

SAN[®]

Electro Heat



Heated Hoses

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Important Information

Our standard heated hoses are available for temperatures up to 250°C and a pressure range up to 500 bar (depends on the diameter). Heated hoses above 250° C are available upon request.

We are also able to offer heated hoses for applications in hazardous areas. The construction of the so called Ex-Heated-Hoses differs to our standard types in the use of Ex-approved heating components. For example heating cable, heating tapes, termination kits, temperature sensors (Ex-PT100), outer sheath and devices for measurement and control. Considering the fact that applications in hazardous areas require complicated and complex solutions please contact our engineers and they will offer individual and economical solutions to your heating problems. Upon request we send you all ex approvals and certificates including the delivery of the products.

You can find the ordering key for the heated hoses with standard length on page 20. And on page 21 the heated hoses for termination at site. Questionnaire on page 22 helps you and our engineering department to fix the specification of the heated hose. The information and advertising statements in this prod-

uct catalogue, regardless of type, in particular descriptions, illustrations, drawings, patterns, and data concerning quality, design, composition, performance, consumption and applicability as well as dimensions of the range of products are subject to alterations unless they are expressly stated as binding. They do not represent any assurances or guarantees, regardless of type. Slight deviations from the product information are regardless as authorized, as far as they are not considered to be unacceptable to the customer. The right to amend errors and technical data is reserved.

For use of customers own medium carrier we are not responsible for quality and suitability in any guarantee matter.

Fluoropolymer materials allow permeation of gases typically encountered in gas sampling and / or analysis applications. This may or may not affect the measurement accuracy attainable with the system. The buyer is responsible for system design and product specification that takes this into consideration and agrees that the seller is not responsible for problems in the buyer's system that are related to the permeation of gases through the tube wall.

Heated Hoses at a glance



Construction and function

Heated hoses are the ideal solution for flexible transportation of liquid or gas substances without heat loss.

The necessary temperature, power, application, and outer protection material determine the choice of the heated hose technique.

Gas substances are channeled from the measurement point to the analysis instrument in the analysis technique, i.e. in trash burning ovens, refineries, chemical industry, motor exhaust analysis, etc. For these applications the gases are to be freeze protected, protected against condensation, or guarantee for constant temperatures up to 250°C.



All our heated hose types can be used in hazardous areas under certain considerations.

Under certain circumstances, terms and approvals heated hoses can be used in hazardous areas. As an **ATEX** certified company (IBExU 03 ATEX 004Q) we fulfill the high level security standard of the Ex-guiding rules 94/4/EG (ATEX 100a). With our **ATEX** approved heating components like heating cable, heating tapes, connection kits, temperature sensors and controllers we supply heated hoses for applications in hazardous areas. Caused by complexity of possible Ex-area applications please contact our engineering department.

Application in general

- Frost protection for different media
- Prevention of condensation
- Maintenance of liquids or gases at operational temperature
- Transportation of gas samples from the measurement point to an analyzer
- Medium transportation of high viscosity materials in a fluid state
- Medium transportation where certain temperatures are essential for the fabrication characteristic
- Medium carrier must be transportable or moveable due to a mobile supply station

Application examples

- Analysis Measurement
- Hot Melt Machines
- Polyurethane foaming equipment
- Wax processing equipment
- Bitumen processing equipment
- Heavy oil processing equipment
- Food processing equipment
- Filling Machines

