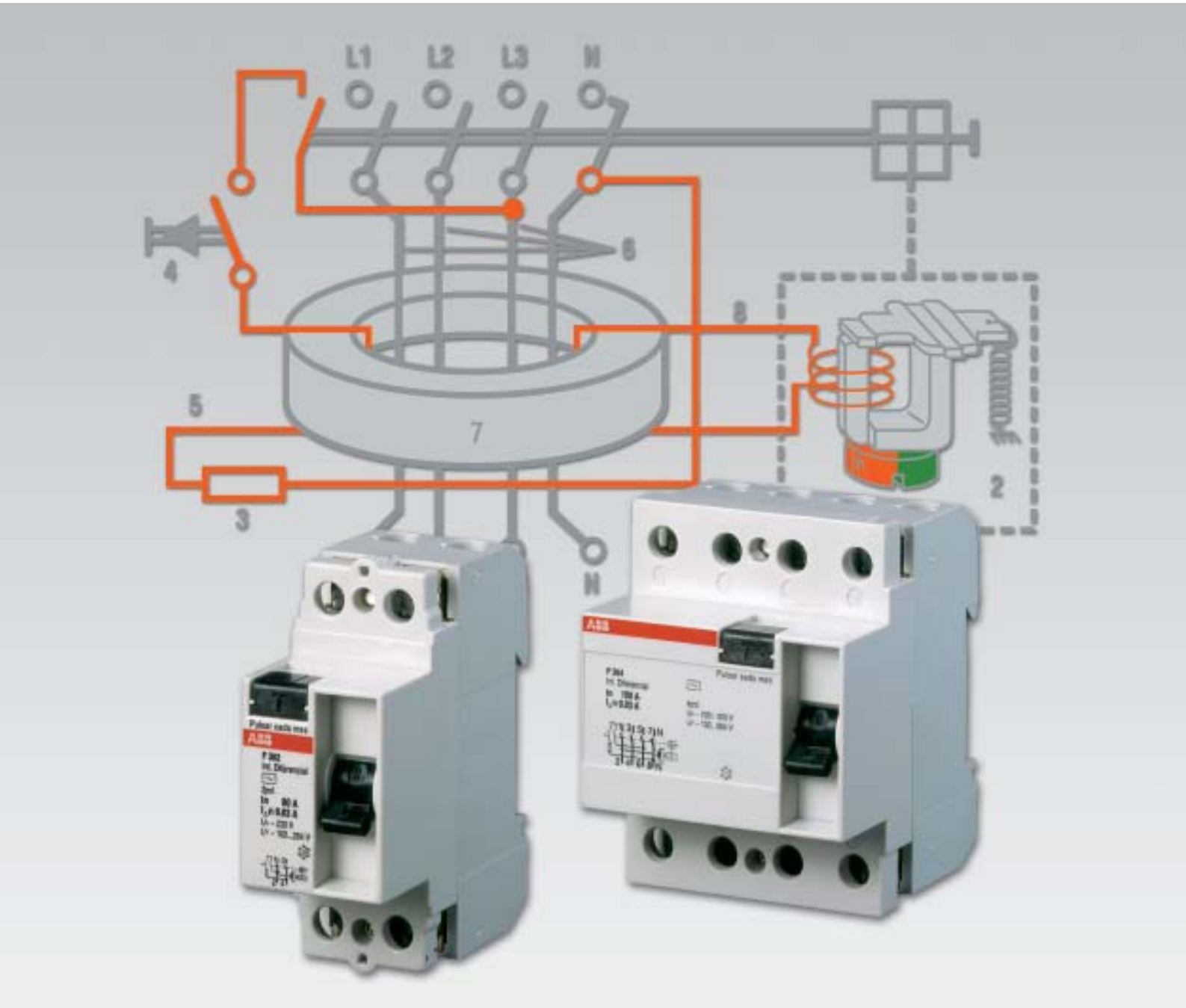
Technical Data

Residual current operated circuit-breakers (RCCB) F 360 X

80 A and 100 A



When connecting aluminium conductors, ensure that the contact surfaces of the conductors are cleaned, brushed and treated with grease.
Re-tighten contacts terminals after 6 to 8 weeks' time.

Conditions for Delivery and Sale

For domestic business, the Standard Terms for Delivery of Products and Services of the Electrical Industry (ABB Form 2292) shall apply in connection with the Standard Sale Terms (ABB Form 2327) in their then applicable version. For foreign business, the Standard Terms for Delivery of Products and Services of the Electrical Industry (ABB Form 2293 German-English, or ABB Form 2294 German- French) shall apply in connection with the Standard Sales Terms (ABB-Form 2381 English) in their then applicable version.

