

Electrical heating cable for freeze protection or temperature maintenance.

## **FREEZSTOP MICRO** Self-Regulating Heating Cable

- Automatically adjusts heat output in response to increasing or decreasing pipe temperature.
- Can be cut-to-length.
- Inherently temperature safe.
- Suitable for use in safe, hazardous and corrosive areas.
- Available up to 227VAC.
- Full range of controls and accessories available.

### DESCRIPTION

FREEZSTOP MICRO is an industrial grade self-regulating heating cable that can be used for freeze protection or temperature maintenance of pipework and vessels.

It is particularly suited to small diameter pipes and instrument tubing such as impulse or analyser lines.

It can be cut-to-length at site and exact piping lengths can be matched without any complicated design considerations.

FREEZSTOP MICRO is approved for use in non-hazardous and hazardous areas to world wide standards.

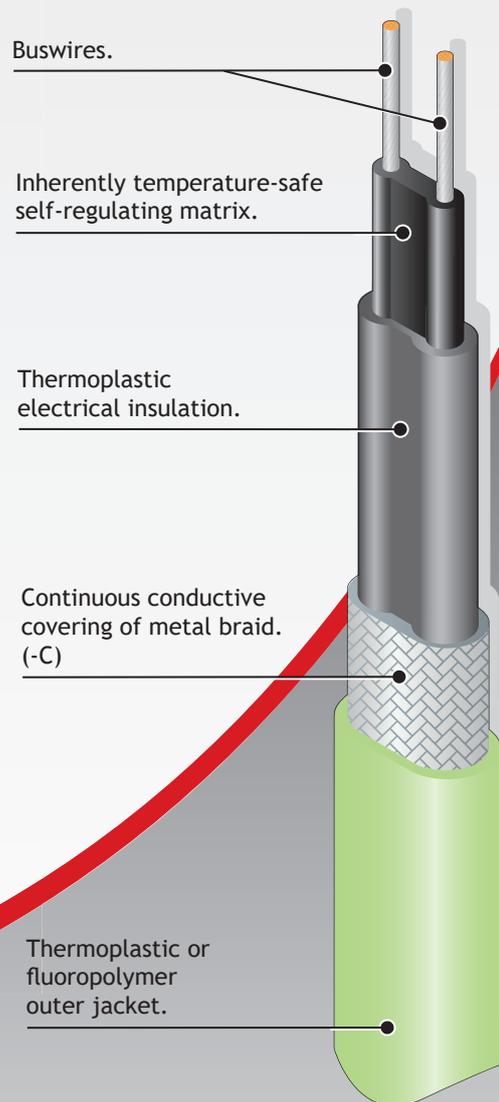
Its self-regulating characteristics improve safety and reliability. FREEZSTOP MICRO will not overheat or burnout, even when overlapped upon itself. Its power output is self-regulated in response to the pipe temperature.

The installation of FREEZSTOP MICRO is quick and simple and requires no special skills or tools. Termination, splicing and power connection components are all provided in convenient kits.

### INHERENTLY TEMPERATURE-SAFE

“ The inherent ability to self-regulate at a temperature level below the maximum product rating and withstand temperature of the insulating materials, without the need for temperature control.”

Other manufacturers self-regulating products are typically limited to a maximum energised temperature, typically 65°C at which point, their retained power output prevent the cable from self-regulating at its own limiting temperatures. All such products require temperature control to ensure their own temperature safety.



FSM-CF is supplied with a black fluoropolymer outer-jacket.



## SPECIFICATION

**MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE (Power ON):** 65°C (149°F)

**MAXIMUM PERMISSIBLE EXPOSURE TEMPERATURE (Power OFF):** 85°C (185°F)

**MINIMUM OPERATING TEMPERATURE:** -65°C\* (-85°F)

**MINIMUM INSTALLATION TEMPERATURE:** -40°C (-40°F)

**POWER SUPPLY:** 12 - 277V AC

**TEMPERATURE CLASSIFICATION:** T6 (85°C)

**MAXIMUM RESISTANCE OF PROTECTIVE BRAIDING:** 18.2 Ohm/km

**INGRESS PROTECTION:** IP67

### WEIGHTS & DIMENSIONS:

Type Ref	Dimensions (mm) +/-0.5	Weight kg/100m	Min Bending radius	Gland Size
FSM-C	9.3 x 4.7	7.4	30mm	M20
FSM-CT	10.5 x 5.9	9.3	35mm	M20
FSM-CF	10.2 x 5.6	10.2	35mm	M20

### APPROVAL DETAILS:

ATEX - Sira 02ATEX3075  
 IECEx - SIR 11.0128  
 FM - 3009080  
 CSA - 1295278, 1547590  
 EAC\* - TC RU C-GB.MIO62.B.06041  
 Japanese - CML 17JPN3005X 1 to 2

### ORDERING INFORMATION:

Example:

Output 17W/m at 5°C \_\_\_\_\_ **17 FSM 2 - C T**  
 FREEZSTOP MICRO \_\_\_\_\_  
 Supply Voltage 220 - 277V AC \_\_\_\_\_  
 Metal Braid \_\_\_\_\_  
 Thermoplastic Outerjacket \_\_\_\_\_

### ACCESSORIES:

Heat Trace supply a complete range of accessories including termination/splice kits, end seals, junction boxes and controls. Such items carry separate approvals from the heating cables. Use only approved components, as per system certification.

### ATEX & IECEx MARKINGS:

Ⓔ II 2GD  
 Ex e IIC T6 Gb  
 Ex tb IIIC T85°C Db

EN 60079-0:2009  
 EN 60079-30-1:2007  
 IEC 60079-31:2008

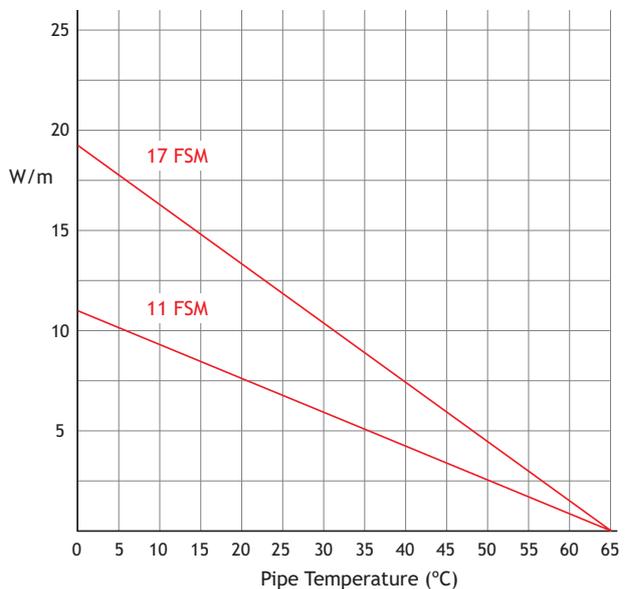
**MAXIMUM LENGTH (m) vs. CIRCUIT BREAKER SIZE:**  
 The following circuit details relate specifically to the trace heating of pipework and equipment. For any other application consult Heat Trace.

Cat. Reference	Start-up Temperature	230V			
		6A	10A	16A	20A
11FSM	5°C	76	126	128	-
	0°C	70	118	128	-
	-20°C	46	78	124	128
	-40°C	36	60	96	120
17FSM	5°C	54	88	102	-
	0°C	50	84	102	-
	-20°C	34	56	88	102
	-40°C	26	42	68	86

Residential buildings	Commercial buildings	Industry and Infrastructure
MCB's certified IEC 60898-1	MCB's certified according both IEC 60898-1 & IEC 60947-2	

### THERMAL RATINGS:

Nominal output at 230V when FSM is installed on insulated metallic pipes and as outlined in the procedures within IEC62395 and IEC60079-30.  
 Note: Please refer to Evolution for more precise power output values as a function of pipe temperature.



### FURTHER INFORMATION:

Please consult the appropriate termination instructions and the Heat Trace Design, Installation, & Maintenance Manual (HTDIMM 010) for further details.

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Electrical heating cable for freeze protection or temperature maintenance.

## FREEZSTOP REGULAR

Self-Regulating Heating Cable

- Automatically adjusts heat output in response to increasing or decreasing pipe temperature.
- Can be cut-to-length.
- Inherently temperature safe.
- Suitable for use in safe, hazardous and corrosive areas.
- Available up to 227VAC.
- Full range of controls and accessories available.

### DESCRIPTION

FREEZSTOP REGULAR is an industrial grade, self-regulating heating cable that can be used for freeze protection or temperature maintenance to 85°C.

It can be cut-to-length on site and exact piping lengths can be matched without any complicated design considerations.

FREEZSTOP REGULAR is approved for use in non-hazardous, hazardous and corrosive environments to world wide standards.

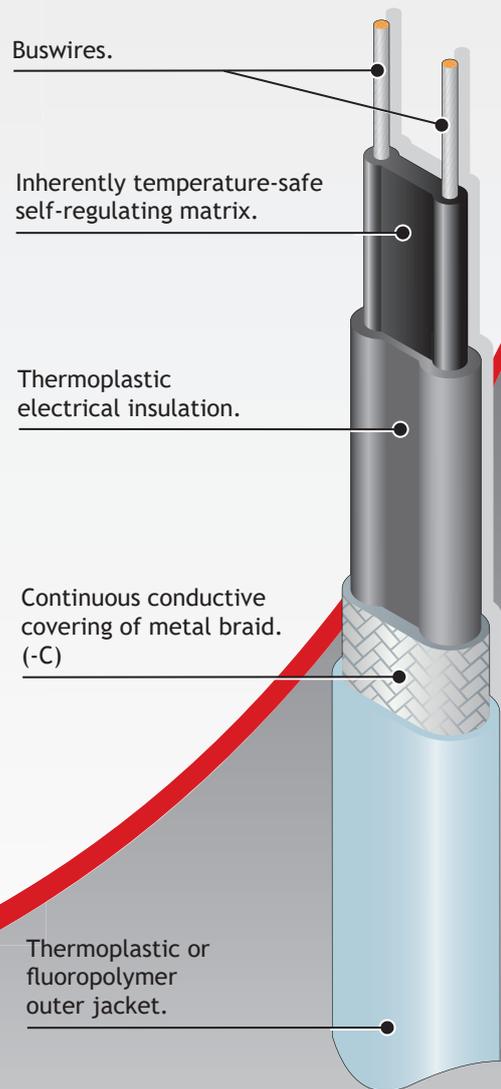
Its self-regulating characteristics improve safety and reliability. FREEZSTOP REGULAR will not overheat or burnout, even when overlapped upon itself. Its power output is self-regulated in response to the pipe temperature.

