX 100a), all our heated Ex analytic hoses are made with a conductive outer jacket.

6 **End caps:** end caps seal off heated hoses at both ends. The integrated strain relief provides reliable relief for the connecting cable. The end caps of our ex-proof heated hoses are available in silicone or EPDM as standard.

7 **Connecting fitting:** connection to analyser or probe

8 **Connecting cables:** by default, the connecting cable is lead out separately (sensor cable and tracer cable). Standard length of the connecting cable is 1.5 m. Only special, ATEX-certified, PTFE-insulated connection wires are used for our connecting cables.

9 **Power connection:** by default, the power connection is established using 1.0-m excess heating cable length. The heating cable comes fully wired with an ATEX-certified cable gland. The power connection also requires a suitable junction box (e.g. our ELAK-EX-R7).

Hose configuration type ELHa…Ex to 200 °C

1 Inner liner

200 °C

ELH/a: fixed PTFE or PFA core

200 °C

ELH/ai: fixed PTFE core
replaceable PTFE or PFA core

250 °C

ELH/ad: fixed PTFE core
with VA braiding and RSL pipe stubs

250 °C

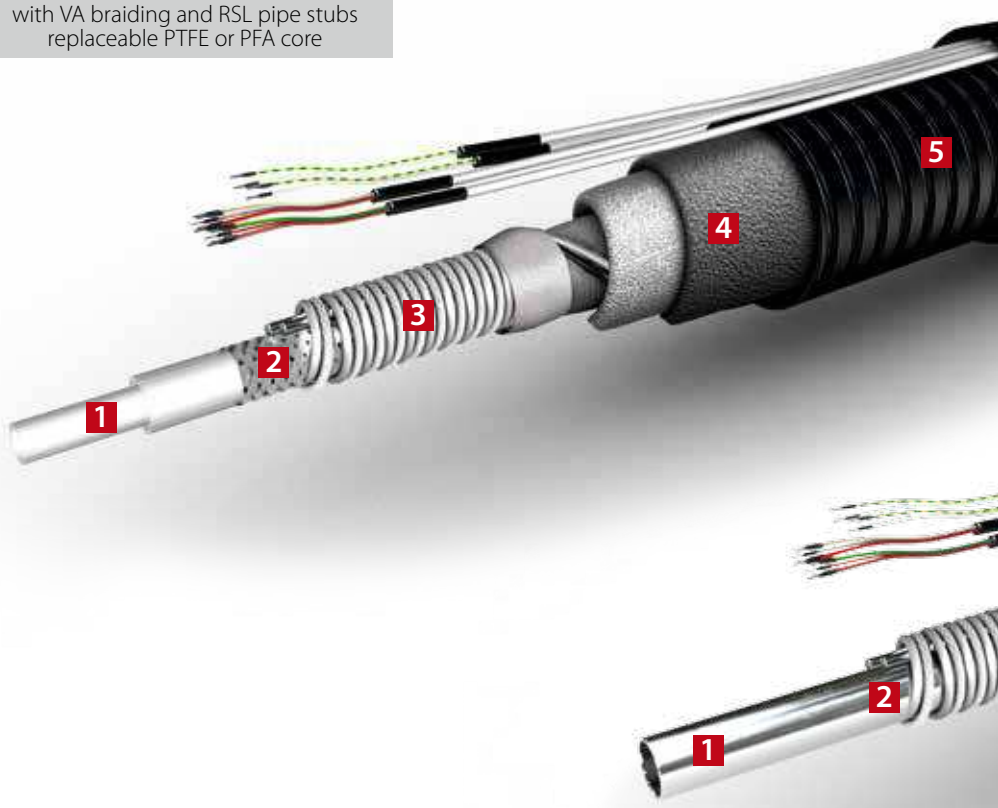
ELH/adi: fixed PTFE core
with VA braiding and RSL pipe stubs
replaceable PTFE or PFA core

600 °C

ELH/ae: fixed stainless steel pipe

Note: temperatures provided below also refer to max. operating temperatures of inner liners. Max. operational temperature of the heated hose type ELH/a.. is 200 °C.

Additional inner liners on request.



6 End caps

Silicone end cap

3 Heating cable

Typr ELKM-AG
ATEX-certified
Certificate no.: PTB 09ATEX1029 U

5 Outer jackets

Corrugated PA hose (PA-11/12)
electrically conductive

Stainless steel braiding
Mat. 1.4301
highly corrosion-resistant

galvanised iron braiding

4 Insulation

multi-layered thermal fleece

foam hose

2 Sensors to control and limit temperatures

PT-100/3-wire for intrinsic safety control

Ex-proof PT-100/4-wire
or 3-wire, type ELTF-PTEx.1
Certificate no.: IECEx IBE 12.0002X

Technical data

Heat output / heating circuit lengths

Power tolerances: < 200 W: +/-10 % > 200 W +5/-10 % acc. to VDE / values applicable with ambient temperatures from -20 °C to +45 °C

A serial resistance heating cable type ELKM-AG is used for the heated hose type ELH/a…Ex. In addition to a suitable controller, it is mandatory to use an appropriate safety limiter (e.g. our controller and limiter series Ex-box) in the Ex-area.

Equipment class: II 2G Ex e IIC T3-T5 Gb II 2D Ex tb IIIC TX Db

to 200 °C Type ELH/a/ad/ae with **fixed inner liner**

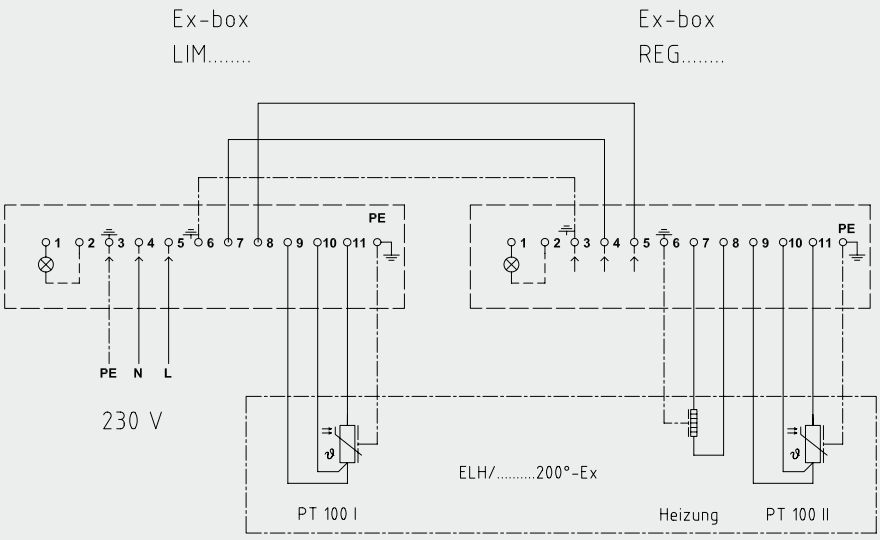
DN	4	6	8	10
Output in W/m	100		110	
Max. heating circuit lengths in m				
115 V	15		12	
230 V	25		22	
400 V	50		45	

to 200 °C Type ELH/ai/adi with **replaceable inner liner**

DN	4	6	8	10
Output in W/m	100		120	
Max. heating circuit lengths in m				
115 V	15		10	
230 V	25		20	
400 V	50		40	

Wiring diagram

Power connection of a regulated heated wire type ELH/a…Ex to a controller and limiter by way of example: Ex-Box



Technical data

Outer diameter / bending radii

Note: bending radii are applicable to static condition. Please request a custom quote for dynamic condition.
Outer diameters are designed for standard configuration at -20 °C.