Warranty

We assume warranty in accordance with the Standard Sale and Delivery Terms. Complaints shall be made in writing within eight days following receipt of the goods.

Technical information and illustrations are not binding and subject to change without notice.

Residual current operated circuit-breaker F 360 X series

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Residual current operated circuit-breaker
F 360 X series

SK 0132 B 00

F 362 X

SK 0134 B 00

F 364 X

Overview

The residual current operated circuit-breaker (RCCB) F 360 X has a balancing transformer with a permanent magnet release for measuring.

It detects:
- a.c. fault currents and is surge proof up to 250 A

  Transient, excessive residual current impulses may result from ripple voltage generated by e.g. switching of fluorescent lamps, x-ray equipment, IT systems and the use of thyristor controls.

In connection with an upstream type gL 100A fuse , F 360 X may withstand solid short-circuit currents of up to 10 kA (⊟10 000).
It is also possible to use a STOTZ selective main circuit breaker type S 700 E 100 instead of a fuse.

RCCB F 360 X is suitable for an ambient temperature range of – 25 °C / -13° F to + 55 °C / 131° F.

Protection against electric shock

Measures against electric shock:

- protection in the case of indirect touch (indirect protection of persons) and fault protection when disconnecting impermissibly high touch voltages caused by short-circuit to exposed conductive parts.

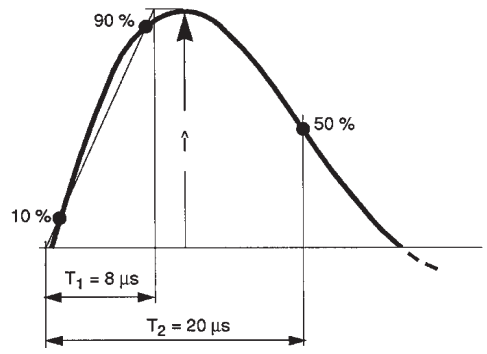
- protection in the case of direct touch (direct protection of persons) – disconnection as additional protection where live conductors are touched directly.
  Hazardous shock currents are disconnected within no time if the rated residual current of the device is $I_{\triangle n} \leq 30$ mA.

- protection against electrically ignited fire (fire protection) – if the rated residual current of the device is $I_{\triangle n} \leq 300$ mA .

Field of application

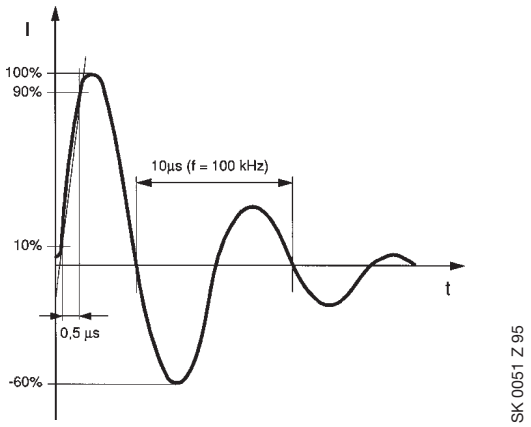
To attain a higher degree of safety in all installations, as well as in areas for which mandatory rules provide for or recommend residual current protective devices.

Surge strenght (see page 5)



SK 0092 Z 94

pulse shape 8/20, Î = 250 A
according to DIN VDE 0432 Part2
and IEC 60-2



SK 0051 Z 95

pulse shape according to IEC 1008
(0.5 µs/100 Hz)

