5SY6 Miniature Circuit Breakers

SENTRON Protection, Switching, Measuring and Monitoring Devices

Miniature circuit breakers are used to protect plants in buildings and infrastructures for industrial applications. The devices can be used as main control switches for disconnecting or isolating plants.

- **Additional components offer increased flexibility**

Additional components, such as auxiliary switches, fault signal contacts, shunt releases, undervoltage releases, remote controlled mechanisms and RC units enhance the miniature circuit breaker's overall functionality.

- **Quick and safe assembly**

Integrated movable terminal covers located at the cable entries ensure the terminals are fully insulated when the screws are tightened. Manual quick-assembly systems guarantee convenient time-saving assembly without requiring any tools.

Highlights

- Touch protection when grasping the device – exceeds VBG4/BGV A3 requirements
- Busbar assembly devices are replaced faster and with less effort
- The infeed can be operated from the top or bottom

Answers for infrastructure.

SIEMENS

Miniature Circuit Breakers

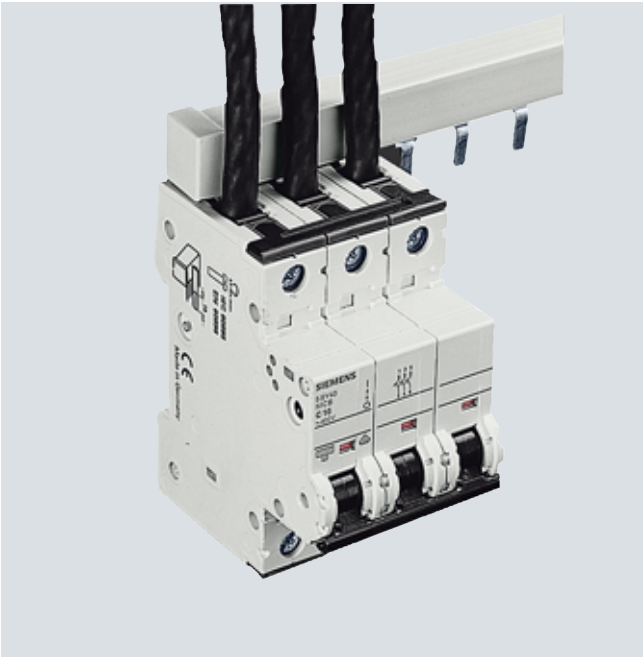
5SY6 miniature circuit breakers

Overview

The devices are approved for worldwide use according to IEC standards for systems up to 250/440 V AC. 60 V DC per pole is permitted in DC systems.

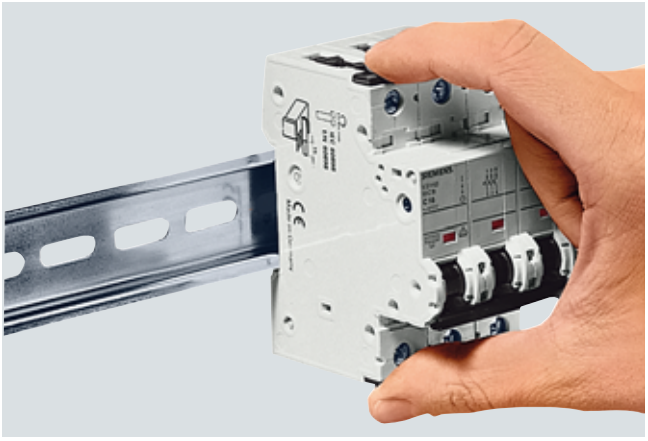
For North America, we also have additional certification to UL 1077 for use as "supplementary protectors" in systems up to 480Y/277 V AC. For use in ship building, the devices also have numerous certifications according to shipping classifications; BV, DNV, GL and LRS.

Benefits

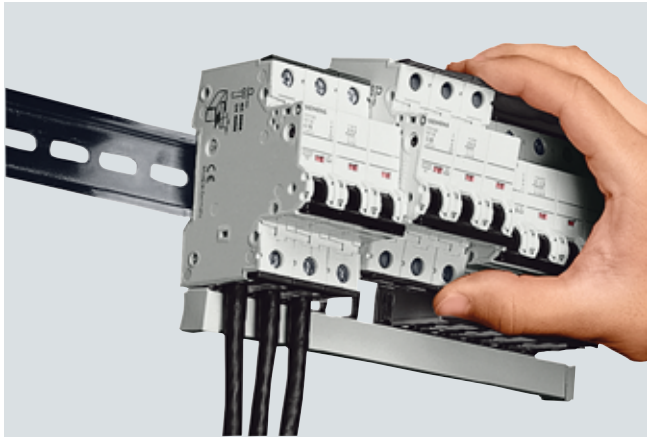


- Optional top or bottom infeed as the terminals are identical
- Clear and visible conductor connection in front of the busbar facilitates controls
- Large and easily accessible wiring space enables easy insertion of conductor in the terminal.

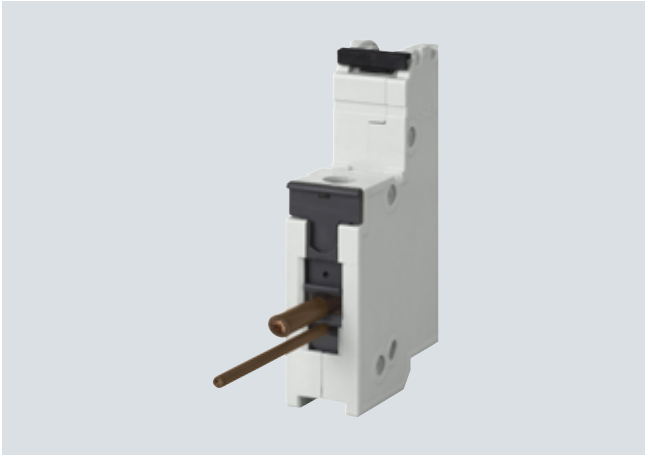
- Integrated movable terminal covers located at the cable entries ensure the terminals are fully insulated when the screws are tightened
- The effective touch protection when grasping the device considerably exceeds the requirements of VBG 4/BGV A3.



- Manual snap-on fixing and release systems that require no tools enable fast assembly and disassembly of MCBs
- Marked labeling field on all modular installation devices for uniform, quick and easy identification.



- Quick and easy manual removal of MCBs from the busbar assembly if connections need to be changed.
- Time-saving replacement of parts as busbars no longer need to be freed from adjacent devices.



- Double terminal chambers enable accommodation of 2 wires of different cross-sections (up to 16 mm^2 in the bottom chamber and 35 mm^2 in the top chamber).

Configuration

Switching capacity

Particular demands are made on miniature circuit breakers with regard to switching capacity.

The values are standardized and are determined according to the test conditions of IEC/EN 60898-1 or DIN VDE 0641-11.

For other test conditions, it is also possible to specify values that are higher than those of IEC/EN 60898 or DIN VDE 0641-11.

One such standard is IEC/EN 60947-2 or DIN VDE 0660-101 for circuit breakers.

Rated switching capacity

5SY6 miniature circuit breakers

		IEC/EN 60898-1		**IEC/EN 60947-2**	
		1-pole 230 V AC	**2-, 3- and 4-pole** 400 V AC	**1-pole** 230 V AC	**2-, 3- and 4-pole** 400 V AC
	I_n [A]	I_{cn} [kA]	I_{cn} [kA]	I_{cu} [kA]	I_{cu} [kA]
5SY6	0.3 ... 6	6		30	
	8 ... 32	6		15	
	40 ... 63	6		10	

Technical specifications

				5SY6
Standards				EN 60898-1; EN 60947-2
Operational voltage			V AC	230/400
		Min.	V AC/DC	24
Acc. to EN 60898-1/-2 and EN 60947-2		Max. Max.	V DC/pole V AC	60[1] 250/440
Acc. to UL 1077 and CSA C22.2 No.235		Max.	V AC V DC/pole	480Y/277 60
Rated switching capacity				
• I_{cn} acc. to IEC/EN 60898-1			kA AC	6
• I_{cn} acc. to IEC/EN 60898-2			kA DC	6
• Acc. to UL1077 and CSA C22.2 No.235			kA AC	5
Insulation coordination				
• Rated insulation voltage			V AC V DC/pole	250/440 --
Degree of pollution for overvoltage category				3/III
Touch protection	Acc. to EN 50274			Yes
Main switch characteristic	Acc. to EN 60204			Yes
Handle end position, sealable				Yes
Degree of protection	Acc. to EN 60529			IP20, with connected conductors
CFC and silicone-free				Yes
Mounting				
• Snap-on fixing system				Yes
Terminals				
• Combined terminals at both ends				Yes
• Terminal tightening torque			Nm lb.in	2.5 ... 3 22 ... 26
Conductor cross-sections				
• Solid and stranded			mm^2	0.75 ... 35
• Finely stranded, with end sleeve			mm^2	0.75 ... 25
• AWG cables			AWG	14 ... 4
Mains connection				
• AC				Any
• DC				Any
Mounting position				Any
Service life On average, with rated load			Actuations	20 000
Ambient temperature			°C	-25 ... +55, max. 95 % humidity
Storage temperature			°C	-40 ... +75
Resistance to climate	Acc. to IEC 60068-2-30			6 cycles
Shock	Acc. to IEC 60068-2-27		m/s^2	150 for 11 ms half-sine
Resistance to vibrations	Acc. to IEC 60068-2-6		m/s^2	50 at 25 ... 150 Hz and 60 at 35 Hz (4 sec)

[1] The operational voltage 60 V DC/pole takes into account a battery charging voltage with a peak value of 72 V.

