27 years in industry

SOLCO.

advanced trace heating solution

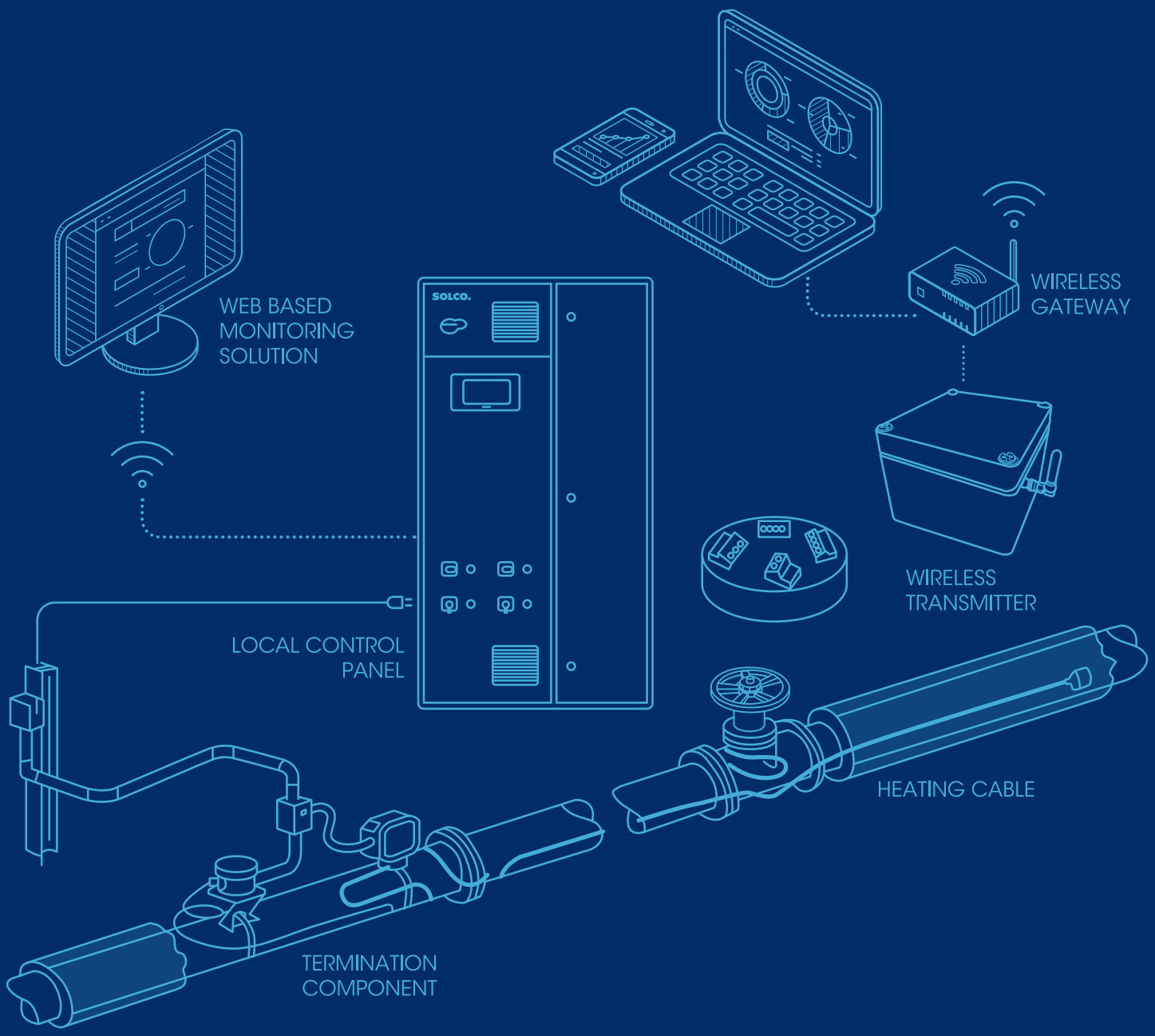
Edition 2021-v01

advanced trace heating solution

SOLCO PYROELEC

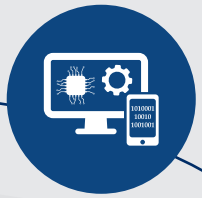
Trace Heating Automation

Reliability • Efficiency • Proactiveness



DISCC

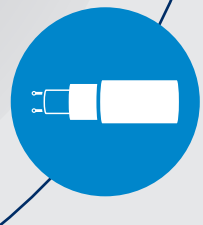
5 Success factors of
trace heating management



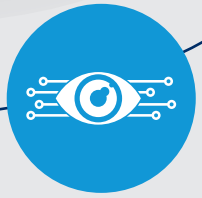
Trace Heating Design

Installation and
Commissioning

Sensors



Heating Cables



Control and Monitoring

SOLCO PYROELEC

provides the most advanced industrial trace heating solution

Safety

- Ex certified trace heating cable system
- Automated circuit monitoring and performance trend analysis
- No more shut-down by proactive maintenance

Reliability

- 27 years experience in trace heating
- Proven quality of trace heating products
- Accepted by big companies in the world
- Worldwide approvals
- Encrypted LoRa wireless communication network
- Quality installation and commissioning service

Economy

- No more process shut-down
- Discover of hidden and unnecessary energy use in trace heating circuits
- Energy saving up to 70%
- No cabling cost for distant sensor installation

Ergonomics

- Web-based monitoring and control
- Easy access to monitoring system wherever internet is available
- Automated trace heating design system
- Easy installation with state-of-the-art termination components

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STS
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PYEX-SS-JB
PYEX-SS-EK
PYEX-TF-JCK
PYEX-TF-EK
PYEX-EP-SPK

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PYEX-PTK-S
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PYEX-CG-M25
PYEX-SS-BRP/BRW
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PYEX-AT
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HACC-PK-P
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HACC-ELK-P

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LBSM-200/300
LBSC-1000
LBSC-3000
LBSC-7000
Components

Monitoring and Control

Sky trace
Blue trace
PYEX - WLT

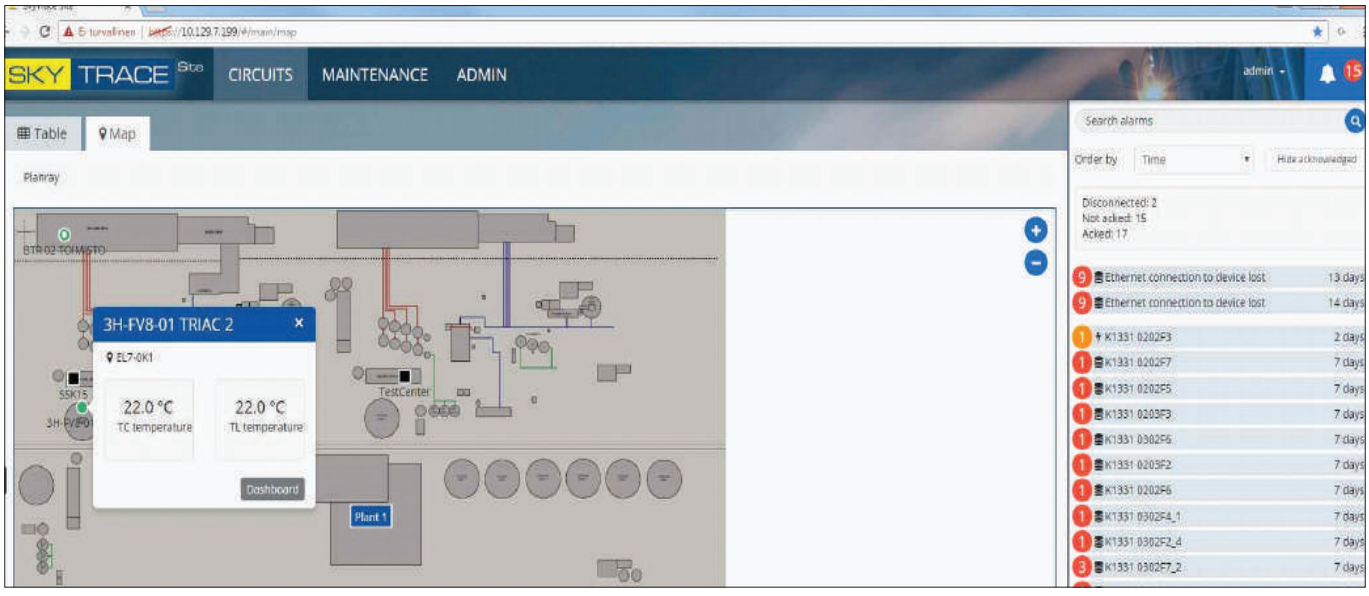
01

Monitoring and Control

SKY TRACE

Web-based monitoring solution
for industrial trace heating application

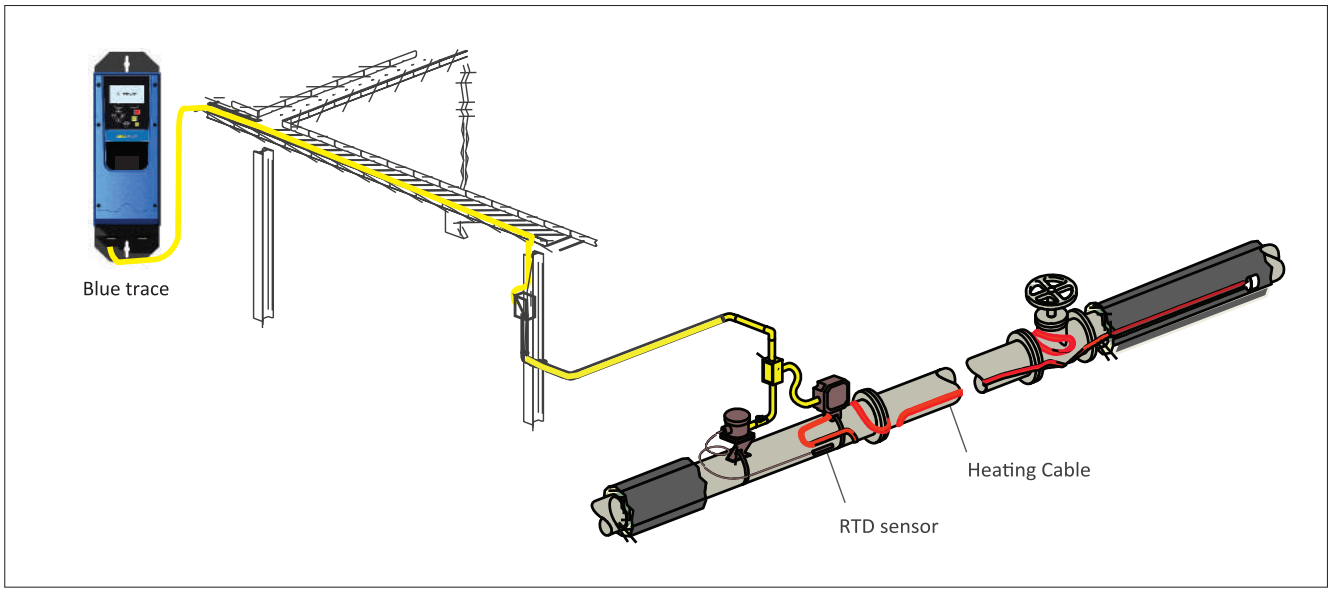
Use	Avoid process downtime. Find hidden energy cost and save money. Identify and solve mysterious problems. Confirm heating cable quality and maintenance schedule.
Specification	Trace heating circuit analysis by table and site map. Control panel and circuit location can be customized after the completion of installation dashboard for controlling and monitoring of individual circuit. Monitoring temperature, load current, leakage current and sensor status. Energy consumption statistics - Top 10 circuits with higher consumption. Top 10 alarm count per circuit.
Features	Web-based monitoring and control solution for trace heating system. Saving energy and labor costs up to 70%. Proactive maintenance analysis. Prioritized alarm 1 to 9. Heating cable performance analysis. Excellent security. Remote control via VPN to LAN network. Integrate to client own automation system. Extendable to 'SKTRACE analytics' via cloud service. Mobile user interface. Monthly report.
Certification	CE



BLUE TRACE

Single circuit controller
for industrial trace heating system

Use	Tanks, Vessels, Pipelines, Conveyors, Filter stations, Gutter, Roof drains, Ventilation grids, Pumps, Ramps, Slabs etc.
Specification	50A x 1 Phase / 3 Phase. Solid state relay. Two RTD inputs. RS485 connection. Adjustable power percentage save time and money in trace heating design. Temperature limiter can be integrated. BluePID algorithm. Temperature window mode. Two programmable voltage inputs 24Vdc, 100-277Vac. Downtime test cycle and circuit status report. Setting can be saved and downloaded for copy.
Features	Self-contained single circuit control and monitoring solution for trace heating system. Plug-and-play. Accurate and intelligent control with BluePID algorithm and softstat function. Easy to use and maintain. Extended lifetime.
Certification	CE Ex



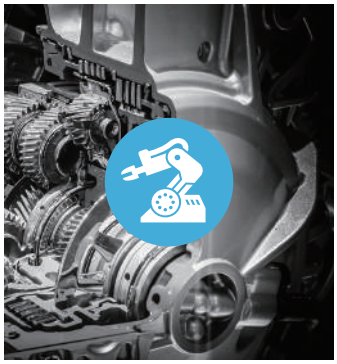
PYEX-WLT

Industrial grade wireless LoRa transmitter

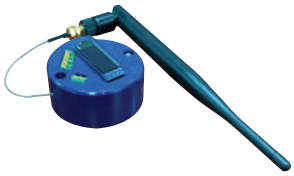
Features	WIRELESS FOR INDUSTRIAL APPLICATIONS Industry grade turn-key solution for cost efficient wireless measurements. Fast and simple set-up also for retro-fit and temporary installation. Reliable, long range, low power wireless data communication with excellent immunity to interference even in high demanding circumstances. SMARTER MAINTENANCE FOR BETTER PRODUCTIVITY Prevent, detect, locate and diagonise problems and failures faster and more efficiently. Optimise inspection and maintenance intervals, conditions, product life-cycle and warranty costs based on real time measurement. Get more insight with more data - temperature, humidity etc. FUTURE-PROOF FLEXIBILITY Use as stand alone solution or to be intergrated into existing automation systems. Scale-up for new sensors, locations and monitoring options. Simple web-based access to real time data, trends and measuring set-up any time, anywhere, also with mobile devices.
Certification	CE

Application references

Detecting the reduced efficiency in heat exchanger with remote and automated temperature measurement.
Problem diagnotics and proactive maintenance for pumps and gears with wireless temperature, pressure and vibration measurements.
Monitoring and improving energy efficiency in surface heating systems.



Components



Wireless LoRa transmitter

Encrypted wireless LoRa communication. LoRaWAN certified.
Energy efficient LoRa 920-923 MHz transmitter using LoRaWAN protocol.
3.6V nominal 8.5Ah Lithium primary cell battery or external 5V DC power supply.
Long range, low power and excellent immunity for external interferences.
1 to 3 sensors per transmeter. (temperature, humidity)
Configurable measuring interval and alarms.
Outstanding signal transmission distance typical 100m indoor, up to 10km outdoor.

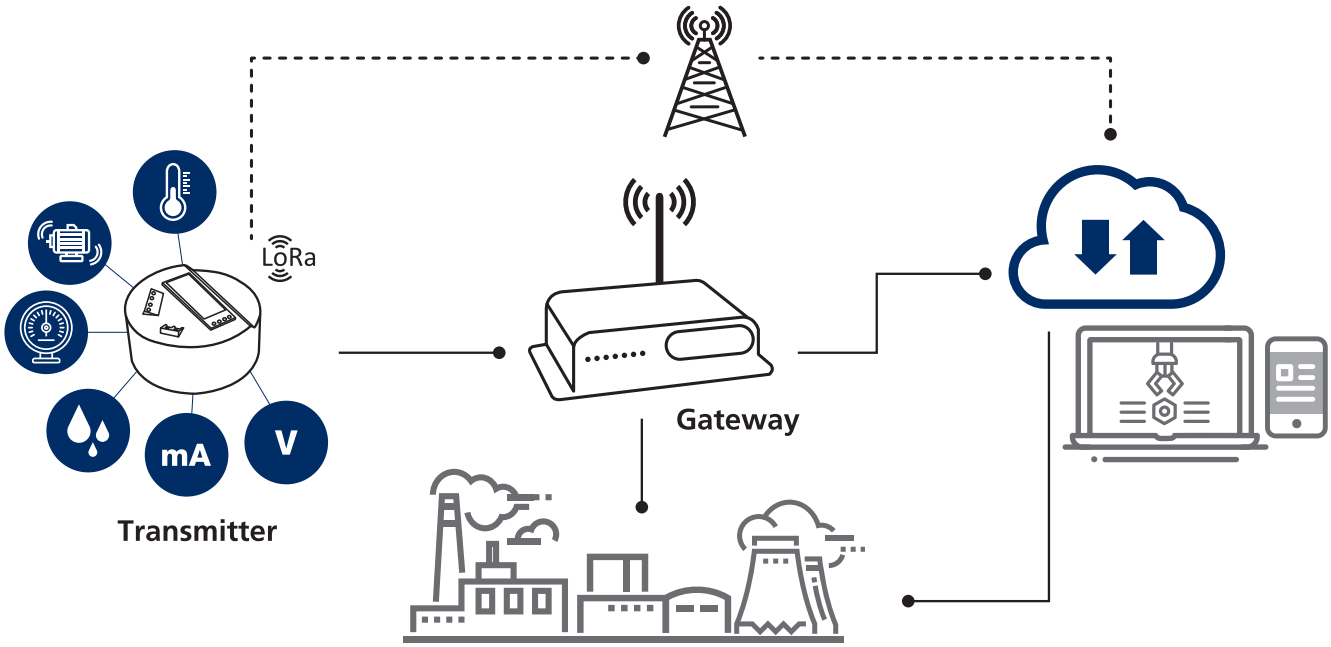
Wireless gateway and monitoring

Data routing (4G / 5G / Ethernet) to LoRa transmitter cloud or any other system.
Real time monitoring, alarms and history data anywhere with any web-enabled device.
Configurable dashboard views and measuring parameters.

Wireless LoRa transmitter temperature sensing kit

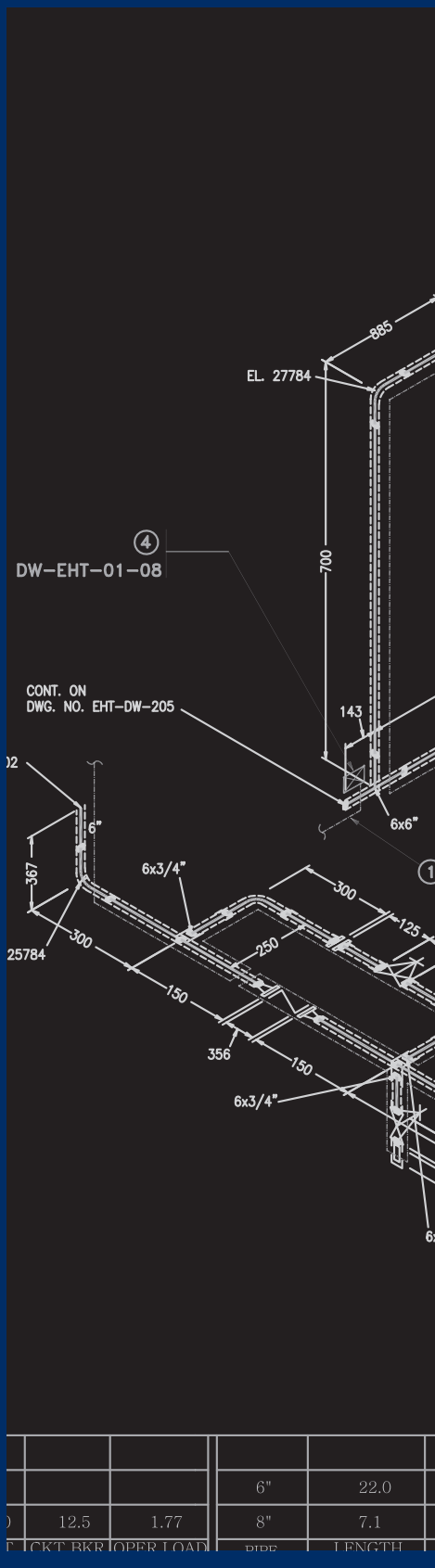
Completed measuring sets according to needs and conditions.
Includes sensors, transmitters, batteries, antennas, housing and other required components.
Pre-configured and ready-to-use for immediate wireless measurements and monitoring.
Unlimited lifetime with solar power option.
Smart power saving and self-diagnostics.