Residual current operated circuit-breaker
F 360 X series

Technical data

standards:		IEC 1008, EN 61 008 BS 4293
No. of poles:		2 and 4 poles
rated current I_n:		80 and 100 A
rated residual currents $I_{\triangle n}$:		30 mA
tripping range:		0.5 ... 1 · $I_{\triangle n}$
tripping times at	1 · $I_{\triangle n}$:	≤ 200 ms
	5 · $I_{\triangle n}$:	≤ 40 ms
surge strength: (pulse shape see page 4)		250 A (impulse wave shape 8/20) 200 A (ring wave 0.5 µs/100 kHz)
rated residual making & breaking current $I_{\triangle m}$*:		1000 A
rated switching capacity I_m*:		1000 A
rated short-circuit current I_{nc}*:		6000 A
rated residual short-circuit current $I_{\triangle c}$*:		6000 A
short-circuit withstand capacity:		10 000 A; in connection with STOTZ selective main circuit-breaker S 700 E 100 A or an upstream fuse type gL 100 A
rated voltage U_n:		230/400 V ~
frequency:		50 ... 60 Hz
max. service voltage U_{smax}:		U_n + 10%
operative range of testing equipment U_T:		100 ... 264 V ~
insulation co-ordination: – overvoltage category: – pollution degree: – surge voltage (1,2/50 µs): – power-frequency voltage strength (50/60 Hz):		according to DIN VDE 0110 Parts 1 and 2 IV 2 6 kV 2.5 kV
casing:		grey moulded plastic (RAL 7035)
operating lever:		black
test button:		black
degree of protection:		IP 20, IP 40 in the distribution board
protection against electric shock:		according to DIN VDE 0106, Part 100
overall dimensions:		according to DIN 43880 size code 1
mounting position:		any
fixing:		snap-on to DIN rails
connection cross section	top:	1.5 to 25 mm² } fine-stranded conductors shall be fitted with a connector sleeve or a cable lug
	bottom:	1.5 to 25 mm² }
connection:		individually or collectively via a busbar
terminals:	top:	combined box terminal using M5-type screws
	bottom:	box terminal using M5-type screws
serviceable life:		at least 5000 switching cycles
climatic resistance according to IEC 1008 / IEC 68 Part 2-30:		damp heat, cyclic (28 cycles)
ambient temperature:		T_{min} – 5 °C / 23°F, T_{max} + 55 °C / 131°F
virbration resistance:		according to IEC 1008, EN 61008
trip-free mechanism:		yes
weight:		see selection table

*** for definitions, see page 14**

Residual current protective devices
Possible areas of application

For universal use in normal circuits
STOTZ-RCCB

SK 0027 B 94

SK 0030 B 94

For additional protection of socket outlet circuits
STOTZ people protector

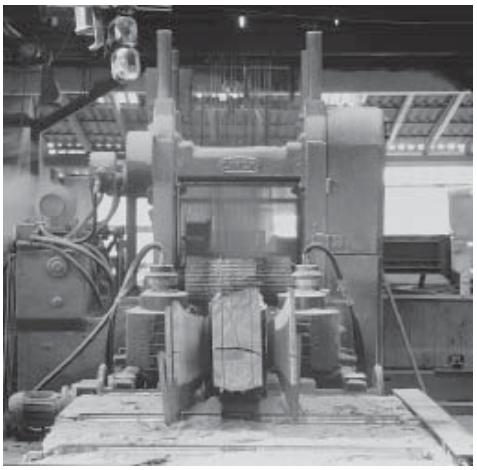
SK 0028 B 94

SK 0029 B 94

SK 0031 B 94

Residual current protective devices
Possible areas of application

To achieve a high degree of service security
STOTZ Main RCCB

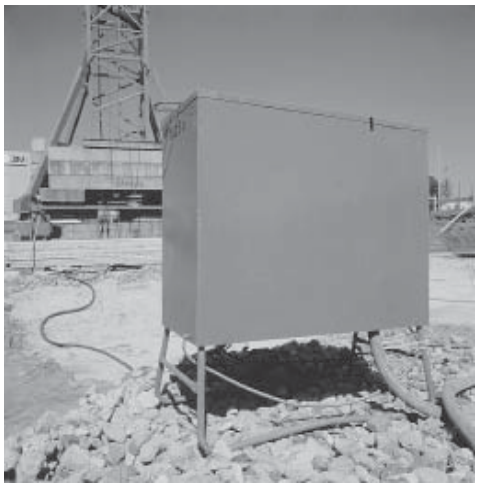


SK 0032 B 94

SK 0035 B 94

For commercial and industrial power installations
STOTZ "multiSTOTZ"

SK 0033 B 94



SK 0034 B 94

SK 0036 B 94

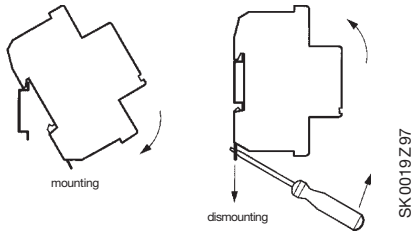
Residual current operated circuit-breaker
F 360 X series

Mounting and operation instructions

1. Mounting

Install in any desired mounting position by means of snap-on fastening to DIN rails EN 50 022, 35 mm.