The hose must not be subject to bending strain in the marked areas of the connection sleeves and the temperature tracers.

to 200 °C	Outer jacket: **stainless steel braiding / galvanised braiding**				
Type	**Dimensions**	**DN**			
		4	**6**	**8**	**10**
ELH/a..EX	Min. bending radius in mm	260			
	Outer ø in mm	50*			
ELH/ai..EX	Min. bending radius in mm	260			
	Outer ø in mm	50*			
ELH/ad..EX	Min. bending radius in mm	260			
	Outer ø in mm	50*			
ELH/adi..EX	Min. bending radius in mm	260			
	Outer ø in mm	50*			
ELH/ae	Min. bending radius in mm	280			
	Outer ø in mm	50			

to 200 °C	Outer jacket: **corrugated PA hose, conductive**				
Type	**Dimensions**	**DN**			
		4	**6**	**8**	**10**
ELH/a..EX	Min. bending radius in mm	300			
	Outer ø in mm	63			
ELH/ai..EX	Min. bending radius in mm	300			
	Outer ø in mm	63			
ELH/ad..EX	Min. bending radius in mm	300			
	Outer ø in mm	63			
ELH/adi..EX	Min. bending radius in mm	300			
	Outer ø in mm	63			
ELH/ae..w	Min. bending radius in mm	320			
	Outer ø in mm	63			

* In the area of the connecting sleeves, the outer diameter is approximately 65 mm. The heated hose must not be subjected to bending strain in the connection sleeves and temperature tracers.

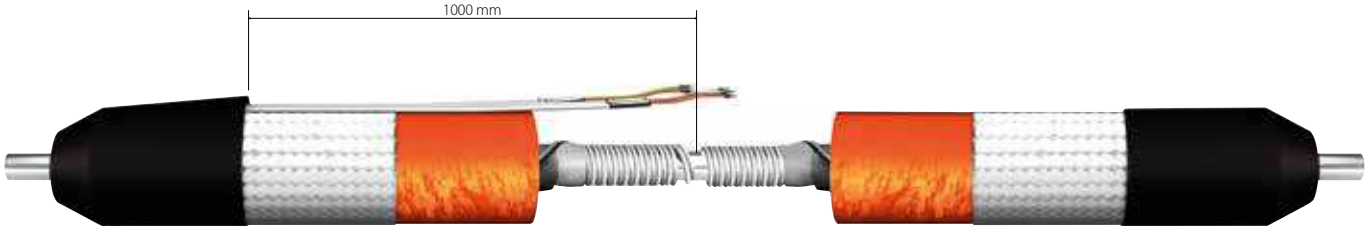
Sensor positioning:

In our analytic heated hoses for the Ex-area, temperature sensors are installed 1000 mm from the power connection.

In general, temperature sensors can be mounted in almost any position within the heated area of the heated hose.

Correct sensor positioning is crucial especially when laying the heated hose across different temperature zones.

Contact us and we will be happy to help.



Hose configuration type ELHa…sb…EX to 120 °C

1 Inner liner

200 °C

ELH/a: fixed PTFE or PFA core

200 °C

ELH/ai: fixed PTFE core
replaceable PTFE or PFA core

Note: temperatures provided below refer to max. operating temperatures of inner liners. Max. operational temperature of the heated hose type ELH/a…sb…is 120 °C max. when switched on / 190 °C when switched off.

Additional inner liners on request.

250 °C

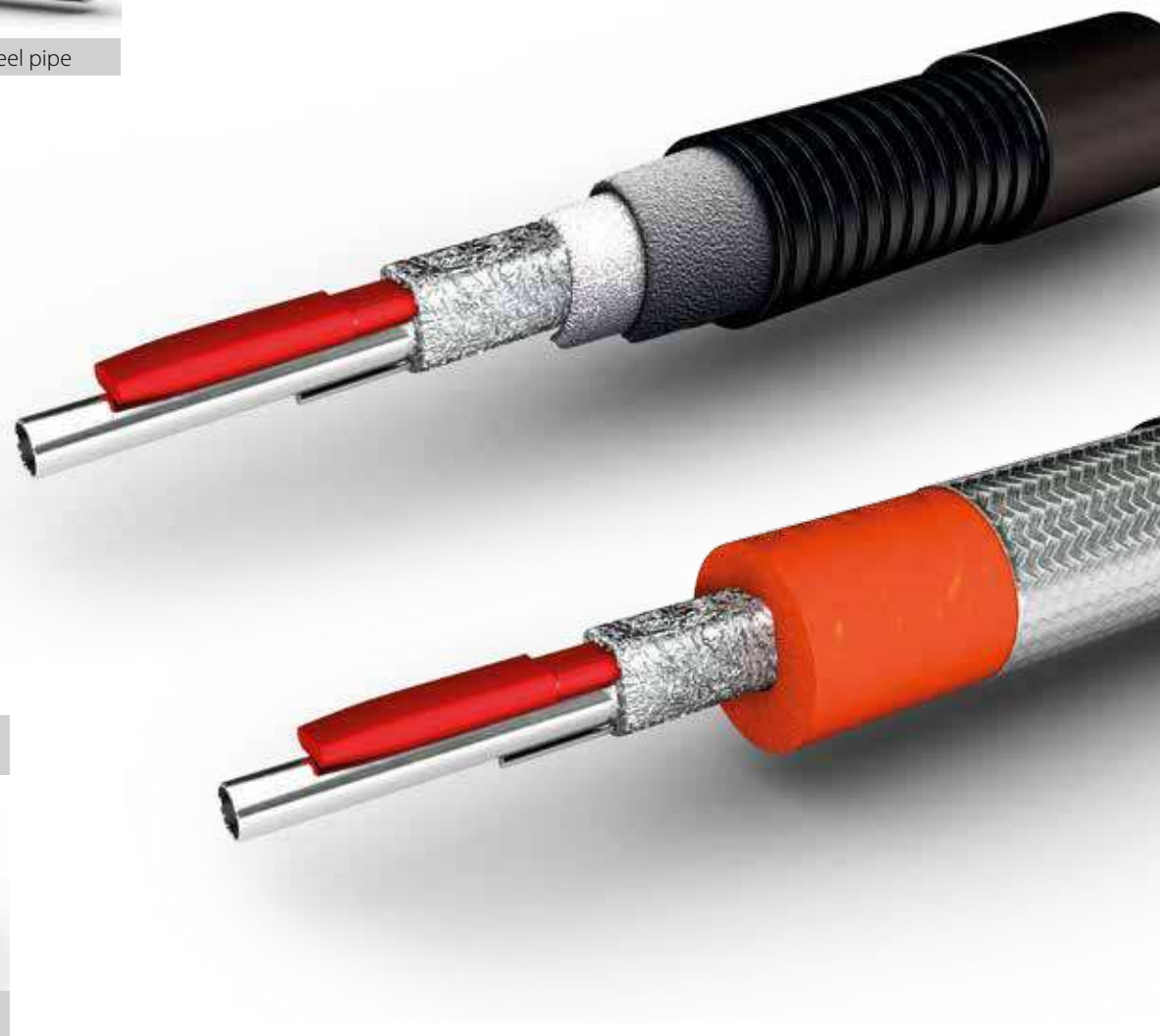
ELH/ad: fixed PTFE core
with VA braiding and RSL pipe stubs