System configuration

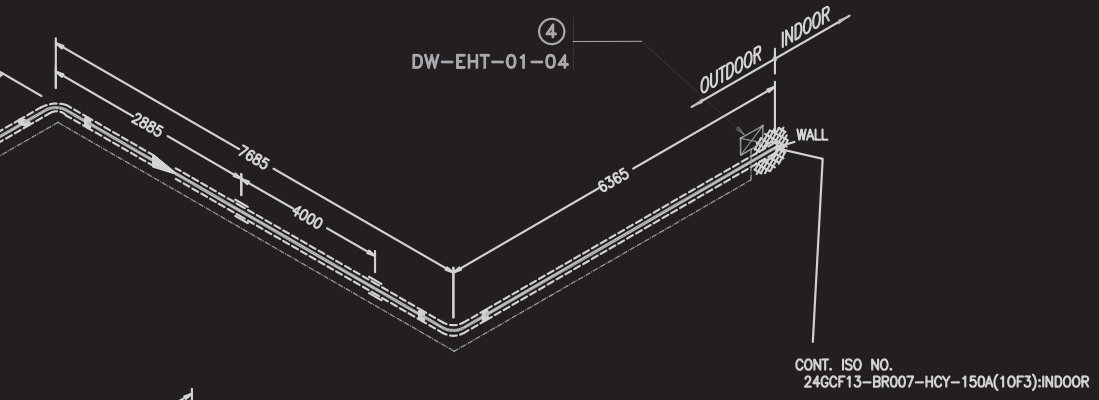


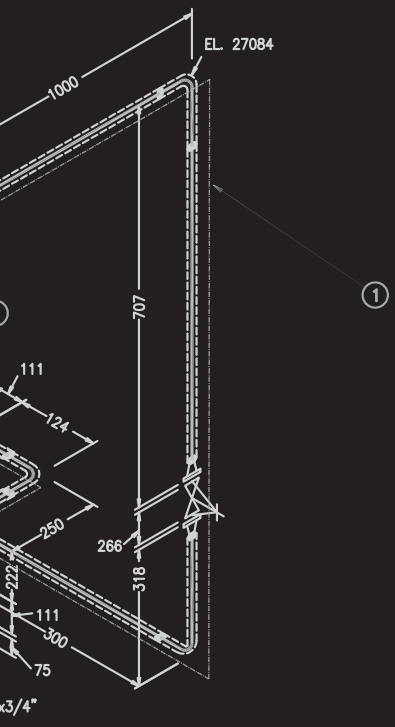
Technical Support

Pyrotechnician (ver.2)
Engineering & Design



02





DESIGN DATA ☐ INDOOR

FLUID	DW
MAX.PIPE TEMP.(INTERMITTENT)	
NORMAL OPER.TEMP.	
MAINTAIN TEMP.	
MINIMUN AMB.TEMP.	
TEMP.DIFFERENTIAL	
SERVICE VOLTAGE	
PIPE MATERIAL	

THERMAL INSULATION

TYPE	"K"	THK.	PIPE SIZ
Perlite	0.0687	5.	6"

	Q'TY	CAT.NO.	DESC
1	59	HSR242-CF	26.3
2		HSR302-CF	32.8
3		VSR302-CF	34.2
4	1	AL-PJB-P	POWER C
5			POWER C
6	1	AL-PJB-LE	LIGHTED
7			END SEA
8			
9			SPLICE C
10		HACC-TK-P	TEE CON
11			
12		HACC-TSK-P	THERMO
13			TEMP. S
14			
15			
16			
17			

Solco. pyroelec

PROJECT NAME

TITLE
ELECTRIC HEAT TRACING

END USER

PROJECT	ENG'S JOB NO.	P.O. NO.
CHP-S1		KKPC CHP-S

LINE NO. 24GCF13-BR003-150A SHT. 1 O

DRAWING NO. EHT-DW-201

24.2	1.0			
24.3	1.0			
HEAT LOSS	TRACE	PITCH	HTR/	HTR/

AREA DEMI AREA
UNIT
REF. PLAN DWG
REF. P & ID

REV					
△					
△					
⚠	2014 03.05	FOR FINAL	SHIN		LIM
⚠	2014 02.20	FOR APPROVAL	SHIN		LIM

Technical Support

Pyrotechnician

Trace heating design software

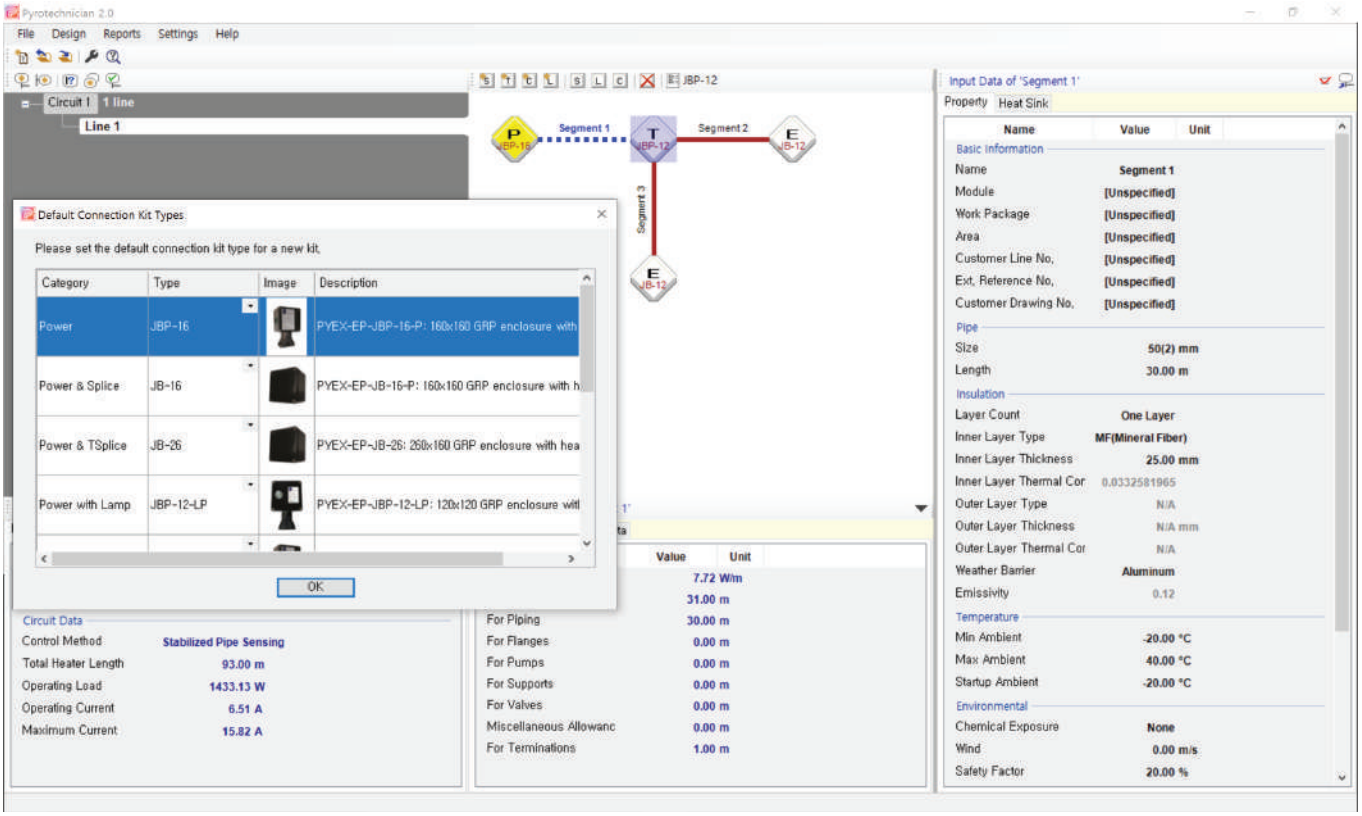
Pyrotechnician, the design software for trace heating application provides the outstanding design-aid performance via user-friendly interface. The process conditions and parameters can be entered individually by keyboard or be downloaded from MS Excel program for multiple lines. User friendly graphics makes the design work more comfortable and easier. The selection of termination kits and/or control devices become easier with more intuitive user interface.

It has all the features you need such as

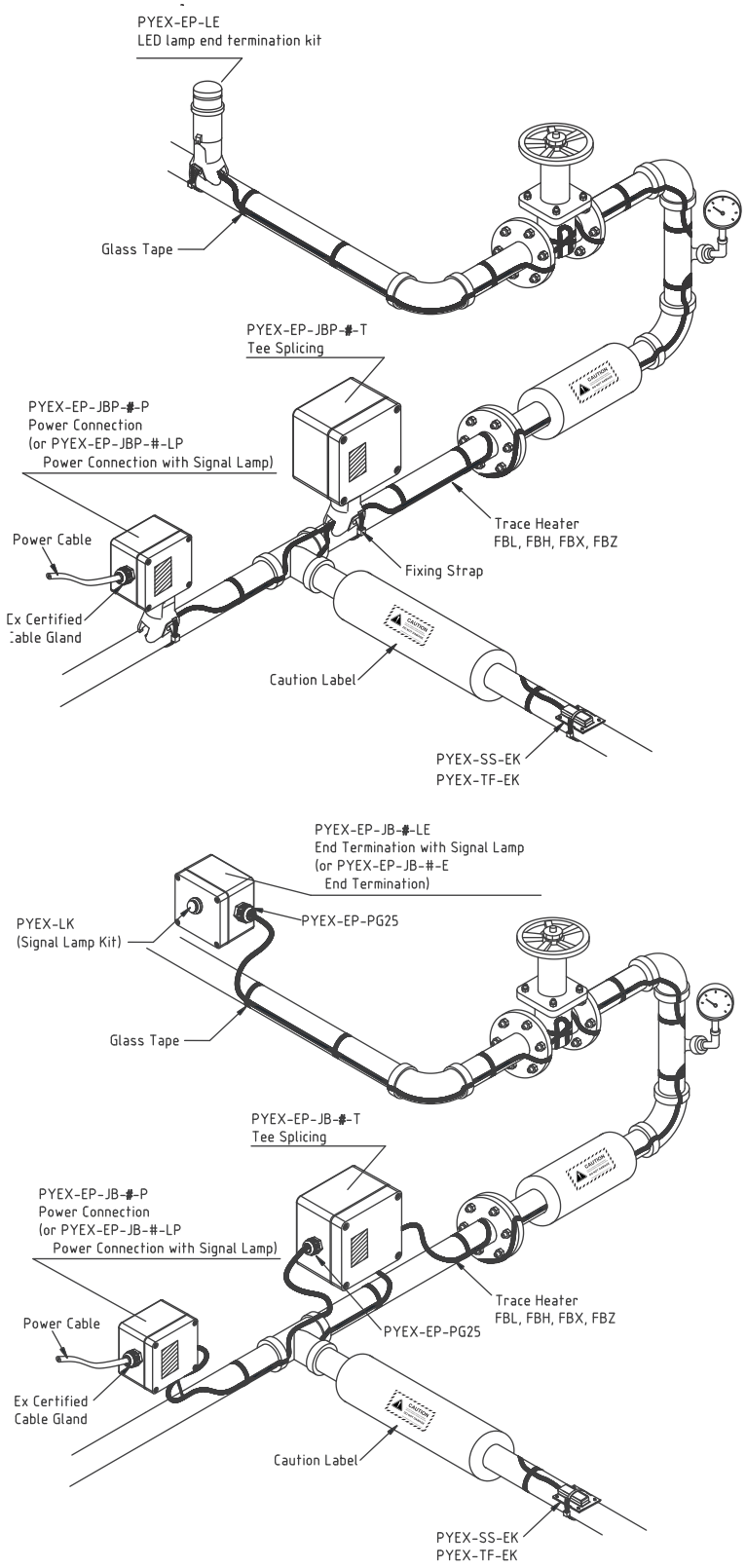
- site conditions and process conditions can be tailored for each pipeline
- heat loss calculation,
- automated heating cable selection
- electrical load for each circuit
- selection of control and monitoring method
- calculated/determined temperature information
- automated generation of design summary and bill of material(BOM).

All reports can be issued in Excel program. Pyrotechnician is the most advanced design software for precision and time-saving design work for both pipe tracing and tank tracing application.

Project window



Typical installation



SOLCO PYROELEC self-regulating cables are to be installed with genuine components being supplied by SOLCO PYROELEC representative to guarantee optimum performance as well as to validate extended warranty scheme. To benefit from SOLCO PYROELEC product warranty, the customer must complete and retain the installation, inspection or commissioning record(s) provided with installation manual. Also the customer should complete warranty registaration form and fax it to SOLCO PYROELEC within thirty(30) days from the installation. Otherwise only standard terms and conditions apply.

Heating Cable

FBL
FBH
FBX
FBZ
FBCW
SFC
LLC
STS
MI

03

Heating Cable

FBL

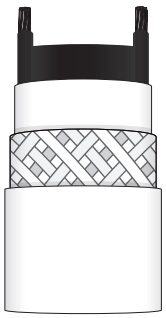
Self-regulating heating cable for low to medium temperature process flow control

Use	Freeze protection for water pipeline. Temperature maintenance for petrochemical and gas plant use in hazardous location. Use in hazardous and non-hazardous location.
Specification	Max. maintain temperature (Power-on) 65°C (150°F) Max. withstand temperature (Power-off) 85°C (185°F) Min. installation temperature : -60°C Temperature classification (T- rating) : T6 (85°C) Rated voltage : 100 ~ 120 Vac, 200 ~ 277 Vac Rated power output : 10, 16, 24 and 30 watt/m@10°C Dimension(nom.) FBL10x, 16x, 24x 11.6mm x 5.6mm FBL30x 13.6mm x 5.6mm Bus wire - ASTM B355 Class 2 NPC AWG16 Outer jacket FR polyolefin (CP) : Exposure to aqueous inorganic chemicals Fluoropolymer (CF) : Exposure to organic chemicals or corrosives
Features	It will not burn or overheat even when overlapped. It self-regulates thermal performance in response to temperature. It can be cut to any length to suit any installation condition. Independent heat output control along the length. Soft power switching for energy saving as well as longer service life. Easy termination for powering and splicing.
Selection Code	FBL ⓐ 16 ⓑ 2 ⓒ - C P ⓓ

ⓐ	Model
ⓑ	Rated output 10, 16, 24 and 30 watt/m@10°C
ⓒ	Rated voltage 1 : 100 ~ 120 Vac, 2 : 200 ~ 277 Vac
ⓓ	Outer jacket P : FR Polyolefin F : Fluoropolymer

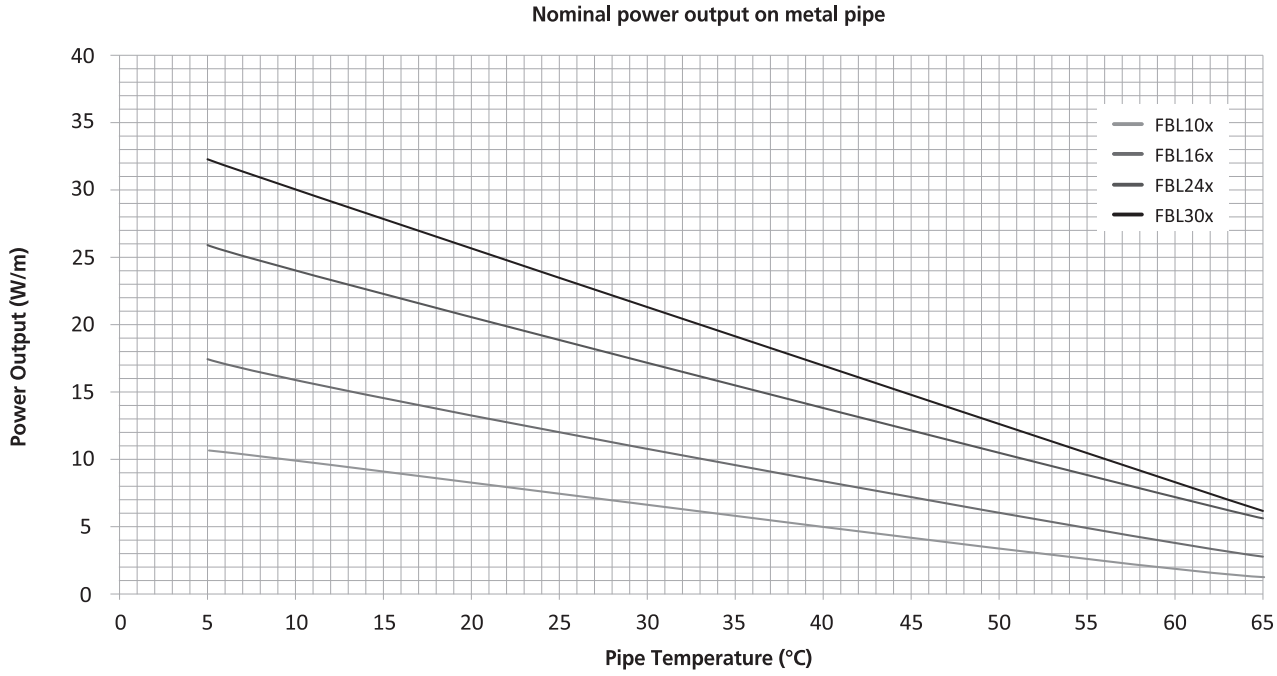
Certification

Product drawing



Bus wire	Nickel plated copper wire
Polymeric heating element	PE + C/B
Primary insulation	Flame-retardant polyolefin
Earthing	Braided tin plated copper wire
Outer jacket	FR polyolefin or fluoropolymer

Power output graph



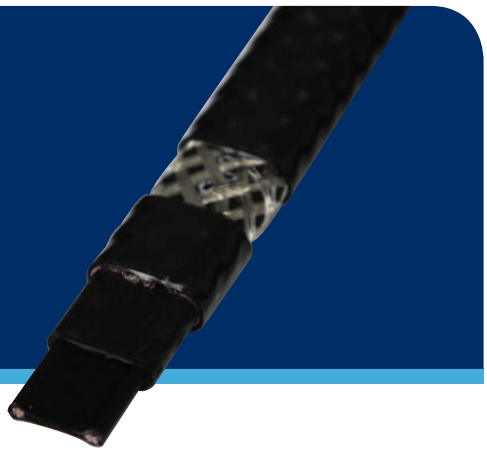
Circuit design guide

Breaker size(A) / Product code	Start-up Temp. -20°C						Start-up Temp. 0°C						Start-up Temp. 10°C					
	10A	16A	20A	25A	32A	40A	10A	16A	20A	25A	32A	40A	10A	16A	20A	25A	32A	40A
FBL102-CP(F)	84	134	155	155	155	155	101	162	169	169	169	169	131	193	193	193	193	193
FBL162-CP(F)	59	94	118	129	129	129	71	113	141	142	142	142	92	147	162	162	162	162
FBL242-CP(F)	42	67	84	104	111	111	49	79	99	122	122	122	66	105	131	137	137	137
FBL302-CP(F)	32	51	64	80	101	101	32	51	64	80	102	113	41	66	82	102	124	124

Max. circuit length(m) at 230Vac based on starting temp. (°C) and typical Type C circuit breaker size (Amps).

FBH

Self-regulating heating cable for medium to high temperature process flow control

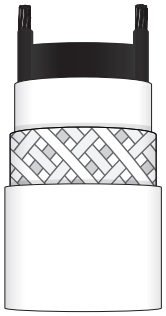


Use	Freeze protection for water, fuel, chemical pipeline. Temperature maintenance for petrochemical and gas plant. Use in hazardous and non-hazardous location.
Specification	Max. maintain temperature (Power-on) 110°C (230°F) Max. withstand temperature (Power-off) 135°C (275°F) Min. installation temperature -60°C Temperature classification (T- rating) : T4 (135°C) Rated voltage : 100 ~ 120 Vac, 200 ~ 277 Vac Rated power output : 15, 30, 45 and 60 watt/m@10°C Dimension(nom.) FBH 15x, 30x, 45x 12.9mm x 5.2mm FBH 60x 14.8mm x 5.6mm Bus wire FBH15x, 30x, 45x ASTM B355 Class 2 NPC AWG16 FBH60x ASTM B355 Class 2 NPC AWG14 Outer jacket Fluoropolymer (CT) : Exposure to organic chemicals or corrosives Flame - retardant XLEVA (CX) : Exposure to aqueous inorganic chemicals
Features	It will not burn or overheat even when overlapped. It self-regulates thermal performance in response to temperature. It can be cut to any length to suit any installation condition. Independent heat output control along the length. Soft power switching for energy saving as well as longer service life. Easy termination for powering and splicing.
Selection Code	FBH ⓐ 30 ⓑ 2 ⓒ - C T ⓓ

ⓐ	Model
ⓑ	Rated output 15, 30, 45 and 60 watt/m@10°C
ⓒ	Rated voltage 1 : 100 ~ 120 Vac, 2 : 200 ~ 277 Vac
ⓓ	Outer jacket T : Fluoropolymer, X : FR XLEVA

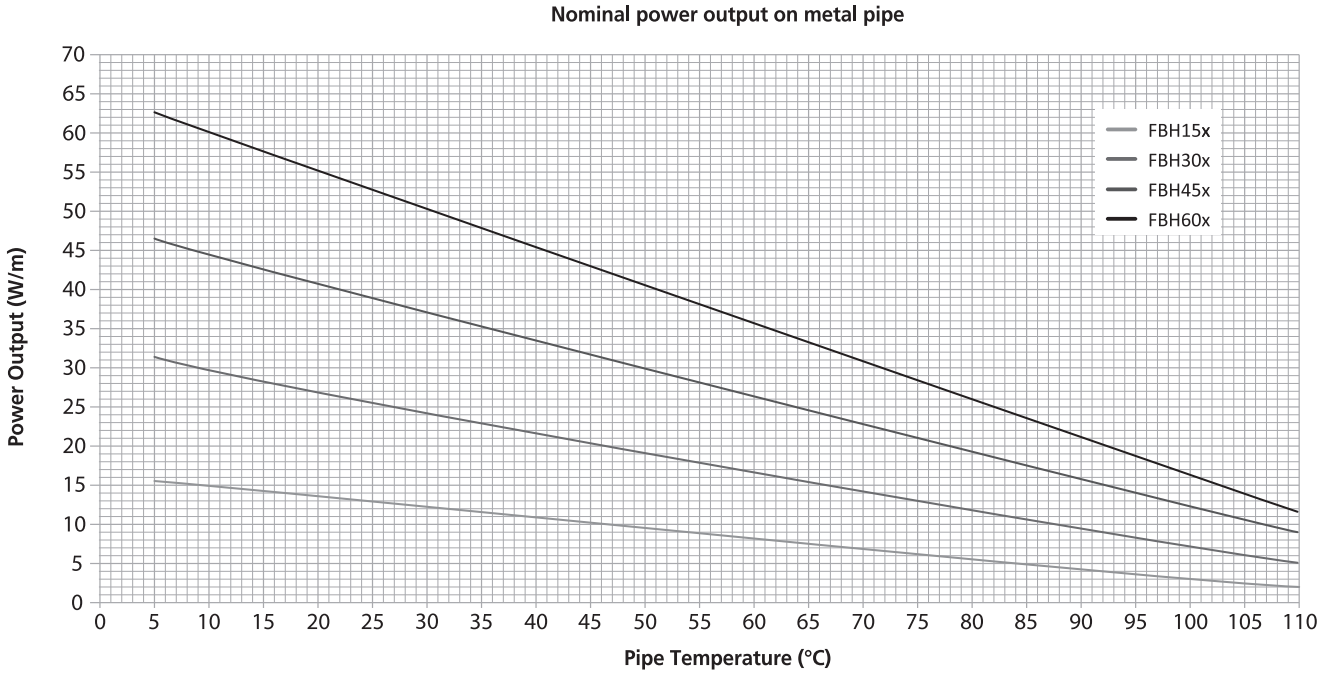
Certification

Product drawing



Bus wire	Nickel plated copper wire
Polymeric heating element	Fluoropolymer + C/B
Primary insulation	Flame-retardant XLEVA
Earthing	Braided tin plated copper wire
Outer jacket	Fluoropolymer

Power output graph



Circuit design guide

Breaker size(A) / Product code	Start-up Temp. -20°C						Start-up Temp. 0°C						Start-up Temp. 10°C					
	10A	16A	20A	25A	32A	40A	10A	16A	20A	25A	32A	40A	10A	16A	20A	25A	32A	40A
FBH152-CT	65	104	130	136	136	136	78	125	149	149	149	149	80	128	151	151	151	151
FBH302-CT	39	63	79	99	106	106	47	75	94	116	116	116	48	77	97	117	117	117
FBH452-CT	28	45	57	71	90	90	33	53	66	82	97	97	35	56	69	87	99	99
FBH602-CT	23	37	46	57	73	85	25	40	50	63	80	88	27	43	54	68	87	92

Max. circuit length(m) at 230Vac based on starting temp. (°C) and typical Type C circuit breaker size (Amps).

