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The invention relates to a test device for residual current devices in accordance with the preamble of Claim 1.

This type of test device, which is known from DE-PS 26 18 295, is required for testing the functional reliability and readiness of fault current tripping devices used in residual current devices. This testing function is performed by depressing the test key which, in by-passing the total current transformer, closes a current path, namely the auxiliary circuit, via a test resistor from one phase to another. A simulated fault current is involved which causes the tripping device of the residual current device to respond and release the mechanism of the residual current device.

A residual current device, which for the purpose of closing a test circuit comprises a test key, with the aid of which a simulated fault current can be switched on which causes the tripping device of the residual current device to respond, is known from DE-PS 27 33 837. In this case the mating contact of the circuit breaker for the testing circuit is formed by a part of the latch which, when the latter is tripped, swings out of the operational area of one of the legs of the leg spring.

In the case of the aforementioned residual current devices it is not possible to recognize with any certainty the position of the main contacts in each case. The position of the starting lever gives only the approximate position.

In EP 0 231 732 a fault current circuit breaker and automatic cut-out with a circuit breaker for a neutral conductor is described, in which the movable connecting bridge (switching element) of the automatic cut-out arranged in one housing part is connected to the movable contact arm of the circuit breaker - received in a further housing part - for the neutral conductor by way of a slide guided on an intermediate wall of the housing. The circuit breaker has a contact position indicating device and a test device which both can be actuated by this slide. The slide moves the contact position indicating device in such a manner that the respective switch position of the fault current circuit breaker and automatic cut-out is indicated through a window in the housing. For actuating the test device the slide is coupled with one leg of a test contact spring belonging thereto, which [leg] is associated with a test contact in such a way that in the "off"-position the leg is raised from the test contact and the test circuit is interrupted and cannot be closed even when a test key acting

on the second leg is actuated, and in the "on"-position it bears against the test contact and the test circuit is closeable by actuating the test key.

The object of the invention is to develop a test device for residual current devices of the above mentioned type which can be combined with a contact position indicating device in a small space, and that parts of both the test device and the contact position indicating device are designed to perform both functions.

This object is attained, according to the invention, by the combination of features indicated in the characterizing part of Claim 1.

The advantages achieved with the invention consist in the fact that outlay on parts required for the "auxiliary circuit" and "contact position indication" functions could be reduced, thus permitting these function units to be used in residual current devices of narrow construction. With this combination of a test device and a contact position indicating device, advantage is taken of the fact that a cantilever spring which actuates the contact position indicating device serves at the same time as a switch-position-dependent contact element.

Further advantageous developments of the object of the invention according to Claim 1 may be seen in the subclaims.

An embodiment of the invention is shown by means of drawings and is explained in greater detail below. In the drawings

Fig. 1 shows a test device with a contact position indicating device in a residual current device in side elevation and in section, position: ON, test key: OFF

Fig. 2 shows a part of this combination in front elevation and in section, in the same position as Fig. 1.

Fig. 3 shows this combination in position: OFF, test key: OFF

Fig. 4 shows this combination in position: ON, test key: ON

Fig. 5 shows this combination in position: OFF, test key: ON.

In the residual current device depicted in Figs. 1 to 5, a switching shaft 1 with a moving contact 2 and a stationary contact 3 are positioned in the bottom part of the circuit breaker housing 11. A cantilever spring 4, which projects into the top part of the circuit breaker housing 11, is connected to the switching shaft 1. The end of the cantilever spring 4 corresponds to a lever 61 belonging to the contact position indicating device 6 which is provided with a pivot 10. The freedom of movement of the cantilever spring 4 is limited by two stops 63 and 64 on the lever 61. The contact position indicating device 6 is equipped, opposite lever 61, with a further lever 62 which is divided into two equal sections, each one identified by different colours. Only one of these sections of the lever 62 is visible through an aperture 12 in the circuit breaker housing 11 at any one time. The position of the contact 2 is transmitted to the contact position indicating device 6 via the switching shaft 1 [and] the cantilever spring 4 and made visible from the outside by the lever 62 through the opening 12 of the circuit breaker housing 11. The rotational movement of the lever 62 is limited by stops 8 and 9.

The testing device consists of a test key 7 with an extension pin 71, the length of which is such that it can contact with a contact spring 5. The contact spring 5 takes the form of a torsion spring with a pivot 52 and has a bend 51 in its middle area.

The mode of operation of the test device is as follows: when test key 7 is actuated, the test device closes an auxiliary circuit by means of which the operation of the residual current device can be tested. It should not be possible to close the auxiliary circuit in the switched-off state.

In the case of position "ON" and test key "OFF", as shown in Figs. 1 and 2, the cantilever spring 4, which is electrically conductively connected to the moving contact 2 and firmly attached in the switching shaft 1, turns the contact position indicating device 6 around the pivot 10 in a counter-clockwise direction to the stop 9. The moving contact 2 is moved by the switching shaft 1 towards the stationary contact 3. The corresponding identification colour of the contact position indicating device 6 is visible through the aperture 12 of the circuit breaker housing 11.

In the case of position "OFF" and test key "OFF", as shown in Fig. 3, the cantilever spring 4 turns the contact position indicating device 6 in a clockwise direction towards the stop 8. The corresponding identification colour of the contact position indicating device 6 is visible through the aperture 12 of the circuit breaker housing 11.

In the case of position "ON" and test key "ON", as shown in Fig. 4, the auxiliary circuit

closes upon actuation of the test key 7 and the contact spring 5 touches the cantilever spring 4.

In the case of position "OFF" and test key "ON", as shown in Fig. 5, the moving contact 2 is open. In this case the auxiliary circuit cannot be closed, even if the test key 7 is actuated.



Claims:

1. A test device for residual current devices with a test key with an auxiliary circuit for testing the residual current device, with a moving contact (2) that is arranged on a switching element (1) and with a stationary contact (3) **characterised in that** a switching shaft (1) as switching element for the moving contact (2) is connected to a cantilever spring (4), the end of which corresponds to a lever (61) of a contact position indicating device (6) which can rotate around a pivot (10), and in that a contact spring (5) rotatable around a pivot (52) is arranged for the auxiliary circuit, the length of the contact spring (5) being such that it touches the cantilever spring (4) when the contacts (2,3) are closed and the auxiliary circuit is closable by actuating the test key (7), and in that the contact spring (5) and the cantilever spring (4) are separated when the contacts (2, 3) are open and the test key (7) is actuated.
2. A test device according to Claim 1, **characterised in that** the contact position indicating device (6) is provided with a segment-shaped lever (62) which is divided into two sections identifiable by different colours.
3. A test device according to one of Claims 1 to [sic] 2, **characterised in that** the lever (61) of the contact position indicating device (6) is provided on the side facing the cantilever spring (4) with two stops (63, 64), between which the end of the cantilever spring (4) is movable.
4. A test device according to one of the Claims 1 to 3, **characterised in that** the movement of the segment-shaped lever (62) of the contact position indicating device (6) is limited by two stops (8, 9), which are spaced at such a distance that one of the sections in each case identified by colours is visible through an aperture (12) in the housing (11) of the residual current device.
5. A test device according to one of the Claims 1 to 4, **characterised in that** the contact spring (5) takes the form of a torsion spring, the free end of which is bent, and in that an extension pin (71) of the test key (7) engages in the area of the bend (51).