Selection and ordering data (Dated 11/2010)

6 000 / 3	I_n	Mounting width	DT	Characteristic B Order No.	PU (UNIT, SET, M)	PS*/ P. unit	PG	Weight per PU approx.
	A	MW[1]						kg
	MCBs 6000 A							
	1P, 230/400 V AC							
	2	1	▶	**5SY6 102-6**	1	1 unit	002	0.165
	4		B	**5SY6 104-6**	1	1 unit	002	0.165
	6		▶	**5SY6 106-6**	1	1/12 unit	002	0.165
	10		▶	**5SY6 110-6**	1	1/12 unit	002	0.165
	13		▶	**5SY6 113-6**	1	1/12 unit	002	0.165
	16		▶	**5SY6 116-6**	1	1/12 unit	002	0.165
	20		▶	**5SY6 120-6**	1	1/12 unit	002	0.165
	25		▶	**5SY6 125-6**	1	1/12 unit	002	0.165
	32		▶	**5SY6 132-6**	1	1/12 unit	002	0.165
	40		B	**5SY6 140-6**	1	1 unit	002	0.165
	50		B	**5SY6 150-6**	1	1 unit	002	0.165
	63		B	**5SY6 163-6**	1	1 unit	002	0.165
	1P+N, 230 V AC							
	6	2	▶	**5SY6 506-6**	1	1 unit	002	0.330
	10		▶	**5SY6 510-6**	1	1 unit	002	0.330
	13		A	**5SY6 513-6**	1	1/6 unit	002	0.330
	16		▶	**5SY6 516-6**	1	1/6 unit	002	0.330
	20		B	**5SY6 520-6**	1	1 unit	002	0.330
	25		B	**5SY6 525-6**	1	1 unit	002	0.330
	32		B	**5SY6 532-6**	1	1 unit	002	0.330
	40		C	**5SY6 540-6**	1	1 unit	002	0.330
	50		C	**5SY6 550-6**	1	1 unit	002	0.330
	63		C	**5SY6 563-6**	1	1 unit	002	0.330
	2P, 400 V AC							
	6	2	▶	**5SY6 206-6**	1	1/6 unit	002	0.330
	10		▶	**5SY6 210-6**	1	1/6 unit	002	0.330
	13		B	**5SY6 213-6**	1	1 unit	002	0.330
	16		▶	**5SY6 216-6**	1	1/6 unit	002	0.330
	20		B	**5SY6 220-6**	1	1 unit	002	0.330
	25		B	**5SY6 225-6**	1	1 unit	002	0.330
	32		▶	**5SY6 232-6**	1	1 unit	002	0.330
	40		B	**5SY6 240-6**	1	1 unit	002	0.330
	50		C	**5SY6 250-6**	1	1 unit	002	0.330
	63		C	**5SY6 263-6**	1	1 unit	002	0.330
	3P, 400 V AC							
	6	3	A	**5SY6 306-6**	1	1 unit	002	0.495
	10		▶	**5SY6 310-6**	1	1/4 unit	002	0.495
	13		B	**5SY6 313-6**	1	1 unit	002	0.495
	16		▶	**5SY6 316-6**	1	1/4 unit	002	0.495
	20		▶	**5SY6 320-6**	1	1 unit	002	0.495
	25		▶	**5SY6 325-6**	1	1 unit	002	0.495
	32		▶	**5SY6 332-6**	1	1/4 unit	002	0.495
	40		A	**5SY6 340-6**	1	1 unit	002	0.495
	50		B	**5SY6 350-6**	1	1 unit	002	0.495
	63		B	**5SY6 363-6**	1	1 unit	002	0.495
	3P+N, 400 V AC							
	6	4	B	**5SY6 606-6**	1	1 unit	002	0.660
	10		B	**5SY6 610-6**	1	1 unit	002	0.660
	13		B	**5SY6 613-6**	1	1 unit	002	0.660
	16		▶	**5SY6 616-6**	1	1 unit	002	0.660
	20		A	**5SY6 620-6**	1	1 unit	002	0.660
	25		B	**5SY6 625-6**	1	1 unit	002	0.660
	32		B	**5SY6 632-6**	1	1 unit	002	0.660
	40		C	**5SY6 640-6**	1	1 unit	002	0.660
	50		C	**5SY6 650-6**	1	1 unit	002	0.660
	63		C	**5SY6 663-6**	1	1 unit	002	0.660
	4P, 400 V AC							
	6	4	C	**5SY6 406-6**	1	1 unit	002	0.660
	10		B	**5SY6 410-6**	1	1 unit	002	0.660
	13		C	**5SY6 413-6**	1	1 unit	002	0.660
	16		A	**5SY6 416-6**	1	1 unit	002	0.660
	20		A	**5SY6 420-6**	1	1 unit	002	0.660
	25		▶	**5SY6 425-6**	1	1 unit	002	0.660
	32		B	**5SY6 432-6**	1	1 unit	002	0.660
	40		B	**5SY6 440-6**	1	1 unit	002	0.660
	50		B	**5SY6 450-6**	1	1 unit	002	0.660
	63		B	**5SY6 463-6**	1	1 unit	002	0.660

[1] 1 MW (modular width) = 18 mm.

* You can order this quantity or a multiple thereof.

