



## 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.



## 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.

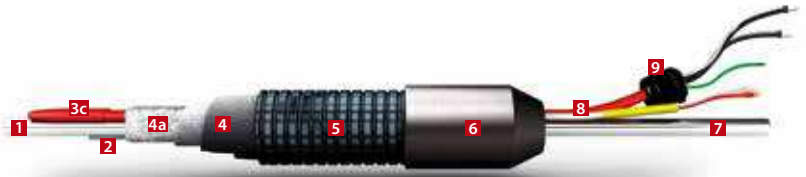




Configuration ELH/a..w...-Ex



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 fluoropolymer. 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

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.



250 °C

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



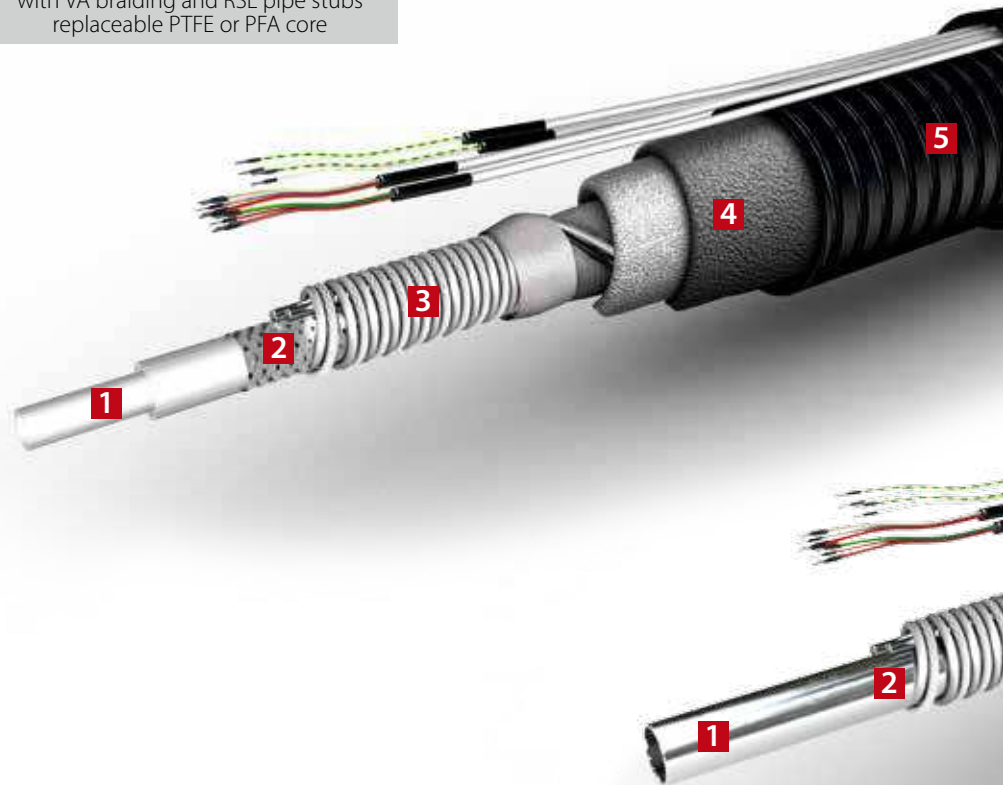
250 °C

**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

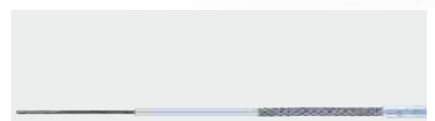


### 6 End caps



**Silicone end cap**

### 3 Heating cable



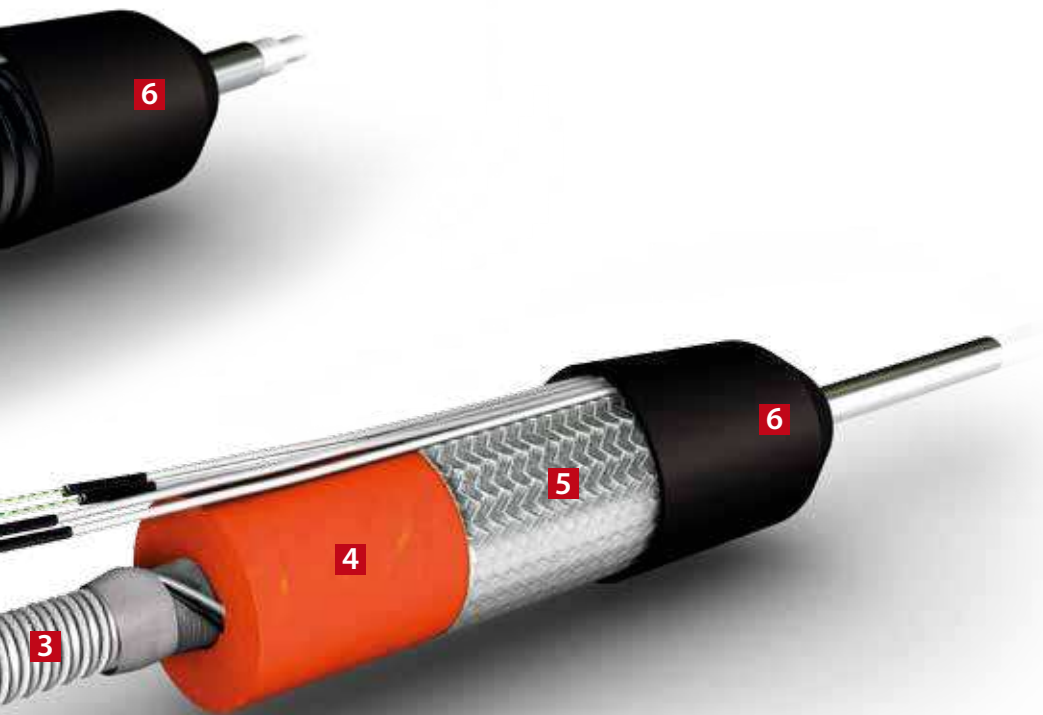
**Typr ELKM-AG**

ATEX-certified

Certificate no.: PTB 09ATEX1029 U



## 5 Outer jackets



## 4 Insulation



## 2 Sensors to control and limit temperatures





## 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 <b>fixed inner liner</b>		
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	

Type ELH/ai/adi with <b>replaceable inner liner</b>				
to 200 °C				
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

