

Raychem

Self-regulation Trace-Heating Systems
Safe and reliable



江南商工(株)

KANGNAM SANGGONG CO.,LTD.

Heat-Tracing Products



Our industrial heating cables are backed by a ten-year extended warranty!

Tyco Thermal Controls offers the industry's most complete line of heat-tracing products to meet every need—for everything from pipe freeze protection to high temperature process maintenance.

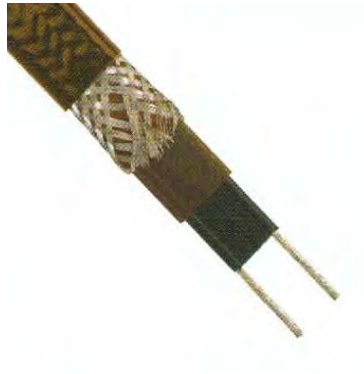


SELF-REGULATING CABLES

The preferred choice for most complex pipe-tracing applications.



Raychem BTV cable provides freeze protection on metal and plastic pipes, maintaining temperatures up to 150°F (65°C) and withstanding exposure to 185°F (85°C).



Raychem QTVR cable provides freeze protection and process temperature maintenance, maintaining and withstanding exposure temperatures up to 225°F (110°C).



Raychem XTV fiber-wrap cable provides process temperature maintenance up to 250°F (121°C) and withstands intermittent exposures to 420°F (215°C).

MINERAL INSULATED CABLES

For high temperature applications.

Pyrotenax MI cable maintains temperatures up to 1022°F (550°C) and withstands continuous exposure to 1238°F (670°C).



POWER-LIMITING CABLES

For applications exceeding the temperature range of self-regulating cables.

Raychem VPL heating cable maintains temperatures greater than 300°F (150°C) and withstands continuous exposure to 482°F (250°C), power off.



Note: These photos and illustrations do not necessarily depict actual applications and installations.





LONGLINE HEATING

Choose from the most complete selection of longline heat-tracing systems and technologies. Circuit lengths can vary from 500 feet (152.4 meters) to over 15 miles (24 kilometers):

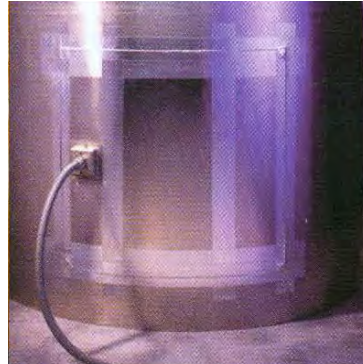
- **Raychem** Self-regulating systems, **LBTV**, **SLBTV** and **VL** cables
- **Raychem** Series resistance systems, **SC** cables
- **Pyrotenax MI** mineral insulated cables
- **Tracer STS** skin-effect system

SNOW AND ICE PREVENTION

- **Raychem** self-regulating heating cables are installed in concrete to prevent dangerous icing on loading ramps, walkways, entrances, and driveways.
- **Raychem** heating cables are installed on roofs and gutters to prevent hazards and property damage caused by ice buildup.

Both systems automatically adjust their heat output in response to ambient temperatures, for better reliability and energy efficiency.

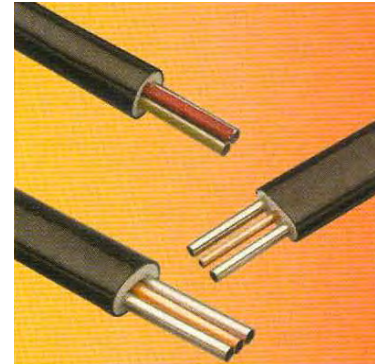
- **Pyrotenax** mineral insulated cables are installed in concrete and asphalt and provide a constant heat output.



TANK HEATING

Choose from tank pad heaters and heating cables for tank and vessel heating solutions.

- The **Raychem RHS** tank heating system maintains tank temperatures up to 200°F (93°C). Heaters are available from 150 watts to 1,400 watts.
- **RHS-L** heaters can be used on polypropylene, FRP, and metal tanks.



TUBING BUNDLES

Raychem tubing bundles (**RTB**) offer a cost-effective alternative to traditional field tracing and insulating.

- Pre-traced and pre-insulated tubing bundles for such applications as impulse, sample, and process lines
- Choice of single or dual tubing in stainless steel, monel, copper, PFA Teflon, or other materials
- Choice of electric or steam-traced bundles

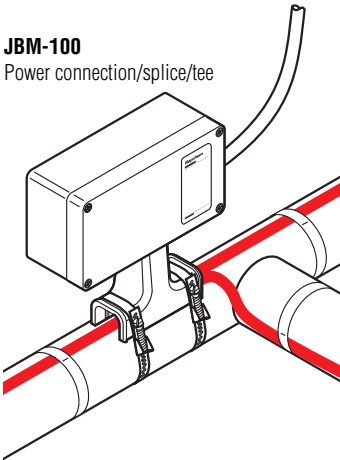
ADVANCED HEAT-TRACING COMPONENTS

Raychem power connections, tees, and splices are vital parts of any heat-tracing system. These high-quality advanced components are easy to install and will deliver reliable service. All install without a torch, heat gun, or messy sealants!

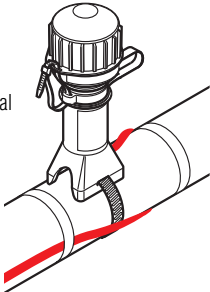
- Spring clamp terminals provide reliable connection and allow easy reentry.
- The power connection installs in less than 10 minutes, using only standard cable-stripping tools and a screwdriver.
- High-intensity LED lights are available with our power connections and end seals to provide visual monitoring of system power and continuity.



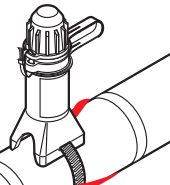
JBM-100
Power connection/splice/tee



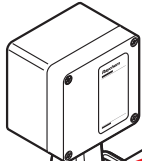
E-100-L
Lighted end seal



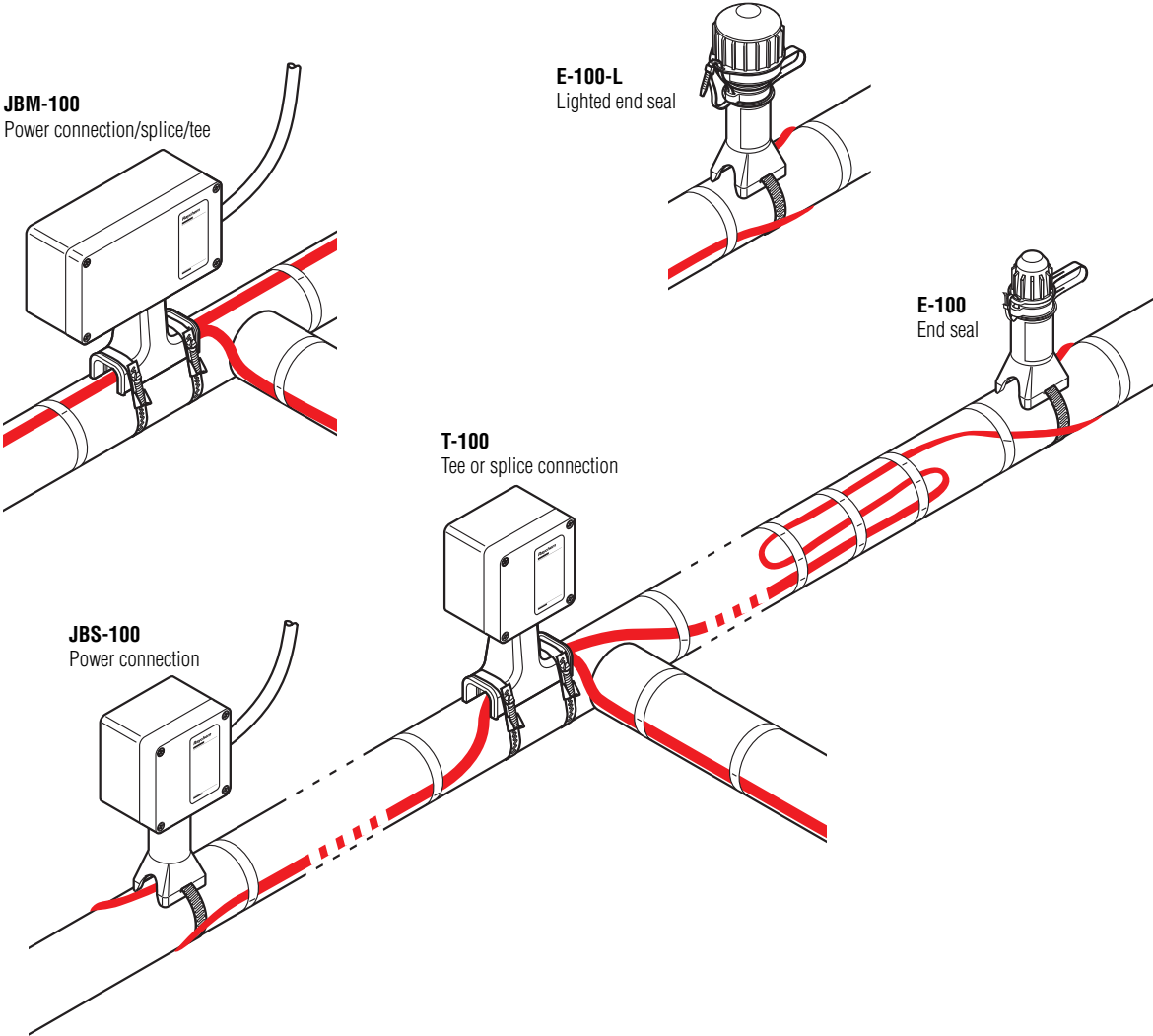
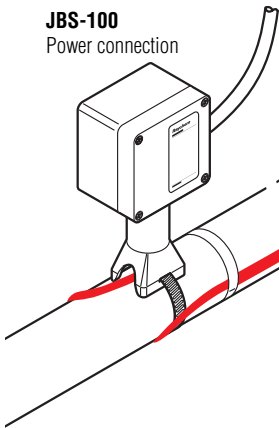
E-100
End seal



T-100
Tee or splice connection



JBS-100
Power connection



Introduction

This guide is designed for the selection of connection components, controls, and accessories for use with Raychem BTV, QTVR, XTV, and KTV self-regulating heating cables. Before using this guide, select the appropriate heating cable using the Heat-Tracing Design Guide (H51149) or TraceCalc design software.

This guide does not cover component selection for LBTV, VL, and AutoSense M-wire heating cables. Contact your local Raychem representative for assistance in selecting components for these products.

System approvals, warranty, and performance require the use of Raychem-specified components. Be sure to use the correct Raychem components for your application and do not substitute parts.

Products in this guide are suitable for use in both ordinary and Division 2 hazardous locations. For Division 1 hazardous locations, a separate selection guide is available (H56075).

Raychem offers a wide range of other heating products for the industrial market, including mineral-insulated cables, tank heating pads, long-line heating cables, and plantwide monitoring and control systems. Contact your local Raychem representative for additional information.

Raychem requires ground-fault protection for all Raychem heating cables. A list of ground-fault protection devices is included in the selection guide.

Contents

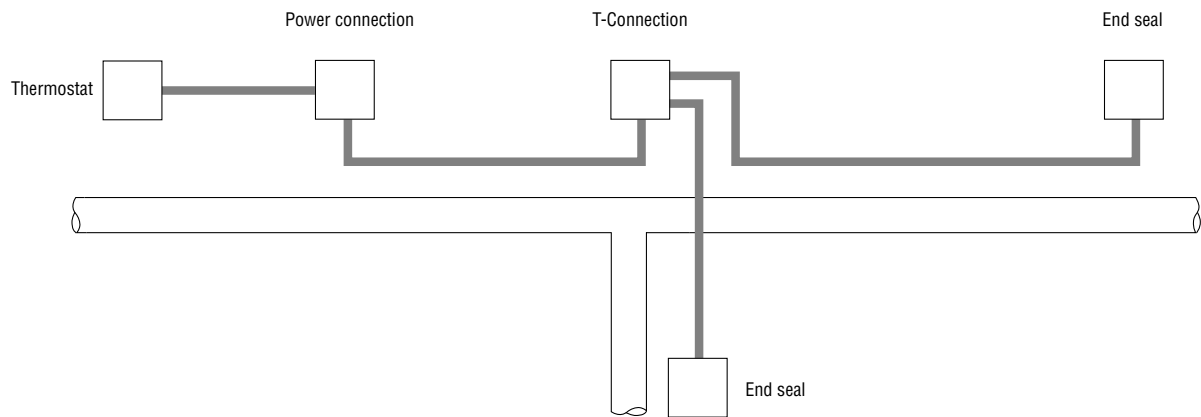
System Overview	1
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System Overview

Typical Heat-Tracing System

The typical heat-tracing system consists of the components shown in the schematic below. All of the components work together to provide a safe and reliable heat-tracing system that is easy to install and maintain.