	I_n	Mounting width	DT	Characteristic C Order No.	PG	DT	Characteristic D Order No.	PE (ST, SZ, M)	PS*/ P. unit	PG	Weight per PU approx.
	A	MW[1]									kg
	MCBs 6000 A										
	1P, 230/400 V AC										
	0.3	1	A	**5SY6 114-7**	003	C	**5SY6 114-8**	1	1 unit	004	0.165
	0.5		▶	**5SY6 105-7**	003	A	**5SY6 105-8**	1	1 unit	004	0.165
	1		▶	**5SY6 101-7**	003	▶	**5SY6 101-8**	1	1 unit	004	0.165
	1.6		▶	**5SY6 115-7**	003	C	**5SY6 115-8**	1	1 unit	004	0.147
	2		▶	**5SY6 102-7**	003	▶	**5SY6 102-8**	1	1/12 unit	004	0.165
	3		▶	**5SY6 103-7**	003	A	**5SY6 103-8**	1	1 unit	004	0.165
	4		▶	**5SY6 104-7**	003	▶	**5SY6 104-8**	1	1 unit	004	0.165
	6		▶	**5SY6 106-7**	003	▶	**5SY6 106-8**	1	1/12 unit	004	0.165
	8		▶	**5SY6 108-7**	003	A	**5SY6 108-8**	1	1 unit	004	0.165
	10		▶	**5SY6 110-7**	003	▶	**5SY6 110-8**	1	1 unit	004	0.165
	13		▶	**5SY6 113-7**	003	A	**5SY6 113-8**	1	1 unit	004	0.165
	16		▶	**5SY6 116-7**	003	▶	**5SY6 116-8**	1	1 unit	004	0.165
	20		▶	**5SY6 120-7**	003	A	**5SY6 120-8**	1	1 unit	004	0.165
	25		▶	**5SY6 125-7**	003	A	**5SY6 125-8**	1	1 unit	004	0.165
	32		▶	**5SY6 132-7**	003	B	**5SY6 132-8**	1	1 unit	004	0.165
	40		▶	**5SY6 140-7**	003	B	**5SY6 140-8**	1	1 unit	004	0.165
	50		▶	**5SY6 150-7**	003	B	**5SY6 150-8**	1	1 unit	004	0.165
	63		▶	**5SY6 163-7**	003	C	**5SY6 163-8**	1	1 unit	004	0.165
	1P+N, 230 V AC										
	0.3	2	B	**5SY6 514-7**	003	C	**5SY6 514-8**	1	1 unit	004	0.330
	0.5		A	**5SY6 505-7**	003	B	**5SY6 505-8**	1	1 unit	004	0.330
	1		▶	**5SY6 501-7**	003	C	**5SY6 501-8**	1	1 unit	004	0.330
	1.6		B	**5SY6 515-7**	003	B	**5SY6 515-8**	1	1 unit	004	0.330
	2		▶	**5SY6 502-7**	003	B	**5SY6 502-8**	1	1 unit	004	0.330
	3		A	**5SY6 503-7**	003	B	**5SY6 503-8**	1	1 unit	004	0.330
	4		▶	**5SY6 504-7**	003	B	**5SY6 504-8**	1	1 unit	004	0.330
	6		▶	**5SY6 506-7**	003	A	**5SY6 506-8**	1	1 unit	004	0.330
	8		B	**5SY6 508-7**	003	B	**5SY6 508-8**	1	1 unit	004	0.330
	10		▶	**5SY6 510-7**	003	B	**5SY6 510-8**	1	1 unit	004	0.330
	13		▶	**5SY6 513-7**	003	C	**5SY6 513-8**	1	1 unit	004	0.330
	16		▶	**5SY6 516-7**	003	A	**5SY6 516-8**	1	1 unit	004	0.330
	20		▶	**5SY6 520-7**	003	C	**5SY6 520-8**	1	1 unit	004	0.330
	25		▶	**5SY6 525-7**	003	C	**5SY6 525-8**	1	1 unit	004	0.330
	32		▶	**5SY6 532-7**	003	C	**5SY6 532-8**	1	1 unit	004	0.330
	40		B	**5SY6 540-7**	003	C	**5SY6 540-8**	1	1 unit	004	0.330
	50		B	**5SY6 550-7**	003	C	**5SY6 550-8**	1	1 unit	004	0.330
	63		B	**5SY6 563-7**	003	C	**5SY6 563-8**	1	1 unit	004	0.330
	2P, 400 V AC										
	0.3	2	B	**5SY6 214-7**	003	B	**5SY6 214-8**	1	1 unit	004	0.330
	0.5		▶	**5SY6 205-7**	003	▶	**5SY6 205-8**	1	1 unit	004	0.330
	1		▶	**5SY6 201-7**	003	▶	**5SY6 201-8**	1	1 unit	004	0.330
	1.6		▶	**5SY6 215-7**	003	A	**5SY6 215-8**	1	1 unit	004	0.330
	2		▶	**5SY6 202-7**	003	▶	**5SY6 202-8**	1	1/6 unit	004	0.330
	3		▶	**5SY6 203-7**	003	▶	**5SY6 203-8**	1	1 unit	004	0.330
	4		▶	**5SY6 204-7**	003	▶	**5SY6 204-8**	1	1/6 unit	004	0.330
	6		▶	**5SY6 206-7**	003	▶	**5SY6 206-8**	1	1/6 unit	004	0.330
	8		▶	**5SY6 208-7**	003	▶	**5SY6 208-8**	1	1 unit	004	0.330
	10		▶	**5SY6 210-7**	003	▶	**5SY6 210-8**	1	1/6 unit	004	0.330
	13		▶	**5SY6 213-7**	003	B	**5SY6 213-8**	1	1 unit	004	0.330
	16		▶	**5SY6 216-7**	003	▶	**5SY6 216-8**	1	1 unit	004	0.330
	20		▶	**5SY6 220-7**	003	▶	**5SY6 220-8**	1	1 unit	004	0.330
	25		▶	**5SY6 225-7**	003	▶	**5SY6 225-8**	1	1 unit	004	0.330
	32		▶	**5SY6 232-7**	003	▶	**5SY6 232-8**	1	1 unit	004	0.330
	40		▶	**5SY6 240-7**	003	B	**5SY6 240-8**	1	1 unit	004	0.330
	50		▶	**5SY6 250-7**	003	B	**5SY6 250-8**	1	1 unit	004	0.330
	63		▶	**5SY6 263-7**	003	B	**5SY6 263-8**	1	1 unit	004	0.330

[1] 1 MW (modular width) = 18 mm.

* You can order this quantity or a multiple thereof.

I_n	Mounting width	DT	Characteristic C Order No.	PG	DT	Characteristic D Order No.	PE (ST, SZ, M)	PS*/ P. unit	PG	Weight per PU approx.
A	MW[1]									kg
MCBs 6000 A										
3P, 400 V AC										
0.3	3	C	**5SY6 314-7**	003	C	**5SY6 314-8**	1	1 unit	004	0.495
0.5		▶	**5SY6 305-7**	003	C	**5SY6 305-8**	1	1 unit	004	0.495
1		▶	**5SY6 301-7**	003	A	**5SY6 301-8**	1	1 unit	004	0.495
1.6		B	**5SY6 315-7**	003	C	**5SY6 315-8**	1	1 unit	004	0.495
2		▶	**5SY6 302-7**	003	▶	**5SY6 302-8**	1	1 unit	004	0.495
3		▶	**5SY6 303-7**	003	A	**5SY6 303-8**	1	1 unit	004	0.495
4		▶	**5SY6 304-7**	003	▶	**5SY6 304-8**	1	1 unit	004	0.495
6		▶	**5SY6 306-7**	003	▶	**5SY6 306-8**	1	1 unit	004	0.495
8		A	**5SY6 308-7**	003	B	**5SY6 308-8**	1	1 unit	004	0.495
10		▶	**5SY6 310-7**	003	▶	**5SY6 310-8**	1	1 unit	004	0.495
13		▶	**5SY6 313-7**	003	B	**5SY6 313-8**	1	1 unit	004	0.495
16		▶	**5SY6 316-7**	003	▶	**5SY6 316-8**	1	1 unit	004	0.495
20		▶	**5SY6 320-7**	003	▶	**5SY6 320-8**	1	1 unit	004	0.495
25		▶	**5SY6 325-7**	003	▶	**5SY6 325-8**	1	1 unit	004	0.495
32		▶	**5SY6 332-7**	003	▶	**5SY6 332-8**	1	1 unit	004	0.495
40		▶	**5SY6 340-7**	003	▶	**5SY6 340-8**	1	1 unit	004	0.495
50		▶	**5SY6 350-7**	003	▶	**5SY6 350-8**	1	1 unit	004	0.495
63		▶	**5SY6 363-7**	003	▶	**5SY6 363-8**	1	1 unit	004	0.495
3P+N, 400 V AC										
0.3	4	C	**5SY6 614-7**	003	C	**5SY6 614-8**	1	1 unit	004	0.660
0.5		C	**5SY6 605-7**	003	C	**5SY6 605-8**	1	1 unit	004	0.660
1		C	**5SY6 601-7**	003	C	**5SY6 601-8**	1	1 unit	004	0.660
1.6		C	**5SY6 615-7**	003	C	**5SY6 615-8**	1	1 unit	004	0.660
2		A	**5SY6 602-7**	003	C	**5SY6 602-8**	1	1 unit	004	0.660
3		C	**5SY6 603-7**	003	C	**5SY6 603-8**	1	1 unit	004	0.660
4		B	**5SY6 604-7**	003	C	**5SY6 604-8**	1	1 unit	004	0.660
6		A	**5SY6 606-7**	003	A	**5SY6 606-8**	1	1 unit	004	0.660
8		C	**5SY6 608-7**	003	C	**5SY6 608-8**	1	1 unit	004	0.660
10		▶	**5SY6 610-7**	003	B	**5SY6 610-8**	1	1 unit	004	0.660
13		B	**5SY6 613-7**	003	C	**5SY6 613-8**	1	1 unit	004	0.660
16		▶	**5SY6 616-7**	003	B	**5SY6 616-8**	1	1 unit	004	0.660
20		▶	**5SY6 620-7**	003	B	**5SY6 620-8**	1	1 unit	004	0.660
25		▶	**5SY6 625-7**	003	B	**5SY6 625-8**	1	1 unit	004	0.660
32		▶	**5SY6 632-7**	003	B	**5SY6 632-8**	1	1 unit	004	0.660
40		▶	**5SY6 640-7**	003	B	**5SY6 640-8**	1	1 unit	004	0.660
50		▶	**5SY6 650-7**	003	B	**5SY6 650-8**	1	1 unit	004	0.660
63		▶	**5SY6 663-7**	003	B	**5SY6 663-8**	1	1 unit	004	0.660