FBX

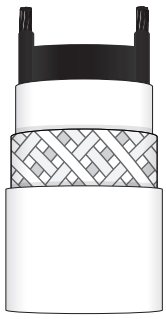
Self-regulating heating cable for high temperature process flow control

Use	Freeze protection for various pipeline under steam purging process. Temperature maintenance for petrochemical and gas plant. Medium or heavy duty heat-up process ex) hopper heater. Use in hazardous and non-hazardous location.
Specification	Max. maintain temperature (Power-on) 150°C (302°F) Use in hazardous and non-hazardous location Max. withstand temperature (Power-off) 200°C (392°F) Min. installation temperature -60°C Temperature classification (T- rating) FBX15x, 30x, 45x : T3 (200°C) FBX60x : T2 (220°C) Rated voltage : 100 ~ 120 Vac, 200 ~ 277 Vac Rated power output : 15, 30, 45 and 60 watt/m@10°C Dimension(nom.) : 12.2mm x 4.8mm Bus wire - ASTM B355 Class 2 NPC AWG16 Outer jacket Fluoropolymer(CT) : Exposure to organic chemicals or corrosives
Features	It will not burn or overheat even when overlapped. It self-regulates thermal performance in response to temperature. It can be cut to any length to suit any installation condition. Independent heat output control along the length. Soft power switching for energy saving as well as longer service life. Easy termination for power connection and splicing.
Selection Code	FBX ⓐ 30 ⓑ 2 ⓒ - C T ⓓ

ⓐ	Model
ⓑ	Rated output 15, 30, 45 and 60 watt/m@10°C
ⓒ	Rated voltage 1 : 100 ~ 120 Vac, 2 : 200 ~ 277 Vac
ⓓ	Outer jacket T : Fluoropolymer

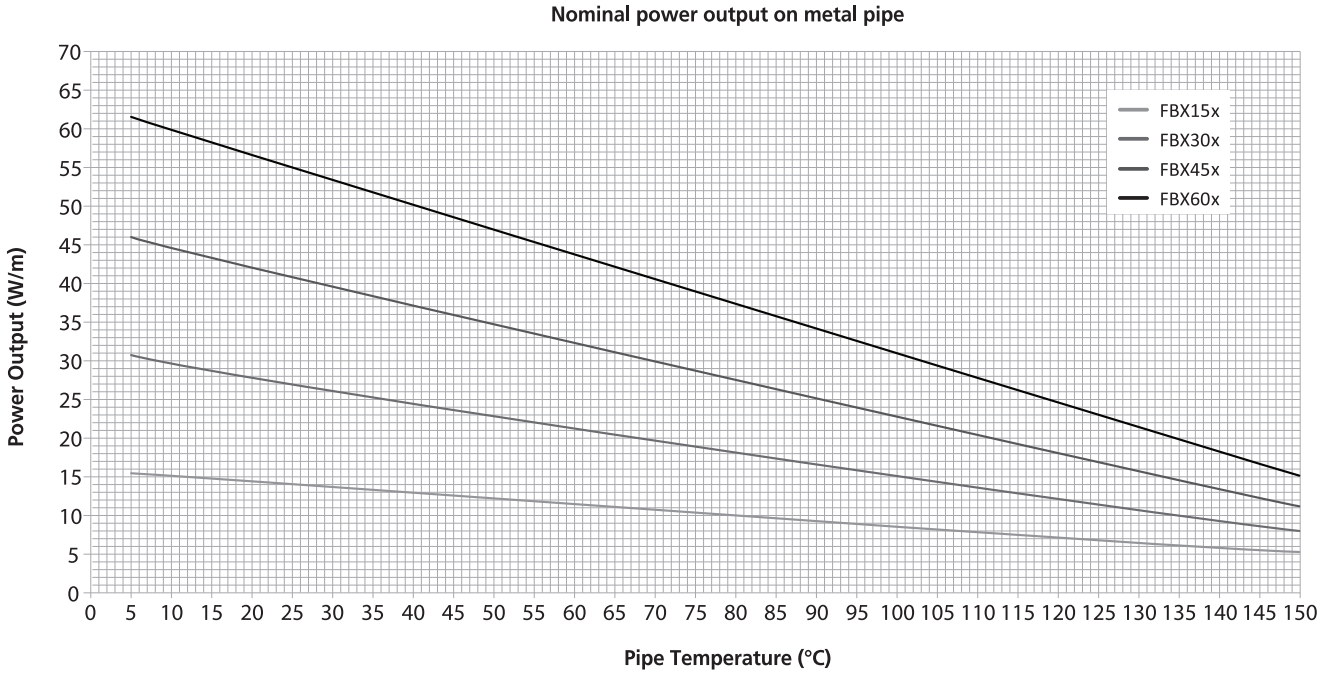
Certification

Product drawing



1	Bus wire	Nickel plated copper wire
2	Polymeric heating element	Fluoropolymer + C/B
3	Primary insulation	Fluoropolymer
4	Earthing	Braided nickel plated or tin plated copper wire
5	Outer jacket	Fluoropolymer

Power output graph



Circuit design guide

Breaker size(A) / Product code	Start-up Temp. -20°C						Start-up Temp. 0°C						Start-up Temp. 10°C					
	10A	16A	20A	25A	32A	40A	10A	16A	20A	25A	32A	40A	10A	16A	20A	25A	32A	40A
FBX152-CT	67	107	134	138	138	138	78	125	149	149	149	149	80	128	151	151	151	151
FBX302-CT	44	70	88	110	112	112	46	74	92	114	114	114	48	77	97	117	117	117
FBX452-CT	31	50	63	79	94	94	33	53	66	83	97	97	35	56	69	87	99	99
FBX602-CT	25	39	49	61	79	84	26	42	52	65	83	86	27	43	54	68	87	88

Max. circuit length(m) at 230Vac based on starting temp. (°C) and typical Type C circuit breaker size (Amps).

FBZ

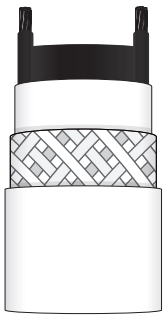
Self-regulating heating cable
for extremely high temperature process flow control

Use	Freeze protection for various pipeline under steam purging process. Temperature maintenance for petrochemical and gas plant. Medium or heavy duty heat-up process ex) hopper heater. Use in hazardous and non-hazardous location.
Specification	Max. maintain temperature(Power-on) 200°C (392°F) Max. withstand temperature(Power-off) 240°C (464°F) Min. installation temperature -60°C Temperature classification (T- rating) FBZ15x, 30x, 45x : T3 (200°C) FBZ60x : T2 (220°C) Rated voltage : 100 ~ 120 Vac, 200 ~ 277 Vac Rated power output : 15, 30, 45 and 60 watt/m@10°C Dimension(nom.) : 12.2mm x 4.8mm Bus wire - ASTM B355 Class 2 NPC AWG16 Outer jacket Fluoropolymer (CT) : Exposure to organic chemicals or corrosives
Features	It will not burn or overheat even when overlapped. It self-regulates thermal performance in response to temperature. It can be cut to any length to suit any installation condition. Independent heat output control along the length. Soft power switching for energy saving as well as longer service life. Easy termination for power connection and splicing.
Selection Code	FBZ ⓐ 60 ⓑ 2 ⓒ - C T ⓓ

ⓐ	Model
ⓑ	Rated output 15, 30, 45 and 60 watt/m@10°C
ⓒ	Rated voltage 1 : 100 ~ 120 Vac, 2 : 200 ~ 277 Vac
ⓓ	Outer jacket T : Fluoropolymer

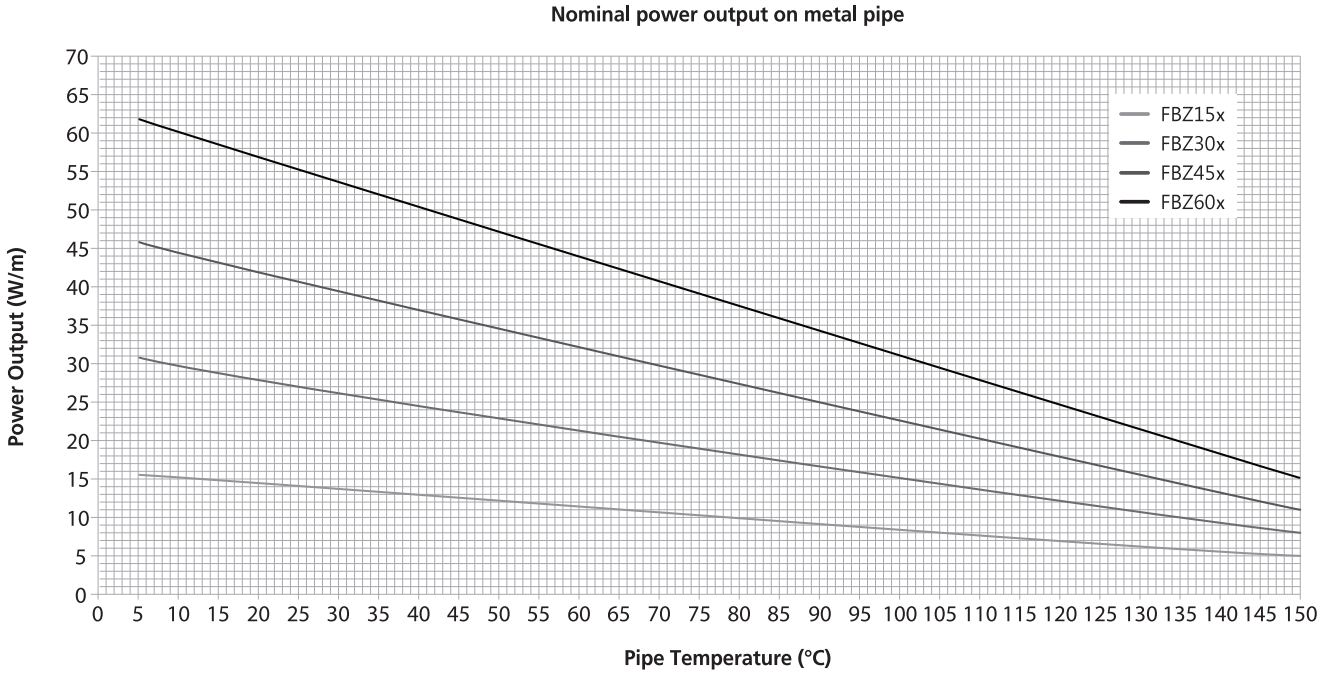
Certification

Product drawing



Bus wire	Nickel plated copper wire
Polymeric heating element	Fluoropolymer + C/B
Primary insulation	Fluoropolymer
Earthing	Braided nickel plated or tin plated copper wire
Outer jacket	Fluoropolymer

Power output graph



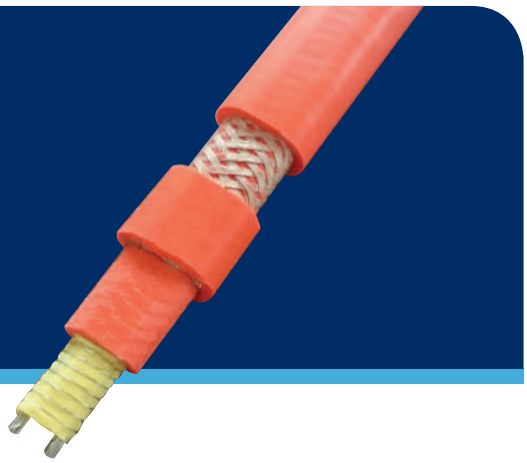
Circuit design guide

Breaker size(A) / Product code	Start-up Temp. -20°C						Start-up Temp. 0°C						Start-up Temp. 10°C					
	10A	16A	20A	25A	32A	40A	10A	16A	20A	25A	32A	40A	10A	16A	20A	25A	32A	40A
FBZ152-CT	51	82	103	121	121	121	60	96	120	130	130	130	62	98	123	132	132	132
FBZ302-CT	37	59	74	93	103	103	39	62	78	97	105	105	41	66	82	102	108	108
FBZ452-CT	28	44	56	69	89	89	29	47	58	73	91	91	31	49	61	77	93	93
FBZ602-CT	22	36	45	56	71	80	24	38	47	59	75	82	25	39	49	61	79	83

Max. circuit length(m) at 230Vac based on starting temp. (°C) and typical Type C circuit breaker size (Amps).

FBCW

Silicone insulated parallel resistance heating cable for industrial applications



Use	Freeze protection or temperature maintenance of vessel and tank. Freeze protection for chemical feeding or process line. Use in hazardous and non-hazardous location.
Specification	Max. maintain temperature (Power-on) 100°C (212°F) Max. withstand temperature (Power-off) 150°C (302°F) Rated voltage : 100 ~ 120 Vac, 200 ~ 240 Vac Rated power output : 10, 20, 30, 40 watt/m@20°C Max. circuit length : 100m Node interval : 10, 20 w/m model : 100cm 30, 40 w/m model : 50cm Conductor size : 10 w/m model : 0.75mm^2 20, 30, 40 w/m model : 1.25 mm^2 Cable dimension (nom.) : 10 w/m model : 9.5mm x 7.5mm 20, 30, 40 w/m model : 11.5mm x 8.0mm Outer jacket (Optional) : CS : Silicone rubber CT : Fluoropolymer
Features	Easy operation and fast response. Zone type parallel circuit heating cable. Flexible and excellent mechanical strength. Excellent resistance to heat, oil and chemicals. Long service life. Save cabling cost and installation cost. No inrush current.
Selection Code	FBCW ⓐ 30 ⓑ 2 ⓒ - C S ⓓ

ⓐ	Model
ⓑ	Rated output 10, 20, 30, 40watt/m@20°C
ⓒ	Rated voltage 1 : 100 ~ 120 Vac, 2 : 200 ~ 240 Vac
ⓓ	Outer jacket S : Silicone rubber, T : Fluoropolymer

Product drawing

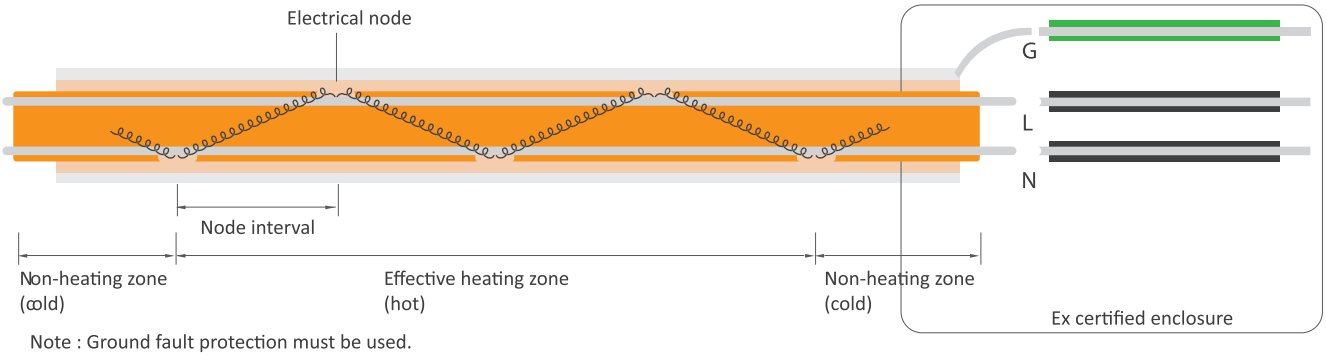
Conductor	Copper
Heating element	Nichrome alloy
Primary insulation	Silicone rubber
Elec. connection node	
Insulation	Braided glassfiber
Sheath	Silicone rubber
Earth covering	Braided tinned copper
Out jacket	- CS : Silicone rubber - CT : Fluoropolymer

Semi-conductor industry

In semi-conductor industry, the variety of aggressive gases are required.
The heat-up or temperature maintenance of the gas supply system including tank or vessel requires an outstanding performance and accuracy together with ultimate energy efficiency.

Solco Pyroelec FBCW heating cable and relevant components show outstanding thermal endurance and mechanical strength up to 150°C.
Also it has no inrush current so as to save cabling cost.

Typical circuit arrangement



Note : Ground fault protection must be used.

Temperature rating (T-Class)

Maximum permitted maintenance temperature (°C) for multiple T-Classes

stablised design

Model	T6	T5	T4	T3
FBCW10x	50	70	105	120
FBCW20x	30	50	85	100
FBCW30x	-	30	65	80
FBCW40x	-	-	35	50

controlled design

Model	T6	T5	T4	T3 (150 °C)
FBCW10x	75	90	125	140
FBCW20x	75	90	125	140
FBCW30x	75	90	125	140
FBCW40x	75	90	125	140

SFC

Teflon insulated series resistance heating cable for industrial heat-up application

Use	Freeze protection or temperature maintenance of long distance pipeline. Freeze protection or temperature maintentance of vessel and tank. Freeze protection for chemical feeding or transportation line.
Specification	Max. continuous exposure temperature (Power-on) 150°C (302°F) Max. intermittent exposure temperature (Power-off) 250°C (482°F) Rated voltage : 600 Vac Max. heat density 40 watt/m Cable size varies depending on conductor size Various conductor size and outjacket selection Non hazardous and hazardous location Circuit length up to 4,000m Outer jacket T : High temperature fluoropolymer
Features	Easy operation and fast response. Heat tracing up to 4km with single power source. Flexible and excellent mechanical strength. Excellent resistance to heat, oil and chemicals. Long service life. Save cabling cost and installation cost. No inrush current.
Selection Code	SFC L 25 - C T ⓐ ⓑ ⓒ ⓓ
Certification	CE

ⓐ	Model
ⓑ	None : Heating cable / L : Cold lead cable
ⓒ	dc resistance ohm/km at 20°C
ⓓ	Outer jacket T : Fluoropolymer

Product drawing

Conductor	Tin plated copper wire
Primary insulation	Fluoropolymer
2nd Insulation	Braided glassfiber
Earthing	Braided tin plated copper wire
Outer jacket	High temperature fluoropolymer

Installation detail

Product Code	Heating Element	Conductor Diameter (mm)	Dc resistance ohm/km@20°C	Cable Diameter (mm)
SFC1.7-CT	Copper	4.10	1.74	6.78
SFC2.9-CT	Copper	3.20	2.92	5.88
SFC4.5-CT	Copper	2.80	4.55	5.48
SFC7.1-CT	Copper	2.00	7.08	4.68
SFC11.3-CT	Copper	1.60	11.28	4.28
SFC14.8-CT	Copper	1.40	14.74	4.08
SFC18.9-CT	Copper	1.40	18.95	4.08
SFC30.5-CT	Copper-Nickel Alloy	1.65	30.53	4.33
SFC42.6-CT	Copper-Nickel Alloy	1.40	42.63	4.08
SFC74.2-CT	Copper-Nickel Alloy	1.50	74.21	4.18
SFC98.4-CT	Copper-Nickel Alloy	1.60	96.63	4.28
SFC148.9-CT	Copper-Nickel Alloy	1.30	150.23	3.98
SFC196.3-CT	Copper-Nickel Alloy	1.60	196.32	4.28
SFC297.4-CT	Copper-Nickel Alloy	1.30	297.37	3.98
SFCL-2.5	Copper	2.00	7.08	4.68
SFCL-4	Copper	2.80	4.55	5.48
SFCL-6	Copper	3.20	2.92	5.88
SFCL-10	Copper	4.10	1.74	6.78
SFCL-16	Copper	5.20	1.03	7.88
SFCL-25	Copper	6.50	0.71	9.18

Tank and vessel heating

In extreme weather condition, heat-up or temperature maintenance of tank or vessel requires an outstanding performance together with ultimate energy efficiency. Solco Pyroelec SFC heating cable and relevant components show outstanding thermal endurance and mechanical strength up to 250°C. Also it has no inrush current so as to save cabling cost.

LLC

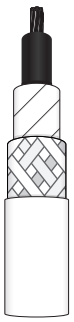
Teflon insulated series heating cable for long distance pipe tracing

Use	Freeze protection of fire hydrant water supply in tunnel. Freeze protection for long distance chemical feeding or transportation line. Use in hazardous and non-hazardous location.
Specification	Max. maintain temperature (Power-on) LLC1X, LLC3X series 90°C (194°F) LLC1T, LLC3T series 150°C (302°F) Max. withstand temperature (Power-off) LLC1X, LLC3X series 135°C (275°F) LLC1T, LLC3T series 240°C (464°F) Rated voltage : 1000V Max. heat density : 40 watt/m Circuit length up to 4,000m Cable size varies depending on conductor size Outer jacket X : XLEVA T : Fluoropolymer
Features	Easy operation and fast response. Heat tracing up to 4km with single power source. Save cabling cost for power supply. Flexible and excellent mechanical strength. Excellent resistance to heat, oil and chemicals. Flat cable for optimized thermal performance. Long service life.
Selection Code	LLC ⓐ 1 ⓑ T ⓒ 015 ⓓ - C T ⓔ

ⓐ	Model LLC : Heating cable, SPCL : Cold lead cable
ⓑ	No. of conductors 1, 2 or 3
ⓒ	Inner sheath X : XLEVA, T : Fluoropolymer
ⓓ	Conductor size 015 / 025 / 040 / 060 / 080 / 100 / 160 / 250 Other sizes are available on request
ⓔ	Outer jacket X : XLEVA, T : Fluoropolymer

Certification

Product drawing

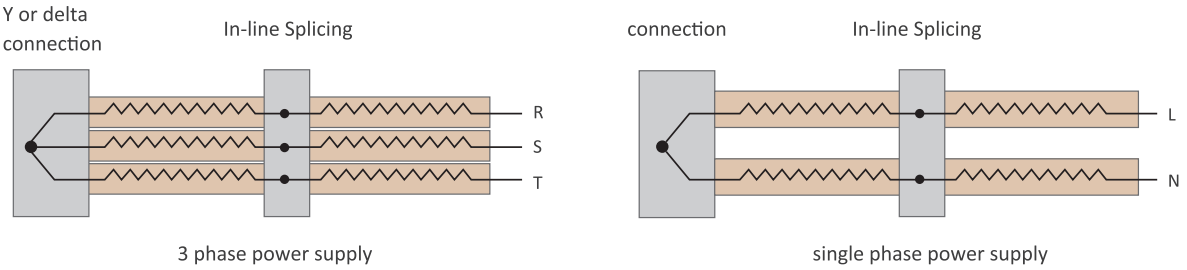


Heating element	Ni-Cu alloy
Primary insulation	Fluoropolymer
2nd insulation	XLEVA or Fluoropolymer
Earthing	Braided tin plated copper wire
Outer jacket	XLEVA or Fluoropolymer

Freeze protection system for long distance pipeline

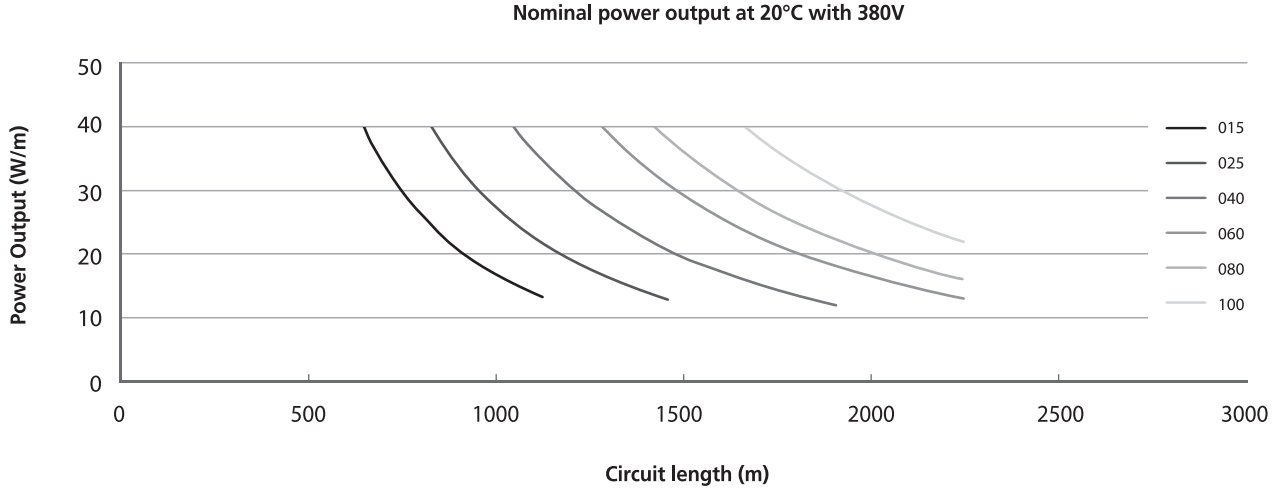
In cold weather, an electrical heat tracing system is highly required for freeze protection of pipelines ex. chemical transport or water supply. But the heat tracing for tunnel or long distance pipeline should bear numbers of power supplies with conventional heating cables. The cabling cost often exceeds that of heat tracing itself. Solco Pyroelec LLC longline heating cable system requires only one power supply in order to trace up to 4 km and saves money and time for extra cablings and connections.

Typical circuit arrangement



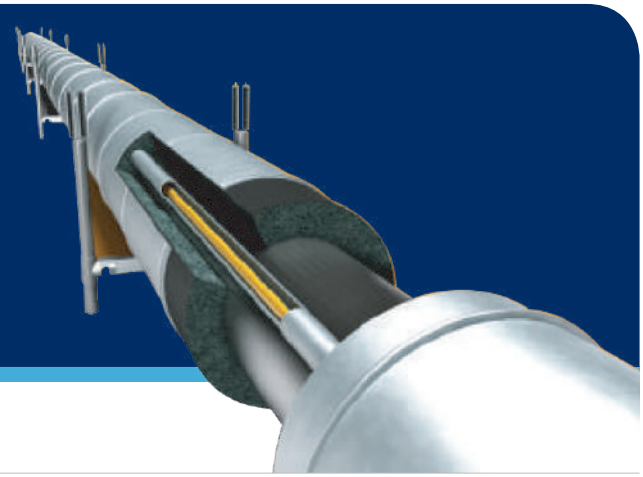
Power output graph

The below power output graphs for typical conductor sizes and supplying voltages are to be used only for reference.
For practical use, more variations should be considered beforehand. Please refer to Solco Pyroelec technical team for further information. Other conductor sizes are available on request.