The installation of FREEZSTOP REGULAR is quick and simple and requires no special skills or tools. Termination, splicing and power connection components are all provided in convenient kits.

### INHERENTLY TEMPERATURE-SAFE

“ The inherent ability to self-regulate at a temperature level below the maximum product rating and withstand temperature of the insulating materials, without the need for temperature control.”

Other manufacturers self-regulating products are typically limited to a maximum energised temperature, typically 65°C at which point, their retained power output prevent the cable from self-regulating at its own limiting temperatures. All such products require temperature control to ensure their own temperature safety.



FSR-CF is supplied with a black fluoropolymer outer-jacket.



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## SPECIFICATION

**MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE (Power ON):** 85°C (185°F)

**MAXIMUM PERMISSIBLE EXPOSURE TEMPERATURE (Power OFF):** 85°C (185°F)

**MINIMUM OPERATING TEMPERATURE:** -65°C\* (-85°F)

**MINIMUM INSTALLATION TEMPERATURE:** -40°C (-40°F)

**POWER SUPPLY:** 12 - 277V AC

**TEMPERATURE CLASSIFICATION:**  
 up to 40W/m @ nom voltage - T6 (85°C)  
 up to 31W/m @ nom 230V powered to 277V - T6 (85°C)  
 >40W/m @ nom voltage - T4 (135°C)  
 >31W/m @ nom 230V powered up to 277V - T4 (135°C)

**MAXIMUM RESISTANCE OF PROTECTIVE BRAIDING:** 18.2 Ohm/km

**INGRESS PROTECTION** IP67

### WEIGHTS & DIMENSIONS:

Type Ref	Dimensions (mm) +/-0.5	Weight kg/100m	Min Bend radius	Gland Size
FSR..C	11.75 x 4.75	9.5	30mm	M20
FSR..CT	12.95 x 5.95	12.9	35mm	M20
FSR..CF	12.65 x 5.65	14.8	35mm	M20

### APPROVAL DETAILS:

ATEX - Sira 02ATEX3070  
 IECEX - SIR 11.0121  
 FM - 3009080  
 VDE - 114665  
 CSA - 1295278, 1547590  
 EAC\* - TC RU C-GB.MIO62.B.06041  
 DNV-GL - TAE0000272  
 Japanese - CML 16JPN3355X 1 to 4  
 CNEX - CNEx19.1555U

### ORDERING INFORMATION:

Example: **17 FSR 2 - C T**  
 Output 17W/m at 10°C \_\_\_\_\_  
 FREEZSTOP REGULAR \_\_\_\_\_  
 Supply Voltage 220 - 277V AC \_\_\_\_\_  
 Metal Braid \_\_\_\_\_  
 Thermoplastic Outerjacket \_\_\_\_\_

### ATEX & IECEX MARKINGS:

Ⓔ II 2GD  
 Ex e IIC T6 Gb  
 Ex tb IIC T85°C Db  
 Ex e IIC T4 Gb  
 Ex tb IIIC T135°C Db

EN 60079-0:2009  
 EN 60079-30-1:2007  
 IEC 60079-31:2008

### MAXIMUM LENGTH (m) vs. CIRCUIT BREAKER SIZE:

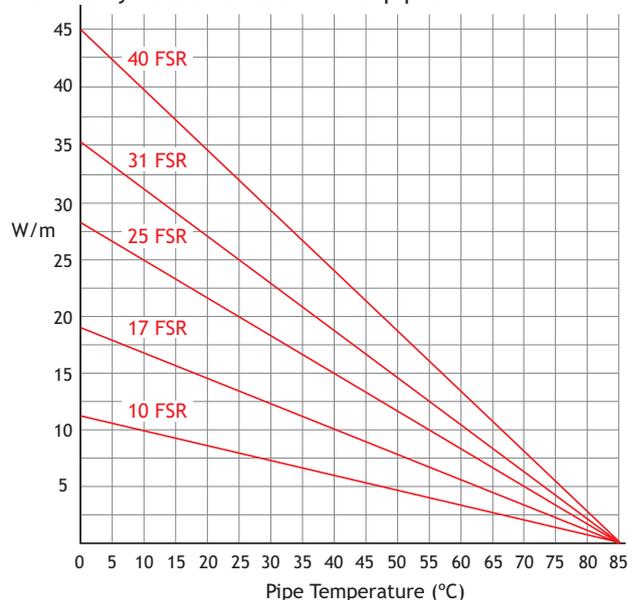
The following circuit details relate specifically to the trace heating of pipework and equipment. For any other application consult Heat Trace.

Cat Reference	Start-up Temperature	230V			
		10A	16A	20A	32A
10FSR	10°C	136	198	198	198
	0°C	122	188	188	188
	-20°C	108	174	176	176
	-40°C	96	154	166	166
17FSR	10°C	92	148	152	152
	0°C	84	134	144	144
	-20°C	74	118	136	136
	-40°C	66	106	128	128
25FSR	10°C	74	118	124	124
	0°C	68	108	120	120
	-20°C	60	94	112	112
	-40°C	52	84	106	106
31FSR	10°C	58	92	112	112
	0°C	52	84	104	106
	-20°C	46	74	92	100
	-40°C	42	66	82	94
40FSR	10°C	46	74	92	98
	0°C	42	66	84	94
	-20°C	36	58	74	88
	-40°C	32	52	66	84

Residential buildings	Commercial buildings	Industry and Infrastructure
MCB's certified IEC 60898-1	MCB's certified according both IEC 60898-1 & IEC 60947-2	

### THERMAL RATINGS:

Nominal output at 115V or 230V when FSR is installed on thermally insulated carbon steel pipes.



### FURTHER INFORMATION:

Please consult the appropriate termination instructions and the Heat Trace Design, Installation & Maintenance Manual (HTDIMM 010) for further details.

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Electrical heating cable for freeze protection or temperature maintenance.

## FREEZSTOP EXTRA Self-Regulating Heating Cable

- Automatically adjusts heat output in response to increasing or decreasing pipe temperature.
- Can be cut-to-length.
- Inherently temperature safe.
- Suitable for use in safe, hazardous and corrosive areas.
- Available up to 227VAC.
- Full range of controls and accessories available.

### DESCRIPTION

FREEZSTOP EXTRA is an industrial grade, self-regulating heating cable that can be used for freeze protection or temperature maintenance to 100°C.

It can be cut-to-length on site and exact piping lengths can be matched without any complicated design considerations.

FREEZSTOP EXTRA is approved for use in non-hazardous, hazardous and corrosive environments to world wide standards.

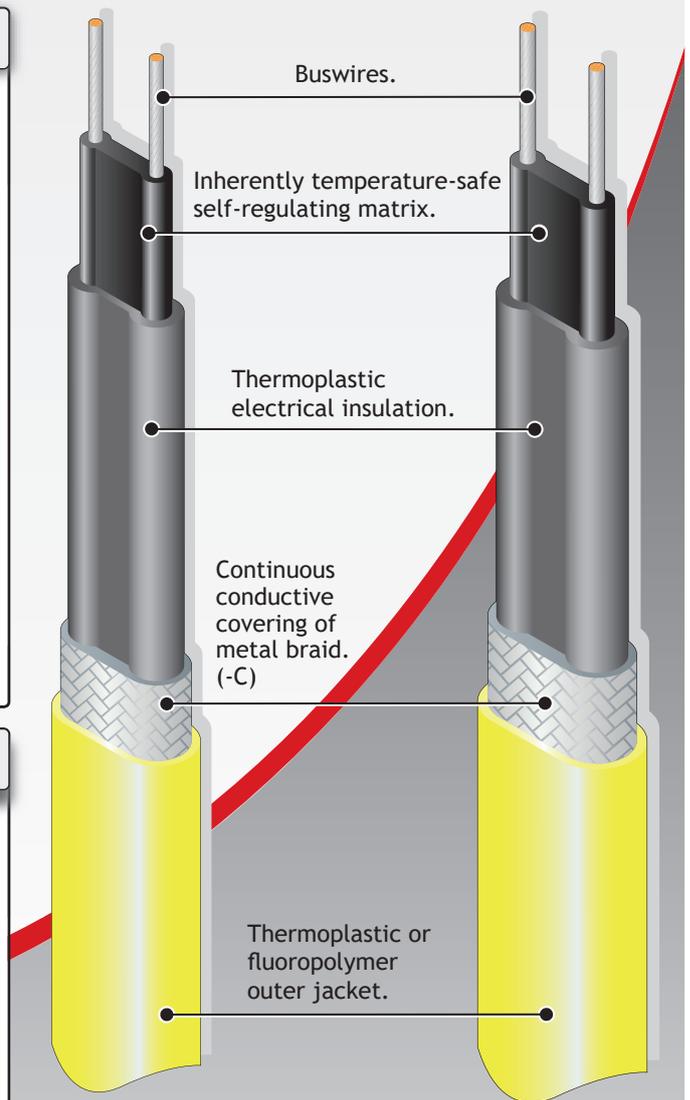
Its self-regulating characteristics improve safety and reliability. FREEZSTOP EXTRA will not overheat or burnout, even when overlapped upon itself. Its power output is self-regulated in response to the pipe temperature.

The installation of FREEZSTOP EXTRA is quick and simple and requires no special skills or tools. Termination, splicing and power connection components are all provided in convenient kits.

### INHERENTLY TEMPERATURE-SAFE

“The inherent ability to self-regulate at a temperature level below the maximum product rating and withstand temperature of the insulating materials, without the need for temperature control.”

Other manufacturers self-regulating products are typically limited to a maximum energised temperature, typically 65°C at which point, their retained power output prevent the cable from self-regulating at its own limiting temperatures. All such products require temperature control to ensure their own temperature safety.



