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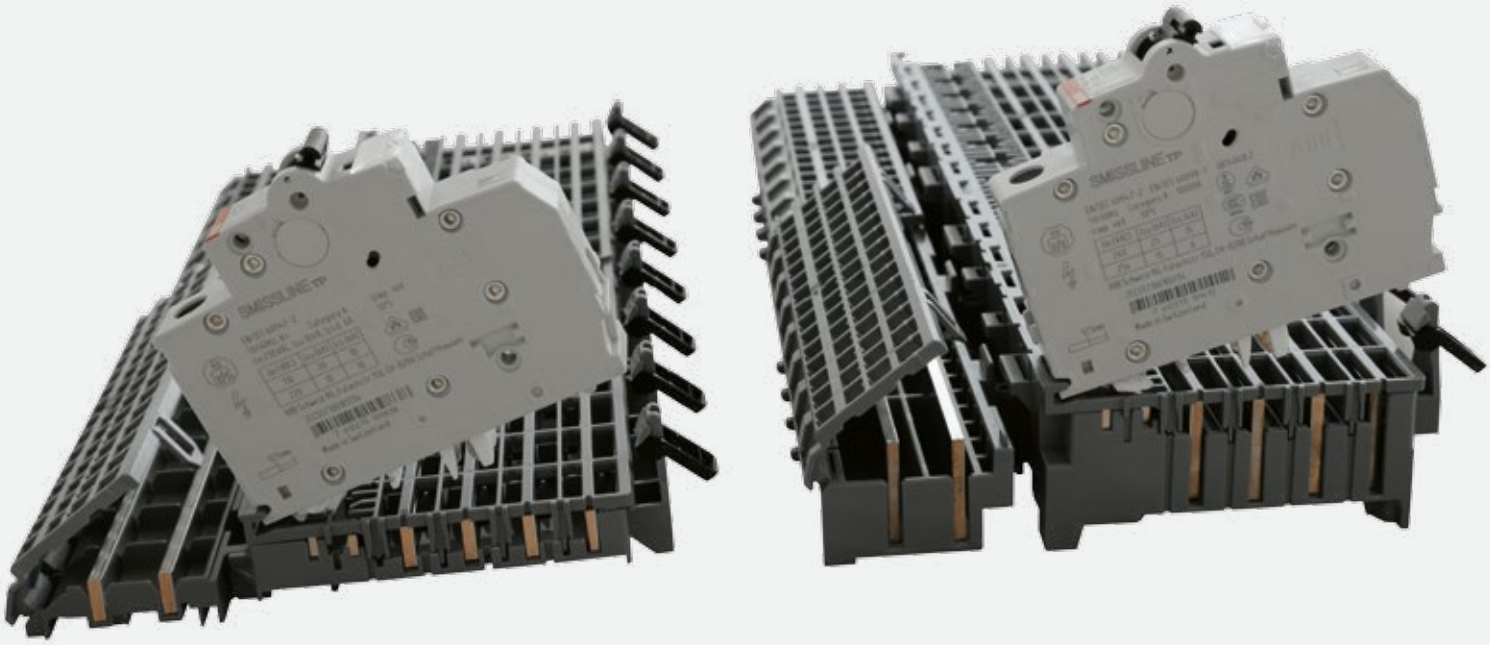
SMISSLINE

Technical catalogue

SMISSLINE TP-Touch proof system
Power and safety



Power behind bars
The world’s safest socket system

Small cause, large effect: as the world’s first pluggable socket system, SMISSLINE TP ensures that load-free devices and components can be snapped on and off under voltage without the need for additional personal protective equipment to guard against electrical hazards. That opens up completely new prospects for you when it comes to installation, operation and flexibility.

New Power Bar System 250 A
The new 250 A system is now available in the shape of the SMISSLINE TP. The busbars have a rated amperage of 250 A and therefore allow a end feed of 250 A. This extends the spectrum of potential applications.

Efficiency you can touch
Plug in components during ongoing operation

Even safer: Protection against electrical hazards
We have upgraded our unique SMISSLINE TP socket system even further through the addition of a pioneering innovation. With the new SMISSLINE TP system, components can now be plugged in or unplugged load-free without any risk from electrical current running through the body.
The SMISSLINE TP pluggable socket system is completely finger-safe (IP20B) – when devices are plugged in and unplugged, the system is always touch-proof. This means that SMISSLINE TP prevents any danger to personnel from switching arcs or accidental arcing.

Even more flexible: make additions and changes during ongoing operation
Pluggable devices can be added and changed quickly, safely and simply during ongoing operation. And this can be done without any need for personal protective equipment.
This means that you benefit from more flexibility, savings on installation and maintenance – and improved safety. SMISSLINE TP provides greater availability and operating safety than conventional systems.

Absolutely safe without protective equipment
The SMISSLINE TP principle taken further

The ingenious Click system
Using the SMISSLINE TP system's unique SMISS CLICK function, five different protective devices can easily be plugged into one pluggable socket system with integrated busbars. In this way, the SMISSLINE system allows the uncomplicated, modular, flexible distribution of power up to a rated current of 250 A. Plugging in the devices quickly and without problems is essential for time-saving, cost-effective planning and execution.

Current measurement system
The CMS is a system for current measurement of electrical lines. The system consists of a Control Unit and sensors with different measurement ranges (20 A, 40 A, 80 A). The sensors measure alternating, direct and mixed currents (TRMS).
The sensors get connected to the Control Unit by a flat cable. You can remotely query the measurement data via a RS485 interface (Modbus RTU).

SMISSLINE TP: The successful system is now finger-safe
With SMISSLINE TP, fitters no longer require personal protective equipment, and so both the fitting and the operation/expansion of the installation can now be carried out more safely, faster and thus more efficiently.

The RANGE
- Miniature circuit-breaker 1-, 2-, 3- and 4-pole
- Residual-current circuit-breaker 2- and 4-pole
- Combined RCCB-MCB 2- and 4-pole
- Surge arrester type 2
- Switch disconnector
- Motor protection switch
- Busbar system, contact rails max. 125 A; incoming system with max. 250 A
- Wide range of accessories

Worth knowing: All SMISSLINE TP devices are downwardly compatible with the existing SMISSLINE pluggable socket system!

SMISSLINE TP at a glance
- **Safe:** load-free plugging in and unplugging possible under power
- **Flexible:** rapid replacement, easy expansion, mixed-pole layout possible
- **Economical:** saves time and space thanks to the plug-in technology

Pro E Power and pro E energy
SMISSLINE TP in ABB enclosures

Horizontal device arrangement
Modules for a horizontal device arrangement for the SMISSLINE TP system The DIN rails are designed to be equipped with the SMISSLINE TP socket base rows.

Vertical device arrangement
Modules for a vertical device arrangement have cable laying grids for fastening the cables.
The DIN rails are designed to be equipped with the SMISSLINE TP socket base rows; it is also possible to connect the SMISSLINE TP additional sockets (N/PE terminals).

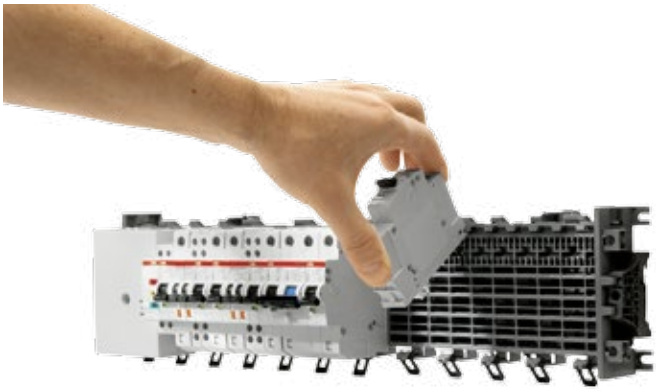
Floor-standing cabinet fitted with modules for SMISSLINE TP devices and for pro M DIN rail mounting devices and for fuse switch disconnectors.

Front view horizontal modules

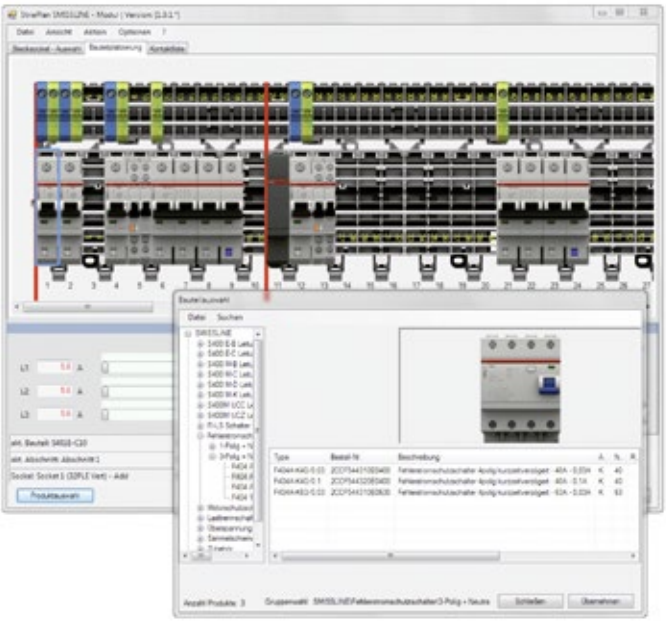
Front view vertical modules

Planning aid SMISSLINE TP socket base

Socket base calculation with SMISSLINE TP Designer Software



In Panel Design Configurator: SMISSLINE TP Designer
The new SMISSLINE TP Designer is integrated into the base version of the Panel Design Configurator. This ensures that Panel Design Configurator now offers simple project planning and calculation for the SMISSLINE TP socket base system.
The SMISSLINE TP Designer allows you to select and configure ABB SMISSLINE TP products in a graphical environment:



Advantages at a glance:
- Full integration in Panel Design Configurator
- Cabinet and module selection in Panel Design Configurator
  is possible specifically for the SMISSLINE TP socket base
- Components are fitted to the socket base in a graphical environment
- Full range of SMISSLINE TP products for selection
- Configuration of accessories
- Automatic equipping
- Support for positioning the power supply

Information on:
- Incoming and outgoing power
- Checking and display of space units, power and power loss
- Technical specifications for devices including price calculation (in Panel Design Configurator)
- Printing or export (in Panel Design Configurator) of parts lists, construction drawings or tender specifications

Accessories dialogue box
- The combination of devices and additional components (such as auxiliary and signal contacts) is fully supported
- Automatic insertion of component combinations
- Automatic component selection for left/right positioning

Remote Power Panel – Data Center
Application Note

Backup protection
Based on backup and selectivity requirements a Molded Case Circuit Breaker (XT4) is used to protect the Sub-Distribution. The rating can go up to 250 A per MCCB if parallel incoming is used. The Backup protection complies with IEC/EN 60898-1 and IEC/EN 60947-2 and allows industrial use. With the integrated COM-Module all voltages, currents, power factors and status data is available through a Modbus RTU interface.

Circuit Monitoring System Control Unit – CMS-700
RPP's heart is the Control Unit CMS-700 which aggregates the current readings from the CMS and the Power Quality Values to create consumption data and generate alarms in case of system errors. In addition to the optional front door touch display CP651-WEB, a generic Modbus TCP and SNMP interface is supported. Typically this protocols are used to interface the data center infrastructure management system – DCIM.

Circuit Monitoring System – open core and solid core sensors
ABB's CMS is the most compact, neat and hassle-free branch circuit monitoring system available on the market. The sensors are mounted directly on the SMISSLINE Miniature Circuit Breakers and there is no need of conventional expensive and cumbersome cabling thanks to internal Modbus instead of typical Current Transformer star wiring. The new range of open core sensors helps to add branch monitoring into existing installations without the need to power-off they system.

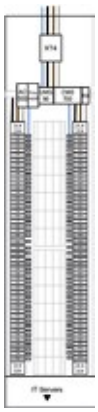
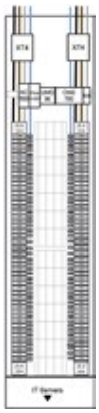
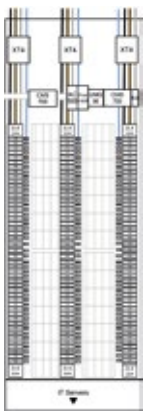
Touch proof system - SMISSLINE TP
The world's first pluggable and touch proof socket system, SMISSLINE TP ensures that load-free devices and components can be safely snapped on and off under voltage without shutting down one single server. In addition maintenance can be done by instructed personnel without electrician's qualification. Moreover you can save 20 % space for the typical A/B distribution in a data center. Compared to a conventional build up time of 15 hours of an RPP like this – SMISSLINE needs only 8h which allows another 45 % of time saving.

Power Quality Analyzer
The Power Quality Analyzer has dual function. First, it provides the voltage and power factor reference value to the PLC for calculating the effective power and energy values for the branch circuit. It allows the class III system reports according to DIN EN 61000-2-4 secondly, it provides the following data for the complete RPP:

- Active, reactive and apparent power
- Residual current monitoring
- Voltage quality (DIN EN 50160)
- Frequency and power factor
- Total harmonic distortion

Remote Power Panel Range

Different sizes for different applications

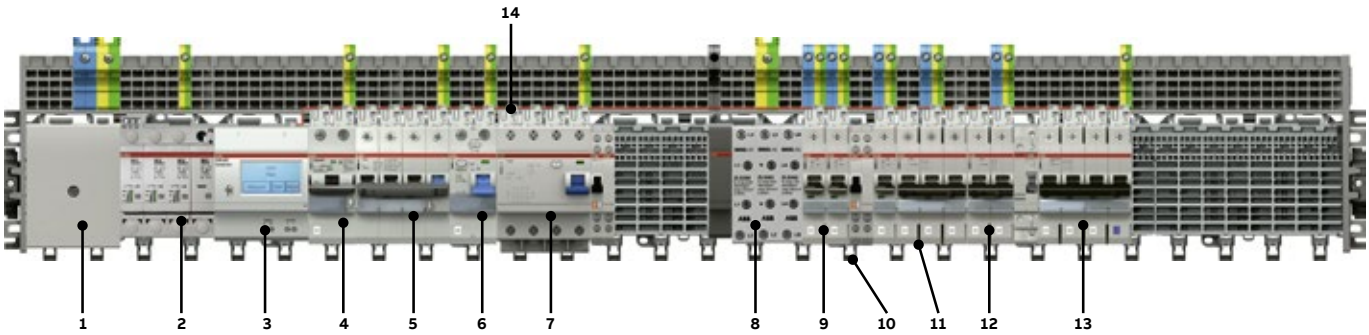
Remote Power Panel families and technical features compared at a glace:		RPP-250A	RPP-500A	RPP-750A	RPP-1000A
Rated current of the assembly (I_{na})		250A	2x250A	3x250A	4x250A
Rated operational voltage		240/415 VAC			
Number of branch circuits per system		128	128	192	256
	with remote tripping indication	84	84	128	170
	with overvoltage module	112	112	168	222
	with MID meter	42	42	63	84
Operating temperature		-5 ... +40 °C			
Storage temperature		-25 ... +70 °C			
CMS-700 Control Unit	Communication	Modbus RTU (RS485); Modbus TCP/IP; SNMP v1/2 and encrypted SNMP v3			
	Accuracy voltage measurement	±1 %			
	Accuracy branch current measurement	±1 % full scale			
Display		Integrated webserver (CMS-700); optional front door device/display			
Dimensions (mm)	H x W x D	1950/550/350	1950/550/350	1950/800/350	1950/1050/350
					

International type numbering of ABB data center solutions

Example type number: RPP-500A-NP-INT-OVR-MID-PQ-TS

	Electrical Specification			Monitoring and Features			
X1	X2	X3	X4	X5	X6	X7	X8
Product	Input current	Protection	MCCB placement	Features	Branch measurement	Power& network analyzing	Display/Touch
RPP	250A	P (single phase)	INT (internal)	Not selected	Not selected	Not selected	Not selected
	500A	NP (phase and neutral)	EXT (external)	RTI (remote tripping indication)	BCM (branch monitoring)	NET (network analyzer)	TS (panel pc/ touchscreen)
	750A	3P (three phase)	SINT (single line with internal)	OVR (overvoltage protection)	MID (billing meters)	PQ (power quality analyzer)	
	1000A	3NP (three phase and neutral)	SEXT (single line with external)	RTIOVR (combination RTI&OVR)			
		KXXX (tolerant tripping curve)					

Six protection devices in one system



1 **Incoming block 100/160 A**
2 **Surge arrester**
3 **Control unit for Current measurement system**
4 **2-pole residual current operated circuit breaker with overcurrent protection**
5 **4-pole residual current operated circuit breaker with overcurrent protection**
6 **2-pole residual current operated circuit breaker**
7 **4-pole residual current operated circuit breaker**
8 **Incoming block 63 A**
9 **Miniature circuit breaker 1 pole**
10 **Device latch**
11 **Miniature circuit breaker 3 poles**
12 **Miniature circuit breaker 2 poles**
13 **4-pole residual current operated circuit breaker with overcurrent protection**
14 **Current measurement sensor**

Table of conteants
SMISSLINE TP

Miniature circuit breaker
Properties






General Information
The SMISSLINE miniature circuit-breaker is an energy-restricting circuit-breaker that has high performance values and that is equally suitable for the industrial sector, for commercial use and for installation at home.
If a short-circuit occurs, it guarantees excellent selectivity conditions to upstream overcurrent circuit breakers while the load on equipment that is connected downstream is limited to a minimum amount.

The most important features
- High rated breaking capacity of 10 kA or 6 kA
- Optimum ease of installation and connection
- The pole conductors are protected against accidental contact
- Tripping characteristic on B, C, D, K, UCZ/UCC

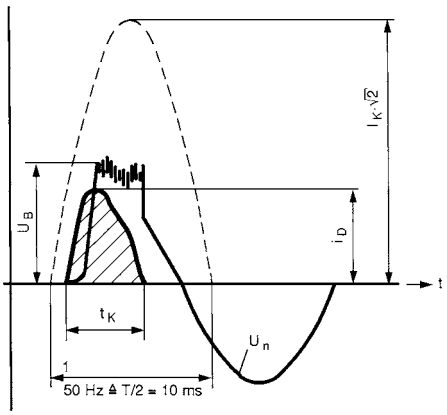
Miniature circuit-breaker in accordance with standard EN 60898-1
This standard is for electrical installation material for household installations and for similar purposes. It regulates the use of miniature circuit-breakers by the layman up to a maximum of 125 A, a voltage of 440 VAC and up to a maximum of 25 kA.

Miniature circuit-breaker in accordance with standard EN60947-2
This standard is for low-voltage material used for industrial purposes. It regulates the use of circuit-breakers (and not miniature circuit-breakers) by qualified personnel up to a maximum voltage of 1000 VAC or 1500 VDC. This standard does not recognise any maximum values when it comes to current and breaking capacity. In practice, the standard is also applied to miniature circuit-breakers.

Brief description of tripping
The SMISSLINE miniature circuit breakers have a current-limiting operation. They have two different releases acting on the mechanism.
1. Thermal release, operating with a time delay, for overload protection
2. Electro-magnetic release plunger operated for short-circuit protection.

They offer: – high short-circuit breaking capacity
– high selectivity to the back-up fuse
– In the event of short-circuits, low electrodynamic and heating effects on the cable and the point of fault location due to the drastically limited let through energy $\int i^2 dt$.

Oscillogram of a short-circuit current interruption



$I_K \cdot \sqrt{2}$ = peak value of prospective short-circuit current
i_D = Max. peak let through current of circuit breaker S 400
U_n = Supply voltage
U_B = Arc voltage of circuit breaker
t_K = Total interruption time

Miniature circuit breaker
Technical data S400E, S400M

When installed correctly the requirements of EN/IEC 61439-2 are met.

	S400E, S400M
General data	
Tripping characteristics	B,C,D,K
Standards	IEC/EN 60898-1, IEC/EN 60947-2
Poles	1P, 1P+NP, 2P, 3P, 3P+NP
Rated current I_n	0.5 A … 63 A
Rated frequency f	50/60 Hz
Rated insulation voltage U_i acc. to DIN EN 60664-1	440 VAC
Rated impulse withstand voltage $U_{imp.}$ (1.2/50 µs)	4 kV
Overvoltage category	III
Pollution degree	2
Data acc. to IEC/EN 60898-1	
Rated operational voltage U_e	1P: 230/400 VAC; 1P+N: 230 VAC; 2 … 4P: 400 VAC; 3P+N: 400 VAC; 1P 60 VDC; 2P 125 VDC
Min. operating voltage	12 VAC–12 VDC
Rated short-circuit capacity I_{cn}	6 kA S400E, 10 kA S400M
Energy limiting class	3
Reference Ambient Air Temperature for Overload Tripping	B, C, D: 30 °C
Electrical and Mechanical Endurance	10 000 ops (AC)
Data acc. to IEC/EN 60947-2	
Rated operational voltage U_e	1P: 240 VAC; 1P+N: 240 VAC; 2 … 4P: 415 VAC; 3P+N: 415 VAC; 254/440 V
Min. operating voltage	12 V AC–12 V DC
Rated ultimate short-circuit capacity I_{cu}	25 kA (0,5 up to 16 A, 240/415 V); 0,5 to 2 A 50 kA on request 15 kA (20 up to 63 A, 240/415 V) 15 kA (0,5 up to 16 A, 254/440 V) 6 kA (20 up to 63 A, 254/440 V)
Rated service short-circuit capacity I_{cs}	15 kA (0,5 up to 16 A, 240/415 V) 7,5 kA (20 up to 63 A, 240/415 V) 6 kA (0,5 up to 16 A, 254/440 V) 3 kA (20 up to 63 A, 254/440 V
Reference Ambient Air Temperature for Overload Tripping	C: 30 °C K: 40 °C
Electrical and Mechanical Endurance	10 000 operating cycles
Mechanical Data	
Housing	RAL 7035
Toggle	black
Classification acc. To NF F 126-101, NF F 16-102	acc. to I2/F3
Protection degree acc. to EN 60529	IP20, IP40 in enclosure with cover
Mechanical endurance	10 000 ops.
Shock resistance acc. to IEC/EN 61373	5 g – 30 ms, 3 shocks
Vibration resistance acc. to IEC/EN 60068-2-6 Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30	2 … 13 Hz – 1 mm displacement, 13 … 100 Hz – 0.7 g; 5 cycles 2 cycles with 55 °C/90–96 % and 25 °C/95–100 %
Ambient temperature	–25 … +55 °C
Storage temperature	–40 … +70 °C
Installation	
Standed Cross-section of conductors (top/bottom)	upper terminal section: 0,75–25 mm², lower terminal section: 0,75–10 mm²
Tightening torque	2.8 Nm
Screwdriver	No. 2 Pozidrive
Mounting	plug in on bus bar system SMISSLINE
Mounting position	any
Supply	any
Dimensions and weight	
Pole dimensions (H x D x W)	91 x 18 x 82
Pole weight	110 g

Miniature circuit breaker
Technical data S400UC

	S400UC
General data	
Tripping characteristics	UCC, UCZ
Standards	IEC/EN 60947-2
Poles	1P, 2P
Rated current I_n	0.5 A … 63 A
Rated frequency f	50/60 Hz
Rated insulation voltage U_i acc. to DIN EN 60664-1	440 V AC
Rated impulse withstand voltage $U_{imp.}$ (1.2/50 µs)	4 kV
Overvoltage category	III
Pollution degree	2
Data acc. to IEC/EN 60947-2	
Rated operational voltage U_e	110 V d.c. (1pole) 220 V d.c. (poles 1; 2) 440 V d.c. (2pole) 230/400 V a.c. (poles 1; 2)
Min. operating voltage	12 V AC–12 V DC
Rated ultimate short-circuit capacity I_{cu}	10 kA (0,5 up to 63 A, 220 V d.c. 1pole) 20 kA (0,5 up to 63 A, 110 V d.c. 1pole) 25 kA (0,5 up to 63 A, 220 V d.c. 2pole) 10 kA (0,5 up to 63 A, 440 V d.c. 2pole) 10 kA (0,5 up to 63 A, 230/400 V) a.c.
Rated service short-circuit capacity I_{cs}	10 kA (0,5 up to 63 A, 220 V d.c. 1pole) 10 kA (0,5 up to 63 A, 110 V d.c. 1pole) 20 kA (0,5 up to 63 A, 220 V d.c. 2pole) 10 kA (0,5 up to 63 A, 440 V d.c. 2pole) 6 kA (0,5 up to 63 A, 230/400 V a.c.
Reference Ambient Air Temperature for Overload Tripping	30 °C
Electrical and Mechanical Endurance	I_n < 32 A: 20 000 operating cycles I_n ≥ 32 A: 10 000 operating cycles
Mechanical Data	
Housing	RAL 7035
Toggle	black
Protection degree acc. to EN 60529	IP20*, IP40 in enclosure with cover
Mechanical endurance	10 000 ops.
Shock resistance acc. to IEC/EN 61373	5 g – 30 ms, 3 shocks
Vibration resistance acc. to IEC/EN 60068-2-6	2.13 Hz – 1 mm displacement, 13.100 Hz – 0.7 g
Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30	2 cycles with 55 °C/90–96 % and 25 °C/95–100 %
Ambient temperature	–25 … +55 °C
Storage temperature	–40 … +70 °C
Installation	
Standed Cross-section of conductors (top/bottom)	upper terminal section: 0,75–25 mm^2 lower terminal section: 0,75–10 mm^2
Tightening torque	2.8 Nm
Screwdriver	No. 2 Pozidrive
Mounting	plug in on bus bar system SMISSLINE
Mounting position	any
Supply	any
Dimensions and weight	
Pole dimensions (H x D x W)	91 x 18 x 82
Pole weight	110 g

Miniature circuit breaker
Series S400 E–B, I_{cn} = 6 kA

B according to EN 60898-1

	I_{cn} [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
	6	6	S401E-B6	2CCS551001R0065	010 1009	10	1	110
	6	8	S401E-B8	2CCS551001R0085	010 8442	10	1	110
	6	10	S401E-B10	2CCS551001R0105	010 1016	10	1	110
	6	13	S401E-B13	2CCS551001R0135	010 1023	10	1	110
	6	16	S401E-B16	2CCS551001R0165	010 1030	10	1	110
	6	20	S401E-B20	2CCS551001R0205	010 1047	10	1	110
	6	25	S401E-B25	2CCS551001R0255	010 1054	10	1	110
	6	32	S401E-B32	2CCS551001R0325	010 1061	10	1	110
	6	40	S401E-B40	2CCS551001R0405	010 1078	10	1	110
	6	50	S401E-B50	2CCS551001R0505	010 1085	10	1	110
	6	63	S401E-B63	2CCS551001R0635	010 1092	10	1	110
	6	6	S402E-B6	2CCS552001R0065	010 1771	5	2	221
	6	8	S402E-B8	2CCS552001R0085	010 8459	5	2	221
	6	10	S402E-B10	2CCS552001R0105	010 1788	5	2	221
	6	13	S402E-B13	2CCS552001R0135	010 1795	5	2	221
	6	16	S402E-B16	2CCS552001R0165	010 1801	5	2	221
	6	20	S402E-B20	2CCS552001R0205	010 1818	5	2	221
	6	25	S402E-B25	2CCS552001R0255	010 1825	5	2	221
	6	32	S402E-B32	2CCS552001R0325	010 1832	5	2	221
	6	40	S402E-B40	2CCS552001R0405	010 1849	5	2	221
	6	50	S402E-B50	2CCS552001R0505	010 1856	5	2	221
	6	63	S402E-B63	2CCS552001R0635	010 1863	5	2	221
	6	6	S403E-B6	2CCS553001R0065	010 2549	3	3	322
	6	8	S403E-B8	2CCS553001R0085	010 8466	3	3	322
	6	10	S403E-B10	2CCS553001R0105	010 2556	3	3	322
	6	13	S403E-B13	2CCS553001R0135	010 2563	3	3	322
	6	16	S403E-B16	2CCS553001R0165	010 2570	3	3	322
	6	20	S403E-B20	2CCS553001R0205	010 2587	3	3	322
	6	25	S403E-B25	2CCS553001R0255	010 2594	3	3	322
	6	32	S403E-B32	2CCS553001R0325	010 2600	3	3	322
	6	40	S403E-B40	2CCS553001R0405	010 2617	3	3	322
	6	50	S403E-B50	2CCS553001R0505	010 2624	3	3	322
	6	63	S403E-B63	2CCS553001R0635	010 2631	3	3	322

Ordering details for auxiliary switch and signal contacts on page 41–45

Miniature circuit breaker
Series S400 E–C, I_{cn} = 6 kA

C according to EN 60898-1

	I_{cn} [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	6	6	S401E-C6	2CCS551001R0064	010 1108	10	1	110
	6	8	S401E-C8	2CCS551001R0084	010 1115	10	1	110
	6	10	S401E-C10	2CCS551001R0104	010 1122	10	1	110
	6	13	S401E-C13	2CCS551001R0134	010 1139	10	1	110
	6	16	S401E-C16	2CCS551001R0164	010 1146	10	1	110
	6	20	S401E-C20	2CCS551001R0204	010 1153	10	1	110
	6	25	S401E-C25	2CCS551001R0254	010 1160	10	1	110
	6	32	S401E-C32	2CCS551001R0324	010 1177	10	1	110
	6	40	S401E-C40	2CCS551001R0404	010 1184	10	1	110
	6	50	S401E-C50	2CCS551001R0504	010 1191	10	1	110
	6	63	S401E-C63	2CCS551001R0634	010 1207	10	1	110
	6	6	S402E-C6	2CCS552001R0064	010 1870	5	2	221
	6	8	S402E-C8	2CCS552001R0084	010 1887	5	2	221
	6	10	S402E-C10	2CCS552001R0104	010 1894	5	2	221
	6	13	S402E-C13	2CCS552001R0134	010 1900	5	2	221
	6	16	S402E-C16	2CCS552001R0164	010 1917	5	2	221
	6	20	S402E-C20	2CCS552001R0204	010 1924	5	2	221
	6	25	S402E-C25	2CCS552001R0254	010 1931	5	2	221
	6	32	S402E-C32	2CCS552001R0324	010 1948	5	2	221
	6	40	S402E-C40	2CCS552001R0404	010 1955	5	2	221
	6	50	S402E-C50	2CCS552001R0504	010 1962	5	2	221
	6	63	S402E-C63	2CCS552001R0634	010 1979	5	2	221
	6	6	S403E-C6	2CCS553001R0064	010 2648	3	3	322
	6	8	S403E-C8	2CCS553001R0084	010 2655	3	3	322
	6	10	S403E-C10	2CCS553001R0104	010 2662	3	3	322
	6	13	S403E-C13	2CCS553001R0134	010 2679	3	3	322
	6	16	S403E-C16	2CCS553001R0164	010 2686	3	3	322
	6	20	S403E-C20	2CCS553001R0204	010 2693	3	3	322
	6	25	S403E-C25	2CCS553001R0254	010 2709	3	3	322
	6	32	S403E-C32	2CCS553001R0324	010 2716	3	3	322
	6	40	S403E-C40	2CCS553001R0404	010 2723	3	3	322
	6	50	S403E-C50	2CCS553001R0504	010 2730	3	3	322
	6	63	S403E-C63	2CCS553001R0634	010 2747	3	3	322

Ordering details for auxiliary switch and signal contacts on page 41–45

Miniature circuit breaker

Series S400 E–C NP with protected neutral, Icn = 6 kA

C according to EN 60898-1

	I_{cn} [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
 	6	10	S401E-C10NP	2CCS551103R8104	144 2750	5	2	221
	6	13	S401E-C13NP	2CCS551103R8134	144 2767	5	2	221
	6	16	S401E-C16NP	2CCS551103R8164	144 2774	5	2	221
	6	20	S401E-C20NP	2CCS551103R8204	144 2781	5	2	221
	6	25	S401E-C25NP	2CCS551103R8254	144 2798	5	2	221
	6	32	S401E-C32NP	2CCS551103R8324	144 2804	5	2	221
	6	40	S401E-C40NP	2CCS551103R8404	144 2811	5	2	221
	6	50	S401E-C50NP	2CCS551103R8504	144 2828	5	2	221
	6	63	S401E-C63NP	2CCS551103R8634	144 2835	5	2	221
 	6	10	S403E-C10NP	2CCS553103R8104	144 2842	2	4	428
	6	13	S403E-C13NP	2CCS553103R8134	144 2859	2	4	428
	6	16	S403E-C16NP	2CCS553103R8164	144 2866	2	4	428
	6	20	S403E-C20NP	2CCS553103R8204	144 2873	2	4	428
	6	25	S403E-C25NP	2CCS553103R8254	144 2880	2	4	428
	6	32	S403E-C32NP	2CCS553103R8324	144 2897	2	4	428
	6	40	S403E-C40NP	2CCS553103R8404	144 2903	2	4	428
	6	50	S403E-C50NP	2CCS553103R8504	144 2910	2	4	428
	6	63	S403E-C63NP	2CCS553103R8634	144 3009	2	4	428

Ordering details for auxiliary switch and signal contacts on page 41–45

Miniature circuit breaker

Series S400 M–B, I_{cn} = 10 kA

B according to EN 60898-1

	I_{cn} [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	10	4	S401M-B4	2CCS571001R0045	010 1214	10	1	110
	10	6	S401M-B6	2CCS571001R0065	010 1221	10	1	110
	10	8	S401M-B8	2CCS571001R0085	010 8411	10	1	110
	10	10	S401M-B10	2CCS571001R0105	010 1238	10	1	110
	10	13	S401M-B13	2CCS571001R0135	010 1245	10	1	110
	10	16	S401M-B16	2CCS571001R0165	010 1252	10	1	110
	10	20	S401M-B20	2CCS571001R0205	010 1269	10	1	110
	10	25	S401M-B25	2CCS571001R0255	010 1276	10	1	110
	10	32	S401M-B32	2CCS571001R0325	010 1283	10	1	110
	10	40	S401M-B40	2CCS571001R0405	010 1290	10	1	110
	10	50	S401M-B50	2CCS571001R0505	010 1306	10	1	110
	10	63	S401M-B63	2CCS571001R0635	010 1313	10	1	110
	10	4	S402M-B4	2CCS572001R0045	010 1986	5	2	221
	10	6	S402M-B6	2CCS572001R0065	010 1993	5	2	221
	10	8	S402M-B8	2CCS572001R0085	010 8428	5	2	221
	10	10	S402M-B10	2CCS572001R0105	010 2006	5	2	221
	10	13	S402M-B13	2CCS572001R0135	010 2013	5	2	221
	10	16	S402M-B16	2CCS572001R0165	010 2020	5	2	221
	10	20	S402M-B20	2CCS572001R0205	010 2037	5	2	221
	10	25	S402M-B25	2CCS572001R0255	010 2044	5	2	221
	10	32	S402M-B32	2CCS572001R0325	010 2051	5	2	221
	10	40	S402M-B40	2CCS572001R0405	010 2068	5	2	221
	10	50	S402M-B50	2CCS572001R0505	010 2075	5	2	221
	10	63	S402M-B63	2CCS572001R0635	010 2082	5	2	221
	10	4	S403M-B4	2CCS573001R0045	010 2754	3	3	322
	10	6	S403M-B6	2CCS573001R0065	010 2761	3	3	322
	10	8	S403M-B8	2CCS573001R0085	010 8435	3	3	322
	10	10	S403M-B10	2CCS573001R0105	010 2778	3	3	322
	10	13	S403M-B13	2CCS573001R0135	010 2785	3	3	322
	10	16	S403M-B16	2CCS573001R0165	010 2792	3	3	322
	10	20	S403M-B20	2CCS573001R0205	010 2808	3	3	322
	10	25	S403M-B25	2CCS573001R0255	010 2815	3	3	322
	10	32	S403M-B32	2CCS573001R0325	010 2822	3	3	322
	10	40	S403M-B40	2CCS573001R0405	010 2839	3	3	322
	10	50	S403M-B50	2CCS573001R0505	010 2846	3	3	322
	10	63	S403M-B63	2CCS573001R0635	010 2853	3	3	322

Ordering details for auxiliary switch and signal contacts on page 41–45

Miniature circuit breaker

Series S400 M–C, I_{cn} = 10 kA , I_{cu} = 15 … 25 kA

C according to EN 60898-1 and IEC/EN 60947-2

	I_{cu} EN 60947-2 [kA]	I_{cn} EN 60898-1 [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
	25	10	0.5	S401M-C0.5	2CCS571001R0984	010 1320	10	1	110
	25	10	1	S401M-C1	2CCS571001R0014	010 1337	10	1	110
	25	10	1.6	S401M-C1.6	2CCS571001R0974	010 1344	10	1	110
	25	10	2	S401M-C2	2CCS571001R0024	010 1351	10	1	110
	25	10	3	S401M-C3	2CCS571001R0034	010 1368	10	1	110
	25	10	4	S401M-C4	2CCS571001R0044	010 1375	10	1	110
	25	10	6	S401M-C6	2CCS571001R0064	010 1382	10	1	110
	25	10	8	S401M-C8	2CCS571001R0084	010 1399	10	1	110
	25	10	10	S401M-C10	2CCS571001R0104	010 1405	10	1	110
	25	10	13	S401M-C13	2CCS571001R0134	010 1412	10	1	110
	25	10	16	S401M-C16	2CCS571001R0164	010 1429	10	1	110
	15	10	20	S401M-C20	2CCS571001R0204	010 1436	10	1	110
	15	10	25	S401M-C25	2CCS571001R0254	010 1443	10	1	110
	15	10	32	S401M-C32	2CCS571001R0324	010 1450	10	1	110
	15	10	40	S401M-C40	2CCS571001R0404	010 1467	10	1	110
	15	10	50	S401M-C50	2CCS571001R0504	010 1474	10	1	110
	15	10	63	S401M-C63	2CCS571001R0634	010 1481	10	1	110
	25	10	0.5	S402M-C0.5	2CCS572001R0984	010 2099	5	2	221
	25	10	1	S402M-C1	2CCS572001R0014	010 2105	5	2	221
	25	10	1.6	S402M-C1.6	2CCS572001R0974	010 2112	5	2	221
	25	10	2	S402M-C2	2CCS572001R0024	010 2129	5	2	221
	25	10	3	S402M-C3	2CCS572001R0034	010 2136	5	2	221
	25	10	4	S402M-C4	2CCS572001R0044	010 2143	5	2	221
	25	10	6	S402M-C6	2CCS572001R0064	010 2150	5	2	221
	25	10	8	S402M-C8	2CCS572001R0084	010 2167	5	2	221
	25	10	10	S402M-C10	2CCS572001R0104	010 2174	5	2	221
	25	10	13	S402M-C13	2CCS572001R0134	010 2181	5	2	221
	25	10	16	S402M-C16	2CCS572001R0164	010 2198	5	2	221
	15	10	20	S402M-C20	2CCS572001R0204	010 2204	5	2	221
	15	10	25	S402M-C25	2CCS572001R0254	010 2211	5	2	221
	15	10	32	S402M-C32	2CCS572001R0324	010 2228	5	2	221
	15	10	40	S402M-C40	2CCS572001R0404	010 2235	5	2	221
	15	10	50	S402M-C50	2CCS572001R0504	010 2242	5	2	221
	15	10	63	S402M-C63	2CCS572001R0634	010 2259	5	2	221
	25	10	0.5	S403M-C0.5	2CCS573001R0984	010 2860	3	3	322
	25	10	1	S403M-C1	2CCS573001R0014	010 2877	3	3	322
	25	10	1.6	S403M-C1.6	2CCS573001R0974	010 2884	3	3	322
	25	10	2	S403M-C2	2CCS573001R0024	010 2891	3	3	322
	25	10	3	S403M-C3	2CCS573001R0034	010 2907	3	3	322
	25	10	4	S403M-C4	2CCS573001R0044	010 2914	3	3	322
	25	10	6	S403M-C6	2CCS573001R0064	010 2921	3	3	322
	25	10	8	S403M-C8	2CCS573001R0084	010 2938	3	3	322
	25	10	10	S403M-C10	2CCS573001R0104	010 2945	3	3	322
	25	10	13	S403M-C13	2CCS573001R0134	010 2952	3	3	322
	25	10	16	S403M-C16	2CCS573001R0164	010 2969	3	3	322
	15	10	20	S403M-C20	2CCS573001R0204	010 2976	3	3	322
	15	10	25	S403M-C25	2CCS573001R0254	010 2983	3	3	322
	15	10	32	S403M-C32	2CCS573001R0324	010 2990	3	3	322
	15	10	40	S403M-C40	2CCS573001R0404	010 3003	3	3	322
	15	10	50	S403M-C50	2CCS573001R0504	010 3010	3	3	322
	15	10	63	S403M-C63	2CCS573001R0634	010 3027	3	3	322

Miniature circuit breaker

Series S400 M–D, I_{cn} = 10 kA

D according to EN 60898-1

	I_{cn} [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	10	6	S401M-D6	2CCS571001R0061	010 1498	10	1	110
	10	8	S401M-D8	2CCS571001R0081	010 1504	10	1	110
	10	10	S401M-D10	2CCS571001R0101	010 1511	10	1	110
	10	13	S401M-D13	2CCS571001R0131	010 1528	10	1	110
	10	16	S401M-D16	2CCS571001R0161	010 1535	10	1	110
	10	20	S401M-D20	2CCS571001R0201	010 1542	10	1	110
	10	25	S401M-D25	2CCS571001R0251	010 1559	10	1	110
	10	32	S401M-D32	2CCS571001R0321	010 1566	10	1	110
	10	40	S401M-D40	2CCS571001R0401	010 1573	10	1	110
	10	50	S401M-D50	2CCS571001R0501	010 1580	10	1	110
	10	63	S401M-D63	2CCS571001R0631	010 1597	10	1	110
	10	6	S402M-D6	2CCS572001R0061	010 2266	5	2	221
	10	8	S402M-D8	2CCS572001R0081	010 2273	5	2	221
	10	10	S402M-D10	2CCS572001R0101	010 2280	5	2	221
	10	13	S402M-D13	2CCS572001R0131	010 2297	5	2	221
	10	16	S402M-D16	2CCS572001R0161	010 2303	5	2	221
	10	20	S402M-D20	2CCS572001R0201	010 2310	5	2	221
	10	25	S402M-D25	2CCS572001R0251	010 2327	5	2	221
	10	32	S402M-D32	2CCS572001R0321	010 2334	5	2	221
	10	40	S402M-D40	2CCS572001R0401	010 2341	5	2	221
	10	50	S402M-D50	2CCS572001R0501	010 2358	5	2	221
	10	63	S402M-D63	2CCS572001R0631	010 2365	5	2	221
	10	6	S403M-D6	2CCS573001R0061	010 3034	3	3	322
	10	8	S403M-D8	2CCS573001R0081	010 3041	3	3	322
	10	10	S403M-D10	2CCS573001R0101	010 3058	3	3	322
	10	13	S403M-D13	2CCS573001R0131	010 3065	3	3	322
	10	16	S403M-D16	2CCS573001R0161	010 3072	3	3	322
	10	20	S403M-D20	2CCS573001R0201	010 3089	3	3	322
	10	25	S403M-D25	2CCS573001R0251	010 3096	3	3	322
	10	32	S403M-D32	2CCS573001R0321	010 3102	3	3	322
	10	40	S403M-D40	2CCS573001R0401	010 3119	3	3	322
	10	50	S403M-D50	2CCS573001R0501	010 3126	3	3	322
	10	63	S403M-D63	2CCS573001R0631	010 3133	3	3	322

Ordering details for auxiliary switch and signal contacts on page 41–45

Miniature circuit breaker (MCB)