6 000
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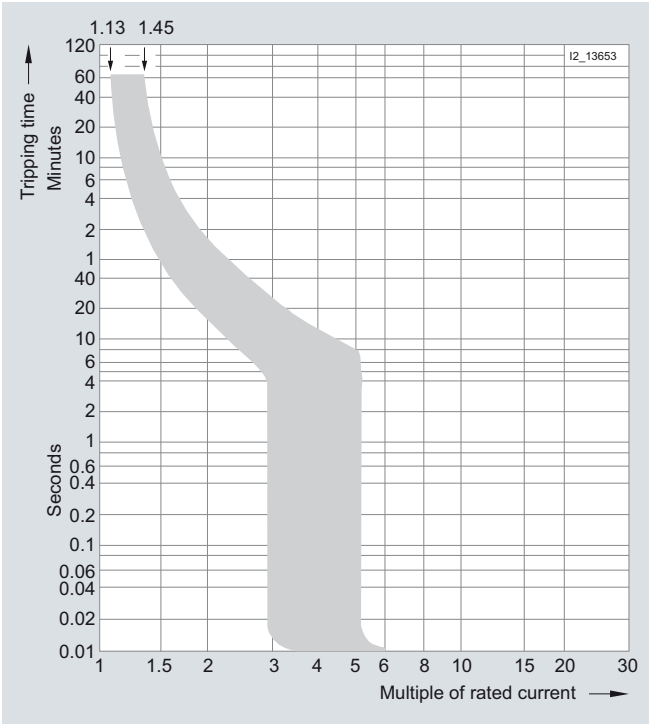
I_n	Mounting width	DT	Characteristic C Order No.	PG	DT	Characteristic D Order No.	PE (ST, SZ, M)	PS*/ P. unit	PG	Weight per PU approx.
A	MW[1]									kg
4P, 400 V AC										
0.3	4	C	**5SY6 414-7**	003	C	**5SY6 414-8**	1	1 unit	004	0.660
0.5		C	**5SY6 405-7**	003	C	**5SY6 405-8**	1	1 unit	004	0.660
1		B	**5SY6 401-7**	003	C	**5SY6 401-8**	1	1 unit	004	0.660
1.6		C	**5SY6 415-7**	003	C	**5SY6 415-8**	1	1 unit	004	0.660
2		A	**5SY6 402-7**	003	C	**5SY6 402-8**	1	1 unit	004	0.660
3		B	**5SY6 403-7**	003	C	**5SY6 403-8**	1	1 unit	004	0.660
4		B	**5SY6 404-7**	003	C	**5SY6 404-8**	1	1 unit	004	0.660
6		▶	**5SY6 406-7**	003	B	**5SY6 406-8**	1	1 unit	004	0.660
8		B	**5SY6 408-7**	003	C	**5SY6 408-8**	1	1 unit	004	0.660
10		▶	**5SY6 410-7**	003	A	**5SY6 410-8**	1	1 unit	004	0.660
13		A	**5SY6 413-7**	003	C	**5SY6 413-8**	1	1 unit	004	0.660
16		▶	**5SY6 416-7**	003	▶	**5SY6 416-8**	1	1 unit	004	0.660
20		▶	**5SY6 420-7**	003	▶	**5SY6 420-8**	1	1 unit	004	0.660
25		▶	**5SY6 425-7**	003	▶	**5SY6 425-8**	1	1 unit	004	0.660
32		▶	**5SY6 432-7**	003	▶	**5SY6 432-8**	1	1 unit	004	0.660
40		▶	**5SY6 440-7**	003	▶	**5SY6 440-8**	1	1 unit	004	0.660
50		▶	**5SY6 450-7**	003	▶	**5SY6 450-8**	1	1 unit	004	0.660
63		▶	**5SY6 463-7**	003	▶	**5SY6 463-8**	1	1 unit	004	0.660

[1] 1 MW (modular width) = 18 mm.

* You can order this quantity or a multiple thereof.

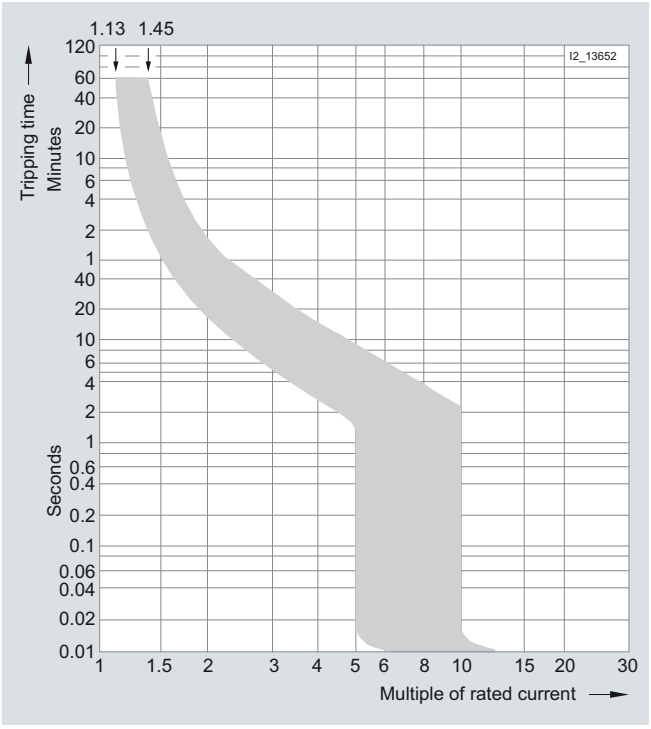
Characteristic curves

Tripping characteristics acc. to IEC/EN 60898, DIN VDE 0641-11



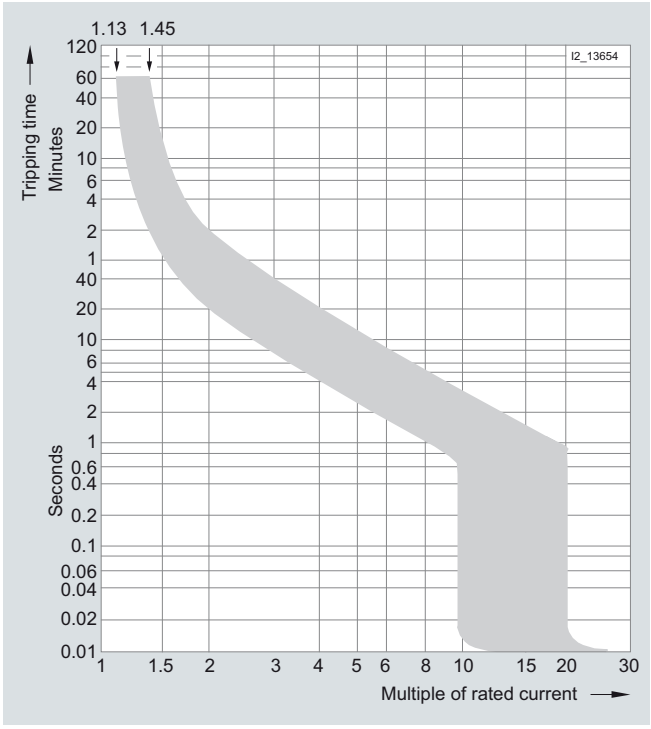
Tripping characteristic B

MCBs with this tripping characteristic are designed for universal use in socket outlet and lighting circuits. Proof of personal safety acc. to DIN VDE 0100-410 is not required.



Tripping characteristic C

In lamp and motor circuits with higher starting currents, MCBs with tripping characteristic C are generally used.



Tripping characteristic D

For electrical circuits with strong pulse-generating equipment, such as transformers or solenoid valves.

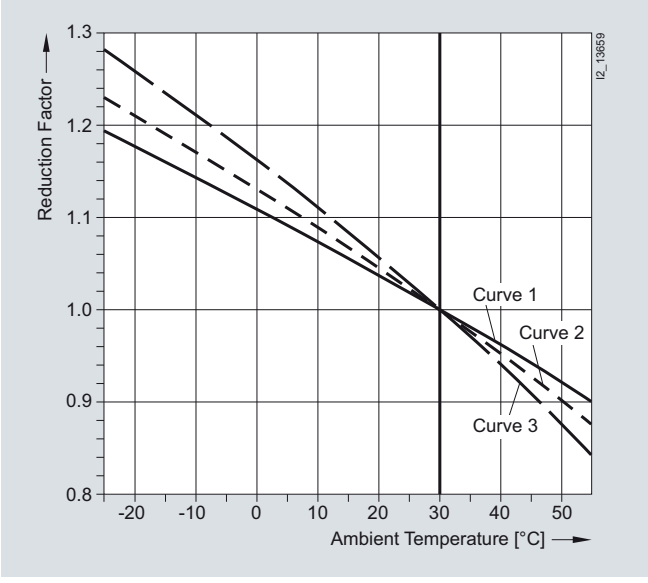
Tripping characteristics

Tripping characteristics at an ambient temperature of 30 °C

Tripping characteristic	Standards	Thermal trips Test currents:				Electromagnetic trips Test currents:		
		Limiting test current I_1	Minimum test current I_2	Tripping time $I_n \leq 63$ A t	$I_n > 63$ A t	Hold I_4	Latest tripping instant I_5	Tripping time t
B	IEC/EN 60898, DIN VDE 0641-11	1.13 × I_n		> 1 h	> 2 h	3 × I_n		≥ 0.1 s
			1.45 × I_n	< 1 h	< 2 h		5 × I_n	< 0.1 s
C	IEC/EN 60898, DIN VDE 0641-11	1.13 × I_n		> 1 h	> 2 h	5 × I_n		≥ 0.1 s
			1.45 × I_n	< 1 h	< 2 h		10 × I_n	< 0.1 s
D	IEC/EN 60898, DIN VDE 0641-11	1.13 × I_n		> 1 h	> 2 h	10 × I_n		≥ 0.1 s
			1.45 × I_n	< 1 h	< 2 h		20 × I_n	< 0.1 s
							(IEC 60898: 50 × I_n)	

