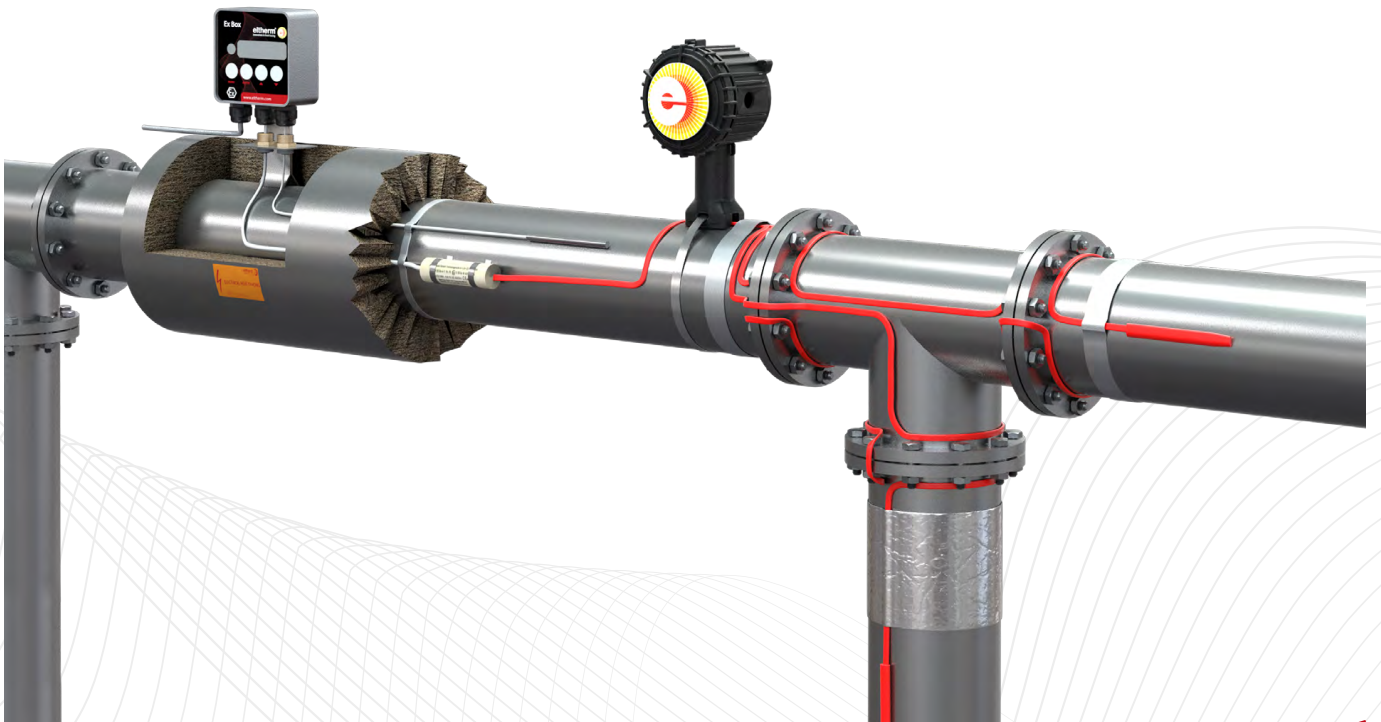
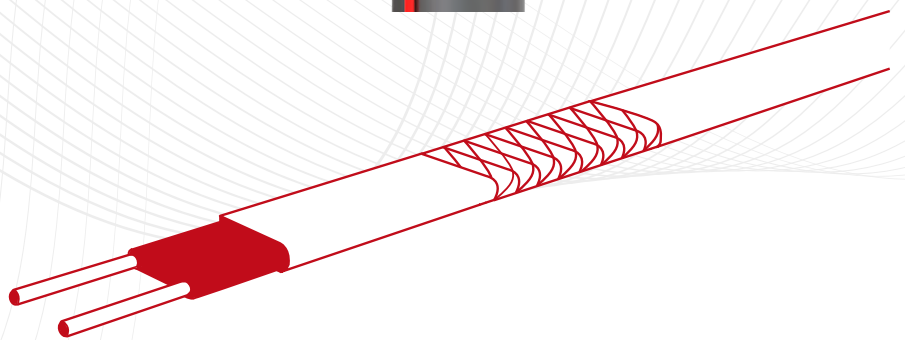


SYSTEM- OVERVIEW



ELSR

Self regulating trace heater
for North America



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Reservation

Subject to technical changes. Changes, errors and misprints do not constitute grounds for claims for damages. For safety components and systems, the assembly instructions as well as the relevant and currently valid standards and regulations must be observed.

eltherm Canada Inc. 1155 Appleby Line, Unit E7 Burlington ON L7L 5H9 Canada T.: +1 (289) 812-6631 1 F.: +1 (844) 325-6750 info@eltherm.com	Document:		System overview ELSR for North America	
	864301ELSR004 system overview ELSR-NA EN			
	Autor:	Jonas Schmidt	Datum:	13.03.2026
	Revision: 0		Datum:	

INTRODUCTION

This system overview is intended to provide a compact overview of the ELSR systems and their components - please refer to the respective data sheets for detailed information on the products.

The system overview focuses on the products that are absolutely necessary for a functioning heating circuit. Accessories are not dealt with separately - information on these can be found in the accessories data sheets.

ELSR (eltherm self-regulating) self-regulating heating cables consist of two parallel supply conductors embedded in a cross-linked heating element doped with carbon particles. When the temperature rises, the distances between the carbon particles increase due to molecular expansion. The resistance increases and the power decreases. When it cools down, this process reverses and the power increases. This prevents any overheating of the heater. Temperature limitation can be dispensed with. Self-regulating heating cables can be laid crosswise, many are also approved for explosive areas.

The ELSR self-regulating heating cables are used for frost protection and temperature maintenance in containers, pipes, valves, etc. They are also suitable for aggressive environments when fitted with a chemical-resistant outer jacket (option "BOT").

