Selection table

Typical maintain temperature range (°C)	Product	Technology
65	BTV	Parallel self-regulating Field-terminated
110	QTVR	Parallel self-regulating Field-terminated
120	XTV	Parallel self-regulating Field-terminated
150	KTV	Parallel self-regulating Field-terminated
230	VPL	Parallel power-limiting Field-terminated
125	IHT	Parallel Constant Wattage Zone Field-terminated
200	FHT	Parallel Constant Wattage Zone Field-terminated
160	XPI-NH	Series Constant Wattage PI Field-terminated
180	XPI	Series Constant Wattage PI Field-terminated
180	XPI-S	Series Constant Wattage PI Field-terminated
40	HCHH/HCCH (HDPE)	Series Constant Wattage MI Factory-terminated
120	HCH/HCC	Series Constant Wattage MI Factory-terminated
250	HDF/HDC	Series Constant Wattage MI Factory-terminated
450	HSQ	Series Constant Wattage MI Factory-terminated
550	HAx	Series Constant Wattage MI Factory-terminated
600	HIQ	Series Constant Wattage MI Factory-terminated
150	STS	Skin effect System STS Engineered Product

50 100 150 200 250 300 350 400 450 500 550 600

Max. exposure temperature (°C) Continuous power on ♦ Power off	Area classification	T Class design method			Preferred control method				Chemical exposure		Mechanical resistance		Typical pipe length range (m)	Page
		Unconditional	Stabilised design	Use of temperature limiter	No control	Ambient sensing	Broad temperature range (+/-10°C)	Tight temperature control (+/-3°C)	Organic	No	Normal	High		
65	T6	■			■	■	■	■	■	■	■		0 - 400	6
110	T4	■			■	■	■	■	■	■	■		0 - 400	8
120	T2-T3	■	*T4		■	■	■	■	■	■	■		0 - 400	10
150	T2	■	**T3-T4		■	■	■	■	■	■	■		0 - 400	12
250♦	T2-T4		■	■	■	■	■	■	■	■	■		0 - 450	14
200♦	Ordinary only					■	■	■	■	■	■		0 - 400	16
260♦	T2-T4		■	■		■	■	■	■	■	■		0 - 450	18
260♦	Ordinary only					■	■	■	■	■	■		Up to 5000	20
260♦	T2-T6		■	■		■	■	■	■	■	■		Up to 5000	22
260♦	T2-T6		■	■		■	■	■	■	■	■	■	Up to 5000	24
80♦	T6		■	■		■	■	■	■	■	■	■	Up to 5000	26
200♦	T3-T6		■	■		■	■	■		■	■	■	Up to 5000	26
400♦	T1-T6		■	■		■	■	■	■	■	■	■	Up to 2500	28
600♦	T1-T6		■	■		■	■	■	■	■	■	■	Up to 500	30
670♦	T1-T6		■	■		■	■	■	■	■	■	■	Up to 5000	32
1000♦	T1-T6		■	■		■	■	■	■	■	■	■	Up to 500	36
250♦	T2-T6		■	■				■	■	■	■	■	400 - 30.000	Contact us

* Stabilised design, T2-T3 → unconditional
** Stabilised design, T2 → unconditional