FSE

FSEw

*FSE-CF & FSEw-CF are supplied with a black fluoropolymer outer-jacket.*



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## SPECIFICATION

### MAXIMUM CONTINUOUS EXPOSURE

TEMPERATURE (Power ON): 100°C (212°F)

### MAXIMUM PERMISSIBLE EXPOSURE

TEMPERATURE (Power OFF): 100°C (212°F)

### MINIMUM OPERATING

TEMPERATURE: -65°C\* (-85°F)

### MINIMUM INSTALLATION

TEMPERATURE: -40°C (-40°F)

POWER SUPPLY: 12 - 277V AC

### TEMPERATURE CLASSIFICATION:

up to 45W/m @ nom voltage - T4 (135°C)  
>45W/m @ nom 230V powered to 277V - T3 (200°C)

### MAXIMUM RESISTANCE

OF PROTECTIVE BRAIDING: 18.2 Ohm/km

### INGRESS PROTECTION:

IP67

### WEIGHTS & DIMENSIONS:

Type Ref	Dimensions (mm) +/-0.5	Weight kg/100m	Min Bend radius	Gland Size
FSE..C	11.5 x 4.75	9.5	30mm	M20
FSE..CT	12.7 x 5.95	12.4	35mm	M20
FSE..CF	12.4 x 5.65	13.2	35mm	M20
FSEw..C	14.2 x 5.3	12.9	30mm	M20
FSEw..CT	15.4 x 6.5	17.0	40mm	M25
FSEw..CF	15.1 x 6.2	16.6	40mm	M25

### APPROVAL DETAILS:

ATEX - FSE: Sira 02ATEX3076  
FSEw: Sira 12ATEX3114

IECEX - FSE: SIR 11.0126  
FSEw: SIR 11.0127

DNV-GL - TAE00002KA

EAC\* - TC RU C-GB.M062.B.06041

Japanese - FSE - CML 17JPN3004X 1 to 2

CNEx - FSE + FSEw - CNEx19.1552U

### ORDERING INFORMATION:

Example:

Output 45W/m at 10°C \_\_\_\_\_ 45 FSEw 2 - C T  
FREEZSTOP EXTRA WIDE \_\_\_\_\_  
Supply Voltage 220 - 277V AC \_\_\_\_\_  
Metal Braid \_\_\_\_\_  
Thermoplastic Outerjacket \_\_\_\_\_

### ATEX & IECEX MARKINGS:

II 2GD  
Ex e IIC T4 Gb  
FSE Ex tb IIIC T135°C Db  
EN 60079-0:2009  
EN 60079-30-1:2007, IEC 60079-31:2008

II 2GD  
Ex e IIC T4 Gb  
FSEw Ex tb IIIC T135°C Db  
Ex e IIC T3 Gb  
Ex tb IIIC T200°C Db  
EN 60079-0:2009  
EN 60079-30-1:2007, IEC 60079-31:2008

### MAXIMUM LENGTH (m) vs. CIRCUIT BREAKER SIZE:

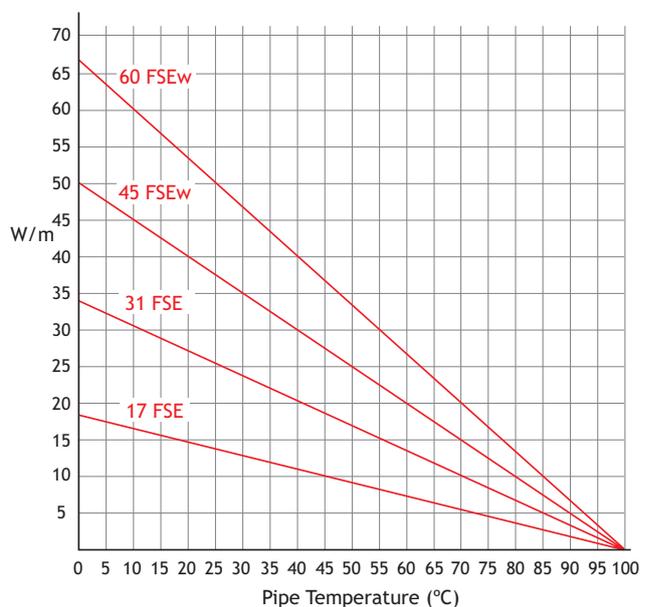
The following circuit details relate specifically to the trace heating of pipework and equipment. For any other application consult Heat Trace.

Cat Reference	Start-up Temperature	230V				
		6A	10A	16A	20A	25A
17FSE	10°C	46	76	120	148	-
	0°C	36	62	98	122	148
	-20°C	24	42	66	82	102
	-40°C	16	28	44	56	68
31FSE	10°C	32	52	82	104	110
	0°C	26	42	68	84	106
	-20°C	16	28	46	56	70
	-40°C	12	18	30	38	48
45FSEw	10°C	24	38	62	76	96
	0°C	20	32	50	64	80
	-20°C	12	22	34	42	52
	-40°C	8	14	22	28	34
60FSEw	10°C	20	35	52	66	82
	0°C	16	28	44	56	70
	-20°C	12	20	32	40	50
	-40°C	8	14	22	28	34

Residential buildings	Commercial buildings	Industry and Infrastructure
MCB's certified IEC 60898-1	MCB's certified according both IEC 60898-1 & IEC 60947-2	

### THERMAL RATINGS:

Nominal output at 115V or 230V when FSE is installed on thermally insulated carbon steel pipes.



### FURTHER INFORMATION:

Please consult the appropriate termination instructions and the Heat Trace Design, Installation & Maintenance Manual (HTDIMM 010) for further details.

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Roof and gutter protection from snow and ice build up.

## G-TRACE Self-Regulating Heating Cable

- Automatically adjusts heat output in response to increasing or decreasing pipe temperature.
- Can be cut-to-length.
- Inherently temperature safe.
- Available up to 277VAC.
- UV inhibitors are included in the cable jacket.

### THE PROBLEM

Snow that has built up on a roof will start to melt as a result of either exposure to the sun or from heat rising from the building below.

As the melted snow runs from the roof into cold gutters and drain pipes, it can re-freeze forming layers of ice that can continue to build up until the flow is blocked. This can result in damaged drains and gutters.

In addition, water can get into the roof and walls of the building, leading to expensive structural damage such as broken roof tiles, damaged plaster and facades, etc.

### THE SOLUTION

Heat Trace have the solution in the form of G-Trace a self-regulating heating cable the characteristics of which means that it can adjust its heat output in accordance with the ambient temperature.

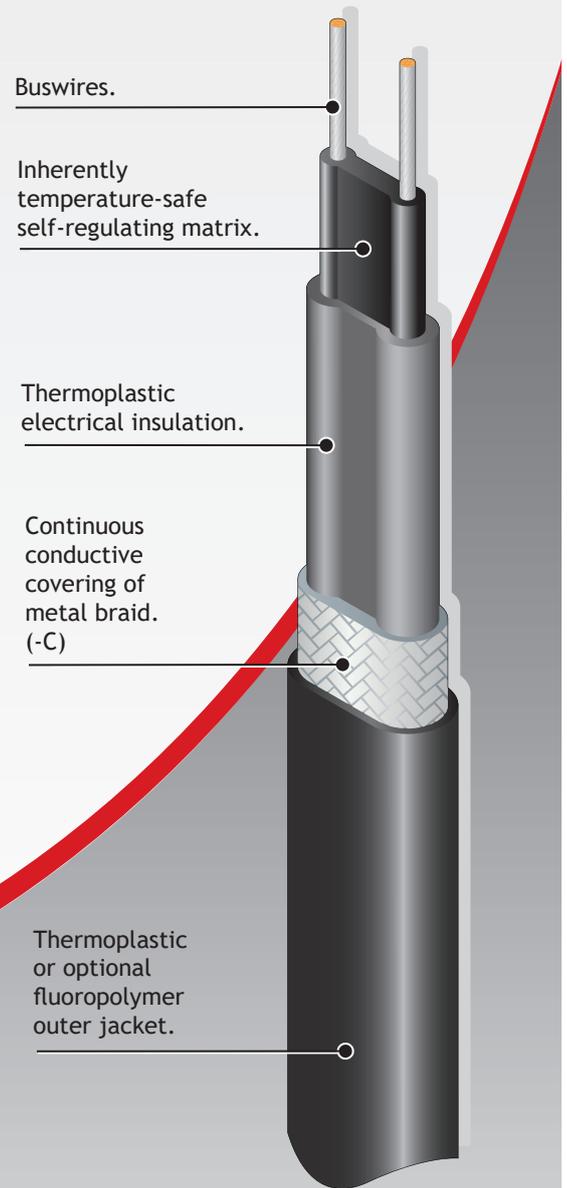
In snow and icy water, the heating cable operates at full power. As the snow melts and the water drains away, G-Trace self-regulates to half power while it dries. As it gets warmer, so G-Trace gradually reduces its output.

The G-Trace system is safe and reliable as self-regulation prevents overheating, G-Trace can even be installed in plastic gutters and with the UV resistant outer jacket, the heating cable is protected from the sun's harmful rays - thus making it totally durable and reliable.

G-Trace provides a cost effective, preventive maintenance solution to damaged roof tops and gutters and the system consumes no more power than it takes to prevent ice formation.

Design and installation of a G-Trace system is simple as there are no fixed lengths. The heating cable can be cut to length during installation. G-Trace is cut off the reel and placed in the gutter. The heating cable is suspended within the downpipe without the need for spacers.

All systems - from the simplest to the most elaborate - use the same components, thereby providing maximum flexibility and ease of design.



## SPECIFICATION

**OPERATING ENVIRONMENTAL RANGE:** +15°C to -15°C  
(+59°F to +5°F)

**AMBIENT TEMPERATURE RANGE:** +60°C to -40°C  
(+140°F to -40°F)

**MINIMUM INSTALLATION TEMPERATURE:** -40°C (-40°F)

**POWER SUPPLY:** 1 - 277V AC

**MAXIMUM RESISTANCE OF PROTECTIVE BRAIDING:** 18.2 Ohm/km

### WEIGHTS & DIMENSIONS:

Type Ref	Dimensions (mm) +/-0.5	Weight kg/100m	Min Bending radius	Gland Size
GT	12.95 x 5.95	11.8	35mm	M20
GT-F	12.65 x 5.65	12.6	35mm	M20

### ORDERING INFORMATION:

Example:



### POWER OUTPUT:

In ice at 0°C 36W/m  
In air at 0°C 18W/m

### COLD START DATA (300 Second Rating)

GT	
Start at °C in ice and water	Start Current (A/m) 230V
-15°C	0.295
0°C	0.259
+15°C	0.236

### ACCESSORIES:

Heat Trace supply a complete range of accessories including termination/splice kits, end seals, junction boxes and controls. These items are recommended for the correct operation of G-Trace heaters.