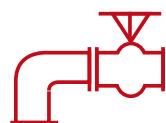
APPLICATIONS



Temperature maintenance



Frost prevention



Valves, pumps



Pipelines



Silos, vessels, tanks



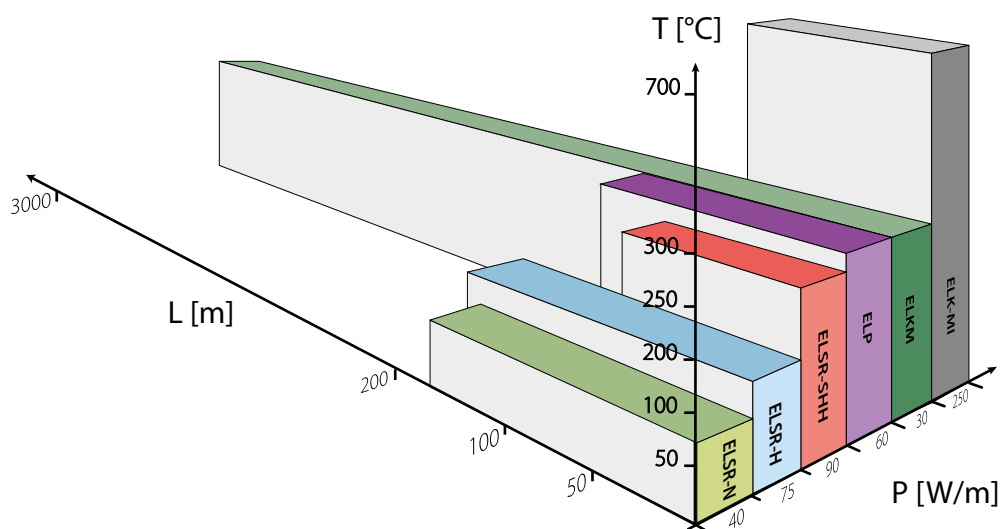
Open spaces



Roof & Gutter



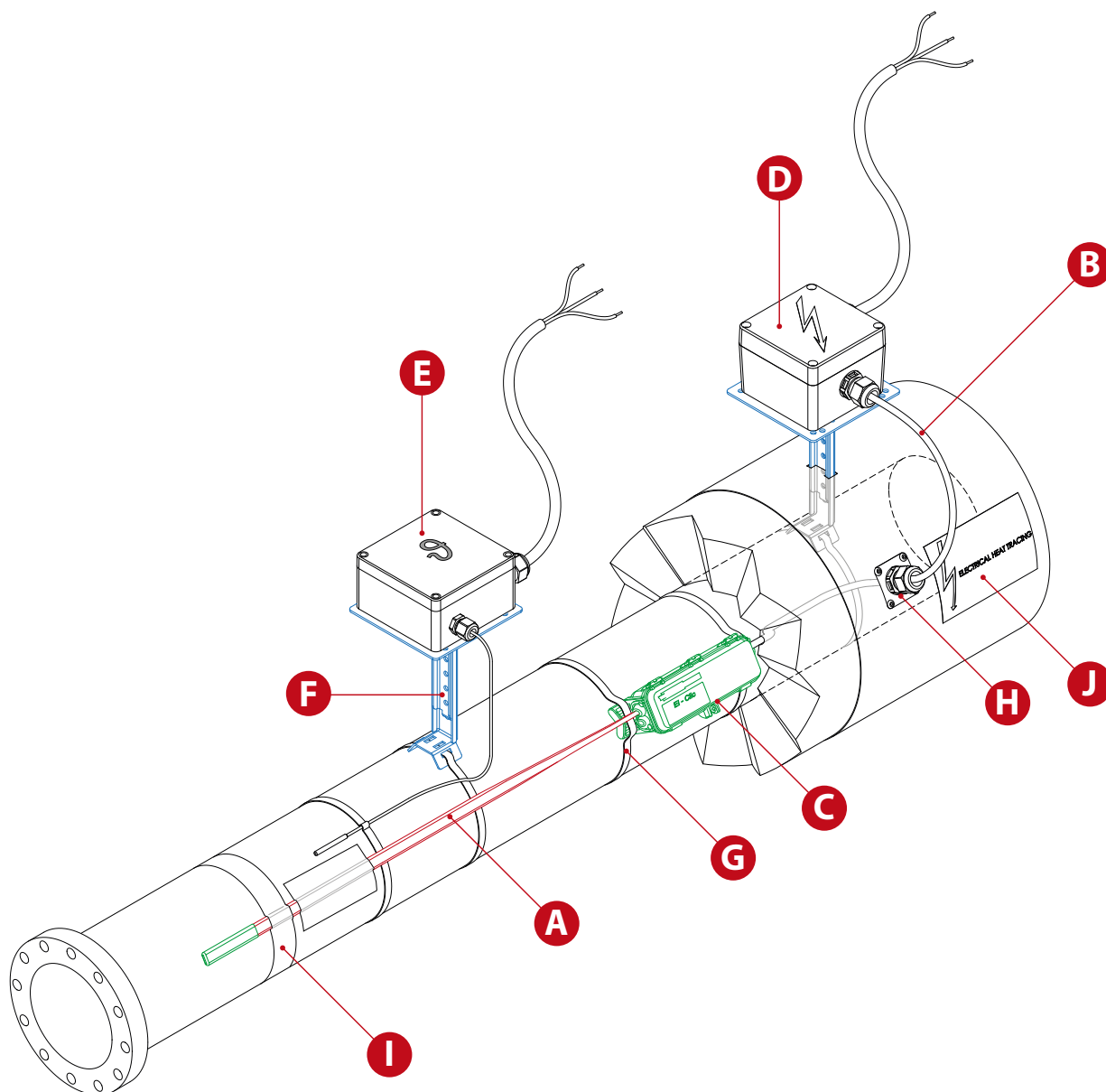
Special solutions



General overview ELSR compared to ELP; ELKM & ELK-MI

SYSTEM DESIGN

A	Trace heater ELSR	Page 5 - 6	F	Mounting bracket	Page 17
B	Connection cable	Page 7	G	Tension straps	Page 17
C	Power connection and Termination	Page 7 - 13	H	Insulation bushing	Page 17
D	Junction box	Page 14 - 15	I	Adhesive tapes and foils	Page 18
E	Temperature controller and sensor	Page 16	J	Warning sign	Page 18



Schematic diagram

NOTE

To determine your required heating power, you can also use our free design software "eltherm designer," which will identify various types of trace heaters that are directly suitable for your application and provide you with a corresponding order list for export.

You can download eltherm designer free of charge at the following link <https://eltherm.com/eltherm-designer>

(A) ELSR - SELF REGULATING TRACE HEATER

LOW temperature (for use up to 176 °F / 80 °C)

							
Parameters		ELSR-NA		ELSR-MA		ELSR-MA-BF	
Max. operation temperatur (switched on)		140 °F (60 °C)		140 °F (60 °C)		140 °F (60 °C)	
Max. operation temperatur (switched off)		176 °F (80 °C)		140 °F (60 °C)		140 °F (60 °C)	
Nominal Voltage		120 / 240 / 277 VAC		120 / 240 VAC		120 / 240 VAC	
min. bending radius		1" (25 mm)		1" (25 mm)		1" (25 mm)	
min. installation temperature		-76 °F (-60 °C)		-49 °F (-45 °C)		- 13 °F (-25 °C)	
Nominal power output at 50 °F		120 VAC	240 VAC	120 VAC	240 VAC	120 VAC	240 VAC
		3 W/ft	4 W/ft	3 W/ft	3 W/ft	3 W/ft	3 W/ft
		5 W/ft	6 W/ft	5 W/ft	5 W/ft		
		7 W/ft	8 W/ft				
			10 W/ft				
Max. Heating circuit length (15A)* ¹		120 VAC	240 VAC	120 VAC	240 VAC	120 VAC	240 VAC
		246 ft	380 ft	233 ft	415 ft	167 ft	302 ft
		187 ft	227 ft	190 ft	346 ft		
		123 ft	164 ft				
			118 ft				
Designs	Aluminum foil, TPE-O outer sheath	AO		AO			
	Braid * ² , TPO outer sheath	BO		BO			
	Braid * ² , Fluoropolymer outer sheath	BOT					
	Braid * ² , NSF compliant outer sheath					BF	
Rating		Wet rated, for outdoor use (-WS)		Wet rated, for outdoor use (-WS)		for use in potable water with 2,000 kPa / 290 psi (-PS)	
For use in hazardous locations		■					

NOTE

*¹ Heating circuit lengths on the following conditions:

- › Voltage 120 VAC (-1-) / 240 VAC (-2-)
- › MCB type QO (100% utilisation)
- › Maximum 10 % line voltage drop on trace heater bus wire
- › Single heater fed from 1 end

Further heating circuit lengths for other switch-on temperatures or circuit breakers can be found in the respective data sheet.

