



*Centre National
d'Expertise Réseaux*

TEMPERATURE SWITCHES FOR TRANSFORMERS



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NT FPTR 100 E

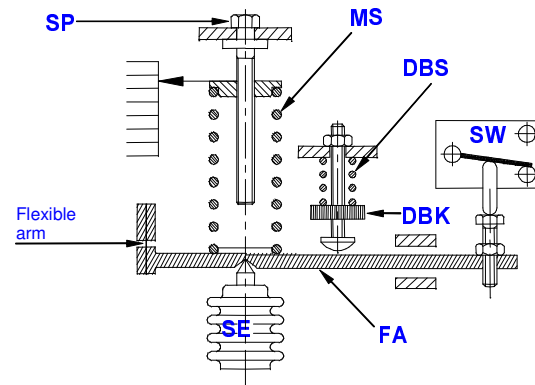
HIGH DIELECTRIC STRENGTH ELECTROMECHANICAL TEMPERATURE SWITCHES

1- PRINCIPLE

The temperature is applied to a remote mount "vapour pressure" sensing element.

The temperature converted into pressure is transmitted by a sealed circuit to a metal bellows "SE". The temperature switch thus behaves like a bellows pressure switch.

The variation in bellows pressure caused by the temperature changes acts on the internal mechanism based on a balanced system of opposing forces (main spring "MS" and sensing element "SE") located on either side of a flexible arm "FA".



The theoretical articulation axis of the flexible arm "FA" comprises a stainless steel strip that provides constant support for the arm.

The force thus produced is balanced by the "MS" range spring enabling the set point to be adjusted using the "SP" screw.

After the set point is exceeded, the movement of the flexible arm is detected by the switch "SW" used at the end of travel.

The temperature change for returning the switch to its initial position is called the dead band. The action of a second spring "DBS" on the arm "FA" increases the dead band by adjusting the high point using the "DBK" knob.

2- USE

2.1 General

All fluids compatible with the sensing element.

2.1 Specific

Controlling transformer oil temperature from 25 to 115°C (Max. 137°C).
Starting up air coolers.

3 - TESTS

"Direction des Etudes et Recherches - ELECTRICITE DE FRANCE - RTE - CNER "

Temperature switch qualification tests in compliance with the HN 46 S 50 standard according to the test report HM 63/9634 of 10/06/1992.

Class P 1 – Category 2 with dead band set to minimum.

(Any other construction or arrangement may compromise the qualification).



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4 – **GENERAL CHARACTERISTICS**

4.1 Housing characteristics

- Aluminium alloy housing with flush buna N cover seal
- Epoxy coating
- Tightness: IP 56 degree of severity according to EN 60529
- Zinc plated steel internal mechanism and external screws
- Electrical output tilted downward at 45°
- Mounted on a Marine type reinforced fixing bracket
- Protected breather
- Leading mechanism for the "SP" range adjustment screw.

4.2 Electrical characteristics

- ABB switch of type C 6830 with screw-terminals (12V switch code)
- Dielectric strength: 2000 V between open switches (common mode)
2000 V between switches and ground (differential mode)
- Electrical shock: 5000 V (1.2/50 µs)
- Connection to internal increased safety terminal block EEx"e" with insulating plate
- Metal cable gland with anchoring for cable diameters 6 to 11
- External earthing screw connection
- Adjustable dead band through the entire scale (internal setting)

4.3 Mechanical characteristics

4.3.1 Construction

Copper (or 316Ti on request) capillary temperature switch with a standard length of 2 metres (L), protected by a stainless steel sheath covered in a vinyl sheath (GIP).
Copper (or 316Ti stainless steel) bulb with dimensions related to the capillary length.

Capillary length	Bulb (mm)	
	Dia. B	Length A
≤ 4 metres	14	150
4 to 8 metres	14	236
8 to 20 metres	14	336

The bulb dimensions above can be reduced, but on the condition that the ambient temperature is always below the lower point of return (set point) of the setting value.

4.3.2 Connection

The temperature switches are delivered without a bulb attachment mode. On request, GEORGIN can supply accessories such as glove fingers or capillary glands with special threads.

