

## Installation and operating instructions

### for two/four-pole residual current circuit breakers DRCCB 5 ST and DRCCB 5 STR

This installation and operating manual is aimed at qualified electrical specialists. The installation of devices of this type is not appropriate for electrical laypersons due to the considerable potential dangers. The installation and operating instructions must be kept so that it can be referred to at a later stage. The operator of the electrical system must be informed about the application and function of this protective device.

#### Application instructions and warnings

1. Devices with visible damage must not be installed or used.
2. Operation must only occur under normal ambient conditions free of corrosive gases in order to preserve the correct tripping function in the long term. Corrosive gases include chlorine, ammonia and sulphur.
3. Erroneous tripping due to operation related leakage currents or atmospheric interference cannot be ruled out with absolute certainty.
4. Automatic operation must be switched off when working on the downstream installation.
5. According to standard DIN VDE 0100-530, automatic restart is only permitted in areas where only trained electricians have access.

#### Intended use and installation

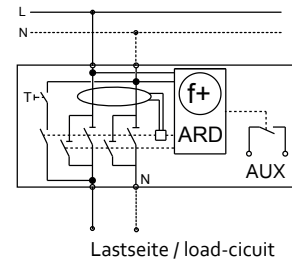
Series DRCCB 5 protective devices are type A pulsating AC-DC sensitive residual current circuit-breakers (RCCBs) which perform a monthly selftest without interrupting the power supply. They are used to protect electrical systems by facilitating automatic switch-off when necessary.

**DRCCB 5 ST (selftest):** A monthly selftest is performed without interrupting the power supply.

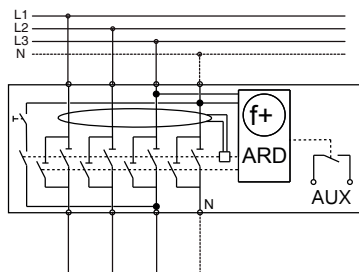
**DRCCB 5 STR (selftest restart):** A monthly selftest is performed without interrupting the power supply. The insulation resistance is also measured every two minutes after a trip (system check). If this resistance reaches a safe value, the system is automatically restarted.

#### Installation notes

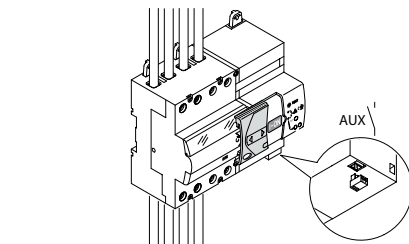
The device is snapped onto a mounting rail in accordance with EN 60715. The connection must be made in accordance with the wiring diagram. Guide all active conductors and the neutral conductor through the circuit breaker. Supply must come from the top.



▲ two-pole, ARD (automatic reclosing device)



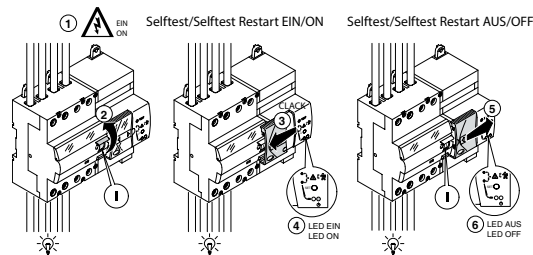
▲ four-pole, ARD (automatic reclosing device)



#### Testing and functional check (Selftest and Selftest restart)

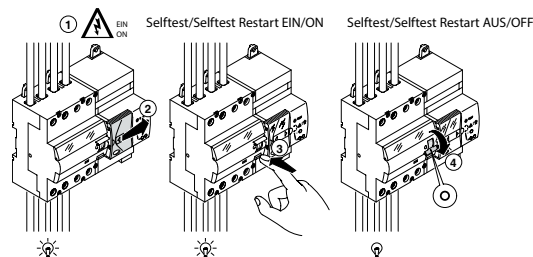
After switching on the operating voltage (1) move the toggle to position I (2). The automatic test cycle is activated as soon as the slider is moved left to position AUTO ON, so that the toggle is completely covered (3). The green LED illuminates (4).

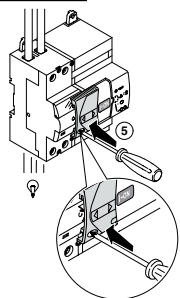
Automatic operation is deactivated as soon as the slider is moved right to position AUTO OFF (5). The green LED goes off (6).