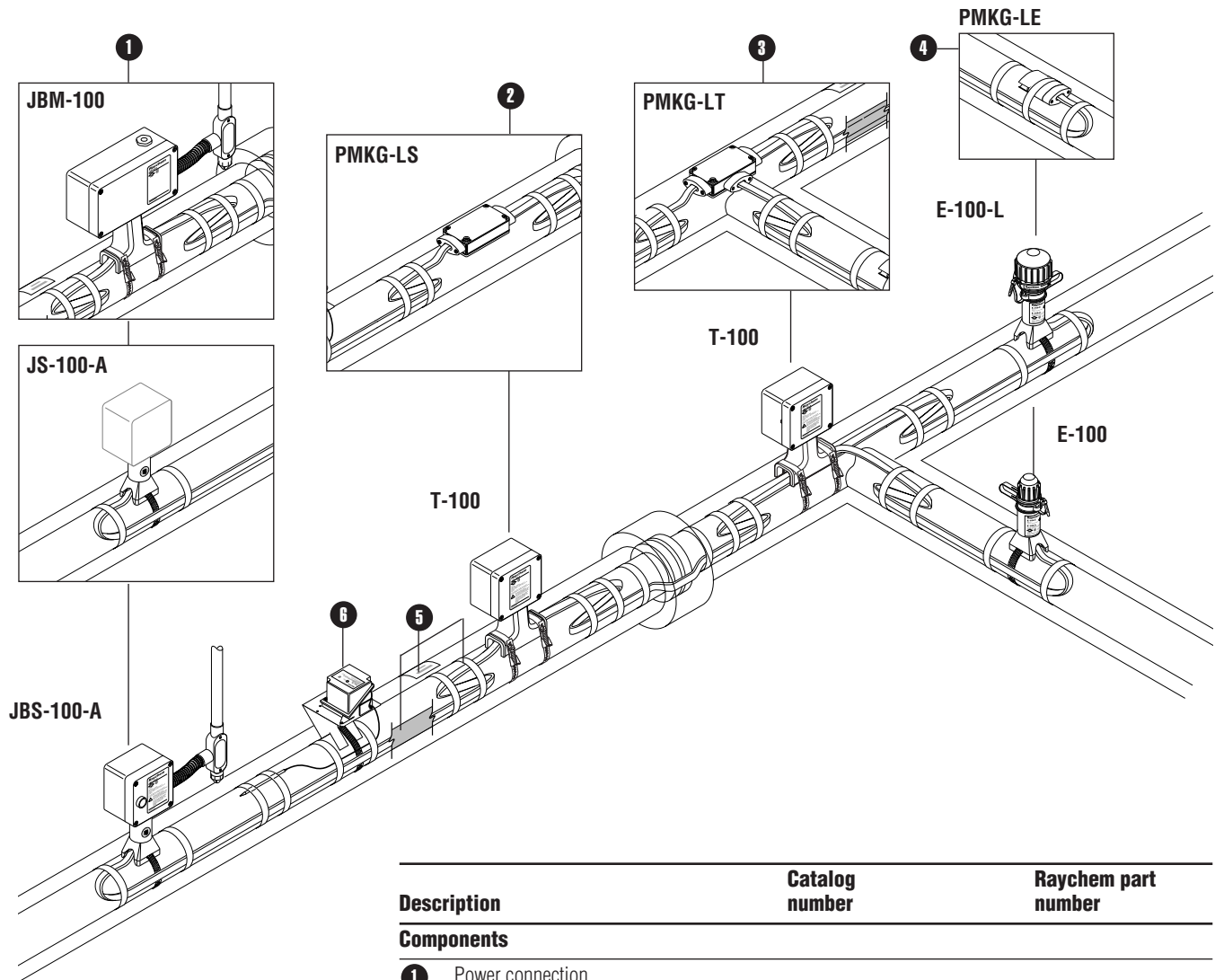
The self-regulating heating cable is cut to length at the job site and attached to the piping or tank surface with glass tape. A power connection kit is used to connect power to one end of the heating cable. An end seal kit is used to seal the other end of the heating cable. Splice and tee kits are used as necessary to connect two or three heating cables together. The heating cable may be controlled automatically by electromechanical or electronic thermostats, which sense either ambient or pipe temperature.



Additional Information

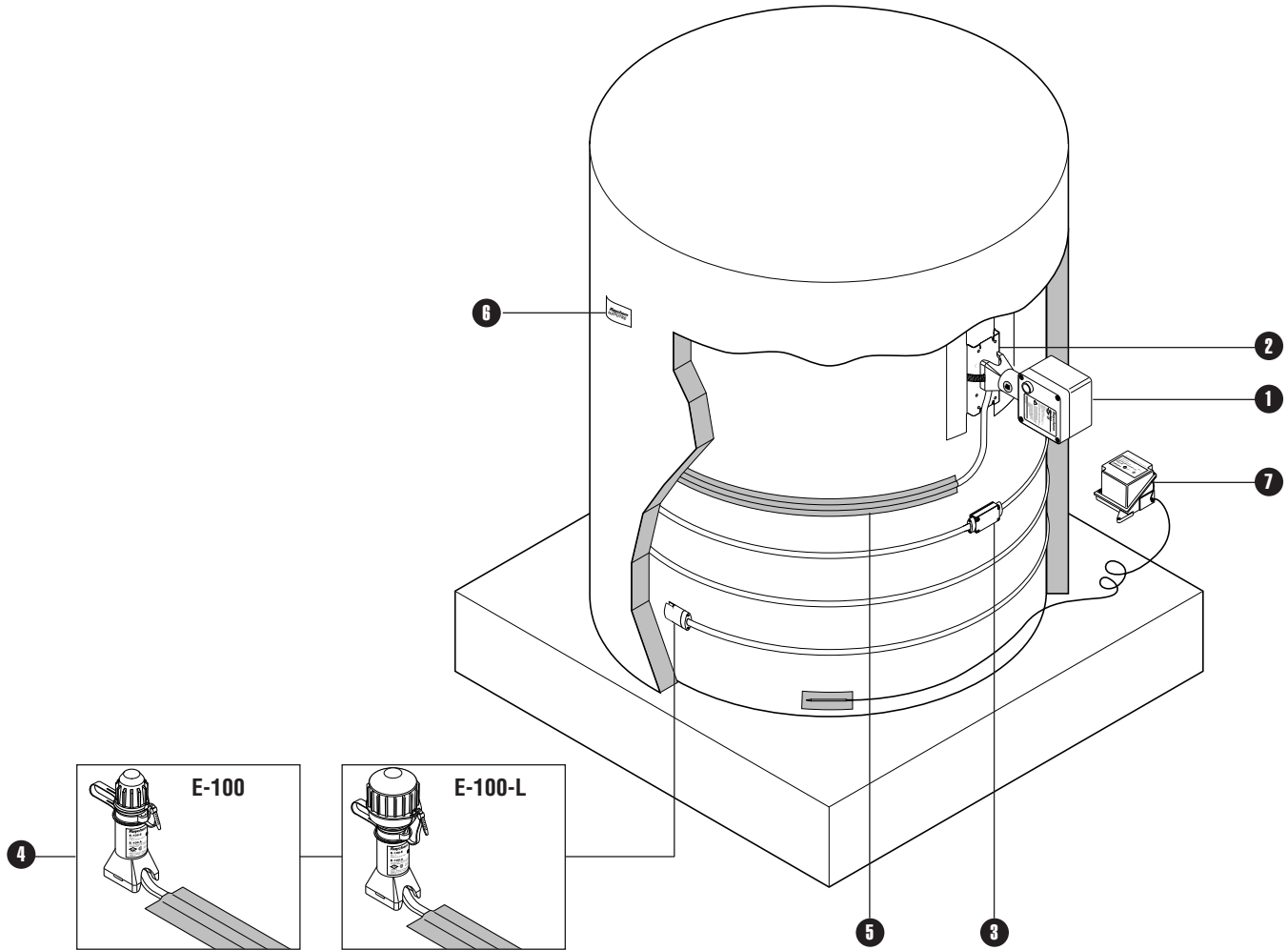
Design literature, data sheets, and installation instructions supplement the information in this selection guide. These documents are available from your local Raychem representative, from Raychem's Fax-On-Demand system (800-329-4494), and from Raychem's Web site (www.raychem.com).

Pipe-Tracing Components



Description	Catalog number	Raychem part number
Components		
1 Power connection		
Single heating cable	JBS-100-A	085947-000
Single heating cable (user-supplied junction box)	JS-100-A	166639-000
Multiple heating cables (1, 2, or 3)	JBM-100-A	179955-000
2 Splice connection		
Above insulation	T-100	447379-000
Below insulation	PMKG-LS	045551-000
3 Tee connection		
Above insulation	T-100	447379-000
Below insulation	PMKG-LT	848907-000
4 End seal		
Above insulation	E-100-A	046567-000
Above insulation, with light	E-100-L1-A (100–120 V)	583377-000
	E-100-L2-A (200–277 V)	478767-000
Below insulation	PMKG-LE	982199-000
Accessories		
5 Attachment tape and labels (see Accessories, pages 8 and 9)		
Controls		
6 Thermostat (see Controls, pages 4 and 5)		

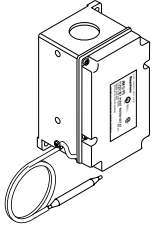
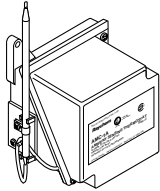
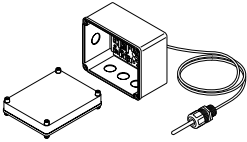
Tank-Tracing Components



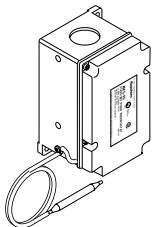
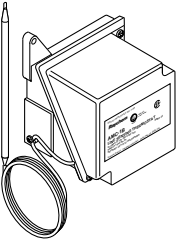
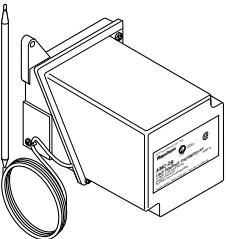
Description	Catalog number	Raychem part number
Components		
① Power connection	JBS-100-A	085947-000
② Support bracket	SB-100-T	279613-000
③ Splice connection	PMKG-LS	045551-000
④ End seal		
Below insulation	PMKG-LE	982199-000
Above insulation	E-100-A	046567-000
Above insulation, with light	E-100-L1-A, 100–120 V E-100-L2-A, 200–277 V	583377-000 478767-000
Accessories		
⑤ Aluminum tape	AT-180	158139-000
⑥ Labels (see Accessories, page 9)		
Controls		
⑦ Thermostat (see Controls, pages 4 and 5)		

Note: RHS tank heating pads are also available for tank-heating applications on metal and plastic tanks. Contact your Raychem representative for further information.

Ambient-sensing thermostats

	Catalog No.	Part No.	Description
	AMC-F5	031661-000	Fixed 40°F (4.4°C) set point for freeze protection applications. Single-pole, 22 A. NEMA 4X.
	AMC-1A	573977-000	Set point range: 15°F to 140°F (–9°C to 60°C). Single-pole, 22 A. NEMA 4X.
	RAYSTAT-ECO-01	178917-000	Electronic, energy-saving freeze protection controller. ON below 40°F (4.4°C). Single-pole control relay rated 3 A. External contactor required. NEMA 4X.

Line-sensing thermostats

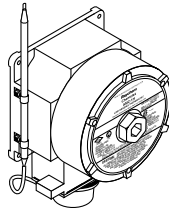
	Catalog No.	Part No.	Description
	AMC-F5	031661-000	Fixed 40°F (4.4°C) set point for freeze protection applications. Single-pole, 22 A. NEMA 4X.
	AMC-1B	943533-000	Set point range: 25°F to 325°F (–4°C to 163°C). Single-pole, 22 A. NEMA 4X.
	AMC-2B	042817-000	Set point range: 25°F to 325°F (–4°C to 163°C). Double-pole, 22 A. NEMA 4X.

