

## Advanced Frost protection system for central heating pipework



Central heating systems in unoccupied buildings are switched off to save energy and reduce the running cost. In freezing conditions, exposed pipework from roof plantrooms, in underground parking, and in other exposed areas, may become frozen causing damage to pipes and property.

The Raychem advanced frost protection system, incorporating the FS-C10-2X cable provides energy efficient self regulating frost protection of pipes whilst withstanding the high temperatures expected during building occupancy.



### ▶ Reliable self-regulating cable

The self-regulating cables deliver just the amount of heat needed and will not over-heat - even when overlapped. The systems are maintenance free, and energy efficient.

### ▶ System Benefits

The FS-C10-2X cable is installed in a straight line directly on the pipe, under the insulation.

### ▶ Flexible installation

The self-regulating cable can be cut-to-length on site and distributed in numerous pipe runs from one circuit, simplifying installation.

### ▶ High Temperature resistant cable.

The cable will withstand the high temperatures associated with central heating pipework without premature aging and loss of output power. A reliable, robust solution.

### ▶ Robust connection system

For use with Raychem High temperature resistant heat shrinkable components.

### Product specification and accessories

|                              |   |
|------------------------------|---|
| FS-C10-2X                    | High temperature resistant, self regulating frost protection cable. |
| Power output                 | 10W/m at 5°C.   |
| Maximum circuit length       | 180 m at 20A  |
| Maximum exposure temperature | 90°C  |
| Nominal voltage              | 230 VAC   |

Max. length of the heating circuit is based on a minimum start-up temperature of -10°C, 230 V ac.

### High temperature resistant components

|           |   |
|-----------|---|
| CCE-04-CT | Heat-shrinkable cold lead connection and end seal kit.    |
| S-19      | Heat-shrinkable splice kit.                               |
| JB 16-02  | Temperature resistant junction box.                       |
| JB-SB-08  | Junction box support bracket                              |
| CE20-01   | Heat-shrinkable connection and end seal kit for JB 16-02. |

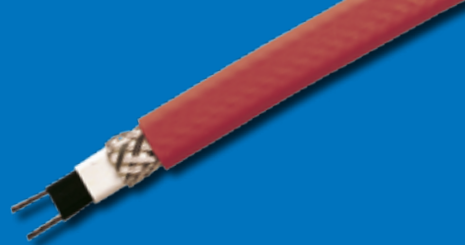
### Control & Monitoring:

|                    |  |
|--------------------|--|
| RAYSTAT-CONTROL-10 | Smart line-sensing thermostat for energy efficiency for circuits up to 180m. |
| AT-TS-14           | Line-sensing control thermostat (for circuits up to 150 m.)                  |

### Electrical protection

- The total length of heating cable determines the number and size of the electrical protection required.
- Residual current device (rcd): 30 mA required
- Installation in accordance with electrical regulations
- The mains connections must be carried out by an approved electrical installer
- Use C type circuit-breakers

# Advanced frost protection for central heating pipes



## Design guide

### 1. Application

Advanced frost protection for pipework up to a max. 90°C pipe temperature.

FS-C10-2X      10 W/m at 5°C

### 2. Cable length

The heating cable should be installed in a straight line on the pipework.

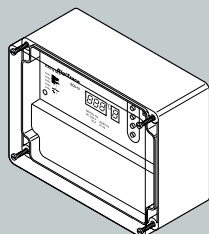
Total length of pipe to be traced  
 + approx. 0.3 m per connection  
 + approx. 1.0 m per T-connection  
 + approx. 1.2 m per 4-way connection