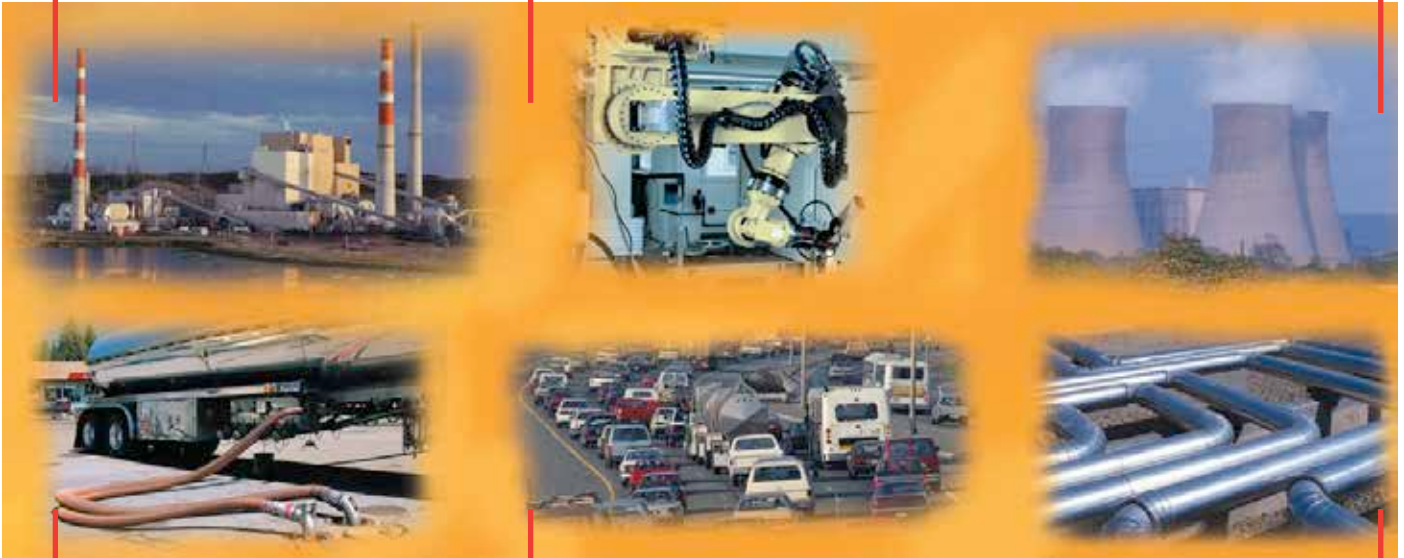
→ **Chemical Industry**

→ **Glueing Systems**

Exhaust Monitoring in power plants ←

→ **Cable Carrier Systems**

Process gas monitoring ←



→ **Tank filling machines**

→ **Car exhaust measurement**

→ **Painting systems for Automotive Industry**

→ **Surface Protection**

→ **Glue Robots for car body compound**

→ **Glue Robots for car windscreens compound**

Water analysis systems ←

Chemical Hoses ←

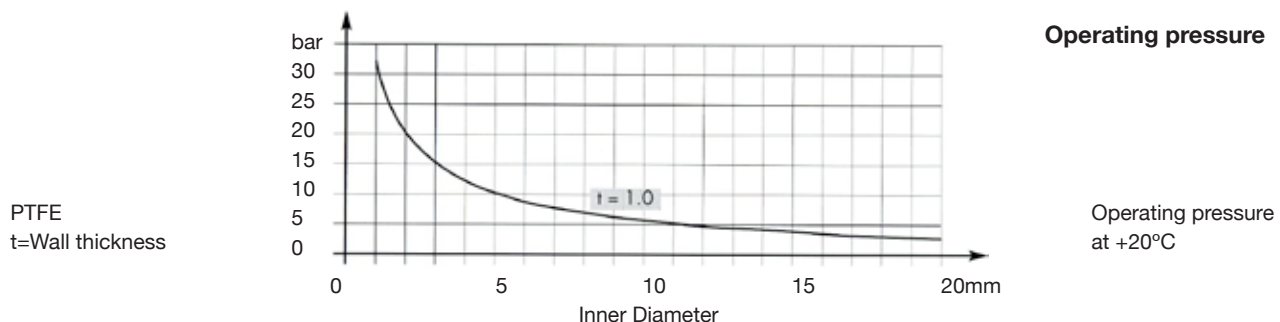
Table of heating power at 230/400 Volts for Standard Analytic Hoses

Type a/ad/ae	DN	4	6	8	10	
Heating power at 100°C	W/m	75	80	90	100	
max length	m	70	65	60	55	
Heating power at 200°C	W/m	80	90	100	110	add.diametres upon request
max length	m	65	60	55	50	
Heating power at 250°C	W/m	95	110	120	130	
max length	m	40	35	30	25	

Type ai/adi	DN	4	6	8	10	
Heating power at 100°C	W/m	75	80	90	100	
max length	m	75	70	68	55	
Heating power at 200°C	W/m	80	90	100	110	add. diametres upon request
max length	m	65	60	55	50	
Heating power at 250°C	W/m	95	110	120	130	
max length	m	40	35	30	25	

Heated Hose outer Sheath

Type	DN	4	6	8	10	
Polyamid braiding						
min. bending radius ad	mm	125	150	170	185	
min bending radius a	mm	200	200	200	200	
min bending radius ae	mm	250	250	250	280	
Outer diameter at 200°C	mm	45	45	45	45	
Outer diameter at 250°C	mm	45	49	49	49	
Corrugated piping						
min bending radius ad	mm	150	170	185	210	add. diametres upon request
min bending radius a	mm	200	200	200	200	
min bending radius ae	mm	250	250	250	280	
Outer diameter at 200°C	mm	42.5	42.5	42.5	42.5	
Outer diameter at 250°C	mm	42.5	42.5	42.5	54.5	
Metal corrugated hose with PVC cover						
min bending radius ad	mm	230	230	230	280	
min bending radius a	mm	200	200	200	200	
min bending radius ae	mm	250	250	250	280	
Outer diameter at 200°C	mm	42	42	42	42	
Outer diameter at 250°C	mm	42	42	42	48	



Main-tenance temp. (°C)	Inner Diameter (mm)	Nominal Voltage (V)	Power at 0°C (W/m)	Power at +10°C (W/m)	Power at operating temp. (W/m)	Hose length		Outer sheath			Temp. Ex. zone 1+2
						at -20°C (m)	at +10°C (m)	Poly-amid-braiding	PA-cor-rugated	Metal corru-gated	
5	4 up to 12	230	13	9.2	11.5	109	161	45mm	43mm	1 1/4"	T6
30			37	30	20	52	84	45mm	43mm		T6
50			40	38	28	65	75	45mm	43mm		T3 (T4)
80			49.5	47	30.5	55	60	45mm	43mm		T3
100			49.5	47	26	55	60	45mm	43mm		T3
120			66	63	35	40	45	55mm	55mm	1 1/2"	T2

Accessories

Termination technique at site for type ELH/sb

Termination set SBA 1

Shrink technique



Termination set SBA 2

Silicone cap with cable entry



Termination set SBA 3

Connection box



Termination set SBA 4

Plastic end cap



Description:

Each set includes the instruction manual.

Standard Heated Pressure for Analysis Technique up to 250°C Type ELH/md, ELH/hd, ELH/shd



Function: ELH/md, /hd, /shd

These types are used to heat maintain temperature and transport media without heat loss. For Example oil, fat, wax, sap, tar, paint, water, carbon dioxide, plastic, moulding material, glue, liquid food. Mostly mounted on moveable machine parts (Robots) or units.

Reason of application

- The medium is only free-flowing at a certain temperature and achieves its specific fabrication characteristics at a certain temperature range.
- The medium can only be treated at a certain temperature.
- The medium carrier must be transportable or moveable due to a mobile supply station.

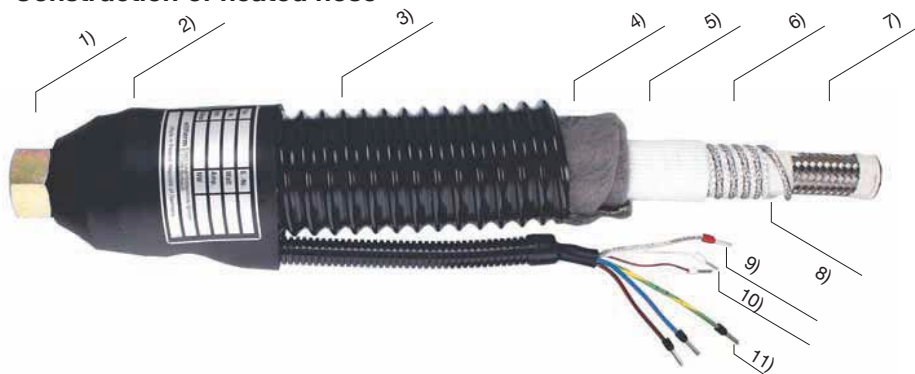
Application Examples

- Compound machinery / hot glue, packaging, label machinery
- Surface protection / tar and painting machinery
- Food processing industry, fill machinery
- Foam machinery, PU-foaming, roof renewal, packaging machinery
- Epoxy sap machinery
- Washing benches, steam cleaner, pipe cleaning
- Fill tubing and silo tubes
- Tanker tubing
- Glass industry, for coating and glueing from thermo glass panels