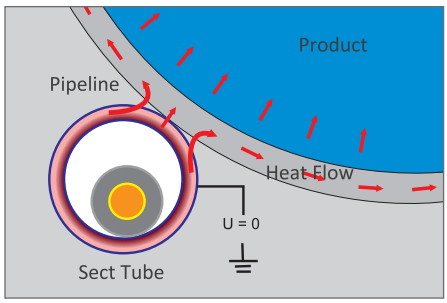


STS

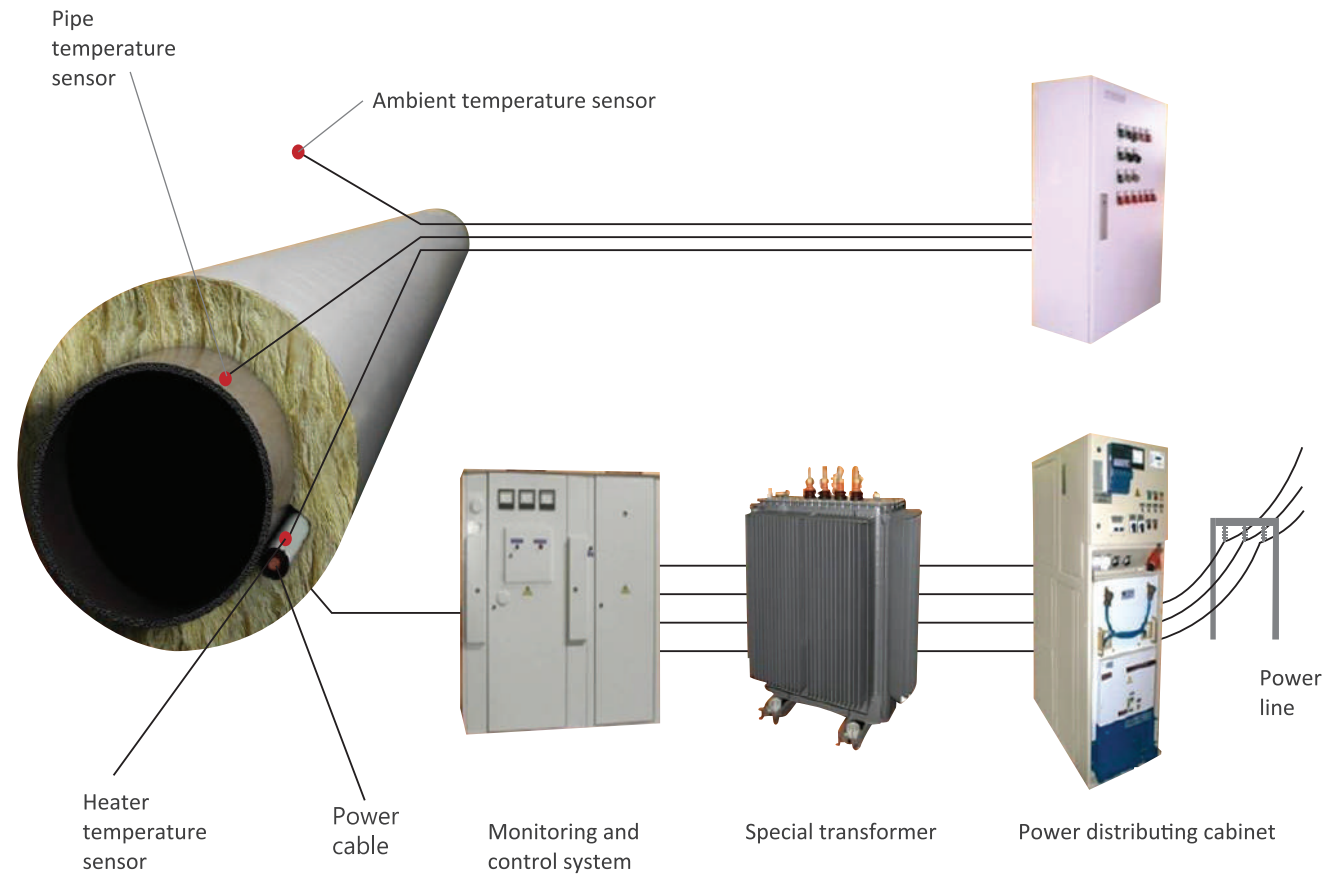
Skin trace heating system

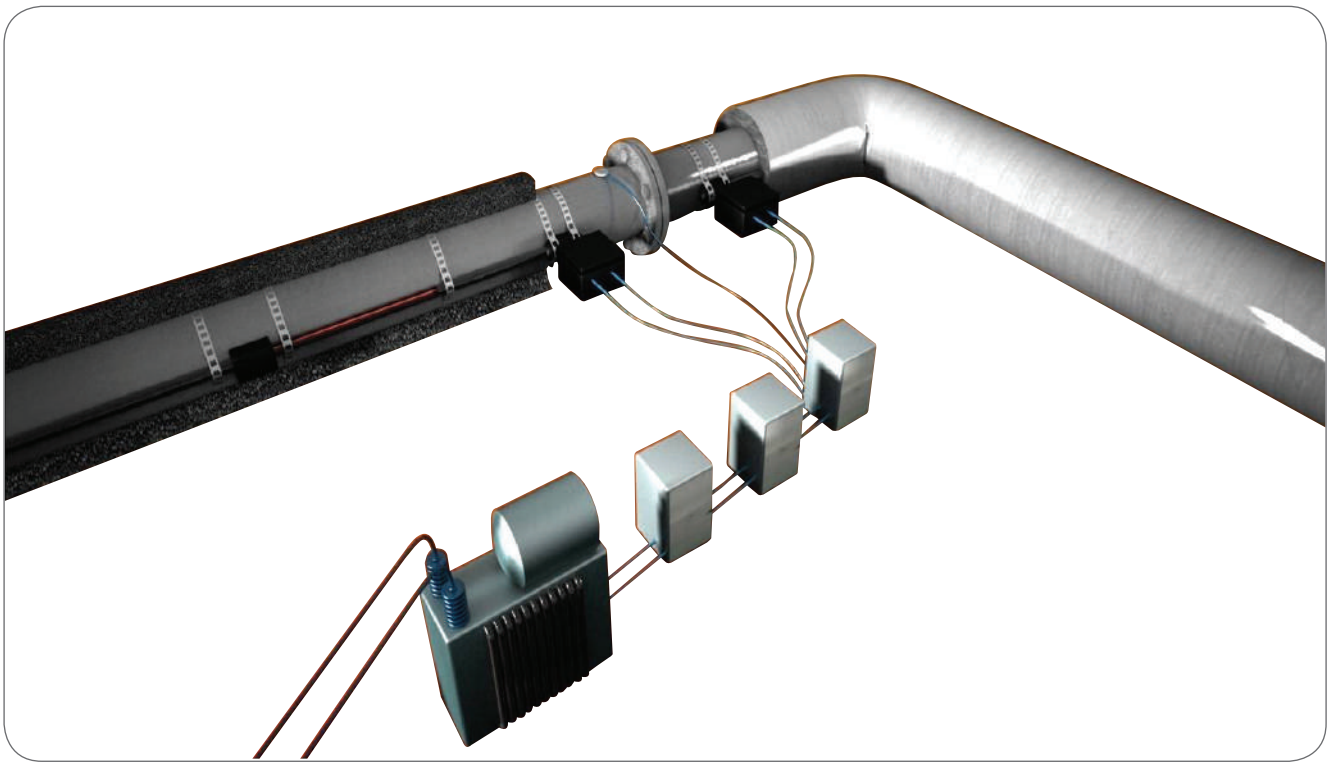


Use	Maintenance of the product temperature. Protection of long trunk pipelines against freezing and ensuring their start heating. Use in hazardous and non-hazardous location.
Specification	Operating temperature : up to 200°C Power output of the heating : up to 120W/m Power supply : up to 5000Vac Circuit length : up to 30km
Features	The only way to heat pipelines with the length up to 30 km without parallel supply network. The most efficient way to heat any trunk pipelines of an unlimited length. Inherent strength and reliability of system design. Zero electrical potential on outer surfaces of heating elements after earthing.
Selection Code	The STS skin trace heating system consists of a ferromagnetic steel tube with outer diameter of 20-60mm and the wall thickness of at least 3.0mm. There is an insulated copper or aluminium conductor with cross-section of 10-50㎟ placed inside the tube. The conductor is electrically connected to the tube at the end of a heating run while AC voltage is supplied between the conductor and the pipe at the run head: the voltage value is calculated based on the required heat output and the heating run length. Currents of the conductor and the tube have opposite directions and thus skin and proximity effects originate in the system. The conductor is non-magnetic, thus, it does not feature any noticeable skin effect and AC flows throughout the whole section of the conductor. The main heat producing element of STS is the tube, which produces heat up to 80% of the system output.
Certification	



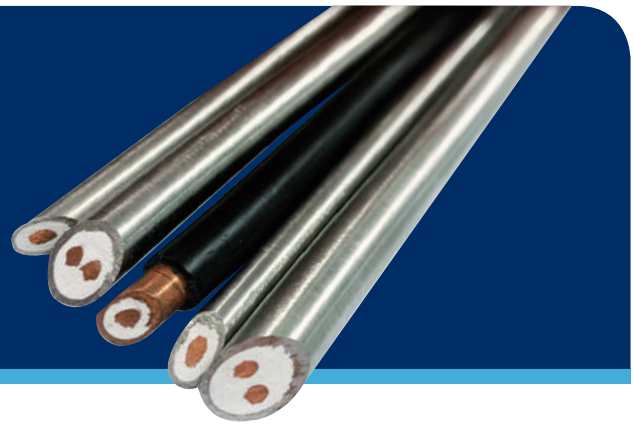
Typical installation





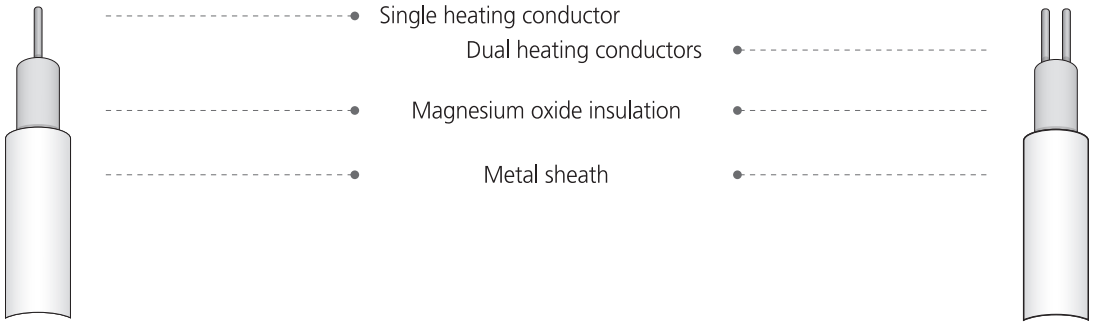
MI

Mineral insulated heating cable



Use	Oil and gas, chemical and petrochemical, power generation, gas storage and many other industrial application. Use in hazardous and non-hazardous location.
Specification	Sheath material : one of the following Copper — Stainless steels of AISI 300x range Cupronickel 70/30 — Alloys 825, Inconel 600 No. of conductors : 1 or 2 Conductor material : one of the following Nichrome Copper Constantan Copper-Nickel alloys Insulation Material : Magnesium Oxide (MgO) Maximum operatkng temperature Copper sheath : 200°C Cupronickel sheath : 400°C Stainless steel and nickel alloy sheath : 600°C Electrical Parameters Supply voltage up to 500Vac (assembled unit) Supply voltage up to 750Vac (cable)
Features	MI cables and elements are ideal for industrial freeze protection, high temperature maintenance of process and areas where good corrosion resistance are required. The cables are enabled to operate at high temperatures for long periods of time in extremely harsh enviroments. For example, petro-chemical, reactor vessels and other applications where the integrity of the cable is the most important. MI cable offers excellent corrosive properties against a wide range of organic acids and alkalis in combination with a high temperature withstand capability.
Certification	CE Ex IECEx

Product drawing



Typical installation

Heating units references

B / H321-A10K / T1 25 / 1.15 / 150
ⓐ ⓑ ⓒ ⓓ ⓔ ⓕ

ⓐ	Unit Design	"B" - Single core heating unit design B "D" - Twin core heating unit design D "E" - Twin core heating unit design E
ⓑ	Cable reference	For cable references see tables below
ⓒ	Type of termination	"T1" - Type 1 / "T2" - Type 2 / "T4" - Type 4
ⓓ	Heated length	Length of heating cable in meters
ⓔ	Cold lead in length	Length of cold lead-in cable and tails, in meters
ⓕ	Tail length	Tail length in mm

Heating cable references

H 122 - 1 D 100 - HDPE
ⓐ ⓑ ⓒ ⓓ ⓔ ⓕ

ⓐ	Category	"H" - Heating cable
ⓑ	Sheath material	122 - Copper 321 - AISI321 Stainless steel 316L - AISI316L Stainless steel 310 - AISI310 Stainless steel 400 - Cupronickel 70/30 600 - Inconel 600 825 - Alloy 825
ⓒ	Number of conductors	1 - One conductor (omitted by default) 2 - Two conductors
ⓓ	Conductor material reference	"A" - Nichrome "B" - Constant "C" - Copper "D" - Copper-Nickel alloys
ⓔ	Conductor(s) resistance	Resistance in ohm/1000m (km) for single conductor or for loop of two conductors
ⓕ	Suffix	Additional information, such as "-300V" - Voltage rating if not 500V "-HDPE" - for HDPE served cables

Cold lead / Wiring cable reference

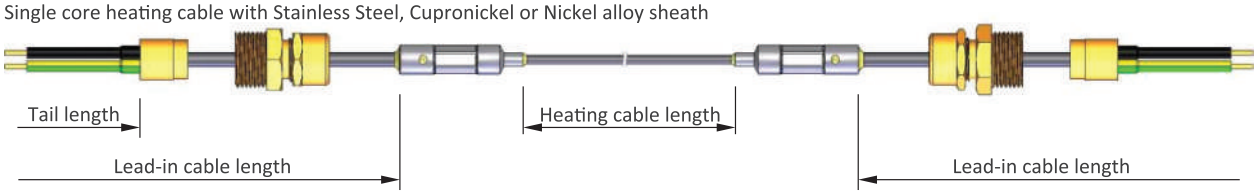
W 122 - 1 C 10 - 750V - HDPE
ⓐ ⓑ ⓒ ⓓ ⓔ ⓕ ⓖ

ⓐ	Category	"W" - Wiring/Cold lead-in cable
ⓑ	Sheath material	122 - Copper 321 - AISI321 316L - AISI316L 310 - AISI310 400 - Cupronickel 70/30 600 - Inconel 600 825 - Alloy 825
ⓒ	Number of conductors	1 - One conductor (omitted by default) 2 - Two conductors
ⓓ	Conductor material reference	"C" - Copper
ⓔ	Conductor cross section area	Cross section area of a single conductor
ⓕ	Voltage Rating	Voltage rating 750V
ⓖ	Suffix	"-HDPE" - for HDPE served cables with copper sheath

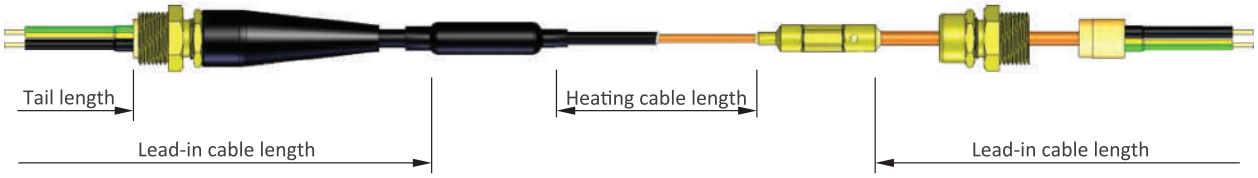
Heating units design types

Design B

Single core heating cable with Stainless Steel, Cupronickel or Nickel alloy sheath

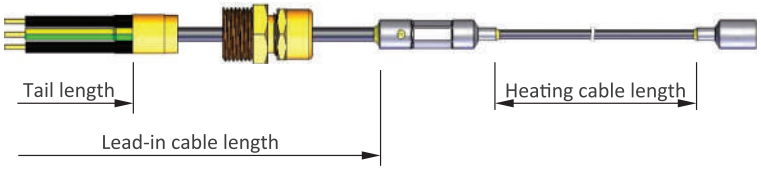


Single core heating cable with Copper sheath bare (right) or HDPE served (left)



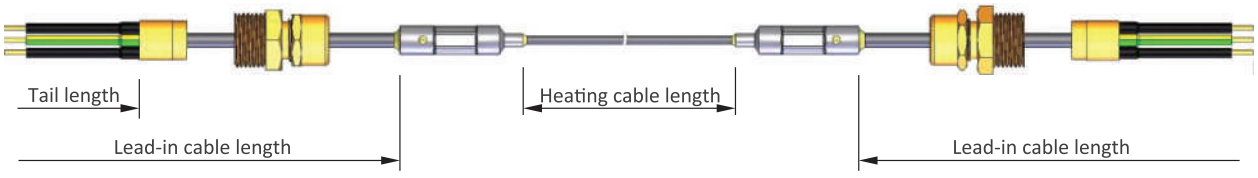
Design D

Twin core heating cable with Stainless Steel, Cupronickel or Nickel alloy sheath

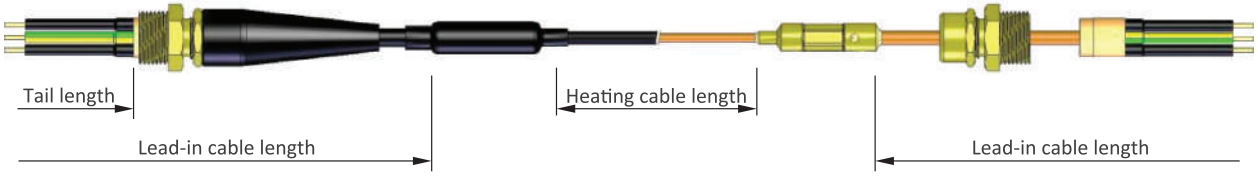


Design E

Twin core heating cable with Stainless Steel, Cupronickel or Nickel alloy sheath

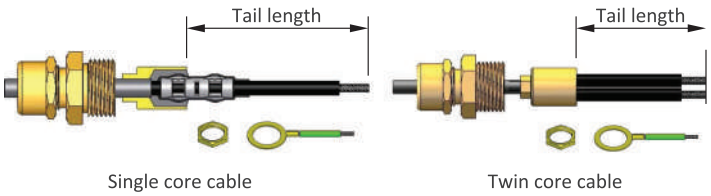


Twin core heating cable with Copper sheath bare (right) or HDPE served (left)



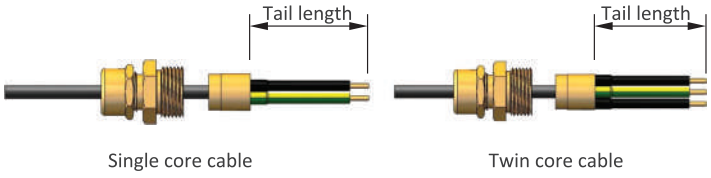
Termination types

Type1



Seal reference	T1
Description	ATEX approved seal for use in hazardous area terminations
Conductor Type	Flexible
Earth tail type	Flexible earth tag with locknut
Pot type	Crimp on pot
Gland thread	M20x1.5 Other sizes on request
Standard tail lengths	150 mm, 300 mm, 450 mm

Type 2



Seal reference	T2
Description	ATEX approved seal for use in hazardous area terminations
Conductor Type	Solid
Earth tail type	Solid
Pot type	Braze on pot
Gland thread	M20x1.5 Other sizes on request
Standard tail lengths	150 mm, 300 mm, 450 mm

Type 4

Seal reference	T4
Description	Long reach seal with on-pot gland CSA and ATEX approved for use in hazardous area terminations
Conductor Type	Flex
Earth tail type	Flexible earth tag with locknut (optional depending on application)
Pot type	Braze on long reach pot
Gland thread	M20x1.5 Other sizes on request
Gland material	Brass, Nickel plated brass, Stainless steel
Standard tail lengths	150 mm, 300 mm, 450 mm

Connection Kit

PYEX-EP-JBP
PYEX-EP-JBP-LP/LE
PYEX-EP-LE
PYEX-EP-JB
PYEX-EP-JB-LP/LE
PYEX-EP-JBS
PYEX-SS-JB
PYEX-SS-EK
PYEX-TF-JCK
PYEX-TF-EK
PYEX-EP-SPK

04

Connection kit

PYEX-EP-JBP

Power connection, T-splicing, End termination
GRP enclosure with plastic pipe-mount

Features

The PYEX-EP-JBP is an Ex certified GRP enclosure with engineering plastic pipe-mount designed and manufactured to meet all requirements from relevant international standards for industrial heat tracing cable system especially for hazardous location such as petrochemical plant, gas plant, ship and off-shore facility.
It is used for the connection and termination of self-regulating heating cables.

Specification

Protection type : Ex eb IIC
Applicable heating cables in hazardous location : FBL, FBH, FBX, FBZ
Temperature classification
  FBL : T6 (85°C)
  FBH : T4 (135°C)
  FBX15x / 30x / 45x, FBZ15x / 30x / 45x : T3 (200°C)
  FBX60x, FBZ60x : T2 (220°C)
Enclosure service temperature : -55°C to 135°C
Plastic pipe-mount service temperature on the pipe :-50°C to 200°C
Max rated voltage 277Vac
Max load current : 50A for PYEX-EP-JBP-12 & 16, 100A for PYEX-EP-JBP-26
Ingress protection : IP66 (when assembled with heating cables)
Enclosure material : Glassfibre reinforced polyester / UV stabilized
Pipe-mount material : PPS
Impact resistance : 7J
Flammability : Self-extinguishing UL 94/V-0
Color : Graphite black
Gasket and seal : Flame-proof silicone rubber
Maximum power conductor cross section : 10mm²
Thread for power cable entry : Max. M25, PF3/4, NPT3/4-14
Approval : KCs, ATEX, IECEx
Reference standards : IEC60079-0, IEC60079-7, IEC60079-30-1

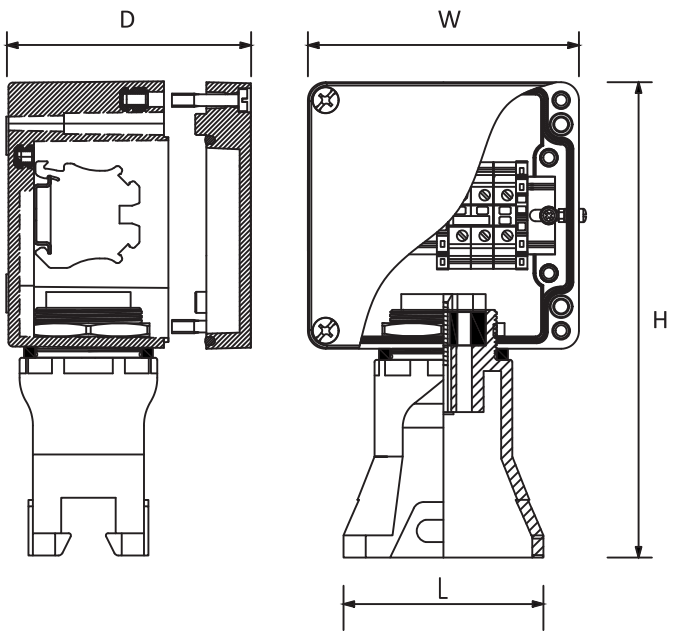
Selection Code

PYEX-EP-JBP - 12 - P
ⓐ ⓑ ⓒ

ⓐ	Model
ⓑ	Enclosure size 12: 120x120x90 mm 16: 160x120x90 mm 26: 260x120x90 mm
ⓒ	Function P: Power connection, T: T-Splicing E: End termination

Certification

Product drawing



Note
The dimension of assembled enclosure system varies depending on the choice of enclosure size.

Model	W	H	L	D
PYEX-EP-JBP-12	122	244	90	90
PYEX-EP-JBP-16	160	284	90	90
PYEX-EP-JBP-26	260	254	90	90

Components

Part Name	Description
PYEX-EP-JB	12 : 122x120x90 16 : 160x160x90 26 : 260x160x90
PYEX-EP-LID	Enclosure lid
PYEX-EP-BODY	Enclosure body
PYEX-TBP	Ex Terminal block for power
PYEX-TBE	Ex Terminal block for earth (Yellow/Green)
PYEX-MEMT	Mount
PYEX-JBP-HS	Heater seal
PYEX-EAS	Earth stud (Optional)

Seal selection and applicable heaters

Part No	Width(A)	Height(B)	Applicable Heaters	Outer Jacket
JBP-HS116	11.6	5.6	FBL 10,16,24	Fluoropolymer -CF / Polyolefin -CP
JBP-HS122	12.2	4.6	FBX FBZ 15,30,45,60	Fluoropolymer -CT
JBP-HS127	12.7	5.2	FBH 15,30,45	Fluoropolymer -CT
JBP-HS136	13.6	5.6	FBL 30	Fluoropolymer -CF / Polyolefin -CP
JBP-HS143	14.3	5.4	FBH 60	Fluoropolymer -CT

All dimensions are in mm.

