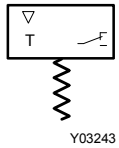
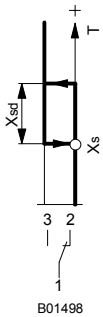
TFL 201: Frost-protection monitor/limiter with capillary-tube sensor





How energy efficiency is improved
Demand-led, large-scale monitoring of installation parts as required, without auxiliary energy.

Areas of application
Temperature monitoring in air heaters, water pipes and air ducting. Especially suitable for compact applications.

Features
- Temperature range: -5 to +15 °C
- Contact rating: 4 mA, 6 V to 10 A, 250 V
- Gold-plated silver contacts
- Switching point and switching difference can be adjusted
- Sealable
- 2 sec. time constant in water at 0.5 m/s
- 1.5, 3 or 6 m copper capillary tube

Technical description
- Transparent cover made of impact-resistant thermoplastic
- Ambient temperature: -5 to +70 ° C
- IP 65
- Active from 10 cm capillary length in switching temperature
- Standard housing-mounted plug with cable connector for cables of 6 to 10 mm in diameter

Type	Function	Setting range °C	Switching difference (Average values) K	Permissible sensor temp. °C	Weight kg
TFL 201 F001	X_{Sd} = fixed	–5...15	2,0	–20...200	0,47
TFL 201 F011	X_{Sd} = variable	–5...15	2...6	–20...200	0,47
TFL 201 F021	limiter	–5...15	2,0	–20...200	0,47

Contact rating		Factory setting	5 °C
as silver contacts [1]	10(3) A, 250 V~	Tolerance of switching difference	max. ± 1 K
	50 W, 250 V=	Perm. temp. at head of instrument [4]	–5...70 °C
min.	100 mA, 24 V	Degree of protection	IP 65 (EN 60529)
as gold contacts [2]	160 mA, 50 V	Protection class	I (IEC 60730)
min.	4 mA, 6 V		
Time constant		Wiring diagram, monitor	A01497
in air 0,3 m/s	35 s	limiter	A05218
in water 0,5 m/s	2 s	Dimension drawing	M09981
		Fitting instructions	MV 505752
Active length of capillary tube [3]	min. 10 cm	Declaration on materials	MD 22.030

Variants (otherwise as standard version)

TFL 201 F101 Capillary tube, 1,5 m long; with 3 holders, X_{sd} = fixed

TFL 201 F601 Capillary tube, 6,0 m long; with 5 holders, X_{sd} = fixed

Accessories
0296936 000* Bracket for rail: top-hat rail EN 50022, 35 × 7,5 or 35 × 15

0303167 000* Five additional holders for capillary tube

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

1) If under inductive load, take RC circuit into account.
2) If the contacts are ever loaded higher than 160 mA, 50 V, the gold plating will be damaged. The contacts are then classed only as silver contacts, since they lose the characteristics of gold contacts.
3) The monitor always reacts to the coldest place (minimum length is 10 cm).
4) The head of the instrument must be fitted at a place which is warmer than that of the sensor.

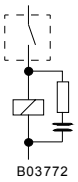
Operation
Normally, contacts 1-3 are closed. Whenever the temperature falls below the lower switching point (set value), the contacts switch over from 1-3 to 1-2. When the temperature exceeds the upper switching point, the contacts switch back from 1-2 to 1-3.

F021 limiter with mechanical lock

When the temperature has again risen by the switching difference X_{Sd}, the contacts can be reset manually from 1-2 to 1-3 (reset button).

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



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 inductive load can be reduced by applying the following rule of thumb (not binding):-

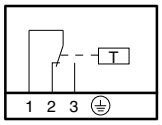
- Capacity of the RC circuitry (µF) ≥ operating current (A)
- Resistance of the RC circuitry (Ω) ≈ coil resistance (Ω)

Influence on switching difference

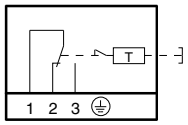
The switching difference is slightly dependent on the setpoint. The switching differences stated in the PDS sheet are typical values at the start of the range. The setpoint's influence on the switching difference increases the switching difference by: ΔX_{Sd} = (setpoint X_S – start of range) × 0.04

Wiring diagram

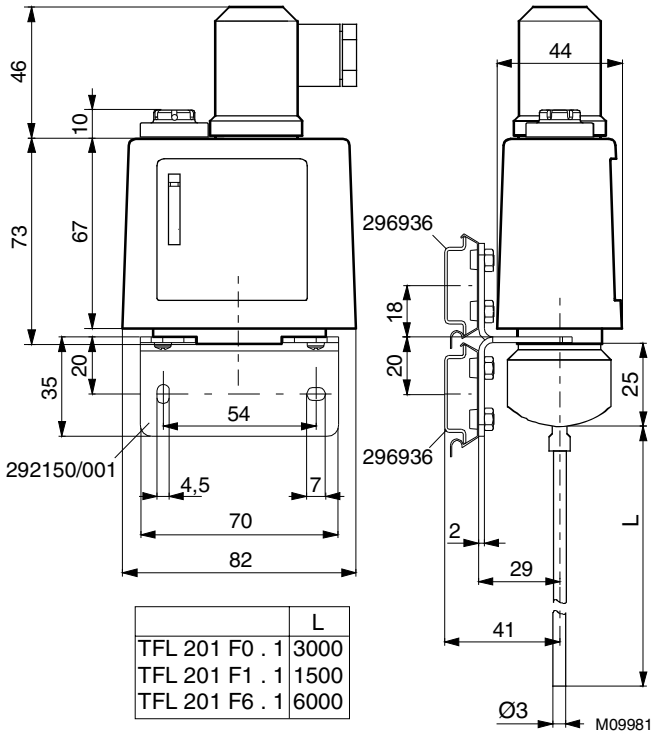
Monitor



Limiter



Dimension drawing



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TFL 201 F0 . 1	3000
TFL 201 F1 . 1	1500
TFL 201 F6 . 1	6000

Accessories

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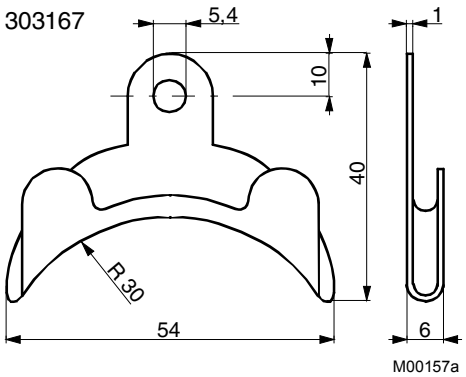

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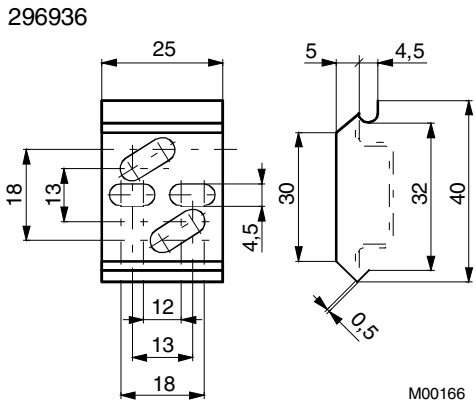

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