#### Manual functional check (Selftest and Selftest restart)

When the operating voltage (1) is on and once automatic operation (2) is deactivated and test button T (3) is pressed, the device must trip (4).





## Function test of automatic reset (selftest restart)

Once the operating voltage (1) is switched on the device must be tripped manually by pressing the test button T (3). Press the button by inserting a screwdriver into the corresponding opening on the slider (5).

If the reset cycle is not performed correctly, the insulation resistance of the system must be checked.

## Selftest and manual tripping

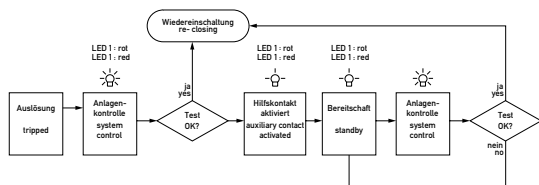
When the operating voltage (1) is on, the automatic selftest for the residual current circuit-breaker is performed monthly without interrupting the system's power supply, as soon as the slider is moved left to position AUTO ON (2). The test can also be triggered manually by pressing the SET key (3). The timer for the monthly test is started when the operating voltage (1) is on or when the SET key is pressed.

## LED displays

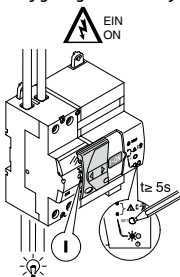
SET

LED 1  
rot/gelb  
red/yellow

LED 2  
grün  
green



## Configuring the auxiliary contact



To configure the auxiliary contact, the slider must be moved left to position AUTO ON (1).

The auxiliary switch is configured by pressing and holding the SET key for at least 5 s. The switch between the different modes is confirmed when LED 1 flashes red.

Mode 1: NO normally opened (make contact)

Mode 2: NC normally closed (break contact)\*

Mode 3: NC+impulse (contact switches for 200 ms ( $\pm 20\%$ ) after every successful selftest\*)

\* auxiliary contact opens in the event of a power failure

**Press and hold the SET key for at least 5 s > then release**

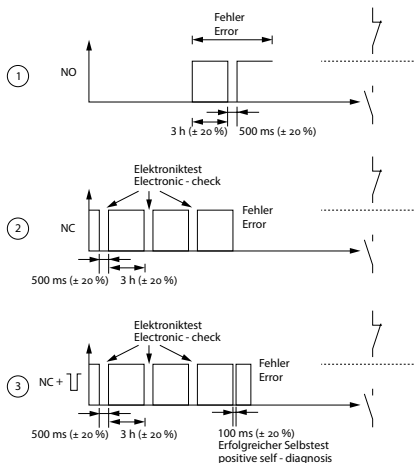
Mode 1: LED 1 flashes red 1 x

**Press and hold the SET key for at least 5 s > then release**

Mode 2: LED 1 flashes red 2 x

**Press and hold the SET key for at least 5 s > then release**

Mode 3: LED 1 flashes red 3 x

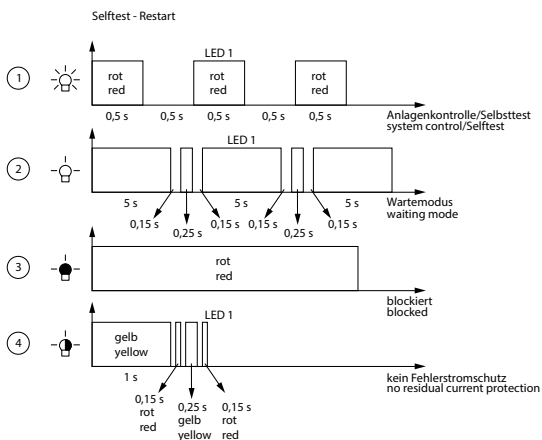


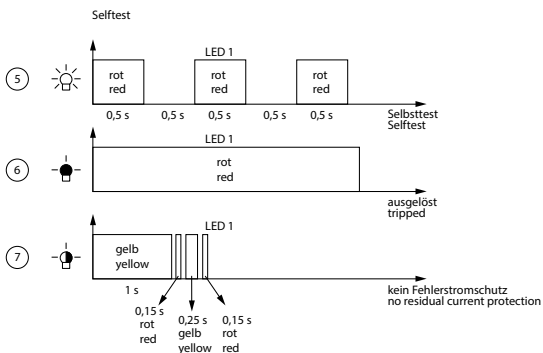
## Pulse diagram for auxiliary contact

## Note

Selftest: regardless of its configuration, the auxiliary contact opens for 500 ms ( $\pm 20\%$ ) every 3 hours ( $\pm 20\%$ ) in order to perform a check of the electronics.

