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Electrical service switching device This Sheet Has Been Replaced



Description

5 The invention relates to an electrical service switching device in accordance with the preamble of Claim 1. Service switching devices in this context are circuit-breakers or residual-current-operated
10 circuit-breakers which have at least one single contact point or twin contact point and whose housing approximately has a T shape. In this case, the fastening surface with the aid of which the service switching device can be fastened on a top-hat rail or
15 the like is located on the free longitudinal surface of the transverse web of the T shape. Running parallel thereto is a leading front surface on the end face of the longitudinal web of the T shape and two trailing front surfaces on the transverse beam of the T shape;
20 narrow-side walls running perpendicular thereto are also provided on the end faces of the transverse web and on the lateral surfaces of the longitudinal web.

25 There is the task of determining and displaying the switch position of the contact point on the service switching device, something which is mostly performed with the aid of an auxiliary switch.

30 In the case of circuit-breakers and residual-current-operating circuit-breakers, the auxiliary switches are attached laterally to one of the broadside surfaces; suitable coupling elements are used to transmit the switch position of the moveable contact piece or, if appropriate, the contact bridge to the auxiliary switch
35 so that the switch position can therefore be displayed. An arrangement is known in which there is provided on one of the trailing front surfaces in the region of the

web an opening into which an auxiliary switch can be inserted parallel to the web, see EP 0 511 042 B1; this configuration is conceived for starting circuit-breakers. In the case of circuit-breakers or residual-current-operated circuit-breakers, the auxiliary switches are laterally aligned because owing to the configuration of the distribution boards with covers there is not sufficient space for an auxiliary switch which can be inserted into the opening of the trailing front wall.

It is the object of the invention to create an electrical service switching device of the type mentioned at the beginning in which the auxiliary switch can be fixed on the service switching device in a simple and space-saving way.

This object is achieved according to the invention by means of the features of Claim 1.

Accordingly, the auxiliary switch can be attached to one of the narrow-side walls and can be coupled to the moveable contact piece via a coupling element which actuates the auxiliary switch contact point and runs transverse to the narrow-side wall. The width of the auxiliary switch corresponds to the module width of a circuit-breaker pole.

In a preferred way, the auxiliary switch is fastened on the end face of the transverse web in the case of circuit-breakers or residual-current-operated circuit-breakers. This avoids widening of the web of a T shape in the region of the leading front surface, with the result that there is no hindrance to installation in a distribution board having a front cover.

The auxiliary switch width corresponds to the width of a circuit-breaker module or residual-current-operated circuit-breaker module, with the result that the



auxiliary switch does not overlap the broadsides of the service switching device.

5 The coupling element is advantageously a slider which is pressed under the force of a spring against the moveable contact piece, for example against a contact bridge or against a deflection lever connected to the contact bridge, or against the contact lever.

10 The auxiliary switch is preferably a microswitch which is accommodated in the auxiliary switch housing; provided on the coupling element, that is to say on the slider, is a cam surface which actuates the microswitch when the slider is moved to and fro.

15 At the point at which the auxiliary switch is fastened, the service switching device has an opening in which, for example, it is possible to insert a supply lead; in the case of the configuration according to the
20 invention, this insertion opening for a supply lead is used for the purpose of fastening the auxiliary switch on the service switching device. For this reason, this opening must also not be closed if the auxiliary switch should not be attached. This also holds when an
25 additional opening is provided merely for inserting the auxiliary switch.

30 Further advantageous refinements and improvements of the invention are to be gathered from the further subclaims.

The fixing of the auxiliary switch housing can be served by latching elements which can be used to fix the auxiliary switch housing on the housing of the
35 service switching device.

The drawing, in which an exemplary embodiment of the invention is represented, is to be used to explain in more detail and describe the invention and further

advantageous refinements and improvements of the invention.

5 The sole figure shows a view of and into a circuit-breaker.

10 The sole figure shows a view into a circuit-breaker 10 having a housing 11 which has a T shape with a transverse web 12 and a longitudinal web 13. The transverse web 12 runs parallel to the fastening surface 14 of the circuit-breaker 10, and has on the latter a cutout with a stationary nose 15 and a moveable nose (not shown), behind the respectively one top-hat rail 16 (illustrated by dashes).

15 Because of the T shape, the circuit-breaker has a leading front surface 17 and two trailing front surfaces 18, 18a, a toggle switch 19 projecting from the leading front surface 17. Located between the leading front surface 17, which is situated in the end face of the longitudinal web 13, and the two trailing front surfaces 18 are leading narrow-side walls 20 and 20a, and trailing narrow-side surfaces 21, 21a are provided between the trailing front surfaces 18, 18a and the fastening surface 14. The narrow-side surfaces run approximately perpendicular to the front surface 17 and to the fastening surface 14.

30 In the configuration according to the sole figure, the circuit-breaker has a breaker mechanism 22 which is connected (in a way not shown in more detail) to the toggle switch 19, a thermostatic bimetallic strip 23, a magnetic-type trip element 24 and an arc-quenching arrangement 25. As is known, there is located on the magnet-type trip element 24 a stationary contact piece 26 which cooperates with a moveable contact piece 28 fastened on a contact lever 27; the sole figure shows the contact point with the two contact pieces 26 and 28



in the closed state. Supply terminals 29 and 30 are located on both sides of the components just described.