Raychem®

BTV

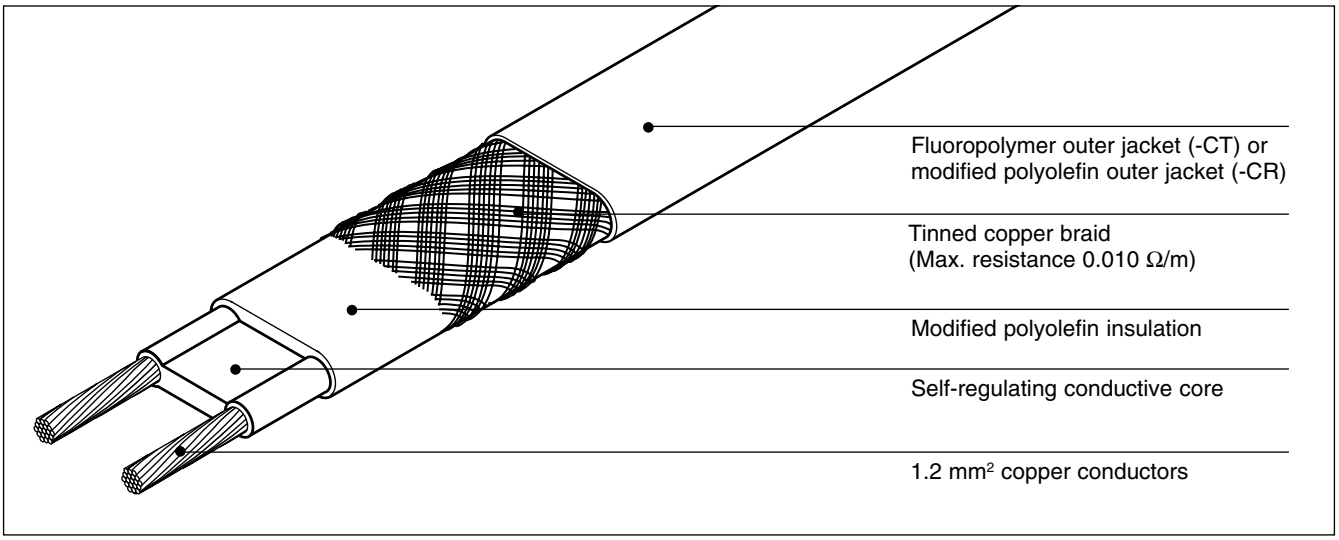
Self-regulating heating cable

Electrical heat-tracing for frost protection without steam cleaning.

The BTV-family of self-regulating, parallel circuit heating cables is used for frost protection of pipes and vessels.

It can also be used for process temperature maintenance up to 65°C.

Heating cable construction

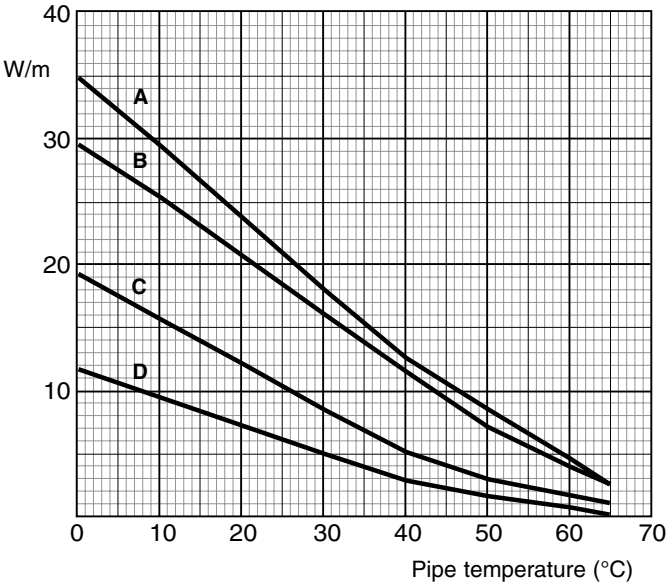


Application	
Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Traced surface type	Carbon steel Stainless steel Plastic Painted or unpainted metal
Chemical resistance	For organic corrosives: use -CT (fluoropolymer outer jacket) For mild inorganic solutions: use -CR (modified polyolefin outer jacket) For aggressive organics and corrosives consult your local Tyco Thermal Controls representative
Supply voltage	230 Vac (Contact your local Tyco Thermal Controls representative for data on other voltages)
Approvals	The BTV heating cables are approved for use in hazardous areas by PTB and Baseefa 2001 Ltd. PTB 98 ATEX 1102 X — BAS98ATEX2338X Ⓔx II 2 G/D EEx e(m) II T6 IP66 T80°C — Ⓔx II 2 GD EExe II T6 The BTV heating cables are approved by DNV for use on ships and mobile off shore units. DNV Certificate No. E-6967 They are also VDE approved.
Specifications	
Maximum exposure temperature (Continuous power on)	65°C
Maximum exposure temperature (Intermittent power on)	85°C Maximum cumulative exposure 1000 hours
Temperature classification	T6 in accordance with European Standard EN 50 014
Minimum installation temperature	–60°C
Minimum bend radius	at 20°C: 13 mm at –60°C: 35 mm

Thermal output rating

Nominal power output at 230 Vac on insulated steel pipes

A 10BTV2-CT, 10BTV2-CR
B 8BTV2-CT, 8BTV2-CR
C 5BTV2-CT, 5BTV2-CR
D 3BTV2-CT, 3BTV2-CR



	3BTV2-CR 3BTV2-CT	5BTV2-CR 5BTV2-CT	8BTV2-CR 8BTV2-CT	10BTV2-CR 10BTV2-CT
Nominal power output (W/m at 10°C)	**9**	**16**	**25**	**29**
Product dimensions (nominal) and weight				
Thickness (mm)	5.5	5.5	5.5	5.5
Width (mm)	10.5	10.5	15.4	15.4
Weight (g/m)	110	110	153	153

