

ABB Patent GmbH
Mannheim
Mp.-No.00/608

31 July 2000
PAT 2-Pn

5 Electrical service device having an integrated fuse

Description

10 The invention relates to an electrical service device having an integrated fuse, according to the precharacterizing clause of Claim 1. The invention may be used, for example, as a connector unit (fuse connection unit or FCU) or as a switched connector unit.

15 In building service systems complying with the British Standard, it is generally normal for individual circuits to be protected by fuses which can be arranged in flush-mounted wall installation boxes, with service devices having an integrated fuse being used for this purpose. Unswitched or switched connector units may be used in this case.

25 The invention is based on the object of specifying an electrical service device having an integrated fuse of the type mentioned initially, by means of which both unswitched and switched connector units can be provided in a relatively simple manner and using as many standard components as possible.

30 In conjunction with the features of the precharacterizing clause, this object is achieved according to the invention by the features specified in the characterizing part of Claim 1.

35 The advantages which can be achieved by the invention are, in particular, that most physical components of the electrical service device can be used as standard



components not only for producing a connector unit but also for producing a switched connector unit, while only a relatively small number of specific components are required for the specific application of "unswitched connector unit" or "switched connector unit". In consequence, tools for production of components are saved and the production process overall is simplified, thus resulting in cost advantages overall. The electrical service device has a compact design and the units which project beyond the wall flush-mounting surface have small dimensions.

By virtue of its nature and design, the proposed service device is very compact and small in comparison to previously commercially available devices, as a result of which the proposed device can advantageously be installed in a single box, while comparable commercially available devices require a dual box or twin box. If a dual box is available, then the proposed installation device can advantageously be combined with device inserts such as switches or a plug socket to form a double combination.

Further advantages will become evident from the following description.

Advantageous refinements of the invention are characterized in the dependent claims.

The invention will be explained in the following text with reference to the exemplary embodiments illustrated in the drawing, in which:

Figure 1 shows an unswitched embodiment of a service device,

Figure 2 shows the design of a central panel for the unswitched embodiment,

Figure 3 shows a switched embodiment of the service device,

5 Figure 4 shows the design of a central panel for the switched embodiment,

Figure 5 shows the design of a base for the unswitched embodiment,

10 Figure 6 shows the design of a base for the switched embodiment,

Figure 7 shows the design of a fuse holder.

15 Figure 1 shows an unswitched embodiment of a service device (connector unit). The right-hand part of the "exploded drawing" shows a functional insert 1 of an electrical service device having a base 2 and a mounting ring 6. The base 2 has a fuse holder 3, a
20 cable connection 4 (for connection of an electrical/electronic appliance) and a lighting insert 5. In the unswitched embodiment, the base 2 is not provided with a switching mechanism. The functional insert 1, which is designed for the "flush-mounting
25 configuration", is covered by a covering frame 7, which is shown in the centre part of the drawing. A central panel 8, which is shown in the left-hand part of the drawing, engages in the opening in the covering frame 7.

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Figure 2 shows the design of a central panel 8 for the unswitched embodiment. The central panel 8 comprises a covering panel 9, which is shown in the left-hand part of the "exploded drawing", a blanking cover 15 which is
35 illustrated in the centre part of the drawing, and an intermediate panel 16 which can be seen in the right-hand part of the drawing. The covering panel 9 has a first recess 10, which is arranged centrally and is used for the fuse holder 3 to pass through. In its

edge region, the first recess 10 is provided with an engagement point 11 for a tool (screwdriver). The covering panel 9 has a second recess 12 for the cable connection 4 for an electrical or electronic appliance which can be connected. Finally, the covering panel 9 is provided with a third recess 13, which is used to hold a transparent lighting cover 14. When the service device is working (has a fuse which is not defective) and is connected to the mains voltage, the lighting insert 5 in the functional insert illuminates, thus indicating the functional device state on the lighting cover 14.