Note:

All controls listed on this page (except MoniTrace 1000 and RAYSTAT-EX-03-A) are approved for use in the following areas:

- Class I, Div. 1 and 2, Groups B, C, D
- Class II, Div. 1 and 2, Groups E, F, G
- Class III

Ambient-sensing thermostats



Catalog No.

AMC-1H

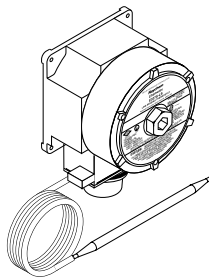
Part No.

889067-000

Description

Set point range:
15°F to 140°F (–9°C to 60°C).
Single-pole, 22 A. NEMA 4, 7, 9.

Line-sensing thermostats



Catalog No.

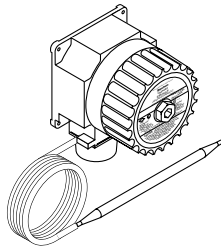
E507S-LS

Part No.

625725-000

Description

Set point range:
25°F to 325°F (–4°C to 163°C).
Single-pole, 22 A. NEMA 4, 7, 9.



Catalog No.

E507S-2LS

Part No.

257301-000

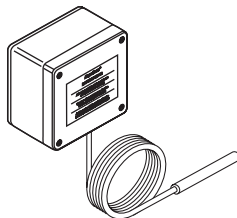
Description

Set point range:
25°F to 325°F (–4°C to 163°C).
Double-pole, 22 A. NEMA 4, 7, 9.

Note:

MoniTrace 1000 and RAYSTAT-EX-03-A are approved for use in the following areas:

- Class I, Div. 2, Groups A, B, C, D
- Class II, Div. 1 and 2, Groups E, F, G
- Class III



Catalog No.

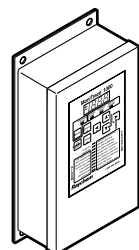
RAYSTAT-EX-03-A

Part No.

453609-000

Description

Electronic line-sensing thermostat.
Set point range:
32°F to 930°F (0°C to 499°C).
Double-pole, 16 A. NEMA 4X.
[Available January 1999]



Catalog No.

MONITRACE 1000

Part No.

716381-000

Single-circuit electronic controller.
Range: –40°F to 999°F (–40°C to 537°C). Double-pole solid-state switch rated 30 A, 277 V. NEMA 4X. Integral ground-fault equipment protection. Temperature and current display and alarms. Diagnostic tests.

Ground-Fault Equipment Protection Devices

All Raychem heating cables must be installed with electrical protection in accordance with local codes and practices.

Ground-Fault Circuit Breaker Selection Table

The following breakers are available from your local Raychem representative:

Bolt-on Style					
Manufacturer	Square D		Cutler Hammer (Westinghouse)		Raychem TraceGuard*
Voltage (amps)	120	208/240**	120	208/240**	277
15	QOB115EPD	QOB215EPD	QBGFEP1015	QBGFEP2015	EHB14015EPD
20	QOB120EPD	QOB220EPD	QBGFEP1020	QBGFEP2020	EHB14020EPD
30	QOB130EPD	QOB230EPD	QBGFEP1030	QBGFEP2030	EHB14030EPD
40	—	—	—	QBGFEP2040	EHB14040EPD
50	—	—	—	QBGFEP2050	EHB14050EPD
Panelboard	NQOD	NQOD	POW-R-LINE 1	POW-R-LINE 1	NEHB
Plug-on Style					
Manufacturer	Square D		Cutler Hammer (Westinghouse)		Raychem TraceGuard*
Voltage (amps)	120	208/240**	120	208/240**	277
15	QO115EPD	QO215EPD	QPGFEP1015	QPGFEP2015	—
20	QO120EPD	QO220EPD	QPGFEP1020	QPGFEP2020	—
30	QO130EPD	QO230EPD	QPGFEP1030	QPGFEP2030	—
40	—	—	—	QPGFEP2040	—
50	—	—	—	QPGFEP2050	—
Panelboard	QO Load Center	QO Load Center	POW-R-LINE 1	POW-R-LINE 1	—
Padlock attachment***	QO1PA	GF12PA	QLPB123PL	QLPB123PL	GFPOHPA-EH

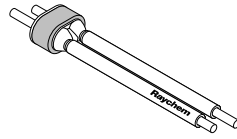
* Raychem's TraceGuard 277 circuit breaker is manufactured by Square D.

** Two-pole ground-fault breakers require 120 volts to power the internal electronics. 240-volt delta systems without a 120-volt neutral reference will require an additional transformer to provide the reference.

*** Padlocks are required to comply with NEC section 427-55(a) if the circuit breaker is utilized as a disconnecting means.

Cold-applied core sealer

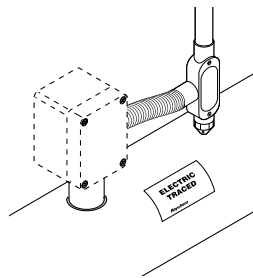
Catalog No.	Part No.	Description
CS-100-A	232949-000	Heating Cable Connection Insulator



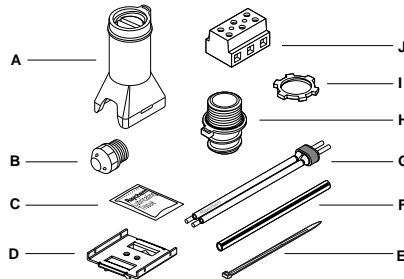
Replacement cold-applied core sealer for Raychem BTV, QTVR, XTV, and KTV heating cables.

Single-entry transition kit

Catalog No.	Part No.	Description
JS-100-A	166639-000	Junction Box Stand



Junction box stand for use with Raychem BTV, QTVR, XTV, and KTV self-regulating heating cables. A separate customer-supplied NEMA 4X junction box is required.

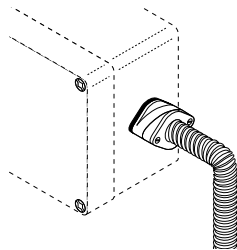


Kit Contents

Item	Description
A	Stand assembly
B	Conduit drain
C	Cleaning tissue
D	Adapter for small pipes
E	Cable tie
F	Green/yellow tube
G	CS-100 cold-applied core sealer
H	JS-100 transition
I	1" locknut
J	Terminal block

Gland entry kit

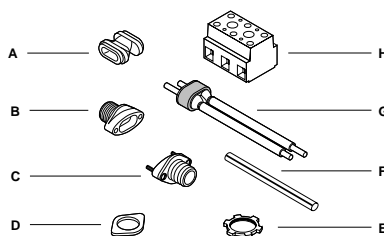
Catalog No.	Part No.	Description
C75-100-A	000539-000	NEMA 4X-rated gland kit



A NEMA 4X-rated gland kit used to transition heating cables into a junction box when making connections off of a pipe or tank. It may be used for power, splice, or tee connections. The C75-100-A is for use with Raychem BTV, QTVR, XTV, KTV,¹ and LBT2-CT² self-regulating heating cables. The kit does not include the junction box, flexible tubing, or tape, which are required to make a complete connection.

¹ For KTV only, order PMK-GP-10 grommet (P/N 700823).

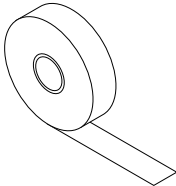
² For LBT2-CT only, order HCS-100-A heat-shrink core sealer (P/N 257649) and PMK-GK-10 grommet (P/N 222724).



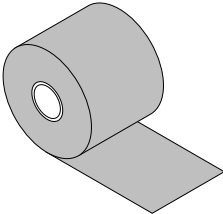
Kit Contents


Item	Description
A	Red grommet
B	Gland with threaded inserts
C	Gland with screws
D	Gland gasket
E	Locknut
F	Green/yellow heat-shrinkable tube
G	CS-100 core sealer
H	Terminal block

Attachment products

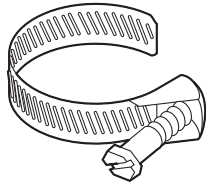
	Catalog No.	Part No.	Description
	GT-66	C77220-000	66-ft (20-m) roll of glass tape for attaching heating cable to pipe. Not for stainless steel pipes or for installation temperatures below 40°F.

	GS-54	C77221-000	54-ft (16.5-m) roll of glass tape for attaching heating cable to pipe. For stainless steel pipes and for any installation below 40°F.
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	AT-180	158139-000	180-ft (55-m) roll of aluminum tape for attaching heating cables and thermostat sensors to pipes and tanks.
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	CT-CABLE-TIE	C77261-000	Plastic cable ties (100 per box) offer an alternative method of attaching heating cable to pipes up to 3 in (75 mm) in diameter.
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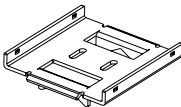
Pipe Straps		Used to secure connection components and brackets to pipes. Order by pipe diameter, as follows:	
PS-01	C77211-000	1/4—1 in	(6–25 mm)
PS-03	C77212-000	1—3 in	(25–75 mm)
PS-10	C77213-000	3—10 in	(75–250 mm)
PS-20	C77216-000	10—20 in	(250–500 mm)

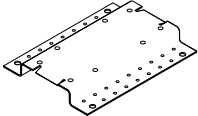


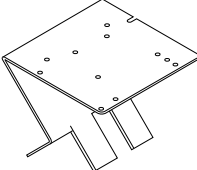
Labels

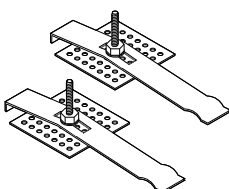
	Catalog No.	Part No.	Description
	ETL-ENGLISH	C77203-000	"Electric-traced" label for identifying traced pipes and tanks.

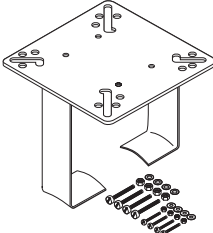
Brackets, Adapters

	Catalog No.	Part No.	Description
	SB-100-SP	800679-000	Adapter for mounting E-100, E-100-L, JBS-100, and JS-100 connection components on 1-in (25-mm) and smaller pipes (included in kits mentioned).

	SB-100-T	279613-000	Bracket for mounting JBS-100, E-100, and E-100-L on a tank surface.
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	UMB	263757-000	Universal mounting bracket for mounting thermostats and other equipment on a pipe.
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	BCK-35	C77215-000	Thermostat bulb clamp kit for attaching thermostat bulb to tank wall.
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	JB-SB-25	471139-000	Stainless steel mounting bracket for RAYSTAT-EX-03-A thermostat.
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Heat-Tracing System Worksheet

	Product Catalog Number	Quantity Required
Step 1: Select heating cable. Select appropriate heating cable for application. To aid in component selection, list: Pipe length Pipe size Pipe material		ft
Step 2: Select system components. Junction box Splice kit Tee kit End seal kit		ea.
Select accessories. Support bracket Tape Labels		ea.
Select controls. Thermostat to suit application		ea.

Step 3:
Contact your local Raychem representative to place your order.

Data Sheets

Data sheets with detailed product specifications are provided for the following components:

JBS-100	Single-entry power connection with junction box
JBM-100	Multiple-entry power/splice/tee connection with junction box
T-100	Splice or tee connection kit
E-100	High-profile end seal
E-100-L	High-profile end seal with light

The JBS-100 kit is designed to connect power to one Raychem BTV, QTVR, XTV, or KTV self-regulating heating cable and is approved by FM, CSA, and PTB for use in hazardous locations.