Maximum circuit length based on type 'C' circuit breakers according to EN 60898

Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)			
16A	–20°C	155	110	70	45
	+10°C	200	160	110	65
20A	–20°C	195	140	90	55
	+10°C	200	160	125	85
25A	–20°C	200	160	110	70
	+10°C	200	160	125	105
32A	–20°C	200	160	125	90
	+10°C	200	160	125	110

The above numbers are for circuit length estimation only. For more detailed information please use the Tyco Thermal Controls TraceCalc software or contact your local Tyco Thermal Controls representative.
Tyco Thermal Controls requires the use of a 30 mA residual current device to provide maximum safety and protection from fire. Where design results in a higher leakage current, a maximum 300 mA residual current device may be used. All safety aspects need to be proven.

Ordering details

Part description	3BTV2-CR	5BTV2-CR	8BTV2-CR	10BTV2-CR
Part No.	914279-000	414809-000	479821-000	677245-000
Part description	3BTV2-CT	5BTV2-CT	8BTV2-CT	10BTV2-CT
Part No.	469145-000	487509-000	008633-000	567513-000

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 electrical requirements.

Raychem®

QTVR

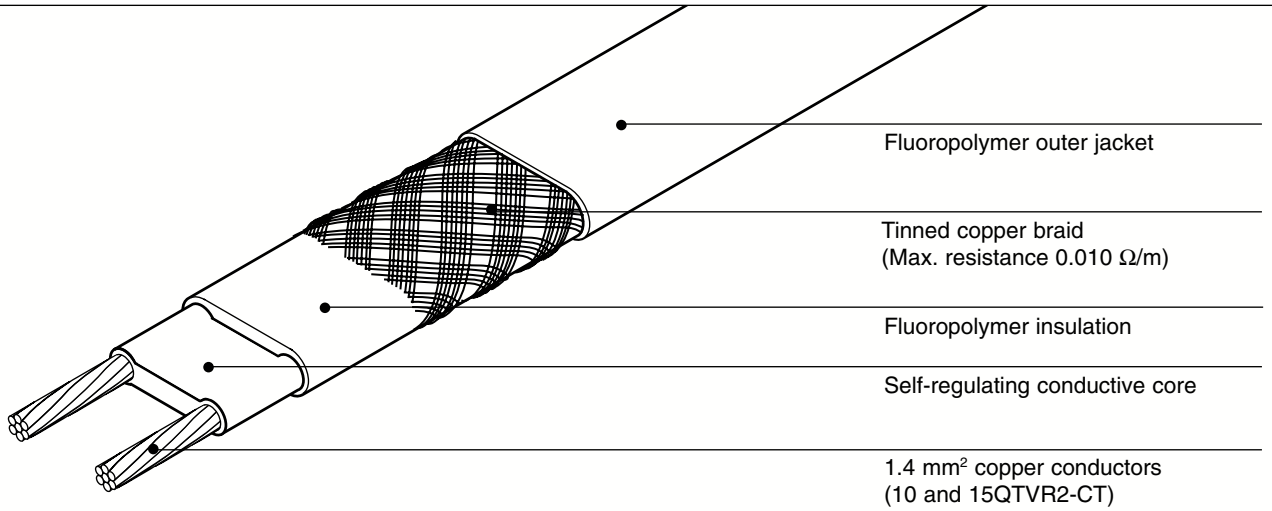
Self-regulating heating cable

Electrical heat-tracing for process temperature maintenance applications up to 110°C which are not subject to steam cleaning.

The QTVR family of self-regulating, parallel circuit heating cables is used for process temperature maintenance of pipes and vessels.

It can also be used for frost protection of large pipes and for applications requiring medium temperature exposure capability.