250 °C

ELH/adi: fixed PTFE core
with VA braiding and RSL pipe stubs
replaceable PTFE or PFA core

600 °C

ELH/ae: fixed stainless steel pipe



6 End caps

Silicone end cap

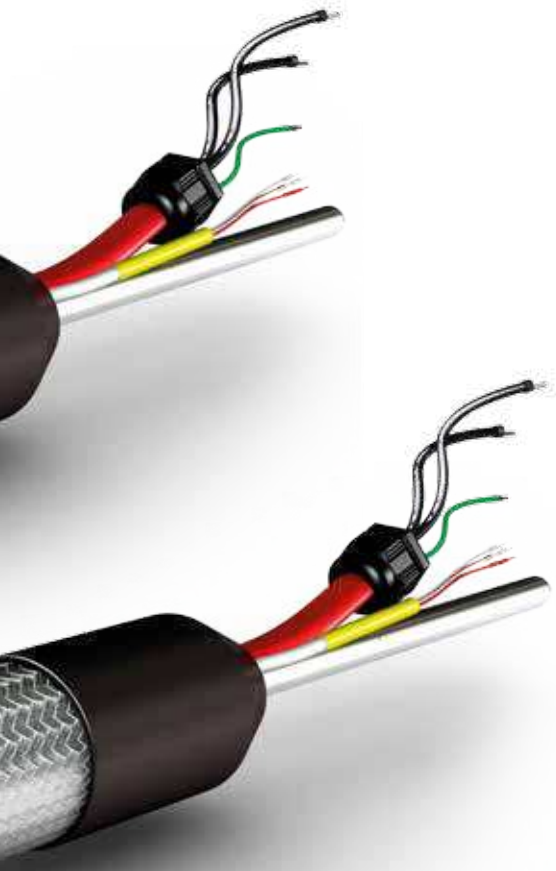
eltherm®
innovations in heat tracing

5 Outer jackets

Corrugated PA hose (PA-11/12)
electrically conductive

Stainless steel braiding
Mat. 1.4301
highly corrosion-resistant

galvanised iron braiding



7 Power connection

1.0 m excess heating cable length with
M25 x 1.5 Ex-proof screwed cable gland

4 Insulation

multi-layered thermal fleece

foam hose

3 Heating cable/heating tape

Type ELSR-N and ELSR-H
ATEX-certified

2 Sensors for temperature control: optional

PT-100/3-wire for intrinsic safety
control

Ex-proof PT-100/4-wire
or 3-wire, type ELTF-PTEx.1
Certificate no.: IECEx IBE 12.0002X

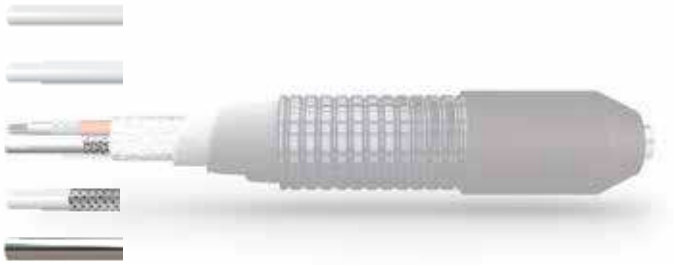
Technical data

Heat output / heating circuit lengths

Power tolerances: < 200 W: +/-10 % > 200 W +5/-10 % acc. to VDE / values applicable with ambient temperatures from -20 °C to +45 °C

Self-regulating heat cables of types ELSR-N and ELSR-H are used with type ELH/a…sb…Ex heated hoses. No limiter required for heated hoses. Depending on application, a controller is also not mandatory with this type of heated hose.

Device class for ELH/a...sb-EX 5 °C - 30 °C: II 2G Ex e IIC T6 Gb II 2D Ex tb IIIC TX Db
Device class for ELH/a...sb-EX 50 °C - 120 °C: II 2G Ex e IIC T3 Gb II 2D Ex tb IIIC TX Db



to 120 °C ELH/adsbEX, ELH/asbEX, ELH/adisbEX, ELH/aisbEX, ELH/aesbEX with **nominal widths 4-12 mm**

Holding temp. in °C	Rated output in W/m at +10°C	Type of heating cable used	Max. temp in °C allowed		Max. heating circuit length
			switched on	switched off	
5	10	ELSR-N...	65	85	110
30	30				50
50	30	ELSR-H...	120	190	65
80	45				45
100	45				45
120	60				35

Assembly set

Assembly set for on-site packaging of heated hose
types ELH/asb…/aisb…& aesb..w/SS/Fe

Type	Nominal widths	Holding temp. in °C	Design	Material	Item no.	Ex-designation
ELH/ SBA 2- 30°C-EX	4 to 10	5-30	Bonding techn.	Silicon end caps	5X3A004	II 2G Ex e II T6 II 2D Ex tD A21 IP65 TX
ELH/ SBA2-100°C-EX	4 to 10	50-100	Bonding techn.	Silicon end caps	5X3A005	II 2G Ex e II T3 II 2D Ex tD A21 IP65 TX
ELH/ SBA2-120°C-EX	4 to 10	120	Bonding techn.	Silicon end caps	5X3A006	
ELH/ ZUMAT	4 to 10	5-120	Bonding techn.	Additional material is required for each SBA2 set. Sufficient for 5 connections and terminations	5X3A007	

Temperature tracers

Temperature tracer for on-site installation of heated hose
types ELH/asb…/aisb…& aesb..w/SS/Fe

Typ	Connection length in m	Holding temp. in °C	Design	Connecting cable insulation	Item no.	Ex-designation
ELTF-PTEx.1	5.0	5-120	PT-100/ 4-wire	PTFE	0X70001	II 2G Ex e IIC T2…T6 Gb II 2D Ex tb IIIC TX Db

Technical data

Outer diameter / bending radii

Note: bending radii are applicable to static condition. Please request a custom quote for dynamic condition.
Outer diameters are designed for standard configuration at -20 °C.