*2 Braid Cu, tin-plated

HIGH temperature (for use up to 482 °F / 250 °C)



Parameters		ELSR-HA		ELSR-SH+	
Max. operation temperatur (switched on)		248 °F (120 °C)		365 °F (185 °C)	
Max. operation temperatur (switched off)		356 °F (180 °C)		482 °F (250 °C)	
Nominal Voltage		120 / 208 / 240 / 277 VAC		120 / 208 / 240 / 277 VAC	
min. bending radius		1" (25 mm)		1" (25 mm)	
min. installation temperature		-76 °F (-60 °C)		-76 °F (-60 °C)	
Nominal power output @ 50 °F		120 VAC	240 VAC	120 VAC	240 VAC
		3 W/ft	3 W/ft	5 W/ft	5 W/ft
		7 W/ft	7 W/ft	10 W/ft	10 W/ft
		10 W/ft	10 W/ft	20 W/ft	15 W/ft
		15 W/ft	15 W/ft		20 W/ft
		20 W/ft	20 W/ft		25 W/ft 30 W/ft
Max. Heating circuit length (15A)* ¹		120 VAC	240 VAC	120 VAC	240 VAC
		307 ft	697 ft	228 ft	492 ft
		167 ft	365 f	131 ft	248 ft
		138 ft	255 ft	61 ft	163 ft
		86 ft	156 ft		131 ft
		63 ft	117 ft		82 ft 59 ft
Design	Braid * ² , Fluoropolymer outer sheath	BOT		BOT	
Rating		Wet rated, for outdoor use (-WS)		Wet rated, for outdoor use (-WS)	
For use in hazardous locations		■		■	

NOTE

*¹ Heating circuit lengths on the following conditions

- Voltage 120 VAC (-1-) / 240 VAC (-2-)
- MCB type QO (100% utilisation)
- Maximum 10 % line voltage drop on trace heater bus wire
- Single heater fed from 1 end

Further heating circuit lengths for other switch-on temperatures or circuit breakers can be found in the respective data sheet.

*² Braid Cu, tin-plated for ELSR-HA; Cu, nickel-plated for ELSR-SH+

(B) - CONNECTION CABLES

There are various options for connecting the ELSR to a junction box. Many of the eltherm junction boxes allow a direct connection of the heating cable with corresponding connection sets (marked as direct connection).

Another possibility to connect the ELSR to a junction box is to use suitable three-core stranded connection cable (e.g. SJE00W 3 x AWG 16) in combination with an appropriate connection technique.

NOTEs for the correct selection can be found in the operating instructions for the connection technology.

(C) - CONNECTION & END TERMINATION SETS

This chapter provides information on the permissible combinations of the connection sets with the respective ELSR cable Types. The ELSR cable Types suitable for use with the respective connection sets are marked in colour

- Light blue for low-temperature applications, e.g., **ELSR-NA**
 - Red for high temperature applications, e.g. **ELSR-HA**
 - Orange for the new generation of heating cables for high-temperature applications, e.g. **ELSR-SH+**
- Please be sure to observe the applicable operating instructions and data sheets for the connection sets.