Heating cable construction



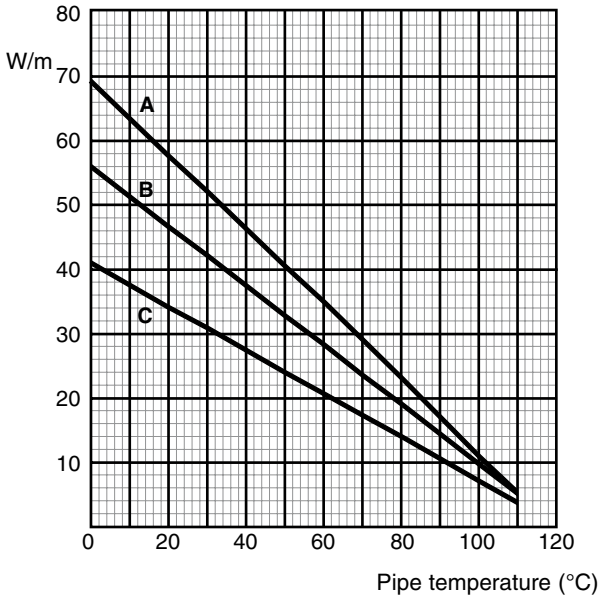
Application	
Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Traced surface type	Carbon steel Stainless steel Painted or unpainted metal
Chemical resistance	Organics and corrosives For aggressive organics and corrosives consult your local Tyco Thermal Controls Representative
Supply voltage	230 Vac (Contact your local Tyco Thermal Controls Representative for data on other voltages)
Approvals	The QTVR heating cables are approved for use in hazardous areas by PTB and Baseefa 2001 Ltd. PTB 98 ATEX 1103 X — BAS98ATEX2337X Ⓔx II 2 G/D EEx e(m) II T4 IP66 T130°C — Ⓔx II 2 GD EEx e II T4 The QTVR heating cables are approved by DNV for use on ships and mobile off shore units. DNV Certificate No. E-6967 They are also VDE approved.

Specifications	
Maximum exposure temperature (Continuous power on)	110°C
Temperature classification	T4 in accordance with European Standard EN 50 014
Minimum installation temperature	–60°C
Minimum bend radius	at 20°C: 13 mm at –60°C: 35 mm

Thermal output rating

Nominal power output at 230 Vac on insulated steel pipes

A 20QTVR2-CT
B 15QTVR2-CT
C 10QTVR2-CT



	10QTVR2-CT	15QTVR2-CT	20QTVR2-CT
Nominal power output (W/m at 10°C)	38	51	64
Product dimensions (nominal) and weight			
Thickness (mm)	4.5	4.5	5.1
Width (mm)	11.8	11.8	14.0
Weight (g/m)	126	126	180

Maximum circuit length based on type 'C' circuit breakers according to EN 60898

Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)		
25A	–20°C	95	75	60
	+10°C	115	95	75
32A	–20°C	115	100	75
	+10°C	115	100	95
40A	–20°C	115	100	95
	+10°C	115	100	115

The above numbers are for circuit length estimation only. For more detailed information please use the Tyco Thermal Controls TraceCalc software or contact your local Tyco Thermal Controls representative.
Tyco Thermal Controls requires the use of a 30 mA residual current device to provide maximum safety and protection from fire. Where design results in a higher leakage current, a maximum 300 mA residual current device may be used. All safety aspects need to be proven.

Ordering details

Part description	10QTVR2-CT	15QTVR2-CT	20QTVR2-CT
Part No.	391991-000	040615-000	988967-000

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 electrical requirements.

Raychem®

XTV

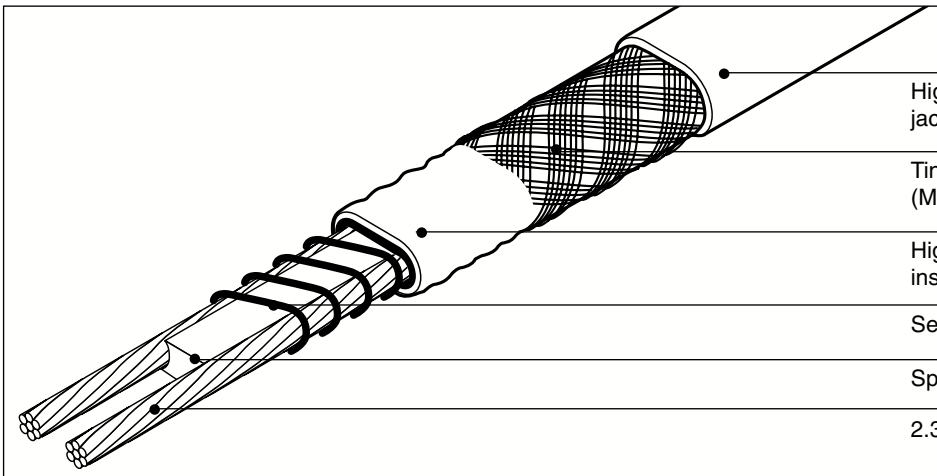
Self-regulating heating cable

Electrical heat-tracing for process temperature maintenance applications up to 120°C which may be subject to steam cleaning.

The XTV family of self-regulating, parallel circuit heating cables is used for process temperature maintenance of pipes and vessels.

It can also be used for frost protection of large pipes and for applications requiring high temperature exposure capability.

