

DATA SHEET

residual current circuit-breaker DFS 4 080-4/0,03-B SK R HD AC/DC sensitive type B, for harsh environments Article number 09154988HD





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 4 devices are compact two or fourpole residual current circuit-breakers. In the standard design, they only take up four module width units of space. Although DFS 4 devices for AC and pulsating DC residual currents are actually designed for three-phase networks, they can also be used in single-phase networks. However, in addition to these, special variants are also available for single or three-phase operation in the form of the AC/DC sensitive designs (type B, type B+). 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 circuitbreakers 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 ≥ 50 V. Pulsating and AC residual currents are detected independent of the mains voltage. For residual current circuit-breakers with characteristic curve SK, the frequency response of the tripping current is designed so that residual currents with high frequencies, such as in the clock frequency range for frequency converters, as opposed to the rated frequency are detected with significantly reduced sensitivity. Undesired trips caused by leakage currents can therefore be widely avoided. However, fire protection depending on the rated residual current of the switch (0.03 A, 0.1 A or 0.3 A) is only provided for residual currents with frequencies up to 1 kHz, 300 Hz or 100 Hz, while the devices with tripping current frequency response B+ or NK offer protection over the entire tripping frequency range up to 20 kHz or 150 kHz, respectively. Devices in the standard design are intended for monitoring circuits with a rated voltage of 230 V, 400 V and a rated frequency of 50 Hz. With an airtight, encapsulated tripping mechanism from a special alloy and the stainless steel latch, residual current circuit-breakers in HD design are protected, in particular from corrosion, corrosive gases, moisture and extreme temperature fluctuations.

Features

High level of immunity against leakage and residual currents due to operational conditions from frequency 1 kHz and higher, AC/DC sensitive for residual currents with frequencies and mixed frequencies of o 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 right

Mounting

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

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.

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.

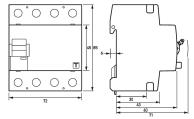
automatic reclosing devices DFA, terminal caps KA, information stickers HAS, auxiliary switches DHi, restart locks DFS WES, software DBS