Technical Data

Heating Power..... up to 310 W/m (higher power upon request)
 Max. Length0.3 up to 60 m (DN 4)
 16 m (DN 25)
 Nominal diameter 4 up to 25 mm

Construction of heated hose



- 1) Fitting
- 2) End cap termination
- 3) Outer Sheath
- 4 + 5) Insulation
- 6) PTFE-insulated heating cable
- 7) PTFE inner hose with pressure layer
single, double or triple
- 8) Spacer
- 9) Temperature sensor
- 10) Additional Cables
- 11) Connection cable – power supply

Operation Temperatures.....up to 250°C (higher temperatures upon request)
 Operating Pressure 80 bar (T1, DN 25)
 500 bar (T3, DN 6)
 Nominal Voltage12 V, 24 V, 110 V, 230 V, 400 V
 Temperature SensorPT 100, Thermo couple

Various Designs

Inner hose.....PTFE with stainless steelbraiding
 single= T1, double=T2, triple=T3
 Fittings..... Steel bichromate coated
 Stainless steel (see Fitting table page12)
 Outer SheathPA corrugated
 PU spirally wound corrugated
 Polyamide braiding
 Galvanized steel braiding
 Stainless steel (AISI 303)
 End Cap Silicone
 EPDM without silicone
 Plastic
 Metal
 Cable exit lateral to the front
 Led back
 Front side
 Under end cap led back
 Lateral
 Combinations
 Glands Fixed glands
 Moveable glands
 Additional Cable On customer's request 0.5 up to 4mm²
 Max. 15 additional cables
 Plugsupon customer's requirements
 Controller..... ELTC-H-Controller

TYPE	DN	4	6	8	10	13	16	20	25
max operating press. md	bar	275	240	200	175	150	135	100	80
max operating press. hd	bar	/	275	250	225	200	175	150	130
max operating press. shd	bar	/	500	475	475	450	363	275	225

Operating pressure valid for operating temperatures in the range of +20° to +50°C

Temperature coefficient of correction ELH/md/hd/shd

100°C	150°C	200°C	250°C
0.98	0.9	0.83	0.6




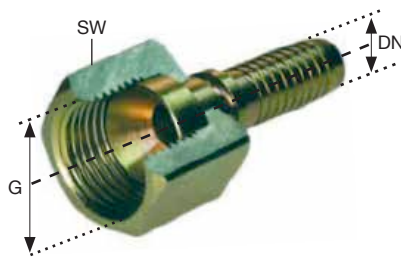
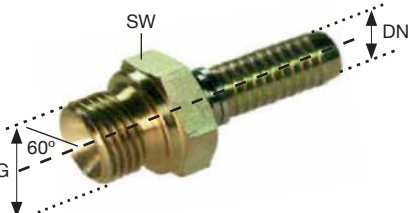
Standard Heating Power at 230/400Volts

TYPE	DN	4	6	8	10	13	16	20	25
Heating power at 100°C	W/m	85	100	110	135	160	180	210	240
max. length	m	60	55	50	40	35	30	25	20
Heating power at 200°C	W/m	110	120	130	150	180	225	260	290
max. length	m	50	45	40	35	30	23	20	18
Heating power at 250°C	W/m	110	130	150	180	210	240	270	310
max length	m	45	40	35	30	25	20	18	16

Outer Sheath

TYPE	DN	4	6	8	10	13	16	20	25
Polyamide braiding									
min bending radius	mm	125	150	170	185	210	250	300	300
Outer diameter at 200°C	mm	45	45	45	45	49	55	61	61
Outer diameter at 250°C	mm	45	49	49	49	55	61	61	68
Stainless steel braiding									
min bending radius	mm	135	170	195	200	230	260	300	300
Outer diameter at 200°C	mm	45	45	45	45	49	55	61	61
Outer diameter at 250°C	mm	45	49	49	49	55	61	61	68
Corrugated piping									
min bending radius	mm	150	170	185	210	210	250	300	300
Outer diameter at 200°C	mm	42.5	42.5	42.5	42.5	42.5	54.5	54.5	82.5
Outer diameter at 250°C	mm	42.5	42.5	42.5	54.5	54.5	82.5	82.5	82.5
Robot-corrugated piping									
min bending radius	mm	150	170	185	210	210	250	300	300
Outer diameter at 200°C	mm	42.5	42.5	42.5	42.5	42.5	54.5	54.5	82.5
Outer diameter at 250°C	mm	42.5	42.5	42.5	54.5	54.5	82.5	82.5	82.5
Polyurethane corrugated piping									
min bending radius	mm	125	150	170	185	210	250	300	
Outer diameter at 100°C	mm	42	42	42	42	50	50	60	
Metal corrugated hose with PVC cover									
min bending radius	mm	280	280	280	320	320	405	535	535
Outer diameter at 200°C	mm	42	42	42	42	48	48	60	72.6
Outer diameter at 250°C	mm	42	42	42	48	48	60	72.5	72.6