4.3.3 Scale

Setting °C	Dead band °C		Max.T. 137°C
	Min. ≤	max. ≥	
25	8.5	25	
35	6.5	20	
45	5.5	17	
85	3	13	
100	2.5	10	
115	2	9	

4.3.4 Display accuracy

- < ± 10% of the scale



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TEMPERATURE SWITCHES FOR TRANSFORMERS FC 12V R TR

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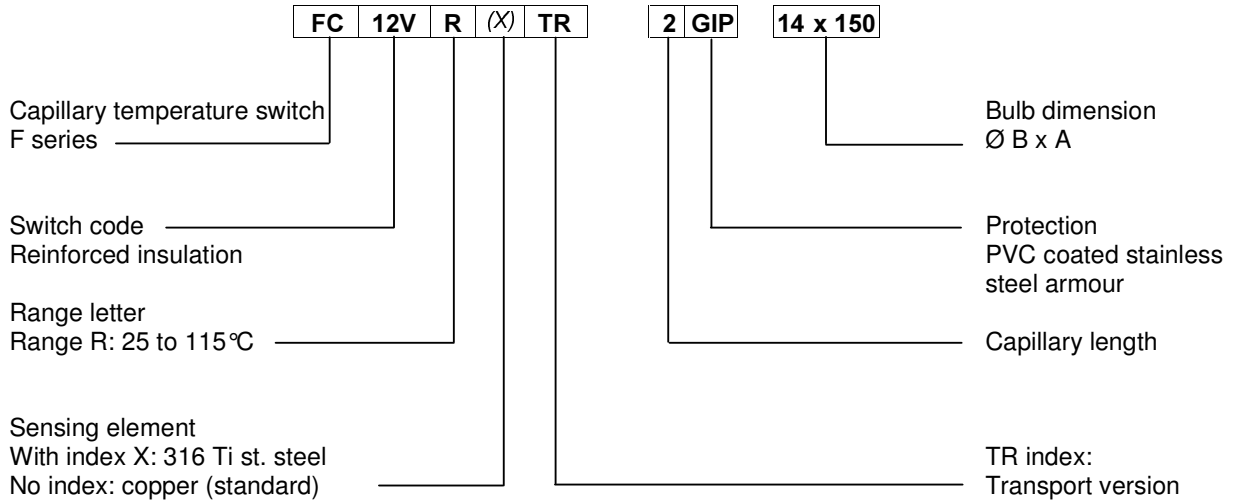


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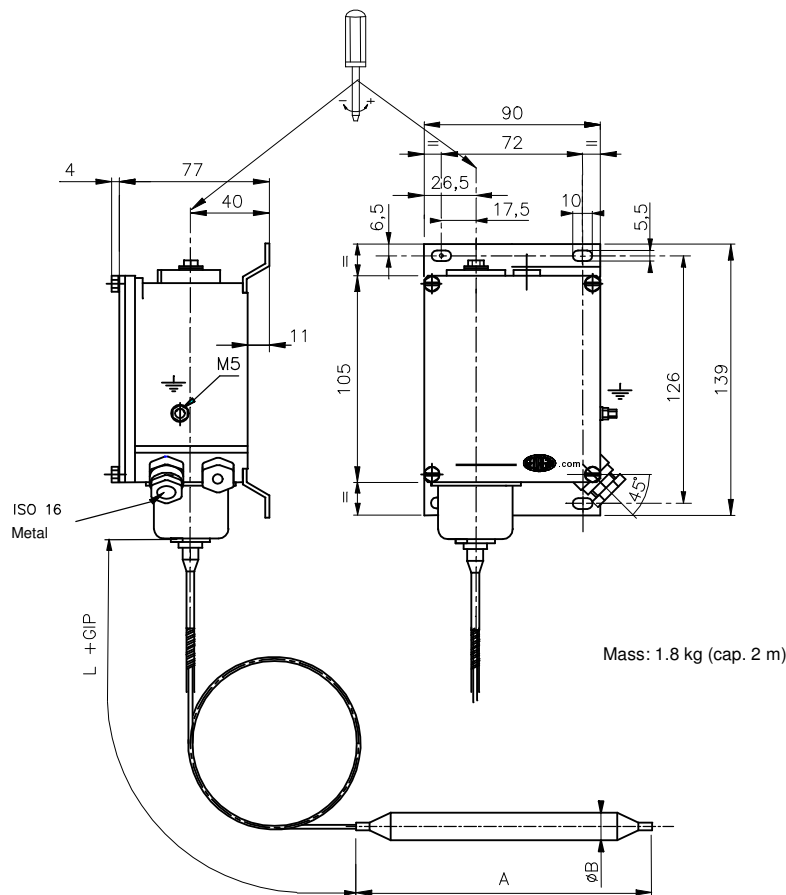
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5 – COMMERCIAL CODE



