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BIMETALLIC THERMOSTAT WITH PRINTED CIRCUIT INTERPOSED BETWEEN A SENSITIVE THERMOSTATIC ELEMENT AND A RELAY

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DESCRIPTION

5 The present invention concerns a bimetallic thermostat with exchange contact with printed circuit interposed between a sensitive thermostatic element and an exchange relay

 Bimetallic thermostats are known comprising an external covering which supports an internal device made up of a base provided with packing which
10 supports contact feet which allow the connection with external devices, an exchange relay connected with the base by means of electric wires and a sensitive thermostatic element connected in turn with said relay by means of contact feet.

 The space present between the external covering and the internal device is
15 generally occupied by insulating resin in order to prevent the feet of the thermostat from touching the projecting wires of the relay.

 What follows is that the manufacture of a thermostat as described above is rather complex and expensive. In addition in the case of breakdown the repair turns out to be difficult if not impossible; the entire thermostat must often be
20 replaced.

 An object of the present invention is to provide a thermostat which remains internally simple but which is utilisable without having "to drown" the internal part into an insulating material.

 According to the invention such object is attained with a bimetallic
25 thermostat with exchange contact comprising an external support covering and an internal device made up of a pierced base provided with a packing and with electric contacts with the outside, of a relay electrically connected with said base and of a sensitive thermostatic element electrically connected with said relay, characterized in that it comprises in addition a printed circuit interposed
30 between the sensing element and the relay.

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The printed circuit has an easy make, it is interchangeable and it does not involve the use of filling insulating material in the space comprised between the external covering and the internal device. At the same time it prevents the direct contact between feet of the sensing element and the electric wires of connection of the relay.

The characteristics and the advantages of the present invention will become evident from the following detailed description an embodiment thereof which is illustrated as a non limiting example in the enclosed drawings in which:

Figure 1 shows an axonometry view of the thermostat according to the present invention;

Figure 2 shows a view in axial section of the thermostat;

Figure 3 shows a sectional view according to the line III-III of Figure 2;

Figure 4 shows a bottom plan view of the thermostat;

Figure 5 shows a top plan view of the thermostat;

Figure 6 shows a bottom plan view of the plate;

Figure 7 shows the electric layout of the thermostat according to the invention.

A bimetallic thermostat comprises an external covering 1 with male thread 11, which supports an internal device 2 made up of a pierced base 3, provided with a packing 4, which supports electric connection external feet 5, 15, 25, 35, which are connected with a printed circuit insulating plate 7 by means of electric wires 6.

A relay 8 is fastened to said plate 7, with which a sensitive thermostatic element 9 is connected by means of feet 10.

The plate 7 has on one of its faces two slots 12, in order to house the feet 10, and holes 13 for the ends of the wires 6. In addition it has holes 14 for the fastening of the relay 8 and printed circuit routes 16

The plate 7 allows to prevent interferences between the feet 10 of the sensing element 9 and the wires adjacent the relay 8, situation which could create the short circuit of the relay or in any case the non correct operation of

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the same relay 8 with consequent wrong output signals through the external feet
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This solution allows an easy assemblage of the thermostat which is as a
result without any filling insulating material.

5 In addition any possible technical problem can be solved owing to the easy
disassembly: substitution of the relay 8 or sensing element 9, contacts which
fail, etc. There is therefore a certain interchangeability of the elements

The reduction of manufacturing times together with the simplicity of the
device justifies a substantial reduction in costs.

10 In figure 7 the electric layout of the above described thermostat is
illustrated, where 5 and 15 are the feeding feet, 25 is the output foot in the
operation with normally closed contact and 35 is the output foot in the operation
with normally open contact, where the two feet 25 and 35 are selected
alternatively as a function of the excitation state or non-excitation state of the
15 relay 8, in turn function of the sensing element 9.

CLAIMS

1. Bimetallic thermostat with electric contacts comprising an external support covering (1) and an inner chamber (2) made up of a pierced base (3) provided with a packing (4) and with electric contacts (5, 15, 25, 35) with the outside, of a relay (8) supported by said base (3) and of a sensitive thermostatic element (9) electrically connected with said relay (8), characterized in that it additionally comprises a printed circuit (7) interposed between the sensitive thermostatic element (9) and the relay (8), said printed circuit comprising first holes for the ends of wires connecting the electric contacts with the printed circuit, second holes for fastening the relay and printed circuit routes.

2. Thermostat according to claim 1, characterized in that said relay (8) is electrically connected with said base (3) by means of electric "wires (6).

3. Thermostat according to claim 1, characterized in that said sensing element (9) is connected with said plate (7) by means of feet (10).

4. Thermostat according to claim 1 and 2, characterized in that said electric contacts with the outside consist of external feet (5) with which said electric wires (6) are connected.

5. Thermostat according to claim 1, characterized in that said external covering (1) is partially provided with an external connection thread (11).