Series S400 M–K, I_{cu} = 15 … 25 kA

K according to IEC/EN 60947-2

	I_{cn} [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	25	0.5	S401M-K0.5	2CCS571001R0157	010 1603	10	1	110
	25	1	S401M-K1	2CCS571001R0217	010 1610	10	1	110
	25	1.6	S401M-K1.6	2CCS571001R0257	010 1627	10	1	110
	25	2	S401M-K2	2CCS571001R0277	010 1634	10	1	110
	25	3	S401M-K3	2CCS571001R0317	010 1641	10	1	110
	25	4	S401M-K4	2CCS571001R0337	010 1658	10	1	110
	25	6	S401M-K6	2CCS571001R0377	010 1665	10	1	110
	25	8	S401M-K8	2CCS571001R0407	010 1672	10	1	110
	25	10	S401M-K10	2CCS571001R0427	010 1689	10	1	110
	25	13	S401M-K13	2CCS571001R0447	010 1696	10	1	110
	25	16	S401M-K16	2CCS571001R0467	010 1702	10	1	110
	15	20	S401M-K20	2CCS571001R0487	010 1719	10	1	110
	15	25	S401M-K25	2CCS571001R0517	010 1726	10	1	110
	15	32	S401M-K32	2CCS571001R0537	010 1733	10	1	110
	15	40	S401M-K40	2CCS571001R0557	010 1740	10	1	110
	15	50	S401M-K50	2CCS571001R0577	010 1757	10	1	110
	15	63	S401M-K63	2CCS571001R0597	010 1764	10	1	110
	25	0.5	S402M-K0.5	2CCS572001R0157	010 2372	5	2	221
	25	1	S402M-K1	2CCS572001R0217	010 2389	5	2	221
	25	1.6	S402M-K1.6	2CCS572001R0257	010 2396	5	2	221
	25	2	S402M-K2	2CCS572001R0277	010 2402	5	2	221
	25	3	S402M-K3	2CCS572001R0317	010 2419	5	2	221
	25	4	S402M-K4	2CCS572001R0337	010 2426	5	2	221
	25	6	S402M-K6	2CCS572001R0377	010 2433	5	2	221
	25	8	S402M-K8	2CCS572001R0407	010 2440	5	2	221
	25	10	S402M-K10	2CCS572001R0427	010 2457	5	2	221
	25	13	S402M-K13	2CCS572001R0447	010 2464	5	2	221
	25	16	S402M-K16	2CCS572001R0467	010 2471	5	2	221
	15	20	S402M-K20	2CCS572001R0487	010 2488	5	2	221
	15	25	S402M-K25	2CCS572001R0517	010 2495	5	2	221
	15	32	S402M-K32	2CCS572001R0537	010 2501	5	2	221
	15	40	S402M-K40	2CCS572001R0557	010 2518	5	2	221
	15	50	S402M-K50	2CCS572001R0577	010 2525	5	2	221
	15	63	S402M-K63	2CCS572001R0597	010 2532	5	2	221
	25	0.5	S403M-K0.5	2CCS573001R0157	010 3140	3	3	322
	25	1	S403M-K1	2CCS573001R0217	010 3157	3	3	322
	25	1.6	S403M-K1.6	2CCS573001R0257	010 3164	3	3	322
	25	2	S403M-K2	2CCS573001R0277	010 3171	3	3	322
	25	3	S403M-K3	2CCS573001R0317	010 3188	3	3	322
	25	4	S403M-K4	2CCS573001R0337	010 3195	3	3	322
	25	6	S403M-K6	2CCS573001R0377	010 3201	3	3	322
	25	8	S403M-K8	2CCS573001R0407	010 3218	3	3	322
	25	10	S403M-K10	2CCS573001R0427	010 3225	3	3	322
	25	13	S403M-K13	2CCS573001R0447	010 3232	3	3	322
	25	16	S403M-K16	2CCS573001R0467	010 3249	3	3	322
	15	20	S403M-K20	2CCS573001R0487	010 3256	3	3	322
	15	25	S403M-K25	2CCS573001R0517	010 3263	3	3	322
	15	32	S403M-K32	2CCS573001R0537	010 3270	3	3	322
	15	40	S403M-K40	2CCS573001R0557	010 3287	3	3	322
	15	50	S403M-K50	2CCS573001R0577	010 3294	3	3	322
	15	63	S403M-K63	2CCS573001R0597	010 3300	3	3	322

Miniature circuit breaker

Series S400 M–B with protected neutral I_{cn} = 10 kA

B according to EN 60898-1

	I_{cn} [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
 	10	6	S401M-B6NP	2CCS571103R8065	010 3317	5	2	221
	10	8	S401M-B8NP	2CCS571103R8085	010 8473	5	2	221
	10	10	S401M-B10NP	2CCS571103R8105	010 3324	5	2	221
	10	13	S401M-B13NP	2CCS571103R8135	010 3331	5	2	221
	10	16	S401M-B16NP	2CCS571103R8165	010 3348	5	2	221
	10	20	S401M-B20NP	2CCS571103R8205	010 3355	5	2	221
	10	25	S401M-B25NP	2CCS571103R8255	010 3362	5	2	221
	10	32	S401M-B32NP	2CCS571103R8325	010 3379	5	2	221
	10	40	S401M-B40NP	2CCS571103R8405	010 3386	5	2	221
	10	50	S401M-B50NP	2CCS571103R8505	010 3393	5	2	221
	10	63	S401M-B63NP	2CCS571103R8635	010 3409	5	2	221
 	10	6	S403M-B6NP	2CCS573103R8065	010 3782	2	4	428
	10	8	S403M-B8NP	2CCS573103R8085	010 8510	2	4	428
	10	10	S403M-B10NP	2CCS573103R8105	010 3799	2	4	428
	10	13	S403M-B13NP	2CCS573103R8135	010 3805	2	4	428
	10	16	S403M-B16NP	2CCS573103R8165	010 3812	2	4	428
	10	20	S403M-B20NP	2CCS573103R8205	010 3829	2	4	428
	10	25	S403M-B25NP	2CCS573103R8255	010 3836	2	4	428
	10	32	S403M-B32NP	2CCS573103R8325	010 3843	2	4	428
	10	40	S403M-B40NP	2CCS573103R8405	010 3850	2	4	428
	10	50	S403M-B50NP	2CCS573103R8505	010 3867	2	4	428
	10	63	S403M-B63NP	2CCS573103R8635	010 3874	2	4	428

Ordering details for auxiliary switch and signal contacts on page 41–45
The neutral is protected with 100% of the nominal value of the pole conductor

Miniature circuit breaker (MCB)

Series S400 M–C with protected neutral I_{cn} = 10 kA, I_{cu} = 15 … 25 kA

C according to EN 60898-1 and IEC/EN 60947-2

	I_{cu} EN 60947-2 [kA]	I_{cn} EN 60898-1 [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	25	10	2	S401M-C2NP	2CCS571103R8024	010 8480	5	2	221
	25	10	3	S401M-C3NP	2CCS571103R8034	010 8497	5	2	221
	25	10	4	S401M-C4NP	2CCS571103R8044	010 8503	5	2	221
	25	10	6	S401M-C6NP	2CCS571103R8064	010 3416	5	2	221
	25	10	8	S401M-C8NP	2CCS571103R8084	010 3423	5	2	221
	25	10	10	S401M-C10NP	2CCS571103R8104	010 3430	5	2	221
	25	10	13	S401M-C13NP	2CCS571103R8134	010 3447	5	2	221
	25	10	16	S401M-C16NP	2CCS571103R8164	010 3454	5	2	221
	15	10	20	S401M-C20NP	2CCS571103R8204	010 3461	5	2	221
	15	10	25	S401M-C25NP	2CCS571103R8254	010 3478	5	2	221
	15	10	32	S401M-C32NP	2CCS571103R8324	010 3485	5	2	221
	15	10	40	S401M-C40NP	2CCS571103R8404	010 3492	5	2	221
	15	10	50	S401M-C50NP	2CCS571103R8504	010 3508	5	2	221
	15	10	63	S401M-C63NP	2CCS571103R8634	010 3515	5	2	221
	25	10	2	S403M-C2NP	2CCS573103R8024	010 8527	2	4	428
	25	10	3	S403M-C3NP	2CCS573103R8034	010 8534	2	4	428
	25	10	4	S403M-C4NP	2CCS573103R8044	010 8541	2	4	428
	25	10	6	S403M-C6NP	2CCS573103R8064	010 3881	2	4	428
	25	10	8	S403M-C8NP	2CCS573103R8084	010 3898	2	4	428
	25	10	10	S403M-C10NP	2CCS573103R8104	010 3904	2	4	428
	25	10	13	S403M-C13NP	2CCS573103R8134	010 3911	2	4	428
	25	10	16	S403M-C16NP	2CCS573103R8164	010 3928	2	4	428
	15	10	20	S403M-C20NP	2CCS573103R8204	010 3935	2	4	428
	15	10	25	S403M-C25NP	2CCS573103R8254	010 3942	2	4	428
	15	10	32	S403M-C32NP	2CCS573103R8324	010 3959	2	4	428
	15	10	40	S403M-C40NP	2CCS573103R8404	010 3966	2	4	428
	15	10	50	S403M-C50NP	2CCS573103R8504	010 3973	2	4	428
	15	10	63	S403M-C63NP	2CCS573103R8634	010 3980	2	4	428

Ordering details for auxiliary switch and signal contacts on page 41–45
The neutral is protected with 100% of the nominal value of the pole conductor

Miniature circuit breaker

Series S400 M–D with protected neutral I_{cn} = 10 kA

D according to EN 60898-1

	I_{cn} [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	10	10	S401M-D10NP	2CCS571103R8101	010 3522	5	2	221
	10	13	S401M-D13NP	2CCS571103R8131	010 3539	5	2	221
	10	16	S401M-D16NP	2CCS571103R8161	010 3546	5	2	221
	10	20	S401M-D20NP	2CCS571103R8201	010 3553	5	2	221
	10	25	S401M-D25NP	2CCS571103R8251	010 3560	5	2	221
	10	32	S401M-D32NP	2CCS571103R8321	010 3577	5	2	221
	10	40	S401M-D40NP	2CCS571103R8401	010 3584	5	2	221
	10	50	S401M-D50NP	2CCS571103R8501	010 3591	5	2	221
	10	63	S401M-D63NP	2CCS571103R8631	010 3607	5	2	221
	10	10	S403M-D10NP	2CCS573103R8101	010 3997	2	4	428
	10	13	S403M-D13NP	2CCS573103R8131	010 4000	2	4	428
	10	16	S403M-D16NP	2CCS573103R8161	010 4017	2	4	428
	10	20	S403M-D20NP	2CCS573103R8201	010 4024	2	4	428
	10	25	S403M-D25NP	2CCS573103R8251	010 4031	2	4	428
	10	32	S403M-D32NP	2CCS573103R8321	010 4048	2	4	428
	10	40	S403M-D40NP	2CCS573103R8401	010 4055	2	4	428
	10	50	S403M-D50NP	2CCS573103R8501	010 4062	2	4	428
	10	63	S403M-D63NP	2CCS573103R8631	010 4079	2	4	428

Ordering details for auxiliary switch and signal contacts on page 41–45
The neutral is protected with 100% of the nominal value of the pole conductor

Miniature circuit breaker

Series S400 M–K with protected neutral I_{cu} = 15 … 25 kA

K according to EN 60898-1

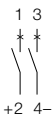
	I_{cu} [kA]	I_n [A]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	25	0.5	S401M-K0.5NP	2CCS571103R8157	010 3614	5	2	221
	25	1	S401M-K1NP	2CCS571103R8217	010 3621	5	2	221
	25	1.6	S401M-K1.6NP	2CCS571103R8257	010 3638	5	2	221
	25	2	S401M-K2NP	2CCS571103R8277	010 3645	5	2	221
	25	3	S401M-K3NP	2CCS571103R8317	010 3652	5	2	221
	25	4	S401M-K4NP	2CCS571103R8337	010 3669	5	2	221
	25	6	S401M-K6NP	2CCS571103R8377	010 3676	5	2	221
	25	8	S401M-K8NP	2CCS571103R8407	010 3683	5	2	221
	25	10	S401M-K10NP	2CCS571103R8427	010 3690	5	2	221
	25	13	S401M-K13NP	2CCS571103R8447	010 3706	5	2	221
	25	16	S401M-K16NP	2CCS571103R8467	010 3713	5	2	221
	15	20	S401M-K20NP	2CCS571103R8487	010 3720	5	2	221
	15	25	S401M-K25NP	2CCS571103R8517	010 3737	5	2	221
	15	32	S401M-K32NP	2CCS571103R8537	010 3744	5	2	221
	15	40	S401M-K40NP	2CCS571103R8557	010 3751	5	2	221
	15	50	S401M-K50NP	2CCS571103R8577	010 3768	5	2	221
	15	63	S401M-K63NP	2CCS571103R8597	010 3775	5	2	221
	25	0.5	S403M-K0.5NP	2CCS573103R8157	010 4086	2	4	428
	25	1	S403M-K1NP	2CCS573103R8217	010 4093	2	4	428
	25	1.6	S403M-K1.6NP	2CCS573103R8257	010 4109	2	4	428
	25	2	S403M-K2NP	2CCS573103R8277	010 4116	2	4	428
	25	3	S403M-K3NP	2CCS573103R8317	010 4123	2	4	428
	25	4	S403M-K4NP	2CCS573103R8337	010 4130	2	4	428
	25	6	S403M-K6NP	2CCS573103R8377	010 4147	2	4	428
	25	8	S403M-K8NP	2CCS573103R8407	010 4154	2	4	428
	25	10	S403M-K10NP	2CCS573103R8427	010 4161	2	4	428
	25	13	S403M-K13NP	2CCS573103R8447	010 4178	2	4	428
	25	16	S403M-K16NP	2CCS573103R8467	010 4185	2	4	428
	15	20	S403M-K20NP	2CCS573103R8487	010 4192	2	4	428
	15	25	S403M-K25NP	2CCS573103R8517	010 4208	2	4	428
	15	32	S403M-K32NP	2CCS573103R8537	010 4215	2	4	428
	15	40	S403M-K40NP	2CCS573103R8557	010 4222	2	4	428
	15	50	S403M-K50NP	2CCS573103R8577	010 4239	2	4	428
	15	63	S403M-K63NP	2CCS573103R8597	010 4246	2	4	428

Ordering details for auxiliary switch and signal contacts on page 41–45
The neutral is protected with 100% of the nominal value of the pole conductor

Miniature circuit breaker

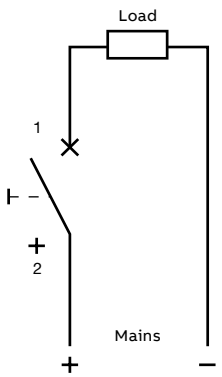
Series S400 M-UC, application, I_{cu} = 10 … 25 kA

C according to IEC/EN 60947-2

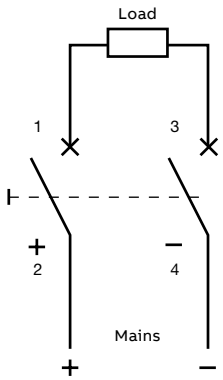
	I_n [A]	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
 1 P 220 V= 	0.5	S401M-UCC0.5	2CCS561001R1984	010 9746	10	1	145
	1	S401M-UCC1	2CCS561001R1014	010 9753	10	1	145
	1.6	S401M-UCC1.6	2CCS561001R1974	010 9760	10	1	145
	2	S401M-UCC2	2CCS561001R1024	010 9777	10	1	145
	3	S401M-UCC3	2CCS571001R1034	010 9784	10	1	145
	4	S401M-UCC4	2CCS571001R1044	010 9791	10	1	145
	6	S401M-UCC6	2CCS571001R1064	010 9807	10	1	145
	8	S401M-UCC8	2CCS571001R1084	010 9814	10	1	145
	10	S401M-UCC10	2CCS571001R1104	010 9821	10	1	145
	13	S401M-UCC13	2CCS571001R1134	010 9838	10	1	145
	16	S401M-UCC16	2CCS571001R1164	010 9845	10	1	145
	20	S401M-UCC20	2CCS571001R1204	010 9852	10	1	145
	25	S401M-UCC25	2CCS571001R1254	010 9869	10	1	145
	32	S401M-UCC32	2CCS571001R1324	010 9876	10	1	145
	40	S401M-UCC40	2CCS571001R1404	010 9883	10	1	145
	50	S401M-UCC50	2CCS571001R1504	010 9890	10	1	145
	63	S401M-UCC63	2CCS571001R1634	010 9906	10	1	145
 2 P 440 V= 	0.5	S402M-UCC0.5	2CCS562001R1984	010 9913	5	2	290
	1	S402M-UCC1	2CCS562001R1014	010 9920	5	2	290
	1.6	S402M-UCC1.6	2CCS562001R1974	010 9937	5	2	290
	2	S402M-UCC2	2CCS562001R1024	010 9944	5	2	290
	3	S402M-UCC3	2CCS572001R1034	010 9951	5	2	290
	4	S402M-UCC4	2CCS572001R1044	010 9968	5	2	290
	6	S402M-UCC6	2CCS572001R1064	010 9975	5	2	290
	8	S402M-UCC8	2CCS572001R1084	010 9982	5	2	290
	10	S402M-UCC10	2CCS572001R1104	010 9999	5	2	290
	13	S402M-UCC13	2CCS572001R1134	011 0001	5	2	290
	16	S402M-UCC16	2CCS572001R1164	011 0018	5	2	290
	20	S402M-UCC20	2CCS572001R1204	011 0025	5	2	290
	25	S402M-UCC25	2CCS572001R1254	011 0032	5	2	290
	32	S402M-UCC32	2CCS572001R1324	011 0049	5	2	290
	40	S402M-UCC40	2CCS572001R1404	011 0056	5	2	290
	50	S402M-UCC50	2CCS572001R1504	011 0063	5	2	290
	63	S402M-UCC63	2CCS572001R1634	011 0070	5	2	290

Ordering details for auxiliary switch and signal contacts on page 41–45

Connection diagram, single-pole (max. 220 V=) S401M-UCC



Connection diagram, two-pole (max. 440 V=) S402M-UCC



Miniature circuit breaker

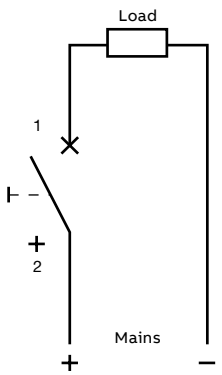
Series S400 M–UC, DC application, I_{cu} = 10 … 25 kA

Z according to IEC/EN 60947-2

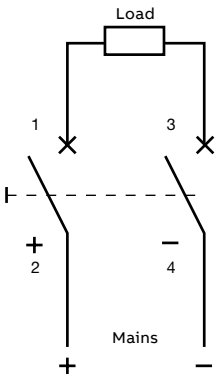
	I_n [A]	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
 1 P 220 V= 	0.5	S401M-UCZ0.5	2CCS561001R1988	011 0087	10	1	110
	1	S401M-UCZ1	2CCS561001R1018	011 0094	10	1	110
	1.6	S401M-UCZ1.6	2CCS561001R1978	011 0100	10	1	110
	2	S401M-UCZ2	2CCS561001R1028	011 0117	10	1	110
	3	S401M-UCZ3	2CCS571001R1038	011 0124	10	1	110
	4	S401M-UCZ4	2CCS571001R1048	011 0131	10	1	110
	6	S401M-UCZ6	2CCS571001R1068	011 0148	10	1	110
	8	S401M-UCZ8	2CCS571001R1088	011 0155	10	1	110
	10	S401M-UCZ10	2CCS571001R1108	011 0162	10	1	110
	13	S401M-UCZ13	2CCS571001R1138	011 0179	10	1	110
	16	S401M-UCZ16	2CCS571001R1168	011 0186	10	1	110
	20	S401M-UCZ20	2CCS571001R1208	011 0193	10	1	110
	25	S401M-UCZ25	2CCS571001R1258	011 0209	10	1	110
	32	S401M-UCZ32	2CCS571001R1328	011 0216	10	1	110
	40	S401M-UCZ40	2CCS571001R1408	011 0223	10	1	110
	50	S401M-UCZ50	2CCS571001R1508	011 0230	10	1	110
	63	S401M-UCZ63	2CCS571001R1638	011 0247	10	1	110
 2 P 440 V= 	0.5	S402M-UCZ0.5	2CCS562001R1988	011 0254	10	2	221
	1	S402M-UCZ1	2CCS562001R1018	011 0261	10	2	221
	1.6	S402M-UCZ1.6	2CCS562001R1978	011 0278	10	2	221
	2	S402M-UCZ2	2CCS562001R1028	011 0285	10	2	221
	3	S402M-UCZ3	2CCS572001R1038	011 0292	10	2	221
	4	S402M-UCZ4	2CCS572001R1048	011 0308	10	2	221
	6	S402M-UCZ6	2CCS572001R1068	011 0315	10	2	221
	8	S402M-UCZ8	2CCS572001R1088	011 0322	10	2	221
	10	S402M-UCZ10	2CCS572001R1108	011 0339	10	2	221
	13	S402M-UCZ13	2CCS572001R1138	011 0346	10	2	221
	16	S402M-UCZ16	2CCS572001R1168	011 0353	10	2	221
	20	S402M-UCZ20	2CCS572001R1208	011 0360	10	2	221
	25	S402M-UCZ25	2CCS572001R1258	011 0377	10	2	221
	32	S402M-UCZ32	2CCS572001R1328	011 0384	10	2	221
	40	S402M-UCZ40	2CCS572001R1408	011 0391	10	2	221
	50	S402M-UCZ50	2CCS572001R1508	011 0407	10	2	221
	63	S402M-UCZ63	2CCS572001R1638	011 0414	10	2	221

Ordering details for auxiliary switch and signal contacts on page 41–45

Connection diagram, single-pole (max. 220 V=) S401M-UCZ



Connection diagram, two-pole (max. 440 V=) S402M-UCZ



Residual current operated circuit breaker FS401

Residual current operated circuit breakers with overcurrent protection (RCBO)
The SMISSLINE residual current operated circuit breakers with overcurrent protection (RCBO) are ideal for protecting people and property in all new and existing distribution systems. The combination of standby current and cable protection in one single device greatly simplifies planning and offers cost benefits. Using a RCBO can e.g. satisfy the minimum level of protection required by regulations in an apartment or in a particular distribution system. Should a residual current arise, only the circuit directly affected is switched off while all other circuits remain in operation. The short time-delayed residual current operated circuit breaker with overcurrent protection FS401 K is a version particularly suited to unfavourable distribution and load situations. Without limiting the personal protection function in any way, the electronic short time delay prevents nuisance tripping which may arise as a result of capacitive discharge currents.

	FS401	FS401K
Type:	RCD Type A	Type F, short delay ARP
Rated voltage U_n:	240 V~	240 V~
Number of poles:	2-pole (1PN)	2-pole (1PN)
Rated frequency f_n:	50/60 Hz	50/60 Hz
Rated breaking capacity I_{cn}:	10 kA – M version 6 kA – E version	10 kA – M version 6 kA – E version
Current limitation class:	3	3
Total cut-off time (average value) acc. to – at I_n – at 5 $I_{\Delta n}$	EN 61009-1 max. 300 ms max. 40 ms	EN 61009-1 10–300 ms Typ F 10–400 ms Typ F
Minimum voltage for test button	170 V	170 V
Connection cross-sections Terminal at load end	Opposing action stroke clamp on cylinder, touch finger-proof. Suitable for connecting single, multi- and fine-wire conductors of up to 25 mm^2	
Degree of protection:	IP20 inside panel IP40	IP20 inside panel IP40
Endurance:	> 5000 operating cycles	> 5000 operating cycles
Resistance to climate, acc. to:	EN 61009	EN 61009
Mounting position:	any	any
Ambient temperature:	–25 °C ... +40 °C	–25 °C ... +40 °C
Vibration resistance:	5 g 5 ... 150 ... 5 Hz	5 g 5 ... 150 ... 5 Hz
Rated peak withstand current:	3 kA (Typ F) 250 A standard Typ A	3 kA (Typ F) 250 A standard Typ A
Plastic parts:	halogen-free	halogen-free
Contacts:	cadmium-free	cadmium-free

Please notice:
For the influence of the ambient temperature and the thermal influences of row mounted RCBO's it is necessary to calculate with the same correction factors like with MCB's.

Residual current operated circuit breaker with overcurrent protection

Series FS401 LN, Type A

B, 6 kA according to EN 61009-1


	$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
new	30	10	6	FS401E-B10/0.03	2CCL562111E1105	147 2825	1	2	200
	30	13	6	FS401E-B13/0.03	2CCL562111E0135	010 8558	1	2	200
	30	16	6	FS401E-B16/0.03	2CCL562111E0165	010 8565	1	2	200
	30	20	6	FS401E-B20/0.03	2CCL562111E0205	010 9692	1	2	200
	30	25	6	FS401E-B25/0.03	2CCL562111E0255	010 9708	1	2	200
	30	32	6	FS401E-B32/0.03	2CCL562111E0325	010 9715	1	2	200

C, 6 kA according to EN 61009-1


	$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
new	30	6	6	FS401E-C6/0.03	2CCL562111E1064	147 2788	1	2	200
new	30	10	6	FS401E-C10/0.03	2CCL562111E1104	147 2801	1	2	200
	30	13	6	FS401E-C13/0.03	2CCL562111E0134	010 8572	1	2	200
	30	16	6	FS401E-C16/0.03	2CCL562111E0164	010 8589	1	2	200
	30	20	6	FS401E-C20/0.03	2CCL562110E0204	010 4574	1	2	200
	30	25	6	FS401E-C25/0.03	2CCL562110E0254	010 4581	1	2	200
	30	32	6	FS401E-C32/0.03	2CCL562110E0324	010 4598	1	2	200

B, 10 kA according to EN 61009-1


	$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	30	6	10	FS401M-B6/0.03	2CCL562110E1065	147 2641	1	2	200
	30	10	10	FS401M-B10/0.03	2CCL562110E0105	010 9685	1	2	200
	30	13	10	FS401M-B13/0.03	2CCL562110E0135	010 4505	1	2	200
	30	16	10	FS401M-B16/0.03	2CCL562110E0165	010 4512	1	2	200
new	30	20	10	FS401M-B20/0.03	2CCL562110E1205	147 2689	1	2	200
new	30	25	10	FS401M-B25/0.03	2CCL562110E1255	147 2726	1	2	200
new	30	32	10	FS401M-B32/0.03	2CCL562110E1325	147 2764	1	2	200

C, 10 kA according to EN 61009-1


	$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	30	6	10	FS401M-C6/0.03	2CCL562010E0064	140 6905	1	2	200
	30	10	10	FS401M-C10/0.03	2CCL562110E0104	010 4543	1	2	200
	30	13	10	FS401M-C13/0.03	2CCL562110E0134	010 4550	1	2	200
	30	16	10	FS401M-C16/0.03	2CCL562110E0164	010 4567	1	2	200
new	30	20	10	FS401M-C20/0.03	2CCL562110E1204	147 2665	1	2	200
new	30	25	10	FS401M-C25/0.03	2CCL562110E1254	147 2702	1	2	200
new	30	32	10	FS401M-C32/0.03	2CCL562110E1324	147 2740	1	2	200

Ordering details for auxiliary switch and signal contacts on page 41–45

Residual current operated circuit breaker with overcurrent protection

Series FS401 LN, Typ F and short delay

B, 10 kA according to EN 61009-1

		$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	new	30	6	10	FS401MK-B6/0.03	2CCL562130E1035	147 2849	1	2	200
	new	30	10	10	FS401MK-B10/0.03	2CCL562310E1105	147 2887	1	2	200
	new	30	13	10	FS401MK-B13/0.03	2CCL562310E1135	147 2900	1	2	200
	new	30	16	10	FS401MK-B16/0.03	2CCL562310E1165	147 2924	1	2	200
	new	30	20	10	FS401MK-B20/0.03	2CCL562310E1205	147 2962	1	2	200
	new	30	25	10	FS401MK-B25/0.03	2CCL562310E1255	147 3006	1	2	200
	new	30	32	10	FS401MK-B32/0.03	2CCL562310E1325	147 3044	1	2	200

C 10 kA according to EN 61009-1

		$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	new	30	6	10	FS401MK-C6/0.03	2CCL562330E1064	140 4031	1	2	200
	new	30	10	10	FS401MK-C10/0.03	2CCL562310E0104	140 4031	1	2	200
	new	30	13	10	FS401MK-C13/0.03	2CCL562310E0134	010 4604	1	2	200
	new	30	16	10	FS401MK-C16/0.03	2CCL562310E0164	010 4611	1	2	200
	new	30	20	10	FS401MK-C20/0.03	2CCL562310E1204	010 4642	1	2	200
	new	30	25	10	FS401MK-C25/0.03	2CCL562310E1254	010 4642	1	2	200
	new	30	32	10	FS401MK-C32/0.03	2CCL562310E1324	010 4642	1	2	200

C, 10 kA according to EN 61009-1

		$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	new	100	6	10	FS401M-C6/0.1	2CCL562120E0064	142 4534	1	2	200
	new	100	10	10	FS401M-C10/0.1	2CCL562120E0104	141 3217	1	2	200
	new	100	13	10	FS401M-C13/0.1	2CCL562120E0134	149 0706	1	2	200
	new	100	16	10	FS401M-C16/0.1	2CCL562120E0164	142 1618	1	2	200
	new	100	20	10	FS401M-C20/0.1	2CCL562122E0204	149 0720	1	2	200
	new	100	25	10	FS401M-C25/0.1	2CCL562122E0254	149 0744	1	2	200
	new	100	32	10	FS401M-C32/0.1	2CCL562122E0324	149 0768	1	2	200

C, 10 kA according to EN 61009-1

		$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	new	300	6	10	FS401MK-C6/0.3	2CCL562130E3034	147 3068	1	2	200
	new	300	10	10	FS401MK-C10/0.3	2CCL562330E1104	147 3082	1	2	200
	new	300	13	10	FS401MK-C13/0.3	2CCL562330E1134	147 3105	1	2	200
	new	300	16	10	FS401MK-C16/0.3	2CCL562330E1164	147 3143	1	2	200
	new	300	20	10	FS401MK-C20/0.3	2CCL562330E1204	147 3181	1	2	200
	new	300	25	10	FS401MK-C25/0.3	2CCL562330E1254	147 3228	1	2	200
	new	300	32	10	FS401MK-C32/0.3	2CCL562330E1324	147 3266	1	2	200

Ordering details for auxiliary switch and signal contacts on page 41–45

Residual current operated breaker RCBO FS403

4-pole RCBO from the ABB SMISSLINE protective devices range

The combination of circuit protection and a residual current protection in one device as 4-pole RCBO simplifies both – planning and installation. It enables you to provide perfect protection
in one device. This protection consists of:

- Short circuit protection
- Overload protection
- Residual current protection
- Preventive fire protection

High rated short-circuit breaking capacity of 10 kA, conforming to EN 61009-1

The I_{cn} 10 kA short-circuit breaking capacity of the RCBO complies with standard EN 61009-1.
This standard specifies testing and usage of RCBO's for household and similar uses.
The devices can also be used by non-professionals.
Features and benefits of the new devices:

- Overall width of 72 mm (4 modules)
- Rated sensitivity 30 mA
- Current rating 10 A to 32 A
- B and C tripping characteristics
- Easy Drive double deck terminals on the output side for connecting two conductors in one chamber. The two chambers can accommodate conductors with different cross sections.

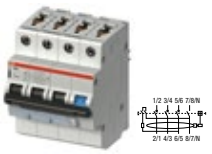
	FS403
Type:	RCD Type A, Type F, short delay ARP
Rated voltage U_n:	240/415 V
Number of poles:	3PN
Rated frequency f_n:	50/60 Hz
Rated breaking capacity I_{cn}:	10 kA – M version, 6 kA – E version
Current limitation class:	3
Total cut-off time (avarage time) acc. to IEC/EN 61009-1 – at $I_{\Delta n}$ – at $5I_{\Delta n}$	EN61009 40 ms 25 ms
Minimum voltage for test button	170 V
Standed Cross-section of conductors (top/bottom)	Upper terminal part 0,75–35 mm^2 Lower terminalpart 0,75–10 mm^2
Tightening torque:	2.8 Nm
Degree of protection:	IP20
Endurance:	> 5000
Resistance to climate:	according to EN61009
Ambient temperature:	–25 °C … +40 °C
Vibration resistance:	EN 61009-1
Plastic parts: contacts:	halogen free, according IEC 61-249-2-21 cadminum free
Approvals and standards:	EN/IEC 61009-1, SEV

Accessory:
Auxiliary- and signal contacts are to attach on to the left of the device through the customer.

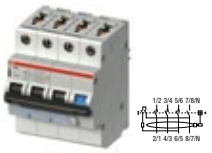
Residual current operated circuit breaker with overcurrent protection

Series FS403 3LN, Type A

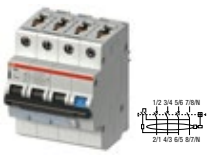
B, 10 kA according to EN 61009-1

	$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	30	6	10	FS403M-B6/0.03	2CCL564110E0065	143 4434	1	4	410
	30	10	10	FS403M-B10/0.03	2CCL564110E0105	140 7612	1	4	410
	30	13	10	FS403M-B13/0.03	2CCL564110E0135	140 7629	1	4	410
	30	16	10	FS403M-B16/0.03	2CCL564110E0165	140 7636	1	4	410
	30	20	10	FS403M-B20/0.03	2CCL563110E0205	144 2576	1	4	410
	30	25	10	FS403M-B25/0.03	2CCL563110E0255	144 2590	1	4	410
	30	32	10	FS403M-B32/0.03	2CCL563110E0325	144 2613	1	4	410

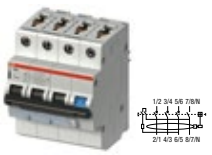
C, 6 kA according to EN 61009-1

	$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	30	6	6	FS403E-C6/0.03	2CCL564111E0064	141 9141	1	4	410
	30	10	6	FS403E-C10/0.03	2CCL564111E0104	143 4489	1	4	410
	30	13	6	FS403E-C13/0.03	2CCL564111E0134	143 4519	1	4	410
	30	16	6	FS403E-C16/0.03	2CCL564111E0164	143 4601	1	4	410
	30	20	6	FS403E-C20/0.03	2CCL564111E0203	140 9609	1	4	410
	30	25	6	FS403E-C25/0.03	2CCL564111E0254	140 8770	1	4	410
	30	32	6	FS403E-C32/0.03	2CCL564111E0324	140 8787	1	4	410

C, 10 kA according to EN 61009-1

	$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	30	6	10	FS403M-C6/0.03	2CCL564110E0064	141 9127	1	4	410
	30	10	10	FS403M-C10/0.03	2CCL564110E0104	140 7674	1	4	410
	30	13	10	FS403M-C13/0.03	2CCL564110E0134	140 7681	1	4	410
	30	16	10	FS403M-C16/0.03	2CCL564110E0164	140 7698	1	4	410
	30	20	10	FS403M-C20/0.03	2CCL563110E0204	144 2569	1	4	410
	30	25	10	FS403M-C25/0.03	2CCL563110E0254	144 2583	1	4	410
	30	32	10	FS403M-C32/0.03	2CCL563110E0324	144 2606	1	4	410

C, 10 kA according to EN 61009-1

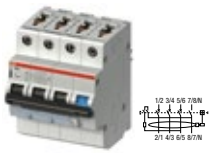
	$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	100	6	6	FS403M-C6/0.1	2CCL564121E0064	142 4527	1	4	410
	100	10	10	FS403M-C10/0.1	2CCL564121E0104	142 4510	1	4	410
	100	13	10	FS403M-C13/0.1	2CCL563120E0134	144 2620	1	4	410
	100	16	10	FS403M-C16/0.1	2CCL564120E0164	142 0109	1	4	410
	100	20	10	FS403M-C20/0.1	2CCL563120E0204	144 2637	1	4	410
	100	25	10	FS403M-C25/0.1	2CCL563120E0254	144 2644	1	4	410
	100	32	10	FS403M-C32/0.1	2CCL563120E0324	144 2651	1	4	410

Ordering details for auxiliary switch and signal contacts on page 41–45

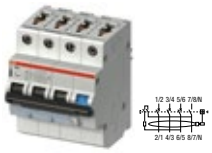
Residual current operated circuit breaker with overcurrent protection

Series FS403 3LN, Type F short delay

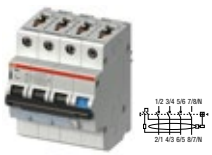
B 10kA according to EN 61009-1

		$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	VPE	Module	Weight in grams
	new	30	6	10	2CCL564310E0065	FS403MK-B6/0.03	147 0951	1	4	410
	new	30	10	10	2CCL564310E0105	FS403MK-B10/0.03	147 0999	1	4	410
	new	30	13	10	2CCL564310E0135	FS403MK-B13/0.03	147 1033	1	4	410
	new	30	16	10	2CCL564310E0165	FS403MK-B16/0.03	147 1071	1	4	410
	new	30	20	10	2CCL563310E0205	FS403MK-B20/0.03	147 0777	1	4	410
	new	30	25	10	2CCL563310E0255	FS403MK-B25/0.03	147 0814	1	4	410
	new	30	32	10	2CCL563310E0325	FS403MK-B32/0.03	147 0852	1	4	410

C, 10kA according to EN 61009-1

		$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	VPE	Module	Weight in grams
	new	30	6	10	2CCL564310E0064	FS403MK-C6/0.03	147 0937	1	4	410
	new	30	10	10	2CCL564310E0104	FS403MK-C10/0.03	147 0975	1	4	410
	new	30	13	10	2CCL564310E0134	FS403MK-C13/0.03	147 1019	1	4	410
	new	30	16	10	2CCL564310E0164	FS403MK-C16/0.03	147 1057	1	4	410
	new	30	20	10	2CCL563310E0204	FS403MK-C20/0.03	147 0753	1	4	410
	new	30	25	10	2CCL563310E0254	FS403MK-C25/0.03	147 0791	1	4	410
	new	30	32	10	2CCL563310E0324	FS403MK-C32/0.03	147 0838	1	4	410

C, 10kA according to EN 61009-1

		$I_{\Delta n}$ [mA]	I_n [A]	I_{cn} [kA]	Type name	ABB IT number	EAN number 761 227	VPE	Module	Weight in grams
	new	300	6	10	2CCL564330E0064	FS403MK-C6/0.3	147 1095	1	4	410
	new	300	10	10	2CCL564330E0104	FS403MK-C10/0.3	147 1118	1	4	410
	new	300	13	10	2CCL564330E0134	FS403MK-C13/0.3	147 1132	1	4	410
	new	300	16	10	2CCL564330E0164	FS403MK-C16/0.3	147 1156	1	4	410
	new	300	20	10	2CCL563330E0204	FS403MK-C20/0.3	147 0876	1	4	410
	new	300	25	10	2CCL563330E0254	FS403MK-C25/0.3	147 0890	1	4	410
	new	300	32	10	2CCL563330E0324	FS403MK-C32/0.3	147 0913	1	4	410

Residual current operated circuit breaker F402, F404
Technical data

	F402	**F404**
RCD Type:	Type A	Type A
Rated voltage U_n:	230V	230/400V
Number of poles:	2	4
Rated frequency f_n:	50/60Hz	50/60Hz (for Type LF $16^2/_3$Hz)
Rated breaking capacity I_m:		1000A
Total trip time (average value) – at $I_{\Delta n}$ – at 5 $I_{\Delta n}$	 ≤ 300ms ≤ 40ms	 ≤ 300ms ≤ 40ms
Delay time at 5 $I_{\Delta n}$:	–	–
Resistance to short circuits (kA):	10kA in conjunction with an upstream fuse gL / gG 100A or a high performance MCB S800, 100A	10kA in conjunction with an upstream fuse gL / gG 100A or a high performance MCB S800, 100A
Connection load side terminal	Double lift terminal touch finger-proof, suitable for connecting single-, multi- and fine-wire conductors of up to 25mm²	
Degree of protection:	IP20 inside panel IP40	IP20 inside panel IP40
Endurance:	> 5000 operating cycles	> 5000 operating cycles
Resistance to climate acc. to:	EN 61008	EN 61008
Mounting position:	any	any
Ambient temperature:	–25°C … +40°C	–25°C … +55°C acc. to EN 61009
Vibration resistance:	5g 5 … 150 … 5Hz	5g 5 … 150 … 5Hz
Plastic parts:	halogen-free	halogen-free
Contacts:	cadmium-free	cadmium-free

	F402…K	**F404…K**	**F404…S**
Rated voltage U_n:	230V	230/400V	230/400V
Number of poles:	2	4	4
Rated frequency f_n:	45 … 60Hz	45 … 60Hz	45 … 60Hz
Resistance to surge current:	3kA 8/20µs	3kA 8/20µs	5kA 8/20µs
Total trip time (average value) – at $I_{\Delta n}$ – at 5 $I_{\Delta n}$	 240ms ≤ 40ms	 120 … 300ms	 150 … 500ms 40 …150ms
Delay time at 5 $I_{\Delta n}$:	10ms	10ms	90 ms
Resistance to short circuits (kA):	10kA in conjunction with an upstream fuse gL / gG 100A or or a high performance MCB S800 100A	10kA	10kA
Connection load side terminal	Double lift terminal touch finger-proof, suitable for connecting single-, multi- and fine-wire conductors of up to 25mm²		
Degree of protection:	IP20 in panel IP40	IP20 in panel IP40	IP20 in panel IP40
Endurance:	> 5000 operating cycles	> 5000 operating cycles	> 5000 operating cycles
Resistance to climate acc. to:	EN 61008	EN 61008	EN 61008
Mounting position:	any	any	any
Ambient temperature:	–25°C … +40°C	–25°C … +55°C	–25°C … +40°C
Vibration resistance:	5g 5 … 150 … 5Hz	5g 5 … 150 … 5Hz	5g 5 … 150 … 5Hz
Plastic parts:	halogen-free	halogen-free	halogen-free
Contacts:	cadmium-free	cadmium-free	cadmium-free

2- and 4-pole residual current operated circuit breaker

F402, F404, Type A

$I_{\Delta n}$ mA	I_n A	Type name	ABB IT number	EAN number 801 254	E number	Pack-aging unit	Module	Weight in grams
10	25	F402 25 A10	2CSF502110R0250	203 7033	531 420 365	1	2	187
30	25	F402 25 A30	2CSF502110R1250	203 4339	531 422 365	1	2	187
30	40	F402 40 A30	2CSF502110R1400	203 6937	531 432 365	1	2	187
100	40	F402 40 A100	2CSF502110R2400	203 4230	531 434 365	1	2	187

2-pole short time delayed residual current operated circuit breaker, series F402 K

30	40	F402 40 APR30	2CSF502410R1400	203 6838	531 433 365	1	2	187

4-pole residual current operated circuit breaker, series F404 (RCCB)

30	25	F404 A 25/0.03	2CCF544110E0250	010 4253		1	4	430
30	40	F404 A 40/0.03	2CCF544110E0400	010 4260		1	4	430
100	40	F404 A 40/0.1	2CCF544120E0400	010 4277		1	4	430
300	40	F404 A 40/0.3	2CCF544130E0400	010 4284		1	4	430
30	63	F404 A 63/0.03	2CCF544110E0630	010 4291		1	4	430
100	63	F404 A 63/0.1	2CCF544120E0630	010 4307		1	4	430
300	63	F404 A 63/0.3	2CCF544130E0630	010 4314		1	4	430
500	63	F404 A 63/0.5	2CCF600517E0630	140 1566		1	4	430

