COMPANY
KRUS-ZAPAD

Technical catalog 2025

Industrial Heat Tracing Systems

KRUS-ZAPAD COMPANY

About company

KRUS-Zapad Company is a Russian full-service engineering and manufacturing company in the field of automated industrial heat tracing systems, low and medium voltage electrical equipment, Ex equipment for corrosive and hazardous environments, packaged and modular buildings and prefab structures to supply power to industrial and process facilities, industrial automation, and hardware and software packages.

100 %
RUSSIAN MADE

over 15
YEARS IN ELECTRICAL HEAT TRACING INDUSTRY

more than 2700
PROJECTS DELIVERED THROUGHOUT RUSSIA AND NEIGHBORING COUNTRIES

over 30 000 sq.m
OF MANUFACTURING AREA

FULL RANGE OF SERVICES

- ENGINEERING
- DELIVERY
- INSTALLATION AND SUPERVISED INSTALLATION
- COMMISSIONING
- AFTERSALES SERVICE AND WARRANTY MAINTENANCE
- TECHNICAL AUDITING

CERTIFICATION

The products are CU TR 004/2011, CU TR 012/2011, CU TR 020/2011 and fire safety certified, certified to meet ISO 9001, ISO 14001, OHSAS 18001, Russian State Standard System, and have a confirmation of being manufactured in Russia and other special certificates and approvals to meet the Customer's requirements or specific operation conditions (e.g. maritime register, INTERGAZCERT Certificate, etc.)..

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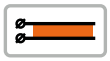
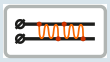
121 / 121	CK-FS.S Self-regulating heating element	
260 / 215	CK-SL Power-limiting heating element	
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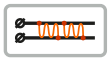
425 / 340	CK-MI-2M Constant wattage heating element	

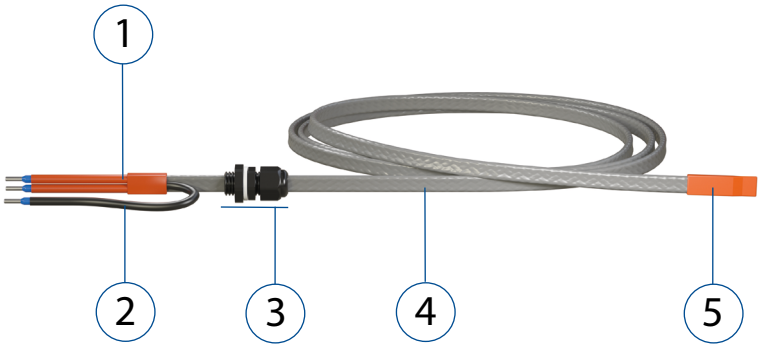
CK-FS.85 Self-Regulating Heating Element

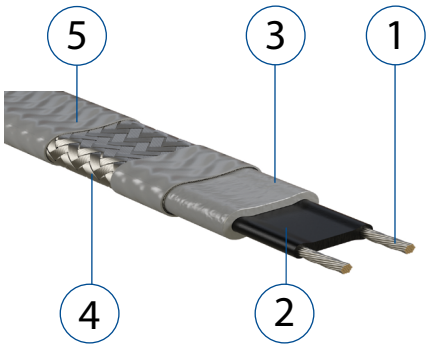
DESCRIPTION

Parallel type self-regulating heating element CK-FS.85 is used for freezing protection or to maintain material temperature in the pipelines, vessels and equipment which are not subject to steam-out, for exposure to temperatures below 85°C.

Self-regulating heating element is supplied as a kit comprising a heat trace cable, connecting elements, an entry gland and termination.

DESIGN





1. Cable connector to feeding terminals in the junction box
2. PE lead to connect cable screening braid to PE terminal in the junction box
3. Cable gland to connect the cable into the junction box (assembly)
4. Heat trace cable
5. Termination

1. Nickel-plated copper wires
2. Semiconductor heating element
3. Electrical insulation
4. Tinned copper braid
5. Jacket for extra cable and braid protection

MODIFICATIONS

Parallel type self-regulating heating elements CK-FS.85 are produced in several designs with various jackets of heat trace cables. The jacketing material is identified with a Roman letter at the end of the item number.

Jacketing material is as marked:

Fluoropolymer.....**CK-FS.85/_-f**

Thermoplastic.....**CK-FS.85/_-t**

P.O. DETAILS

To place a P.O., please select the item number of the heating element from the Marking table that suits your project specification, and specify the jacket material and design length (m).

E.g., a P.O. for a CK-FS.85 type heating element (fluoropolymer jacketed heat cable, specific output = 23 W/m and design length = 30 m), should contain the following number:
CK-FS.85/25/30-f

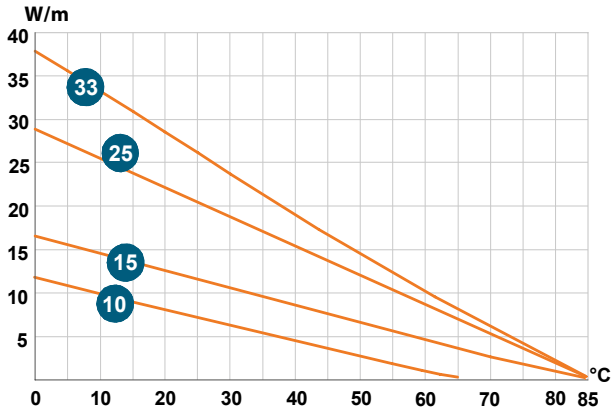
CK-FS.85 Self-Regulating Heating Element

GENERAL SPECIFICATION

Exposure temperature, max	**85°C**
Maintenance temperature, max	**65°C**
Supply voltage	**~ 230 V**
Jacket material	**Fluoropolymer, thermoplastic**
Wire material	**Cu, Cu-Ni alloy**
Type of heat cable	**Parallel, self-regulating**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T2 Gb X, Ex tb IIIC T85°C...T300°C Db X**
UV resistance	**Yes**

OUTPUT RATING

Cable output vs. Temperature, @ 230 V



MARKING

Item #	Specific output, @ 10°C
CK-FS.85/10	**10 W/m**
CK-FS.85/15	**15 W/m**
CK-FS.85/25	**25 W/m**
CK-FS.85/33	**33 W/m**

CK-FS.85 Self-Regulating Heating Element

MAX HEATING CIRCUIT LENGTH

Cable grade	CB Rating, A	Max heat cable circuit length, with Type C circuit breaker, m			
		Initial temperature, ° C			
		10	0	-20	-40
CK-FS.85/10	16	191	191	156	127
	25	226	226	226	199
	32	226	226	226	226
CK-FS.85/15	16	164	155	98	90
	25	205	184	153	123
	32	205	184	184	180
CK-FS.85/25	16	93	93	64	64
	25	146	146	128	100
	32	146	140	130	128
CK-FS.85/33	16	70	65	49	43
	25	110	109	90	65
	32	115	109	100	82

CK-FS.200 Self-Regulating Heating Element

DESCRIPTION

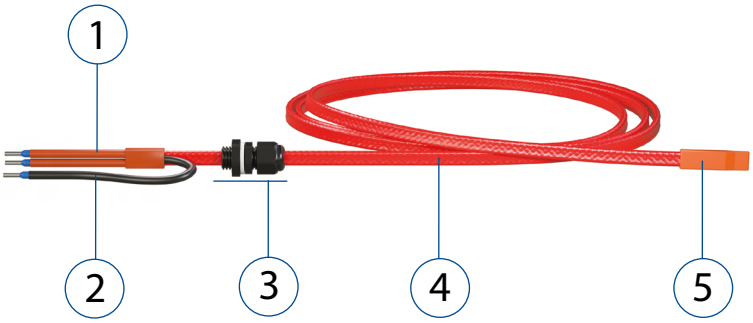
Parallel type self-regulating heating element CK-FS.200 is used for freezing protection or to maintain material temperature in the pipelines, vessels and equipment for exposure to temperatures below 200 °C.

Self-regulating heating element is supplied as a kit comprising a heat trace cable, connecting elements, and termination.

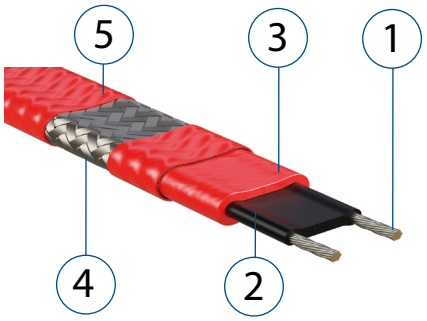
DESIGN

Heating element is sized to the Customer's specifications. The scope of supply includes a made-to-order heat trace cable, with wires for terminal connection and end termination, and a properly sized gland.

A gland is used to connect the cable into the power box while ensuring adequate tightness for hazardous area applications.



1. Cable connector to feeding terminals in the junction box
2. PE lead to connect cable screening braid to PE terminal in the power box
3. Cable gland to connect the cable into the power box for hazardous areas (assembly)
4. Heat trace cable
5. Termination



1. Nickel-plated copper wires
2. Semiconductor heating element
3. Electrical insulation
4. Tinned copper braid
5. Jacket for extra cable and braid protection

MODIFICATIONS

Parallel type self-regulating heating elements CK-FS.200 are produced with fluoropolymer jacketed heat trace cables. The jacketing material is identified with a Roman letter at the end of the item number.

Jacketing material is as marked:

Fluoropolymer.....**CK-FS.200/_-f**

P.O. DETAILS

To place a P.O., please select the item number of the heating element from the Marking table that suits your project specification, and specify the jacket material and design length (m).

E.g., a P.O. for a CK-FS.200 type heating element with a fluoropolymer jacketed heat trace cable, specific output = 30 W/m and design length = 31 m, should contain the following number:

CK-FS.200/30/31-f

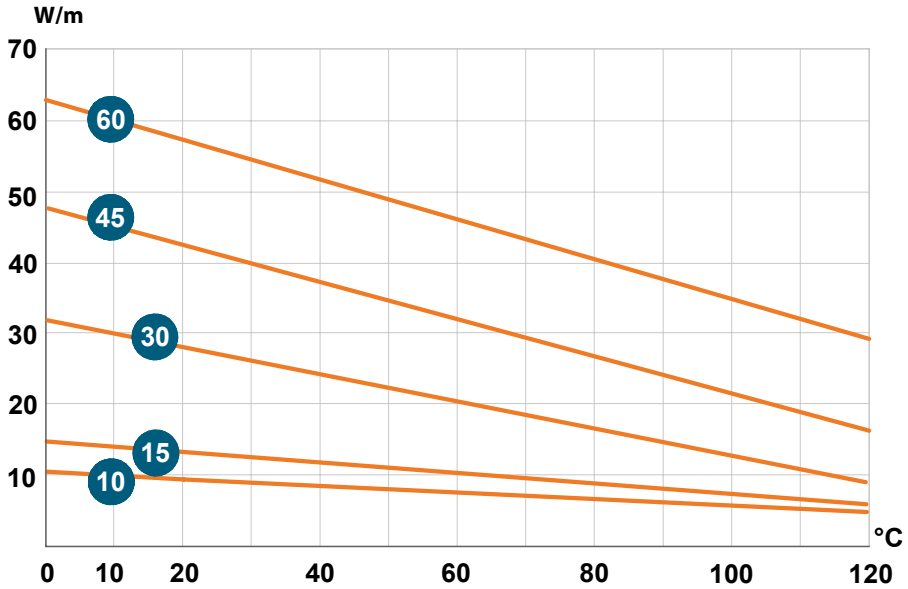
CK-FS.200 Self-Regulating Heating Element

GENERAL SPECIFICATION

Exposure temperature, max	**200°C**
Maintenance temperature, max	**120°C**
Supply voltage	**~230 V**
Jacket material	**Fluoropolymer**
Wire material	**Cu, Cu-Ni alloy**
Type of heat cable	**Parallel, self-regulating**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T2 Gb X, Ex tb IIIC T85°C...T300°C Db X**

OUTPUT RATING

Cable output vs. Temperature, @ 230 V .



MARKING

Item #	Specific output, @ 10°C
CK-FS.200/10	**10 W/m**
CK-FS.200/15	**15 W/m**
CK-FS.200/30	**30 W/m**
CK-FS.200/45	**45 W/m**
CK-FS.200/60	**60 W/m**

CK-FS.200 Self-Regulating Heating Element

MAX HEATING CIRCUIT LENGTH

Cable grade	CB Rating, A	Max heat cable circuit length, with type C circuit breaker, m			
		Initial temperature, °C			
		10	0	-20	-40
CK-FS.200/10	16	200	160	125	90
	25	235	160	139	118
	32	235	219	190	173
CK-FS.200/15	16	165	143	143	86
	25	189	160	139	115
	32	219	219	190	173
CK-FS.200/30	16	92	89	89	73
	25	114	112	112	108
	32	134	134	117	108
CK-FS.200/45	16	70	61	61	47
	25	82	77	77	74
	32	99	97	94	91
CK-FS.200/60	16	50	48	45	43
	25	60	58	55	52
	32	81	78	74	70

CK-FS.250 Self-Regulating Heating Element

DESCRIPTION

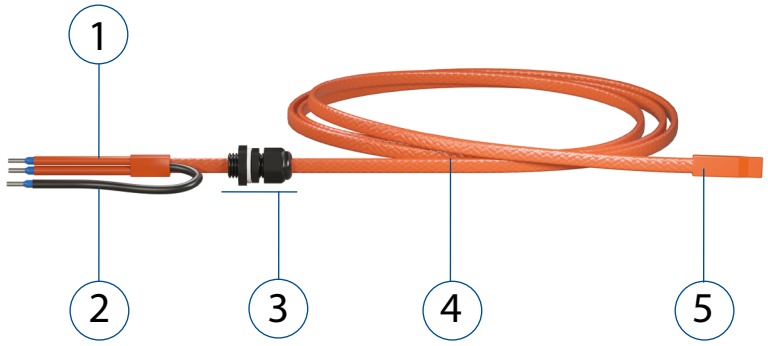
Parallel type self-regulating heating element CK-FS.250 is used for freezing protection or to maintain material temperature in the pipelines, vessels and equipment for exposure to temperatures below 250 °C.

Self-regulating heating element is supplied as a kit comprising a heat trace cable, connecting elements, and termination.

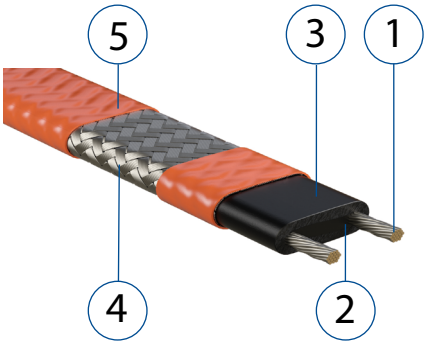
DESIGN

Parallel type self-regulating heating element CK-FS.250 is used for freezing protection or to maintain material temperature in the pipelines, vessels and equipment for exposure to temperatures below 250 °C.

Self-regulating heating element is supplied as a kit comprising a heat trace cable, connecting elements, and termination.



1. Cable connector to feeding terminals in the junction box
2. PE lead to connect cable screening braid to PE terminal in the power box
3. Cable gland to connect the cable into the power box for hazardous areas (assembly)
4. Heat trace cable
5. Termination



1. Nickel-plated copper wires
2. Semiconductor heating element
3. Electrical insulation
4. Tinned copper braid
5. Jacket for extra cable and braid protection

MODIFICATIONS

Parallel type self-regulating heating elements CK-FS.250 are produced in several designs with various jackets of heat trace cables. The jacketing material is identified with a Roman letter at the end of the item number.

Jacketing material is as marked:

Fluoropolymer.....**CK-FS.250/_-f**
Silicone.....**CK-FS.250/_-s**
Metal.....**CK-FS.250/_-a**

P.O. DETAILS

To place a P.O., please select the item number of the heating element from the Marking table that suits your project specification, and specify the jacket material and design length (m).

E.g., a P.O. for a CK-FS.250 type heating element with a fluoropolymer jacketed heat trace cable, specific output = 18 W/m and design length = 30 m, should contain the following number:

CK-FS.250/20/30-f

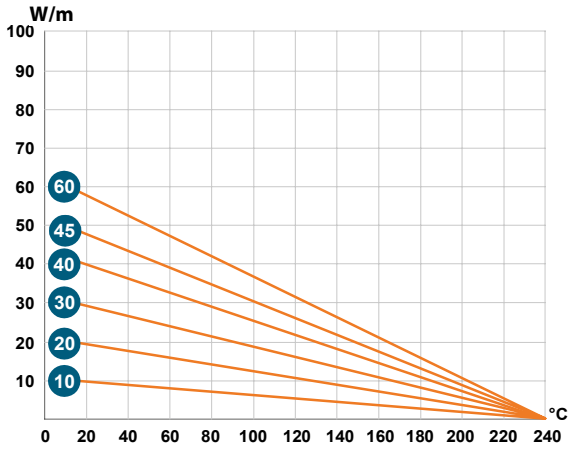
CK-FS.250 Self-Regulating Heating Element

GENERAL SPECIFICATION

Exposure temperature, max	**250°C**
Maintenance temperature, max	**150°C**
Supply voltage	**~230 V**
Jacket material	**Fluoropolymer, Silicone, Metal, Combo**
Wire material	**Cu, Cu-Ni alloy**
Type of heat cable	**Parallel, self-regulating**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T2 Gb X, Ex tb IIIC T85°C...T300°C Db X**

OUTPUT RATING

Cable output vs. Temperature, @ 230 V



MARKING

Item #	Specific output, @ 10°C
CK-FS.250/10	**10 W/m**
CK-FS.250/20	**20 W/m**
CK-FS.250/30	**30 W/m**
CK-FS.250/40	**40 W/m**
CK-FS.250/45	**45 W/m**
CK-FS.250/60	**60 W/m**

CK-FS.250 Self-Regulating Heating Element

MAX HEATING CIRCUIT LENGTH

Cable grade	CB Rating, A	Max heat cable circuit length, with Type C Circuit Breaker, m			
		Initial temperature, °C			
		10	0	-20	-40
CK-FS.250/10	16	177	177	171	134
	25	215	215	215	215
	32	215	215	215	215
CK-FS.250/20	16	114	114	114	95
	25	152	152	152	152
	32	152	152	152	152
CK-FS.250/30	16	82	74	70	68
	25	110	106	100	96
	32	110	110	110	110
CK-FS.250/40	16	65	65	65	58
	25	106	106	106	96
	32	106	106	106	106
CK-FS.250/45	16	62	52	45	43
	25	82	78	71	67
	32	88	84	82	80
CK-FS.250/60	16	42	40	36	34
	25	64	64	56	56
	32	76	71	67	64

CK-FS.S Self-Regulating Heating Element

DESCRIPTION

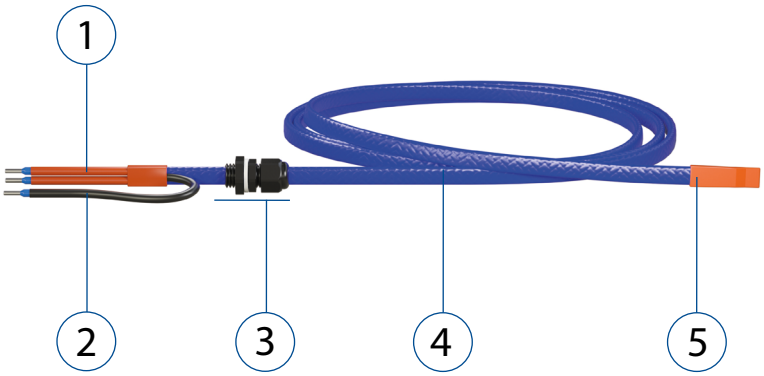
Parallel type self-regulating heating element CK-FS.S is used for freezing protection or to maintain material temperature in the pipelines, vessels and equipment, to warm floors, roads and ramps. A heat trace cable is embedded in concrete using a CK-IEK.F mounting kit.

Self-regulating heating element is supplied as a kit comprising a heat trace cable, connecting elements, and termination.

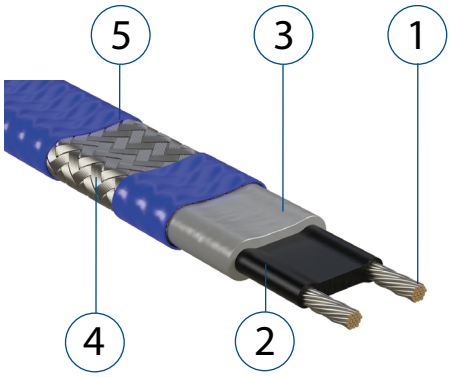
DESIGN

Heating element is sized to the Customer's specifications. The scope of supply includes a made-to-order heat trace cable, with wires for terminal connection and end termination, and a properly sized gland.

A gland is used to connect the cable into the power box while ensuring adequate tightness for hazardous area applications.



1. Cable connector to feeding terminals in the junction box
2. PE lead to connect cable screening braid to PE terminal in the power box
3. Cable gland to connect the cable into the power box for hazardous areas (assembly)
4. Heat trace cable
5. Termination



1. Nickel-plated copper wires
2. Semiconductor heating element
3. Electrical insulation
4. Tinned copper braid
5. Jacket for extra cable and braid protection

MODIFICATIONS

Parallel type self-regulating heating elements CK-FS.S are produced in several designs with various jackets of heat trace cables. The jacketing material is identified with a Roman letter at the end of the item number.

Jacketing material is as marked:

Thermoplastic.....**CK-FS.S/90-t**

P.O. DETAILS

To place a P.O., please select the item number of the heating element from the Marking table that suits your project specification, and specify the jacket material and design length (m).

E.g., a P.O. for a CK-FS.S type heating element with a heat trace cable, specific output = 102 W/m and design length = 30 m, should contain the following number:

CK-FS.S/90/30-t

CK-FS.S Self-Regulating Heating Element

GENERAL SPECIFICATION

Exposure temperature, max	**121°C**
Maintenance temperature, max	**121°C**
Supply voltage	**~230 V**
Jacket material	**Thermoplastic, silicone**
Wire material	**Cu, Cu-Ni alloy**
Type of heat cable	**Parallel, self-regulating**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T2 Gb X, Ex tb IIIC T85°C...T300°C Db X**

MARKING

Item #	Specific Output, @ 10°C
CK-FS.S/90	**90 W/m**

MAX HEATING CIRCUIT LENGTH

Cable grade	CB Rating, A	Max heat cable circuit length, with Type C Circuit Breaker, m		
		Initial temperature, °C		
		10	0	-20
CK-FS.S/90	**16**	**31**	**31**	**31**
	25	**50**	**50**	**50**
	32	**65**	**65**	**65**

CK-SL Power-Limiting Heating Element

260°C

DESCRIPTION

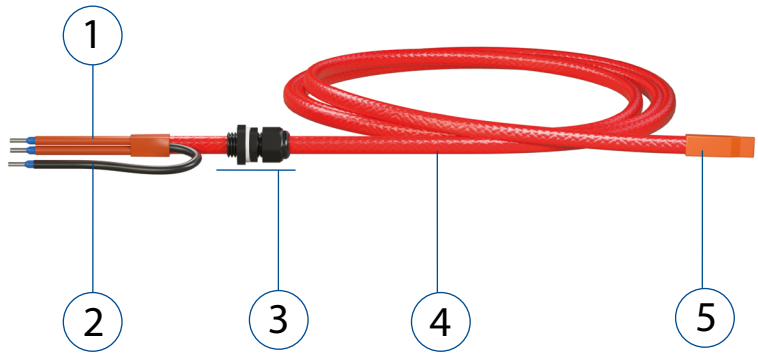
Parallel type power-limiting heating element CK-SL is used for freezing protection or to maintain material temperature in the pipelines, vessels and equipment for exposure to temperatures below 260 °C.

Power-limiting heating element is supplied as a kit consisting of a heat trace cable, connectors and termination.

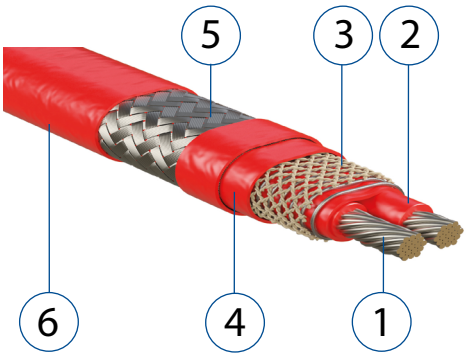
DESIGN

Heating element is sized to the Customer's specifications. The scope of supply includes a made-to-order heat trace cable, with wires for terminal connection and end termination, and a properly sized gland.

A gland is used to connect the cable into the power box while ensuring adequate tightness for hazardous area applications.



1. Cable connector to feeding terminals in the junction box
2. PE lead to connect cable screening braid to PE terminal in the power box
3. Cable gland to connect the cable into the power box for hazardous areas (assembly)
4. Heat trace cable
5. Termination



1. Nickel-plated copper wires
2. Electric insulation
3. Ni-Cr alloy heating element
4. Electric insulation
5. Tinned copper braid
6. Jacket for extra cable and braid protection

P.O. DETAILS

To place a P.O., please select the item number of the heating element from the Marking table that suits your project specification, and specify the design length (m).

E.g., a P.O. for a CK-SL type heating element with a heat trace cable, specific output = 45 W/m and design length = 30 m, should contain the following number:

CK-SL/45/30

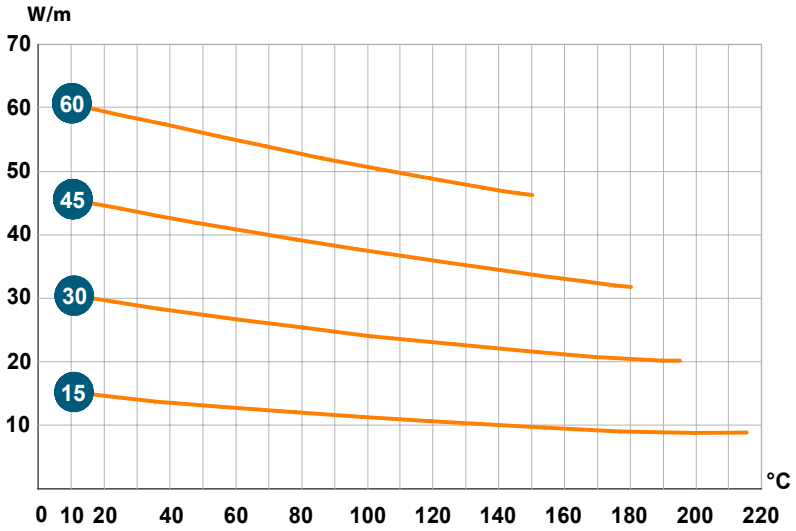
CK-SL Power-Limiting Heating Element

GENERAL SPECIFICATION

Exposure temperature, max	**260°C**
Maintenance temperature, max	**215°C for CK-SL/15** **195°C for CK-SL/30** **180°C for CK-SL/45** **150°C for CK-SL/60**
Supply voltage	**~230 V**
Jacket material	**Fluoropolymer**
Conductor / heater wire material	**Cu-Ni alloy / composite metal alloy**
Type of heat cable	**Parallel, max power**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T2 Gb X, Ex tb IIIC T85°C...T300°C Db X**

OUTPUT RATING

Cable output vs. Temperature, @ 230 V



MARKING

Item #	Specific output, @ 10°C
CK-SL/15	**15 W/m**
CK-SL/30	**30 W/m**
CK-SL/45	**45 W/m**
CK-SL/60	**60 W/m**

MAX HEATING CIRCUIT LENGTH

Cable grade	CB Rating, A	Max heat cable circuit length, with Type C Circuit Breaker, m			
		Initial temperature, °C			
		10	0	-20	-40
CK-SL/15	16	167	167	167	167
	25	271	271	271	271
	32	375	375	375	375
CK-SL/30	16	85	85	85	85
	25	136	136	136	136
	32	180	180	180	180
CK-SL/45	16	57	57	57	57
	25	92	92	92	92
	32	120	120	120	120
CK-SL/60	16	44	44	44	44
	25	70	70	70	70
	32	91	90	86	82

CK-SL.C Constant Wattage Heating Element

260°C

DESCRIPTION

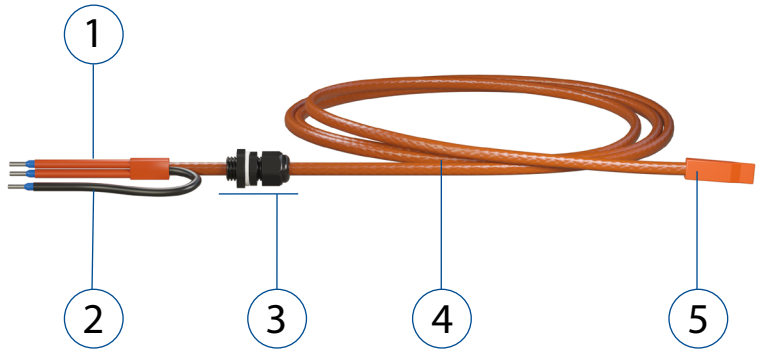
Parallel type constant wattage heating element CK-SL.C is used for freezing protection or to maintain material temperature in the pipelines, vessels and equipment for exposure to temperatures below 260 °C.

Constant wattage heating element is supplied as a kit consisting of a heat trace cable, connectors and end termination.

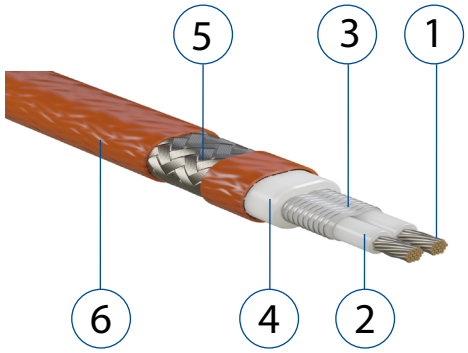
DESIGN

Heating element is sized to the Customer's specifications. The scope of supply includes a made-to-order heat trace cable, with wires for terminal connection and termination, and a properly sized gland.

A gland is used to connect the cable into the power box while ensuring adequate tightness for hazardous area applications.



1. Cable connector to feeding terminals in the junction box
2. PE lead to connect cable screening braid to PE terminal in the power box
3. Cable gland to connect the cable into the power box for hazardous areas (assembly)
4. Heat trace cable
5. Termination



1. Nickel-plated copper wires
2. Electric insulation
3. Ni-Cr alloy heating element
4. Electric insulation
5. Tinned copper braid
6. Jacket for extra cable and braid protection

MARKING

Item #	Specific output, @ 10°C	Maximum length, m
CK-SL.C/8-ff	**8 W/m**	**375**
CK-SL.C/10-t/-s	**10 W/m**	**160**
CK-SL.C/15-ff	**15 W/m**	**257**
CK-SL.C/16-f	**16 W/m**	**125**
CK-SL.C/20-t/-s	**20 W/m**	**112**
CK-SL.C/24-ff	**24 W/m**	**195**
CK-SL.C/25-f	**25 W/m**	**100**
CK-SL.C/30-s	**30 W/m**	**90**
CK-SL.C/33-ff	**33 W/m**	**170**
CK-SL.C/33-f	**33 W/m**	**90**
CK-SL.C/40-s	**40 W/m**	**60**
CK-SL.C/45-f	**45 W/m**	**75**

GENERAL SPECIFICATION

Exposure temperature, max	**260°C for fluoropolymer jacket**
	204°C for fluoropolymer jacket (-ff cables)
	220°C for silicone jacket
	80°C for thermoplastic jacket
Supply voltage	**230/575/690 V**
Jacket material	**Fluoropolymer, thermoplastic, silicone**
Conductor/heater wire material	**Cu**
Type of heating cable	**Parallel, constant wattage**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T2 Gb X, Ex tb IIIC T85°C...T300°C Db X**

P.O. DETAILS

To place a P.O., please select the item number of the heating element from the Marking table that suits your project specification, and specify the design length (m).

E.g., a P.O. for a CK-SL.C type heating element with a heat trace cable, specific output = 33 W/m and design length = 30 m, fluoropolymer jacketed, should contain the following number:

CK-SL.C/33/30-f

CK-MI-2M Constant Wattage Heating Element

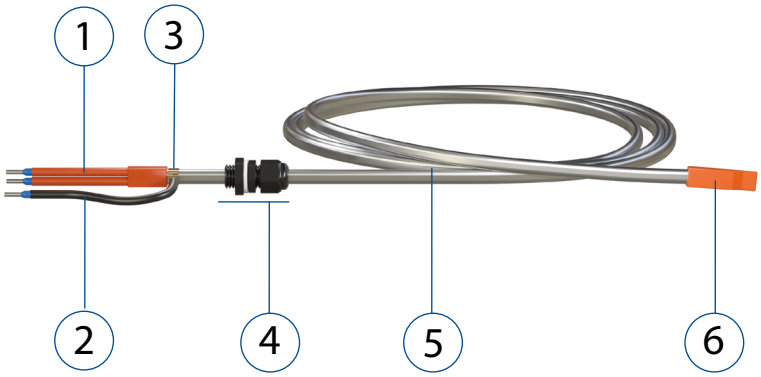
425°C

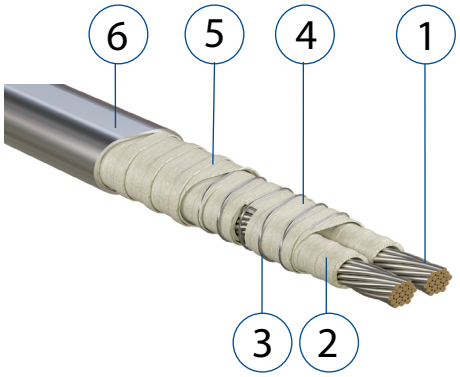
DESCRIPTION

Metal-jacketed constant wattage heating element CK-MI-2M is used for freezing protection or to maintain material temperature in the pipelines, vessels and equipment for exposure to temperatures below 425 °C.

Metal-jacketed constant wattage heating element is supplied as a kit consisting of a heat trace cable, cold gland, and end termination. As this is a parallel-type cable with a segmental heater, cold entry requires cable end fan-out for termination.

DESIGN





1. Wires connecting the cable to feeding terminal in the junction box
2. PE lead to connect cable screening braid to PE terminal in the power box
3. Clamp for PE lead connection to cable metal jacket
4. Cable gland to connect the cable into the power box for hazardous areas (assembly)
5. Metal jacketed heat trace cable
6. Termination

1. Nickel-plated copper wires
2. Electric insulation
3. Ni-Cr alloy heating element
4. Contact point
5. Electric insulation
6. Seamless metal jacket for extra cable protection

P.O. DETAILS

To place a P.O., please select the item number of the heating element from the Marking table that suits your project specification, and specify the design length (m). .

E.g., a P.O. for a CK-MI-2M type heating element with a heat trace cable, specific output = 70 W/m and design length = 30 m, should contain the following number:

CK-MI-2M.70/30

CK-MI-2M Constant Wattage Heating Element

GENERAL SPECIFICATION

Exposure temperature, max	**425°C**
Maintenance temperature, max	**340°C**
Supply voltage	**~230 V**
Jacket material	**Al**
Conductor/heater wire material	**Cu, Cu-Ni alloy / Alloy 600**
Type of heat cable	**Parallel, segmented, constant wattage**
ZoHazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T1 Gb X, Ex tb IIIC T85°C...T450°C Db X**

MARKING

Item #	Specific output, W/m	Max length, m
CK-MI-2M.15	**15**	**118**
CK-MI-2M.30	**30**	**83**
CK-MI-2M.50	**50**	**64**
CK-MI-2M.70	**70**	**54**
CK-MI-2M.100	**100**	**46**
CK-MI-2M.150	**150**	**37**

CK-ML Series Type Heating Element

260°C

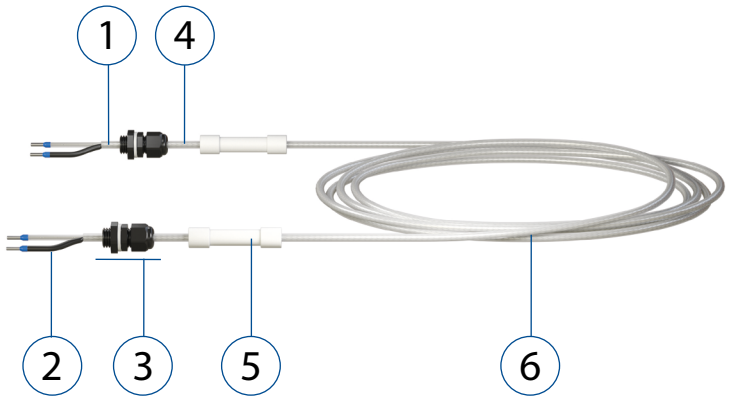
DESCRIPTION

Series type heating element CK-ML is used for freezing protection or to maintain material temperature in the pipelines, vessels and equipment for exposure to temperatures below 260 °C, to warm floors, roads and ramps.

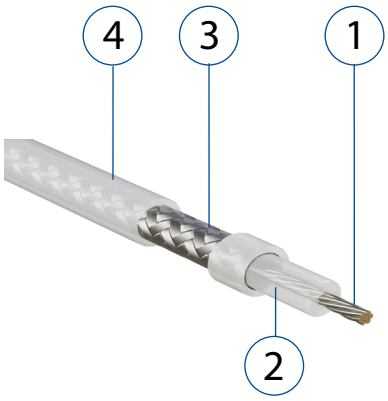
Series type heating element is supplied as a kit consisting of a heat trace cable, connectors and cold lead cables.

DESIGN

Heating element is sized to the Customer's specifications. The scope of supply includes a made-to-order heat cable, with connectors and cold tails for connection into a junction box. A gland is used to connect the cable into the power box while ensuring adequate tightness for hazardous area applications.



1. Cold lead cable wire to be connected to the feeding terminal in the junction box
2. PE lead to connect cable screening braid to PE terminal in the power box
3. Cable gland to connect the cable into the power box for hazardous areas (assembly)
4. Cold lead cable
5. Cold lead connector
6. Heat trace cable



1. Ni-plated conductor
2. Electric insulation
3. Ni-plated copper braid
4. Jacket for extra cable and braid protection

MODIFICATIONS

Constant Wattage Heating Element CK-ML is has a few modifications:
CK-ML/X1/X2/X3/CLX4-X5-X6

X1 – conductor resistance, Ω/km;
X2 – heating run length, m;
X3 – voltage between connecting wires, V;
X4 – cold lead cross section, sq.mm;
X5 - cold lead cable length (m) on both sides – only for nontypical length specification. The typical length of cold lead cable runs on both sides of the section is 1.5 m. Nontypical cold lead cable length is subject to manufacturer's confirmation.
X6 - jacket material index. A PFA jacket is used if the index is missing. An -LT index stands for a FEP jacket.

P.O. DETAILS

To place a P.O., please select the item number of the heating element from the Marking table that suits your project specification, and specify the design length (m).

E.g., a P.O. for a CK-ML type heating element with a heat trace cable, resistivity = 100 Ω/km and design length = 30 m, @ 230 V, PFA jacketed, should contain the following number:

CK-ML/100/1P/30

CK-ML Series Type Heating Element

GENERAL SPECIFICATION

Exposure temperature, max, PFA jacket	**260°C**
Maintenance temperature, max, PFA jacket	**200°C**
Exposure temperature, max, FEP jacket	**200°C**
Maintenance temperature, max, FEP jacket	**150°C**
Supply voltage, max	**750 V**
Jacket material	**Fluoropolymer**
Wire material	**Cu, Ni-Cr, Cu-Ni alloy**
Type of heat cable	**Series type, constant wattage**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T2 Gb X, Ex tb IIIC T85°C...T300°C Db X**

MARKING

Item #	Resistivity @ 20 °C, Ω/km	Cable OD, sq.mm
CK-ML/1.8	**1.8**	**7.20**
CK-ML/2.9	**2.9**	**7.00**
CK-ML/4.4	**4.4**	**6.30**
CK-ML/7	**7**	**5.50**
CK-ML/7.1	**7.1**	**5.10**
CK-ML/7.2	**7.2**	**5.54**
CK-ML/9.7	**9.7**	**4.75**
CK-ML/10	**10**	**5.10**
CK-ML/11.6	**11.6**	**4.90**
CK-ML/11.7	**11.7**	**4.90**
CK-ML/11.9	**11.9**	**4.60**
CK-ML/15	**15**	**4.70**
CK-ML/17.4	**17.4**	**4.30**
CK-ML/17.8	**17.8**	**4.60**
CK-ML/24.8	**24.8**	**4.30**
CK-ML/25	**25**	**4.60**
CK-ML/31.5	**31.5**	**4.90**
CK-ML/32.7	**32.7**	**4.60**
CK-ML/50	**50**	**4.70**
CK-ML/62	**62**	**4.28**
CK-ML/65	**65**	**4.40**
CK-ML/68	**68**	**4.40**
CK-ML/80	**80**	**4.30**
CK-ML/100	**100**	**4.90**
CK-ML/142	**142**	**4.20**

MARKING

Item #	Resistivity @ 20 °C, Ω/km	Cable OD, sq.mm
CK-ML/150	**150**	**4.60**
CK-ML/170	**170**	**3.90**
CK-ML/178	**178**	**3.96**
CK-ML/200	**200**	**4.40**
CK-ML/240	**240**	**4.00**
CK-ML/250	**250**	**4.00**
CK-ML/320	**320**	**4.50**
CK-ML/330	**330**	**3.80**
CK-ML/340	**340**	**3.88**
CK-ML/360	**360**	**4.30**
CK-ML/370	**370**	**4.30**
CK-ML/380	**380**	**4.40**
CK-ML/410	**410**	**4.28**
CK-ML/480	**480**	**4.30**
CK-ML/490	**490**	**4.05**
CK-ML/500	**500**	**3.96**
CK-ML/590	**590**	**3.96**
CK-ML/600	**600**	**4.20**
CK-ML/665	**665**	**3.90**
CK-ML/700	**700**	**4.10**
CK-ML/730	**730**	**4.10**
CK-ML/765	**765**	**3.84**
CK-ML/810	**810**	**4.30**
CK-ML/1000	**1000**	**4.20**
CK-ML/1300	**1300**	**3.75**
CK-ML/1440	**1440**	**4.10**
CK-ML/1480	**1480**	**3.71**
CK-ML/1730	**1730**	**4.10**
CK-ML/1750	**1750**	**4.10**
CK-ML/1865	**1865**	**3.96**
CK-ML/2000	**2000**	**4.20**
CK-ML/2160	**2160**	**4.10**
CK-ML/2400	**2400**	**4.00**
CK-ML/2825	**2825**	**3.78**
CK-ML/3000	**3000**	**4.10**
CK-ML/3950	**3950**	**3.66**
CK-ML/4000	**4000**	**3.66**
CK-ML/5600	**5600**	**3.54**
CK-ML/5900	**5900**	**3.54**
CK-ML/7000	**7000**	**3.5**
CK-ML/8000	**8000**	**3.80**

CK-MI-xM (CK-MI-Mx)

Constant Wattage Heating Element

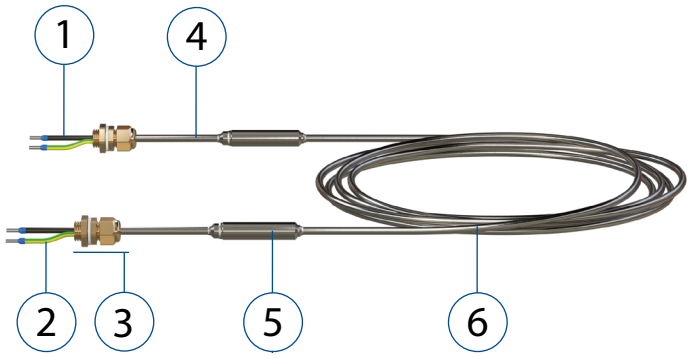
DESCRIPTION

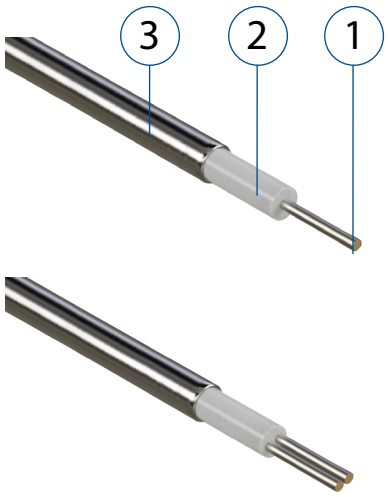
Mineral-insulated constant wattage heating element CK-MI-1M is used for freezing protection or to maintain material temperature in the pipelines, vessels and equipment for exposure to temperatures below 850 °C.