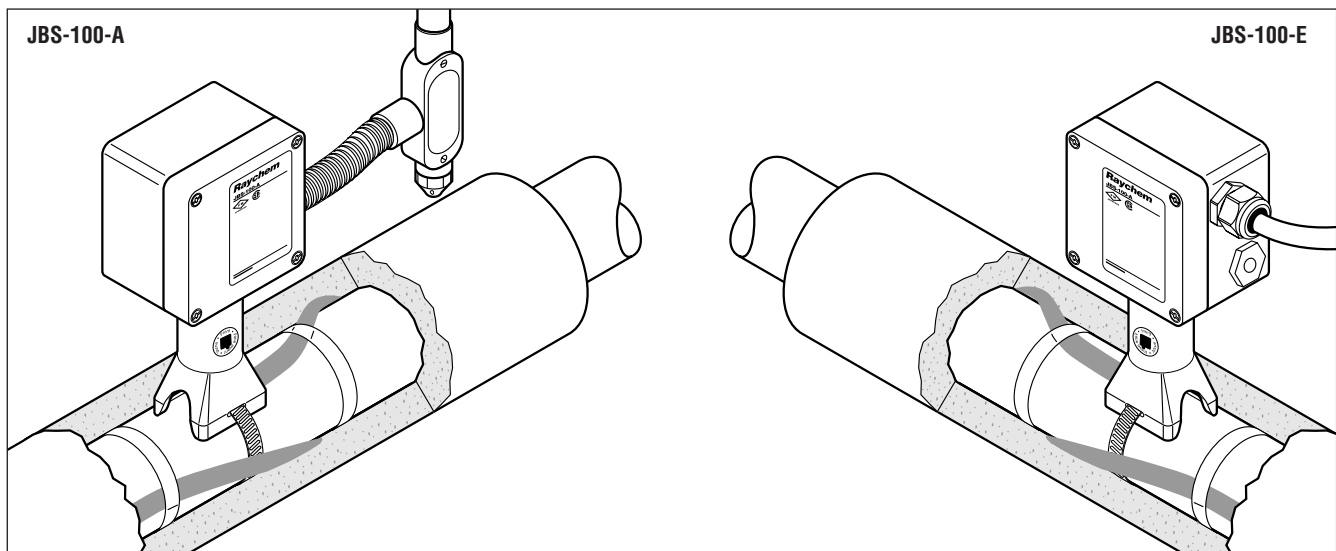
The JBS-100 integrates the functions of both connection kits and insulation entries. The rugged stand protects the heating cable and allows for up to 100 mm (4") of thermal insulation.

The new core sealing boot does not require a heat gun or torch for the installation (no hot work permit necessary). The noncuring sealant in the boot allows easy installation and facilitates maintenance.






Innovative cage clamp terminals from WAGO provide fast installation and safe, reliable, maintenance-free operation.

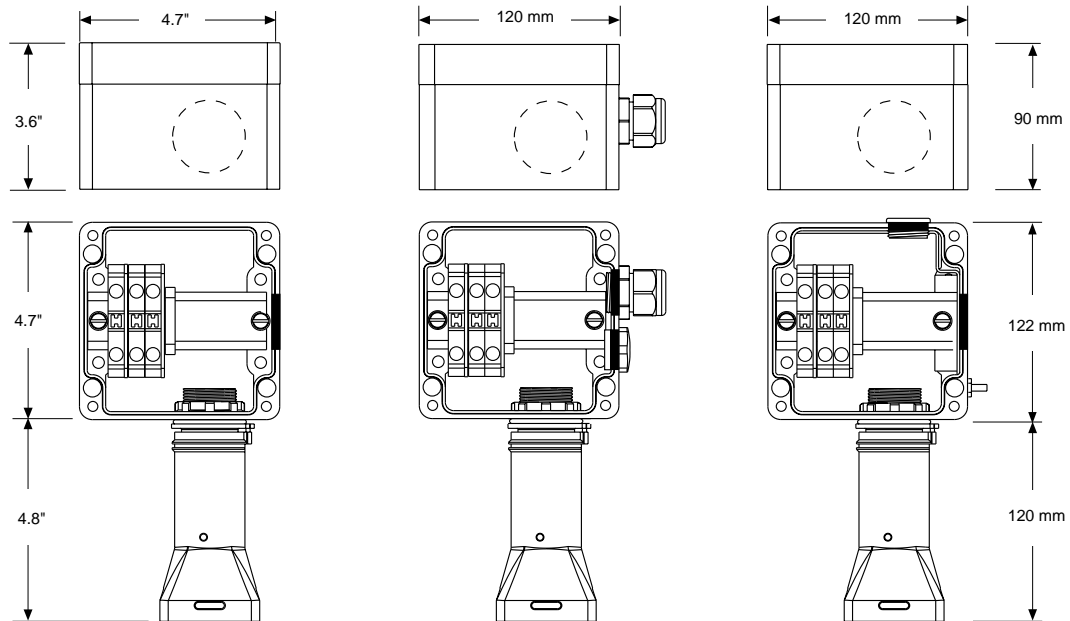
Compared to existing systems, this connection kit significantly reduces installation time.

The kit is offered in three versions, customized for local installation. Each kit contains all the necessary materials for a complete installation except for the pipe straps, which must be ordered separately.



	JBS-100-A	JBS-100-E	JBS-100-EP
Description	This kit is for use in North America and has one through-hole for use with 3/4" conduit. A conduit drain is provided to prevent condensate from collecting in the box.	This kit is for use in Europe and provides two M25 threaded entries, one stopping plug, and one plastic power cable gland.	This kit is for use in Europe and provides two M25 threaded entries, an earthing plate, and an external earthing stud. It is designed for use with armored cables.
Kit contents	1 junction box with terminals 1 stand 1 core sealer 1 braid insulator 1 3/4" conduit drain 1 adapter for small pipes	1 junction box with terminals 1 stand 1 core sealer 1 braid insulator 1 M25 gland for power cable 8–17 mm in diameter 1 M25 stopping plug 1 adapter for small pipes	1 junction box with terminals, earth plate, and stud 1 stand 1 core sealer 1 braid insulator 1 M25 stopping plug 1 adapter for small pipes

Approvals	Hazardous Locations		
	 Class I, Div. 2, Groups B, C, D  Class II, Div. 1 and 2, Groups E, F, G Class III	 II 2 G EEx e II PTB 97 ATEX 1058 U	 II 2 G EEx e II PTB 97 ATEX 1058 U
	 CLI, ZN1, AEx e IIC		

JBS-100-A**JBS-100-E****JBS-100-EP****Dimensions (nominal)****Raychem product specifications**

Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT		
Ingress protection	NEMA Type 4X	IP67	IP67
Entries	1 x 3/4"	2 x M25	2 x M25
Min. installation temperature	-40°F (-40°C)	-40°F (-40°C)	-40°F (-40°C)
Min. usage temperature	-60°F (-75°C)	-60°F (-75°C)	-60°F (-75°C)
Max. pipe temperature	420°F (215°C)	420°F (215°C)	420°F (215°C)
Terminals	WAGO 284 series (EEx e) 2 line, 1 ground	WAGO 284 series (EEx e) 1 phase, 1 neutral, 1 earth	WAGO 284 series (EEx e) 1 phase, 1 neutral, 1 earth
Max. conductor size	8 AWG stranded	10 mm ² stranded, 10 mm ² solid	10 mm ² stranded, 10 mm ² solid
Max. operating voltage	277 Vac	277 Vac	277 Vac
Max. continuous operating current	50-A heating cable circuit	50-A heating cable circuit	50-A heating cable circuit
Deluge testing	Passed Shell UK requirements	Passed Shell UK requirements	Passed Shell UK requirements

Materials of construction

Enclosure, lid, and stand	Electrostatic-charge-resistant glass-filled engineering polymers, black	Electrostatic-charge-resistant glass-filled engineering polymers, black	Electrostatic-charge-resistant glass-filled engineering polymers, black
Lid screws	Stainless steel	Stainless steel	Stainless steel
Lid gasket	Silicone rubber	Silicone rubber	Silicone rubber
Earth continuity plate	N/A	N/A	Steel, zinc plated, and yellow chromated

Ordering details

Part description	JBS-100-A	JBS-100-E	JBS-100-EP
Raychem part number	085947-000	829939-000	158251-000
Weight	2.5 lb	1.2 kg	1.3 kg

The JBM-100 kit is designed to splice, tee, or connect power to as many as three Raychem BTV, QTVR, XTV, or KTV self-regulating heating cables and is approved by FM, CSA, and PTB for use in hazardous locations.

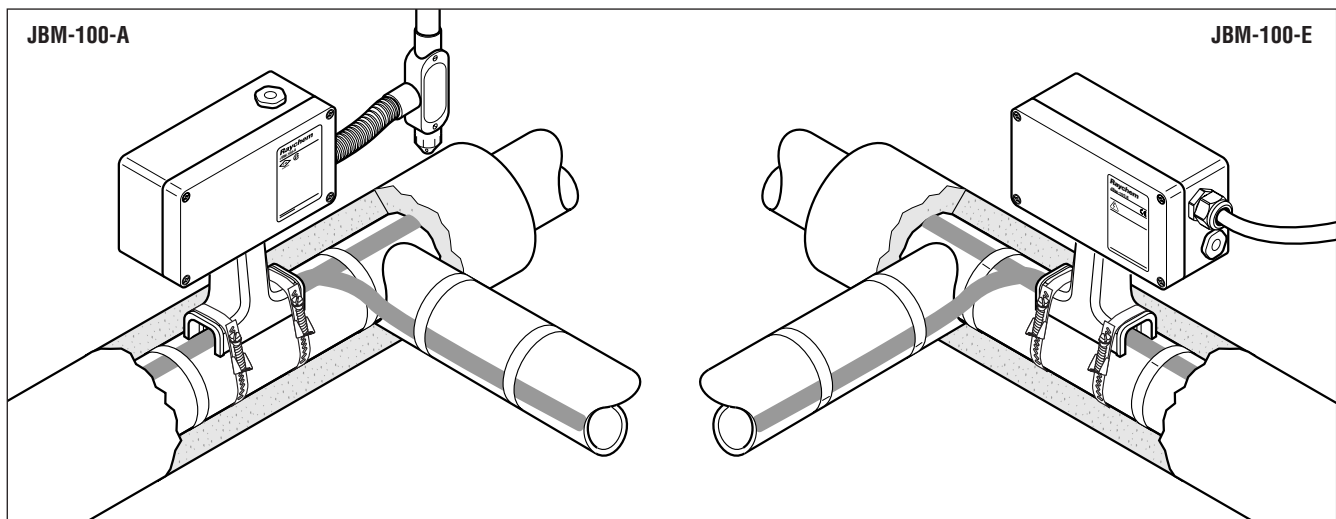
The JBM-100 integrates the functions of both connection kits and insulation entries. The rugged stand protects the heating cable and allows for up to

100 mm (4") of thermal insulation. The new core sealing boot does not require a heat gun or torch for the installation (no hot work permit necessary). The noncuring sealant in the boot allows easy installation and facilitates maintenance.

Innovative cage clamp terminals from WAGO provide fast installation and safe, reliable, maintenance-free operation.

Compared to existing systems, this connection kit significantly reduces installation time.

The kit is offered in three versions, customized for local installation. Each kit contains all the necessary materials for a complete installation except for the pipe straps, which must be ordered separately.



	JBM-100-A	JBM-100-E	JBM-100-EP
Description	This kit is for use in North America and has two 3/4" through holes for use with 3/4" conduit. Two stopping plugs are supplied in the kit. A conduit drain is provided to prevent condensate from collecting in the box.	This kit is for use in Europe and provides two M25 threaded entries, two stopping plugs, and one plastic power cable gland.	This kit is for use in Europe and provides two M25 threaded entries, an earthing plate, and an external earthing stud. It is designed for use with armored cables.
Kit contents	1 junction box with terminals 1 stand 3 core sealers 3 braid insulators 1 3/4" conduit drain 1 adapter for small pipes	1 junction box with terminals 1 stand 3 core sealers 3 braid insulators 1 M25 gland for power cable 8–17 mm in diameter 2 M25 stopping plugs 1 adapter for small pipes	1 junction box with terminals, earth continuity plate, and stud 1 stand 3 core sealers 3 braid insulators 2 M25 stopping plugs 1 adapter for small pipes

