



## DATA SHEET

***residual current circuit-breaker***

**DFS 2 040-2/0,03-B NK**

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

Article number 09134595



### Function

Residual current circuit-breakers (RCCBs) are components for implementing protective measure "Automatic disconnection of the power supply" as per VDE 0100 part 410 or corresponding international installation regulations. Series DFS 2 devices are compact two-pole residual current circuit-breakers for single-phase networks. In the standard design, they only take up two module-width units of space. In spite of the compact dimensions, a number of different tripping currents and characteristics are available at rated currents, depending on the design, up to 125 A. They also have large two-tier terminals for large conductor cross-sections, a practical multi-functional switch toggle and can be provided with labels using free-of-charge software. 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 residual current circuit-breakers with characteristic curve NK, the tripping current frequency response runs below human tolerance levels for shock currents with different frequencies. For RCCBs with a rated residual current of 30 mA, extensive personal safety is achieved even with residual currents above the rated frequency. With an upper tripping threshold of 300 mA at frequencies up to 150 kHz, significantly more sensitive and wider-reaching protection from earth leakage currents is provided compared to characteristics B SK and B+. 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 characteristic requires the monitored system to be set up with low leakage currents. Devices in the standard design are intended for monitoring circuits with a rated voltage of 230 V and a rated frequency of 50 Hz.

## Features

AC/DC sensitive for residual currents with frequencies and mixed frequencies of 0 Hz (smooth direct current) up to 150 kHz, high availability even of voltage-independent detection of smooth DC residual current and AC residual current with frequencies not equal to 50/60 Hz thanks to full functional compatibility with mains voltages from at least 50 V AC on any two active conductors, mains-voltage-independent tripping when type A residual currents occur, compact design for all rated currents, high short-circuit resistance, double-sided two-tier terminals for large conductor cross-section and busbar, switch position indicator, viewing window for labels, multifunction switch toggle with three positions: "on", "off" and "tripped", Neutral conductor position left or right

## 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, Facilities at risk of fire

## Notes

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

## Accessories

automatic reclosing devices DFA, terminal caps KA, information stickers HAS, auxiliary switches DHi, restart locks DFS WES, software DBS

### Technical Data

Technical Data	DFS 2 040-2/0,03-B NK
Series	DFS 2 B NK
Number of poles	2

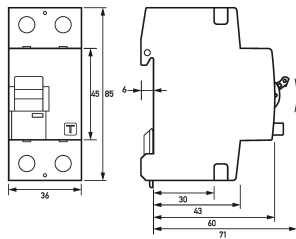
Subject to technical changes

Technical Data		DFS 2 040-2/0,03-B NK
Residual current type		B
Tripping characteristic curve		NK
Rated current (AC)		40 A
Rated residual current $I_{\Delta n}$		0.03 A
Short-time delayed		true
Selective		false
min. Operating voltage range of test circuit		150 V
max. Operating voltage range of test circuit		250 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		$1 \cdot I_{\Delta n} \leq 300 \text{ ms}$ ; $5 \cdot I_{\Delta n} \leq 40 \text{ ms}$
Internal consumption		max. 0.8 W
		<b>load circuit</b>
Specification		load disconnect contact
min. Contact opening		4 mm
Rated voltage (AC)		230 V
Rated current (AC)		40 A
Rated short-circuit current		10 kA
Surge current strength		3 kA
max. Total rated switching capacity		500 A
Rated insulation voltage		400 V
Rated impulse withstand voltage		4 kV
Rated frequency		50 Hz
Current heat loss per current path		1.3 W
Thermal Backup-fuse OCPD		40 A
Short-circuit backup-fuse SCPD		100 A
Back-up fuse type		gG
		<b>screw-type terminal top and bottom (load circuit)</b>
Neutral conductor position		left or right
Protection against direct contact		DGUV V3, VDE 0660-514, finger and back-of-hand proof
Connection C1 Maximum number of conductors per terminal		2 (conductors of same type and cross-section)
Cross section solid		1-wire: 1.5 mm <sup>2</sup> ... 50 mm <sup>2</sup> ; 2-wire: 1.5 mm <sup>2</sup> ... 16 mm <sup>2</sup>
Connecting capacity flexible		1-wire: 1.5 mm <sup>2</sup> ... 50 mm <sup>2</sup> ; 2-wire: 1.5 mm <sup>2</sup> ... 16 mm <sup>2</sup>
Cross section stranded		1-wire: 1.5 mm <sup>2</sup> ... 50 mm <sup>2</sup> ; 2-wire: 1.5 mm <sup>2</sup> ... 16 mm <sup>2</sup>
Cross section AWG, solid		15 ... 1
Cross section AWG, stranded		15 ... 1
Cross section AWG, flexible		15 ... 1
Cross section AWG, flexible with ferrule		15 ... 1
Tightening torque		2.5 Nm ... 3 Nm
		<b>General data</b>
Operating position		optional

Subject to technical changes

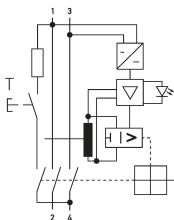
Technical Data		DFS 2 040-2/0,03-B NK
max. Operating altitude above MSL		2000 m
Mechanical endurance		min. 5000 cycles
Electrical endurance		min. 2000 cycles
Surrounding atmosphere		normal environmental conditions
Storage temperature		-35 °C ... 75 °C
Ambient temperature		-25 °C ... 40 °C
Climate resistance		according to IEC 60068-2-30: humid heat / cyclic (25 °C / 55 °C; 93 % / 97 % RH)
Shock resistance		20 g / 20 ms Duration
Fatigue limit		> 5 g (f ≤ 80 Hz, duration > 30 min.)
Housing type		distribution board housing
Installation type		Mounting rail (35 mm)
Housing material		thermoplastic
Protection class		IP20 (installed: IP40)
sealable		true
Width		36 mm
Height		85 mm
Depth		75 mm
Installation depth		69 mm
Module widths		2
Weight		0.259 kg
Design requirements/Standards		VDE 0664-10, VDE 0664-40, VDE 0664-400, ÖVE/ÖNORM E 8601, DIN EN 61008-1, EN 62423
Degree of pollution		2
Certifications		VDE

Dimensions



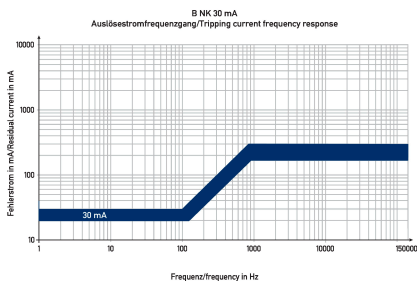
Dimensional drawing Group view

Wiring example



Wiring diagram

Diagrams



Characteristic B NK 30 mA