SIEMENS

Product Guide

5SP and 5SY Supplementary Protection – UL 1077

for North American and International applications

usa.siemens.com/5SY

Table of contents

Certifications and features

Certifications and standards

- UL recognized and certified to Canadian Standards (File E116386)
- UL 1077
- CSA 22.2 No. 235
- CE
- EN 60 898, IEC/EN 60 947-2

Features

- Thermal magnetic protection
- High interrupting rating / Rated switching capacity –
  - UL 1077: up to 14,000 maximum RMS symmetrical amps AC
  - (I_{cn}) to IEC 60 898-1: up to 10,000 A AC
  - (I_{cu}) to IEC 60 947-2: up to 15,000 A AC
- Can be used for "field wiring" applications:
  - 5SP4: AWG 14 to AWG 2, Copper (Cu) only
  - 5SY: AWG 14 to AWG 4, Copper (Cu) only
- Calibration base:
  - UL: 25°C (77°F)
  - IEC: 30°C (86°F)
- Meets trip characteristics: A, B, C, D
- Rated voltage
  - UL 1077
    - 277 VAC (1- & 1+N-pole)
    - 480 VAC (multi-poles)
  - EN 60 898 and EN 60947-2
    - VAC/DC: 24 minimum
    - VDC/pole: 60 maximum
    - VAC: 440 maximum
- Available with: 1-, 1+N-, 2-, 3-, 3+N- and 4-poles
- Available from: 0.3 to 80 Amps (depending on the device selected)
- Visible indicator for ON and OFF/Trip
- Touch protection to EN 50274-1
- Standard DIN rail mounting
- Identical wire screw connections on line and load side
- CFC and silicone free

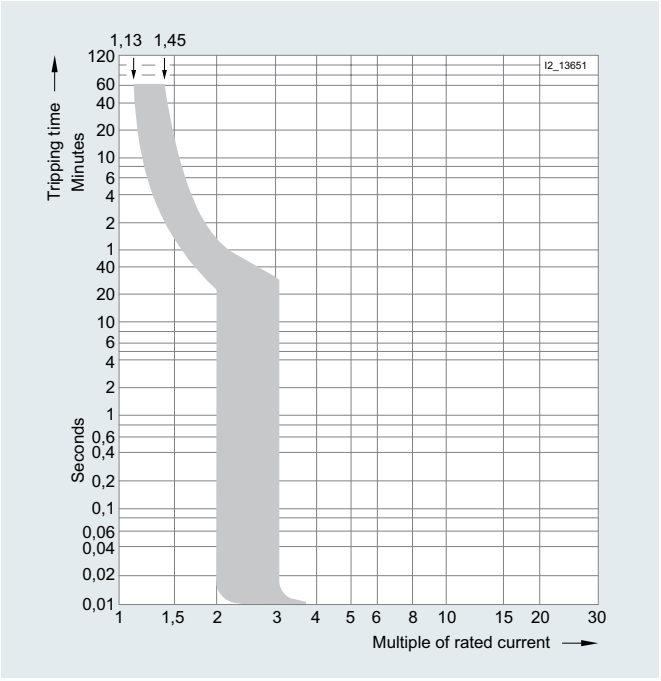
Description

5SP and 5SY Supplementary Protectors are single and multi-pole thermal / magnetic overcurrent protection devices that are intended for general industrial use. They are UL Recognized (File No. E116386) in accordance with UL 1077, "Supplementary Protectors for Use in Electrical Equipment" and Certified to Canadian Standards (CSA 22.2 No. 2352). They are provided with a manual means for opening the circuit and they are not ambient compensated.

Approvals	VDE	IMQ	ЯЦ	UL	BV	DNV	GL	LRS	CCC
5SY4	✓	✓	✓	✓	✓	✓	✓	✓	✓
5SP4	✓	—	✓	✓	—	—	✓	—	✓
5SP5	✓	—	—	✓	—	—	—	—	—
5SY5, universal current	✓	—	—	—	—	—	—	—	✓
5SY7	✓	✓	✓	✓	✓	✓	✓	✓	✓
5SY8	—	—	✓	✓	—	—	—	—	—