Connection sets for hazardous locations

EL-HAZELECT

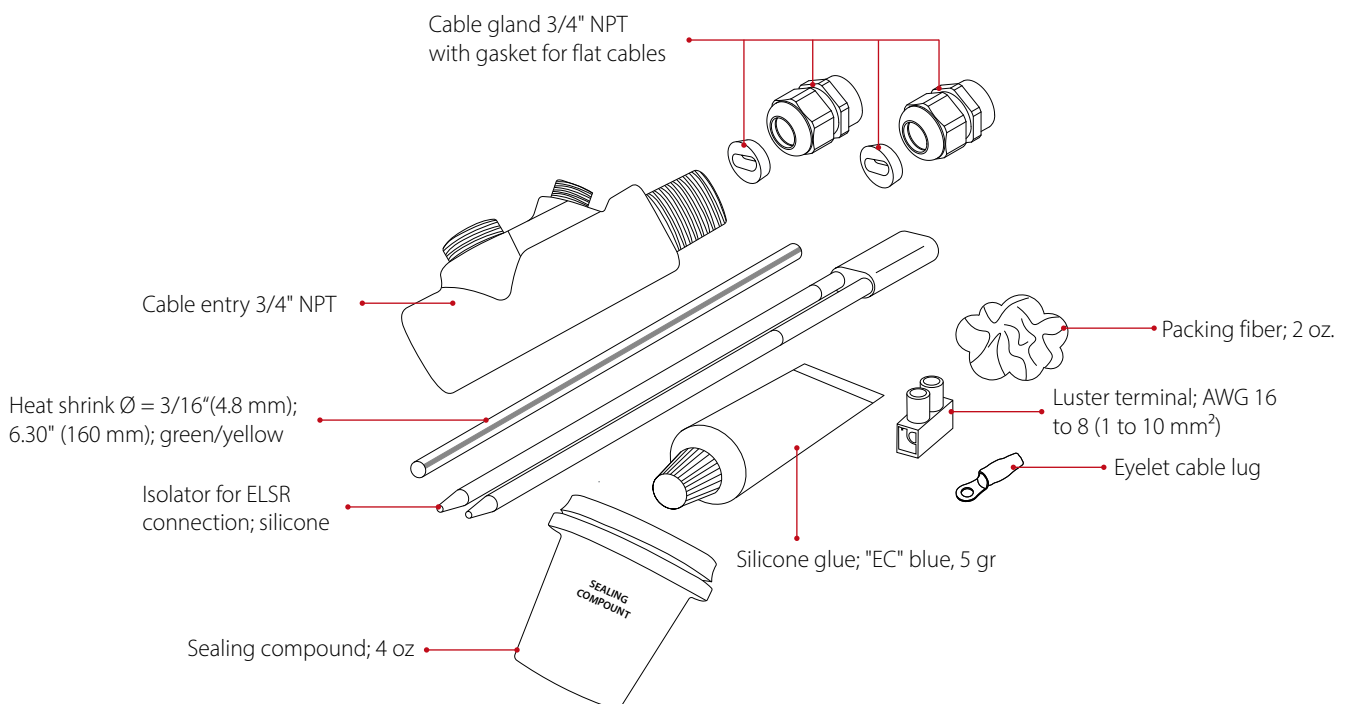
ELSR-NA

ELSR-HA

ELSR-SH+

Article N°: **09CA051** - Heater entry kit for ELSR trace heaters

Heater entry kit for Class I, Division 1 rated junction boxes

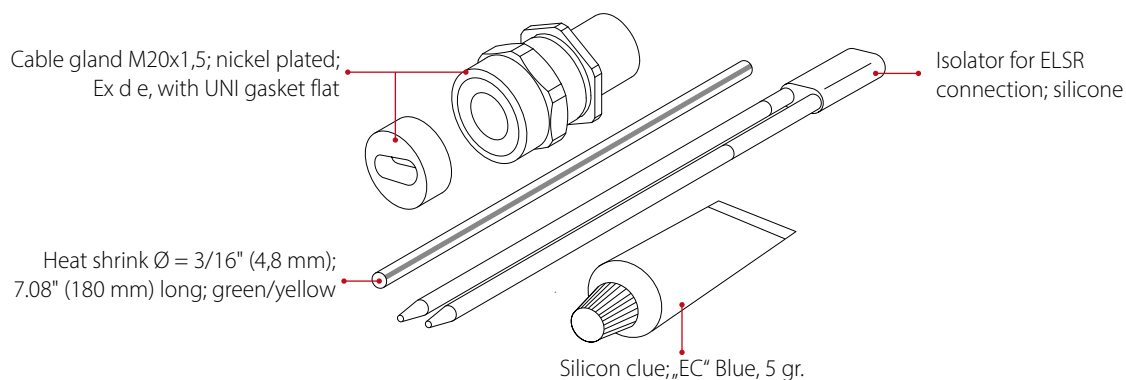


ELVB-SREx-SH+-20

ELSR-SH+

Article N°: **09CA070**

Power connection set incl. nickel plated cable gland M20 for direct connection

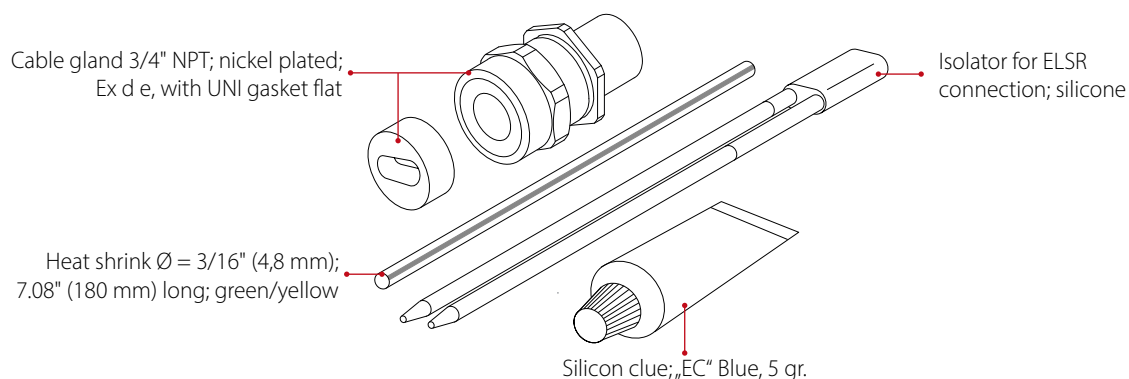


ELVB-SREX-SH+-3/4"

ELSR-SH+

Article N°: **09CA071**

Power connection set incl. nickel plated cable gland 3/4" NPT for direct connection

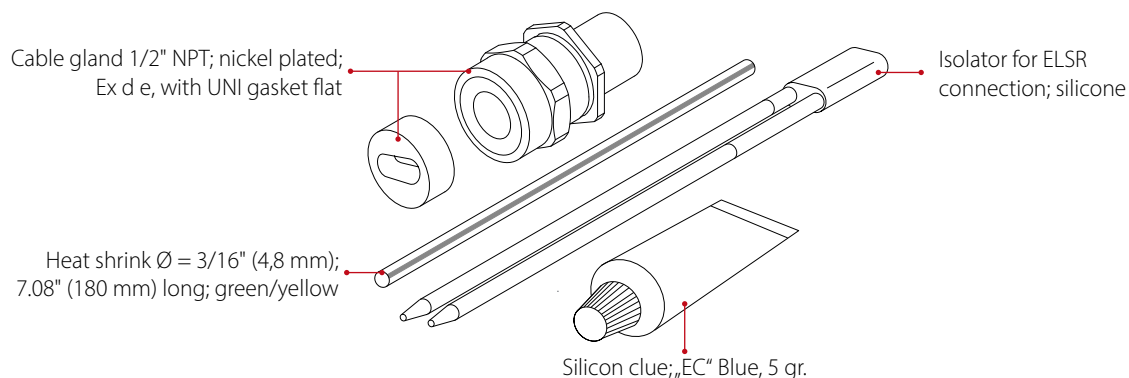


ELVB-SREX-SH+-1/2"

ELSR-SH+

Article N°: **09CA072**

Power connection set incl. nickel plated cable gland 1/2" NPT for direct connection



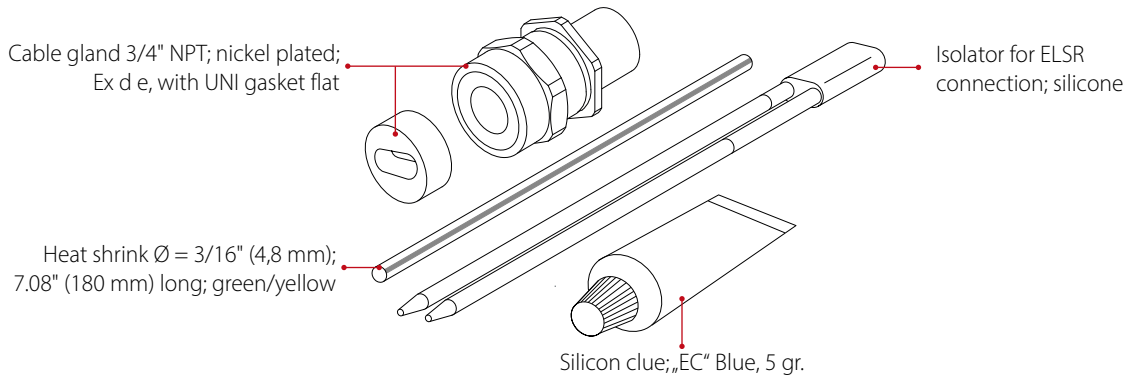
ELVB-SREx-3/4" BR HT

ELSR-NA

ELSR-HA

Article N°: **09CA017**

Power connection set incl. nickel plated cable gland 3/4" NPT for direct connection



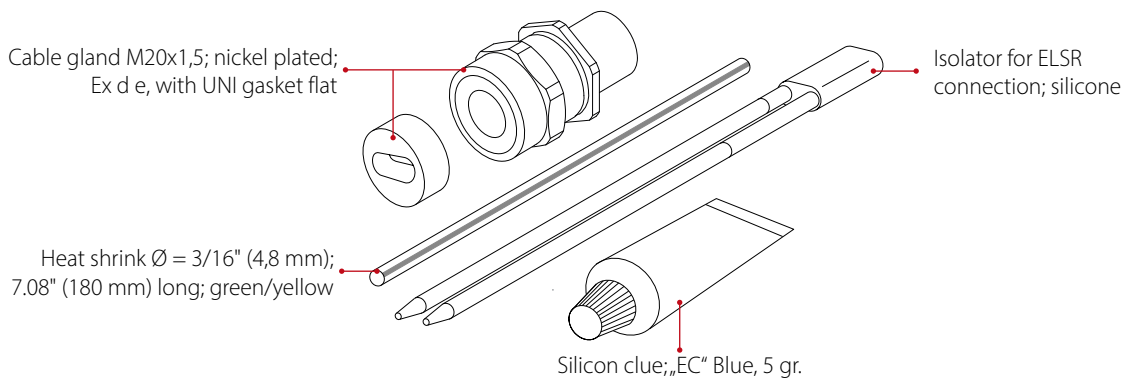
ELVB-SREX-20 BR HT

ELSR-NA

ELSR-HA

Article N°: **09CA008**

Power connection set incl. nickel plated cable gland M20 for direct connection



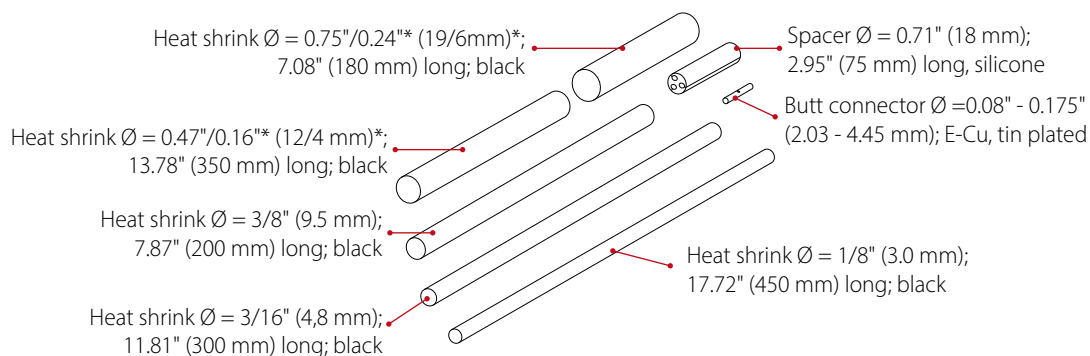
EL-SPN-16

ELSR-NA

Article N°: **09CA033**

Heat shrink connection set (splice set) for repair or connection.