Correction factors for rated current of 5SY at different ambient temperatures

Dependence of permissible continuous load current on ambient temperature for 5SY miniature circuit breakers



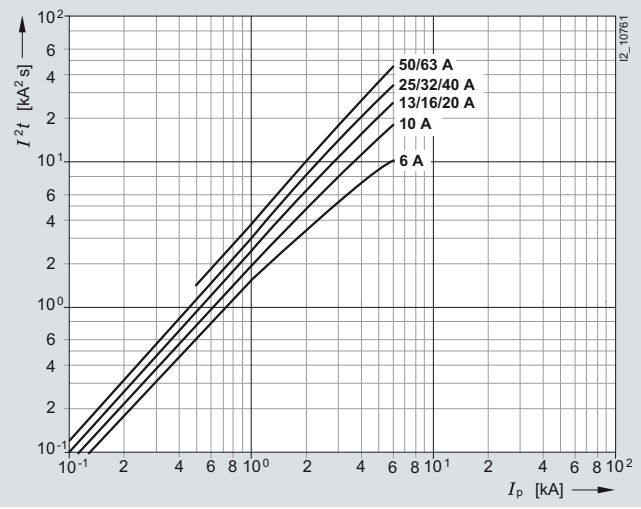
For the curve of the respective correction factor, please refer to the following table.

Curve for correction factor for 5SY miniature circuit breakers (for curves, please refer to the top diagram)

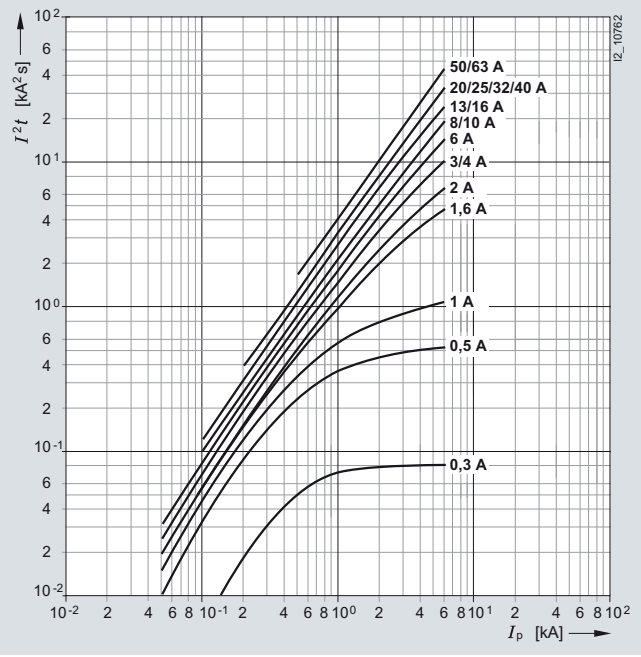
Rated current (A)		0.3	0.5	1	1.6	2	3	4	6	8	10	13	16	20	25	32	40	50	63	80
Characteristic	Pol type	Applicable curve for correction factor for 5SY miniature circuit breakers																		
B	1P/2P	--	--	--	--	--	--	--	3	--	3	2	2	3	3	2	3	2	3	2
	3P/4P	--	--	--	--	--	--	--	2	--	2	1	2	2	1	1	1	1	1	1
C	1P/2P	3	3	2	2	2	3	3	3	3	3	2	3	3	2	2	3	2	3	2
	3P/4P	2	2	2	1	2	2	2	2	3	3	2	2	2	2	1	1	1	2	1
D	1P/2P	3	3	2	2	2	3	3	3	3	3	2	3	3	2	2	3	2	3	--
	3P/4P	2	2	2	1	2	2	2	2	3	3	2	2	2	2	2	2	1	2	--

Let-through I^2t values 5SY6 (AC)

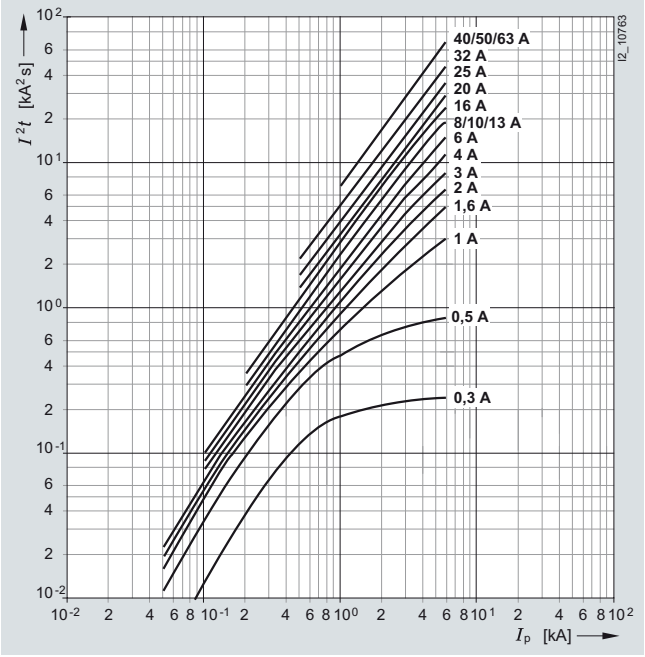
Characteristic B



Characteristic C



Characteristic D



Selective miniature circuit breakers/fuses

Distribution systems are usually set up as radial networks. An overcurrent protection device is required for each reduction of the conductor cross-section. This produces a series connection staggered according to rated currents, which should be "selective" if possible.

Selectivity means that, in the event of a fault, only the protective device that is directly next to the fault in the current path is tripped. This means that current paths in parallel can maintain a power flow.

In the case of miniature circuit breakers with upstream fuses, the selectivity limit depends largely on the current limitation and tripping characteristics of the miniature circuit breaker and the melting I^2t value of the fuse.

This produces different selectivity limits for miniature circuit breakers with different characteristics and rated switching capacity.

The following tables provide information on the short-circuit currents up to which selectivity exists between miniature circuit breakers and upstream fuse according to DIN VDE 0636-21. The values specified in kA are limit values that were determined under unfavorable test conditions. Under normal practical conditions, you can often expect considerably better values, depending on the upstream fuses.

Limit values of selective line miniature circuit breakers/fuses in kA

Downstream miniature circuit breakers		**Upstream fuses**							
	I_n [A]	16 A	20 A	25 A	35 A	50 A	63 A	80 A	100 A
5SY6 . . .-6									
Characteristic B	6	0.3	0.4	0.7	1.2	3.0	3.2	•	•
	10	--	0.4	0.6	1.0	2.2	3.0	5.0	•
	13	--	--	0.5	1.0	2.2	3.0	5.0	•
	16	--	--	--	1.0	2.0	2.4	4.0	•
	20	--	--	--	--	2.0	2.4	4.0	•
	25	--	--	--	--	--	2.0	3.5	•
	32	--	--	--	--	--	1.7	2.9	•
	40	--	--	--	--	--	--	2.0	4.0
	50	--	--	--	--	--	--	--	4.0
5SY6 . . .-7									
Characteristic C	≤ 2	0.3	0.5	1.2	1.7	•	•	•	•
	3	0.3	0.4	0.8	1.4	4.0	5.0	•	•
	4	0.3	0.4	0.6	1.1	3.0	4.0	•	•
	6	--	0.4	0.6	1.0	2.4	3.2	•	•
	8	--	--	0.5	0.9	1.4	2.6	3.1	•
	10	--	--	0.5	0.9	1.4	2.1	3.1	•
	13	--	--	--	0.8	1.3	2.0	3.0	•
	16	--	--	--	0.8	1.3	2.0	3.0	•
	20	--	--	--	--	1.3	2.0	2.7	•
	25	--	--	--	--	--	2.0	2.4	5.0
	32	--	--	--	--	--	--	2.2	4.0
	40	--	--	--	--	--	--	--	3.5
	50	--	--	--	--	--	--	--	3.0
	63	--	--	--	--	--	--	--	3.0

• ≙ ≥ rated switching capacity 5SY6 according to EN 60898 6 000.

Selective miniature circuit breakers/circuit breakers

Distribution systems can also be set up without fuses. In such cases, a circuit breaker acts as an upstream protective device. In this case, the selectivity limit depends on the level of peak current Î let through by the miniature circuit breaker and the tripping current of the circuit breaker.