4-pole short time delayed residual current operated circuit breaker, series F404 K (RCCB)

30	40	F404 A-K 40/0.03	2CCF544310E0400	010 4321		1	4	430
100	40	F404 A-K 40/0.1	2CCF544320E0400	010 4338		1	4	430
30	63	F404 A-K 63/0.03	2CCF544310E0630	010 4345		1	4	430

4-pole selective residual current operated circuit breaker, series F404 S (RCCB)

100	63	F404 A-S 63/0.1	2CCF544220E0630	010 4352		1	4	430
300	63	F404 A-S 63/0.3	2CCF544230E0630	010 4369		1	4	430

4-pole residual current operated circuit breaker, special design $16^2/_3$ Hz, series F404 LF (RCCB)

30	63	F404 A-LF 63/0.03	2CCF544110E0631	010 4376		1	4	430
300	63	F404 A-LF 63/0.3	2CCF544130E0631	010 4383		1	4	430

Ordering details for auxiliary switch and signal contacts on page 41–45

Surge arrester OVR
Technical data

Typ	**OVR404 4L 40-275 P TS QS**	**OVR404 3N 40-275 P TS QS**
Technologie	varistor	Varistor/gaz tube (N)
System network	TNS	TT–TNS
Electrical features		
Standard	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type / test class	Type 2	Type 2
Number of pole	4	4
Nominal voltage UN (L-N, L-L)	240/415 V	240/415 V
Type of voltage	a.c. 45–65 Hz	a.c. 45–65 Hz
Max. cont. operating voltage U_c	275 V AC	275 V AC
Nominal discharge current I_n (8/20)	20 kA	20 kA
Maximum discharge current I_{max} (8/20)	40 kA	40 kA
Maximum impulse current I_{imp} (10/350)	2 kV	2 kA
Voltage protection level U_p at I_n (L-N / N-PE / L-PE)	1.5 kV	1.25/1.4/1.5 kV
Voltage protection level U_p at 3 kA (L-N / N-PE / L-PE)	0.5 kV	0.8/1.4/0.85 kV
Voltage protection level U_p at 5 kA (L-N / N-PE / L-PE)	0.7 kV	0.85/1.4/0.95 kV
Voltage protection level U_p at 10 kA (L-N / N-PE / L-PE)	0.9 kV	1/1.4/1.15 kV
TOV (Temporary overvoltage) withstand U_t (L-N: 5s./N-PE: 200 ms)	337/-V	337/1200 V
Response time Response time	≤ 25 ns	≤ 25 ns
Short-circuit withstand capability Isccr	100 kA	100 kA
Back up prootection circuit breaker	≤ 125 A; S800S B	≤ 125 A; S800S B
Pluggable cartridge	Yes	Yes
Integrated QuickSafe® technology	Yes	Yes
State indicator	Yes	Yes
Auxiliary contact (TS)	Yes	Yes
Installation		
Wire range (L, N, PE)	2.5…25 mm² cable or rope	2.5…25 mm² cable or rope
Connection cross-section	2.5…16 mm² litz wire with ferrule	2.5…16 mm² litz wire with ferrule
Tightening torque	2.8 Nm	2.8 Nm
Auxiliary contact (TS)		
Contacts information	1 NO – 1 NC	1 NO – 1 NC
Max. load/current	12 V DC – 10 mA	12 V DC – 10 mA
Min. load/current	250 V AC – 1 A 1.5 mm²	250 V AC – 1 A 1.5 mm²
Operating temperature	–25 °C – +60 °C	–25 °C – +60 °C
Storage temperature	–25 °C – +80 °C	–25 °C – +80 °C

Back up protection

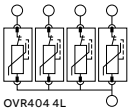
Typ 2 QuickSafe® Surge Protective Devices	**Prospective short circuit current at SPD location (Ip)**	**Circuit breaker maximum ratings [1] curve B or C**	**Fuse [2] (gL - gG)**
Maximum ratings			
I_n: 5, 20, 30 kA	0,625 kA < I_p < 100 kA	S800S B or C – 125 A [2]	125 A fuse
U_c: 275, 350, 440, 600 V			

[1] Maximum ratings, must be in accordance with the installation to follow coordination rules with main or upstream short circuit protection(s).
[2] up to I_p ≤ 50 kA

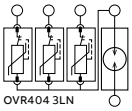
Surge arrester Type 2, Switch disconnector

Surge arrester OVR404

	I_{sn} (8/20 µs) [kA]	Type name	ABB IT number	EAN number	Pack-aging unit	Module	Weight in grams
	20	OVR404 4L 40-275 P TS QS	2CCF606000R0001	761 227 145 5491	1	4	470
	20	OVR404 3N 40-275 P TS QS	2CCF606002R0001	761 227 145 5507	1	4	450
	20	OVR404 4L 40-440 P TS QS	2CCF606000A0003	761 227 146 5322	1	4	470



OVR404 4L



OVR404 3LN

Switch disconnector IS404

	I_n [A]	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
	63	IS404 63	2CCF544160E0630	010 4390	1	4	380

Ordering details for auxiliary switch and signal contacts on page xx–xx

Cover switch disconnector IS404/F404
The Cover ist for the Incoming terminals

	Type name	ABB IT number	EAN number 761 227	E number	Pack-aging unit	Weight in grams
	ZFI301	2CCA601560R0001	142 0451	550 510 503	1	1

Combi module: starting solutions in kit form

Mounting possibilities

Direct-On-Line Starters

MS116
+ BEA16-4
+ AF09, AF12, AF16

MS116 up to 16 A
+ BEA26-4
+ AF26, AF30, AF38

MS116 > 16 A
+ BEA38-4
+ AF26, AF30, AF38

MS132
+ BEA16-4
+ AF09, AF12, AF16

MS132 up to 10 A
+ BEA26-4
+ AF26, AF30, AF38

MS132 > 10 A
+ BEA38-4
+ AF26, AF30, AF38

with control voltage

Reversing Starters

MS116
+ BEA16-4, BER16-4, VEM4
+ AF09, AF12, AF16

MS116 up to 16 A
+ BEA26-4, BER38-4, VEM4
+ AF26, AF30, AF38

MS116 > 16 A
+ BEA38-4, BER38-4, VEM4
+ AF26, AF30, AF38

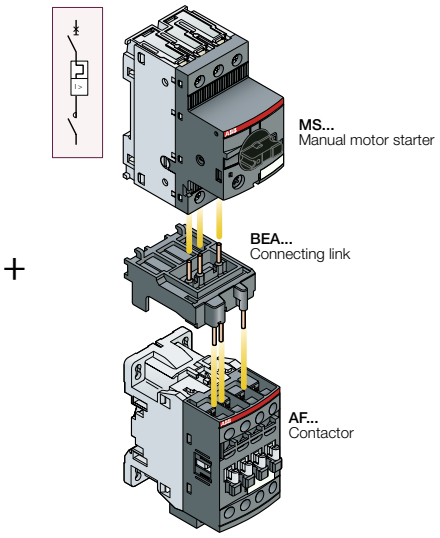
MS132
+ BEA16-4, BER16-4, VEM4
+ AF09, AF12, AF16

MS132 up to 10 A
+ BEA26-4, BER38-4, VEM4
+ AF26, AF30, AF38

MS132 > 10 A
+ BEA38-4, BER38-4, VEM4
+ AF26, AF30, AF38

without control voltage

Mounting possibilities on the combi module:
The following combinations of contactor, motor circuit breaker and connector are possible on the combi module.



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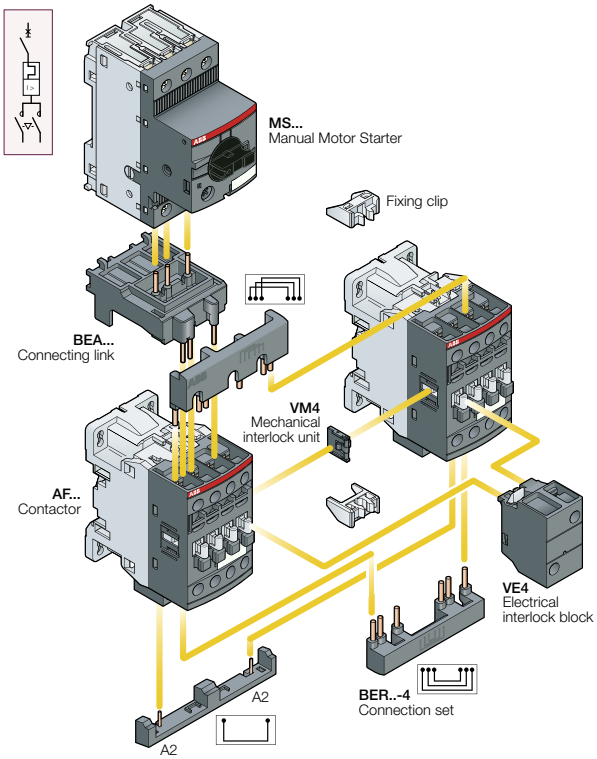


Combi module 32 A (I_N), 6 A (I_A, I_B)
MS116/132 + AF contactor

Combi module for MS116/MS132 and AF contactor

Designation	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
Combi module L1,L2,L3 top feed	ZMS132-3L	2CCA182500R0001	1414641	1	2,5	95
Combi module L1,L2,L3 top feed	ZMS132-3LA	2CCA182502R0001	1414634	1	2,5	98
Combi module L1,L2<,L3 top feed	ZMS132-3LB	2CCA182504R0001	1414627	1	2,5	98
Combi module L1,L2,L3 top feed	ZMS132-3LAB	2CCA182506R0001	1414610	1	2,5	102
Combi module without plug-in contacts	ZMS137	2CCA182508R0001	1414603	1	2,5	75
Connection pin to mont 2 combi moduls together	E210-SPV	2CCC703715R0001	1414801	Set of 30 pces		
Intermediate piece 9 mm	ZMS935	2CCA182616R0001	141 4412	1	0,5	6

Adapter for manual motor starter MS116 and MS132

Top feed Bottom feed

Designation	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
Adapter MS116/132 L123 wire bottom feed	ZMS930	2CCA182520R0001	141 4597	1	2,5	30
Adapter MS116/132 L123LALB wire bottom feed	ZMS931	2CCA182522R0001	141 4580	1	2,5	62
Adapter MS116/132 L123LA wire bottom feed	ZMS936	2CCA182521R0001	142 4619	1	2,5	58
Adapter MS116/132 L123 wire top feed	ZMS932	2CCA182524R0001	141 4573	1	2,5	30
Adapter MS116/132 L123LALB wire top feed	ZMS933	2CCA182526R0001	141 4566	1	2,5	62
Adapter MS116/132 L123LA wire top feed	ZMS937	2CCA182525R0001	142 4626	1	2,5	58
Adapter MS116/132 empty	ZMS934	2CCA182512R0001	141 4559	1	2,5	34
Intermediate piece 9 mm	ZMS935	2CCA182616R0001	141 4412	1	0,5	6

The 9 mm wide additional housing is need to use when an unequal number (1, 3, 5, ...) of combi modules or adapter are plugged on the socket.
This is needed to fill the space into a full module (18 mm).
The 9 mm wide additional housing can be also use when on one side of the manual motor starter an auxiliary contact is mounted.
The order codes of manual motor starter and the contactors auf in the ABB catalogue DOC 1SBC100155C0202 or in the local ABB catalogue.

Adapter for motor starter
MS116, MS132, MS325

Adapter for MS116, MS132

Designation	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
Adapter MS116/132 L123 wire bottom feed	ZMS930	2CCA182520R0001	141 4597	1	2,5	30
Adapter MS116/132 L123LALB wire bottom feed	ZMS931	2CCA182522R0001	141 4580	1	2,5	62
Adapter MS116/132 L123 wire top feed	ZMS932	2CCA182524R0001	141 4573	1	2,5	30
Adapter MS116/132 L123LALB wire top feed	ZMS933	2CCA182526R0001	141 4566	1	2,5	62
Adapter MS116/132 empty	ZMS934	2CCA182512R0001	141 4559	1	2,5	34
Adapter MS116/132 L123LA wire top feed	ZMS937	2CCA182525R0001	142 4626	1	2,5	58
Adapter MS116/132 L123LA wire bottom feed	ZMS936	2CCA182521R0001	142 4619	1	2,5	58
Intermediate piece 9 mm	ZMS935	2CCA182616R0001	141 4412	1	0,5	7
Connection pin to mont 2 combi moduls together	E210-SPV	2CCC703715R0001	1414801	Set of 30 pces		

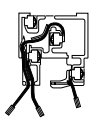
Adapter plate for MS325 contact to busbars with plug contacts

	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Weight in grams
3L	ZMS915	2CCF002817R0001	002 1215	1	30
L1, N(20A)	ZMS916	2CCF002818R0001	002 1222	1	30
L2, N(20A)	ZMS917	2CCF002819R0001	002 1239	1	30
L3, N(20A)	ZMS918	2CCF002820R0001	002 1246	1	30
2L (reversible)	ZMS919	2CCF010620R0001	002 1253	1	30

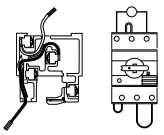
Auxiliary switch and signal contacts, connection support
Contact pin, short

	ABB IT number	EAN number 761 227	Pack-aging unit	Weight in grams
for power supply via auxiliary busbars	2CCF002794R0001	001 9526	1	2

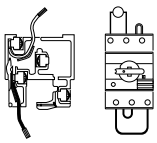
ZMS 915 ⑤ MS325 / ZLS 5.., I_n max. 32 A



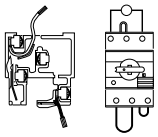
ZMS 916 ⑤ MS325, I_n max. 20 A



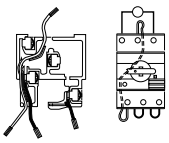
ZMS 917 ⑤ MS325, I_n max. 20 A



ZMS 918 ⑤ MS325, I_n max. 20 A



ZMS 919 ⑤ MS325, I_n max. 20 A



Auxiliary switches and signal contacts
Description, Technical data

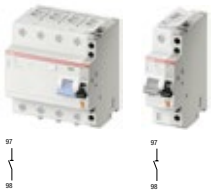
General
The auxiliary switches and signal contacts are snapped on to the left of the protective devices. On the miniature circuit breakers an optional mounting on the right is also possible.
For auxiliary switches and signal contacts supplied via SMISSLINE auxiliary busbars LA or LB a version with integrated contacting pieces is available Conventional supply via the terminals of the auxiliary devices is possible.

Function
The auxiliary switch works in the same way as the main contacts. The signal contact only operates when the protective device trips.
This can be simulated with the white test button. Each time the signal contact is tripped, it must be reset to its starting position using the orange-coloured reset button.
Auxiliary switch and signal contacts have special contacts whitch ensure high switching reliability even in systems with low voltages or low currents (PLC, signal systems etc.).

Auxiliary switch contacts operate at the same time as the contacts of the protective device (activated manually or automatically).

Normally open contact **NO** (normally open) — 13 / 14 — joint operation with protective device

Normally open contact **NC** (normally close) — 21 / 22 — opposing operation with protective device



Signal contacts only operate when the protective device is tripped electrically as a result of a short-circuit, a fault current or overcurrent (undervoltage for MS325).

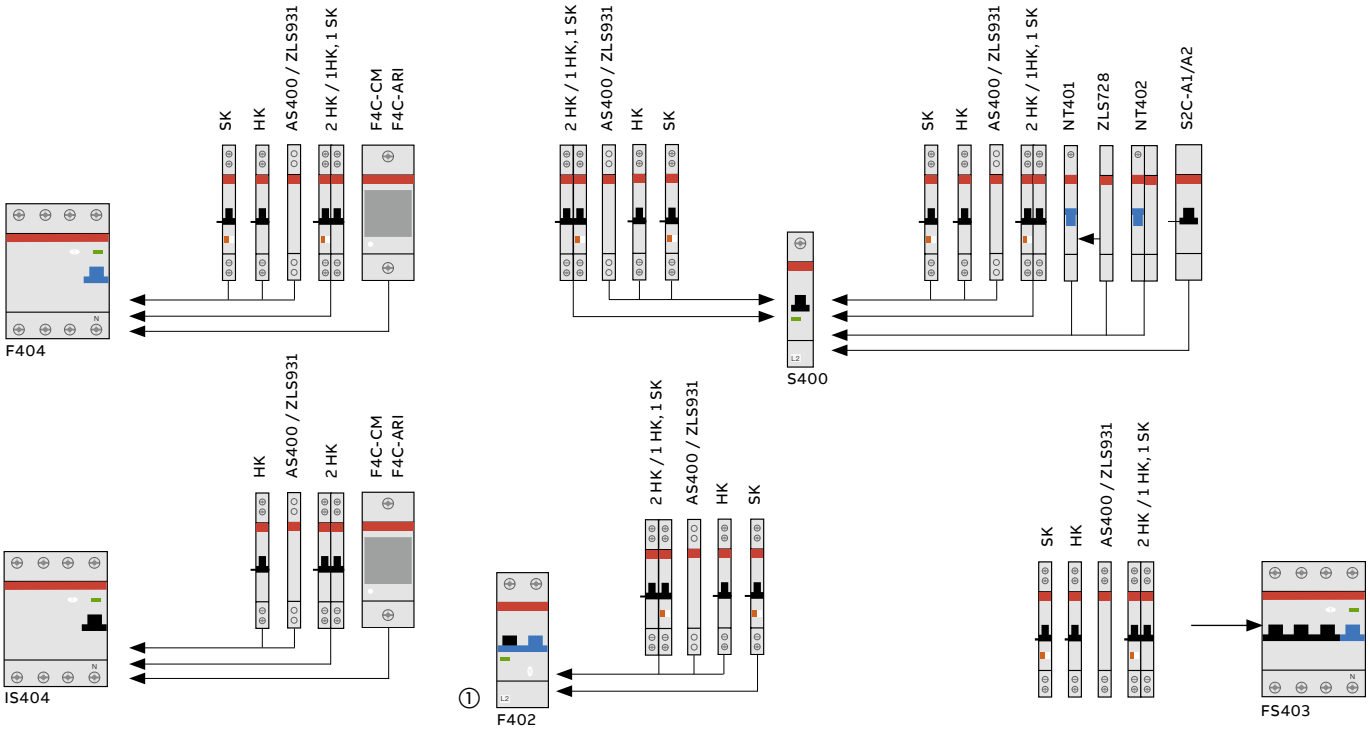
Normally open contact **NO** (normally open) — 97 / 98 — closes during automatic trip

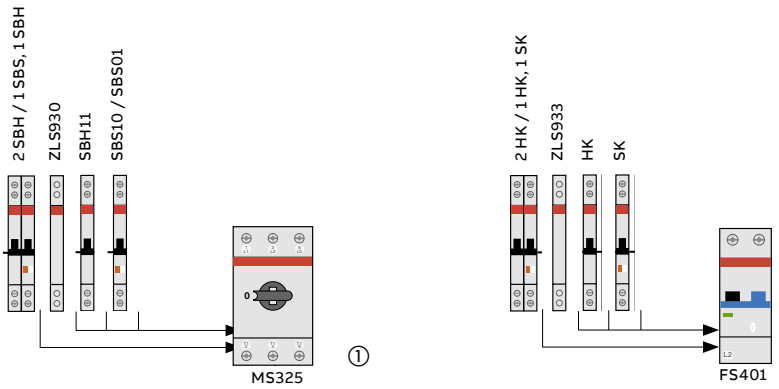
Normally open contact **NC** (normally close) — 05 / 06 — opens during automatic trip

Technical data for auxiliary switch and signal contact

	Signal contact SK400	Auxiliary switch HK400
Rated voltage U_n	400 V	400 V
Rated impulse withstand voltage	4 kV	4 kV
Rated current		
– I_{th}	6 A	6 A
– AC15	2 A/230 V / 1 A/400 V	2 A/230 V / 1 A/400 V
– DC13	0.55 A/125 V=	0.55 A/125 V=
– DC13	0.27 A/250 V=	0.27 A/250 V=
Minimum current/voltage (to ensure reliable electrical operation)	10 mA 12 V=	10 mA 12 V=
Connection cross-sections:	2 x 1.5 mm² strand with sleeve	2 x 1.5 mm² strand with sleeve
Plastic parts:	Free of halogen und cadmium	Free of halogen und cadmium
Internal resistance Ri:	0.0065 Ω	0.0065 Ω
Power loss at rated current Pv:	0.24 W	0.24 W
Ambient temperature:	Tmax. +55 °C Tmin –25 °C	Tmax. +55 °C Tmin –25 °C
Tightening torque:	1 Nm	1 Nm

Accessory mounting
Options for protective devices

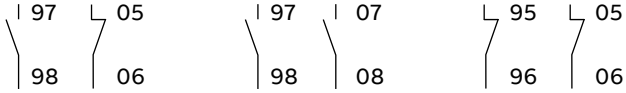




On each protective device can be mounted:

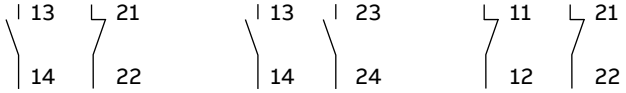
1 auxiliary switch
or 1 signal contact
or 2 auxiliary contact switches
or 1 auxiliary switch and 1 signal contact

Contact description signal contact



SK40011 SK40020 SK40002

Contact description auxiliary switch



① If you use an auxiliary switch and a signal contact you must connect first the signal contact on the MS325.

Auxiliary switch and signal contacts
MCB S400, RCCB F404, RCCB F402, RCBO FS401

The auxiliary switch and signal contacts are supplied with one contacting piece.
The signal contact collective alarm are supplied with two contacting pieces.

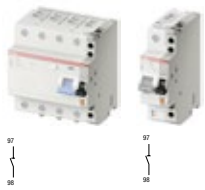
Auxiliary switch

	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
for left side mounting on MCB S400, RCBO FS401, FS403						
1NO and 1NC	HK40011-L	2CCS500900R0081	010 0910	10	0.5	45
2NO	HK40020-L	2CCF201112R0001	011 1183	10	0.5	40
2NC	HK40002-L	2CCF201114R0001	011 1190	10	0.5	40
for right side mounting on RCB F404/402, MCB S400 and IS404						
1NO and 1NC	HK40011-R	2CCS500900R0214	010 8619	10	0.5	45
2NO	HK40020-R	2CCF201113R0001	011 1206	10	0.5	40
2NC	HK40002-R	2CCF201115R0001	011 1213	10	0.5	40

Signal contacts

	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
for left side mounting on MCB S400, RCBO FS401, FS403						
1NO and 1NC	SK40011-L	2CCS500900R0101	010 0934	10	0.5	45
2NO	SK40020-L	2CCF201162R0001	011 1107	10	0.5	40
2NC	SK40002-L	2CCF201164R0001	011 1114	10	0.5	40
for right side mounting on RCB F404/402, MCB S400 and IS404						
1NO and 1NC	SK40011-R	2CCS500900R0215	010 8626	10	0.5	45
2NO	SK40020-R	2CCF201163R0001	011 1121	10	0.5	40
2NC	SK40002-R	2CCF201165R0001	011 1138	10	0.5	40

Signal contact collective alarm and auxiliary contact



	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
for left side mounting						
1NO	SK40010-L SA	2CCS500900R0141	010 7964	10	0.5	45
1NO	HK40010-L SA	2CCF201212R0001	140 7902	10	0.5	45
for right side mounting						
1NO	SK40010-R SA	2CCS500900R0216	010 8633	10	0.5	45
1NO	HK40010-R SA	2CCF201213R0001	140 7919	10	0.5	45

Collective alarm, signal contact contacts the auxiliary busbars LA, LB
A cost-effective collective alarm solution can be implemented without additional wiring by using this arrangement.

Dummy, housing, Neutral disconnector, shunt trip

Connection support dummy housing
for left or right side mounting on MCB S400, RCCB F402, RCCB F404, RCBO FS401

	Connection support	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
		AS400	2CCS500900R0151	010 0958	10	0.5	45
	Dummy housing						
	Compensation to 18 mm	ZLS931	2CCS500900R0161	010 0965	10	0.5	35

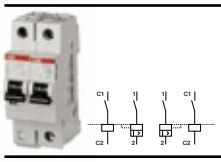
Contacting pieces for auxiliary switch and signal contacts

	Connection support	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	Contacting piece for HK/SK LA, LB Pack contains 100 items	ZLS632	2CCS500900R0171	010 0972	Pack contains 100 items	–	200
	Contacting piece for HK/SK LA, LB Pack contains 10 items	ZLS635	2CC5201307R0171	010 9265	Pack contains 10 items	–	20
	Contact Pin	ZLS633	2CCS500900R0201	010 8640	Pack contains 10 items		

Neutral disconnector
On the load side terminal two separate conductors can be clamped

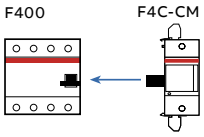
	Connection support	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	Neutral disconnector 9 mm	NT401 63	2CCS500900R0021	010 0859	10	0.5	45
	Neutral disconnector 18 mm	NT402 63	2CCS500900R0011	010 0842	10	1	58
	Compensation to 18 mm for NT401 63	ZLS728	2CCS400900R0101	010 4710	1 Bag contains 5 items	0.5	15

Shunt trip
Function: remote opening of the device when a voltage is applied. Suitable for MCBs S400 series.

	Rated voltage	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	12–60 VAC/DC	S 2C-A1	2CDS 200 909 R0001	257 0992	1	1	150
	110–415 VAC/DC, 110–250 VDC	S 2C-A2	2CDS 200 909 R0002	257 1005	1	1	150

Orders for this two types can be done over DESTO

F4C-CM motor operating devices
Technical specifications

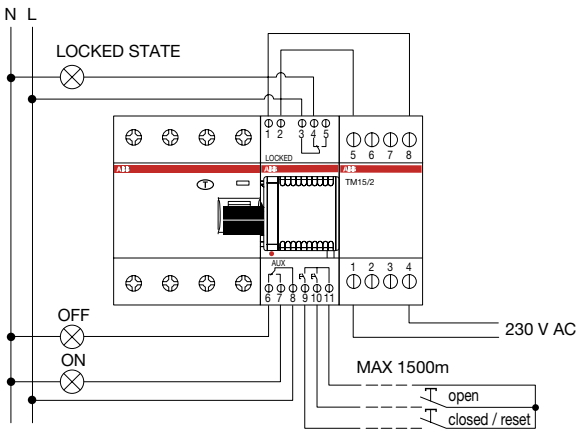


Supply voltage:	12 ... 30 V AC + 10 % – 15 % (50 – 60 Hz); 12 ... 48 V DC + 10 % – 15 %
Insulation voltage:	2500 V for 1 minute
Power consumption: 12 V AC	< 15 VA
24 V AC	< 22 VA
30 V AC	< 25 VA
12 ... 48 V DC	< 20 VA
Power consumption at rest:	≤ 1,5 VA
Remote command*:	via free voltage contacts
Closing time at ambient temperature:	≤ 1 second
Opening time at ambient temperature:	≤ 0,5 seconds
Delay time for remote resetting after opening due to fault:	8 seconds
Number of operations:	≤ 20000
Operating temperature:	– 25 °C ... + 55 °C
Storage temperature:	– 40 °C ... + 70 °C
Fixing:	on EN 60715 rails (35 mm) with rapid fixing system
Protection degree (EN 60529):	terminals: IP2X
	housing: IP4X
Cables length of control circuit:	≤ 1500 m
Cable cross-section:	≤ 2,5 mm^2
Auxiliary contact (terminals 6, 7, 8):	1NO + +NC change-over
Rated current:	3 A (250 V AC), resistive load
Command terminals:	terminal 9 = closing contact
	terminal 10 = opening contact
	terminal 11 = common reference for control contacts + 5 V DC (supplied by motor operating device)

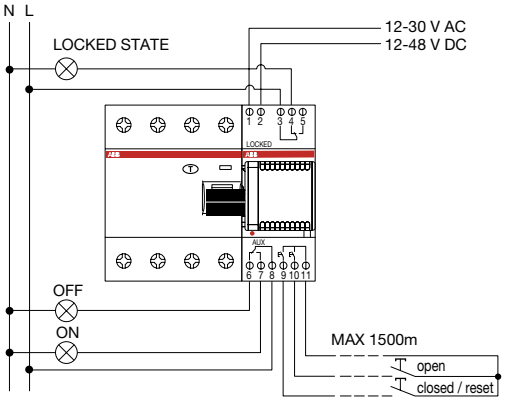
* 1) After powering up the device, wait 5 seconds before activating the command functions.
2) After opening due to a fault, wait 8 seconds before performing the remote resetting.

Wiring diagrams for F4C-ARI motor operating devices

Use at 230 V AC via a TM15/12 bell transformer



Low voltage use: 12 ... 30 V AC, 12 ... 48 V DC



F4C-ARI auto-reclosing unit
Specific features

The F4C-ARI auto-reclosing device, installed to the right side of the residual current circuit breakers, automatically performs three reclosing attempts in the event of a fault. If the result of the three reclosing attempts is negative, the device enters a locked state.

The luminous two- colors red/green LED shows the operating state of the auto-reclosing device.

- Blinking green LED: this is displayed for five seconds after the device is powered up. When the LED stops blinking, the device is ready to operate.
- Steady green LED: the remote control is activated and the device is powered.
- LED is off: no power supply.
- Blinking red LED: reclosing cycle in progress.
- Steady red LED: the remote control is excluded on the device or is in a locked state following three unsuccessful reclosing attempts, or as a result of a remote opening command.

The lower section of the device contains an integrated 1NO+1NC auxiliary change-over contact, which indicates the position of the contacts of the associated circuit breaker.

The locked state can be reset:
- locally, by manually moving the mobile element on the front of the device to the OFF position and subsequently to the ON position. The device will reset and automatically reclose the circuit breaker;
- remotely, by means of a close command (NO contact) which resets the device and close the circuit breaker.

Using both of the resetting methods, the cycle of three reclosing attempts can be repeated.

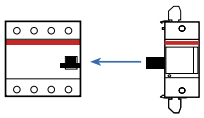
The associated residual current circuit breaker can be remotely opened via a command with the NO contact. The remote open command locks out the resetting logic and brings the auto-reclosing device into a locked state.

Operation of the close/reset and open commands can be performed via an impulse command.

Remote commands and reclosing logic may be deactivated locally by means of the mobile element on the front of the device. This is desirable during maintenance interventions with the device in the OFF position, in order to avoid remote-activated closing operations or automatic reclosing. In this case, with the selector and the circuit breaker in the OFF position, the device may be physically locked by threading a padlock through the with draw able element on the front.

F4C-ARI motor operating devices
Technical specifications

F400 F4C-ARI

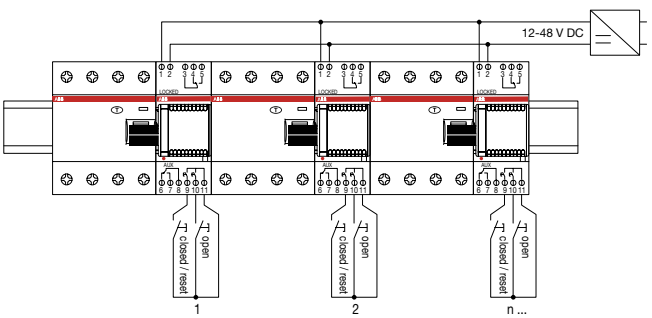


Supply voltage:	12 ... 30 V AC + 10 % – 15 % (50 – 60 Hz); 12 ... 48 V DC + 10 % – 15 %
Number of automatic reclosing attempts:	3
Counter reset time:	16 seconds
Insulation voltage:	2500 V for 1 minute
Power consumption: 12 V AC	< 15 VA
24 V AC	< 22 VA
30 V AC	< 25 VA
12 ... 48 V DC	< 20 VA
Power consumption at rest:	≤ 1,5 VA
Delay time for activation of automatic reclosing:	3 seconds
Reclosing time at ambient temperature:	≤ 1 second
Opening time at ambient temperature:	≤ 0,5 seconds
Number of operations:	≤ 20000
Operating temperature:	– 25 °C ... + 55 °C
Storage temperature:	– 40 °C ... + 70 °C
Fixing on EN 60715 rails (35 mm) with rapid fi xing system	
Protection degree (EN 60529):	terminals: IP2X
	housing: P4X
Cables length of control circuit:	≤ 1500 m
Cable cross-section:	≤ 2,5 mm²
Auxiliary contact (terminals 6, 7, 8):	1 change-over
Rated current:	3 A (250 V AC), resistive load
Remote command*:	via dry contacts
Command terminals:	terminal 9 = contact for closing and for remote reset of locked state
	terminal 10 = opening contact
	terminal 11 = common reference for control contacts, + 5 V DC (supplied by motor operating device)

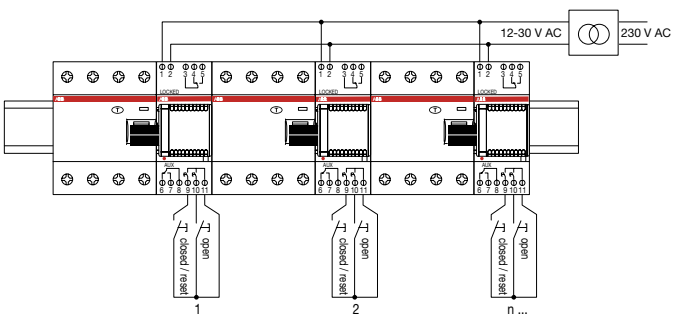
* After powering up the device, wait 5 seconds before activating the command functions.

Wiring diagrams for F4C-ARI motor operating devices

Low voltage use of several motor operating devices: 12 ... 30 V AC, 12 ... 48 V DC



Use of several motor operating devices at 230 V AC via a single safety transformer



F4C-ARI motor operating devices

Motor operating devices for residual current circuit breakers F404 25 ... 63A
Supply voltage 12 ... 30VAC; 12 ... 48VDC
1 integrated auxiliary contact

	Type name	ABB IT number	EAN number	Packaging unit	Modul	Weight in grams
	F4C-CM	2CSF204986R0013	8012542998730	1	2	166

For Supply voltage 230V it is needed to use a safety transformer TS16/12 (2CSM161401R401R0811).

Motor operating auto-reclosing unit for residual current circuit breakers F404 25 ... 63A
Supply voltage 12 ... 30VAC; 12 ... 48VDC
1 integrated auxiliary contact

	Type name	ABB IT number	EAN number	Packaging unit	Modul	Weight in grams
	F4C-ARI	2CSF204987R0013	8012542998631	1	2	166

For Supply voltage 230V it is needed to use a safety transformer TS16/12 (2CSM161401R401R0811).

Safety transformer

	Type name	ABB IT number	EAN number	Packaging unit		Weight in grams
	TS16/12	2CSM161401R0811	8012542368908	1		355

CMS – Current Measurement System
Technical data

Sensors	CMS-100PS	CMS-101PS	CMS-102PS
Measurement range	0 .. 80 A	0 .. 40 A	0 .. 20 A
Measurement method	TRMS, AC 50/60 Hz, DC	TRMS, AC 50/60 Hz, DC	TRMS, AC 50/60 Hz, DC
Crest factor of distorted wave forms	≤ 1.5	≤ 3	≤ 6
AC Accuracy (TA = +25 °C)	≤ ±0.5 %	≤ ±0.5 %	≤ ±0.5 %
AC Temperature coefficient	≤ ±0.036 %/K	≤ ±0.036 %/K	≤ ±0.036 %/K
DC Accuracy (TA = +25 °C)	≤ ±0.7 %	≤ ±1.0 %	≤ ±1.7 %
DC Temperature coefficient	≤ ±0.047 %/K	≤ ±0.059 %/K	≤ ±0.084 %/K
Resolution	10 mA	10 mA	10 mA
Sampling rate internal	5 kHz	5 kHz	5 kHz
Settling time (±1 %)	typ. 0.25 sec	typ. 0.25 sec	typ. 0.25 sec
Cable feed through	10 mm Ø	10 mm Ø	10 mm Ø
Insulation Voltage	690 V AC / 1500 V DC	690 V AC / 1500 V DC	690 V AC / 1500 V DC
Weight	12 g	12 g	12 g
Dimensions B x H x T	17.4 mm x 15.5 mm x 41.0 mm (1TE)	17.4 mm x 15.5 mm x 41.0 mm (1TE)	17.4 mm x 15.5 mm x 41.0 mm (1TE)

Control Unit	CMS-600
Supply voltage	24 V DC (±10 %)
Power dissipation	min. 0.4 W; max. 24 W (with 64 sensors)
Interface	RS485 2-wire
Protocol	Modbus RTU
Data rate	2400 .. 115 200 Baud
Data refresh time	< 1 sec for 64 sensors' results
Insulation Voltage	400 V AC
Screw-type terminals	0.5 .. 2.5 mm2, max. 0.6 Nm
Mounting	DIN-rail 35 mm acc. DIN 50022 or SMISSLINE TP busbar system
Weight	153 g
Dimensions B x H x T	71.8 mm x 87.0 mm x 64.9 mm (4TE)

General Data	Sensors and Control Unit
Operating temperature	–25 °C .. +70 °C
Storage temperature	–40 °C .. +85 °C
Electrostatic discharge (ESD)	IEC/EN 61000-4-2
Electromagnetic compatibility (EMC)	IEC/EN 61000-4-3, -4-4, -4-5, -4-6, -6-3, -6.4

CMS – Circuit Monitoring System

Open-core sensors



Description	GTIN 7612271 EAN	Bestelldetails Artikelnr.	Bestellnummer	Weight of 1 unit (kg)	Packaging unit (pce.)
Open-core sensors 18 mm for SMISSLINE installation devices with twin terminals					
80 A	452957	CMS-120PS	2CCA880210R0001	0.012	1
40 A	452971	CMS-121PS	2CCA880211R0001	0.012	1
20 A	452995	CMS-122PS	2CCA880212R0001	0.012	1
Open-core sensors 18 mm for DIN rail mounting (universally usable)					
80 A	453077	CMS-120DR	2CCA880240R0001	0.015	1
40 A	453091	CMS-121DR	2CCA880241R0001	0.015	1
20 A	453114	CMS-122DR	2CCA880242R0001	0.015	1
Open-core sensors 18 mm for cable tie mounting (universally usable)					
80 A	453015	CMS-120CA	2CCA880220R0001	0.011	1
40 A	453039	CMS-121CA	2CCA880221R0001	0.011	1
20 A	453053	CMS-122CA	2CCA880222R0001	0.011	1

Solid-core sensors






Description	GTIN 7612271 EAN	Bestelldetails Artikelnr.	Bestellnummer	Weight of 1 unit (kg)	Packaging unit (pce.)
Solid-core sensors 18 mm for SMISSLINE installation devices with twin terminals					
80 A	419202	CMS-100PS	2CCA880100R0001	0.012	1
40 A	419219	CMS-101PS	2CCA880101R0001	0.012	1
20 A	419226	CMS-102PS	2CCA880102R0001	0.012	1
Solid-core sensors 18 mm for DIN rail mounting (universally usable)					
80 A	426583	CMS-100DR	2CCA880128R0001	0.015	1
40 A	426590	CMS-101DR	2CCA880129R0001	0.015	1
20 A	426606	CMS-102DR	2CCA880130R0001	0.015	1
Solid-core sensors 18 mm for cable tie mounting (universally usable)					
80 A	426613	CMS-100CA	2CCA880107R0001	0.011	1
40 A	426620	CMS-101CA	2CCA880108R0001	0.011	1
20 A	426637	CMS-102CA	2CCA880109R0001	0.011	1
Solid-core sensors 25 mm for DIN rail mounting (universally usable)					
160 A	426675	CMS-200DR	2CCA880132R0001	0.030	1
80 A	426682	CMS-201DR	2CCA880133R0001	0.030	1
40 A	426699	CMS-202DR	2CCA880134R0001	0.030	1
Solid-core sensors 25 mm for cable tie mounting (universally usable)					
160 A	426705	CMS-200CA	2CCA880117R0001	0.026	1
80 A	426712	CMS-201CA	2CCA880118R0001	0.026	1
40 A	426729	CMS-202CA	2CCA880119R0001	0.026	1
Control units					
Control unit CMS-600	418700	CMS-600	2CCA880000R0001	0.153	1
Control unit CMS-700	453138	CMS-700	2CCA880700R0001	0.329	1

Accessories

Flat cable 2 m	419233	CMS-800	2CCA880148R0001	0.017	1
Flat cable 5 m	474225	CMS-802	2CCA880331R0001	0.045	1
Flat cable 10 m	475758	CMS-803	2CCA880332R0001	0.090	1
Flat cable 30 m	468880	CMS-805	2CCA880333R0001	0.270	1
Connector set (35 pcs.)	419240	CMS-820	2CCA880145R0001	0.024	35

Approvals according to IEC/EN 61439-6
Busbar system 125 A

Power bar system touch proof:
Use only for wall mounted application (horizontal or vertical). When installed correctly the requirements of EN/IEC 61439-2 are met.