Technical Data

Series DFS 4 B SK HD	Technical Data	DFS 4 080-4/0,03-B SK R HD
Number of poles Residual current type B Tripping characteristic curve SK Rated current (AC) 8 o A Rated residual current (AC) Short-time delayed true Selective false min. Operating voltage range of test circuit max. Operating voltage range of test circuit Minimum rated operating voltage (AC) Non-trip time 10 ms Tripping frequency 10 Hz 150 kHz Maximum disconnection times 1 - 16m < 50 om Sp. 16m < 40 ms Internal consumption Ioad circuit Specification Ioad circuit Specification ioad disconnect contact min. Contact opening 4, mm Rated voltage (AC) 330 V, 400 V Rated current (AC) 80 A Rated short-circuit current 10 kA Surge current strength 3 kA max. Total rated switching capacity Rated insulation voltage 4 4 kV Rated insulation voltage Rated impulse withstand voltage So V AC Voltage CPD 80 A Short-circuit backup-fuse SCPD 135 A Back-up fuse OCPD 80 A Short-circuit backup-fuse SCPD 135 A Back-up fuse SCPD 135 A Back-up fuse CPP Short-circuit backup-fuse SCPD 136 A Thermal Backup fuse OCPD 80 A Short-circuit backup-fuse SCPD 137 A So Minimum 10 (acconductors per urrent) 2 (conductors of same type and cross-section) 10 unimer of conductors per urrent 2 (conductors of same type and cross-section) 10 unimer of conductors per urrent 2 (conductors of same type and cross-section) 10 unimer of conductors		
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Specification load disconnect contact min. Contact opening Rated voltage (AC) Rated current (AC) Rated current (AC) Rated short-circuit current 10 kA Surge current strength 3 kA max. Total rated switching capacity Rated insulation voltage Rated frequency 50 Hz Current heat loss per current path Thermal Backup-fuse OCPD 80 A Short-circuit backup-fuse SCPD 9G Screw-type terminal top and bottom (load circuit) right Protection against direct contact DGUV V3, VDE 0660-514, finger and back-of-hand proof Connection C1 Maximum number of conductors per terminal Cross section Solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded 15 1	Internal consumption	max. 2.2 W
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Surge current strength max. Total rated switching capacity Rated insulation voltage Rated impulse withstand voltage Rated impulse withstand voltage Rated frequency So Hz Current heat loss per current path Thermal Backup-fuse OCPD 80 A Short-circuit backup-fuse SCPD Back-up fuse type GG screw-type terminal top and bottom (load circuit) Neutral conductor position Protection against direct contact DGUV V3, VDE 0660-514, finger and back-of-hand proof Connection C1 Maximum number of conductors per terminal Cross section solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded	Rated current (AC)	8o A
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Current heat loss per current path Thermal Backup-fuse OCPD 80 A Short-circuit backup-fuse SCPD 125 A Back-up fuse type gG screw-type terminal top and bottom (load circuit) Neutral conductor position Protection against direct contact DGUV V3, VDE 0660-514, finger and back-of-hand proof Connection C1 Maximum number of conductors per terminal Cross section solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded	Rated impulse withstand voltage	4 kV
Thermal Backup-fuse OCPD 80 A Short-circuit backup-fuse SCPD 125 A Back-up fuse type gG screw-type terminal top and bottom (load circuit) Neutral conductor position right Protection against direct contact DGUV V3, VDE 0660-514, finger and back-of-hand proof Connection C1 Maximum number of conductors per terminal Cross section solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded	Rated frequency	50 Hz
Short-circuit backup-fuse SCPD Back-up fuse type gG screw-type terminal top and bottom (load circuit) Neutral conductor position Protection against direct contact DGUV V3, VDE 0660-514, finger and back-of-hand proof Connection C1 Maximum number of conductors per terminal Cross section solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded 15 1		5 W
Back-up fuse type gG screw-type terminal top and bottom (load circuit) Neutral conductor position right Protection against direct contact DGUV V3, VDE o66o-514, finger and back-of-hand proof 2 (conductors of same type and cross-section) number of conductors per terminal Cross section solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded	Thermal Backup-fuse OCPD	8o A
Screw-type terminal top and bottom (load circuit) Neutral conductor position Protection against direct contact DGUV V3, VDE o660-514, finger and back-of-hand proof 2 (conductors of same type and cross-section) number of conductors per terminal Cross section solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded 15 1	Short-circuit backup-fuse SCPD	125 A
Neutral conductor position Protection against direct contact DGUV V3, VDE o660-514, finger and back-of-hand proof 2 (conductors of same type and cross-section) number of conductors per terminal Cross section solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded 15 1	Back-up fuse type	gG
Protection against direct contact DGUV V3, VDE o660-514, finger and back-of-hand proof 2 (conductors of same type and cross-section) number of conductors per terminal Cross section solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded 15 1		screw-type terminal top and bottom (load circuit)
Connection C1 Maximum number of conductors per terminal Cross section solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded 15 1	Neutral conductor position	
number of conductors per terminal Cross section solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded 15 1		DGUV V ₃ , VDE o66o-514, finger and back-of-hand proof
Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded 15 1	number of conductors per	2 (conductors of same type and cross-section)
Cross section stranded 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 15 1 Cross section AWG, stranded 15 1	Cross section solid	1-wire: 1.5 mm ² 50 mm ² ; 2-wire: 1.5 mm ² 16 mm ²
Cross section AWG, solid 15 1 Cross section AWG, stranded 15 1	Connecting capacity flexible	1-wire: 1.5 mm ² 50 mm ² ; 2-wire: 1.5 mm ² 16 mm ²
Cross section AWG, stranded 15 1	Cross section stranded	1-wire: 1.5 mm ² 50 mm ² ; 2-wire: 1.5 mm ² 16 mm ²
	Cross section AWG, solid	15 1
Consequence AMC florible	Cross section AWG, stranded	15 1
Cross section Awg, riexible 15 1	Cross section AWG, flexible	15 1

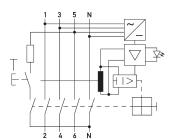
Technical Data	DFS 4 080-4/0,03-B SK R HD
Cross section AWG, flexible with ferrule	15 1
Tightening torque	2.5 Nm 3 Nm
	General data
Operating position	optional
max. Operating altitude above MSL	2000 m
Mechanical endurance	min. 5000 cycles
Electrical endurance	min. 2000 cycles
Surrounding atmosphere	harsh environmental conditions
Storage temperature	-35 °C 75 °C
Ambient temperature	-25 °C 60 °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 ≤ 8o 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	72 mm
Height	8 ₅ mm
Depth	75 mm
Installation depth	69 mm
Module widths	4
Weight	o.496 kg
Design requirements/Standards	VDE 0664-10, VDE 0664-40, ÖVE/ÖNORM E 8601, DIN EN 61008-1, EN 62423
Degree of pollution	2
Certifications	VDE

Dimensions

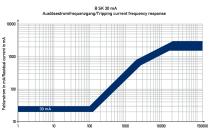


Dimensional drawing Group view

Wiring example



Diagrams



Characteristic B SK 30 mA

Wiring diagram