Caution:
Installation and removal must be carried out by authorised personnel only

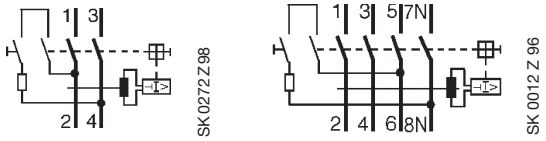


2. Anschluß

Ensure proper, secure connection of conductors

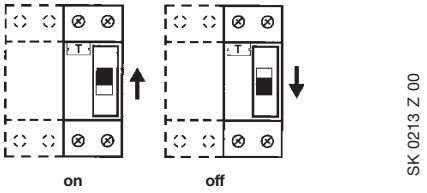
Max. pick-up torque 3 Nm

Incoming supply from above or below. To ensure proper test button functionality of four-pole RCCBs operated as two-pole devices, connect terminals 5 and 7 or, as the case may be, 6 and 8. In the case of a 3-phase circuit with U_n 127/230 V (without neutral conductor N) terminals 4 and 8 have to be bridged.



3. Operation

F 360 is switched ON and OFF with the black operating lever.



4. Operating test

No maintenace other than the monthly operating test is required.

To carry out the operating test, the circuit-breaker must be properly installed. Press the test button in the ON position, and the RCCB must trip immediately (the operating lever jumps from position "I" to "0").

5. Test of effectiveness of protection

In addition to the operating test, test the effectiveness of the circuit-breaker's protection of the installation according to the applicable code of practice. The maximum permissible earth/ electrode resistance for rcd protection is as follows:

max. permissible touch voltage U_L	max. permissible earth-electrode resistance if rated residual current is		
	30 mA	100 mA	300 mA
25 V	833 Ω	250 Ω	83 Ω
50 V	1666 Ω	500 Ω	166 Ω

6. Cleaning

Dirty RCCBs may be cleaned with a damp cloth moistened with soapy water if dry cleaning is impossible. Never use caustic detergents or solvents.

7. Malfunctioning

The high-quality STOTZ residual current operated circuit-breakers are throurougly adjusted and tested in our works. Where damage occurs (caused e.g. by transport, storage , etc.) no repair work must be undertaken.
If the device responds immediately after putting the RCCB into operation, check the down-stream active circuit and any connected current-consuming appartus for earth fault current. Remove insulation faults or connections between the neutral conductor and the protective conductor existing in load circuit.
Where the RCCB does not trip in the first operating test after pressing the test button, check first whether the test circuit is connected correctly. Where none of the above causes apply, or should the operating test be completed unsuccessfully, the RCCB must be replaced.

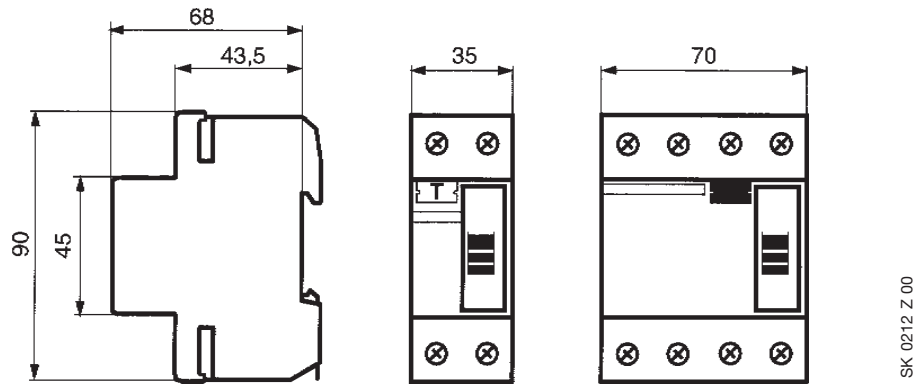
Opening the device will lead to a loss of warranty.