PYEX-EP-JBP-LP/LE

GRP enclosure with plastic pipe-mount & signal lamp

Features

The PYEX-EP-JBP-LP/LE is designed and manufactured to meet all requirements of relevant standards for industrial heat tracing cable system in hazardous location such as petrochemical plant, gas plant, ship and off-shore facility and utilizes an Ex certified GRP enclosure with plastic pipe-mount for self-regulating heating cable's connection. For the monitoring purpose, an Ex certified LED signal lamp is installed on the lid of GRP enclosure.

Specification

Protection type : Ex db eb IIC
Applicable heating cables in hazardous location : FBL, FBH, FBX, FBZ
Temperature classification
- FBL : T6 (85°C)
- FBH : T4 (135°C)
- FBX15x / 30x / 45x, FBZ15x / 30x / 45x : T3 (200°C)
- FBX60x, FBZ60x : T2 (220°C)

Enclosure service temperature : -55°C to 135°C
Plastic pipe-mount service temperature on the pipe : -50°C to 200°C
Max rated voltage 277Vac
LED signal lamp
- Rated voltage: 20~ 250Vac
- Power consumption: ≤1W
- Color: Green, Red, Yellow, Blue, White

Max load current : 50A for PYEX-EP-JBP-12 & 16, 100A for PYEX-EP-JBP-26
Ingress protection : IP66 (when assembled with heating cables)
Enclosure material : Glassfibre reinforced polyester / UV stabilized
Pipe-mount material : PPS
Impact resistance : 7J
Flammability : Self-extinguishing UL 94/V-0
Color : Graphite black
Gasket and seal : Flame-proof silicone rubber
Maximum power conductor cross section : 10mm²
Thread for power cable entry : Max. M25, PF3/4, NPT3/4-14
Approval : KCs, ATEX, IECEx
Reference standards : IEC60079-0, IECE60079-1, IEC60079-7, IEC60079-30-1

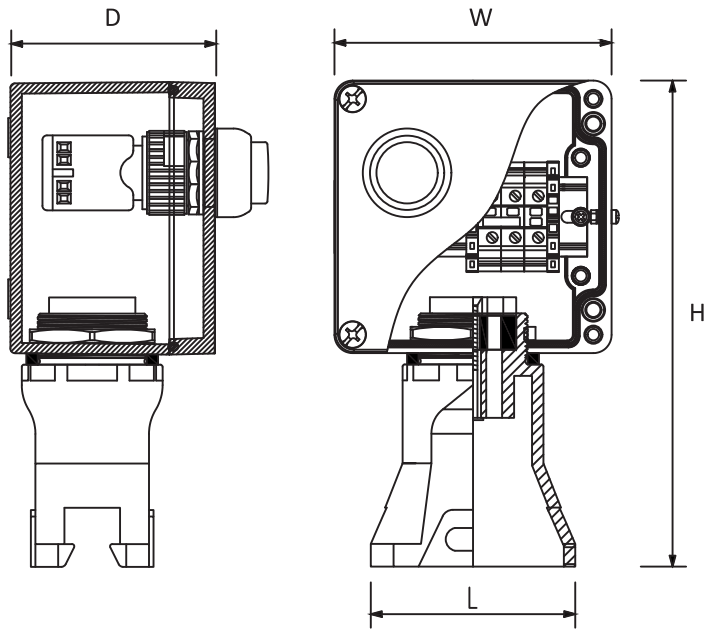
Selection Code

PYEX-EP-JBP - 12 - LP
ⓐ ⓑ ⓒ

ⓐ	Model
ⓑ	Enclosure size 12: 120x120x90 mm 16: 160x120x90 mm 26: 260x120x90 mm
ⓒ	Function LP: Power connection with signal lamp LE: End termination with signal lamp

Certification

Product drawing



Note
The dimension of assembled enclosure system varies depending on the choice of enclosure size.

Model	W	H	L	D
PYEX-EP-JBP-12	122	244	90	90
PYEX-EP-JBP-16	160	284	90	90
PYEX-EP-JBP-26	260	254	90	90

Components

Part Name	Description
PYEX-EP-JB	12 : 122x120x90 16 : 160x160x90 26 : 260x160x90
PYEX-EP-LID	Enclosure lid
PYEX-EP-BODY	Enclosure body
PYEX-TBP	Ex Terminal block for power
PYEX-TBE	Ex Terminal block for earth (Yellow/Green)
JBP-MEMT	Mount
JBP-HS	Heater seal
PYEX-LK	Signal lamp kit
PYEX-EAS	Earth stud (Optional)

Seal selection and applicable heaters

Part No	Width(A)	Height(B)	Applicable Heaters	Outer Jacket
JBP-HS116	11.6	5.6	FBL 10,16,24	Fluoropolymer -CF / Polyolefin -CP
JBP-HS122	12.2	4.6	FBX FBZ 15,30,45,60	Fluoropolymer -CT
JBP-HS127	12.7	5.2	FBH 15,30,45	Fluoropolymer -CT
JBP-HS136	13.6	5.6	FBL 30	Fluoropolymer -CF / Polyolefin -CP
JBP-HS143	14.3	5.4	FBH 60	Fluoropolymer -CT

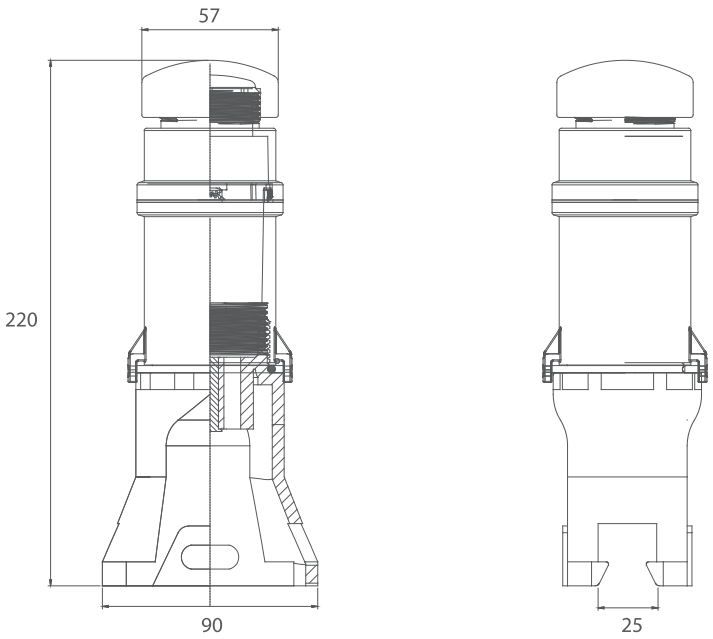
All dimensions are in mm.

PYEX-EP-LE

End termination kit with LED signal lamp for industrial trace heating applications

Features	The PYEX-EP-LE is an end termination kit with LED signal lamp. It is designed and manufactured to meet all relevant standards for industrial trace heating cable system in hazardous locations such as petrochemical plant, gas plant, ship and off-shore facilities. It consists of an Ex certified plastic termination enclosure and all necessary parts together with intrinsically safe signal lamp assembly. It has a specially 'single-twist-lock' technology for easy and time-saving connection with Solco Pyroelec self-regulating heating cables on various sites.
Use	Monitoring the performance of industrial trace heating circuits such as freeze protection or temperature maintenance of vessel, tank, chemical feeding or transportation pipelines. Non hazardous and hazardous location.
Specification	Protection type : Ex eb ib IIC T2...T6 Gb Electrical rating : 100 ~ 240 Vac / 49mW / 0.125A Color : Green (250nm) / other colors on request Optical efficiency (typ.) : 6 x 2.5 lm/W (green) Ambient temperature : -50°C to +60°C Temperature class T6 (85°C) when used with FBL T4 (135°C) with FBH T3 (200°C) with FBX15x, 30x, 45x / FBZ15x, 30x, 45x T2 (220°C) with FBX60x / FBZ60x Enclosure service temp. : -50°C to +130°C Product dimension : Ø 57mm x 220mm Construing materials Lamp cover : PC (transparent) Main housing : glassfibre-reinforced nylon Pipe-mount : PPS O-rings and grommets : silicone rubber Ingress protection : IP66 (when assembled with heating cables) Impact resistance : 7 Joules Weather-proof : Yes Approval : KCs, CE Reference standards : IEC60079-0, IEC60079-7, IEC60079-11, IEC60079-30-1
Certification	KCs CE

Product drawing



Partlist

Part Name	Description
ELK-PC-COVER	Transparent lamp cover
ELK-PA-PCB	PCB Housing nylon 66
ELK-PA-MAIN	Termination enclosure nylon 66
PYEX-MEMT	Pipe-mount PPS
ELK-PCB-LED	LED PCB
ELK-PCB-MAIN	Main PCB
ELK-MOLD	Encapsulation
ELK-LOCK	'no-twist-back' teeth
ELK-SR-B	Gasket for mount
JBP-HSG	Heater seal for PYEX-MEMT

PYEX-EP-JB

Power Connection, T-Splicing, End Termination
GRP enclosure with plastic gland for heating cable

Features

The PYEX-EP-JB is an Ex certified GRP enclosure system designed and manufactured to meet all requirements from relevant international standards for industrial heat tracing cable system especially for hazardous location such as petrochemical plant,gas plant, ship and off-shore facility and utilizes an Ex certified GRP enclosure with Ex certified M20 or M25 cabe gland for the connection and termination of self-regulating heating cables.

Specification

Protection type : Ex eb IIC
Applicable heating cables in hazardous location : FBL, FBH, FBX, FBZ
Temperature classification
  FBL : T6 (85°C)
  FBH : T4 (135°C)
  FBX152 / 302 / 452, FBZ152 / 302 / 452 : T3 (200°C)
  FBX602, FBZ602 : T2 (220°C)
Enclosure service temperature : -55°C to 135°C
M25 heating cable gland service temperature : -60°C to 121°C
Max rated voltage 277Vac
Max load current : 50A for PYEX-EP-JB-12 & 16, 100A for PYEX-EP-JB-26
Ingress protection : IP65 (when assembled with heating cables)
Enclosure material : Glassfibre reinforced polyester / UV stabilized
Impact resistance : 7J
Flammability : Self-extinguishing UL 94/V-0
Color : Graphite black
Gasket and seal : Flame-proof silicone rubber
Maximum power conductor cross section : 10mm²
Thread for power cable entry : Max. M25, PF3/4, NPT3/4-14
Approval : ATEX, IECEx
Reference standards : IEC60079-0, IEC60079-7, IEC60079-30-1

Selection Code

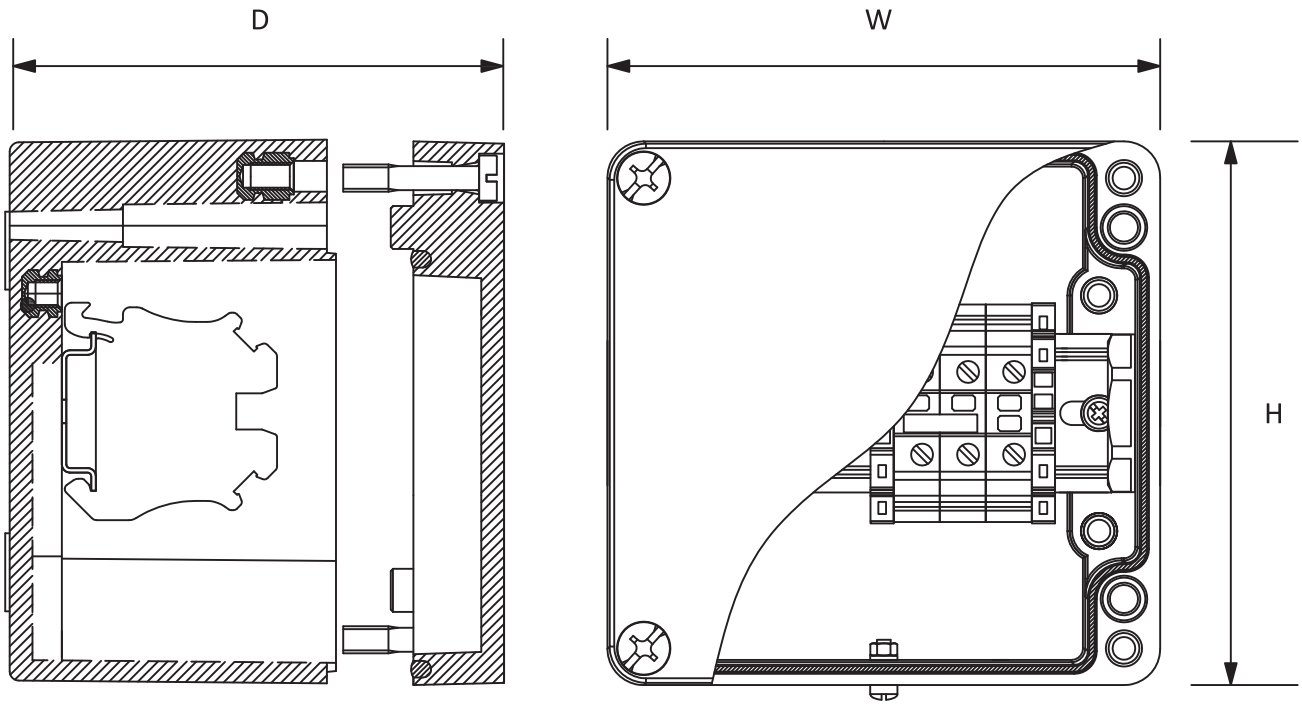
PYEX-EP-JB - 12 - P
ⓐ ⓑ ⓒ

ⓐ	Model
ⓑ	Enclosure size 12: 120x120x90 mm 16: 160x120x90 mm 26: 260x120x90 mm
ⓒ	Function P: Power connection, T: T-Splicing E: End termination

Certification

CE Ex IECEx DNV UKCA

Product drawing



Note
The dimension of assembled enclosure system varies depending on the choice of enclosure size.

Model	W	H	D
PYEX-EP-JB-12	122	120	90
PYEX-EP-JB-16	160	160	90
PYEX-EP-JB-26	260	160	90

Components

Part Name	Description
PYEX-EP-JB	12 : 122x120x90 16 : 160x160x90 26 : 260x160x90
PYEX-EP-LID	Enclosure lid
PYEX-EP-BODY	Enclosure body
PYEX-TBP	Ex Terminal block for power
PYEX-TBE	Ex Terminal block for earth (Yellow/Green)
PYEX-EP-PG25	M25 Ex Plastic cable gland
PYEX-EAS	Earth stud (Optional)

PYEX-EP-JB-LP/LE

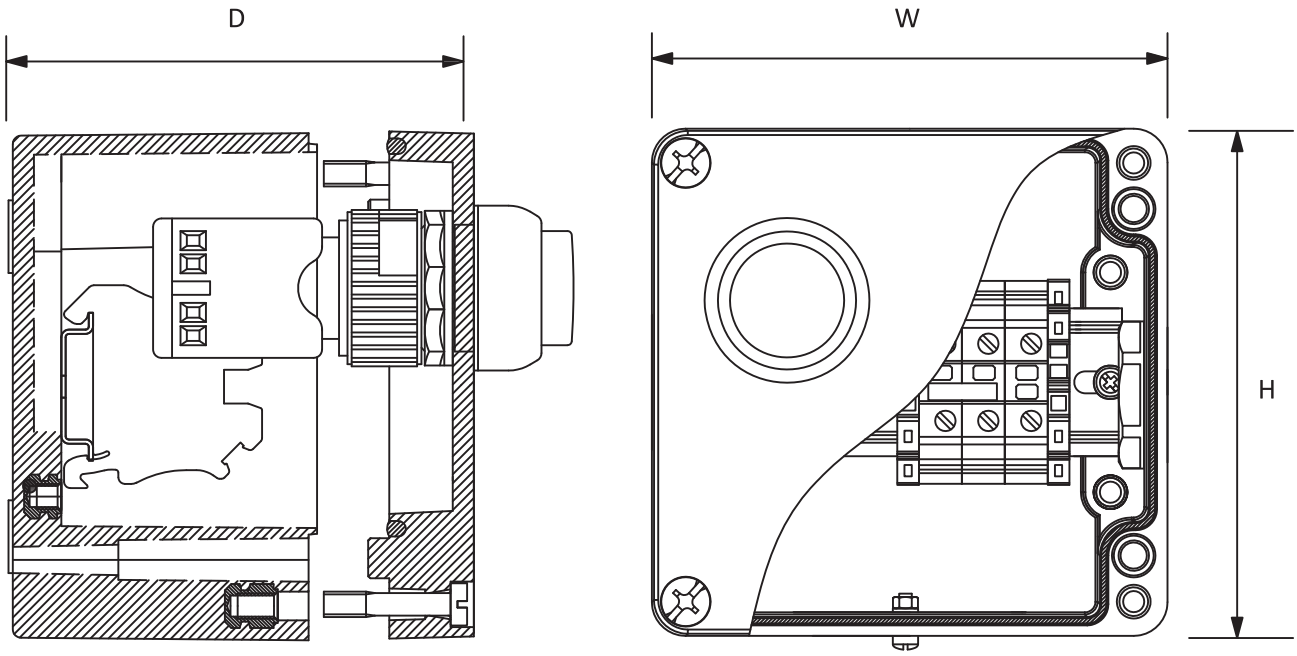
Power connection, Monitoring
GRP enclosure with signal lamp & plastic gland
for heating cable

Features	The PYEX-EP-JB-LP/LE is designed and manufactured to meet all requirements of relevant standards for industrial heat tracing cable system in hazardous location such as petrochemical plant, gas plant, ship and off-shore facility and utilizes an Ex certified GRP enclosure with Ex certified GRP enclosure with Ex certified M20 or M25 cabe gland for the connection and termination of self-regulating heating cables.
Specification	Protection type : Ex db eb IIC Applicable heating cables in hazardous location : FBL, FBH, FBX, FBZ Temperature classification FBL : T6 (85°C) FBH : T4 (135°C) FBX15x / 30x / 45x, FBZ15x / 30x / 45x : T3 (200°C) FBX60x, FBZ60x : T2 (220°C) Enclosure service temperature : -55°C to 135°C Plastic heating cable gland (PYEX-EP-PG25) service temperature : -40°C to 110°C Max rated voltage 277Vac LED signal lamp Rated voltage: 20~ 250Vac Power consumption: ≤1W Color: Green, Red, Yellow, Blue, White Max load current : 50A for PYEX-EP-JB-12 & 16, 100A for PYEX-EP-JB-26 Ingress protection : IP65 (when assembled with heating cables) Enclosure material : Glassfibre reinforced polyester / UV stabilized Impact resistance : 7J Flammability : Self-extinguishing UL 94/V-0 Color : Graphite black Gasket and seal : Flame-proof silicone rubber Maximum power conductor cross section : 10mm² Thread for power cable entry : Max. M25, PF3/4, NPT3/4-14 Approval : ATEX, IECEx Reference standards : IEC60079-0, IECEx60079-1, IEC60079-7, IEC60079-30-1
Selection Code	PYEX-EP-JB - 12 - LP/LE ⓐ ⓑ ⓒ

ⓐ	Model
ⓑ	Enclosure size 12: 120x120x90 mm 16: 160x120x90 mm 26: 260x120x90 mm
ⓒ	Function LP: Power connection with signal lamp LE: End termination with signal lamp

Certification

Product drawing



Note
The dimension of assembled enclosure system varies depending on the choice of enclosure size.

Model	W	H	D
PYEX-EP-JB-12	122	120	90
PYEX-EP-JB-16	160	160	90
PYEX-EP-JB-26	260	160	90

Components

Part Name	Description
PYEX-EP-JB	12 : 122x120x90 16 : 160x160x90 26 : 260x160x90
PYEX-EP-LID	Enclosure lid
PYEX-EP-BODY	Enclosure body
PYEX-TBP	Ex Terminal block for power
PYEX-TBE	Ex Terminal block for earth (Yellow/Green)
PYEX-EP-PG25	M25 Ex Plastic cable gland
PYEX-LK	Signal lamp kit
PYEX-EAS	Earth stud (Optional)

PYEX-EP-JBS

Power Connection, T-Splicing, End Termination
GRP enclosure with stainless steel pipe-mount

Features

The PYEX-EP-JBS is an Ex certified GRP enclosure system designed and manufactured to meet all requirements from relevant international standards for industrial heat tracing cable system especially for hazardous location such as petrochemical plant, gas plant, ship and off-shore facility and utilizes an Ex certified GRP enclosure with stainless steel pipe-mount for the connection and termination of self-regulating heating cables.

Specification

Protection type : Ex eb IIC
Applicable heating cables in hazardous location : FBL, FBH, FBX, FBZ
Temperature classification
  FBL : T6 (85°C)
  FBH : T4 (135°C)
  FBX15x / 30x / 45x, FBZ15x / 30x / 45x : T3 (200°C)
  FBX60x, FBZ60x : T2 (220°C)
Enclosure service temperature : -55°C to 135°C
Stainless steel pipe-mount service temperature on the pipe : -50°C to 300°C
Max rated voltage 277Vac
Max load current : 30A for PYEX-EP-JBS-12, 16 & 26
Ingress protection : IP66 (when assembled with heating cables)
Enclosure material : Glassfibre reinforced polyester / UV stabilized
Impact resistance : 7J
Flammability : Self-extinguishing UL 94/V-0
Color : Graphite black
Gasket and seal : Flame-proof silicone rubber
Maximum power conductor cross section : 10mm²
Thread for power cable entry : Max. M25, PF3/4, NPT3/4-14
Approval : ATEX, IECEx
Reference standards : IEC60079-0, IEC60079-7, IEC60079-30-1

Selection Code

PYEX-EP-JBS - 12 - P
ⓐ ⓑ ⓒ

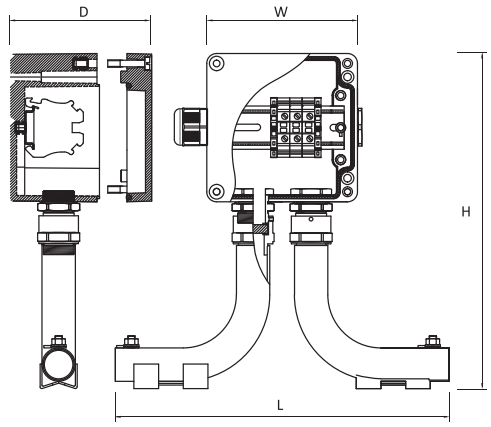
ⓐ	Model
ⓑ	Enclosure size 12: 120x120x90 mm 16: 160x120x90 mm 26: 260x120x90 mm
ⓒ	Function P: Power connection, T: T-Splicing E: End termination

Certification

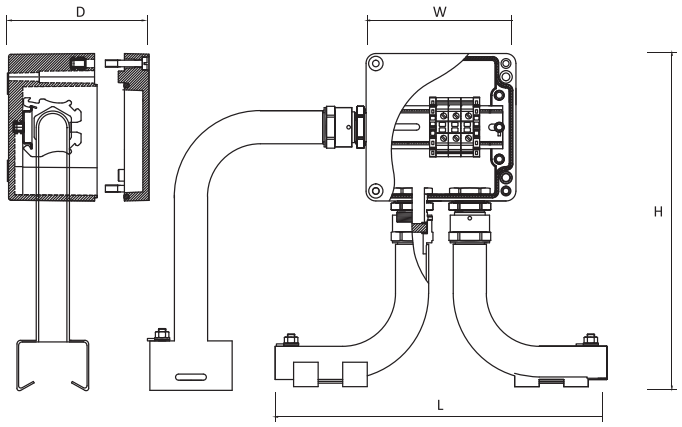
CE Ex IECEx DNV UKCA

Product drawing

① PYEX-EP-JBS-P/E



② PYEX-EP-JBS-T



Note
The dimension of assembled enclosure system varies depending on the choice of enclosure size.