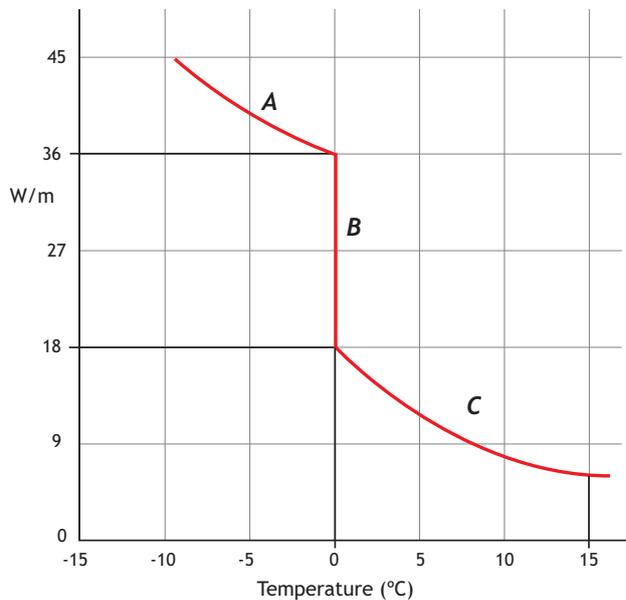
### MAXIMUM LENGTH (m) vs. CIRCUIT BREAKER SIZE:

Cat Reference	Start-up Temperature	230V				
		6A	10A	16A	20A	32A
GT	10°C	26	42	68	84	90
	0°C	24	38	62	78	86
	-15°C	20	34	54	68	80

Note: Cable shall not be energised below 0°C. For use with Type C circuit breakers to IEC 60898

### THERMAL RATINGS:

Nominal output at rated voltage.



### Notes:

- A In snow and ice water, the heating cable will operate at full power.
- B As the snow begins to melt and the water drains away, the heating cable self-regulates to half power while it dries.
- C As it gets warmer, the heating cable will reduce its power output.

### FURTHER INFORMATION:

Please consult the appropriate termination instructions and the G-Trace Roof & Gutter Heating Design Guide (PDG020) for further details.

G-Trace systems are energised at +5°C and de-energised -10°C to -15°C when there is no possibility of melt water being present.

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Electrical heating cable for temperature maintenance of hot water services in domestic and commercial buildings.

## HOTWAT Self-Regulating Heating Cable

- Automatically adjusts heat output in response to increasing or decreasing pipe temperature. for instantly available hot water.
- Can be cut-to-length.
- Inherently temperature safe.
- Eliminates the need for return pipework and re-circulating pumps.
- Available up to 277VAC.
- Full range of controls and accessories available.

### FEATURES

When hot water taps are infrequently used, the water stays in the distribution pipework cools and is usually run to waste before hot water from the storage cylinder arrives at the tap. The use of re-circulating systems usually only maintains the water temperature in the main pipes and doubles the amount of pipework from which heat, and therefore energy, is lost. HOTWAT is a parallel resistance, self-regulating heating cable designed to compensate for heat losses from hot water distribution systems.

The heater comprises a semi-conductive self-regulating heating element which automatically reduces its power output as the pipe temperature increases. Thus, the heater cannot overheat or burn out.

By applying HOTWAT to the pipework (beneath the thermal insulation) heat losses are eliminated and the water is maintained at the required temperature. Further savings are achieved by removing the need for recirculating pipework together with pumps and valves etc.

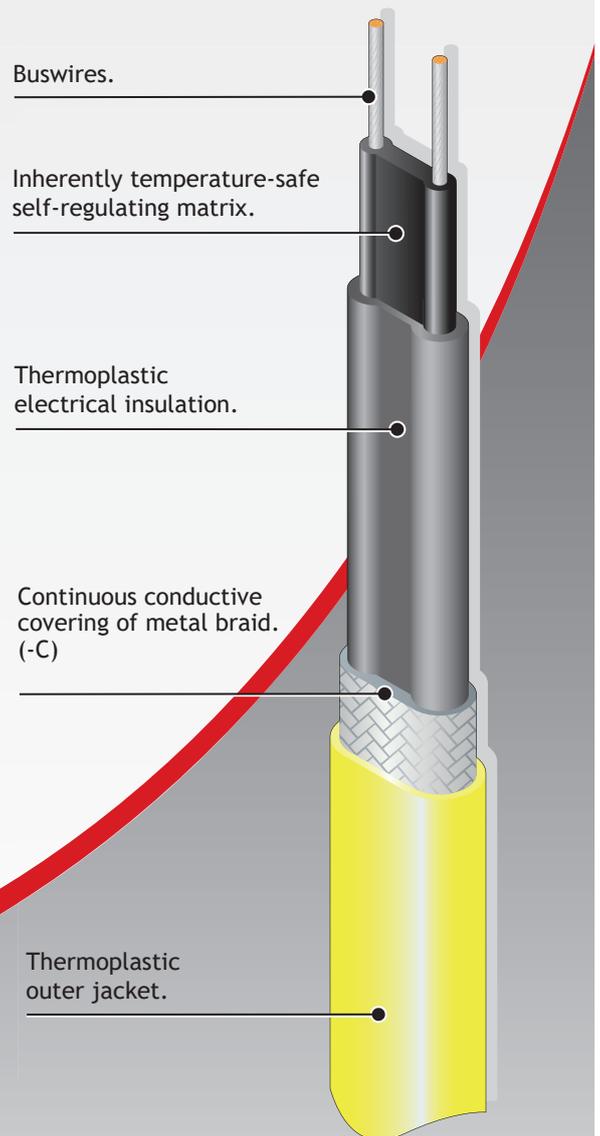
There are two HOTWAT systems available. HW-R is simply used to maintain the pipework at approximately 50-60°C, whilst HW-P is used to maintain 45-70°C during normal operation with an extra disinfection feature at timed intervals to reduce the risks of legionella.

The application of HOTWAT to insulated hot water pipework enables hot water to be available at each tap and dramatically improves the system efficiency compared with un-insulated re-circulated systems.

### INHERENTLY TEMPERATURE-SAFE

“The inherent ability to self-regulate at a temperature level below the maximum product rating and withstand temperature of the insulating materials, without the need for temperature control.”

Similar competitor self-regulating products are typically limited to a maximum energised temperature, typically 65°C at which point, their retained power output prevent the cable from self-regulating at its own limiting temperatures. All such products require temperature control to ensure their own temperature safety.



## SPECIFICATION

**MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE (Power ON):** 80°C (176°F)

**MAXIMUM PERMISSIBLE EXPOSURE TEMPERATURE (Power OFF):** 100°C (212°F)

**MINIMUM INSTALLATION TEMPERATURE:** -40°C (-40°F)

**POWER SUPPLY:** 12 - 277V AC

**MAXIMUM RESISTANCE OF PROTECTIVE BRAIDING:** 18.2 Ohm/km

### WEIGHTS & DIMENSIONS:

Type Ref	Dimensions (mm) +/-0.5	Weight kg/100m	Min Bend radius	Gland Size
HWR	11.5 x 4.75	9.5	30mm	M20
HWP	11.5 x 4.75	9.5	30mm	M20
HWR-T	12.7 x 5.95	11.8	35mm	M20
HWP-T	12.7 x 5.95	11.8	35mm	M20

### APPROVAL DETAILS:

FM - 3009080

VDE - 114665

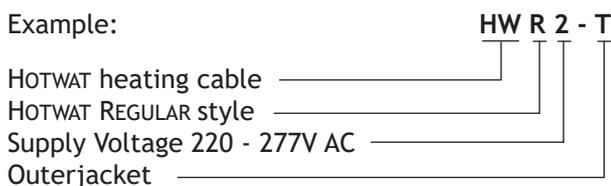
### ORDERING INFORMATION:

#### Options

**HWR ..T** HOTWAT REGULAR heating cable with a thermoplastic overjacket for maintaining the pipework at approximately 50-60°C.

**HWP ..T** HOTWAT PLUS is a higher power output heating cable with a thermoplastic overjacket for maintaining the pipework at between 45-70°C with the added benefit of thermal disinfection.

Example:



### ACCESSORIES:

Heat Trace supply a complete range of accessories including termination/splice kits, end seals, junction boxes and controls. These items are recommended for the correct operation of HOTWAT products.

### MAXIMUM LENGTH (m) vs. CIRCUIT BREAKER SIZE:

Cat Reference	Start-up Temperature	230V			
		6A	10A	16A	20A
HWR	18°C	56	92	128	-
	0°C	38	64	102	128
HWP	18°C	34	56	90	94
	0°C	24	40	64	80

For use with Type C circuit breakers to IEC 60898

### RECOMMENDED INSULATION THICKNESS (MM)

Cat Ref.	Maintain Temperature	Pipe Size (mm)					
		15	22	28	35	42	54
HWR	60°C	25	30	40	50	60	75
	55°C	20	25	30	40	50	60
	50°C	15	20	25	30	40	50
HWP	45-70°C	30	40	50	60	75	75

The above figures are based on the thermal insulation having a K-value of 0.038W/mK at 36°C mid-point temperature.

### SYSTEM FEATURES:

	HWR	HWP
Hot Water Supply System	Localised or Centralised	Centralised
Temperature Control System	Fixed Temperature	Variable temperature setting by POWERTRIM
Thermal Pasteurisation	Not available	D-BUG timer unit or BMS (Building Management System)
Circuit Temp. Scanning	Not available	Contact Heat Trace
Electrical Supply	230V	230V
Typical Maintain Temperature	50, 55 or 60°C	45°C - 70°C
Nominal Output	9W/m at 55°C	9.5W/m at 70°C

### FURTHER INFORMATION:

Please consult the appropriate termination instructions, the Hot Water Heating Design Application Guide (APDG0702) and the Heat Trace Design, Installation and Maintenance Manual (HTDIMM 010) for further details.

# HEAT TRACE™

SETTING THE STANDARDS LEADING THE WAY

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Electrical heating cable for snow melting and ice prevention of roads, ramps and walkways.

## SNOMELT Self-Regulating Heating Cable

- Automatically adjusts heat output in response to increasing or decreasing surface temperature.
- Can be cut-to-length.
- Inherently temperature safe.
- Simple installation in concrete.
- Available up to 277VAC.
- Controls can provide high power for melting and reduced power for ice prevention.

### FEATURES

SNOMELT is a self-regulating heating cable that can be used for snow melting and ice prevention of surfaces such as concrete roads, ramps and paths. It may also be used on stairways, walkway gratings or loading docks.