The hose must not be subject to bending strain in the marked areas of the connection sleeves and the temperature tracers.

to 120 °C	Bending radii in mm: corrugated PA hose (W), corrugated TPE hose (W)					
Type	Holding temp. in °C	DN				Outer diameter in mm
		4	6	8	10	
ELH/asb, ELH/adsb	5-100	220		270		43
	120	230		280		55
ELH/aesb	5-100	290		330		43
	120	300		340		55
ELH/aisb, ELH/adisb	5-100	270		320		43
	120	280		330		55

to 120 °C	Bending radii in mm: stainless steel braiding (SS), galvanised iron braiding (FE)					
Type	Holding temp. in °C	DN				Outer diameter in mm
		4	6	8	10	
ELH/asb, ELH/adsb	5-100	200		260		45
	120	210		270		55
ELH/aesb	5-100	270		290		45
	120	280		300		55
ELH/aisb, ELH/adisb	5-100	260		290		45
	120	270		300		55

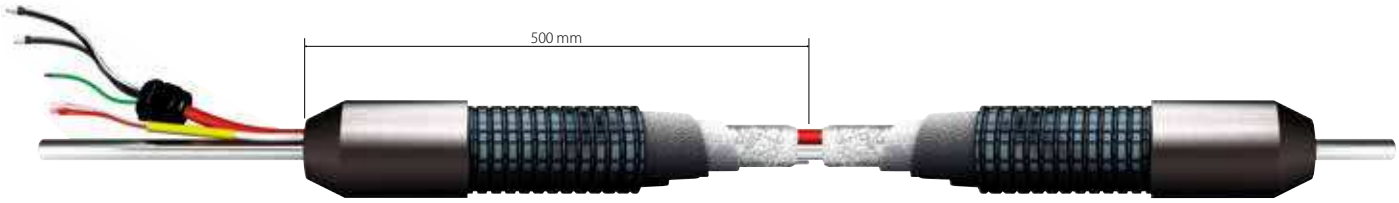
Sensor positioning:

If an optional temperature sensor is integrated into the self-regulating analytic heated hose, the standard mounting position is 500 mm upstream of the power connection.

In general, the temperature tracer can be mounted in nearly any position within the heated area of the heated hose.

Correct sensor positioning is crucial especially when laying the heated hose across different temperature zones.

Contact us and we will be happy to advise you.



Special heated hoses

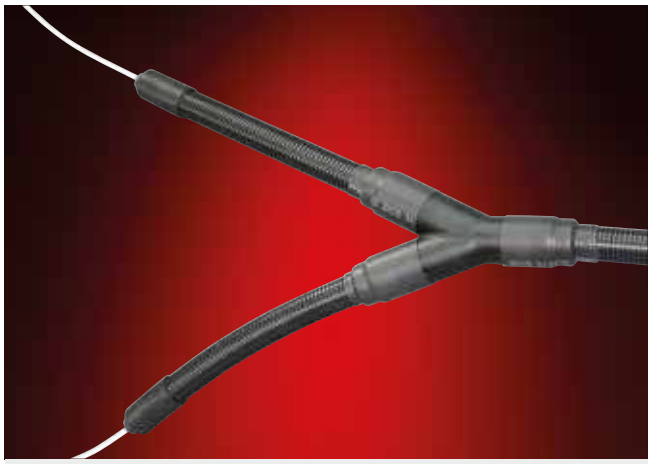
Type ELH/2a…, Type ELH/3a…, Type ELH…SP

In addition to the standard heated sample gas line designs shown, we can also offer special designs optimally customised to suit your application and requirements.

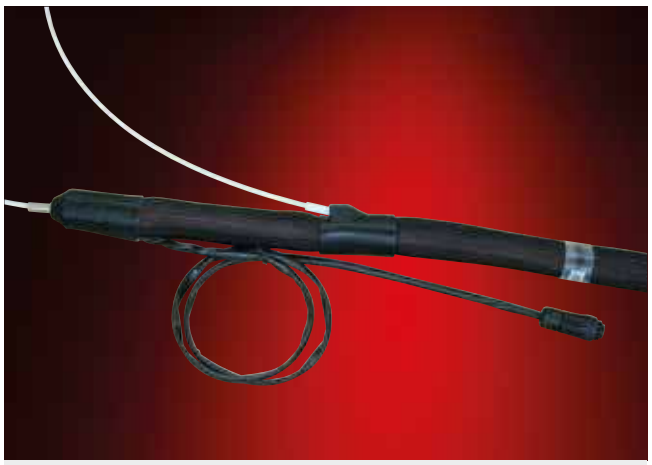
Our business thrives on customised designs.

Contact us.

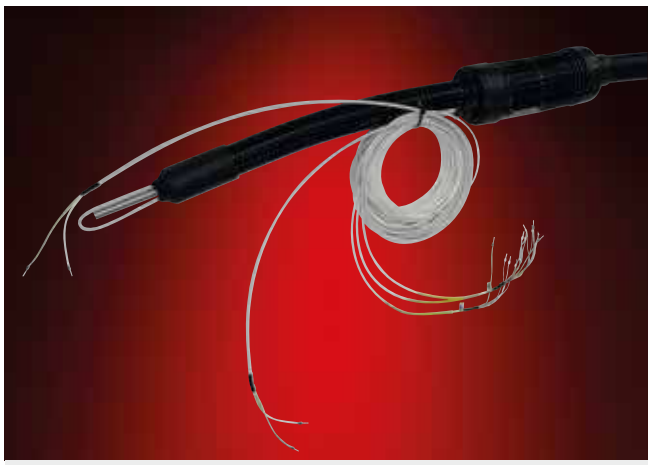
Type: ELH/adw 200 °C NW4/6 –SP
with heated T-branch on the probe side



