

A protected electric switching apparatus.

The invention relates to an electric apparatus with thermal protection comprising :

- 05 - a contactor having a fixed base provided with means for fixing said apparatus on a profiled rail, a front face which extends opposite said base and lateral faces including a first association face which extends between said base and said front face, said first association face comprising, in the vicinity of the front face, a row of terminals including
10 power terminals and at least a signalling terminal and said fixing means comprising a latch provided with a control means which projects from said first association face, and
- 15 - a thermal relay comprising a second association face provided with conducting pins arranged so as to be engaged and fixed in said power terminals when said thermal relay is in an assembled position, with the second association face facing the first association face and in close vicinity thereof, said conducting pins thus serving to assume both an electric connection and a mechanical fixing between said
20 contactor and said thermal relay.

In known apparatus, whose construction complies with that mentioned above, and which are very widely used for supplying motors, it is necessary to dissociate the thermal relay from the contactor in order to have access to the
25 fixing latch and change this apparatus; this requirement is due to the fact that the locking hook is generally placed in a plane of symmetry of the contactor which itself passes through a region of the thermal relay containing the conducting pins connecting it to the terminals of this
30 contactor.

05 Changing a single contactor is in fact not a very frequent operation, for the number of operating cycles which the contacts of power switches can carry out is chosen to be appreciably greater than that which will be effectively used; however, the deterioration of an electromagnet coil or the need to re-organise equipment inside a control cabinet, form possibilities which the constructor must take into account in order to facilitate the work of the maintenance staff.

10 The present invention consequently proposes providing the user with a protected switching apparatus whose general construction complies with that mentioned above, and in which measures are taken so that a response is made to the needs felt.

15 According to the present invention, an electric apparatus with thermal protection as first set forth hereinabove is characterised in that :-

20 - said control means for the latch projects from said first association face of the contactor in a region located near the base, under said signalling terminal ;

- said second association face is provided with a recess forming a passage extending perpendicularly to said base along an axis passing in front of said signalling terminal and through said control means, said passage providing access for a tool to unlock said latch.

25 The invention will be better understood from the following description with reference to the figures of the accompanying drawings wherein :-

Figure 1 is an elevational view of a protected switching apparatus, in which the contactor and the relay are dissociated; and

05 Figure 2 is a view from the left in Figure 1 of the apparatus of Figure 1, in which the contactor and the relay are associated.

10 A protected switching apparatus 1 results from the association of a contactor 2 whose function is to establish the passage of multiphase currents to a load such as a motor, and a thermal relay 3 whose function is to react to low but extended current overloads.

Contactor 2 is fixed to a profiled rail 4 which is fixed to a wall or plate such as 5.

15 The contactor has a first set of power switches, whose input terminals and output terminals are shown by the references 6, 7, 8 respectively 9, 10, 11; a second set of signalling switches, possibly only comprising one as can be seen in Figure 1, has an input terminal 13 and an output terminal 14.

20 The case 12 of the contactor has, under its base 15, a recess 16 which is limited by a fixed edge 17 and which receives, on the opposite side, the end 18 of a resiliently mobile hook or latch 20, see Figure 2. This end and this edge are engaged on the flanges 21, 22 of the profiled rail
25 4; as can be seen in Figure 1, this locking hook 20 has a projecting lug 23 and an operating eye or notch 24 which are laterally offset with respect to a plane of symmetry PP' of the contactor.

This offset may bring the lug and/or the notch up to the level of the sidewall 25 of case 12, but does not necessarily mean that the end 18 of latch 20 is itself substantially offset with respect to the plane PP'.

05 However, this lateral offset brings the operating notch 24 in the vicinity of wall 25 near which are disposed the terminals 13, 14 of the auxiliary switch.

10 The case 26 of the thermal relay 3 has, on a face 27 placed opposite a face 28 of the contactor, three projecting conducting pins 31, 32, 33 whose spacing apart and length are chosen so that they may penetrate into terminals 9, 10, 11 and be clamped therein by the corresponding screws.

15 These pins form the inputs of current circuits comprising bi-metal strips and ending in output terminals 35, 36, 37 on an opposite face 29.

20 It will be noted that the numbers disposed in the immediate vicinity of the screws of these terminals have no relation with the references of the described elements; they correspond to standardised marking which has been chosen for identifying their functions. When relay 3 is associated with contactor 2, the plane PP' forms substantially a plane of symmetry common to these two elements.

25 In a side region of face 27 is placed a recess or passage 30 which is situated opposite the auxiliary switch terminal 14 and which does not interfere with the region 38 containing pins 31, 32, 33. Preferably, this passage will open into a side face 19 of the thermal relay extending the lateral face 25 of the contactor.

05 When the contactor and the thermal relay are associated, see Figure 2, this passage, which extends substantially perpendicularly to the fixing plane RR' of the profiled rail, is limited by the immediate proximity of faces 27, 28 and makes possible the access of a tool such as a screwdriver 40 between the front face 43 of relay 3 adjacent the front face 44 of the contactor and the operating notch 24, so as to communicate thereto a movement in direction G for freeing the end 18 of latch 20.

10 As can be seen in Figure 2, the mechanical fastening of the thermal relay, which is partly provided by the pins nipped in the terminals, is completed by the penetration of a hook 41 projecting from face 27 into a notch 42 opening into face 28.

CLAIMS

1. An electric apparatus with thermal protection comprising :

05 - a contactor having a fixed base provided with means for fixing said apparatus on a profiled rail, a front face which extends opposite said base and lateral faces including a first association face which extends between said base and said front face, said first association face comprising, in the vicinity of the front face, a row of terminals including 10 power terminals and at least a signalling terminal and said fixing means comprising a latch provided with a control means which projects from said first association face, and

15 - a thermal relay comprising a second association face provided with conducting pins arranged so as to be engaged and fixed in said power terminals when said thermal relay is in an assembled position, with the second association face facing the first association face and in close vicinity thereof, said conducting pins thus serving to assume both an electric connection and a mechanical fixing between said 20 contactor and said thermal relay.

characterised in that :

- said control means for the latch projects from said first association face of the contactor in a region located near the base, under said signalling terminal ;

25 - said second association face is provided with a recess forming a passage extending perpendicularly to said base along an axis passing in front of said signalling terminal and through said control means, said passage providing access for a tool to unlock said latch.



05

2. An electric apparatus, as claimed in claim 1, wherein the signalling terminal is adjacent a sidewall of the contactor and said recess ends at a lateral face of the thermal relay and extends towards a notch of said latch which is laterally offset with respect to a median plane common to the relay and to the contactor.

3. An electric apparatus substantially as described herein with reference to the accompanying drawings.



* C L M S *