Heating cable construction

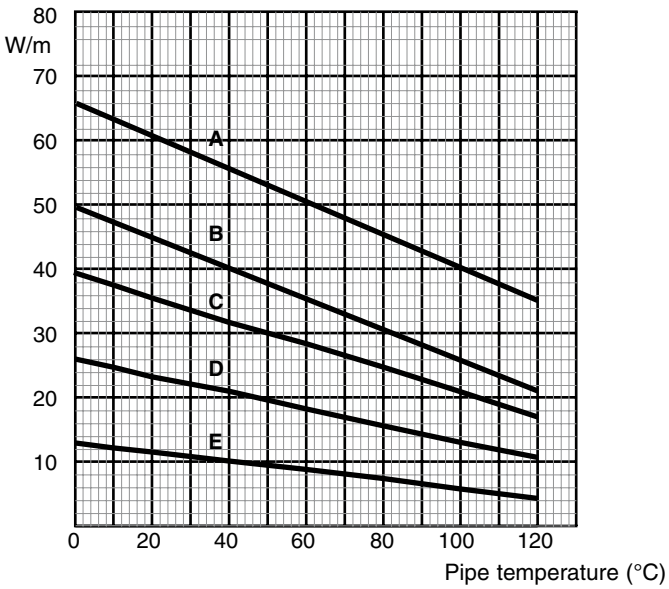


Application	
Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Traced surface type	Carbon steel Stainless steel Painted or unpainted metal
Chemical resistance	Organics and corrosives For aggressive organics and corrosives consult your local Tyco Thermal Controls representative
Supply voltage	230 Vac (Contact your local Tyco Thermal Controls representative for data on other voltages)
Approvals	The XTV heating cables are approved for use in hazardous areas by PTB and Baseefa 2001 Ltd. PTB 98 ATEX 1105 X Ⓔx II 2 G/D EEx e(m) II T4/T3/250°C(T2) IP66 T130°C, T195°C, T250°C BAS98ATEX2336X Ⓔx II 2 GD EEx e II T3 and 240°C (T2) The XTV heating cables are approved by DNV for use on ships and mobile off shore units. DNV Certificate No. E-6968 They are also VDE approved.
Specifications	
Maximum exposure temperature (continuous power on)	120°C
Max. exposure temperature (intermittent power on and off)	215°C (20 bar saturated steam) Maximum cumulative exposure 1000 hours
Temperature classification	T2: 20XTV2-CT-T2 T3: 4XTV2-CT-T3, 8XTV2-CT-T3, 12XTV2-CT-T3, 15XTV2-CT-T3 in accordance with European Standard EN 50 014
Minimum installation temperature	–60°C
Minimum bend radius	at 20°C: 13 mm at –60°C: 51 mm

Thermal output rating

Nominal power output at 230 Vac on insulated steel pipes

A 20XTV2-CT-T2
B 15XTV2-CT-T3
C 12XTV2-CT-T3
D 8XTV2-CT-T3
E 4XTV2-CT-T3



	4XTV2-CT-T3	8XTV2-CT-T3	12XTV2-CT-T3	15XTV2-CT-T3	20XTV2-CT-T2
Nominal power output (W/m at 10°C)	12	25	38	47	63
Product dimensions (nominal) and weight					
Thickness (mm)	7.2	7.2	7.2	7.2	7.2
Width (mm)	11.7	11.7	11.7	11.7	11.7
Weight (g/m)	170	170	170	170	170

Maximum circuit length based on type 'C' circuit breakers according to EN 60898

Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)				
16A	–20°C	145	90	65	55	40
	+10°C	170	105	75	60	45
25A	–20°C	225	145	105	85	65
	+10°C	245	165	120	95	70
32A	–20°C	245	175	135	105	80
	+10°C	245	175	140	125	90
40A	–20°C	245	175	140	135	105
	+10°C	245	175	140	135	105

The above numbers are for circuit length estimation only. For more detailed information please use the Tyco Thermal Controls TraceCalc software or contact your local Tyco Thermal Controls representative.
Tyco Thermal Controls requires the use of a 30 mA residual current device to provide maximum safety and protection from fire. Where design results in a higher leakage current, a maximum 300 mA residual current device may be used. All safety aspects need to be proven.

Ordering details

Part description	4XTV2-CT-T3	8XTV2-CT-T3	12XTV2-CT-T3	15XTV2-CT-T3	20XTV2-CT-T2
Part No.	002735-000	325059-000	427089-000	214999-000	849015-000

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 electrical requirements.