For use in Canada only



*Shrink behaviour of the heat shrink

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End termination-Sets for hazardous locations

EL-ECSH-Ex

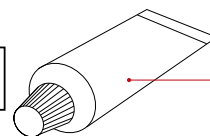
ELSR-HA

ELSR-SH+

Article N°: **09CA024**

End-Termination set for ELSR

Termination cap EL-ECSH,
Silicon, Red



Silicon glue; „ECH“ Red, 5 gr.

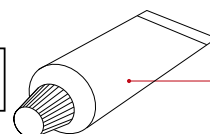
EL-ECN-Ex

ELSR-NA

Article N°: **09CA022**

End-Termination set for ELSR

Termination cap EL-ECN,
Silicon, Black



Silicon glue; „EC“ Blue, 5 gr.

Connection sets for non-hazardous locations

El-Clíc P & El-Clíc S - Fast Connector

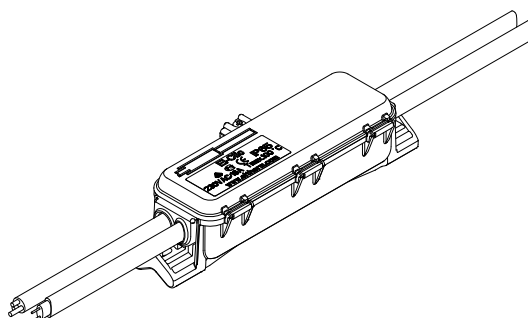
ELSR-NA

Article N°: **09CAICP** (El-Clíc P) & **09CAICS** (El-Clíc S)

Fast connector for up to 3 trace heaters or 2 trace heaters and 1 connection cable