Residual current operated circuit-breaker
F 360 X series
Accessories

Dimension drawings

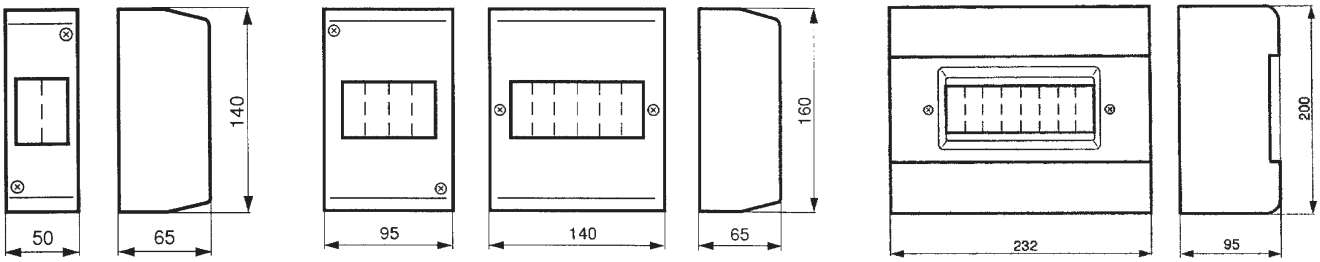
all measurements in mm

F 362 X, F 364 X



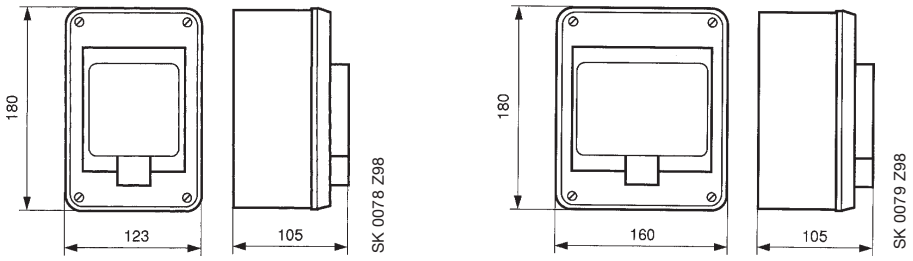
F 362 X **F 364 X**

Terminal covers



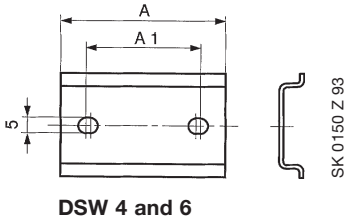
PCD 2 N SK 0136 Z 96 **PCD 4 N** **PCD 6 N** SK 0137 Z 96 **PCD 8 N** SK 0138 Z 96

Casing of insulation material



QES 4/3 N **QES 6/3 N**

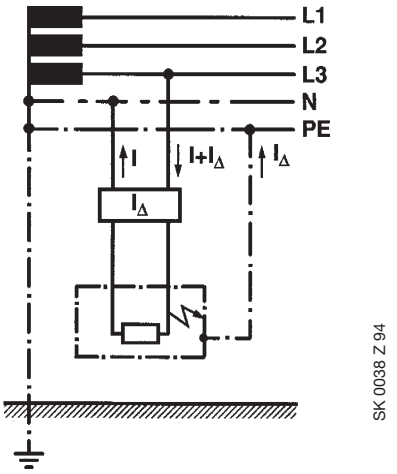
Mounting rails



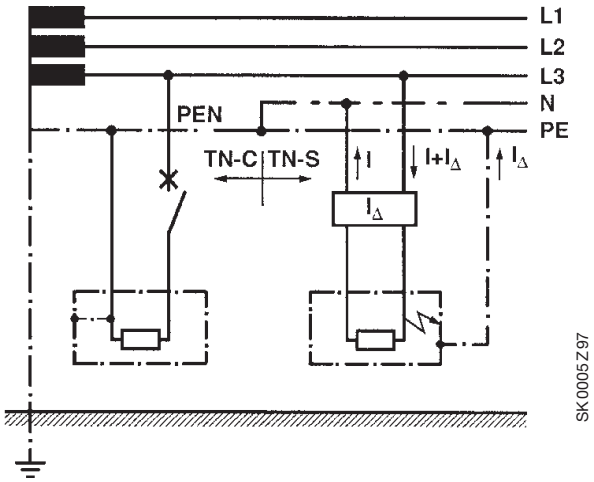
DSW 4 and 6

code	A	A1
DSW 1	17.5	15
DSW 2	35	20
DSW 3	52.5	37.5
DSW 4	70	55
DSW 6	105	90

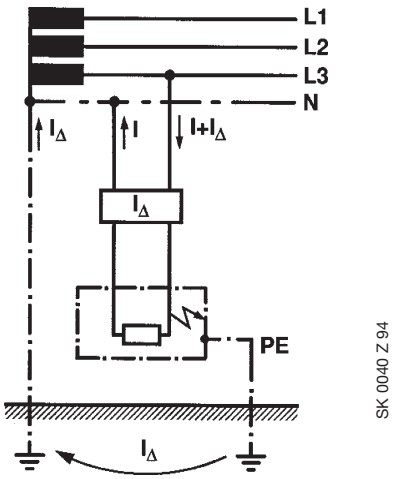
Residual current operated circuit-breaker
Examples for protection against electric shock