Model	W	H	L	D
PYEX-EP-JBS-12	122	272	268	90
PYEX-EP-JBS-16	160	312	271	90
PYEX-EP-JBS-26A	260	312	297	90
PYEX-EP-JBS-26B	255	402	292	90

Components

Part Name	Description
PYEX-EP-JB	12 : 122x120x90 26A : 260x160x90 16 : 160x160x90 26B : 255x250x90
PYEX-EP-L	Enclosure lid
PYEX-EP-B	Enclosure body
PYEX-DR	Din rail
PYEX-TBP	Ex Terminal block for power
PYEX-TBE	Ex Terminal block for earth (Yellow/Green)
PYEX-SS-MT	Pipe-mount assembly
PYEX-HS	Heater seal
PYEX-EP-PG25	Ex Plastic cable gland (optional)
PYEX-SP-M25	Ex stopping plug (optional)
PYEX-BR-PMG25	Metallic cable gland for pipe mount (optional)
PYEX-SS-SE	SUS side elbow pipe-mount (optional)

Seal selection and applicable heaters

Part No	Width(A)	Height(B)	Applicable Heaters	Outer Jacket
JBS-HS116	11.6	5.6	FBL 10,16,24	Fluoropolymer -CF / Polyolefin -CP
JBS-HS122	12.2	4.6	FBX FBZ 15,30,45,60	Fluoropolymer -CT
JBS-HS127	12.7	5.2	FBH 15,30,45	Fluoropolymer -CT
JBS-HS136	13.6	5.6	FBL 30	Fluoropolymer -CF / Polyolefin -CP
JBS-HS143	14.3	5.4	FBH 60	Fluoropolymer -CT

All dimensions are in mm.

PYEX-SS-JB

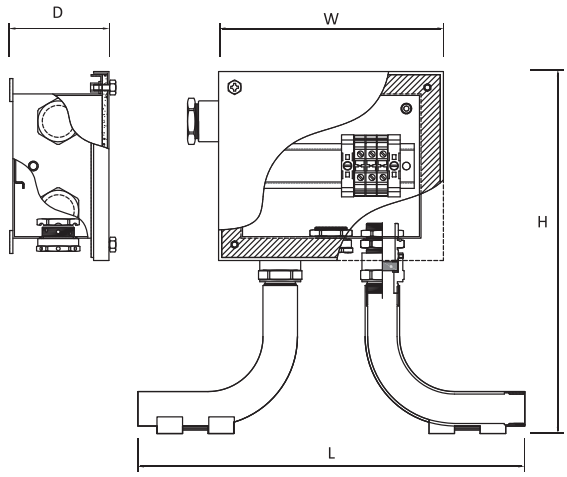
Pipe mounted junction enclosure
for trace heating installations

Use	Electrical installation in hazardous and safe location. Trace heating for ship-building and off-shore plant. Oil well and petro chemical plant. Control station. Instrument installation.
Features	Designed for trace-heating in harsh environment. High ingress protection IP66 or higher. Manufactured of acid resistant stainless steel. Tailored size and performance. High strength and corrosion resistance / Long lifetime. Several earthing alternatives. Drain plug in box without water ingression.
Specification	Protection type : Ex eb IIC Ingress protection : IP66/IP67 Material : Stainless steel AISI 304 or 316L Finish acid treatment Ambient temperature : -50˚C < Ta < +50˚C Applicable heating cable : FBL, FBH, FBX, FBZ Terminal block : Pheonix Contact UT2.5/4/6/10/16 Max. conductor size : 16mm² Rated voltage : up to 750V
Selection Code	PYEX-SS-JB - P ⓐ ⓑ

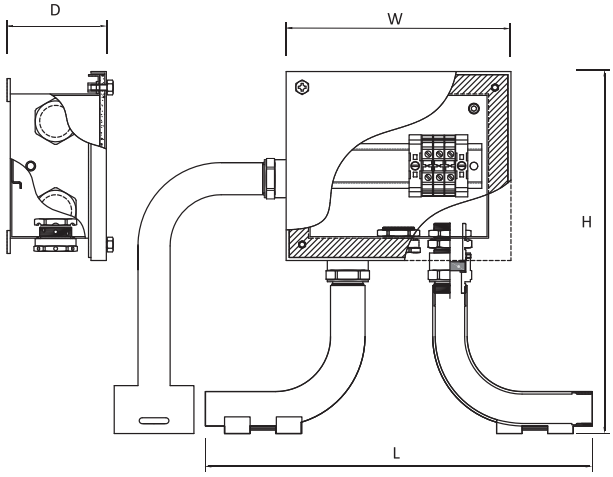
ⓐ	Model
ⓑ	Function P: Power connection, T: T-Splicing E: End termination

Product drawing

① PYEX-SS-JB-P/E



② PYEX-SS-JB-T



Note
The dimension of assembled enclosure system varies depending on the choice of enclosure size.

Model	W	H	L	D
PYEX-SS-JB18	176	265	303	90
PYEX-SS-JB25	253	306	380	90

Components

Part Name	Description
PYEX-SS-JB	18 : 176x148x78 25 : 253x175x108
PYEX-SS-L	Enclosure lid
PYEX-SS-B	Enclosure body
PYEX-DR	Din rail
PYEX-TBP	Ex Terminal block for power
PYEX-TBE	Ex Terminal block for earth (Yellow/Green)
PYEX-SS-MT	SUS Pipe-mount assembly
PYEX-HS	Heater seal
PYEX-BR-DP	Drain plug
PYEX-BR-MG25	Ex Certified metallic cable gland (optional)
PYEX-BR-PMG25	Metallic cable gland for pipe mount (optional)
PYEX-SS-SE	SUS side elbow pipe-mount (optional)

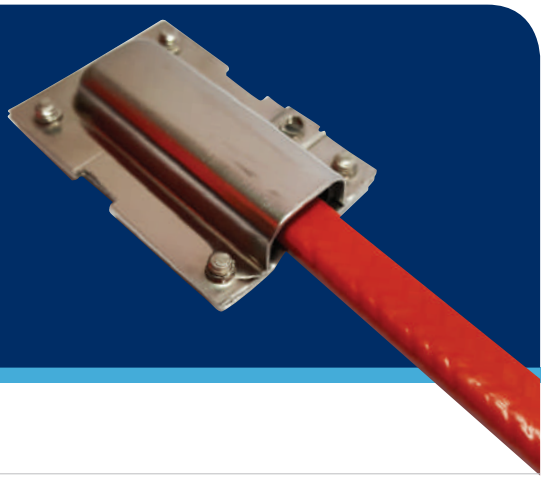
Seal selection and applicable heaters

Part No	Width(A)	Height(B)	Applicable Heaters	Outer Jacket
SJB-HS116	11.6	5.6	FBL 10,16,24	Fluoropolymer -CF / Polyolefin -CP
SJB-HS122	12.2	4.6	FBX FBZ 15,30,45,60	Fluoropolymer -CT
SJB-HS127	12.7	5.2	FBH 15,30,45	Fluoropolymer -CT
SJB-HS136	13.6	5.6	FBL HSR 30	Fluoropolymer -CF / Polyolefin -CP
SJB-HS143	14.3	5.4	FBH 60	Fluoropolymer -CT

All dimensions are in mm.

PYEX-SS-EK

Cold applied end termination kit
for heat tracing cable system



Use	Freeze protection for water pipeline. Temperature maintenance for fuel feedline.
Features	The PYEX-SS-EK is a low-profile end termination kit for FBL, FBH, FBX and FBZ parallel heat tracing cables. The service temperature is -50˚C to 180˚C. It is certified for ATEX and IECEx for use in hazardous areas. It provides both excellent electrical insulation and ultimate mechanical protection as it is the ideal combination between molded silicone rubber end seal and stainless steel cover. This kit does not require a heat gun or torch for the installation. Therefore hot work is not required.
Specification	Protection type : Ex eb IIC Ingress protection : IP66 Min. Ambient temperature : -50˚C Max. Exposure temperature : 180˚C Construction material : Stainless steel & Silicone rubber Approval : ATEX, IECEx Reference standards : IEC60079-0, IEC60079-7, IEC60529, IEC60079-30-1
Certification	CE Ex IECEx DNV UKCA

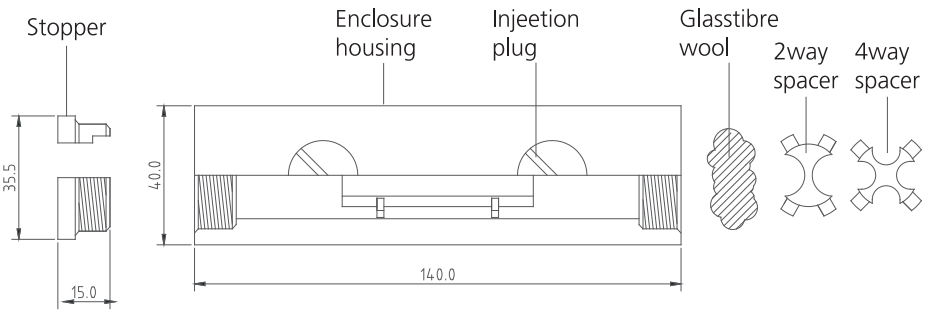
Seal selection and applicable heaters

Part No	Width(A)	Height(B)	Applicable Heaters	Outer Jacket
EX-ES11	11.6	5.6	FBL 10,16,24	Fluoropolymer -CF / Polyolefin -CP
EK-ES12	12.7	5.2	FBX FBZ 15,30,45,60 FBH 15,30,45	Fluoropolymer -CT
EK-ES13	13.6	5.6	FBL HSR 30	Fluoropolymer -CF / Polyolefin -CP
EK-ES14	14.3	5.4	FBH 60	Fluoropolymer -CT

All dimensions are in mm.

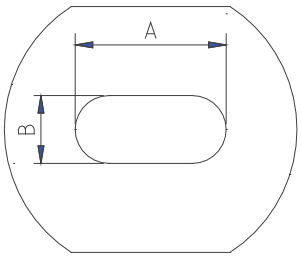
PYEX-TF-JCK

Termination kit for industrial trace heating applications

Use	Integral termination kits under the thermal insulation. Power connection, splicing, and end termination of high temperature trace heating system. Temperature maintenance of vessel, tank, chemical feeding or transportation pipelines. Non hazardous and hazardous location.
Features	The PYEX-TF-JCK is an integral termination kits for power connection, splicing connection and/or end termination of series resistance trace heating cables such as LLC and SFC by Solco Pyroelec. Once assembled, it is small, 140mm long and 40mm in diameter, and water-proof so to be installed under the thermal insulation. It is exceptionally heat-resistant as it is made of PTFE rod. It provides 2-way or 4-way non-metallic spacer for safe crimping connections between conductors inside cylindrical enclosure depending on heater type. Once RTV potting compound applied, both ends of termination kit are secured by mineral wool and non-metallic stopper for curing at room temperature.
Specification	Protection type : Ex 60079-30-1 IIC T2...T6 Gb Electrical rating : 1000 Vac / 106 A Color : White Temperature class : Refer to the installation manual Enclosure service temp. : -50°C to +260°C Product dimension : Ø 40mm x 140mm Construing materials : Enclosure and spacer : PTFE Stopper : Glassfibre wool Potting compound : RTV
Certification	
Product Drawing	

PYEX-TF-EK

Cold applied end termination kit
for trace heating cable system

Use	Integral termination kits under the thermal insulation. End termination of high temperature trace heating system. Temperature maintenance of vessel, tank, chemical feeding or transportation pipelines. Non hazardous and hazardous location.
Features	The PYEX-TF-EK is a low-profiled integral end termination kits for FBL, FBH, FBX, and FBZ self-regulating trace heating cables by Solco Pyroelec. Once assembled, it is small, 45mm x 25mm, and water-proof so to be installed under the thermal insulation. The service temperature is -50°C to +260°C. It has an excellent electrical insulation and mechanical stength as it is made of PTFE rod. The termination process does not require heat application by heat-gun or torch.
Specification	Protection type : Ex 60079-30-1 IIC T2...T6 Gb Electrical rating : 1000 Vac / 30 A Color : White Temperature class : Refer to the installation manual Enclosure service temp. : -50°C to +260°C Product dimension : 45mm x 25mm x 21mm Construing materials : Housing : PTFE Potting compound : RTV
Kit Selection Guide	

Part No.	Width (A)	Height (B)
TF-EK13	12.9 $^{+0.2}_{-0.0}$	5.8 $^{+0.2}_{-0.0}$
TF-EK15	14.8 $^{+0.2}_{-0.0}$	5.8 $^{+0.2}_{-0.0}$
TF-EK20	20.0 $^{+0.2}_{-0.0}$	12.0 $^{+0.2}_{-0.0}$

Applicable Heaters

Part No.	Applicable Heaters	Outer
TF-EK13	FBL/HSR 10/16/24W models all FBX/FBZ models FBH 15/30/45W models	Polyolefin -CP Fluoropolymer -CF / -CT
TF-EK15	FBL/HSR 30W models FBH 60W model	Polyolefin -CP Fluoropolymer -CF / -CT
TF-EK20	SmSR model	Polyolefin -CX

Certification

PYEX-EP-SPK

Power Connection, Splicing
Engineering plastic enclosure installed under insulation

Features	The PYEX-EP-SPK is the water-proof engineering plastic enclosure for power connection and/or splice connection of heating cable. It is small and water tight (IP65) so to be installed under insulation. It has an excellent mechanical strength in both extreme weather as it is made of engineering plastic. It can accommodate power cable and heating cable up to 15mm in diameter. It is small enough to suit narrow installation work. The clamping nut can be used as cable gland having 1"PF thread.
Specification	After assembled diameter 40mm, length 120mm. Ingress protection : IP65 Operating temperature : -55˚C to 130˚C Compatible with conventional pipe thread-both end 1"PF
Selection Code	PYEX-EP-SPK - P ⓐ ⓑ ⓐ Model ⓑ Function P : Powering S : Splice E : End Termination
Certification	

Heater Seal Selection

Part No	Width(A)	Height(B)	Applicable Heaters
JBP-HS116	11.6	5.6	FBL 10,16,24
JBP-HS136	13.6	5.6	FBL 30, FBH15, 30.45 FBX, FBZ
JBP-HS145	14.5	5.6	FBH60

All dimensions are in mm.

Component

PYEX-PTK-M
PYEX-ETK-M
PYEX-PTK-S
PYEX-EP-PG25
PYEX-CG-M25
PYEX-SS-BRP/BRW
PYEX-CL-S
PYEX-GT
PYEX-AT
PYEX-FS
HACC-PK-P
HACC-TK-P
HACC-ELK-P

05

Component

Component

PYEX-PTK-M

Cold applied power connection kit for heat tracing cable system

This kit is certified for ATEX and IECEx for use in hazardous areas.
The silicone molded power tube does not require a heat gun or torch for insulating heating core.

PYEX-ETK-M

Cold applied end termination kit for heat tracing cable system

This connection kit is designed for end terminating all Solco Pyroelec self-regulating heating cables while maintaining electrical insulation of the heating cable conductors and core.

PYEX-PTK-S

Heat shrink power connection kit for self-regulating heating cables

PTK-S is for power connecting FBL, FBH, FBX and FBZ parallel heating cables to Ex certified enclosure.

PYEX-EP-PG25

M25 Cable gland

The M25 plastic cable gland is made of fiberglass reinforced nylon for thermal endurance and mechanical strength. The silicone rubber seal should be selected with care to maintain optimum sealing with the heating cable to use with. An additional locknut is provided for unthreaded enclosure wall.

PYEX-CG-M25

M25 metal cable gland

PYEX-CG-M25 is made of stainless steel for heat tracing application, specially for non-circular heating cables. It can accommadate flexible conduit for further mechanical protection.

PYEX-SS-BRP-H

Pipe mounting bracket (Horizontal)

Support brackets are used to fix equipment such as the Ex enclosure on pipes.
Applicable Ex enclosure.
-16H : PYEX-EP-JB-12, PYEX-EP-JB-16
-26H : PYEX-EP-JB-26

PYEX-SS-BRP-V

Pipe mounting bracket (Vertical)

Support brackets are used to fix equipment such as the Ex enclosure on pipes.
Applicable Ex enclosure.
-16V : PYEX-EP-JB-12, PYEX-EP-JB-16
-26V : PYEX-EP-JB-26

PYEX-SS-BRW-16V

Wall mounting bracket

Support brackets are used to fix equipment such as the Ex enclosure on pipe trays or wall.
Applicable Ex enclosure.
-16V : PYEX-EP-JB-12, PYEX-EP-JB-16
-26V : PYEX-EP-JB-26

Component

PYEX-CL-S

Warning labels

S : PET sheet type warning label.

PYEX-GT

Glass tape

The attachment tape is used to fix the heating cable or temperature sensor.
The glass tape is made of fiberglass for thermal endurance and mechanical strength.
- Max. Exposure Temp. 130˚C, Size 12mm x 30M

PYEX-AT

Aluminium tape

The attachment tape is used to fix the heating cable or temperature sensor.
The high performance tape is made of aluminum for thermal conductivity and mechanical strength.
- Max. Exposure Temp. 125˚C, Size 50mm x 50M

PYEX-FS

Pipe straps

Metal straps for pipe mounting of enclosure connection kit.

PYEX-FS-045	0.5" - 1.5"	10 - 45mm
PYEX-FS-100	2" - 4"	45 - 100mm
PYEX-FS-225	4" - 9"	92 - 225mm
PYEX-FS-380	9" - 15"	220 - 380mm
PYEX-FS-540	15" - 20"	375 - 540mm

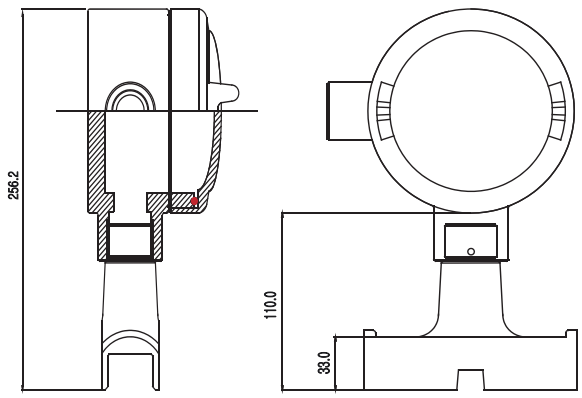
HACC-PK-P
HACC-TK-P

Explosion proof 'Ex-db'
Power connection / T-splicing enclosure

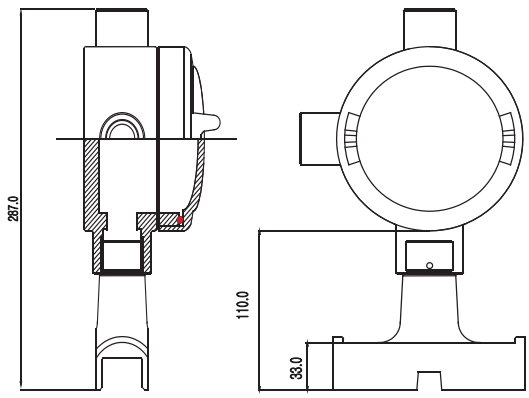
Features	HACC is an aluminium enclosure specially for heating cable installation. It is designed and manufactured to meet all the technical requirements for hazardous locations. The additional suffix describes the specific use of HACC enclosure set for the installation with heating cables. HACC-PK-P : Power connection HACC-TK-P : T-splicing It is made of special grade aluminium to meet the required pressure tests against explosion or ignition of explosive gas or dust. The flame proof gasket stops the ingression of water and dust. In order to use with non-circular cables, suitable sealing fitting is required to accommodate non-circular cables size up to 15mm^{2}.
Specification	Ex db IIC T6 Ambient temperaturerange : -20˚C to 50˚C Max rated voltage 600Vac Max load current : 20A Ingress protection : IP65 Enclosure material : Aluminium Cable entry 3/4"PF compatible to conventional pipe thread Gasket and Seal : Flame proof silicone rubber Maximum power conductor cross section : 15mm² Approval : KCs Reference standards: IEC60079-0, IEC60079-1,IEC60079-14
Certification	KCs

Product drawing

① HACC-PK-P



② HACC-TK-P



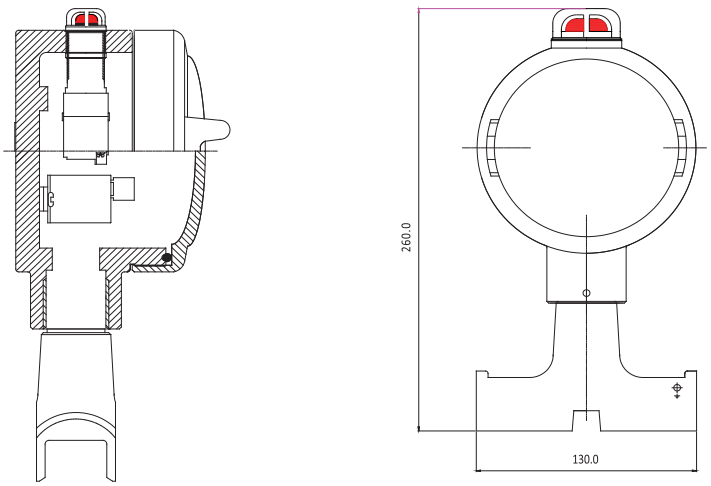
HACC-ELK-P

Explosion-proof 'Ex-db'
End termination enclosure with signal lamp

Features	HACC-ELK-P is an aluminium enclosure fitted with specially designed pilot lamp, which shows the status of power supply of each circuit of electrical heat tracing. It is made of special grade of aluminum to meet the required pressure tests against explosion or ignition of explosive gas or dust. The flame proof gaskets stops the ingression of water and dust.
Specification	Assembled enclousure : height 257mm, width 132mm, depth 64mm Ex db IIC T6 IP66 Gasket and cable seal : Flameproof silicone rubber 220Vac / 110Vac, 15mA
Part List	
Certification	

Part Name	Description
Pipe mount	ALPJB-MB/TS
Heater seal	SH-HS
Heat seal stopper	GS-CS
Enclosure body	AL-PJB-B/TS
Pilot lamp	PL
Gasket	SR-GSK
Enclosure cover	AL-PJB-C/TS
Mount grub screw	GS-GRS

Product drawing



Temperature Measurement

PYEX-EP-MTS12
PYEX-EP-RTD
Temperature sensor
HACC-TSK-P
PYEX-BT
PYEX-Z2BT

06

Temperature
Measurement

PYEX-EP-MTS12

Explosion proof capillary thermostat

Features

The explosion proof capillary thermostat PYEX-EP-MTS12 is built to sense and control surface temperature of various objects in potentially explosive areas.

The capillary thermostat is enclosed within Ex db (flameproof) aluminium enclosure and then the whole aluminium enclosure assembly is fitted inside 120 x 120 x 90mm engineering plastic enclosure for easy installation and maintenance on site.

The electrical switching element of capillary thermostat works based on the expansion / shrinkage of liquid and gas, being enclosed within the sensing bulb and capillary tube.

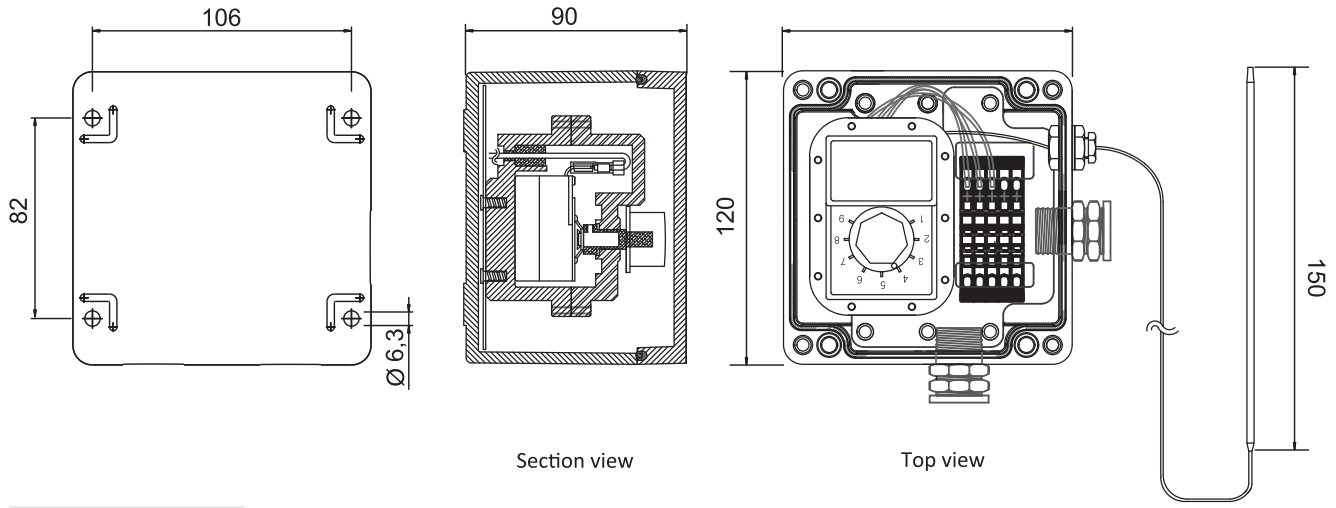
PYEX-EP-MTS12 is only single thermostat. Two more numerics shown after -MTS12 are for selection guide.