Mineral-insulated constant wattage heating element is supplied as a kit consisting of a heat trace cable, cold tails, a connection kit and cold lead cables.

DESIGN

Heating element is sized to the Customer's specifications. The scope of supply includes a made-to-order heat cable, with a brazed cold lead connector and a cold lead cable for junction box connection, and properly sized brass glands. A gland is used to connect the cable into the power box while ensuring adequate tightness for hazardous area applications.





1. Wire for cable connection to the feeding terminal in the junction box
2. PE lead to connect cable jacket to PE terminal in the power box
3. Brass cable gland to connect the cable into the power box for hazardous areas (assembly)
4. Cold lead cable
5. Cold lead connector
6. Heat trace cable

1. Solid conductor
2. Hot pressed MgO insulation
3. Seamless metal jacket

MODIFICATIONS

CK-MI-1M type constant wattage heating elements are produced in several modifications:

Constant wattage heating element CK-MI-X1M.X2/X3/X4/X5/CLX6-X7-X8

X1 – number of cores;
X2 – jacket material;
The jacket material is indicated by the corresponding Latin letter:
N – Alloy 400;
S – Stainless steel;
I – Alloy 600 ;
A – Alloy 825.
X3 – conductor resistance, Ω/km;
X4 – heating run length, m;
X5 – voltage between connecting wires, V;
X6 – cold lead cross section, sq.mm;
X7 – cold lead cable length (m) on both sides – only for nontypical length specification. The typical length of cold lead cable runs on both sides of the section is 1 m. Nontypical cold lead cable length is subject to manufacturer's confirmation;
X8 - "-L" index for laser welded heating section.

CK-MI-xM (CK-MI-Mx)

Constant Wattage Heating Element

GENERAL SPECIFICATION

Exposure temperature, max for Alloy 400 jacketed cable (CK-MI-1M.N)	**400°C max**
Exposure temperature, max for SS jacketed cable (CK-MI-1M.S)	**700°C max**
Exposure temperature, max for Alloy 825 jacketed cable (CK-MI-1M.A)	**700°C max**
Exposure temperature, max for Alloy 600 jacketed cable (CK-MI-1M.I)	**850°C max**
Maintenance temperature, max	**380 °C for Alloy 400; 670 °C for stainless steel ; 700 °C for Alloy 600; 670 °C for Alloy 825**
Supply voltage	**600 V max**
Connection	**230 V - 1P, 380 V - 2P, 380 V - 3P (wye)**
Jacket material	**Alloy 825, Alloy 600, Alloy 400, Stainless Steel**
Wire material	**Cu, Ni-Cr, Cu-Ni alloy**
Type of heat cable	**Series type, constant wattage**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex de IIC T6...T1 Gb X, 1Ex e IIC T6...T1 Gb X, Ex tb IIIC T85°C...T450°C Db X**

P.O. DETAILS

E.g., a P.O. for a CK-MI.1M type heating element with a heat trace cable, stainless steel jacketed, resistivity = 2500 Ω/km and design length = 54 m, @ 230 V operating voltage, 2.5 sq.mm and 1.5 m long cold tail, should contain the following number:

CK-MI-1M.S/2500/54/230/CL2.5-1.5

MARKING

Item #	Resistivity @ 20 °C, Ω/km	Cable OD, sq.mm
CK-MI-1M.A/10000	**10000**	**3.20**
CK-MI-1M.A/6560	**6560**	**4.30**
CK-MI-1M.A/6300	**6300**	**3.20**
CK-MI-1M.A/5250	**5250**	**4.30**
CK-MI-1M.A/4270	**4270**	**4.30**
CK-MI-1M.A/4000	**4000**	**3.20**
CK-MI-1M.A/3280	**3280**	**4.30**
CK-MI-1M.A/2790	**2790**	**4.30**
CK-MI-1M.A/2500	**2500**	**3.60**
CK-MI-1M.A/2300	**2300**	**4.30**
CK-MI-1M.A/1650	**1650**	**4.30**
CK-MI-1M.A/1640	**1640**	**4.30**
CK-MI-1M.A/1600	**1600**	**3.80**
CK-MI-1M.A/1250	**1250**	**4.30**
CK-MI-1M.A/1000	**1000**	**4.10**
CK-MI-1M.A/980	**980**	**4.30**
CK-MI-1M.A/820	**820**	**4.30**
CK-MI-1M.A/660	**660**	**4.40**

CK-MI-xM (CK-MI-Mx)

Constant Wattage Heating Element

MARKING

Item #	Resistivity @ 20 °C, Ω/km	Cable OD, sq.mm
CK-MI-1M.A/630	**630**	**4.50**
CK-MI-1M.A/560	**560**	**4.60**
CK-MI-1M.A/490	**490**	**4.30**
CK-MI-1M.A/400	**400**	**5.00**
CK-MI-1M.A/330	**330**	**4.30**
CK-MI-1M.A/260	**260**	**4.30**
CK-MI-1M.A/250	**250**	**5.60**
CK-MI-1M.A/230	**230**	**4.30**
CK-MI-1M.A/200	**200**	**4.30**
CK-MI-1M.A/160	**160**	**6.50**
CK-MI-1M.A/130	**130**	**4.40**
CK-MI-1M.A/98	**98**	**4.70**
CK-MI-1M.A/66	**66**	**5.10**
CK-MI-1M.A/63	**63**	**3.20**
CK-MI-1M.A/33	**33**	**4.30**
CK-MI-1M.A/25	**25**	**3.70**
CK-MI-1M.A/21.4	**21.4**	**4.00**
CK-MI-1M.A/21	**21**	**4.00**
CK-MI-1M.A/17	**17**	**4.60**
CK-MI-1M.A/13.4	**13.4**	**5.00**
CK-MI-1M.A/13	**13**	**5.00**
CK-MI-1M.A/11	**11**	**4.20**
CK-MI-1M.A/8.5	**8.5**	**5.80**
CK-MI-1M.A/8	**8**	**5.80**
CK-MI-1M.A/7	**7**	**4.90**
CK-MI-1M.A/5.3	**5.3**	**5.00**
CK-MI-1M.A/5	**5**	**5.00**
CK-MI-1M.N/1600	**1600**	**3.20**
CK-MI-1M.N/1000	**1000**	**3.40**
CK-MI-1M.N/630	**630**	**3.70**
CK-MI-1M.N/400	**400**	**4.00**
CK-MI-1M.N/250	**250**	**4.40**
CK-MI-1M.N/160	**160**	**4.90**
CK-MI-1M.N/63	**63**	**3.20**
CK-MI-1M.N/40	**40**	**3.40**
CK-MI-1M.N/25	**25**	**3.70**
CK-MI-1M.N/17	**17**	**4.60**
CK-MI-1M.N/11	**11**	**4.90**
CK-MI-1M.N/7	**7**	**5.30**

CK-MI-xM (CK-MI-Mx)

Constant Wattage Heating Element

MARKING

Item #	Resistivity @ 20 °C, Ω/km	Cable OD, sq.mm
CK-MI-1M.N/4	4	5.90
CK-MI-1M.S/10000	10000	3.20
CK-MI-1M.S/6560	6560	3.20
CK-MI-1M.S/6300	6300	3.20
CK-MI-1M.S/4000	4000	3.20
CK-MI-1M.S/2790	2790	3.40
CK-MI-1M.S/2500	2500	3.40
CK-MI-1M.S/1600	1600	3.60
CK-MI-1M.S/1000	1000	3.90
CK-MI-1M.S/630	630	4.30
CK-MI-1M.S/400	400	4.70
CK-MI-1M.S/250	250	5.30
CK-MI-1M.S/160	160	6.50
CK-MI-1M.S/98	98	3.20
CK-MI-1M.S/63	63	3.20
CK-MI-1M.S/40	40	3.40
CK-MI-1M.S/25	25	3.70
CK-MI-1M.S/17	17	4.60
CK-MI-1M.S/11	11	4.20
CK-MI-1M.S/7	7	4.90
CK-MI-1M.S/4	4	5.90
CK-MI-1M.I/10000	10000	3.20
CK-MI-1M.I/6300	6300	3.20
CK-MI-1M.I/4000	4000	3.20
CK-MI-1M.I/2500	2500	3.40
CK-MI-1M.I/1600	1600	3.60
CK-MI-1M.I/1000	1000	3.90
CK-MI-1M.I/630	630	4.30
CK-MI-1M.I/400	400	4.70
CK-MI-1M.I/250	250	5.30
CK-MI-1M.I/160	160	6.50
CK-MI-2M.A/59000	59000	4.40
CK-MI-2M.A/36000	36000	4.00
CK-MI-2M.A/29500	29500	4.10
CK-MI-2M.A/24500	24500	4.00
CK-MI-2M.A/19700	19700	4.10
CK-MI-2M.A/16400	16400	4.10
CK-MI-2M.A/13200	13200	3.70

CK-MI-xM (CK-MI-Mx)

Constant Wattage Heating Element

MARKING

Item #	Resistivity @ 20 °C, Ω/km	Cable OD, sq.mm
CK-MI-2M.A/10400	**10400**	**4.40**
CK-MI-2M.A/9000	**9000**	**3.90**
CK-MI-2M.A/8200	**8200**	**4.10**
CK-MI-2M.A/6600	**6600**	**4.30**
CK-MI-2M.A/5600	**5600**	**4.20**
CK-MI-2M.A/4590	**4590**	**4.10**
CK-MI-2M.A/3750	**3750**	**4.40**
CK-MI-2M.A/3000	**3000**	**4.10**
CK-MI-2M.A/2300	**2300**	**4.30**
CK-MI-2M.A/1560	**1560**	**4.50**
CK-MI-2M.A/1240	**1240**	**4.60**
CK-MI-2M.A/965	**965**	**4.50**
CK-MI-2M.A/820	**820**	**4.30**
CK-MI-2M.A/660	**660**	**4.10**
CK-MI-2M.A/495	**495**	**4.30**
CK-MI-2M.A/330	**330**	**4.70**
CK-MI-2M.A/240	**240**	**4.40**
CK-MI-2M.A/190	**190**	**4.50**
CK-MI-2M.A/150	**150**	**4.80**
CK-MI-2M.A/105	**105**	**4.70**
CK-MI-2M.S/59000	**59000**	**4.40**
CK-MI-2M.S/36000	**36000**	**4.00**
CK-MI-2M.S/29500	**29500**	**4.10**
CK-MI-2M.S/24500	**24500**	**4.00**
CK-MI-2M.S/19700	**19700**	**4.10**
CK-MI-2M.S/16400	**16400**	**4.10**
CK-MI-2M.S/13200	**13200**	**3.70**
CK-MI-2M.S/10400	**10400**	**4.40**
CK-MI-2M.S/9000	**9000**	**3.90**
CK-MI-2M.S/8200	**8200**	**4.10**
CK-MI-2M.S/6600	**6600**	**4.30**
CK-MI-2M.S/5600	**5600**	**4.20**
CK-MI-2M.S/4590	**4590**	**4.10**
CK-MI-2M.S/3750	**3750**	**4.40**
CK-MI-2M.S/3000	**3000**	**4.10**
CK-MI-2M.S/2300	**2300**	**4.30**
CK-MI-2M.S/1560	**1560**	**4.50**
CK-MI-2M.S/1240	**1240**	**4.60**
CK-MI-2M.S/965	**965**	**4.50**

CK-MI-xM (CK-MI-Mx)

Constant Wattage Heating Element

MARKING

Item #	Resistivity @ 20 °C, Ω/km	Cable OD, sq.mm
CK-MI-2M.S/820	**820**	**4.30**
CK-MI-2M.S/660	**660**	**4.10**
CK-MI-2M.S/495	**495**	**4.30**
CK-MI-2M.S/330	**330**	**4.70**
CK-MI-2M.S/240	**240**	**4.40**
CK-MI-2M.S/190	**190**	**4.50**
CK-MI-2M.S/150	**150**	**4.80**
CK-MI-2M.S/105	**105**	**4.70**
CK-MI-2M.I/59000	**59000**	**4.40**
CK-MI-2M.I/36000	**36000**	**4.00**
CK-MI-2M.I/29500	**29500**	**4.10**
CK-MI-2M.I/24500	**24500**	**4.00**
CK-MI-2M.I/19700	**19700**	**4.10**
CK-MI-2M.I/16400	**16400**	**4.10**
CK-MI-2M.I/13200	**13200**	**3.70**
CK-MI-2M.I/10400	**10400**	**4.40**
CK-MI-2M.I/9000	**9000**	**3.90**
CK-MI-2M.I/8200	**8200**	**4.10**
CK-MI-2M.I/6600	**6600**	**4.30**
CK-MI-2M.I/5600	**5600**	**4.20**
CK-MI-2M.I/4590	**4590**	**4.10**
CK-MI-2M.I/3750	**3750**	**4.40**
CK-MI-2M.I/3000	**3000**	**4.10**
CK-MI-2M.I/2300	**2300**	**4.30**
CK-MI-2M.I/1560	**1560**	**4.50**
CK-MI-2M.I/1240	**1240**	**4.60**
CK-MI-2M.I/965	**965**	**4.50**
CK-MI-2M.I/820	**820**	**4.30**
CK-MI-2M.I/660	**660**	**4.10**
CK-MI-2M.I/495	**495**	**4.30**
CK-MI-2M.I/330	**330**	**4.70**
CK-MI-2M.I/240	**240**	**4.40**
CK-MI-2M.I/190	**190**	**4.50**
CK-MI-2M.I/150	**150**	**4.80**
CK-MI-2M.I/105	**105**	**4.70**

CK-TH-R

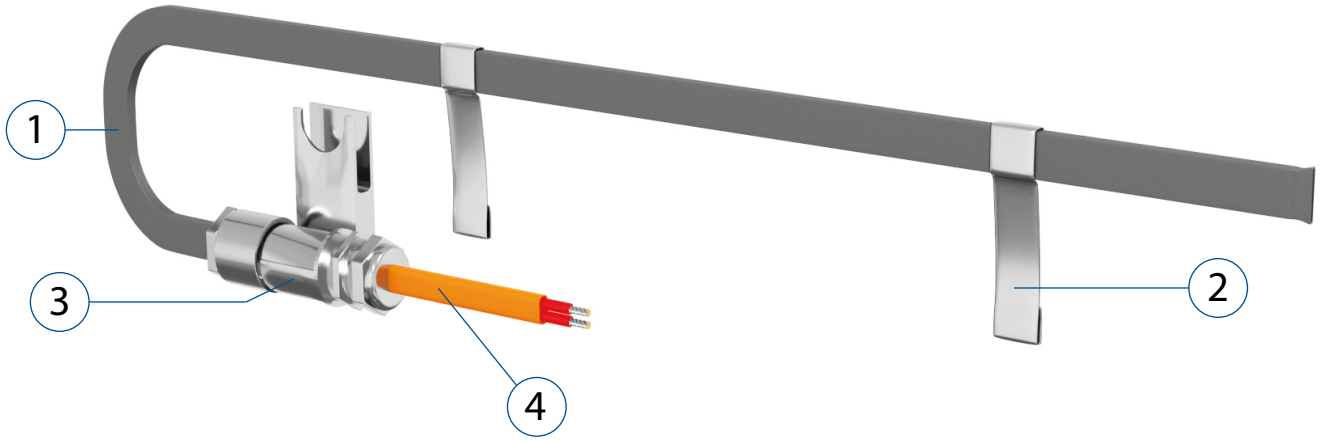
Constant Wattage Heating Element for Heat Tracing of Railway Tracks and Points

600°C

DESCRIPTION

The product is used to ensure smooth performance of railway tracks and points in the winter season.
The purpose is to prevent icing and snow packs on the moving parts of the railway points and tracks.

DESIGN



1. Rail heating element assembly
2. Clip CK-FIX 2 to attach the heating element to rail
3. Clip CK-FIX 1 to attach the heating element head to rail
4. Flexible power cable

P.O. DETAILS

To place a P.O., please select the item number of the heating element from the Marking table that suits your project specification.

For example, to order the CK-TH-R heating element using a heating cable with a power of 1,5 kW and a length of 6,08 m, it is necessary to specify the following trade code:

CK-TH-R-6080/1,5

CK-TH-R

Constant Wattage Heating Element for Heat Tracing of Railway Tracks and Points

GENERAL SPECIFICATION

Supply voltage	**230 V, 50 Hz**
Sheath material	**Chrome Nickel Steel Incoloy 800**
Type of heat cable	**Series type, constant wattage**
Hazardous area classification	**Normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T1 Gb X, Ex tb IIIC T85°C...T450°C Db X**

MARKING

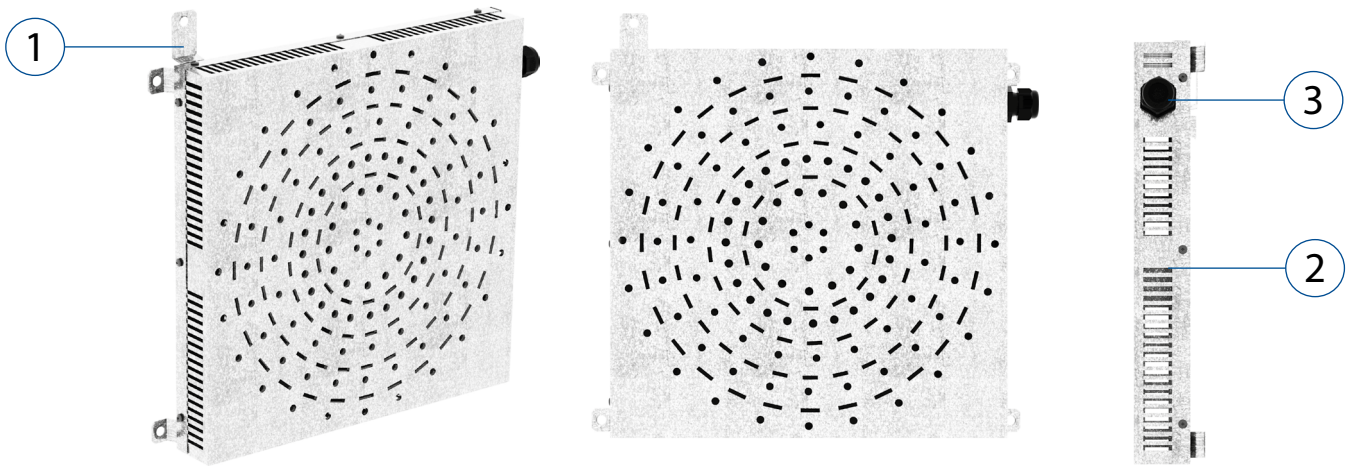
Item #	Output, kW	Length, mm
CK-TH-R-6080/1,5	**1,5**	**6080**
CK-TH-R-4800/1,5	**1,5**	**4800**
CK-TH-R-4200/1,6	**1,6**	**4200**
CK-TH-R-2800/1,1	**1,1**	**2800**
CK-TH-R-1800/0,9	**0,9**	**1800**
CK-TH-R-1100/0,9	**0,9**	**1100**

CK-TN Instrument Cabinet Heater

DESCRIPTION

CK-TN is a rectangular metal case used for instrument cabinet heat tracing, that accommodates a self-regulating heat trace cable, which maintains the temperature at no risk of overheating.

DESIGN



1. Metal case
2. Heat trace cable
3. Cable gland

P.O. DETAILS

To place a P.O., please select the item number of the heater from the Marking table that suits your project specification. A heater may be made to order with the overall dimensions and capacity based on customer preferences.

E.g., a P.O. for a 50 W CK-TN heater should contain the following number:
CK-TN-50-1

CK-TN Instrument Cabinet Heater

GENERAL SPECIFICATION

Maximum surface temperature	**55°C**
Rated voltage	**230 V, 50 Hz**
Heater power	**up to 300 W**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T3 Gb X, Ex tb IIIC T85°C...T200°C Db X**
Overall dimensions, WxHxD*	**360x360x41 mm max**

* overall dimensions may vary as requested

MARKING

Item #	Overall dimensions, WxHxD	Output @ 10°C, W
CK-TN-50-1	**240x240x22**	**50**
CK-TN-75-1	**240x240x22**	**75**
CK-TN-75-3	**300x300x22**	**75**
CK-TN-100-2	**240x240x41**	**100**
CK-TN-100-3	**300x300x22**	**100**
CK-TN-150-5	**360x360x22**	**150**
CK-TN-150-2	**240x240x41**	**150**
CK-TN-150-4	**300x300x41**	**150**
CK-TN-200-5	**360x360x22**	**200**
CK-TN-200-4	**300x300x41**	**200**
CK-TN-300-6	**360x360x41**	**300**

CODING

Code	Value
CK-TN	**Heater type**
50	**Heater power**
1	**Standard case size**

CK-TN-A Heater for Ex Cabinets and Enclosures

DESCRIPTION

CK-TN-A is used for cabinet (including instrument cabinets) and enclosure heat tracing. Temperature is maintained at no overheating risk as a self-regulating heat cable is used as the heater.

OVERVIEW

P.O. DETAILS

To place a P.O., please select the item number of the heater from the Marking table that suits best your project specification.

E.g., a P.O. for a 20 W CK-TN-A heater should contain the following number:
CK-TN-A-20

CK-TN-A Heater for Ex Cabinets and Enclosures

GENERAL CHARACTERISTICS

Max surface temperature	**55°C**
Rated voltage	**230 V, 50 Hz**
Heater power	**45 W max**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA65.B.00705/20, 1Ex e IIC T6...T3 Gb X, Ex tb IIIC T85°C...T200°C Db X**
Overall dimensions, WxHxD*	**600x20x40 mm max**

* overall dimensions may vary as requested

MARKING

Item #	Overall dimensions, WxHxD	Output @ 10°C, W
CK-TN-A-20	**300x20x40**	**20**
CK-TN-A-30	**400x20x40**	**30**
CK-TN-A-45	**600x20x40**	**45**

ACH Heater

DESCRIPTION

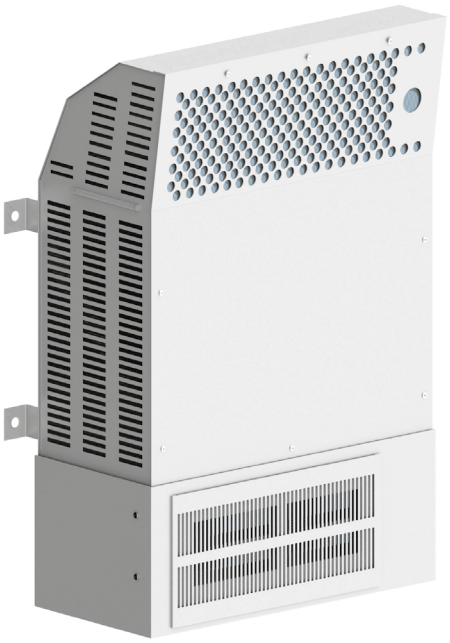
ACH is a forced air cooled heater. 750 W finned electric heating elements are used which are made of stainless steel, with 2 or 4 installed in each heater depending on the type. A cross fan is used for a quicker room warmup. The fan circuit is protected with a fuse. Two +100°C overheat protection thermostats are housed inside the heater to avoid heater exterior temperatures exceeding +50°C even in emergency cases.

An ACH is typically designed for use in temperature-controlled rooms, however, it may be optionally supplied with an adjustable thermostat which is mounted onto the heater top. The heater may be supplied with replaceable filter elements for use in contaminated rooms. Colour: RAL9005 (jet black). Powder coated. Climate version: УХЛ3. Please refer to the table below for ACH performance.

GENERAL SPECIFICATION

Rated voltage	**230 V, 50/60 Hz**
Power	**1500 W, 3000 W**
Design	**Floor-mounted/Wall-mounted**
IP rating	**IP30, IP31, IP40, IP41**
Filter element capability	**Yes (option)**
Adjustable thermostat capability	**Yes (option)**
Overall dimensions, wall-mounted (HxWxD)	**278x402x355 mm**
Overall dimensions, floor-mounted (HxWxD)	**549x460x235, 756x460x235 mm**

OVERVIEW



DESIGN

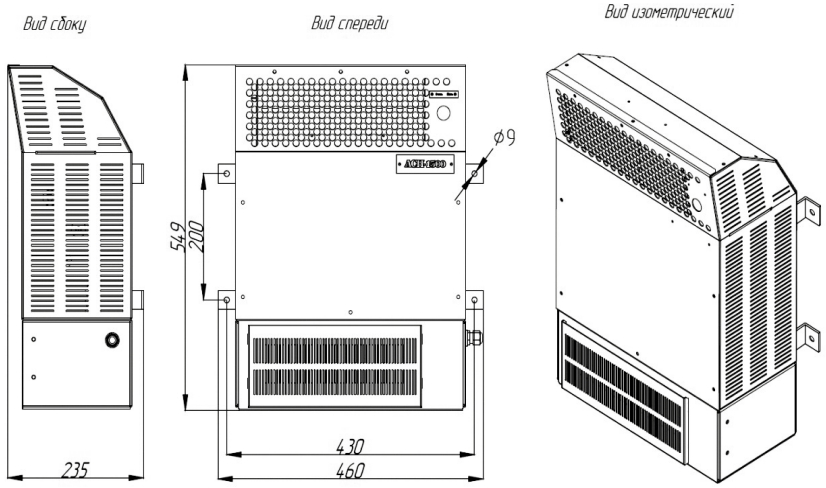


Fig. 1

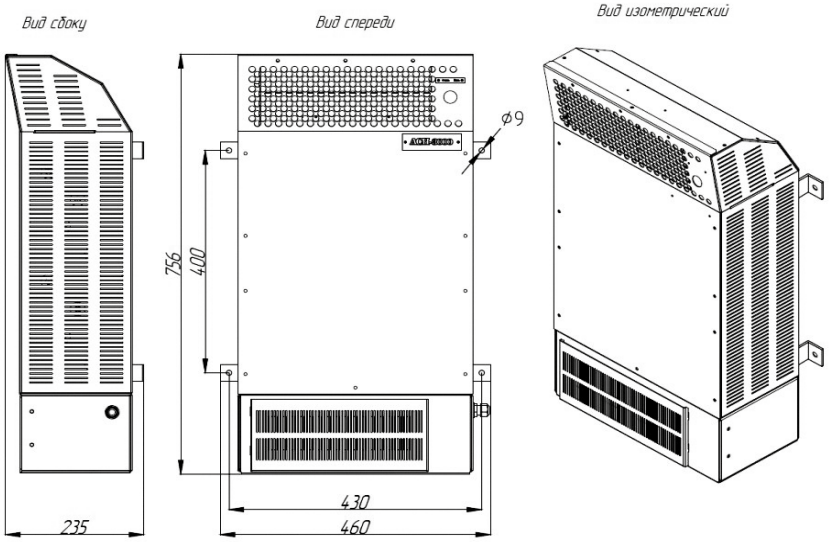


Fig. 2

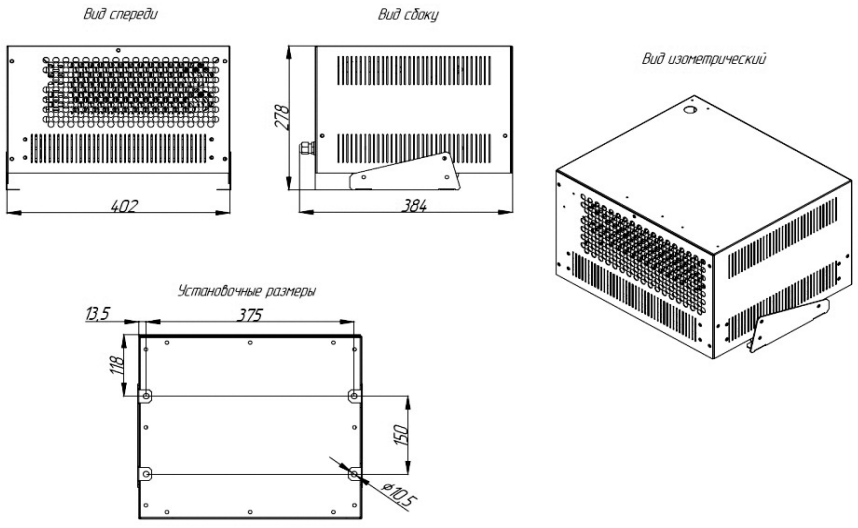


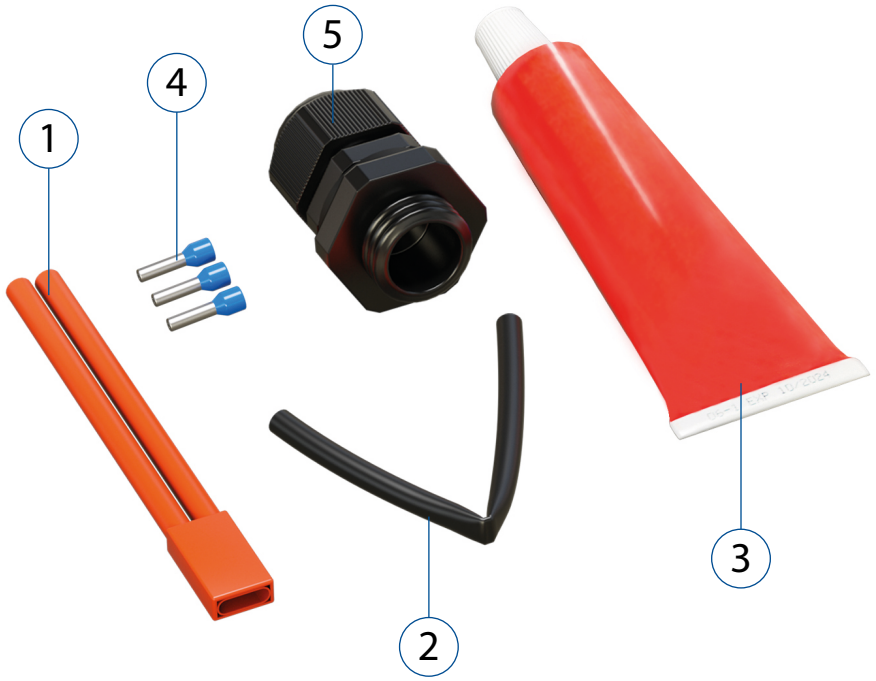
Fig. 3

CK-FS.CONN.IN Connection Kit

DESCRIPTION

A connection kit for a polymer insulated heat trace cable. Compatibility: CK-FS, CK-SL and CK-SL.C heating elements.

DESIGN



The kit includes:

1. Insulated gloves (1 pc.)
2. Heat shrink tube for braid (1 pc.)
3. RTV silicone (1 pc.)
4. Insulated ferrule (3 pcs.)
5. M20 gland with a locknut (1 pc.) (not in CK-FS.CONN.IN.A scope of supply)

MARKING

Item #
CK-FS.CONN.IN
CK-FS.CONN.IN.A
CK-FS.CONN.G

P.O. DETAILS

Please specify the following item number in your P.O. for a CK-FS.CONN.IN connection kit:
CK-FS.CONN.IN
Please specify the following item number in your P.O. for a CK-FS.CONN.IN connection kit without a gland:
CK-FS.CONN.IN.A
Please specify the following item number in your P.O. for a CK-FS polymer insulated heat trace cable gland:
CK-FS.CONN.G

CK-FS.CONN.E Cable end Termination Kit

DESCRIPTION

An end termination kit for a polymer insulated heat trace cable. Compatibility: CK-FS, CK-SL and CK-SL.C heating elements.

DESIGN

The kit includes:

1. End termination (1 pc.)
2. RTV silicone (1 pc.)

MARKING

Item #
CK-FS.CONN.E
CK-FS.CONN.G

P.O. DETAILS

Please specify the following item number in your P.O. for a CK-FS.CONN.E termination:
CK-FS.CONN.E
Please specify the following item number in your P.O. for a CK-FS.CONN.E termination:
CK-FS.CONN.G

CK-FS.CONN Connection Kit

DESCRIPTION

An connection kit for a polymer insulated heat trace cable. Compatibility: CK-FS, CK-SL and CK-SL.C heating elements.

DESIGN

The kit includes:

1. Insulated gloves (1 pc.)
2. Heat shrink tube for braid (1 pc.)
3. RTV silicone (1 pc.)
4. Insulated ferrule (3 pcs.)
5. M20 gland with a locknut (1 pc.) (not in CK-FS.CONN.A scope of supply)
6. End termination (1 pc.)

MARKING

Item #
CK-FS.CONN
CK-FS.CONN.A
CK-FS.CONN.G

P.O. DETAILS

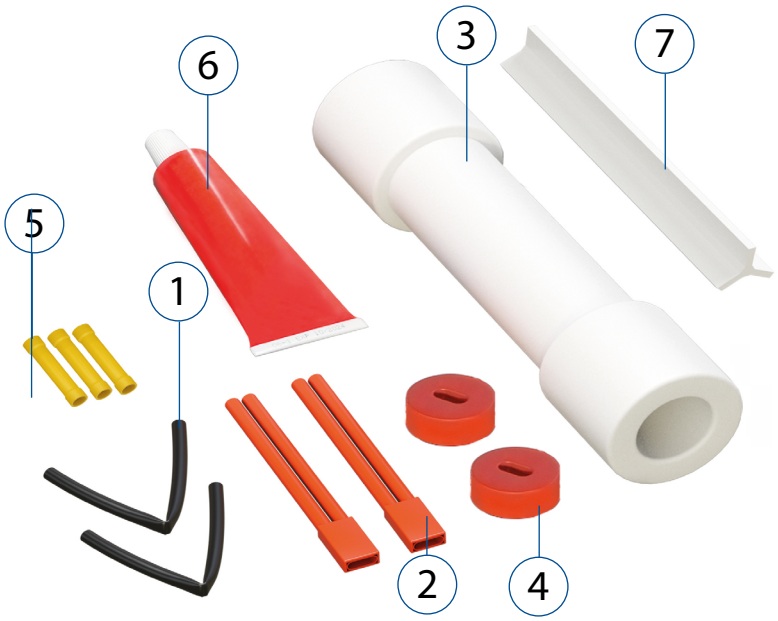
Please specify the following item number in your P.O. for a CK-FS.CONN kit:
CK-FS.CONN
Please specify the following item number in your P.O. for a CK-FS.CONN kit without a gland:
CK-FS.CONN.A
Please specify the following item number in your P.O. for a CK-FS polymer insulated heat trace cable gland:
CK-FS.CONN.G

CK-FS.CONN.SX Connection/Repair Kit

DESCRIPTION

A connection/repair kit for a parallel resistance cable. Compatibility: CK-FS heating elements.

DESIGN



The connection / repair kit includes:

1. Heat shrink tube for braid (2 pcs.)
2. Insulated gloves (2 pcs.)
3. Connector (1 pc.)
4. Sealing bush (2 pcs.)
5. Connector (3 pcs.)
6. RTV silicone (1 pc.)
7. Spacer (1 pc.)

MARKING

Item #
CK-FS.CONN.SX

P.O. DETAILS

Please specify the following item number in your P.O. for a CK-FS.CONN.SX connection/repair kit:
CK-FS.CONN.SX

CK-FS/SMB.CONN Connection Kit

DESCRIPTION

A connection kit for a polymer insulated heat trace cable. Compatibility: CK-FS.S heating element.

DESIGN

The kit includes:

1. Insulated gloves (1 pc.)
2. Heat shrink tube for braid (1 pc.)
3. RTV silicone (1 pc.)
4. Insulated ferrule (3 pcs.)
5. M25 gland with a locknut (1 pc.) (not in CK-FS/SMB.CONN.A scope of supply)
6. End termination (1 pc.)

MARKING

Item #
CK-FS/SMB.CONN
CK-FS/SMB.CONN.A
CK-FS/SMB.CONN.G

P.O. DETAILS

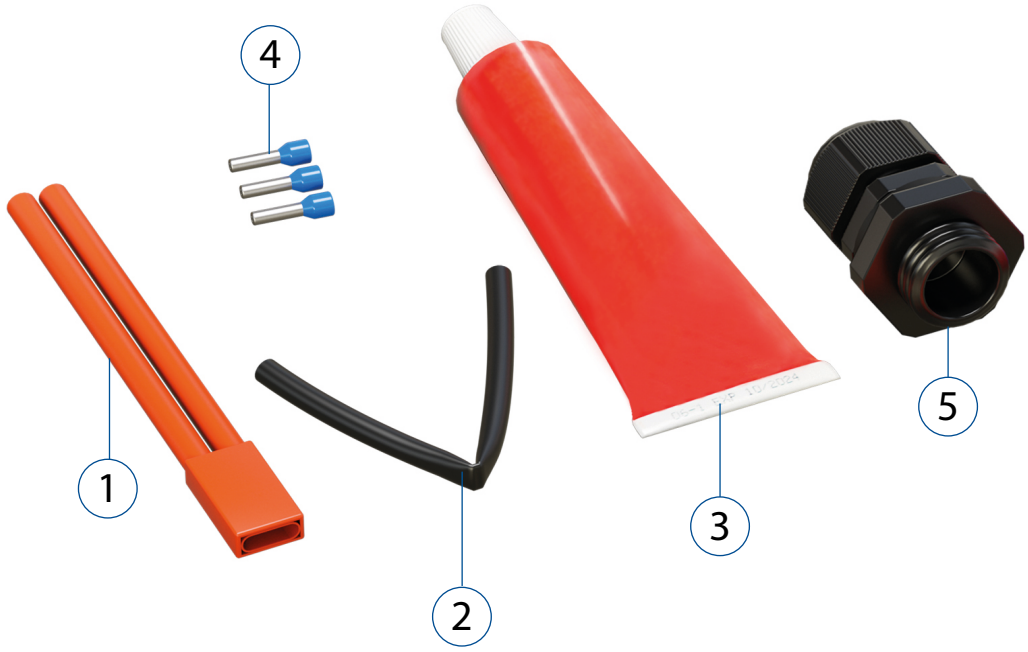
Please specify the following item number in your P.O. for a CK-FS/SMB.CONN connection kit:
CK-FS/SMB.CONN
Please specify the following item number in your P.O. for a CK-FS/SMB.CONN connection kit without a gland:
CK-FS/SMB.CONN.A
Please specify the following item number in your P.O. for a CK-FS/SMB polymer insulated heat trace cable gland:
CK-FS/SMB.CONN.G

CK-FS/SMB.CONN.IN Connection Kit

DESCRIPTION

A connection kit for a polymer insulated heat trace cable. Compatibility: CK-FS.S heating element.