It can be cut-to-length at site and exact lengths can be matched without any complicated design considerations.

Power output is self-regulated in response to surface temperature. SNOMELT cannot overheat and tends to reduce power when not needed.

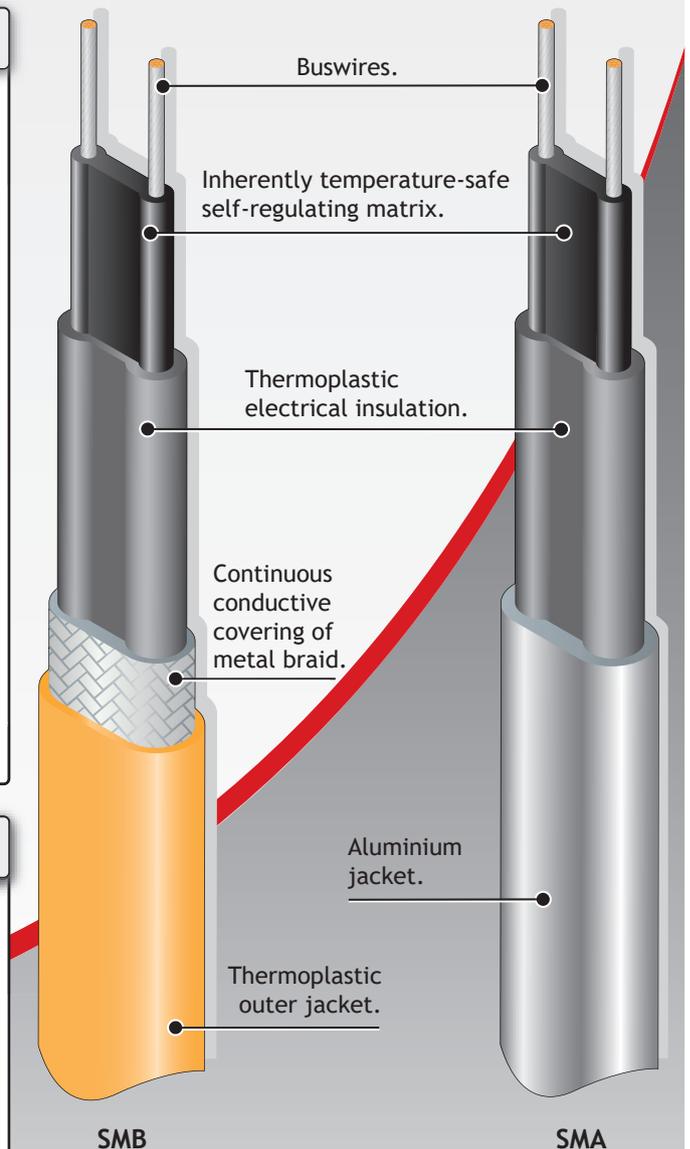
SNOMELT is ideally suited for most general snow and ice prevention applications. Installations can be combined with Heat Trace's specially developed high energy efficient control systems that can apply full power for melting and a reduced lower output for ice prevention.

The SNOMELT / POWERMATCH MICRO+ controlled system can reduce operating costs by as much as 80% when compared with conventionally controlled snow melting and ice prevention systems.

### INHERENTLY TEMPERATURE-SAFE

“The inherent ability to self-regulate at a temperature level below the maximum product rating and withstand temperature of the insulating materials, without the need for temperature control.”

Similar competitor self-regulating products are typically limited to a maximum energised temperature, typically 65°C at which point, their retained power output prevent the cable from self-regulating at its own limiting temperatures. All such products require temperature control to ensure their own temperature safety.



## SPECIFICATION

**MAXIMUM SURFACE TEMPERATURE:** 40°C (104°F)

**MINIMUM INSTALLATION TEMPERATURE:** -30°C (-22°F)

**POWER SUPPLY:** 1 - 277V AC

### WEIGHTS & DIMENSIONS:

Type Ref	Dimensions (mm) +/-0.5	Weight kg/100m	Min Bending radius	Gland Size
SMB	15.4 x 6.5	15.7	40mm	M20
SMA	15.0 x 6.1	15.8	50mm	M20

### APPROVAL DETAILS:

FM - 3009080

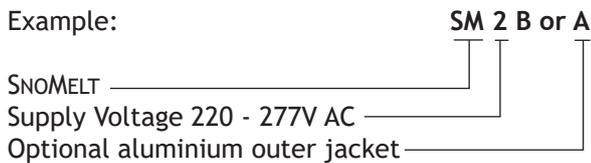
### ORDERING INFORMATION:

#### Options

**SMB** SNOMELT for all applications, ideally suited for use on car park ramps, access roads, walkways, access ramps, driveways etc.

**SMA** SNOMELT as above, but braid and outer jacket replaced with extruded aluminium outer jacket, offering greater mechanical protection when required.

Example:



### MAXIMUM LENGTH (m) vs. CIRCUIT BREAKER SIZE:

Cat Reference	Start-up Temperature	230V			
		6A	10A	16A	20A
SMB	10°C	14	22	36	44
	0°C	12	18	30	38
SMA	10°C	14	22	36	44
	0°C	12	18	30	38

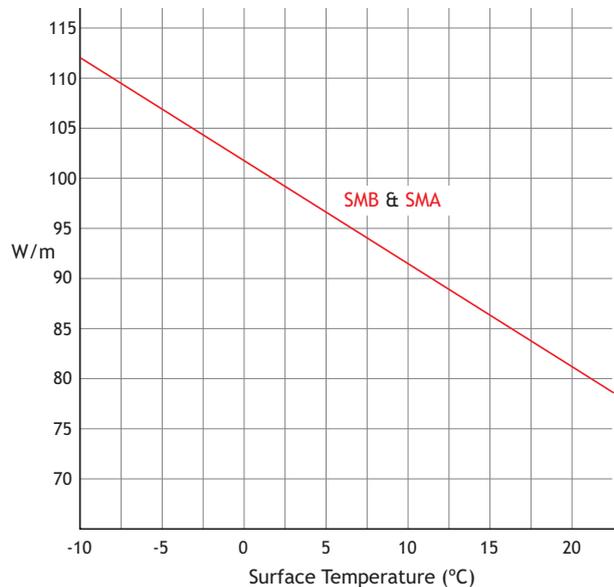
For use with Type C circuit breakers to IEC 60898

### ACCESSORIES:

Heat Trace supply a complete range of accessories including termination/splice kits, end seals, junction boxes and controls. These items are recommended for the correct operation of SNOMELT products.

### POWER OUTPUT CURVE:

The following graph indicates the cable performance when buried in concrete. For other conditions, refer to the Factors Table shown below.



### FACTORS:

For burial in:	Power Output Multiplying Factor
Sand (wet)	W/m in concrete x 0.9
Metal Conduit	W/m in concrete x 0.4
Plastic Conduit	W/m in concrete x 0.3

### FURTHER INFORMATION:

Please consult the appropriate termination instructions and the Heat Trace Installation, Maintenance and Testing Manual (HTDIMM 010) for further details.

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Self-regulating electric heating cable for conductor rail, 3rd rail & points heating.

## CONDUCTOR RAIL HEATER

Cut To Length - Parallel Resistance Self-Regulating Heating Cable

- Automatically adjusts heat output in response to increasing or decreasing pipe temperature.
- Can be supplied in pre-terminated lengths, or in bulk reel stock.
- Inherently temperature safe.
- Available up to 1000 Volts AC or DC (as standard).
- Nominal outputs up to 130W/m.
- Full range of controls and accessories available including GRP Capping and associated retaining clips.

### DESCRIPTION

The CRH conductor rail heater has been specifically developed for conductor, or 3rd rails, operating on traction power voltages and also for points heating applications.

CRH rail heater is designed to maintain the operational integrity of rail networks, ensuring that conductor rails, or points systems are kept clear of snow and ice during adverse weather conditions.

CRH may be supplied in bulk on reels, or in pre-terminated lengths fitted with cold power connection lead and remote end seal. It is suitable for direct replacement of existing rail heaters and can integrate with the majority of existing rail heating systems.

The heater is held in place on the rail using a protective GRP insulated, or non-insulated, capping section and appropriate purpose made heavy duty rail clips.

The installation of CRH heating cables is quick and simple and requires no special tools. The fitting of new or replacement heaters can be carried out quickly and safely with minimum track possession time and therefore minimum disruption to rail traffic. All system components are modular to ensure fast and simple installation.

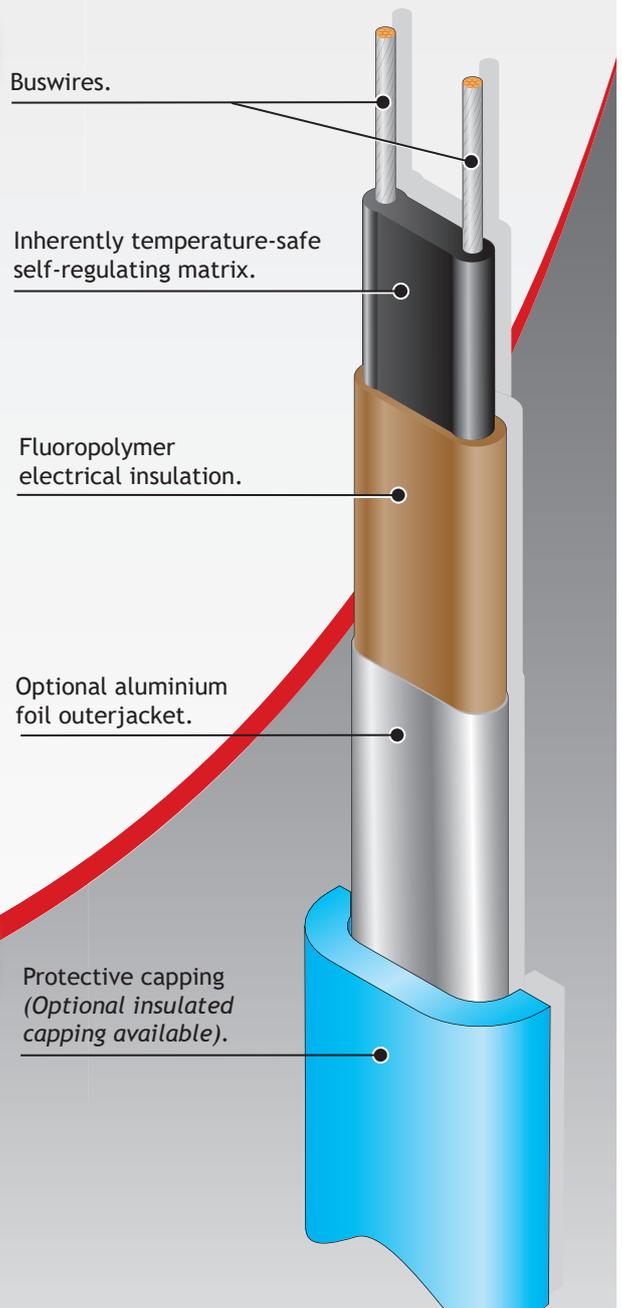
CRH heating cables and system components are suitable for withstanding the hazards of a rail environment, such as severe and continuous vibration due to rail traffic, immersion in icy water, snow, weed killer formulations, diesel oils, lubrication oils, oxalic acid and de-icing fluids.