Raychem®

KTV

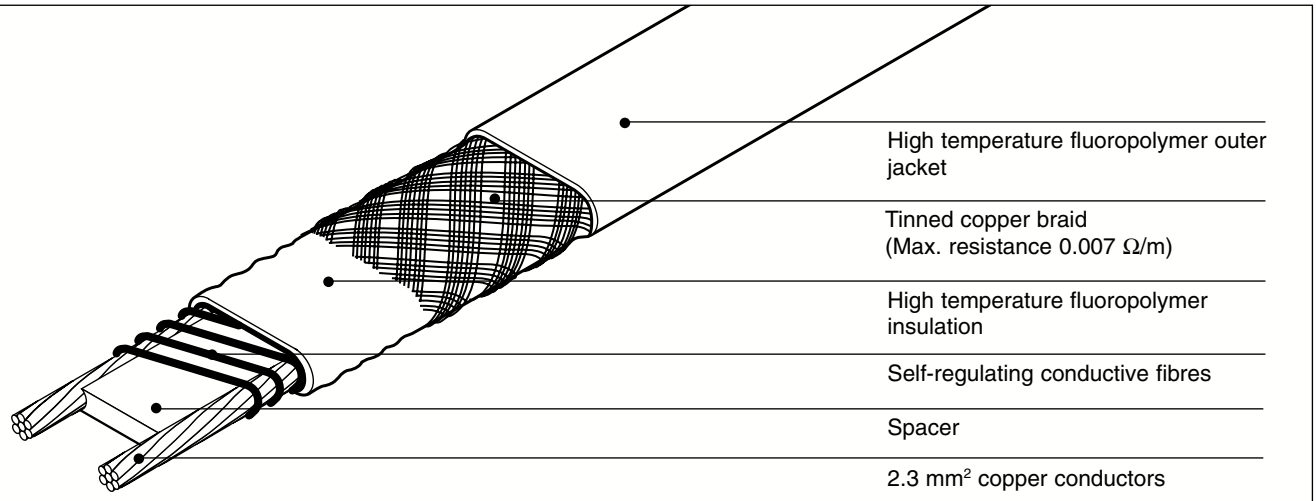
Self-regulating heating cable

Electrical heat-tracing for process temperature maintenance applications up to 150°C which may be subject to steam cleaning.

The KTV family of self-regulating, parallel circuit heating cables is used for process temperature maintenance of pipes and vessels.

It can also be used for frost protection of large pipes and for applications requiring high temperature exposure capability.

Heating cable construction

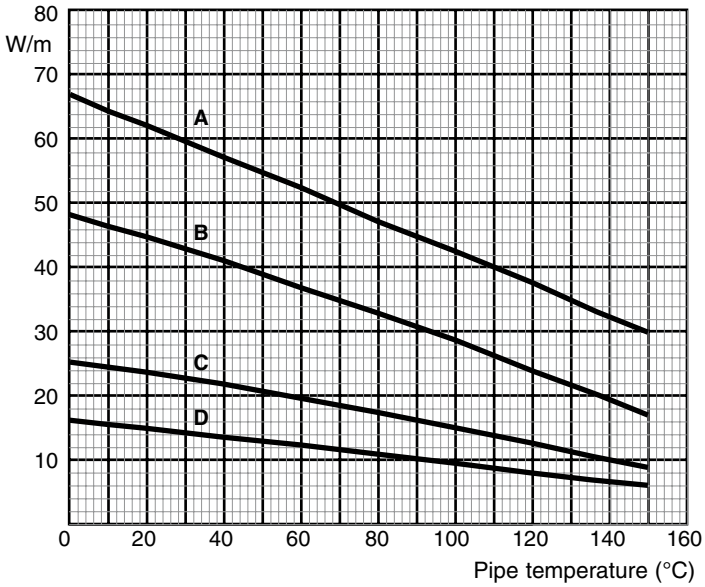


Application	
Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary
Traced surface type	Carbon steel Stainless steel Painted or unpainted metal
Chemical resistance	Organics and corrosives For aggressive organics and corrosives consult your local Tyco Thermal Controls representative
Supply voltage	230 Vac (Contact your local Tyco Thermal Controls representative for data on other voltages)
Approvals	The KTV heating cables are approved for use in hazardous areas by PTB and Baseefa 2001 Ltd. PTB 98 ATEX 1104 X — BAS98ATEX2335X Ⓔx II 2 G/D EEx e(m) II T4/T3/226°C (T2) — Ⓔx II 2 GD EEx e II 226°C (T2) IP66 T130°C, T195°C, T226°C The KTV heating cables are approved by DNV for use on ships and mobile off shore units. DNV Certificate No. E-6968 They are also VDE approved.
Specifications	
Maximum exposure temperature (continuous power on)	150°C
Max. exposure temperature (intermittent power on and off)	215°C (20 bar saturated steam) Maximum cumulative exposure 1000 hours
Temperature classification	T2 in accordance with European Standard EN 50 014
Minimum installation temperature	–60°C
Minimum bend radius	at 20°C: 26 mm at –60°C: 51 mm

