



# Product Catalogue



*Worldwide Specialists in Electric Heat Tracing*



### **HTS Global Technologies GmbH**

HTS Global Technologies GmbH is an international operating manufacturer of electric heating cables. Positioned with offices in Switzerland and Germany, the HTS Group is working on a worldwide scale. Our cables are manufactured in Switzerland in the well-known Swiss quality.

The complete range of our technically advanced heat tracing solutions, fulfils all international standards. We serve the industrial sector as well as the domestic and construction market. Due to our policy of worldwide growth HTS is always expanding in new regions. HTS Global Technologies GmbH and it's professionally trained partners in many countries provide marketing, distribution and customer service of the entire heat tracing product range.

### **ThermTrace®**

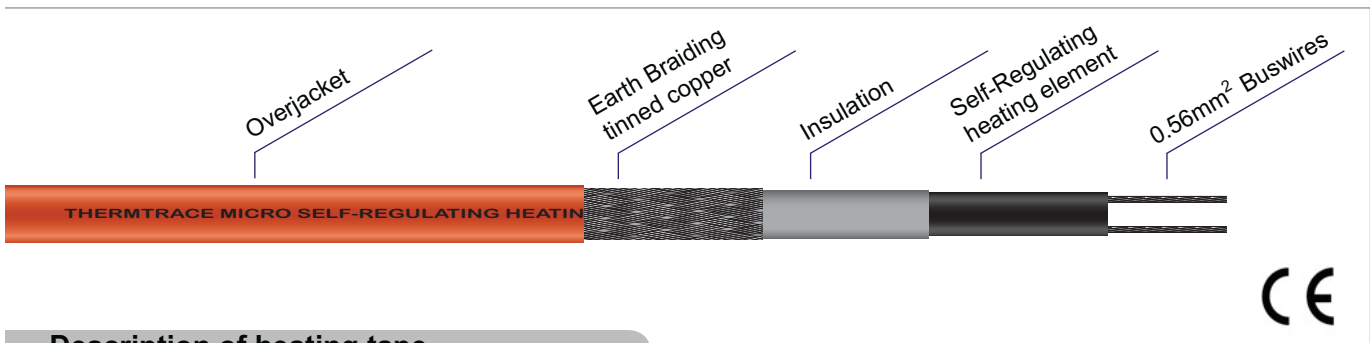
Our ThermTrace series of heating tapes includes a complete range of self-regulating products for all applications. Starting with micro low-temperature heating cables for freeze protection to our high-end industrial grade cables for temperatures up to 240°C.

Our partners appreciate the quality and reliability of our ThermTrace range as outstanding and competitive.

As addition to self-regulating cables HTS is offering constant wattage cables and also a broad variety of accessories.

# ThermTrace<sup>®</sup> Micro (TTM) Self-Regulating parallel heating tape

up to 65°C



## Description of heating tape

- Self-regulating
- 3 power output ranges
- Cut-to-length

### Applications:

ThermTrace<sup>®</sup>Micro is a light construction grade self-regulating heating tape that may be used for freeze protection, or low temperature maintenance of pipework and vessels.

### Function:

Self-regulating heating tapes consist of two parallel buswires, embedded in a semi-conductive self-regulating matrix. This means that the heating cable automatically responds to changes in ambient conditions.

With increase in temperature, the synthetic material expands by molecular force, and the connections between the carbon particles diminish, reducing the load. Conversely, as the temperature decreases, the load increases as the connections between the carbon particles increases accordingly.

Thus, the heating power varies according to the temperature of the surface the heating tape is applied to.

Self-regulating heating tapes will not overheat or burnout - even when overlapped.

### Technical Data:

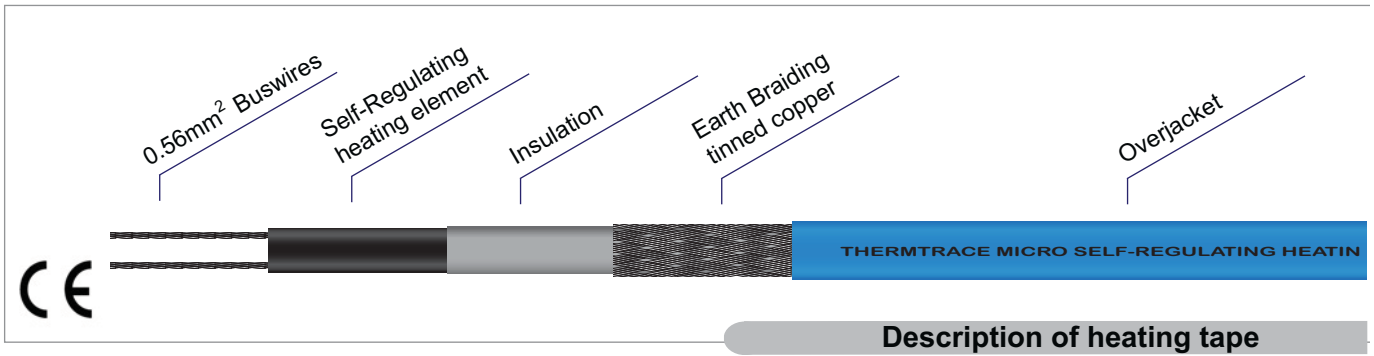
Maximum temperature		65°C
Nominal voltage		230V (115V available to order)
Minimum bending radius	TTM-BO	35mm
	TTM-BOT	35mm
Minimum installation temperature		-30°C
Moisture protected		Yes

Name	Power Output On Insulated Metal Pipes at 5°C (W/m)	Maximum Permissible Temperature (°C)	Earth Braid Description	Nominal Dimensions (mm)	Nominal Weight kg/100m
11TTM-2-BO	11	65	tinned copper	7.9 x 5.6	7
11TTM-2-BOT	11	65	tinned copper	7.9 x 5.6	7
17TTM-2-BO	17	65	tinned copper	7.9 x 5.6	7
17TTM-2-BOT	17	65	tinned copper	7.9 x 5.6	7
20TTM-2-BO	20	65	tinned copper	7.9 x 5.6	7
20TTM-2-BOT	20	65	tinned copper	7.9 x 5.6	7

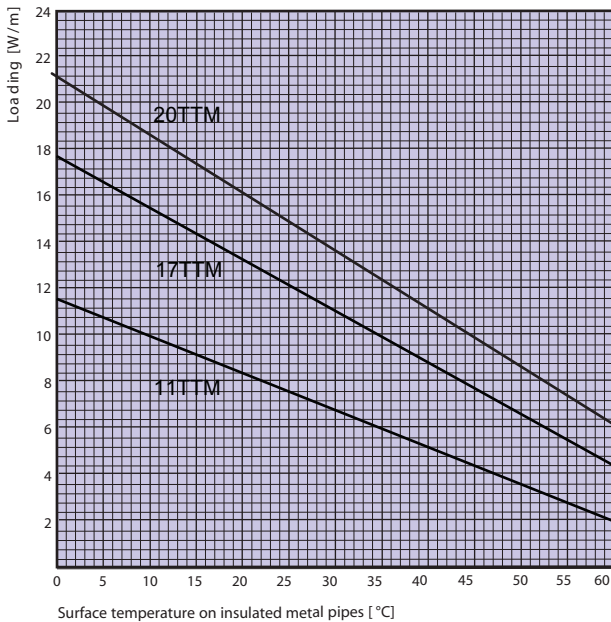
BO: Braid and thermoplastic overjacket  
BOT: Braid and fluoropolymer overjacket

up to 65°C

# ThermTrace<sup>®</sup> Micro (TTM) Self-Regulating parallel heating tape



## Temperature/Loading diagram TTM



Maximum recommended length of heating circuit at 230VAC using Type-C circuit breakers:

Product Reference	Circuit Breaker	Start up Temperature		
		+10°C	0°C	-20°C
11TTM	10A	100m*	95m	77m
17TTM	10A	72m	66m	52m
20TTM	10A	60m	58m	41m

\* 60m maximum heating circuit for use inside drinking water pipelines (11TTM-2-BOT)

## Approval Details



## Product Ordering Information

Power Output TTM-Voltage-Overjacket

Example 11W/m @ 5°C with tinned copper braiding and flouropolymer overjacket (230V):

11 TTM-2-BOT

Example 17 W/m @ 5°C with insulation (115V)

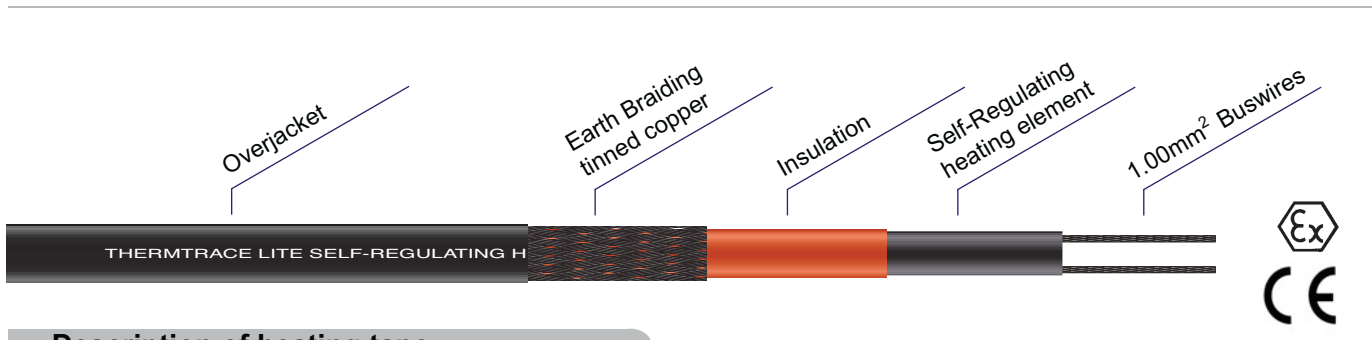
17 TTM-1

BO: tinned copper braiding and thermoplastic overjacket  
BOT: tinned copper braiding and fluoropolymer overjacket



# ThermTrace<sup>®</sup> Lite (TTL) Self-Regulating parallel heating tape

up to 85°C



## Description of heating tape

- Self-regulating
- 4 power output ranges
- Cut-to-length

### Applications:

ThermTrace<sup>®</sup>Lite is a construction / light industrial grade self-regulating heating tape that may be used for freeze protection, or low temperature maintenance of pipework and vessels.

