Frost Protection Thermostats TS-FS

Description

The TS-FS frost protection thermostats provide a switched output based on the average temperature detected along a six metre capillary sensor. The unit is fixed across a duct using capillary clips, downstream of the frost coil and is used to prevent the icing up of filters, fans and coils.

Features

- Auto or manual reset versions
- 6 metre capillary
- 16A @ 240Vac switch rating

Technical Specification

Control range:	-30°C to +15°C
Differential:	TS-FS-A - 1.5...16°C
	TS-FS-M - Fixed 2.5°C
Switch rating:	24(10)A @ 230Vac
	3A @ 24Vdc
Reset:	FS-A: Auto
	FS-M: Manual
Capillary:	6m x 2mm dia copper
Sensor Type:	Vapour Charge
Ambient range:	Housing: 0°C to 50°C
	Capillary: -50...+70°C
Protection:	IP44 (IP65 to order)

Order Codes

TS-FS-A	Auto reset frost protection thermostat
TS-FS-M	Manual reset frost protection thermostat
TS-FS-A-IP65	Auto reset frost protection thermostat IP65
TS-FS-M-IP65	Manual reset frost protection thermostat IP65
TS-FS-FC	Capillary fixing clips - pack of 5

Vapour charge – Sensor type

These sensing elements always sense from the coldest point on the capillary, coil, bulb or power element head. For proper operation it must be ensured that this coldest point is at the sensor portion which is exposed to the medium temperature to be sensed. The sensing location should be at least 2K colder than the other parts of the thermal system.

Sensor type is a capillary type of sensor which can be wrapped around a heat exchanger's surface in order to sense the coldest point on the heat exchanger for frost protection applications. Vapour charges respond faster to temperature changes than absorption and liquid charges.

Setpoints

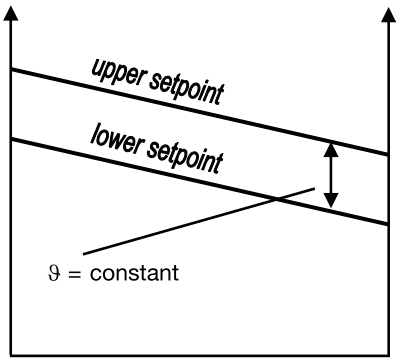
TS-FS are adjustable controls with adjustment spindles for rangeand differential*. By turning the range spindle, the upper setpoint is defined and by adjusting the differential spindle, the differential and hence the lower setpoint is defined. The dependency between upper and lower setpoint is always as follows:

Lower setpoint = Upper setpoint – Differential

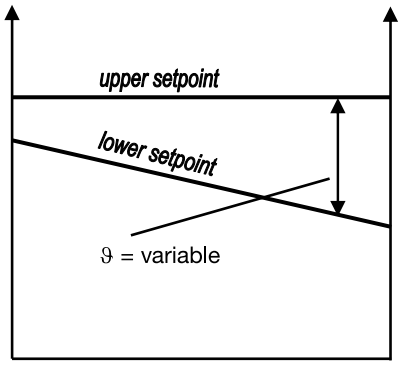
The following two rules should be kept in mind:

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

The following diagrams depict this dependency:



Effect of turning range spindle



Effect of turning differential spindle

The controls are equipped with display scale and pointers to indicate the approximate settings. Top operated controls have display scales in units °C and °F. For precise setting of the controls, external thermometers must be used.

* Manual reset controls have a fixed differential and no differential spindle

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Electrical contacts

TS-FS temperature controls are equipped with high rated double snap action contacts for shatter-free and reliable operation. All contacts throughout this range of controls are designed as Single Pole Double Throw (SPDT) contacts. One contact may be used for control and the other contact for alarm/status indication or auxilliary control.

Gold plated contacts are available on request for low electrical loads, for example in electronic signalling applications.

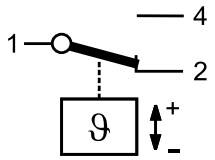
Contact function

Thermostat contacts TS-FS are labelled 1-2-4 where '1' refers to the common pole, '2' refers to the lower setpoint and '4' refers to the upper setpoint.