Thermal output rating

Nominal power output at 230 Vac on insulated steel pipes

A 20KTV2-CT
B 15KTV2-CT
C 8KTV2-CT
D 5KTV2-CT



	5KTV2-CT	8KTV2-CT	15KTV2-CT	20KTV2-CT
Nominal power output (W/m at 10°C)	16	25	47	65
Product dimensions (nominal) and weight				
Thickness (mm)	7.6	7.6	7.6	7.6
Width (mm)	13.3	13.3	13.3	13.3
Weight (g/m)	250	250	250	250

Maximum circuit length based on type 'C' circuit breakers according to EN 60898

Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)			
16A	–20°C	130	95	60	40
	+10°C	145	105	65	45
25A	–20°C	205	150	90	65
	+10°C	230	165	100	75
32A	–20°C	230	180	115	85
	+10°C	230	180	130	95
40A	–20°C	230	180	130	105
	+10°C	230	180	130	110

The above numbers are for circuit length estimation only. For more detailed information please use the Tyco Thermal Controls TraceCalc software or contact your local Tyco Thermal Controls representative.
Tyco Thermal Controls requires the use of a 30 mA residual current device to provide maximum safety and protection from fire. Where design results in a higher leakage current, a maximum 300 mA residual current device may be used. All safety aspects need to be proven.

Ordering details

Part description	5KTV2-CT	8KTV2-CT	15KTV2-CT	20KTV2-CT
Part No.	866752-000	196865-000	368748-000	790842-000

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 electrical requirements.

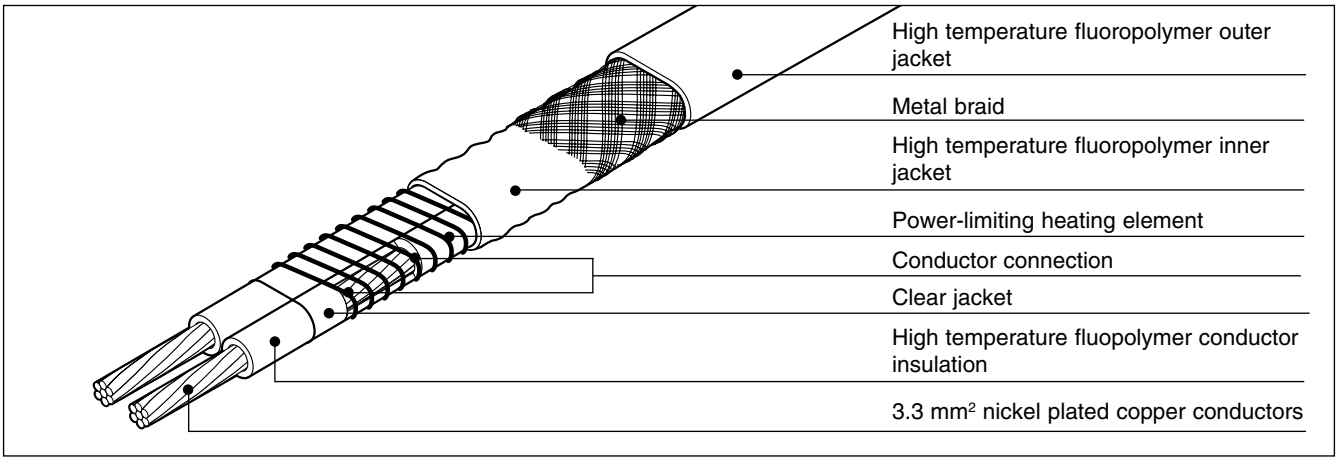
Raychem®

VPL

Ⓔx High-temperature power-limiting heating cable

VPL is a family of power limiting heating cables designed for pipe and equipment heat-tracing in industrial applications. VPL can be used for frost protection and process temperature maintenance requiring high power output and/or high temperature exposure. VPL can provide process temperature maintenance up to 230°C and can withstand routine steam purges and temperature exposure to 250°C with power off.
Power-limiting cables are parallel heaters formed by a coiled resistor alloy heating element wrapped around two parallel conductors. The distance between conductor contact points forms the heating zone length. This parallel construction allows it 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 hazardous areas. Approvals are listed below.