Number of poles	max. 6 to 110 3p+N / 2 additional bars PE+N
Rated operational voltage (U_e)	690 VAC, 1000 VDC (400 VAC, 250 VDC when used for load-free snap on and off under power)
Rated insulation voltage (U_i)	690 VAC, 1000 VDC
IP Code	IP20B
Mounting position	horizontal or vertical, direct mounting or mounting on DIN rail acc. to EN 60715 35 mm
Pollution degree	3 (690 V a.c.) 2 (1000 V d.c.)
Rated impulse voltage (U_{imp})	8 kV (all cicuits)
Rated current of the assembly (I_nA)	Max. 100 A (side feeding), max. 125 A (max. 35 °C Ambient air temperature for 125 A continuously) Max. 200 A (center feeding) Max. 250 A (max. 35 °C Ambient air temperature for 250 A continuously)
Auxiliary circuit	max. 40 A
Rated current of a circuit (I_{nc})	Main circuit: Max. 125 A
Rated current of Auxiliary circuit	40 A
Rated short-time withstand current (I_{cw})	10 kA / 300 ms
Auxiliary circuit	4 kA / 50 ms
Rated peak withstand current (I_{pk})	Main circuit: 35 kA
Auxiliary circuit	6 kA
Rated diversity factor (RDF)	1
Rated frequency (f)	50/60 Hz
Rated conditional short-circuit current (I_{cc})	50 kA
Ambient air temperature	max. 60°C
Size of CU bars 3P+N+PE	3 x 10 mm (30 mm²)
Size of CU auxiliary bars La Lb	2 x 5 mm (10 mm²)

Rated conditional short-circuit current (I_{cc})	Incoming current of main busbars (L1, L2, L3, N)	Short circuit protection device (SCPD)	
		Fuse	MCCB
50 kA	250 A		ABB T_{max} 250 A
	200 A	NH1 gG 690 V/200 A	ABB T_{max} 250 A
	160 A	NH1 gG 690 V/160 A	ABB T_{max} 250 A
	63 A	NH00 gG 690 V/63 A	ABB Type S803S in combination with Type S803S-SCL63-SR
	Incoming current of auxiliary busbars (LA LB)		
	40 A	NH00 gG 690 V/40 A	ABB Type S800 with 240 V/415 V

Technical data IEC and technical data UL508A
Busbar system 125 A

	Maximum rated voltage	Maximum rated current	Cross-section of conductors
Incoming terminal block ZLS224/225/228/229	690 VAC 1000 VDC	160 A 3LN, 40 A LA, LB	6 mm²–50 mm², 2 x 25 mm² 3LN, 10 mm² LA, LB
Incoming terminal block ZLS250–253	690 VAC 1000 VDC	200 A	35 mm²–95 mm² max. 1 wire, 10–25 mm² 1 or 2 wires
Incoming terminal block ZLS260–262	690 VAC 1000 VDC	63 A 3LN, 6 A LA, LB	2 mm²–25 mm² 3LN, LA, LB max. 1 wire
Busbar ZLS200	690 VAC 1000 VDC	100 A	
Busbar ZLS202	690 VAC 600 VDC	40 A	
Universal adapters 32 A	690 VAC 600 VDC	32 A Line or neutral	
Universal adapters 63 A	690 VAC 600 VDC	63 A Line or neutral	
Combi module	690 VAC 600 VDC	32 A Line or neutral 6A LA, LB	
The SMISSLINE system and components are tested for vibration according to IEC 60068-2-6 (2–13.2 Hz/1 mm displacement, 13.2–100 Hz/0.7 g) and for Miniature circuit breakers (5 g, 20 frequency cycles 5 …150 … 5 Hz at 0.8 rated current)			
Governing standard: IEC 60068-2-6 Environmental testing – Part 2–6: Test Fc. Vibration (sinusoidal)			

SMISSLINE TP system for UL 508 – Industrial Control Equipment,
CSA C22.2 No. 14-13 – Industrial Control Equipment File 20170427-E22211

Technical data UL508 Industrial Control Equipment SMISSLINE TP busbar system
Rated Voltage: 600 V AC
Rated Current (End Feed, left and right): 125 A left, 125 A right
Rated Current (Center Feed): 250 A max. if used with two feeder blocks.
Short Circuit Ratings: 50 kA, max. 480 V AC and 480 Y/277 V and 240 V AC or 35 kA, max. 600 V AC and 600 Y/347 V

Technical data UL508 Industrial Control Equipment

	Busbar ZLS200	socket addtional socket	Feeder blockZLS22X, ZLS95X	Combimodule ZLS840X, 842X	Universal-adpter ZLS97X	Terminals ZLS95XUL, 91XUL	Combi modul ZMS132X	Adapter moter strater ZMS93X
Maximum nominal voltage	600 VAAC	600 VAAC	600 VAAC	600 VAAC	600 VAAC	600 VAAC	600 VAAC	600 VAAC
Maximum nominal current	125 A		125 A, 250 A	30 A	32 A, 63 A	32 A, 100 A, 150 A	32 A	32 A

Circuit breaker accessories UL489

	970UL, 971UL, 972UL or 973UL
Maximum nominal voltage	600 V
Maximum nominal current	25 A, 45 A

Starter pack Touch proof 3L
Busbar system 125 A

Starter Pack 3L: L1, L2, L3 inclusive socket end piece

Solutions available	Busbars length incl. Socket end piece mm	Busbars length mm	Type name	ABB IT number	EAN number 761 227	Pack-aging	Weight in grams
18 PLE 3L	364	320	ZLS905E18-3L	2CCA183232R0001	142 6514	1	530
20 PLE 3L	401	357	ZLS905E20-3L	2CCA183100R0001	141 3231	1	637
22 PLE 3L	437	393	ZLS905E22-3L	2CCA183102R0001	141 3255	1	693
24 PLE 3L	473	429	ZLS905E24-3L	2CCA183104R0001	141 3279	1	749
26 PLE 3L	509	465	ZLS905E26-3L	2CCA183106R0001	141 3293	1	813
28 PLE 3L	545	501	ZLS905E28-3L	2CCA183108R0001	141 3415	1	848
30 PLE 3L	581	537	ZLS905E30-3L	2CCA183110R0001	141 3439	1	933
32 PLE 3L	617	573	ZLS905E32-3L	2CCA183112R0001	141 3453	1	981
34 PLE 3L	653	609	ZLS905E34-3L	2CCA183114R0001	141 3477	1	1044
36 PLE 3L	689	645	ZLS905E36-3L	2CCA183116R0001	141 3491	1	1100
38 PLE 3L	725	681	ZLS905E38-3L	2CCA183118R0001	141 3514	1	1156
40 PLE 3L	761	717	ZLS905E40-3L	2CCA183120R0001	141 3538	1	1212
42 PLE 3L	797	753	ZLS905E42-3L	2CCA183122R0001	141 3552	1	1276
44 PLE 3L	833	789	ZLS905E44-3L	2CCA183124R0001	141 3576	1	1332
46 PLE 3L	869	825	ZLS905E46-3L	2CCA183126R0001	141 3590	1	1388
48 PLE 3L	905	861	ZLS905E48-3L	2CCA183128R0001	141 3613	1	1444
50 PLE 3L	941	897	ZLS905E50-3L	2CCA183130R0001	141 3637	1	1508
52 PLE 3L	977	933	ZLS905E52-3L	2CCA183132R0001	141 3651	1	1564
54 PLE 3L	1013	969	ZLS905E54-3L	2CCA183134R0001	141 3675	1	1620
56 PLE 3L	1049	1005	ZLS905E56-3L	2CCA183136R0001	141 3699	1	1675
58 PLE 3L	1058	1041	ZLS905E58-3L	2CCA183138R0001	141 3712	1	1739
60 PLE 3L	1122	1078	ZLS905E60-3L	2CCA183140R0001	141 3736	1	1795
62 PLE 3L	1158	1114	ZLS905E62-3L	2CCA183142R0001	141 3750	1	1851
64 PLE 3L	1194	1150	ZLS905E64-3L	2CCA183144R0001	141 3774	1	1907
66 PLE 3L	1230	1186	ZLS905E66-3L	2CCA183146R0001	141 3798	1	1971
68 PLE 3L	1266	1222	ZLS905E68-3L	2CCA183148R0001	141 3811	1	2027
70 PLE 3L	1302	1258	ZLS905E70-3L	2CCA183150R0001	141 3835	1	2083
72 PLE 3L	1338	1294	ZLS905E72-3L	2CCA183152R0001	141 3859	1	2139
74 PLE 3L	1374	1330	ZLS905E74-3L	2CCA183154R0001	141 3873	1	2203
76 PLE 3L	1410	1366	ZLS905E76-3L	2CCA183156R0001	141 3897	1	2269
78 PLE 3L	1446	1402	ZLS905E78-3L	2CCA183158R0001	141 3910	1	2314
80 PLE 3L	1482	1438	ZLS905E80-3L	2CCA183160R0001	141 3934	1	2370

Starter pack Touch proof 3LN
Busbar system 125 A

Starter Pack 3LN: L1, L2, L3, N inclusive socket end piece

Solutions available	Busbars length incl. Socket end piece mm	Busbars length mm	Type name	ABB IT number	EAN number 761 227	Pack-aging	Weight in grams
18 PLE 3LN	364	320	ZLS905E18-3LN	2CCA183234R0001	142 6521	1	615
20 PLE 3LN	401	357	ZLS905E20-3LN	2CCA183101R0001	141 3248	1	724
22 PLE 3LN	437	393	ZLS905E22-3LN	2CCA183103R0001	141 3262	1	789
24 PLE 3LN	473	429	ZLS905E24-3LN	2CCA183105R0001	141 3286	1	800
26 PLE 3LN	509	465	ZLS905E26-3LN	2CCA183107R0001	141 3408	1	926
28 PLE 3LN	545	501	ZLS905E28-3LN	2CCA183109R0001	141 3422	1	970
30 PLE 3LN	581	537	ZLS905E30-3LN	2CCA183111R0001	141 3446	1	1046
32 PLE 3LN	617	573	ZLS905E32-3LN	2CCA183113R0001	141 3460	1	1120
34 PLE 3LN	653	609	ZLS905E34-3LN	2CCA183115R0001	141 3484	1	1193
36 PLE 3LN	689	645	ZLS905E36-3LN	2CCA183117R0001	141 3507	1	1257
38 PLE 3LN	725	681	ZLS905E38-3LN	2CCA183119R0001	141 3521	1	1322
40 PLE 3LN	761	717	ZLS905E40-3LN	2CCA183121R0001	141 3545	1	1387
42 PLE 3LN	797	753	ZLS905E42-3LN	2CCA183123R0001	141 3569	1	1459
44 PLE 3LN	833	789	ZLS905E44-3LN	2CCA183125R0001	141 3583	1	1524
46 PLE 3LN	869	825	ZLS905E46-3LN	2CCA183127R0001	141 3606	1	1589
48 PLE 3LN	905	861	ZLS905E48-3LN	2CCA183129R0001	141 3620	1	1653
50 PLE 3LN	941	897	ZLS905E50-3LN	2CCA183131R0001	141 3644	1	1726
52 PLE 3LN	977	933	ZLS905E52-3LN	2CCA183133R0001	141 3668	1	1791
54 PLE 3LN	1013	969	ZLS905E54-3LN	2CCA183135R0001	141 3682	1	1855
56 PLE 3LN	1049	1005	ZLS905E56-3LN	2CCA183137R0001	141 3705	1	1920
58 PLE 3LN	1058	1041	ZLS905E58-3LN	2CCA183139R0001	141 3729	1	1992
60 PLE 3LN	1122	1078	ZLS905E60-3LN	2CCA183141R0001	141 3743	1	2057
62 PLE 3LN	1158	1114	ZLS905E62-3LN	2CCA183143R0001	141 3767	1	2122
64 PLE 3LN	1194	1150	ZLS905E64-3LN	2CCA183145R0001	141 3781	1	2186
66 PLE 3LN	1230	1186	ZLS905E66-3LN	2CCA183147R0001	141 3804	1	2259
68 PLE 3LN	1266	1222	ZLS905E68-3LN	2CCA183149R0001	141 3828	1	2324
70 PLE 3LN	1302	1258	ZLS905E70-3LN	2CCA183151R0001	141 3842	1	2388
72 PLE 3LN	1338	1294	ZLS905E72-3LN	2CCA183153R0001	141 3866	1	2453
74 PLE 3LN	1374	1330	ZLS905E74-3LN	2CCA183155R0001	141 3880	1	2526
76 PLE 3LN	1410	1366	ZLS905E76-3LN	2CCA183157R0001	141 3903	1	2590
78 PLE 3LN	1446	1402	ZLS905E78-3LN	2CCA183159R0001	141 3927	1	2655
80 PLE 3LN	1482	1438	ZLS905E80-3LN	2CCA183161R0001	141 3941	1	2719

Starter pack Touch proof 3L LA LB
Busbar system 125 A

Starter Pack 3LLALB: L1, L2, L3, LA, LB inclusive socket end piece

Solutions available	Busbars length incl. Socket end piece mm	Busbars length mm	Type name	ABB IT number	EAN number 761 227	Pack-aging	Weight in grams
18 PLE 3L LA LB	364	320	ZLS905E18-3LLALB	2CCA183233R0001	142 6538	1	586
20 PLE 3L LA LB	401	357	ZLS905E20-3LLALB	2CCA183162R0001	141 6904	1	753
22 PLE 3L LA LB	437	393	ZLS905E22-3LLALB	2CCA183164R0001	141 6911	1	821
24PLE 3L LA LB	473	429	ZLS905E24-3LLALB	2CCA183166R0001	141 6928	1	835
26PLE 3L LA LB	509	465	ZLS905E26-3LLALB	2CCA183168R0001	141 6935	1	964
28PLE 3L LA LB	545	501	ZLS905E28-3LLALB	2CCA183170R0001	141 6942	1	1011
30PLE 3L LA LB	581	537	ZLS905E30-3LLALB	2CCA183172R0001	141 6959	1	1107
32PLE 3L LA LB	617	573	ZLS905E32-3LLALB	2CCA183174R0001	141 6966	1	1167
34PLE 3L LA LB	653	609	ZLS905E34-3LLALB	2CCA183176R0001	141 6973	1	1242
36PLE 3L LA LB	689	645	ZLS905E36-3LLALB	2CCA183178R0001	141 6980	1	1310
38PLE 3L LA LB	725	681	ZLS905E38-3LLALB	2CCA183180R0001	141 6997	1	1377
40PLE 3L LA LB	761	717	ZLS905E40-3LLALB	2CCA183182R0001	141 7000	1	1445
42PLE 3L LA LB	797	753	ZLS905E42-3LLALB	2CCA183184R0001	141 7017	1	1520
44PLE 3L LA LB	833	789	ZLS905E44-3LLALB	2CCA183186R0001	141 7024	1	1588
46PLE 3L LA LB	869	825	ZLS905E46-3LLALB	2CCA183188R0001	141 7031	1	1656
48PLE 3L LA LB	905	861	ZLS905E48-3LLALB	2CCA183190R0001	141 7048	1	1723
50PLE 3L LA LB	941	897	ZLS905E50-3LLALB	2CCA183192R0001	141 7055	1	1799
52PLE 3L LA LB	977	933	ZLS905E52-3LLALB	2CCA183194R0001	141 7062	1	1866
54PLE 3L LA LB	1013	969	ZLS905E54-3LLALB	2CCA183196R0001	141 7079	1	1934
56PLE 3L LA LB	1049	1005	ZLS905E56-3LLALB	2CCA183198R0001	141 7086	1	2001
58PLE 3L LA LB	1058	1041	ZLS905E58-3LLALB	2CCA183200R0001	141 7093	1	2077
60PLE 3L LA LB	1122	1078	ZLS905E60-3LLALB	2CCA183202R0001	141 7109	1	2144
62PLE 3L LA LB	1158	1114	ZLS905E62-3LLALB	2CCA183204R0001	141 7116	1	2212
64PLE 3L LA LB	1194	1150	ZLS905E64-3LLALB	2CCA183206R0001	141 7123	1	2279
66PLE 3L LA LB	1230	1186	ZLS905E66-3LLALB	2CCA183208R0001	141 7130	1	2355
68PLE 3L LA LB	1266	1222	ZLS905E68-3LLALB	2CCA183210R0001	141 7147	1	2423
70 PLE 3L LA LB	1302	1258	ZLS905E70-3LLALB	2CCA183212R0001	141 7154	1	2490
72PLE 3L LA LB	1338	1294	ZLS905E72-3LLALB	2CCA183214R0001	141 7161	1	2558
74PLE 3L LA LB	1374	1330	ZLS905E74-3LLALB	2CCA183216R0001	141 7178	1	2633
76PLE 3L LA LB	1410	1366	ZLS905E76-3LLALB	2CCA183218R0001	141 7185	1	2701
78PLE 3L LA LB	1446	1402	ZLS905E78-3LLALB	2CCA183220R0001	141 7192	1	2768
80PLE 3L LA LB	1482	1438	ZLS905E80-3LLALB	2CCA183222R0001	141 7208	1	2836

Starter pack Touch proof 3LN LA LB
Busbar system 125 A

Starter Pack 3LNLALB: L1, L2, L3, N, LA, LB inclusive socket end piece

Solutions available	Busbars length incl. Socket end piece mm	Busbars length mm	Type name	ABB IT number	EAN number 761 227	Pack-aging	Weight in grams
18 PLE 3LN LA LB	364	320	ZLS905E18-3LNLALB	2CCA183235R0001	142 6545	1	671
20 PLE 3LN LA LB	401	357	ZLS905E20-3LNLALB	2CCA183163R0001	141 7215	1	841
22 PLE 3LN LA LB	437	393	ZLS905E22-3LNLALB	2CCA183165R0001	141 7222	1	917
24PLE 3LN LA LB	473	429	ZLS905E24-3LNLALB	2CCA183167R0001	141 7239	1	939
26PLE 3LN LA LB	509	465	ZLS905E26-3LNLALB	2CCA183169R0001	141 7246	1	1078
28PLE 3LN LA LB	545	501	ZLS905E28-3LNLALB	2CCA183171R0001	141 7253	1	1133
30PLE 3LN LA LB	581	537	ZLS905E30-3LNLALB	2CCA183173R0001	141 7260	1	1238
32PLE 3LN LA LB	617	573	ZLS905E32-3LNLALB	2CCA183175R0001	141 7277	1	1306
34PLE 3LN LA LB	653	609	ZLS905E34-3LNLALB	2CCA183177R0001	141 7284	1	1391
36PLE 3LN LA LB	689	645	ZLS905E36-3LNLALB	2CCA183179R0001	141 7291	1	1467
38PLE 3LN LA LB	725	681	ZLS905E38-3LNLALB	2CCA183181R0001	141 7307	1	1543
40PLE 3LN LA LB	761	717	ZLS905E40-3LNLALB	2CCA183183R0001	141 7314	1	1619
42PLE 3LN LA LB	797	753	ZLS905E42-3LNLALB	2CCA183185R0001	141 7321	1	1704
44PLE 3LN LA LB	833	789	ZLS905E44-3LNLALB	2CCA183187R0001	141 7338	1	1780
46PLE 3LN LA LB	869	825	ZLS905E46-3LNLALB	2CCA183189R0001	141 7345	1	1856
48PLE 3LN LA LB	905	861	ZLS905E48-3LNLALB	2CCA183191R0001	141 7352	1	1933
50PLE 3LN LA LB	941	897	ZLS905E50-3LNLALB	2CCA183193R0001	141 7369	1	2017
52PLE 3LN LA LB	977	933	ZLS905E52-3LNLALB	2CCA183195R0001	141 7376	1	2093
54PLE 3LN LA LB	1013	969	ZLS905E54-3LNLALB	2CCA183197R0001	141 7383	1	2169
56PLE 3LN LA LB	1049	1005	ZLS905E56-3LNLALB	2CCA183199R0001	141 7390	1	2246
58PLE 3LN LA LB	1058	1041	ZLS905E58-3LNLALB	2CCA183201R0001	141 7406	1	2330
60PLE 3LN LA LB	1122	1078	ZLS905E60-3LNLALB	2CCA183203R0001	141 7413	1	2406
62PLE 3LN LA LB	1158	1114	ZLS905E62-3LNLALB	2CCA183205R0001	141 7505	1	2482
64PLE 3LN LA LB	1194	1150	ZLS905E64-3LNLALB	2CCA183207R0001	141 9172	1	2559
66PLE 3LN LA LB	1230	1186	ZLS905E66-3LNLALB	2CCA183209R0001	141 7420	1	2643
68PLE 3LN LA LB	1266	1222	ZLS905E68-3LNLALB	2CCA183211R0001	141 7437	1	2719
70 PLE 3LN LA LB	1302	1258	ZLS905E70-3LNLALB	2CCA183213R0001	141 7444	1	2796
72PLE 3LN LA LB	1338	1294	ZLS905E72-3LNLALB	2CCA183215R0001	141 7451	1	2872
74PLE 3LN LA LB	1374	1330	ZLS905E74-3LNLALB	2CCA183217R0001	141 7468	1	2956
76PLE 3LN LA LB	1410	1366	ZLS905E76-3LNLALB	2CCA183219R0001	141 7475	1	3032
78PLE 3LN LA LB	1446	1402	ZLS905E78-3LNLALB	2CCA183221R0001	141 7482	1	3109
80PLE 3LN LA LB	1482	1438	ZLS905E80-3LNLALB	2CCA183223R0001	141 7499	1	3185

Sockets Touch proof
Busbar system 125 A

Socket base

	Description	Type name	ABB IT number	EAN number 761 227	Pack unit	Moduls (1 PLE 18mm)	Weight in grams
	8-module socket Length 144 mm (includes base and cover)	ZLS908	2CCA183030R0001	141 3965	10	8	92
	6-module socket Length 108 mm (includes base and cover)	ZLS906	2CCA183035R0001	141 3958	10	6	71

Busbars for the sockets

	Description	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
	100 A busbar plated, 10 x 3 mm, for L1, L2, L3, N and PE – Delivery length 1979 mm	ZLS200	2CCF002772R0001	001 5702	10	110	640
	40 A auxiliary busbar plated, 5 x 2 mm, for LA und LB – Delivery length 1979 mm	ZLS202	2CCF002773R0001	001 5719	10	110	240

Socket end piece

	Description	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module
	To prevent displacement of sockets and busbars	ZLS920	2CCA183017R0001	141 5617	1	2 pieces, left and right

Incoming terminal block and components

Incoming terminal block 18 mm, 63 A 2,5 mm² to 25 mm² max. 1 wire
1 contact above 1 contact bottom

		Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	L1, L3 63 A	ZLS260	2CCA205305R0001	011 1572	1	1	90
	L2, N 63 A	ZLS261	2CCA205306R0001	011 1589	1	1	90
	LA, LB 6 A	ZLS262	2CCA205307R0001	011 1596	1	1	90

Incoming terminal component 10 mm² to 95 mm²

	Version	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	Feeder component L1	ZLS251	2CCV672501R0001	050 5319	1	2	120
	Feeder component L2	ZLS252	2CCV672502R0001	050 5326	1	2	120
	Feeder component L3	ZLS253	2CCV672503R0001	050 5333	1	2	120
	Feeder component N	ZLS250	2CCV672500R0001	050 5340	1	2	120
	Feeder component N additional socket	ZLS954	2CCV672508R0001	142 4404	1	2	100
	Feeder component PE additional socket	ZLSP959	2CCV672509R0001	142 4411	1	2	100
	Feeder component N additional socket (2 holes)	ZLS954-1	2CCF183335R0001	145 2797	1	2	88

Incoming terminal blocks 6 mm² to 50 mm² (2 x 25 mm²) + 2 x 10 mm² (LA, LB)
Standard incoming terminal block, complete with main terminals and cover, construction height 50 mm

		Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
	50 mm² (2 x 25 mm²), 3LN left	ZLS224	2CCF015196R0001	001 9816	1	4	180
	50 mm² (2 x 25 mm²), 3LN right	ZLS224R	2CCA180152R0001	051 0726	1	4	180
	50 mm² (2 x 25 mm²) + 2 x 10 mm² 3LNAB (auxiliary busbars)	ZLS224LAB	2CCA180154R0001	005 4251	1	4	200
	50 mm² (2 x 25 mm²), 3L left	ZLS225	2CCF015197R0001	001 9823	1	4	150
	50 mm² (2 x 25 mm²), 3L right	ZLS225R	2CCA180153R0001	051 0733	1	4	150
	50 mm² (2 x 25 mm²) + 2 x 10 mm² 3LAB (auxiliary busbars)	ZLS225LAB	2CCA180155R0001	005 4220	1	4	170
	Cover for standard incoming terminal block						
		ZLS235	2CCA180069R0001	002 1543	1	4	37
	Additional parts for standard incoming terminal block						
	Auxiliary terminal max. 2 items 10 mm² (for auxiliary bus bars LA, LB)	ZLS233	2CCF002786R0001	001 9151	2	–	10
	N terminal for incom. term. block	ZLS232	2CCF002785R0001	001 9144			30
	Incoming terminal block, low, complete with main terminals, construction height 36 mm						
	50 mm² (2 x 25 mm²), 3LN	ZLS228	2CCF015200R0001	001 9854	1	4	180
	50 mm² (2 x 25 mm²), 3L	ZLS229	2CCF015201R0001	001 9861	1	4	150
	50 mm² (2 x 25 mm²), 3LN right	ZLS228R	2CCF180157R0001	146 5254	1	4	180
	50 mm² (2 x 25 mm²), 3L right	ZLS229R	2CCF180158R0001	146 5261	1	4	180

Socket accessories

Intermediate piece

		Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
	light grey, fills shock-proof empty module spaces 18 mm – bag containing 5 items	ZLS725	2CCS500900R0181	010 0989	1	1	100
	Compensation piece to 18 mm for NT 9 mm – bag containing 5 items	ZLS728	2CCS400900R0101	010 4710	1	1	70

Busbar insulator

	dark grey, 20 for isolation and spacing of separate busbar sections, 18 mm	ZLS938	2CCA205611R0001	141 8205	1	1	1

Busbar cover

	electrically protected covering of main and auxiliary busbars. The 4 modules cover can be divided. Suitable to accept extension adapter ZLS 101 4x18 mm – bag containing 5 items	ZLS100	2CCF002762R0001	001 5603	1	1	95

Add-on adapter

	18 mm wide, can be plugged on busbar cover ZLS100. To mount conventional DIN devices with 45 mm cap size. – bag containing 10 items	ZLS101	2CCF002763R0001	001 5610	10	1	2

Mounting rail adapter

	Height compensation 22.5 mm, to equalize the installation depth of standard DIN-rail mounted devices alongside the SMISSLINE plug-in system.	ZLS741	2CCA180081R0001	001 9632	10	1	3

Locking device

	Padlock adapter 3 mm – Bag containing 10 items	SA 1	GJF1101903R0001	010 4833	1	–	23
	Padlock	SA 2	GJF1101903R0002	010 4857	1	–	20

Universal adapters
IEC 32 A, 63 A, UL489 25 A, 45 A

Universal adapters 32 A and 63 A, Adapter for use EN/IEC 61439-6 or UL508

Designation	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
Adapter 32A						
L1 or L2 or L3 wire top	ZLS970	2CCA180551R0001	144 4563	10	1	20
L1 or L2 or L3 wire bottom	ZLS971	2CCA180552R0001	144 4570	10	1	20
N wire top	ZLS970N	2CCA180553R0001	144 4587	10	1	20
N wire bottom	ZLS971N	2CCA180554R0001	144 4570	10	1	20
Adapter 63A						
L1 or L2 or L3 wire top	ZLS972	2CCA180555R0001	144 4709	10	1	24
L1 or L2 or L3 wire bottom	ZLS973	2CCA180556R0001	144 4716	10	1	24
N wire top	ZLS972N	2CCA180557R0001	144 4723	10	1	24
N wire bottom	ZLS973N	2CCA180558R0001	144 4730	10	1	24
Adapter 32A with 300mm wire						
L1 or L2 or L3 wire top	ZLS970300	2CCA180559R0001	144 4747	10	1	26
L1 or L2 or L3 wire bottom	ZLS971300	2CCA180560R0001	144 4754	10	1	26
N wire top	ZLS970N300	2CCA180561R0001	144 4761	10	1	26
N wire bottom	ZLS971N300	2CCA180562R0001	144 4778	10	1	26
Adapter 63A with 300mm wire						
L1 or L2 or L3 wire top	ZLS972300	2CCA180563R0001	144 4785	10	1	37
L1 or L2 or L3 wire bottom	ZLS973300	2CCA180564R0001	144 4792	10	1	37
N wire top	ZLS972N300	2CCA180565R0001	144 4808	10	1	37
N wire bottom	ZLS973N300	2CCA180566R0001	144 4815	10	1	37

Universaldapter 25 A and 45 A for use UL489

Adapter 25A UL489, adapter can be only used together with ABB Pro M MCB S200 UL489						
L1 or L2 or L3 wire top	ZLS970UL	2CCA337020R0001	144 4822	10	1	21
L1 or L2 or L3 wire bottom	ZLS971UL	2CCA337021R0001	144 4839	10	1	21
Adapter 45A UL489, adapter can be only used together with ABB Pro M MCB S200 UL489						
L1 or L2 or L3 wire top	ZLS972UL	2CCA337024R0001	144 4860	10	1	25
L1 or L2 or L3 wire bottom	ZLS973UL	2CCA337025R0001	144 4877	10	1	25

Accessory

Dummy housing						
	ZLS964	2CCA180550R0001	144 4556	10	1	11
Connector for multi-pole adapter						
Bag with 30 pcs. 2 connectors are needed to connect 2 adapters	E210-SPV	2CCC703715R0001	141 4801	Set of 30 pcs.		50

Additonal socket touch proof
Busbar system 125 A

Additional socket
The additional socket can easily be fitted onto the socket base to accomodate the external N and/or PE busbars. This enables neutral connections to be made where single-pole miniature circuit breakers are used with unswitched neutral.

Neutral terminals are clipped onto the additional socket and can be used as detachable neutral connections. One N busbar and/or one PE busbar can be fitted. Each socket base can be equipped with an additional socket.

Additional socket for external N and PE busbars

	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
 – 8-module socket (suitable for 8-module socket)	ZLS928	2CCA183630R0001	142 0444	10	8	34
 – 6-module socket (suitable for 6-module socket)	ZLS926	2CCA183635R0001	142 0437	10	6	26

SMISSLINE TP
Terminal range IEC

N terminals and PE terminals
Corresponding N terminals (blue) or PE terminals (yellow-green) are available for the power supply and the outgoing conductors of the external N and PE busbars for cross sections. The terminals are fitted with label holders which can be used with the marking adapter or the marking label (Phoenix Contact type Clipline UC-TM).

Connection for the terminals

ZLS912, 915	0,75 mm² up to 10 mm² litz wire with ferrule 1 mm² up to 10 mm² strand 2 x 1,5 mm² or 2 x 2,5 mm² allowed, all other combinations it is only allowed with one wire
ZLS913, 929	16 mm² up to 35 mm² wire with ferrule, max. 1 wire
ZLS954, 959	50 mm² up to 95 mm² wire with ferrule, max. 1 wire

N terminal for additional socket light blue, for external busbars

	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
N 10 mm²	ZLS918	2CCA183440R0001	148 7027	10	0.5	11
N 35 mm²	ZLS913	2CCA183470R0001	142 1304	10	1	30
N 95 mm²	ZLS954	2CCV672508R0001	142 4404	1	2	100
N 95 mm² two holes	ZLS954-1	2CCF183335R0001	145 2797	1	2	100

PE terminal for additional socket yellow-green, for external busbars

PE 10 mm²	ZLS919	2CCA183441R0001	148 7041	10	0.5	11
PE 35 mm²	ZLS929	2CCA183387R0001	148 6921	10	1	30
PE 95 mm²	ZLS959	2CCA672510R0001	148 7164	1	2	100

Red/orange terminals for additional socket

10 mm²	ZLS918/Red	2CCA183443R0001	148 7089	10	0.5	11
10 mm²	ZLS919/Orange	2CCA183444R0001	148 7102	10	0.5	11
10 mm²	ZLS918/Black	2CCA183445R0001	148 7126	10	0.5	11
35 mm²	ZLS913/Red	2CCA183465R0001	142 1342	10	1	30
35 mm²	ZLS916/Orange	2CCA183466R0001	142 1366	10	1	30

Insulator block

The dark grey insulator block isolates the interrupted bus bar ends from one another and simultaneously marks the disconnection point externally.

Insulator block for additional socket

	Type name	ABB IT number	EAN number 761 227	Packaging unit	Module	Weight in grams
dark gray, to isolate the N bus bar on the additional socket	ZLS927	2CCA183442R0001	148 7065	10	0.5	9

SMISSLINE TP
Terminal range UL

Connection for the terminals

ZLS918UL, 919UL	0,75 mm² up to 10 mm² litz wire with ferrule 1 mm² up to 10 mm² strand 2 x 1,5 mm² or 2 x 2,5 mm² allowed, all other combinatins it is only allowed with one wire
ZLS913UL, 929UL	16 mm² up to 35 mm² wire with ferrule, max. 1 wire
ZLS954UL, 959UL	50 mm² up to 95 mm² wire with ferrule, max. 1 wire

N terminal for additional socket light blue, for external busbars

	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
						
N 10 mm²	ZLS918UL	2CCA183446R0001	149 3301	10	0.5	11
N 35 mm²	ZLS913UL	2CCA183398R0001	148 6945	10	1	30
N 95 mm²	ZLS954UL	2CCA672511R0001	148 7188	1	2	88

PE terminal for additional socket yellow-green, for external busbars

	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
						
PE 10 mm²	ZLS919UL	2CCA183447R0001	148 7140	10	0.5	11
PE 35 mm²	ZLS929UL	2CCA183399R0001	148 6969	10	1	30
PE 95 mm²	ZLS959UL	2CCA672512R0001	148 7201	1	2	88

Insulator block

The dark grey insulator block isolates the interrupted bus bar ends from one another and simultaneously marks the disconnection point externally.

Insulator block for additional socket

	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
						
dark gray, to isolate the N bus bar on the additional socket	ZLS927	2CCA183442R0001	148 7065	10	0.5	9

Busbars 40 A and 125 A

40 A and 125 A busbars / selection table for sockets

Order data busbar 125 A	ABB IT number	EAN number 761 227	ZLS908	ZLS906	Module	Length incl. end piece	Busbar length in mm	Order date busbar 40 A	ABB IT number	EAN number 761 227
ZLS201E6	2CCF800158R0001	001 6778	–	1	6	148	103	ZLS203E6	2CCF800218R0001	001 7966
ZLS201E8	2CCF800159R0001	001 6983	1	–	8	186	139	ZLS203E8	2CCF800219R0001	001 8178
ZLS201E12	2CCF800160R0001	001 6211	–	2	12	256	211	ZLS203E12	2CCF800220R0001	001 7409
ZLS201E14	2CCF800161R0001	001 6310	1	1	14	292	247	ZLS203E14	2CCF800221R0001	001 7508
ZLS201E16	2CCF800162R0001	001 6334	2	–	16	328	283	ZLS203E16	2CCF800222R0001	001 7522
ZLS201E18	2CCF800163R0001	001 6358	–	3	18	364	319	ZLS203E18	2CCF800223R0001	001 7546
ZLS201E20	2CCF800164R0001	001 6372	1	2	20	401	355	ZLS203E20	2CCF800224R0001	001 7560
ZLS201E22	2CCF800165R0001	001 6396	2	1	22	437	391	ZLS203E22	2CCF800225R0001	001 7584
ZLS201E24	2CCF800666R0001	001 6419	3	–	24	473	427	ZLS203E24	2CCF800226R0001	001 7607
ZLS201E26	2CCF800167R0001	001 6433	1	3	26	509	463	ZLS203E26	2CCF800227R0001	001 7621
ZLS201E28	2CCF800168R0001	001 6457	2	2	28	545	499	ZLS203E28	2CCF800228R0001	001 7645
ZLS201E30	2CCF800169R0001	001 6471	3	1	30	581	535	ZLS203E30	2CCF800229R0001	001 7669
ZLS201E32	2CCF800170R0001	001 6495	4	–	32	617	571	ZLS203E32	2CCF800230R0001	001 7683
ZLS201E34	2CCF800171R0001	001 6518	2	3	34	653	607	ZLS203E34	2CCF800231R0001	001 7706
ZLS201E36	2CCF800172R0001	001 6532	3	2	36	689	643	ZLS203E36	2CCF800232R0001	001 7720
ZLS201E38	2CCF800173R0001	001 6556	4	1	38	725	679	ZLS203E38	2CCF800233R0001	001 7744
ZLS201E40	2CCF800174R0001	001 6570	5	–	40	761	715	ZLS203E40	2CCF800234R0001	001 7768
ZLS201E42	2CCF800175R0001	001 6594	3	3	42	797	751	ZLS203E42	2CCF800235R0001	001 7782
ZLS201E44	2CCF800176R0001	001 6617	4	2	44	833	787	ZLS203E44	2CCF800236R0001	001 7805
ZLS201E46	2CCF800177R0001	001 6631	5	1	46	869	823	ZLS203E46	2CCF800237R0001	001 7829
ZLS201E48	2CCF800178R0001	001 6655	6	–	48	905	859	ZLS203E48	2CCF800238R0001	001 7843
ZLS201E50	2CCF800179R0001	001 6679	4	3	50	941	895	ZLS203E50	2CCF800239R0001	001 7867
ZLS201E52	2CCF800180R0001	001 6693	5	2	52	977	932	ZLS203E52	2CCF800240R0001	001 7881
ZLS201E54	2CCF800181R0001	001 6716	6	1	54	1013	968	ZLS203E54	2CCF800241R0001	001 7904
ZLS201E56	2CCF800182R0001	001 6730	7	–	56	1049	1004	ZLS203E56	2CCF800242R0001	001 7928
ZLS201E58	2CCF800183R0001	001 6754	5	3	58	1085	1040	ZLS203E58	2CCF800243R0001	001 7942
ZLS201E60	2CCF800184R0001	001 6785	6	2	60	1122	1076	ZLS203E60	2CCF800244R0001	001 7973
ZLS201E62	2CCF800185R0001	001 6808	7	1	62	1158	1112	ZLS203E62	2CCF800245R0001	001 7997
ZLS201E64	2CCF800186R0001	001 6822	8	–	64	1194	1148	ZLS203E64	2CCF800246R0001	001 8017
ZLS201E66	2CCF800187R0001	001 6846	6	3	66	1230	1184	ZLS203E66	2CCF800247R0001	001 8031
ZLS201E68	2CCF800188R0001	001 6860	7	2	68	1266	1220	ZLS203E68	2CCF800248R0001	001 8055
ZLS201E70	2CCF800189R0001	001 6884	8	1	70	1302	1256	ZLS203E70	2CCF800249R0001	001 8079
ZLS201E72	2CCF800190R0001	001 6907	9	–	72	1338	1292	ZLS203E72	2CCF800250R0001	001 8093
ZLS201E74	2CCF800191R0001	001 6921	7	3	74	1374	1328	ZLS203E74	2CCF800251R0001	001 8116
ZLS201E76	2CCF800192R0001	001 6945	8	2	76	1410	1364	ZLS203E76	2CCF800252R0001	001 8130
ZLS201E78	2CCF800193R0001	001 6969	9	1	78	1446	1400	ZLS203E78	2CCF800253R0001	001 8154
ZLS201E80	2CCF800194R0001	001 6990	10	–	80	1482	1436	ZLS203E80	2CCF800254R0001	001 8185
ZLS201E82	2CCF800195R0001	001 7010	8	3	82	1518	1472	ZLS203E82	2CCF800255R0001	001 8208
ZLS201E84	2CCF800196R0001	001 7034	9	2	84	1554	1508	ZLS203E84	2CCF800256R0001	001 8222
ZLS201E86	2CCF800197R0001	001 7058	10	1	86	1590	1544	ZLS203E86	2CCF800257R0001	001 8246
ZLS201E88	2CCF800198R0001	001 7072	11	–	88	1626	1580	ZLS203E88	2CCF800258R0001	001 8260
ZLS201E90	2CCF800199R0001	001 7096	9	3	90	1662	1616	ZLS203E90	2CCF800259R0001	001 8284
ZLS201E92	2CCF800200R0001	001 7119	10	2	92	1698	1652	ZLS203E92	2CCF800260R0001	001 8307
ZLS201E94	2CCF800201R0001	001 7133	11	1	94	1734	1688	ZLS203E94	2CCF800261R0001	001 8321
ZLS201E96	2CCF800202R0001	001 7157	12	–	96	1770	1724	ZLS203E96	2CCF800262R0001	001 8345
ZLS201E98	2CCF800203R0001	001 7171	10	3	98	1806	1760	ZLS203E98	2CCF800263R0001	001 8369
ZLS201E100	2CCF800204R0001	001 6006	11	2	100	1843	1796	ZLS203E100	2CCF800264R0001	001 7195
ZLS201E102	2CCF800205R0001	001 6020	12	1	102	1879	1832	ZLS203E102	2CCF800265R0001	001 7218
ZLS201E104	2CCF800206R0001	001 6044	13	–	104	1915	1868	ZLS203E104	2CCF800266R0001	001 7232
ZLS201E106	2CCF800207R0001	001 6068	11	3	106	1951	1904	ZLS203E106	2CCF800267R0001	001 7256
ZLS201E108	2CCF800208R0001	001 6082	12	2	108	1987	1940	ZLS203E108	2CCF800268R0001	001 7270

Planning for the incorporation of feeder block and spare places should be taken into account.
The total lengths given above were calculated taking socket spacings and tolerances into account.
For this reason, the indicated busbar length is not necessarily a multiple of 18 mm (1 Module).

Technical data according to IEC/EN 61439-6
Power Bar System 250 A

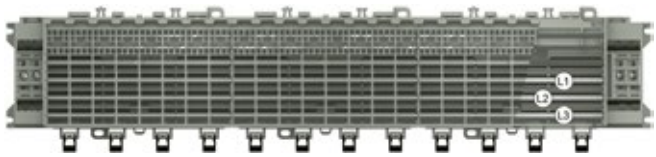
Busbar system touch proof:

Use only for wall mounted application (horizontal or vertical). When installed correctly the requirements of EN/IEC 61439-2 are met.