## Flow diagram for selftest/selftest restart





## LED flashing codes

### Selftest/Selftest Restart off (slider moved right to position AUTO OFF)

LED 1	LED 2	Toggle position	Auxiliary contact	
Off	Off	Up	On after 15 minutes	
Off	Off	Down	Off	
Yellow	Off	Up	On	Electronics fault
Yellow	Off	Down	On	Electronics fault
4 or 7	Off	Up	On	⚠ No residual current protection <sup>1)</sup>
4 or 7	Off	Down	On	⚠ No residual current protection <sup>1)</sup>

### Selftest Restart on (slider moved left to position AUTO ON):

LED 1 (red/yellow)	LED 2 (green)	Toggle position	Auxiliary contact	
Off	On	Up	Off	
1	On	Down	Off	System check
1	On	Up	Off	Selftest
3	On	Down	On	Locked
Yellow	On	Up	On	Electronics fault
Yellow	On	Down	On	Electronics fault
4	On	Up	On	⚠ No residual current protection <sup>1)</sup>
4	On	Down	On	⚠ No residual current protection <sup>1)</sup>
2	On	Down	On	Service mode

### Selftest on (slider moved left to position AUTO ON):

LED 1 (red/yellow)	LED 2 (green)	Toggle position	Auxiliary contact	
Off	On	Up	Off	
5	On	Up	Off	Selftest
6	On	Down	On	Trip
Yellow	On	Up	On	Fault
Yellow	On	Down	On	Fault
7	On	Up	On	⚠ No residual current protection <sup>1)</sup>

LED 1 (red/yellow)	LED 2 (green)	Toggle position	Auxiliary contact	
7	On	Down	On	⚠ No residual current protection <sup>1)</sup>

### Selftest Restart:

- System check (LED 1 red) = 0.5 s ON / 0.5 s OFF (1 Hz)
- Service mode (LED 1 red) = 5 s ON / 0.15 s OFF / 0.25 s ON / 0.15 s OFF
- Locked = LED 1 continuously red
- No residual current protection (LED 1) = 1 s yellow / 0.15 s red / 0.25 s yellow / 0.15 s red

### Selftest:

- Selftest (LED 1 red) = 0.5 s ON / 0.5 s OFF (1 Hz)
- Tripped = LED 1 continuously red
- No residual current protection (LED 1) = 1 s yellow / 0.15 s red / 0.25 s yellow / 0.15 s red

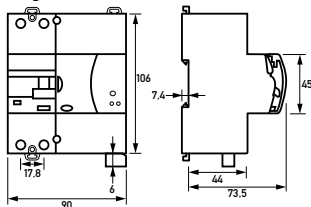
### Functional overview

	Selftest	Selftest restart
Automatic selftest (uninterruptible power supply)	✓	✓
Display: selftest in progress	✓	✓
Display: selftest not successful/fault	✓	✓
Automatic restart when trip occurs		✓
Insulation resistance measurement		✓
Constant system check		✓
Restart function lock in the event of a fault		✓
Display: restart in progress		✓
Display: fault		✓
Automatic restart function can be toggled on/off		✓
Auxiliary contact for remote signalling		✓
Overcurrent protection		PTC

### Warranty

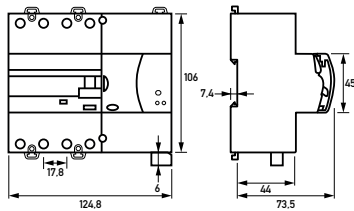
All professionally installed, unaltered devices are covered by warranty during the statutory warranty period from the day of purchase by the end user. The warranty is not applicable to damage incurred during transport or caused by short-circuit, overloading or improper use. In the event of defects in workmanship or material being discovered within the warranty period, the company will provide a repair or replacement free of charge. The warranty will be rendered null and void if the device is opened without authorisation.