Approvals

Hazardous Locations



Class I, Div. 2,
Groups B, C, D
Class II, Div. 1 and 2,
Groups E, F, G
Class III



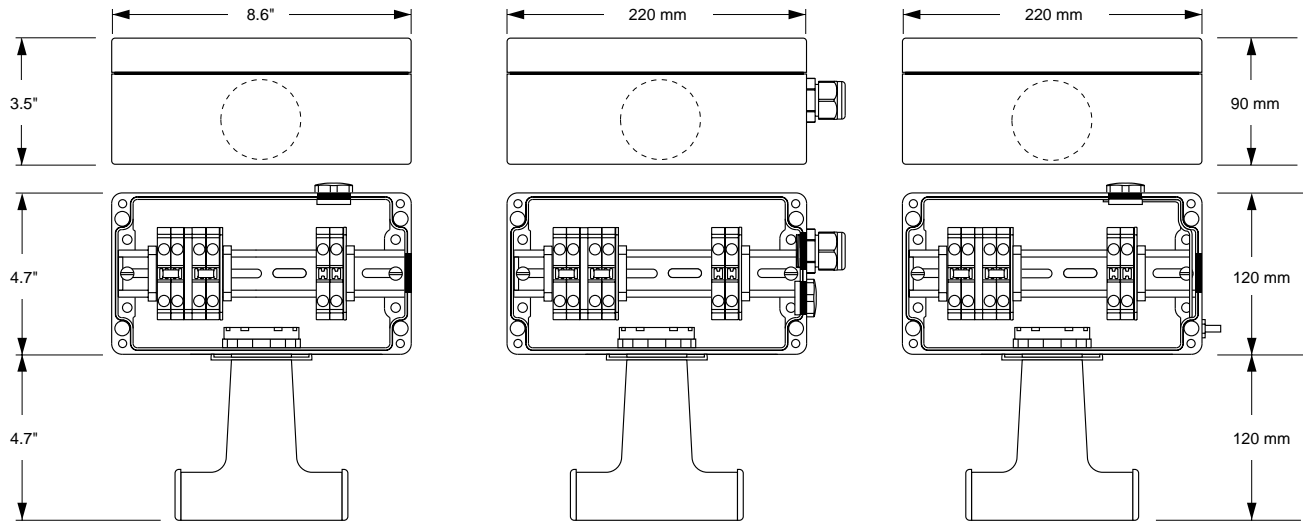
CLI, ZN1, AEx e IIC



II 2 G EEx e II
PTB 98 ATEX 1021 U



II 2 G EEx e II
PTB 98 ATEX 1021 U

JBM-100-A**JBM-100-E****JBM-100-EP****Dimensions (nominal)****Raychem product specifications**

Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT		
Ingress protection	NEMA Type 4X	IP66	IP66
Entries	2 x 3/4"	2 x M25	2 x M25
Min. installation temperature	-40°F (-40°C)	-40°F (-40°C)	-40°F (-40°C)
Min. usage temperature	-60°F (-75°C)	-60°F (-75°C)	-60°F (-75°C)
Max. pipe temperature	420°F (215°C)	420°F (215°C)	420°F (215°C)
Terminals	WAGO 284 series (EEx e) 4 line, 2 ground	WAGO 284 series (EEx e) 2 phase, 2 neutral, 2 earth	WAGO 284 series (EEx e) 2 phase, 2 neutral, 2 earth
Max. conductor size	8 AWG stranded	10 mm ² stranded, 10 mm ² solid	10 mm ² stranded, 10 mm ² solid
Max. operating voltage	277 Vac	277 Vac	277 Vac
Max. continuous operating current	50-A heating cable circuit	50-A heating cable circuit	50-A heating cable circuit
Deluge testing	Passed Shell UK requirements	Passed Shell UK requirements	Passed Shell UK requirements

Materials of construction

Enclosure, lid, and stand	Electrostatic-charge-resistant glass-filled engineering polymers, black	Electrostatic-charge-resistant glass-filled engineering polymers, black	Electrostatic-charge-resistant glass-filled engineering polymers, black
Lid screws	Stainless steel	Stainless steel	Stainless steel
Lid gasket	Silicone rubber	Silicone rubber	Silicone rubber
Earth continuity plate	N/A	N/A	Steel, zinc plated, and yellow chromated

Ordering details

Part description	JBM-100-A	JBM-100-E	JBM-100-EP
Raychem part number	179955-000	831519-000	986415-000
Weight	4.3 lb	1.9 kg	2.1 kg

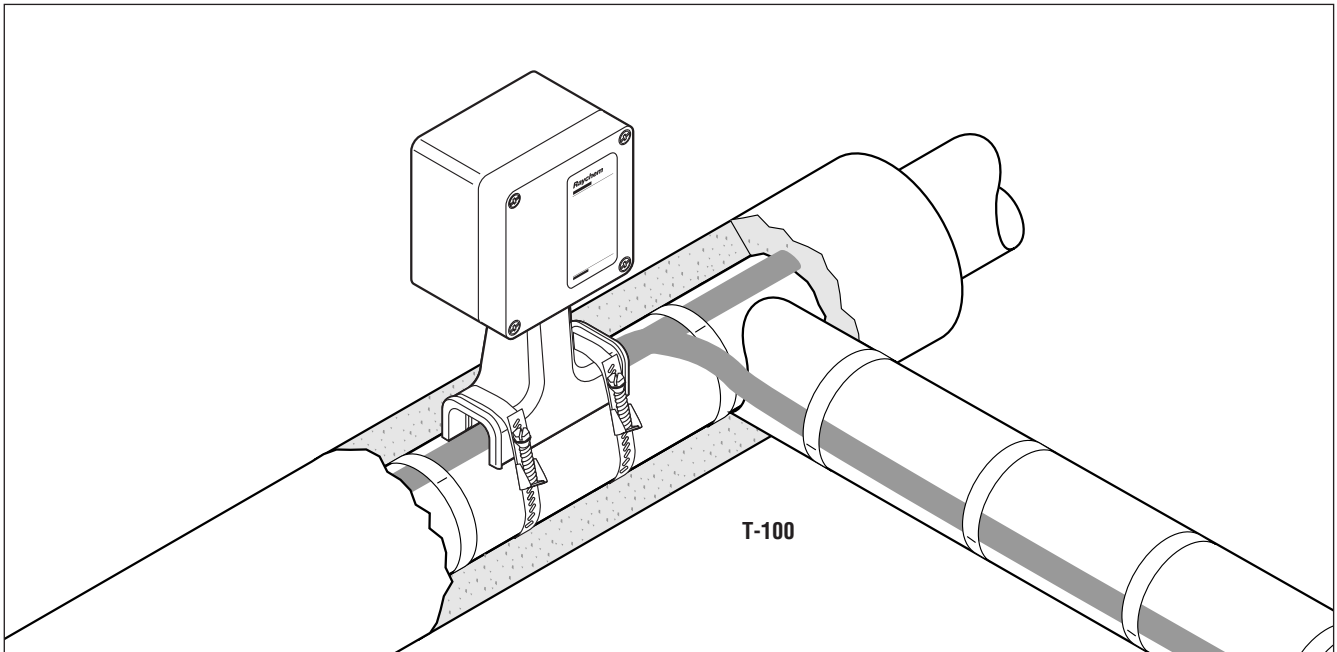
The T-100 is an above-insulation splice or tee kit, designed for use with up to three Raychem BTV, QTVR, XTV, or KTV self-regulating heating cables. It is approved by FM, CSA, and PTB for use in hazardous locations.

The rugged stand protects the heating cable and allows for up to 100 mm (4") of thermal insulation.

The new core sealing boot does not require a heat gun or torch for the installation (no hot work permit necessary). The noncuring sealant in the boot allows easy installation and facilitates maintenance.

Compared to existing systems, the T-100 significantly reduces installation and maintenance time and effort.

Each kit contains all the necessary materials for a complete installation except for the pipe straps, which must be ordered separately.



Description

This kit is an above-insulation splice/tee, appropriate for use worldwide with no requirements for local customization.

Kit contents

Note: Order appropriate pipe straps separately (two straps per kit).

- 1 splice/tee enclosure and lid
- 1 stand assembly
- 3 core sealers
- 3 braid insulators
- 1 adapter for small pipes
- 3 compression crimps
- 3 crimping insulating tubes

Approvals

Hazardous Locations



Class I, Div. 2, Groups B, C, D
Class II, Div. 1 and 2, Groups E, F, G
Class III

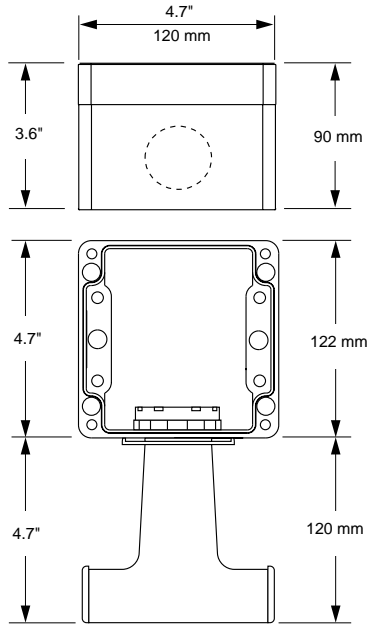


II 2 G EEx e II
PTB 98 ATEX 1020 U



CLI, ZN1, AEx e IIC

Dimensions (nominal)



Specifications

Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTV-CT, KTV-CT
Ingress protection	NEMA Type 4X/IP67
Min. installation temperature	-40°F (-40°C)
Min. usage temperature	-75°F (-60°C)
Max. pipe temperature	420°F (215°C)
Max. operating voltage	277 Vac
Max. continuous operating current	50-A heating cable circuit
Deluge testing	Passed Shell UK requirements

Materials of construction

Enclosure, lid, and stand	Electrostatic-charge-resistant glass-filled engineering polymers, black
Lid screws	Stainless steel
Lid gasket	Silicone rubber

Ordering details

Part description	T-100
Raychem part number	447379-000
Weight	2.5 lb/1.2 kg

The E-100 is a NEMA 4X-rated end seal kit for Raychem BTV, QTVR, KTV, and XTV heating cables. Once installed, these end seals are easily reentered for maintenance; the heating cable can be accessed without removing the end seal.

Quick and easy to install

Installation is extremely fast and no grommet selection is required. All parts are captive and are correctly positioned at the time of installation. The only tools needed are a utility knife, wire cutters, and a screwdriver; no heat source is required. To reduce the risk of tampering, a tool-only reentry feature is offered.

Super sealed and corrosion resistant

The combination of compression grommet and O-rings provides the E-100 with a complete water seal. The heating-cable core and bus wires are insulated and sealed separately from the braid by means of a sealant-filled boot. The NEMA 4X-rated E-100 is resistant to chemical and salt corrosion.

Exceptionally rugged

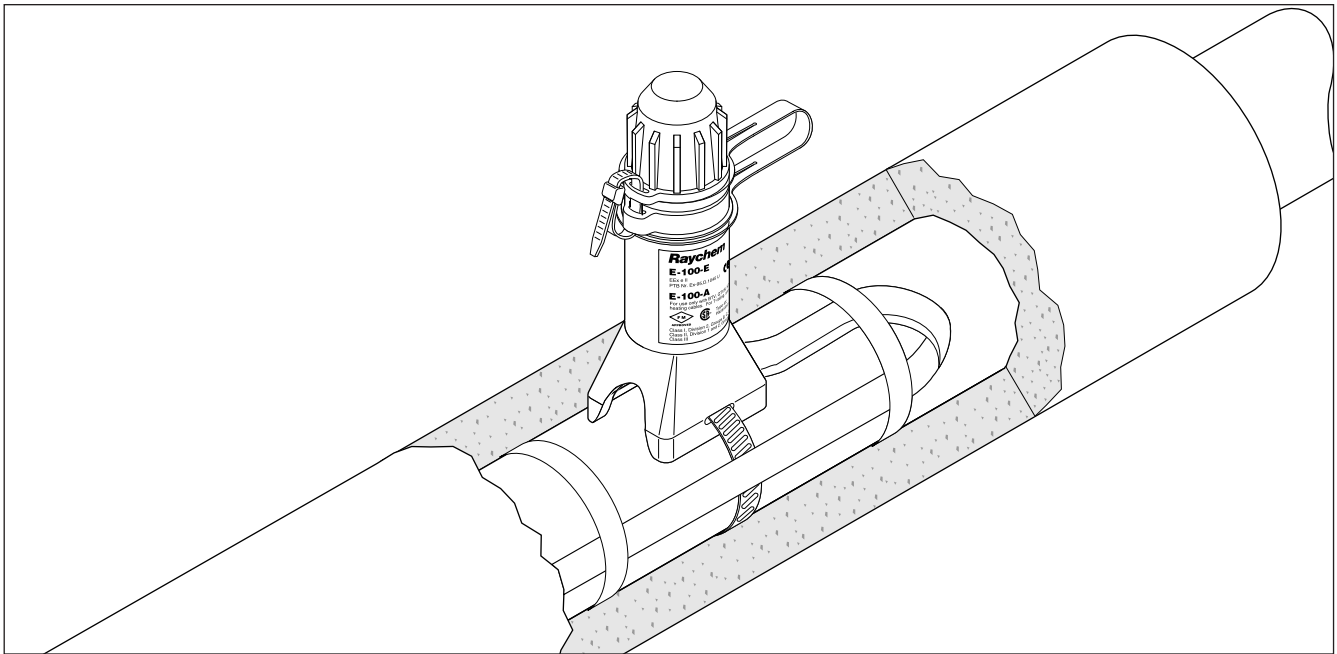
Using the latest in polymer technology, the E-100 is designed for extreme durability during and after installation. The E-100 meets or exceeds IEEE and European Norm standards for impact resistance and ruggedness.