El-Clíc P: Fast connector with 2.5m cold lead SJEOOW AWG 14

El-Clíc S: Fast connector T-splice

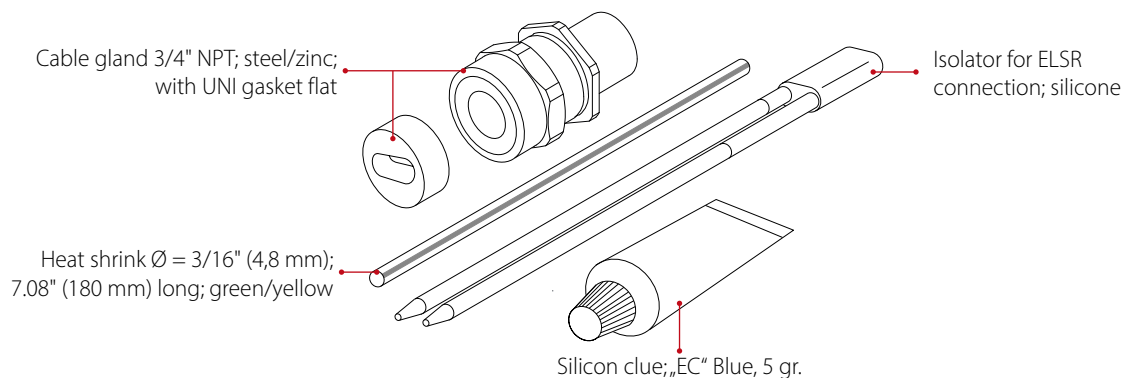


ELVB-SRAH-3/4" ST

ELSR-HA

Article N°: **09CA011**

Power connection set incl. steel/zinc cable gland 3/4" NPT for direct connection

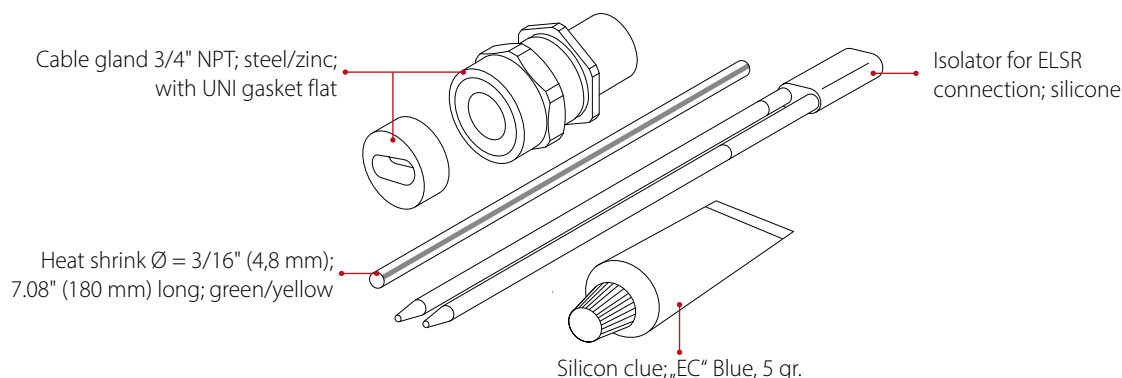


ELVB-SRAN-3/4" ST

ELSR-NA

Article N°: **09CA012**

Power connection set incl. steel/zinc cable gland 3/4" NPT for direct connection



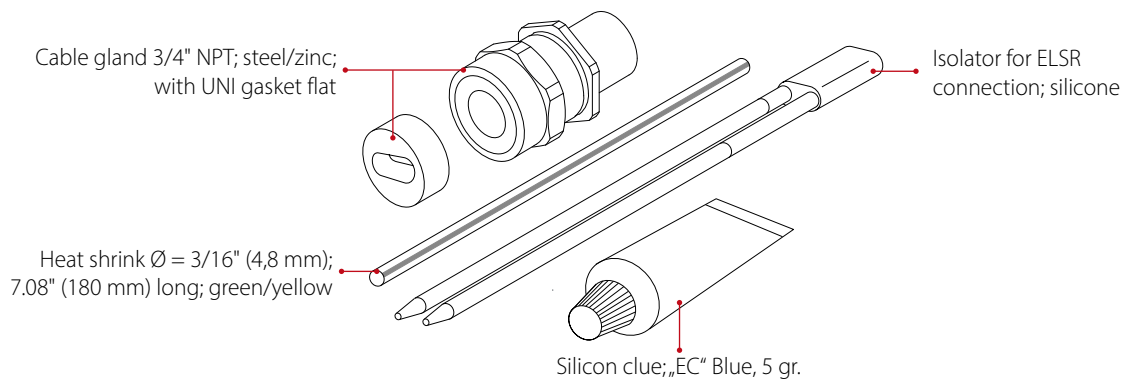
ELVB-SRAM-3/4" ST

ELSR-MA

ELSR-MA-BF

Article N°: **09CA013**

Power connection set incl. steel/zinc cable gland 3/4" NPT for direct connection

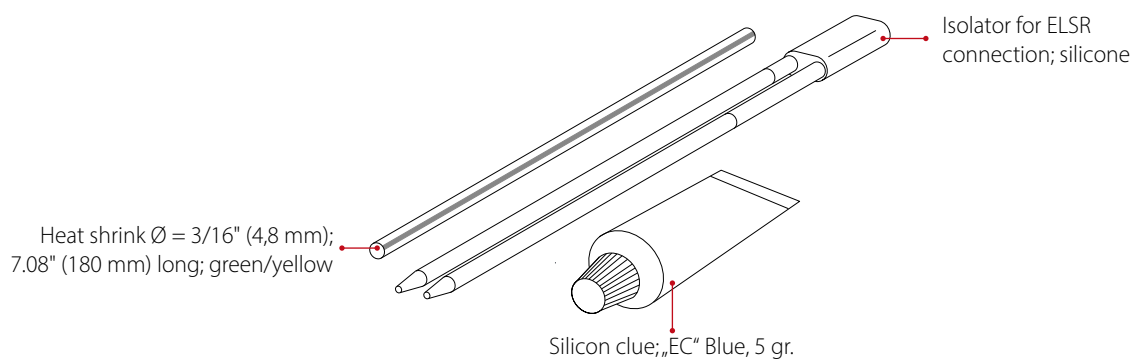


ELVB-SRAH

ELSR-HA

Article N°: **09CA014**

Power connection set without cable gland for direct connection

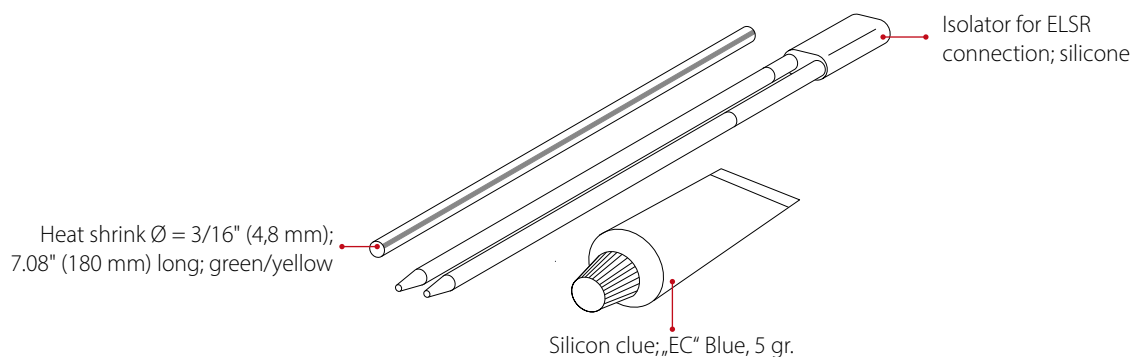


ELVB-SRAN

ELSR-NA

Article N°: **09CA015**

Power connection set without cable gland for direct connection

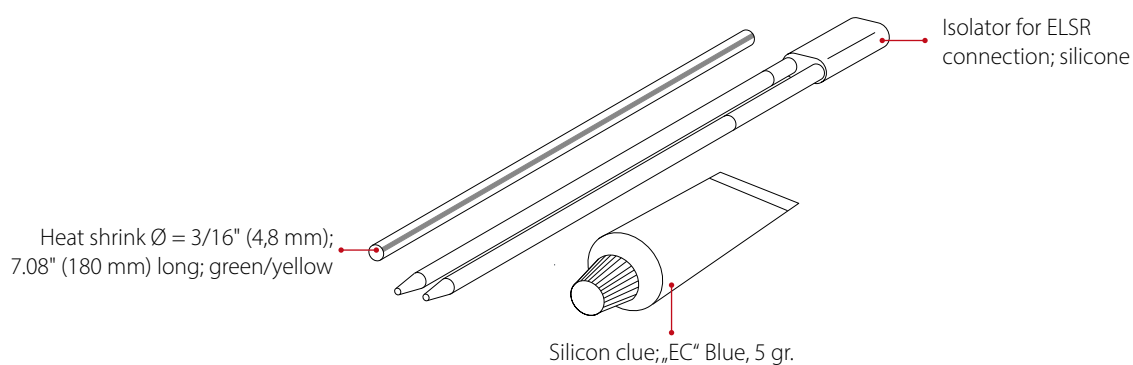


ELVB-SRAM

ELSR-MA

Article N°: **09CA041**

Power connection set without cable gland for direct connection



End termination-Sets for non-hazardous locations

Ex-It-LAG & Ex-It-LAR - End of circuit lighted termination

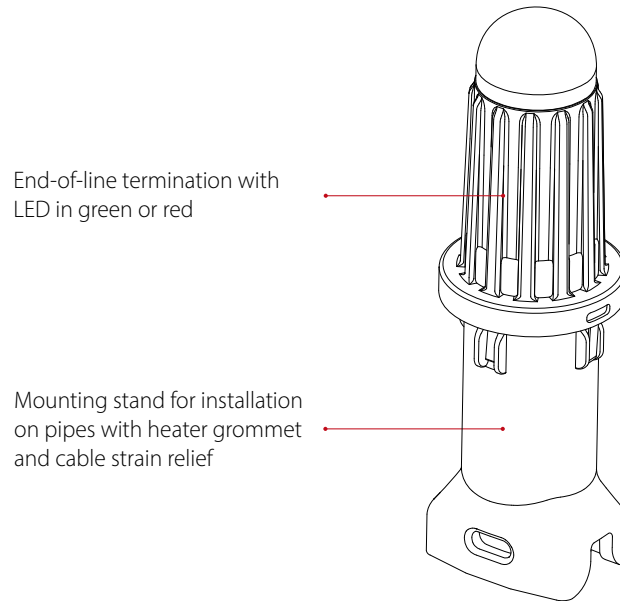
End of circuit light incl. mounting post for 1 trace heater ELSR with LED light and termination kit

Dimensions: (app.) Ø3" / 1.8" (76 mm / 45 mm), Height incl. Stand 10" (251 mm)

Article N°: **09CALAG** - Ex-It-LAG End-of-circuit lighted termination with green LED

Article N°: **09CALAR** - Ex-It-LAR End-of-circuit lighted termination with red LED

Externally accessible end termination kit to signalise the operating status of an ELSR trace heater,



EL-ECM

ELSR-MA

Article N°: **09CA041**

End-Termination set for ELSR

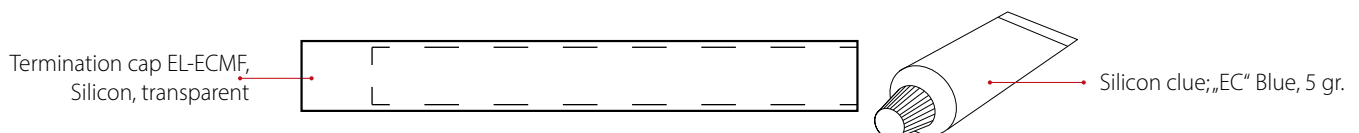


EL-ECMF

ELSR-MA ELSR-MA-BF

Article N°: **09CA042**

End-Termination set for ELSR, suitable for potable water



(D) - JUNCTION BOXES

This section is intended to provide an overview of the eltherm junction boxes for use with the ELSR Heating cable. For detailed information about the junction boxes, please refer to the respective data sheets.