Number of poles:	max. 6 to 110 3p+N / 2 additional bars PE+N
Rated operational voltage (U_e):	690 VAC, 1000 VDC (400 VAC, 250 VDC when used for load-free snap on and off under power)
Rated insulation voltage (U_i) Main circuit:	690 VAC, 1000 VDC
Rated insulation voltage (U_i) Auxilary circuit:	415 VAC
IP Code:	IP20B
Mounting position:	horizontal or vertical, direct mounting or mounting on DIN rail acc. to EN 60715 35 mm
Pollution degree:	3 (690 V a.c.) 2 (1000 V d.c.)
Rated impulse voltage (U_{imp}):	8 kV mainbusbars; 6 KV auxillary busbars
Rated current of the assembly (I_nA) :	max. 250 A side feeding; max. 400A double side feed, or double center feed
Auxiliary circuit:	max. 40 A
Rated current of a circuit (I_{nc}) :	Main circuit: Max. 100 A
Rated current of Auxiliary circuit:	40 A
Rated short-time withstand current (I_{cw}):	15 kA/100 ms System on Din rail 1979 mm long 17 kA/100 mS System screwed on plate 1400 mm long
Auxiliary circuit:	4 kA / 50 ms
Rated peak withstand current Main circuit (I_{pk}):	Main circuit: 30 kA
Rated peak withstand current Auxilary circuit (I_{pk}):	6 kA
Rated frequency (f):	50/60 Hz
Rated conditional short-circuit current (I_{cc}):	see table below
Ambient air temperature:	max. 60°C
Size of CU bars 3P+N+PE:	3 x 25 mm (75 mm²)
Size of CU auxiliary bars La Lb:	2 x 5 mm (10 mm²)

Rated conditional short-circuit current (I_{cc}) at 415 VAC	Incoming current of main busbars (L1, L2, L3, N)	Short circuit protection device (SCPD)	
		Fuse	MCCB
40 kA	400 A	NH3 gG 690 V/400 A	ABB T_{max} 400 A
100 kA	250 A	NH2 gG 690 V/250 A	ABB T_{max} T/XT 250 A
	Incoming current of auxiliary busbars (LA LB)		
	40 A	NH00 gG 500 V/40 A	ABB Type S800 in combination with (240 V/415 VAC)

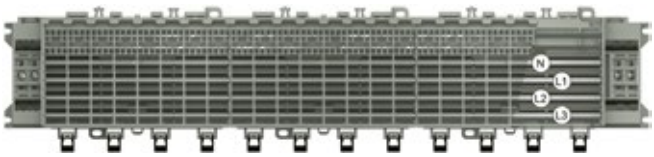
Starter 3L
Power Bar System 250 A



Starter Pack 3L: L1, L2, L3 included socket end piece

Solutions available	Type name	ABB IT number	EAN number 761 227	Pack unit	Moduls (1 PLE 18mm)	Weight in grams
Starter Pack 3L PLE 30	ZLSP950E30-3L	2CCF212200A0001	148 8246	1	30PLE-3L	1755
Starter Pack 3L PLE 32	ZLSP950E32-3L	2CCF212201A0001	148 8260	1	32PLE-3L	1863
Starter Pack 3L PLE 34	ZLSP950E34-3L	2CCF212202A0001	148 8284	1	34PLE-3L	1981
Starter Pack 3L PLE 36	ZLSP950E36-3L	2CCF212203A0001	148 8307	1	36PLE-3L	2088
Starter Pack 3L PLE 38	ZLSP950E38-3L	2CCF212204A0001	148 8321	1	38PLE-3L	2195
Starter Pack 3L PLE 40	ZLSP950E40-3L	2CCF212205A0001	148 8345	1	40PLE-3L	2303
Starter Pack 3L PLE 42	ZLSP950E42-3L	2CCF212206A0001	148 8369	1	42PLE-3L	2421
Starter Pack 3L PLE 44	ZLSP950E44-3L	2CCF212207A0001	148 8383	1	44PLE-3L	2528
Starter Pack 3L PLE 46	ZLSP950E46-3L	2CCF212208A0001	148 8406	1	46PLE-3L	2635
Starter Pack 3L PLE 48	ZLSP950E48-3L	2CCF212209A0001	148 8420	1	48PLE-3L	2742
Starter Pack 3L PLE 50	ZLSP950E50-3L	2CCF212210A0001	148 8444	1	50PLE-3L	2861
Starter Pack 3L PLE 52	ZLSP950E52-3L	2CCF212211A0001	148 8468	1	52PLE-3L	2968
Starter Pack 3L PLE 54	ZLSP950E54-3L	2CCF212212A0001	148 8482	1	54PLE-3L	3075
Starter Pack 3L PLE 56	ZLSP950E56-3L	2CCF212213A0001	148 8505	1	56PLE-3L	3182
Starter Pack 3L PLE 58	ZLSP950E58-3L	2CCF212214A0001	148 8529	1	58PLE-3L	3301
Starter Pack 3L PLE 60	ZLSP950E60-3L	2CCF212215A0001	148 8543	1	60PLE-3L	3408
Starter Pack 3L PLE 62	ZLSP950E62-3L	2CCF212216A0001	148 8567	1	62PLE-3L	3515
Starter Pack 3L PLE 64	ZLSP950E64-3L	2CCF212217A0001	148 8581	1	64PLE-3L	3622
Starter Pack 3L PLE 66	ZLSP950E66-3L	2CCF212218A0001	148 8604	1	66PLE-3L	3741
Starter Pack 3L PLE 68	ZLSP950E68-3L	2CCF212219A0001	148 8628	1	68PLE-3L	3848
Starter Pack 3L PLE 70	ZLSP950E70-3L	2CCF212220A0001	148 8642	1	70PLE-3L	3955
Starter Pack 3L PLE 72	ZLSP950E72-3L	2CCF212221A0001	148 8666	1	72PLE-3L	4062
Starter Pack 3L PLE 74	ZLSP950E74-3L	2CCF212222A0001	148 8680	1	74PLE-3L	4180
Starter Pack 3L PLE 76	ZLSP950E76-3L	2CCF212223A0001	148 8703	1	76PLE-3L	4288
Starter Pack 3L PLE 78	ZLSP950E78-3L	2CCF212224A0001	148 8727	1	78PLE-3L	4395
Starter Pack 3L PLE 80	ZLSP950E80-3L	2CCF212225A0001	148 8741	1	80PLE-3L	4502
Starter Pack 3L PLE 82	ZLSP950E82-3L	2CCF212226A0001	148 8765	1	82PLE-3L	4620
Starter Pack 3L PLE 84	ZLSP950E84-3L	2CCF212227A0001	148 8789	1	84PLE-3L	4728
Starter Pack 3L PLE 86	ZLSP950E86-3L	2CCF212228A0001	148 8802	1	86PLE-3L	4835
Starter Pack 3L PLE 88	ZLSP950E88-3L	2CCF212229A0001	148 8826	1	88PLE-3L	4942
Starter Pack 3L PLE 90	ZLSP950E90-3L	2CCF212230A0001	148 8840	1	90PLE-3L	5060
Starter Pack 3L PLE 92	ZLSP950E92-3L	2CCF212231A0001	148 8864	1	92PLE-3L	5167
Starter Pack 3L PLE 94	ZLSP950E94-3L	2CCF212232A0001	148 8888	1	94PLE-3L	5275
Starter Pack 3L PLE 96	ZLSP950E96-3L	2CCF212233A0001	148 8901	1	96PLE-3L	5382
Starter Pack 3L PLE 98	ZLSP950E98-3L	2CCF212234A0001	148 8925	1	98PLE-3L	5500
Starter Pack 3L PLE 100	ZLSP950E100-3L	2CCF212235A0001	148 8949	1	100PLE-3L	5607
Starter Pack 3L PLE 102	ZLSP950E102-3L	2CCF212236A0001	148 8963	1	102PLE-3L	5715
Starter Pack 3L PLE 104	ZLSP950E104-3L	2CCF212237A0001	148 8987	1	104PLE-3L	5822
Starter Pack 3L PLE 106	ZLSP950E106-3L	2CCF212238A0001	148 9007	1	106PLE-3L	5940
Starter Pack 3L PLE 108	ZLSP950E108-3L	2CCF212239A0001	148 9021	1	108PLE-3L	6047
Starter Pack 3L PLE 110	ZLSP950E110-3L	2CCF212240A0001	148 9045	1	110PLE-3L	6121

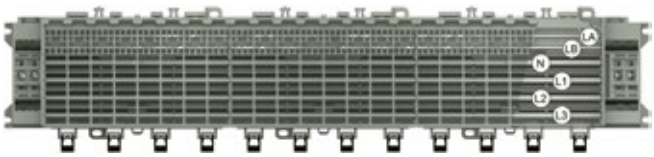
Starter 3LN
Power Bar System 250 A



Starter Pack 3L: L1, L2, L3 included socket end piece

Solutions available	Type name	ABB IT number	EAN number 761 227	Pack unit	Moduls (1 PLE 18mm)	Weight in grams
Starter Pack 3LN PLE 30	ZLSP950E30-3LN	2CCF212300A0001	148 9069	1	30PLE-3LN	2122
Starter Pack 3LN PLE 32	ZLSP950E32-3LN	2CCF212301A0001	148 9083	1	32PLE-3LN	2253
Starter Pack 3LN PLE 34	ZLSP950E34-3LN	2CCF212302A0001	148 9106	1	34PLE-3LN	2396
Starter Pack 3LN PLE 36	ZLSP950E36-3LN	2CCF212303A0001	148 9120	1	36PLE-3LN	2527
Starter Pack 3LN PLE 38	ZLSP950E38-3LN	2CCF212304A0001	148 9144	1	38PLE-3LN	2659
Starter Pack 3LN PLE 40	ZLSP950E40-3LN	2CCF212305A0001	148 9168	1	40PLE-3LN	2791
Starter Pack 3LN PLE 42	ZLSP950E42-3LN	2CCF212306A0001	148 9182	1	42PLE-3LN	2933
Starter Pack 3LN PLE 44	ZLSP950E44-3LN	2CCF212307A0001	148 9205	1	44PLE-3LN	3065
Starter Pack 3LN PLE 46	ZLSP950E46-3LN	2CCF212308A0001	148 9229	1	46PLE-3LN	3197
Starter Pack 3LN PLE 48	ZLSP950E48-3LN	2CCF212309A0001	148 9243	1	48PLE-3LN	3328
Starter Pack 3LN PLE 50	ZLSP950E50-3LN	2CCF212310A0001	148 9267	1	50PLE-3LN	3471
Starter Pack 3LN PLE 52	ZLSP950E52-3LN	2CCF212311A0001	148 9281	1	52PLE-3LN	3603
Starter Pack 3LN PLE 54	ZLSP950E54-3LN	2CCF212312A0001	148 9304	1	54PLE-3LN	3734
Starter Pack 3LN PLE 56	ZLSP950E56-3LN	2CCF212313A0001	148 9328	1	56PLE-3LN	3866
Starter Pack 3LN PLE 58	ZLSP950E58-3LN	2CCF212314A0001	148 9342	1	58PLE-3LN	4008
Starter Pack 3LN PLE 60	ZLSP950E60-3LN	2CCF212315A0001	148 9366	1	60PLE-3LN	4140
Starter Pack 3LN PLE 62	ZLSP950E62-3LN	2CCF212316A0001	148 9380	1	62PLE-3LN	4272
Starter Pack 3LN PLE 64	ZLSP950E64-3LN	2CCF212317A0001	148 9403	1	64PLE-3LN	4403
Starter Pack 3LN PLE 66	ZLSP950E66-3LN	2CCF212318A0001	148 9427	1	66PLE-3LN	4546
Starter Pack 3LN PLE 68	ZLSP950E68-3LN	2CCF212319A0001	148 9441	1	68PLE-3LN	4678
Starter Pack 3LN PLE 70	ZLSP950E70-3LN	2CCF212320A0001	148 9465	1	70PLE-3LN	4809
Starter Pack 3LN PLE 72	ZLSP950E72-3LN	2CCF212321A0001	148 9489	1	72PLE-3LN	4941
Starter Pack 3LN PLE 74	ZLSP950E74-3LN	2CCF212322A0001	148 9502	1	74PLE-3LN	5084
Starter Pack 3LN PLE 76	ZLSP950E76-3LN	2CCF212323A0001	148 9526	1	76PLE-3LN	5215
Starter Pack 3LN PLE 78	ZLSP950E78-3LN	2CCF212324A0001	148 9540	1	78PLE-3LN	5347
Starter Pack 3LN PLE 80	ZLSP950E80-3LN	2CCF212325A0001	148 9564	1	80PLE-3LN	5478
Starter Pack 3LN PLE 82	ZLSP950E82-3LN	2CCF212326A0001	148 9588	1	82PLE-3LN	5621
Starter Pack 3LN PLE 84	ZLSP950E84-3LN	2CCF212327A0001	148 9601	1	84PLE-3LN	5753
Starter Pack 3LN PLE 86	ZLSP950E86-3LN	2CCF212328A0001	148 9625	1	86PLE-3LN	5884
Starter Pack 3LN PLE 88	ZLSP950E88-3LN	2CCF212329A0001	148 9649	1	88PLE-3LN	6016
Starter Pack 3LN PLE 90	ZLSP950E90-3LN	2CCF212330A0001	148 9663	1	90PLE-3LN	6159
Starter Pack 3LN PLE 92	ZLSP950E92-3LN	2CCF212331A0001	148 9687	1	92PLE-3LN	6290
Starter Pack 3LN PLE 94	ZLSP950E94-3LN	2CCF212332A0001	148 9700	1	94PLE-3LN	6422
Starter Pack 3LN PLE 96	ZLSP950E96-3LN	2CCF212333A0001	148 9724	1	96PLE-3LN	6554
Starter Pack 3LN PLE 98	ZLSP950E98-3LN	2CCF212334A0001	148 9748	1	98PLE-3LN	6696
Starter Pack 3LN PLE 100	ZLSP950E100-3LN	2CCF212335A0001	148 9762	1	100PLE-3LN	6828
Starter Pack 3LN PLE 102	ZLSP950E102-3LN	2CCF212336A0001	148 9786	1	102PLE-3LN	6959
Starter Pack 3LN PLE 104	ZLSP950E104-3LN	2CCF212337A0001	148 9809	1	104PLE-3LN	7091
Starter Pack 3LN PLE 106	ZLSP950E106-3LN	2CCF212338A0001	148 9823	1	106PLE-3LN	7234
Starter Pack 3LN PLE 108	ZLSP950E108-3LN	2CCF212339A0001	148 9847	1	108PLE-3LN	7365
Starter Pack 3LN PLE 110	ZLSP950E110-3LN	2CCF212340A0001	148 9861	1	110PLE-3LN	7463

Starter 3LN LA LB
Power Bar System 250 A



Starter Pack 3L: L1, L2, L3 included socket end piece

Solutions available	Type name	ABB IT number	EAN number 761 227	Pack unit	Moduls (1 PLE 18mm)	Weight in grams
Starter Pack 3LN LA LB PLE 30	ZLSP950E30-3LNLALB	2CCF212400A0001	148 9885	1	30PLE-3LNLALB	2480
Starter Pack 3LN LA LB PLE 32	ZLSP950E32-3LNLALB	2CCF212401A0001	148 9908	1	32PLE-3LNLALB	2611
Starter Pack 3LN LA LB PLE 34	ZLSP950E34-3LNLALB	2CCF212402A0001	148 9922	1	34PLE-3LNLALB	2754
Starter Pack 3LN LA LB PLE 36	ZLSP950E36-3LNLALB	2CCF212403A0001	148 9946	1	36PLE-3LNLALB	2885
Starter Pack 3LN LA LB PLE 38	ZLSP950E38-3LNLALB	2CCF212404A0001	148 9960	1	38PLE-3LNLALB	3017
Starter Pack 3LN LA LB PLE 40	ZLSP950E40-3LNLALB	2CCF212405A0001	148 9984	1	40PLE-3LNLALB	3149
Starter Pack 3LN LA LB PLE 42	ZLSP950E42-3LNLALB	2CCF212406A0001	149 0003	1	42PLE-3LNLALB	3291
Starter Pack 3LN LA LB PLE 44	ZLSP950E44-3LNLALB	2CCF212407A0001	149 0027	1	44PLE-3LNLALB	3423
Starter Pack 3LN LA LB PLE 46	ZLSP950E46-3LNLALB	2CCF212408A0001	149 0041	1	46PLE-3LNLALB	3555
Starter Pack 3LN LA LB PLE 48	ZLSP950E48-3LNLALB	2CCF212409A0001	149 0065	1	48PLE-3LNLALB	3686
Starter Pack 3LN LA LB PLE 50	ZLSP950E50-3LNLALB	2CCF212410A0001	149 0089	1	50PLE-3LNLALB	3829
Starter Pack 3LN LA LB PLE 52	ZLSP950E52-3LNLALB	2CCF212411A0001	149 0102	1	52PLE-3LNLALB	3961
Starter Pack 3LN LA LB PLE 54	ZLSP950E54-3LNLALB	2CCF212412A0001	149 0126	1	54PLE-3LNLALB	4092
Starter Pack 3LN LA LB PLE 56	ZLSP950E56-3LNLALB	2CCF212413A0001	149 0140	1	56PLE-3LNLALB	4224
Starter Pack 3LN LA LB PLE 58	ZLSP950E58-3LNLALB	2CCF212414A0001	149 0164	1	58PLE-3LNLALB	4366
Starter Pack 3LN LA LB PLE 60	ZLSP950E60-3LNLALB	2CCF212415A0001	149 0188	1	60PLE-3LNLALB	4498
Starter Pack 3LN LA LB PLE 62	ZLSP950E62-3LNLALB	2CCF212416A0001	149 0201	1	62PLE-3LNLALB	4630
Starter Pack 3LN LA LB PLE 64	ZLSP950E64-3LNLALB	2CCF212417A0001	149 0225	1	64PLE-3LNLALB	4761
Starter Pack 3LN LA LB PLE 66	ZLSP950E66-3LNLALB	2CCF212418A0001	149 0249	1	66PLE-3LNLALB	4904
Starter Pack 3LN LA LB PLE 68	ZLSP950E68-3LNLALB	2CCF212419A0001	149 0263	1	68PLE-3LNLALB	5036
Starter Pack 3LN LA LB PLE 70	ZLSP950E70-3LNLALB	2CCF212420A0001	149 0287	1	70PLE-3LNLALB	5167
Starter Pack 3LN LA LB PLE 72	ZLSP950E72-3LNLALB	2CCF212421A0001	149 0300	1	72PLE-3LNLALB	5299
Starter Pack 3LN LA LB PLE 74	ZLSP950E74-3LNLALB	2CCF212422A0001	149 0324	1	74PLE-3LNLALB	5442
Starter Pack 3LN LA LB PLE 76	ZLSP950E76-3LNLALB	2CCF212423A0001	149 0348	1	76PLE-3LNLALB	5573
Starter Pack 3LN LA LB PLE 78	ZLSP950E78-3LNLALB	2CCF212424A0001	149 0362	1	78PLE-3LNLALB	5705
Starter Pack 3LN LA LB PLE 80	ZLSP950E80-3LNLALB	2CCF212425A0001	149 0386	1	80PLE-3LNLALB	5836
Starter Pack 3LN LA LB PLE 82	ZLSP950E82-3LNLALB	2CCF212426A0001	149 0409	1	82PLE-3LNLALB	5979
Starter Pack 3LN LA LB PLE 84	ZLSP950E84-3LNLALB	2CCF212427A0001	149 0423	1	84PLE-3LNLALB	6111
Starter Pack 3LN LA LB PLE 86	ZLSP950E86-3LNLALB	2CCF212428A0001	149 0447	1	86PLE-3LNLALB	6242
Starter Pack 3LN LA LB PLE 88	ZLSP950E88-3LNLALB	2CCF212429A0001	149 0461	1	88PLE-3LNLALB	6374
Starter Pack 3LN LA LB PLE 90	ZLSP950E90-3LNLALB	2CCF212430A0001	149 0485	1	90PLE-3LNLALB	6517
Starter Pack 3LN LA LB PLE 92	ZLSP950E92-3LNLALB	2CCF212431A0001	149 0508	1	92PLE-3LNLALB	6648
Starter Pack 3LN LA LB PLE 94	ZLSP950E94-3LNLALB	2CCF212432A0001	149 0522	1	94PLE-3LNLALB	6780
Starter Pack 3LN LA LB PLE 96	ZLSP950E96-3LNLALB	2CCF212433A0001	149 0546	1	96PLE-3LNLALB	6912
Starter Pack 3LN LA LB PLE 98	ZLSP950E98-3LNLALB	2CCF212434A0001	149 0560	1	98PLE-3LNLALB	7054
Starter Pack 3LN LA LB PLE 100	ZLSP950E100-3LNLALB	2CCF212435A0001	149 0584	1	100PLE-3LNLALB	7186
Starter Pack 3LN LA LB PLE 102	ZLSP950E102-3LNLALB	2CCF212436A0001	149 0607	1	102PLE-3LNLALB	7317
Starter Pack 3LN LA LB PLE 104	ZLSP950E104-3LNLALB	2CCF212437A0001	149 0621	1	104PLE-3LNLALB	7449
Starter Pack 3LN LA LB PLE 106	ZLSP950E106-3LNLALB	2CCF212438A0001	149 0645	1	106PLE-3LNLALB	7592
Starter Pack 3LN LA LB PLE 108	ZLSP950E108-3LNLALB	2CCF212439A0001	149 0669	1	108PLE-3LNLALB	7723
Starter Pack 3LN LA LB PLE 110	ZLSP950E110-3LNLALB	2CCF212440A0001	149 0683	1	110PLE-3LNLALB	7821

Sockets and Incoming components
Power Bar System 250 A

Socket base

Description	Type name	ABB IT number	EAN number 761 227	Pack unit	Moduls (1 PLE 18mm)	Weight in grams
6-module socket Length 108 mm (includes base and cover)	ZLSP906	2CCF212053A0001	148 7324	10	6	113
8-module socket Length 144 mm (includes base and cover)	ZLSP908	2CCF212052A0001	148 7300	10	8	147

Busbars for the sockets

Description	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
250 A busbar plated, 25 x 3 mm, for L1, L2, L3, N and PE – Delivery length 1979 mm	ZLSP1250	2CCF212100M0110	148 8222	1	110	1343
40 A auxiliary busbar plated, 5 x 2 mm, for LA und LB – Delivery length 1979 mm	ZLS202	2CCF002773R0001	001 5719	10	110	240

Socket end piece

Description	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
To prevent displacement of main sockets and busbars for the main socket	ZLSP920	2CCF212082A0001	148 7386	1	2	103
To prevent displacement of addtional sockets and busbars addtional socket	ZLSP921	2CCF212085A0001	148 7409	1	2	54

Incoming terminal component 10 mm2 to 95 mm², 250 A

Version	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
Feeder component N	ZLSP250	2CCV672600R0001	149 0782	1	2	112
Feeder component L1	ZLSP251	2CCV672601R0001	149 0805	1	2	112
Feeder component L2	ZLSP252	2CCV672602R0001	149 0829	1	2	112
Feeder component L3	ZLSP253	2CCV672603R0001	149 0843	1	2	112
Feeder component N additional socket	ZLSP954	2CCV672608R0001	149 0867	1	2	100
Feeder component PE additional socket	ZLSP959	2CCV672609R0001	149 0881	1	2	100

Additonal socket
Power Bar System 250 A

Additional socket
The additional socket can easily be fitted onto the socket base to accomodate the external N and/or PE busbars. This enables neutral connections to be made where single-pole miniature circuit breakers are used with unswitched neutral.

Neutral terminals are clipped onto the additional socket and can be used as detachable neutral connections. One N busbar and/or one PE busbar can be fitted. Each socket base can be equipped with an additional socket.

Additional socket for external N and PE busbars

	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
– 8-module socket (suitable for 8-module socket)	ZLSP928	2CCF212060A0001	148 7348	10	8	67
– 6-module socket (suitable for 6-module socket)	ZLSP926	2CCF212061A0001	148 7362	10	6	53

Busbar insulator

	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
dark grey, 20 for isolation and spacing of separate busbar sections, 18 mm	ZLS938	2CCA205611R0001	141 8205	1	1	1

Busbar cover

	Type name	ABB IT number	EAN number 761 227	Pack-aging unit	Module	Weight in grams
electrically protected covering of main and auxiliary busbars. The 4 modules cover can be divided. Suitable to accept extension adapter ZLS 101 4x18 mm – bag containing 5 items	ZLS100	2CCF002762R0001	001 5603	1	1	95
DIN rail Clip for ZLSP926 and ZLSP928. This item is need if the additional socket will be mounted on a DIN rail. 1 pcs. every 30cm	ZLSP937	2CCA212012R0001	498 306	Bag of 5	–	18

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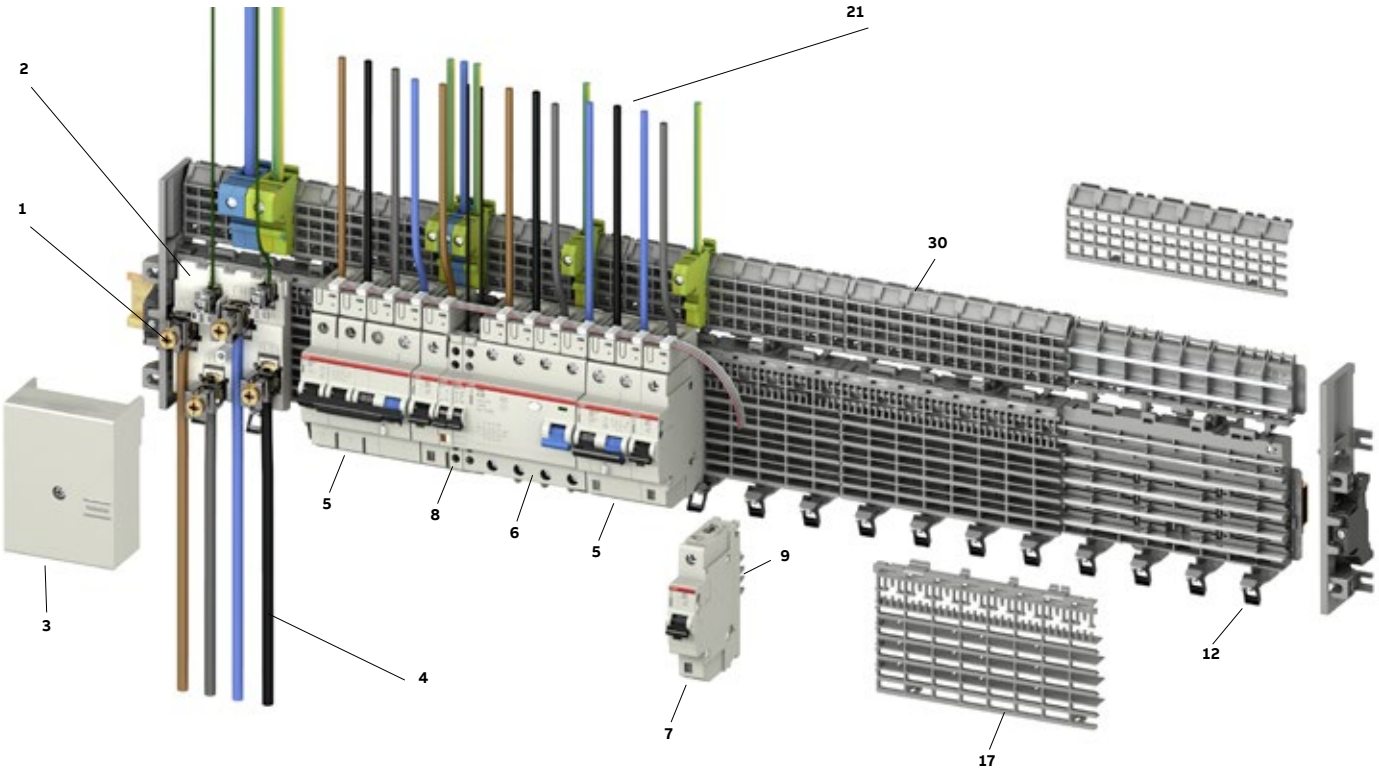
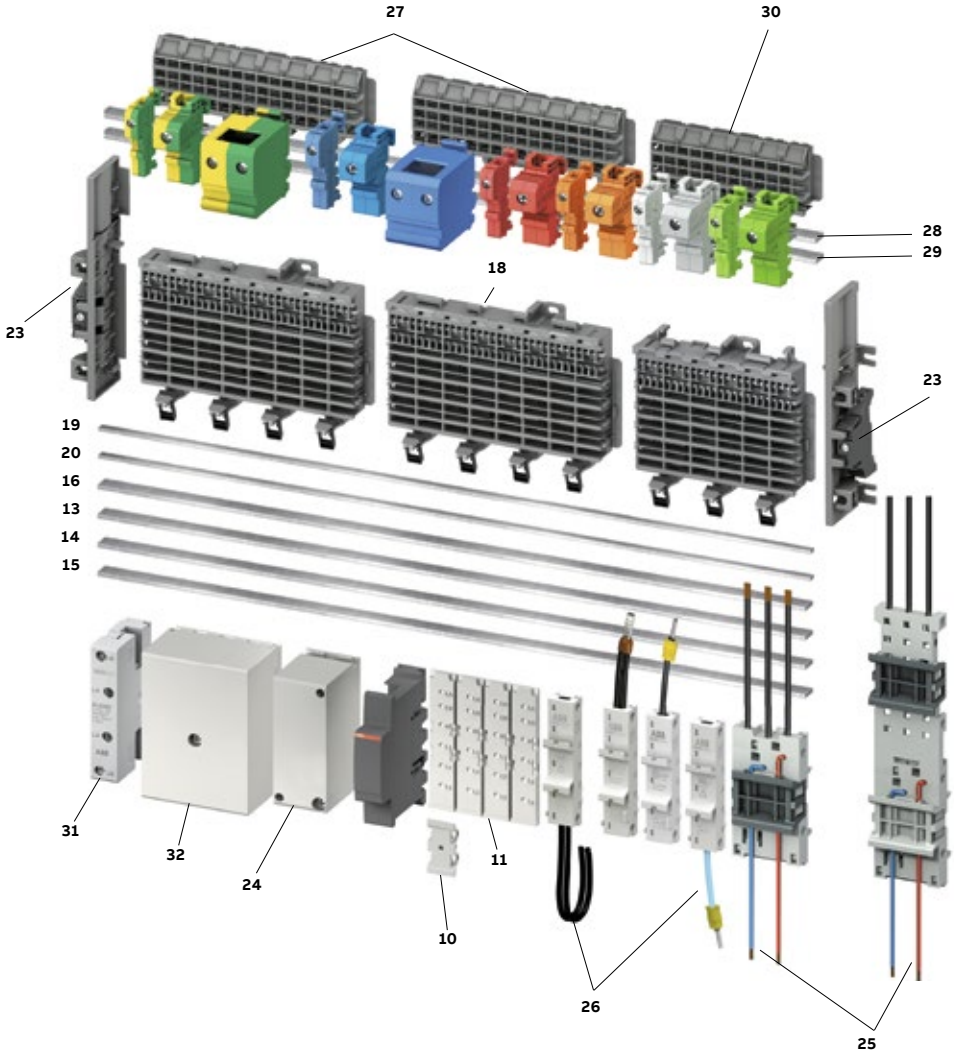
Smissline TP technical details
Busbar system 125 A Overview



1 **Supply terminal**
2 **Incoming terminal block with a max. current rating of 160 A 50 mm² (2 x 25 mm²) + 2 x 10 mm² (LA, LB)**
3 **Cover for incoming terminal block**
4 **Supply cable**
5 **Residual current operated circuit breaker with overcurrent protection RCBO FS401 and FS403**
6 **Residual-current circuit breaker F404**
7 **Miniature circuit breaker S401 M**
8 **Signal contact**
9 **Plug contacts**
10 **DIN adapter**
11 **Spare way cover**
12 **Device latch**
13 **Busbar L3 or DC +, –**
14 **Busbar L2 or DC +, –**
15 **Busbar L1 or DC +, –**
16 **Busbar N**
17 **Cover for socket**
18 **Sockets**
19 **Auxiliary busbar LA**

Smissline TP technical details
Busbar system 125 A Overview



20 **Auxiliary busbar LB**
21 **Output circuits**
22 **Busbar isolator**
23 **Socket end piece on left and right**
24 **Incoming terminal component, centre power supply 200 A, maximum 95 mm²**
25 **Combi module with a current rating of 32 A**
26 **Adapter for DIN rail components**
27 **N- and PE Terminals, red and orange Terminals for d.c. Application**
28 **Busbar PE, additional socket**
29 **Busbar N, additional socket**
30 **Additional socket**
31 **Incoming terminal block 63A**
32 **Incoming terminal block 160A**

Smissline TP technical details
Busbar system 125 A

Socket bases ZLS906, ZLS908
The smissline socket system is a totally new kind of assembly and connection technology for the construction of distributions. Besides the classic method of snapping the devices onto 35-mm mounting rails, the new family of devices can be directly attached to the socket bases with integrated busbars. The time-consuming process of connecting up the supply is thereby no longer needed. In addition, in the event of rearrangement or expansion, the replacement of devices in existing systems is made significantly easier.
The socket sections and the wide range of accessories make it possible to plan with the capability for expansion and to construct distribution systems of any desired size in a short period of time.
6- and 8-module sockets are installed either by screwing them onto any flat surface or by snapping them onto a 35 mm DIN mounting rail. Lateral movement or detachment of the sockets again is possible before final fixing.
- In order to determine the required socket length, the space necessary for
- the devices required
- the incoming terminal block and
- any reserve spaces needed must be determined.

Snap mounting
Pull down the slide with a screwdriver until it latches (socket can be moved).
Press on front of slid:
Fixed position
(Sockets fixed)

The key features
- System of any desired length (even number of poles)
- Integrated busbars
- Simple device change
- Long-term planning and problem free extension possible
- Significant time savings during assembly and connection

Busbars for the sockets and additional socket ZLS200
The busbars of size 10 x 3 mm can be loaded with currents up to 125 A. They are plated for perfect contact wiith the devices plug-in contacts. The maximum available busbar length is 1979 mm. The same busbar type is used, regardless whether it is fitted in the socket (L1, L2, L3, N) or in the additional socket (N, PE). The busbars are inserted in to the socket from the front.

Auxiliary busbars for the socket ZLS202
The 5 x 2 mm auxiliary busbars are intended for a common power supply of auxiliary switches and signal contacts. They are also plated and their max. delivery length is 1979 mm.
Like the main busbars, the auxiliary busbars are inserted in holders LA and LB from the front. Of course, only on auxiliary busbar can be fitted.

Smissline TP technical details
Busbar system 125 A Incoming

Incoming terminal blocks ZLS260 to 262
Compact terminal block with the construction width of 18 mm for 2 poles. The maximum rated current is 63 A for L1, L2, L3N and 6 A for LA, LB.

General
The incoming terminal block is used to connect cables directly to the busbars. The terminals act directly on the busbars and therefore fix the incoming terminal block. Removable terminal tops permit the connection of continous conductrors (risers) white horizontal or vertical cable entry is also possible.
Instead of using the incoming terminal block, the power supply can also be realized via a device (e.g. residual current operated circuit breaker, miniature circuit breaker or switch disconnector).

Incoming terminal blocks ZLS224, 225
A standard incoming terminal block whose cover provides protection against accidental contact. Construction height 50 mm. The base plate can be fitted with a maximum of 4 main terminals L1, L2, L3 and N for the busbars, and 2 auxiliary termiinals LA and LB for the auxiliary busbars.

Incoming terminal blocks, low ZLS228, 229
Incoming terminal block with construction height of 36 mm.

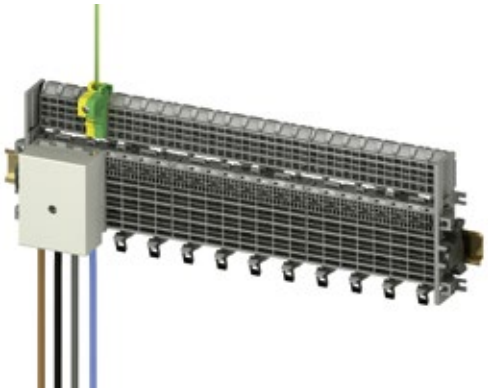
Feed block left and right
In order to prevent the cables from crossing when two sockets rows are connected it is a good solution to use a left and a right incoming block (see photo).

Incoming terminal component ZLS250 to 255
The incoming terminal component, with an installation width of 36 mm is available as a single-pole component for the line conductors L1, L2, L3 and as neutral. The terminals act directly on the busbars and thereby fix the incoming terminal component. The incoming terminal component, L1, L2, L3 and N can be combined to meet specific needs. A maximum cable cross-section of 95 mm^2 can be connected to the incoming terminal component.

Smissline TP technical details
Busbar system 125 A Incoming

—
01 Power supply left or right, maximum 125 A. 125 A (max. 35 °C Ambient air temperature for 125 A continuously)
—
02 Power supply left or right, maximum 100 A. 125 A (max. 35 °C Ambient air temperature for 125 A continuously)
—
03 Power supply in centre, maximum 160 A. A maximum of 125 A is permitted on either side. A total of 160 A must not be exceeded.
—
04 Incoming maximum 63 A.
—
05 Incoming terminal component, in centre, maximum 200 A. But on each side not more than 125 A.

— 01



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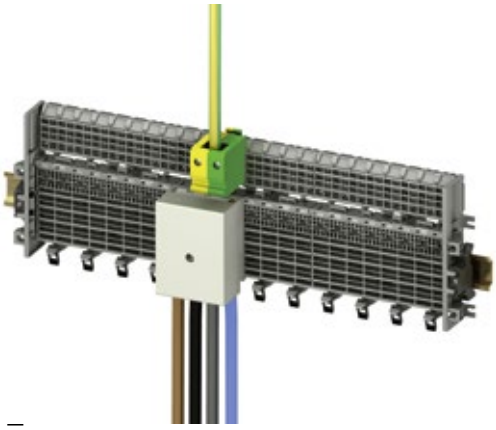

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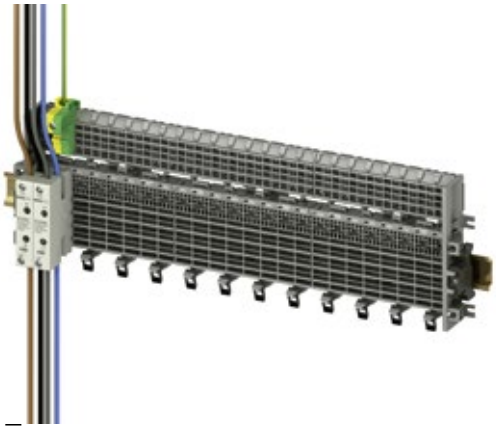

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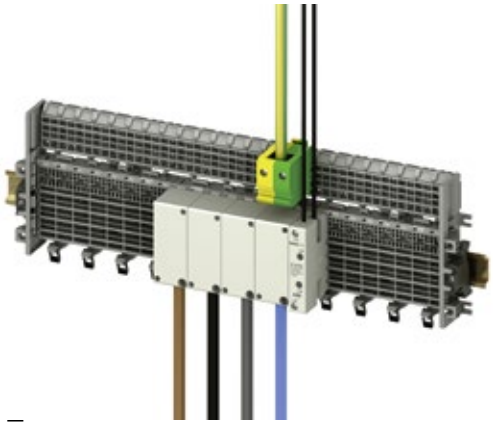
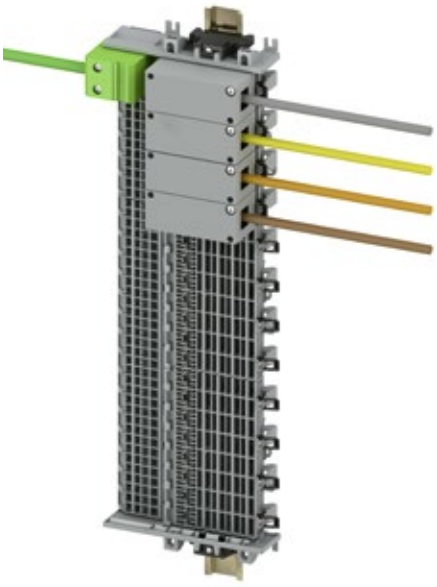


— 05

Incoming Power Bar System
250 A and 400 A

—
01 Power supply side feed, maximum 250 A.
—
02 Central feed 250A, 400A total. The cables in the connections must have the same length. Incoming terminal blocks ZLP25X.
—
03 Side feed maximum 250 A, 400 A total. The cables in the connections must have the same length.



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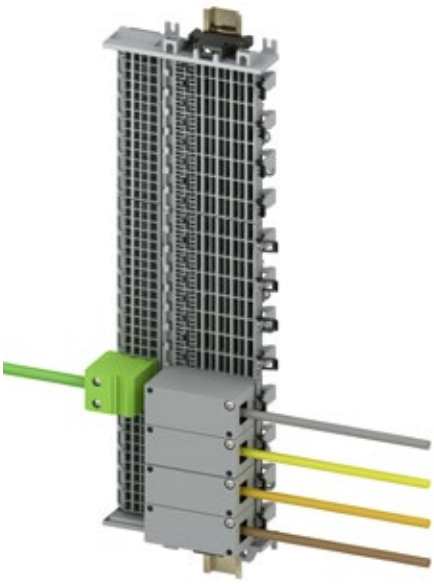

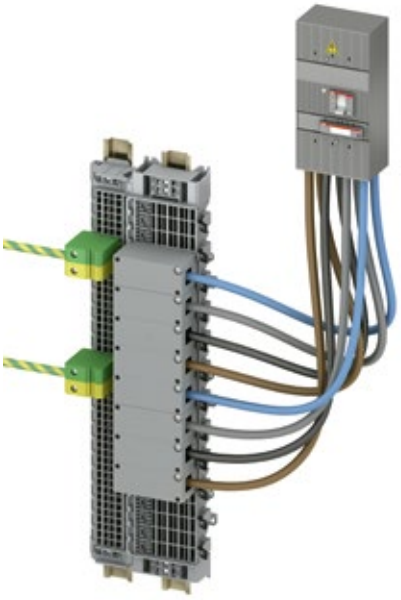

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02

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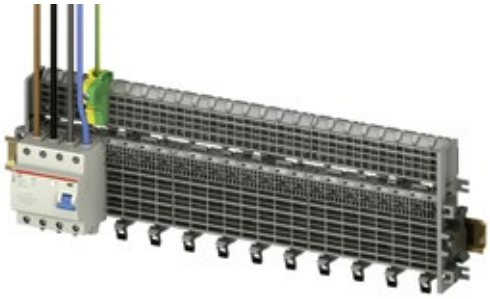
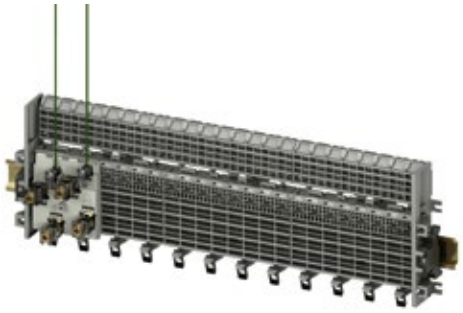
03

Technical details
Busbar system power supply

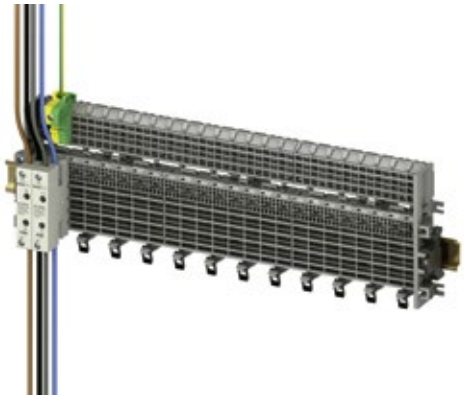


Indirect supply via residual current operated circuit breaker (RCCB)
(or switch disconnector)
The supply cable is connected at the top of the RCCB. This supply variant gives the busbars and therefore all subsequent devices RCCB protection. If several RCCB groups are planned, the busbars should be separated and spaced using the dark grey busbar insulator ZLS938. Attention must then be paid to the regulations governing protection of the residual current circuit breaker by subsequent miniature circuit breakers. The supply can also be fed in through the switch disconnector.

Direct supply to residual current operated circuit breaker (or switch disconnector)
Instead of using the incoming terminal block, the power can also be supplied via a device.
In this case, the supply cable is connected to the lower terminal of the device. The residual current operated circuit breaker or switch disconnector can be supplied with 63 A regardless of its rated current, since the plug-in connection arrangement of the device is suitable for this amount of current.
For current in excess of 63 A, the incoming terminal block or the incoming terminal component should be used.



Supply of auxiliary busbars LA and LB
The two auxiliary busbars LA and LB can be supplied using the additional terminal ZLS 233 via a incoming terminal block. The maximum operating current of the auxiliary busbars is 40 A.



Incoming block for two auxiliary busbars LA, LB
The pluggable incoming block is especially for the two auxiliary busbars LA, LB. The maximum rated current is 6 A.

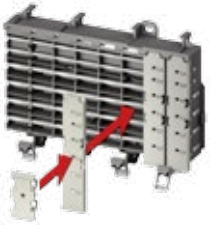
Smissline TP technical details
Busbar system 125 A accessories

Socket end piece ZLS920
To prevent displacement of sockets and busbars (particulary when installed vertically) end pieces can be fitted at the start and finish of each row of sockets. These simultaneously ensure electrically protected covering of the busbar end faces and mechanical fixing of the sockets oh the mounting rail.

Intermediate piece ZLS725
The light grey intermediate piece matches the device profile and fills empty module spaces.

Busbar insulator ZLS938
The dark grey busbar insulator electrically isolates the separated busbar ends from each other (e.g. when using several RCD protected groups) and also identifies the isolation point from outside. It conforms with the device profile and its space requirement is 1 module.

Busbar cover ZLS100
If component modules or spare modules are not requiered, the busbar cover ensures electrically protected covering of the main and auxiliary busbars. The cover (4 modules) can be divided anywhere. The openings allow voltage measurements on the busbars without removing the cover.



Extension adapter ZLS101
The extension adapter, single or several side by side, can be plugged into the busbar cover via the built-in holding device. This enables conventional DIN devices with 45 mm cap size to be snapped onto the SMISSLINE socket. By plugging in several extension adapters one on top of the other, heights can be adjusted in multiples of 7 mm

Definitions

Rated short-circuit breaking capacity I_{cn}
According to EN 60898-1
The maximum current which a switching device can switch off without damage at a rated operational voltage and rated operational frequency. It is specified as an effective value.

Rated ultimate short-circuit breaking capacity I_{cu}
According to EN 60947-2
Ultimate short-circuit breaking capacity that a circuit breaker can switch off without damage at a rated operational voltage and rated operational frequency. It is specified as an effective value.

Rated service short-circuit breaking capacity I_{cs}
According to EN 60947-2
Service short-circuit breaking capacity that a circuit breaker can switch off without damage at a rated operational voltage and rated operational frequency. It is specified as an effective value.

