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Installation switch

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Description

The invention relates to an installation switch, in particular a circuit breaker or residual current device according to the precharacterizing clause of Claim 1.

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The connection technology for circuit breakers or residual current devices in the past was based only on screws, with a terminal being provided in which a busbar arrangement and a conductor wire were fixed at the same time by means of a terminal screw. In this case, the terminal arrangement is chosen such that the busbar arrangement - seen from the front face of the switching device - is clamped firmly in front of the conductor wire. This means that there are difficulties involved in threading the conductor wire into the terminal arrangement as the threading-in point or the holding opening is covered by the busbar arrangement. In this case, poor connections often occur.

25 A terminal device has been disclosed in the configuration in DE 40 21 825 A1, in which an intermediate part which can be plugged onto a connecting lug of the busbar arrangement is plugged into a plug terminal in the switching device and is thus screwed in place. The circuit breaker together with the intermediate part is plugged onto the busbar.

35 The configuration disclosed in DE 199 05 442.8 provides an opportunity to fix a lead wire using a screw terminal and to plug the busbar arrangement into the terminal arrangement using a connecting lug. However, once again, this results in the problem that the busbar



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arrangement is physically located in front of the lead wire connection, so that firmly clamping the lead wire results in problems, since the insertion opening is covered.

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The object of the invention is thus to provide a terminal arrangement for an installation switch of the type mentioned initially, in which the problems of the known arrangements are avoided.

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According to the invention, this object is achieved in that a screw terminal is provided for the conductor wire and a plug terminal is provided for the cross-wiring in the form of a busbar arrangement, with the plug terminal being located closer to the mounting side than the screw terminal.

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It is thus possible to clamp the busbar arrangement together with a plug connection on the circuit breaker or residual current device, or to clamp the conductor wire in place by means of a screw terminal, with the insertion opening for the conductor wire being located in front of the insertion opening for the connecting lug of the busbar arrangement, so that the insertion opening for the conductor wire is visible and not covered by the busbar arrangement.

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According to an advantageous refinement of the invention, the plug terminal may have at least two tongues which are pressed against one another resiliently, between which the connecting lug on the busbar arrangement can be pushed in.

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The further dependent claims describe a further advantageous refinement of the invention.

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The invention together with further advantageous refinements and improvements of the invention will be

explained and described in more detail with reference to the drawing, which shows a number of exemplary embodiments of the invention.

5 In the figures:

Figure 1 shows a view into a circuit breaker,

10 Figures 2 to 4 show three different busbar arrangements which can be inserted into the circuit breaker shown in Figure 1.

A commercially available circuit breaker 10 has a mounting side 11 in which a recess 12 is provided by means of which the circuit breaker is fixed on a top-hat profile mounting rail 13. For this purpose, the recess 12 has a fixed tab 14 on one wall and a moving tab 15 on the opposite wall, which tab 15 is pressed by the pressure of a spring against the top-hat profile mounting rail 13 when the circuit breaker 10 is mounted on the top-hat profile mounting rail 13.

The circuit breaker 10 also has a latching mechanism 16 to which a switching toggle 17 is connected in order to operate the circuit breaker 10. The release is an electromagnetic release 18 which is intended to disconnect short-circuits, and an overcurrent release 19 in the form of a bimetallic strip which acts on the latching mechanism on the line 20. The electromagnetic release 18 likewise acts on the latching mechanism on a line 21, and an armature which is associated with the release 18 strikes on a contact lever 22 in the direction of the arrow 23, as a result of which a contact point 24 is opened. The electromagnetic release 18 also acts via the line of action 21 on the latching mechanism, as a result of which the moving contact lever is moved permanently to the disconnected position, along the line of action 25.





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When the moving contact lever 22 is moved to the disconnected position in the event of a release, the arc foot produced on the lever 22 jumps onto an arc guiderail 26, which carries the arc into an arc quenching stack 27, so that the arc is quenched.

In the upper region (see Figure 1) there is a connecting terminal 28, which may be a screw terminal.

