Doepke

The experts in residual current protection technology

Residual Current Circuit-Breakers with Overcurrent Protection (RCBO)

FIB / FIC

- » efficient
- » reliable
- » flexible
- » future-oriented

FIB / FIC type A / AC

one-pole +N

three-pole +N

Applications

Protection of socket-outlet ring circuits in domestic and utility buildings as well as industrial installations with TN-S and TN-C-S systems. In IT systems RCBOs can be provided for disconnection in the event of a second short-to-earth.

They must not be used in installations with TN-C systems or for protecting circuits in which electronic power equipment can give rise to smooth DC residual currents or residual currents with frequencies other than 50 Hz.

Function

Miniature circuit-breakers with mains voltage-independent residual current trip to EN 61009-1 for protecting installations in the event of short-circuits and overloads as per the requirements of IEC 60364-4-43 as well as for the protection of persons, livestock and property in cases of fault currents to earth as per IEC 60364-4-41.

Mounting method

» snap-on fastening on DIN-rail to EN 60715 possible in all standard distribution panels
» any mounting position possible

Features

» overcurrent tripping characteristic B and C
» one-pole +N and three-pole +N versions (Type A / AC / B)
» one module width version (Type AC only)
» rated currents (2-pole) 6 A to 40 A
» rated currents (4-pole) 6 A to 32 A
» rated residual currents 0.01 A, 0.03 A and 0.3 A

Special Unit

Type AC (one-pole)

The single module RCBO is an electronic unit designed specifically for fitting into consumer units (plastic and metal) to give earth leakage protection to an individual circuit.

one-pole

FIC / FIB type B

one-pole +N

three-pole +N

Characteristics

» compact design for all current ratings
» highly short-circuit proof
» indication of switch position
» B and C characteristics for precise adaptation of the RCBO to protection requirement
» use of standard wiring rails possible
» neutral wire on right
» AC-DC sensitive for residual currents with frequencies from 0 Hz (smooth DC current) to 100 kHz
» high availability also in respect of the voltage-dependent detection of smooth DC currents and AC residual currents with frequencies ≠ 50 Hz due to full functionality with mains voltages from min. 50 V AC at any two active wires
» mains voltage-independent tripping with type A residual currents
» meets the stipulations of design standards EN 61009-1, E DIN VDE 0664-200, IEC 62423 Ed. 2

Mounting method

» snap-on fastening on DIN-rail to EN 60715
» any mounting position
» direction of input preferably from above

Notes

» suitable for use in 50 Hz AC systems
» RCBOs are available for other frequencies upon request.

Applications

» commercial and industrial installations with TT, TN-S and TN-C-S system, where electric power equipement that is not electrically isolated from mains is used, such as e.g. frequency converts, switching supply circuits, high-frequency current inverters, photovoltaic/solar energy systems or UPS systems with transformer-less inverters
» RCBO with SK characteristic can be employed where high leakage currents are likely to arise and where fire protection is not required.

Tripping characteristic NK

The NK range guarantees classic fire protection from 300 mA at frequencies up to 100 kHz and thereby substantially exceeds the requirements of the new german standard for type B+ (DIN VDE 0664-401) residual current circuit-breakers (RCCBs). It is thus the optimum protection for installations with residual currents at high frequencies.

Tripping characteristic SK

In many electrical installations, such as e. g. in construction site power distribution, fire protection plays a secondary role. Here it is often the case that only fault protection and high availability of plant are demanded. Due to the lower response sensitivity at higher frequencies, there are few equipment-related unwanted tripping incidents.