= **required heating cable length**

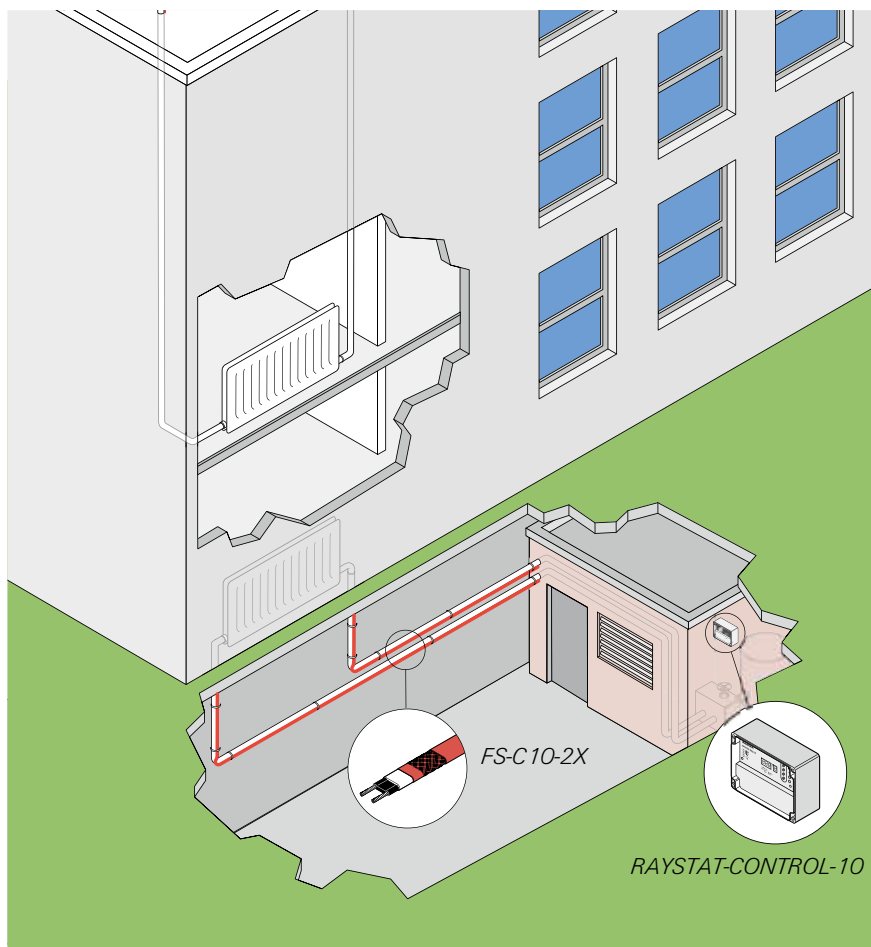
Maximum circuit length 180 m.  
 (150 m maximum circuit length with 16 A supply. **Note:** The AT-TS-14 control is capable of switching 16 A. Therefore a maximum circuit length of 180 m requires the implementation of a RAYSTAT-CONTROL-10.)

### 3. Advanced energy efficiency electronic thermostat.

#### RAYSTAT-CONTROL-10



- Adjustable temperature set-point range: 0 degrees to +150 degrees.
- Line temperature sensing probe (included) for precise control and energy efficiency.
- Max. switching capacity, 25A 230Vac.



### 4. Insulation selection

Frost protection to -20°C

| Insulation thicknesses | mm<br>Inches | Pipe diameter |            |          |            |             |          |             |          |           |
|------------------------|--------------|---------------|------------|----------|------------|-------------|----------|-------------|----------|-----------|
|                        |              | 15<br>1/2"    | 22<br>3/4" | 28<br>1" | 35<br>5/4" | 42<br>11/2" | 54<br>2" | 67<br>21/2" | 76<br>3" | 108<br>4" |
| 10 mm                  |              | ☺             |            |          |            |             |          |             |          |           |
| 15 mm                  |              | ☺             | ☺          | ☺        |            |             |          |             |          |           |
| 20 mm                  |              | ☺             | ☺          | ☺        | ☺          | ☺           |          |             |          |           |
| 25 mm                  |              | ☺             | ☺          | ☺        | ☺          | ☺           | ☺        |             |          |           |
| 30 mm                  |              | ☺             | ☺          | ☺        | ☺          | ☺           | ☺        | ☺           |          |           |
| 40 mm                  |              | ☺             | ☺          | ☺        | ☺          | ☺           | ☺        | ☺           | ☺        |           |
| 50 mm                  |              | ☺             | ☺          | ☺        | ☺          | ☺           | ☺        | ☺           | ☺        | ☺         |

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