DESIGN



The kit includes:

1. Insulated gloves (1 pc.)
2. Heat shrink tube for braid (1 pc.)
3. RTV silicone (1 pc.)
4. Insulated ferrule (3 pcs.)
5. M25 gland with a locknut (1 pc.) (not in CK-FS/SMB.CONN.IN.A scope of supply)

MARKING

Item #
CK-FS/SMB.CONN.IN
CK-FS/SMB.CONN.IN.A
CK-FS/SMB.CONN.G

P.O. DETAILS

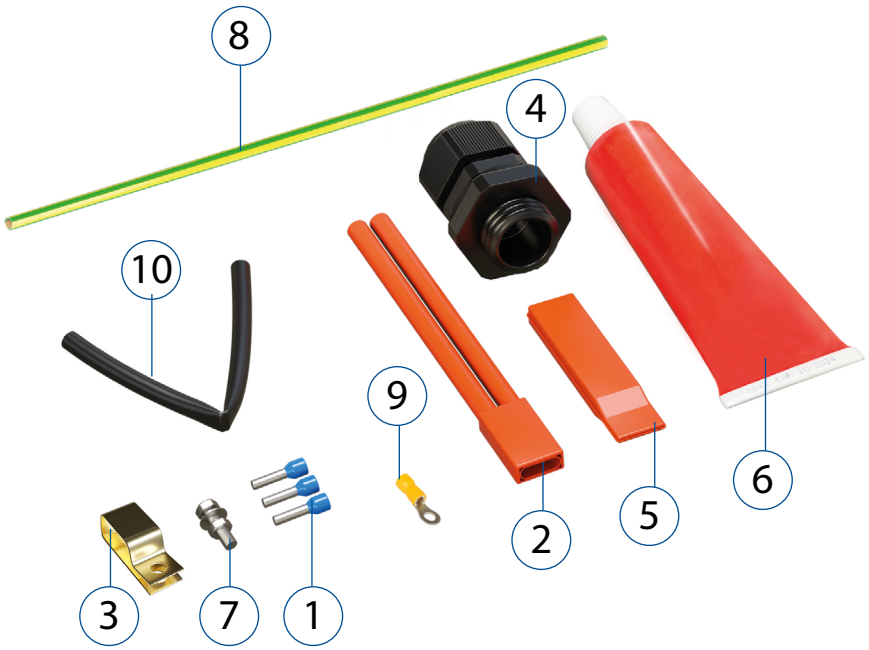
Please specify the following item number in your P.O. for a CK-FS/SMB.CONN connection kit:
CK-FS/SMB.CONN.IN
Please specify the following item number in your P.O. for a CK-FS/SMB.CONN.IN connection kit without a gland:
CK-FS/SMB.CONN.IN.A
Please specify the following item number in your P.O. for a CK-FS/SMB polymer insulated heat trace cable gland:
CK-FS/SMB.CONN.G

CK-MI-2M.CONN Connection Kit

DESCRIPTION

A connection kit for a metal-sheathed heat trace cable. Compatibility: metal-sheathed CK-MI-2M, CK-FS heating elements.

DESIGN



The kit includes:

1. Insulated ferrule (3 pcs.)
2. Insulated gloves (1 pc.)
3. Clamp for PE wire connection to cable metal sheath (1 pc.)
4. M20 gland with a locknut (1 pc.) (not in CK-MI-2M.CONN.A scope of supply)
5. End termination (1 pc.)
6. RTV silicone (1 pc.)
7. Bolt, nut and washer (1 pc.)
8. Grounding conductor (1 pc.)
9. Insulated eye lug (1 pc.)

MARKING

Item #
CK-MI-2M.CONN (CK-MI-2M/FS-a.CONN)
CK-MI-2M.CONN.A (CK-MI-2M/FS-a.CONN.A)
CK-FS.CONN.G

P.O. DETAILS

Please specify the following item number in your P.O. for a CK-MI-2M.CONN connection kit:
CK-MI-2M.CONN or CK-MI-2M/FS-a.CONN
Please specify the following item number in your P.O. for a CK-MI-2M.CONN connection kit without a gland:
CK-MI-2M.CONN.A or CK-MI-2M/FS-a.CONN.A
Please specify the following item number in your P.O. for a CK-FS polymer insulated heat trace cable gland:
CK-FS.CONN.G

CK-CONN.T Connection Kit

DESCRIPTION

An connection kit for a polymer insulated heat trace cable. Compatibility: CK-ML series type heating elements

DESIGN

The kit includes:

1. Heat shrink tube for braid (2 pcs.)
2. M20 gland with a locknut and sealing bush (assembly) (2 pcs.) (not in CK-CONN.T.A scope of supply)
3. Insulated ferrule (4 pcs.)
4. Ferrule connector (4 pcs.)
5. 1.5 m cold lead (2 pcs.)
6. Connector (2 pcs.)
7. RTV silicone (1 pc.)

MODIFICATIONS

CK-CONN.T connection kit is offered in several designs depending on the cable section.

Cable sections are consistent with the marking below:
Section 2.5 mm^2 .....**CK-CONN.T-2,5**
Section 6 mm^2 .....**CK-CONN.T-6**

MARKING

Item #
CK-CONN.T-2,5
CK-CONN.T-6
CK-CONN.T.A
CK-CONN.T.G

P.O. DETAILS

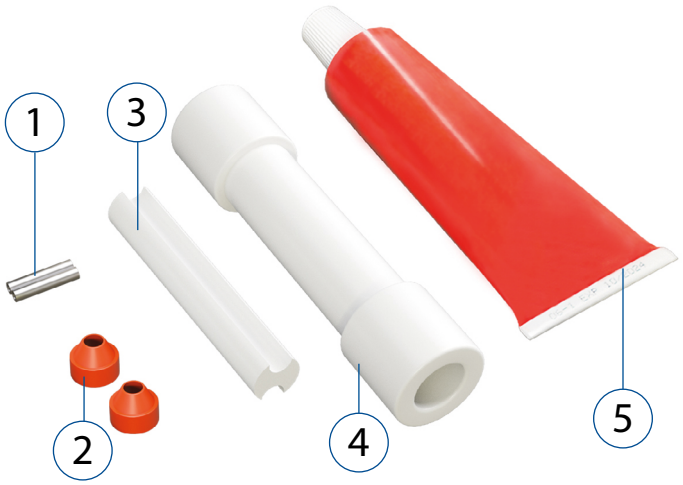
Please specify the following item number in your P.O. for a CK-CONN.T connection kit for use in conjunction with cable cross sections less than 2.5 mm2:
CK-CONN.T-2,5
Please specify the following item number in your P.O. for a CK-CONN.T connection kit without a gland:
CK-CONN.T.A
Please specify the following item number in your P.O. for a CK-ML series-type polymer insulated heat trace cable gland:
CK-CONN.T.G

CK-CONN.T.SX Connector

DESCRIPTION

Connecting sleeve for polymer-insulated heating cables. Compatibility: CK-ML serial heating elements.

DESIGN



The product includes

1. Ferrule connector (1 pc.)
2. Sealing bush (2 pcs.)
3. Spacer (1 pc.)
4. Connector 1 pc.)
5. RTV silicone (1 pc.)

MODIFICATIONS

A CK-CONN.T.SX connector is offered in several designs depending on the cable section.

Cable sections are consistent with the marking below:

Section 2.5 mm^2 .....**CK-CONN.T.SX-2,5**

Section 2.5 mm^2 .....**CK-CONN.T.SX-6**

MARKING

Item #
CK-CONN.T.SX-2,5
CK-CONN.T.SX-6
CK-CONN.T.G

P.O. DETAILS

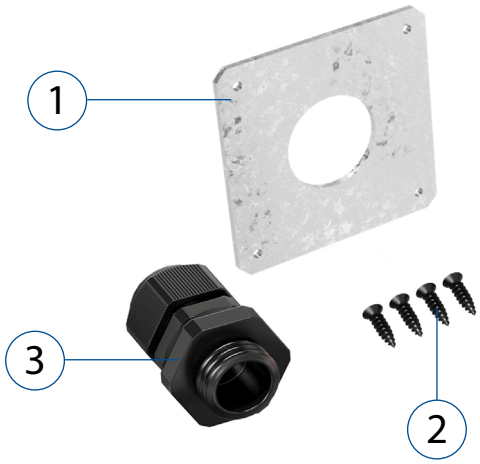
Please specify the following item number in your P.O. for a CK-CONN.T.SX connector for cable sections less than 2.5 mm^2:
CK-CONN.T.SX-2,5
Please specify the following item number in your P.O. for a CK-ML series-type polymer insulated heat trace cable gland:
CK-CONN.T.G

CK-IEK.S Mounting Kit for Thermal Insulation

DESCRIPTION

The kit is used to draw a heat trace cable through thermal insulation ensuring protection against water ingress.

DESIGN



The kit includes:

1. Fixing plate (1 pc.)
2. M3x10 screw (4 pcs.)
3. Gland, with locknut and O-ring (1 pc.)

MARKING

Item #
CK-IEK.S
CK-IEK.SO

P.O. DETAILS

Please specify the following item number in your P.O. for a CK-IEK.S kit:
CK-IEK.S
Please specify the following item number in your P.O. for a CK-IEK.SO temperature sensor penetration kit:
CK-IEK.SO

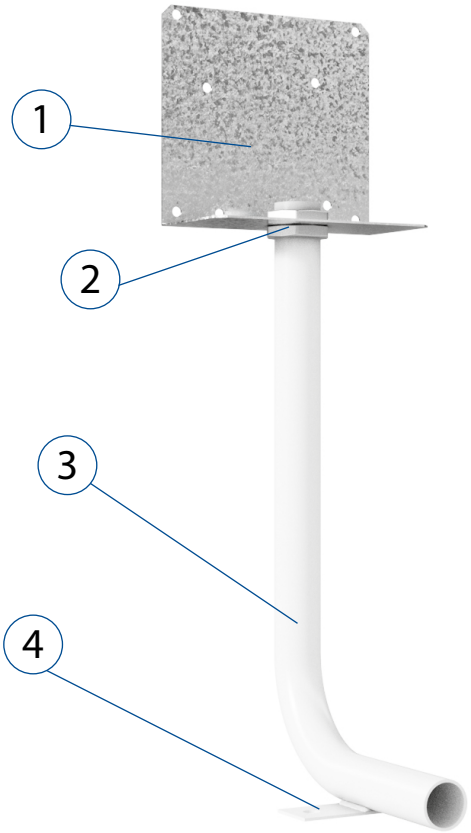
CK-IEK.F Mounting Kit for Concrete

DESCRIPTION

A mounting kit for concrete penetration is used to attach a power junction box for heat traced poured concrete flooring, roads and ramps. A bracket support is fixed to the underlay of poured flooring. A heat trace cable is passed through the tube and into the power junction box.

The kit is used in conjunction with a CK-FS.S heating element and CK-HB/CK-MHB junction boxes.

DESIGN



1. Power box attachment base
2. Base to support attachment
3. Bracket support
4. Bracket loops

MARKING

Designation	Description
CK-IEK.F-HB	**Used in conjunction with MexTRACE-HB-01-G power box**
CK-IEK.F-TD	**Used in conjunction with MexTRACE-PT100-EXE-G temperature sensor**

P.O. DETAILS

Please specify the following item number in your P.O. for a CK-IEK.F bracket:
CK-IEK.F

CK-1000 Heat Trace Cable Entry Adapter

DESCRIPTION

CK-1000 may be of three types, e.g. CK-1000, CK-1000-E, and CK-1000-LP. Its modular design offers different height options depending on the pipelione insulation thickness.

DESIGN

CK-1000 CK-1000-E CK-1000-LP

The product includes:

1. Cap
2. Body
3. Sealing bush
4. Base
5. CK-320 reducer

GENERAL SPECIFICATION

Rated voltage	**690 V, max**
Rated current	**32 A, max**
Ambient temperature range	**-65 to +60 °C**
IP rating	**IP 66**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. HA62.B.01242/21, 1Ex eb IIC T6 Gb X, Ex tb IIIC T850C Db X. For CK-1000-LP: 1Ex eb mb IIC T6 Gb X, Ex tb IIIC T850C Db X**
Max base exposure temperature	**260 °C**

MARKING

Item #	Purpose
CK-1000	**Box entry adapter for up to three heat trace cables**
CK-1000-E	**Termination / tee adapter on top of lagging**
CK-1000-LP-G	**Heat trace cable termination adapter, with green LED**
CK-1000-LP-R	**Heat trace cable termination adapter, with red LED**
CK-1000-LP-Y	**Heat trace cable termination adapter, with yellow LED**
CK-1000-SR	**Junction box support (for series-type heating element or temperature sensor)**
CK-1000-SR-E	**Termination / tee adapter on top of lagging (for series-type heating element)**
CK-320	**CK-1000 fastening reducer for small size (32 mm max) pipelines**

P.O. DETAILS

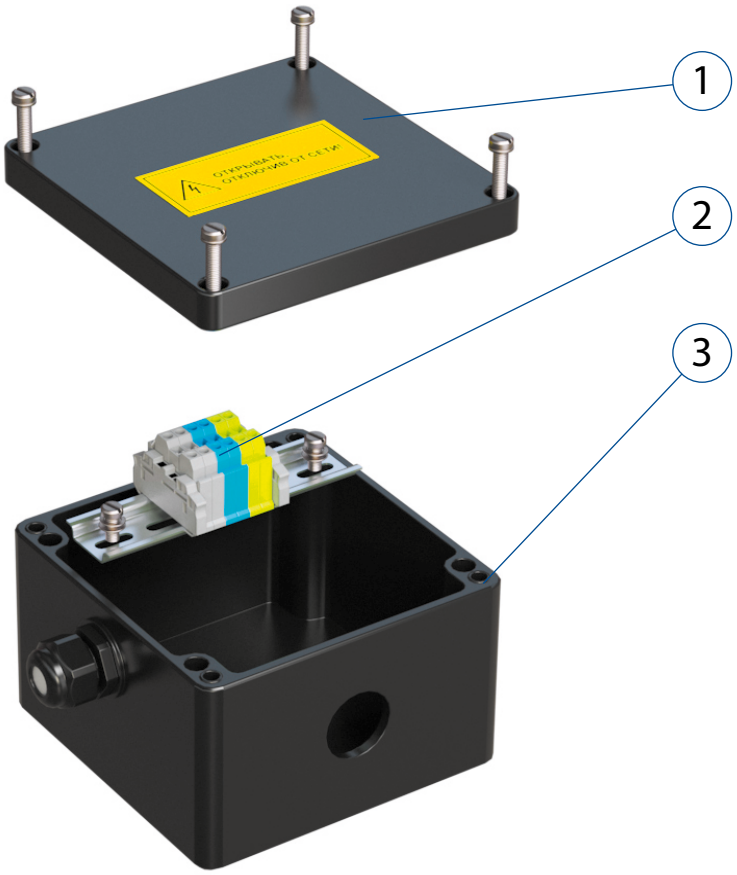
Please provide the following item number in your P.O. for a green LED heat trace cable termination adapter CK-1000-LP-G:
CK-1000-LP-G

MexTRACE-HB Power Junction Box

DESCRIPTION

A power junction box is used for heating element to power cable connections. A junction box is mounted onto a heat traced pipe or equipment using a bracket or a support. The product is IP 66 explosion proof.

DESIGN



1. Cover
2. Connecting terminals
3. Body

GENERAL SPECIFICATION

Normal operating voltage, max	**690 V, 50 Hz**
Ambient temperature range	**-60°C to +55°C**
Hazardous area classification	**Hazardous, normal**
IP rating	**IP 66**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. AA71.B.00076/19, 1 Ex e IIC T6...T4 Gb X and Ex tb IIIC T800C...1300C Db X**

MexTRACE-HB Power Junction Box

MARKING

Item #	Scope of Supply	Description
MexTRACE-HB-01	Box body (1 pc.), separator plates (2 pcs.), clamps[1] (4 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.), threaded cable[2] entry (1 pc.)	Power box, single hole and single cable entry. For MexTRACE-HB-02 connection
MexTRACE-HB-02	Box body (1 pc.), separator plates (2 pcs.), pluggable jumpers (2 pcs.), clamps[1] (6 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.), threaded cable[2] entry (1 pc.)	Power box, two holes and single cable entry. For connection of one series type heating element, or two parallel type heating elements
MexTRACE-HB-03	Box body (1 pc.), separator plates (2 pcs.), clamps[1] (10 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.), threaded cable[2] entry (1 pc.)	Power box with three holes and one cabPower box, three holes and single cable entry. For wye / delta connection of a series type heating element, or of three parallel type heating elements
MexTRACE-HB-01.L*	Box body (1 pc.), separator plates (2 pcs.), clamps[1] (4 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.), threaded cable[2] entry (1 pc.), LED[3] (1 pc.)	MexTRACE-HB-01 type power box with green LED on the body
MexTRACE-HB-02.L*	Box body (1 pc.), separator plates (2 pcs.), pluggable jumpers (2 pcs.), clamps[1] (6 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.), threaded cable[2] entry (1 pc.), LED[3] (1 pc.)	MexTRACE-HB-02 type power box with green LED on the body
MexTRACE-HB-03.L*	Box body (1 pc.), separator plates (2 pcs.), clamps[1] (10 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.), threaded cable[2] entry (1 pc.), LED[3] (1 pc.)	MexTRACE-HB-03 type power box with green LED on the body
MexTRACE-HB-03.S	Box body (1 pc.), support (1 pc.), separator plates (2 pcs.), clamps[1] (10 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.), threaded cable[2] entry (1 pc.)	MexTRACE-HB-03 type power box with CK-1000 support for three parallel type cables (slot holes)
MexTRACE-HB-03.SR	Box body (1 pc.), support (1 pc.), separator plates (2 pcs.), clamps[1] (10 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.) (for constant wattage cable), threaded cable[2] entry (1 pc.)	MexTRACE-HB-03 type power box with CK-1000-SR adapter, six round holes
MexTRACE-HB-03.SR.L*	Box body (1 pc.), support (1 pc.), separator plates (2 pcs.), clamps[1] (10 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.) (for constant wattage cable), threaded cable[2] entry (1 pc.), LED[3] (1 pc.)	MexTRACE-HB-03.SR type power box with green LED on the body
MexTRACE-HB-03.S.L*	Box body (1 pc.), support (1 pc.), separator plates (2 pcs.), clamps[1] (10 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.), threaded cable[2] entry (1 pc.), LED[3] (1 pc.)	MexTRACE-HB-03.S type power box with green LED on the body
MexTRACE-HB-01-G	Box body (1 pc.), separator plates (2 pcs.), clamps[1] (3 pcs.), DIN rail (1 pc.), 1" O-ring (1 pc.), 1" locknut (1 pc.), metalware kit (1 pc.), nameplate (1 pc.), threaded cable[2] entry (1 pc.)	Power box with an opening for CK-IEK.F. For cable heat tracing of open areas

MexTRACE-HB Power Junction Box

Trade code	Configuration	Description
MexTRACE-HB-03.S-T	**Box body (1 pc.), support (1 pc.), separator plates (2 pcs.), clamps[1] (10 pcs.), pluggable jumpers (6 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.)**	**MexTRACE-HB-03 type power box with CK-1000 adapter for three parallel type cables (slot holes). A box for tee connection of heating elements. W/o cable entry**
MexTRACE-HB-03.SR-P	**Box body (1 pc.), support (1 pc.), separator plates (2 pcs.), clamps[1] (10 pcs.), pluggable jumpers (2 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.) (for constant wattage cable)**	**MexTRACEHB-03 type power box with CK-1000-SR adapter with six round holes. To be used as a termination or pull box for series type heating sections. W/o cable entry**
MexTRACE-HB-04-P	**Box body (1 pc.), end insulators (2 pcs.), clamps[1] (6 pcs.), DIN rail (1 pc.), kit of fasteners (1 pc.), nameplate (1 pc.). There are 4 M20 holes in the box.**	**Power box with four holes M20. It is intended for use as a pass-through box for the serial heating element. Without cable gland**
MexTRACE-HB-06-P	**Box body (1 pc.), separator plates (2 pcs.), clamps[1] (6 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.)**	**Power box with six M20 holes. To be used as a pull box for a for series-type heating element. W/o cable entry**
MexTRACE-HB-02-K	**MexTRACE-HB-02-K - Box body (1 pc.), separator plates (2 pcs.), clamps[1] (6 pcs.), pluggable jumpers (2 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.) . There are 2 holes M20 in the box**	**Power box with two M20 holes. To be used as a termination box for a series-type heating element. W/o cable entry.**
MexTRACE-HB-03-K	**Box body (1 pc.), separator plates (2 pcs.), clamps[1] (6 pcs.), pluggable jumpers (4 pcs.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.)**	**Power box with three M20 holes. To be used as a termination box for a series-type heating element. W/o cable entry.**

[1] - Cable wire cross section: 0.5-6 mm^2.
[2] - Cable entry type: plastic. Wired power cable size: 13-18 mm for M25 entry.
[3] - LED colour to be consistent with symbol item #7. A green LED will be wherever the colour index is not provided.

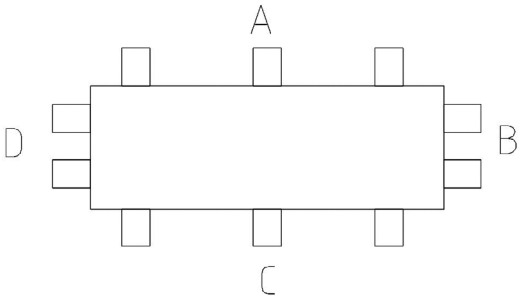
Components

Please select a modification for non-typical box specifications:

MODIFICATIONS

MexTRACE-HB series power junction boxes are offered in various designs, e.g.:

BOX SIDE IDENTIFICATION



Indexes:
Power junction box MexTRACE-HB-XX/XX/XX/XX/X/X.X
1 2 3 4 5 6 7

1 - Number of outgoing heating elements; if a gland is required, please indicate the type which is subject to the heating cable used. For modifications including an entry adapter (S, SR), please indicate 03. The required box side may additionally be specified.

TYPE OF GLAND

Designation	Description
xF	**Gland M20 for self-regulating cable**
xH	**Gland M25 for self-regulating cable of over 64 W/m**
xN	**Gland M20 for for constant wattage cable**
xP	**Hole for M20 gland**
xR	**Hole for M25 gland**
xT	**Plugged hole M20**
xV	**Plugged hole M25**

Where x is the quantity.

E.g.: MexTRACE-HB-1H(C),2F(C)/XX/XX/XX/X/X.X

means a box for two self-regulating heating sections (power output below 64 W/m) and one self-regulating heating section (power output over 64 W/m), in assembly with glands. Gland entries are located on side C.

2 – box unit size (selected based on required quantity and sizes of cable entries).

SIZING TABLE

Dimensions (WxHxD), mm	Size
113x113x85	**113**
182x152x109	**182**
280x271x145	**280**
544x271x145	**544**

Example:

MexTRACE-HB-XX/113/XX/XX/X/X.X – For a 113x113x85 box.

3 – quantity and sizes of cable entries (sized M16 to M63, up to 48 entries depending on box unit size). "G" means plugged. "Mb" means a metal gland for an armoured cable. "Gr" means an earth tag on a metal gland for an armoured cable. The box entry side may additionally be indicated.

Indexes: XX MXX.XX (XX)
3.1 - number of entries;
3.2 - gland size;
3.3 - entry type index;
3.3.1 - plugged gland "G"
3.3.2 - metal cable gland for armoured cable "mb"/ non-armoured cable "m";
3.3.3- earth tag "Gr";
3.3.4 - hole "O";
3.3.5 - plugged hole "OG";
3.4 - entry side.
If a cable gland is not identified, a plastic gland is used.

Example

means a box with a plastic gland and plastic plug on side D, one hole on side A.

4 – size and number of clamp screws used. "Z" means spring clamps. "PE" stands for earth terminals. For earth bar requirement, please indicate "PE bar". "b", "g" and other indexes are used for terminal colour identification.

TYPES OF CLAMPS

Designation	Description
K1	**For 0,14 to 4 mm² cables**
K2	**For 0,14 to 6 mm² cables**
K3	**For 0,2 to 10 mm² cables**
K4	**For 0,5 to 16 mm² cables**
K5	**For 1,5 to 25 mm² cables**
K6	**For 1,5 to 50 mm² cables**

Example:
MexTRACE-HB-XX/XX/XX/2g, 2b, 2PE-K3/X/X.X - For terminal screws;
MexTRACE-HB-XX/XX/XX/2g, 2b, 2PE.Z-K3/X/X.X – For two gray and two blue terminal screws and two PE spring terminals. .

5 – means jumpers.
Indexes: XXPXX
1 2
1 – number of jumpers;
2 – number of jumper pins.
Example: MexTRACE-HB-XX/XX/XX/XX/4P2, 5P4/X.X
Jumper cross section similar to clamps.

6 – "S" for support (CK-1000) to fix the box on a pipeline or equipment.
Note: for boxes mounted on CK-1000 support, please provide only the number of cable glands, terminals, and LED requirement. Compatible sizes: 182.

Example: MexTRACE-HB-XX/XX/XX/XX/X/S.X

7 – "L" means indicator LED. The colour is specified additionally, i.e. G for green, B for blue, Y for yellow, R for red etc. as required in the engineering specification.

Example: MexTRACE-HB-XX/XX/XX/XX/X/X.L-G

CK-HB power junction box, with a support for mounting onto piping, green LED.

ORDERING INFORMATION

E.g. a MexTRACE-HB power junction box for a single self-regulating cable having a M20 gland on side C, 182x152x109, single M25 plug and single M20 plug, two K1 type clamp screws with gray terminals, two K1 type clamp screws with blue terminals, two K1 type spring clamps with PE terminals, three K1 type jumpers for 2 terminals, with LED and support, should have the following identification:

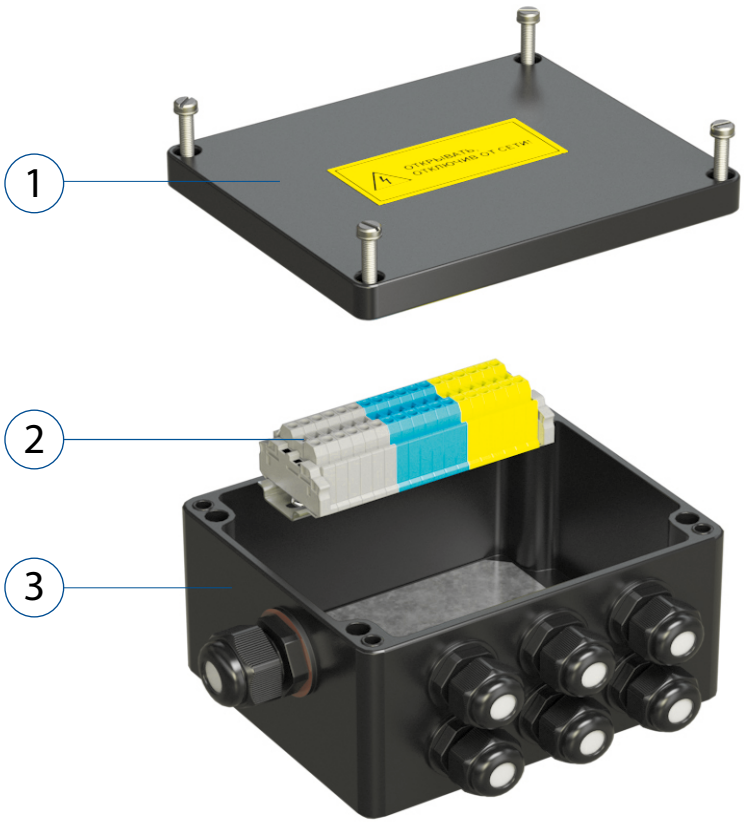
MexTRACE-HB-1F(C)/182/1M25.G, 1M20.G/2g, 2b, 2PE.Z-K1/3P2/S.L

MexTRACE-MHB Power Junction Box

DESCRIPTION

Power junction box type MexTRACE-MHB for hazardous areas is intended for various applications: a terminal box for power cable connections, heat trace cable connections, a case for Ex components.

DESIGN



1. Cover
2. Connecting terminals
3. Body

MARKING

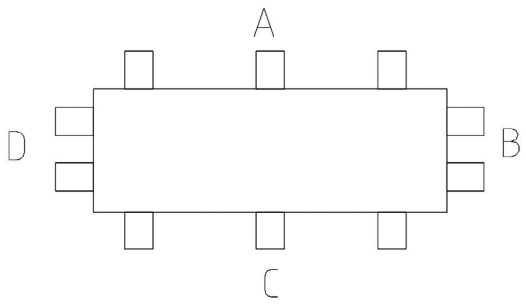
Item #	Scope of Supply	Description
MexTRACE-MHB-06	**Box body of 280 size (1 pc.), separator plates (2 pcs.), jumpers (14 pcs.), clamps (14 pcs.), earth bar (1 pc.), DIN rail (1 pc.), metalware kit (1 pc.), nameplate (1 pc.), threaded cable entry M25 (6 pcs.), threaded cable entry M32 (1 pc.)**	**Junction box for a single incoming and six outgoing power cables**

Box specification:
Cable entry type: plastic;
Wired power cable size: 13-18 mm for M25 entry;
14-21 mm for M32 entry;
Cable wire cross section 0.5-6 mm^2.

Please select a modification for non-typical box specifications:

MODIFICATIONS

MexTRACE-MHB series power junction boxes are offered in various designs, e.g.:



Distribution terminal box MexTRACE-MHB- XX/XX/XX/X/X
1 2 3 4 5

1 – quantity and sizes of cable entries. The required box side may additionally be specified.

Indexes: XX MXX.XX (XX)
1.1 1.2 1.3 1.4
1.1 – number of entries;
1.2 - gland size;
1.3 - entry type index:
- plugged gland "G"
- metal cable gland for armoured cable "mb"/ non-armoured cable "m";
- earth tag "Gr";
- hole "O";
- plugged hole "OG";

1.4 - entry side.

If a cable gland is not specified, a plastic gland is used.

Example: MexTRACE-MHB-1M25.G(D),6M25.O(A)/XX/XX/X/X
means a box with a plastic gland and plastic plug on side D, six holes on side A.

2 – box size (based on required entry quantities and sizes).

SIZING TABLE

Dimensions (WxHxD), mm	Size
113x113x85	**113**
182x152x109	**182**
280x271x145	**280**
544x271x145	**544**

Example:
MexTRACE-MHB-XX/182/XX/X/X – For a 182x152x109 box

3 – size and number of clamp screws used. "Z" means spring clamps. "PE" stands for earth terminals. For earth bar requirement, please indicate "PE bar". "b", "g" and other indexes are used for terminal colour identification..

MexTRACE-MHB Power Junction Box

TYPES OF CLAMPS

Designation	Description
K1	**For 0,14 to 4 mm² cables**
K2	**For 0,14 to 6 mm² cables**
K3	**For 0,2 to 10 mm² cables**
K4	**For 0,5 to 16 mm² cables**
K5	**For 1,5 to 25 mm² cables**
K6	**For 1,5 to 50 mm² cables**

Example:
MexTRACE-MHB-XX/XX/4g, 4b, 4PE-K3/X/X - For terminal screws;
MexTRACE-MHB-XX/XX/4g, 4b, 4PE.Z-K3/X/X – For 4 gray, 4 blue terminal screws and 4 PE spring terminals.

4 – means jumpers.
Indexes: XXPXX
1 2
1 - number of jumpers;
2 - number of jumper pins.
Example: MexTRACE-MHB-XX/XX/XX/5P2, 4P4/X
Jumper cross section similar to clamps.

5 – "L" means indicator LED (green).
Example: MexTRACE-MHB-XX/XX/XX/X/L

GENERAL SPECIFICATION

Power frequency	**50 Hz**
Supply voltage	**690 V max, with dead earthed neutral TN-S**
Ambient temperature range	**-60°C to +55°C**
Cable entry	**bottom**
IP rating	**IP 66**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. AA71.B.00076/19, 1 Ex e IIC T6...T4 Gb X and Ex tb IIIC T800C...1300C Db X**
Material	**Glass fiber reinforced thermoset polyester**

P.O. DETAILS

E.g., a MexTRACE-MHB power junction box for six connections, 182x152x109, having two M32 plastic glands with a plastic plug on side A, six M25 holes with plugs on side C, six K3 type clamp screws with gray terminals, six K3 type clamp screws with blue terminals, six K3 type spring clamps with PE terminals, two K3 type jumpers having six pins, and a LED, should have the following identification:

MexTRACE-MHB-2M32.G(A), 6M25.OG(C)/182/6g, 6b, 6PE.Z-K3/2P6/L

EXAMPLE OF POWER JUNCTION BOX DESIGN

MexTRACE-RMO-EXE-01-1

Single-Channel Thermostat

DESIGN

1. X proof housing
2. X-proof single-channel load control
3. Terminals
4. Cable glands
5. Heat trace cable entry adapter

DESCRIPTION

A MexTRACE-RMO-EXE-01-1 single-channel thermostat is used to control one heat tracing line and monitor the heating element. The thermostat can provide load control based both on its own measurements and data received from external modules. Piping temperature-based control is possible with load current characteristics rather than temperature sensing.

MexTRACE-RMO-EXE-01-1 measures operating current, residual (leakage) current, and has interlock functions based on these.

The thermostat may be used independently or as part of automated EHT systems.

Data exchange with the monitoring / control system is provided via RS-485/CAN serial interface.

Any setting and modes, and firmware updates are possible via a USB service port.

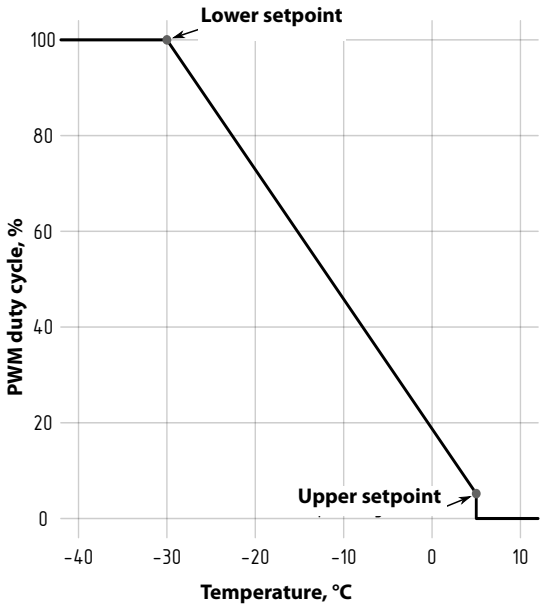
The product may optionally have a NFC-Port via 1-Wire to enable configuration with a smartphone without having to open the enclosure or isolate the device used in hazardous zones. Configuration is possible in power off state, e.g. during commissioning.

Commutation is done with a triac-relay combo that has an enhanced lifespan of up to 1,000,000 cycles, as compared to alternatives having a life of up to 100,000 cycles.

The thermostat has a powerdown feature to enable power adjustment at 1 to 100% of heat trace cable rated output. The device is useful for reducing the starting currents of the heating section thus providing a soft start.

Heating sections are controlled by switching between the following modes:

- "Heater OFF" – The line is always off.
- "Heater ON." – The line is always on.
- "Remote" - The line is controlled with higher level signals via communication interfaces.
- "Thermal Relay" - The device supports custom object temperature relying on temperature sensor data .
- "PWM"-The line is alternately turned on and off subject to user-defined interval and PWM duty cycle duration.
- "Proportional PWM" - PWM duty cycle duration is interpolated linearly between two points, i.e. between the upper and lower setpoints. The temperature and duration of the duty cycle are defined for each setpoint. As long as air temperature does not exceed the lower setpoint, the duty cycle value remains constant and equal to the value at the given setpoint. If air temperature exceeds the upper setpoint, the duty cycle value is equal to zero, i.e. the line is off. The time the line goes on between the upper and lower limits is determined by interpolation.



MexTRACE-RMO-EXE-01-1

Single-Channel Thermostat

GENERAL SPECIFICATION

Rated voltage	**230 V, 50 Hz**
Control lines	**1**
Operating current	**40 A max**
Interface (option)/ protocol	**RS-485(CAN) / ModBus RTU (CANopen)**
Earth system	**TN-S, TN-C, TN-C-S**
IP rating	**IP 66**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. AM02.B.00668/22,1Ex eb mb IIC T5 Gb X, 1Ex eb mb [ia Ga] IIC T5 Gb X, Ex tb IIIC T100 °C Db X**
Type of temperature sensors	**Pt100; Pt1000; Ni100; Cu 100; Cu 50; 100 M; 50 M; Pt 50; 50 П; 100 П; 1000 П J, K, N, L, E, R, T, A1, A2, A3, S, B, M, 0(4) to 20 mA analog signal**
Number of temperature sensor connections	**2**
Temperature sensor wiring diagram	**three-wire, two-wire**
AC switching voltage	**0 to 480 V**
Load current range	**0 to 40 A**
Residual current range	**0 to 400 mA**
Operating temperature range	**-60 to +55 °C**
Dimensions, WxHxD	**152x180x109 mm**

MODIFICATIONS

MexTRACE-RMO-EXE-01-1 series products are available in several designs.

Indexes:

Single-channel thermostat MexTRACE-RMO-EXE-01-1/XXX/XXX/XXX/XXX/XXX/XXX/XXX/XXX/XXX/XXX/XXX

1 2 3 4 5 6 7 8 9 10 11

1 – Type of bracket:

S – CK-1000 type adapter. Applicable for box size 182. L type low temperature sensors are connected via an adapter, while no adapter is used for H type high temperature sensors. Mineral insulated heating sections are not used with an adapter. The product enables heating section L-N connection;

126 – bracket. Applicable for box size 182. L type low temperature sensors are connected via a cable entry, whereas H type high temperature sensors are connected into the cable entries of the sensor. The product enables heating section L-N connection;

R – an individual frame should be used. Applicable for box size 280. L type low temperature sensors are connected via a cable entry, whereas H type high temperature sensors are connected into the cable entries of the sensor. The product enables heating section L-N and L-L connection.

2 – Box size:

182 – 182x152x109 mm dimensions. This unit size provides for a single heating section connection, with no power cable daisy chain wiring;

280 – 280x271x145 mm dimensions. This unit size is applicable for designs having power and control cable terminals. This option allows for up to three heating section connections. Power and interface cables are to be daisy chained.

3 – Cable gland size for power cable: XM20/XM25/XM32

where X is the number of cable glands (1 or 2), 2 cable glands being available for box size 280 only.

Interface cable entry size: two M20 cable glands are assumed for all modifications (not identified with an index). All cable glands are supplied plugged.

4 – cable entry types for power, interface and control cables:

A – armoured cable glands;
AM – entries for armoured cables in metal hoses;
NM – metal entries for non-armoured cables;
NP – plastic entries for non-armoured cables.
Plastic entries are used for L type temperature sensors.

5 – number of XM20 holes for heating section wiring, plugged:

X – number of holes (for a bracket or frame);
0 – no holes (for use with CK-1000).

6 – external earth bolt on box body:

1 – yes;
0 – no.

7 – LED indication (LED module) on box body:

LP – spreader on box body;
0 – no spreader on box body;

8 – Temperature sensors:

T0 – No temperature sensors;
T1 – One temperature sensor;
T2 – Two temperature sensors;
Tout – outer (ambient) air sensor.
X – Type of temperature sensor:
H – High temperature (MexTRACE-PT100-EXE-1-SE);
L – Low temperature (MexTRACE-PT100-EXE-SE).

9 – Type of temperature sensor:

TI – RTD;
AI – 0(4) to 20 mA analog signal. For control devices with 0(4) to 20 mA type sensor, please select MexTRACE-PT100.4/20-EXE or MexTRACE-PT100.4/20-EXE-1 on a CK-26 bracket (temperature sensors, control cable and brackets are not in the scope of supply).

10 – Type of control device:
A – for single-phase load (230 V);
B – for single-phase load (230 V) and two-phase load (380 V). This type of control device is suitable for box size 280 only. B type control devices require 230 V power supply.

11 – NFC module:

NFC – yes;
0 – no.

Example:
MexTRACE-RMO-EXE-01-1/126/182/1M25/2/A/0/-/T2/TI/A/0 is a thermostat for a single series-type heating section connection for 230 V power supply, bracket-mounted. The product will have a cable entry for an M25 armoured power cable, a cable entry for an M20 armoured interface cable, two plastic glands for temperature sensors, and two temperature sensors.