Easy to locate

The high-profile E-100 end seal is mounted on the pipe, and projects through the thermal insulation and cladding for easy visibility. A brightly colored "leash" holds the cap captive to the stand.

Reenterable

With the E-100 end seal, heating-cable bus wires and grounding braid are easily accessed for voltage and continuity checks. Simply unscrew the E-100 cap and remove the reusable sealing boot; there is no need to completely disassemble or remove the end seal.



Kit contents

Note: Order appropriate pipe strap separately.

1 end seal
1 end seal label
1 cable tie

Approvals

Hazardous Locations

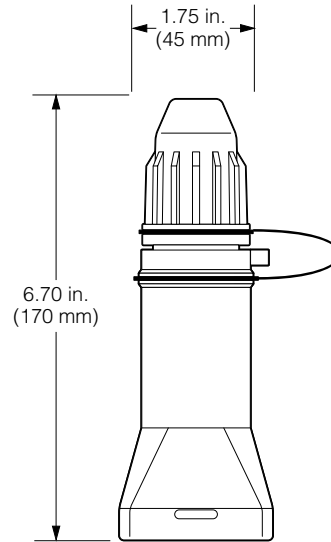


Class I, Div. 2, Groups A, B, C, D
Class II, Div. 1 and 2, Groups E, F, G
Class III



CLI, ZN1, AEx e IIC

Dimensions



Specifications

Heating cable compatibility	BTV-CR/-CT, QTVR-CT, XTV-CT, KTV-CT; not LBTV or M-wire
Ingress protection	NEMA Type 4X, IP65
Min. installation temperature	-40°F (-40°C)
Max. pipe temperature	419°F (215°C)
Materials	High-performance glass-filled engineering polymers
Impact resistance	10 ft-lb at -22°F (-30°C) (IEEE 515-5.1.6) 7 joules after 1 month thermal aging (EN 50 014-23.4.7.2)
Flammability	IEEE 515-5.3.4
Dust exclusion	IEC 529-5.6.2
Cable creepage	FM 3820-5.2.5, EN 50 014-B.1.3
Tools required	Wire cutters, utility knife, screwdriver
Max. thickness pipe insulation	4 in (100 mm)

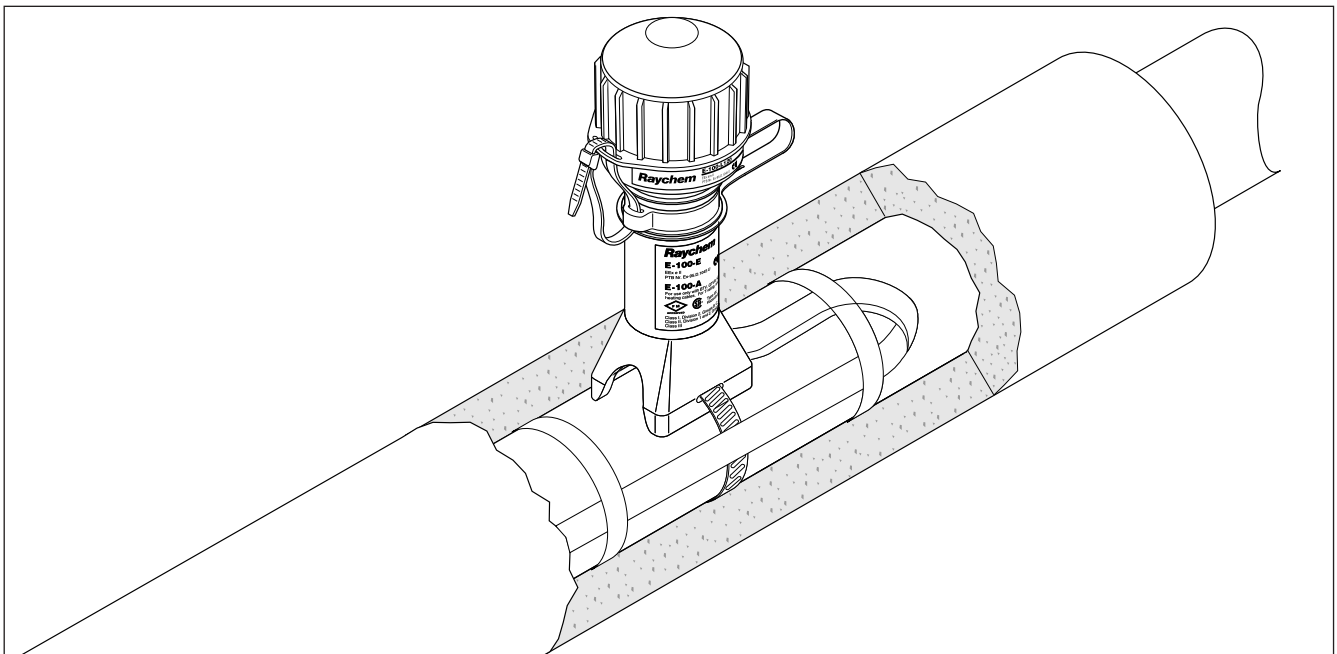
Ordering details

High-profile end seal kit	
Part description	E-100-A
Raychem part number	046567-000
Weight	0.5 lb
Replacement sealing boots (5 per pack)	
Part description	E-100-BOOT-5/PACK
Raychem part number	281053-000
Weight	0.25 lb

The E-100-L is a high-profile end seal with a signal light module. This unit is approved for use with most Raychem heating cables and has worldwide approvals for use in ordinary and hazardous areas. These rugged end seals are resistant to impact, high temperatures, and chemical and UV attack. Sealing is done separately with O-rings and a sealant-filled boot.

The light module uses an array of super-bright LEDs for excellent visibility and long life. The robust industrial-grade electronics are encapsulated to reliably seal out moisture and dust.

The light module can be retrofitted into previously installed E-100 and PMK-RE end seals, and the light module is replaceable.



Kit contents

Note: Order appropriate pipe strap separately.

1 end seal with lighted cap
1 end seal label
1 cable tie

Approvals

Hazardous Locations

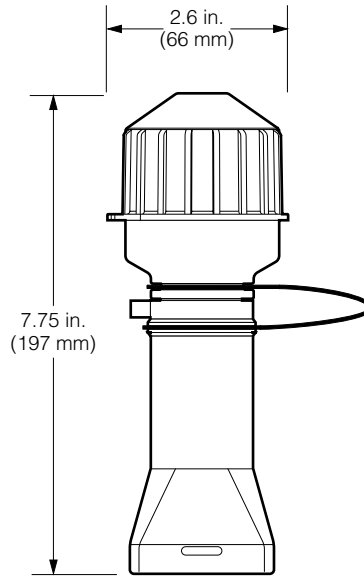


Class I, Div. 2, Groups A, B, C, D
Class II, Div. 1 and 2, Groups E, F, G
Class III



CLI, ZN1, AEx e IIC

Dimensions



Specifications

Heating cable compatibility	BTV-CR/-CT, QTVR-CT, XTV-CT, KTV-CT; not LBTV or M-wire	
Ingress protection	NEMA Type 4X, IP65	
Min. installation temperature	-40°F (-40°C)	
Max. pipe temperature	419°F (215°C)	
Min./max. ambient temperature	-40°F to 105°F (-40°C to 40°C)	
Materials	High-performance engineering polymers	
Impact resistance	IEEE 515 EN 50 014	10 ft-lb at -40°F (-40°C) ≥ 7 joules
Light source	Super-bright light emitting diodes (LEDs)	
Light source power supply	Linear (non-switching)	
Power consumption	< 2 watts	
Electromagnetic compatibility	Immunity Emissions	Complies with EN 50 082-2:1995 Complies with EN 50 081-1:1991 (commercial and light industrial classes) and meets requirements of FCC, Part 15, Class B
	CE	
Vibration	IEC 68-2-6	20 m/s ² , 10–150 Hz
Shock	IEC 68-2-27	500 m/s ² , 11 ms
Tools required	Wire cutters, utility knife, screwdriver, crimp tool	
Max. thickness pipe insulation	4 in (100 mm)	

Ordering details

Complete lighted end seal kit (requires one pipe strap, not supplied)	100–120 Vac*	Red LEDs	E-100-L1-A RPN 583377 (1.3 lb)
	200–277 Vac*	Red LEDs	E-100-L2-A RPN 478767 (1.3 lb)
Replacement/retrofit lighted end seal kit (for use with existing PMK-RE or E-100)	100–120 Vac*	Red LEDs	E-100-LR1-A RPN 552225 (0.9 lb)
	200–277 Vac*	Red LEDs	E-100-LR2-A RPN 874485 (0.9 lb)

*Voltage tolerance: ± 10%, 50/60 Hz



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TE&I Division

Raychem Corporation
300 Constitution Drive
Menlo Park, California 94025-1164
Tel (800) 545-6258
Fax (800) 611-2323
Fax-on-Demand (800) 329-4494
ciinfo@raychem.com
www.raychem.com

Raychem Canada Limited
Toronto, Ontario M5H 4A2
Canada
Tel (800) 988-5171
Fax (800) 988-5172

Raychem S.A.I.C.
Carlos Pellegrini 1163, Piso 7
1009 Capital Federal
Buenos Aires, Argentina
Tel (54) 1/394-5150
Fax (54) 1/326-9985

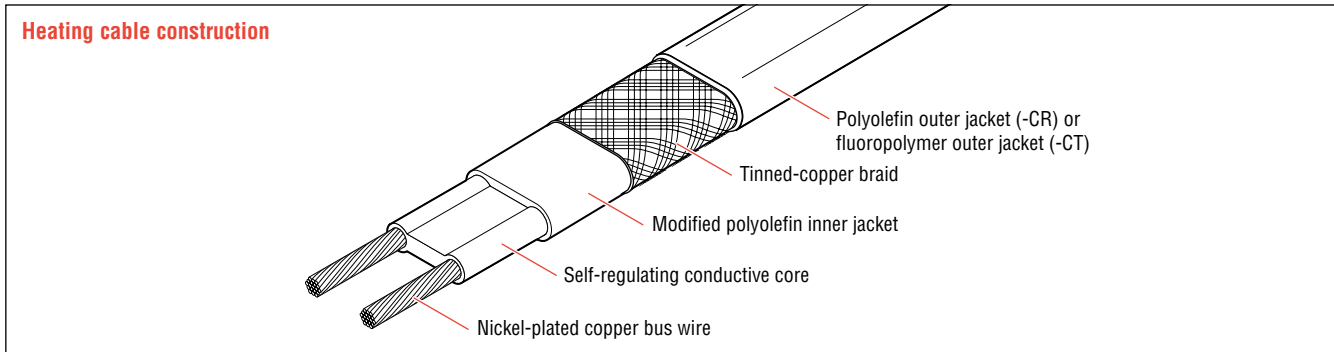
Self-regulating heating cables

Electrical freeze protection for both non-hazardous and hazardous (classified) locations

The BTV family of self-regulating heating cables provides the solution to freeze-protection and process-temperature maintenance applications. BTV heating

cables maintain process temperatures up to 150°F (65°C) and can withstand intermittent exposure to temperatures up to 185°F (85°C). The heating cables are configured for use in nonhazardous and hazardous (classified) locations, including areas where corrosives may be present.

Raychem BTV cables meet the requirements of the U.S. National Electrical Code and the Canadian Electrical Code. For additional information, contact your Tyco Thermal Controls representative or call Tyco Thermal Controls at (800) 545-6258.



Application

Area classification	Nonhazardous and hazardous locations
Traced surface type	Metal and plastic
Chemical resistance	Exposure to aqueous, inorganic chemicals: Use -CR (modified polyolefin outer jacket) Exposure to organic chemicals or corrosives: Use -CT (fluoropolymer outer jacket) For aggressive organics and corrosives: Consult your Raychem HTS representative.

Supply voltage

BTV1	100–130 Vac
BTV2	200–277 Vac

Temperature rating

Maximum maintain or continuous exposure temperature (power on)	150°F (65°C)
Maximum intermittent exposure temperature, 1000 hours (power on)	185°F (85°C)

Temperature ID number (T-rating)

T6: 185°F (85°C)
Raychem self-regulating heating cables have an unconditional T-rating per Table 500-3(d) of the National Electrical Code.