### Function:

Self-regulating heating tapes consist of two parallel buswires, embedded in a semi-conductive self-regulating matrix. This means that the heating cable automatically responds to changes in ambient conditions.

With increase in temperature, the synthetic material expands by molecular force, and the connections between the carbon particles diminish, reducing the load. Conversely, as the temperature decreases, the load increases as the connections between the carbon particles increases accordingly.

Thus, the heating power varies according to the temperature of the surface the heating tape is applied to.

Self-regulating heating tapes will not overheat or burnout - even when overlapped.

### Technical Data:

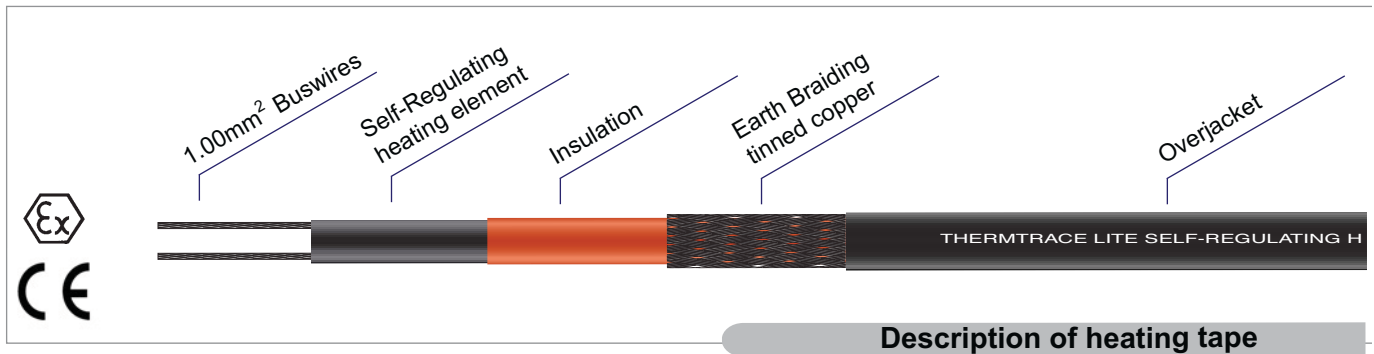
Maximum exposure temperature (unpowered) Intermittent, 1000 cumulative hours	85°C
Maximum operating temperature (powered)	65°C
Nominal voltage	230V
Minimum bending radius	25mm
Minimum installation temperature	-30°C
Maximum resistance of braid	18 Ohms/km
Waterproof bonded insulation	optional

Name	Power Output on Insulated Metal Pipes at 5°C (W/m)	Maximum Permissible Temperatures powered (°C)    unpowered (°C)		Earth Braid Description	Nominal Dimensions (mm)	Nominal Weight kg/100m
12TTL-2-BO	12	65	85	tinned copper	10.5 x 6.0	10
12TTL-2-BOT	12	65	85	tinned copper	10.5 x 6.0	10
17TTL-2-BO	17	65	85	tinned copper	10.5 x 6.0	10
17TTL-2-BOT	17	65	85	tinned copper	10.5 x 6.0	10
23TTL-2-BO	23	65	85	tinned copper	10.5 x 6.0	10
23TTL-2-BOT	23	65	85	tinned copper	10.5 x 6.0	10
28TTL-2-BO	28	65	85	tinned copper	10.5 x 6.0	10
28TTL-2-BOT	28	65	85	tinned copper	10.5 x 6.0	10

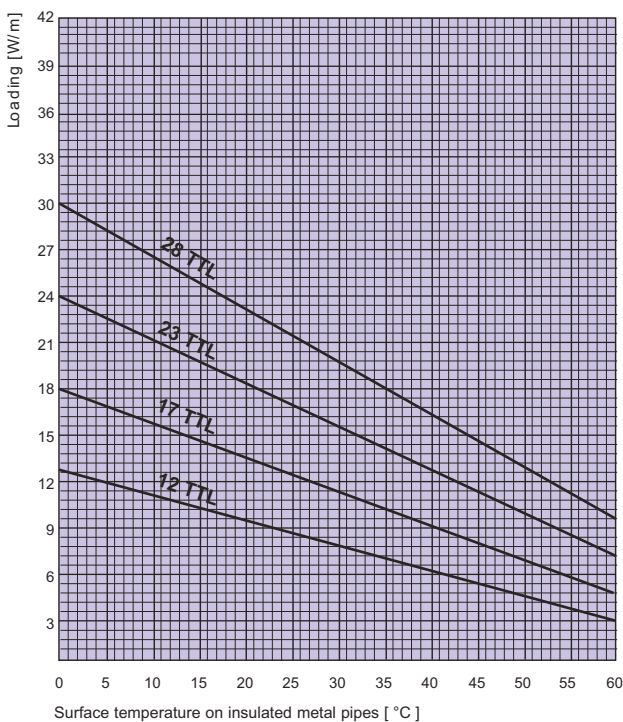
BO: Braid and thermoplastic overjacket  
BOT: Braid and fluoropolymer overjacket

up to 85°C

# ThermTrace® Lite (TTL) Self-Regulating parallel heating tape



Temperature/Loading diagram TTL

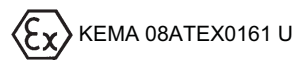


TTL exposure up to 85°C

Catalogue Reference	Circuit Breaker	Start up Temperature			
		+10°C	0°C	-15°C	-25°C
12TTL	10A	118m	109m	90m	79m
	16A	154m	154m	139m	118m
17TTL	10A	104m	95m	78m	70m
	16A	139m	139m	122m	113m
23TTL	10A	79m	73m	62m	57m
	16A	116m	113m	97m	89m
28TTL	10A	60m	51m	45m	42m
	16A	100m	86m	72m	65m

Maximum recommended length of heating circuit at 230VAC using Type-C circuit breakers.

### Approval Details



### Product Ordering Information

Power Output TTL-Voltage-Overjacket

Example 23W/m@5°C with tinned copper braiding and flouropolymer overjacket (230V):

23 TTL-2-BOT

Example 17 W/m@5°C with insulation (115V)

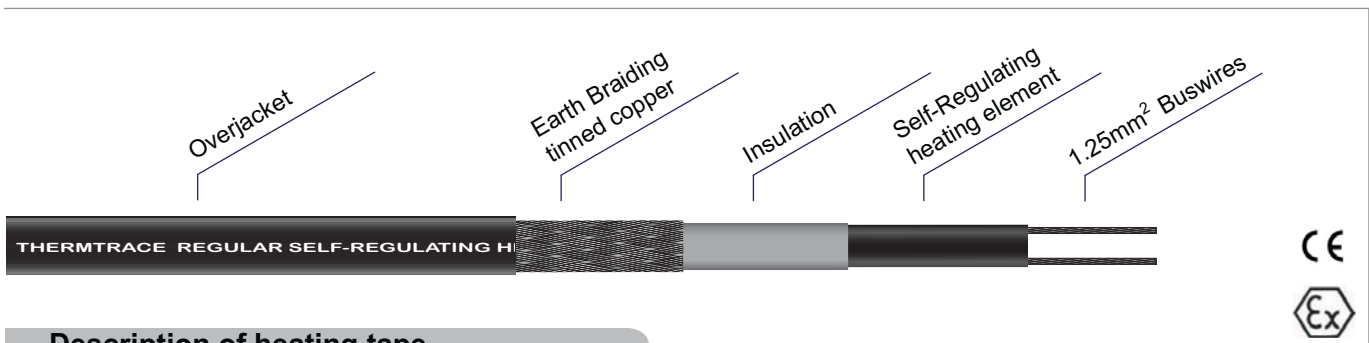
17 TTL-1

BO: tinned copper braiding and thermoplastic overjacket  
BOT: tinned copper braiding and fluoropolymer overjacket



# ThermTrace<sup>®</sup> Regular (TTR) Self-Regulating parallel heating tape

up to 85°C



## Description of heating tape

- Self-regulating
- 5 power output ranges
- Proprietary bonded jacket

### Applications:

ThermTrace<sup>®</sup>Regular is a construction and industrial grade self-regulating heating tape that may be used for freeze protection, or low temperature maintenance of pipework and vessels.

### Function:

Self-regulating heating tapes consist of two parallel buswires, embedded in a semi-conductive self-regulating matrix. This means that the heating cable automatically responds to changes in ambient conditions.

With increase in temperature, the synthetic material expands by molecular force, and the connections between the carbon particles diminish, reducing the load. Conversely, as the temperature decreases, the load increases as the connections between the carbon particles increases accordingly.

Thus, the heating power varies according to the temperature of the surface the heating tape is applied to.

Self-regulating heating tapes will not overheat or burnout - even when overlapped.

### Technical Data:

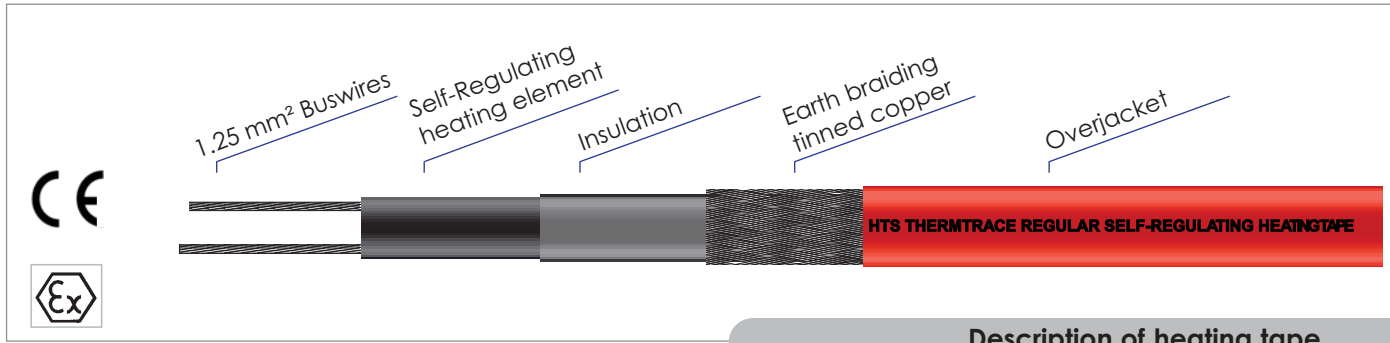
Maximum exposure temperature (unpowered) Intermittent, 1000 cumulative hours	85°C
Maximum operating temperature (powered)	65°C
Nominal voltage	230V (120V available to order)
Minimum bending radius	25mm
Minimum installation temperature	-30°C
Maximum resistance of braid	18.2 Ohms/km
Fluoropolymer Overjacket	optional
T-Rating 10,15,25 W/m	T6
T-Rating 33 W/m	T5