The following tables show the short-circuit current in kA up to which selectivity is guaranteed between miniature circuit breakers and upstream circuit breakers according to IEC/EN 60947-2, at 230/400 V AC, 50 Hz.

Limit values of selective miniature circuit breakers/circuit breakers in kA

Downstream miniature circuit breakers				**Upstream circuit breakers**								
				3RV1.1		**3RV1.2**						
	I_n [A]	$I >$[A]	I_{cn} [kA]	10 120 50	12 144 50	8 96 100	10 120 100	12,5 150 100	16 192 50	20 240 50	22 264 50	25 300 50
				Selectivity limits [kA][1]								
5SY6 . . .-6												
Characteristic B	6	30	6/10/15	0.2	0.2	--	--	0.2	0.2	0.3	0.5	0.5
	10	50	6/10/15	--	0.2	--	--	0.2	0.2	0.3	0.4	0.5
	13	65	6/10/15	--	--	--	--	--	0.2	0.2	0.4	0.4
	16	80	6/10/15	--	--	--	--	--	--	0.2	0.4	0.4
	20	100	6/10/15	--	--	--	--	--	--	--	--	0.4
	25	125	6/10/15	--	--	--	--	--	--	--	--	--
	32	160	6/10/15	--	--	--	--	--	--	--	--	--
	40	200	6/10/15	--	--	--	--	--	--	--	--	--
	50	250	6/10/15	--	--	--	--	--	--	--	--	--
	63	315	6/10/15	--	--	--	--	--	--	--	--	--
	80	400	6/10/15	--	--	--	--	--	--	--	--	--
5SY6 . . .-7												
Characteristic C	0.5	5	6/10/15	0.2	0.2	0.1	0.1	0.2	0.2	0.5	0.6	0.6
	1	10	6/10/15	0.2	0.2	0.1	0.1	0.2	0.2	0.5	0.6	0.6
	1.6	16	6/10/15	0.2	0.2	0.1	0.1	0.2	0.2	0.5	0.6	0.6
	2	20	6/10/15	0.2	0.2	0.1	0.1	0.2	0.2	0.5	0.6	0.6
	3	30	6/10/15	--	0.2	--	--	0.2	0.2	0.3	0.4	0.5
	4	40	6/10/15	--	0.2	--	--	0.2	0.2	0.3	0.4	0.5
	6	60	6/10/15	--	0.2	--	--	0.2	0.2	0.3	0.4	0.5
	8	80	6/10/15	--	0.2	--	--	0.2	0.2	0.2	0.4	0.4
	10	100	6/10/15	--	0.2	--	--	0.2	0.2	0.2	0.4	0.4
	13	130	6/10/15	--	--	--	--	--	0.2	0.2	0.4	0.4
	16	160	6/10/15	--	--	--	--	--	--	0.2	0.4	0.4
	20	200	6/10/15	--	--	--	--	--	--	--	--	0.4
	25	250	6/10/15	--	--	--	--	--	--	--	--	--
	32	320	6/10/15	--	--	--	--	--	--	--	--	--
	40	400	6/10/15	--	--	--	--	--	--	--	--	--
	50	500	6/10/15	--	--	--	--	--	--	--	--	--
	63	630	6/10/15	--	--	--	--	--	--	--	--	--
	80	800	6/10/15	--	--	--	--	--	--	--	--	--
5SY6 . . .-8												
Characteristic D	2	40	6/10/15	--	--	--	--	0.2	0.2	0.4	0.6	0.6
	6	120	6/10/15	--	--	--	--	--	--	0.3	0.4	0.4
	10	200	6/10/15	--	--	--	--	--	--	0.2	0.4	0.4
	16	320	6/10/15	--	--	--	--	--	--	--	--	--
	32	640	6/10/15	--	--	--	--	--	--	--	--	--
	40	800	6/10/15	--	--	--	--	--	--	--	--	--
	50	1000	6/10/15	--	--	--	--	--	--	--	--	--
	63	1260	6/10/15	--	--	--	--	--	--	--	--	--

[1] In 240/415 V, 50 Hz systems, the selectivity limits are reduced by 10 %.
$I >$ ≙ tripping current.

In the event of a short circuit, there is selectivity between miniature circuit breakers and circuit breakers according to IEC/EN 60947-2 up to the specified values in kA.

Limit values of selective line miniature circuit breakers/fuses in kA

Downstream miniature circuit breakers				**Upstream circuit breakers**						
				3RV1.3						
	I_n [A]	$I >$[A]	I_{cn} [kA]	16 192 50	20 240 50	25 300 50	32 384 50	40 480 50	45 540 50	50 600 50
				Selectivity limits [kA][1]						
5SY6 . . .-7										
Characteristic C	0.5	5	6/10/15	0.3	0.5	0.6	1	1	1.5	3
	1	10	6/10/15	0.3	0.5	0.6	1	1	1.5	3
	1.6	16	6/10/15	0.3	0.5	0.6	1	1	1.5	3
	2	20	6/10/15	0.3	0.5	0.6	1	1	1.5	3
	3	30	6/10/15	0.2	0.3	0.4	0.6	0.8	1	1
	4	40	6/10/15	0.2	0.3	0.4	0.6	0.8	1	1
	6	60	6/10/15	0.2	0.3	0.4	0.6	0.8	1	1
	8	80	6/10/15	0.2	0.2	0.4	0.6	0.6	0.8	1
	10	100	6/10/15	0.2	0.2	0.4	0.6	0.6	0.8	1
	13	130	6/10/15	0.2	0.2	0.4	0.6	0.6	0.8	1
	16	160	6/10/15	--	0.2	0.4	0.6	0.6	0.8	1
	20	200	6/10/15	--	--	0.4	0.6	0.6	0.8	1
	25	250	6/10/15	--	--	--	0,5	0.6	0.8	0.8
	32	320	6/10/15	--	--	--	--	0.6	0.8	0.8
	40	400	6/10/15	--	--	--	--	--	--	0.8
	50	500	6/10/15	--	--	--	--	--	--	--
	63	630	6/10/15	--	--	--	--	--	--	--
	80	800	6/10/15	--	--	--	--	--	--	--
5SY6 . . .-8										
Characteristic D	2	40	6/10/15	0.3	0.5	0.6	0.8	1.2	1.5	1.5
	6	120	6/10/15	0.2	0.3	0.4	0.6	0.8	1	1
	10	200	6/10/15	--	0.3	0.4	0.5	0.6	0.8	0.8
	16	320	6/10/15	--	--	--	0.5	0.6	0.6	0.8
	32	640	6/10/15	--	--	--	--	--	0.6	0.6
	40	800	6/10/15	--	--	--	--	--	--	--
	50	1000	6/10/15	--	--	--	--	--	--	--
	63	1260	6/10/15	--	--	--	--	--	--	--

[1] In 240/415 V, 50 Hz systems, the selectivity limits are reduced by 10 %.
$I >$ ≙ tripping current.

In the event of a short circuit, there is selectivity between miniature circuit breakers and circuit breakers according to IEC/EN 60947-2 up to the specified values in kA.