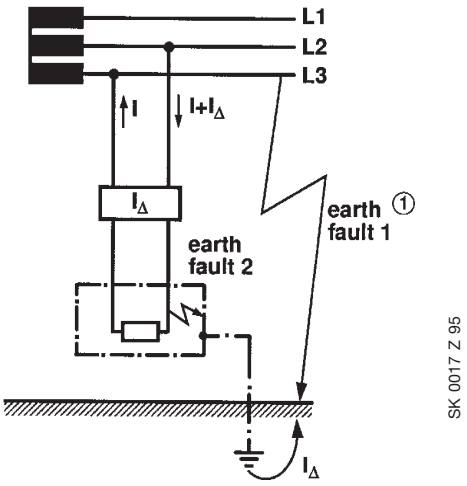
TN-S system
separate neutral and protective conductors throughout the network



TN-C-S system
neutral and protective conductor (PEN) combined in one part of the network



TT system



① only indicated by line isolation monitor

IT system
The residual current operated circuit-breaker trips if a double fault occurs, as e.g. is indicated as fault 1 and fault 2 above.

Explanation of abbreviations

L1, L2, L3	”**l**ine” outer conductor	I	”**i**solation”
PE	”**p**rotection **e**arth” protective conductor	C	”**c**ombined” PE and N (PEN) in the network
N	”**n**eutral”	S	”**s**eparated” PE and N in the network
PEN	PE and N combined	”...”	terms used in international IEC standards
T	”**t**erre” direct bond to earth		

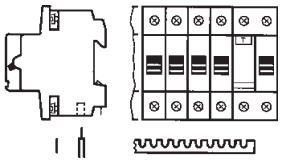
Residual current operated circuit-breaker
F 360 X series
80 and 100 A

SK 0133 B 00

F 362 X

SK 0135 B 00

F364 X



SZ-KS 1/12
SZ-KS 2/12

SK 0014 Z 01

SK 0091 B 93

DSW 2 ... 6

Selection table

rated residual current $I_{\Delta n}$ mA	rated current I_n A	**order details** type code	order code	**bbn** - **EAN**	**price** 1 piece **DM**	price group	weight 1 pc. kg	pack. unit pc.

F 360 X series

Residual current operated circuit-breaker F 362 X, 2 poles

30	80	**F 362- 80/0,03**	GH F362 0046 R2620	-			0.280	1
	100	**F 362-100/0,03**	GH F362 0046 R2630	-			0.280	

Residual current operated circuit-breaker F 364 X, 4 poles

30	80	**F 364- 80/0,03**	GH F364 0046 R2620	-			0.430	1
	100	**F 364-100/0,03**	GH F364 0046 R2630	-			0.430	

Busbars

cross section mm^2	length mm	no. of poles	**order details** type code	order code	**bbn** **40 12233** **EAN**	**price** 1 piece **DM**	price group	weight 1 pc. kg	pack unit pc.

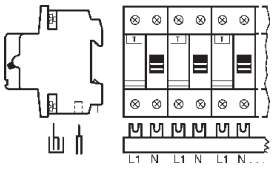
Universal comb busbars for cross-wiring STOTZ RCCBs F 360 X from below with STOTZ MCB S 2

Single-phase feeder
Mounting comb busbars in no way affects protection against unintentional touch of live parts according to DIN VDE 0106 Part 100.

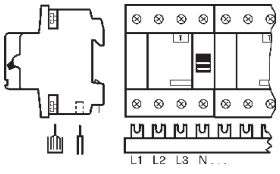
12	210	12 x 1	**SZ-KS 1/12**	GJI 2 322 322 R0001	**59790 1**		0.015	100
24	210	12 x 1	**SZ-KS 2/12**	GJI 2 322 322 R0003	**59810 6**		0.031	100

Mounting rails (EN 50 022 – 35 x 7.5)
mounted individually with 2 screws on an even surface (1 module = 17.5 mm)

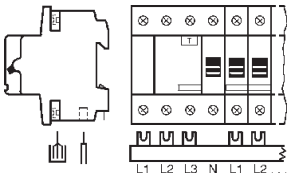
for 2 modules	**DSW 2**	GH S210 1926 R0002	**13590 5**			0.012	10
3 modules	**DSW 3**	GH S210 1926 R0003	**13600 1**			0.018	10
4 modules	**DSW 4**	GH S210 1926 R0004	**13610 0**			0.024	10
6 modules	**DSW 6**	GH S210 1926 R0006	**13620 9**			0.030	10