Name	Power Output On Insulated Metal Pipes at 10°C (W/m)	Maximum Permissible Temperature (°C)	Earth Braid Description	Nominal Dimensions (mm)	Nominal Weight kg/100m
10TTR-2-BO	10	65	tinned copper	11.5 x 5.5	12
10TTR-2-BOT	10	65	tinned copper	11.5 x 5.5	12
15TTR-2-BO	15	65	tinned copper	11.5 x 5.5	12
15TTR-2-BOT	15	65	tinned copper	11.5 x 5.5	12
20TTR-2-BO	20	65	tinned copper	11.5 x 5.5	12
20TTR-2-BOT	20	65	tinned copper	11.5 x 5.5	12
25TTR-2-BO	25	65	tinned copper	11.5 x 5.5	12
25TTR-2-BOT	25	65	tinned copper	11.5 x 5.5	12
33TTR-2-BO	33	65	tinned copper	11.5 x 5.5	12
33TTR-2-BOT	33	65	tinned copper	11.5 x 5.5	12

BO: Braid and thermoplastic overjacket  
BOT: Braid and fluoropolymer overjacket

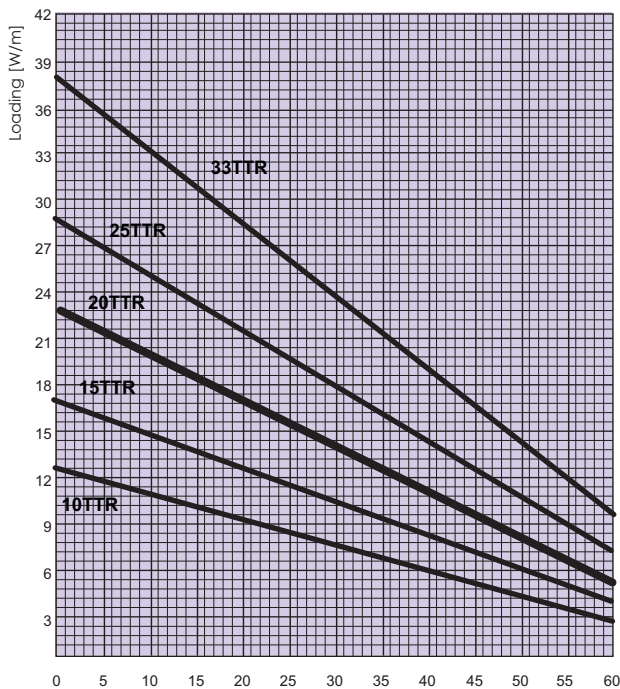
up to 85°C

# ThermTrace® Regular (TTR) Self-Regulating parallel heating tape



Description of heating tape

## Temperature/Loading diagram TTR



Surface temperature on insulated metal pipes [°C]

Maximum recommended length of heating circuit at 230VAC using Type-C circuit breakers:

Product Reference	Circuit Breaker	Start up Temperature		
		+10°C	-15°C	-20°C
10TTR	16A	205m	140m	123m
	20A		186m	165m
	30A		195m	195m
15TTR	40A			
	16A	145m	93m	82m
	20A	162m	125m	111m
20TTR	30A		160m	160m
	40A			
	16A	116m	75m	62m
25TTR	20A	140m	93m	85m
	30A		140m	115m
	40A			140m
33TTR	16A	88m	60m	50m
	20A	117m	75m	70m
	30A	126m	117m	105m
33TTR	40A		125m	125m
	16A	70m	50m	45m
	20A	90m	65m	58m
33TTR	30A	108m	95m	85m
	40A		105m	105m

### Product Ordering Information

Power output + TTR-Voltage-(Overjacket)

Example 33W/m@10°C with tinned copper braiding and fluoropolymer jacket (230V):

**33 TTR-2-BOT**

Example 15W/m@10°C with only insulation (120V) :

**15 TTR-1**

B: tinned copper braid

BO: Braid and thermoplastic overjacket

BOT: Braid and fluoropolymer overjacket



# ThermTrace<sup>®</sup> Super (TTS) Self-Regulating parallel heating tape

up to 200°C

Overjacket  
Earth braiding  
tinned copper  
Insulation  
Self-Regulating  
heating element  
1.25 mm<sup>2</sup> Buswires



THERMTRACE SUPER SELF-REGULATING H

## Description of heating tape

- Self-regulating
- 7 power output ranges
- Cut to length

### Applications:

ThermTrace Super is a construction and industrial grade self-regulating heating tape that may be used for freeze protection, or temperature maintenance of pipework and vessels.

### Function:

Self-regulating heating tapes consist of two parallel buswires, embedded semi-conductive self-regulating matrix. This means that the heating cable automatically responds to changes in ambient conditions.

With increase in temperature, the synthetic material expands by molecular force, and the connections between the carbon particles diminish, reducing the load. Conversely, as the temperature decreases, so the load increases as the connections between the carbon particles increases accordingly.

Thus, the heating power varies according to the temperature of the surface the heating tape is applied to.

Self-regulating heating tapes will not overheat or burnout - even when overlapped.

### Technical Data:

Maximum exposure temperature (unpowered)	200°C*
*maximal 1000 hours exposure time	
Maximum operating temperature (powered)	120°C
Nominal voltage	230V (120V available to order)
Minimum bending radius	25mm
Minimum installation temperature	-30°C
Maximum resistance of braid	18.2 Ohms/km
T-Rating	T3

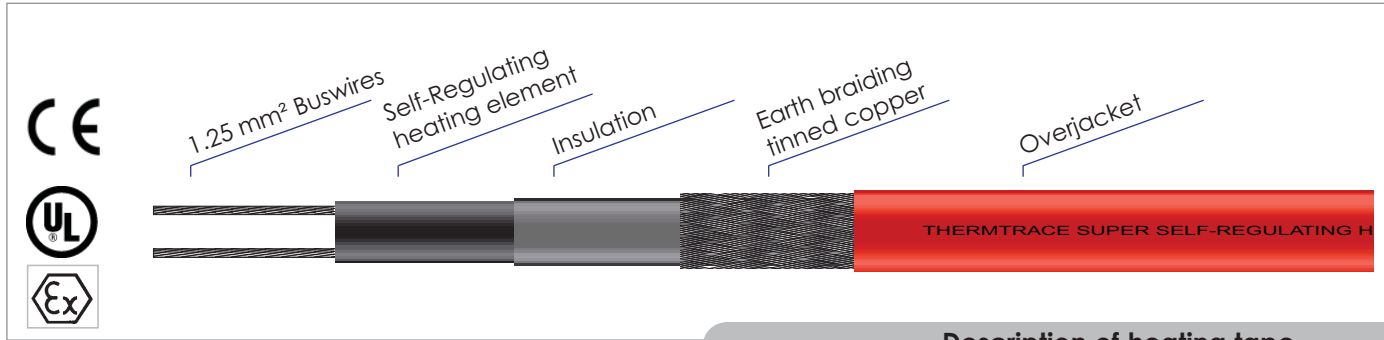
Part Number	Power Output on Insulated Metal Pipes at 10°C (W/m)	Maximum Permissible Ambient Temperature energised (°C)	Maximum Permissible Ambient Temperature de-energised (°C)	Earth Braid Description	Nominal Dimensions (mm)	Nominal Weight kg/100m
10TTS-2-B	10	120	200	tinned copper	9.5 x 4.0	12
10TTS-2-BOT	10	120	200	tinned copper	10.5 x 5.0	12
15TTS-2-B	15	120	200	tinned copper	9.5 x 4.0	12
15TTS-2-BOT	15	120	200	tinned copper	10.5 x 5.0	12
20TTS-2-B	20	120	200	tinned copper	9.5 x 4.0	12
20TTS-2-BOT	20	120	200	tinned copper	10.5 x 5.0	12
25TTS-2-B	25	120	200	tinned copper	9.5 x 4.0	12
25TTS-2-BOT	25	120	200	tinned copper	10.5 x 5.0	12
30TTS-2-B	30	120	200	tinned copper	9.5 x 4.0	12
30TTS-2-BOT	30	120	200	tinned copper	10.5 x 5.0	12

B: tinned copper braid  
BOT: Braid and fluoropolymer overjacket



up to 200°C

# ThermTrace® Super (TTS) Self-Regulating parallel heating tape



## Description of heating tape

Name	Power Output on Insulated Metal Pipes at 10°C (W/m)	Maximum Permissible Ambient Temperature energised (°C)	Maximum Permissible Ambient Temperature de-energised (°C)	Earth Braid Description	Nominal Dimensions (mm)	Nominal Weight (kg/100m)
45TTS-2-B	45	120	200	tinned copper	9.5 x 4.0	12
45TTS-2-BOT	45	120	200	tinned copper	10.5 x 5.0	12
60TTS-2-B	60	120	200	tinned copper	9.5 x 4.0	12
60TTS-2-BOT	60	120	200	tinned copper	10.5 x 5.0	12

B: tinned copper braid  
BOT: Braid and fluoropolymer overjacket

## TTS exposure up to 200°C (maximal 1000 hours exposure time)

	Start-up temp.	230V			120V		
		16A	20A	30A	16A	20A	30A
10 TTS	+10	200	235		100	120	
	-25	175	235		89	120	
15 TTS	+10	165	189		80	95	
	-25	117	152	189	56	75	95
20 TTS	+10	135	160		67	80	
	-25	100	130	160	50	65	80
25 TTS	+10	120	140		60	69	
	-25	88	120	140	44	59	69
30 TTS	+10	85	114		44	58	
	-25	69	92	114	35	45	58
45 TTS	+10	70	82		35	41	
	-25	49	66	82	24	33	41
60 TTS	+10	50	64		25	32	
	-25	38	52	64	20	25	32

Maximum recommended length of heating circuit at 230VAC using Type-C circuit breakers.