6 – DIMENSIONS (mm)



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**TEMPERATURE SWITCHES FOR TRANSFORMERS
 FC 12V R TR**

HIGH DIELECTRIC STRENGTH ELECTROMECHANICAL TEMPERATURE SWITCHES

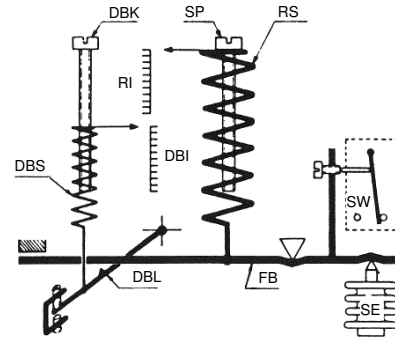
1- PRINCIPLE

The temperature is applied to a remote mount "vapour pressure" sensing element.

The temperature converted into pressure is transmitted by a sealed circuit to a metal bellows "SE". The temperature switch thus behaves like a bellows pressure switch.

The variation in bellows pressure caused by the temperature changes acts on the "FB" balance.

The force thus produced is balanced by the range spring "RS" enabling the set point to be adjusted using the "SP" screw.



After the set point is exceeded, the movement of the "FB" balance is detected by the switch "SW" used at the end of travel.

The temperature change for returning the switch to its initial position is called the dead band. The action of a second spring "DBS" on the "DBL" level increases this dead band by adjusting the high point using the screw "DBK".

2- USE

2.1 General

All fluids compatible with the sensing element.

2.1 Specific

Controlling transformer oil temperature from 25 to 125°C (max. 135°C) for 2 ranges.
 Starting up air coolers.

3 - TESTS

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4 - GENERAL CHARACTERISTICS

4.1 Housing characteristics

- Aluminium alloy housing with flush buna N cover seal
- Epoxy coating
- Tightness: IP 56 or 66 (according to finish) degree of severity according to EN 60529
- Zinc plated steel internal mechanism and external screws
- Mounted on a standard bracket behind the housing
- Protected breather (optional)



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4.2 Electrical characteristics

- Schaltbau switch S840B20 with tab terminals (6V switch code)
- Dielectric strength: 2000 V between open switches (common mode)
2000 V between switches and ground (differential mode)
- Connection to internal terminal block with insulating plate
- Metal cable gland with anchoring for cable diameters 7.5 to 13
- External earthing screw connection
- Adjustable dead band through the entire scale

4.3 Mechanical characteristics

4.3.1 Construction

Copper (or 316Ti stainless steel on request) capillary temperature switch with a standard length of 2 metres (L), protected by a vinyl coated (GIP) stainless steel armour.

Copper (or 316Ti stainless steel) bulb with dimensions related to the capillary length of the P range.

Capillary length	Bulb (mm)	
	Dia. B	Length A P/R range
≤ 4 metres	14	150/150
4 to 8 metres	14	236/150
8 to 20 metres	14	336/150

The bulb dimensions above can be reduced, but on the condition that the ambient temperature is always below the lower point of return (set point) of the setting value.

4.3.2 Connection

The temperature switches are delivered without a bulb attachment mode. On request, GEORGIN can supply accessories such as glove fingers or capillary glands with special threads.

4.3.3 Scale

C 6V P

Range: 25°C to 95°C		Max. T. 105°C*
Setting °C	Dead band °C	
	Min. ≤	max. ≥
25	6	25
35	5	22
45	4	18
75	2.2	11
85	1.8	9
95	1.6	8

* 112°C optional

C 6V R

Range: 45°C to 125°C		Max. T. 135°C
Setting °C	Dead band °C	
	Min. ≤	max. ≥
45	7.5	30
65	5	20
85	3.2	15
100	2.5	12
115	2	10
125	1.8	8

4.3.4 Display accuracy

- < ± 10% of the scale



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TEMPERATURE SWITCHES FOR TRANSFORMERS C 6V P/R

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Equipment
identification
sheet

NT PTR 100 E (11-04)