Type: ELH/2aw 200 °C NW4/6-SP
2 heated inner liners with probe-side Y-branching



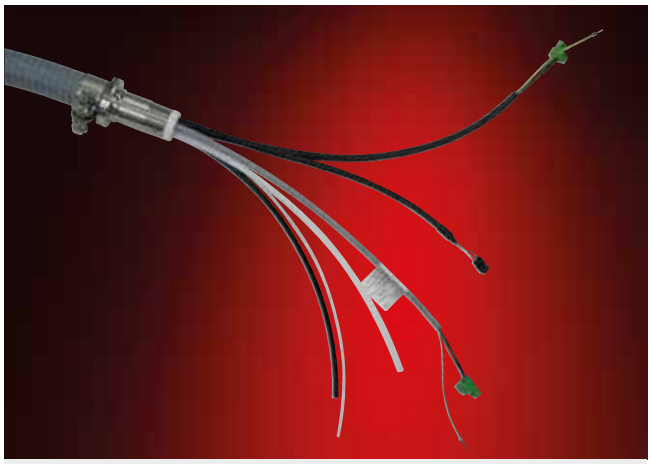
Type: ELH/2adi 200°C NW 4/6
Sample gas line with replaceable inner liner and unheated inner liner for calibration gas



Type: ELH/adw 200 °C Ex NW 6
Analytic hose with excess heating cable length for Ex-area

Type: ELH/2aw NW 4/6
Analytic hose with 2 heated inner liners

Type: ELH/a 100 °C NW 2,7
Highly flexible analytic mini hose



Type: ELH/3asb-5 °C-SP
Special bundle analysis cable with 3 inner liners and additional wire. Holding temperature: Frost protection +5 °C

Type: ELH/2adT-150 °C-NW8/10
Heated analytic hose with 2 inner liners NW 8/10 with tread-resistant corrugated metal hose. Holding temperature: 150 °C

Special analytic heated hose type ELH/2adsbw-100 °C- NW6/8-EX-SP for ex-range with 2 inner liners made of PTFE NW 6/8 and attached Ex terminal box; type Ex-it-R. Holding temperature: 100 °C

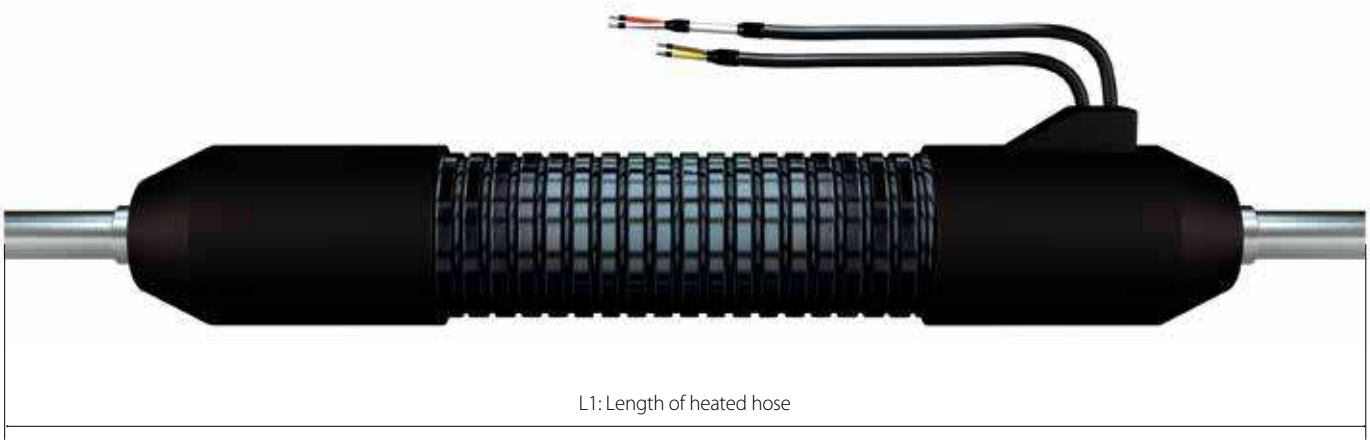
ELH/2aw-200 °C-NW6, analytic hose with 2 inner liners NW 6/8 made of PFA with transition-free special RSL pipe stub on both sides. Holding temperature 200 °C

Defined terms

Lengths

Hose lengths of our standard analytic heated hoses are defined as follows:

1.) With heated hoses equipped with connection fittings
(Types: ELH/ad.. / adi.. /adsb.. /adisb…)
Applicable measured length is from fitting to fitting.



2.) In heated hoses with excess hose length
(ELH/a../ai../asb../aisb..)
and excess pipe length (ELH/ae../aesb..):
Heated length = length of heated hose.
Excess lengths are indicated separately.

Defined terms

Connection fittings

Connection fittings with heated hose type ELH/ ad…/adi…/adsb../adisb…
type RSL pipe stub for ferrule compression fittings

DN	Outer diameter in mm (d)	Length in mm (L)
4	6	25
6	8	25
8	10	26
10	12	26
13	15	28
16	18	30

Material: Stainless steel, also available in Hastelloy on request

Note: RSL pipe stubs must only be used with suitable ferrule compression fittings. Use of cutting ring fittings is no longer allowed.

Length allowances

Allowable deviations from L1 measurement in fully assembled heated hoses.
Manufacturing tolerances as per DIN 20066.

Length L1 in mm	Allowable tolerance up to NW 16
up to 630	+7 / -3 mm
over 630 to 1250	+12 / -4 mm
over 1250 to 2500	+20 / -6 mm
over 2500 to 8000	+1.5 % / -0.5 %
more than 8000	+3% / -1%

Nominal widths

Nominal widths always indicate the interior diameter (ID) of the hose or pipe.

Accessory ELH/a/sb… cabinet entries

Fittings and end caps

OD of heated hose in mm	Type	Properties	Material
43	Fitting M 63 x 1.5	movable	Plastic or stainless steel
43	Plastic end cap with PG29 thread	not movable	Polyamide
43	M 50 x 1.5 tube coupler	not movable	PA / galvanised brass thread
55	M72x2 thread	movable	brass
55	M 63 x 1.5 tube coupler	not movable	PA / galvanised brass thread
55	Bolted flange joint KEL-Jumbo with KTF 54 seal	Can be mounted subsequently	Polyamide / elastomer seal
63	Bolted flange joint KEL-Jumbo with seal KTF 62	Can be mounted subsequently	Polyamide / elastomer seal