### Product Ordering Information

Power output + TTS-Voltage-(Overjacket)

Example 60W/m@10°C with tinned copper braiding and fluoropolymer jacket (230V):

**60 TTS-2-BOT**

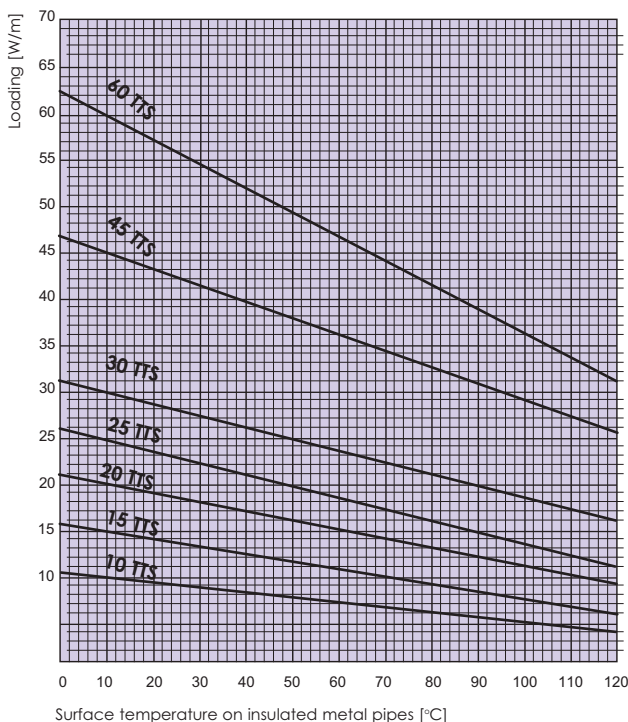
Example 15W/m@10°C with only insulation (120V):

**15 TTS-1**

B: tinned copper braid

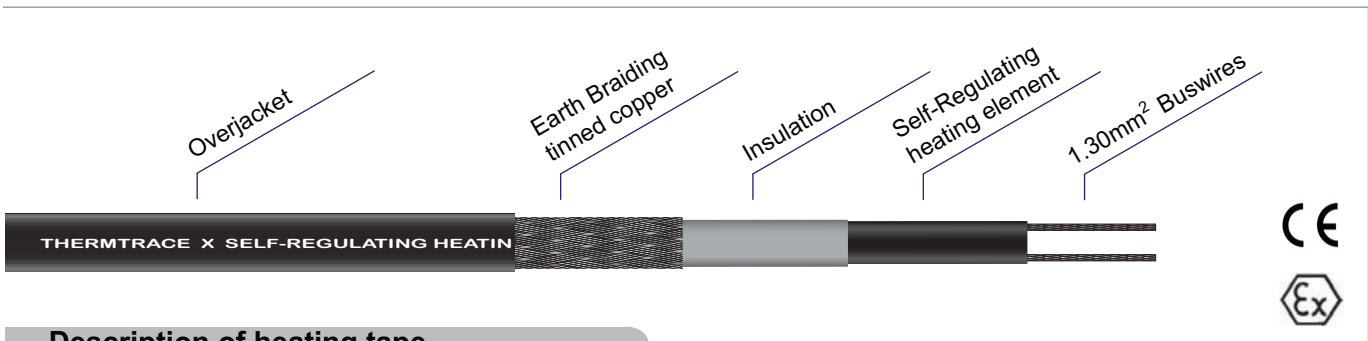
BOT: Braid and fluoropolymer overjacket

## Temperature/Loading diagram TTS



# ThermTrace<sup>®</sup> X (TTX) Self-Regulating parallel heating tape

up to 240°C



## Description of heating tape

- Self-regulating
- 6 Power Output Ranges
- Cut-to-length

### Applications:

ThermTrace X is a construction / industrial grade self-regulating heating tape that may be used for freeze protection, or temperature maintenance of pipework and vessels.

### Function:

Self-regulating heating tapes consist of two parallel buswires, embedded in a semi-conductive self-regulating matrix. This means that the heating cable automatically responds to changes in ambient conditions.

With increase in temperature, the synthetic material expands by molecular force, and the connections between the carbon particles diminish, reducing the load. Conversely, as the temperature decreases, the load increases as the connections between the carbon particles increases accordingly.

Thus, the heating power varies according to the temperature of the surface the heating tape is applied to.

Self-regulating heating tapes will not overheat or burnout - even when overlapped.

## Performance Ratings

Output wattage:

16 through 98W/m @ 10°C

Supply voltages:

230V or 115V

Continuous maintenance temperature: 190°C max

Intermittent exposure temperature :

(max. 1000 hours exposure time) 240°C max

T Rating:

16 to 49W/m: T4

65 to 98W/m: T3

Braid resistance:

Tinned copper: 0.0098 Ohm/m

Nominal dimensions: 11.75 x 5.4mm

## Approvals/Certifications

### Factory Mutual:

Ordinary locations

Hazardous locations

Class I, Div 1\*, Groups B, C, D

Class I, Div 2, Groups A, B, C, D

Class II/III, Div 1\*, Groups E, F, G

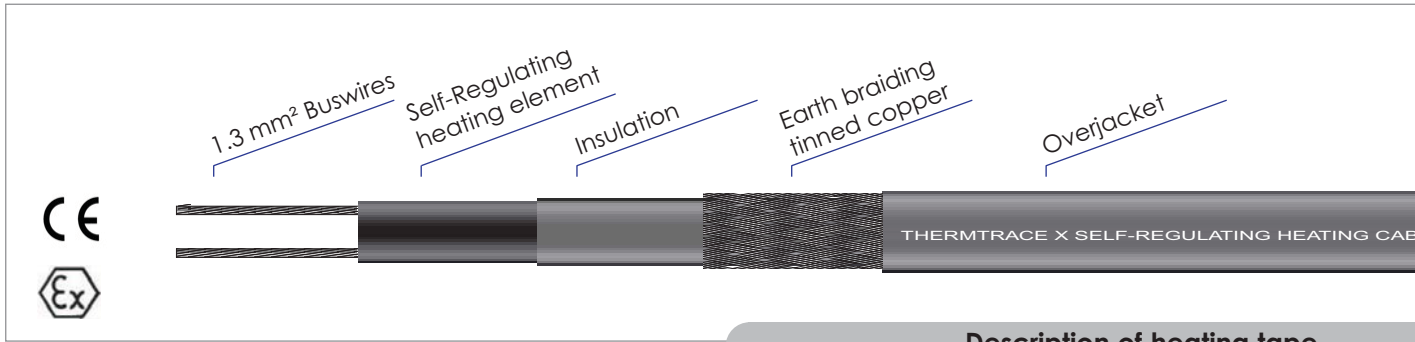
Class II/III, Div 2, Groups F, G

Class I, Zone 1\*, Group IIB + H2,

Class I, Zone 2, Group IIC

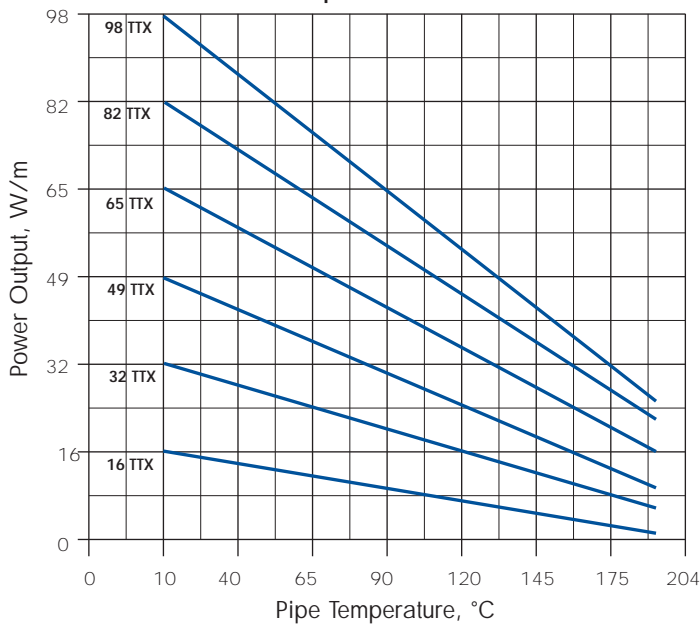
up to 240°C

# ThermTrace<sup>®</sup>X (TTX) Self-Regulating parallel heating tape



## Description of heating tape

Power Output Curves - TTX Series



Power Adjustment Factor

Part No.	208 Volts	277 Volts
32 TTX-2	.88	1.14
65 TTX-2	.94	1.08
98 TTX-2	.99	1.01

### Product Ordering Information

Power output + TTX-Voltage-(Overjacket)

Example 65W/m @10°C with tinned copper braiding and fluoropolymer jacket (240V):

**65 TTX-2-BOT**

Example 65W/m @10°C with braiding only (115V):

**65 TTX-1-B**

B: tinned copper braiding

BOT: tinned copper braid and fluoropolymer overjacket

## 120 Volt Circuit Breaker Sizing vs. Max Circuit Length (m)

Series	Starting Temp.	15A	20A	30A
16 TTX-1	10°C	54	73	102
	-20°C	50	67	100
	-45°C	65	61	91
32 TTX-1	10°C	36	48	54
	-20°C	32	42	54
	-45°C	27	36	54
49 TTX-1	10°C	24	32	41
	-20°C	21	27	41
	-45°C	18	24	36
65 TTX-1	10°C	18	27	36
	-20°C	16	21	41
	-45°C	15	19	30
82 TTX-1	10°C	13	18	26
	-20°C	12	15	24
	-45°C	12	15	24
98 TTX-1	10°C	12	15	21
	-20°C	10	13	21
	-45°C	10	13	21

## 240 Volt Circuit Breaker Sizing vs. Max Circuit Length (m)

Series	Starting Temp.	15A	20A	30A
16 TTX-2	10°C	109	146	164
	-20°C	99	131	164
	-45°C	88	117	164
32 TTX-2	10°C	73	97	109
	-20°C	70	92	109
	-45°C	68	91	109
49 TTX-2	10°C	48	64	82
	-20°C	42	56	82
	-45°C	36	48	73
65 TTX-2	10°C	35	45	70
	-20°C	33	44	67
	-45°C	32	42	64
82 TTX-2	10°C	27	36	51
	-20°C	24	30	48
	-45°C	24	30	49
98 TTX-2	10°C	24	30	42
	-20°C	21	27	42
	-45°C	21	27	42

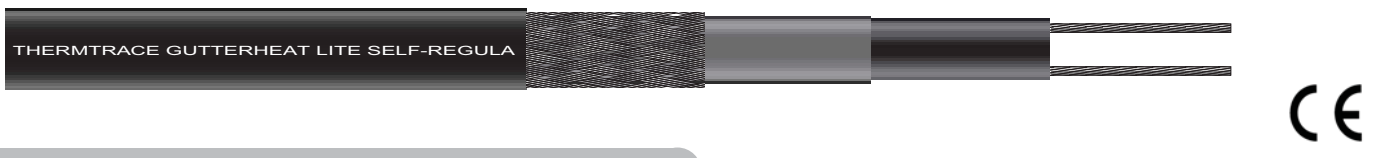
**NOTE:** Recommended circuit breakers to minimize the effect of transit start-up currents.  
Westinghouse: Types BA, EB, EHB, FB, HFB. General Electric: E100 Type TEB, E150, Types TED, THED. **Square D:** Types EH, FAIF. The National Electric Code requires ground fault protection of equipment for each branch circuit supplying electrical heating cables or devices.



