



## DATA SHEET

**residual current operated circuit-breakers with integral overcurrent protection**

**DRCBO 4 B20/0,10/3N-B NK**

**AC/DC sensitive type B, fire protection according to VDE 0100-420**

**Article number 09948255**



### Function

RCCB/MCB combinations (RCBO) are residual current operated circuit-breakers with integral overcurrent protection for protecting systems in the event of a short-circuit and overload as per the requirements of VDE 0100 Part 430, and for protecting persons, farm animals and material items in the event of earth leakage currents as per VDE 0100 Part 410. Overload tripping occurs at currents in the overload range through a short-time delayed, heat-sensitive bimetal trip and at short-circuit currents through an electromagnetic instantaneous trip. The DRCBO 4 have a rated switching capacity of 6 kA. They provide a labelling area in addition to the tripping indicator. Type B residual current circuit-breakers detect smooth DC residual currents and all other residual currents at frequencies up to 150,000 Hz. The operating voltage required for this is taken from the mains supply. Correct power supply is ensured when the voltage between the mains conductors is  $\geq 50$  V. Pulsating and AC residual currents are detected independent of the mains voltage. For switches with characteristic curve NK, the tripping current frequency response runs below human tolerance levels for shock currents with different frequencies. With an upper tripping threshold of 300 mA at frequencies up to 150 kHz, wider-reaching protection from earth leakage currents is provided compared to type B+ switches or type B switches with the characteristic curve SK. As a result, extensive fire protection is also possible even with electronic equipment with high clock frequencies. The wide scope of protection thanks to the NK tripping characteristic curve requires the monitored system to be set up with low leakage currents. RCBOs with characteristic B ensure standard protection for lighting and socket circuits. As their short-circuit trip is three to five times the rated current, they should not be used to fuse-protect load circuits with high inrush currents. Devices in standard design are intended for monitoring circuits with a rated voltage of 230 V or 400 V and a rated frequency of 50 Hz.

### Features

AC/DC sensitive for residual currents with frequencies of 0 Hz (smooth direct current) up to 150 kHz, mains-voltage-independent tripping when type A residual currents occur, compact design for all rated currents, switch position indicator, separate indication of tripping cause, strain-relief clamps with a wide terminal cross-section range on both connection sides, neutral conductor right, labelling area

### Mounting

quick fastening to mounting rail, any installation position, supply preferably from above

### Applications

commercial and industrial installations with TT, TN-S and TN-C-S systems, where power electronics equipment is used without galvanic isolation from the mains, e.g. frequency converters, switching power supplies, high-frequency converters, photovoltaic installations and UPS equipment with frequency converters without transformers, Type B+ and type B RCBOs with characteristic curve NK should be used where fire protection is legally required.

### Notes

suitable for use in 50 Hz AC networks, RCBOs are also available for other frequencies upon request, not designed for use in direct current networks or on the output side of controlled electrical equipment such as frequency converters

### Accessories

auxiliary switches DRCBO 4 Hi 2, wiring components DRCBO 4-busbars 4-pole

### Technical Data

| Technical Data                | DRCBO 4 B20/0,10/3N-B NK |
|-------------------------------|--------------------------|
| Series                        | DRCBO 4                  |
| Number of poles               | 3+N                      |
| Residual current type         | B                        |
| Tripping characteristic curve | NK                       |

