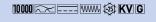


DATA SHEET

residual current circuit-breaker
DFS 4 063-4/0,30-B SK MI R HD
AC/DC sensitive type B, for mobile installations, for harsh
environments
Article number 09146893HD





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. The MI variant is also equipped with a tripping threshold of 6 mA for DC residual currents additional to the AC/ DC sensitivity of Type B or B+. This prevents pre-magnetisation of upstream RCCBs Type A or F, so that they can continue to fulfil their protective function. 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

Applications

Ideally suited for mobile use in power distributors e.g. for rental equipment, where upstream RCCBs of an unknown type are present. Due to the low DC tripping threshold, the AC-DC sensitive RCCB version MI also can be operated downstream of an RCCB Type A or F, 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.

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

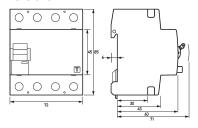
automatic reclosing devices DFA, terminal caps KA, information stickers HAS, auxiliary switches DHi, restart locks DFS WES, software DBS

Technical Data

Series DFS 4 B SK MI HD Number of poles	Technical Data	DFS 4 063-4/0,30-B SK MI R HD
Residual current type Tripping characteristic curve SK Rated current (AC) 6 3 A Rated residual current Lán O C tripping threshold Short-time delayed true Selective false min. Operating voltage range of test circuit max. Operating voltage range of test circuit Minimum rated operating av AC voltage (Type AJAC operation) Minimum rated operating voltage (Type By AJAC operation) Non-trip time 10 ms Tripping frequency 10 ks 150 kHz Maximum disconnection times 11 -151 -15 30 om Smy, 5 -154 n: 40 ms max. 2 k W Internal consumption load circuit Specification load circuit	Series	DFS 4 B SK MI HD
Fipping characteristic curve Rated current (AC) Rated current (AC) Rated current (AC) Rated current (AC) Rated residual current (An) Rated voltage (Type A/AC operation) Rated voltage (AC) Rated short-circuit current Rated voltage (AC) Rated short-circuit current Rated current (AC) Rated short-circuit current Rated current (AC) Rated short-circuit current Rated insulation voltage Rated insulation voltage Rated insulation voltage Rated insulation voltage Rated frequency Solt A, Golt A Rated short-circuit current Rated frequency Solt A, Golt A Rated short-circuit current Rated frequency Solt A, Golt A Rated short-circuit current Rated frequency Solt A, Golt A Rated short-circuit current Rated frequency Solt A, Golt A Rated short-circuit current Rated frequency Solt A, Golt A Rated frequency Solt	Number of poles	4
Rated current (AC) Rated residual current IΔn 0.3 A 0.5 A 0.5 C tripping threshold 6 mA Short-time delayed true Selective min. Operating voltage range of test circuit max. Operating voltage range of test circuit max. Operating voltage range of test circuit max. Operating voltage range of test circuit Minimum rated operating voltage (Type A/AC operation) Minimum rated operating voltage (Type A/AC operation) Non-trip time 10 ms 10 ms 11 pping frequency 11 LiAn: 3 soo ms, 5 - IAn: 4 d ms 11 IAn: 5 soo ms, 5 - IAn: 5 d ms 11 IAn: 6 soo ms, 5 - IAn: 5 d ms 11 IAn: 6 soo ms, 5 - IAn: 6 d ms 11 IAn: 7 mm Rated voltage (Type A/AC operation) Rated voltage (AC) Rated current (AC) Rated current (AC) Rated current (AC) Rated soft-circuit current Rated voltage (AC) Rated soft-circuit current Rated voltage (AC) Rated soft-circuit current Rated insulation voltage Rated insu	Residual current type	В
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DC tripping threshold Short-time delayed True Short-time delayed True Talse min. Operating voltage range of test circuit max. Operating voltage (Type MAC operating) voltage (Type MAC operating) voltage (Type B operation) Non-trip time 10 ms Tripping frequency 10 Mz 150 kHz Maximum disconnection times 10 LiAn: \$300 ms; 5: lAn: \$40 ms Internal consumption 10 ded circuit Specification 10 ded disconnect contact 10 min. Contact opening Rated voltage (AC) 230 V, 400 V Rated current (AC) 63 A Rated short-circuit current 10 kA Surge current strength 3 kA max. Total rated switching capacity Rated insulation voltage 4, kV Rated insulation voltage 4, kV Rated insulation voltage 4, kV Rated insulation voltage A b Current heat loss per current path 1 hermal Backup fuse CCPD 5 hort-circuit backup-fuse OCPD 6 h	Rated current (AC)	63 A
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woltage (Type A)AC operation) Minimum rated operating voltage (Type B operation) 50 V AC Non-trip time 10 ms Tripping frequency 0 Hz ±50 kHz Maximum disconnection times 1 · I An : ≤ 300 ms; 5 · I An : ≤ 40 ms Internal consumption max. ±2 W Specification load circuit Specification load disconnect contact min. Contact opening 4 mm Rated voltage (AC) 230 V, 400 V Rated solt-circuit current 10 kA Surge current strength 3 kA max. Total rated switching capacity 630 A Rated insulation voltage 4 kV Rated insulation voltage 4 kV Rated impulse withstand voltage 4 kV Rated frequency 50 Hz, 60 Hz Current heat loss per current path 3.1 W path 3.1 W Phermal Backup-fuse OCPD 63 A Short-circuit backup-fuse SCPD 30 A Short-circuit backup-fuse SCPD 30 A Pack-up fuse type gG Screw-type terminal top and bottom (load circuit) night Protection against direct c		250 V