Approvals

Hazardous Locations



Class I, Div. 2, Groups A, B, C, D
Class II, Div. 2, Groups F, G
Class III⁽¹⁾



Class I, Div. 1 & 2⁽²⁾, Groups A, B, C, D
Class II, Div. 1 & 2⁽²⁾, Groups E, F, G
Class III

⁽¹⁾ FM Approved only.

⁽²⁾ BTV-CR is CSA Certified for Division 2 only.

⁽³⁾ BTV-CT only.

Zone Approvals



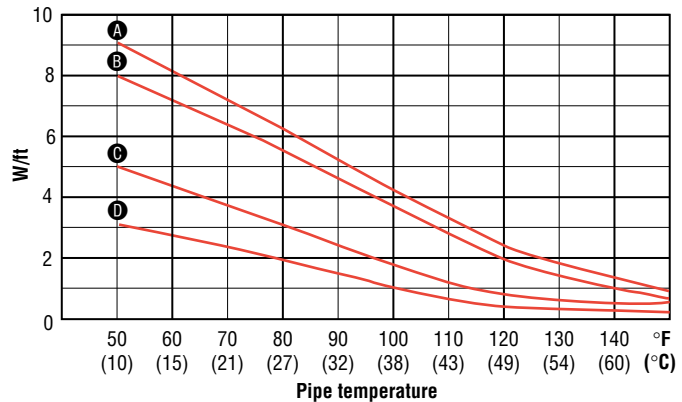
CL I, ZN1, AEx e IIC⁽³⁾

BTV heating cables also have many other approvals including BASEEFA, PTB, DNV, and ABS.

Nominal power output rating on metal pipes at 120 V/240 V

	Adjustment factors	
	Power output	Circuit length
208 V		
3BTV2-CR/CT	0.82	0.96
5BTV2-CR/CT	0.85	0.94
8BTV2-CR/CT	0.89	0.92
10BTV2-CR/CT	0.89	0.92
277 V		
3BTV2-CR/CT	1.13	1.08
5BTV2-CR/CT	1.12	1.09
8BTV2-CR/CT	1.08	1.11
10BTV2-CR/CT	1.08	1.11

- Ⓐ 10BTV-CR/CT
- Ⓑ 8BTV-CR/CT
- Ⓒ 5BTV-CR/CT
- Ⓓ 3BTV-CR/CT



To choose the correct heating cable for your application, use the Design section of the *Industrial Product Selection and Design Guide*. For more detailed information, use TraceCalc design software.

Maximum circuit lengths based on circuit-breaker sizes

	Ambient temperature at start-up	Maximum continuous circuit length (in feet) per circuit breaker							
		120 V				240 V			
		15 A	20 A	30 A	40 A	15 A	20 A	30 A	40 A
3BTV-CR/CT	50°F	330	330	330	330	660	660	660	660
	0°F	185	250	330	330	430	575	660	660
	-20°F	145	195	290	330	370	495	660	660
5BTV-CR/CT	50°F	230	270	270	270	460	540	540	540
	0°F	150	200	270	270	300	400	540	540
	-20°F	130	175	260	270	260	345	520	540
8BTV-CR/CT	50°F	150	200	210	210	295	390	420	420
	0°F	105	140	210	210	195	260	390	420
	-20°F	95	125	185	210	170	230	340	420
10BTV-CR/CT	50°F	115	150	180	180	230	305	360	360
	0°F	70	95	145	180	150	200	300	360
	-20°F	60	85	125	165	135	180	270	360

Note: Tyco Thermal Controls and national electrical codes require both ground-fault protection of equipment and a grounded metallic covering on all heating cables. Following are some of the ground-fault breakers that satisfy this equipment protection requirement: Square D Type QOB-EPD or QO-EPD; Tyco Thermal Controls/Square D Type GFFD EHB-EPD (277 Vac); Cutler Hammer (Westinghouse) Type QBGFEP.

Product characteristics

	3BTV	5BTV 8BTV 10BTV
Weight (lb per 10 ft, nominal)	0.7	1.0
Bus wire size	16 AWG	16 AWG
Outer jacket color	Black	Black
Heating cable dimensions	0.46 x 0.25 in.	0.65 x 0.26 in.

Components

Tyco Thermal Controls offers a full range of components for power connections, splices, and end seals. These components must be used to ensure proper functioning of the product and compliance with warranty, code, and approvals requirements.

Self-regulating heating cables

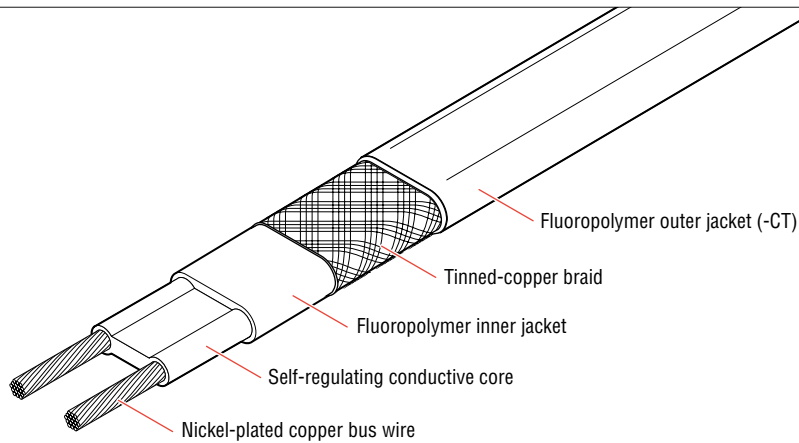
Electrical process-temperature maintenance for both nonhazardous and hazardous (classified) locations

The QTVR family of self-regulating heating cables are designed for pipe heat tracing in industrial applications. QTVR heating cables can provide process-temperature

maintenance up to 225°F (110°C) and can also be used for freeze protection in systems having high heat loss. The heating cables are configured for use in nonhazardous and hazardous (classified) locations, including areas where corrosives may be present.

Raychem QTVR cables meet the requirements of the U.S. National Electrical Code and the Canadian Electrical Code. For additional information, contact your Tyco Thermal Controls representative or call Tyco Thermal Controls at (800) 545-6258.

Heating cable construction



Application

Area classification	Nonhazardous and hazardous locations
Traced surface type	Metal and some plastics
Chemical resistance	Aqueous, organic, or inorganic chemicals and corrosives

Supply voltage

QTVR1	100–130 Vac
QTVR2	200–277 Vac

Temperature rating

Maximum maintain or continuous exposure temperature (power on)	225°F (110°C)
Temperature ID number (T-rating)	T4: 275°F (135°C) Raychem self-regulating heating cables have an unconditional T-rating per Table 500-3(d) of the National Electrical Code.

Approvals

Hazardous Locations



Class I, Div. 2, Groups A, B, C, D
Class II, Div. 2, Groups F, G
Class III



Class I, Div. 1 and 2, Groups A, B, C, D
Class II, Div. 1 and 2, Groups E, F, G
Class III

Zone Approvals



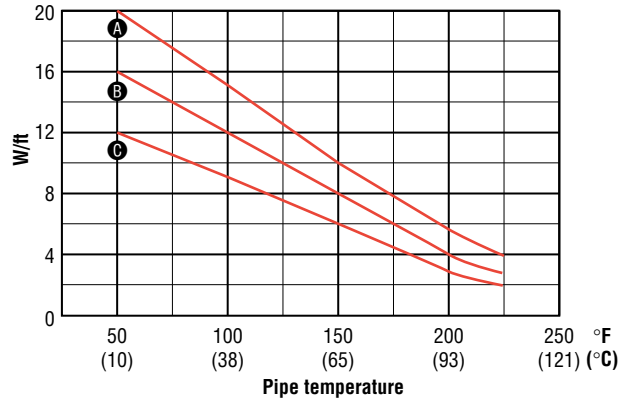
CL I, ZN1, AEx e IIC

QTVR heating cables also have many other approvals including BASEEFA, PTB, DNV, and ABS.

Nominal power output rating on metal pipes at 120 V/240 V

	Adjustment factors	
	Power output	Circuit length
208 V		
10QTVR2-CT	0.85	0.94
15QTVR2-CT	0.91	0.91
20QTVR2-CT	0.90	0.91
277 V		
10QTVR2-CT	1.18	1.06
15QTVR2-CT	1.09	1.10
20QTVR2-CT	1.07	1.11

- A 20QTVR-CT
- B 15QTVR-CT
- C 10QTVR-CT



To choose the correct heating cable for your application, use the Design section of the *Industrial Product Selection and Design Guide*. For more detailed information, use TraceCalc design software.

Maximum circuit lengths based on circuit-breaker sizes

	Ambient temperature at start-up	Maximum continuous circuit length (in feet) per circuit breaker									
		120 V					240 V				
		15 A	20 A	30 A	40 A	50 A	15 A	20 A	30 A	40 A	50 A
10QTVR-CT	50°F	100	130	195	195	†	200	265	390	390	†
	0°F	80	105	160	195	†	160	210	320	390	†
	-20°F	70	95	145	195	†	145	195	295	390	†
	-40°F	65	90	135	180	†	135	180	275	365	†
15QTVR-CT	50°F	75	100	150	200	220	160	210	320	340	†
	0°F	60	80	120	160	200	125	170	255	340	†
	-20°F	55	70	110	145	185	115	155	235	315	†
	-40°F	50	65	100	135	170	110	145	220	290	†
20QTVR-CT	50°F	60	80	120	160	195	120	160	240	320	390
	0°F	45	60	95	125	160	95	125	190	255	320
	-20°F	40	55	85	115	145	85	115	175	235	295
	-40°F	40	55	80	110	135	80	110	165	220	275

† Not permitted.

Note: Tyco Thermal Controls and national electrical codes require both ground-fault protection of equipment and a grounded metallic covering on all heating cables. Following are some of the ground-fault breakers that satisfy this equipment protection requirement: Square D Type QOB-EPD or QO-EPD; Tyco Thermal Controls/Square D Type GFPD EHB-EPD (277 Vac); Cutler Hammer (Westinghouse) Type QBGFEP.

Product characteristics

	10QTVR1-CT 10QTVR2-CT 15QTVR2-CT	15QTVR1-CT 20QTVR1-CT 20QTVR2-CT
Weight (lb per 10 ft, nominal)	0.85	1.21
Bus wire size	16 AWG	14 AWG
Outer jacket color	Brown	Brown
Heating cable dimensions	0.55 x 0.25 in.	0.61 x 0.25 in.

Components

Tyco Thermal Controls offers a full range of components for power connections, splices, and end seals. These components must be used to ensure proper functioning of the product and compliance with warranty, code, and approvals requirements.

High-temperature self-regulating heating cables

Electrical freeze protection and process-temperature maintenance for both nonhazardous and hazardous locations.

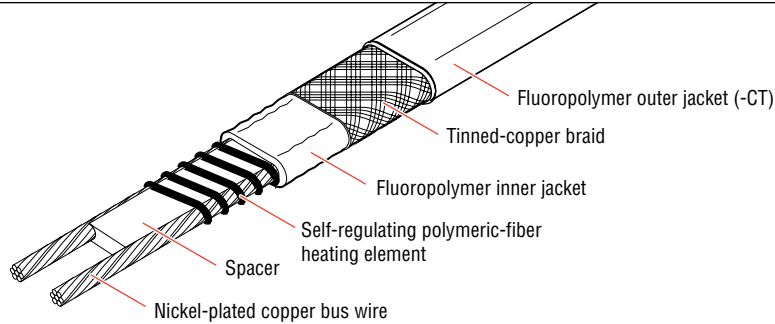
The XTV family of self-regulating heating cables provides solutions for industrial freeze protection and process-temperature maintenance applications requiring high power output. XTV heating cables can withstand temperatures up to 420°F (215°C) and provide process temperature maintenance to 250°F (121°C).

The heating cables are configured for use in nonhazardous and hazardous (classified) locations, including areas where corrosives may be present.

The power output of self-regulating heating cable depends on the heating cable temperature, and can provide up to 20 W/ft at 50°F (10°C).

Raychem XTV cables meet the requirements of the U.S. National Electrical Code and the Canadian Electrical Code. For additional information, contact your Tyco Thermal Controls representative or call Tyco Thermal Controls at (800) 545-6258.