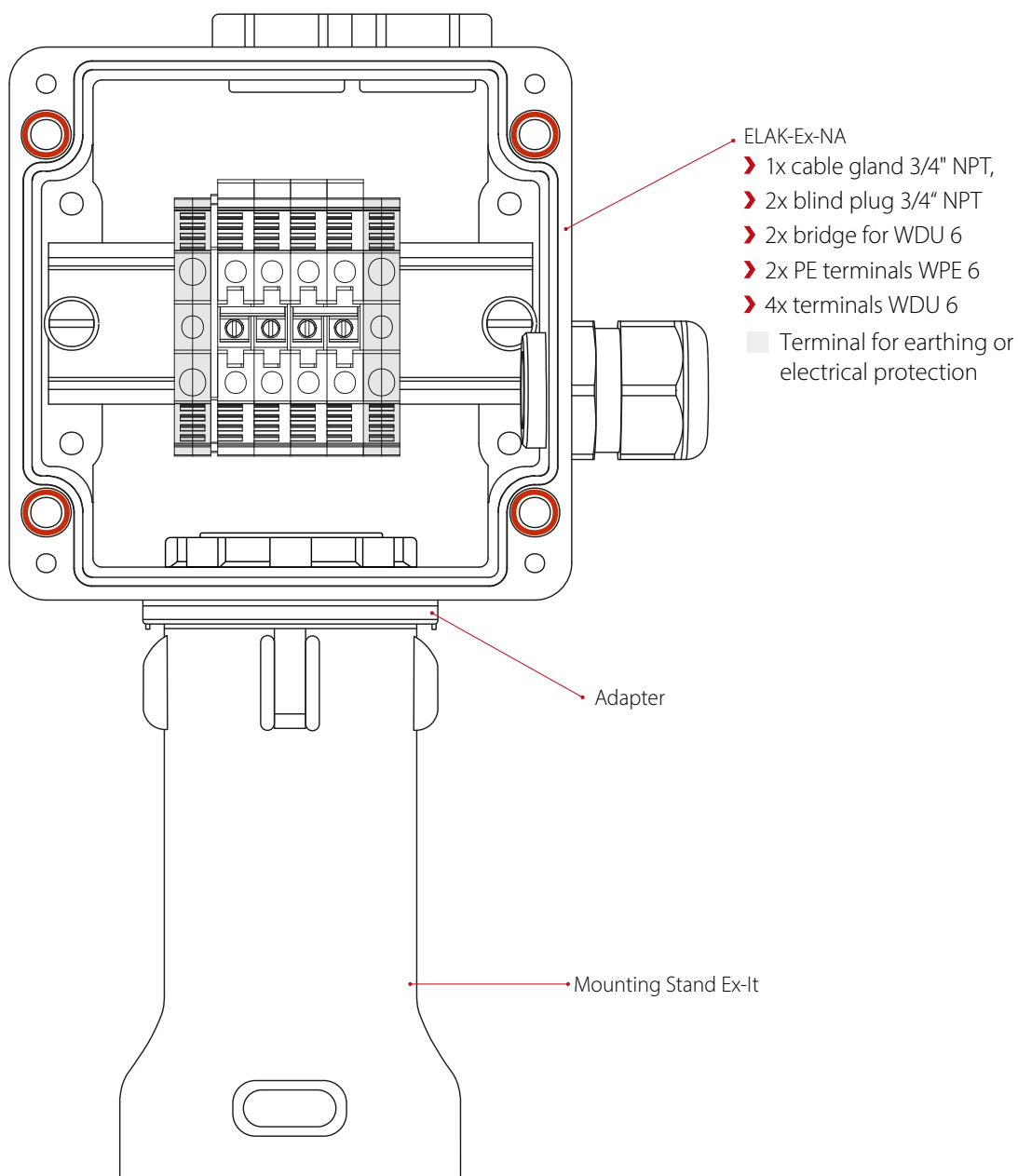
Junction boxes for hazardous areas

Ex-it-NA / ELAK-Ex-NA Junction box and mounting stand for up to 3 ELSR-NA & -HA

Dimensions: (app.) 5" x 4 3/4" x 3 1/2" (127 mm x 121 mm x 99 mm) (L x H x D) for the JB, Height incl. mounting stand = 9.7" (246 mm)

Article N°: **0X8CA97** Ex-It-NA

Junction box with mounting stand for 1 to 3 trace heater ELSR-NA, -HA

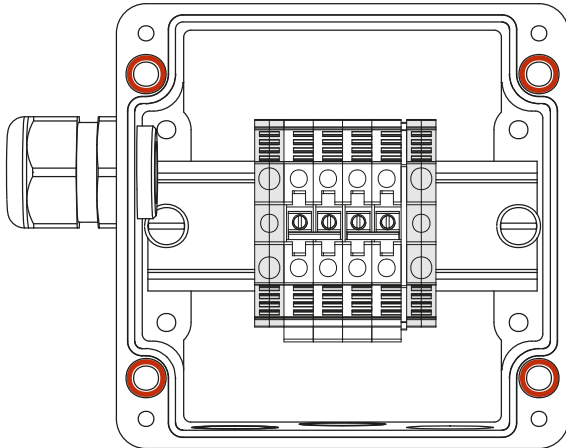


Junction boxes for non-hazardous areas

ELAK-5.7-NA

Junction box for 1 - 3 trace heaters ELSR & 1x connection cable

Dimensions: 4.8" x 4.8" x 3.56" (122 x 122 x 90.5 mm) (WxHxD), Article N°: **0920093**



- › 1x M25 cable gland, 9-17mm
- › 3x blind plug 3/4" NPT*
- › 3x drilling 3/4" NPT
- › 2x sealing for M25
- › 2x bridge for WDU 6
- › 2x PE terminals WPE 6
- › 4x terminals WDU 6
- *Enclosed, loose

Dimension housing: 4.8" x 4.8" x 3.56"
(122 x 120 x 90 mm)

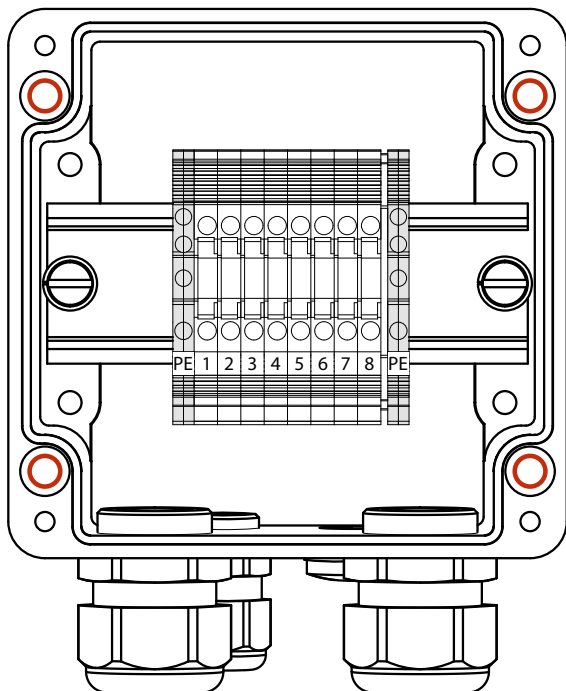
○ Hole pattern: 4.17" x 3.23", ø 0.236
(106 x 82 mm, ø 6.5 mm)

■ Terminal for earthing or electrical protection

ELAK-5.8-NA

Junction box for 1 - 2 Pt100 RTD temperature sensors

Dimensions: 4.8" x 4.8" x 3.56" (122 x 122 x 90.5 mm) (WxHxD), Article N°: **0920094**



- › 2x cable gland M25, 9-17 mm
- › 1x cable gland M16, 5-10 mm
- › 1x sealing for M16
- › 1x blind plug M16*
- › 2x PE terminals WPE 2.5
- › 8x terminals WDU 2.5

Dimension housing: 4.8" x 4.8" x 3.56"
(122 x 120 x 90 mm)

○ Hole pattern: 4.17" x 3.23", ø 0.236
(106 x 82 mm, ø 6.5 mm)

■ Terminal for earthing or electrical protection

(E) - Temperature Controller

This section is intended to provide an overview of the eltherm temperature controller for use with the ELSR Heating cable. For detailed information about the temperature controller, please refer to the respective data sheets.