# ThermTrace® GutterHeat Lite (TTGHL) Self-Regulating parallel heating tape

up to 85°C

Overjacket  
Earth braiding  
tinned copper  
Insulation  
Self-Regulating  
heating element  
1.00 mm<sup>2</sup> Buswires



## Description of heating tape

- Self-regulating
- Black UV Resistant TPE Overjacket
- Cut to length

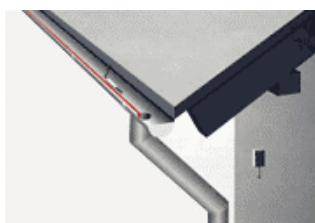
### Applications:

TTGHL is a self-regulating heating tape that may be used for freeze protection of roofs and gutters.

### Function:

Self-regulating heating tapes consist of two parallel buswires, embedded semi-conductive self-limiting matrix. This means that the heating cable automatically responds to changes in ambient conditions.

With increase in temperature, the synthetic material expands by molecular force, and the connections between the carbon particles diminish, reducing the load. Conversely, as the temperature decreases, so the load increases as the connections between the carbon particles increases accordingly.

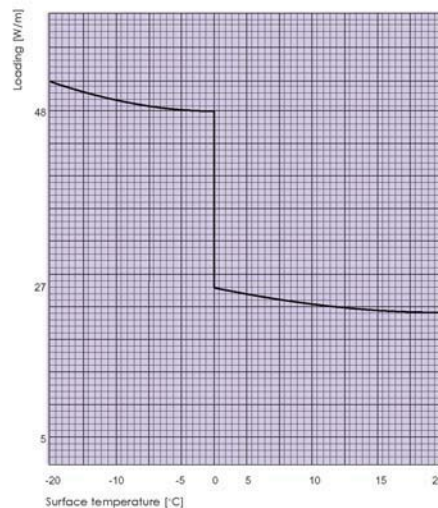


Thus, the heating power varies according to the temperature of the surface the heating tape is applied to.

Self-regulating heating tapes will not overheat or burnout - even when overlapped.

### Technical Data:

Maximum exposure temperature (unpowered)	85°C
Maximum operating temperature (powered)	65°C
Nominal voltage	230V
Minimum bending radius	25mm
Minimum installation temperature	-30°C
Maximum resistance of braid	18.2 Ohms/km



Part Number	Power Output at 230V (W/m)	Environment	Max. recommended heating circuit	Nominal Dimensions (mm)
TTGHL-2-BO	23	5°C on pipe	110 m	10.5 x 6.0
TTGHL-2-BO	25	0°C in air	90 m	10.5 x 6.0
TTGHL-2-BO	40	in ice water	50 m	10.5 x 6.0

Technical information subject to change without notification!

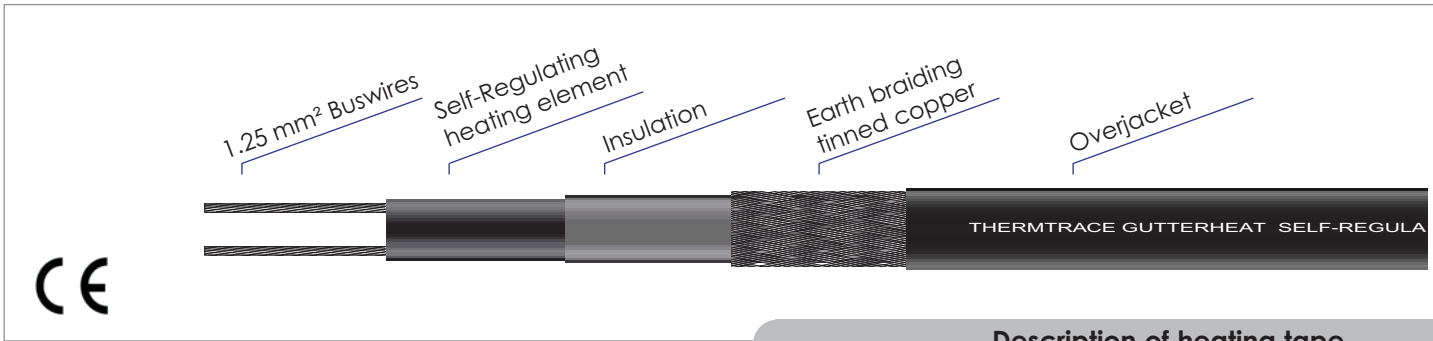
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up to 85°C

# ThermTrace® GutterHeat (TTGH) Self-Regulating parallel heating tape



## Description of heating tape

- Self-regulating
- Black UV Resistant TPE Overjacket
- Proprietary bonded jacket
- Cut to length

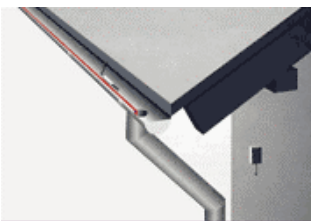
### Applications:

TTGH is a self-regulating heating tape that may be used for freeze protection of roofs and gutters.

### Function:

Self-regulating heating tapes consist of two parallel buswires, embedded semi-conductive self-limiting matrix. This means that the heating cable automatically responds to changes in ambient conditions.

With increase in temperature, the synthetic material expands by molecular force, and the connections between the carbon particles diminish, reducing the load. Conversely, as the temperature decreases, so the load increases as the connections between the carbon particles increases accordingly.

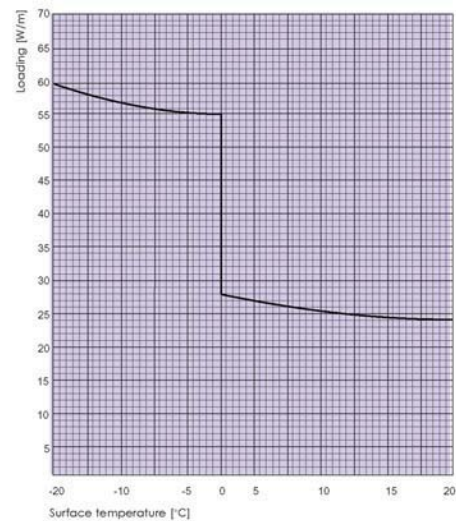


Thus, the heating power varies according to the temperature of the surface the heating tape is applied to.

Self-regulating heating tapes will not overheat or burnout - even when overlapped.

### Technical Data:

Maximum exposure temperature (unpowered)	85°C
Maximum operating temperature (powered)	65°C
Nominal voltage	230V
Minimum bending radius	25mm
Minimum installation temperature	-30°C
Maximum resistance of braid	18.2 Ohms/km



Part Number	Power Output at 230V (W/m)	Environment	Max. recommended heating circuit	Nominal Dimensions (mm)
TTGH-2-BO	25	10°C on pipe	88 m	11.5 x 5.5
TTGH-2-BO	28	0°C in air	77 m	11.5 x 5.5
TTGH-2-BO	55	in ice water	35 m	11.5 x 5.5

BO: Braid and thermoplastic overjacket

Technical information subject to change without notification!



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# ThermTrace® RampTrace Super Self-Regulating parallel heating tape

up to 120°C

TPE Overjacket  
Earth braiding  
tinned copper  
Fluoropolymer Insulation  
Self-Regulating  
heating element  
1.25 mm Buswires



## Description of heating tape

- Designed for use in concrete
- Self-regulating
- Cut to length

### Applications:

ThermTrace Ramptrace Super is a construction grade self-regulating heating tape that may be used for freeze protection of ramps built of concrete.

### Function:

Self-regulating heating tapes consist of two parallel buswires, embedded semi-conductive self-regulating matrix. This means that the heating cable automatically responds to changes in ambient conditions.

With increase in temperature, the synthetic material expands by molecular force, and the connections between the carbon particles diminish, reducing the load. Conversely, as the temperature decreases, so the load increases as the connections between the carbon particles increases accordingly.

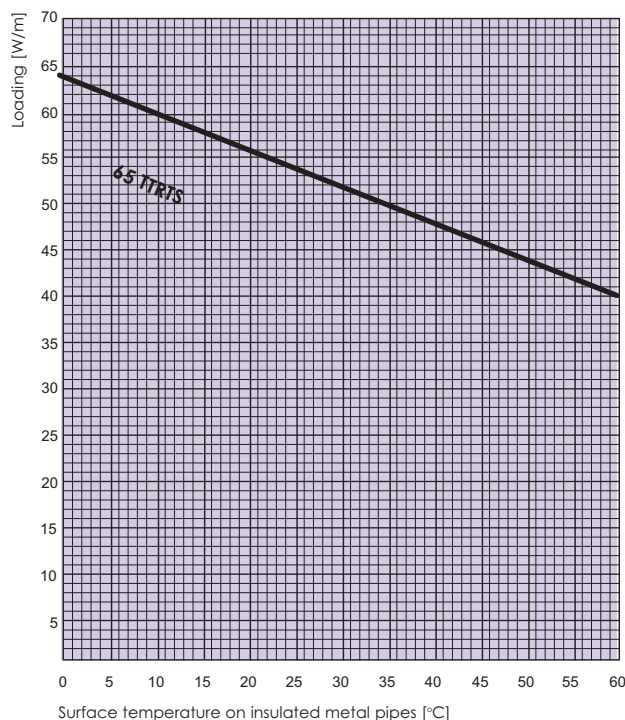
Thus, the heating power varies according to the temperature of the surface the heating tape is applied to.