Product range – Type A / AC / B

Type A / AC (one-/three-pole +N)

Type A	B Characteristic		C Characteristic	
I∆n	one-pole+N Order no.	three-pole+N Order no.	one-pole+N Order no.	three-pole+N Order no.
006 A				
0,01 A	09952141		09952151	
0,03 A	09952101	09955101	09952121	09955121
0,30 A	09952111	09955111	09952131	09955131
010 A				
0,01 A	09952142		09952152	
0,03 A	09952102	09955102	09952122	09955122
0,30 A	09952112	09955112	09952132	09955132
013 A				
0,01 A	09952143		09952153	
0,03 A	09952103	09955103	09952123	09955123
0,30 A	09952113	09955113	09952133	09955133
016 A				
0,01 A	09952144		09952154	
0,03 A	09952104	09955104	09952124	09955124
0,30 A	09952114	09955114	09952134	09955134
020 A				
0,03 A	09952105	09955105	09952125	09955125
0,30 A	09952115	09955115	09952135	09955135
025 A				
0,03 A	09952106	09955106	09952126	09955126
0,30 A	09952116	09955116	09952136	09955136
032 A				
0,03 A	09952107	09955107	09952127	09955127
0,30 A	09952117	09955117	09952137	09955137
040 A (5 module widths)				
0,03 A	09952108	09955108	09952128	09955128
0,30 A	09952118	09955118	09952138	09955138

Order numbers of Type AC devices on request.

Type B (one-/three-pole +N)

Type B NK	B Characteristic		C Characteristic	
I∆n	one-pole+N Order no.	three-pole+N Order no.	one-pole+N Order no.	three-pole+N Order no.
006 A				
0,03 A	09959201	09958201	09959221	09958221
0,30 A	09959211	09958211	09959231	09958231
010 A				
0,03 A	09959202	09958202	09959222	09958222
0,30 A	09959212	09958212	09959232	09958232
013 A				
0,03 A	09959203	09958203	09959223	09958223
0,30 A	09959213	09958213	09959233	09958233
016 A				
0,03 A	09959204	09958204	09959224	09958224
0,30 A	09959214	09958214	09959234	09958234
020 A				
0,03 A	09959205	09958205	09959225	09958225
0,30 A	09959215	09958215	09959235	09958235
025 A				
0,03 A	09959206	09958206	09959226	09958226
0,30 A	09959216	09958216	09959236	09958236
032 A				
0,03 A	09959207	09958207	09959227	09958227
0,30 A	09959217	09958217	09959237	09958237

Type B SK	B Characteristic		C Characteristic	
I∆n	one-pole+N Order no.	three-pole+N Order no.	one-pole+N Order no.	three-pole+N Order no.
006 A				
0,03 A	09959101	09958101	09959121	09958121
0,30 A	09959111	09958111	09959131	09958131
010 A				
0,03 A	09959102	09958102	09959122	09958122
0,30 A	09959112	09958112	09959132	09958132
013 A				
0,03 A	09959103	09958103	09959123	09958123
0,30 A	09959113	09958113	09959133	09958133
016 A				
0,03 A	09959104	09958104	09959124	09958124
0,30 A	09959114	09958114	09959134	09958134
020 A				
0,03 A	09959105	09958105	09959125	09958125
0,30 A	09959115	09958115	09959135	09958135
025 A				
0,03 A	09959106	09958106	09959126	09958126
0,30 A	09959116	09958116	09959136	09958136
032 A				
0,03 A	09959107	09958107	09959127	09958127
0,30 A	09959117	09958117	09959137	09958137

Accessories for two-pole RCBOs

Auxiliary Switch Hi 11

Function
The Hi 11 can be retrofitted as an auxiliary switch to two-pole RCBOs.

With the aid of other signalling devices (buzzer, indicator lamp, etc.) or via the Dupline bus system it enables the operating status of a residual current circuit-breaker
to be indicated.

Features
» auxiliary switch function
» retrofittable
» compact design
» 1 normally closed contact / 1 normally open contact

Mounting Method
» clamped on the left side of the residual current circuit-breaker
» snap-on fastening on DIN-rail to EN 60715 possible in all standard distribution panels
» any mounting position possible

Applications
Operating status of power supplies in domestic and utility buildings as well as industrial installations

Note
The auxiliary switch does not affect the function of the RCBO.

