Sontay®
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ST-FRE
Capillary Frost Thermostats

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Features and Benefits

- Universal mounting
- Easy adjustment of set point
- Setting indicator
- Volt Free Contacts, ST-FRE1 & ST-FRE-2
- IP65 housing option
- Manual reset versions have an exposed push button on the front cover so no tools needed to reset

Technical Overview

The ST-FRE range of thermostats provide a switch output based on the average temperature detected along a 6 meter or 2 meter capillary sensor.

The most common application is for frost protection on fresh air intakes or air-conditioning systems, to prevent the icing up of filters, fans and coils. The capillary is fixed in a matrix across the duct, in a position downstream of the pre-heater or frost coil.

Product Codes

ST-FRE-1	IP44, 6-Meter capillary, auto reset
ST-FRE-2	IP44, 6-Meter capillary, manual reset
ST-FRE-3	IP44, 2-Meter capillary, auto reset
ST-FRE-4	IP44, 2-Meter capillary, manual reset
ST-FRE-1-IP65	IP65, 6-Meter capillary, auto reset
ST-FRE-2-IP65	IP65, 6-Meter capillary, manual reset
ST-FRE-3-IP65	IP65, 2-Meter capillary, auto reset
ST-FRE-4-IP65	IP65, 2-Meter capillary, manual reset

Accessories

ST-DFK*	Additional duct fixing clips 6-pack
BRK	Mounting bracket

* 6 meter thermostats include 6 capillary fixing clips as standard, 2 meter versions 1 capillary fixing clip.

Specification

Control range	-30 to +10°C
Differential:	
ST-FRE-1 & 3	2 to 16°C
ST-FRE-2 & 4	2.5°C (fixed)
Switch rating:	
230Vac	24(10)A
24Vdc	3A
Manual reset	On low temperature (ST-FRE-2 & 4)
Housing material	ABS
Housing dimensions	86 x 75 x 44mm (IP44) 130 x 130 x 100mm (IP65)
Capillary:	
Material	Copper
Charge	Vapour
Max. temp	+150°C
Dimensions	6m or 2m x 1.8mm dia.
Ambient range:	
Housing	-50 to +70°C
Storage	-50 to +70°C
Sensing range	-55 to +180°C
Vibration resistance	4g (10 to 1000 Hz)
Protection	IP44 (IP65 enclosure option)
Country of origin	Czech Republic
Conformity	LVD, CE & UKCA Marked

The body of the device must be located at a point where it will not be subjected to temperatures lower than the set point.

WEEE Directive:

At the end of the products useful life please dispose as per the local regulations.
Do not dispose of with normal household was
Do not burn.

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Installation

Installation Steps:

1) Install only by a qualified technician experienced with hazardous voltages.
2) Isolate all power before starting work.
3) Use cables up to 2.5 mm²; do not overtighten terminals.
4) Mount on a flat surface or optional bracket; ensure screws do not penetrate >8 mm. Avoid distortion and vibration.
5) Fix the capillary at the sensing point; max 100 mm outside control. Ensure the unit body stays above set temperature.
6) Secure the capillary with clips; avoid twisting/kinking (min bend radius 25 mm).
7) Feed cable through the grommet or use a PG13.5 gland.
8) Make electrical connections (max torque 1.2 Nm).
9) Set switching point and differential (ST-FRE1 & 3) using the adjustment screws.

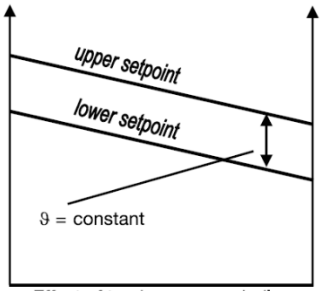
ST-FRE-1 & 3: Range spindle sets the upper point; differential spindle sets the lower point.

Lower set point = Upper set point – Differential

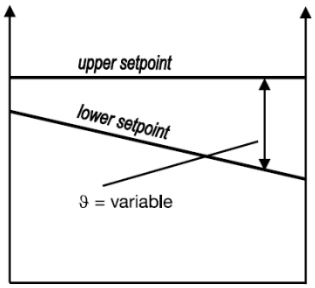
The following two rules should be kept in mind:

- An adjustment of the range spindle always affects both, upper and lower set point.
- An adjustment of the differential spindle affects the lower set point, only.

The following diagrams depict this dependency:



Effect of turning range spindle

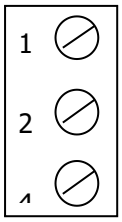


Effect of turning differential spindle

10) To test the switch, use the check-out lever to manually override the electrical contact position.

Connections

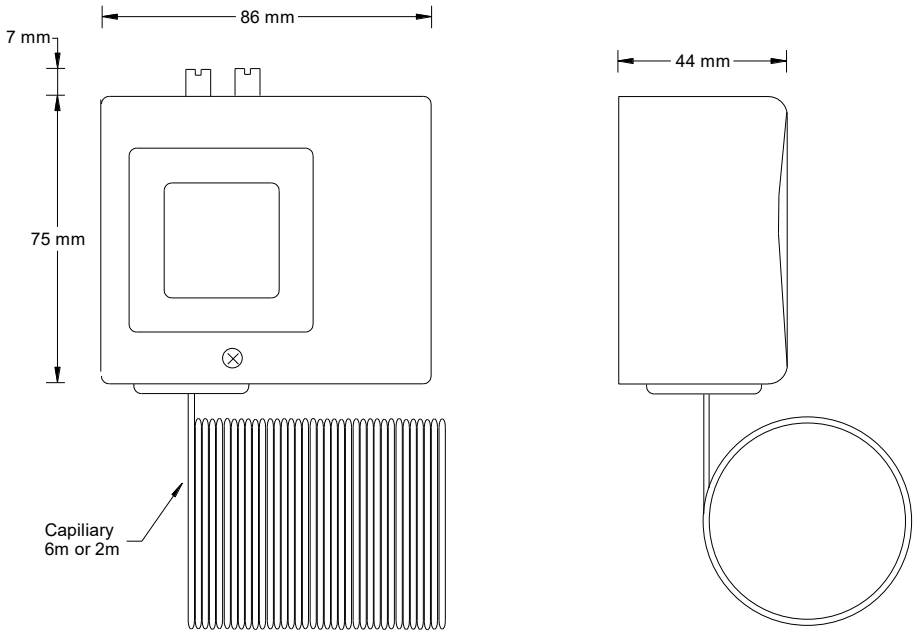
1.	Common
2.	Rising temperature
3.	Falling temperature



Please note: The ST-FRE-3 and ST-FRE-4 are both fitted with an 82kΩ resistor that acts as a bellows heater. If a VFC output is required, use the ST-EFRE-3 or ST-EFRE-4 as alternatives.

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Dimensions



Whilst every effort has been made to ensure the accuracy of this specification, Sontay cannot accept responsibility for damage, injury, loss or expense resulting from errors or omissions. In the interest of technical improvement, this specification may be altered without notice.

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