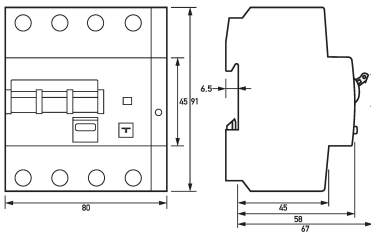
Subject to technical changes

| Technical Data  | DRCBO 4 B20/0,10/3N-B NK  |
|---|---|
| Rated current (AC)                                      | 20 A  |
| Rated residual current $I_{\Delta n}$                   | 0.1 A   |
| Short-time delayed                                      | true  |
| Selective   | false   |
| min. Operating voltage range of test circuit            | 100 V   |
| max. Operating voltage range of test circuit            | 254 V   |
| Minimum rated operating voltage (Type A/AC operation)   | 0 V AC  |
| Minimum rated operating voltage (Type B operation)      | 50 V AC   |
| Non-trip time   | 10 ms   |
| Tripping frequency                                      | 0 Hz ... 150 kHz  |
| Maximum disconnection times                             | $1 \cdot I_{\Delta n}: \leq 300 \text{ ms}; 5 \cdot I_{\Delta n}: \leq 40 \text{ ms}$               |
| Tripping characteristic                                 | B   |
| Supply side   | up  |
| Operating voltage (AC)                                  | max. 440 V  |
| Internal consumption                                    | max. 2.2 W  |
|   | <b>load circuit</b>   |
| Specification   | load disconnect contact   |
| Rated voltage (AC)                                      | 230 V, 400 V  |
| Rated current (AC)                                      | 20 A  |
| Rated short-circuit current                             | 6 kA  |
| Surge current strength                                  | 3 kA  |
| max. Total rated switching capacity                     | 6 kA  |
| Rated insulation voltage                                | 440 V   |
| Rated impulse withstand voltage                         | 4 kV  |
| Rated frequency   | 50 Hz   |
| Current heat loss per current path                      | 3.1 W   |
| Back-up fuse type                                       | gG  |
| Overvoltage class                                       | III   |
|   | <b>screw-type terminal top, bottom (load circuit)</b>   |
| Neutral conductor position                              | right   |
| Connection C1 Maximum number of conductors per terminal | 2 (conductors of same type and cross-section)   |
| Cross section solid                                     | 1-wire: 1 mm <sup>2</sup> ... 35 mm <sup>2</sup> ; 2-wire: 1 mm <sup>2</sup> ... 10 mm <sup>2</sup> |
| Connecting capacity flexible                            | 1-wire: 1 mm <sup>2</sup> ... 25 mm <sup>2</sup> ; 2-wire: 1 mm <sup>2</sup> ... 10 mm <sup>2</sup> |
| Cross section stranded                                  | 1-wire: 1 mm <sup>2</sup> ... 25 mm <sup>2</sup> ; 2-wire: 1 mm <sup>2</sup> ... 10 mm <sup>2</sup> |
| Tightening torque                                       | 2 Nm ... 2.4 Nm   |
|   | <b>General data</b>   |
| Operating position                                      | optional  |
| Mechanical endurance                                    | min. 5000 switching cycles  |
| Electrical endurance                                    | min. 2000 switching cycles  |
| Ambient temperature                                     | -25 °C ... 40 °C  |
| Climate resistance                                      | according to IEC 60068-2-30   |
| Shock resistance  | 20 g / 20 ms Duration   |
| Fatigue limit   | > 5 g (f ≤ 80 Hz, duration > 30 min.)   |
| Housing type  | distribution board housing  |

Subject to technical changes

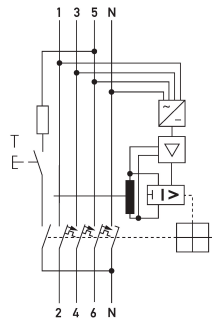
| Technical Data                | DRCBO 4 B20/0,10/3N-B NK   |
|-------------------------------|--|
| Installation type             | Mounting rail (35 mm)  |
| Housing material              | thermoplastic  |
| Protection class              | IP20 (installed: IP40)   |
| Width                         | 80 mm  |
| Height                        | 91 mm  |
| Depth                         | 73.5 mm  |
| Installation depth            | 67 mm  |
| Module widths                 | 4.5  |
| Weight                        | 0.323 kg   |
| Design requirements/Standards | VDE 0664-20, VDE 0664-40, VDE 0664-401, EN 61009-1, EN 62423, ÖVE/ÖNORM E 8601 |
| Power limitation category     | 3  |
| Degree of pollution           | 2  |
| Certifications                | VDE  |

**Dimensions**



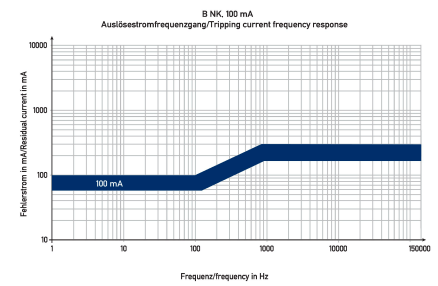
Dimensional drawing Group view

**Wiring example**



Wiring diagram

**Diagrams**



Characteristic B NK 100 mA