M 63 x 1.5 moveable tube coupler

M 50 x 1.5 tube coupler

Bolted KEL-Jumbo flange joint with seal

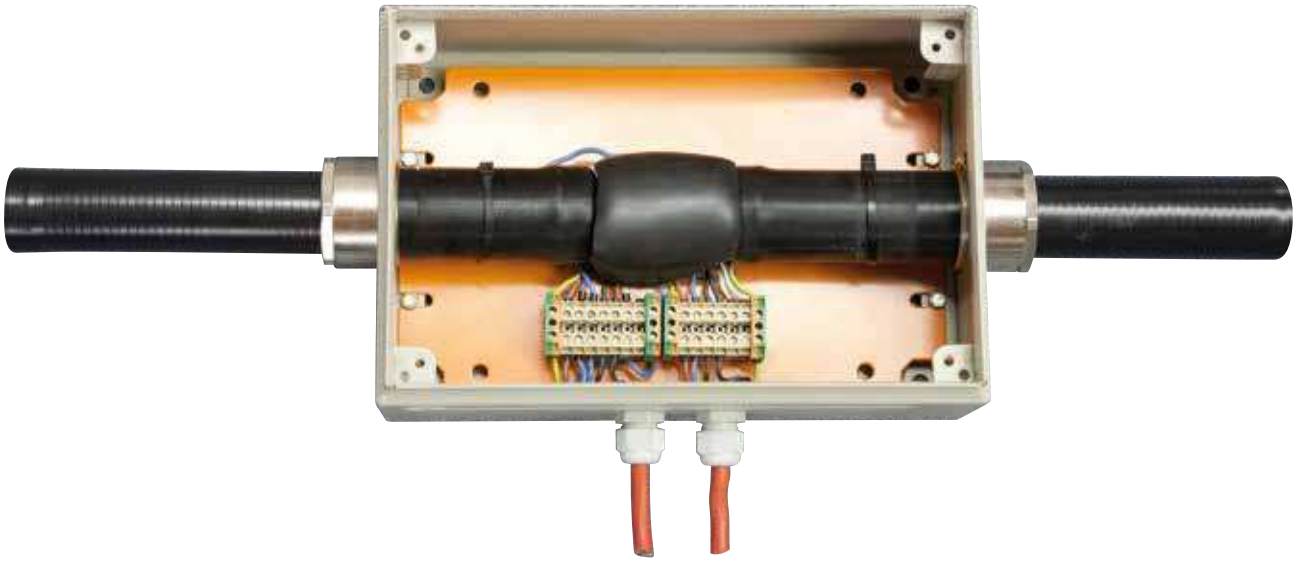
Plastic end cap with PG29 thread

Plastic end cap with terminal housing and PG29 thread

Accessory ELH/a/sb… coupling point heaters

Coupling box type ELH/KK…

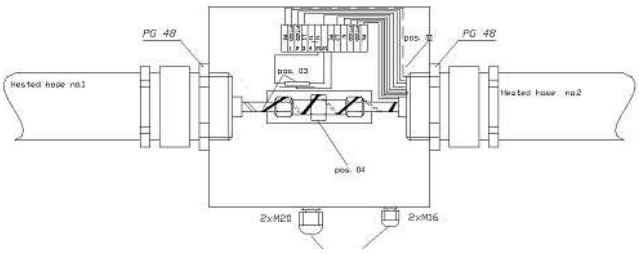
Coupling boxes are an ideal solution when it is necessary to bridge very long stretches using a heated sample gas line or existing sample gas lines have to be extended due to structural modifications. Junction boxes are made of powder-coated sheet metal (stainless steel available on request) and are equipped with terminals for feeding the heated hose to be coupled.
By default, our junction boxes are delivered with a ready-made heating cable for heating the coupling point.
Additional junction boxes, such s for t-branches or for Ex-area use are available on request.
Please note that the required ferrule compression fittings must be ordered separately.



Technical data

Type	ELH/KK-2-M63-1HK Junction box for connecting 2 analytic wires ELH/a...200°C
Dimensions	300 x 200 x 120 mm
Housing material	Sheet metal, powder-coated RAL 7032
Screw glands	2 x M63x1.5; 1 x M25 x 1.5; 1 x M20 x 1.5
Insulation material	0.3 m silicone foam hose
Coupling point heating	via ready-made heating cable type ELKM-AE
Item no.	5KZC001

Not for use in Ex-area!



Accessory /ELH/a/… hose protection

Plastic abrasion protection, polyamide protectors, type ELH/protector

Field of application:

- Additional abrasion and impact protection for our heated hoses with corrugated PA hose
- Additional labelling of heated hoses

Special characteristics:

- Simple subsequent installation
- Highly abrasion-resistant
- absolutely firm and optimal stability on our corrugated PA hoses

Colour:

- black

Temperature range:

- from min. –40°C to max. +100°C

Material:

- Polyamide

Designation	Item no.	for outer hose-ø (mm)
ELH/ protect-PG29	5XZC006	35
ELH/ protect-PG36	5XZC007	43
ELH/ protect-PG48	5XZC008	55
ELH/ protect-PG52	5XZC009	63
ELH/ protect-PG70	5XZC010	83

Accessory ELH/a/sb… hose protection

Plastic abrasion protection, protective plastic spiral, type ELH/protect-PE…

Field of application:

- Additional abrasion protection for heated hoses and hose lines
- Additional contact protection for heated hoses with high surface temperature
- Also suitable for bundling of unheated hose lines or connecting cables

Special characteristics:

- Highly abrasion-resistant
- Easy subsequent installation by wrapping
- UV-resistant / tolerance for acids, oils and solutions
- Antistatic additives included
- Recyclable
- Rounded edges preventing hose lines and do not damage outer jackets

Colour:

- black

Temperaturbereich:

- from –50 °C min. to +100 °C max.

Material:

- HD polyethylene

Designation	Item no.	Inner ø (mm)	Outer ø (mm)	Wall thickness	for outer hose-ø (mm)
ELH/ protect-PE 09	5XZC000	9.6	12	1.2	9-13
ELH/ protect-PE 13	5XZC001	13.4	16	1.3	13-18
ELH/ protect-PE 27	5XZC002	27.0	32	2.5	27-36
ELH/ protect-PE 34	5XZC003	34.6	40	2.7	34-44
ELH/ protect-PE 43	5XZC004	43.2	50	3.4	43-55
ELH/ protect-PE 55	5XZC005	55.6	63	3.7	55-67

Accessory ELH/a/sb… ferrule compression fittings

Type: straight ferrule compression fitting
Material: stainless steel 316

Item no.	NW	for connection with outer diameter
2883000600	4/6	2 x 6 mm
2883000800	6/8	2 x 8 mm
2883001000	8/10	2 x 10 mm
2883001300	10/12	2 x 12 mm

Type: T-ferrule compression fitting
Material: stainless steel 316

Item no.	NW	for connection with outer diameter
2883T00600	4/6	3 x 6 mm
2883T00800	6/8	3 x 8 mm
2883T01000	8/10	3 x 10 mm
2883T01200	10/12	3 x 12 mm

Electronic temperature controller

Type ELTC/H-14

The electronic temperature controller of type series ELTC/H-14 is a controller with digital display for wall mounting. The temperature measured with a Pt 100 temperature sensor is processed and displayed by a micro controller. After comparison of actual and set-point value the output relay is switched in keeping with the configuration. The device is equipped with installation sockets. It device is available in splash-proof housing fitted with a transparent housing lid.