Specification

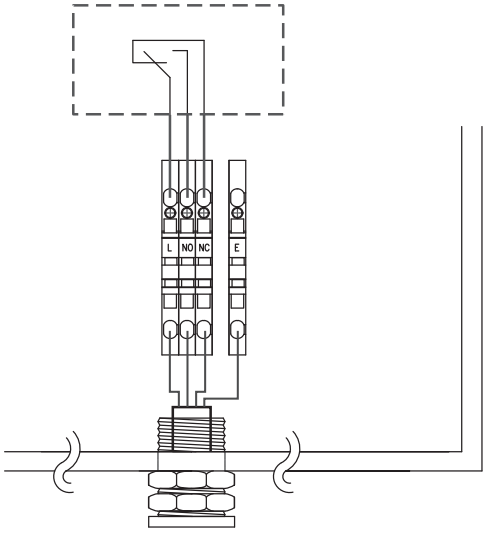
Protection Type	Ex db eb IIC T6
Ingress Protection	IP56
Ambient temperature range	- 20 °C to + 40 °C
Switching capacity	max. 250V / 16A
Relay output	Refer to Table 1.
Set point range (optional)	Refer to Table 1.
Housing	Glassfibre reinforced polyester 120 x 120 x 90mm
Cable entry method	Plastic cable gland M16, M20, M25, M32 available
Number of cable entry (optional)	max. 2
Capillary sensor	made of stainless steel Capillary Ø 1.0mm diameter, 830~1730mm in depending on model length
Sensor probe	Capillary bending radius 5.0mm max
Operating temp range	Refer to Table 1.
Terminal	Refer to Table 2.

Certification

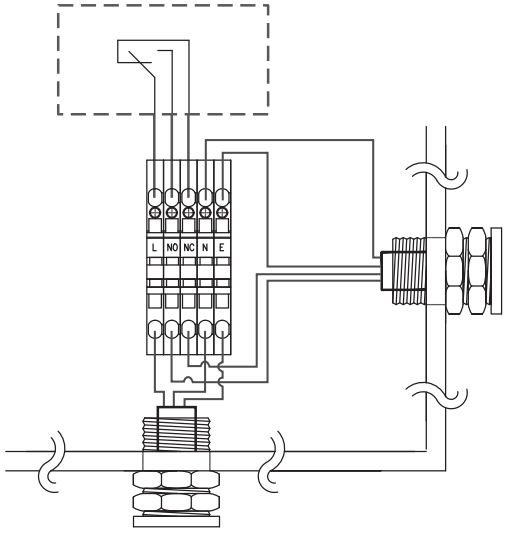
Product drawing



Wiring diagrams



For one cable entry



For two cable entries

Selection guide

Table 1.
Thermostat Selection Guide for PYEX-EP-MTS12 series

Thermostat No.	Temp. setting range	Service temperature for sensor probe	Capillary length (mm)	Probe diameter	Probe length	Output Terminal
1	-20 °C ~ +20 °C	-30 °C ~ +80 °C	1730	6.0	98	3
2	0 °C ~ +50 °C	-50 °C ~ +100 °C	1730	6.0	98	2
3	+30 °C ~ +90 °C	-20 °C ~ +120 °C	870	6.0	98	3
4	+30 °C ~ +110 °C	-10 °C ~ +120 °C	870	6.0	113	2
5	+30 °C ~ +110 °C	-10 °C ~ +140 °C	870	6.0	113	3
6	+54 °C ~ +324 °C	-10 °C ~ +330 °C	870	3.0	160	3
7	+200 °C ~ +600 °C	0 °C ~ +650 °C	830	3.9	163	3

Table 2.
Terminal Block Selection

Terminal Selection	conductor size (㎟)
1	2.5
2	4.0
3	6.0

Note
Tension crimping and
screw tightening type are available.

PYEX-EP-RTD

Ex temperature sensing kit
Explosion proof RTD enclosure kit
for heating cable system

Features

PYEX-EP-RTD is an Ex certified plastic enclosure kit assembled with RTD sensor probe for both ambient sensing and pipeline sensing. It is designed and manufactured to meet all the technical requirements from relevant standards for the use in hazardous location such as petrochemical plant, gas plants, ship-building and off-shore plant etc, as well as for the best permormance of electrical trace heating cable system.

The plastic enclosure is made of fiberglass-reinforced polyester for ultimate thermal endurance and mechanical strength. The enclosure surface is UV resistant and electrically conductive having 10^9 ohm to reduce the static hazard risk.

Each kit includes an IP66 rated junction box and 2.5mm² terminal block. Ex certified RTD sensor probe enters into the enclosure through M16 metallic cable gland with compression seal. The length of mineral insulated RTD sensing probe can be extended up to 2m for convenient installation on site. The pipe-and wall-mount bracket are sold separately for easy installation.

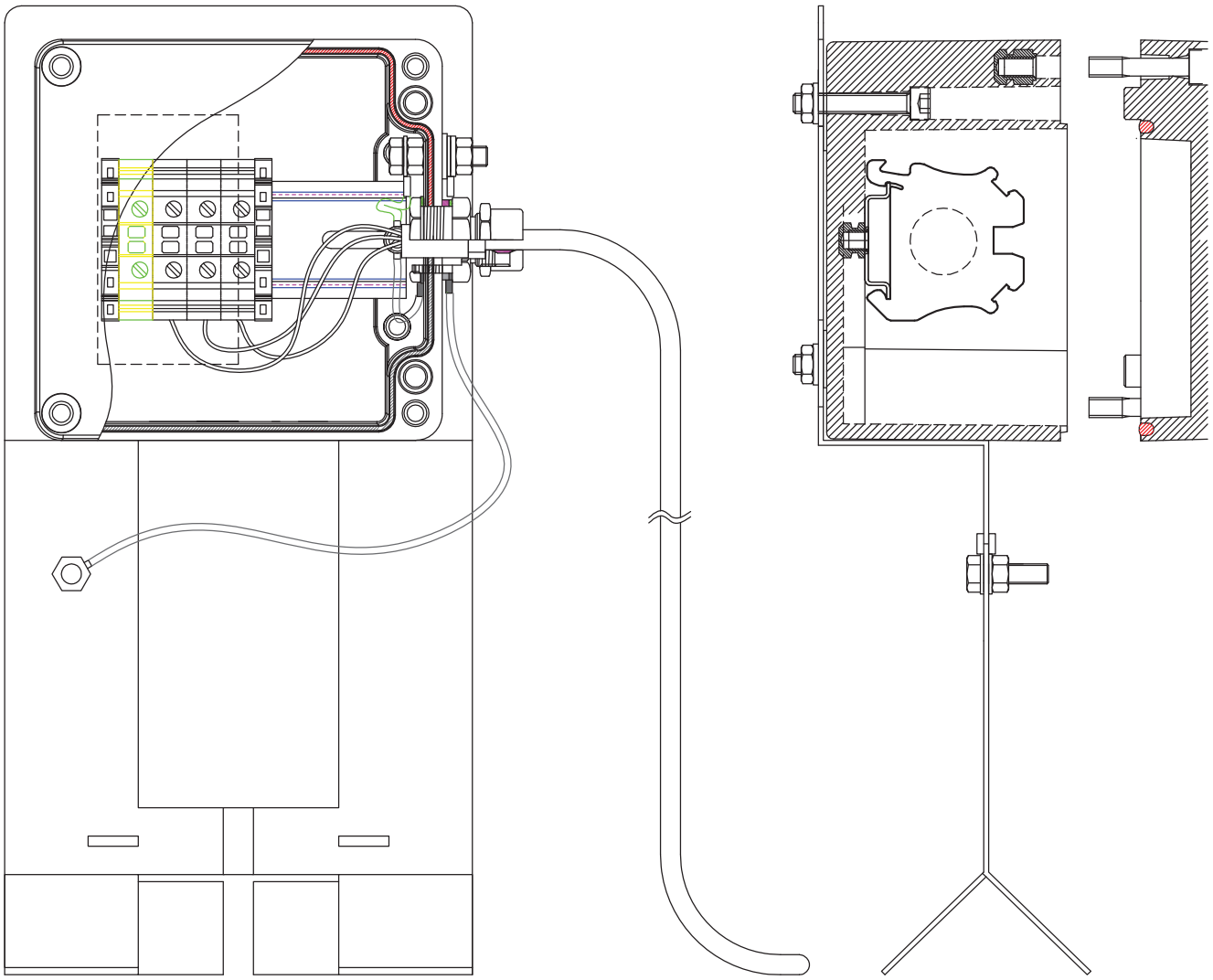
Specification

Protection type : Ex eb IIC T6
Ingress protection : IP64 (when assembled with trace heating cable)
Impact strength : 7J
Temperature rating : T6 to T2
(T-Rating varies depending on the type of heating cable and sensor probe.
Refer to installation manual.)
Surface resistance : < 10^9 Ω
Flammability : Self-extinguishing UL94/V-0
Maximum conductor size for terminal : 2.5mm²
M16 metallic cable gland for compression fitting
The length of RTD sensing probe : Max. 2.0m
Enclosure dimension 122 x 120 x 90mm

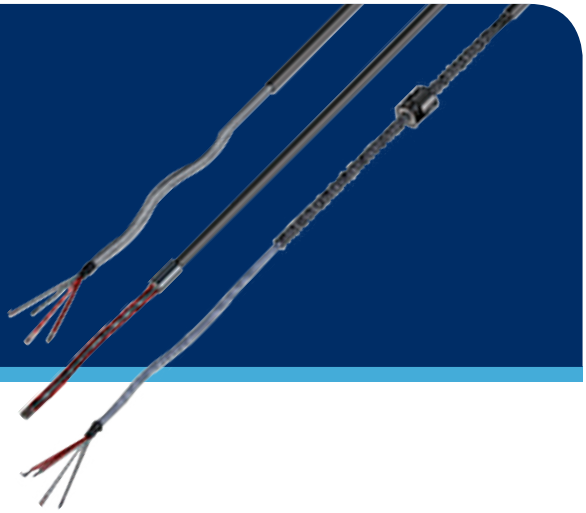
Certification

CE Ex IECEx DNV UKCA

Product drawing



Temperature Sensor



Mineral insulated RTD / thermocouple

Features

Temperature sensor for high temperature range
MI materials and AISI 316L
RTD(pt100) or thermocouple
Ex certified temperature sensor

Specification

Marking	Ambient Temperature	T Class
Ex eb IIC T6…T4	-40°C to +80°C	T6
	-40°C to +95°C	T5
	-40°C to +130°C	T4

Temperature sensor:
W-M-303-ⓐ/ⓑ-ⓒ/FDF-4-A-Ex : Pt100
T-M-303-ⓐ/ⓑ-ⓒFDS-Z-1-Ex : Thermocouple K or N type
Max. measuring current : 10mA
Temperature range : -60°C ...+450°C Temporary +550 °C
Diameter of sensor probe : 3mm, 6mm, 8mm
Tinned copper connection Wires : 0.22mm^2
Max. service temperature (connection to MI cable) : +130°C
Max. service temperature (end sleeve) : +105°C

Selection Code

W - M - 3 0 3 - ⓐ / ⓑ - ⓒ / F D F - 4 - A - E x

ⓐ	Sensor probe diameter 3.0mm 6.0mm 8.0mm
ⓑ	Probe length in millimeter, min. 30
ⓒ	Lead cable length in millimeter, min. 50

T - M - 3 0 3 - ⓐ / ⓑ - ⓒ / F D S - Z - 1 - E x

ⓐ	Sensor probe diameter 3.0mm 6.0mm 8.0mm
ⓑ	Probe length in millimeter, min. 10
ⓒ	Lead cable length in millimeter, min. 50

Certification

Stainless steel RTD

Features

Temperature sensor for multiple temperature measurement purposes
MI materials and AISI 316L
Pt100, accuracy class A
Ex certified temperature sensor

Specification

Marking	Ambient Temperature	T Class
Ex eb IIC T6…T3	-40°C to +80°C	T6
	-40°C to +95°C	T5
	-40°C to +130°C	T4
	-40°C to +185°C	T3

Temperature sensor: Pt100
Max. measuring current: 10mA
Operating temperature: -40°C ...+200°C
Diameter of sensor probe: 6mm
Tinned copper connection wires: 0.22mm^2

Selection Code

ⓐ WT-KAAPELI-6/ⓑ-ⓒ/TDT-4J-KLA-Ex

ⓐ	No. of sensor None : 1, 2X :2
ⓑ	Probe length in millimeter, min. 30
ⓒ	Lead cable length to end sleeve in millimeter, min. 50

Certification

Bayonet RTD

Features

Spring-loaded bayonet sensor for measuring temperature
MI materials and AISI 316L
Pt100
Ex certified temperature sensor

Specification

Marking	Ambient Temperature	T Class
Ex eb IIC T6…T3	-40°C to +80°C	T6
	-40°C to +95°C	T5
	-40°C to +130°C	T4
	-40°C to +185°C	T3

Temperature sensor: Pt100 x 1, or Pt100 x 2
Max. measuring current: 10mA
Operating temperature: -40°C ...+200°C
Diameter of sensor probe: 6mm, 8mm
Tinned copper connection wires: 0.22mm^2

Selection Code

ⓐ WT-BAJONETTI-ⓑ/ⓒ-ⓓ/TDT-4J-KLA-Ex

ⓐ	No. of sensor None : 1, 2X :2
ⓑ	Sensor probe diameter 6.0mm 8.0mm
ⓒ	Probe length in millimeter, min. 25
ⓓ	Lead cable length to end sleeve in millimeter, min. 300

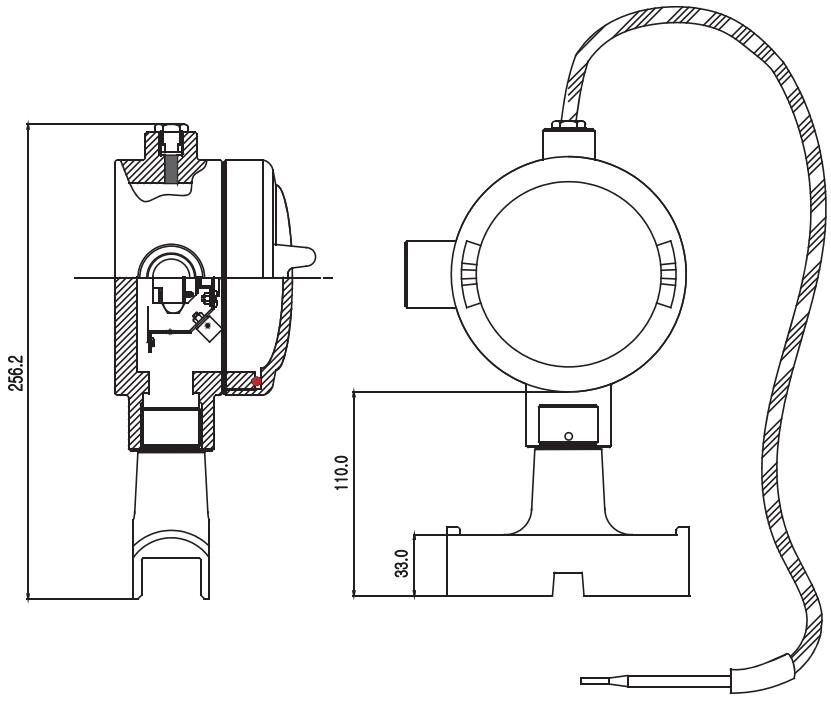
Certification

HACC-TSK-P

Line sensing thermostat enclosure
Ex 'db' explosion-proof enclosure thermostat control

Features	HACC-TSK-P is the explosion-proof aluminium enclosure fitted with thermostat control unit, which detects and control the temperature of each circuit of pipeline or vessel for ultimate efficiency and safety. It is made of special-grade aluminium to meet the required pressure tests against explosion or ignition of explosive gas or dust. The elastomer cover gasket stops the ingression of water and dust
Specification	Assembled height : 257mm, width : 132mm, depth : 64mm Protection type Ex db IIC T6 ingress protection IP65 Operating temp -20˚C < Ta < 50˚C Cable entry 3/4"PF compatible to conventional pipe thread Gasket and cable seal : silicone rubber Armoured flexible conduit for capillary sensor up to cable 75cm, sensor diameter 6.0mm
Certification	

Product drawing



PYEX-BT

Explosion-proof bimetal thermostat
safety device for thermal cutout

Use	Temperature limiting for surface heating system. Semiconductor, display and petro chemical industry. Hazardous and non-hazardous locations.
Specification	Ex 'mb' encapsulated explosion proof bimetallic thermostat. Connected to power relay to limit temperature rise. The smallest temperature monitoring equipment. Can be installed independently inside various surface heating equipments. ATEX, IECEx and KCs certified for zone 1and 2 hazardous location.
Features	Protection type : Ex mb IIC T4...T6 Gb Operating temperature : 0 °C to 100 °C with interval of 5 °C Operating tolerance : ± 5 °C Switching voltage and current : 250Vac/30mA, 24Vdc/50mA On-off differential : 30 ± 15 K Ambient temperature : -40°C to +100°C Stainless housing Dimension Φ 17.0 x 30.0mm (Type 3/8) Φ 20.5 x 32.5mm (Type 1/2) 14.0 x 18.0 x 31.5mm (Type B1418) Ingress protection : IP67 Leadwire : AWG 22
Selection Code	PYEX-BT - 1/2 - 70 - NC ⓐ ⓑ ⓒ ⓓ

ⓐ	Model
ⓑ	Type / Construction 1/2 - 1/2 inch cylindrical bar 3/8 - 3/8 inch cylindrical bar B1418 - rectangular bar
ⓒ	Swiching temperature 0 ~ 100°C
ⓓ	Nomal close (NC) / Nomal open (NO)

Certification

PYEX-Z2BT

Explosion-proof bimetal thermostat
safety device for thermal cutout

Use

Temperature limiting for surface heating system
Semiconductor, display and petro chemical industry
Hazardous and non-hazardous locations

Features

Ex 'nC' encapsulated bimetallic thermostat
Connected to power relay to limit temperature rise
The smallest temperature monitoring equipment
Can be installed independently inside various surface heating equipments
ATEX, IECEx and KCs certified for zone 2 hazardous location.

Specification

Protection type : Ex nC IIC T4...T6 Gc / Ex tc IIIC T85°C ... T135°C Dc
Operating temperature : 0 °C to 100 °C with interval of 5 °C
Operating tolerance : ± 5 °C
Switching voltage and current : 250Vac/5A, 125Vac/8A, 24Vdc/50mA
On-off differential : 30 ± 15 K
Ambient temperature : -40°C to +100°C
Stainless housing
Dimension 6.5 x 9.0 x 28.0mm
Ingress protection IP67
Leadwire AWG 22

Selection Code

PYEX-Z2BT - 70 - NC - 2.0
ⓐ ⓑ ⓒ ⓓ

ⓐ	Model
ⓑ	Swiching temperature 0 ~ 100°C
ⓒ	Nomal close (NC) / Nomal open (NO)
ⓓ	Lead cable lenght 1.0-20.0m

Certification

Heating Jacket

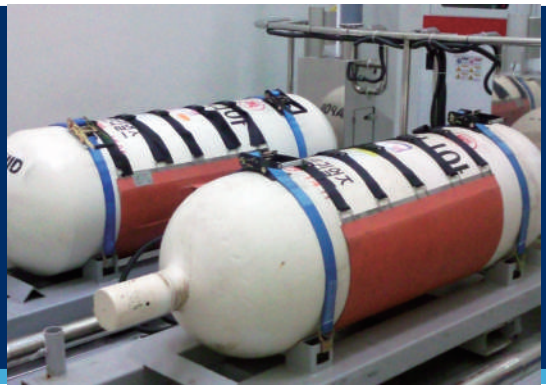
FBJH-SR
FBJH-GR
FBJH-GP
FBJH-GB

07

Heating Jacket

FBJH-SR

Silicone rubber substrated heating jacket for cylindrical tanks and vessels in chemistry and gas industry

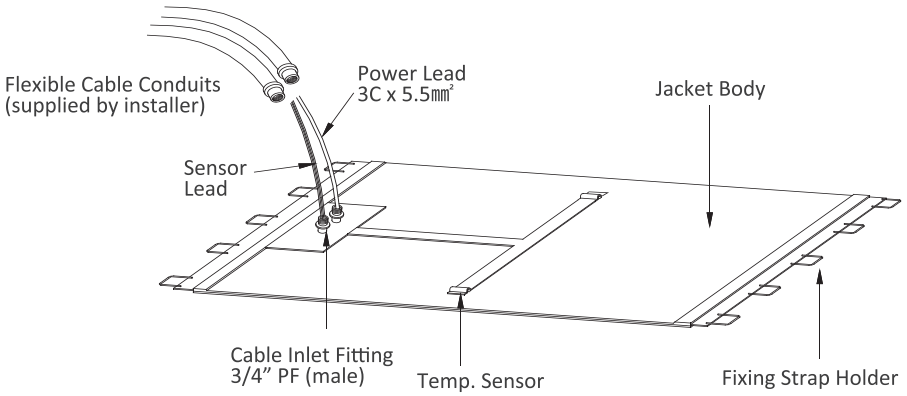


Use	Gentle heat-up or temperature maintenance of gas cylinder. Freeze protection or temperature maintenance of chemical tanks. Hazardous and non-hazardous locations.
Features	Explosion proof heating jacket for various containers. Wire type or etched foil type heating element. Flat heating element for highly efficient thermal performance. Glassfiber reinforced silicone rubber substrate for high thermal endurance. Flexible and excellent mechanical strength. Easy installation and fast response. Resistance to heat, oil and chemicals.
Specification	Max. maintain temperature (Power-on) 40°C (104°F) Max. continuous temperature (Power-off) 150°C (302°F) Rated voltage : 110 / 220 Vac Power consumption : 1,000 ~ 8,000 watt per set Temperature class (T-class) : T4 (135°C) Min. installation Temperature : -20°C Minimum bending radius 310 mm Temperature sensors Pt100 RTD or type K thermocouple Cable outlet fitting 3/4 inch PF threaded elbow Certification to use in hazardous locations Protection type Ex e IIC T4 Gb
Selection Code	FBJH-SR / Y 6000 - F ⓐ ⓑ ⓒ ⓓ

ⓐ	Model / Type Sillicone rubber substrate heating jacket
ⓑ	Dimension Y 880mm* X 1270mm (* product with -H suffix, 805mm X 1270mm) T 1400mm X 1940mm B47x ** 480mm* X 510mm (** -x denote rated voltage 1 : 110V 2 : 220V)
ⓒ	Power consumption in watt per set 4000, 6000, 8000
ⓓ	Option H : Size variation 850mm x 1270mm G : Graphite earthing layer F : Etched foil heating element

Certification

Product drawing



FBJH-GR

Ex 'eb' Explosion-proof glassfiber substrate heating jacket
for tanks and vessels in chemistry and gas industry