Remote Trip Module FAM 1

Function
The FAM 1 can be retrofitted as an external triggering device to two-pole RCBOs. Triggering of the residual current trip function by an external contact (push-button, time switch etc.) results in remote switch-off.

Features
» retrofittable
» compact design

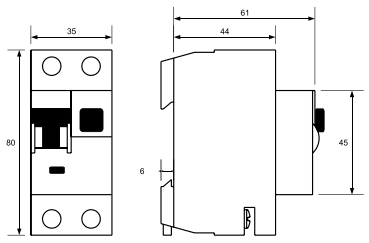
Mounting Method
» clamped on the left side of the combined RCCB/MCB
» snap-on fastening on DIN-rail to EN 60715 possible in all standard distribution panels
» any mounting position possible

Applications
Disconnection of power supply circuits in domestic and utility buildings as well as industrial installations by means of fault indicators and alarm systems.

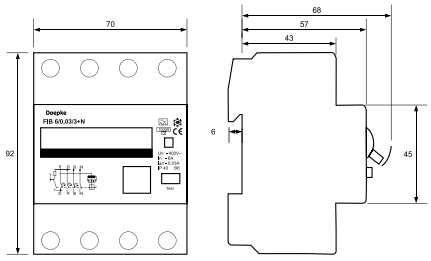
Note
» the FAM 1 does not affect the function of the combined RCBO
» not suitable for operational switching

Technical data

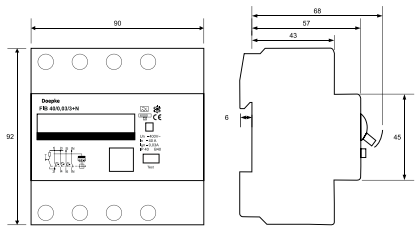
Technical data	FIB/FIC one-pole +N	FIB/FIC three-pole +N
Number of poles	one-pole +N	three-pole +N
module widths	2 (Type A/AC) 4 (Type B)	4 (Type A/AC 6 A to 32 A) 5 (Type A/AC 40 A) 6 (Type B)
Design requirements	EN 61009-1	
Rated voltage	~230 V	~400 V
Rated frequency	50 Hz	50 Hz
Residual current sensitivity		
Type AC	Type AC residual current	
Type A	AC and pulsating DC residual currents	
Type B	AC-DC sensitive	
Energy limiting class	3	
Rated breaking capacity / short circuit resistance	10 kA / 6 kA	6 kA
Tripping characteristic	B and C	
Back-up fuse	100 A/gL	
Conductor cross-section	1 to 25 mm²	
Enclosure protection type, installed	IP 40	
Ambient temperature	-25 °C to +40 °C	
Tightening torque of connecting terminals	2 to 2.4 Nm	
Mounting	on DIN EN 60715 rail	



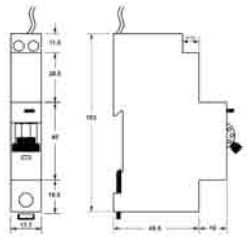
Type A, one-pole +N



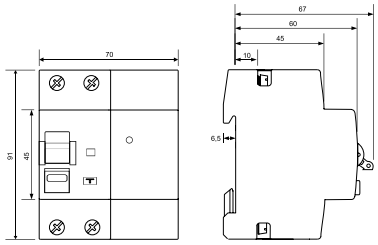
Type A, three-pole +N



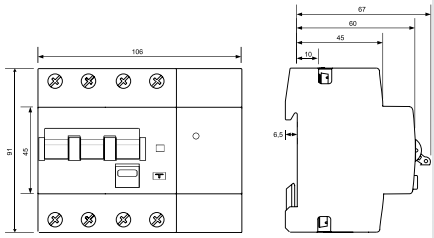
Type A, three-pole +N (40 A)



Type AC, one-pole



Type B, one-pole +N



Type B, three-pole +N

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