Advantages:

- LED display to -25 °C
- Programmable 0 °C to +390 °C
- Switches max. 20 A resistive load with hybrid relay
- Signal contact (configurable as alarm contact or enable contact)
- Pt 100 possible in 2-wire and 3-wire circuit
- Operating voltage: 90 - 260 VAC / 50/60 Hz

Fields of application:

- industrial applications
- Heated sleeves, heated hoses

Data

Operating voltage	90-260 VAC 50/60 Hz
Power consumption	max. 4 mA, < 5 W
Switching capacity of relay 1	max. 20A with hybrid relay*
Switching capacity of relay 2	8 A, changeover contact (alarm)
Operating temperature	-25 °C ... +55 °C
Storage temperature	-30 °C ... +60 °C
Display range	-50 °C ... +400 °C
Adjustment range	0 °C ... +390 °C, configurable
Sensor connection	Pt 100 2-wire, 3-wire, configurable
Display	LED, red
Protection	IP 65
Dimensions (WxHxD)	130 x 130 x 75 mm

* Depending on the relevant installation socket

Type	Design	Item number
ELTC/H1-14	Installation socket 7-pole (10 A)	0620001
ELTC/H2-14	Installation socket 3+4-pole (16 A)	0620002
ELTC/H3-14	Installation socket 5-pole (20 A)	0620003

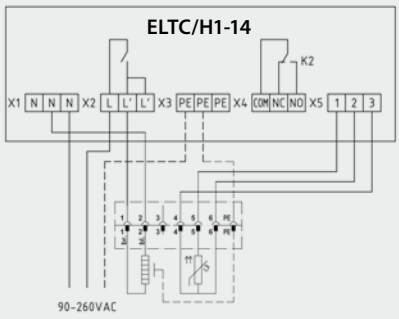
Sensor and display: 2 different sensor types can be used, Pt100/2-wire or Pt100/3-wire, and values can be displayed either as °C or °F. When using a Pt100/2-wire, the actual temperature value can be corrected. Range +/- 10 K or +/- 18 F. If a Pt100/3-wire is used, the temperature is automatically corrected.

Relay configuration: Relay 1: Controller relay
relay 2: Alarm relay: Alarm / temp. reached.

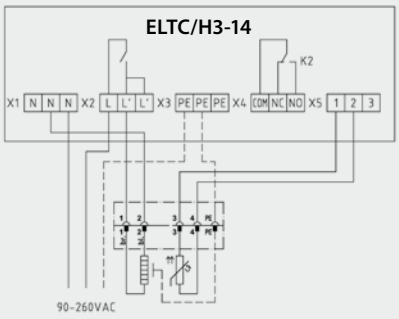
Temperature alarm: If the measured actual value deviates from pre-set limit values, an alarm is triggered and passed on using the K2 relay as an alarm relay.

Connection diagram

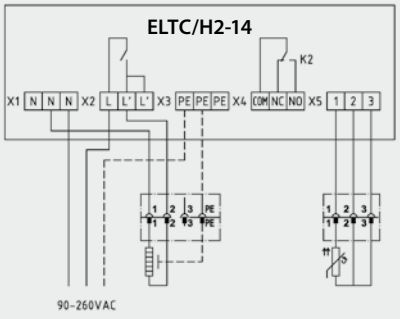
7-pole



5-pole



3- and 4-pole



Electronic temperature controller

Type ELTC-21 and type ELTC-22 for 24 VDC

ELTC-21 and ELTC-22 are electronic temperature controllers with digital display for rail-mounting. The temperature measured with a Pt 100 temperature tracer is processed and displayed by a micro controller. After comparison of actual and set-point value the output relay is switched in keeping with the configuration.

Advantages:

- LED display up to -25 °C
- Programmable -50 to +400 °C
- Switches 16 A resistive load
- Alarm contact Pt 100 possible in 2-wire and 3-wire circuit

Fields of application:

- Industrial applications
- Building services

Technical data

Power consumption	max. 4 mA
Switching capacity relay 1	16 A make contact (heater)
Switching capacity relay 2	8 A changeover contact (alarm)
Operating temperature	-25 °C ... +55 °C
Storage temperature	-25 °C ... +60 °C
Temperature range	0 °C ... +400 °C, configurable
Tracer connection	Pt 100 2-wire, 3-wire, configurable
Display	LED, red
Protection class	IP20
Installation	on top-hat rail
Dimensions [WxHxD in mm]	51.5 x 87.5 x 58.0
Operating voltage ELTC-21	230 V
Operating voltage ELTC-22	24 VDC

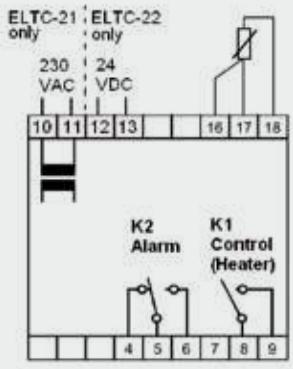
Type	Item no.
ELTC-21	0610093
ELTC-22	0610094

Tracer and display: 2 different types of tracers can be used: Pt100/2-wire or Pt100/3-wire, and display values in either °C or °F. When using a Pt100/2-wire, the actual temperature value can be corrected. Range +/- 10K or +/- 18F. When using the Pt100/3-wire, the temperature is corrected automatically. Also suitable for use with ELTF-PTEx 1-4 sensors.

Relay configuration: Relay 1: Regulating relay, Relay 2: Alarm relay

Temperature alarm: If the measured actual value deviates from pre-set limit values, an alarm can be triggered and passed on using the K2 relay as an alarm relay.

Connection diagram



Mini temperature controller, fully assembled

Type ELTC-Mini

The ELTC-Mini is an electronic temperature controller with extremely compact dimensions. It can be mounted directly onto our heated hoses, heated jackets as well as special heating systems. It offers the ideal solution for application where external controllers cannot be used and set-point values do not need to be changed. The controller is installed in very stable and extremely compact polyamide housing resistant to vibrations and impact. A multi-colour LED displays the operational status.