CRH heating cables are able to operate in 'free air', totally, or partially, without affecting their working life.

### INHERENTLY TEMPERATURE-SAFE

"The inherent ability to self-regulate at a temperature level below the maximum product rating and withstand temperature of the insulating materials, without the need for temperature control."

Similar competitor self-regulating products are typically limited to a maximum energised temperature, typically 120°C, at which point their retained power output prevents the cable from self-regulating at its own limiting temperatures. All such products require temperature control to ensure their own temperature safety.



## SPECIFICATION

**MAXIMUM TEMPERATURE:  
ENERGISED OR UN-ENERGISED:** 250°C (482°F)

**MINIMUM INSTALLATION  
TEMPERATURE:** -40°C (-4°F)

**POWER OUTPUT (nominal):** up to 130W/m @ 0°C

**POWER SUPPLY:** up to 1000 Volts (AC or DC)

### CONSTRUCTION:

Heating Element: Semi-conductive self-limiting matrix.  
Power Conductors: Nickel plated copper.  
Primary Insulation: Fluoropolymer.  
Outer Jacket (optional): Aluminium foil.

### WEIGHTS & DIMENSIONS:

Type Ref	Dimensions (mm)+/-0.5	Weight kg/100m	Min Bending radius
CRH	13.6 x 4.8	11.5	30mm

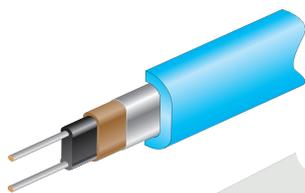
### ORDERING INFORMATION:

Example - pre-terminated lengths 120 CRH 6 - 100M  
Nominal Output 120W/m @ 0°C  
CRH Heating cable  
Supply Voltage 600V DC  
Heated Length (if pre-terminated)

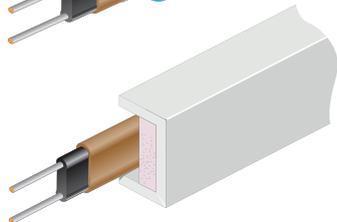
### ATTACHING THE HEATER TO THE RAIL:

Heaters may be mounted on the rail using a channel capping. For applications that use an aluminium clad conductor rail, an angle section is also available.

Specially designed spring clips hold the heater and the channel, or angle, to the rail. A range of clips are available to suit a variety of different rail profiles.



Foiled heater shown with non-insulated capping



Unfoiled heater shown with insulated capping

### ACCESSORIES:

Heat Trace supply a complete range of installation accessories including cold lead connections, rail clips, control systems, insulated and non-insulated protective capping.

### IMPORTANT NOTES:

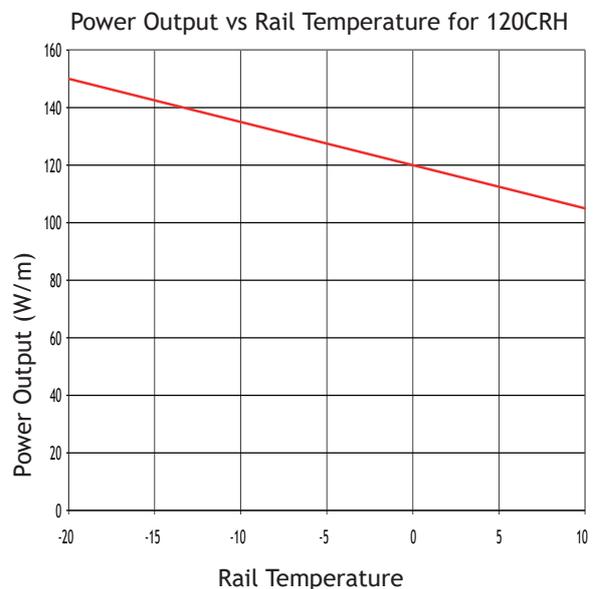
The CRH Rail Heater should only be fitted to rails using approved methods. The heating cable should only be terminated using the approved cold lead connection and the special heat shrink boot and tubing. Connections must be of an approved type.

Full details of all approved ancillary and control equipment is available on request. Installation of the CRH heating cables must be carried out in accordance with Heat Trace's Code of Practice for the Installation of Rail Heating Systems.

### NB

Information on MAXIMUM CIRCUIT LENGTH (m) vs. CIRCUIT BREAKER at various voltages is available on request. Different voltages will affect circuit lengths and circuit breaker sizes. Once the application information and required operating parameters are available, maximum circuit lengths and circuit breaker sizes can be calculated accordingly.

### HEATER OUTPUT GRAPH:



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## FREEZSTOP LOW VOLTAGE

Electrical heating cable for freeze protection or temperature maintenance.

*Self-Regulating Heating Cable*

- Automatically adjusts heat output in response to increasing or decreasing pipe temperature.
- Can be cut-to-length.
- Inherently temperature safe.
- Suitable for use in safe, hazardous and corrosive areas.
- Available up to 227VAC.
- Full range of controls and accessories available.

### DESCRIPTION

FREEZSTOP LOW VOLTAGE is a light industrial or commercial grade self-regulating heating cable that can be used for freeze protection or temperature maintenance of pipework and vessels in the construction and refrigeration industries.

It can be cut-to-length at site and exact piping lengths can be matched without any complicated design considerations.

FREEZSTOP LOW VOLTAGE is approved for use in non-hazardous and hazardous areas to world wide standards.

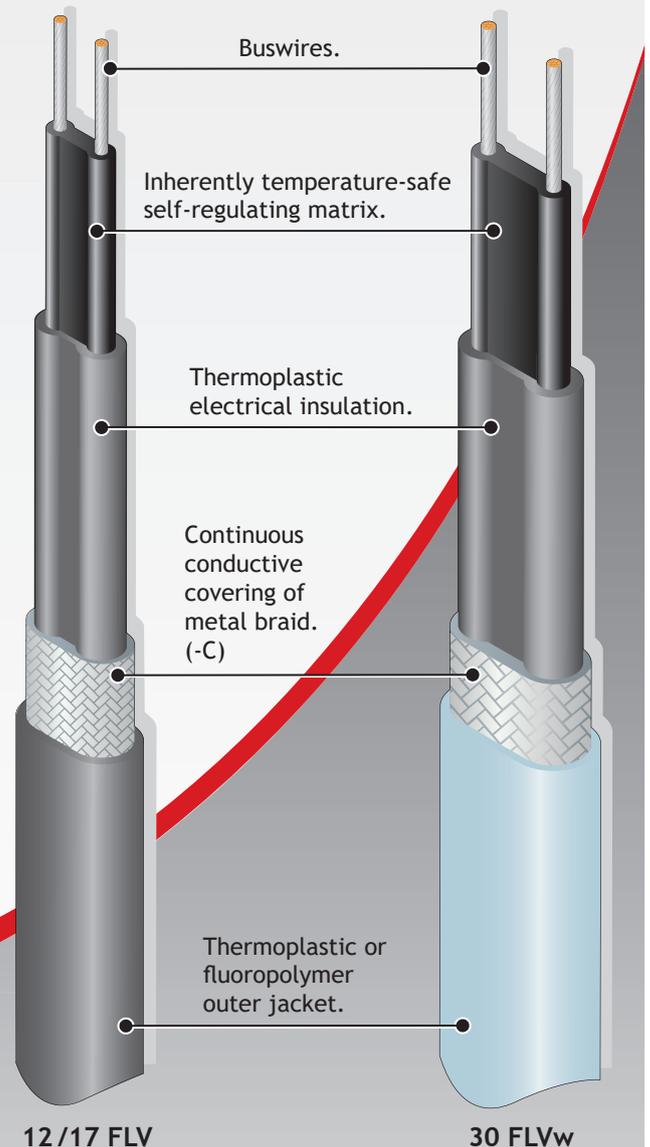
Its self-regulating characteristics improve safety and reliability. FREEZSTOP LOW VOLTAGE will not overheat or burnout, even when overlapped upon itself. Its power output is self-regulated in response to the pipe temperature.

The installation of FREEZSTOP LOW VOLTAGE is quick and simple and requires no special skills or tools. Termination, splicing and power connection components are all provided in convenient kits.

### INHERENTLY TEMPERATURE-SAFE

“The inherent ability to self-regulate at a temperature level below the maximum product rating and withstand temperature of the insulating materials, without the need for temperature control.”

Other manufacturers self-regulating products are typically limited to a maximum energised temperature, typically 65°C at which point, their retained power output prevent the cable from self-regulating at its own limiting temperatures. All such products require temperature control to ensure their own temperature safety.