The intermediate panel 16 has latching apparatuses 17 for attachment of the covering panel 9 and blanking cover 15. The intermediate panel 16 is itself fitted on the base 2 by means of suitable latching apparatuses, which are not shown. In this case, sprung side arms 18 on two mutually opposite side edges of the intermediate panel 16 make it possible to compensate for tolerances to a major extent in order to ensure, once the functional insert 1 has been fitted in a wall, that covering frame 7 can always be pressed flush against the wall surface irrespective of the different thicknesses of wallpaper (or in the event of re-wallpapering). The intermediate panel 16 has a recess corresponding to the recesses 10, 12, 13, of course, on whose side edge a latching apparatus 19 is arranged, with the purpose of locking the fuse holder 3, as will be explained in more detail in the following text.

Figure 3 shows the switched embodiment (switched connector unit) of a service device. The explanations relating to Figure 1 are also applicable to this embodiment, but with the difference that the base 2 in the switched embodiment is provided with a switching mechanism. Accordingly, the central panel 20 also has a switching rocker (see item 21 in Figure 4) rather than a blanking cover.

Figure 4 shows the design of a central panel 20 for the switched embodiment. The explanations relating to Figure 2 are also applicable to this embodiment, but with the difference that a switching rocker 21 is used instead of the blanking cover 15.

Figure 5 shows the design of a base 2 for the unswitched embodiment. The base 2 has an insulating housing 22 which is formed from plastic and is provided with numerous chambers for holding individual components, which are generally formed from an electrically conductive metal. In order to connect the service device to the main voltage, the base 2 has a first connecting terminal 23 for the mains connection which, via a first connecting lug 24, forms a first connecting contact for a fuse 25 (cylindrical fuse link with a central glass body and contact-making caps at the end). The second connecting contact of the fuse 25 is formed by a second connecting lug 26, which leads to a first supporting point 27 for the cable connection 4. A second connecting terminal 28 for the mains connection is connected via a link 29 to a second supporting point 30 for the cable connection 4. This therefore results in two separate electrical connections, firstly an electrical connection comprising the connecting terminal 23/connecting lug 24/fuse 25/connecting lug 26/supporting point 27, and secondly an electrical connection comprising the connecting terminal 28/link 29/supporting point 30.

Figure 6 shows the design of a base 2 for the switched embodiment. In order to connect the service device to the mains voltage, the base 2 once again has two connecting terminals 23, 28 mounted in the insulating housing 22. The connecting terminals 23 and 28 are provided with respective switching contacts 31 and 32. The first connecting contact for the fuse 25 is formed by a connecting lug 33 which has a switching contact

34. The second connecting contact for the fuse 25 is once again formed by the second connecting lug 26, which leads to the first supporting point 27 for the cable connection 4. The second supporting point 30 for the cable connection 4 is provided with a switching contact 36.

A switching mechanism is formed by inserting contact rockers 35 and 37 into chamber-like depressions in the insulating housing 22 of the base 2. This thus results in two separate electrical switching connections, firstly the switching connection comprising the connecting terminal 23/switching contact 31/contact rocker 35/switching contact 34/connecting lug 33/fuse 25/connecting lug 26/supporting point 27, and secondly the switching connection comprising the connecting terminal 28/switching contact 32/contact rocker 37/switching contact 36/supporting point 30.

Figures 5 and 6 show a major advantage of the invention: the screws of the connecting terminals 23, 28 and of the supporting points 27, 30 virtually all point in the same direction. This is a major advantage during installation, because the cable comes from one direction and need not be cut to different lengths, there is no need to rotate the base 2 during installation, and the connected base 2 can easily be mounted in a box.