### Technical Data:

Power output	65 W/m @0°C
Power output in concrete	90 W/m @0°C
Nominal voltage	230V
Maximum exposure temperature (unpowered)	120°C
Maximum operating temperature (powered)	120°C
Minimum bending radius	25mm
Minimum installation temperature	-30°C
Dimensions	10.4x4.5mm

### Temperature/Loading diagram TTRTS



Maximum recommended length of heating circuit:

Start-up temp. (°C)	Circuit Breaker (230V)		
	16A	20A	30A
65 TTRTS +10	50m	64m	
-25	38m	52m	64m

### Product Ordering Information

Power output + 65 TTRTS-Voltage-(Overjacket)  
Example with tinned copper braiding  
and thermoplastic jacket (230V):

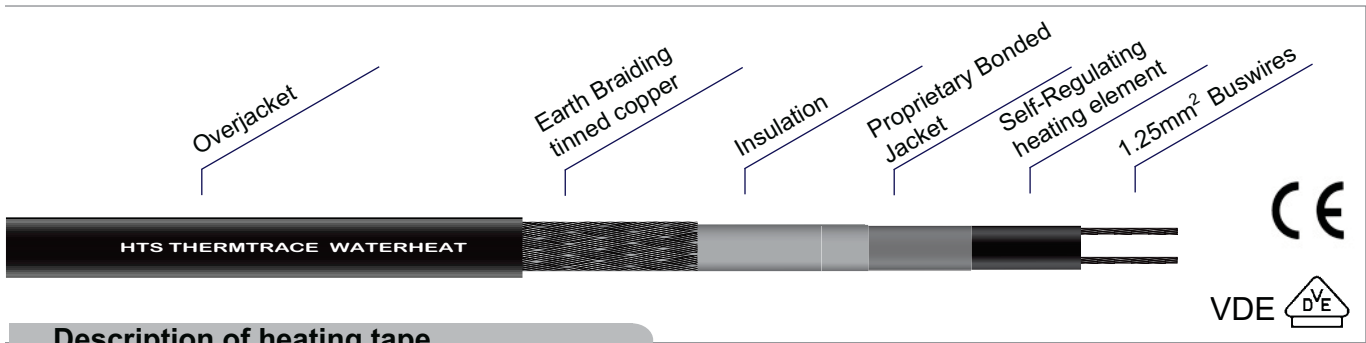
**65 TTRTS-2-BO**

\*Please note that TTRTS is only in 230V available

BO: tinned copper braiding and thermoplastic overjacket

# ThermTrace® WaterHeat Self-Regulating parallel heating tape

up to 85°C



## Description of heating tape

- Self-regulating
- 9 W/m @ 55°C or 12 W/m @ 60°C
- Cut-to-length

### Applications:

ThermTrace® WaterHeat is a construction grade self-regulating heating tape that may be used for temperature maintenance of hot water systems.

### Function:

Self-regulating heating tapes consist of two parallel buswires, embedded in a semi-conductive self-regulating matrix. This means that the heating cable automatically responds to changes in ambient conditions.

With increase in temperature, the synthetic material expands by molecular force, and the connections between the carbon particles diminish, reducing the load. Conversely, as the temperature decreases, the load increases as the connections between the carbon particles increases accordingly.

Thus, the heating power varies according to the temperature of the surface the heating tape is applied to.

Self-regulating heating tapes will not overheat or burnout - even when overlapped.

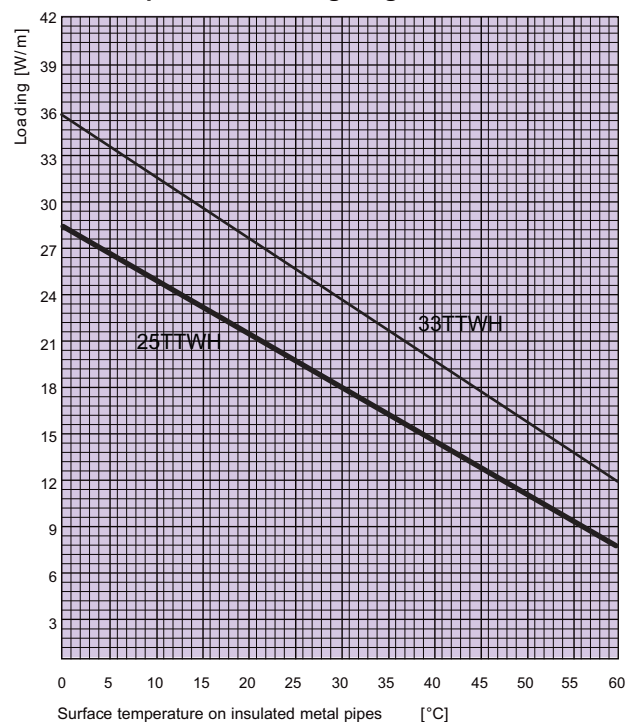
Maximum recommended length of heating circuit using Type-C circuit breakers:

Product Reference	Start up Temp.	Circuit Breaker		
		16A	20A	30A
25TTWH	+ 10°C	88m	117m	126m
33TTWH	+ 10°C	80m	90m	105m

### Technical Data:

Maximum exposure temperature (unpowered)	85°C
Intermittent, 1000 cumulative hours	
Maximum operating temperature (powered)	65°C
Nominal voltage	230V
	(120V available to order)
Minimum bending radius	25mm
Minimum installation temperature	-30°C
Maximum resistance of braid	18.2 Ohms/km

Temperature/Loading diagram WaterHeat



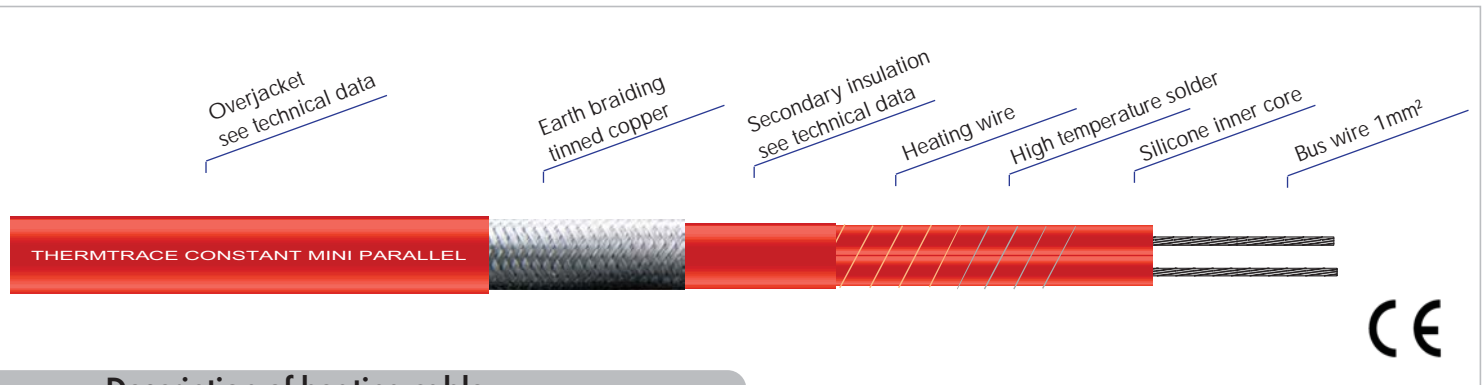
Name	Power Output on Insulated Metal Pipes at 10°C (W/m)	Power Output in typical application (W/m)	Earth Braid Description	Nominal Dimensions (mm)	Nominal Weight kg/100m
25TTWH-2-BO	25	9 W/m at 55°C	tinned copper	11.5 x 5.5	12
33TTWH-2-BO	33	12 W/m at 60°C	tinned copper	11.5 x 5.5	12

BO: Braid and thermoplastic overjacket



# ThermTrace® Constant Mini (TTCM) parallel heating tape

up to 225°C



## Description of heating cable

- *flexible.*
- *Tough.*
- *Braid offers a earth return and screen.*
- *Small in size (easy to fit under insulation).*
- *Are easy to test for ohms & Insulation Resistance.*
- *Has excellent water and UV resistance.*
- *Lead free solder used in the construction.*
- *Translucent core for ease of cutting.*
- *Light weight for ease of handling / carriage.*
- *Excellent temperature withstand range.*
- *Manufactured in nominal lengths of 500m.*

## Technical Data:

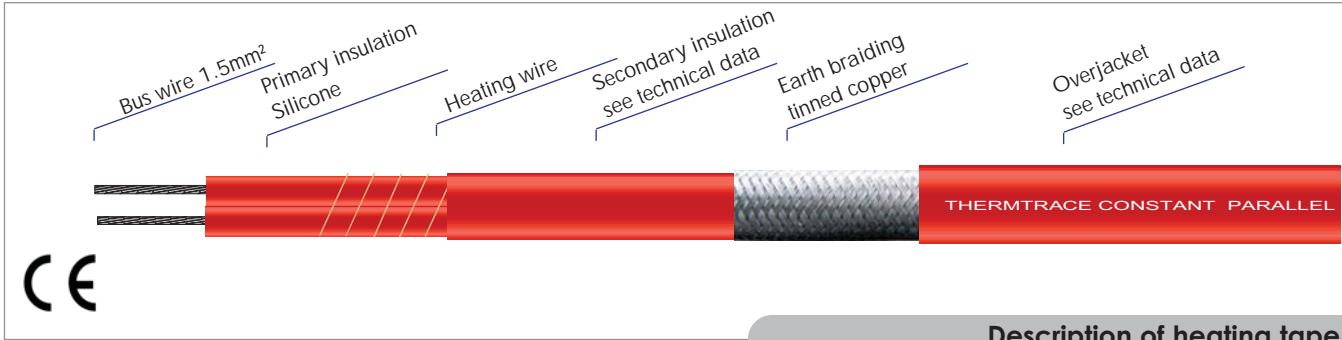
Bus wires	Tinned copper 1mm
Core	Translucent 80 Shore Silicone
Resistance element	80/20 NiCr
Solder	High temp., lead free
Primary insulation	80 Shore Silicone
Braiding	Tinned Copper
Outer insulation	80 Shore Silicone
Thickness	7.4mm
Width	11.4mm
Minimum installation temp.	-50°C
Maximum exposure temp.	+225°C
Minimal bending radius	25mm

TTCM Heating Tapes were designed for general and industrial applications not just frost protection, they are ideal for use in refrigeration applications, temperature maintenance of small pipe work, gutters and gully's, tanks or any application where the specifications are suitable.