Fitting Table



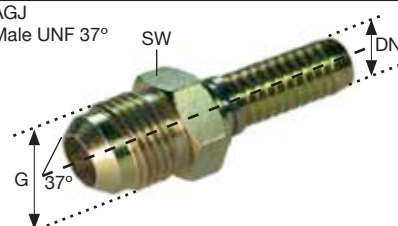
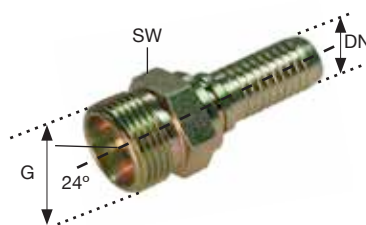
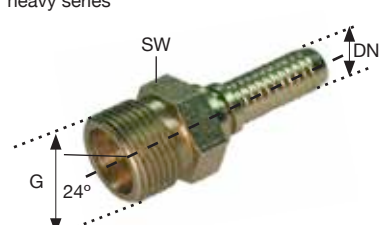
End fitting	DN	Thread	to tube mm	Hex	Order No.
RSL standpipe light series 	05		D 6	L 25mm	RSL-05
	06		D 8	L 25mm	RSL-06
	08		D 10	L 26mm	RSL-08
	10		D 12	L 26mm	RSL-10
	13		D 15	L 28mm	RSL-13
	16		D 18	L 30mm	RSL-16
	20		D 22	L 32mm	RSL-20
	25		D 28	L 30mm	RSL-25
	32		D 35	L 35mm	RSL-32
	40		D 42	L 38mm	RSL-40
RSS standpipe, heavy series 	05		D 8	L 27mm	RSS-05
	06		D 10	L 29mm	RSS-06
	08		D 12	L 29mm	RSS-08
	10		D 14	L 29mm	RSS-10
	13		D 16	L 33mm	RSS-13
	16		D 20	L 39mm	RSS-16
	20		D 25	L 44mm	RSS-20
	25		D 30	L 44mm	RSS-25
	32		D 38	L 41mm	RSS-32
	DKR Female Sealing head, swivel nut (BSP) 	05	G 1/4"		17
06		G 1/4"		17	DKR-06
08		G 3/8"		19	DKR-08
10		G 3/8"		19	DKR-10
10		G 1/2"		27/24	DKR-10-1/2"
13		G 1/2"		27/24	DKR-13
16		G 3/4"		32	DKR-16
20		G 1"		41	DKR-20
25		G 1"		41	DKR-25
25		G 1 1/4"		50	DKR-25-1 1/4"
32		G 1 1/4"		50	DKR-32
40		G 1 1/2"		56	DKR-40
DKJ Female swivel sealing head 37° (UNF) 	06	UNF 7/16 - 20		14	DKJ-06-7/16
	06	UNF 1/2 - 20		17	DKJ-06
	06	UNF 9/16 - 18		17	DKJ-06-9/16
	08	UNF 9/16 - 18		17	DKJ-08
	10	UNF 3/4 - 16		24	DKJ-10
	13	UNF 3/4 - 16		22/24	DKJ-13
	13	UNF 7/8 - 14		27/32	DKJ-13-7/8
	16	UNF 7/8 - 14		27/32	DKJ-16
	16	UNF 1 1/16 - 12		32	DKJ-16-1 1/16
	20	UNF 1 1/16 - 12		32	DKJ-20
	25	UNF 1 5/16 - 12		41	DKJ-25
	32	UNF 1 5/8 - 12		51	DKJ-32
40	UNF 1 7/8 - 12		56	DKJ-40	
AGR Male 60° (BSP) 	05	G 1/8"		14	AGR-04
	06	G 1/4"		17	AGR-06
	08	G 3/8"		22	AGR-08
	10	G 3/8"		22	AGR-10
	10	G 1/2"		27	AGR-10-1/2"
	13	G 1/2"		27	AGR-13
	16	G 3/4"		32	AGR-16
	20	G 3/4"		32	AGR-20-3/4"
	20	G 1"		36	AGR-20
	25	G 1"		41	AGR-25
	32	G 1 1/4"		50	AGR-32
	40	G 1 1/2"		55	AGR-40

SAN Electro Heat a/s






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CVR No.: 42 16 59 13 - A/S reg. No.: 53 053

End fitting	DN	Thread	to tube mm	Hex	Order No.	
AGR F Male flat sealing 	05	G 1/8"		14	AGR-05-fld	
	06	G 1/4"		17	AGR-06-fld	
	08	G 3/8"		22	AGR-08-fld	
	10	G 3/8"		22	AGR-10-fld	
	10	G 1/2"		27	AGR-10-fld-1/2"	
	13	G 1/2"		27	AGR-13-fld	
	16	G 3/4"		32	AGR-16-fld	
	20	G 3/4"		32	AGR-20-fld-3/4"	
AGN/NPT Male 	06	1/4" 18 NPT		14	AGN-06	
	08	3/8" 18 NPT		17	AGN-08	
	10	3/8" 18 NPT		19	AGN-10	
	10	1/2" 14 NPT		22	AGN-10-1/2"	
	13	1/2" 14 NPT		22	AGN-13	
	16	3/4" 14 NPT		27	AGN-16	
	20	3/4" 14 NPT		27	AGN-20	
	20	1" 11 1/2 NPT		36	AGN-20-1	
	25	1" 11 1/2 NPT		36	AGN-25	
	32	1 1/4" 11 1/2 NPT		46	AGN-32	
	40	1 1/2" 11 1/2 NPT		50	ANG-40	
AGJ Male UNF 37° 	06	UNF 7/16 - 20		14	AGJ-06-7/16"	
	06	UNF 1/2 - 20		14	AGJ-06	
	08	UNF 1/2 - 21		14	AGJ-08-1/2"	
	08	UNF 9/16 - 18		17	AGJ-08	
	10	UNF 9/16 - 18		17	AGJ-10	
	13	UNF 3/4 - 16		22	AGJ-13	
	16	UNF 7/8 - 14		24	AGJ-16	
	20	UNF 1 1/16 - 12		27	AGJ-20	
	25	UNF 1 5/16 - 12		36	AGJ-25	
	32	UNF 1 5/8 - 12		46	AGJ-32	
	40	UNF 1 7/8 - 12		50	AGJ-40	
CEL Metric Male 24° light series 	05	M 12 x 1.5	6	12	CEL-04	
	06	M 14 x 1.5	8	14	CEL-06	
	08	M 16 x 1.5	10	17	CEL-08	
	10	M 18 x 1.5	12	19	CEL-10	
	13	M 22 x 1.5	15	22	CEL-13	
	16	M 26 x 1.5	18	27	CEL-16	
	20	M 30 x 2	22	32	CEL-20	
	25	M 36 x 2	28	36	CEL-25	
	32	M 45 x 2	35	46	CEL-32	
	40	M 52 x 2	42	55	CEL-40	
CES Metric Male 24° heavy series 	05	M 16 x 1.5	8	17	CES-05	
	06	M 18 x 1.5	10	19	CES-06	
	08	M 20 x 1.5	12	22	CES-08	
	10	M 22 x 1.5	14	22	CES-10	
	13	M 24 x 1.5	16	24	CES-13	
	16	M 30 x 2	20	30	CES-16	
	20	M 36 x 2	25	36	CES-20	
	25	M 42 x 2	30	46	CES-25	
	32	M 52 x 2	38	55	CES-32	