MexTRACE-RMO-EXE-01-1

Single-Channel Thermostat

MARKING

Typical Devices and Scope of Supply:

Item #	Description
MexTRACE-RMO-EXE-01-1	**Thermostat for a single parallel or series type heating section (230 V) attachable with CK-1000, with plastic cable glands. The product includes an M25 power cable gland, two interface cable glands, and plugs. A feature is provided for two low-temperature sensors. Temperature sensors are provided separately.**
MexTRACE-RMO-EXE-01-1.L.T1	**MexTRACE-RMO-EXE-01-1 in assembly with one MexTRACE-PT100-EXE-SE type temperature sensing element**
MexTRACE-RMO-EXE-01-1.S.L.T1	**MexTRACE-RMO-EXE-01-1 attachable with CK-1000, in assembly with one MexTRACE-PT100-EXE-SE type temperature sensing element**
MexTRACE-RMO-EXE-01-1.H.T1	**MexTRACE-RMO-EXE-01-1 in assembly with one MexTRACE-PT100-EXE-1-SE type temperature sensing element**
MexTRACE-RMO-EXE-01-1.L.T2	**MexTRACE-RMO-EXE-01-1 in assembly with two MexTRACE-PT100-EXE-SE type temperature sensing elements**
MexTRACE-RMO-EXE-01-1.S.L.T2	**MexTRACE-RMO-EXE-01-1 attachable with CK-1000, in assembly with two MexTRACE-PT100-EXE-SE type temperature sensing elements**
MexTRACE-RMO-EXE-01-1.H.T2	**MexTRACE-RMO-EXE-01-1 in assembly with two MexTRACE-PT100-EXE-1-SE type temperature sensing elements**
MexTRACE-RMO-EXE-01-1.Tout	**MexTRACE-RMO-EXE-01-1 in assembly with one outdoor air temperature sensor**

P.O. DETAILS

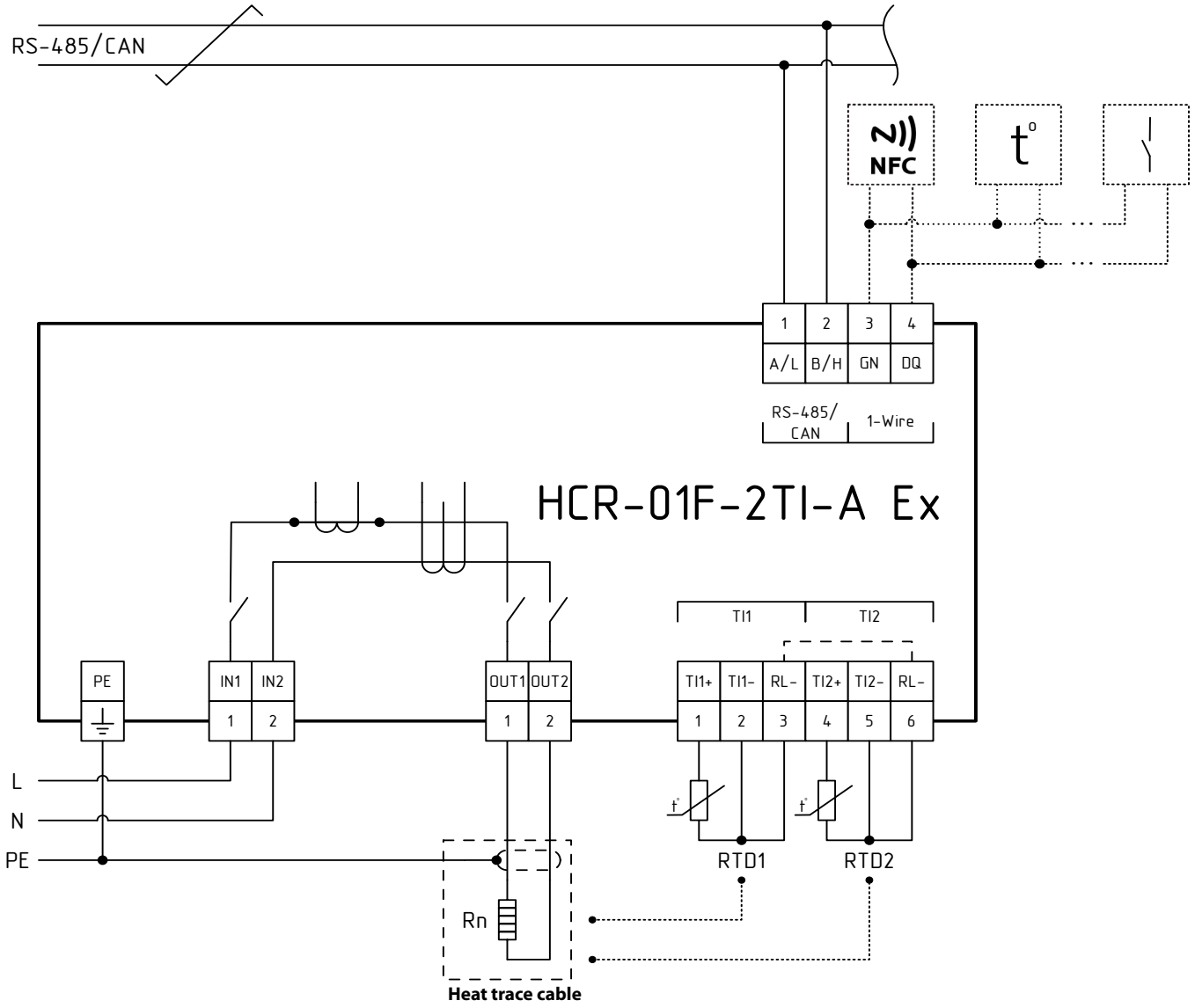
Please provide the following item number in your P.O. for a MexTRACE-PT100-EXE-SE thermostat with two temperature sensors:
MexTRACE-RMO-EXE-01-1.L.T2
Please provide the following item number in your P.O. for a controller:
HCR-01F-2TI Ex
HCR-01F-2TI-A Ex
HCR-01F-2AI Ex *(Type of temperature sensor: 0(4) to 20 mA analog signal)*
HCR-01F-2AI-A Ex *(Type of temperature sensor: 0(4) to 20 mA analog signal)*

MexTRACE-RMO-EXE-01-1

Single-Channel Thermostat

CIRCUIT DIAGRAM (EXAMPLE)

One-phase load connection

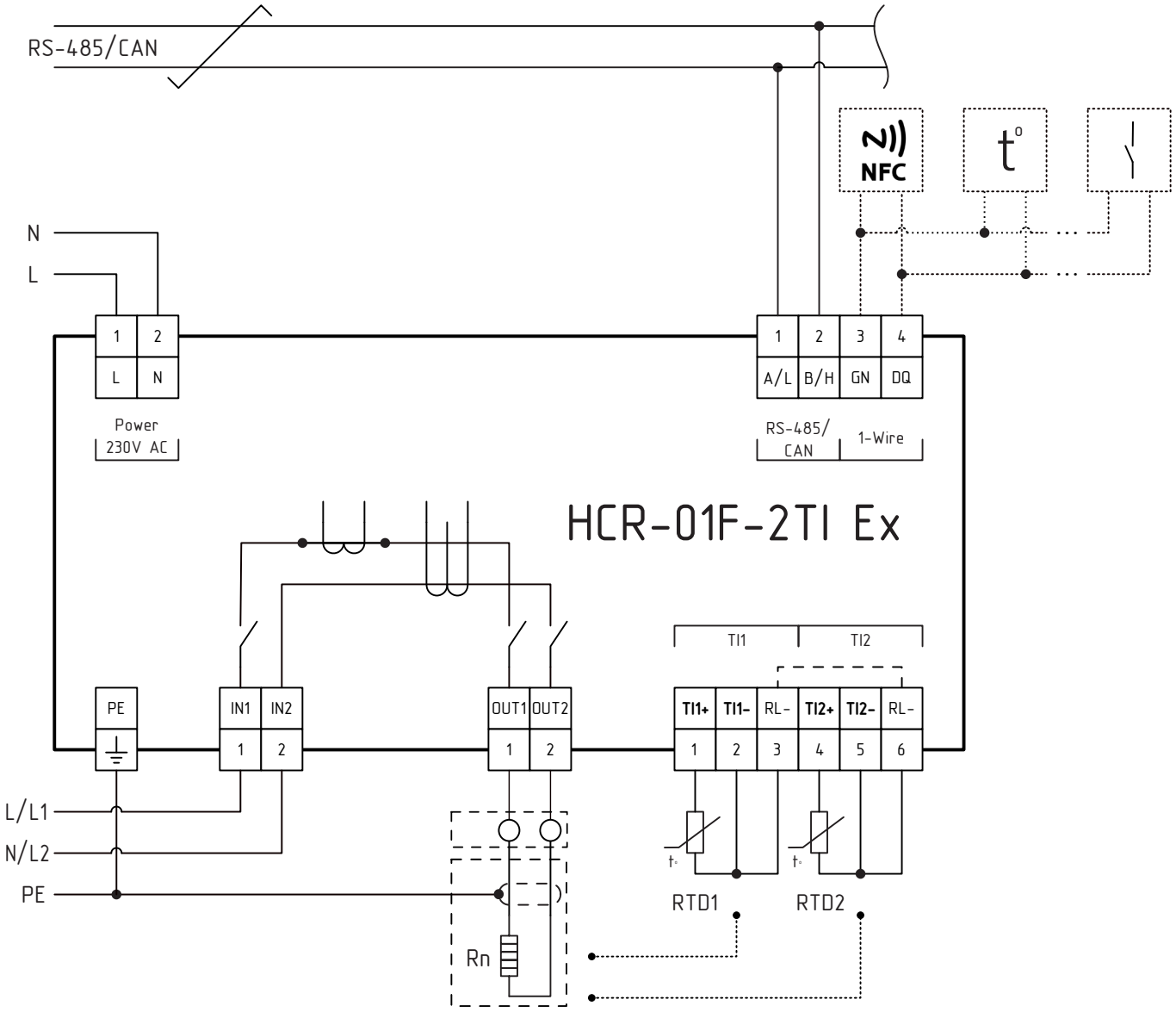


MexTRACE-RMO-EXE-01-1

Single-Channel Thermostat

CIRCUIT DIAGRAM (EXAMPLE)

Two-phase load connection



MexTRACE-RMO-EXE-03

Three-Channel Thermostat

DESIGN

1. X-proof housing
2. X-proof three-phase load control
3. Terminals
4. Cable glands

DESCRIPTION

Three-channel (three-phase) thermostat type MexTRACE-RMO-EXE-03 is used to control three single-phase heat tracing lines or one three-phase heat tracing line and monitor the heating elements.

The thermostat can provide load control based both on its own measurements and data received from external modules. Piping temperature-based control is possible with load current characteristics rather than temperature sensing.

MexTRACE-RMO-EXE-03 measures operating current, residual (leakage) current, and has interlock functions based on these.

The thermostat may be used independently or as part of automated EHT systems.

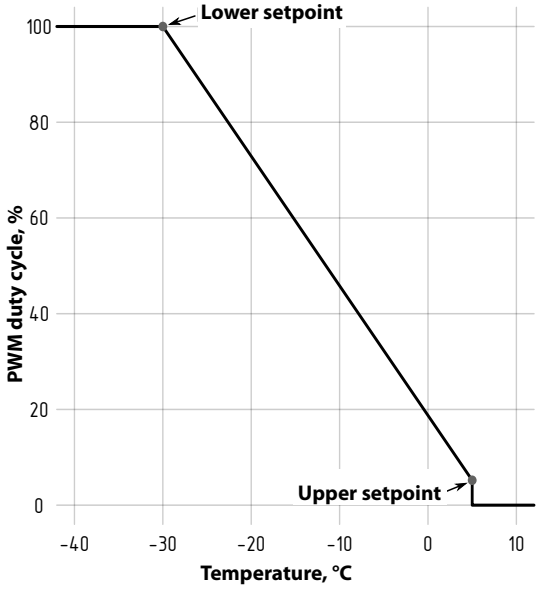
Data exchange with the monitoring / control system is provided via RS-485/CAN serial interface. Any setting and modes, and firmware updates are possible via a USB service port.

The product may optionally have a NFC-Port via 1-Wire to enable configuration with a smartphone without having to open the enclosure or isolate the device used in hazardous zones. Configuration is possible in power off state, e.g. during commissioning.

Commutation is done with a triac-relay combo that has an enhanced lifespan of up to 1,000,000 cycles, as compared to alternatives having a life of up to 100,000 cycles.

Heating sections are controlled by switching between the following modes:

- "Heater OFF" – The line is always off.
- "Heater ON" – The line is always on.
- "Remote" - The line is controlled with higher level signals via communication interfaces
- "Thermal Relay" - The device supports custom object temperature relying on temperature sensor data
- "PWM" - The line is alternately turned on and off subject to user-defined interval and PWM duty cycle duration.
- "Proportional PWM" - PWM duty cycle duration is interpolated linearly between two points, i.e. between the upper and lower setpoints. The temperature and duration of the duty cycle are defined for each setpoint. As long as air temperature does not exceed the lower setpoint, the duty cycle value remains constant and equal to the value at the given setpoint. If air temperature exceeds the upper setpoint, the duty cycle value is equal to zero, i.e. the line is off. The time the line goes on between the upper and lower limits is determined by interpolation.



MexTRACE-RMO-EXE-03

Three-Channel Thermostat

GENERAL SPECIFICATION

Rated voltage	**230 V, 50 Hz**
Control lines	**3**
Operating current	**up to 40 A**
Interface (option) / protocol	**RS-485(CAN) / ModBus RTU (CANopen)**
Earth system	**TN-S, TN-C, TN-C-S**
IP rating	**IP 66**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. AM02.B.00668/22,1Ex eb mb IIC T5 Gb X, 1Ex eb mb [ia Ga] IIC T5 Gb X, Ex tb IIIC T100 °C Db X**
Type of temperature sensors	**Pt100; Pt1000; Ni100 ; Cu 100 ; Cu 50; 100 M; 50 M; Pt 50; 50 П; 100 П; 1000 П**
Number of temperature sensor connections	**3 max**
Temperature sensor wiring diagram	**three-wire, two-wire**
AC switching voltage	**0 to 480 V**
Load current range	**0 to 40 A**
Residual current range	**0 to 400 mA**
Operating temperature range	**-60 to +55 °C**
Dimensions WxHxD	**280x271x145 mm**

MARKING

Item #
MexTRACE-RMO-EXE-03

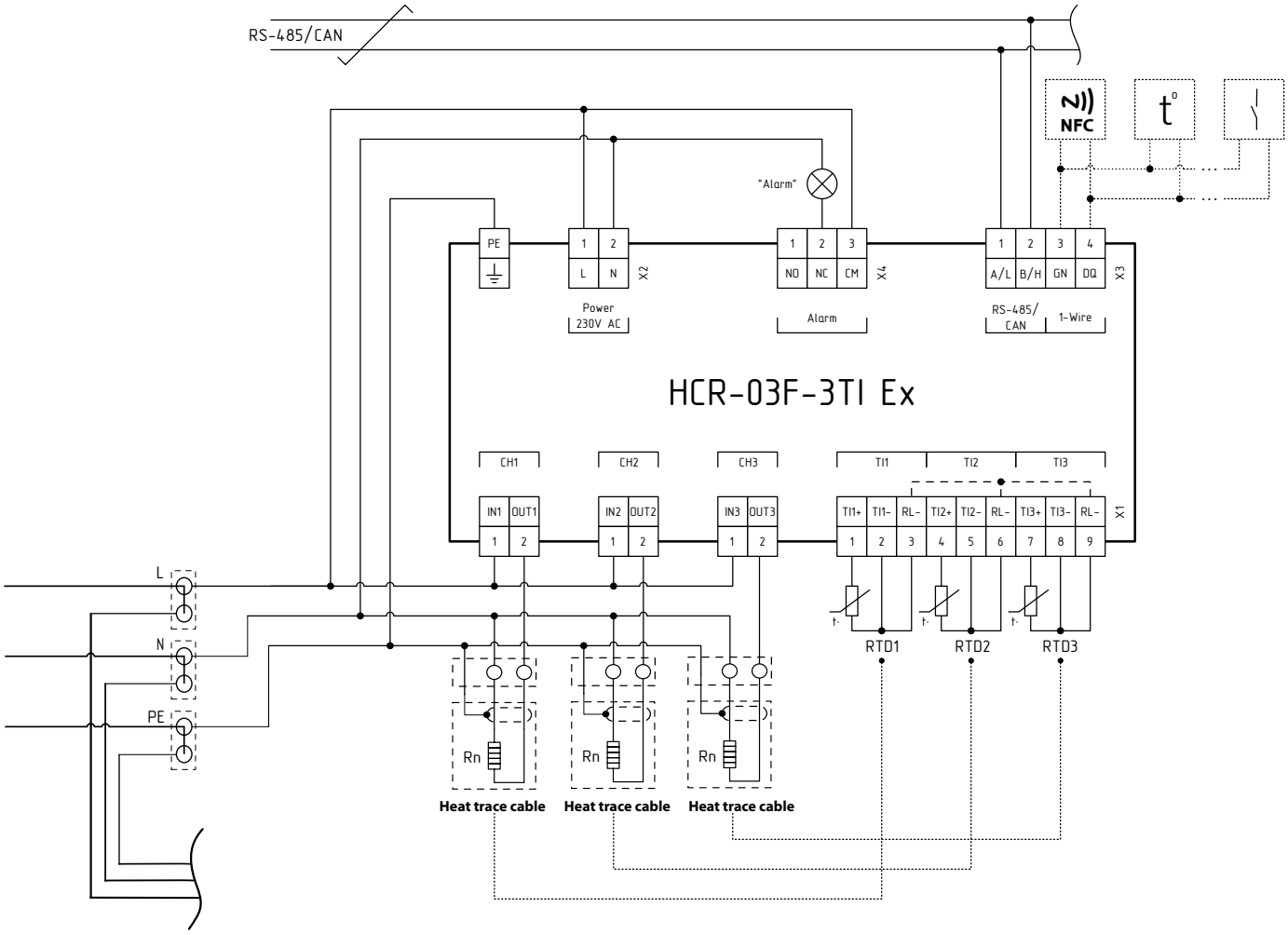
P.O. DETAILS

Please provide the following item number in your P.O. for a distribution and control module (three control lines):
MexTRACE-RMO-EXE-03
Please provide the following item number in your P.O. for a controller:
HCR-03F-3TI EX

MexTRACE-RMO-EXE-03

Three-Channel Thermostat

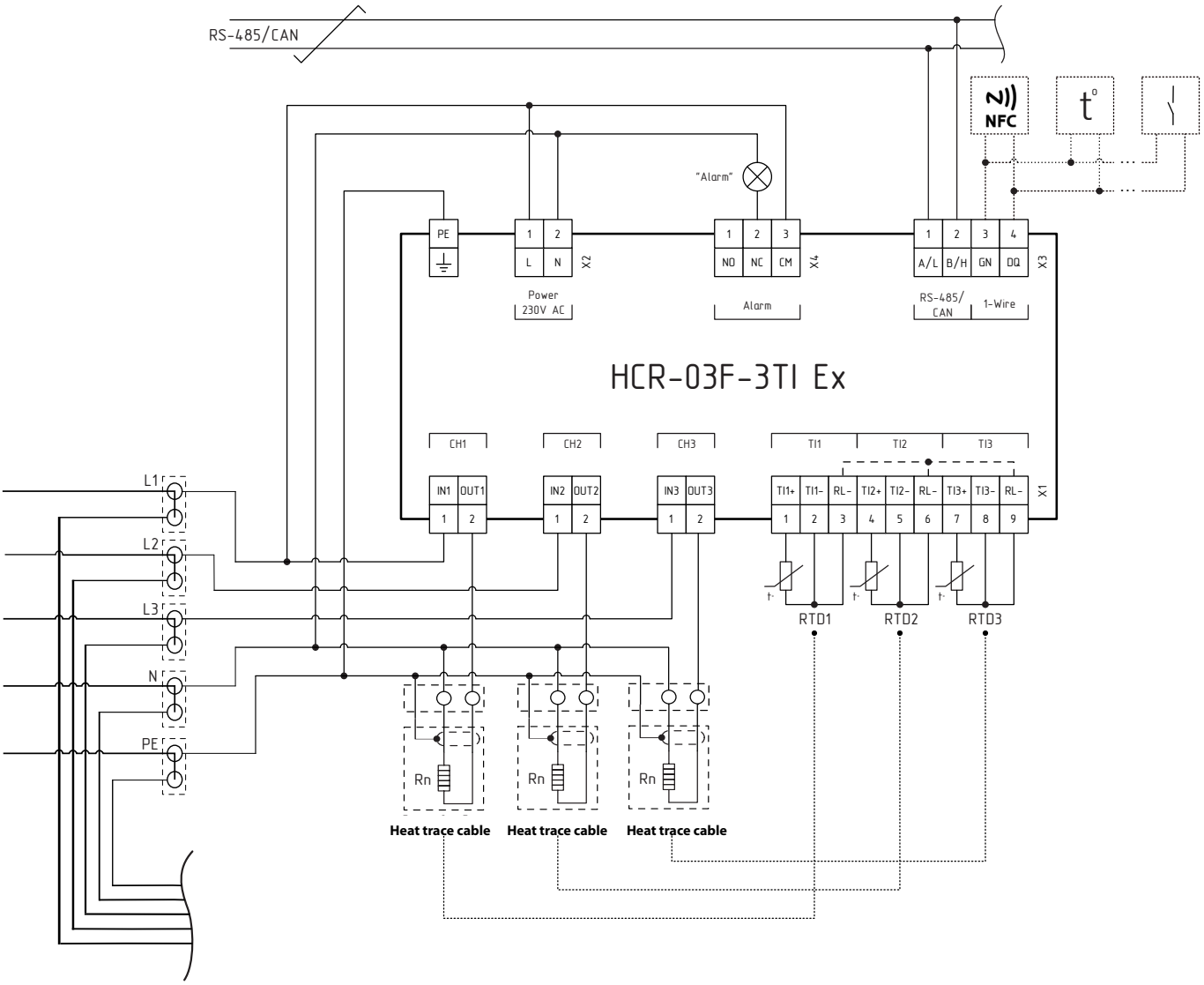
CIRCUIT DIAGRAM (EXAMPLE)



MexTRACE-RMO-EXE-03

Three-Channel Thermostat

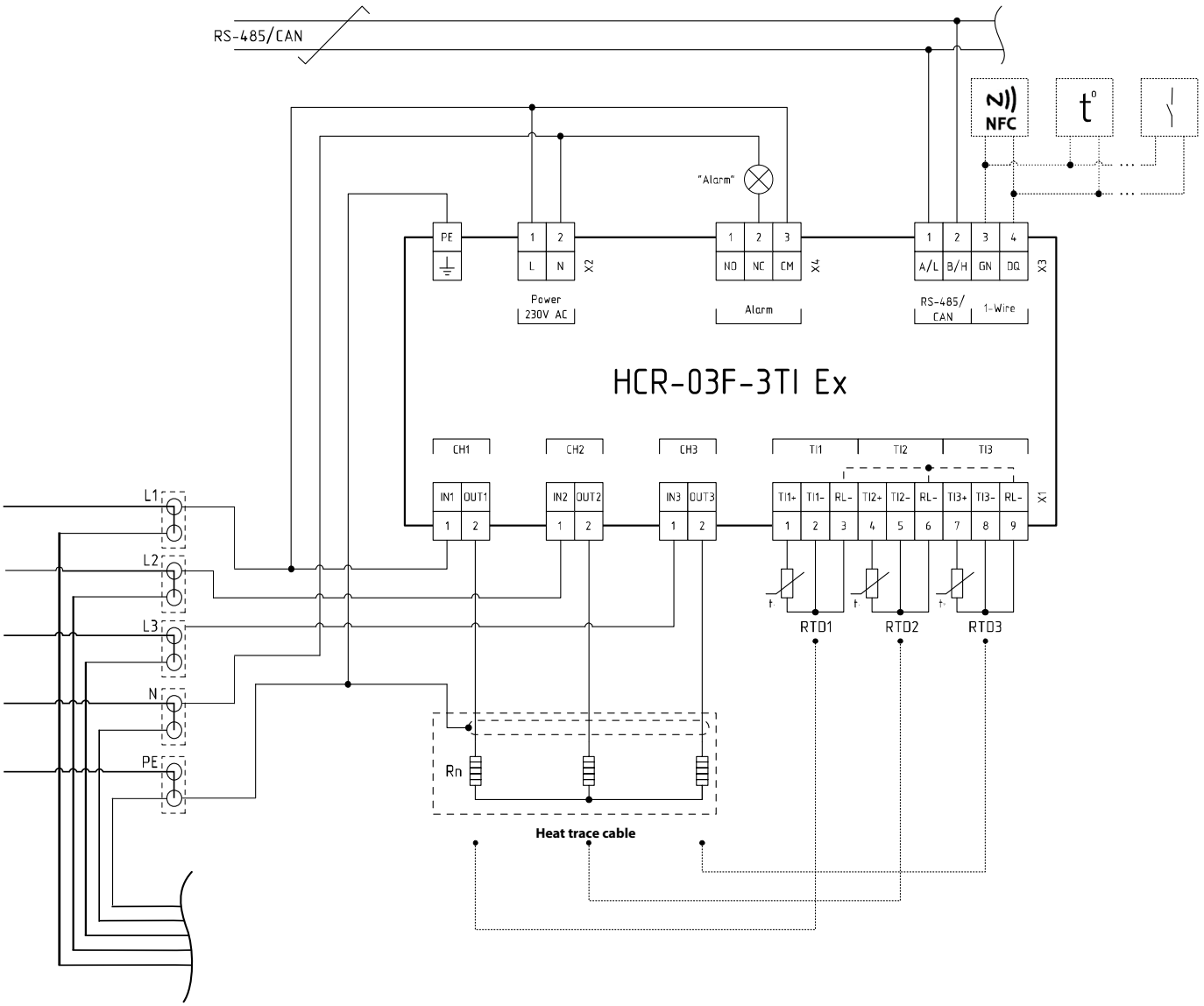
CIRCUIT DIAGRAM (EXAMPLE)



MexTRACE-RMO-EXE-03

Three-Channel Thermostat

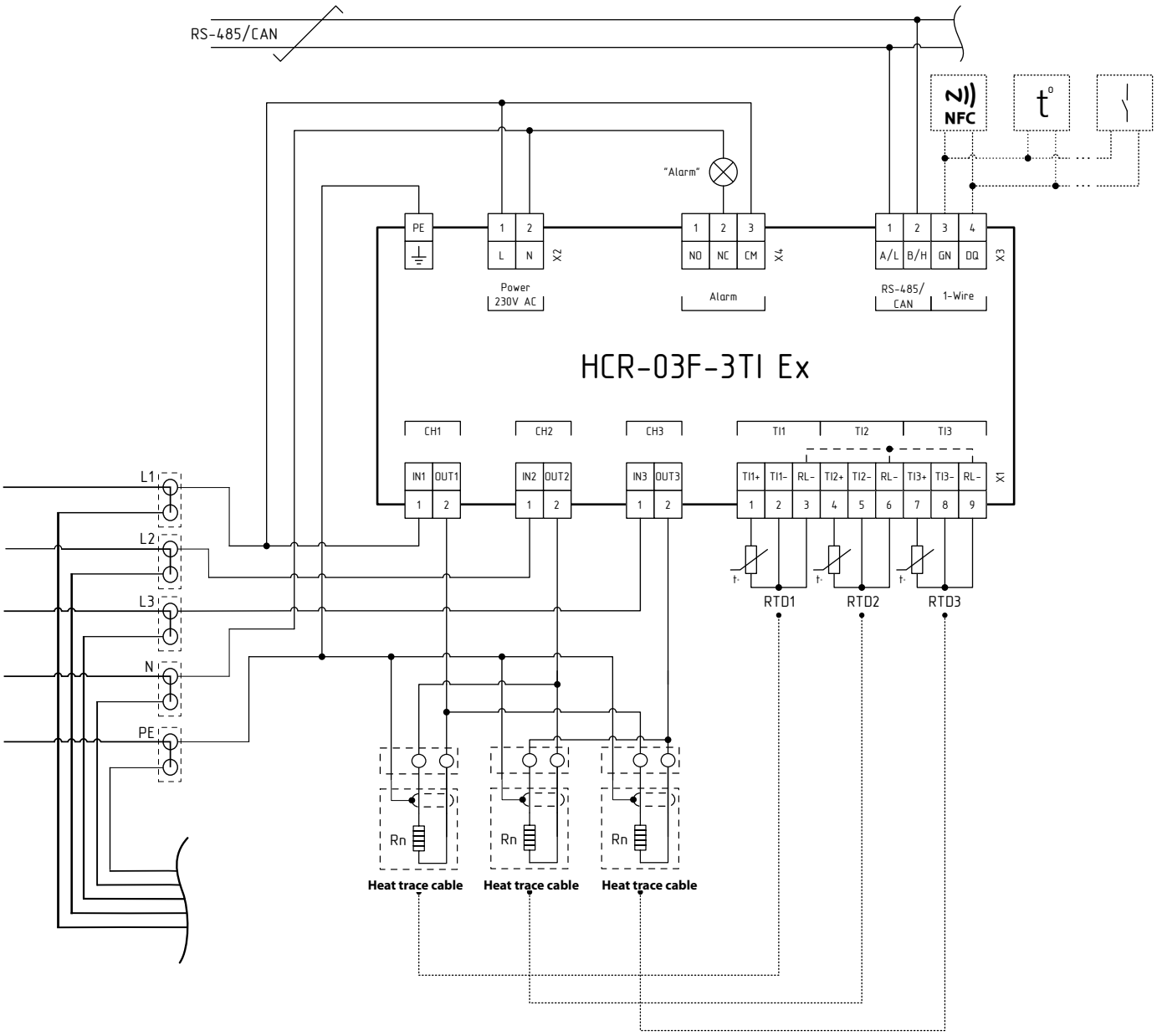
CIRCUIT DIAGRAM (EXAMPLE)



MexTRACE-RMO-EXE-03

Three-Channel Thermostat

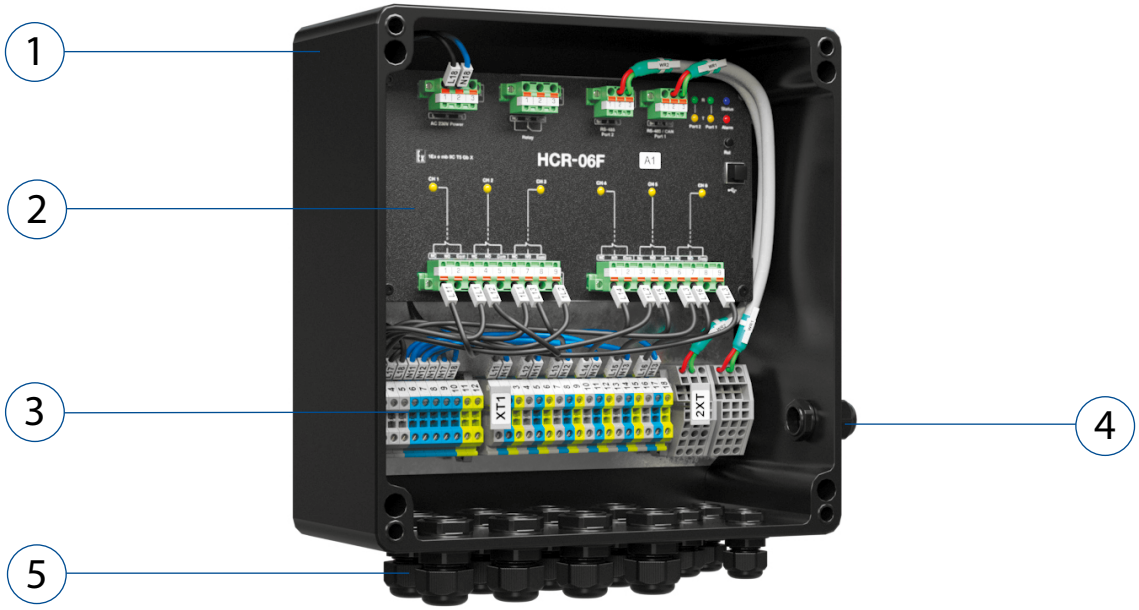
CIRCUIT DIAGRAM (EXAMPLE)



MexTRACE-RMO-EXE-06

Six-Channel Thermostat

DESIGN



1. X-proof housing
2. X-proof load control device
3. Terminals
4. Feeding cable glands
5. Heating cable glands

DESCRIPTION

Distribution and control module type MexTRACE-RMO-EXE-06 is a device used to monitor and control six heat tracing lines as part of an automated EHT control system.

The unit is capable of delivering control over heating circuits based on the feedback from a MexTRACE-RMM-EXE type measuring and control module or its own measurement.

MexTRACE-RMO-EXE-06 is supplied as a kit in a X-proof body accommodating a controller and terminals.

The housing accommodates two power cable glands, two commuinication cable glands, ans six cable glands to hook up heating elements.

An Ex controller provides automatic and remote disrete control of user power and electrical current measurement. The device may be operated both independently and as part of automated supervisory and process control systems. Number of channels: six (6).

When operated automatically, the device allows for consumed power control based on load current feedback or the signals from a partner measuring module, which is connected via a dedicated RS-485 serial interface. The product is applicable in explosive gas environments (gas group IIC as per GOST R IEC 60079-0-2011).

Data exchange with the monitoring / control system is provided via RS-485/CAN serial interface.

The thermostat has a powerdown feature to enable power adjustment at 1 to 100% of heat trace cable rated output. The device is useful for reducing the starting currents of the heating section thus providing a soft start.

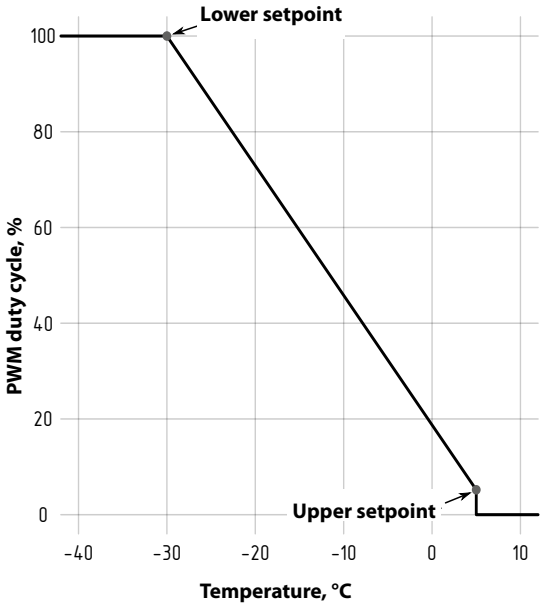
The product may optionally have a NFC-Port via 1-Wire to enable configuration with a smartphone without having to open the enclosure or isolate the device used in hazardous zones. Configuration is possible in power off state, e.g. during commissioning.

MexTRACE-RMO-EXE-06

Six-Channel Thermostat

Heating sections are controlled by switching between the following modes:

- "Heater OFF" – The line is always off.
- "Heater On" – The line is always on.
- "Remote" - The line is controlled with higher level signals via communication interfaces
- "Thermal Relay" - The device supports custom object temperature relying on temperature sensor data.
- "PWM" - The line is alternately turned on and off subject to user-defined interval and PWM duty cycle duration.
- "Proportional PWM" - PWM duty cycle duration is interpolated linearly between two points, i.e. between the upper and lower setpoints. The temperature and duration of the duty cycle are defined for each setpoint. As long as air temperature does not exceed the lower setpoint, the duty cycle value remains constant and equal to the value at the given setpoint. If air temperature exceeds the upper setpoint, the duty cycle value is equal to zero, i.e. the line is off. The time the line goes on between the upper and lower limits is determined by interpolation.



GENERAL SPECIFICATION

Rated voltage	**230/400 V, 50 Hz**
Control lines	**6**
Operating current	**per line 12 A max**
Interface (option) / protocol I	**RS-485(CAN) / ModBus RTU (CANopen)**
Earth system	**TN-S, TN-C, TN-C-S**
IP rating	**IP 66**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. AM02.B.00668/22,1Ex eb mb IIC T5 Gb X, 1Ex eb mb [ia Ga] IIC T5 Gb X, Ex tb IIIC T100 °C Db X**
AC switching voltage	**0 to 250 V**
Load current range	**0 to 30 A**
Operating temperature range	**-60 to +55 °C**
Dimensions WxHxD	**271x280x145 mm**

MexTRACE-RMO-EXE-06

Six-Channel Thermostat

MODIFICATIONS

MexTRACE-RMO-EXE-06 series products are available in several designs.
Indexes:

Six-channel thermostat MexTRACE-RMO-EXE-06/XXX/XXX/XXX/XXX/XXX
1 2 3 4 5

1 – Supply voltage: 230 V or 400 V.

2 – Additional devices wired to 1-wire interface:

0 – no additional devices;
NFC – an NFC port provided to enable major settings in a smart phone without having to open up the enclosure;
DTS – a digital outdoor air temperature sensor provided.

3 – Type of EHT line control contacts:

NC – normally closed, power off to heating sections in case of controller failure;
NO – normally open, uncontrolled power on to heating sections in case of controller failure.

4 – Types of cable glands:

A - armoured cable glands;
AM - glands for armoured cables in metal hoses;
NM - metal glands for non-armoured cables;
NP - plastic glands for non-armoured cables.

5 – Temperature sensors:
T0 – no temperature sensors;
Tout – outdoor air temperature sensor.

Example:
MexTRACE-RMO-EXE-06/230/NFC/NC/NP/T0 - is a thermostat for 230 V power supply for connection of six heating sections, with plastic glands for non-armoured cables, an NFC module, NC, no temperature sensors. The product includes six M25 plastic glands, two M20 plastic glands, and one M32 plastic gland. Power terminals are intended for max 6 mm2 cable wiring.

MARKING

Item #	Description
MexTRACE-RMO-EXE-06	**A thermostat for connection of six heating sections. 230 V power supply. The product includes six M25 plastic glands, two M20 plastic glands, and one M32 plastic gland. Power terminals are intended for max 6 mm2 cable wiring. NC type.**
MexTRACE-RMO-EXE-06.Tout	**MexTRACE-RMO-EXE-06 in assembly with one outdoor air temperature sensor**

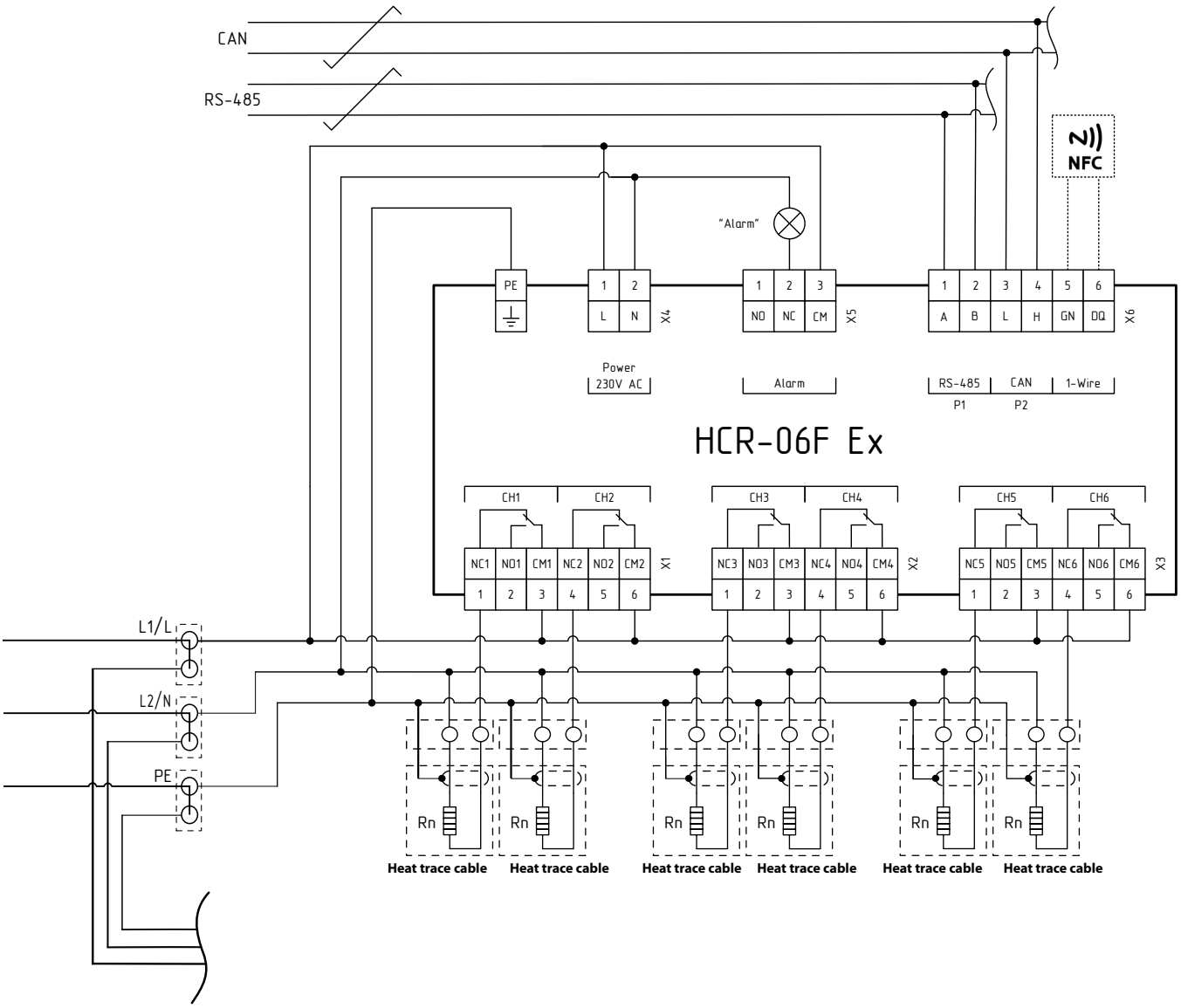
P.O. DETAILS

Please provide the following item number in your P.O. for a distribution and control module (6 control lines):
MexTRACE-RMO-EXE-06
Please provide the following item number in your P.O. for a distribution and control module (6 control lines) in assembly with an outdoor air temperature sensor:
MexTRACE-RMO-EXE-06.Tout
Please provide the following item number in your P.O. for a controller: **HCR-06F Ex**

MexTRACE-RMO-EXE-06

Six-Channel Thermostat

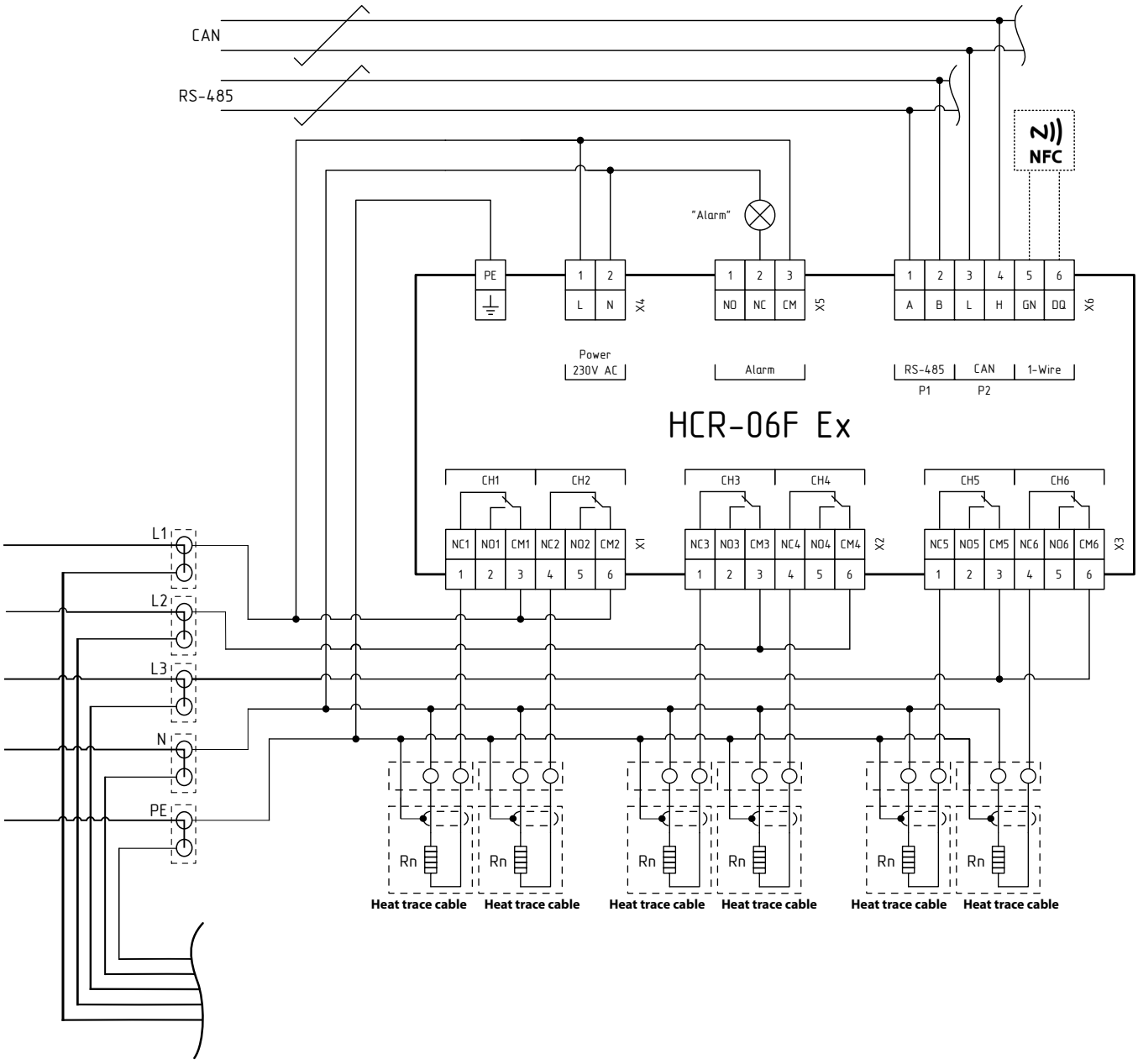
CIRCUIT DIAGRAM (EXAMPLE)



MexTRACE-RMO-EXE-06

Six-Channel Thermostat

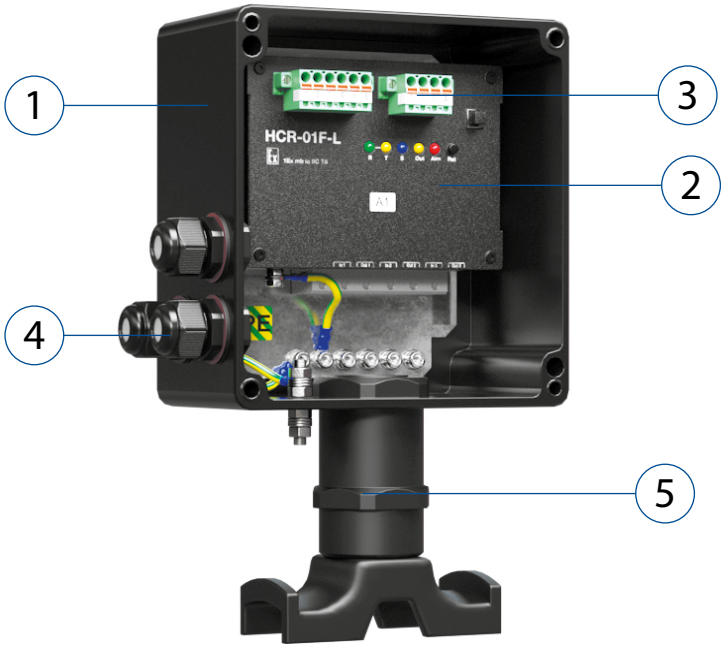
CIRCUIT DIAGRAM (EXAMPLE)



MexTRACE-RMO-EXE-01-2

Single-Channel Thermostat

DESIGN



1. X-proof housing
2. X-proof single-channel load control
3. Terminals
4. Cable glands
5. Heat trace cable entry adapter

DESCRIPTION

Single-channel thermostat type MexTRACE-RMO-EXE-01-2 is used to control one heat tracing line and monitor the heating element.