230V TYPE	MAX LENGTH/ZONE LENGTH	110V TYPE	MAX LENGTH/ ZONE LENGTH
10 TTCM-2-BO	145m/1m	10 TTCM-1-BO	70m/1m
15 TTCM-2-BO	110m/1m	20 TTCM-1-BO	55m/1m
20 TTCM-2-BO	95m/1m		
30 TTCM-2-BO	78m/1m	Other wattages and voltages can be manufactured to order	
40 TTCM-2-BO	65m/1m		

up to 225°C

# ThermTrace® Constant (TTC) parallel heating tape



## Description of heating tape

- Connection at one end
- Full loading up to nominal temperature
- No connection cable required
- Cut to length
- Constant loading, whatever the length
- Highly flexible

TTC Heating tape is a industrial quality parallel circuit heating . The addition of the braid and silicone outer insulation makes this heating tape tough. TTC heating tape has been designed to be reliable in operation especially in arduous environments, the use of silicone rubber gives good flexibility and a excellent range of temperature withstand.

TTC can be used for many applications from frost protection to process heating temperature maintenance and temperature raising.

230V TYPE	MAX LENGTH/ZONE LENGTH	110V TYPE	MAX LENGTH/ ZONE LENGTH
10 TTC-2-BO	200m/1m	10 TTC-1-BO	95m/1m
15 TTC-2-BO	150m/1m	15 TTC-1-BO	84m/1m
20 TTC-2-BO	130m/1m	20 TTC-1-BO	73m/1m
30 TTC-2-BO	115m/1m	30 TTC-1-BO	62m/1m
40 TTC-2-BO	100m/1m	40 TTC-1-BO	50m/1m
50 TTC-2-BO	85m/1m	50 TTC-1-BO	42m/1m

## SPECIFICATION

Bus wires	Tinned Copper 1.5mm
Core	80 Shore Silicone Rubber Translucent
Resistance Element	80/20 Nickel/Chrome
Solder	High Temperature Lead Free
Outer Insulation (Both)	80 Shore Silicone Rubber Red & Translucent
Braid	Tinned Copper
Thickness	8.8 mm
Width	12.5 mm
Minimum Temperature	-50°C
Maximum Temperature	+225°C

## Function

Two Tinned Copper Bus wires (1.5mm<sup>2</sup>) are extruded into a Silicone Rubber Core, at a precise distance a Notch is automatically cut into the Silicone Rubber to expose the Tinned Copper Bus wires.

A Resistance Wire Heating Element is wrapped around the Core, this is Soldered to the Tinned Copper Bus wires with a High Temperature Lead Free Solder and Non Corrosive Flux.

A Silicone Rubber inner Insulation is extruded over the completed Core, a Tinned Copper Braid is added. Over this Silicone outer Insulation is extruded.

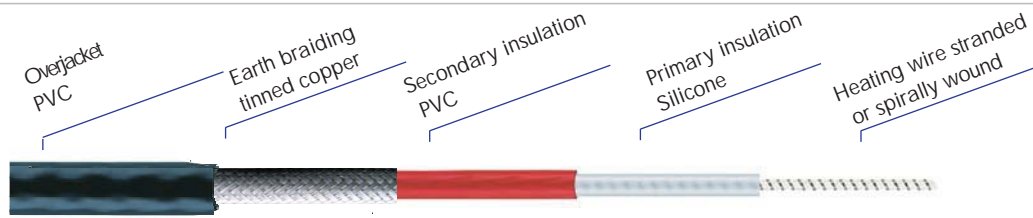


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# Xenius® Regular (XR) Heating cable

up to 80°C



## Description of heating cable

- Economical frost protection of pipes, gutters and floorheating
- For applications in pipes and wet rooms
- Designed for use in screed and concrete

### Technical Data

Primary insulation . . . . . Silicone  
 Secondary insulation . . . . . PVC  
 Earth braiding. . . . . tinned copper  
 Overjacket . . . . . PVC

Nominal temperature . . . . . 90 °C  
 Nominal voltage . . . . . 300/500 V

Max. loading. . . . . 25 W/m  
 Max. operating temperature 80°C  
 Min. bending radius. . . . . 25 mm  
 Min. installation temperature. . . . . 0 °C

### Standards

Manufactured according to DIN VDE 0253  
 Test procedure acc. to . . . . 3000VAC

Item	Resistance [Ω/m]
XR 0.14	0.14
XR 0.18	0.18
XR 0.2	0.2
XR 0.25	0.25
XR 0.36	0.36
XR 0.45	0.45
XR 0.52	0.52
XR 0.65	0.65
XR 0.8	0.8
XR 0.86	0.86
XR 1.0	1.0
XR 1.3	1.3
XR 1.47	1.47
XR 1.9	1.9
XR 2.1	2.1
XR 2.5	2.5
XR 2.9	2.9
XR 4.0	4.0
XR 12	12.0
XR 18	18.0
XR 40	40.0

### Product Ordering Information

XR + overjacket + resistance  
 Example with PVC overjacket and 40 Ohm/m  
**XR-BO 40.0**  
 Example with braiding only and 0.14 Ohm/m  
**XR-B 0.14**  
 B: tinned copper braiding  
 BO: tinned copper braiding and overjacket



# HTS Kits and Accessories

## Standard kits and accessories

Product	Description	For use with HTS Type
ThermConnect TC-1	Shrink sleeve connection and end-termination kit	TTM
ThermConnect TC-2	Shrink sleeve connection and end-termination kit	TTL, TTR, TTGH, TTGHL, TTWH, TTRTS
ThermConnect TC-S	Shrink sleeve connection for high temperatures	TTS
ThermConnect TC-S-END	End seal for high temperatures	TTS
Junction Box	Junction Box for use with ThermConnect	TTM, TTL, TTR, TTS, TTGH, TTGHL, TTRTS, TTWH
Mounting Bracket	Horizontal Mounting Bracket incl. Screws for Junction Box	TTM, TTL, TTR, TTS, TTGH, TTGHL, TTRTS, TTWH
Insulation Entry Kit	Insulation Entry kit for use with ThermConnect	TTM, TTL, TTR, TTS, TTGH, TTGHL, TTRTS, TTWH
ThermConnect TC-TTC	Silicone sealant termination kit including end termination	TTC, TTCM
ThermTwist B-C	Quick connection kit	TTR, TTWH
ThermTwist B-E	End seal for ThermTwist	TTR, TTWH
ThermTwist B-S	Quick connection kit for power connection including power cable and end seal	TTR, TTWH
ThermTwist B-A	Quick connection kit for power connection including power cable	TTR, TTWH
ThermTwist B-T	Quick connection kit for T-connection including end seal	TTR, TTWH

## Hazardous area kits and accessories

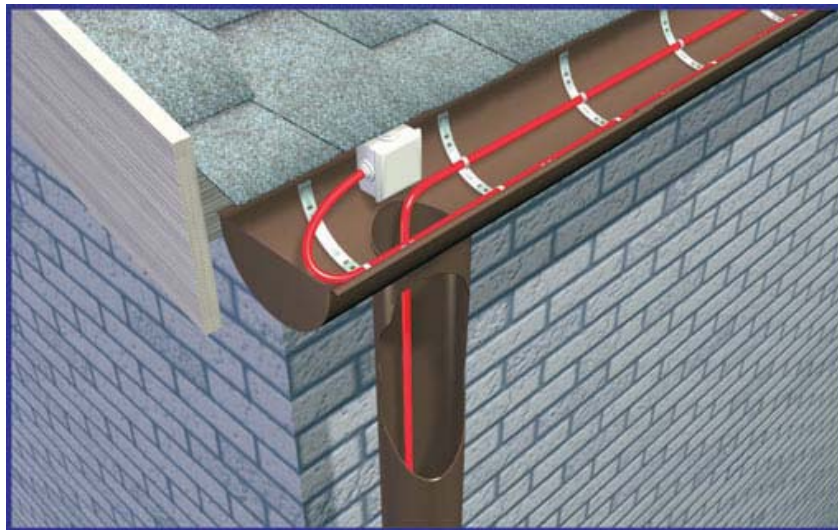
Product	Description	For use with HTS type	Type of Ex Approval
ThermConnect Ex TTR	Ex-Shrink sleeve connection kit including end-termination	TTR	ATEX
ThermConnect Ex TTS	Ex-Shrink sleeve connection kit including end-termination	TTS	ATEX
Junction Box Ex-1	Ex-Junction Box for connection of 1 heating cable	TTR, TTS	ATEX
Junction Box Ex-2	Ex-Junction Box for connection of 2 heating cables	TTR, TTS	ATEX
ThermConnect TTX	Connection kit with stand-off bracket including junction box	TTX	FM
End Seal TTX	End Seal	TTX	FM





***Trace Heating Systems Serving  
Your Industrial and  
Domestic Requirements***

## **Roof and Gutter De-icing System**





# Roof and Gutter De-icing System

Gutters, roofs, and fall pipes are in danger by snowfall and long periods of cold weather. By exposure to the sun the snow melts and then the melted snow runs from the roof into cold gutters and fall pipes. The water freezes as the ambient temperature drops, forming ice layers that will build up and block the flow.

This will result that the gutters break off, or the fall pipes crack, or that unseen problems may occur. In addition to this ice-cicles may form, break off and cause damages to vehicles, plants or even injure people. Expensive structural damage may occur to outer walls, plaster and roof tiles when the water builds up on these and freezes.

UV resistant self-regulating heating tapes are use in order to prevent this from happening. Due to the characteristics of these tapes the heating output adjusts in accordance to the ambient temperature. In ice water and snow the power output of the cables is maximized. As the snow and ice melts the power output reduces somewhat until the cable has dried. As the temperature raises, the power output will sink gradually further.

Should there be colder positions, such as shaded positions that don't melt or heat up as quickly as others that may have sunlight, these positions of the heating tape will continue to provide more power output. It acts then like a heating circuit within a heating circuit.

HTS may provide the solution for your gutter or roof de-icing needs. The cut-to-length self-regulating heating cables, ThermTrace Gutter Heat Lite (TTGHL) and ThermTrace Gutter Heat (TTGH), are some of the best produced self-regulating heating tapes that are available on the Market. The UV resistance TPE over-jacket protects from the harmful sunlight, providing long years of use.