Fitting Table


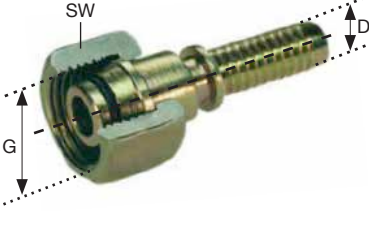
End fitting	DN	Thread	to tube mm	Hex	Order No.
BDN female swivel flat sealing 	05	G 1/4"		17	BDN-05-G
	06	G 1/4"		17	BDN-06-G
	08	G 3/8"		19	BDN-08-G
	10	G 3/8"		19	BDN-10-G
	10	G 1/2"		27	BDN-10-G-1/2"
	13	G 1/2"		27	BDN-13-G
	16	G 3/4"		32	BDN-16-G
	20	G 1"		41	BDN-20-G
	25	G 1"		41	BDN-25-G
	25	G 1 1/4"		50	BDN-25-G-1 1/4"
	32	G 1 1/4"		50	BDN-32-G
	40	G 1 1/2"		56	BDN-40-G
BDN M female swivel flat sealing, metric 	05	M 12 x 1.5	6	14	BDN-05-M
	06	M 14 x 1.5	8	17	BDN-06-M
	08	M 16 x 1.5	10	19	BDN-08-M
	10	M 18 x 1.5	12	22	BDN-10-M
	13	M 22 x 1.5	15	27	BDN-13-M
	16	M 26 x 1.5	18	32	BDN-16-M
	20	M 30 x 2	22	36	BDN-20-M
	25	M 36 x 2	28	41	BDN-25-M
	32	M 45 x 2	35	50	BDN-32-M
	40	M 52 x 2	42	60	BDN-32-M
DKL Female sealing head, metric 	05	M 12 x 1.5	6	14	DKL-05
	06	M 14 x 1.5	8	17	DKL-06
	08	M 16 x 1.5	10	19	DKL-08
	10	M 18 x 1.5	12	22	DKL-10
	13	M 22 x 1.5	15	27	DKL-13
	16	M 26 x 1.5	18	32	DKL-16
	20	M 30 x 2	22	36	DKL-20
	25	M 36 x 2	28	41	DKL-25
	32	M 45 x 2	35	50	DKL-32
	40	M 52 x 2	42	60	DKL-40
DKM female sealing head, metric 	20	M 30 x 1.5	22	36	DKM-20
	25	M 38 x 1.5	28	46	DKM-25
	32	M 45 x 1.5	35	55	DKM-32
	40	M 52 x 1.5	42	60	DKM-40
	50	M 65 x 2	52	75	DKM-50
DKS female sealing head, metric, heavy series 	06	M 18 x 1.5	10	22	DKS-06
	08	M 20 x 1.5	12	24	DKS-08
	10	M 22 x 1.5	14	27	DKS-10
	13	M 24 x 1.5	16	30	DKS-13
	16	M 30 x 2	20	36	DKS-16
	20	M 36 x 2	25	46	DKS-20
	25	M 42 x 2	30	50	DKS-25
	32	M 52 x 2	38	60	DKS-32

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CVR No.: 42 16 59 13 - A/S reg. No.: 53 053

End fitting	DN	Thread	to tube mm	Hex	Order No.
DKOL female swivel light series 	06	M 14 x 1.5	8	17	DKOL-06
	08	M 16 x 1.5	10	19	DKOL-08
	10	M 18 x 1.5	12	22	DKOL-10
	13	M 22 x 1.5	15	27	DKOL-13
	16	M 26 x 1.5	18	32	DKOL-16
	20	M 30 x 2	22	36	DKOL-20
	25	M 36 x 2	28	41	DKOL-25
	32	M 45 x 2	35	50	DKOL-32
	40	M 52 x 2	42	60	DKOL-40
DKOS Female swivel heavy series 	05	M 16 x 1.5	8	19	DKOS-05
	06	M 18 x 1.5	10	22	DKOS-06
	08	M 20 x 1.5	12	24	DKOS-08
	10	M 22 x 1.5	14	27	DKOS-10
	13	M 24 x 1.5	16	30	DKOS-13
	16	M 30 x 2	20	36	DKOS-16
	20	M 36 x 2	25	46	DKOS-20
	25	M 42 x 2	30	50	DKOS-25
	32	M 52 x 2	38	60	DKOS-32

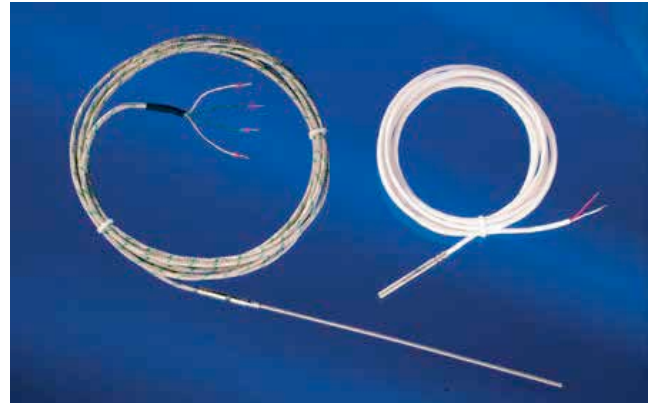
Material: Stainless steel
 Steel bichromate coated
 Special materials upon request

Special materials and fittings upon request

Temperature Elements, Outer Sheath and End Caps

Temperature controlling and over temperature protection

PT 100, 2-, 3- and 4-wires
 Thermocouple Fe-CuNi
 Thermocouple NiCr-Ni
 PTC
 Temperature switch (break contact/make contact) 150....200°C
 Option:
 Temperature sensor
 Sensor and/or switch exchangeable



Outer Sheath

Polyamide black



PA corrugated hose



Galvanized steel or
stainless steel braiding



PU spirally wound
corrugated hose



End Cap

Metal end cap



Silicone/EPDM end cap



Plastic end cap



Correction cable exit

Lateral



Lateral to the front



Front side



Led back



Combination



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ELTC/H 1-4

Description

The electronic temperature controller type ELTC/ is designed for use as an ambient thermostat or surface thermostat with remote sensor. Cable glands and terminations are provided for the power connection. The unit is supplied in a weather proof polycarbonate casing for wall mounting, with a transparent (ELTC/05 = grey) cover. The controller should be protected from direct sunlight when used outdoors.