The thermostat can provide load control based both on its own measurements and data received from external modules. Piping temperature-based control is possible with load current characteristics rather than temperature sensing.

MexTRACE-RMO-EXE-02 measures operating current, residual (leakage) current, and has interlock functions based on these.

The thermostat may be used independently or as part of automated EHT systems.

Data exchange with the monitoring / control system is provided via RS-485/CAN serial interface.

The operating conditions and variables may be set with rotary switches, via RS-485 serial interface, or 1-Wire interface (NFC-Port), depending on the modification.

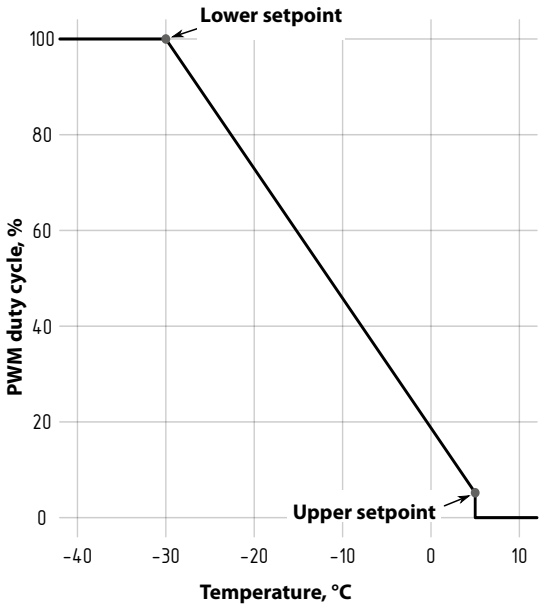
The current variables may be output to a seven-segment LED display.

Commutation is done with a triac-relay combo that has an enhanced lifespan of up to 1,000,000 cycles, as compared to alternatives having a life of up to 100,000 cycles.

The device features bright status LEDs and a transparent filter fitted on its cover.

Heating sections are controlled by switching between the following modes:

- "Heater OFF" – The line is always off.
- "Heater ON" – The line is always on.
- "Remote" – The line is controlled with higher level signals via communication interfaces
- "Thermal Relay" – The device supports custom object temperature relying on temperature sensor data
- "PWM" – The line is alternately turned on and off subject to user-defined interval and PWM duty cycle duration.
- "Proportional PWM" – PWM duty cycle duration is interpolated linearly between two points, i.e. between the upper and lower setpoints. The temperature and duration of the duty cycle are defined for each setpoint. As long as air temperature does not exceed the lower setpoint, the duty cycle value remains constant and equal to the value at the given setpoint. If air temperature exceeds the upper setpoint, the duty cycle value is equal to zero, i.e. the line is off. The time the line goes on between the upper and lower limits is determined by interpolation.



MexTRACE-RMO-EXE-01-2

Single-Channel Thermostat

GENERAL

Rated voltage	**230 V, 50 Hz**
Control lines	**1**
Operating current	**40 A max**
Interface (option) / protocol	**RS-485(CAN) / ModBus RTU (CANopen)**
Earth system	**TN-S, TN-C, TN-C-S**
IP rating	**IP 50**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. AM02.B.00668/22,1Ex eb mb IIC T5 Gb X, 1Ex eb mb [ia Ga] IIC T5 Gb X, Ex tb IIIC T100 °C Db X**
Type of temperature sensors	**Pt100; Ni100; Cu 100; Cu 50; 100 M; 50 M; Pt 50; 50 П; 100 П**
Number of temperature sensors connections	**2**
Temperature sensor wiring diagram	**three-wire**
Operating temperature range	**-60 to +55 °C**
Dimensions WxHxD	**152x180x109 mm**

MARKING

Item #
MexTRACE-RMO-EXE-01-2

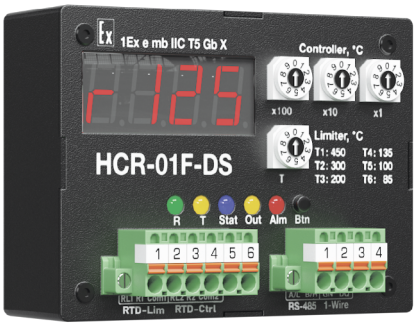
P.O. DETAILS

Please provide the following item number in your P.O. for an X-proof single-channel load control / temperature control:
MexTRACE-RMO-EXE-01-2-DS *(with a* **HCR-01F-DS Ex** *controller)*
MexTRACE-RMO-EXE-01-2-S *(with a* **HCR-01F-S Ex** *controller)*
MexTRACE-RMO-EXE-01-2-D *(with a* **HCR-01F-D Ex** *controller)*
MexTRACE-RMO-EXE-01-2-L *(with a* **HCR-01F-L Ex** *controller)*

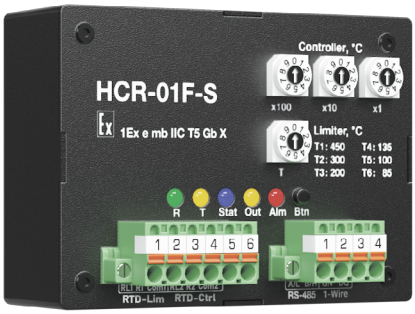
MexTRACE-RMO-EXE-01-2

Single-Channel Thermostat

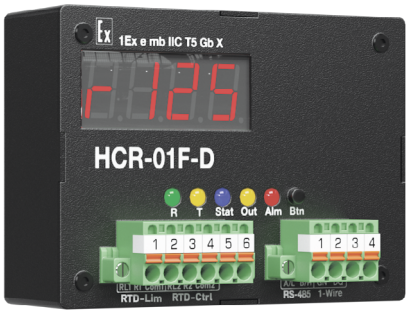
TYPES OF CONTROLS



HCR-01F-DS Ex - X-proof single-channel load control / temperature control. The product features a seven-segment LED to output the current variables, and rotary switches for temperature settings.



HCR-01F-S Ex -X-proof single-channel load control / temperature control. The product features rotary switches for temperature settings.



HCR-01F-D Ex -X-proof single-channel load control / temperature control. The product features a seven-segment LED to output the current variables.

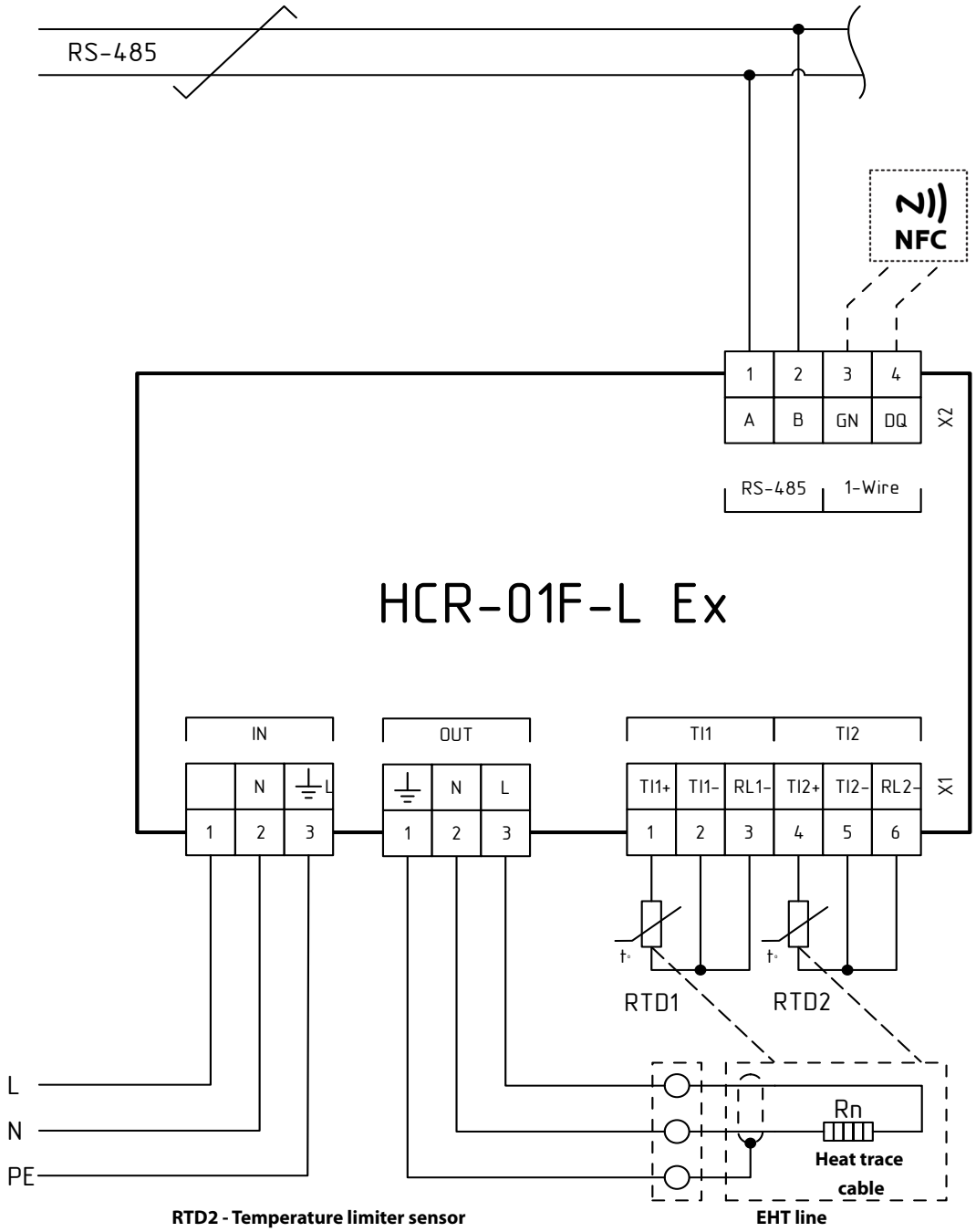
HCR-01F-L Ex -X-proof single-channel load control / temperature control.

MexTRACE-RMO-EXE-01-2

Single-Channel Thermostat

CIRCUIT DIAGRAM (EXAMPLE)

Load Connection



MexTRACE-RMO-EXE-01-3

Single-Channel Thermostat

DESIGN

1. X-proof housing
2. X-proof single-channel load control
3. Terminals
4. Cable glands
5. Heat trace cable entry adapter

DESCRIPTION

Single-channel thermostat MexTRACE-RMO-EXE-01-3 is used to control one heat tracing line and monitor the heating element.

The product is used to ensure local load control based on internal measurements with two temperature sensors.

Rotary switches are used to set the target temperature and limiter trip temperature.

The device features bright status LEDs and a transparent filter fitted on its cover.

Commutation is done with a triac-relay combo that has an enhanced lifespan of up to 1,000,000 cycles, as compared to alternatives having a life of up to 100,000 cycles.

Another product feature is a Soft Start function to reduce starting currents.

Heating sections are controlled by switching between the following modes:

- "Heater OFF" – The line is always off.
- "Heater ON"– The line is always on.
- "Thermal Relay" – The device supports custom object temperature relying on temperature sensor data

MexTRACE-RMO-EXE-01-3

Single-Channel Thermostat

GENERAL SPECIFICATION

Rated voltage	**230 V, 50 Hz**
Control lines	**1**
Operating current	**20 A max**
Interface	**dry contact**
Earth system	**TN-S, TN-C, TN-C-S**
IP rating	**IP 66**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. AM02.B.00668/22,1Ex eb mb IIC T5 Gb X, Ex tb IIIC T100 °C Db X**
Type of temperature sensors	**Pt100; Ni100; Cu 100; Cu 50; 100 M; 50 M; Pt 50; 50 П; 100 П**
Number of temperature sensors connections	**2**
Temperature sensor wiring diagram	**three-wire**
AC switching voltage	**0 to 264 V**
Operating temperature range	**-60 to +55 °C**
Dimensions WxHxD	**170x140x125 mm**

MARKING

Item #	Description
MexTRACE-RMO-EXE-01-3	**Single-channel thermostat. To be used in conjunction with support bracket CK-101 or CK-126**
MexTRACE-RMO-EXE-01-3.L.T1	**Single-channel thermostat. To be used in conjunction with support bracket CK-101 or CK-126. Includes one MexTRACE-PT100-EXE-SE sensor**
MexTRACE-RMO-EXE-01-3.H.T1	**Single-channel thermostat. To be used in conjunction with support bracket CK-101 or CK-126. Includes one MexTRACE-PT100-EXE-1-SE sensor**
MexTRACE-RMO-EXE-01-3.L.T2	**Single-channel thermostat. To be used in conjunction with support bracket CK-101 or CK-126. Includes two MexTRACE-PT100-EXE-SE sensors**
MexTRACE-RMO-EXE-01-3.H.T2	**Single-channel thermostat. To be used in conjunction with support bracket CK-101 or CK-126. Includes two MexTRACE-PT100-EXE-1-SE sensors**
MexTRACE-RMO-EXE-01-3.S	**Single-channel thermostat. Includes CK-1000 for heat trace cable connection**
MexTRACE-RMO-EXE-01-3.S.L.T1	**Single-channel thermostat. Includes CK-1000 for heat trace cable connection and one MexTRACE-PT100-EXE-SE sensor**
MexTRACE-RMO-EXE-01-3.S.L.T2	**Single-channel thermostat. Includes CK-1000 for heat trace cable connection and two MexTRACE-PT100-EXE-SE sensors**

P.O. DETAILS

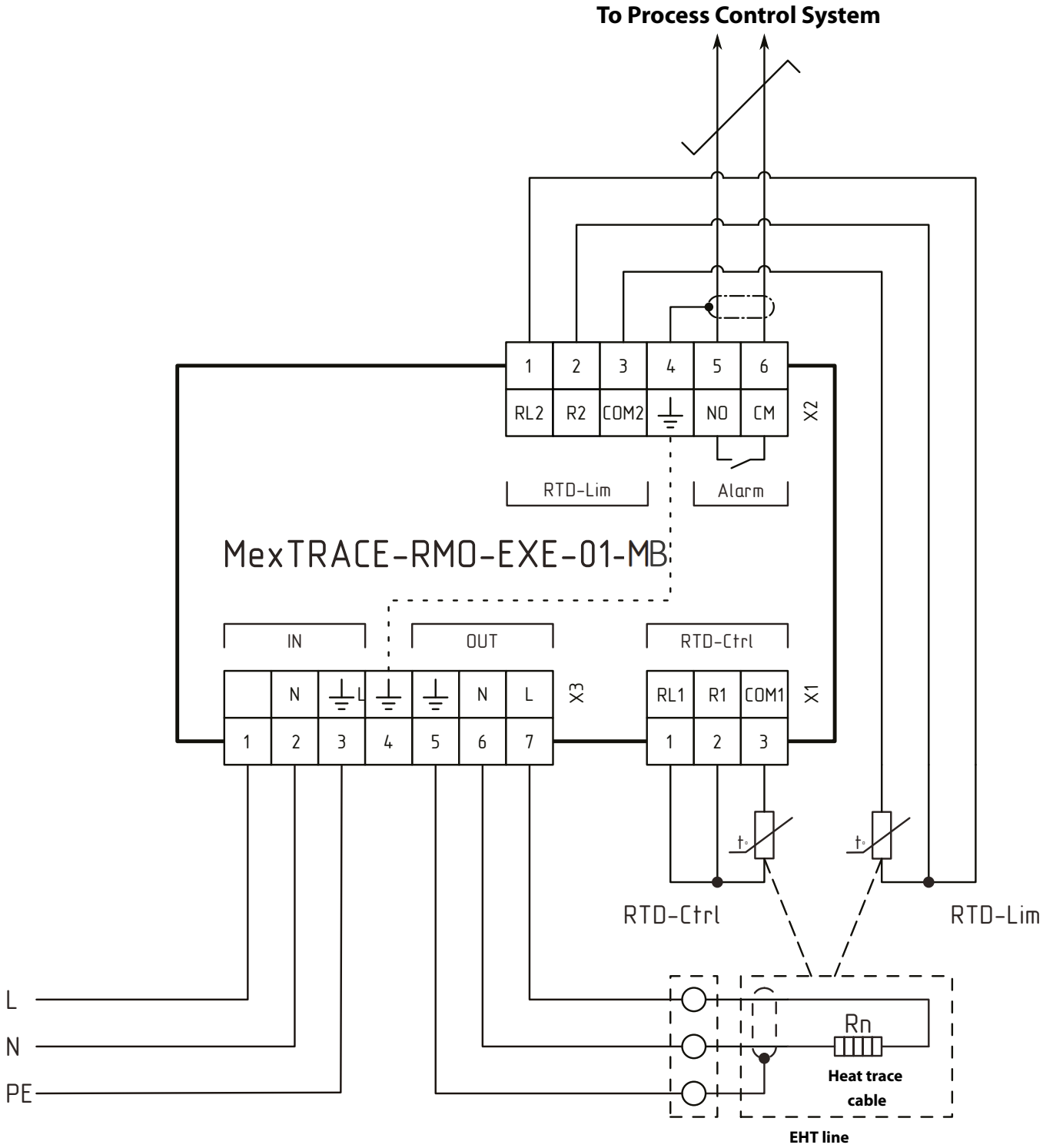
Please provide the following item number in your P.O. for an X-proof single-channel load control / temperature control:
MexTRACE-RMO-EXE-01-3

MexTRACE-RMO-EXE-01-3

Single-Channel Thermostat

CIRCUIT DIAGRAM (EXAMPLE)

Load Connection



MDR-02 Temperature Control

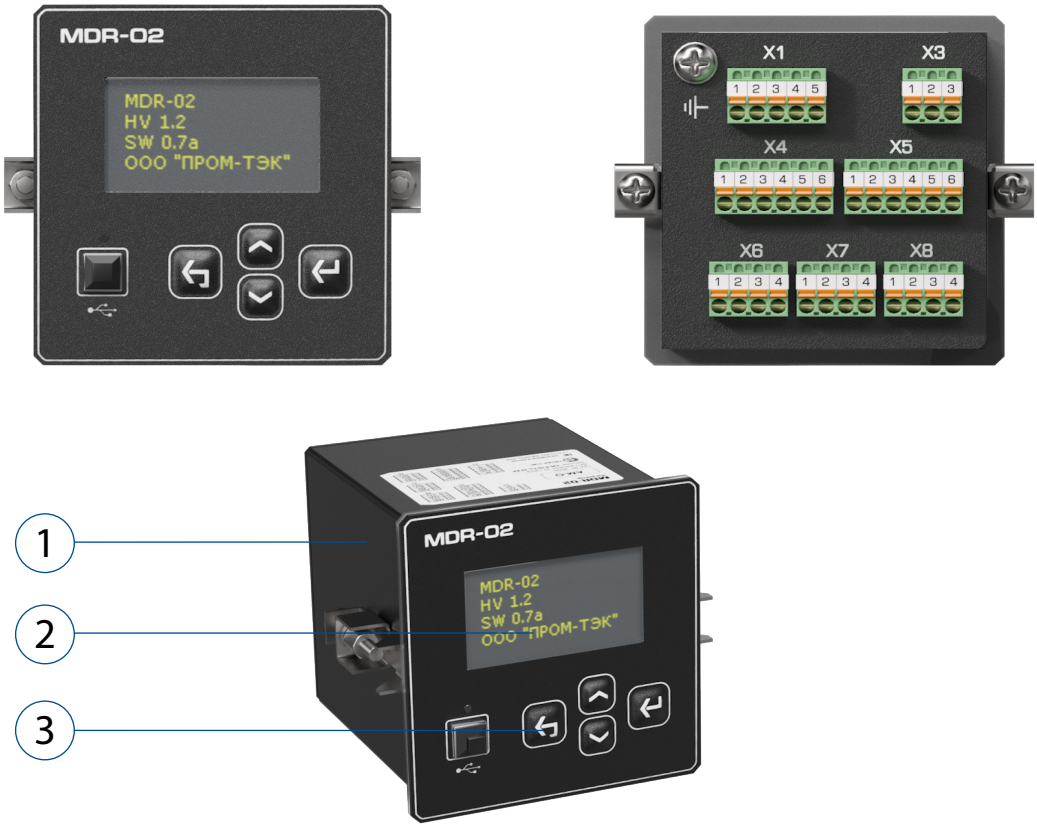
DESCRIPTION

MDR-02 type multi-purpose temperature control is used for measuring, indication and automatic discrete control of process variables based on 0(4) to 20 mA DC RTD or sensor signals.

The device provides measurement of current consumed using external transformers, indication of switching device status, and additional interlocking when using in-built discrete inputs. The device has a 24 V power supply for sensors with a standardized 0(4) to 20 mA output signal. A monochrome graphical OLED display is provided for display of readings and variables.

The product may operate both independently and as part of an automated supervisory and process control system. Data exchange with the monitoring / control system is provided via RS-485/CAN serial interface. The operating conditions and variables are set with front panel push buttons or via a USB service interface, which is also used to get firmware updates.

DESIGN



1. Body
2. Monochrome graphic display
3. Control pushbuttons

P.O. DETAILS

Please provide the following item number in your P.O. for an MDR-02 temperature control:
MDR-02-AM *(230 V, 50 Hz power supply) or* **MDR-02-DM** *(24 V DC power supply)*

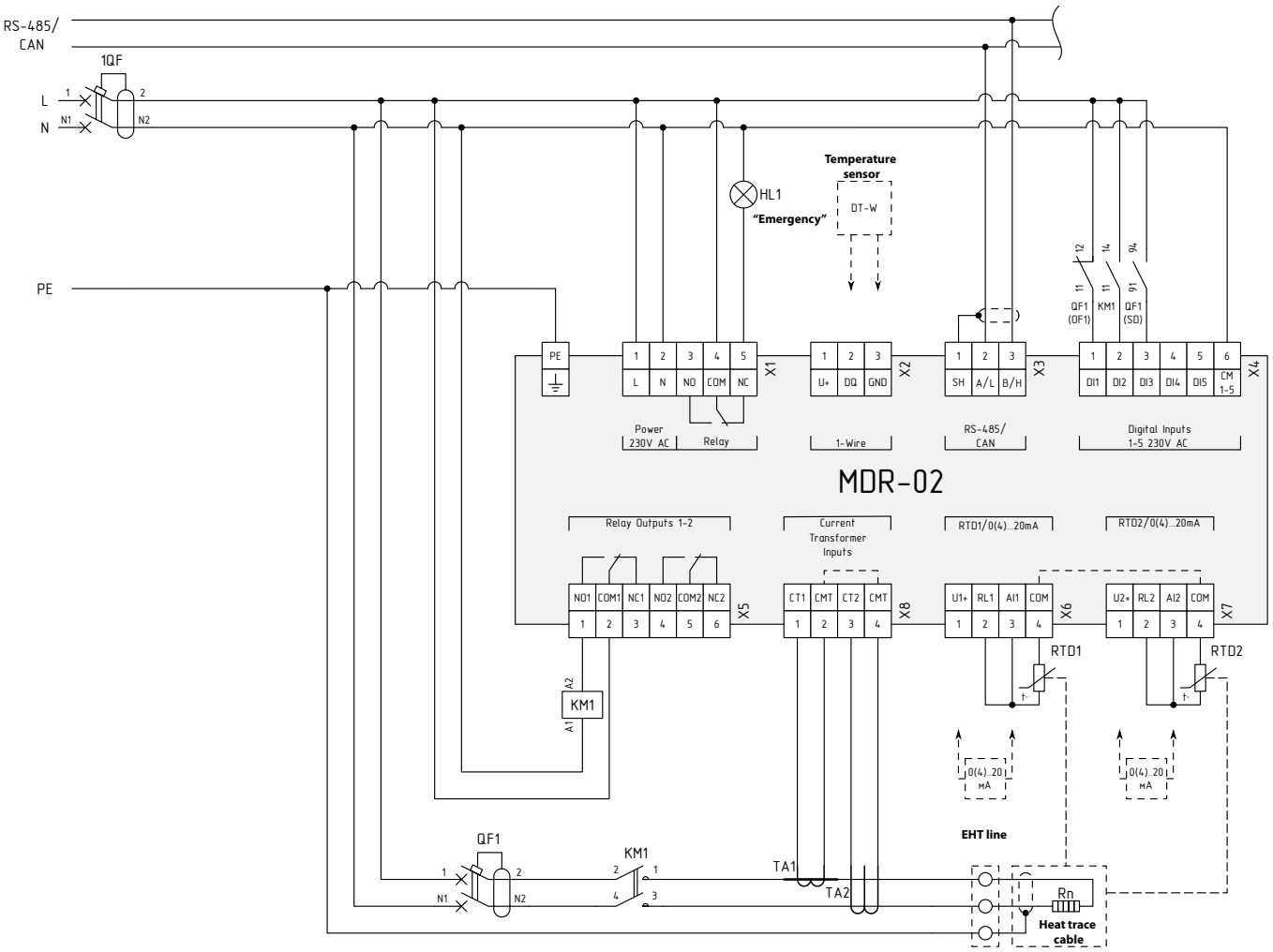
MDR-02 Temperature Control

GENERAL SPECIFICATION

Measurements	
RTD analog inputs	
Input channels	**2**
Sensor hookup	**Three-wire**
Types of supported sensors	**50M/100M/PT50/PT100/PT1000/50П/100П/100H**
Allowable basic percent error limits for temperature measurements, max	**0,2 %**
Analog input 0(4) to 20 mA DC	
Input channels	**2**
Current range	**0 to 22 mA**
Allowable basic percent error limits for amperage measurements, max	**0,1 %**
Analog input 0 to 50 mA AC	
Current range	**0 to 50 mA**
Allowable basic percent error limits for for amperage measurements, max	**0,2 %**
Discrete input	
Input channels	**5**
AC logic high (1)	**90 to 244 V**
AC logic low (0)	**0 to 40 V**
Control	
Control channels	
Channels	**2**
Type	**Relay, toggle**
AC load capacity, A, max	**0 to 16 A (30 A for 4 s)**
AC switching voltage	**0 to 250 V**
Communication interfaces & protocols	
Type	**RS-485/CAN**
Nr.	**1**
Data protocols	**Modbus RTU/CANopen**
Data rate	**4.8 to 115,2/50 to 1000 kbps**
Power Supply	
Supply voltage	
AC source (frequency)	**85 to 244 V (47 to 63 Hz))**
DC source	**100 to 370 V**
Power consumption, max	**20 VA**
Miscellaneous	
Operating conditions	
Temperature	**-40 to +60** °C
Relative humidity	**30 to 90 %**
Atmospheric pressure	**84 to 106.7 kPa**
Overall dimensions (H×W×D), mm	**96x109x110**
IP rating, body / front panel	**IP30/IP54**
Monochrome OLED resolution	**128x64 pixels**
Weight, kg, max	**0,6 kg**

EXAMPLE OF MDR-02 USE

Single heat tracing line. Heat trace cable switching via an external contactor switch

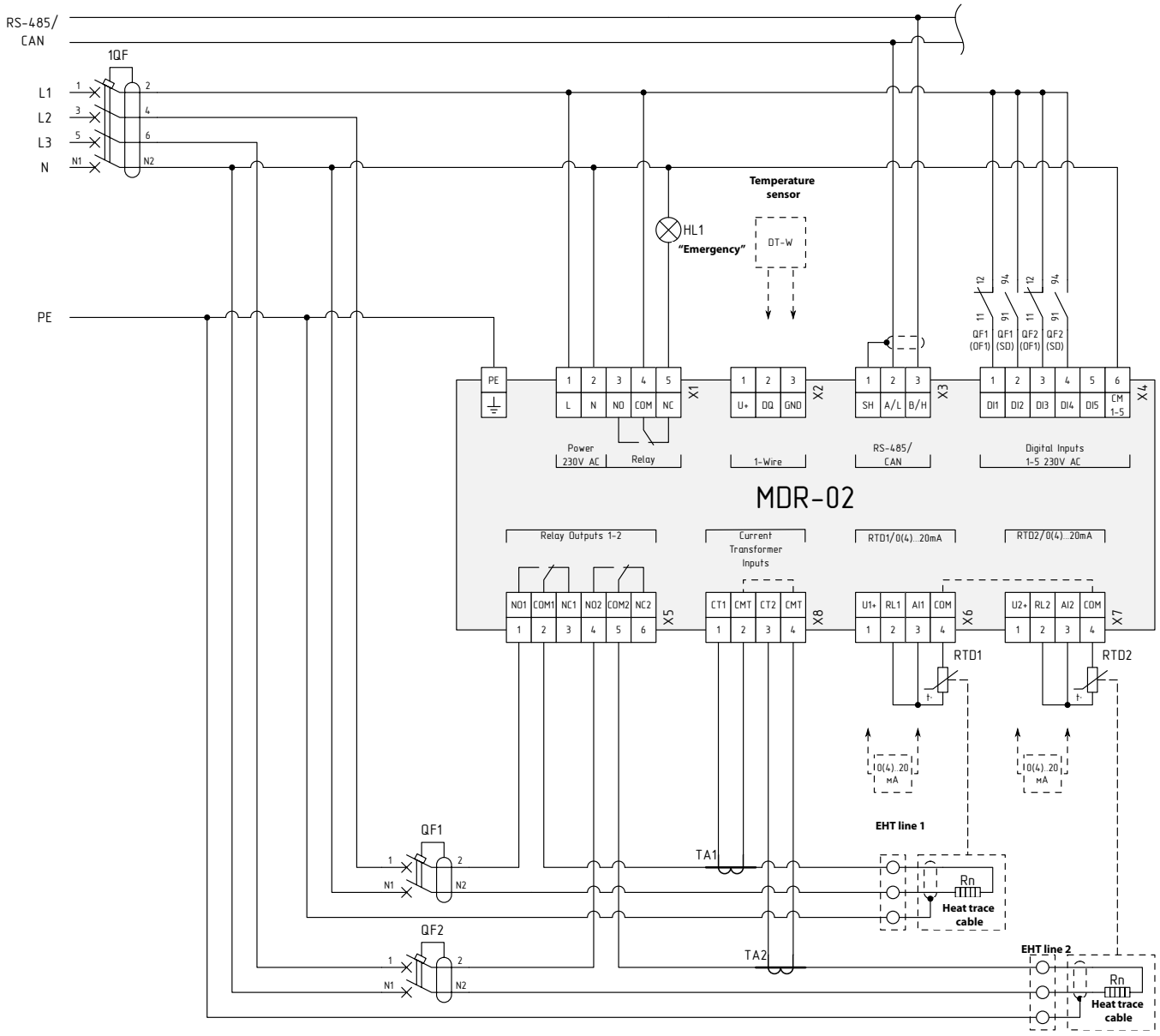


FEATURES

1. Two-point temperature regulation
2. Connectivity for external 1WTS single-wire temperature sensors to measure outdoor air and EHT control cabinet temperature, etc.
3. EHT line load current measurement
4. EHT line leakage current measurement
5. Contactor and automatic switch status monitoring
6. RS-485/CAN communication with control system

EXAMPLE OF MDR-02 USE

Two heat tracing lines. Heat trace cable switching via embedded relays. Note: load current not to exceed 16 A for direct connect scenarios.



FEATURES

1. Connectivity for external 1WTS single-wire temperature sensors to measure outdoor air and EHT control cabinet temperature, etc.
2. EHT line load current measurement
3. Contactor and automatic switch status monitoring
4. RS-485/CAN communication with control system

MexTRACE-RMM-EXE

Temperature Measurement and Conversion Module

DESCRIPTION

A MexTRACE-RMM-EXE type measuring module serves to measures temperature as part of integrated automated EHT control.

MexTRACE-RMM-EXE can accommodate up to twelve (12) Pt100 type sensors for ambient or EHT piping temperature measurements. The modules of this type are connected to the communications cabinet via RS-485, to ensure integrated temperature control. One twisted pair RS-485 cable links up to 32 MexTRACE-RMM-EXE type modules, to enable control of up to 384 external temperature sensors.

MexTRACE-RMM-EXE is supplied as a kit in a X-proof body accommodating a controller and terminals. The housing accommodates two glands to connect and daisy-chain power, two glands to connect and daisy-chain a commuinication cable, ans 12 glands to hook up temperature sensors.

DESIGN

1. X-proof junction box
2. X-proof measuring controller
3. Terminal block
4. Communication cable glands
5. Power feed cable glands
6. Temperature sensor glands

P.O. DETAILS

Please provide the following item number in your P.O. for a MexTRACE-RMM-EXE type temperature measurement and conversion module:

MexTRACE-RMM-EXE

MexTRACE-RMM-EXE

Temperature Measurement and Conversion Module

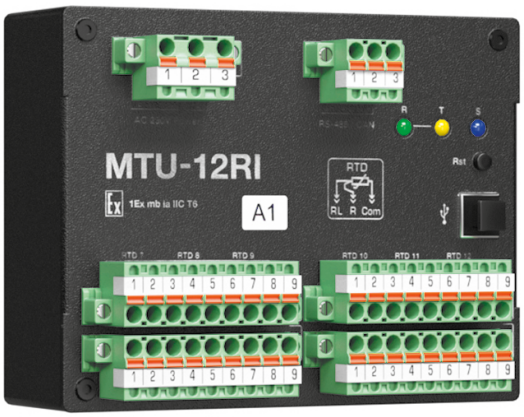
GENERAL SPECIFICATION

Rated voltage	**230 V, 50 Hz**
Earth system	**TN-S, TN-C, TN-C-S**
Measuring lines	**12**
Line type	**Temperature, for Pt100 100 H Cu 100 Cu 50 100 M 50 M Pt 50 50 П 100 П**
Range	**-100...+700°C**
Temperature sensor wiring	**Three-wire**
IP rating	**IP 66**
Interface (interface 2) / protocol	**RS-485(CAN) / ModBus RTU (CANopen)**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # RU C-RU. AM02.B.00688/22, 1Ex eb mb [ia Ga] IIC T6 Gb X, Ex tb IIIC T85°C Db X**
Overall dimensions WxHxD	**271x280x145 mm**

MARKING

Item #
MexTRACE-RMM-EXE

MTU-12RI EX MEASURING CONTROLLER (MAY BE DELIVERED SEPARATELY)



A measuring controller is an explosion proof input device for RTD sensor signal pre-processing, intended for use in automated EHT systems.

The product is applicable in explosive gas environments (gas group IIC). The measuring channels are Ex ia (intrinsically safe) protected.

Data exchange with the monitoring / control system is provided via RS-485/CAN serial interfaces. Any setting and modes, and firmware updates are possible via a USB service port.