The contact function for automatic and manual reset versions is as described below.

Automatic reset

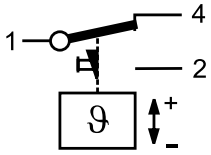
On temperature rise above the upper setpoint, contacts 1-2 open and contacts 1-4 close. On decreasing temperature lower setpoint contacts 1-4 open and contacts 1-2 close.



Automatic reset contact function

Manual reset low temperature

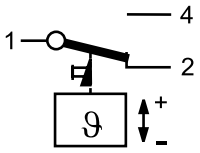
On decreasing temperature below the lower setpoint, contacts 1-4 open, contacts 1-2 close and latch. Only on pressure rise above upper setpoint and after pressing the manual reset button contacts 1-2 will open and contacts 1-4 will close again.



Manual reset low pressure contact function

Manual reset high temperature

On increasing temperature above the upper setpoint, contacts 1-2 open, contacts 1-4 close and latch. Only on falling temperature below lower setpoint and after pressing the manual reset button, contacts 1-4 will open and contacts 1-2 will close again.



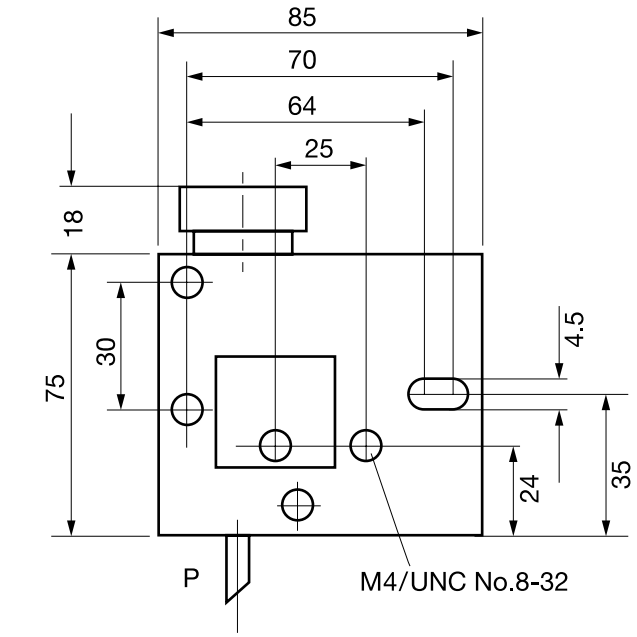
Manual reset high temperature contact function

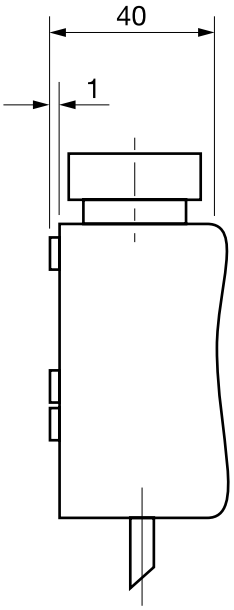
Installation and maintenance

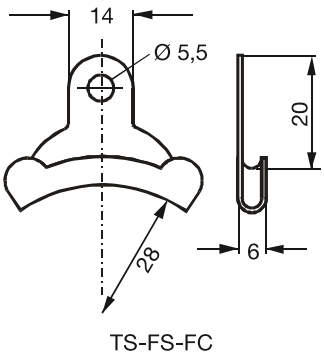
Controls come with an adjustment knob and a lockplate which may be used to protect the settings by wire-seal if desired. Range and differential spindle may be sealed independent from each other.

A front access manual toggle is provided for checking out control operation. All TS-FS controls come with heavy duty terminal blocks which are finger-proof and feature wire clamps plus non-loosable terminal screws for ease of wiring. Available accessories include capillary fixinf clips TF-FS-FC. The standard mounting holes for mounting brackets are equipped with a universal thread to fit both, M4 and UNC 8-32 screws. The standard wholesale package includes two mounting screws. In addition, further hole patterns for surface mounting are provided.

Dimensions







TS-FS-FC

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