### Dimensional drawings



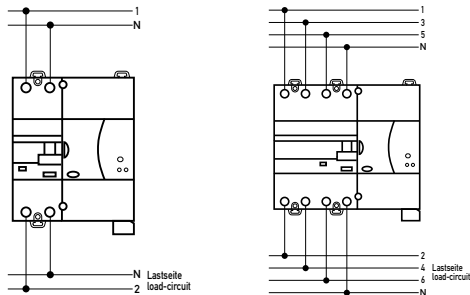
▲ two-pole

1) Main contacts remain closed



▲ four-pole

Wiring diagram



▲ two-pole

▲ four-pole

Technical data

Type	Selftest/Selftest Restart two-pole	Selftest/Selftest Restart four-pole
Electrical properties		
Standards	Selftest: EN 61008-1, VDE V 0664-120 (Annex M) Selftest Restart: EN 61008-1, EN 50557	
Distribution System	Selftest: TT-TN-IT Selftest Restart: TT-TN	
Rated operational voltage (Ue)	230 V AC <sup>1)</sup>	400 V AC
Minimum operating voltage (Ue min)	85% Ue	
Maximum operating voltage (Ue max)	110% Ue	
Rated insulation voltage (Ui)	500 V	
Dielectric strength	2500 V AC for 1 minute	
Rated impulse withstand voltage (Uimp)	4 kV	
Rated frequency	50 Hz	
Residual making and breaking capacity (IΔm)	630 A	
Rated conditional residual short-circuit current with fuse (IΔc)	10,000 A (gL 63 A) at 25/40 A 10,000 A (gL 80 A) at 63 A	
Number of poles	2	4
Type of residual current operated protective device	A	

Type	Selftest/Selftest Restart two-pole	Selftest/Selftest Restart four-pole
short-time delayed	Yes	
Surge current strength	3 kA   8/20 μs in accordance with IEC 60060-2	
Rated current (I <sub>n</sub> )	25 A, 40 A, 63 A	
Rated residual operating current (IΔn)	30 mA	30 mA, 300 mA
Resistance to earth to block restart (R <sub>do</sub> )	8 kΩ (Selftest Restart only)	8 kΩ (30 mA, Selftest Restart only) 2,5 kΩ (300 mA, Selftest Restart only)
Resistance to earth to enable restart (R <sub>d</sub> )	16 kΩ (Selftest Restart only)	16 kΩ (30 mA, Selftest Restart only) 5 kΩ (300 mA, Selftest Restart only)
Current heat loss per current path with I <sub>n</sub>	1.1 W (25 A) 2,7 W (40 A) 3,1 W (63 A)	1.17 W (25 A) 2 W (40 A) 4 W (63 A)
Power consumption during normal operation	4 VA (cos φ = 0.2)	
Power consumption during restart	41 VA (cos φ = 0.55)	
Restart function	Automatic (Selftest Restart only)	
Supply	From the top	
Mechanical properties		
Number of module widths	5	7
Reclosing time	10 s (Selftest Restart only)	
Duration of selftest	7 s	
Maximum switching frequency	30/h	
Mechanical switching cycles (number of restarts)	4000	
Maximum number of consecutive automatic reclosing operations <sup>2)</sup>	3 (Selftest Restart only)	
Counter reset time number of consecutive automatic reclosing operations	60 s (Selftest Restart only)	
Wiring	≤ 35 mm <sup>2</sup> , flexible – ≤ 35 mm <sup>2</sup> , solid	
Rated tightening torque	2 Nm	
Protection class	IP20 (terminals) – IP40 (housing)	
Ambient temperature <sup>3)</sup>	-25°C to +60°C	
Resistance to climatic changes	55°C – rel. hum. 95%	
Auxiliary contact properties		
Type of contact	PhotoMOS	
Operating voltage	5–230 V AC/DC	
Maximum current	100 mA (cos φ = 1)	
Minimum current	0.6 mA	
Operating frequency	50 Hz	
Utilisation category	AC 12	
Type of contact	Make contact/Break contact/Break contact with impulse <sup>4)</sup>	
Wiring	≤ 2.5 mm <sup>2</sup>	
Rated tightening torque	0.4 Nm	

Key:

- 1. 230 V phase – neutral conductor
- 2. In a system with no faults
- 3. Average daytime temperature ≤ 35°C
- 4. Contact switches for 100 ms (± 20%) after every successful selftest.