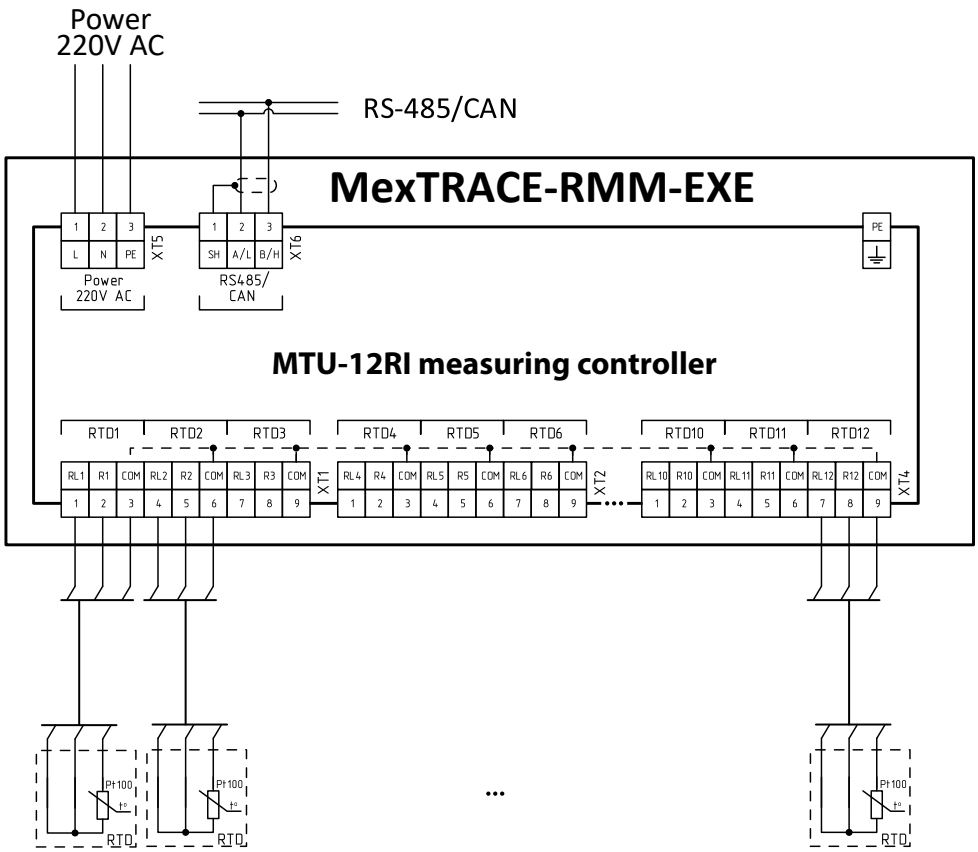
P.O. DETAILS

Please provide the following item number in your P.O. for a measuring controller:
MTU-12RI Ex

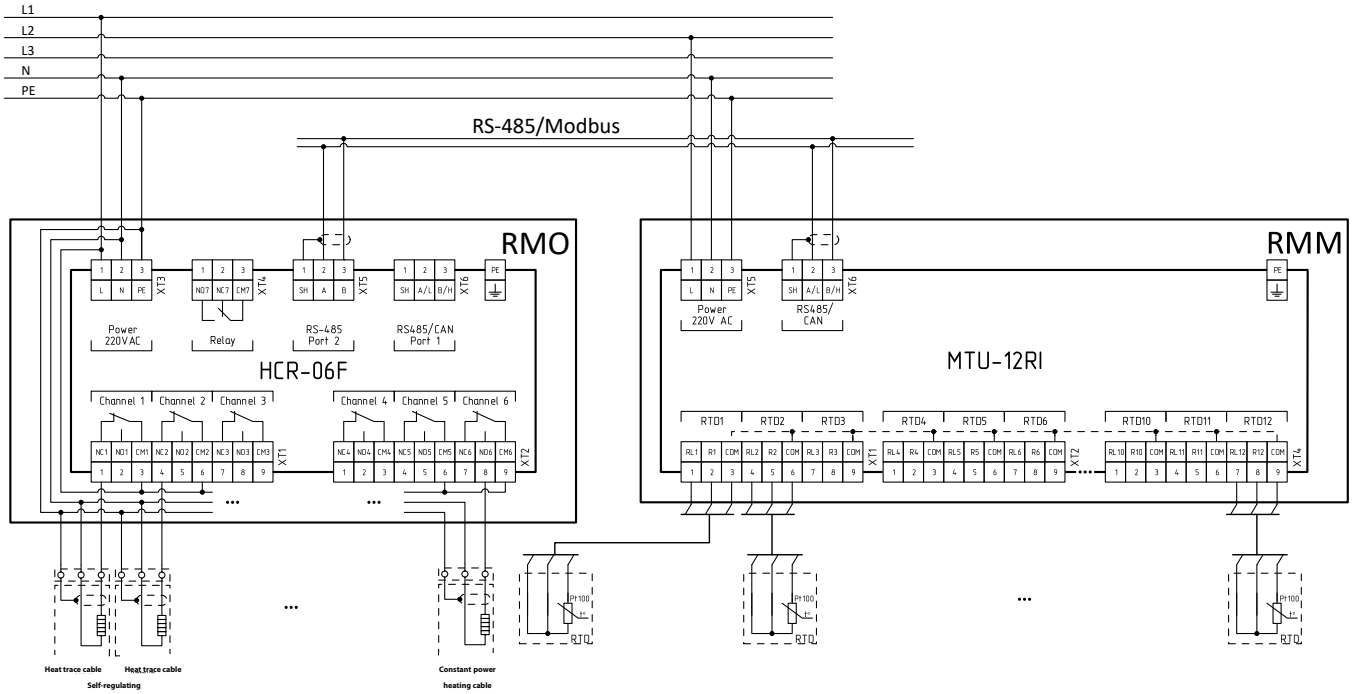
MexTRACE-RMM-EXE

Temperature Measurement and Conversion Module

CIRCUIT DIAGRAM (EXAMPLE)



EXAMPLE OF MEXTRACE-RMM-EXE APPLICATION AS A SMART MEASUREMENT MODULE FOR A CONTROL MODULE



Equipment

MexTRACE-PT100-EXE

Temperature Sensor for Hazardous Areas

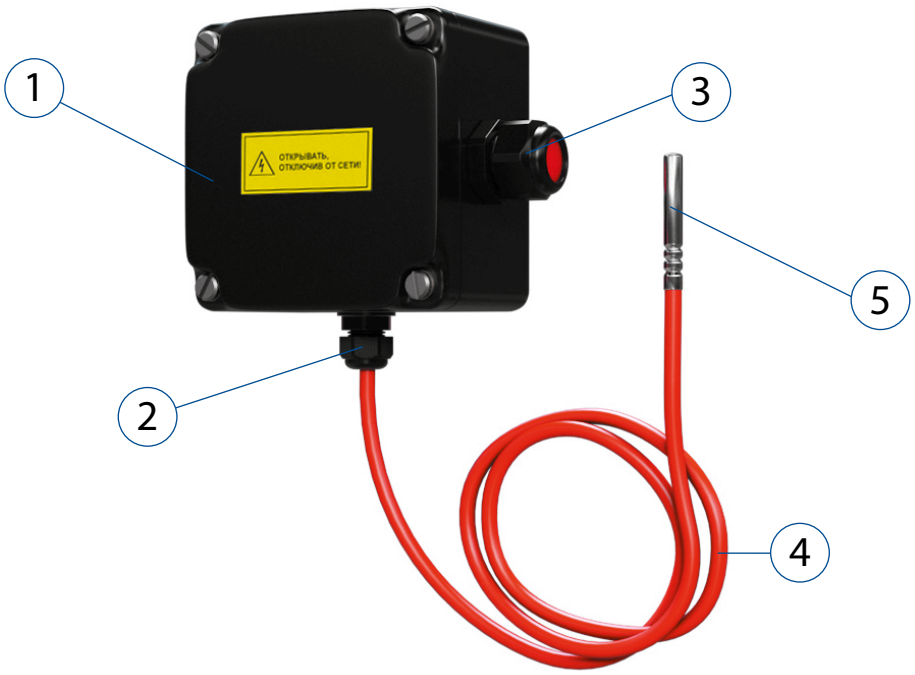
260°C

DESCRIPTION

An Ex temperature sensor is used in centralized process control systems for measuring the temperature of the facilities, measuring at temperatures of +260 °C max.

A MexTRACE-PT100-EXE type Ex temperature sensor is supplied as a kit comprising a temperature sensor, a connection kit and an X-proof junction box accommodating terminal blocks.

DESIGN



1. X-proof junction box
2. Sensor cable gland
3. Control cable gland
4. Temperature sensor flexible cable
5. Temperature sensing element

P.O. DETAILS

Please provide the item number in your P.O. for a temperature sensor using the Marking table below. E.g., a P.O. for a 4-20 mA MexTRACE-PT-100-EXE Ex temperature sensor kit should have the following item number:

MexTRACE-PT100.4/20-EXE

MexTRACE-PT100-EXE

Temperature Sensor for Hazardous Areas

GENERAL SPECIFICATION

Temperature range	**-60°C...+260°C**
Ambient temperature	**-60°C...+55°C**
Sensor Type Standard	**Standard Pt 100**
Sensor accuracy	**Class B**
IP rating	**IP 66**
Hazardous area classification	**Hazardous area (class 1 or 2), normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, # EAEU RU C-RU. HA67.B.00180/21, 1ExeiaIICT6Gb X , 1ExdiaIICT6Gb X, ExtbIIICT85°CDb X**

MARKING

Item #	Sensor type	4-20 mA output	Description
MexTRACE-PT100-EXE	**PT100**		**Temperature sensor in assembly with 1. X-proof junction box 2. Sensor cable gland 3. Control cable gland 4. Temperature sensor flexible cable (1 m) 5. Sleeved RTD**
MexTRACE-PT100.4/20-EXE	**PT100**	**+**	**MexTRACE-PT100-EXE in assembly with a resistance to 4-20 mA signal converter**
MexTRACE-PT100-EXEнв	**PT100**		**MexTRACE-PT100-EXE without a flexible sensor cable**
MexTRACE-PT100.4/20-EXEнв	**PT100**	**+**	**MexTRACE-PT100-EXEнв in assembly with a resistance to 4-20 mA signal converter**
MexTRACE-PT100-EXE-SE	**PT100**		**Temperature sensor (temperature sensing element) in assembly with 1. Temperature sensor flexible cable (1 m) 2. Sleeved RTD**
MexTRACE-PT100-EXE-G	**PT100**		**MexTRACE-PT100-EXE Temperature Sensor with an outlet for CK-IEK.F-TD. Used for open air area temperature control. For unit size 182, an X-proof box is provided.**

MexTRACE-PT100-EXE-1

Temperature Sensor for Hazardous Areas

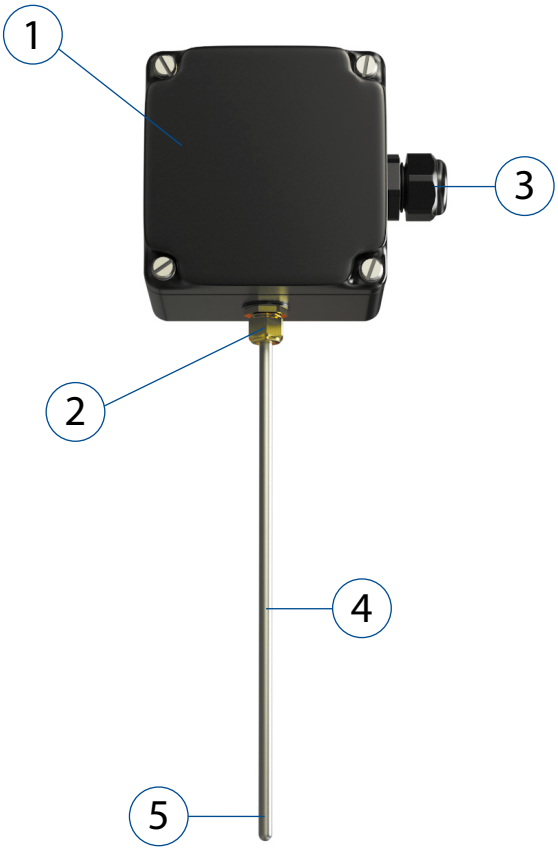
550°C

DESCRIPTION

An Ex temperature sensor is used in centralized process control systems for measuring the temperature of the facilities, measuring at temperatures of +550 °C max.

a MexTRACE-PT100-EXE-1 type Ex sensor is supplied as a kit comprising a temperature sensor, a connection kit and an X-proof junction box accommodating terminal blocks.

DESIGN



1. X-proof junction box
2. Sensor cable gland
3. Control cable gland
4. Temperature sensor flexible section
5. Temperature sensing element

P.O. DETAILS

Please provide the following item number in your P.O. for a temperature sensor using the Marking table below. E.g., a P.O. for a 4-20 mA MexTRACE-PT-100-EXE-1 type Ex high temperature sensor should have the following item number:

MexTRACE-PT100.4/20-EXE-1

MexTRACE-PT100-EXE-1

Temperature Sensor for Hazardous Areas

GENERAL SPECIFICATION

Temperature range	**-60°C...+550°C**
Ambient temperature	**-60°C...+55°C**
Sensor Type Standard	**Standard Pt 100**
Sensor accuracy	**Class B**
IP rating	**IP 66**
Hazardous area classification	**Hazardous area (class 1 or 2), normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, #EAEU RU C-RU. HA67.B.00180/21, 1ExeiaIICT6Gb X , 1ExdiaIICT6Gb X, ExtbIIICT85°CDb X**

MARKING

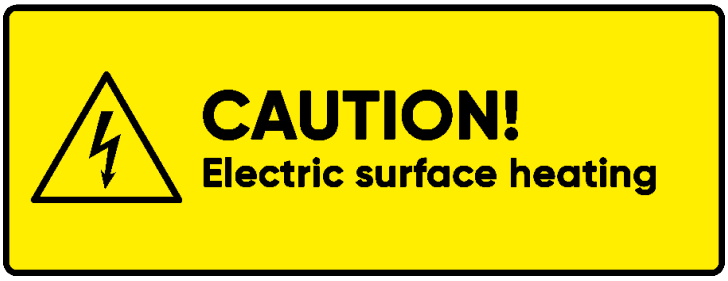
Item #	Sensor type	4-20 mA output	Description
MexTRACE-PT100-EXE-1	**PT100**		**Temperature sensor in assembly with 1. X-proof junction box; 2. Sensor cable gland; 3. Control cable gland; 4. Temperature sensor flexible section (1 m); 5. Temperature sensing element.**
MexTRACE-PT100.4/20-EXE-1	**PT100**	**+**	**MexTRACE-PT100-EXE in assembly with a resistance to 4-20 mA signal converter**
MexTRACE-PT100-EXE-1-SE	**PT100**		**Temperature sensor (temperature sensing element) in assembly with 1. Temperature sensor flexible section with a cable gland (1 m) 2. Temperature sensing element**

LAB-01 Warning Sticker

DESCRIPTION

A sticker made of PP film with an adhesive layer. Weather and temperature-resistant. The label is attached to a heat traced line every 6 meters. The warning can be issued in four languages.

GENERAL VIEW



GENERAL SPECIFICATION

Size	**77x200 mm**
Material	**PP NG Top White film with rubber-based adhesive S445 (adhesive range -40 °C / +70 °C)**
Min application temperature	**-5°C**

MARKING

Item #	Marking language
LAB-01	**Russian**
LAB-02	**English**
LAB-03	**French**
LAB-04	**German**

P.O. DETAILS

Please provide the item number in your P.O. for a warning label using the Marking table below. E.g.:
LAB-02

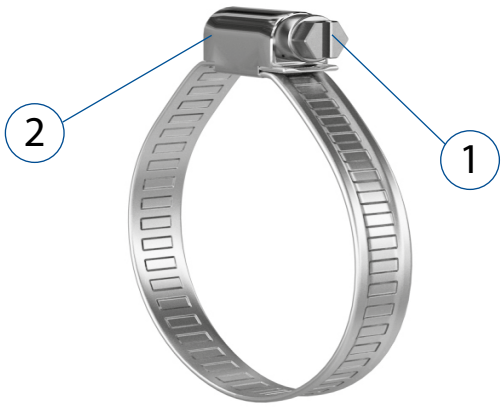
**Customer information may be added*

CK-BUC Mounting Strap Screw

DESCRIPTION

A mounting strap screw is used to tighten metal straps. It consists of a Ni-plated steel bushing and a galvanized steel screw. The bushing is slipped over a metal strap, the screw is driven into the bushing tightening the strap.

GENERAL VIEW



The product includes:

1. Screw
2. Metal bushing

MARKING

Item #
CK-BUC

P.O. DETAILS

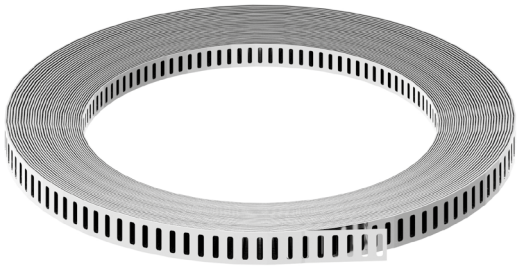
Please provide the following item number in your P.O. for a CK-BUC mounting strap screw:
CK-BUC

CK-PFS Mounting Strap Tape

DESCRIPTION

Metal straps are used to attach integrated power in units, junction boxes and end terminations onto piping (on top of lagging), and support brackets and tubular tails under thermal insulation.

GENERAL VIEW



GENERAL SPECIFICATION

Roll length	**30 m**
Material	**Zinc aluminum**

MARKING

Item #
CK-PFS

P.O. DETAILS

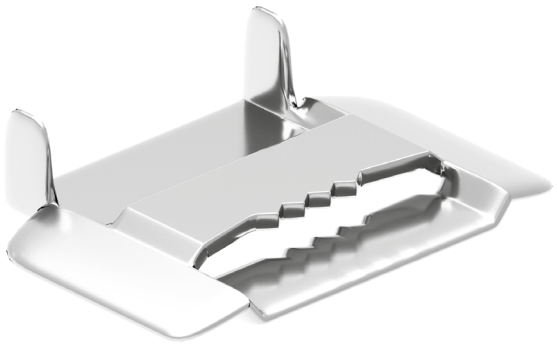
Please provide the following item number in your P.O. for a CK-PFS mounting strap tape:
CK-PFS

CK-STI Mounting Strap Retainer

DESCRIPTION

A mounting strap retainer is used to tighten metal straps.

GENERAL VIEW



MARKING

Item #
CK-STI

P.O. DETAILS

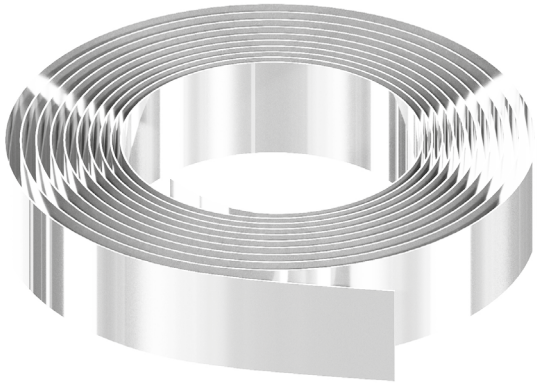
Please provide the following item number in your P.O. for a CK-STI mounting strap retainer:
CK-STI

CK-SBT Mounting Strap Tape

DESCRIPTION

Metal straps are used to attach integrated power in units, junction boxes and end terminations onto piping (on top of lagging), and support brackets and tubular tails under thermal insulation.

GENERAL VIEW



GENERAL SPECIFICATION

Roll length	**30 m**
Material	**Stainless steel**

MARKING

Item #
CK-SBT

P.O. DETAILS

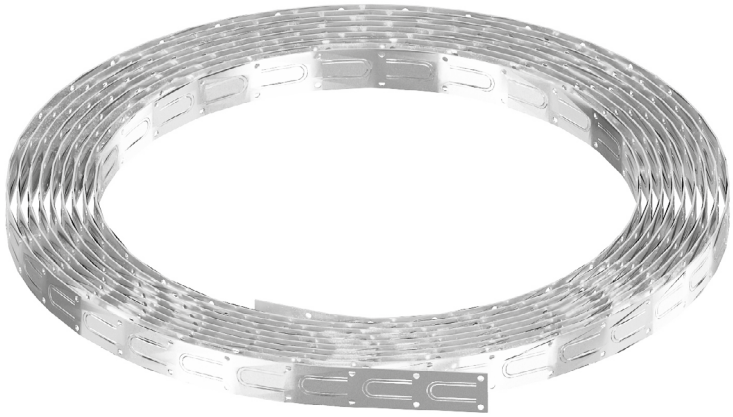
Please provide the following item number in your P.O. for a CK-SBT mounting strap tape:
CK-SBT

H-spacer Attachment Strap

DESCRIPTION

A strap is used to attach heat trace cables onto walls, tanks, vessels etc.

GENERAL VIEW



GENERAL SPECIFICATION

Min installation temperature	**-60°C**
Max operation temperature	**700°C**
Width	**20 mm**
Thickness	**550 µm**
Clamp pitch	**25 mm**
Roll length	**10 m**

MARKING

Item #
H-spacer

P.O. DETAILS

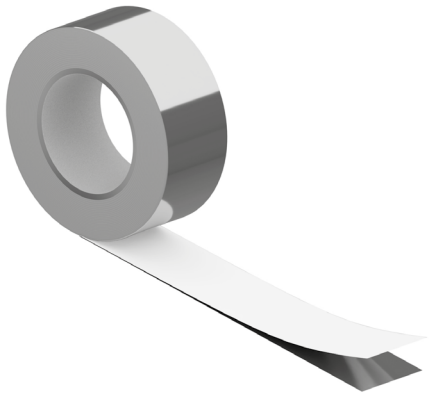
Please provide the following item number in your P.O. for an H-spacer strap:
H-spacer

AT-75 Al Tape

DESCRIPTION

An aluminium tape is used to attach heat trace cables and temperature sensors to piping and equipment. The product can withstand temperatures of 300°C max.

GENERAL VIEW



GENERAL SPECIFICATION

Min installation temperature	**0°C**
Max operation temperature	**300°C**
Tape thickness for AT-75/100	**100 µm**
Tape thickness for AT-75/100-50	**50 µm**
Roll length	**50 m**

MARKING

Item #	Width
AT-75/100	**75 mm**
AT-75/100-50	**50 mm**

P.O. DETAILS

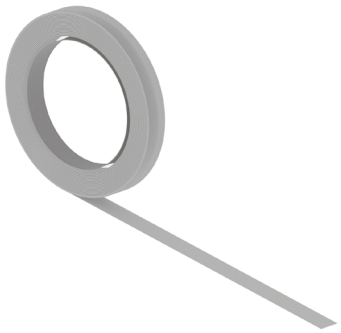
Please provide the following item number in your P.O. for an Al tape:
AT-75/100
AT-75/100-50

FT/HTP Fiberglass Tape

DESCRIPTION

A fibreglass tape is used to attach polymer-insulated heating elements.

GENERAL VIEW



GENERAL SPECIFICATION

Min installation temperature	**up to -20°C**
Max exposure temperature	**260°C**
Width	**11 mm**
Roll length	**50 m**

MARKING

Item #
FT/HTP

P.O. DETAILS

Please provide the following item number in your P.O. for an FT/HTP fibreglass tape:
FT/HTP

RMI-IW Installation Wire

DESCRIPTION

Installation wire is used to attach mineral insulated heat trace cables.

GENERAL VIEW

GENERAL SPECIFICATION

Material	**Steel**

MODIFICATIONS

RMI-IW installation wire is available in a few modifications depending on the material used. The respective material is identified with a Roman letter index at the end of the item number.

The material is consistent with the following marking:
Galvanized.....**RMI-IW.Z**
Stainless steel.....**RMI-IW.S**

Wire size is identified with a digit at the end of the item number.

The cross section is consistent with the following marking:
0,8 mm.....**RMI-IW.Z-0,8**
1,4 mm.....**RMI-IW.S-1,4**
1,5 mm.....**RMI-IW.Z-1,5**

MARKING

Item #	Roll length, m
RMI-IW.Z-0,8	**95**
RMI-IW.Z-1,5	**25**
RMI-IW.S-0,8	**95**
RMI-IW.S-1,4	**100**

P.O. DETAILS

Please provide the following item number in your P.O. for a 0.8 mm RMI-IW SS wire:
RMI-IW.S-0,8

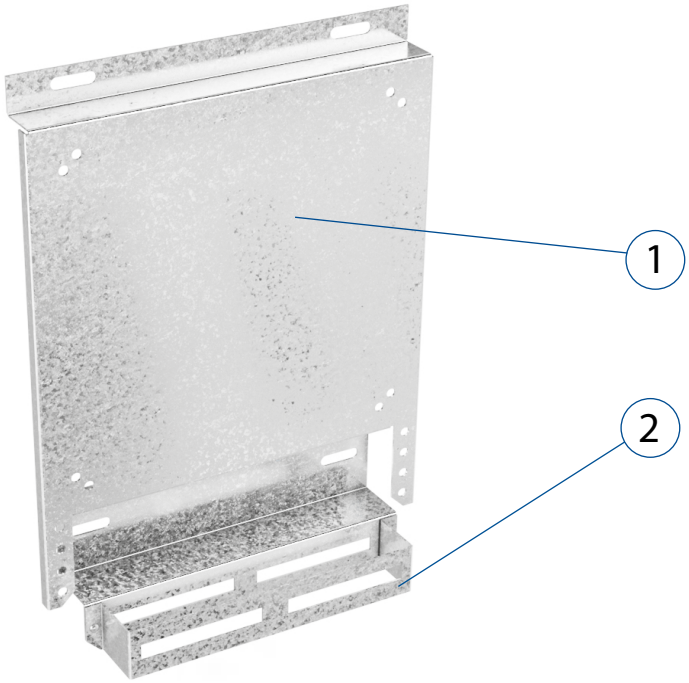
SF-MHB-6 Power Junction Box Frame

DESCRIPTION

The frame is used to attach a 280 sized power junction box, a typical MexTRACE-MHB-6 box, a MexTRACE-RMO-EXE-06 thermostat, or a MexTRACE-RMM-EXE temperature measurement and conversion module.

** sizes may vary upon Customer's demand*

DESIGN



1. Junction box attachment base
2. Attachment clip for appropriate wires

MARKING

Item #
SF-MHB-6

P.O. DETAILS

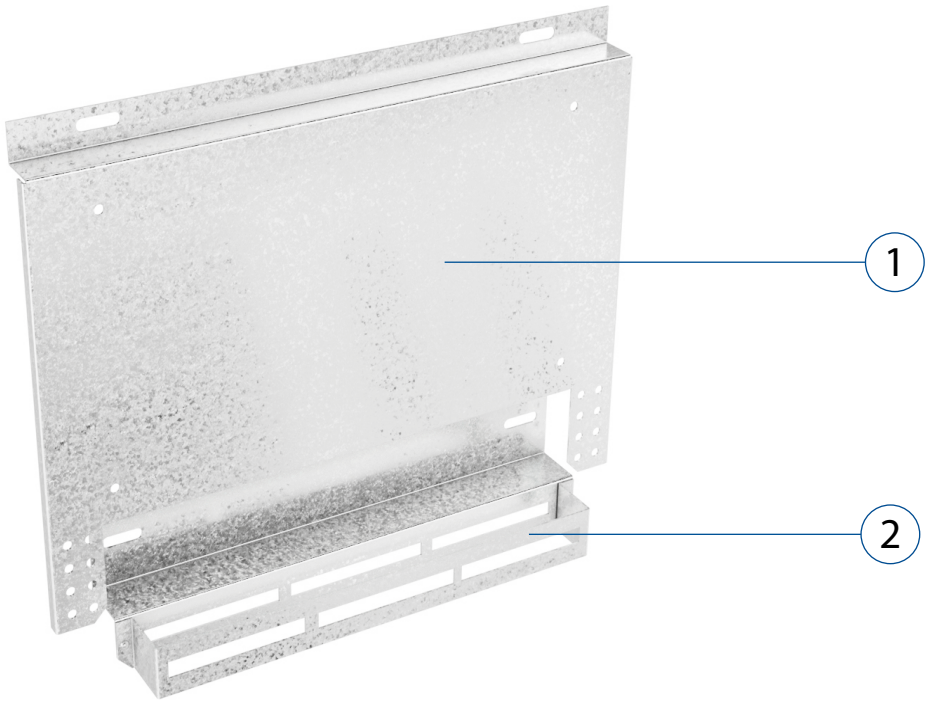
Please provide the following item number in your P.O. for a SF-MHB-6 power junction box frame:
SF-MHB-6

SF-MHB-12 Power Junction Box Frame

DESCRIPTION

The frame is used to attach a power junction box.
Compatibility: **MexTRACE-MHB and MexTRACE-HB sizes: 400, 544**
** the dimensions are subject to change upon the customer request.*

DESIGN



1. Junction box attachment base
2. Attachment clip for appropriate wires

MARKING

Item #
SF-MHB-12

P.O. DETAILS

Please provide the following item number in your P.O. for a SF-MHB-12 power junction box frame:
SF-MHB-12

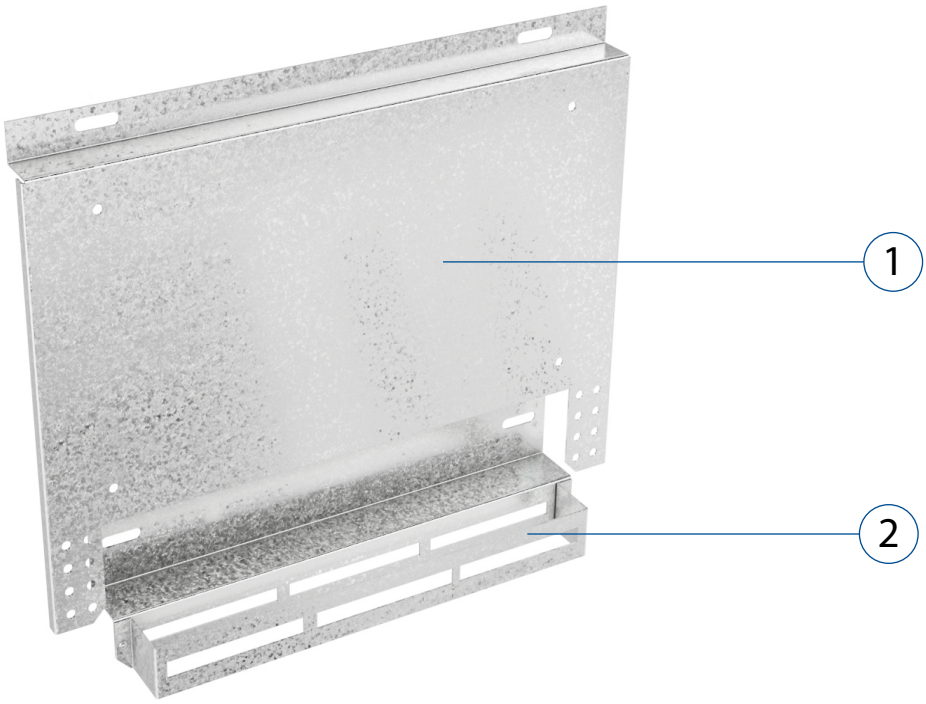
SF-RMM-EXE Measurement & Control Module Frame

DESCRIPTION

The frame is used to attach a smart measurement and control module, or a smart distribution and control module. Compatibility: **MexTRACE-RMO-EXE, MexTRACE-RMM-EXE**

** sizes may vary upon Customer's demand*

DESIGN



1. Measurement and control module base
2. Attachment clip for appropriate wires

MARKING

Item #
SF-RMM-EXE

P.O. DETAILS

Please provide the following item number in your P.O. for a SF-RMM-EXE measurement and control module frame:
SF-RMM-EXE

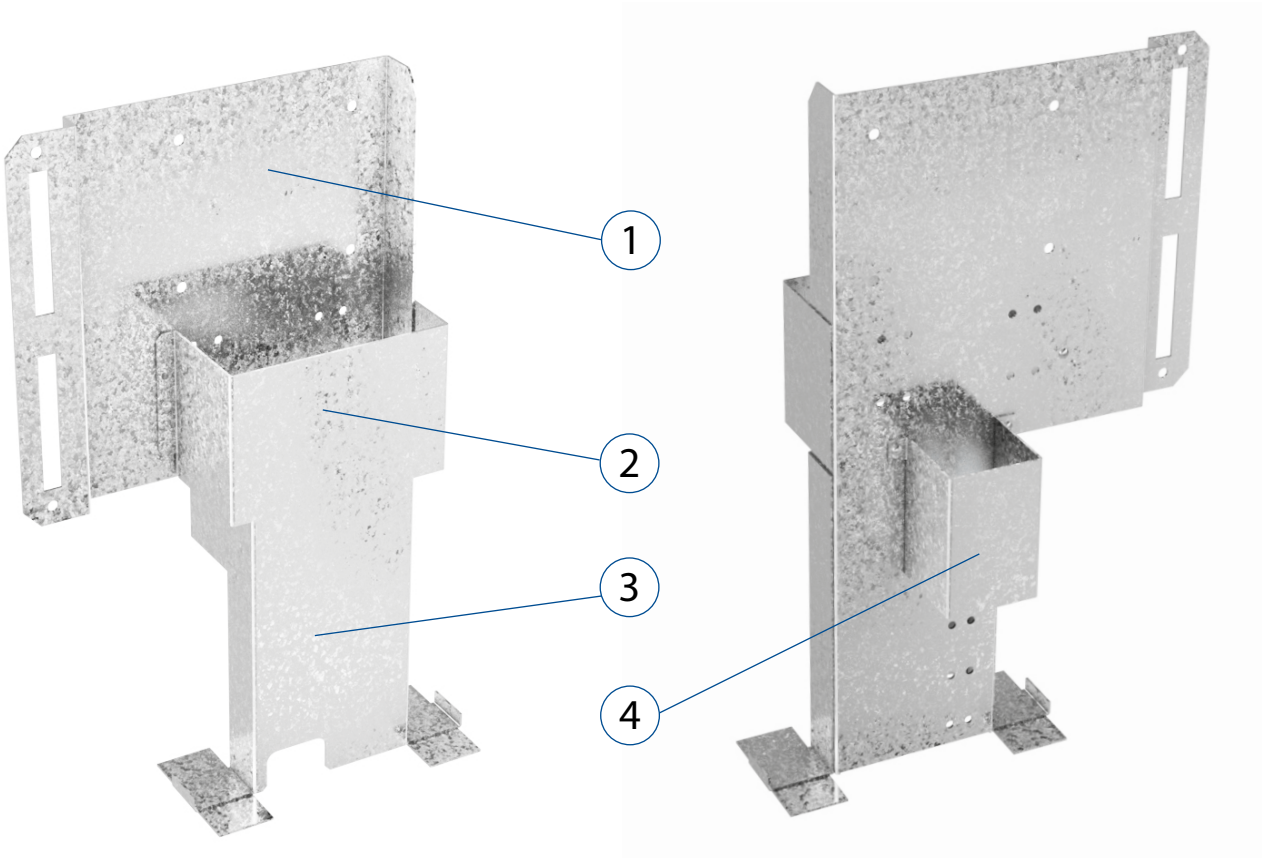
CK-126 Support Bracket (Multi-Purpose)

DESCRIPTION

Brackets are used to attach devices like power junction boxes or temperature sensors onto pipelines. A bracket is designed in a way that all incoming and outgoing cables are shielded to prevent any incidental damage. Support brackets are installed with mounting clamps that are not in the scope of supply.

Compatibility: **MexTRACE-MHB, MexTRACE-HB with sizes: 122, 182 and MexTRACE-PT100**

DESIGN



1. Power box attachment base
2. Power box gland shield
3. Bracket support with an internal cable duct
4. Temperature sensor box gland shield

MARKING

Item #
CK-126

P.O. DETAILS

Please provide the following item number in your P.O. for a CK-126 bracket:
CK-126

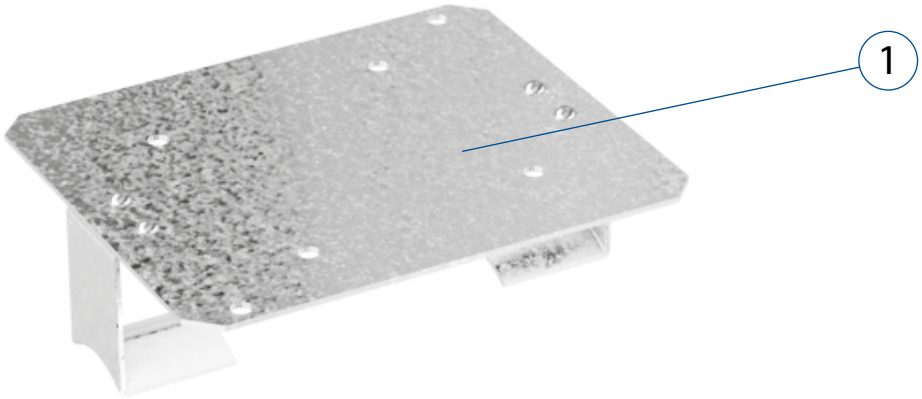
CK-101 Support Bracket

DESCRIPTION

Brackets are used to attach devices like power junction boxes and temperature sensors onto impulse lines (except for PI) and instrument cabinets. A support bracket is made of galvanized steel. Distance between pipe and plate: 50 mm. Support brackets are mounted using clamps that are not in the scope of supply.

Compatibility: **MexTRACE-MHB, MexTRACE-HB with sizes: 122, 182**

DESIGN



1. Support bracket

MARKING

Item #
CK-101

P.O. DETAILS

Please provide the following item number in your P.O. for a CK-101 support bracket:
CK-101

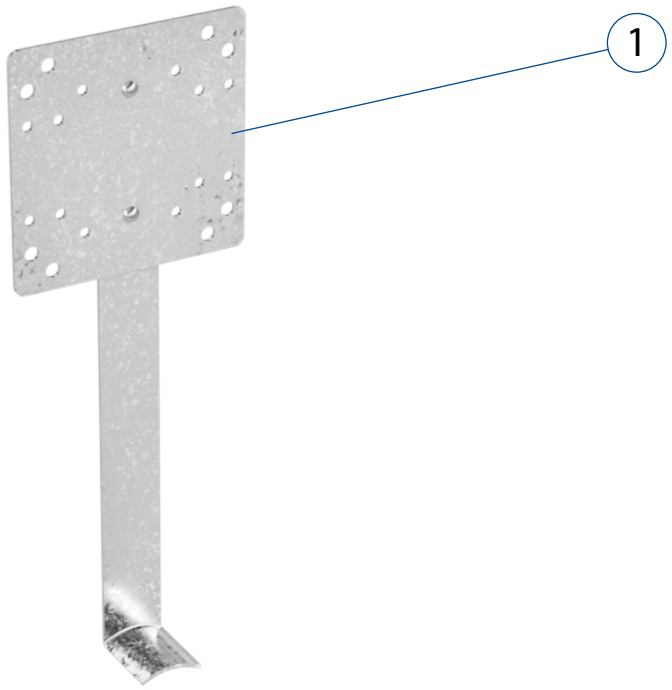
CK-26 Support Bracket for Temperature Sensor

DESCRIPTION

Support brackets are used to attach instruments like temperature sensors onto pipelines. A support bracket is made of galvanized steel. Distance between pipe and plate: 160 mm. Support brackets are mounted using clamps that are not in the scope of supply.

Compatibility: **MexTRACE-PT100-EXE**

DESIGN



1. Support bracket

MARKING

Item #
CK-26

P.O. DETAILS

Please provide the following item number in your P.O. for a CK-26 support bracket for temperature sensor:
CK-26

CK-201 Support Bracket

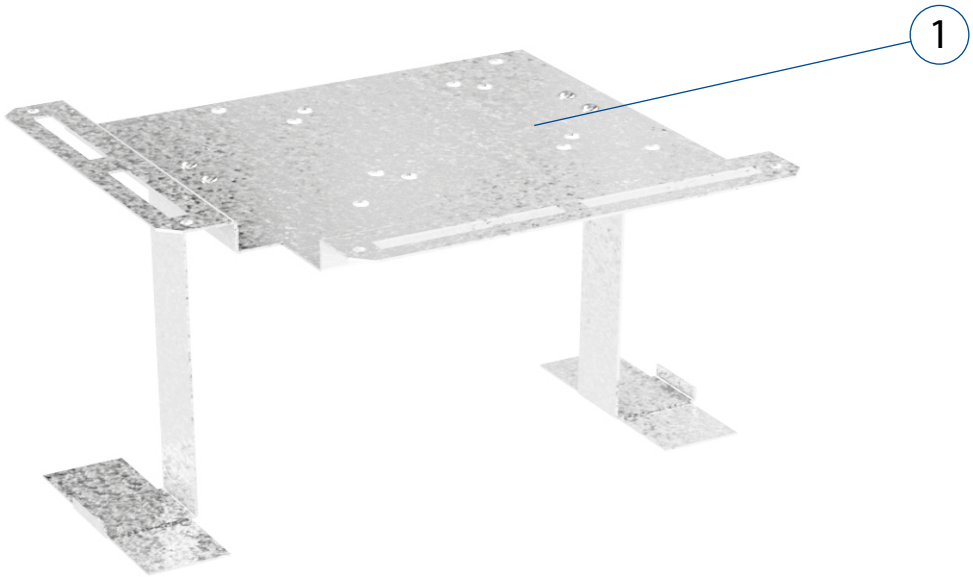
DESCRIPTION

Support brackets are used to attach equipment like power junction boxes onto pipelines. The product is powder coated to make it weatherproof and resistant to mechanical impact. Support brackets are mounted using clamps that are not in the scope of supply.

Compatibility: **MexTRACE-MHB, MexTRACE-HB with sizes: 182**

** sizes may vary upon Customer's demand.*

DESIGN



1. Support bracket

MARKING

Item #
CK-201

P.O. DETAILS

Please provide the following item number in your P.O. for a CK-201 support bracket:
CK-201

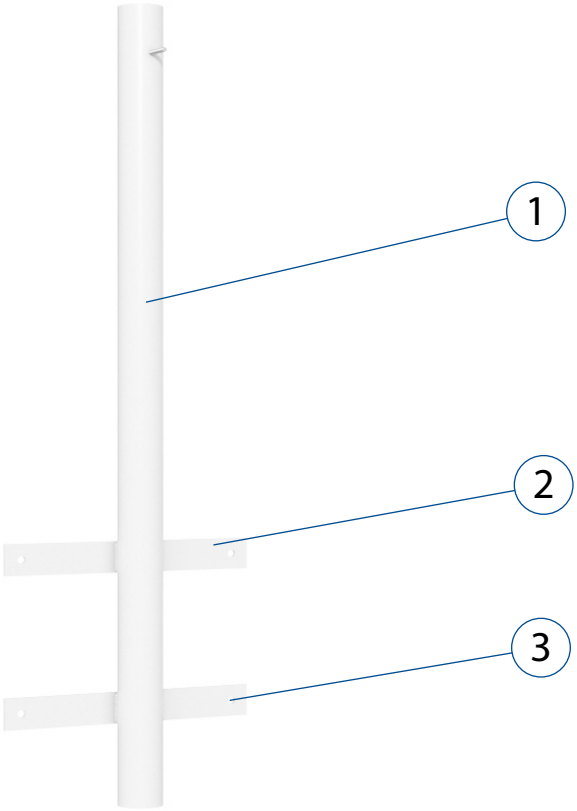
CK-401 Support Bracket

DESCRIPTION

A bracket is a pole used to attach support brackets. The product is suitable for fixing power junction boxes in immediate vicinity of vessels and equipment mounted onto concrete foundations or with curbed edge.

Compatibility: **CK-101, CK-126 and CK-201**

DESIGN



1. Steel pipe
2. Galvanized bar
3. Stud anchor (4 pcs.)

MARKING

Item #
CK-401

P.O. DETAILS

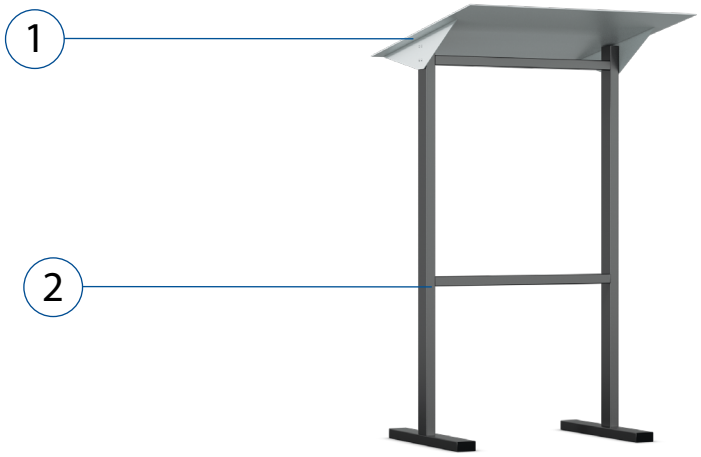
Please provide the following item number in your P.O. for a CK-401 support bracket:
CK-401

SF-K-CUBE Control and Protection Panel Frame

DESCRIPTION

SF-K-CUBE is used with Ex control and protection panels.