Rated insulation voltage U_i
The rated insulation voltage (U_i) is the voltage to which dielectric checks and creepage distances refer. The maximum rated operational voltage must not exceed its rated insulation voltage.

Rated impulse withstand voltage U_{imp}
Peak of a withstand voltage of a specified form and polarity with which the circuit can be loaded under specified test conditions without a breakdown and to which clearances relate.
The rated impulse withstand voltage must be equal to or greater than the values of the withstand over-voltages (transient overvoltages) which occur in the system in which the device is used.

Rated short-time withstand current I_{cw}
The rated short-time withstand current is the effective value of the short-circuit current, as specified by the manufacturer for this circuit, that the circuit can conduct without damage. Unless otherwise specified, a time of 1s shall apply.

Rated conditional short-circuit current I_{cc}
The rated conditional short-circuit current is the value of the prospective short-circuit current, as specified by the manufacturer, for a switching device combination that the latter can conduct during the total break time. The information about the specified short-circuit device must be given by the manufacturer.

Rated fused short-circuit current I_{cf}
The rated fused short-circuit current is the conditional rated short-circuit current if the short-circuit device is a fuse in accordance with IEC 60269 [IEV 441-17-21, modified].

Rated peak withstand current I_{pk}
The rated peak withstand current is the peak value of the withstand current of the circuit of a combination of switching devices, as specified by the manufacturer.

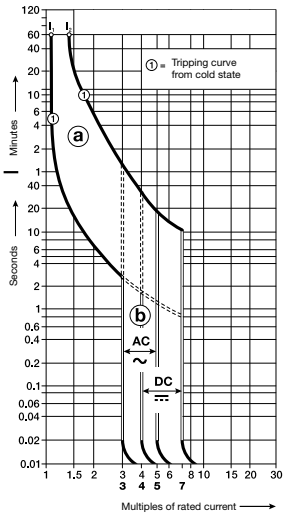
Back-up protection
Assignment of two overcurrent protective devices in series, where the protective device, generally but not necessarily on the supply side, effects the overcurrent protection with or without the assistance of the other protective device and prevents excessive stress on the latter [IEC 60947-1, definition 2.5.24].

Total selectivity
Overcurrent discrimination where, in the presence of two overcurrent protective devices in series, the protective device on the load side effects the protection without causing the other protective device to operate [IEC 60947-2, definition 2.17.2].

Partial selectivity
Overcurrent discrimination where, in the presence of two overcurrent protective devices in series, the protective device on
the load side effects the protection up to a given level of overcurrent, without causing the other protective device to operate [IEC 60947-2, definition 2.17.3].

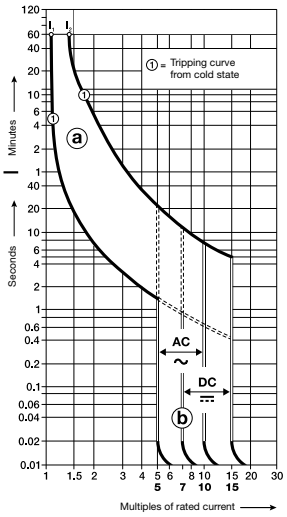
MCBs technical details
Trip characteristics

EN60898-1



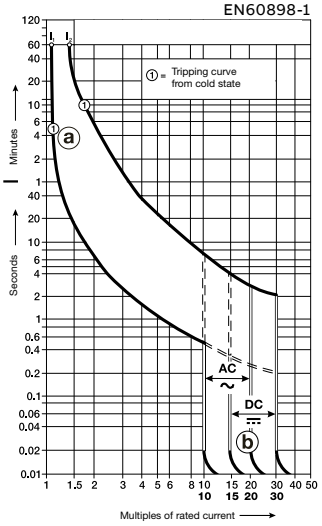
Trip characteristics: B
Thermal trip
1.13...1.45 x I_n
Electromagnetic trip
3...5 x I_n AC
4...7 x I_n DC
Calibration temperature 30°C

EN60898-1



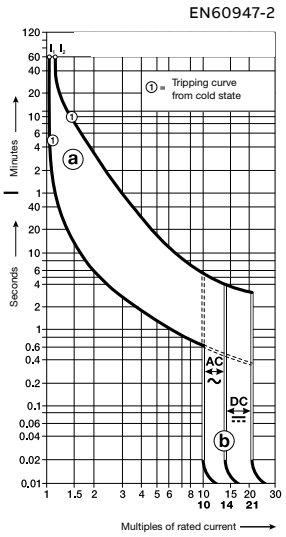
Trip characteristics: C
Thermal trip
1.13...1.45 x I_n acc. to EN60898-1
Thermal trip
1.05...1.3 x I_n acc. to EN60947-2
Electromagnetic trip
5...10 x I_n AC
7...14 x I_n DC
Calibration temperature 30°C

EN60898-1



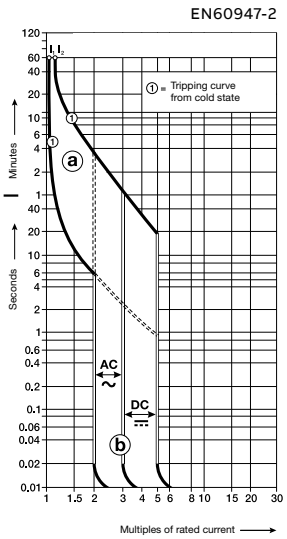
Trip characteristics: D
Thermal trip
1.13...1.45 x I_n
Electromagnetic trip
10...20 x I_n AC
15...30 x I_n DC
Calibration temperature 30°C

EN60947-2



Trip characteristics: K
Thermal trip
1.05...1.3 x I_n
Electromagnetic trip
10...14 x I_n AC
14...20 x I_n DC
Calibration temperature 40°C

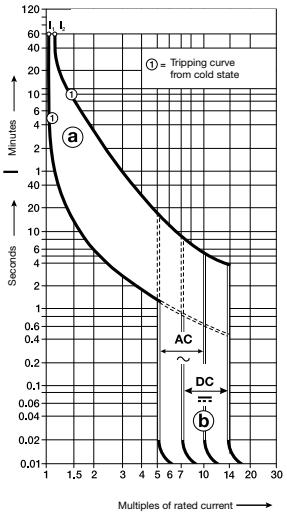
EN60947-2



Trip characteristics: UC

Z	C
1.05...1.35 x I_n	1.13...1.35 x I_n
3...5 x I_n DC	7...14 x I_n DC
2...3 x I_n AC	5...10 x I_n AC

Calibration temperature 40°C

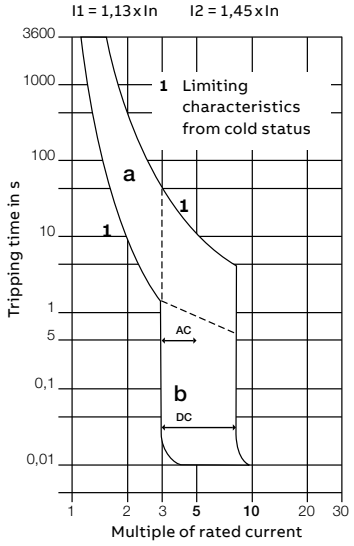


MCBs technical details
Trip characteristics

Trip characteristics example of trip curve interpretation of B-characteristics

a Thermal trip characteristics:
Lower test current I_1 = defined as non-tripping current.
The circuit breaker withstands 1.13 times the rated current for at least 60 minutes.
Upper test current I_2 = defined as trip current.
The circuit breaker trips at 1.45 times the rated current within 60 minutes.

b Electro-magnetic trip characteristics AC:
The circuit breaker withstands 3 times the rated current for more than 0.1 sec. (in this example, up to around 2 sec.).
The circuit breaker trips in less than 0.1 sec. at 5 times the rated current.



Trip behaviour of different trip characteristics

Trip characteristics and current ratings		Thermal release Test currents: lower I_1	upper test current I_2	Trip time	Electromagnetic release Test currents: lower test current	upper test current	Trip time
B	4 to 63 A	$1.13 \times I_n$	$1.45 \times I_n$	> 1 h < 1 h	$3 \times I_n$	$5 \times I_n$	> 0.1 s < 0.1 s
C	0.5 to 63 A	$1.13 \times I_n$	$1.45 \times I_n$	> 1 h < 1 h	$5 \times I_n$	$10 \times I_n$	> 0.1 s < 0.1 s
D	6 to 63 A	$1.13 \times I_n$	$1.4 \times I_n$	> 1 h < 1 h	$10 \times I_n$	$20 \times I_n$	> 0.1 s < 0.1 s
K	0.5 to 63 A	$1.05 \times I_n$	$1.2 \times I_n$ $1.5 \times I_n$ $6.0 \times I_n$	> 2 h < 2 h < 2 min > 2 s	$10 \times I_n$	$14 \times I_n$	> 0.2 s < 0.2 s

Application characteristics: B
Miniature circuit breaker for circuits supplying loads generating no or only minor inrush currents (boilers, electric heaters, cookers).

Application characteristics: C
The 'standard' miniature circuit breaker for circuits supplying loads producing inrush currents particular to inductive loads (TV sets, fluorescent and discharge lamps) and for socket outlets.

Application characteristics: D
Miniature circuit breaker for circuits supplying loads producing very high inrush currents (transformers, capacitor banks).
Main circuit breaker for the back-up protection of downstream connected circuit breakers.

Application characteristics: K
Circuit breaker for equipment:
The characteristics of these types enable the close protection requirements for equipment to be met.

Application characteristics: UC
Device protection in DC systems of up to 250 V = with a time constant of <15 ms (emergency networks, electroplating, etc.).

MCBs technical details

Internal resistances at rated voltage and power losses

Internal resistances and power loss per pole (cold resistance at room temperature)

Rated current I_n A	S400 B Ri mΩ	PV [W]	C Ri mΩ	PV [W]	D Ri mΩ	PV [W]	K Ri mΩ	PV [W]
0.5			5023	1.3			4419	1.1
1			1424	1.4			1311	1.3
1.6			677	1.7			627	1.6
2			338.3	1.4			326.2	1.3
3			146.3	1.3			134.9	1.2
4	131.1	2.1	86.4	1.4			85.2	1.4
6	50.5	1.8	48.8	1.8	45.5	1.6	46.7	1.7
8	21.5	1.4	21.6	1.4	19.9	1.3	19.5	1.2
10	18	1.8	15.7	1.6	14.4	1.4	17.3	1.7
13	12.6	2.1	10.5	1.8	10.1	1.7	11.8	2.0
16	8.6	2.2	8.2	2.1	8.2	2.1	7.4	1.9
20	5.2	2.1	4.9	2.0	5.1	2.0	4.9	1.9
25	3.9	2.4	3.9	2.4	3.9	2.4	3.7	2.3
32	3.1	3.2	3.1	3.1	3	3.1	3	3.1
40	2.3	3.7	2.2	3.5	2.2	3.6	2	3.3
50	2.1	5.2	1.6	4.0	1.6	4.1	1.4	3.6
63	1.18	4.7	1.28	5.1	1.37	5.5	1.21	4.8

Rated current In A	S400 M-UC UCC Ri mΩ	PV [W]	UCZ Ri mΩ	PV [W]
0.5	5018	1.3	8173	2.0
1	1428	1.4	2174	2.2
1.6	651	1.7	1039	2.7
2	337.3	1.3	521	2.1
3	144.5	1.3	235	2.1
4	85.4	1.4	131.9	2.1
6	48.6	1.7	66.7	2.4
8	22.1	1.4	28.6	1.8
10	16.5	1.6	19.6	2.0
13	10.3	1.7	14.9	2.5
16	8.1	2.1	10	2.6
20	5.3	2.1	5.6	2.2
25	4	2.5	4.3	2.7
32	2.9	3.0	3.7	3.8
40	2.1	3.3	2.6	4.2
50	1.6	4.0	1.7	4.2
63	1.25	5.0	1.41	5.6

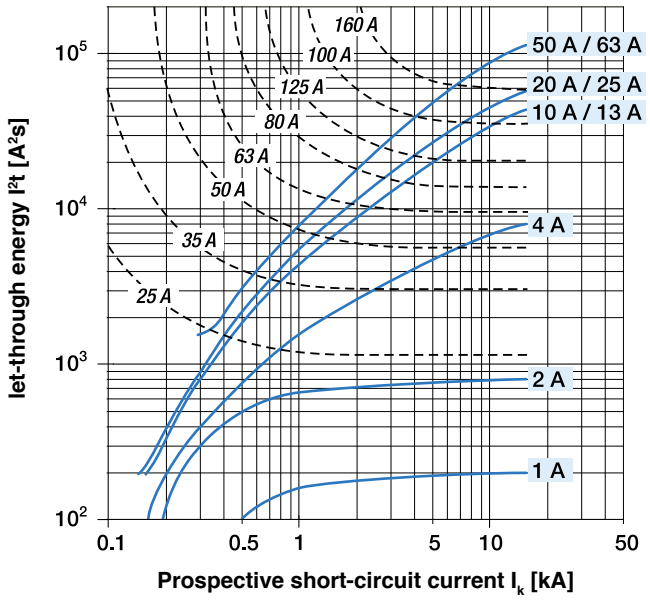
MCBs technical details

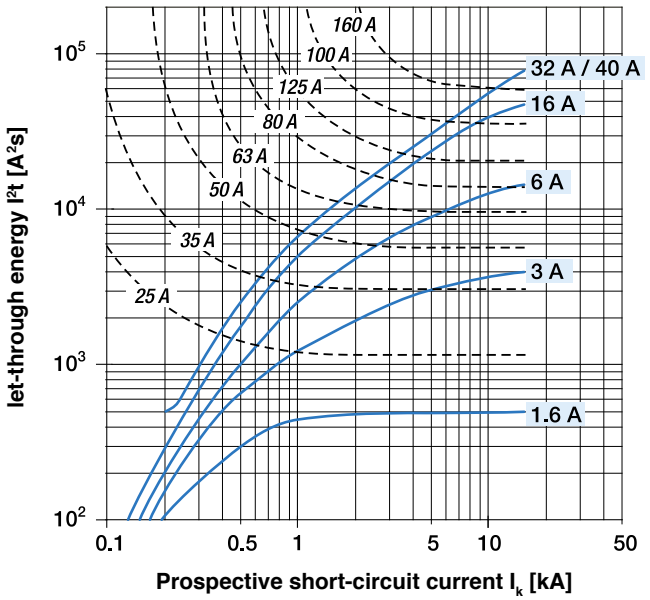
Limitation of specific let-through energy I^2t

I^2t diagrams - Specific let-through energy value I^2t

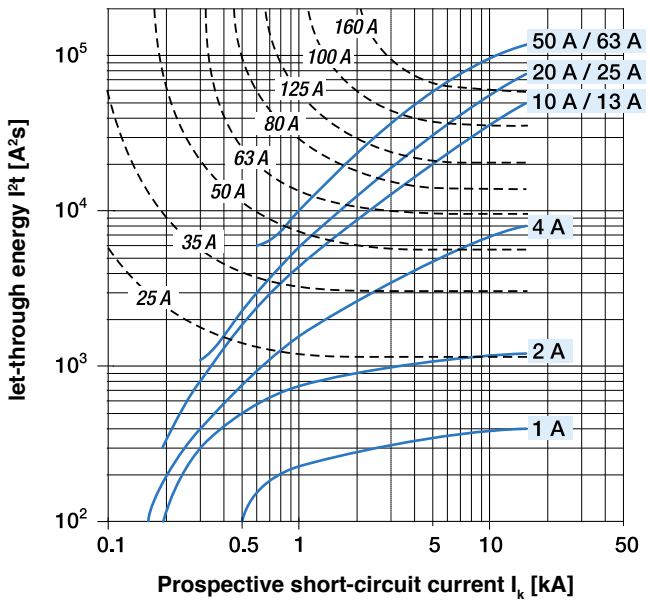
The I^2t curves give the values of the specific let-through energy expressed in A^2s (A=amps; s=seconds) in relation to the perspective short-circuit current (I_{rms}) in kA.

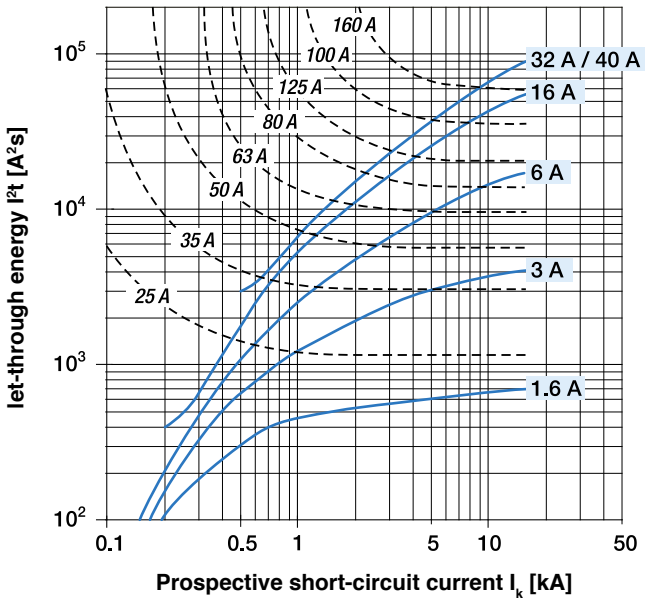
S400 characteristics B–C





S400 characteristics D–K

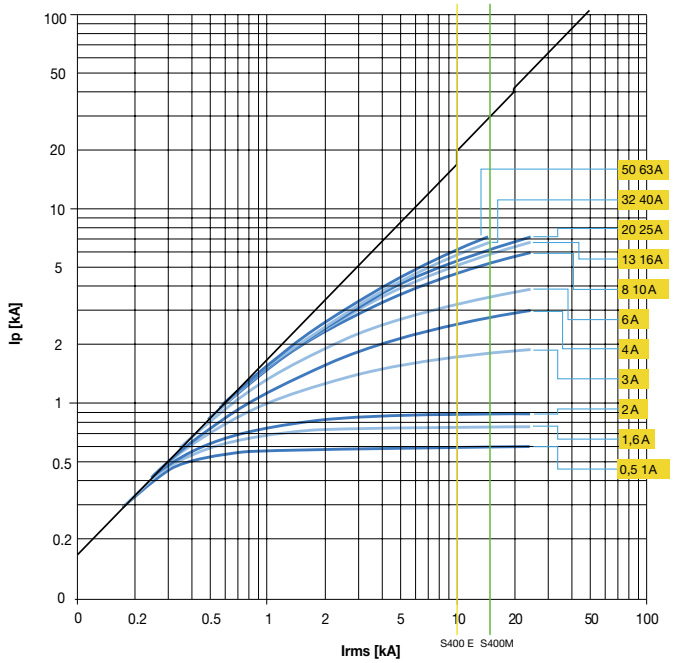




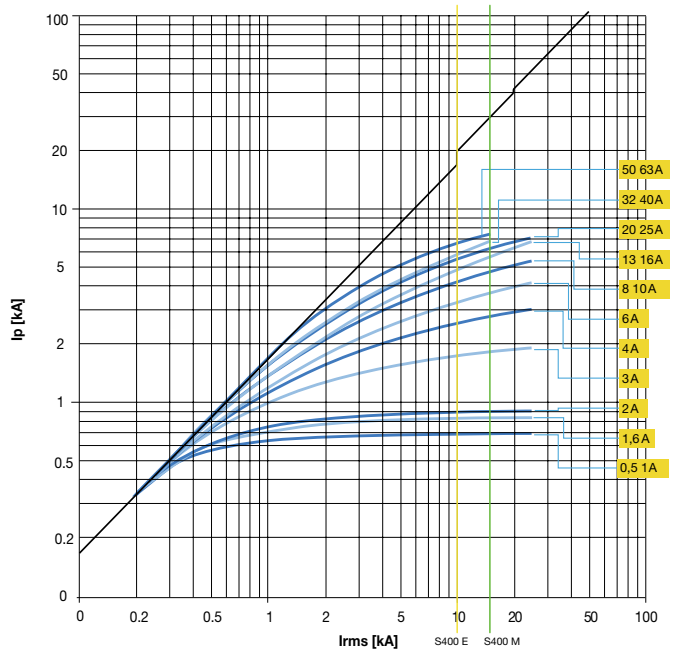
MCBs technical details
Peak current I_p

Limitation curves – Peak current values
The I_p curves give the values of the peak current, expressed in kA, in relation to the perspective symmetrical short-circuit current (kA).

Characteristics B–C



Characteristics K–D



Power supply: overload and short-circuit protection

Overload and short-circuit protection of the plug-in socket system
Protection of the busbar system without upstream overcurrent protection
An important factor for the protection of the busbar system (sockets, incoming terminal block, incoming terminal component, adapter, combi module or terminals) is the characteristic of the rated peak withstand current I_{pk}. The rated peak withstand current I_{pk} of the SMISSLINE busbar system is 35 kA.

Protection of the busbar system with upstream overcurrent protection
The rated short-circuit current Icf of the SMISSLINE busbar system is 50 kA.
If, on the power supply side, a circuit breaker of the type Sace Tmax 200 A, a high performance circuit breaker S800 or a NH fuse is positioned upstream of the busbar system, then due to the short-circuit current limiting effect of this protection device, a larger prospective short-circuit current of up to 50 kA for the plug-in socket system is permissible.

Overload and short-circuit protection of devices on the busbar system
The rated short-circuit breaking capacity (or rated breaking capacity) of the protective devices, together with the maximum short-circuit current at the installation location of the devices on the busbar system, must be taken into consideration.
This is not only relevant for the SMISSLINE busbar system, but is also applicable to the distribution construction.

Miniature circuit breaker
If the prospective short-circuit current at the installation location of a miniature circuit breaker is not greater than its rated breaking capacity, no back-up protection via an upstream overcurrent protection device is necessary.
If the prospective short-circuit current at the installation location of a miniature circuit breaker is greater than its rated short-circuit breaking capacity, the current ratings of the upstream overcurrent protection device must not exceed the table values in the back-up tables (catalogue, page 2/20 onwards).

Residual-current circuit breaker
A back-up fuse with max. 100 A gL/gG or a high performance circuit breaker S800 100 A is required for short-circuit protection upstream or downstream (see Coordination table, page 2/42). A back-up fuse is not required up to the level of the internal short-circuit withstand rating. Thermal protection can be ensured by means of downstream miniature circuit breakers, but only if the rated currents do not exceed the value of the current rating of the residual-current circuit breaker in consideration of a utilisation factor.

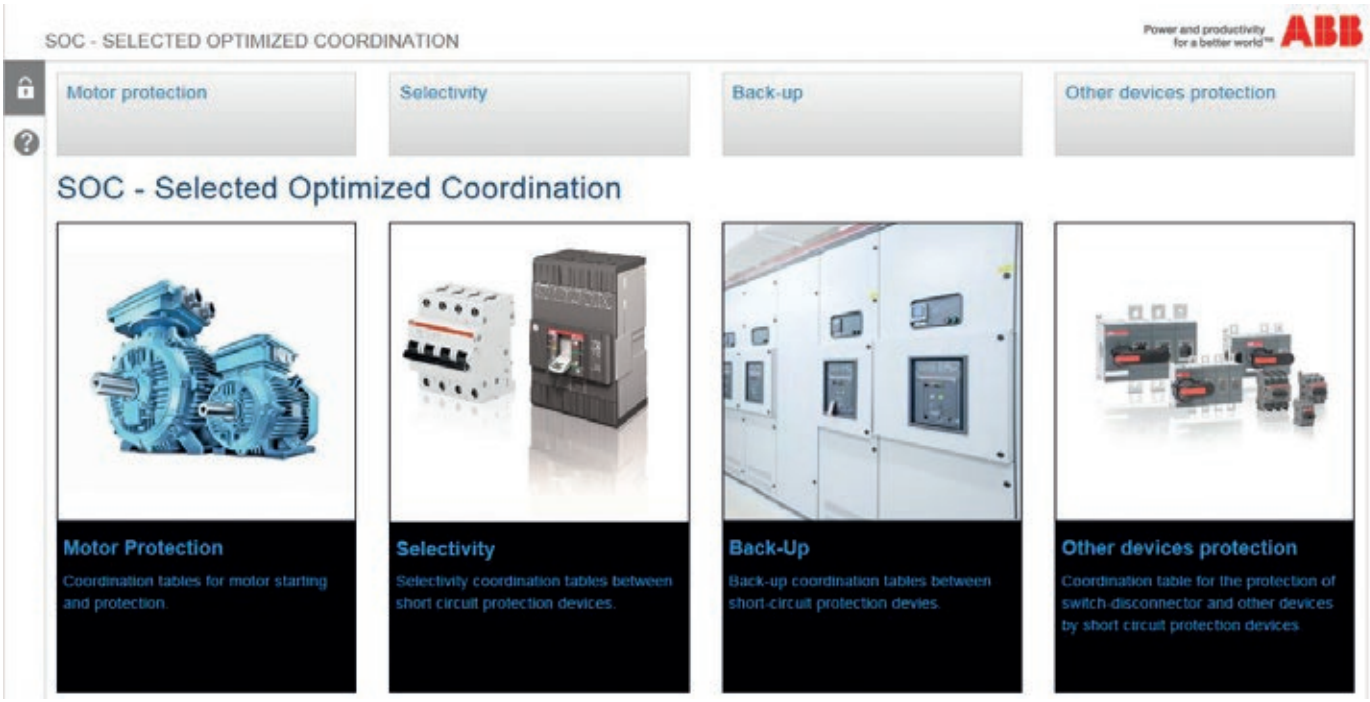
Surge arrester OVR
An upstream overcurrent protection device with max. 160 A gL/gG is necessary for short-circuit protection (in the case of non-independent interruptions of the secondary current).

Back-up fuses for devices with a universal adapter
In principle, the same requirements apply as for directly plugged-in devices.

Back-up and selectivity dates: Online on ABB webpage SOC

Back-up and selectivity dates

SOC - Selected Optimized Coordination
See as well ABB on https://applications.it.abb.com/SOC/



MCBs technical details
Back-up protection with fuses, S800

a) If the short-circuit current at the point of installation of the circuit breaker is not greater than the nominal breaking capacity of the MCB, an upstream fuse is not needed. If a fuse is fitted upstream for installation reasons, any nominal current may be selected for the fuse.

b) If the short-circuit current at the point of installation of the circuit breaker is greater than its nominal breaking capacity, the nominal currents of the upstream fuses must not exceed the values specified in the table (back-up protection of the circuit breaker).

Upstream: Fuse NH..gL/gG

L.		I_{cu} [kA]	S.	NH gL/gG							
			I_n [A]	25	40	63	80	100	125	160	200
S400M/S450M FS401M/FS451M FS403M/FS453M		I_{cn} [kA] 10	all types	100	100	100	100	80	50	30	20
S400E/S450E FS401E/FS451E FS403E/FS453E		I_{cn} [kA] 6	all types	100	100	70	40	25	15	10	–

S800S – S400M (SMISSLINE) @ 230/400 V

L.	Char.	I_{cu} [kA]	S.	S800S							
				B, C, D, K							
				50							
			I_n [A]	25	32	40	50	63	80	100	125
S400M FS401M FS403M	B, D	I_{cn} [kA] 10	4*…16	50	50	50	50	50	50	50	50
			20		50	50	50	50	50	50	50
			25			50	50	50	50	50	50
			32				50	50	50	50	50
			40					50	50	50	50
			50						50	50	50
			63							50	50

L.	Char.	I_{cu} [kA]	S.	S800S							
				B, C, D, K							
				50							
			In [A]	25	32	40	50	63	80	100	125
S400M	C, K	50	0.5…2	50	50	50	50	50	50	50	50
		25	3…20	50	50	50	50	50	50	50	50
		15	25			50	50	50	50	50	50
			32				50	50	50	50	50
			40					50	50	50	50
			50						50	50	50
			63							50	50

S800N – S400M (SMISSLINE) @ 230/400 V

L.	Char.	I_{cu} [kA]	S.	S800N							
				B, C, D							
				36							
			In [A]	25	32	40	50	63	80	100	125
S400M FS401M FS403M	B, D	I_{cn} [kA] 10	4*…16	36	36	36	36	36	36	36	36
			20		36	36	36	36	36	36	36
			25			36	36	36	36	36	36
			32				36	36	36	36	36
			40					36	36	36	36
			50						36	36	36
			63							36	36

L.	Char.	I_{cn} [kA]	S.	S800 N							
				B, C, D							
				36							
			In [A]	25	32	40	50	63	80	100	125
S400M	C, K	50	0.5…2	36	36	36	36	36	36	36	36
		25	3…20	36	36	36	36	36	36	36	36
		15	25			36	36	36	36	36	36
			32				36	36	36	36	36
			40					36	36	36	36
			50						36	36	36
			63							36	36

E. = Upstream
L. = Downstream
Selectivity limits are specified in kA

Consulting the back-up table

This table provides the value (in kA) for which the back-up protection is ensured between a given combination of circuit breakers. The table covers possible combinations between the S800 or SACE series Tmax and between SMISSLINE miniature circuit breakers 400 M.

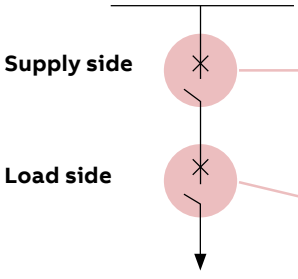
MCBs technical details
Back-up protection with T_{max} an XT

Sace T_{max} – S400 @ 230/400V

			Up-Stream	T1	T1	T1	T2	T3	T4	T2	T3	T4	T2	T4	T2	T4	T4
	Version		Version	B	C	N	N	N	N	S	S	S	H	H	L		V
Downstream		I_n [A]	I_{cu} [kA]	16	25	36	36	36	36	50	50	50	70	70	85	120	200
S400E FS401E/403E	B, C	6...10	6	16	25	30	36	36	36	36	40	40	40	30	40	40	40
		13...63						16	16		16	16	16	16	16	16	16
S400M FS401M/403M	C, K	0.5...10	10	16	25	30	36	36	36	40	40	40	50	40	50	40	40
		13...63						25	36		25	40	50	40	50	40	40
S400M FS401M/403M	B, D	6...10	10	16	25	30	36	36	36	40	40	40	50	40	50	40	40
		13...63						25	36		25	40	50	40	50	40	40

Sace XT – S400 @ 230/400V

			Up-Stream	XT1		XT2	XT3	XT4	XT1	XT2	XT3	XT4	XT1	XT2	XT4	XT2	XT4	XT2	XT4
	Version		Version	B	C	N			S				H			L		V	
Downstream		I_n [A]	I_{cu} [kA]	18	25	36			50				70			120		150	
FS400E S400E S450E	B, C	6...10	6	18	25	30	36	36	30	36	40	40	30	40	40	40	40	40	40
		13...63						16			16								
FS400M S400M S450M	C, K	0.5...10	10	18	25	30	36	36	30	50	40	40	30	70	40	85	40	85	40
		13...63						25			25			60		60		60	
FS400M S400M S450M	B, D	6...10	10	18	25	30	36	36	30	50	40	40	30	70	40	85	40	85	40
		13...63						25			25			60		60		60	



S800N - S400E @ 230/400V

			E.	S800N							
	Char.			B, C, D							
L.		I_{cu} [kA]		36							
			In [A]	25	32	40	50	63	80	100	125
S400E	B	6	6	36	36	36	36	36	36	36	36
			10	36	36	36	36	36	36	36	36
			13	36	36	36	36	36	36	36	36
			16	36	36	36	36	36	36	36	36
			20		36	36	36	36	36	36	36
			25			36	36	36	36	36	36
			32				36	36	36	36	36
			40					36	36	36	36
			50						36	36	36
			63							36	36

Example 1: With a S800 nominal current 50A is a Back-up protection till a nominal current of 25A to a S400 given. The Back-up protection ist till 36kA.

Example 2: There is no Back-up protection between supply side and the load side given.

Back-up protection
The tables given provide the value (in kA, referring to the breaking capacity) for which the back-up protection among the combination of selected circuit breakers is verified. The tables cover the possible combinations between S800 and those between the above mentioned circuit breakers and the ABB series of modular circuit breakers S400.
The values indicated in the tables refer to the voltage:
– Vn of 230/400VAC

MCBs technical details
Influence of ambient temperature

Allowable current of miniature circuit breakers depending on ambient temperature and max. load current for row mounted miniature circuit breakers.

Practical procedure
Conditions often arise which allow for simple consideration of the ambient temperature and thermal influences of row mounted circuit breakers according to EN 60898 and EN 60947-2. The following procedure has proven to be effective:

1. Selection of circuit breaker according to the rated current of the equipment or the current carrying capacity of the cable depending on whitch of these is the lower value.
2. Consideration of thermal factors
   – for an ambient temperature
   – for thermal influence of row mounted circuit breakers
3. This results in the rated current of the circuit breaker to be selected for the relevant current

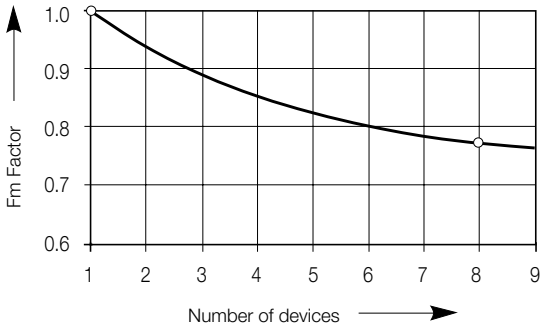
This procedure considers all thermal influence factors and results in an optimum choice of the rated current for the circuit breaker.

Basis for the simplified procedure

1. Different ambient temperature
The thermal releases are set to a reference ambient temperature. For trip characteristic K, this is 40 °C, for trip characteristics B, C and D, this is 30 °C. At different ambient temperatures, the specified current values change by around 6 % per 10 °C difference in temperature.
For more accurate calculations and very high or very low ambient temperatures, the following tables apply:

2. Influence of row mounted devices at continuous load
If the circuit breakers are lined up close to one another and have equally high load levels, a correction factor must be taken. This influence can be reduced if fillers and/or spacers (9 mm wide) are used.

Influence of adjacent devices S400



Influence of adjacent devices
Correction factor Fm

No. of adjacent devices	correction factor
1	1
2	0.95
3	0.9
4	0.86
5	0.82
6	0.8
7	0.78
8	0.77
9	0.76
>9	0.76

MCBs technical details
Influence of ambient temperature

Max. operating currents depending on ambient temperature for S400 miniature circuit breakers of tip characteristics B, C, D, UC-C and UC-Z

I_n (A)	Ambient temperature T (°C)										
	0	10	15	20	25	30	35	40	45	50	55
0.5*	0.58	0.55	0.53	0.52	0.51	0.50	0.48	0.47	0.46	0.44	0.43
1.0*	1.15	1.09	1.07	1.04	1.02	1.0	0.97	0.94	0.91	0.89	0.86
1.6*	1.85	1.75	1.71	1.67	1.63	1.6	1.55	1.50	1.46	1.42	1.38
2.0*	2.31	2.19	2.13	2.08	2.03	2.0	1.93	1.88	1.83	1.77	1.72
3.0*	3.5	3.32	3.24	3.16	3.09	3.0	2.93	2.85	2.77	2.69	2.61
4.0*	4.6	4.37	4.27	4.17	4.07	4.0	3.86	3.76	3.66	3.56	3.45
6.0	6.9	6.59	6.44	6.29	6.14	6.0	5.83	5.68	5.53	5.37	5.22
8.0	9.2	8.84	8.63	8.42	8.22	8.0	7.81	7.6	7.39	7.19	6.98
10.0	11.5	10.9	10.7	10.4	10.2	10.0	9.65	9.39	9.14	8.88	8.63
13.0	15.0	14.4	14.0	13.7	13.3	13.0	12.7	12.3	12.0	11.6	11.3
16.0	18.5	17.6	17.2	16.8	16.4	16.0	15.6	15.2	14.7	14.3	13.9
20.0	23.1	22.1	21.6	21.0	20.5	20.0	19.5	19.0	18.5	18.0	17.5
25.0	28.9	27.5	26.9	26.3	25.6	25.0	24.3	23.7	23.0	22.4	21.8
32.0	37.0	35.3	34.5	33.7	32.8	32.0	31.2	30.4	29.5	28.7	27.9
40.0	46.2	44.1	43.0	42.0	41.0	40.0	39.0	37.9	36.9	35.9	34.9
50.0	57.7	55	53.7	52.4	51.1	50.0	48.6	47.3	46.0	44.7	43.4
63.0	72.7	69.3	67.7	66.1	64.5	63.0	61.3	59.7	58.1	56.4	54.8

* only applies to C

Max. operating currents depending on ambient temperature for S400 miniature circuit breakers of trip characteristic K

I_n (A)	Ambient temperature T (°C)									
	10	15	20	25	30	35	40	45	50	55
0.5	0.54	0.52	0.51	0.50	0.49	0.47	0.5	0.45	0.43	0.42
1.0	1.14	1.12	1.09	1.07	1.0	1.02	1.0	0.96	0.94	0.91
1.6	1.85	1.81	1.77	1.73	1.7	1.65	1.6	1.56	1.52	1.48
2.0	2.29	2.23	2.18	2.13	2.1	2.03	2.0	1.93	1.87	1.82
3.0	3.48	3.40	3.32	3.25	3.2	3.09	3.0	2.93	2.85	2.77
4.0	4.58	4.48	4.38	4.28	4.2	4.07	4.0	3.87	3.77	3.66
6.0	6.91	6.76	6.61	6.46	6.3	6.15	6.0	5.85	5.69	5.54
8.0	9.24	9.03	8.82	8.62	8.4	8.21	8.0	7.79	7.59	7.38
10.0	11.5	11.2	11.0	10.7	10.5	10.2	10.0	9.69	9.43	9.18
13.0	15.1	14.7	14.4	14.0	13.7	13.4	13.0	12.7	12.3	12.0
16.0	18.4	18.0	17.6	17.2	16.8	16.4	16.0	15.6	15.2	14.8
20.0	23.0	22.5	22.0	21.5	20.9	20.4	20.0	19.4	18.9	18.4
25.0	28.9	28.3	27.6	27.0	26.3	25.7	25.0	24.4	23.8	23.1
32.0	36.9	36.1	35.3	34.4	33.6	32.8	32.0	31.1	30.3	29.5
40.0	46.2	45.1	44.1	43.1	42.1	41.1	40.0	39.0	38.0	37.0
50.0	57.7	56.4	55.1	53.8	52.5	51.3	50.0	48.7	47.4	46.1
63.0	72.5	70.9	69.3	67.7	66.1	64.5	63.0	61.3	59.6	58.0

MCBs technical details
Protection of circuits with fluorescent lamps

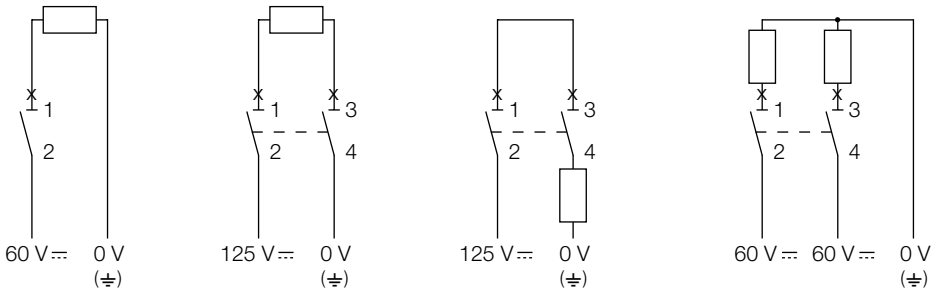
Protection of circuits with fluorescent lamps
The following table gives the maximum permissible number of fluorescent lamps which can be protected by a single-pole circuit breaker of characteristic. The figure for multi-pole circuit breakers is reduced by 20%.

Rated current	FL not compensated KVG			FL compensated in parallel KVG			FL with electronic ballast EVG[1)]		
	18/20 W	36/40 W	58/65 W	18/20 W	36/40 W	58/65 W	18/20 W	36/40 W	58/65 W
13	35	30	19	41	41	27	21	21	10
16	43	37	24	51	51	33	26	26	12
20	53	46	30	64	64	41	33	33	15
25	66	58	37	82	82	53	42	42	19

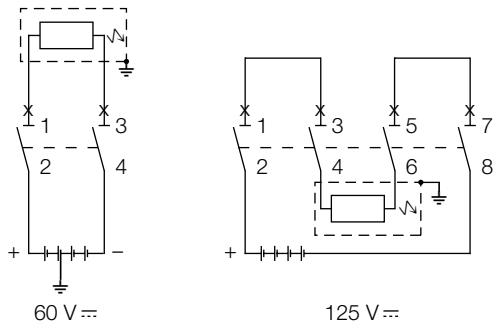
[1)] EVG: Two-lamp version, lamps switched together, electronic ballast
KVG: Conventional ballast

Use of miniature circuit breakers S400 M for DC systems
A standard miniature circuit breaker type S400 M and S400 E can be used in a DC system by observing the following conditions: Single pole miniature circuit breaker max. 60 V DC. 2-pole miniature circuit breaker with 2-poles in series max. 125 V DC. The polarity needs not to be taken into account. Load connection can either be at the top or at the bottom of the MCB.

Example of permissible DC voltages depending on the number of poles and the circuit configeration in earthed DC systems:



Examples for different voltages between a conductor and earth where voltages between conductors are identical:



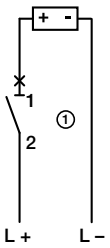
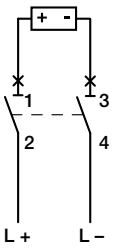
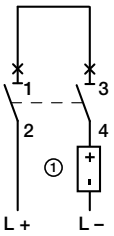
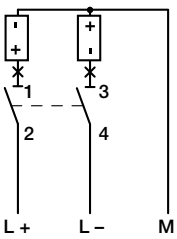
MCBs technical details
S400UC

UC = Universal Current = AC/DC

S400UC MCBs can be used in the one-pole version as 250 V d.c., and in the 2-pole version with series connection of two poles up to 440 V d.c..

For DC incoming supply from above
S400 UC-... MCBs have, in the area of arc chutes, permanent magnets, it is therefore necessary to take into account the polarity during the installation process.
Doing so ensures that in the case of a short circuit the magnetic field of the permanent magnets corresponds with the electromagnetic field of the short-circuit current, therefore safely leading the short circuit into the arc chute. Incorrect polarities may cause damage to the MCB.
This is why – in the case of top-fed devices – terminal 1 must be connected to (–) and terminal 3 (+).

Example for permissible voltages between the conductors depending on the number of poles and circuit layout:

voltage U_N between conductors	250 V d.c.	440 V d.c.	440 V d.c.	440 V d.c.
voltage U_N between conductor and earth	250 V d.c.	250 V d.c.	440 V d.c.	250 V d.c.
supply				

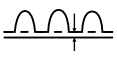
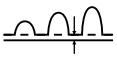
RCDs technical details
Properties

General information about residual current operated circuit breakers
The residual current operated circuit breaker prevents personal injury and damage to property caused by electric current. Use of this circuit breaker is required in various national and international standards for electrical installations.
Modern residual current operated circuit breakers respond to small residual currents. Interruption occurs in a fraction of a second even before a hazardous situation for people, animals and property can arise.
The principle of magnetic tripping independable of the supply voltage ensures perfect and safe operation even in the event of undervoltage and neutral interruptions.