Heating cable construction



Application

Area classification	Nonhazardous and hazardous locations
Traced surface type	Metal
Chemical resistance	Aqueous, organic, or inorganic chemicals and corrosives

Supply voltage

XTV1	100–130 Vac
XTV2	200–277 Vac

Temperature rating

Maximum maintain or continuous exposure temperature (power on)	250°F (121°C)
Maximum intermittent exposure temperature, 1000 hours (power on or off)	420°F (215°C)

Temperature ID number (T-rating)

T2C: 446°F (230°C) **T2D:** 419°F (215°C) **T3:** 392°F (200°C)
Raychem self-regulating heating cables have an unconditional T-rating per Table 500-3(d) of the National Electrical Code.

Approvals

Hazardous Locations



Class I, Div. 2, Groups A, B, C, D
Class II, Div. 2, Groups F, G
Class III



Class I, Div. 1 and 2, Groups A, B, C, D
Class II, Div. 1 and 2, Groups E, F, G
Class III

Zone Approvals

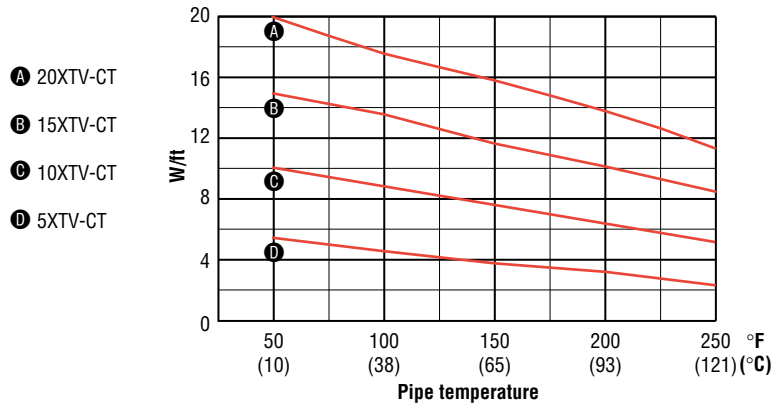


CL1, ZN1, AEx e IIC

XTV heating cables also have many other approvals including BASEEFA, PTB, DNV, and ABS.

Nominal power output rating on metal pipes at 120 V/240 V

Adjustment factors		
	Power output	Circuit length
208 V		
5XTV2	0.84	1.00
10XTV2	0.83	0.98
15XTV2	0.85	0.97
20XTV2	0.88	0.97
277 V		
5XTV2	1.13	1.03
10XTV2	1.17	1.06
15XTV2	1.13	1.08
20XTV2	1.10	1.11



To choose the correct heating cable for your application, use the Design section of the *Industrial Product Selection and Design Guide*. For more detailed information, use TraceCalc design software.

Maximum circuit length based on circuit-breaker sizes

	Ambient temperature at start-up	Maximum continuous circuit length (in feet) per circuit breaker									
		120 V					240 V				
		15 A	20 A	30 A	40 A	50 A	15 A	20 A	30 A	40 A	50 A
5XTV-CT	50°F	180	240	360	380	380	360	480	720	765	765
	0°F	155	210	315	380	380	315	420	630	765	765
	-20°F	150	200	300	380	380	300	400	600	765	765
10XTV-CT	50°F	110	145	220	270	270	220	295	440	540	540
	0°F	95	130	195	260	270	195	260	385	515	540
	-20°F	90	120	185	245	270	185	245	370	490	540
15XTV-CT	50°F	75	100	150	200	220	150	200	300	400	440
	0°F	65	85	130	175	220	130	175	265	350	440
	-20°F	60	80	125	165	210	125	165	250	335	420
20XTV-CT	50°F	60	80	120	160	190	115	155	230	305	380
	0°F	55	70	110	145	185	105	140	210	275	345
	-20°F	50	70	105	140	175	100	130	200	260	330

Note: Tyco Thermal Controls and national electrical codes require both ground-fault protection of equipment and a grounded metallic covering on all heater cables. Following are some of the ground-fault breakers that satisfy this equipment protection requirement Square D Type QOB-EPD or QO-EPD; Tyco Thermal Controls/Square D Type GFPD EHB-EPD (277 Vac); Cutler Hammer (Westinghouse) Type QBGFEP.

Product characteristics

	5XTV1-CT-T3 (T3)
	5XTV2-CT-T3 (T3)
	10XTV1-CT-T3 (T3)
	10XTV2-CT-T3 (T3)
	15XTV1-CT-T3 (T3)
	15XTV1-CT-T2 (T2D)
	20XTV1-CT-T2 (T2D)
	20XTV2-CT-T2 (T2D)
Weight (lb per 10 ft, nominal)	1.1
Bus wire size	14 AWG
Outer jacket color	Red
Heating cable dimensions	0.46 x 0.3 in.

Components

Tyco Thermal Controls offers a full range of components for power connections, splices, and end seals. These components must be used to ensure proper functioning of the product and compliance with warranty, code, and approvals requirements.

High-temperature power-limiting heating cables

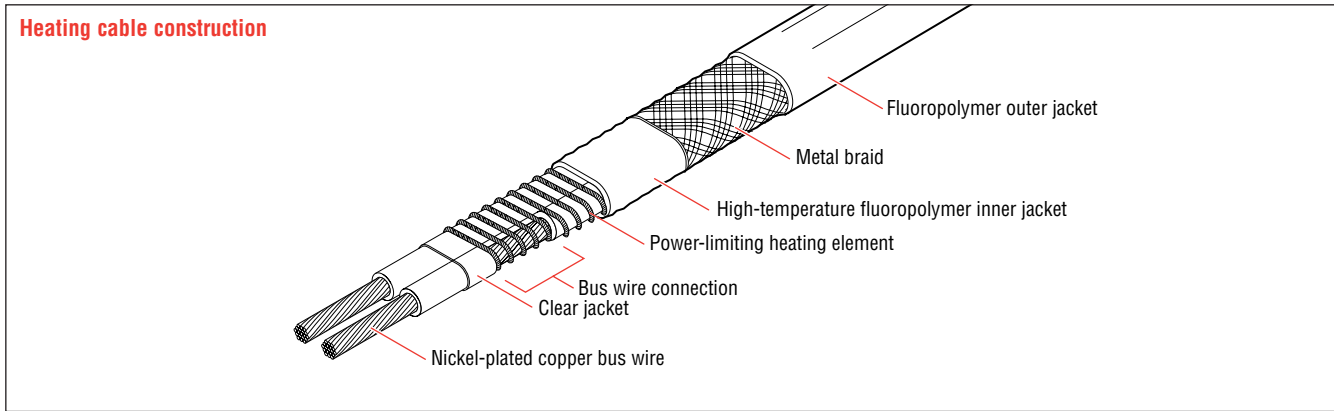
VPL is a family of power-limiting heating cables designed for pipe and equipment heat tracing in industrial applications. VPL can be used for freeze protection and process-temperature maintenance requiring high power output and/or high temperature exposure. VPL can provide process-temperature maintenance up to 300°F (150°C) and can withstand routine steam purges and temperature excursions to 482°F (250°C) with power off.

Power-limiting cables are parallel heaters formed by a coiled resistor alloy heating element wrapped around two parallel bus wires. The distance between conductor contact points forms the heating zone length. This parallel construction allows the cable to be cut to length and terminated on site. The power output of VPL heating cables decreases with increasing temperature. VPL heating cables can be overlapped. The relatively flat

power temperature curve of VPL ensures a low start-up current and high output at elevated temperatures.

VPL cables are approved for use in non-hazardous and hazardous locations. Approvals are listed below.

For additional information contact your Raychem HTS representative or call Raychem HTS at (800) 545-6258.



Application

Area classification	Nonhazardous and hazardous locations
Traced surface type	Metal
Chemical resistance	Aqueous, organic, or inorganic chemicals and corrosives

Temperature rating

Maximum maintain temperature (power on)	300°F (150°C)
Maximum exposure temperature (power off)	482°F (250°C)

Temperature ID number (T-rating)

To be established using the principles of stabilized design. Use TraceCalc design software or contact Raychem HTS for assistance.

Approvals

Hazardous Locations



Class I, Div. 2, Groups B, C, D
Class II, Div. 2, Groups F, G
Class III, Div. 1 and 2

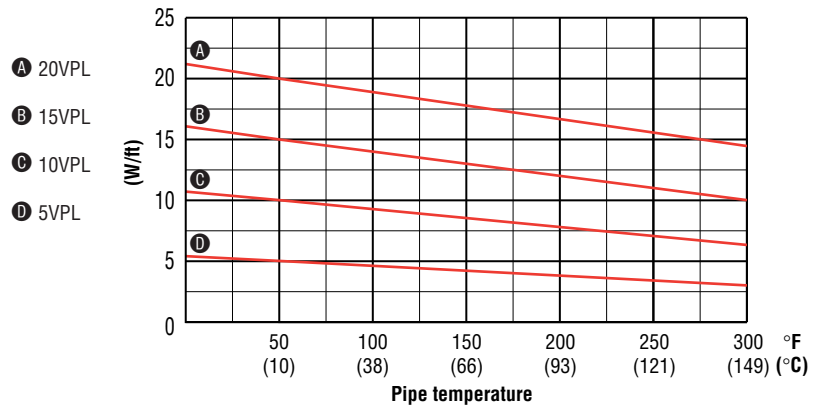


Class I, Div. 1 and 2, Groups A, B, C, D
Class II, Div. 1 and 2, Groups E, F, G

Nominal power output rating on metal pipes at 120 V and 240 V

	Adjustment factors	
	Power output	Circuit length
208 V		
5VPL2-CT	0.77	0.89
10VPL2-CT	0.78	0.90
15VPL2-CT	0.79	0.91
20VPL2-CT	0.80	0.92

To choose the correct heating cable for your application, use the Design section of the *Industrial Product Selection and Design Guide*. For more detailed information, use TraceCalc design software.



Maximum circuit length based on circuit-breaker sizes

	Ambient temperature at start-up	Maximum continuous circuit length (in feet) per circuit breaker									
		120 V					240 V				
		15 A	20 A	30 A	40 A	50 A	15 A	20 A	30 A	40 A	50 A
5VPL-CT	-20°F (-29°C)	235	315	370	—	—	470	630	740	—	—
	0°F (-18°C)	240	325	370	—	—	485	650	740	—	—
	50°F (10°C)	260	350	370	—	—	525	700	740	—	—
10VPL-CT	-20°F (-29°C)	120	160	240	260	—	240	315	475	525	—
	0°F (-18°C)	120	165	245	260	—	245	325	490	525	—
	50°F (10°C)	130	175	255	260	—	260	350	520	525	—
15VPL-CT	-20°F (-29°C)	80	105	160	215	—	160	215	320	430	—
	0°F (-18°C)	80	110	165	215	—	165	220	330	430	—
	50°F (10°C)	85	115	175	215	—	175	235	350	430	—
20VPL-CT	-20°F (-29°C)	60	80	120	165	185	120	160	245	325	370
	0°F (-18°C)	60	85	125	165	185	125	165	250	330	370
	50°F (10°C)	65	85	130	175	185	130	175	260	350	370

Note: Raychem HTS and national electrical codes require both ground-fault protection of equipment and a grounded metallic covering on all heating cables. Following are some of the ground-fault breakers that satisfy this equipment protection requirement: Square D Type QOB-EPD or QO-EPD; Cutler Hammer (Westinghouse) Type QBGFEP.

Product characteristics

	5VPL1-CT 10VPL1-CT 15VPL1-CT 20VPL1-CT	5VPL2-CT 10VPL2-CT 15VPL2-CT 20VPL2-CT
Supply voltage	100–120 Vac	200–240 Vac
Bus wire size	12 AWG	12 AWG
Outer jacket color	Red	Red
Weight (lb per 10 ft, nominal)	1.4	1.4
Dimensions	0.46 x 0.31 in.	0.46 x 0.31 in.

Components

Raychem HTS offers a full range of components for power connections, splices and end seals. These components must be used to ensure proper functioning of the product and compliance with warranty, code, and approvals requirements.



Trace-heating systems

- Safe and reliable
- Easy project design
- Self-regulating technology
- Steam-cleanable systems
- Unique and safe construction
- Support by a quality organization
- ISO9000 approval
- Fast delivery



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Thermal Controls

江南商工(株)

KANGNAM SANGGONG CO.,LTD.

蔚山廣域市南區新亭1洞 570-1

電話：052·276·2773(代)

F A X：052·267·9313(代)

E-mail：kn2773@korea.com

<http://www.raychem.co.kr>