10 The components described so far exist in all circuit breakers and intrinsically have nothing to do with the invention. They serve only for explanation and are thus illustrated only schematically.

15 On the side opposite the connecting terminal 28, a connecting terminal arrangement 29 is provided which, according to the invention, comprises a single frame terminal 30 with a terminal frame 31 and a terminal screw 32; between the terminal screw 32 and the
20 terminal frame 31 there is an opening 33 into which the stripped end of a conductor wire 34 can be inserted, and can be clamped by means of the terminal screw 32. To this end, there is a through-opening 35 on the switch 10; the through-opening, by means of which the
25 conductor 34 can be inserted into the interior of the single screw terminal 31, is not shown in Figure 1.

The single frame terminal 30 is located in the area or vicinity of the front face 36.

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The connecting terminal arrangement 29 comprises in the region of the mounting surface 11 a terminal tulip 37 (also called a tulip contact 37), which has two sprung lugs 38 and 39 into which a busbar arrangement 40 can
35 be inserted, which is illustrated in more detail in Figure 2. The busbar arrangement according to Figure 2 is known per se and has a busbar housing 41 in which a number of flat ribbon conductors 42, 43 and 44



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corresponding to the number of phases are located, on which connecting lugs 45, 46, 47 are formed which can be inserted into the corresponding tulip contacts 37 in each circuit breaker. In a three-pole arrangement, the
5 three circuit breakers shown in Figure 1 are arranged alongside one another; the connecting lug 45 engages in the terminal tulip 37 of the first circuit breaker, the connecting lug 46 engages in the corresponding terminal tulip of the next circuit breaker, and the connecting
10 lug engages in the corresponding terminal tulip of the third circuit breaker.

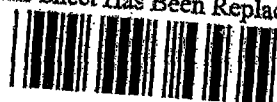
The arrangement shown in Figure 3 shows a similar busbar arrangement 50 in which the connecting lugs 51,
15 52 are not located in a plane, as in the busbar arrangement shown in Figure 2, but in which the connecting lugs 51, 52 run at right angles to the longitudinal extent and parallel to one another. In a corresponding way, the connecting tulip 37 would then
20 be formed by two spring elements which form an opening between them and parallel to the plane of the drawing, that is to say running parallel to the broad face plane of the circuit breaker 10.

25 In the busbar arrangement 55 shown in Figure 4, the busbars which are located in the interior of the busbar housing 56 are connected to sprung cylindrical contacts 57 to 59, with a longitudinal slot 60, 61 and 62 being provided in order to achieve a spring characteristic. A
30 corresponding cylindrical socket contact or plug pin contact is then located in the circuit breaker 10.

The terminal tulip 37 is connected by means of a connecting conductor 65 to the frame terminal 30 so
35 that electrical contact is achieved between the two terminals 30 and 37. A braided conductor 66 can then be connected to the connecting conductor 65, and then supplies current to the individual components. The

connecting conductor 65 may be rigid, and the connecting terminal arrangement 29 together with the frame terminal 30 and the terminal tulip 37 thus becomes a unit which can be preassembled.

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Patent claims

1. Installation switch, in particular a circuit
breaker or residual current device having a
5 connecting point for cross-wiring and for a
conductor wire, characterized in that a screw
terminal is provided for the conductor wire and a
plug terminal is provided for the cross-wiring in
the form of a busbar arrangement, with the plug
10 terminal being located closer to the mounting side
than the screw terminal.
2. Installation switch according to Claim 1,
characterized in that the plug terminal has at
15 least two tongues which are pressed against one
another resiliently, between which a connecting
lug on the busbar arrangement can be pushed in.
3. Installation switch according to Claim 2,
20 characterized in that the tongues form a holding
area which is open parallel to the mounting
surface towards the associated narrow face.
4. Installation switch according to Claim 2,
25 characterized in that the tongues which are
pressed against one another resiliently form a
holding opening which runs parallel to the broad
face of the installation switch and is open
towards the associated narrow face.
- 30 5. Installation switch according to Claim 1,
characterized in that the plug terminal forms a
plug pin or a plug socket.



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