Use	Gentle heat-up or temperature maintenance of various gas cylinder. Freeze protection or temperature maintenance of chemical tanks. Hazardous and non-hazardous locations.
Features	Explosion proof heating jacket designed for various containers. Easy installation and fast response. Aluminum backed glass fiber fabric for ultimate thermal endurance. Flexible and excellent mechanical strength. Resistance to heat, oil and chemicals. Long service life.
Specification	Max. maintain temperature (Power-on) 40°C (104°F) Max. continuous temperature (Power-off) 150°C (302°F) Rated voltage : 220 Vac Power consumption : 70 ~ 400 watt per set Temperature class (T-Class) T4 (135°C) except - PTC version T6 (85°C) Min. installation Temperature : -20°C Minimum bending radius 110 mm Temperature sensors Pt100 RTD or type K themodouple Cable outlet fitting 1/2 inch PT threaded elbow made of stainless steel Certification to use in hazardous locations Ex eb IIC T4 or T6

Selection Code

FBJH-GR / 47 - 200 PTC
ⓐ ⓑ ⓒ ⓓ

ⓐ	Model / Type Aluminum backed glassfibre fabric based heating jacket
ⓑ	Dimension 10 550mm x 300mm 47 880mm x 500mm* (* product with -400 suffix, 880mm X 1000mm) 54 952mm x 450mm
ⓒ	Power consumption watt per set
ⓓ	Heating cable None series heating cable PTC self-regulating (PTC) heating cable

Certification

FBJH-GP

Glassfibre insulated heating jacket
for gas purifier application

Use	Semi-conductor, LCD, battery industries. Hazardous and non-hazardous locations.
Features	Explosion proof heated jacket for purifier tank. Easy and fast installation with heat resistance velcro. Aluminum backed glass fiber fabric for ultimate thermal endurance. Flexible and excellent mechanical strength. Resistance to heat, oil and chemicals. Long service life.
Specification	Max. maintenance temperature 350°C Max. intermittent exposure 500°C Rated voltage and current 240Vac, 15A Power consumption 3,000 W max. per set Min. installation temperature -40°C Temperature sensors 2 x thermocouple Height 690mm Heating cable glassfibre insulated series heating cable 400°C 50mm E-Glass insulation
Selection Code	FBJH-GP - 8 - 3000 ⓐ ⓑ ⓒ
Certification	CE

ⓐ	Model / Type Glassfibre insulation purifier heating jacket
ⓑ	Dimension 8 - D317mm x H690mm 12 - D417mm x H690mm
ⓒ	Power consumption watt per set

FBJH-GB

Glassfibre insulated heating jacket for IBC chemical container

Use	Heat-up and temperature maintenance for IBC chemical containers. Chemical industries. Hazardous and non-hazardous locations.
Features	Explosion proof heated jacket for IBC chemical container. Easy and fast installation with heat resistance velcro. Glassfibre fabric for thermal endurance. Flexible and excellent mechanical strength. Resistance to heat, oil and chemicals. Long service life.
Specification	Max. maintenance temperature 135°C Heat-up control range 0 to +90°C Rated voltage and current 110 - 277Vac, 30A Power consumption 2 x 1,100W max. per set Min. installation temperature -40°C Temperature sensors 2 x Pt100 RTD Dimension when assembled L1,000mm x W1,200mm x H1,000mm Dimension when opened H1000mm x L4400mm Customized dimension available on request Silicone coated glassgfibre fabric 400°C Ingress protection IP65 min Explosion-proof termination enclosure IP66 Built-in capillary thermostat
Selection Code	FBJH-GB / 1 - 2200 PTC ⓐ ⓑ ⓒ ⓓ

ⓐ	Model / Type Glassfibre fabric based heating jacket for IBC container
ⓑ	Rated voltage 1 - 100 - 120Vac 2 - 200 - 277Vac
ⓒ	Power consumption watt per set
ⓓ	Heating cable None series heating cable PTC self-regulating (PTC) heating cable

Certification	CE

Liquid Leak Detection

LEAKBAN LDS
LBMM-100
LBSM-200/300
LBSC-1000
LBSC-3000
LBSC-7000
Components

08

Liquid Leak Detection

LEAKBAN LDS

Leak detection system

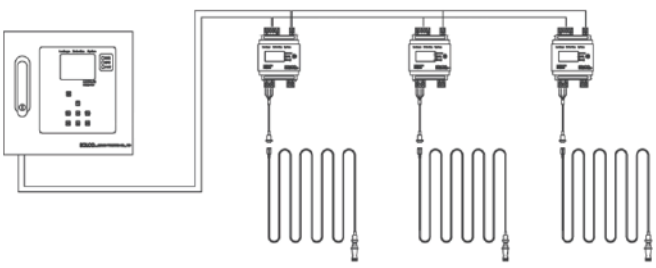
The fluid leakage in the building such as data centre or command room can stop all electrical and electronic equipment and the relevant safety systems from correct appropriate operation. Furthermore it can cause serious losses such as environmental pollution, fire, explosion and/or casualties. LEAKBAN leak detection cable system can detect various types of leakage from pipes and other equipment. Furthermore, it pinpoints the position where the leakage occurred with high accuracy. LEAKBAN LDS is an essential part for safety and a preventive operation system in industrial and commercial areas.

Use	Power plant and sub-station : water and various chemical detection around power generation plants, data centres, central command units Digital media centre : water detection including floor surfaces, subfloors and equipment locations Semi-conductor, battery, display panel (LCD/LED) factory : water, acid and base leakage detection around pipes, storage tanks, and trenches such as sulphuric acid, sulphurous acid, nitric acid, PAC and sodium hydroxide etc. Army bases : Oil and chemical leak detection including pipes and storage tanks SOLCO intrinsically safe leak detection system is approved for installation in ordinary and hazardous areas when used with LBSC-1000 or LBSC-7000 sensing cable with safety barrier being stated in the Ex certificates. Protection Ex ia IIC T4 Ga Certificate No. BASEEFA 15Y0074, IECEx BAS15.0064X
Features	Conforms with relevant EMI/EMC and Electrical Safety requirements Sensing cable can be connected up to 1km Fast response (default 8 seconds) Leak point positioning within ± 1m / 1,000m Sensing wires sit in deep grooves making it fault-free Durable and flexible / Reusable Chemical and abrasion resistance
Certification	

Product drawing

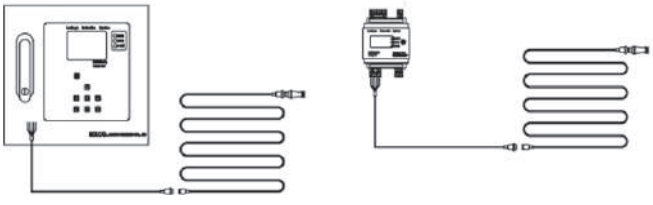
Network System

LEAKBAN LBMM-100, the main display module, is connected with LBSM, the Submodule, via RS485 and monitors the status of all the linked submodules and sensing cables. When a leakage is detected, it automatically triggers an auditory and visual alarm for recognition and alert from a distance. Max. 32 submodules can be linked with LBMM-100 via RS485, and each submodule can accommodate up to 500m of sensing cable at maximum.



Stand-Alone System

LBMM-100, main display module can be directly connected with a leak sensing cable without a LBSM. It can accommodate up to 1,000m of sensing cable at max. On the other hand, LBSM-200 or LBSM-300, submodules can be used without the LBMM. If necessary, it can be connected with a Windows PC via the RC-MBT unit for monitoring the status of leak sensing cables and for positioning the point where the leakage occurred.



LBMM-100

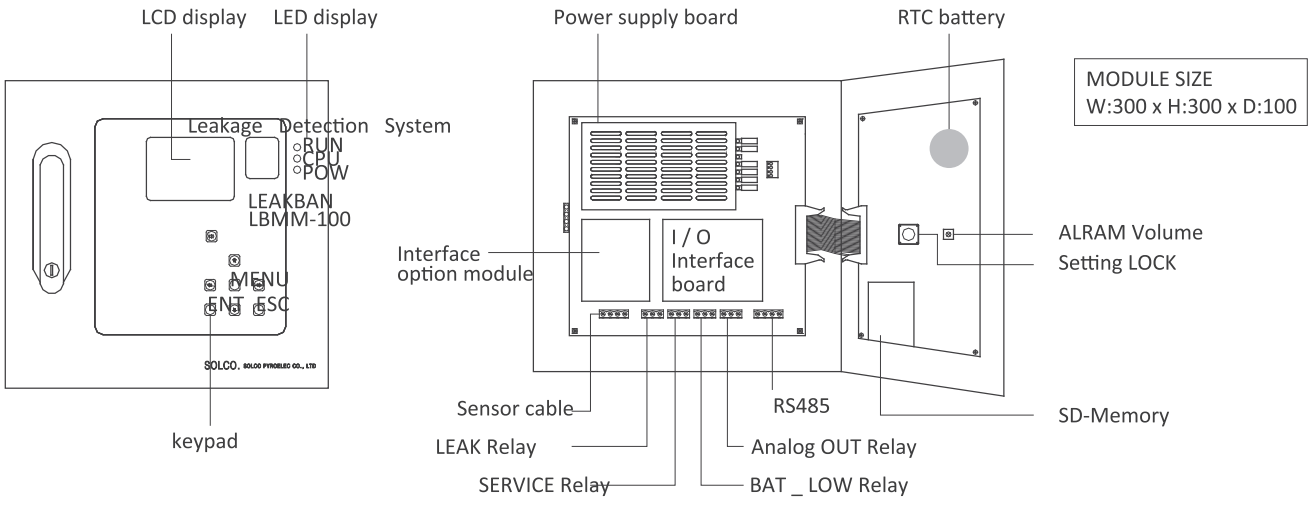
Master module monitoring and alarm

LBMM-100 is the main monitoring unit for the leak detection system and it works with sub-modules and sensing cables. When the LBMM is working in master mode, it is connected with the LBSM, the sub-module via RS485, for monitoring all the events and status of sub-modules on the provided LCD display. When detecting any event with a LBSM in slave mode, it produces a visual and auditory alarm to be noticed from distance with ease. Furthermore, all the data, which is safely stored in the provided external SD-Card, can be read by a personal computer even in the case the product is no longer functional. When the LBMM is working in slave mode, it performs the same functions as the LBSM, sub-module does.

Product specification

Power Supply	110 ~ 250Vac / 50, 60Hz (DC SMPS Built in)
Functions	Leak detection and positioning / Contamination check of sensing cable / Continuity check of sensing cable
Display/Alarm	3.5 Inch TFT-LCD / Built in
Sensing Time	Max. 8 seconds (default)
Sensing Length	max 1.000M / 1M accuracy
Operating Temp. / Humidity	-10 ~ 85°C / 30 ~ 80% RH
Output	Replay – 3 Channels 250Vac - 10A , 30Vdc - 10A Analog Output; 1 Channel (0 - 20mA) 1 Channel (0 - 10Vdc)
RTC Battery / Memory	Built in / SD-CARD
Parameter Setting	KEY & Modbus RTU
Communication Method	RS485 – 2wire
Protocol	Modbus-RTU
Communication Distance / Number of Multi-Drop	1.2km / 32
Data Transferring Speed	9600BPS
Data bit / Stop bit / Parity bit	8bit / 1bit / none (Fixed)
Housing	

Product drawing



LBSM-200/300

Master module monitoring and alarm

LBSM-200 and LBSM-300 are sub-modules for LeakBan leak detection system and they generally work with the LBMM, master-module unit and a leak sensing cable. When leak sensing cables detect any event ,the LBSM sends pre-determined signals to the LBMM and at the same time they produce a visual and auditory alarm. Being determined as master module, the LBMM device should be linked with LBSM200 or LBSM300 via RS485 communication protocol for monitoring and alarming all the events and for showing the status of leak sensing cables on the LCD screen. All technical parameters and event-related data are automatically saved and stored in the provided external SD-card of the LBMM device and then can be read by PC or other electronic devices. LBSM can pinpoint the place where the leakage occurs with high accuracy. The housing of LBSM-200 and 300 is constructed with flame retardant PC and provides IP54 ingress protection. It can be mounted inside an enclosure by DIN rail or wall-mounted by the provided fixing screws. The LBSM-200 features a 1.4in LCD display and one LED light while LBSM-300 has no LCD display.

Product specification

Power Supply	10~30Vdc / 1.5W
Functions	Leak detection and positioning / Contamination check of sensing cable / Continuity check of sensing cable
Display/Alarm	LCD & LED / ALARM (LBSM-200) LED / ALARM (LBSM-300)
Event Relay	1 Channel A,C Point of Contact - (24Vdc-1A, 250Vac-0.5A)
Sensing Time	Max. 8 seconds (default)
Sensing Length	Max. 500m / 1m accuracy
Operating Temp. / Humidity	-10 ~ 85°C / 30 ~ 80% RH
Mounting Method	DIN rail or panel hole attachment

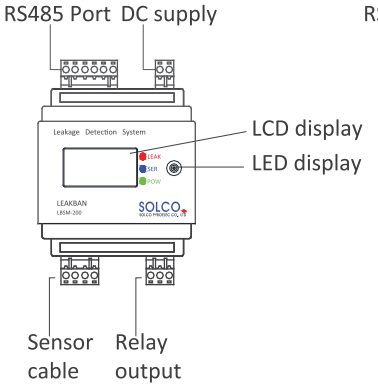
Conform with EMI/EMC requirements

Product drawing

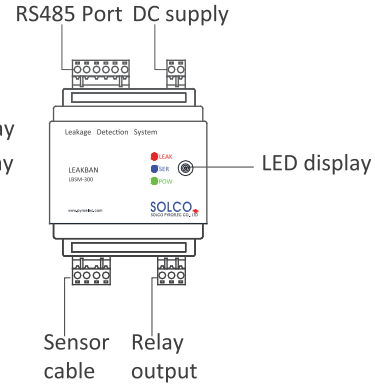
MODULE SIZE
W:70 x H: 117 x D: 60

LBSM-200

LBSM-300



[LBSM-200]



[LBSM-300]

LBSC-1000

Water sensing cable

The LeakBan LBSC-1000 sensing cable detects the presence of water at any point along the length. Being installed with LBMM, master module and LBSM, slave module (sub-module), LBSC-1000 senses leakage or intrusion instantly and sends event signal to LBMM via LBSM by RS485 communication protocol. Upon reception, LBMM and LBSM trigger an alarm and find the position where the leakage occurs. LBSC-1000 sensing cable can be supplied in standard supply lengths, which are factory-terminated with a pair of circular plastic connectors to plug together. These are keyed to avoid incorrect polarity/connection for easy and quick installation. Multiples of pre-terminated sensing cables can be easily connected up to 1 km to suit on-site layouts and conditions. LBSC-1000 sensing cable consists of two continuity wires and two sensing wires being coated with a conductive material for corrosion resistance.
The sensing wires are spirally wound and positioned in the groove of the twisted spacer. As the groove is deep enough, it eliminates any single chance of false alarms even when the sensing cable lies on a metal surface.
The spacer of LBSC-1000 cable is constructed with crosslinked rigid plastic so it exhibits excellent abrasion resistance as well as chemical resistance. LBSC-1000 is thin, lightweight, flexible and less elastic so keeps its position after installation.

Use

LBSC-1000 sensing cable is designed for various applications :
data centre sub-floor telecommunication centre HVAC equipment insulated pipelines
electrical vaults storage areas roof or bathroom

Features

Cable diameter	approx. 6 mm
Continuity wire	AWG 20 x 2
Sensing wire	AWG 30 x 2 alloy with conductive coating
Spacer	XLEVA, orange color
Maximum continuous operating temperature	80°C
Humidity	up to 80% RH
Flame retardant	VW-1
Min. bending radius	35mm
Min. installation Temperature	-40°C
Pre-terminated standard length	3.5m, 7m or 15m
CPC connector polyester/glass-filled nylon	Max. Ø25mm

Specification

Conforms with EMI/EMC and electrical safety requirements
Sensing cable can be extended up to 1km
Fast response (default 8 seconds)
Leak Point Accuracy (± 1m /1,000m)
Resistance to abrasion, chemicals
Standard supply 3.5m, 7m, 15m
Operating temp. -40°C ~ 80°C

Selection Code

LBSC-1000 - 15 - EX
ⓐ ⓑ ⓒ

ⓐ	ⓑ	ⓒ
Model	Pre-terminated cable length(m) : 3.5, 7, 15	Supply form None : for Safe area EX : for Hazardous area

Certification

LBSC-3000

Acid sensing Cable

The LeakBan LBSC-3000 sensing cable detects the presence of acids such as sulphuric/sulphurous acid, hydrochloric acid and PAC etc. at any point along the length. Being installed with LBMM, master module and LBSM, slave module (sub-module), LBSC-3000 senses leakage or intrusion instantly and sends an event signal to LBMM via LBSM by RS485 communication protocol. Upon reception, LBMM and LBSM trigger an alarm and find the position where leakage occurs. LBSC-3000 sensing cable can be supplied in standard supply lengths, which are factory-terminated with a pair of circular metallic connectors to plug together. These are keyed to avoid incorrect polarity/connec-tion for easy and quick installation. Multiples of pre-terminated sensing cables can be easily connected up to 1 km to suit on-site layouts and conditions. LBSC-3000 sensing cable consists of two continuity wires and two sensing wires. The sensing wires are spirally wound and positioned in the groove of the twisted spacer. As the sensing wires are coated with a special material, it eliminates any chance of false alarm even when the sensing cable is installed outdoor and exposed to water, rain or flying conductive dusts. The flame-retardant woven-fibre covering is therefore optional for outdoor use and not provided for protection against water, rain or dusts. The spacer of LBSC-3000 is constructed with crosslinked rigid plastic so it exhibits excellent abrasion and chemical resistance. LBSC-3000 is thin, lightweight, flexible and less elastic so keeps its position after installation.

Use

LBSC-3000 sensing cable is designed for various applications :
semi-conductor factory battery factory display panel (LCD/LED) factory all other chemical plants
Applicable chemical : sulphuric acid, hydrochloric acid, nitric acid, and PAC etc.

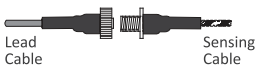
Features

Cable diameter	approx. 7 mm
Continuity wire	AWG 20 x 2
Sensing wire	AWG 30 x 2 alloy with conductive coating
Spacer	chemical resistant XLEVA, red color
Maximum continuous operating temperature	80°C
Humidity	up to 80% RH
Flame retardant	VW-1
Min. bending radius	40mm
Min. installation Temperature	-40°C
Pre-terminated standard length	3.5m, 7m or 15m

Specification

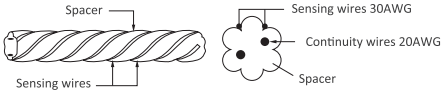
Confirms with EMI/EMC and electrical safety requirements
Sensing cables can be extended up to 1km
Fast response less than 15 minutes depending on the acid type
Leak positioning accuracy (± 1m /1,000m)
Resistance to abrasion, chemicals
Standard supply 3.5m, 7m, 15m
Operating temp. -40°C ~ 80°C

Cable Connection



End Termination

LBSC-3000



Selection Code

LBSC-3000 - 15 - C
ⓐ ⓑ ⓒ

ⓐ	ⓑ	ⓒ
Model	Pre-terminated cable length(m) : 3.5, 7, 15	Outdoor covering (Optional)

LBSC-7000

Multi-purpose sensing Cable

The LeakBan LBSC-7000 sensing cable detects the presence of any conductive liquids such as acids, bases and water at any point along the length hence is multi-purpose. Being installed with LBMM, master module and LBSM, slave module (submodule), LBSC-7000 senses leakage or intrusion instantly and sends event signal to LBMM via LBSM by RS485 communication protocol. Upon reception, LBMM and LBSM trigger an alarm and find the position where leakage occurs. LBSC-7000 sensing cables can be supplied in standard supply lengths, which are factory-terminated with a pair of circular plastic connectors to plug together. These are keyed to avoid incorrect polarity/con-nection for easy and quick installation. Multiples of pre-terminated sensing cables can be easily connected up to 1 km to suit on-site layouts and conditions. LBSC-7000 sensing cable consists of two continuity wires and two sensing wires. The sensing wires are spirally wound and positioned in the groove of the twisted spacer. As the sensing wires are coated with a conductive polymer, they have excellent corrosion resistance so perform for an extended period of time even when installed in corrosive and wet environments. The spacer of the LBSC-7000 is constructed with crosslinked rigid plastic so that it has good abrasion and chemical resistance. LBSC-7000 is thin, lightweight, flexible and less elastic so keeps its position after installation.

Use

LBSC-7000 sensing cable is designed for various applications :
semi-conductor factory battery factory display panel (LCD/LED) factory all other chemical plants
Applicable chemical : sulphuric acid, hydrochloric acid, nitric acid, and PAC etc.

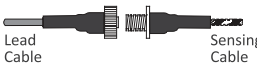
Features

Cable diameter	approx. 7 mm
Continuity wire	AWG 20 x 2
Sensing wire	AWG 30 x 2 alloy with conductive coating
Spacer	chemical resistant XLEVA, grey color
Maximum continuous operating temperature	80°C
Humidity	up to 80% RH
Flame retardant	VW-1
Min. bending radius	40mm
Min. installation temperature	-40°C
Pre-terminated standard length	3.5m, 7m or 15m
CPC connector polyester/glass-filled nylon	Max. Ø25mm

Specification

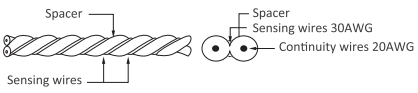
Confirms with EMI/EMC and electrical safety requirements
Sensing cables can be extended up to 1km
Fast response 8 seconds max. depending on liquid type
Leak positioning accuracy (± 1m /1,000m)
Resistance to abrasion, chemicals
Standard supply 3.5m, 7m, 15m
Operating temp. -40°C ~ 80°C

Cable Connection



End Termination

LBSC-7000



Selection Code

LBSC-7000 - 15 - EX
ⓐ ⓑ ⓒ

ⓐ	ⓑ	ⓒ
Model	Pre-terminated cable length(m) : 3.5, 7, 15	Supply form None : for Safe area EX : for Hazardous area

Certification

Components

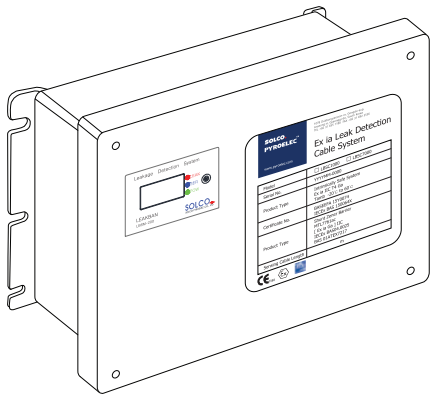
Water sensing cable

Model	: LBSC-1000 Ex
Protection Type	: Ex i IIC T4 Ga
Ambient Temp	: -20°C ≤ Ta ≤ +60°C
Cable diameter	: approx. 6 mm
Continuity wire	: AWG 20 x 2
Sensing wire	: AWG 30 x 2
Spacer	: XLEVA
Outer govering	: Flame retardant nylon fibre
Color	: Black with red stripe

Multi-purpose sensing cable

Model	: LBSC-7000 Ex
Protection Type	: Ex i IIC T4 Ga
Ambient Temp	: -20°C ≤ Ta ≤ +60°C
Cable diameter	: approx. 6 mm
Continuity wire	: AWG 20 x 2
Sensing wire	: AWG 30 x 2
Spacer	: XLEVA
Outer govering	: Flame retardant nylon fibre
Color	: Black with blue stripe

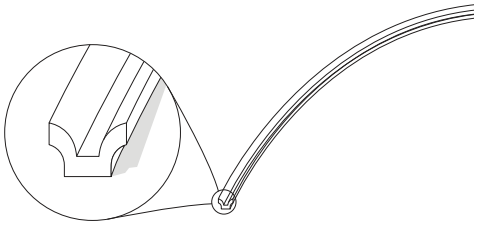
Safety barrier kit



Model	: LBZK
Component	: ① LBSM-200 Submodule
	② SMPS 12V
	③ Safety barrier* X 2
	④ Weather-proof enclosure IP66

* Please refer to sales representative for more information on Ex certified safety barrier.

Insulative fixing clip



Model	: LBIG
Materal	: Flame retardant PVC
Dimension	: 15mm X 20mm

Thanks

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