## SPECIFICATION

**MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE (Power ON):** 85°C (185°F)

**MAXIMUM PERMISSIBLE EXPOSURE TEMPERATURE (Power OFF):** 85°C (185°F)

**MINIMUM OPERATING TEMPERATURE:** -65°C\* (-85°F)

**MINIMUM INSTALLATION TEMPERATURE:** -40°C (-40°F)

**POWER SUPPLY:** 12 - 24V AC or DC

**TEMPERATURE CLASSIFICATION:** T6 (85°C)

**MAXIMUM RESISTANCE OF PROTECTIVE BRAIDING:** 18.2 Ohm/km

**INGRESS PROTECTION:** IP67

### WEIGHTS & DIMENSIONS:

Type Ref	Dimensions (mm) +/-0.5	Weight kg/100m	Min Bending radius	Gland Size
FLV-C	9.3 x 4.7	8.4	30mm	M20
FLV-CT	10.5 x 5.9	11.7	35mm	M20
FLV-CF	10.2 x 5.6	10.9	35mm	M20
FLVw-C	11.75 x 4.75	9.5	30mm	M20
FLVw-CT	12.95 x 5.95	11.8	35mm	M20
FLVw-CF	12.65 x 5.65	12.6	35mm	M20

### APPROVAL DETAILS:

ATEX - FLV: Sira 12ATEX3115  
FLVw: Sira 12ATEX3113

IECEX - FLV: SIR 11.0130  
FLVw: SIR 11.0122

EAC\* - TC RU C-GB.AA87.B.00519

### ORDERING INFORMATION:

Example:

Output 12W/m at 10°C

FREEZSTOP LOW VOLTAGE

Supply Voltage 22 - 24V AC

Metal Braid

Thermoplastic Outerjacket

12 FLV 24 - CT

### ATEX & IECEX MARKINGS:

Ex II 2GD  
Ex e IIC T4 Gb  
FLV Ex tb IIIC T135°C Db  
EN 60079-0:2009  
EN 60079-30-1:2007  
IEC 60079-31:2008

Ex II 2GD  
Ex e IIC T4 Gb  
FLVw Ex tb IIIC T135°C Db  
Ex e IIC T3 Gb  
Ex tb IIIC T200°C Db  
EN 60079-0:2009  
EN 60079-30-1:2007  
IEC 60079-31:2008

### MAXIMUM LENGTH (m) vs. CIRCUIT BREAKER SIZE:

The following circuit details relate specifically to the trace heating of pipework and equipment. For any other application consult Heat Trace.

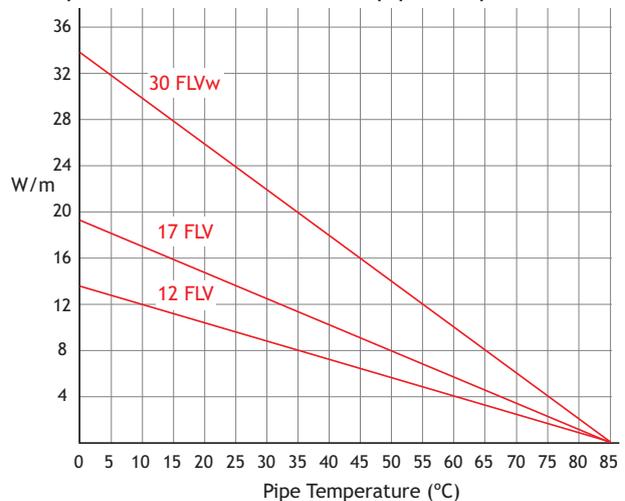
Cat Reference	Start-up Temperature	24V			
		6A	10A	16A	20A
12FLV	5°C	8	14	18	-
	0°C	8	12	18	-
	-20°C	6	12	16	-
	-40°C	6	10	14	-
17FLV	5°C	6	8	14	16
	0°C	4	8	12	14
	-20°C	4	6	10	14
	-40°C	4	6	10	12
30FLVw	5°C	4	6	10	12
	0°C	4	6	8	10
	-20°C	2	4	8	10
	-40°C	2	4	6	8

Residential buildings	Commercial buildings	Industry and Infrastructure
MCB's certified IEC 60898-1	MCB's certified according both IEC 60898-1 & IEC 60947-2	

### THERMAL RATINGS:

Nominal output at 12V or 24V when FLV is installed on thermally insulated carbon steel pipes.

Note: Please refer to Evolution for more precise power output values as a function of pipe temperature.



### ACCESSORIES:

Heat Trace supply a complete range of accessories including termination/splice kits, end seals, junction boxes and controls. Such items carry separate approvals from the heating cables. Use only approved components, as per system certification.

### FURTHER INFORMATION:

Please consult the appropriate termination instructions and the Heat Trace Design, Installation & Maintenance Manual (HTDIMM 010) for further details.

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Very high temperature self-regulating heating cable.

## FailSafe Super Inherently Temperature-Safe Heating Cable

- Automatically adjusts heat output in response to increasing or decreasing pipe temperature.
- Can be cut-to-length.
- Inherently temperature safe.
- Suitable for use in safe, hazardous and corrosive areas.
- High power outputs to 75W/m at 10°C.
- Full range of controls and accessories available.

### DESCRIPTION

FSS is a very high temperature self-regulating heating cable, having an exposure limit of 225°C, energised or not.

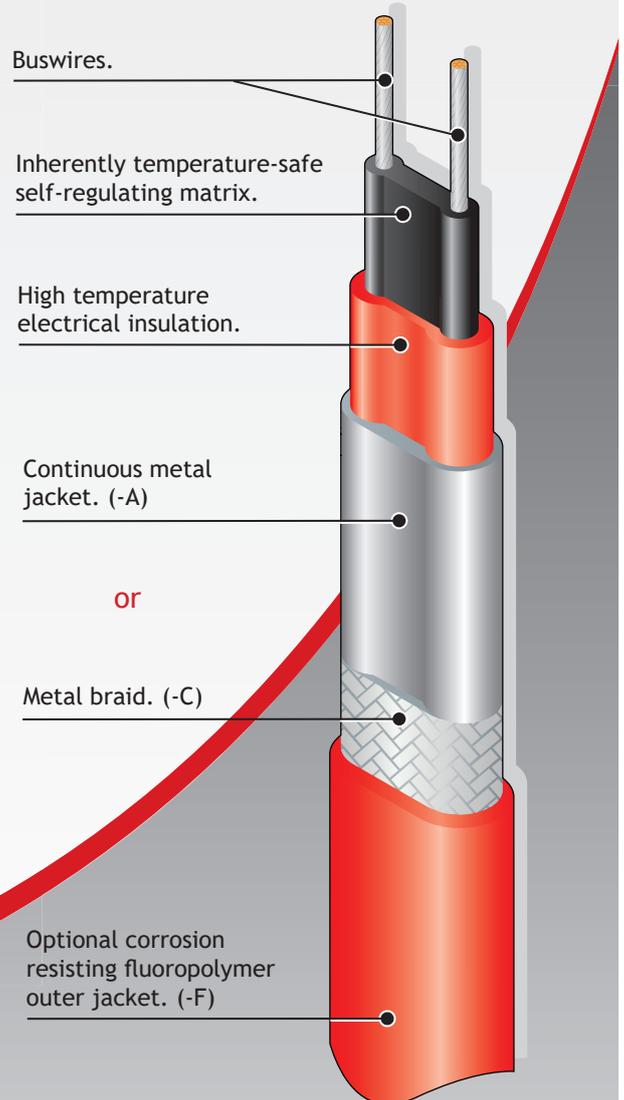
It may be provided with a continuous extruded metal jacket for applications where high mechanical strength is required or a metal braid where flexibility is preferred.

The continuous metal outer jacket is ductile, yet withstands high mechanical loads, thus averting damage when being installed in arduous environments.

Easy terminations, cut-to-length.

Safest ever self-regulating product range for very high temperature exposure; will not overheat even when exposed to 225°C when energised or switched off as it is *inherently temperature-safe*.

ATEX/ IECEx Approved.



### INHERENTLY TEMPERATURE-SAFE

“ The inherent ability to self-regulate at a temperature level below the maximum product rating and withstand temperature of the insulating materials, without the need for temperature control.”

Similar competitor self-regulating products are typically limited to a maximum energised temperature, typically 120°C at which point, their retained power output prevent the cable from self-regulating at its own limiting temperatures. All such products require temperature control to ensure their own temperature safety.



# SPECIFICATION

**MAXIMUM CONTINUOUS EXPOSURE TEMPERATURE:** 225°C (437°F)  
(ENERGISED OR SWITCHED OFF)

**MINIMUM OPERATING TEMPERATURE:** -65°C\* (-85°F)

**MINIMUM INSTALLATION TEMPERATURE:** -40°C (-40°F)

**POWER SUPPLY:** 12 - 277V AC  
(other voltages available on request)

**TEMPERATURE CLASSIFICATION:**  
15FSS, 30FSS, 45FSS & 60FSS @ nom 230V - T3 (200°C)  
75FSS @ nom 230V - T2 (300°C)

**Note:** for any other voltages contact Heat Trace Ltd

**INGRESS PROTECTION** IP67

**WEIGHTS & DIMENSIONS:**

Type Ref	Dimensions (mm) +/-0.5	Weight kg/100m	Min Bending radius	Gland size
FSS-A	12.25 x 6.05	13.7	50mm	M20
FSS-AF	13.15 x 6.95	17.4	50mm	M20
FSS-C	10.55 x 4.35	10.4	30mm	M20
FSS-CF	11.45 x 5.25	13.4	35mm	M20

**APPROVAL DETAILS:**

- ATEX - Sira 02ATEX3072
- IECEX - SIR 11.0120
- EAC\* - TC RU C-GB.MIO62.B.06041
- FM - 3009080

**ORDERING INFORMATION:**

Example; 30 FSS 2 - A or C option F

Output 30w/m at 10°C  
FSS Heating Cable  
Supply Voltage 220 - 240V AC  
Continuous Outer jacket  
Metal Braid  
Outer Sheath, Fluoropolymer

**ACCESSORIES:**

Heat Trace supply a complete range of accessories including termination/splice kits, end seals, junction boxes and controls. Such items carry separate approvals from the heating cables. Use only approved components, as per system certification.

**FURTHER INFORMATION:**

Please consult the appropriate termination instructions and the Heat Trace Installation, Maintenance and Testing Manual (HTDIMM 010) for further details.

**MAXIMUM LENGTH (m) vs. CIRCUIT BREAKER SIZE:**  
The following circuit details relate specifically for the trace heating of pipework and equipment. For any other application consult Heat Trace.