DESIGN



1. Shield
2. Frame

GENERAL SPECIFICATION

Frame material	**Galvanized steel DX51D+Z275-M-A 3 mm thick**
Shield material	**Galvanized steel DX51D+Z275-M-A 1.5 mm thick**
Size (WxHxD)	**1545x2259x1088 mm**
Weight	**90 kg**

MARKING

Item #
SF-K-CUBE

P.O. DETAILS

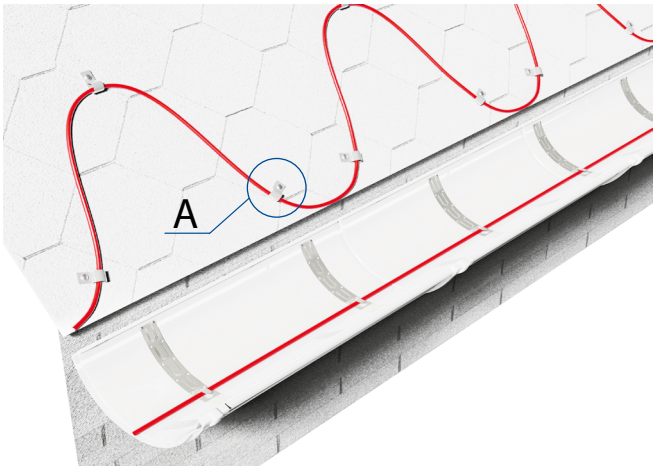
Please provide the following item number in your P.O. for a SF-K-CUBE control and protection panel frame:
SF-K-CUBE

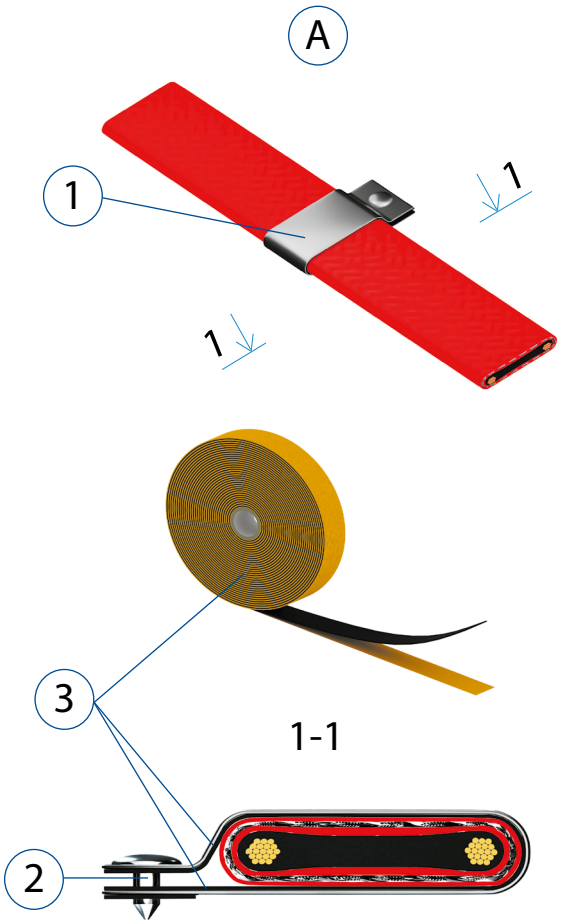
CK-FIX-R Fastener Kit

DESCRIPTION

A fastener kit for roofing and gutter heat tracing (20 pcs./kit)

DESIGN





The kit includes:

1. Galvanized strap (W=20 mm, L=100 mm) with d=4 mm rivet holes (20 pcs.)
2. 3x10 mm rivets (20 pcs.)
3. Butyl rubber tape (W=40 mm, 1.5 mm thick (1 pc.)

MARKING

Item #
CK-FIX-R

P.O. DETAILS

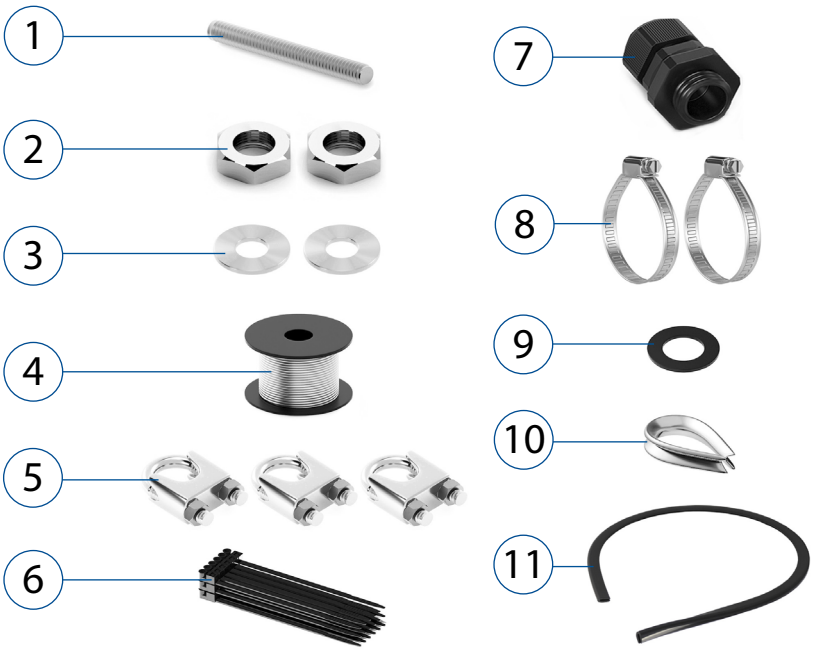
Please provide the following item number in your P.O. for a CK-FIX-R fastener kit:
CK-FIX.R

CK-FIX-G Fastener Kit

DESCRIPTION

A fastener kit is used to fix a heat trace cable in downspouts.

DESIGN



A connection/repair kit includes:

1. M8 threaded pin (0.5 m)
2. M8 nut (2 pcs.)
3. M8 fender washer (2 pcs.)
4. Dia 2 steel wire (20 m)
5. Wire U-clip (3 pcs.)
6. 2.5x100 plastic wire clamp (1 set (100 pcs.))
7. M20 plastic gland (1 pc.)
8. 100-120 mm metal clamp band (2 pcs.)
9. Rubber insert (1 pc.)
10. Thimble (1 pc.)
11. Edge protector (1 m)

MARKING

Item #
CK-FIX-G

P.O. DETAILS

Please provide the following item number in your P.O. for a CK-FIX-G fastener kit:
CK-FIX-G

M(ex)DCB Ex Differential Breaker

GENERAL SPECIFICATION

ATEX code for products below 25 A	**1Ex d e IIC T6 Gb X**
ATEX code for products below 40 A	**1Ex d e IIC T5 Gb X**
Rated breaking capacity	**6 kA**
Type	**AC - alternating current, A - alternating and pulsed direct current**
Operating ambient temperature	**-20 to +50 °C**
Storage temperature	**-20 to +50 °C**
Rated voltage	**230 V**
Auxiliary contacts	**230 V AC/24 V DC**
Rated auxiliary contact current	**1A AC / 1 A DC**
Breaking capacity	**as per data sheets**
Rated impulse withstand voltage	**as per data sheets**
Switching wear resistance	**10000**
Mechanical wear resistance	**20000**
Housing Characteristics	
Material	**Fibre reinforced thermoset polyester**
Color	**white**
Dimensions HxWxD	
Modular design 1	**155x67x116 mm**
Modular design 2	**155x83x116 mm**
Orientation	**Vertical, horizontal**

Rated current	Modular design 1					
	Curve: B					
	Rated breaking capacity: 6 kA					
	1P+N					
	Differential protection current and rated residual current					
	A 30 mA	A 100 mA	A 300 mA	AC 30 mA	AC 100 mA	AC 300 mA
6 A	M(ex)DCB-1P+N-6-B-A-30-6	M(ex)DCB-1P+N-6-B-A-100-6	M(ex)DCB-1P+N-6-B-A-300-6	M(ex)DCB-1P+N-6-B-AC-30-6	M(ex)DCB-1P+N-6-B-AC-100-6	M(ex)DCB-1P+N-6-B-AC-300-6
10 A	M(ex)DCB-1P+N-10-B-A-30-6	M(ex)DCB-1P+N-10-B-A-100-6	M(ex)DCB-1P+N-10-B-A-300-6	M(ex)DCB-1P+N-10-B-AC-30-6	M(ex)DCB-1P+N-10-B-AC-100-6	M(ex)DCB-1P+N-10-B-AC-300-6
16 A	M(ex)DCB-1P+N-16-B-A-30-6	M(ex)DCB-1P+N-16-B-A-100-6	M(ex)DCB-1P+N-16-B-A-300-6	M(ex)DCB-1P+N-16-B-AC-30-6	M(ex)DCB-1P+N-16-B-AC-100-6	M(ex)DCB-1P+N-16-B-AC-300-6
20 A	M(ex)DCB-1P+N-20-B-A-30-6	M(ex)DCB-1P+N-20-B-A-100-6	M(ex)DCB-1P+N-20-B-A-300-6	M(ex)DCB-1P+N-20-B-AC-30-6	M(ex)DCB-1P+N-20-B-AC-100-6	M(ex)DCB-1P+N-20-B-AC-300-6
25 A	M(ex)DCB-1P+N-25-B-A-30-6	M(ex)DCB-1P+N-25-B-A-100-6	M(ex)DCB-1P+N-25-B-A-300-6	M(ex)DCB-1P+N-25-B-AC-30-6	M(ex)DCB-1P+N-25-B-AC-100-6	M(ex)DCB-1P+N-25-B-AC-300-6
32 A	M(ex)DCB-1P+N-32-B-A-30-6	M(ex)DCB-1P+N-32-B-A-100-6	M(ex)DCB-1P+N-32-B-A-300-6	M(ex)DCB-1P+N-32-B-AC-30-6	M(ex)DCB-1P+N-32-B-AC-100-6	M(ex)DCB-1P+N-32-B-AC-300-6
40 A	M(ex)DCB-1P+N-40-B-A-30-6	M(ex)DCB-1P+N-40-B-A-100-6	M(ex)DCB-1P+N-40-B-A-300-6	M(ex)DCB-1P+N-40-B-AC-30-6	M(ex)DCB-1P+N-40-B-AC-100-6	M(ex)DCB-1P+N-40-B-AC-300-6

Rated current	Modular design 1					
	Curve: C					
	Rated breaking capacity: 6 kA					
	1P+N					
	Differential protection current and rated residual current					
	A 30 mA	A 100 mA	A 300 mA	AC 30 mA	AC 100 mA	AC 300 mA
6 A	M(ex)DCB-1P+N-6-C-A-30-6	M(ex)DCB-1P+N-6-C-A-100-6	M(ex)DCB-1P+N-6-C-A-300-6	M(ex)DCB-1P+N-6-C-AC-30-6	M(ex)DCB-1P+N-6-C-AC-100-6	M(ex)DCB-1P+N-6-C-AC-300-6
10 A	M(ex)DCB-1P+N-10-C-A-30-6	M(ex)DCB-1P+N-10-C-A-100-6	M(ex)DCB-1P+N-10-C-A-300-6	M(ex)DCB-1P+N-10-C-AC-30-6	M(ex)DCB-1P+N-10-C-AC-100-6	M(ex)DCB-1P+N-10-C-AC-300-6
16 A	M(ex)DCB-1P+N-16-C-A-30-6	M(ex)DCB-1P+N-16-C-A-100-6	M(ex)DCB-1P+N-16-C-A-300-6	M(ex)DCB-1P+N-16-C-AC-30-6	M(ex)DCB-1P+N-16-C-AC-100-6	M(ex)DCB-1P+N-16-C-AC-300-6
20 A	M(ex)DCB-1P+N-20-C-A-30-6	M(ex)DCB-1P+N-20-C-A-100-6	M(ex)DCB-1P+N-20-C-A-300-6	M(ex)DCB-1P+N-20-C-AC-30-6	M(ex)DCB-1P+N-20-C-AC-100-6	M(ex)DCB-1P+N-20-C-AC-300-6
25 A	M(ex)DCB-1P+N-25-C-A-30-6	M(ex)DCB-1P+N-25-C-A-100-6	M(ex)DCB-1P+N-25-C-A-300-6	M(ex)DCB-1P+N-25-C-AC-30-6	M(ex)DCB-1P+N-25-C-AC-100-6	M(ex)DCB-1P+N-25-C-AC-300-6
32 A	M(ex)DCB-1P+N-32-C-A-30-6	M(ex)DCB-1P+N-32-C-A-100-6	M(ex)DCB-1P+N-32-C-A-300-6	M(ex)DCB-1P+N-32-C-AC-30-6	M(ex)DCB-1P+N-32-C-AC-100-6	M(ex)DCB-1P+N-32-C-AC-300-6
40 A	M(ex)DCB-1P+N-40-C-A-30-6	M(ex)DCB-1P+N-40-C-A-100-6	M(ex)DCB-1P+N-40-C-A-300-6	M(ex)DCB-1P+N-40-C-AC-30-6	M(ex)DCB-1P+N-40-C-AC-100-6	M(ex)DCB-1P+N-40-C-AC-300-6

Rated current	Modular design 2 Curve: B Rated breaking capacity: 6 kA 1P+N with aux contacts Differential protection current and rated residual current					
	A 30 mA	A 100 mA	A 300 mA	AC 30 mA	AC 100 mA	AC 300 mA
6 A	M(ex)DCB-1P+N-6-B-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-6-B-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-6-B-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-6-B-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-6-B-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-6-B-AC-300-OF+SD(1NO/NC)-6
10 A	M(ex)DCB-1P+N-10-B-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-10-B-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-10-B-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-10-B-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-10-B-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-10-B-AC-300-OF+SD(1NO/NC)-6
16 A	M(ex)DCB-1P+N-16-B-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-16-B-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-16-B-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-16-B-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-16-B-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-16-B-AC-300-OF+SD(1NO/NC)-6
20 A	M(ex)DCB-1P+N-20-B-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-20-B-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-20-B-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-20-B-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-20-B-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-20-B-AC-300-OF+SD(1NO/NC)-6
25 A	M(ex)DCB-1P+N-25-B-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-25-B-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-25-B-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-25-B-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-25-B-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-25-B-AC-300-OF+SD(1NO/NC)-6
32 A	M(ex)DCB-1P+N-32-B-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-32-B-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-32-B-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-32-B-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-32-B-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-32-B-AC-300-OF+SD(1NO/NC)-6
40 A	M(ex)DCB-1P+N-40-B-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-40-B-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-40-B-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-40-B-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-40-B-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-40-B-AC-300-OF+SD(1NO/NC)-6

Rated current	Modular design 2 Curve: C Rated breaking capacity: 6 kA 1P+N with aux contacts Differential protection current and rated residual current					
	A 30 mA	A 100 mA	A 300 mA	AC 30 mA	AC 100 mA	AC 300 mA
6 A	M(ex)DCB-1P+N-6-C-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-6-C-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-6-C-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-6-C-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-6-C-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-6-C-AC-300-OF+SD(1NO/NC)-6
10 A	M(ex)DCB-1P+N-10-C-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-10-C-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-10-C-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-10-C-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-10-C-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-10-C-AC-300-OF+SD(1NO/NC)-6
16 A	M(ex)DCB-1P+N-16-C-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-16-C-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-16-C-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-16-C-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-16-C-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-16-C-AC-300-OF+SD(1NO/NC)-6
20 A	M(ex)DCB-1P+N-20-C-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-20-C-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-20-C-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-20-C-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-20-C-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-20-C-AC-300-OF+SD(1NO/NC)-6
25 A	M(ex)DCB-1P+N-25-C-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-25-C-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-25-C-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-25-C-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-25-C-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-25-C-AC-300-OF+SD(1NO/NC)-6
32 A	M(ex)DCB-1P+N-32-C-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-32-C-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-32-C-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-32-C-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-32-C-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-32-C-AC-300-OF+SD(1NO/NC)-6
40 A	M(ex)DCB-1P+N-40-C-A-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-40-C-A-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-40-C-A-300-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-40-C-AC-30-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-40-C-AC-100-OF+SD(1NO/NC)-6	M(ex)DCB-1P+N-40-C-AC-300-OF+SD(1NO/NC)-6

M(ex)CB Ex Differential Breaker

GENERAL SPECIFICATION

ATEX code for products below 25 A	**1Ex d e IIC T6 Gb X**
ATEX code for products below 40 A	**1Ex d e IIC T5 Gb X**
Rated breaking capacity	**6 kA**
Type	**AC - alternating current, A - alternating and pulsed direct current**
Operating ambient temperature	**-20 to +50 °C**
Storage temperature	**-20 to +50 °C**
Rated operating voltage	
Power contacts 1P	**230/400 V AC**
Power contacts 2P	**400 V AC**
Auxiliary contacts	**230 V AC/24 V DC**
Rated auxiliary contact current	**1 AC /1 A DC**
Tripping characteristics	**B: 3In ≤ Im ≤ 5In C: 5In ≤ Im ≤ 10In**
Breaking capacity	**as per data sheets**
Rated impulse withstand voltage	**as per data sheets**
Switching wear resistance	**below 32 A: 20000; 32 A and more: 10000**
Housing Characteristics	
Material	**Fibre reinforced thermoset polyester**
Color	**White**
Dimensions HxWxD	
Modular design 1	**155x67x116 mm**
Modular design 2	**155x83x116 mm**
Orientation	**Vertical, horizontal**

Rated current	Modular design 1	
	1P	
	Rated breaking capacity: 6 kA	
	Curve	
	B	C
1 A	-	**M(ex)CB-1P-1-C-6**
2 A	-	**M(ex)CB-1P-2-C-6**
4 A	-	**M(ex)CB-1P-4-C-6**
6 A	**M(ex)CB-1P-6-B-6**	**M(ex)CB-1P-6-C-6**
10 A	**M(ex)CB-1P-10-B-6**	**M(ex)CB-1P-10-C-6**
16 A	**M(ex)CB-1P-16-B-6**	**M(ex)CB-1P-16-C-6**
20 A	**M(ex)CB-1P-20-B-6**	**M(ex)CB-1P-20-C-6**
25 A	**M(ex)CB-1P-25-B-6**	**M(ex)CB-1P-25-C-6**
32 A	**M(ex)CB-1P-32-B-6**	**M(ex)CB-1P-32-C-6**
40 A	**M(ex)CB-1P-40-B-6**	**M(ex)CB-1P-40-C-6**

Rated current	Modular design 1	
	1P + aux contacts (OF + SD)	
	Rated breaking capacity: 6 kA	
	Curve	
	B	C
1 A	-	**M(ex)CB-1P-1-C-OF+SD-6**
2 A	-	**M(ex)CB-1P-2-C-OF+SD-6**
4 A	-	**M(ex)CB-1P-4-C-OF+SD-6**
6 A	**M(ex)CB-1P-6-B-OF+SD-6**	**M(ex)CB-1P-6-C-OF+SD-6**
10 A	**M(ex)CB-1P-10-B-OF+SD-6**	**M(ex)CB-1P-10-C-OF+SD-6**
16 A	**M(ex)CB-1P-16-B-OF+SD-6**	**M(ex)CB-1P-16-C-OF+SD-6**
20 A	**M(ex)CB-1P-20-B-OF+SD-6**	**M(ex)CB-1P-20-C-OF+SD-6**
25 A	**M(ex)CB-1P-25-B-OF+SD-6**	**M(ex)CB-1P-25-C-OF+SD-6**
32 A	**M(ex)CB-1P-32-B-OF+SD-6**	**M(ex)CB-1P-32-C-OF+SD-6**
40 A	**M(ex)CB-1P-40-B-OF+SD-6**	**M(ex)CB-1P-40-C-OF+SD-6**

Rated current	Modular design 1	
	2P	
	Rated breaking capacity: 6 kA	
	Curve	
	B	C
1 A	-	**M(ex)CB-2P-1-C-6**
2 A	-	**M(ex)CB-2P-2-C-6**
4 A	-	**M(ex)CB-2P-4-C-6**
6 A	**M(ex)CB-2P-6-B-6**	**M(ex)CB-2P-6-C-6**
10 A	**M(ex)CB-2P-10-B-6**	**M(ex)CB-2P-10-C-6**
16 A	**M(ex)CB-2P-16-B-6**	**M(ex)CB-2P-16-C-6**
20 A	**M(ex)CB-2P-20-B-6**	**M(ex)CB-2P-20-C-6**
25 A	**M(ex)CB-2P-25-B-6**	**M(ex)CB-2P-25-C-6**
32 A	**M(ex)CB-2P-32-B-6**	**M(ex)CB-2P-32-C-6**
40 A	**M(ex)CB-2P-40-B-6**	**M(ex)CB-2P-40-C-6**

Rated current	Modular design 2	
	2P + aux contacts (OF + SD)	
	Rated breaking capacity: 6 kA	
	Curve	
	B	C
1 A	-	**M(ex)CB-2P-1-C-OF+SD-6**
2 A	-	**M(ex)CB-2P-2-C-OF+SD-6**
4 A	-	**M(ex)CB-2P-4-C-OF+SD-6**
6 A	**M(ex)CB-2P-6-B-OF+SD-6**	**M(ex)CB-2P-6-C-OF+SD-6**
10 A	**M(ex)CB-2P-10-B-OF+SD-6**	**M(ex)CB-2P-10-C-OF+SD-6**
16 A	**M(ex)CB-2P-16-B-OF+SD-6**	**M(ex)CB-2P-16-C-OF+SD-6**
20 A	**M(ex)CB-2P-20-B-OF+SD-6**	**M(ex)CB-2P-20-C-OF+SD-6**
25 A	**M(ex)CB-2P-25-B-OF+SD-6**	**M(ex)CB-2P-25-C-OF+SD-6**
32 A	**M(ex)CB-2P-32-B-OF+SD-6**	**M(ex)CB-2P-32-C-OF+SD-6**
40 A	**M(ex)CB-2P-40-B-OF+SD-6**	**M(ex)CB-2P-40-C-OF+SD-6**

Rated current	Modular design 2 3P Rated breaking capacity: 6 kA Curve	
	B	C
1 A	-	**M(ex)CB-3P-1-C-6**
2 A	-	**M(ex)CB-3P-2-C-6**
4 A	-	**M(ex)CB-3P-4-C-6**
6 A	**M(ex)CB-3P-6-B-6**	**M(ex)CB-3P-6-C-6**
10 A	**M(ex)CB-3P-10-B-6**	**M(ex)CB-3P-10-C-6**
13 A	**M(ex)CB-3P-13-B-6**	**M(ex)CB-3P-13-C-6**
16 A	**M(ex)CB-3P-16-B-6**	**M(ex)CB-3P-16-C-6**
20 A	**M(ex)CB-3P-20-B-6**	**M(ex)CB-3P-20-C-6**
25 A	**M(ex)CB-3P-25-B-6**	**M(ex)CB-3P-25-C-6**
32 A	**M(ex)CB-3P-32-B-6**	**M(ex)CB-3P-32-C-6**
40 A	**M(ex)CB-3P-40-B-6**	**M(ex)CB-3P-40-C-6**

M(ex)DCB.1 Ex Differential Breaker

GENERAL SPECIFICATION

ATEX code for products below 25 A	**1Ex d e IIC T6 Gb X**
ATEX code for products below 63 A	**1Ex d e IIC T5 Gb X**
Operating ambient temperature	**-20 to +50 °C**
Storage temperature	**-20 to +50 °C**
Rated voltage	**230 V**
Auxiliary contacts	**230 V AC/ 24 V DC**
Rated auxiliary contact current	**1 A AC / 1 A DC**
Breaking capacity	**as per data sheets**
Rated impulse withstand voltage	**as per data sheets**
Switching wear resistance	**10000**
Mechanical wear resistance	**20000**
Housing Characteristics	
Material	**Fibre reinforced thermoset polyester**
Color	**white**
Overall dimensions HxWxD	
Modular design 1	**155x67x116 mm**
Modular design 2	**155x83x116 mm**
Orientation	**Vertical, horizontal**

M(ex)DCB.1 Ex Differential Breaker

P.O. Number	Modular Design	Number of poles	Rated switching current	Differential Protection	Rated Resid Current	Number and type of signal contacts
M(ex)DCB.1-1P+N-25-AC-30	1	1P+N	25 A	AC (sinewave AC earth leakage protection)	30 mA	-
M(ex)DCB.1-1P+N-40-AC-30	1	1P+N	40 A		30 mA	
M(ex)DCB.1-1P+N-25-AC-100	1	1P+N	25 A		100 mA	
M(ex)DCB.1-1P+N-40-AC-100	1	1P+N	40 A		100 mA	
M(ex)DCB.1-1P+N-25-AC-300	1	1P+N	25 A		300 mA	
M(ex)DCB.1-1P+N-40-AC-300	1	1P+N	40 A		300 mA	
M(ex)DCB.1-1P+N-25-A-30	1	1P+N	25 A	A (sinewave AC & pulsating DC earth leakage protection)	30 mA	
M(ex)DCB.1-1P+N-40-A-30	1	1P+N	40 A		30 mA	
M(ex)DCB.1-1P+N-25-A-100	1	1P+N	25 A		100 mA	
M(ex)DCB.1-1P+N-40-A-100	1	1P+N	40 A		100 mA	
M(ex)DCB.1-1P+N-25-A-300	1	1P+N	25 A		300 mA	
M(ex)DCB.1-1P+N-40-A-300	1	1P+N	40 A		300 mA	
M(ex)DCB.1-1P+N-25-AC-30-OF+SD(1NO/NC)	2	1P+N	25 A	AC (sinewave AC earth leakage protection)	30 mA	OF 1CO contact SD 1CO trip indicating contact
M(ex)DCB.1-1P+N-40-AC-30-OF+SD(1NO/NC)	2	1P+N	40 A		30 mA	
M(ex)DCB.1-1P+N-25-AC-100-OF+SD(1NO/NC)	2	1P+N	25 A		100 mA	
M(ex)DCB.1-1P+N-40-AC-100-OF+SD(1NO/NC)	2	1P+N	40 A		100 mA	
M(ex)DCB.1-1P+N-25-AC-300-OF+SD(1NO/NC)	2	1P+N	25 A		300 mA	
M(ex)DCB.1-1P+N-40-AC-300-OF+SD(1NO/NC)	2	1P+N	40 A		300 mA	
M(ex)DCB.1-1P+N-25-A-30-OF+SD(1NO/NC)	2	1P+N	25 A	A (sinewave AC & pulsating DC earth leakage protection)	30 mA	
M(ex)DCB.1-1P+N-40-A-30-OF+SD(1NO/NC)	2	1P+N	40 A		30 mA	
M(ex)DCB.1-1P+N-25-A-100-OF+SD(1NO/NC)	2	1P+N	25 A		100 mA	
M(ex)DCB.1-1P+N-40-A-100-OF+SD(1NO/NC)	2	1P+N	40 A		100 mA	
M(ex)DCB.1-1P+N-25-A-300-OF+SD(1NO/NC)	2	1P+N	25 A		300 mA	
M(ex)DCB.1-1P+N-40-A-300-OF+SD(1NO/NC)	2	1P+N	40 A		300 mA	

M(ex)CON Ex Contactor

GENERAL SPECIFICATION

ATEX code for products below 25 A	**1Ex d e IIC T6 Gb X**
ATEX code for products below 63 A	**1Ex d e IIC T5 Gb X**
Operating ambient temperature	**-20 to +50 °C**
Storage temperature	**-20 to +50 °C**
Rated voltage	
Power contacts 1P	**250 V AC**
Auxiliary contacts	**230 V AC/ 24 V DC**
Rated auxiliary contact current	**2A AC / 1A DC**
Rated impulse voltage	**as per data sheets**
Wear resistance (on-off cycles)	
Switching	**100000**
Connection Characteristics	
Housing Characteristics	
Material	**Fibre reinforced thermoset polyester**
Color	**white**
Dimensions HxWxD	
Modular design 1	**155x63x110 mm**
Modular design 2	**155x79x110 mm**
Orientation	**Vertical, horizontal**

M(ex)CON Ex Contactor

P.O. Number	Modular design	Number and type of power contacts	Number and type of signal contacts	Rated switching current
M(ex)CON-10A-2NO-230AC	**1**	**2 NO**	**-**	**10 A**
M(ex)CON-16A-2NO-230AC	**1**	**2 NO**	**-**	**16 A**
M(ex)CON-20A-2NO-230AC	**1**	**2 NO**	**-**	**20 A**
M(ex)CON-25A-2NO-230AC	**1**	**2 NO**	**-**	**25 A**
M(ex)CON-32A-2NO-230AC	**1**	**2 NO**	**-**	**32 A**
M(ex)CON-40A-2NO-230AC	**1**	**2 NO**	**-**	**40 A**
M(ex)CON-10A-2NO-1NO/1NC-230AC	**2**	**2 NO**	**1 CO**	**10 A**
M(ex)CON-16A-2NO-1NO/1NC-230AC	**2**	**2 NO**	**1 CO**	**16 A**
M(ex)CON-20A-2NO-1NO/1NC-230AC	**2**	**2 NO**	**1 CO**	**20 A**
M(ex)CON-25A-2NO-1NO/1NC-230AC	**2**	**2 NO**	**1 CO**	**25 A**
M(ex)CON-32A-2NO-1NO/1NC-230AC	**2**	**2 NO**	**1 CO**	**32 A**
M(ex)CON-40A-2NO-1NO/1NC-230AC	**2**	**2 NO**	**1 CO**	**40 A**

M(ex)R Ex Relay

GENERAL SPECIFICATION

ATEX code	**1Ex d e IIC T6 Gb X**
Operating ambient temperature	**-20 to +50 °C**
Storage temperature	**-20 to +50 °C**

Contact Part Characteristics

Material of switching contacts	**AgNi**
Max switching voltage	**250 V AC/ 30 V DC**
Max switching current	**5 A**
Rated switching current	**1 A**

Housing Characteristics

Material	**Fibre reinforced thermoset polyester**
Color	**White**

Dimensions HxWxD

Modular design 1	**155x63x110 mm**
Orientation	**vertical, horizontal**

M(ex)R Ex Relay

P.O. Number	Modular design	Rated Controln Voltage Urated	Number and type of contacts	Active Part Characteristics			
				Coil Current	Operate Time	Release time	Lost power
M(ex)R-24-DC-2NO	**1**	**= 24 V**	**2 NO**	**37,5 mA**	**≤20 ms**	**≤20 ms**	**~1,2 W**
M(ex)R-24-DC-3NO	**1**	**= 24 V**	**3 NO**	**37,5 mA**	**≤20 ms**	**≤20 ms**	**~1,2 W**
M(ex)R-24-DC-2NO+1NC	**1**	**= 24 V**	**2 NO & 1 NC**	**37,5 mA**	**≤20 ms**	**≤20 ms**	**~1,2 W**
M(ex)R-230-AC-2NO	**1**	**~230 V**	**2 NO**	**14 mA**	**≤20 ms**	**≤20 ms**	**~1,2 W**
M(ex)R-230-AC-3NO	**1**	**~230 V**	**3 NO**	**14 mA**	**≤20 ms**	**≤20 ms**	**~1,2 W**
M(ex)R-230-AC-2NO+1NC	**1**	**~230 V**	**2 NO & 1 NC**	**14 mA**	**≤20 ms**	**≤20 ms**	**~1,2 W**

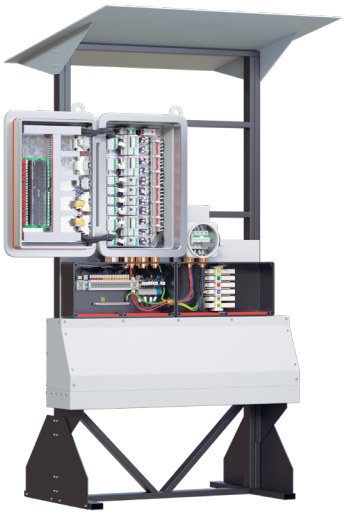
K-CUBE-EJB Ex Control and Protection Panel

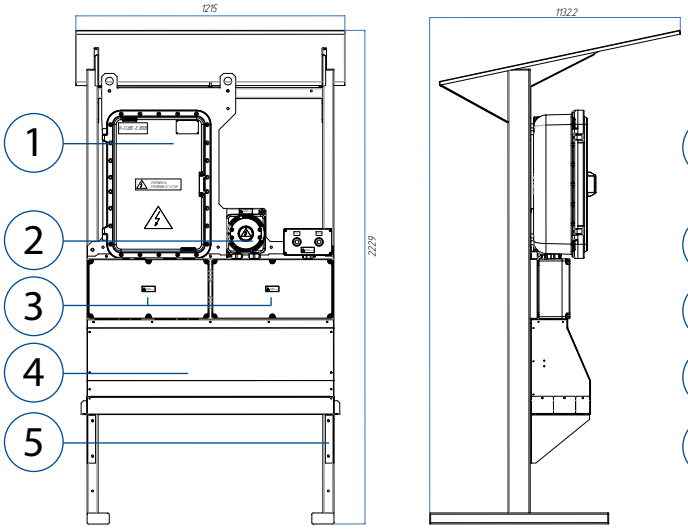
DESCRIPTION

A K-CUBE-EJB X-proof integrated switchgear receives and distributes electrical power, controls electrical equipment and protects it against short circuits and overloads. The LV switchgear is used as part of power supply, control and automation as distribution switchboards, power distribution stations, control and automation panels and cabinets.

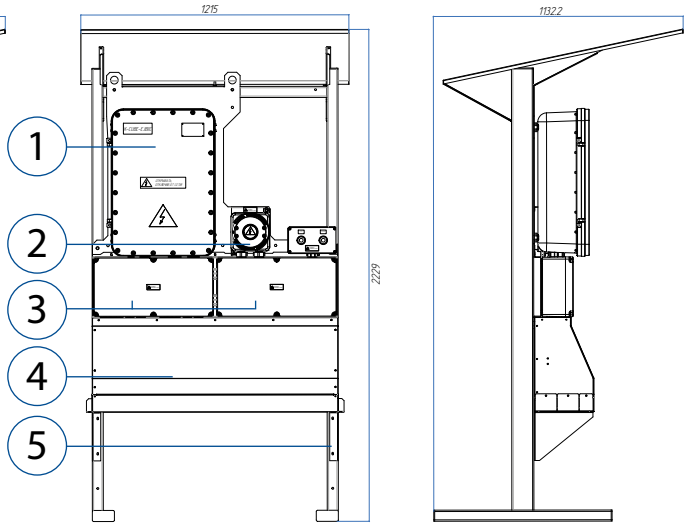
A K-CUBE-EJB is basically applied in automated EHT control systems. Its switching units are delivered in plug-in modules for a quick installation or replacement in hazardous conditions. A K-CUBE-EJB includes a hard wired logic controller maintaining an EHT / lighting / etc. control system operable even in case of PLC loss. The product is supplied as a kit comprising an Ex enclosure accommodating switches, protection and communication devices, and an Ex enclosure accommodating an input breaker, two Ex terminal boxes, and a cable duct for cable protection.

DESIGN





For IIB atmospheres



For IIC atmospheres

1. X-proof equipment panel
2. X-proof automatic input breaker
3. X-proof input panel
4. Cable tray for external connection
5. SF-K-CUBE frame (purchased under a separate P.O.)

K-CUBE-EJB Ex Control and Protection Panel

P.O. DETAILS

The panel may be a typical design mounted on a frame and having an input breaker, a shield, terminal boxes and an enclosure, or pursuant to customer data sheets. Please use the item number from the Marking Table below in your P.O. for a typical design X-proof protection and control panel.

E.g., a P.O. for a K-CUBE-EJB protection and control panel for IIB atmospheres, 80 A input breaker, should be identified as **K-CUBE-EJBIIB-80-11**

CONTROLS

A K-CUBE-EJB has the following types of control:

- Remote control, effected remotely via an automated EHT control system
- Auto control, i.e. based on controller internal logic. In case of EHT control communication loss, the controller will interrogate the sensors and undertake control of the EHT system based on the latest setpoints received prior to loss of communication.

Panel de-energizing for maintenance purposes:

- De-energized locally using an X-proof panel switch

MARKING

Item #	Atmosphere	Rated current, A	Outgoing lines
K-CUBE-EJBIIB-80-11	**IIB**	**80**	**10**
K-CUBE-EJBIIC-80-10	**IIC**	**80**	**10**
K-CUBE-EJBIIB-125-11	**IIB**	**125**	**10**
K-CUBE-EJBIIC-125-10	**IIC**	**125**	**10**

K-CUBE-EJB Ex Control and Protection Panel

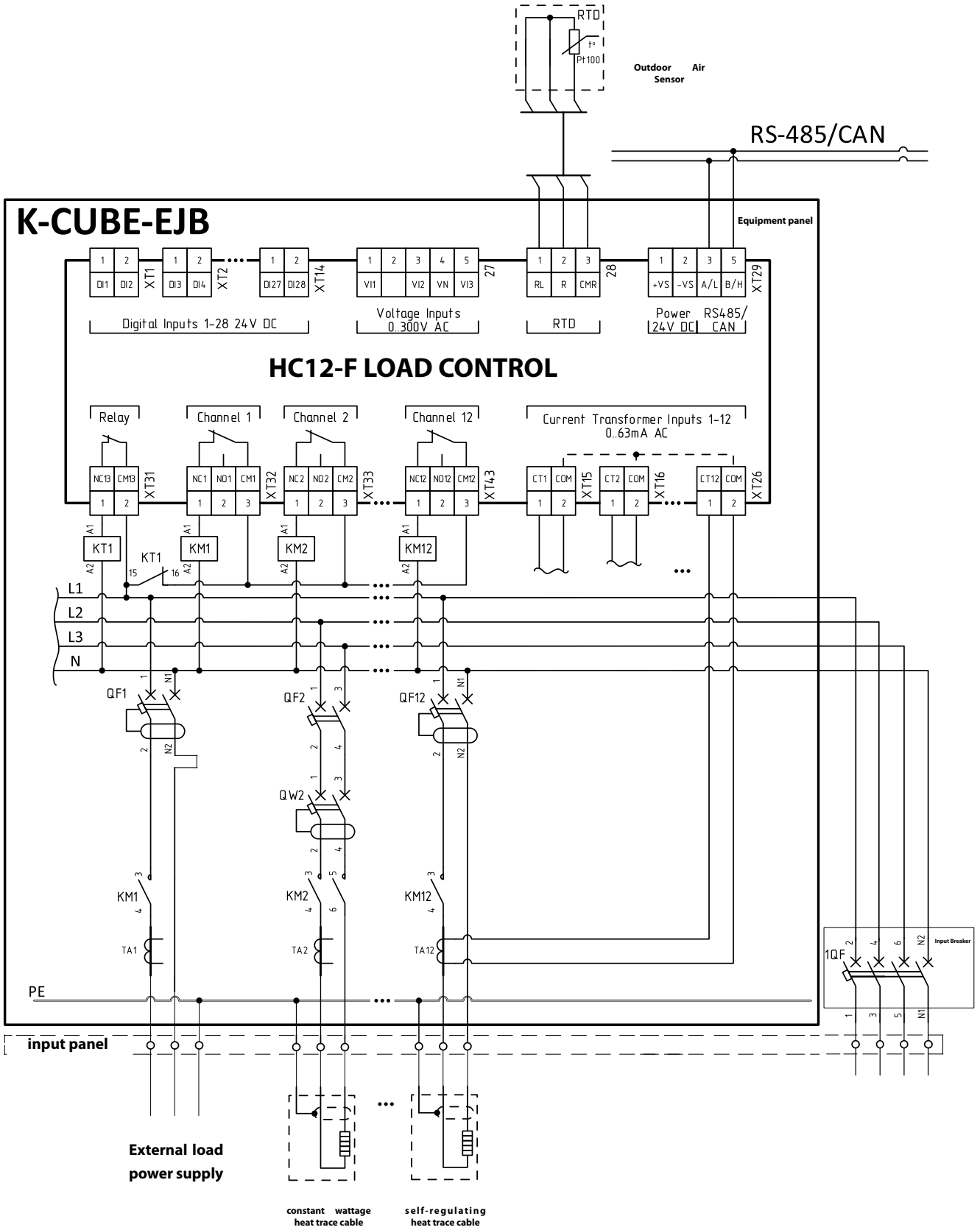
SWITCHING & PROTECTION DEVICES

Protection switching devices are selected based on data sheets.