Limit values of selective miniature circuit breakers/circuit breakers in kA

Downstream miniature circuit breakers				**Upstream circuit breakers**									
				3RV1.4									
	I_n [A]			16	20	25	32	40	50	63	75	90	100
		$I >$[A]		192	240	300	384	480	600	756	900	1080	1140
			I_{cn} [kA]	100	100	100	100	100	100	100	100	100	100
				Selectivity limits [kA][1]									
5SY6 . . .-6													
Characteristic B	6	30	6/10/15	0.2	0.4	0.5	0.6	0.8	1.2	2	3	6/10/15	6/10/15
	10	50	6/10/15	0.2	0.3	0.5	0.6	0.8	1	1.5	2.5	4	4
	13	65	6/10/15	0.2	0.3	0.5	0.6	0.8	1	1.5	2	3	3
	16	80	6/10/15	--	0.3	0.5	0.6	0.8	1	1.5	2	3	3
	20	100	6/10/15	--	--	0.5	0.6	0.8	1	1.5	2	3	3
	25	125	6/10/15	--	--	--	0.5	0.8	0.8	1.5	2	3	3
	32	160	6/10/15	--	--	--	--	0.6	0.8	1.5	2	3	3
	40	200	6/10/15	--	--	--	--	0.6	0.8	1.2	1.5	2.5	2.5
	50	250	6/10/15	--	--	--	--	--	--	1.2	1.5	2.5	2.5
5SY6 . . .-7													
Characteristic C	0.5	5	6/10/15	0.4	0.6	0.8	0.8	1	3	6/10/15	6/10/15	6/10/15	6/10/15
	1	10	6/10/15	0.4	0.6	0.8	0.8	1	3	6/10/15	6/10/15	6/10/15	6/10/15
	1.6	16	6/10/15	0.4	0.6	0.8	0.8	1	3	6/10/15	6/10/15	6/10/15	6/10/15
	2	20	6/10/15	0.4	0.6	0.8	0.8	1	3	6/10/15	6/10/15	6/10/15	6/10/15
	3	30	6/10/15	0.2	0.3	0.5	0.6	0.8	1	2	2.5	5	5
	4	40	6/10/15	0.2	0.3	0.5	0.6	0.8	1	2	2.5	5	5
	6	60	6/10/15	0.2	0.3	0.5	0.6	0.8	1	2	2.5	5	5
	8	80	6/10/15	0.2	0.3	0.4	0.6	0.6	1	1.5	2	3	3
	10	100	6/10/15	0.2	0.3	0.4	0.6	0.6	1	1.5	2	3	3
	13	130	6/10/15	0.2	0.3	0.4	0.6	0.6	1	1.5	2	3	3
	16	160	6/10/15	--	0.3	0.4	0.6	0.6	1	1.5	2	3	3
	20	200	6/10/15	--	--	0.4	0.6	0.6	1	1.5	2	3	3
	25	250	6/10/15	--	--	--	0.5	0.6	0.8	1.2	1.5	2.5	2.5
	32	320	6/10/15	--	--	--	--	0.6	0.8	1.2	1.5	2.5	2.5
	40	400	6/10/15	--	--	--	--	--	0.6	1	1.5	2	2
	50	500	6/10/15	--	--	--	--	--	--	1	1.2	1.5	2
	63	630	6/10/15	--	--	--	--	--	--	--	--	1.5	1.5
5SY6 . . .-8													
Characteristic D	2	40	6/10/15	0.4	0.5	0.6	0.8	1	1.5	3	4	6/10/15	6/10/15
	6	120	6/10/15	0.2	0.3	0.4	0.6	0.6	1	1.5	2.5	3	3
	10	200	6/10/15	--	0.3	0.4	0.5	0.6	0.8	1.5	2	3	3
	16	320	6/10/15	--	--	--	0.5	0.6	0.8	1.2	1.5	2.5	2.5
	32	640	6/10/15	--	--	--	--	--	0.6	1	1.5	2	2
	40	800	6/10/15	--	--	--	--	--	--	1	1.2	1.5	1.5
	50	1000	6/10/15	--	--	--	--	--	--	1	1.2	1.5	1.5

[1] In 240/415 V, 50 Hz systems, the selectivity limits are reduced by 10 %.
$I >$ ≙ tripping current.

In the event of a short circuit, there is selectivity between miniature circuit breakers and circuit breakers according to IEC/EN 60947-2 up to the specified values in kA.

Limit values of selective miniature circuit breakers/circuit breakers in kA

Downstream miniature circuit breakers				**Upstream circuit breakers**											
				3VL1, TM Non-adjustable						**3VL2, TM Adjustable**					
	I_n [A]	$I>$[A]	I_{cn} [kA]	50 500 40/70/ 100	63 630 40/70/ 100	80 800 40/70/ 100	100 1000 40/70/ 100	125 1250 40/70/ 100	160 1600 40/70/ 100	50 400 40/70/ 100	63 500 40/70/ 100	80 630 40/70/ 100	100 800 40/70/ 100	125 1000 40/70/ 100	160 1280 40/70/ 100
				Selectivity limits [kA][1]											
5SY6 . . .-6															
Characteristic B	6	30	6/10/15	5.5	5.5	T	T	T	T	2.5	2.5	5.1	7.3	T	T
	10	50	6/10/15	3.1	3.1	6.7	6.7	6.7	6/12/4	2.0	2.0	3.0	3.9	5.0	8.6
	13	65	6/10/15	2.5	2.5	5.0	5.0	5.0	8.0	1.5	1.5	3.1	3.4	4.5	5.8
	16	80	6/10/15	2.5	2.5	4.4	4.4	4.4	7.2	1.5	1.5	2.0	3.1	4.0	5.1
	20	100	6/10/15	2.0	2.0	4.3	4.3	4.3	6.6	1.5	1.5	2.0	2.5	3.9	5.0
	25	125	6/10/15	2.0	2.0	3.9	3.9	3.9	6.1	1.5	1.5	2.0	2.1	3.4	4.6
	32	160	6/10/15	2.0	2.0	3.7	3.7	3.7	5.0	1.5	1.5	2.0	2.1	3.4	4.8
	40	200	6/10/15	2.0	2.0	3.7	3.7	3.7	5.0	1.2	1.2	2.0	2.1	3.3	4.3
	50	250	6/10/15	--	1.5	3.2	3.2	3.2	4.0	--	--	1.5	2.0	2.5	3.6
5SY6 . . .-7															
Characteristic C	0.5	5	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
	1	10	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
	1.5	15	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
	2	20	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
	3	30	6/10/15	3.2	3.2	T	T	T	T	2.5	T	T	T	T	T
	4	40	6/10/15	3.2	3.2	T	T	T	T	2.5	T	T	T	T	T
	6	60	6/10/15	3.2	3.2	7	7	7	6/10/ 13.9	2.5	2.5	5.1	7.3	T	T
	8	80	6/10/15	2.5	2.5	5.4	5.4	5.4	6/9/2	2.3	3.7	3.8	3.9	5.6	8.6
	10	100	6/10/15	2.5	2.5	5.4	5.4	5.4	6/9/2	2.0	2.0	3.0	3.4	5.6	8.6
	13	130	6/10/15	2.5	2.5	4.3	4.3	4.3	7.1	1.5	1.5	2.5	3.4	4.5	5.8
	16	160	6/10/15	2.0	2.5	4.0	4.0	4.0	7.1	1.5	1.5	2.5	3.1	4.0	5.1
	20	200	6/10/15	2.0	2.0	3.7	3.7	3.7	6.3	1.5	1.5	2.0	2.5	3.9	5.0
	25	250	6/10/15	2.0	2.0	3.6	3.6	3.6	5.5	1.5	1.5	2.0	2.5	3.5	4.6
	32	320	6/10/15	2.0	2.0	3.5	3.5	3.5	5.5	1.5	1.5	2.0	2.5	3.4	4.5
	40	400	6/10/15	1.5	1.5	3.3	3.3	3.3	5.1	1.2	1.2	2.0	2.5	3.3	4.3
	50	500	6/10/15	--	1.5	3.1	3.1	3.1	4.0	--	--	1.5	2.5	2.5	3.6
5SY6 . . .-8															
Characteristic D	2	40	6/10/15	2.4	6	6	6	6	6	4.2	6	6	6	6	6
	6	120	6/10/15	1.4	1.4	4.8	5	6	6	2.3	4.1	4.2	4.2	4.3	6
	10	200	6/10/15	1.3	1.3	4.5	5	6	6	1.9	3.7	3.7	3.7	4	6
	16	320	6/10/15	1.1	1.1	3.2	3.2	3.2	4.0	1.7	3.3	3.7	3.3	3.5	4.7
	32	640	6/10/15	--	--	2.3	2.3	2.3	4.0	--	--	--	2.4	2.7	3.7
	40	800	6/10/15	--	--	--	2.1	2.1	3.8	--	--	--	--	1.5	3
	50	1000	6/10/15	--	--	--	--	2.0	2.8	--	--	--	--	--	2.6

T ≙ full selectivity up to rated breaking capacity I_{cn} of the downstream protective device.

[1] In 240/415 V, 50 Hz systems, the selectivity limits are reduced by 10 %.
The selectivity limits for adjustable releases apply to the maximum value,
I_n = rated current. $I>$ ≙ tripping current.

In the event of a short circuit, there is selectivity between miniature circuit breakers and circuit breakers according to IEC/EN 60947-2 up to the specified values in kA.

Limit values of selective miniature circuit breakers/circuit breakers in kA

Downstream miniature circuit breakers			**Upstream circuit breakers**											
			3VL3, TM		**3VL4, TM**				**3VL6, ETU**		**3VL7. ETU**	**3VL8, ETU**	**3WN1**	**3WN6**
I_n [A]			200	250	200	250	315	400	315	400 ... 800	400 ... 1250	800 ... 2500	315 ... 6300	315 ... 3200
$I >$[A]			2000	2500	2000	2500	3150	4000	3200	1575 ... 6400	15000	20000	3780 ... 75600	3780 ... 48000
		I_{cn} [kA]	40 ... 100	40 ... 100	45 ... 100	45 ... 100	45 ... 100	45 ... 100	45 ... 100	45 ... 100	50 ... 100	70/100	65 ... 100	65/75
			Selectivity limits [kA][1]											
5SY6 ...-6														
Characteristic B														
6	30	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
10	50	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
13	65	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
16	80	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
20	100	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
25	125	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
32	160	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
40	200	6/10/15	6	6	6	T	T	T	T	T	T	T	T	T
50	250	6/10/15	6	6	6/10/14.1	T	T	T	T	T	T	T	T	T
5SY6 ...-7														
Characteristic C														
0.5	5	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
1	10	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
1.5	15	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
2	20	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
3	30	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
4	40	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
6	60	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
8	80	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
10	100	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
13	130	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
16	160	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
20	200	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
25	250	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
32	320	6/10/15	6/10/11	T	T	T	T	T	T	T	T	T	T	T
40	400	6/10/15	6/10	T	T	T	T	T	T	T	T	T	T	T
50	500	6/10/15	6/10	T	T	T	T	T	T	6/10/14.2	T	T	T	T
5SY6 ...-8														
Characteristic D														
2	40	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
6	120	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
10	200	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
16	320	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
32	640	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
40	800	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T
50	1000	6/10/15	T	T	T	T	T	T	T	T	T	T	T	T

T ≙ full selectivity up to rated breaking capacity I_{cn} of the downstream protective device.