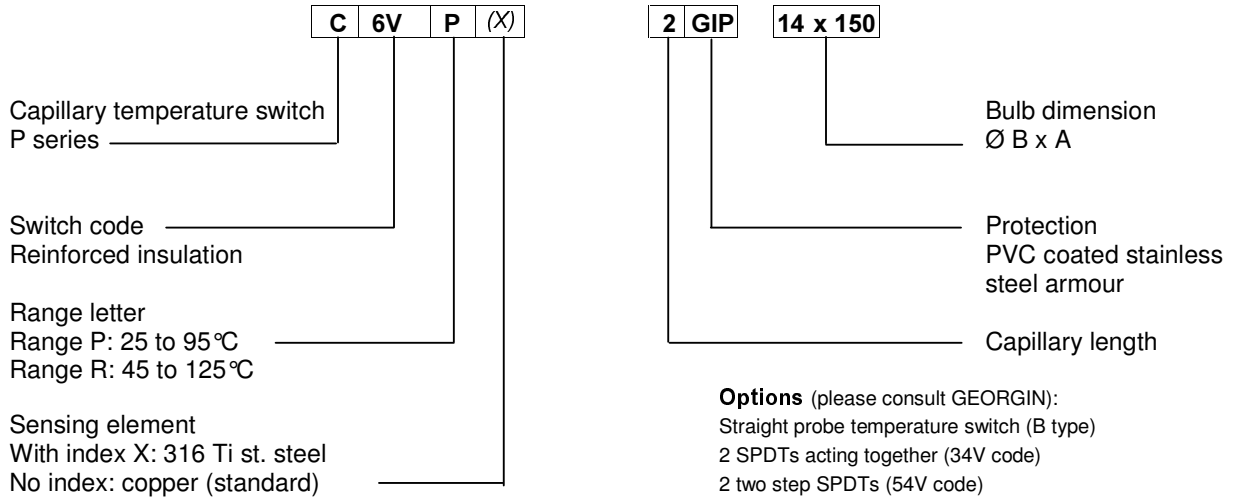


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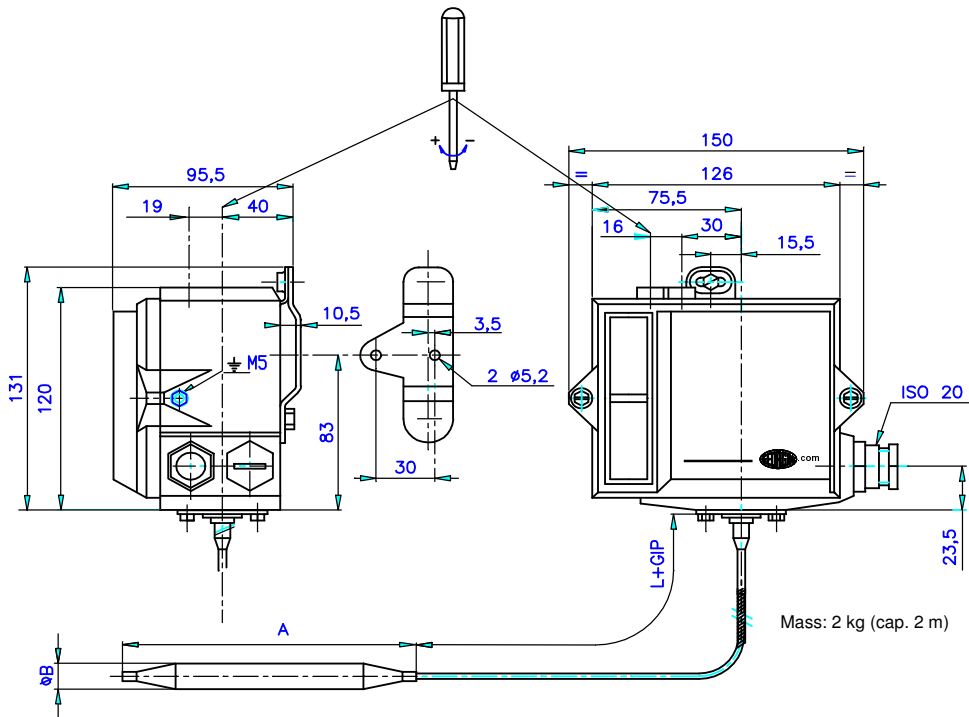
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