Technical Data

Electronic temperature controller

Temperature ranges0 up to +100°C / 0 up to +200°C /
0 up to +250°C

SensorPt100 (2 wire)

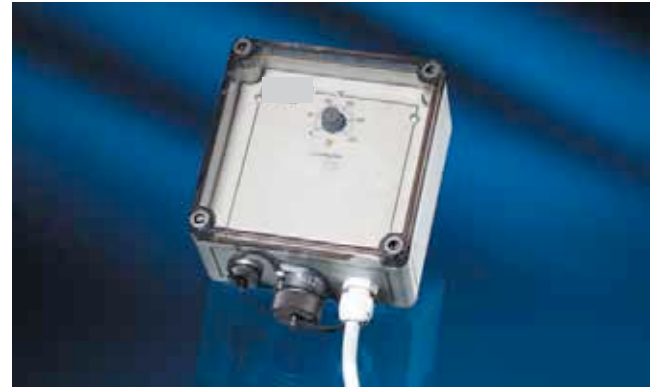
Power Supply230V with shock-proof-plug and
3m connection cable

Switching capacity 12A/16A

IP Rating.....IP66

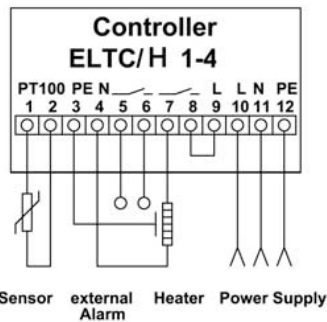
Installation7-pol. or 3-pol. and 4-pol.
for heating and sensor

Ambient temperatures.....-30°C...+60°C

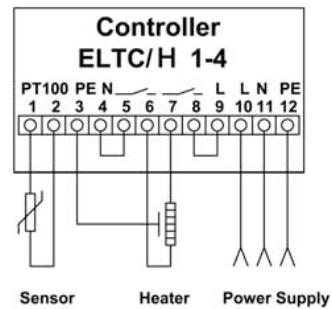


Function

If the sensed temperature is lower than the adjusted set point, the relay contact closes and the heating switches on. The yellow LED glows while the contact is closed. During sensor discontinuity or sensor short circuit, the heating is switched off!



Heating ON



ELTC/H SSR1...

Description

The electronic temperature controller type ELTC/ is designed for use as an ambient thermostat or surface thermostat with remote sensor. Cable glands and terminations are provided for the power connection.

The unit is supplied in a weather proof polycarbonate casing for wall mounting, with a transparent (ELTC/05 = grey) cover. The controller should be protected from direct sunlight when used outdoors.

Technical Data

Electronic temperature controller

Temperature ranges 0 up to +200°C

SensorPt100 (2 wire)

Nominal Voltage 230V 50Hz

Switching capacity20A

IP ratingIP66

Power Supply230V with shock-proof-plug and
3m connection cable

Installation7-pol., combined for heating and sensor

Ambient temperatures.....-30°C...+60°C



Function

If the sensed temperature is lower than the adjusted set point, the relay contact closes and the heating switches on. The yellow LED glows while the contact is closed. During sensor discontinuity or sensor short circuit, the heating is switched off!

Temperature Controller Mini ready for connection

The ELTC-Mini is an electronic temperature controller featuring an ultra-compact design and suited for direct contact installation on our heated hoses, heating jackets and special trace-heated applications. It is the ideal solution for applications which neither allow the use of an external controller nor need an alteration of value setting. The controller is housed in an extremely stable and ultra-compact enclosure to protect it against vibrations and shocks. The operating status is signaled through multicolor LEDs.



Advantages:

- Compact design
- Fully encapsulated electronics protected against vibrations and shocks
- Working temperature -25°C up to $+55^{\circ}\text{C}$
- Switching capacity 1500W, especially for trace-heated applications optimized through zero-voltage switch

Applications:

- Heated analysis hoses for mobile applications
- Heated loading & discharge hoses
- Heating jackets
- Heating mats
- Heated vessels
- Special trace-heating applications

Technical Details:

Operating voltage.....	230V / 50/60Hz
Power consumption.....	max. 2VA
Operating temperature.....	-25°C up to 55°C
Storage temperature.....	-30°C up to 60°C
Sensor input.....	PT-100 / 2-wire
Hysteresis.....	2...30K, value setting in factory
Temperature range.....	0°C up to 400°C , value setting in factory
Switching capacity.....	1500W
Dimensions.....	75x46x35mm (lxwxh)
IP rating.....	IP54
Supply cable.....	2.00m long temperature rubber cable, temperature-resistant up to 120°C , available with Schuko plug on request.
Multicolor LED...Flashing green:	normal operation/heating ON
..... Flash red:	fault / heating OFF

The controller comes with factory-set values and features a 2.0m long connecting cable (other length on request) for the installation on our heated hoses, heating jacket and special trace-heated applications.



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GP3

Description

The controller can be configured for various functions in the factory.