The key features
- High short-circuit resistance 10 kA
- Sensitive for alternating and pulsating DC residual currents
- 2- and 4-pole types
- Nominal residual trip currents 10, 30, 100, 300 and 500 mA
- Snap-on auxiliary switches and signal contacts
- Nominal currents 25, 40, 63 A
- Double terminals

According to the wave form of the earth leakage currents they are sensitive to, the RCDs may be classed as:
- A type (for alternating and/or pulsating current with DC components
- AC type (for alternating current only)

ABB SMISSLINE RCD's are all type A.

Shape of the fault current			**Correct RDC function alternating current Type AC**	**pulsating current sensitiv Type A**
				
sinusoidal a.c.	rampant	slowly rising		
				
pulsating d.c.	rampant with or without overlapping DC components from 6 mA	slowly rising		

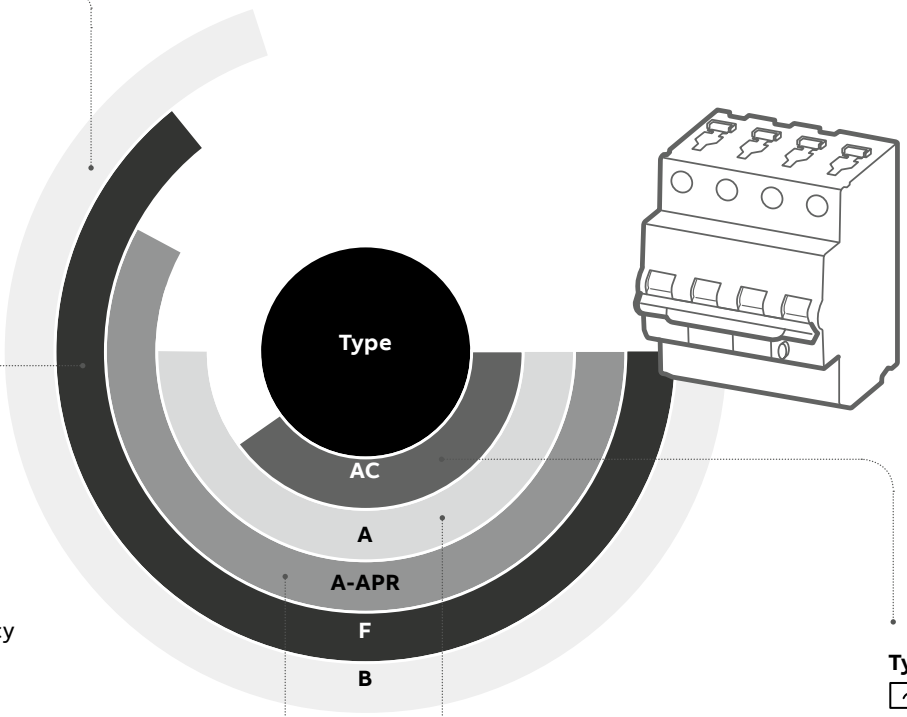
Selectivity
RCDs raise similar issue to those surrounding the installation of MCBs, and in particular the need to reduce to a minimum the parts of the system out of order in the event of a fault.
For RCBOs the problem of selectivity in the case of short-circuit currents may be handled with the same specific criteria as for MCBs.
However, for correct residual current protection, the more important aspects are linked to tripping times. Protection against contact voltages is only effective if the maximum times indicated on the safety curve are not exceeded.

RCDs technical details
Properties

The variety of residual current devices has continuously increased in last decades following the technology evolution and the massive introduction of electronics in all fields of applications.
According to the capability to detect different waveforms of residual current and the relative sophisticated type testing, today the spectrum of RCDs types covers from pure AC loads up to high frequency and DC related applications with an increasing level of protection passing from AC types up to F and B types.

Type B

Full type F features.
+ Detection of smooth DC currents.



Type F

Full type A-APR short delay features.
+ Detection of high frequency currents
up to 1kHz.

Type AC

Alternating current only.

Type A-APR

APR

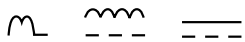
Full type A features.
+ High immunity to unwanted tripping.

Type A

Full type AC features.
+ Detection of pulsating current with DC components.

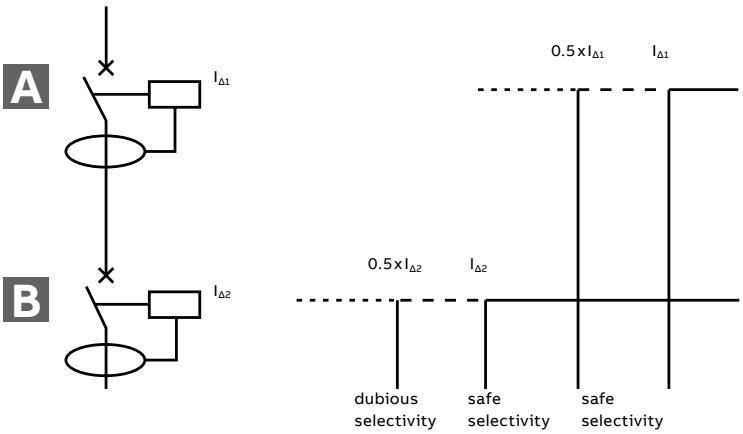
RCDs technical details
Properties

Auslösesträme

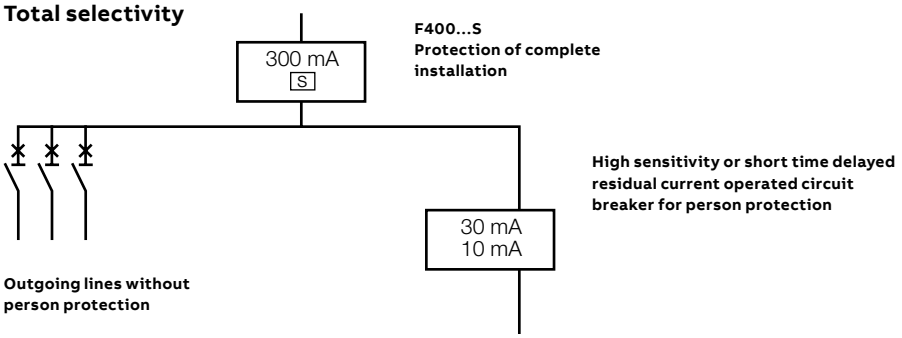
Proper functionning of residual current protective devices of type		RCD type			
		Type AC	Type A	Type F	Type B
	0,5 ... 1 $I_{\Delta n}$	■	■	■	■
	0,35 ... 1,4 $I_{\Delta n}$	–	■	■	■
	0,25 ... 1,4 $I_{\Delta n}$	–	■	■	■
	0,11 ... 1,4 $I_{\Delta n}$				
	max. 1,4 $I_{\Delta n}$ + 6 mA	–	■	■	■
	max. 1,4 $I_{\Delta n}$ + 10 mA	–	–	■	■
	0,5 ... 1,4 $I_{\Delta n}$	–	–	■	■
	0,5 ... 2 $I_{\Delta n}$	–	–	–	■
	0,5 ... 2,4 $I_{\Delta n}$	–	–	–	■
	0,5 ... 6 $I_{\Delta n}$				
	0,5 ... 14 $I_{\Delta n}$				

RCDs technical details
Properties

Partial selectivity



Total selectivity



Amperometric (partial) selectivity

Selectivity may be created by placing low-sensitivity RCDs upstream and higher-sensitivity RCDs downstream.

An essential condition which must be satisfied in order to achieve selective co-ordination is that the $I_{\Delta1}$ value of the breaker upstream (main breaker) is more than double the $I_{\Delta2}$ value of the breaker downstream. The operative rule to obtain an amperometric (partial) selectivity is $I_{\Delta n}$ of the upstream breaker = $3 \times I_{\Delta n}$ of the downstream breaker (e.g.: F404, 300 mA upstream; F402, 100 mA downstream).

In this case, selectivity is partial and only the downstream breaker trips for earth fault currents $I_{\Delta2} < I_{\Delta m} < 0{,}5 \times I_{\Delta1}$).

Chronometric (total) selectivity

To achieve total selectivity, delayed or selective RCDs must be installed.

The tripping times of the two devices connected in series must be co-ordinated so that the total interruption time t_2 of the downstream breaker is less than the upstream breaker's no-response limit time t_1, for any current value. In this way, the downstream breaker completes its opening before the upstream one.

To completely guarantee total selectivity, the IΔ value of the upstream device must also be more than double that of the downstream device in accordance with IEC 64-8/563.3, comments. The operative rule to obtain an amperometric (partial) selectivity is $I_{\Delta n}$ of the upstream breaker = 3 x $I_{\Delta n}$ of the downstream breaker (e.g.: F404, S type, 300 mA upstream).

For safety reasons, the delayed tripping times of the upstream breaker must always be below the safety curve.

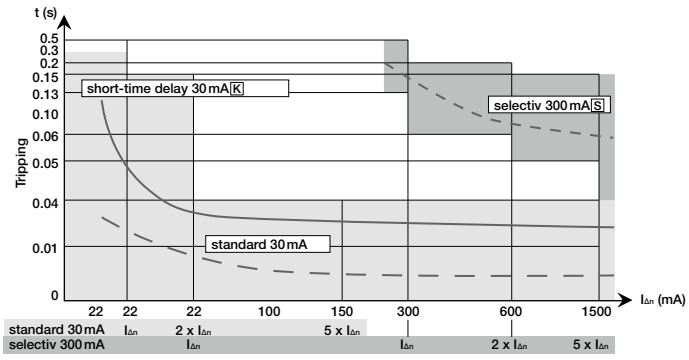
RCDs technical details
Standard, short-time delayed and selective type

The use of multiple electronic reactors for the supply of fluorescent lamps instead generates permanent leakage currents and inrush currents that can provoke nuisance tripping of a standard residual current breaker.
IT system loads and other electronic equipment (e.g. dimmers, computers, inverters) with capacitive input filters connected between the phases and ground can also generate permanent earth leakage currents whose sum may provoke the nuisance tripping of a standard residual current breaker.
For these situations, the SHORT-TIME DELAY breakers allow a greater number of devices to be connected to the installation.
Soft-starters for motors are loads which can generate high-frequency capacitive currents (provoked by the harmonics) toward ground or fed into the network. Also in this case, the use of SHORT-TIME DELAY residual breakers reduces the sensibility to nuisance tripping.

Compared with standard type breakers, SHORT-TIME DELAY residual current breakers are therefore characterised, for any given sensibility, by:
- Higher residual trip current
- Tripping time delay
- Better resistance to overvoltages, harmonics and impulse disturbances.

Regulations
The tests set out in the IEC 61008 and IEC 61009 standards verify the resistance of residual current breakers to unwanted tripping provoked by operation overvoltages, using a ring wave impulse shape of 0.5 µs/100 kHz. All residual current circuit-breakers are required to pass this test with a peak current value of 200 A.
For what concerns atmospheric overvoltages, the IEC 61008 and 61009 standards prescribe the 8/20 µs surge test with a 3000 A peak current, but limit the requirement to residual current devices classified as selective; no test is required for other types.
The ABB range of SHORT-TIME DELAY anti-nuisance tripping breakers and blocks pass the general 0.5 µs/100 kHz ring wave test and also withstand the 8/20 µs impulse test with the same peak current of 3000 A prescribed for selective devices.
The F402 K and F404 K should therefore be used to prevent unwanted tripping.

Three different types of Residual current operated circuit breaker
- standard RCD 30 mA
- selective RCD 300 mA S
- short-time delay RCD 30 mA K



- The standard RCD 30 mA tripp after circa 22 mA and a release time of ≤ 35 ms.
- The selectiv RCD 300 mA tripp after circa 200 mA and a release time of circa 180 ms.
- The short-time delay RCD 30 mA tripp after circa 25 mA and a release time of 100 … 120 ms.

RCDs technical details
Standard, short-time delayed and selective type

Unwanted tripping
In the event of disturbance in the mains, the RCDs normally present in the system are tripped, breaking the circuit even in the absence of a true earth fault.
Disturbances of this kind are most often caused by:
- operation overvoltages caused by inserting or removing loads (opening or closing protection of control devices, starting and stopping motors, switching fluorescent lighting systems on and off, etc.)
- overvoltages of atmospheric origin, caused by direct or indirect discharges on the electrical line.

Under these circumstances, breaker tripping is unwanted, since it does not satisfy the need to avoid the risks due to direct and indirect contacts. On the contrary, the sudden and unjustified interruption of the power supply may result in very serious problems.

SHORT-TIME DELAY RCDs
The ABB range of SHORT-TIME DELAY anti-disturbance residual current circuitbreakers and blocks was designed to overcome the problem of unwanted tripping due to overvoltages of atmospheric or operation origin.
The electronic circuit in these devices can distinguish between temporary leakage caused by disturbances on the mains and permanent leakage due to actual faults, only breaking the circuit in the latter case.
SHORT-TIME DELAY residual current circuit-breakers and blocks have a slight delay into the tripping time, but this does not compromise the safety limits set by the Standards in force (release time at 2 $I_{\Delta n}$ =150 ms).
Guaranteeing conventional residual current protection, their installation in the electrical circuit therefore allows any unwanted tripping to be avoided in domestic and industrial systems in which service continuity is essential.
This delay makes the SHORT-TIME DELAY residual current devices especially suited for installations involving motor starters/variable speed drives, fluorescent lamps or IT/electronic equipment.

Table of RDC selectivity

Downstream $I_{\Delta n}$ [mA]	Upstream $I_{\Delta n}$	10 [mA] inst	30 inst	100 inst	300 inst	300 S	500 inst
10	inst		■	■	■	■	■
30	inst			■	■	■	■
100	inst				■	■	
300	inst						
300	S						
500	inst						
500	S						

inst = instantaneous S = selective ■ = amperometric (partial) selectivity ■ = chronometric (total) selectivity

RCDs technical details
Technical data

Coordination tables between Short Circuit Protection Devices (SCPD) and F404 RCCBs
If you are using an RCCB you must verify that the Short Circuit Protection Device (SCPD) protects it from the effects of high current that arise under short-circuit conditions. The IEC/EN 61008 provides some tests to verify the behaviour of RCCB in short-circuit conditions. The tables below provide the maximum withstanding short-circuit current expressed in eff. kA for which the RCCBs are protected thanks to the coordination with the SCPD with a rated current (thermal protection) less than or eqaul to the rated current of the associated RCCB.

	F404 25 A	F404 40 A	F404 63 A
gG fuse 25 A	100		
gG fuse 40 A	60	60	
gG fuse 63 A	20	20	20
gG fuse 100 A	10	10	10
S403M	10	10	10
S803N	20	20	20
S803S	25	25	25

Internal resistances and power losses of RCCBs and RCBOs
Internal resistances and power losses per pole (cold resistance at room temperature)

4-pole RCCB F404			2-pole RCCB F402		
in A	R_i mΩ	P_v W	Type	R_i mΩ	P_v W
25	2.1	1.3	25 A/10 mA	8.8	5.5
40	2.0	3.2	25 A/30 mA	6.1	3.8
63	1.1	4.4	40 A/30 mA	5.8	9.3

RCBO Type F technical details
Properties

Nowadays single phase inverters are present in many household and industrial loads, such as washing machines, hoovers, dishwashers, ventilation, pumps etc.... Inverter technology is a “plus” in domestic equipment, since it helps to reach better performance reducing power consumption and improving energy efficency.

Working principle
A single phase frequency converter, also named inverter, is a commonly used electric drive which regulates the speed of an electric motor, operating on supply voltage and frequency.

During normal operation, the current generated by a single phase inverter in the downstream section is the result of the overlapping of mixed frequency components which varies from 10 Hz (motor frequency), to 50 Hz (rated frequency) and 1000 Hz (switching frequency).

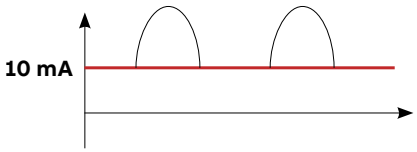
RCDs type F have been specifically designed for single phase inverters applications in order to meet the requirement to assure adequate protection level in case of an earth fault with such harmonic content, offering at the same time an increased resistance to nuisance tripping.

On the other side only RCD type B remain the only devices which are suitable to detect smooth DC components in the residual current caused by insulation faults in the DC section of a three phase frequency converter.

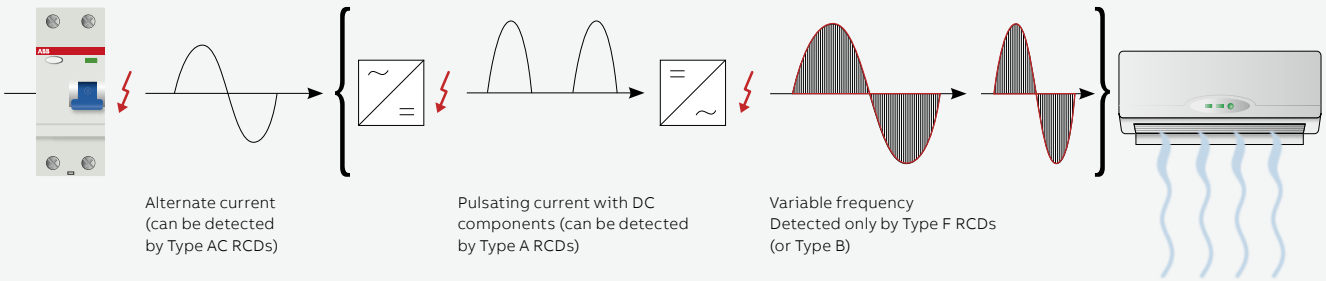
Type F features at a glance:
Type F RCDs offer the same range of protection and functionality as an RCD Type A APR; this means that they detect sinusoidal AC currents as well as pulsating DC currents. In addition to this, they are also tested according to IEC/EN 62423 which foresees the application of a simulated multi-frequency residual current with appropriate coefficient associated to the each level of frequency up to 1 kHz.

The intervention characteristic has a short-time delayed which prevents unwanted tripping in case pulsed leakage currents of up to ten milliseconds occur at activation of filters.

The RCDs Type F have a surge current withstand capacity of more than 3 kA and can accept superimposed smooth DC residual currents of up to 10mA without affecting their standard functionality.



Typical residual current waves that can occur in a circuit that supplies a single phase inverter:



Alternate current (can be detected by Type AC RCDs)

Pulsating current with DC components (can be detected by Type A RCDs)

Variable frequency Detected only by Type F RCDs (or Type B)

RCBO technical details
Internal resistances and power losses, Derating

Max. operating currents depending on ambient temperature for RCBO of tip characteristics B and C.

B,C	Ambient temperature T (°C)							
In (A)	–25	–20	–10	0	10	20	30	40
2	2.6	2.5	2.4	2.3	2.2	2.1	2	1.9
4	4.9	4.8	4.6	4.5	4.3	4.2	4	3.8
6	7.95	7.8	7.4	7.1	6.7	6.4	6	5.6
8	10.3	10.1	9.7	9.3	8.8	8.4	8	7.6
10	11.8	11.6	11.3	11	10.7	10.3	10	9.7
13	15.65	15.4	14.9	14.4	14	13.5	13	12.5
16	18.65	18.4	17.9	17.4	17	16.5	16	15.5
20	23.1	22.8	22.2	21.7	21.1	20.6	20	19.4
25	30.8	30.3	29.2	28.2	27.1	26.1	25	23.9
32	39.3	38.6	37.3	36	34.7	33.3	32	30.7
40	50.7	49.7	47.8	45.8	43.9	41.9	40	38.1

Influence of adjacent devices

No. of adjacent devices	correction factor
1	1
2	0.95
3	0.9
4	0.86
5	0.82
6	0.8
7	0.78
8	0.77
9	0.76
10	0.76

Internal resistances and power losses
Internal resistances and power losses per pole (cold resistance at room temperature)

Type	FS401 B Ri mΩ	PV [W]	FS401 C Type	Ri mΩ	PV [W]
FS401M-B6	53.8	1.9	S401M-C6	50.3	1.8
FS401M-B10	20.5	2.1	FS401M-C10	18.2	1.8
FS401M-B13	14.7	2.5	FS401M-C13	12.7	2.2
FS401M-B16	10.7	2.7	FS401M-C16	10.4	2.7
FS401M-B20	7.4	3.0	FS401M-C20	7.7	3.1
FS401M-B25	6.3	4.0	FS401M-C25	7.6	4.8
FS401M-B32	5.5	5.7	FS401M-C32	5.5	5.6

RCBO technical details
Internal resistances and power losses, Derating

Internal resistances and power losses

Internal resistances and power losses per pole (cold resistance at room temperature)

FS403

Typ	R_i mΩ	P_v W
6A B, C	50	3
10A B, C	17.6	2.69
13A B, C	11.9	2.96
16A B, C	9.8	3.52
20A B, C	7.3	3.94
25A B, C	4.8	5.19
32A B, C	3.6	6.38

Performances at different ambient temperatures
Max. operating current depending on the ambient temperature of a circuit-breaker in load circuit of characteristics type B, C

B,C	Ambient temperature T (°C)							
In (A)	–25	–20	–10	0	10	20	30	40
6	7.95	7.8	7.4	7.1	6.7	6.4	6	5.6
10	11.8	11.6	11.3	11	10.7	10.3	10	9.7
13	15.65	15.4	14.9	14.4	14	13.5	13	12.5
16	18.65	18.4	17.9	17.4	17	16.5	16	15.5
20	23.1	22.8	22.2	21.7	21.1	20.6	20	19.4
25	30.8	30.3	29.2	28.2	27.1	26.1	25	23.9
32	39.3	38.6	37.3	36	34.7	33.3	32	30.7

Influence of adjacent devices Correction factor Fm

No. Of adjacent devices	correction factor
1	1
4	0.86
6	0.8
7	0.78
8	0.77
9	0.76
10	0.76

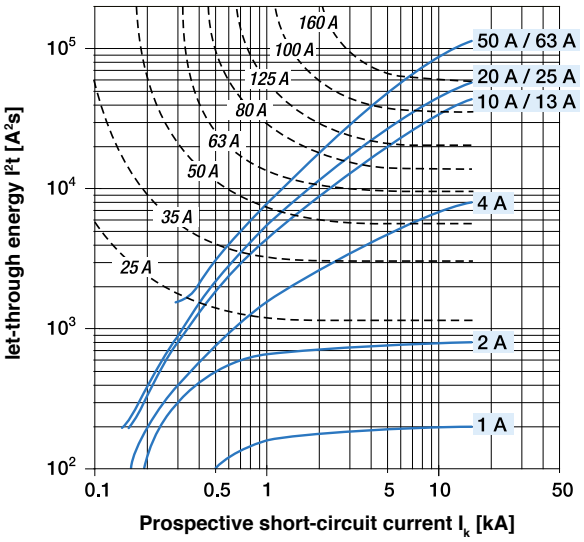
RCBO technical details

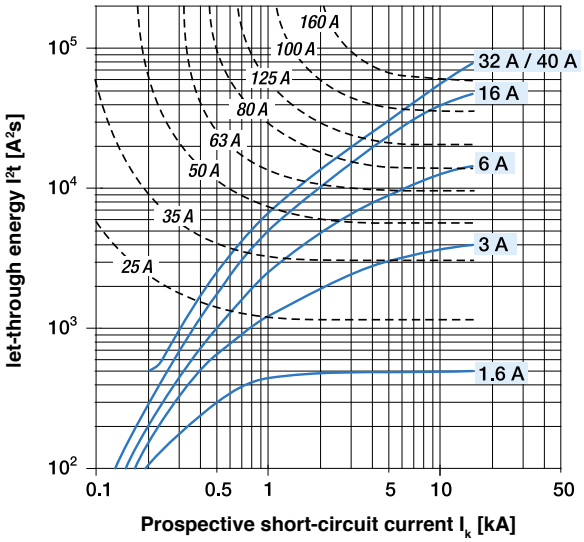
Limitation of specific let-through energy I^2t, peak current I_p

I^2t diagrams - Specific let-through energy value I^2t

The I^2t curves give the values of the specific let-through energy expressed in A^2s (A=amps; s=seconds) in relation to the perspective short-circuit current (I_{rms}) in kA.

FS400M characteristics B–C

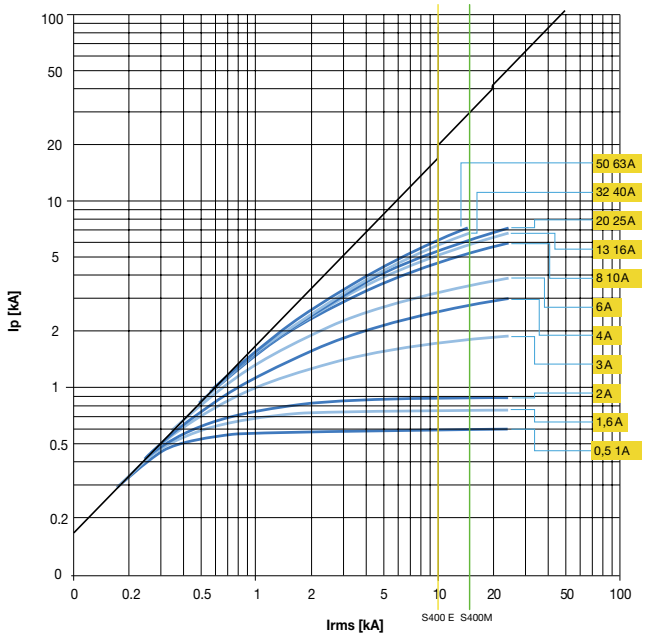




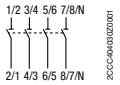
Limitation curves – Peak current values

The I_p curves give the values of the peak current, expressed in kA, in relation to the perspective symmetrical short-circuit current (kA).

FS400M Characteristics B–C



IS404 technical details
Switch disconnector



General switch disconnector
When used in a smissline socket system, the switch disconnector can be used instead of the incoming terminal block for up to 63 A.
With the smissline IS404 switch disconnector, individual loads, groups of loads or entire system parts can be separated or connected to the input supply.
The key features of the switch disconnector

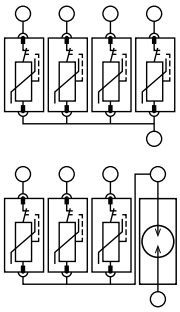
- Input supply switch
- On-Off function
- Clear indication of switching position
- Snap-on auxiliary switch available
- Uniform smissline design

Technical data for switch disconnector IS404

Rated voltage U_n	230/400 V~
Rated current I_n	63 A
Rated frequency f_n	50 Hz
Number of poles	4
Rated impulse withstand voltage	6 kV
Connection cross-sections C_u	At top, touch finger-proof. Suitable for connecting up single-, multi- and fine-wire conductors of up to 25 mm^2
Degree of protection	IP40
Endurance, mechanical/electrical	5000 operating cycles
Mounting position	any
Ambient temperature	–25 °C ... +40 °C
Specifications	EN/IEC 60947-3
Approvals	SEV
Weight (approx.)	250 g
Switching duty	AC-22A
Plastic parts	halogen-free
Contacts	cadmium-free

OVR technical details
Surge arrester OVR

The type 2 surge arresters in the QuickSafe product range are suitable for protecting electrical low voltage systems and terminals in the 240/415 V system. The devices can be used as type 2 surge arresters within the scope of the lightning protection zone concept at zone transition 0B–1 and higher. The high nominal discharge capability of 20 kA makes it possible for the equipment to have a longer service life in comparison to the minimum requirements of the standard. The devices consist of a basic unit and pluggable protection modules, which can be removed extremely easily to carry out insulation measurement. They are fully compatible with SMISSLINE installation devices and the surge arresters in the ABB System pro M model series. The surge arresters are tested as type 2 arresters in accordance with the EN/IEC 61643-11 test standard.



Mounting

Installation and electrical connection

The over voltage protection device “OVR” will be installed near the front of the protected consumers conditioning.

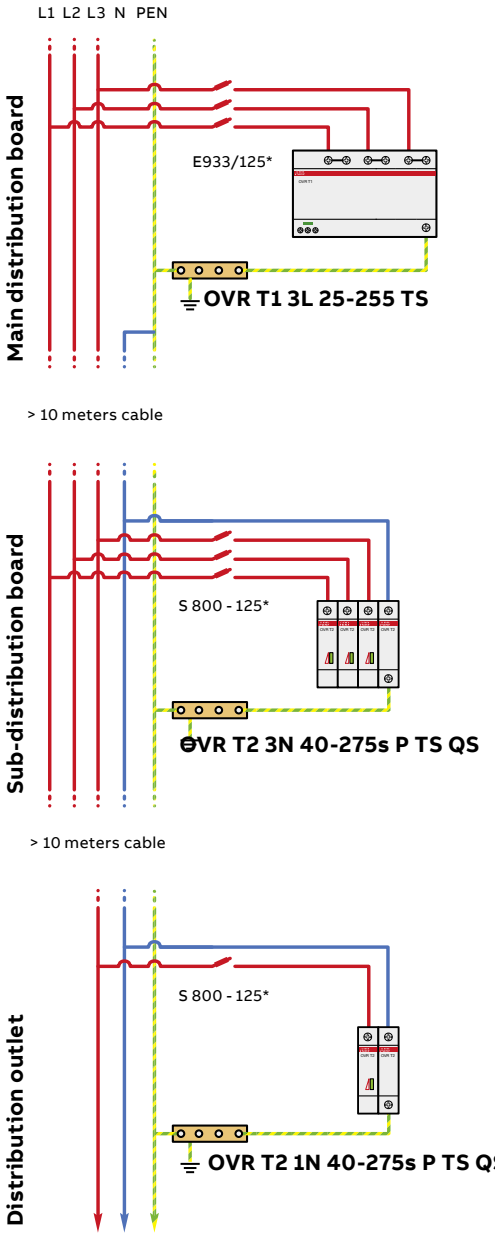
The surge arrester is to be mounted right after the Incoming block of the socket system.

The OVR404 is snapped directly onto the SMISSLINE bus bar system.

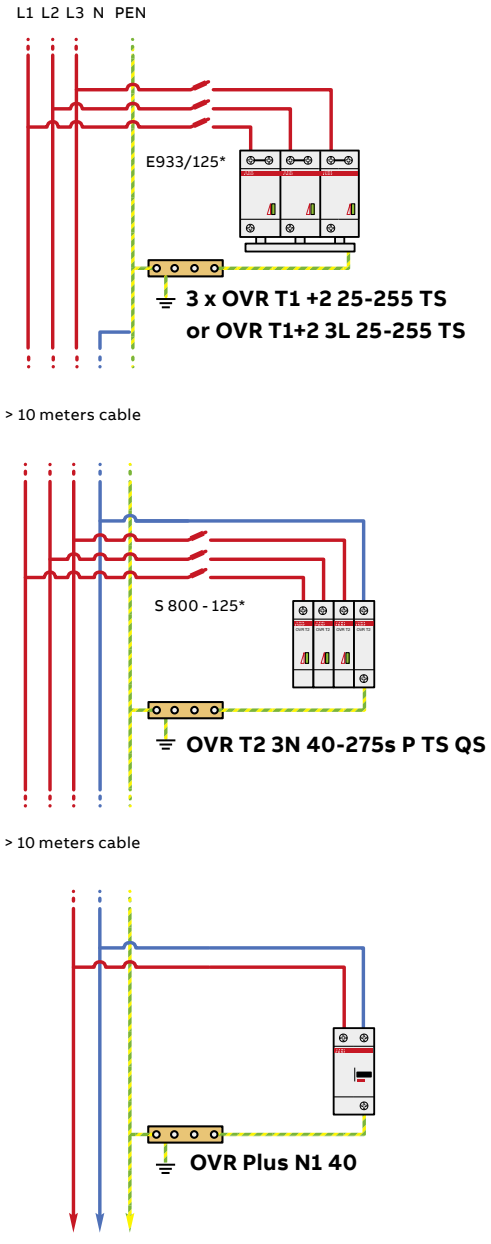
OVR technical details
Coordination

Coordination of surge protection devices
The first over voltage protection device does not provide effective protection for the entire power system. Therefore, a coordination of the over voltage protection devices with each other is required.

Configuration 1
15 kA ≤ I_p ≤ 50 kA



Configuration 2
7 kA ≤ I_p ≤ 15 kA



Surge and lightning protection solutions
Products Standards, IEC 61643

The New IEC 61643-11:2011 is similar to the EN 61643-11:2012 and are the standards for Low-Voltage Surge Protective Devices. These standards exist since the nineties and have gone through different releases improving them. In the last release not only the evaluation of the product performances is under focus, but the stress on safety evaluation.

Regarding performances, **this new edition recognizes the possibility to evaluate and certify a SPD under multiple categories,** option not considered in the previous editions. So in order to certify an SPD under the Type 1 and Type 2 category, two different tests need to be performed to validate the features under each one of them.

Until now, the safety of the SPD was verified reproducing situations that represent the working conditions of the SPD, as for example, the short-circuit test or the temporary over-voltage test. According to the new edition of the standard, **new tests reproducing the potential interruption of the Neutral conductor and the different modes of end of life of the SPD are performed.**

These two additional tests are a real Plus on safety management and they are a guarantee for the final user that the installation will not suffer any stress in case of the end of life of the SPD. The new QuickSafe® range has been specially developed to answer to these new requirements. All this reducing the stress on the back-up protection device.

The new **QuickSafe® technology allows to comply with the end of life tests thanks to a patented internal disconnection system,** this systems disconnects the internal circuit before the internal components (MOVs) go into short-circuit.

The advantage for the customer is that **the product is self-protected up to higher values of current** and this **allows to install back-up protection elements with higher rated current,** as these elements will only intervene in the rear case of a short-circuit on site together with a sudden End of Life of the SPD (this happens when for example the SPD is hit by a current higher than it's Imax).
You will find the tables on page 18 indicating the maximum back-up rated current MCB or fuse to use to guarantee the coordination.

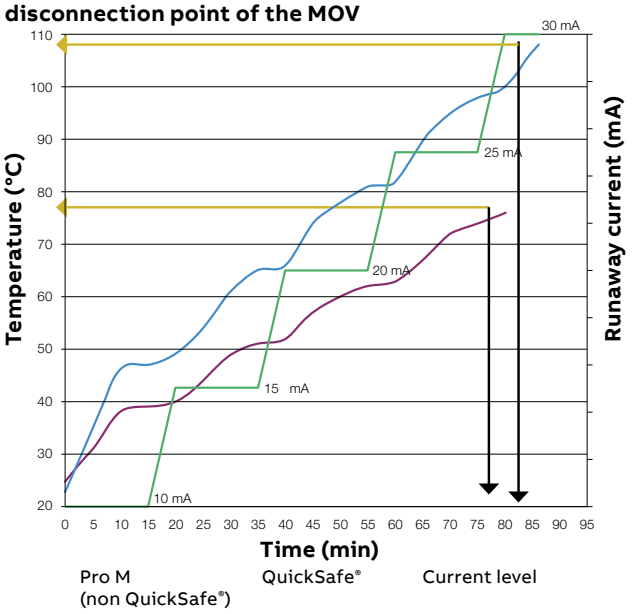
This new technology allows as well to increase the prospective withstand short-circuit current at the point of the installation up to Isccr = 100 kA with a back up protection of maximum rated current of 125 A (for OVR T2 QS and OVR T2-T3 QS) and 160 A (for OVR T1-T2s QS and OVR T2s QS).

What's new in IEC/EN 61643-11:2012?

- New test procedure which takes into account the failure behavior of protective equipment in the event of an overload, or when the service life has expired
- The Type 1 operating duty test is conducted with a higher current than that specified in the previous standard
- Recognition of the mixed types, as Type 1+2 and Type 2+3, this allows as to certify the product with more than one category.

In simple words, the new OVR QuickSafe® can be used in 99.9 % of standard installations and becomes an easy replacement to any other SPD ranges.

Thermal Disconnection – Temperatures measured at the disconnection point of the MOV



Here we can see 2 different curves representing the behavior of the actual range (blue curve) and the new QuickSafe® range (red curve), for the same level of current (the green line represent the evolution of the current with the time, as specified by the IEC 61643-11).

- These curves represent the temperature INCREASE that the MOV suffers when being tested under these values of current for the indicated time. These are NOT absolute temperature, but relatives ones
- As you can see with the black arrows, the time to guarantee the disconnection fo the same level of current has been reduced by 6 minutes
- And even better, as you can see with the orange arrows, the maximum reached temperature required to guarantee the disconnection is lower, from 108 to 76 °C.

Surge and lightning protection solutions
QuickSafe® technology

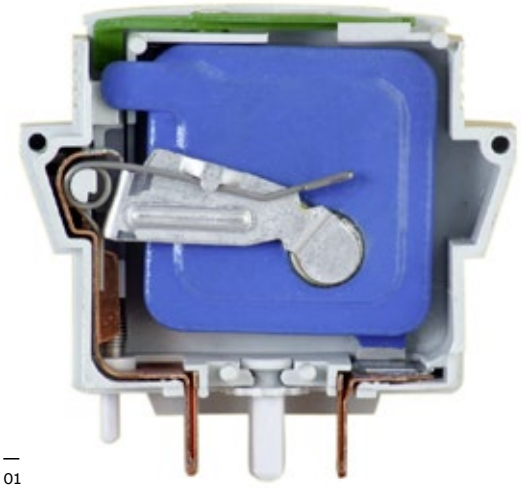
—
01 Here the disconnection system in Close position. During the test simulating and end of life of the SPD, the SPD has to bear a high voltage that forces a current passing through it. In this example, the passing current is 10 A.
—
02 Few seconds later, the MOV achieves a temperature that is high enough to melt the special metallic alloy that guarantees the contact and the mechanical position of the metallic arm. This releases the metallic arm pushed far away by the junction spring.
—
03 The tension in the spring is enough to quickly push up the arm and guarantee the insulation of the MOV. The speed of this movement is a key feature to interrupt the electric arc that will appear between the MOV core and the metallic arm. This movement combined with the characteristics of the MOV will guarantee the complete extinction of the arc.
—
04 At the end of this movement, the metallic arm will stop without any bouncing. There is no risk of a new electric arc development. At this moment, the MOV has not suffered any thermal runaway, so it is not in short-circuit. The distance between between the MOV electrode and the metallic arm guarantees an insulation voltage of over 6000 V, avoiding any risks for the installation.

In case of an end of life of an MOV in normal conditions, the current passing through the MOV increases progressively creating a quick temperature increase. This phenomenon will slowly damage the MOV itself until it gets into short-circuit. This phenomenon is called a thermal runaway.

In order to avoid such thermal runaway we have added a thermal disconnection that will detect this temperature increase and will open the circuit.

This disconnection QuickSafe® is directly welded into the surface of the MOV to allow a very fast detection of the raise of temperature, it will react opening the circuit when the temperature achieve the levels considered hazardous for the installation.
This disconnection is guaranteed by a metallic arm linked to a spring guaranteeing a quick disconnection.

This is a phenomenon that happens only after thousands of surge protection interventions in average. Most of SPDs get changed during the installation updates before this ever happens. This is the ultimate protection at the very end of life of the SPD.



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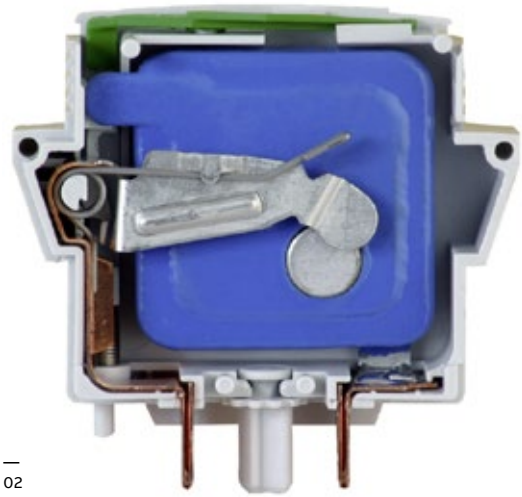

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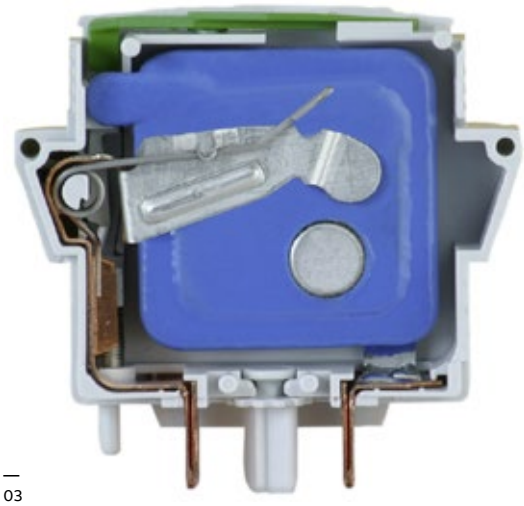
02



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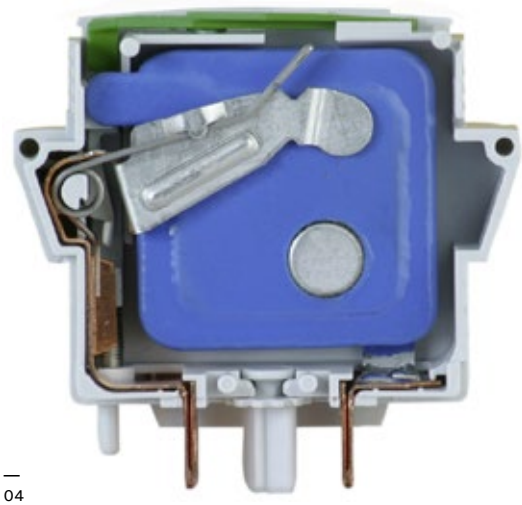
03



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04

Surge and lightning protection solutions
Selection of surge protective devices

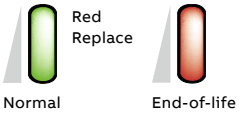
End of life indicator of the standard surge protective device
This option enables indication of the surge protective device state via a mechanical indicator which changes from green to red as the surge protective device comes to end-of-life. When this occurs, the surge protective device must be changed as protection is no longer guaranteed.

Technical features of the integrated auxiliary contact
- Contacts information: Normally-opened (NO)/Normally-closed (NC)
- Min. load: 12 V DC – 10 mA
- Max. load: 250 V AC – 1 A
- Connection cross-section: 1.5 mm².

Pluggable
The pluggable feature of ABB surge protective devices facilitates maintenance. Should one or more worn cartridges need to be replaced, the electrical circuit does not have to be isolated nor do the wires have to be removed.

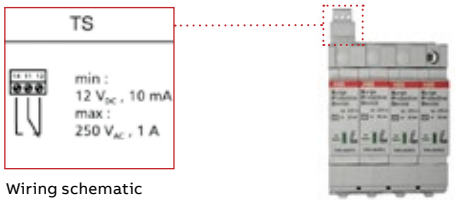
Auxiliary contact (TS)
This function, achieved by wiring a 3-point 1 A volt-free contact, enables the operational state of the surge protective device to be checked remotely (maintenance premises). For standard products, the TS changes status when the cartridge needs to be replace, protection is not guaranteed. On products fitting the Safety Reserve (s) system, it indicates that one component of the cartridge is damaged, but the protection is still guaranteed.

End-of-life indicator standard SPD



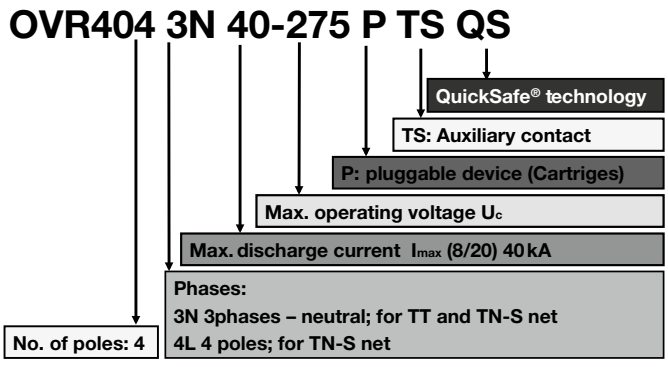
NOTE:
A faulty surge protective device does not interrupt continuity of service (if wired such that priority is given to continuity of service), it simply disconnects itself. But, the equipment is no longer protected.

