DATA SHEET

DFS 4 040-4/0,03-B SK MI

AC/DC sensitive type B

Article number 09134892

Internetlink

10000 KV G

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 four-pole 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 multifunctional switch toggle and can be provided with pre-prepared labels using free-of-charge software. DFS 2 and DFS 4 devices with residual current characteristic B detect smooth DC residual currents as well as all other type B residual currents as per IEC 60755. 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. Type A residual currents are detected regardless of the mains voltage. Furthermore, these residual current circuit-breakers completely detect residual currents of all frequencies up to 100 kHz. With this wide frequency range for residual current detection, these devices more than meet the requirements for the design standards for type B residual current circuit-breakers. Protection as per VDE 0100 part 410 is provided with a corresponding earth resistance via the entire frequency range of residual current detection. The maximum permissible earth resistance is calculated as the quotient from the permissible touch voltage and the maximum trip residual current in the entire detected frequency range. 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.

Features

high immunity against transient leakage and residual currents thanks to slow tripping response, meets the requirements of design regulations VDE 0664-10, VDE 0664-40, ÖVE/ÖNORM E 8601, AC/DC sensitive for residual currents with frequencies and mixed frequencies of 0 Hz (smooth direct current) up to 150 kHz, electromagnetic compatibility in accordance with VDE 0664-30 and VDE 0839-6-2 (interference resistance for industrial applications), high availability even of voltage-independent detection of smooth DC residual current and AC residual current with frequencies ≠ 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", also available in the "HD" design, Neutral conductors with standard design left, for two-terminal-pair devices type A/AC/F up to 125 A and type B/B+ up to 80 A; N-right available at no extra charge.

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.

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

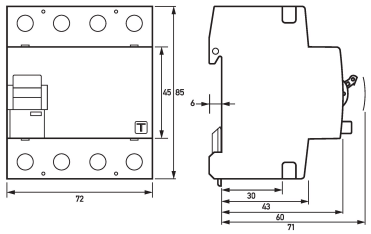
Clamp covers KA, Information stickers HAS, Auxiliary Switches DHi, Restart locking facilities WES, Software BS DLS/DFS

Technical Data

Technical Data	DFS 4 040-4/0,03-B SK MI
Series	DFS 4 B SK MI
Number of poles	4
Residual current type	B
Tripping characteristic curve	SK
Rated current (AC)	40 A
Rated residual current IΔn	0.03 A
DC tripping threshold	6 mA
Short-time delayed	true
Selective	false
min. Operating voltage range of test circuit	250 V
max. Operating voltage range of test circuit	440 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
Neutral conductor position	left
Tripping frequency	0 Hz ... 150 kHz
Maximum disconnection times	1 · IΔn: ≤ 300 ms; 5 · IΔn: ≤ 40 ms
Internal consumption	max. 2.2 W
	Load circuit
Specification	Load switch contact
min. Output O1 Contact opening	4 mm
Rated voltage (AC)	230 V, 400 V
Rated current (AC)	40 A
Rated short-circuit current	10 kA
Surge current strength	3 kA
max. Output O1 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
	Screw-type terminal top and bottom (Load circuit)
Protection against direct contact	DGUV V3, VDE 0660-514, finger-safe and safe for back-of-hand
Connection C1 Maximum number of conductors per terminal	2 (conductors of same type and cross-section)

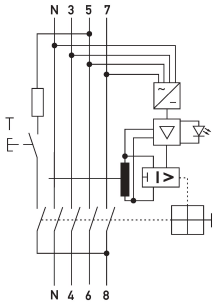
Technical Data	DFS 4 040-4/0,03-B SK MI
Cross section solid	1-wire: 1.5 mm² ... 50 mm²; 2-wire: 1.5 mm² ... 16 mm²
Connecting capacity flexible	1-wire: 1.5 mm² ... 50 mm²; 2-wire: 1.5 mm² ... 16 mm²
Cross section stranded	1-wire: 1.5 mm² ... 50 mm²; 2-wire: 1.5 mm² ... 16 mm²
Tightening torque	2.5 Nm ... 3 Nm
General data description	General data
Operating position	any
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	Distributor housing
Mounting type	Mounting rail
Housing material	Thermoplastic resin
Protection class	IP20 (installed: IP40)
sealable	true
Width	72 mm
Height	85 mm
Depth	75 mm
Installation depth	69 mm
Width (modules)	4
Design requirements/Standards	VDE 0664-10, VDE 0664-40, ÖVE/ÖNORM E 8601
Degree of pollution according to EN 60664	2

Dimensions



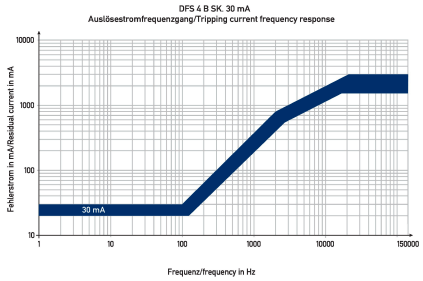
Dimensional drawing Group view

Wiring example



Wiring diagram

Diagrams



Characteristic B SK 30 mA