These heating tapes are safe, reliable, maintenance free and save money through reduced energy consumption. Energy is only expended when it is needed, for example when snow or ice is present. Over-heating does not occur when using self-regulating heating tapes and may even be installed in plastic gutters and fall pipes.

The design may however not be used to keep ice or snow from falling from the roof, but to prevent dams produced by frozen melt water on the roof and to keep ice in the gutters and fall pipes from blocking the flow. It is recommended that snow fences be used on the roof to prevent snow movement.



## ThermTrace®GutterHeat Lite (TTGHL)

Nominal Voltage:	230V
Min.bending radius:	25mm
Dimensions:	10,5 x 6,0mm
Max.exposure temp:	85°C unpowered 65°C powered
Min.Installation temp:	-30°C

Power Output	Max. Installation length (16A)
40 W/m ice water	50m
25W/m @ 0°C in air	90m
23W/m @ 5°C on pipe	110m

## ThermTrace®GutterHeat (TTGH)

Nominal Voltage:	230V
Min.bending radius:	25mm
Dimensions:	11,5 x 5,5mm
Max.exposure temp:	85°C unpowered 65°C powered
Min.Installation temp:	-30°C

Power Output	Max. Installation length (16A)
55 W/m ice water	35m
28W/m @ 0°C in air	77m
25W/m @ 10°C on pipe	88m

**\* Please note that information of this publication are subject to change without notice!**



# Roof and Gutter De-icing System

## Engineering and Design

### Gutter and Fall Pipe Design:

Determine the required heating tape length:

Length of gutter (2xlength by more than 300mm width.) \_\_\_\_\_m

+ Length of fall pipe \_\_\_\_\_m

+ 1m x each fall pipe \_\_\_\_\_m

+ 1m per outlet feeding internal gutters \_\_\_\_\_m

+ 0,25m for each power connection \_\_\_\_\_m

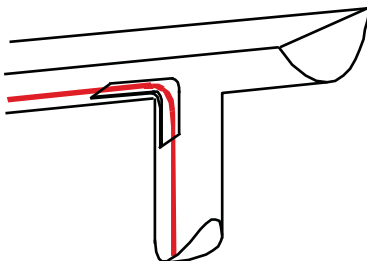
+ 1,0m per splice \_\_\_\_\_m

+ 2,5% allowance for cutting, wastage, etc. \_\_\_\_\_m

**TOTAL CABLE LENGTH** \_\_\_\_\_m

Installation Notes:

- The double amount of heating tape is necessary by installation above 2000m Sea Level.
- The distance between the heating tapes in shed gutters is 120mm.
- Special requirements are necessary by long fall pipes due to the weight of the heating tape.



### Roof Design:

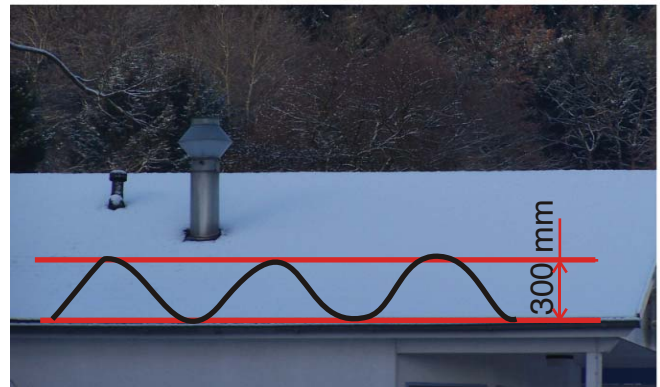
Determine the required heating tape length:

The ThermTrace GutterHeat self-regulating tapes are to be laid in a zig-zag fashion at least 300mm above the outer building wall level or 100mm above the snow fence, whichever is higher, and extended down to the gutter. This ensures a continuous run off for melted water.

General installation length requirements

Roof size in sqm. X multiplications factor = heater length in m

Height over Sea Level	Multiplications factor
700	3
1000	4
1500	5
2000	6
Over 2000	7





Trace Heating Systems Serving  
Your Industrial and  
Domestic Requirements

## Snow and Ice Melting



## Self-Regulating RampTrace



# Self-Regulating Snow and Ice Melting

Snow and ice on walkways, ramps, stairs, bridges and asphalt may cause restrictions in their usage and danger for pedestrians and vehicles. A person could slip out on your sidewalk and you are faced with a law suit or your garage driveway has a large slope that causes problems, by snow and ice, to leave or enter the garage without damaging the vehicle.

Most of the residences do not have a janitor or other person to clear these areas while at work or on vacation and clearing the areas of snow and ice is a waste of expenses and time consumption.

When using our self-regulating ThermTrace® Ramp-Trace these are a problem of the past. The embedding of RampTrace in concrete and under asphalt helps to ensure that the desired electrical heated area remains clear of snow and ice.

Due to the self-regulating characteristic of Ramp-Trace, the electrical heating applies heating only when necessary and prevents ice from forming on cold surfaces and melts the snow as it falls. It is an efficient, permanent and cost relative method of ensuring access to these areas without using chemicals and salts that cause environmental damages.

Self-regulating heating tapes consist of two parallel buswires, embedded semi-conductive self-regulating matrix. This means that the heating cable automatically responds to changes in ambient conditions.

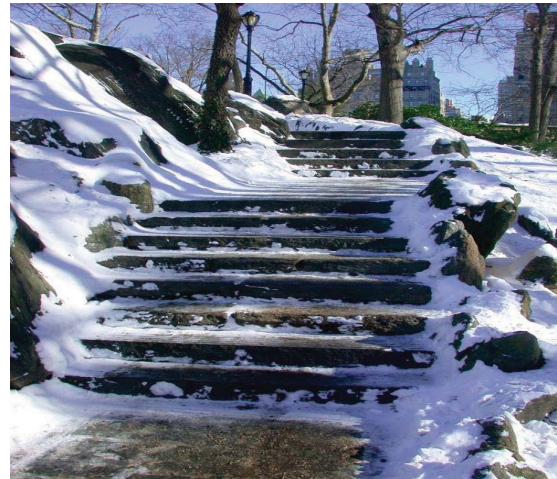
With increase in temperature, the synthetic material expands by molecular force, and the connections between the carbon particles diminish, reducing the load. Conversely, as the temperature decreases, so the load increases as the connections between the carbon particles increases accordingly.

Thus, the heating power varies according to the temperature of the surface the heating tape is applied to.

Self-regulating heating tapes will not over-heat or burnout - even when overlapped or when a air pocket is present in the concrete.

The heating cable is designed for domestic and commercial applications and does not require any special knowledge. The heating cable should however be tested and connected to the network according to local and electrical standards by certified electricians.

RampTrace is cut-to-length from the reel so that shorter or longer circuits may be installed according to need and to prevent material wastage. Attention is to be paid to the maximal circuit lengths.



### Heat loss calculation:

General Heat losses depending on weather conditions. These value are experience values.

- Very severe weather (Russia).....250 - 350 W/sq.m
- Severe weather (Germany).....200 - 300 W/sq.m
- Mild weather (UK).....150 - 250 W/sq.m

### Determine the installation spacing between cables:

- In concrete.....300mm
- In sand bed.....250mm

### Determine the necessary cable length:

Driveways and sidewalks

$$\frac{\text{Surface area to be heated}}{\text{Heater cable spacing}} \times 1000$$

Stairways

$$\text{no. stairs} \times 2 \times (\text{width(m)} + 0.5)$$

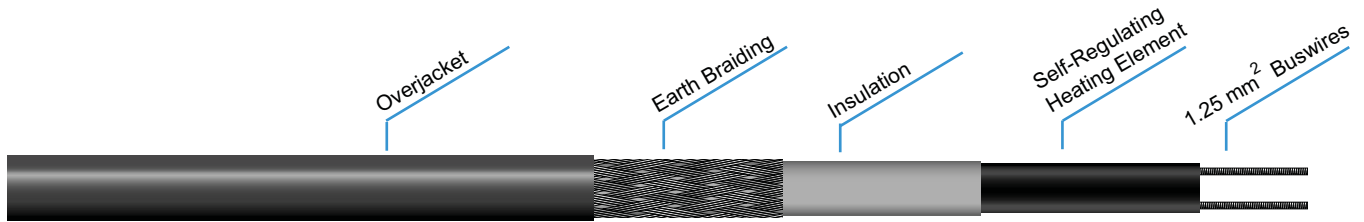
Calculated length from above + 1m for connections.

### Choose circuit breaker according to length and start-up temperature.

**\*Please note that information of this publication are subject to change without notice!**

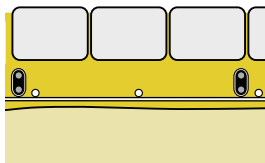


# Self-Regulating Snow and Ice Melting

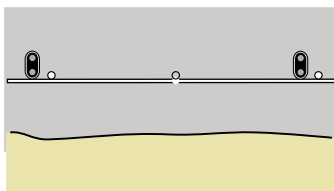


## Surface finishes:

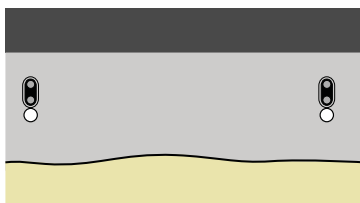
Where paving blocks are used, the heaters may be placed 20-30mm below these in sand.



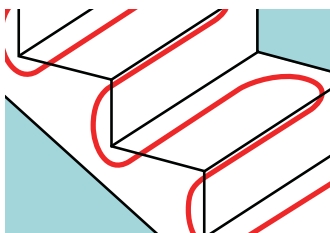
The heaters are embedded 50-70mm below the surface when placed in concrete.



The heaters are embedded 20 mm under the concrete surface under asphalt. The self-regulating heaters may not be placed in the asphalt due to temperature.



The heaters are to be placed 50mm in and 50mm deep from the stair edges.



An additional 20% loading is recommended for heat losses to bottom for suspended bridges, stairways and ramps. Consideration should be made to compensate the heat losses to bottom by installing thermal insulation.

## Technical data ThermTrace RampTrace Super:

Power output	65 W/m @0°C
Power output in concrete	90 W/m @0°C
Nominal voltage	230V
Maximal exposure temperature (unpowered)	120°C
Maximal exposure temperature (powered)	120°C
Maximal bending radius	25mm
Minimum installation temperature	-30°C
Dimensions	10.4x4.5mm





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