SK 0119 Z 96



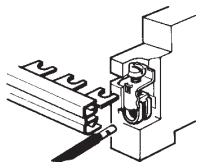
SK 0120 Z 96



SZ-PSB 97 N SK 0121 Z 96

PSB-END SK 0073 Z 91

Busbar blocks for RCCBs with combined box terminal



SK 0074 Z 91

(no connectors required)

(bottom end cap)

cross section mm²	length mm	no. of x poles	**order details type code**	order code	**bbn 40 12233 EAN**	**price** 1 pc. **DM**	weight 1 pc. kg	pack unit pc.
for RCCB feeder:		**type F 362 X,**		**2 poles 1 phase + N**				end caps: **PSB-END 3**
10	213	6 x 2	**SZ-PSB 53 N**	GH V036 0874 R0031	**54940 5**		0.078	30
10	1035	29 x 2	**SZ-PSB 54 N**	GH V036 0874 R0032	**54950 4**		0.403	10
16	213	6 x 2	**SZ-PSB 55 N**	GH V036 0874 R0033	**54960 3**		0.106	30
16	1035	29 x 2	**SZ-PSB 56 N**	GH V036 0874 R0034	**54970 2**		0.534	10
		type F 364 X,		**4 poles 3 phases + N**				end caps: **PSB-END 4**
10	213	3 x 4	**SZ-PSB 61 N**	GH V036 0874 R0039	**55020 3**		0.112	30
10	1056	15 x 4	**SZ-PSB 62 N**	GH V036 0874 R0040	**55030 2**		0.650	10
16	213	3 x 4	**SZ-PSB 63 N**	GH V036 0874 R0041	**55040 1**		0.156	30
16	1056	15 x 4	**SZ-PSB 64 N**	GH V036 0874 R0042	**55050 0**		0.884	10
for combination of RCCB feeder:		**type F 364 X,**		**4 poles + MCB S 260, S 270, S 280 3 phases + N**				end caps: **PSB-END 3**
10	213	3x3+2x1	**SZ-PSB 97 N** ★	GH V036 0875 R0025	**554904**		0.099	30
10	1018	15 x 4	**SZ-PSB 98 N**	GH V036 0875 R0026	**55500 0**		0.480	10

★ 3x3+2x1(N recess)

End caps for shock-protected busbar blocks

			PSB-END 5	GH L520 1921 R0005	**97410 8**		0.001	50
			PSB-END 6	GH L520 1921 R0006	**97420 7**		0.001	50
			PSB-END 3	GH V036 1325 R0001	**55630 4**		0.001	50
			PSB-END 4	GH V036 1352 R0002	**55640 3**		0.001	50

SK 0077 B 96

PCD 4 N

SK 0079 B 96

PCD 8 N

SK 0019 B 98

QES 4/3 N

description	**order details**		**bbn** 40 12233	**price** 1 piece	weight 1 pc.	pack unit
	type code	order code	**EAN**	**DM**	kg	pc.

Terminal cover with base plate, degree of protection IP 20

The terminal cover is snapped onto the base plate and is sealable.
The base plate has an integrated top-hat mounting rail.

for 2 modules	**PCD 2 N**	GH S270 1921 R0002	**12402 6** ②		0.08	1
for 4 modules	**PCD 4 N**	GH S270 1921 R0004	**12404 0** ②		0.14	1
for 6 modules	**PCD 6 N**	GH S270 1921 R0006	**12406 4** ②		0.175	1
for 8 modules	**PCD 8 N**	GH S270 1921 R0008	**12408 8** ②		0.63	1
earth (PE) rail ①	**ES**	GH S270 1912 R0001	**36660 6**		0.08	10
blanking plate 1 module = 17.5 mm (half normal module width)	**BP**	GH S270 1913 R0001	**12857 4** ②		0.005	10

① for retrofitting into terminal cover PCD...