voltage (Type B operation) Non-trip time 10 ms Tripping frequency 0 Hz 150 kHz Maximum disconnection times 1 · I∆n: ≤ 300 ms, 5 · I∆n: ≤ 40 ms Internal consumption max. 2. 2 W load circuit Specification load disconnect contact min. Contact opening 4 mm Rated voltage (AC) 230 V, 400 V Rated short-circuit current 10 kA Surge current strength 3 kA max. Total rated switching capacity Rated insulation voltage 4 kV Rated insulation voltage 4 kV Rated impulse withstand voltage 4 kV Rated insulation soltage 4 kV Rated insulation voltage 50 Hz, 60 Hz Current heat loss per current 3 .1 W ath Thermal Backup-fuse OCPD 63 A Short-circuit backup-fuse SCPD 9 G Screw-type terminal top and bottom (load circuit) right Neutral conductor position Protection against direct contact DGUV V3, VDE 060-514, 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	voltage (Type A/AC operation)	o V AC
Tripping frequency Maximum disconnection times 1 · I Δn: s 300 ms; 5 · I Δn: s 40 ms Internal consumption max. 2.2 W Specification Ioad circuit Specification Ioad disconnect contact min. Contact opening 4 mm Rated voltage (AC) Rated current (AC) 63 A Rated short-circuit current 10 kA Surge current strength 3 kA max. Total rated switching capacity Rated insulation voltage Rated insulation voltage Rated insulation voltage Rated insulation voltage Rated frequency Current heat loss per current 3.1 W Thermal Backup-fuse OCPD 63 A Short-circuit backup-fuse SCPD 9G Screw-type terminal top and bottom (load circuit) Protection against direct contact DGUV V3, VDE 0660-5146, 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 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² Cross section AWG, solid 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm²		50 V AC
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Internal consumption Dad directived	Tripping frequency	<u> </u>
Specification Ioad disconnect contact	Maximum disconnection times	1 · IΔn: ≤ 300 ms; 5 · IΔn: ≤ 40 ms
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Rated impulse withstand voltage Rated frequency 50 Hz, 60 Hz Current heat loss per current path Thermal Backup-fuse OCPD 63 A Short-circuit backup-fuse SCPD 100 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 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		6 ₃ 0 A
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Current heat loss per current path Thermal Backup-fuse OCPD 63 A Short-circuit backup-fuse SCPD 100 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 AWG, solid 15 1 Cross section AWG, stranded 15 1	Rated impulse withstand voltage	4 kV
Thermal Backup-fuse OCPD Short-circuit backup-fuse SCPD 100 A Back-up fuse type gG screw-type terminal top and bottom (load circuit) Neutral conductor position Protection against direct contact 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 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	Rated frequency	50 Hz, 60 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		3.1 W
Back-up fuse type 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	63 A
Screw-type terminal top and bottom (load circuit) Neutral conductor position 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 15 1	Short-circuit backup-fuse SCPD	100 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	right
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	Protection against direct contact	DGUV V3, VDE o660-514, finger and back-of-hand proof
Connecting capacity flexible 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 1-wire: 1.5 mm² 50 mm²; 2-wire: 1.5 mm² 16 mm² 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, stranded 15 1	Cross section AWG, solid	151
	Cross section AWG, stranded	
	Cross section AWG, flexible	15 1

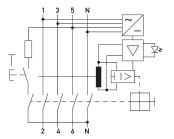
Technical Data	DFS 4 063-4/0,30-B SK MI R HD
Cross section AWG, flexible with ferrule	15 1
Tightening torque	2.5 Nm 3 Nm
	General data
Operating position	optional
max. Operating altitude above MSL	2000 m
Mechanical endurance	min. 5000 cycles
Electrical endurance	min. 2000 cycles
Surrounding atmosphere	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	85 mm
Depth	75 mm
Installation depth	69 mm
Module widths	4
Weight	o.48 kg
Design requirements/Standards	VDE 0664-10, VDE 0664-40, ÖVE/ÖNORM E 8601, DIN EN 61008-1, EN 62423
Degree of pollution	2

Dimensions

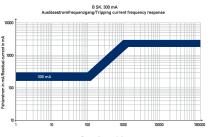


Dimensional drawing Group view

Wiring example



Diagrams



Characteristic B SK 300 mA

Wiring diagram