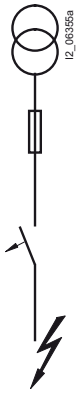
[1] In 240/415 V, 50 Hz systems, the selectivity limits are reduced by 10 %.
The selectivity limits for adjustable releases apply to the maximum value,
I_n = rated current. $I >$ ≙ tripping current.

Back-up protection miniature circuit breakers/fuses

If the maximum short-circuit current of the miniature circuit breaker at the installation site is unknown, or if the specified rated switching capacity is exceeded, an additional protective device must be connected upstream as back-up protection to prevent overloading of the miniature circuit breaker. This is usually a fuse.

The following table shows the short-circuit currents in kA up to which back-up protection is guaranteed when using fuses according to DIN VDE 0636-21.

Limit values of back-up protection miniature circuit breakers/fuses in kA



Downstream miniature circuit breakers		**Upstream fuses**					
	I_n [A]	50 A	63 A	80 A	100 A	125 A	160 A
5SY6							
	0.3 ... 4	No back-up protection required up to 50 kA					
	6	50	50	50	50	50	35
	8	50	50	50	50	50	35
	10	50	50	50	50	50	35
	13	50	50	50	35	35	30
	16	50	50	50	35	30	30
	20	50	50	50	35	25	25
	25	50	50	50	35	30	25
	32	50	50	50	35	30	25
	40	50	50	50	50	25	15
	50	50	50	50	50	25	15
	63	50	50	35	25	25	15

Test circuit data:

U_p = 250 V
p.f. = 0.3 ... 0.5

Test cycle:

Acc. to EN 60947-2 (0 - C0)

Back-up protection miniature circuit breakers/circuit breakers

If miniature circuit breakers are installed in fuseless distribution boards, circuit breakers according to IEC/EN 60947-2 must be used as back-up protection.

The following tables show the short-circuit currents in kA up to which back-up protection is guaranteed when using circuit breakers.

Limit values of back-up protection miniature circuit breakers/circuit breakers in kA

Downstream miniature circuit breakers			**Upstream circuit breakers**																	
			3VL1 Non-adjustable											**3VL2 adjustable**						
		I_n [A]	16	20	25	32	40	50	63	80	100	125	160	50	63	80	100	125	160
		$I >$ [A]	160	200	250	320	400	500	630	800	1000	1250	1600	400	500	630	800	1000	1280
		I_{cu} [kA]	40/ 70	40/ 70	40/ 70	40/ 70	40/ 70	40/ 70	40/ 70	40/ 70	40/ 70	40/ 70	40/ 70	40/70 /100	40/70 /100	40/70 /100	40/70 /100	40/70 /100	40/70 /100
	I_n [A]	I_{cn} [kA]	**Back-up protection up to kA**																	
5SY6																				
Characteristic B, C, D	0.3 ... 6	6	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	8 ... 32	6	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	40 ... 63	6	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

Downstream miniature circuit breakers			Upstream circuit breakers													
			3VL3		3VL4				3VL5				3VL6	3VL7	3VL8	3WN1/ 3WS1
		I_n [A]	200	250	200	250	315	400	250 ... 315	315 ... 400	400 ... 500	500 ... 630	320 ... 800	400 ... 1250	1600 ... 2000	315 ... 6300
		I >[A]	2000	2500	2000	2500	3150	4000	2500 ... 3150	3150 ... 4000	4000 ... 5000	5000 ... 6300	3200 ... 6300	15000	20000	3780 ... 75600
		I_{cn} [kA]	40/70/ 100	40/70/ 100	45/70/ 100	45/70/ 100	45/70/ 100	45/70/ 100	45/70/ 100	45/70/ 100	45/70/ 100	45/70/ 100	45/70/ 100	50/70/ 100	70/100	65 ... 100
	I_n [A]	I_{cn} [kA]	Back-up protection up to kA													
5SY6																
Characteristic	0.3 ... 6	6	35	35	35	35	35	35	35	35	35	35	35	35	35	35
B, C, D	8 ... 32	6	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	40 ... 63	6	20	20	20	20	20	20	20	20	20	20	20	20	20	20

Internal resistance and power loss

Data per pole (with I_n)

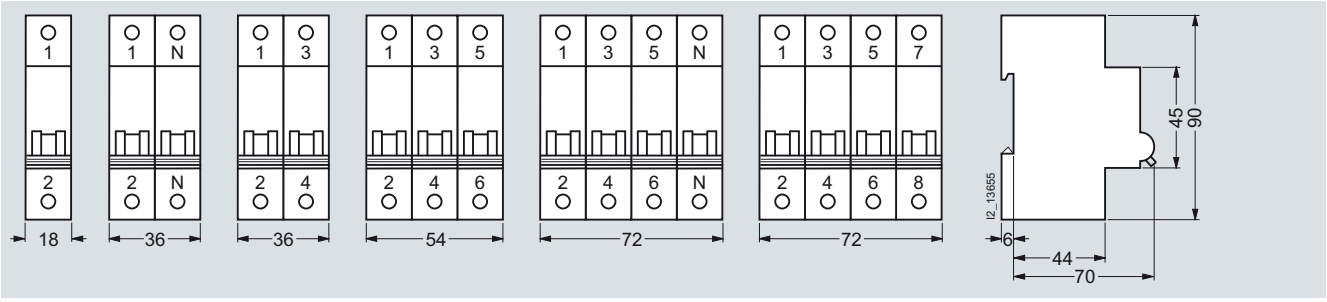
		Characteristic A		Characteristic B		Characteristic C		Characteristic D	
	I_n	R_1	P_v	R_1	P_v	R_1	P_v	R_1	P_v
	A	mΩ	W	mΩ	W	mΩ	W	mΩ	W
5SY6									
	0.3	--	--	--	--	10500	0.9	10200	1
	0.5	--	--	--	--	3400	0.9	3120	0.8
	1	1955	2.0	--	--	1210	1.2	1030	1.0
	1.6	786	2.0	--	--	459	1.2	409	1.1
	2	510	2.0	375	1.5	295	1.2	292	1.2
	3	205	1.9	--	--	137	1.2	131	1.2
	4	134	2.1	91	1.45	81	1.3	73	1.2
	6	58	2.1	55	2.0	44	1.6	43	1.6
	8	27	1.7	--	--	14	0.9	12	0.7
	10	18.1	1.8	13	1.3	10	1.0	8.4	0.8
	13	11.4	1.9	9.5	1.6	8.0	1.4	8.0	1.4
	16	8.4	2.2	6.6	1.7	5.9	1.5	5.8	1.5
	20	6.2	2.5	5.2	2.1	4.0	1.6	3.8	1.5
	25	4.6	2.9	3.4	2.2	3.3	2.1	3.0	1.9
	32	3	3.1	2.3	2.4	2.4	2.5	1.9	2.0
	35	--	--	--	--	2.0	2.4	--	--
	40	2.2	3.5	2.1	3.4	2.1	3.3	1.8	2.8
	50	1.7	4.3	1.5	3.8	1.4	3.5	1.4	3.5
	63	1.5	5.9	1.4	5.4	1.1	4.4	1.1	4.4
	80	--	--	1.0	6.4	1.0	6.4	--	--

Correction factor for power loss

• Direct current and alternating current up to	60 Hz × 1.0
• Alternating current	200 Hz × 1.1 400 Hz × 1.15 1000 Hz × 1.3

Dimensional drawings

5SY

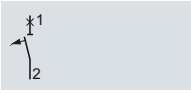


1P 1P+N 2P 3P 3P+N 4P

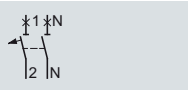
Schematics

Symbols

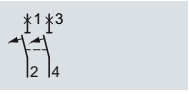
5SY6



1P



1P+N



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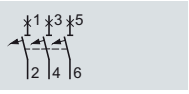

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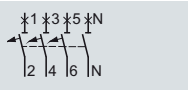
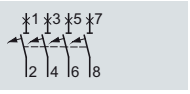


3P+N



4P

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