Advantages:

- Compact design
- Vibration and impact-resistant due to fully encapsulated electronics
- Operating temperature -25 °C to +55 °C
- Switching capacity 1500 W, produced specifically for heating applications, optimised with a zero-voltage switch

Data

Operating voltage	230V / 50/60Hz
Power consumption	max. 2VA
Operating temperature	25 °C to 55 °C
Storage temperature	-30 °C to 60 °C
Tracer connection	PT-100/ 2-wire
Hysteresis	2…30K, configurable ex works
Temperature range	0 °C to 400 °C, configurable ex works
Switching capacity	1500 W
Dimensions	75 x 46 x 35 mm (LxWxH)
Protection	IP54

- 2.00-m high temperature rubber hose supply cable, temperature-resistant to 120 °C, also deliverable with two-pin earthed plug on request

Additional controllers can be found in our separate Measurement and Control Technology catalogue.

eltherm®
innovations in heat tracing

Questionnaire for heated analytic hoses

via e-mail to: info@eltherm.com or via fax to: +49 27 36 44 13-50

Company: _____ Contact: _____

Street: _____ Post code/city: _____

Tel.: _____ E-mail: _____

Heated hose type

☐ ELH/a…	☐ ELH/ai…	☐ ELH/asb…	☐ ELH/aisb…	☐ ELH/ad…
☐ ELH/adi…	☐ ELH/adsb…	☐ ELH/adisb…	☐ ELH/ae…	☐ ELH/aesb…

Ex-proof design

☐ no ☐ yes

ATEX zone:

Temperature class:

Number: _____ Quantity

Inner liner NW: _____ mm

Material

☐ PTFE ☐ PTFE/ VA-braided ☐ PFA ☐ stainless steel (1.4571) ☐ Special:

Number of inner liners: _____ Quantity

Length: _____ mm

Max. operating temperature: _____ °C

Holding temperature: _____ °C

Voltage: _____ V

Min. ambient temperature

☐ Standard (-20 °C) ☐ Special: °C

Operating pressure

☐ Standard (no pressure) ☐ Special: bar at °C

Outer jacket

☐ Corrugated PA hose (w)	☐ Corrugated TPRIB hose (w)	☐ Corrugated PA hose for robotic application (w)	☐ Corrugated metal hose stainless steel (T)	☐ Corrugated metal hose (T) steel galvanised	☐ Corrugated metal hose with PVC outer jacket (T)
☐ Nylon braiding (N)	☐ Stainless steel braiding (SS)	☐ galvanised iron braiding (Fe)	☐ Silicone outer jacket red (GSI)	☐ Silicone outer jacket black (SI)	

Sensor Number of sensors: Quantity

☐ PT-100 / 2-wire	☐ ex-protected PT-100/ 3-wirer	☐ thermocouple type NiCr-Ni	☐ Special:
☐ PT-100/3-wire	☐ ex-proof PT-100/ 4-wire	☐ thermocouple type FeCu-Ni	
Sensor position:	☐ Standard (500 mm from power supply)	☐ Special:	mm from power supply

Fittings power supply side

☐ Excess hose length/excess pipe length mm

☐ RSL pipe stub stainless steel

☐ Special:

Fittings termination side

☐ excess hose length/excess pipe length mm

☐ RSL pipe stub stainless steel

☐ Special:

Cabinet entry

☐ no ☐ yes

Type:

Additional wires

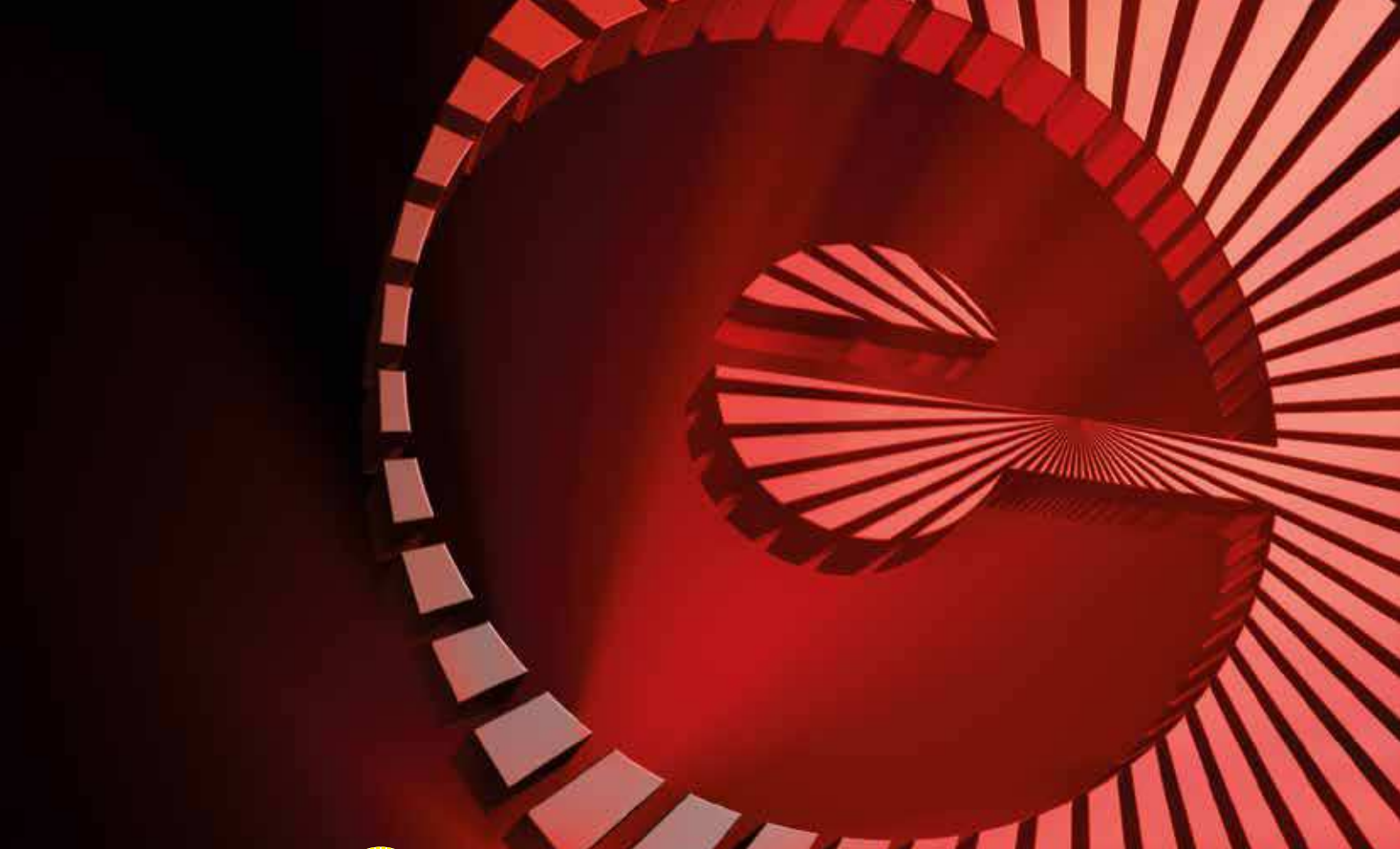
☐ Number of conductors: mm²

Connector cable exit

☐ Standard (returned) ☐ to the side ☐ nto the back (on the hose side) ☐ to the front

Length of connection cable: _____ mm

Comments: _____



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