Casing of insulating material, degree of protection IP 55

package includes mounting rails EN 50 022 and 3 or 5 cable entry grommets Pg 21
for 4 modules, knockouts: on top 1 x Pg 21, on bottom 2 x Pg 21

with 2 grommets	**QES 4/3 N**	GH L111 2304 R0013	**12644 0** ②		0.330	1
for 6 modules, knockouts: 3 x Pg 21 on each top and bottom						
with 2 grommets	**QES 6/3 N**	GH L111 2306 R0013	**12646 4** ②		0.420	1

casing for 10 modules (QES 10/3 N) upon request

② **bbn No. 80 0012**

Residual current operated circuit-breaker
Definitions

Extracts from DIN VDE 0664 Part 101/EN 61008-1...+A17:2000:

Rated residual making and breaking capacity $I_{\Delta m}$

The rated residual making and breaking capacity is the r.m.s. value of the a.c. component of residual prospective current, assigned by the manufacturer, which an RCCB can make, carry and break under specific circumstances.

Rated making and breaking capaity (rated switching capacity) I_m

The rated making and breaking capacity is the r.m.s. value of the a.c. component of prospective current, assigned by the manufacturer, which an RCCB can make, carry and break under specific circumstances.

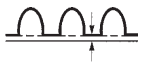
Rated conditional short-circuit current I_{nc}

The rated conditional short-circuit current is the r.m.s. value of prospective current, assigned by the manufacturer, which an RCCB, protected by an SCPD, can withstand under specified conditions without undergoing alterations impairing its functions.

Rated conditional residual short-circuit current $I_{\Delta c}$

Rated conditional residual short-circuit current is the value of the prospective residual current, assinged by the manufacturer, which an RCCB, protected by an SCPD, can withstand under specific conditions without undergoing alterations impairing its functions.

Protection ensured by types AC, A and B residual current devices (RCD) according to CEI IEC 755

	form of residual current	correct functioning of residual current devices[1] types		
		AC	A	B
sinusodial a.c.	 suddenly applied  slowly rising SK 0005 Z 96	+	+	+
pulsating d.c.	 suddenly applied with and without superimosed smooth d.c. of 6 mA  slowly rising SK 0003 Z 96		+	+
smooth d.c.	 SK 0001 Z 96			+

[1] correct functioning is marked with an +

Classification of STOTZ residual-current-operated devices

types		
AC	**A**	**B**
F 360 F 360 X F 660	F 370 F 390 F 670 F 694 F 270 P 270 F 402	F 804 F 220 BF

Notes

ABB STOTZ-KONTAKT, the Heidelberg-based company, develops, manufactures and sells highly modern, modular systems for electrical building installations.
It offers complete installation ranges for a wide variety of applications:

System pro *M*

For classic installation applications

The modular **System pro *M*** for installation on DIN rails incorporates Europe's best-selling miniature circuit-breakers and residual-current-operated circuit-breakers as well as a complete range of built-in devices.
The system components have been designed with various functions and performance capabilities and are therefore able to optimally cover the complete range of applications in building installation:

- conventional domestic electrical installations
- industrial and commercial installations
- protection and switch functions
- checking and monitoring tasks
- control and time-dependent tasks etc.

System pro *M* compact®

The extension of **System pro *M*** for targeted use in domestic electrical installations stands out due to its compact and easily comprehensible range of miniature circuit-breakers, residual-current-operated circuit-breakers and cross wiring tools as well as an optimized installation technology taking into account the special circumstances and requirements of domestic electrical installations.

System *Connect*

This pioneering system concept contains seamlessly integrated system units – consisting of miniature circuit-breakers and residual-current-operated circuit-breakers as well as apparatus racks and flush-mounted wall boxes - was designed to suit the special requirements of domestic electrical

The new plug-in connection technology for the devices and apparatus rack ensures quick and reliable installations: assembly, connection of the devices and cross wiring are carried out time-effectively in one single step.
If need be, component sets may still be changed quickly and flexibly right until transfer takes place; devices may also be exchanged easily at some later date, and economically in terms of both money and time, at that.

The entire **System *Connect*** was developed by ABB STOTZ-KONTAKT and Striebel & John, within the framework of their successful system partnership.

EIB Installation Systems

For intelligent Building Installation

Highly modern, programmable installation systems with bus technology based on the European EIB standard.

ABB i-bus® EIB

System with special 2-core bus cable, primarily for new buildings.

ABB Powernet EIB

System for retrofitting in existing buildings. Transfer of information via the existing network.

Security Systems

All-in-one Protection

Wide range of security systems and components: intruder and fire alarm systems, radio-controlled alarm systems, door locking system and signalling components.

During the century-long experience of the company, it has always contributed pioneering solutions to the safe application of electricity.
Today, ABB STOTZ-KONTAKT GmbH is an integral part of the ABB Group, a major player on the electrical and electronic markets.

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