Temperature controller for non-hazardous areas

ELTC-14-NA

Electronic temperature controller for 1 trace heater & Pt100 2- & 3-wire

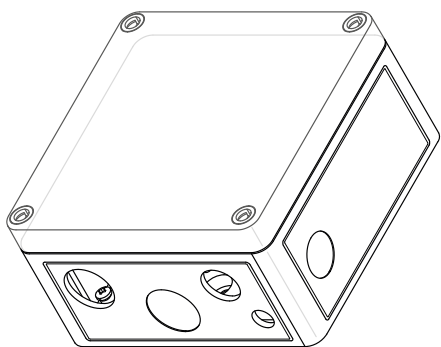
Dimensions: 5" x 5" x 3" (122 x 122 x 90.5 mm) (WxHxD)

Article N°: **0620007** (ELTC-14-NA)

Electronic temperature controller

The eltherm Series ELTC-14-NA electronic temperature controllers are designed for monitoring and control of heat tracing circuits. The temperature controller comes complete with a single circuit 20A switching output and additional 8A alarm relay. The controller is designed to operate with 3-wire or 2-wire Pt100 RTD temperature sensors (optionally supplied by eltherm).

ELTC-14-NA series controllers are supplied fully integrated in weather-proof enclosures, suitable for wall mounting, complete with transparent cover to allow for viewing and access to the front panel and user interface of the controller.



Applications [ELTC-14-NA]

- Wall mounting
- LED display
- Programmable 32 °F to 734 °F (0 to +390 °C)
- Switches 20 A resistive load
- Alarm contact (configurable)
- 2- & 3-wire Pt100 RTD
- Up to 2 trace heaters can be connected

Accessories [ELTC-14-NA]

- 2x cable gland M25 (6-13 mm),
2x seal (2x6 mm),
2x O-ring f. M25
- 2x cable gland M20 (6-12 mm),
2x O-ring f. M20
- 1x cable gland M12 (3-6,5 mm),
1x O-ring f. M12
- 1x locknut M25
- 1x locknut M20

Temperature sensor

ELTF-PT.1

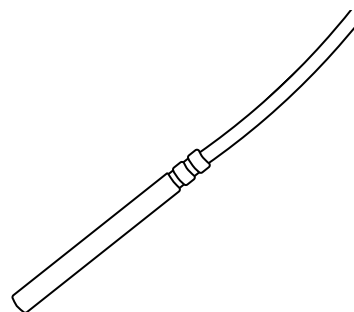
Article N°: **0650001**

2-wire Pt100 RTD, sensor 5x50 mm, lead 16,4 ft (5,0 m), PVC,
T_{op} = -22 °F to +175 °F (-30 °C to +80 °C)

ELTF-PT.3.1

Article N°: **0650002**

3-wire Pt100 RTD, sensor 5x50 mm, lead 9,84 ft (3,0 m), Fluoropolymer,
T_{op} = -58 °F to +482 °F (-50 °C to +250 °C)



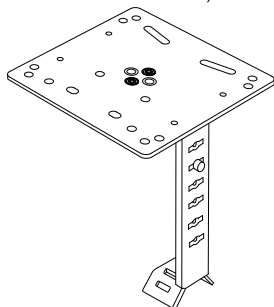
(F) - MOUNTING BRACKET

EL-VSB 300

Article N°: **0941085**

Variable mounting bracket for ELTC-14-NA as well as ELAK-5.7 and ELAK-5.8 junction boxes

(max. insulation thickness 280 mm)

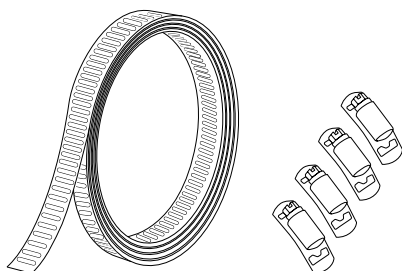


Enclosed every mounting bracket:

Type	Qty.
Cylinder head screw M6x30	4
Cylinder head screw M4x25	4
Nut M6 self-locking	4
Nut M4 self-locking	4

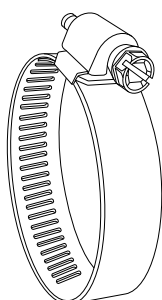
(G) - TENSION STRAPS

Tension strap for self-cutting



Type	Article-No.	Material	Description
ELB-13V1	2723001010	1.4301 (AISI 304)	Threaded tension strap 30 m x 11 mm
ELB-13V2	0930042	1.4301 (AISI 304)	Turn buckle, 10 Pcs. per unit

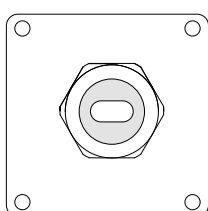
Hole clamp, complete



Type	Article-No.	Material	Description
ELB-15.02	2723001016	1.4301 (AISI 304)	Ø 16 to 25 mm; DN 15, 1/2"
ELB-15.04	2723001025	1.4301 (AISI 304)	Ø 25 to 40 mm; DN 25, 1"
ELB-15.090	2723040090	1.4016 (AISI 430)	Ø 40 to 90 mm; DN 65, 2,5"
ELB-15.11	2723001090	1.4301 (AISI 304)	Ø 90 to 110 mm; DN 80, 3"
ELB-15.325	2723060325	1.4016 (AISI 430)	Ø 60 to 325 mm; DN 100, 4,5"
ELB-15.650	2723060650	1.4016 (AISI 430)	Ø 60 to 650 mm; DN 600, 4,5"

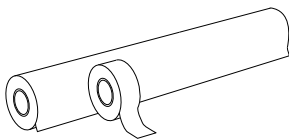
(H) - INSULATION BUSHINGS

Insulation bushing; Dimensions: 70 x 70 mm, plate aluminum



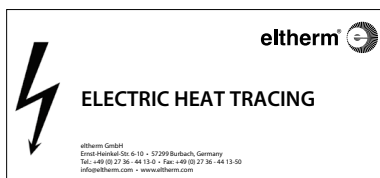
Type	Article-N°.	Cable gland	suitable for
ELISD-R1	0921035	1x M25	ELSR-NA; -SH+
ELISD-R4	0921047	1x M25	ELSR-HA
ELISD-R5	0921101	1x M25	ELSR-MA
ELISD-1.12	0921011	1x M12	sensor lead 3 - 6.5 mm
ELISD-1.16	0921015	1x M16	cold lead 4.5 - 10 mm

(I) - SELF-ADHESIVE TAPES AND FOILS



Type	Article-Nº.	Description
ELB-02A	2486800126	Fibreglass adhesive tape, 30 m x 12 mm, up to 500 °F (260 °C)
ELB-02B	2486800130	Fibreglass adhesive tape, 50 m x 12 mm, up to 500 °F (260 °C)
ELB-06HT-HT	2489900007	Aluminum foil, 50 m x 75 mm, self-adhesive, flame retardant, up to 662 °F (350 °C)
ELB-06HTB-HT	2489900004	Aluminum foil, 66 m x 75 mm, self-adhesive, flame retardant, up to 662 °F (350 °C)
ELB-06HTC-HT	2489900003	Aluminum foil, 50 m x 500 mm, self-adhesive, flame retardant, up to 662 °F (350 °C)
ELB-06	0942200	Aluminum foil, 50 m x 75 mm, self-adhesive, up to 284 °F (140 °C)
ELB-06D	2701900076	Aluminum foil, 100 m x 75 mm, self-adhesive, up to 284 °F (140 °C)
ELB-06E	2701900500	Aluminum foil, 50 m x 563 mm, self-adhesive, up to 284 °F (140 °C)
ELB-06C	2701900051	Aluminum foil, 50 m x 75 mm, mesh-reinforced, self-adhesive, up to 266 °F (130 °C)

(J) - WARNING SIGNS



Type	Article-Nº.	Description
EI-WS01E	2986900012	Warning sign; „ELECTRIC HEAT TRACING“, English
EI-WS01F	2986900032	Warning sign; „TRAÇAGE ELECTRIQUE“, France

Other languages upon request

seforz

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