GENERAL SPECIFICATION

Mains Supply	
Normal operating conditions	
Rated voltage	**230/400 V (TT, IT, TN-S, TN-C, TN-C-S)**
Certificate, Ex protection	**1Ex d e IIB T6…T4 Gb X/1Ex d e IIB+H2 T6…T4 Gb X /1Ex d e IIC T6…T4 Gb X**
Frequency	**50 Hz**
Voltage of control circuits and automatic controls	**12/24/48/230 V**
Design Characteristics	
Equipment panel	
Dimensions (WxHxD), max	**500x700x300 mm**
Cable entry	**as per data sheets**
IP rating	**65/66**
Internal heating with a thermostat	**as per data sheets**
Input panel	
Dimensions (WxHxD), max	**550x300x200 mm**
Cable entry	**as per data sheets**
IP rating	**66**
Automatic input switch	
Dimensions (WxHxD), max	**300x300x200 mm**
Cable entry	**as per data sheets**
IP rating	**66**

CIRCUIT DIAGRAM (EXAMPLE)



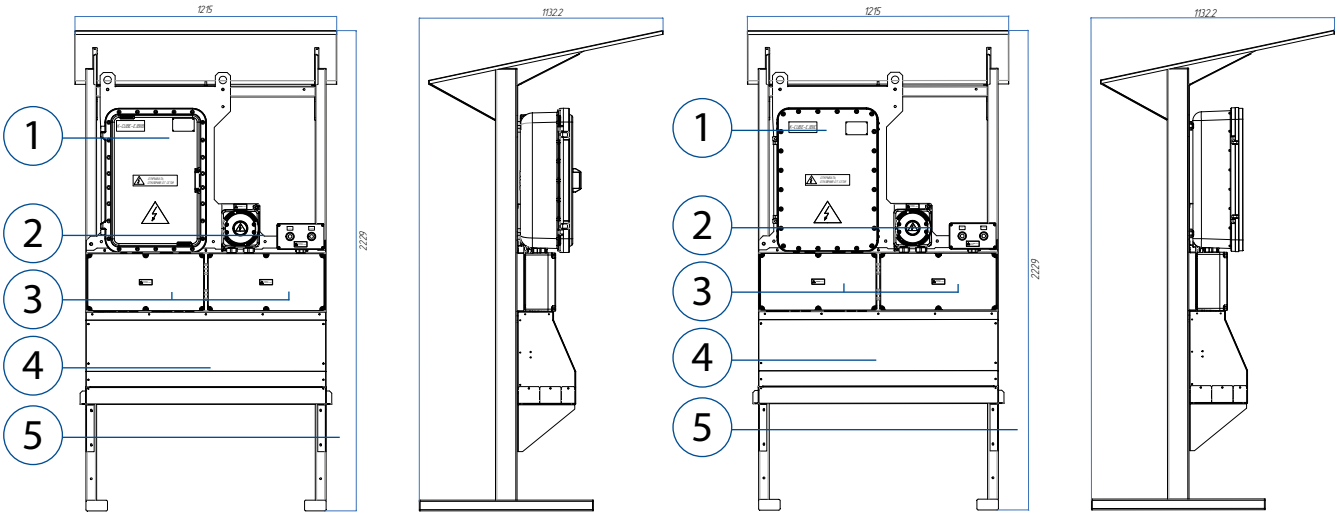
K-CUBE-EJB-C-10-2 Control and Communication Switchboard

DESCRIPTION

K-CUBE-EJB-C-10-2 is an Ex control and communication switchboard to accommodate interface converters and data acquisition and communication equipment.

A K-CUBE-EJB-C-10-2 is supplied as a kit consisting of an Ex enclosure accommodating communication devices, an Ex enclosure accommodating an input breaker, two Ex terminal boxes, and a cable tray for external connections.

DESIGN



For IIB atmospheres

For IIC atmospheres

1. X-proof equipment panel
2. X-proof automatic input breaker
3. X-proof input panel
4. Cable tray for external connection
5. SF-K-CUBE frame (purchased under a separate P.O.)

K-CUBE-EJB-C-10-2 Control and Communication Switchboard

P.O. DETAILS

The product may be a typical design mounted on a frame and supplied with an input breaker, a shield, terminal boxes and an enclosure, or as per data sheets.

Please use the item number from the Marking Table below in your P.O. for an X-proof protection and control panel.

E.g., **K-CUBE-EJBIIB-C-10-2**

SWITCHING & PROTECTION DEVICES

Thermal-magnetic circuit breakers are used to protect the cable network and electrical equipment against fault currents. Magnetic tripping current must not exceed 10, C curve.

The communications cabinet accommodates an equipment panel with protective devices and devices that collect, convert and transmit data, a panel for external connections having power and control cable terminals, and an input panel with a load break switch.

GENERAL SPECIFICATION

Mains Supply	
Normal operating conditions	
Rated voltage	**230/400 V (TT, IT, TN-S, TN-C, TN-C-S)**
Certificate, Ex protection	**1Ex d e IIB T6…T4 Gb X/1Ex d e IIB+H2 T6…T4 Gb X /1Ex d e IIC T6…T4 Gb X**
Frequency	**50 Hz**
Voltage of control circuits and automatic controls	**12/24/48/230 V**
Design Characteristics	
Equipment panel	
Dimensions (WxHxD), max	**500x700x300 mm**
Cable entry	**as per data sheets**
IP rating	**65/66**
Internal heat tracing with thermostat	**as per data sheets**
Input panel and external connection panel	
Dimensions (WxHxD), max	**550x300x200 mm**
Cable entry	**as per data sheets**
IP rating	**66**
Automatic input breaker	
Dimensions (WxHxD), max	**300x300x200 mm**
Cable entry	**bottom**
IP rating	**66**

MARKING

Item #	Design
K-CUBE-EJBIIB-C-10-2	**IIB**
K-CUBE-EJBIIC-C-10-2	**IIC**

MexTRACE-BOX(e)

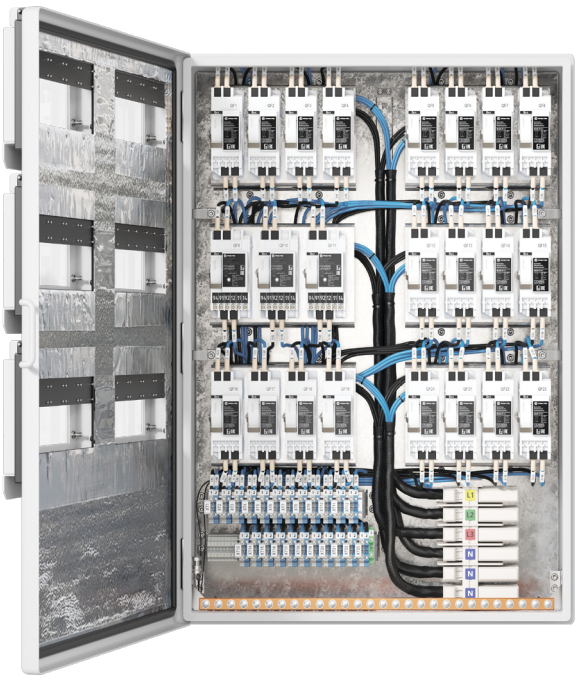
X-proof Cabinet

DESCRIPTION

Explosion proof MexTRACEBOX(e) series low-voltage systems receive and distribute electrical power, control electrical equipment and provide fault current / overload protection.

The product is used as part of power supply, control and automation systems as distribution switchboards, power distribution stations, control and automation panels and cabinets, the principal application of MexTRACEBOX(e) being automated eletrcical heat tracing control systems.

DESIGN



MexTRACE-BOX(e)

X-proof Cabinet

FEATURES

- All equipment mounted in MexTRACE-BOX(e) is generally fixed. Other options are possible on demand
- MexTRACE-BOX(e) cabinets may be as much as IP66, and have a very ergonomic and aesthetic design
- MexTRACE-BOX(e) cabinets are intended for Щnormal and hazardous areas
- The colour of MexTRACE-BOX(e) is subject to the customer's preferences for ergonomic, aesthetic or regulatory reasons as approved for the facilities concerned
- MexTRACE-BOX(e) has built-in electrical heat tracing

GENERAL CHARACTERISTICS

Rated voltage Ue	**max 5000 V**
Frequency, F	**50 Hz**
Rated current, A	**max 200 A**
Earth system	**TT, IT, TN-C, TN-C-S, TN-S**
Operating temperature range	**-60..+90°C**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, №TC RU C-RU.AA71.B.00546/24,1 Ex db eb mb [ia Ga] IIC T6 ... T4 Gb X, 1 Ex eb IIC T6 ... T4 Gb X, Ex tb IIIC T85°C. .. T135°C Db X**
IP rating	**66 max**

P.O. DETAILS

A distribution and control cabinet is fabricated based on data sheets and specifications.

EXAMPLE OF PRODUCT DESIGN

K-PANEL

Distribution and Control Board, with Pluggable and Fixed Switches

DESCRIPTION

Low-voltage package systems of K-PANEL series receive and distribute three-phase AC, 50 Hz, 0.4 kV and 0.69 kV electrical power in dead-earthed or insulated neutral, and provide electrical equipment control and fault current / overload protection.

A K-PANEL product is used as part of power supply, control and automation systems as distribution switchboards, power distribution stations, control and automation panels and cabinets. The products are also suitable as low-voltage distribution switchgears in integrated transformer substations.

DESIGN

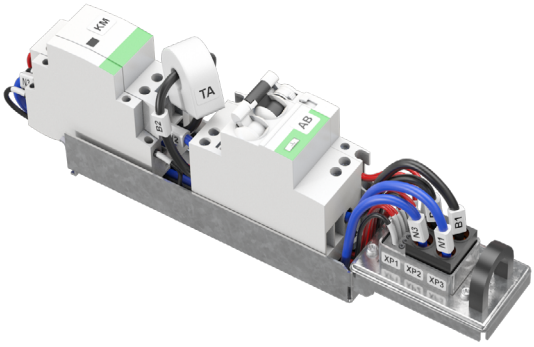
FEATURES

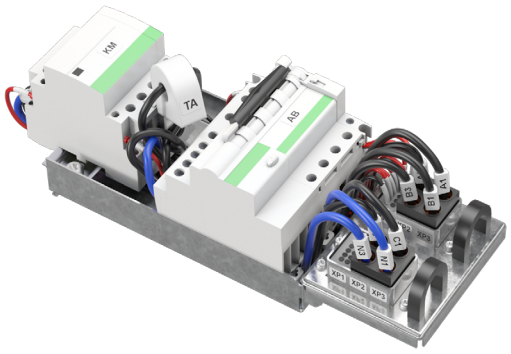
- Top or backside location of main distribution busbars
- All K-PANEL equipment may have either a fixed or pluggable configuration. Plug-in design is achieved by using ready-to-use typical pluggable modules (K-MODE)
- K-PANEL panels have max. IP54 rating
- K-PANEL panels may be sectioned to 4b to ensure safe operation
- The K-PANEL colour depends on the customer's preferences
- Max main busbar current is 3,200 A

GENERAL SPECIFICATION

Rated insulation voltage	**1000 V**
Rated voltage	**400 V**
Frequency	**50 Hz**
Rated impulse withstand voltage	**12 kV**
Rated secondary voltage, V	**12/24/48/230**
Overvoltage category	**IV**
Rated current (max) In	**3200 A**
Rated short-time withstand current Icw	**85 kA (rms value)/1 s**
Peak withstand rating Ipk	**187 kA**
Earth system	**TT, IT, TN-C, TN-C-S, TN-S**
Certificate	**Pursuant to CU TR 004/2011, CU TR 020/2011, #EAEU RU C-RU.МЮ62.B.01270/19**

K-MODE-P Pluggable Modules





K-MODE-P DESCRIPTION

Modular	1	2
Poles	1P+N	2P; 2P+N; 3P; 3P+N
Rated voltage V	230	400
Rated current, A	6-63	6-63
Rated trip current, kA	as per data sheets	
Differential protection, mA	30; 100; 300	30; 300;300
Magnetic tripping	as per data sheets	
Current measurement range, A	0 to 50	
Status indication (on, emergency)	Yes	

P.O. DETAILS

Distribution and control switchboards are fabricated based on data sheets and specifications.

K-BLOCK Distribution and Control Board, with Drawout Modules

DESCRIPTION

Low-voltage systems of K-BLOCK series receive and distribute three-phase AC, 50 Hz, 0.4 kV and 0.69 kV electrical power in dead-earthed or insulated neutral, control electrical equipment and provide fault current / overload protection.

A K-BLOCK LV package is used as part of power supply, control and automation systems as distribution switchboards, power distribution stations, control and automation panels and cabinets. K-BLOCK LV packages are also applicable as low-voltage distribution switchgears in integrated transformer substations.

DESIGN

FLEXIBLE DESIGN AND ENGINEERING SOLUTIONS

The modular design of K-BLOCK series LV package allowing for multiple pillar designs and protection and switching device configurations makes it easy and convenient to tailor the product to any applications.

MAXIMUM POWER DISTRIBUTION CAPACITY

The main distribution busbar max current of 7,300 A secures sufficient power supply to most energy-consuming power systems at 0.4/0.69 kV.

RELIABILITY

By using advanced top-quality materials to fabricate K-BLOCK series systems, protection and switching devices from major global manufacturers, and state-of-the-art production facilities, with quality control effected at each stage of production, we have ensured all capability to manufacture reliable equipment that runs for many years at minimized costs.

What is more, a K-BLOCK package system is highly serviceable and maintainable due to its modular design, streamlined assembly and upgrade capability.

SAFETY

High protection IP rating (up to IP54) guarantees high level integrity, while maximum form of separation (4b) provides for high personnel safety and allows for multiple repairs and routing activities without de-energizing the switchboard busbars. A wide choice of protective devices and switches makes it possible to ensure best protection and reliable operation of your electrical equipment. Multiple integrated interlocks are also usefuil in enhancing personnel safety and uninterrupted power supply.

P.O. DETAILS

A draw-out distribution and control board is fabricated based on data sheets and specifications.

GENERAL SPECIFICATION

Mechanical Characteristics

Cable entry	**top/bottom**
Pillar maintenance	**one-side/two-side access**
IP (protection against ingress of solids and liquids)	**max 54**
IK (protection against mechanical impacts)	**max 10**
Form of separation	**4b**

Pillar sizes

Height	**2200/2350 mm (including a 100 mm base)**
Width	**325/650/1000/1550 mm**
Depth	**500/600/800/900/1000/1100/1200/1300/1400 mm**
Average weight	**650 kg**
Enclosure & case parts	**Zinc galvanized steel, polymerized epoxy-polyester powder coating (SP03); >50 µm**
Enclosure color	**As specified by Customer**

Electrical Performance

Rated insulation voltage (Ui)	**1000 V**
Rated voltage	**690/400 V**
Frequency (F)	**50 Hz**
Rated secondary voltage	**12/24/48/230 V**
Overvoltage category	**IV**
Degree of pollution	**3**
Rated current of horizontal main busbars	**7300 A max**
Rated current of main busbars in CB sections	**6300 A max**
Rated current of vertical distribution busbars	**6300; 4000; 2100; 1500 A**
Rated short-time withstand current (Icw), 1 sec, horizontal main busbars (rated peak value current Ipk)	**50/80/100/150 kA rms value (110/176/220/330 kA)**
Rated short-time withstand current (Icw), 1 sec, vertical distribution busbars (rated peak value current Ipk)	**50/80/100 kA rms value (110/176/220/330 kA)**
Rated conditional short-circuit current	**150 kA max**
IEC internal arc protection (100 kA, rms value), sec	**0,3**
Earth system	**TT, IT, TN-S,TN-C, TN-C-S**
Certificate	**Pursuant to CU TR 004/2011, CU TR 020/2011, #EAEU RU C-RU.МЮ62.B.01286/19**

K-PANEL-C.S Central Control Panel

DESCRIPTION

K-PANEL-C.S is a central EHT control panel for automatic heat tracing control of pipelines, equipment, floors and instrument lines. An integrated controller exchanges data with field equipment (sensors and actuators) and the EHT control server via ModBus TCP. The panel switches support data exchange via a fibre optic ring.

An EHT central control panel is supplied as a kit consisting of a panel, programmable controller, EHT control server, switches and auxiliary equipment.

DESIGN

Components:

1. Panel
2. Programmable controller
3. Industrial Ethernet switch
4. RS-485 to Ethernet converters (up to 4 pcs.)
5. Data acquisition controller
6. EHT control server
7. Optical termination box
8. 24 V power supply
9. Uninterrupted power supply
10. Fans (2 pcs.)
11. Power, control and interface cable terminals

K-PANEL-C.S Central Control Panel

GENERAL SPECIFICATION

Mains Supply

Voltage	**230/400 V (TT, IT, TN-S, TN-C, TN-C-S)**
Frequency	**50 Hz**
Voltage of control circuits and automatic controls	**12/24/48/230 V**

Design Characteristics

IP rating	**54 max**
Body material	**steel**
Dimensions (WxHxD)	**630x1250x410 mm**

MARKING

Item #
K-PANEL-C.S

PROTECTIVE AND SWITCHING DEVICES

Thermal-magnetic (combo) circuit breakers are used to protect the control circuits against short circuits.

P.O. DETAILS

Please use the item number from the Marking Table in your P.O. for a central control panel.

CK-CE Skin Effect Heat Tracing System

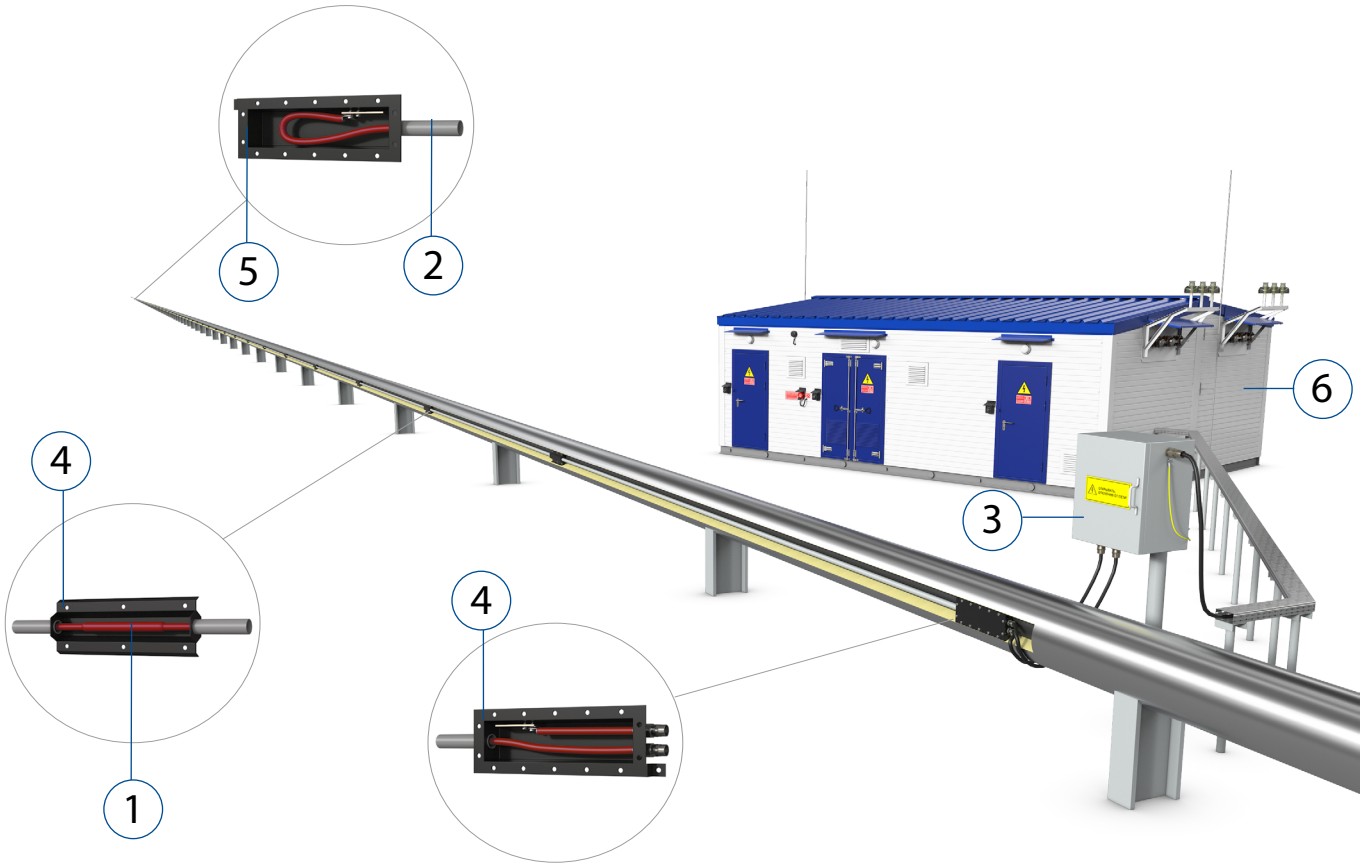
DESCRIPTION

A CK-CE system is used for freezing protection or maintaining material temperature in pipelines over 1,500 m long, enabling tracing pipelines of up to 30 km without a parallel supply line.

A heating element consists of a 20-60 mm OD ferromagnetic steel tube with a wall thickness of min. 3.0 mm accommodating an insulated copper wire sized 10 - 50 mm2.

The conductor is electrically connected to the tube at the end of the leg, while AC voltage is introduced between the tube and the conductor at the beginning of the leg. AC voltage is calculated based on the heat output requirement and the heat traced piperun length. The skin effect conductor is powered by a power board installed in a КТП М type packaged transformer substation.

DESIGN



1. СК/П skin effect conductor
2. Steel heat tube
3. СК/ПК feed box
4. СК/СК junction box
5. СК/КК termination box
6. КТП М packaged transformer substation

GENERAL SPECIFICATION

Max exposure temperature, max	**260°C**
Max maintaining temperature, max	**200°C**
Supply voltage , max	**5 kV**
Conductor material	**Copper**
Specific ourput, max	**165 W/m**
Hazardous area classification	**Hazardous, normal**
Certificate, Ex protection	**Pursuant to CU TR 012/2011, #EAEU RU C-RU. МЮ62.B.01422/19, 1Ex e IIC T6...T2 Gb X**

P.O. DETAILS

A CK-CE system is ordered based on data sheets and specifications.

КТП М Type Modular Packaged Transformer Substations

DESCRIPTION

Fully pre-fab and ready-to-operate packaged transformer substations (КТП М) supply power to the Customer's industrial facilities and process plants and are delivered split into transportable modules.

Fully pre-fab and ready-to-operate КТП М products are delivered with every required system, including internal systems like lighting, ventilation, heating etc., and are fully factory tested in assembly with all utility systems.

GENERAL VIEW

A КТП М product is a modular package disintegrated into transportable modules for shipping by rail, truck, or marine transport. The product is structurally designed as a metal welded frame with rigging elements and connections, insulated with sandwich panels on top and at sides, which thickness is subject to climatic conditions. The colour palette will be consistent with the Customer's brand book.

The КТП М product may be equipped with personal protection equipment and spares, maintenance platforms, load grippers (crossbars) and other accessories as demanded by the Customer.

DESIGN

MODIFICATIONS

Packaged transformer substation units may be used for installation of

- MV cubicles (below 35 kV),
- Dry type and oil-filled power transformers,
- LV cubicles (below 1 kV),
- Control cabinets for EHT system / power supply control / process control / etc.,
- Miscellaneous electricals (capacitors, VSD, UPS etc.)

P.O. DETAILS

A packaged transformer substation (КТП М) is fabricated based on data sheets and specifications

INTERNAL UTILITY SYSTEMS

Fully pre-fab and ready-to-operate КТП М packaged transformer substations are fitted out with internal systems, i.e.

- lighting (primary and emergency, i.e. escape / standby),
- heating (electrical, water),
- ventilation (natural, forced),
- air conditioning (monoblocks, split systems, including Ex systems),
- earth and lightning protection,
- local automation systems suitable for integration into the facility system (power control, telemetry etc.),
- other systems upon demand (telephony, radio etc.).

GENERAL SPECIFICATION

Seismic stability, MSK64	**9**
Building fire resistance	**1,2,3,4,5**
Overall dimensions	**as per data sheets**
Type of MoC	**Noncombustible (НГ)**
Internal systems	**Included ****
Fire and intrusion alarms	**Included ****
Transportation	**Rail, truck, water**

* scope of КТП М technical specification

MARKING

Item #
--

SOFTWARE PRODUCTS

INTRODUCTION

CK-Line is a hardware and software package used for centralized supervisory control and servicing of EHT equipment in a plant. CK-Line Software is used as part of EHT systems.

CK-Line ware has a three-tier architecture:

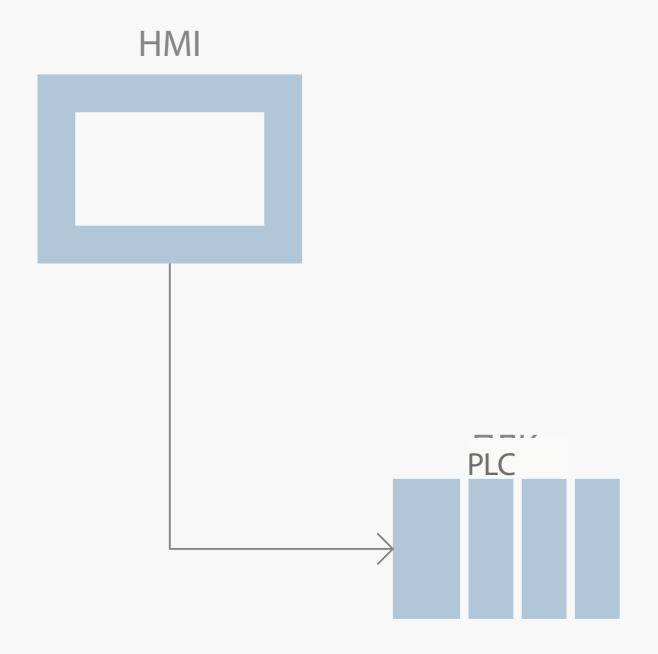
Zero tier is the level of instruments and actuators, and consists of heating line monitor sensors and a required number of actuators (switching devices, heat tracing lines, protection devices).

First tier is the level of PLCs, I/O devices, interface converters that acquire zero tier information, process and generate commands for actuators.

Second tier consists of operator workstations, I/O servers, active network equipment and peripheral devices (printers, external data storage etc.). The second tier provides process and system data access to process personnel, engineers and office staff and managers, and data transfer to the plant process control level.

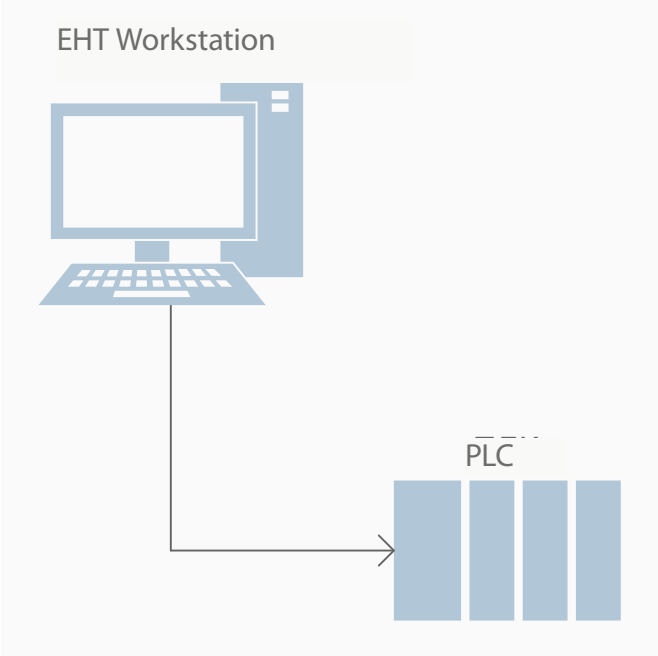
The second tier may be of various types:

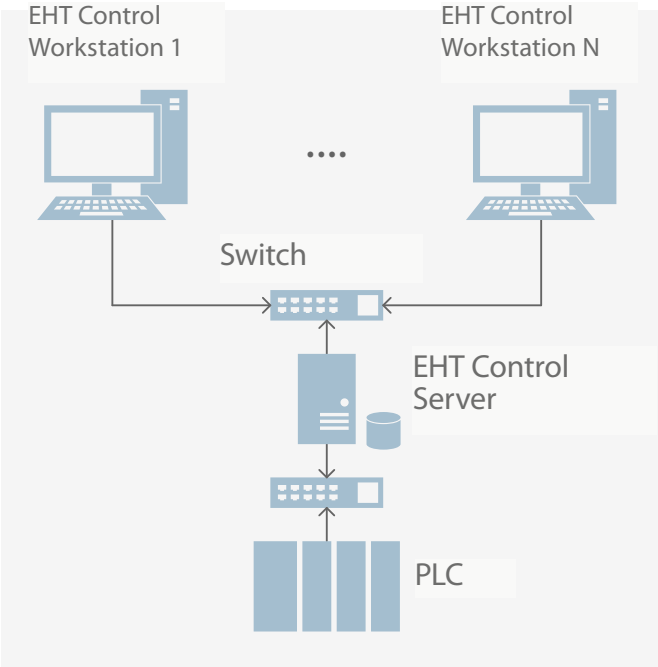
1. Cabinet type: HMI panel, minimalistic interface, easy field use and no extra features



2. Desktop type (SingleNode). A full-fledged EHT system workstation, full data access, best value for money.

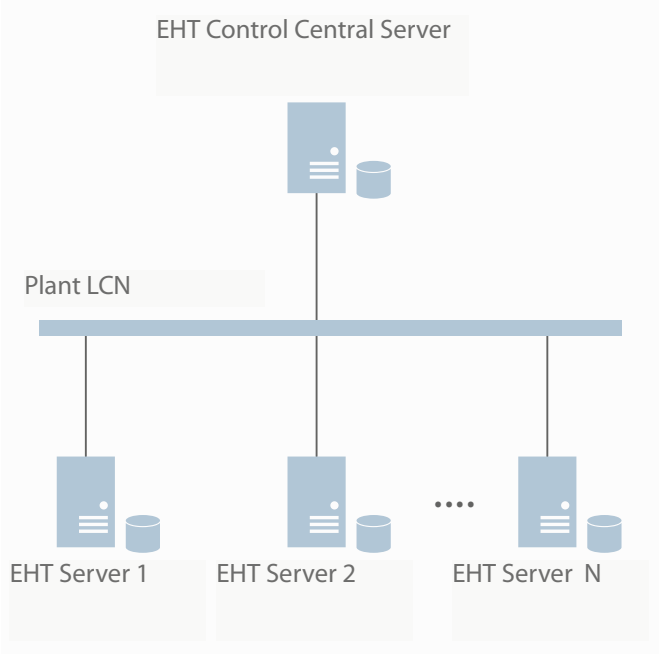
3. Desktop type, client-server architecture: 1 server + 2 EHT system workstations. Powerful, reliable and functional. Workstations could well be thin clients, to partially make up for server costs. The number of workstations may be extended at the user's discretion; the workstations may be located remotely in different process rooms and offices. Desktop workstations may be combined with panel PCs on a board.

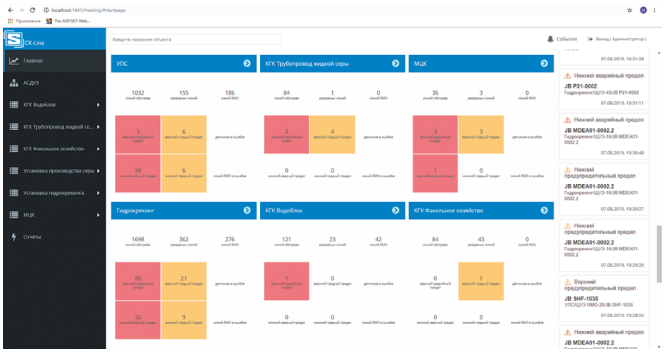




4. Central heating: data consolidation from several local CK-Line servers. This feature allows for consolidation of control of a few CK-Line hardware and software packages in a single HMI interface. Supervisory control of a large number of field equipment effected via a single control centre. This option involves extra costs, while at the same time, it minimizes the number of staff to service the EHT equipment throughout the plant (field, site etc.).

We included a SCADA KSE Platform-based CK-Line software package for all above options except for the first one.

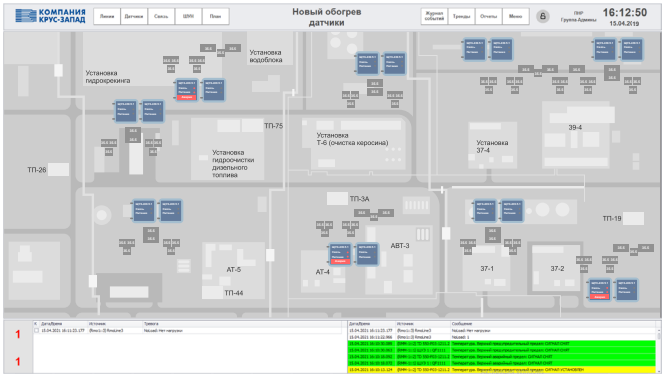




CK-LINE DESCRIPTION

Basic functions:

- Heat trace line control pursuant to a preset sequence or as defined by operator
- Equipment setting, changing automatic control and regulation modes
- Event acquisition and historization, report generation
- Communications hardware (controller connection diagram) and heating equipment (plant plan depicting lines) troubleshooting feature
- EHT line power supply control (board status mimics, event logging, historical trends)
- Regular EHT line status reporting
- Historical trending based on EHT line characteristics
- Metering of electric power used for heat tracing
- EHT line energy performance



ADVANTAGES

1. EHT line remote control upon the operator's command enables:

- Combined independent control of each EHT line by the relative temperature of heating element plus manual switch on/off feature
- Flexible control of feeding substation loads
- Partial off-loading of feeding substations upon command from the operator's workstation
- Taking equipment offline for maintenance upon command from the workstation
- Enhanced capability of putting EHT equipment on-stream without potential overload of feeding substations

2. Flexible settings and due consideration of EHT line operation modes enables:

- Reducing operational expenses through automated EHT control in the most efficient conditions based on preset temperature settings as required by the process
- Comparison of the current EHT settings against the design values, printout of line reports with non-design settings

3. Keeping a regulatory EHT data base enables:

- Keeping track of EHT equipment run time, including lines, number of switching operations and circuit breaker trips
- Formation of records (EHT line registers, switching equipment registers, EHT line protection equipment registers)
- EHT equipment maintenance scheduling
- Computer-aided make and printing of as-built documentation for EHT equipment maintenance
- Formation of routine switching logs

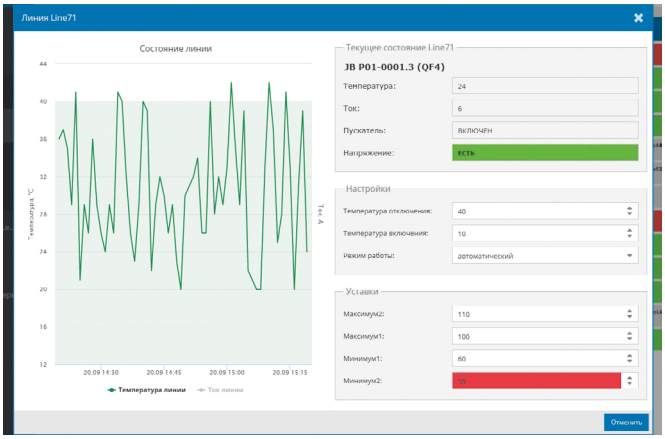
4. The basic functions of CK-Line enable:

- Investigation of emergency situations through review of the event log and historical trends

PURPOSES

CK-Line software helps achieve the following purposes:

- Higher energy performance of EHT process
- Lower overhead costs related to EHT maintenance
- Higher reliability of EHT equipment resulting from general process reliability
- Reduced emergency rate due to upsets of EHT equipment



CK-Line EHT Software

SYSTEM ARCHITECTURE

- Client-server architecture
- OPC UA as a transport protocol
- Failure-free configurations made possible with backup of client applications and servers
- Modbus - client
- OPCUA - server
- OPCUA - client
- OPCDA - client

ENVIRONMENT

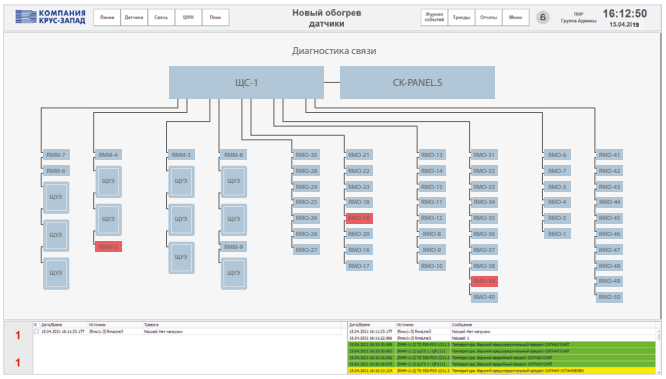
- An extensive environment including a mimic editor, user script support, running mimics in debug mode from studio, convenient tools for app diagnostics and debugging
- Multiple user development capability
- Supported development over network (development studio uses OPCUA protocol to connect to the server)
- Powerful and simple tools for data backup and recovery integrated into the environment

DATA HISTORIAN

- High performance data historian: data storage, aggregation, and retrieval
- All configurations and historical data are stored in a single embedded data base
- A long list of supported units (as per OPCUA specification)

MIMICS

- Vector graphics supported
- Embedded graphics controls library for EHT implementation
- A tool is provided to create / expand and embedded graphics controls library
- HMI windowing capability

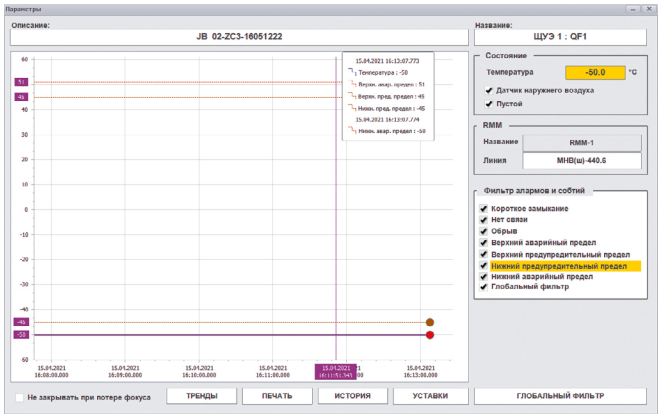


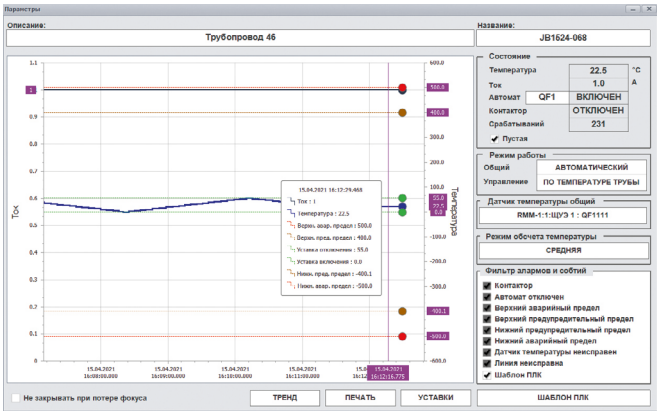
EVENTS

- Embedded emergency and warning event display client (current events, histories)
- Embedded alarm display client

TRENDS

- Embedded graphic trend display client (current and historical data)

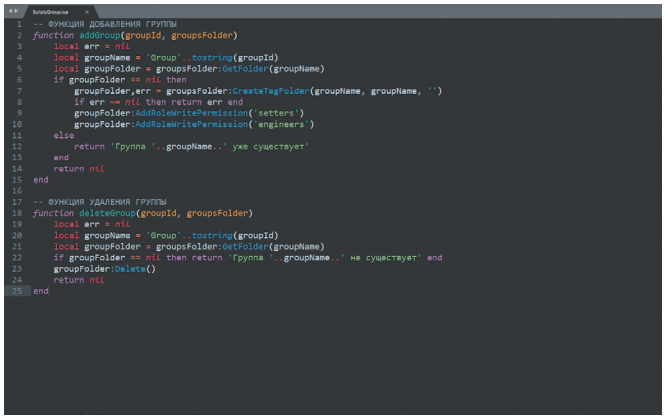




REPORTS

- Embedded report editor: on-demand or scheduled report generation, report display in API operator environment

API



```
-- ФУНКЦИЯ ДОБАВЛЕНИЯ ГРУППЫ
function addGroup(groupId, groupsFolder)
    local err = nil
    local groupName = 'Group'..tostring(groupId)
    local groupFolder = groupsFolder:GetFolder(groupName)
    if groupFolder == nil then
        groupFolder,err = groupsFolder:CreateTagFolder(groupName, groupName, '')
        if err ~= nil then return err end
        groupFolder:AddRoleWritePermission('setters')
        groupFolder:AddRoleWritePermission('engineers')
    else
        return 'Группа '..groupName..' уже существует'
    end
    return nil
end

-- ФУНКЦИЯ УДАЛЕНИЯ ГРУППЫ
function deleteGroup(groupId, groupsFolder)
    local err = nil
    local groupName = 'Group'..tostring(groupId)
    local groupFolder = groupsFolder:GetFolder(groupName)
    if groupFolder == nil then return 'Группа '..groupName..' не существует' end
    groupFolder:Delete()
    return nil
end
```

- User client implementation capability (full server access via external API)

SAFETY

- Compatibility with Kaspersky Industrial Cyber Security software endorsed by Kaspesky Lab
- Built-in SCADA integrity control tool
- Safety functions: password complexity configuration, password history

CK-LINE SERVICE

EHT Service Software

DESCRIPTION

CK-LINE SERVICE Software is intended

- to create a well-structured EHT system data base covering all facilities,
- to optimize and increase the performance efficiency of EHT maintenance personnel, and
- to facilitate and streamline use of the application by the maintenance personnel.

CK-LINE SERVICE is used

- to find out which equipment needs to be serviced / repaired on-site;
- to record any changes in equipment location resulting from re-installation;
- to keep track of any activities done on the equipment, with dates and names of the responsible personnel;
- to form a report of findings in native (Excel) format.

FEATURES

CK-LINE SERVICE has the following functionality:

1. Mobility – the app can be installed both on a PC and on a mobile or tablet
2. Rapid access to information – the app allows quick access to technical details or required variables of the chosen facility via search function, since all on-site electrical equipment location data are stored in digital form
3. Scalability – new objects can be added on the plan and the existing objects can be modified
4. Photo reporting – photo reporting is available for individual EHT elements

KRUS-HEAT EHT Calculation Software

DESCRIPTION

KRUS-HEAT is an engineering tool for EHT systems which is applied for EHT simulation using all types of self-regulating and constant power cables and skin effect heat tracing systems.

Product Capability

- Piping heat tracing calculations
- Vessel heat tracing calculations
- Data upload/download
- Formation of an equipment specification
- Automatic P.O. placement based on EHT calculations

Advantages:

- Selection of heat trace cables from various manufacturers (subject to Customer's requirements)
- Automatic selection of a heat trace cable for a pipeline or vessel based on a stabilized model in conformity with the Russian regulations
- Quick data upload/download
- High accuracy
- User-friendly interface and a Russian language manual