An auxiliary switch 31 is fitted, preferably latched on the trailing narrow-side wall 31, that is to say on that one which is adjoined by the fastening surface 14 and is next to the contact lever 27, said auxiliary switch 31 having a housing 32 in which a microswitch 33 is located. The housing 32 has a guide arm 34 on which a slider 35 can be displaced to and fro parallel to the fastening surface 14, the slider 35 being permanently pressed inwards against the contact lever 27 by means of a compression spring 36. On the inside the slider has a nose 37 which bears against the contact lever 27, and in the region of the auxiliary switch or the microswitch 33 a cam surface which is formed by a sloping surface 38 with the aid of which the switching plunger 39 of the microswitch 33 is actuated whenever the slider 35 is displaced to the left. This is the case when the contact lever 27 reaches an open position when there is a switching operation. The sloping surface 38 then runs onto the actuating plunger 39 and opens or closes the microswitch and vice versa depending on how the microswitch is connected. The auxiliary switch housing 32 also has supply terminals 40 which, just like the supply terminals 29 and 30, can be actuated from the front side.

The guide arm 34 with the slider 35 is inserted into the switch parallel to the fastening surface through an opening serving to connect a lead.

In the direction of the longitudinal extent of the top-hat rail 16, the width of the auxiliary switch 31 corresponds exactly to the module width for example of a circuit-breaker pole. In this way, the auxiliary switch 31 does not overlap the circuit-breaker module on both sides.

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As a consequence of the fitting of the auxiliary switch module on the rear narrow side 21, covers in the distribution board which run parallel to the fastening surface or the front surface 17 and adjoin the front narrow-side walls 20, 20a are not hindered by the auxiliary switch attachment.

A further advantage is to be seen in that the auxiliary switch is plugged into an opening on the rear narrow-side wall and latched there; such an opening, which can be provided in addition to a terminal connection opening, need not be closed separately when an auxiliary switch is provided.

It is shown in the drawing that the coupling element runs approximately perpendicular to the trailing narrow-side surface 21; of course, depending on the arrangement of the contact lever, it is also possible for the coupling element to be arranged in a sloping fashion relative to the narrow-side surface, that is to say at an angle.

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Patent Claims

1. Electrical service switching device, in particular a circuit-breaker or residual-current-operated circuit-breaker, having at least one single-contact point or twin-contact point, having an auxiliary switch, assigned to one of these contact points, for displaying the switch position, whose switching contact point is coupled to the moveable contact piece, and having an approximately T-shaped housing which has a fastening service on the free transverse web of the T shape, approximately parallel thereto a leading front surface on the end face of the longitudinal web of the T shape and two trailing front surfaces, likewise running parallel thereto, on the transverse beam of the T shape, as well as trailing narrow-side walls, running perpendicular thereto, on the end faces of the transverse web and on the lateral surfaces of the longitudinal web of the T shape and leading narrow-side walls on both sides of and perpendicular to the front surfaces, as well as lateral broadside surfaces, characterized in that the auxiliary switch can be attached to one of the narrow-side walls and be latched thereon and can be coupled to the moveable contact piece via a coupling element which actuates the auxiliary switch contact point and runs transverse to the narrow-side wall.
2. Service switching device according to Claim 1, characterized in that the auxiliary switch is fastened on a trailing narrow-side surface or on the end face of the transverse web of the T shape.
3. Service switching device having supply terminals which are located in the switching device housing and are accessible via first openings arranged on the trailing front surfaces by means of a tool and



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5 into which supply leads can be inserted via second openings provided on the narrow-side surfaces adjoining the fastening surface, according to Claim 1 or 2, characterized in that the auxiliary switch can be inserted with the coupling element into one of the two openings so that the coupling element comes into engagement with the moveable contact piece.

10 4. Service switching device according to one of the preceding claims, characterized in that the coupling element is a slider which actuates the contact point located in the auxiliary switch.

15 5. Service switching device according to one of the preceding claims, characterized in that the auxiliary switch contact point is a microswitch.

20 6. Service switching device according to Claim 5, characterized in that the slider has a cam surface which actuates the microswitch.

25 7. Service switching device according to one of the preceding claims, characterized in that there are provided for the auxiliary switch in the auxiliary switch housing supply terminals which can be actuated from the front side.

30 8. Service switching device according to one of the preceding claims, characterized in that the coupling element is pressed permanently in a resilient fashion against the moveable contact piece.

35 9. Service switching device according to one of the preceding claims, having a pivotable contact lever supporting the moveable contact piece, characterized in that the slider engages with the contact lever.

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10. Service switching device according to one of Claims 1 to 8, having a contact bridge bridging two stationary contact pieces, characterized in that the coupling element engages with the contact bridge.
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11. Service switching device according to one of the preceding claims, characterized in that the coupling element is a pivoting lever.
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