The following types of controller are available from the factory:

- 2-position controller (conventional or PID) with hysteresis (normal case)
- PID-controller with PWM (= Pulse-Width-Modulation) output (quasi-continuous)
- PID-continuous controller
- Limiter

Function

The temperature controller switches the connected heating based on a given set-point. The limiter ensures that the heating is switched off when reaching the over temperature. Further temperature limits can be monitored. If a limit is exceeded or not reached, potential free contacts are switched (K3/K4)

Technical data GP3

Electronic temperature controller

Nominal Voltage230 V, 50 Hz

Power consumption max. 5 VA

Temperature range0° C up to 400° C

Switching capacity16A

Accuracy:

- with Pt100 $\pm(0.5^\circ \text{ C} + 0.5\% \text{ v.M.})$
- with thermocouple type K T
- with thermocouple type J $\pm(1.5^\circ \text{ C} + 1.5\% \text{ v.M.})$

Resolution (internal)..... 0.1° C (Pt100)
0.4° C (Thermocouples)

Housing Plastic-walled housing with transparent cover, cable gland

IP ratingIP67

Ambient temperature..... 0° C to 40° C

Dimensions..... 213 x 185 x 117 mm (B x H x T)

Connections 30 cage pull-terminal screws à 2.5 mm2

Cable glands 1 x M20; 3 x M16; 2 x M12;
in addition 1 x M20 optional



ex-box DIS

Description

The new eltherm ex-box is a hazardous location temperature controller developed from and by eltherm for customer needs. This product may either be used separately as a controller or limiter or as a controller-limiter combination.

Attributes

- Rugged housing IP 65
- Operation and programming in hazardous area
- Optional hand held controller (ex-control)
- Optional as controller or limiter
- Information transfer with a personal computer
- Fail alarm, high safety
- Switch rating 16A
- Integrated heating circuit monitoring

Technical data ex-box DIS

with ex-box enclosed operation panel:

Certificate IBEU 04 ATEX 1165

Classification II 2GD E Ex em [ib] IIC T4 IP65 T100

Housing dimensions..... 170 x 130 x 140 mm (wxhxd)
(incl. cooling device and mounting bracket)

Housing material Aluminium

IP rating IP 65

Ambient temperature..... - 32 to 60°C

Cable entrances 2 x M20
1 x M25

Display..... 2 x 4 35-Segment LED

Supply Voltage230V +/- 10%

Power Supply230V / 16A, 2-pole

Alarm output.....optically separated 100mA

Bus-card.....current loop, intrinsically safe

Measurement entrancePt-100 2/3 core, intrinsically safe

Measurement range-40° C to +300°C

Control range.....over entire measurement range

Control characteristics Dual mode controller

Weight approx. 3.5 kg (without mounting bracket)



Ex-Box

**ex-box LED****Description**

ex-box LED: Same as the ex-box DIS with ex-control except for the following: no personal computer bus-card, but interface and supply (8.2 V 100mA)
 green: ok, no heating
 orange: ok, heating on
 red blinking: Alarm or fault but still ready for operation
 red: severe fault, separation from supply

Technical Data ex-box LED

Certificate IBEExU 04 ATEX 1165
 Classification II 2GD E Ex em [ib] IIC T4 IP65 T100
 Housing dimensions 170 x 130 x 140 mm (wxhxd)
 (incl. cooling device and mounting bracket)
 Housing material Aluminium
 IP rating IP 65
 Ambient temperature - 32 to 60°C
 Cable entrances 2 x M20
 1 x M25
 Supply Voltage 230V +/- 10%
 Power Supply 230V / 16A, 2-pole
 Alarm output optically separated 100mA
 Bus-card intrinsically safe for ex-control
 Measurement entrance Pt-100 2/3 core, intrinsically safe
 Measurement range -40 C° to +300°C
 Control range over entire measurement range
 Control characteristics Dual mode controller
 Weight ... approx. 3.5 kg (without mounting bracket) ex-control

**ex-control****Description**

Intrinsically safe hand held controller pad, without local power supply, power supply from ex-box, to connection on ex-box.

Technical Data ex-control

Dimensions 135 x 80 x 35 mm (l x w x h)
 Classification II 2GD EEx ib II C T4 IP65 T100
 IP rating IP 65
 Cable entrance 1.5 m connection cable with
 5-pole plug
 Display 2 x 4 35-Segment LED
 with back lighting
 Bus-card intrinsically safe for ex-box LED
 Weight 0.5 kg

Programmable Parameters

- pper set point of adjustable temperature range
- Temperature set point
- Alarm, under-temperature
- Alarm, over-temperature
- Loaded disconnecting
- Bus address 1 – 32
- Adjusting point PT100
- Degree Unit °C and °F

Fault display

- Sensor short
- Sensor cut
- Over-temperature at PT100
- Under-temperature at PT100
- Over-temperature internal
- External Bus fault
- Internal Bus fault
- Internal Hardware fault
- Operation supply fault
- Supply voltage fault



Heated Hose Type

- md = T1 Medium Pressure Heated Hose
- hd = T2 High Pressure Heated Hose
- shd = T3 Super High Pressure Heated Hose
- a = Analytic Hose, inner hose PTFE
- ai = Analytic Hose, exchangeable inner hose of PTFE
- ad = Analytic Hose, fixed stainless steel inner hose
- adi = Analytic Hose, fixed stainless steel inner hose and exchangeable inner hose of PTFE
- ae = Analytic Hose, stainless steel inner hose

Outer Sheath

- N = Polyamide braiding, black
- gs = Tinned steel braiding
- ss = Stainless steel braiding
- w = PA corrugated hose, black
- T = Metal corrugated hose with PVC cover
- m = Tinned metal corrugated hose
- S = Special types

ELH- adi / N / 200 / 25 / 0Ex / 1 / 12 / 2 / 13.5

Operating Temperature in °C	_____							
Diameter Carrier Hose	_____							
Heating Cable type	Standard	= 0						
	Standard Ex-Area	= 0 Ex						
	Self regulating	= sb						
	Self regulating Ex-Area	= sb Ex						
Nominal Voltage		230 = 1						
		400 = 2						
		110 = 3						
		24 = 4						
		48 = 5						
		Special Voltage = S						
Temperature Sensor		Without Sensor	= 0					
		PT 100 2-wire	= 1					
		PT 100 3-wire	= 2					
		Thermocouple type J	= 3					
		Thermocouple type K	= 4					
		2 x PT100 Exi	= 5					
		2 x PT100 Exe	= 6					
		Special sensor type	= S					
Number of assembled temperature sensors						1-4		
Electric supply		Standard	= 1					
		Ordering key termination	= 2					
Length in meter								e.g. 13.5 m