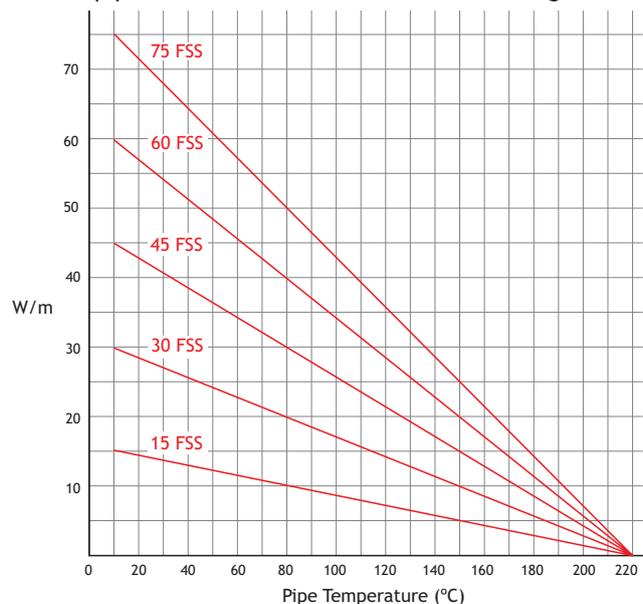
Cat Reference	Environmental Start-up Temp.	230V				
		10A	16A	20A	32A	50A
15FSS	10°C	76	122	154	172	172
	0°C	70	112	140	172	172
	-20°C	62	98	122	172	172
	-40°C	52	82	102	164	172
30FSS	10°C	52	82	102	122	122
	0°C	46	74	92	122	122
	-20°C	40	66	82	122	122
	-40°C	34	54	68	110	122
45FSS	10°C	38	62	76	100	100
	0°C	34	56	70	100	100
	-20°C	30	50	62	98	100
	-40°C	22	34	44	70	100
60FSS	10°C	30	50	62	86	86
	0°C	28	44	56	86	86
	-20°C	20	32	40	62	86
	-40°C	12	18	24	38	60
75FSS	10°C	24	40	50	76	76
	0°C	18	30	38	60	76
	-20°C	14	22	26	42	66
	-40°C	8	12	16	26	40

For use with Type C circuit breakers to IEC 60898.

These circuit lengths may be exceeded dependant on specific design parameters.

**THERMAL RATINGS:**

Nominal output at 230V when FSS is installed on thermally insulated carbon steel pipes. For 75W/m and above, the use of aluminium overfoiling is strongly recommended to optimise the thermal transmission to the pipe and achieve the stated thermal ratings.



Extremely high temperature self-regulating heating cable.

## FailSafe Ultimo

Inherently Temperature-Safe Heating Cable

- Automatically adjusts heat output in response to increasing or decreasing pipe temperature.
- Can be cut-to-length.
- Inherently temperature safe.
- Suitable for use in safe, hazardous and corrosive areas.
- High power outputs to 100W/m at 10°C.
- Full range of controls and accessories available.

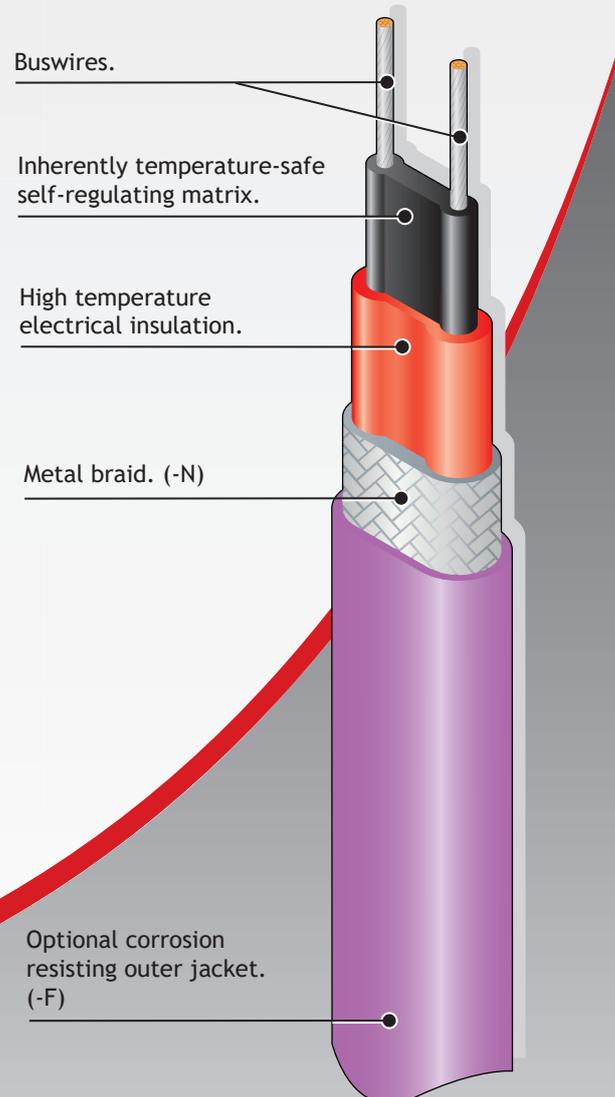
### DESCRIPTION

FSU is an extremely high temperature self-regulating heating cable, having an exposure limit of 250°C, energised or not.

Easy terminations, cut-to-length.

Safest ever self-regulating product range for extremely high temperature exposure; will not overheat even when exposed to 250°C when energised or switched off as it is inherently temperature-safe.

ATEX and IECEx Approved.



### INHERENTLY TEMPERATURE-SAFE

“ The inherent ability to self-regulate at a temperature level below the maximum product rating and withstand temperature of the insulating materials, without the need for temperature control.”

Similar competitor self-regulating products are typically limited to a maximum energised temperature, typically 120°C at which point, their retained power output prevent the cable from self-regulating at its own limiting temperatures. All such products require temperature control to ensure their own temperature safety.



## SPECIFICATION

**MAXIMUM EXPOSURE TEMPERATURE:** 250°C (482°F)  
(ENERGISED OR SWITCHED OFF)

**MINIMUM OPERATING TEMPERATURE:** -65°C\* (-85°F)

**MINIMUM INSTALLATION TEMPERATURE:** -40°C (-40°F)

**POWER SUPPLY:** 12 - 277V AC

**TEMPERATURE CLASSIFICATION: #**  
15FSU, 30FSU, 45FSU & 60FSU @ nom 230V - T3 (200°C)  
75FSU @ nom 230V - T2 (300°C)

**Note:** for any other voltages contact Heat Trace Ltd

### WEIGHTS & DIMENSIONS:

Type Ref	Dimensions (mm) +/-0.5	Weight kg/100m	Min Bending radius	Gland Size
FSU-N	11.2 x 4.5	11.3	30mm	M20
FSU-NF	12.1 x 5.4	14.6	35mm	M20
FSUw-N	13.5 x 4.7	15.8	30mm	M25
FSUw-NF	14.4 x 5.6	19.5	35mm	M25

### APPROVAL DETAILS:

ATEX - Sira 04ATEX3012, Sira 13ATEX3126  
IECEX - SIR 11.0131, SIR 11.0132  
DNV-GL - TAE00002KC  
CSA - 1295278, 1547590  
EAC\* - TC RU C-GB.MIO62.B.06041  
Japanese - CML 17JPN3006X - 1 to 4

### ORDERING INFORMATION:

Example: **75 FSU 2 - N F**  
Output 75W/m at 10°C \_\_\_\_\_  
FSU Heating Cable \_\_\_\_\_  
Supply Voltage 220 - 277V AC \_\_\_\_\_  
Metal Braid \_\_\_\_\_  
Outer Sheath, Fluoropolymer \_\_\_\_\_

### ACCESSORIES:

Heat Trace supply a complete range of accessories including termination/splice kits, end seals, junction boxes and controls. Such items carry separate approvals from the heating cables. Use only approved components, as per system certification.

### FURTHER INFORMATION:

Please consult the appropriate termination instructions and the Heat Trace Design, Installation and Maintenance Manual (HTDIMM 010) for further details.

**INGRESS PROTECTION:** IP67

### ATEX & IECEX MARKINGS:

Ⓔ II 2 GD  
Ex e IIC T3 or T2# Gb  
Ex tb IIIC T200°C or T300°C Db

EN 60079-0: 2012+A11:2013

EN 60079-31: 2014

EN 60079-30-1: 2007

### MAXIMUM LENGTH (m) vs. CIRCUIT BREAKER SIZE:

The following circuit details relate specifically for the trace heating of pipework and equipment. For any other application consult Heat Trace.

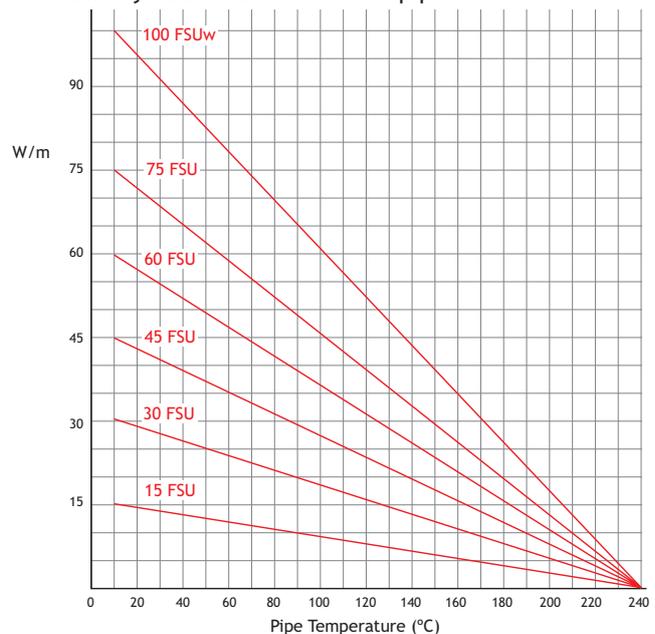
Cat Reference	Environmental Start-up Temp.	230V				
		10A	16A	20A	32A	50A
15FSU	10°C	76	122	154	172	172
	0°C	70	112	140	172	172
	-20°C	62	98	122	172	172
	-40°C	52	82	102	164	172
30FSU	10°C	52	82	102	122	122
	0°C	46	74	92	122	122
	-20°C	40	66	82	122	122
	-40°C	34	54	68	110	122
45FSU	10°C	38	62	76	100	100
	0°C	34	56	70	100	100
	-20°C	30	50	62	98	100
	-40°C	22	34	44	70	100
60FSU	10°C	30	50	62	86	86
	0°C	28	44	56	86	86
	-20°C	20	32	40	62	86
	-40°C	12	18	24	38	60
75FSU	10°C	22	34	44	70	76
	0°C	16	26	34	54	76
	-20°C	12	18	24	38	60
	-40°C	8	12	14	22	36
100FSUw	10°C	18	30	36	58	84
	0°C	18	28	34	56	84
	-20°C	16	24	30	50	76
	-40°C	14	22	28	46	70

For use with Type C circuit breakers to IEC 60898

These circuit lengths may be exceeded dependant on specific design parameters.

### THERMAL RATINGS:

Nominal output at 230V when FSU is installed on thermally insulated carbon steel pipes.



# HEAT TRACE™

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SETTING THE STANDARDS LEADING THE WAY

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