Figure 7 shows the design of a fuse holder 3. The lower part of the drawing shows the section plane A-A through a base 2, which forms the basis of the sections shown in the upper and central parts of the drawing. The upper section shows the situation in which the fuse holder 3 passes through the covering panel 9, or is pulled out of this covering panel, in such a manner that a defective fuse 25 can be removed, and a replacement fuse inserted. The fuse holder 3 comprises a front cover 39 with an engagement point 42 for a tool

(screwdriver), a central section with an installation area 38 for the fuse 25, and a bottom 41 with a latching projection 40 integrally formed at the side.

- 5 In order to replace a defective fuse 25, a tool (the blade of a screwdriver) engages in the engagement point 42, and the fuse holder 3 is pulled out of the covering panel 9 by insertion of this tool, until the latching projection 40 presses against the latching apparatus
- 10 19, thus providing a first end stop, beyond which it is no longer possible to pull the fuse holder 3 out. At this first end stop, the side region of the bottom 41 presses against the side surfaces of the recess 10 in such a manner that this prevents the fuse holder 3 from
- 15 tilting. Once the fuse has been replaced, the fuse holder 3 can easily be moved in the direction of the base 2 once again by pushing on the front cover 39, and a second end stop is reached as soon as the front cover 39 comes into contact with the latching apparatus 19.
- 20 In this position (second end step), both connecting contacts of the fuse 25 make contact with the connecting lugs 24 and 26 (see Figure 5), and 33 and 26 (see Figure 6).

Patent Claims

1. Electrical service device having a base (2), which
5 has a pull-out fuse holder (3), which holds a fuse
(25), and has an insulating housing (22) having at
least one cable connection (4) for connection of an
electrical or electronic appliance, and which is at
least partially covered by means of a central panel (8,
10 20) which can be latched on the insulating housing
(22), characterized in that the central panel (8, 20)
is formed from an intermediate panel (16), a covering
panel (9) which can be plugged onto the intermediate
panel, and a blanking cover (15) or switching rocker
15 (21) which can be plugged on alongside this covering
panel (9), with the covering panel (9) having at least
one recess (12) for the cable connection (4) and one
recess (10) for the fuse holder (3), and the blanking
cover (15) being capable of being pulled on in order to
20 form an unswitched connector unit, and the switching
rocker (21) being capable of being pulled on in order
to form a switched connector unit.

2. Electrical service device according to Claim 1,
25 characterized in that the covering panel (9) also has a
recess (13) for fitting a lighting cover (14).

3. Electrical service device according to Claim 1
and/or 3, characterized in that the intermediate panel
30 (16) has side arms (18) which press in a sprung manner
against a covering frame (7) which surrounds the
central panel (8, 20).

4. Electrical service device according to one of the
35 preceding claims, characterized in that the insulating
housing (22) of the base (2) has connecting terminals
(23, 28) for a mains connection, supporting points (27,
30) for the cable connection (4), and connecting lugs
(24, 26, 33) for the fuse (25).



5. Electrical service device according to Claim 4, characterized in that contact rockers (35, 37) are inserted into chamber-like depressions in the insulating housing (22), which, in conjunction with switching contacts (31, 32) of the connecting terminals (23, 28) and switching contacts (34, 36) of a connecting lug (33) and of a supporting point (30), form a switching mechanism for a switched connector unit.

6. Electrical service device according to Claim 4, characterized in that a link (29) is inserted between a connecting terminal (28) and a supporting point (30) in order to form an unswitched connector unit.

7. Electrical service device according to one of the preceding claims, characterized in that the fuse holder (3) is provided with a latching projection (40) which, when the fuse holder is pulled out, presses against a latching apparatus (19) on the intermediate panel (16).

8. Electrical service device according to one of the preceding claims, characterized in that the fuse holder (3) is provided with a front cover (39) which, when the fuse holder is inserted, presses against the covering panel (9).

9. Electrical service device according to one of the preceding claims, characterized in that the recess (10) for the fuse holder (3) and/or the front cover (39) has an engagement point (11 and/or 42) for a tool.

10. Electrical service device according to one of the preceding claims, characterized in that the functional insert (1) and/or the insulating housing (22) have/has a lighting insert (5).