Ordering Key Termination

Connection side

- Si** = Silicone cap without kink protection
- SiK** = Silicone cap with kink protection
- Ka** = Plastic cap with junction box
- Kav** = Plastic cap with junction box and gland to the front side
- Ks** = Plastic cap with plug connection
- Ksv** = Plastic cap with plug connection and gland to the front side
- Ms** = Metal cap, tinned
- Sch** = Shrunked end cap
- SBA** = Termination set
- S** = Special type

Termination side

- = **Si**
- = **SiK**
- = **Ka**
- = **Kav**
- = **Ks**
- = **Ksv**
- = **Ms**
- = **Sch**
- = **SBA**
- = **S**

Plastic cap up to DN 10 available

Connection Cable

- 1** = Heating and sensor cable led together
- 2** = Heating and sensor cable led different
- 3** = Heating cable exit for sb- and sbEx-Type
- 4** = Termination set SBA 1 for Type ELH/sb
- 5** = Termination set SBA 2 for Type ELH/sb
- 6** = Termination set SBA 3 for Type ELH/sb
- 7** = Termination set SBA 4 for Type ELH/sb
- S** = Special Type

Cable Insulation

- 1** = PVC
- 2** = Silicone
- 3** = PTFE
- 4** = Glass gloth
- 5** = Insulation ELSR heating Cable
- S** = Special type

ELH- Kav / 1 / 1 / 2.5 / 0.5 / 33 / 15/ 1 / SiK

Length of connection cable (m)

Extension inner hose on both sides in m

- | | | |
|-------|---------------------|-----|
| Plugs | No plug | = 0 |
| | 7-pol. | = 1 |
| | 4-pol. only heating | = 2 |
| | Shock-proof-plug | = 3 |
| | no sensor | = 0 |
| | 2-pol. for sensor | = 1 |
| | 3-pol. for sensor | = 2 |
| | Thermocouple plug | = 3 |

- | | |
|---------------------------|----------|
| Additional cables without | = 0 |
| with 1mm ² | = 1 |
| with 1,5 mm ² | = 2 |
| with 2,5 mm ² | = 3 |
| Total number | = Pieces |

- | | |
|--|-----|
| without plug for additional cables | = 0 |
| with plug for additional cables (specify type) | = 1 |

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Send to: Fax: +45 4839 8898

Company:

Address:

Contact Person/Phone/Fax:

Industrial range:

Project engineer: Date:

Already supplied: Order-no.:

Type of heated hose: ELH/md ELH/hd ELH/shd ELH/a ELH/a/i ELH/ae
 ELH/ad ELH/ad/i ELH/sb..... addition T addition w

Inner Hose: DNmm Material:

Length:mm

Operation temperature: °C

Max. operation press at: °C bar

Burstin pressure: bar

Min. bending radiusmm

Wattage: watts total watts/m

Voltage: volts

Temp.-sensor: type installation position:

Length of conn. cable:mm

Cable exit: lateral to the front to the back

Outer protection sheath: corrugated hose spirally corrugated hose nylon braiding galvanized steel
 stainless steel step-proof others

Type of fitting:

material fitting: free-cutting steel, bichromated coated stainless steel AISI 303
 stainless steel AISI 316 Ti

Customers delivered additional cables:mm² total number of wires

Time of delivery:

Remarks:

Special Types

Description

Some applications require a very special construction of the heated hose. eltherm's range of products for production of heat tracing systems combines high quality heating cables and components in the early planning phase already. This ensures that all heated hoses are exactly tuned to the system requirements and the expectation our customers. Whenever there is a problem with heated hoses eltherm will find a solution which meets the specification, time frame and budget of the project.

Analytic heated hose with heating jacket

To maintain the operating temperature on heated hoses connectors or t-Connectors, the optimal solution is our flexible heating jacket. You can service the connection line after you have opened the Velcro stripes. The heating jacket can also be manufactured for complex forms and shapes of the connector or T-Connector. For the heated line is no extra temperature control necessary.



Heated hoses for hazardous areas

Under certain circumstances terms and approvals heated hoses can be used in hazardous areas. As an ATEX certified company (IBExU 03 ATEX 004Q) Eltherm Elektrowaermetechnik GmbH full fills the high level security standard of the Ex-guiding rules 94/4/EG (ATEX 100a). With our ATEX approved heating components like heating cable, heating tapes, connection kits, temperature sensors and controllers we supply heated hoses for applications in hazardous areas. Caused by complexity of possible Ex-area applications please contact our engineering department.



Heated hoses for mobile drinking water modules

For mobile field camp hospitals, drinking water and disposal water modules eltherm developed heated hoses as a modular system to set up a flexible drinking water and waste water supply network. Self regulating heating cables, a insulation and a weather proofed outer sheath guarantee a availability of this network down to -32°C . To meet the food approval guide lines a special inner hoses is used (PE-Inliner). The construction of the heated hoses ensures that different hoses can be connected with hose connectors, thus networks with a length of 245 m and more were realised.



Junction Box for supply cable and sample transport

In gas analysis applications often the distance between analyser and probe withdrawal is very long. We recommend to shorten heated hoses up to a certain length to shorter single heated hoses and to connect them with heated connection boxes. On the one hand the installation is easier and on the other hand customers mustn't change the whole heated hoses if one single piece fails. A separation to shorter length does not cause in any case more heating circuits. Please ask our skilled engineering department.



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Member of the NIBE Group

Electro Heat

- Process Heating
- Heating Elements
- Heating Cables
- Finned Tubular Radiators
- Immersion Heaters
- Church Heating
- Frost Protection
- Ex-Material
- Oilfilled Radiators
- Drum Heaters
- Heating Pads
- Flow Heaters
- Air Duct Heaters
- High-voltage Resistors
- Controllers



With more than 50 years of experience SAN Electro Heat's most valuable asset is special knowhow about design, product development and manufacturing of professional electrical heating equipment for industrial use.

The company is geared to deliver 100% customized products, and thus functions both as a catalyst for a development project and as supplier of the final product. At the same time we insure and maintain the required quality level, mechanical and electrical dimensioning, approvals and documentation.



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