NOTE:
Pluggable surge protective device cartridges have a foolproof system (Neutral cartridges different to Phase cartridges) preventing incorrect operations when replacing a cartridge.



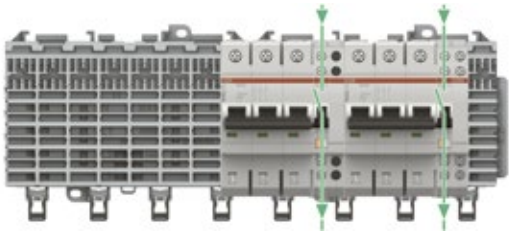
Wiring schematic

Surge protective device fitted with the auxiliary contact option

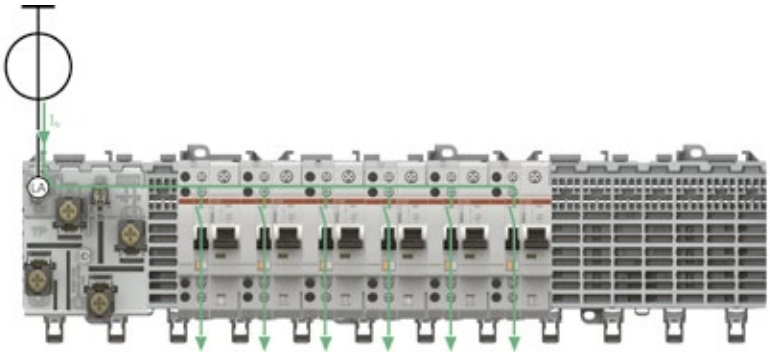


Auxiliary switches and signal contacts
Wiring variants

1. Wiring without auxiliary busbars LA, LB
Wiring of auxiliary switch and signal contact blocks without contact to the auxiliary busbars LA and LB.

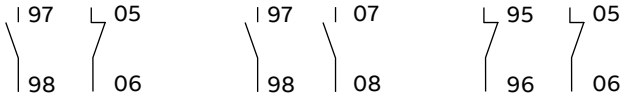


2. Input contacts the auxiliary busbars LA, LB. Standard output wiring.

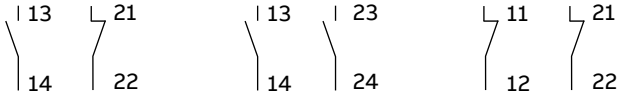


3. Collective alarm, signal contact contacts the auxiliary busbars LA, LB
A cost-effective collective alarm solution can be implemented without additional wiring by using this arrangement.

Contact description signal contact



Contact description auxillary contact



Auxiliary switches and signal contacts
Contact arrangements to auxiliary busbars

Left/right mounting of auxiliary switch/signal contact for miniature circuit breaker
Space-saving on the socket system
By mounting the auxiliary switches/signal contacts alternately on the left and right, the installation width on the SMISSLINE socket system can be reduced. A dummy housing is therefore not needed when just using auxiliary switches or signal contacts.

S400 miniature circuit breakers with auxiliary switches mounted on left and right:
25% space saving

S400 miniature circuit breakers with NT40163 9 mm on the right and S400 with auxiliary switch on the left:
20% space saving

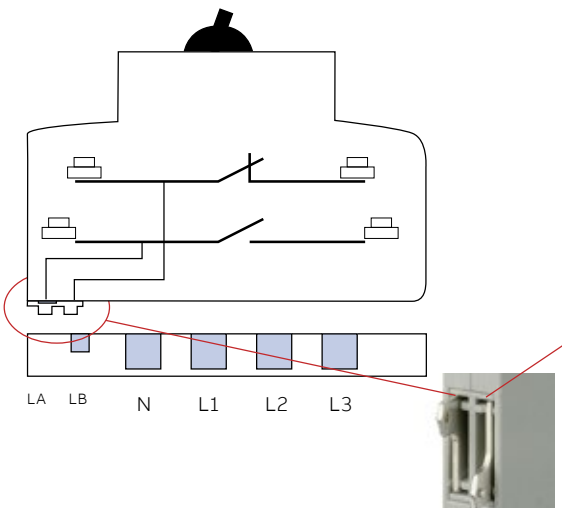
Supply options for auxiliary busbars LA and LB

Supply option for auxiliary busbars using incoming terminal block.

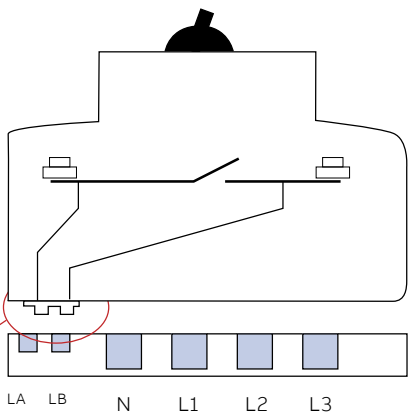
Supply option for auxiliary busbars using incoming terminal block.

Positioning of contacting piece ZLS632 on auxiliary switch and signal contact
The small auxiliary switch/signal contact contacting piece can be simply and quickly changed from the position of the LA to the LB auxiliary busbar by reversing it by 180 degree.

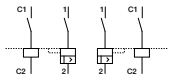
HK/SK 1NO, 1NC



Signal or auxilary contact
Collective alarm



Shunt trip for S400
Technical details



Shunt trips
Function: remote opening of the device when a voltage is applied suitable for MCB S400.

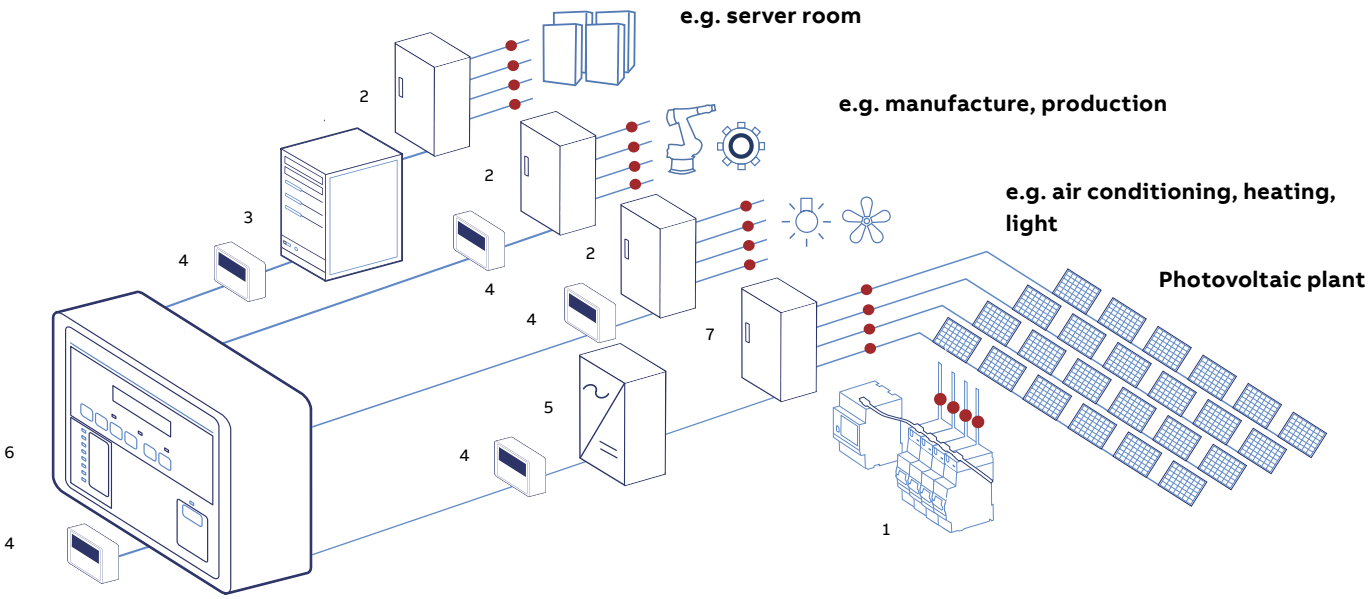
Shunt trip

			S2C-A1						S2C-A2				
Rated voltage	AC	V	12 ... 60						110 ... 415				
	DC	V	12 ... 60						110 ... 250				
Max. release duration		ms	< 10						< 10				
Min. release voltage	AC	V	7						55				
	DC	V	10						80				
Consumption on release	Ub	V	12 DC	12 AC	24 DC	24 AC	60 DC	60 AC	110 DC	110 AC	220 DC	230 AC	415 AC
	Ib max	A	2.2	2.5	4.5	5	14	8.8	0.35	0.5	1.1	1.0	2.7
Coil resistance		Ω	3.7						225				
Terminals		mm^2	16						16				
Tightening torque		Nm	2						2				
Dimensions (H x D x W)		mm	100 x 69 x 17.5						100 x 69 x 17.5				

CMS – Circuit Monitoring System
A system packed with benefits

«The CMS is a compact AC and DC multichannel branch monitoring system.»

The measurement system consists of a Control Unit and sensors. The components can be installed quite simply and very clearly arranged inside control and distribution cabinets. During the system's development, special attention was paid to achieve the best possible user friendliness, a large measurement range (up to 160 A) and scalable solutions for every application. Thanks to its special design, the system is also ideal as a simple retrofit upgrade solution for existing installations. After all, no-one today wants to spend lots of time contemplating and installing the latest technology – all we want to do is make use of the technical benefits.



1 **CMS system (● Measuring points)**
2 **Sub-distribution**
3 **UPS system**
4 **Energy meter**
5 **Power inverter**
6 **Main distribution**
7 **Combiner box**

CMS – Circuit Monitoring System
A system packed with benefits

This is the sign of success!

Minimum space requirement
Small, smaller, CMS – everything needed for effective measuring has been accommodated in the width of a sugar cube

Always retrofittable and upgradeable
The system can be supplemented or modified at any time as it is extremely flexible and modular.Retrofitting is possible sensor by sensor and is key for brownfield extension.

User-friendly commissioning
Configuring can be this smart: Thanks to the intuitive operating concept, the system can be set up and made ready for measuring in a matter of minutes. The integrated Web UI does not need any external software.

One sensor for all types of current
Direct current, alternating current or mixed current, the CMS sensors measure everything in a huge measuring range of up to 160A.

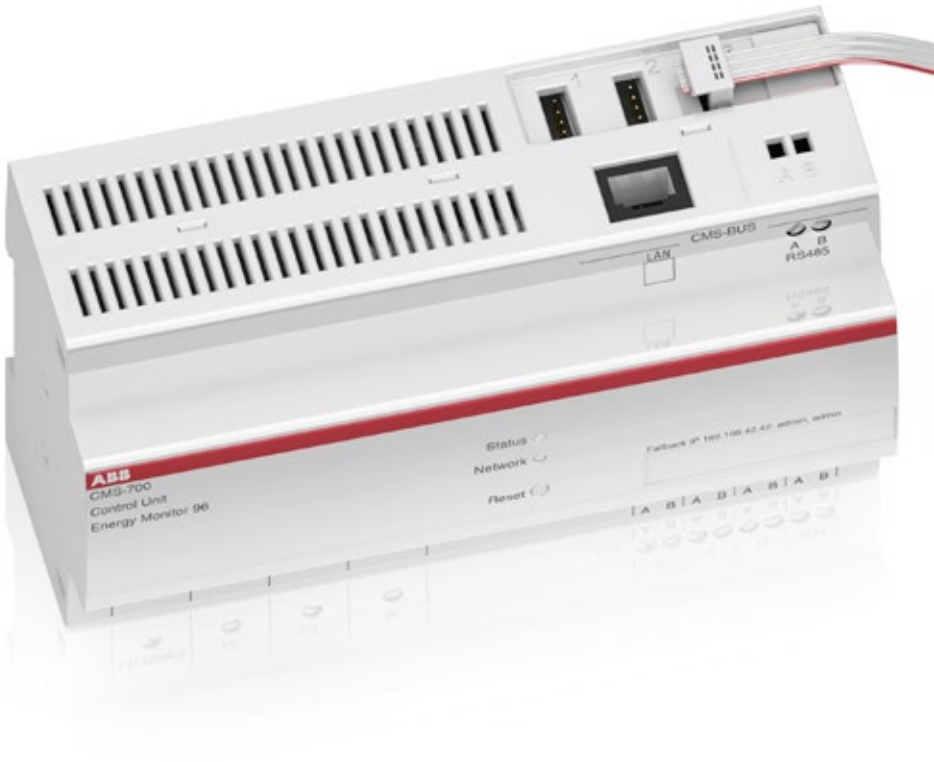
Very simple installation
The sensors are mounted in no time thanks to a simple and tidy bus wiring. No special tools are needed for the entire connection process.

Maximum security and reliability
Protocols include Modbus RTU, TCP and SNMP v1, 2 & 3. Using the new encrypted SNMPv3, utmost data security is guaranteed. The contactless measuring process rules out potential sources of error right from the start. The negligible amount of wiring required ensures maximum system stability.

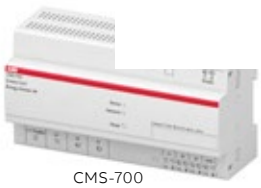
CMS – reliable interfaces
System overview

The quality of a Circuit Monitoring System is dependent on the strengths of the individual components and how well they interact. ABB's CMS sets the bar particularly high. Regardless of whether we're talking compactness, technology, measurement results, user friendliness or flexibility, every component and every feature of this CMS has been fully optimized in terms of practicality and functionality.

Example illustration:
Control Unit CMS-700 in combination with CMS open-core sensors




CMS-600


CMS-700

The Control Unit is a kind of computing and communication center that, depending on the equipment connected to it, evaluates the different data picked up by the sensors and makes it available via the built-in interfaces.

You have a choice of two different units depending on your applications: CMS-600 and CMS-700.

CMS – reliable interfaces
System overview

Connection technology
Connecting the sensors to the Control Unit is extremely simple and requires no special tools. All sensors are connected to the Control Unit by means of a flexible flat cable and insulation displacement connectors. The positioning of sensors is fully customizable so that they sit exactly where a measurement is required.

Serial interfaces
Depending on the unit, numerous interfaces and protocols are available to ensure smooth network implementation: RS485 (Modbus RTU), LAN (TCP/IP and Modbus TCP), SNMP v1/v2 and encrypted v3.

Thanks to the built-in web server, an internet browser or a free Android or iOS app can be used to visualize the values measured. What's more, the measured values can also be exported to CSV files.

Sensors
The CMS sensors form the heart of the system and they can be mounted everywhere without any problem. Initializing the sensors is also child's play, with the desired identifier being assigned to each individual sensor via the Control Unit in just a few simple steps. The entire configuration and commissioning procedure takes just a matter of minutes. All measurement functions are available immediately following initialization.

The sensors – the heart of the CMS
Top-level performance packed into a tiny space

No space is wasted here! Everything is built into an 18 or 25 mm wide unit to enable precise and effective measurements. This makes these CMS sensors the most compact and most powerful on the market.

Small format, colossal performance: Alternating (AC), direct (DC) or mixed (TRMS) currents – the CMS sensors monitor and measure all types of current over a measurement range of up to 160 A (TRMS). They even measure harmonic components in the signal curve.
As each sensor is equipped with its own microprocessor for processing the signal, the measurement data is transmitted digitally to the Control Unit via the bus interface. This minimizes the amount of cabling required in the distribution cabinet and maximizes measured-value transmission reliability. Disturbances like those experienced with analog data now most definitely belong to the past.

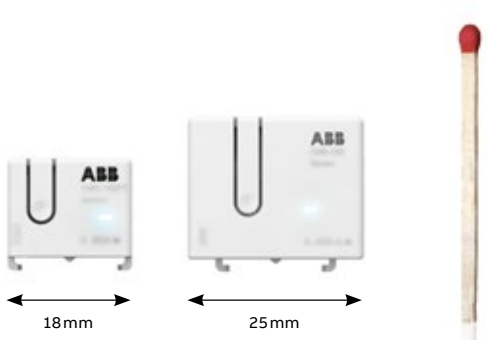
Solid-core sensor

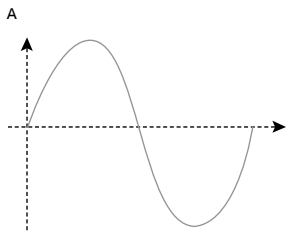
Open-core sensor

Sensor designs
Our CMS sensors are available within a solid-core or open-core design. The solid-core units feature an enclosed structure and AC measurement accuracy* of ≤ ±0.5 %, and are therefore suitable for all applications in which maximum-precision measurement is crucial.

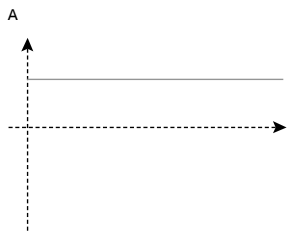
Thanks to their U shape, the open-core sensors can be retrofitted to existing installations with total ease without having to disconnect the cabling or shut down the equipment. With AC accuracy* of ≤ ±1.0 %, they can be used in a multitude of applications without any problem.

*All accuracy specifications refer to the relevant full scale value and apply to 25 °C.

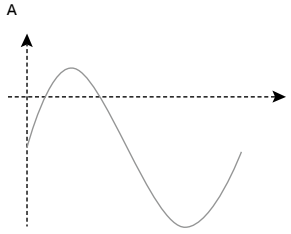




Alternating current



Direct current

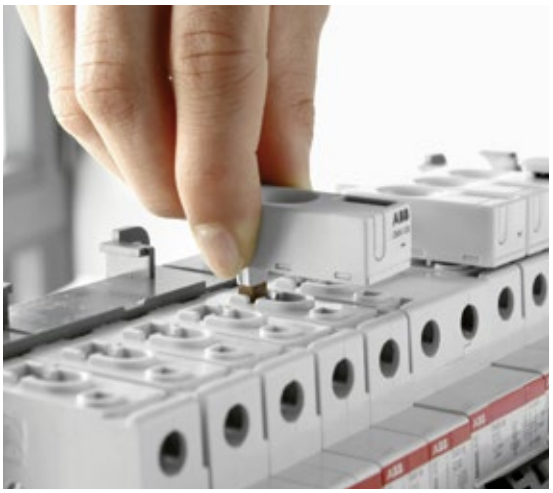


Mixed current

CMS – Current Measurement System
Integrating sensors

CMS sensors are rapidly mounted on ABB low-voltage protection devices. Thanks to the sophisticated design, you have a perfect, compact and clearly arranged unit in the power distribution unit.

The **CMS-120PS** (80A)**, CMS-121PS** (40A)**, CMS-122PS** (20A) are designed for ABB pro M compact and SMISSLINE devices with twin terminals. The sensor only needs to be plugged into the rear terminal connection.



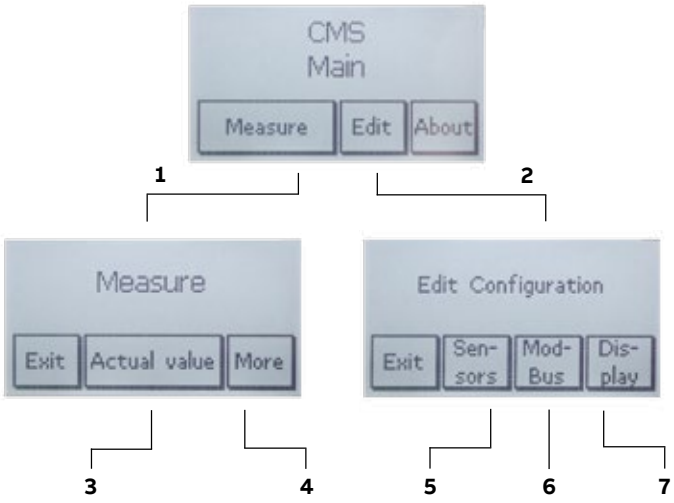
Control Unit CMS-600
Compact current monitoring for the Modbus RTU architecture

The Control Unit CMS-600 is a compact Modbus variant for professional current monitoring.

The CMS-600 system enables you to measure AC and DC currents in up to 64 branches.
For simple and fast operation, the Control Unit is equipped with an illuminated touch display that makes not only initialization but also control of the sensors extremely simple. A 2-wire RS485 Modbus RTU interface enables users to remotely query and process the measurement data. As such, the CMS-600 Control Unit can be very easily integrated into an existing Modbus architecture. As an option, the measured values can also be visualized and processed by means of a programmable logic control (PLC).

Among other things, Control Units CMS-600 are put to use in the critical power systems of hospitals and in similar industrial applications, too. Furthermore, these devices can also be found in functional buildings such as airports, hotels, office buildings, universities/colleges and museums or in industrial photovoltaics.

Great care has been taken to ensure that the navigation concept of the CMS software is highly intuitive. All functions and menus can be called up with just a few clicks. There's as good as no need at all for extensive and costly user tutorials, neither for initialization nor for subsequent operation. This saves a lot of time, effort and, last but not least, money.



Crystal-clear menu navigation

1 **Measurement |** 2 **Configuration |** 3 **Display of actual values**
4 **Display of Max., Min. and Hold values |**
5 **Initialization / parameterization of sensors**
6 **Modbus configuration |** 7 **Display settings**

CMS system components
At a glance

Find the right CMS sensor for your installation in next to no time.

Sensor mounting methods

				
	System pro M, SMISSLINE	**S800**	**DIN rail**	**Cable tie**
	For all LS, FI & FI-LS with twin terminals	For all S800 devices with cage terminals	Universally usable	Universally usable

Open-core sensors

AC accuracy* of ≤ ±1.0 % The laying method influences the accuracy. **18-mm overall width**				
CMS-120xx (80 A) CMS-121xx (40 A) CMS-122xx (20 A)	CMS-120PS CMS-121PS CMS-122PS		CMS-120DR CMS-121DR CMS-122DR	CMS-120CA CMS-121CA CMS-122CA

Solid-core sensors

AC accuracy* ≤ ±0.5 % **18-mm overall width**				
CMS-100xx (80 A) CMS-101xx (40 A) CMS-102xx (20 A)	CMS-100PS CMS-101PS CMS-102PS	CMS-100S8 CMS-101S8 CMS-102S8	CMS-100DR CMS-101DR CMS-102DR	CMS-100CA CMS-101CA CMS-102CA
25-mm overall width				
CMS-200xx (160 A) CMS-201xx (80 A) CMS-202xx (40 A)		CMS-200S8 CMS-201S8 CMS-202S8	CMS-200DR CMS-201DR CMS-202DR	CMS-200CA CMS-201CA CMS-202CA

CMS – Circuit Monitoring System
Technical Data

Control Unit CMS-600 – «Modbus RTU»

CMS-600

CMS-600
User Manual

Supply voltage	[VDC]	24 (± 10 %)
Power input	[W]	4 – 24 (dep. on number of sensors)
Interface		RS485 2-wire
Protocol		Modbus RTU
Data rate	[Baud]	2400 ... 115200
Refresh time		≤1 sec with max. 64 sensors
Insulation strength	[VAC]	400
Screw-type terminals		0.5 ... 2.5 mm², max. 0.6 Nm
Mounting method		35 mm DIN rail (DIN 50022) or SMISSLINE TP plug base
Dimensions	[mm]	71.8 x 87.0 x 64.9 (4 WM)
Operating temperature	[°C]	– 25 ... +70
Bearing temperature	[°C]	– 40 ... +85
Standards		IEC 61010-1 UL 508/ CSA C22.2 No. 14

Control Unit CMS-700

CMS-700

CMS-700
User Manual

Supply voltage	[VAC]	80 – 277 (L1-N, +5%)
Frequency	[Hz]	50 / 60
Power input (L1-N)	[W]	5 ... 40 (dep. on number of sensors)
Power input, current transformer, secondary side	[VA]	Current circuit <2 (per phase)
Voltage measurement range	[VAC]	80 – 277 (L1, L2, L3-N)
Measurement range, current transformer, secondary side	[A]	nominal: 5 max.: 6
Harmonic component	[Hz]	up to 2000
Data rate of Modbus RTU	[Baud]	RS485 2-wire, 2400 ... 115200
Refresh time		≤1 sec with max. 96 sensors
LAN	[Mbit/s]	100
Conductor cross-section	[mm²]	0.5 ... 2.5
Mounting method		35 mm DIN rail (DIN 50022)
Degree of protection		IP20
Dimensions	[mm]	161.5 x 87.0 x 64.9 (9 WM)
Operating temperature	[°C]	– 25 ... +60
Bearing temperature	[°C]	– 40 ... +85
Standards		IEC61010-1 UL 508/ CSA C22.2 No. 14

Main circuit accuracy

Voltage		± 1 %
Current		± 1 %
Harmonic component		1 %
Active power		± 2 %
Apparent power		± 2 %
Reactive power		± 2 %
Power factor		± 0.2 %

CMS website
Go to new.abb.com/circuit-monitoring-systems to find all available information and materials on the topic of CMS Circuit Monitoring Systems.

CMS – Circuit Monitoring System
Technical Data

Open-core sensors 18 mm

CMS-12XPS

CMS-12XDR

CMS-12XCA

Sensor type			CMS-120xx	CMS-121xx	CMS-122xx
Measurement range		[A]	80	40	20
Measuring method			TRMS, AC 50 / 60 Hz, DC		
Peak factor, distorted waveform			≤ 1.5	≤ 3	≤ 6
AC accuracy (TA = +25 °C)*			≤ ±1 %		
AC temperature coefficient*			≤ ±0.04 %		
DC accuracy (TA = +25 °C)*			≤ ±1.2 %	≤ ±1.4 %	≤ ±1.8 %
DC temperature coefficient*			≤ ±0.14 %	≤ ±0.24 %	≤ ±0.44 %
Resolution		[A]	0.01		
Sampling rate, internal		[Hz]	5000		
Response time (±1 %)		[sec]	typ. 0.34		
Conductor penetration		[mm]	9,6		
Insulation strength			690 AC / 1500 DC		
Operating/storage temperature		[°C]	-25 ... +70 / -40 ... +85		
Dimensions	CMS-120PS Serie	[mm]	17.4 x 41.0 x 26.5		
	CMS-120CA Serie	[mm]	17.4 x 41.0 x 29.0		
	CMS-120DR Serie	[mm]	17.4 x 51.5 x 43.2		
Standards			IEC 61010-1 | UL508 / CSA C22.2 No 14		

Solid-core sensors 18 mm

CMS-10XPS

CMS-10XS8

CMS-10XDR

CMS-10XCA

Sensor type			CMS-100xx	CMS-101xx	CMS-102xx
Measurement range		[A]	80	40	20
Measuring method			TRMS, AC 50 / 60 Hz, DC		
Peak factor, distorted waveform			≤ 1.5	≤ 3	≤ 6
AC accuracy (TA = +25 °C)*			≤ ±0.5 %		
AC temperature coefficient*			≤ ±0.036 %		
DC accuracy (TA = +25 °C)*			≤ ±0.7 %	≤ ±1.0 %	≤ ±1.7 %
DC temperature coefficient*			≤ ±0.047 %	≤ ±0.059 %	≤ ±0.084 %
Resolution		[A]	0.01		
Sampling rate, internal		[Hz]	5000		
Response time (±1 %)		[sec]	typ. 0.25		
Conductor penetration		[mm]	10		
Insulation strength		[V]	690 VAC / 1500 VDC		
Operating/storage temperature		[°C]	-25 ... +70 / -40 ... +85		
Dimensions	CMS-100PS Serie	[mm]	17.4 x 41.0 x 26.5		
	CMS-100S8 Serie	[mm]	26.5 x 45.5 x 31.8		
	CMS-100DR Serie	[mm]	17.4 x 51.5 x 43.2		
	CMS-100CA Serie	[mm]	17.4 x 41.0 x 29.0		
Standards			IEC 61010-1 | UL508 / CSA C22.2 No 14		

* All accuracy specifications refer to the relevant full scale value and apply to 25 °C. In the case of open-core sensors, the position of the cable influences the precision.

CMS – Circuit Monitoring System
Technical Data

Solid-core sensors 25 mm

CMS-20XS8

CMS-20XDR

CMS-20XCA

Sensor type			CMS-200xx	CMS-201xx	CMS-202xx
Measurement range		[A]	160	80	40
Measuring method			TRMS, AC 50 / 60 Hz, DC		
Peak factor, distorted waveform			≤ 1.5	≤ 3	≤ 6
AC accuracy (TA = +25°C)*			≤ ± 0.5 %		
AC temperature coefficient*			≤ ± 0.036 %		
DC accuracy (TA = +25°C)*			≤ ± 0.7 %	≤ ± 1.0 %	≤ ± 1.7 %
DC temperature coefficient*			≤ ± 0.047 %	≤ ± 0.059 %	≤ ± 0.084 %
Resolution		[A]	0.01		
Sampling rate, internal		[Hz]	5000		
Response time (±1%)		[sec]	typ. 0.25		
Conductor penetration		[mm]	15		
Insulation strength		[V]	690 VA / 1500 VDC		
Operating/storage temperature		[°C]	- 25 ... + 70 / - 40 ... + 85		
Dimensions	CMS-200S8 Serie	[mm]	26.5 x 43.0 x 38.5		
	CMS-200DR Serie	[mm]	25.4 x 43.0 x 43.2		
	CMS-200CA Serie	[mm]	25.4 x 43.0 x 35.7		
Standards			IEC 61010-1 | UL508 / CSA C22.2 No 14		

* All accuracy specifications refer to the relevant full scale value and apply to 25 °C. In the case of open-core sensors, the position of the cable influences the precision.

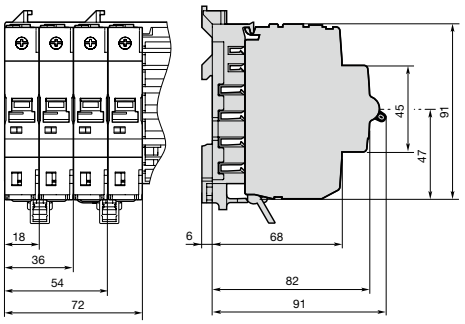
S4C-CM motor operating devices
Specific features

- On the front of the device there is a moveable element for allowing or locking out remote commands. This element may be used when performing maintenance with the residual current circuit breaker in the OFF position, in order to avoid remote-activated closing operations.
- The operation can be performed via an impulse command. Manual operation is performed by moving the motorized command lever which, in the absence of an operation, allows the circuit breaker lever to be freely moved.
- The lower section of the device contains an integrated 1NO+1NC auxiliary change-over contact, which indicates the position of the contacts of the associated circuit breaker.
- The red LED on the front of the device gives a local visual indication of the intervention of the associated device

Table of conteants
SMISSLINE TP

SMISSLINE dimension (in mm)

—
01 1-, 2-, 3- and 4-pole miniature circuit breakers S400
—
02 4-pole residual current operated circuit breaker
—
03 4-pole residual current operated circuit breaker, switch disconnector
—
04 F4C-CM and F4C-ARI
—
05 Auxiliary switch and signal contact
—
06 Residual current circuit-breakers with overcurrent protection (RCBO) FS401
—
07 Surge Arrester
—
08 2-pole residual current operated circuit breaker F402



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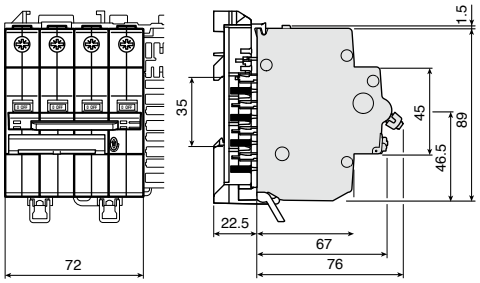

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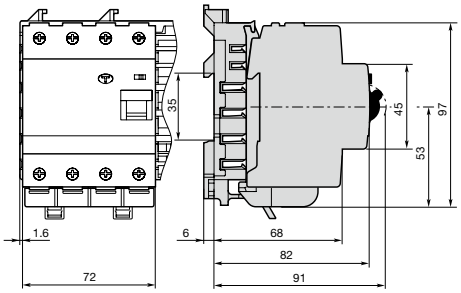

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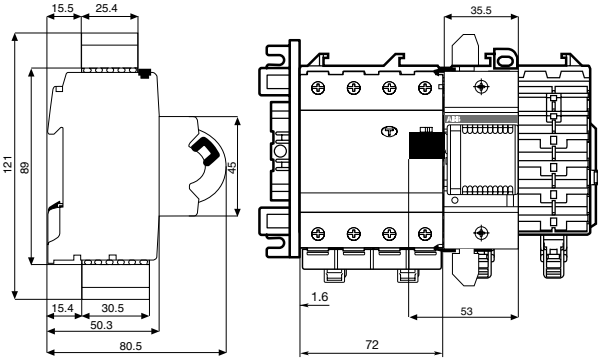

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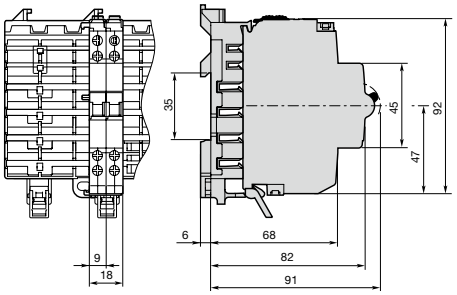

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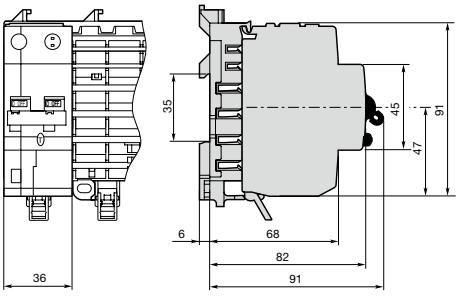

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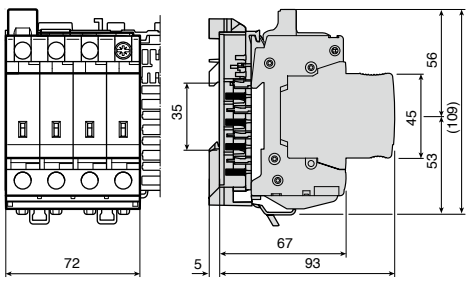

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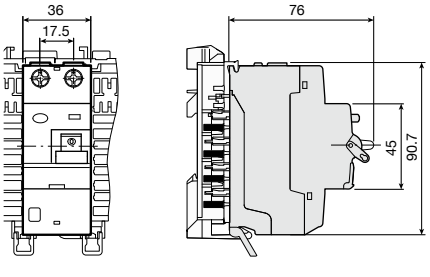

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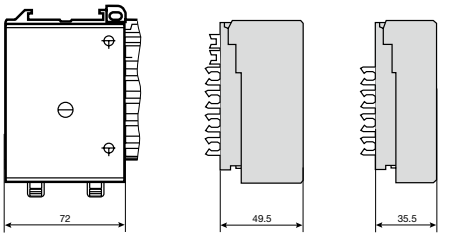
08

SMISSLINE dimension (in mm)

—
01 Incoming terminal blocks 100A/160A
—
02 Incoming terminal component 200A
—
03 Incoming terminal blocks 63A
Incoming terminal block LA, LB
—
04 Neutral disconnector
—
05 Socket base ZLS9P08 Power Bar
—
06 Socket base ZLS906 Receptacle – 6 dimensional units



ZLS 224, 225 ZLS 228, 229

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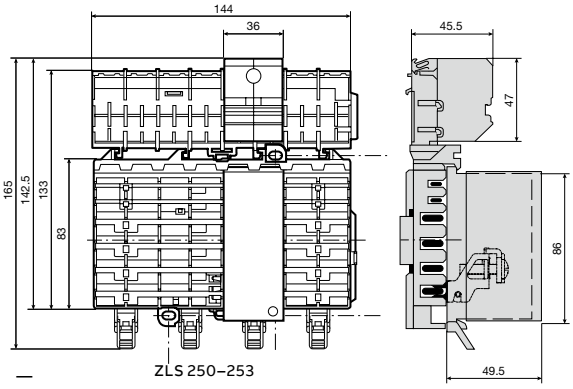
01



ZLS 250–253

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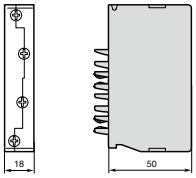

ZLS 260-262

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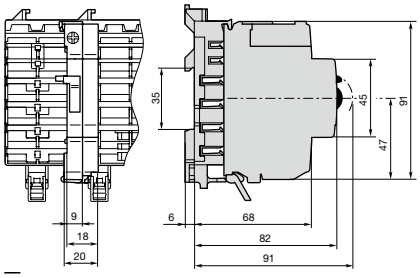

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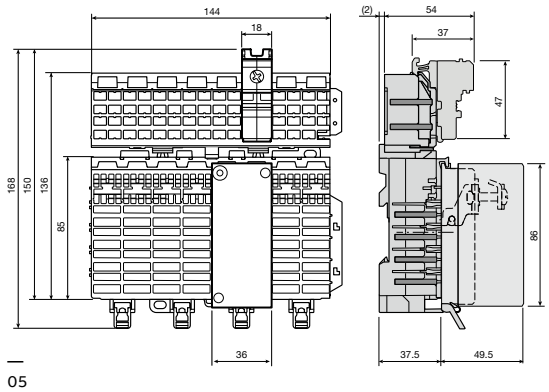

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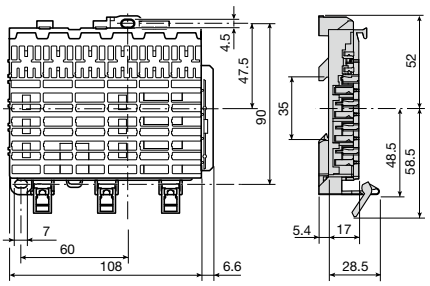

ZLS906

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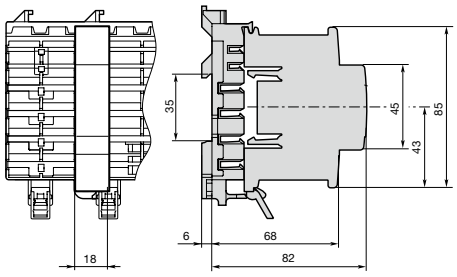
06

SMISSLINE dimension (in mm)

—
01 Intermediate piece ZLS 725
—
02 Combi module ZMS132, Adapter MS116/132
—
03 Busbar cover ZLS100
—
04 Extension adapter ZLS101
—
05 Sensor (CMS-100PS)
—
06 Control Unit (CMS-600)
—
07 Universal adapter 32 A, 63 A
—
028 Surge Arrester OVR404



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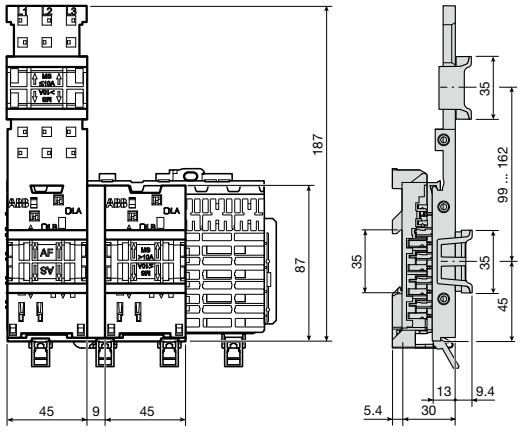

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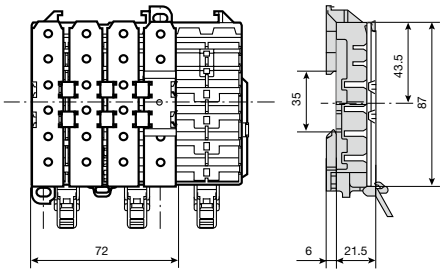

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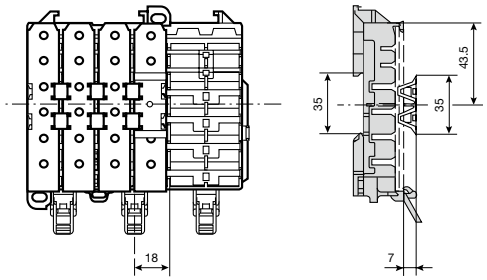

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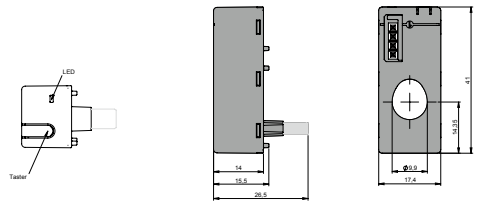

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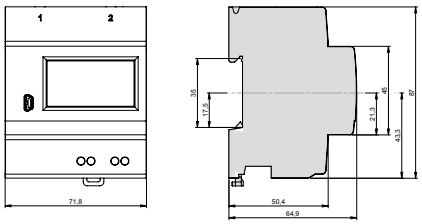

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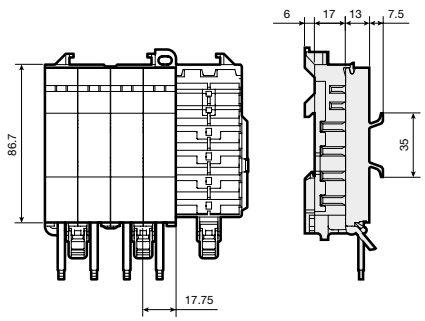

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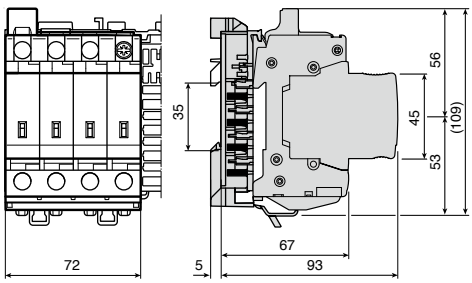

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08

Table of conteants
SMISSLINE TP

Approvals and standards
According to IEC/EN

	CH	CH	DE	US Canada				China	RU								
	SEV		VDE	UL508A	UL489	DNV	Lloyds register		GOST	AS/NZS 4417	EN60947-2	EN60898-1	EN61008-1	EN61009-1	EN/IEC 61643-11	EN60947-3	EN 61439-6	EN60947-5-1
Miniature circuit breaker 6 kA S400 E	■		■									■						
Miniature circuit breaker 10 kA S400 B and D	■		■				□		■			■						
Miniature circuit breaker 10 kA S400 C	■		■			■	□	■	■		■	■						
Miniature circuit breaker 10 kA S400 K	■		■			■	□	■	■		■							
Miniature circuit breaker 10 kA S400 UC C, Z						■			■		■							
2-pole residual current operated circuit breaker F402		■	■						■				■					
Residual current operated circuit breaker FS401	■		■					■	■	■				■				
Residual current operated circuit breaker FS403	■		■							■				■				
4-pole residual current operated circuit breaker F404		■	■						■				■					
Switch disconnector IS404	■								■							■		
Surge arrester OVR404									■						■			
Auxiliary switch and signal contacts						■	□	■	■									■
Bus Bar System			■	■		■											■	
Universal adapter 32 A, 63 A			■	■		■											■	
Universal adapter 25, 45 A (UL489)			■		■	■											■	
Combi module				■														

■ Approved
□ Device is submitted for approval