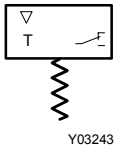
TFC: Frost-protection monitor with capillary-tube sensor

How energy efficiency is improved
Demand-led monitoring without external energy.

Areas of application
For monitoring the temperature in heating coils (air side), water drains and ducts. Especially suitable for equipment that is subject to vibrations.

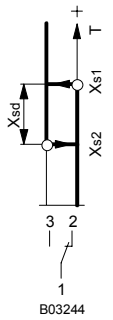
Features
- Temperature range: 0 to15 °C
- Contact rating: 1 mA, 6 V to 10 A, 400 V
- Gold-plated silver contacts
- Upper and lower switching points can be set independently
- Sealable
- 2 sec. time constant in water at 0.5 m/s
- 6 m copper capillary tube

Technical description
- Light-alloy housing with transparent cover
- Splash-proof
- Ambient temperature: 0 to +70 ° C
- IP 54 with accessories



Type	Setting range °C	Min. switching difference [1] K	Permissible sensor temp. °C	Weight kg
TFC 7B12 F001	0...15	2...3	–40...180	0,9

Contact rating		Perm. ambient temp.	0...70 °C [4]
as silver contacts [2] for higher loading		Degree of protection	IP 44 (EN 60529)
max.	10(2) A, 400 V~ 25 W, 250 V=	Protection class	I (IEC 60730)
min.	100 mA, 24 V	Wiring diagram	A01497
as gold contacts [3] for lower loading		Dimension drawing	M259249
max.	200 mA, 50 V	Fitting instructions	MV 23158
min.	1 mA, 6 V		
Time constant			
in air 0,3 m/s	35 s		
in water 0,5 m/s	2 s		

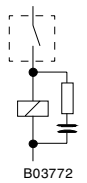


Accessories
0044529 000 Plug spanner for the setting screws
0233310 000 Aluminium cover with window (with accessory 0259299 000 = IP 54)
0259189 000* Bracket for off-wall mounting
0259299 000 Cable screw fitting Pg 13,5
0259409 000* Bracket (for 3-point fixing when used with 0259189)
0303167 000* Five holders for capillary tube

*) Dimension drawing or wiring diagram are available under the same number

1) The small values apply to the high setting points, the large values to the low ones.
2) If under inductive load, take RC circuit into account.
3) If the contacts are ever loaded higher than 200 mA, 50 V, the gold plating will be damaged. The contacts are then classed only as silver contacts, since they lose the properties of gold contacts.
4) The head of the instrument must be fittes at a place which is warmer than that of the sensor.

Operation
Whenever the temperature exceeds the upper switching point (which can be set on the right-hand scale), the contacts switch over from 1-2 to 1-3.
When the temperature falls below the lower switching point (which can be set on the left-hand scale), the contacts switch over from 1-3 to 1-2.
The vibration-proof snap-action switch has a pre-loaded spring which prevents the change-over mechanism from operating until the switching point has been attained. This ensures that the contacts remain fully closed right up to the switching point, even if operation is very slow.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Technical notes

RC circuit under inductive load

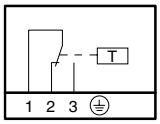
For the optimum RC circuitry, refer to the specifications supplied by the manufacturers of the relays, contactors etc. If these are not available, the following rule of thumb can be applied in order to reduce the inductive load:-

- Capacitance of the RC circuit (μF) is equal to or greater than the operating current (A).
- Resistance of the RC circuit (Ω) is approx. equal to the resistance of the coil (Ω).

Additional technical data

Complies with:-	
Directive 2006/95/EC	EN 60730-1/ EN 60730-2-9
EMC directive 2004/108/EC	EN 61000-6-1/ EN 61000-6-2
	EN 61000-6-3/ EN 61000-6-4

Wiring diagram



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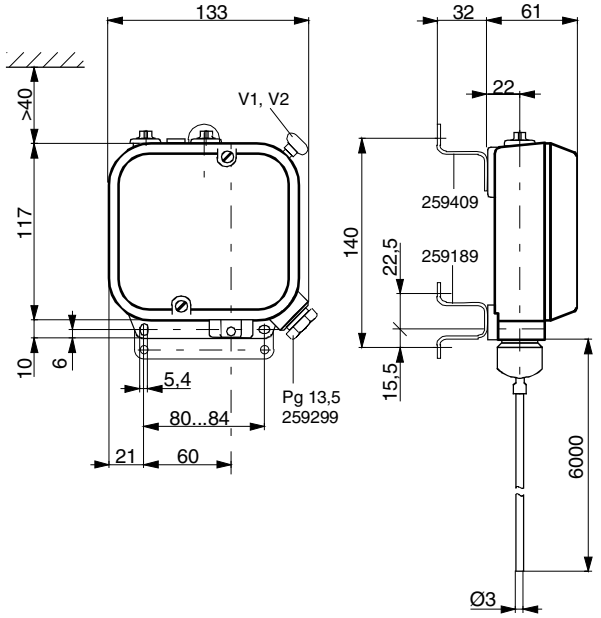
Dimension drawing



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Accessories

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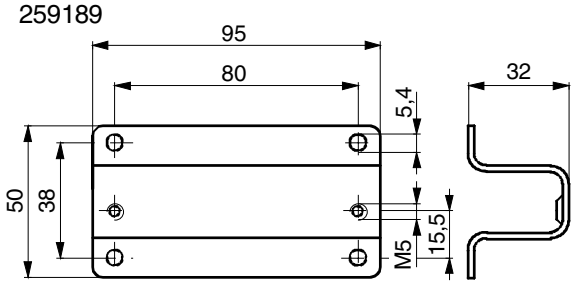

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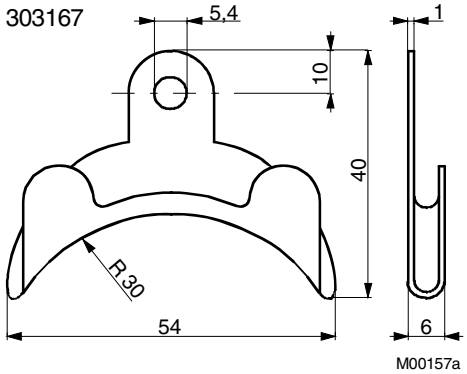

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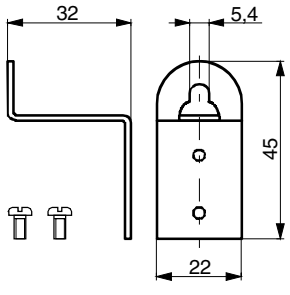

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N.B.: A comma between cardinal numbers denotes a decimal point

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