Heating cable construction

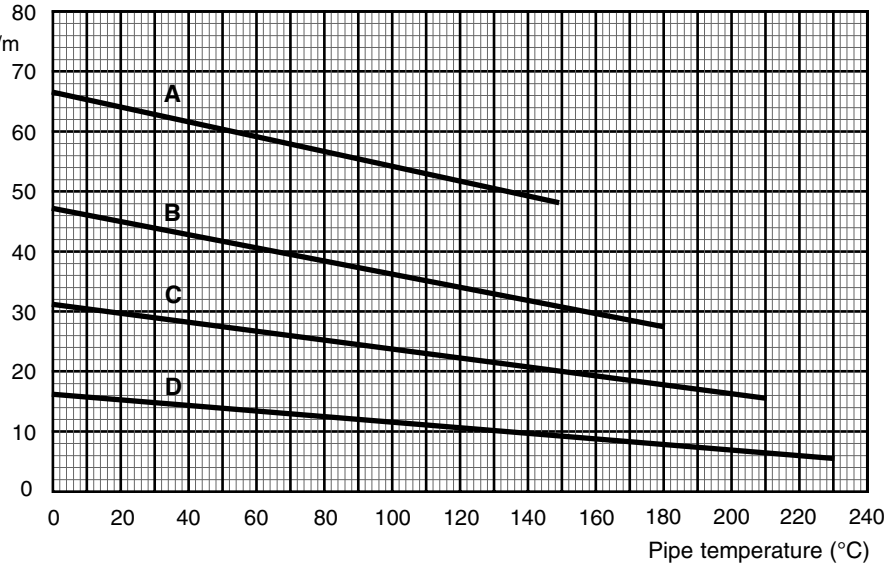


Application			
Area classification	Hazardous, Zone 1, Zone 2 (Gas), Zone 21, Zone 22 (Dust) Ordinary		
Traced surface type	Carbon steel Stainless steel Painted or unpainted metal		
Chemical resistance	Organics and corrosives For aggressive organics and corrosives consult your local Tyco Thermal Controls representative		
Supply voltage	230 or 254 Vac (Contact your local Tyco Thermal Controls representative for data on other voltages)		
Approvals	The VPL heating cable is approved for use in hazardous areas by Baseefa 2001 Ltd. BAS00ATEX2163X Ⓔx II 2 GD Ex es II T* * By design		
Specifications			
Maximum maintain temperature (continuous power on)	**Cable**	**230V**	**254V**
	5VPL2-CT	230°C	225°C
	10VPL2-CT	210°C	200°C
	15VPL2-CT	180°C	145°C
	20VPL2-CT	150°C	Not allowed
Max. exposure temperature (continuous power off)	250°C		
Temperature classification	To be established using the principles of stabilized design. Use TraceCalc design software or contact Tyco Thermal Controls for assistance.		
Minimum installation temperature	–60°C		
Minimum bend radius	at –60°C: 20 mm		

Thermal output rating

Nominal power output rating on metal pipes at 230 V

A 20VPL-CT
B 15VPL-CT
C 10VPL-CT
D 5VPL-CT



To choose the correct heating cable for your application use the TraceCalc design software.

Adjustment Factors for 254V

	Power Output	Circuit Length
5VPL2-CT	1.20	1.05
10VPL2-CT	1.19	1.04
15VPL2-CT	1.19	1.04
20VPL2-CT	Not allowed	

	5VPL2-CT	10VPL2-CT	15VPL2-CT	20VPL2-CT
Nominal power output (W/m at 10°C)	15	30	45	61
Product dimensions (nominal) and weight				
Thickness (mm)	7.9	7.9	7.9	7.9
Width (mm)	11.7	11.7	11.7	11.7
Nominal cold lead/ heating zone length (mm)	1219	914	610	508
Weight (g/m)	200	200	200	200

Maximum circuit length based on type 'C' circuit breakers according to EN 60898

230V		5VPL2-CT	10VPL2-CT	15VPL2-CT	20VPL2-CT
Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)			
16A	–20°C	195	100	70	50
	+10°C	215	110	75	55
25A	–20°C	220	155	105	80
	+10°C	220	155	115	85
32A	–20°C	220	155	130	100
	+10°C	220	155	130	110
40A	–20°C	220	155	130	110
	+10°C	220	155	130	110

The above numbers are for circuit length estimation only. For more detailed information please use the Tyco Thermal Controls TraceCalc software or contact your local Tyco Thermal Controls representative.
Tyco Thermal Controls requires the use of a 30 mA residual current device to provide maximum safety and protection from fire. Where design results in a higher leakage current, a maximum 300 mA residual current device may be used. All safety aspects need to be proven.

Ordering details

Part description	5VPL2-CT	10VPL2-CT	15VPL2-CT	20VPL2-CT
Part No.	451828-000	892652-000	068380-000	589252-000

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 electrical requirements.