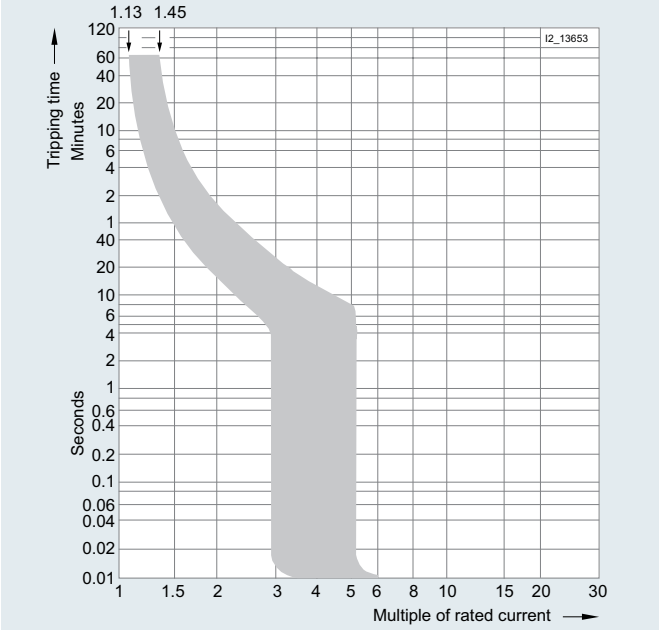
Characteristic curves

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



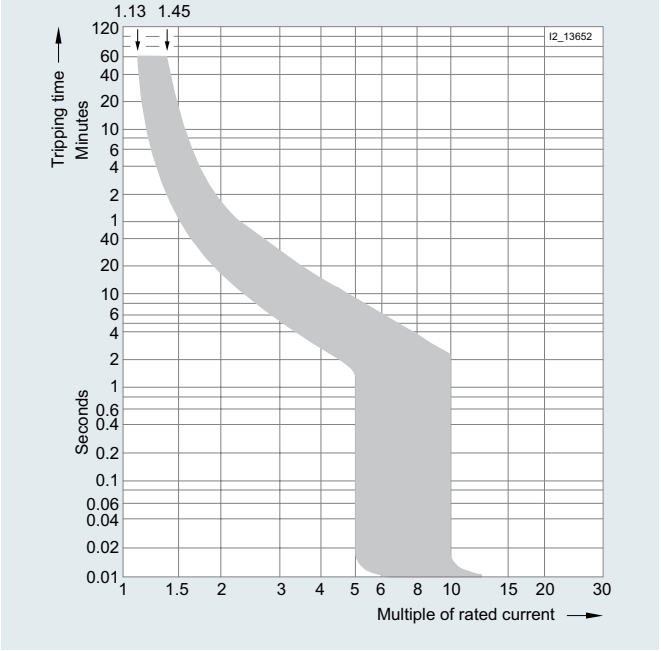
Tripping characteristic A

For limited semiconductor protection, protection of measuring circuits with transformers. Protection of circuits with tripping in 0.4 s according to DIN VDE 0100-410 for long cable lengths.



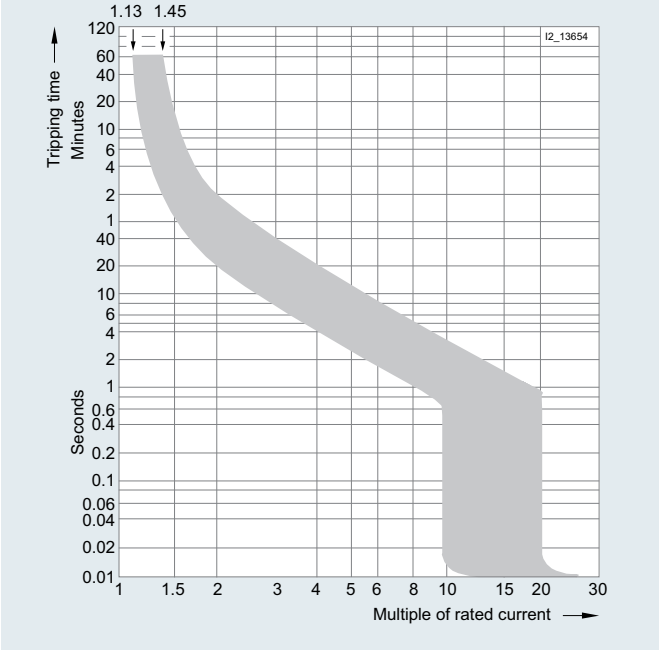
Tripping characteristic B

For universal use in socket output and lighting circuits. Proof of personal safety according to DIN VDE 0100-410 is not required.



Tripping characteristic C

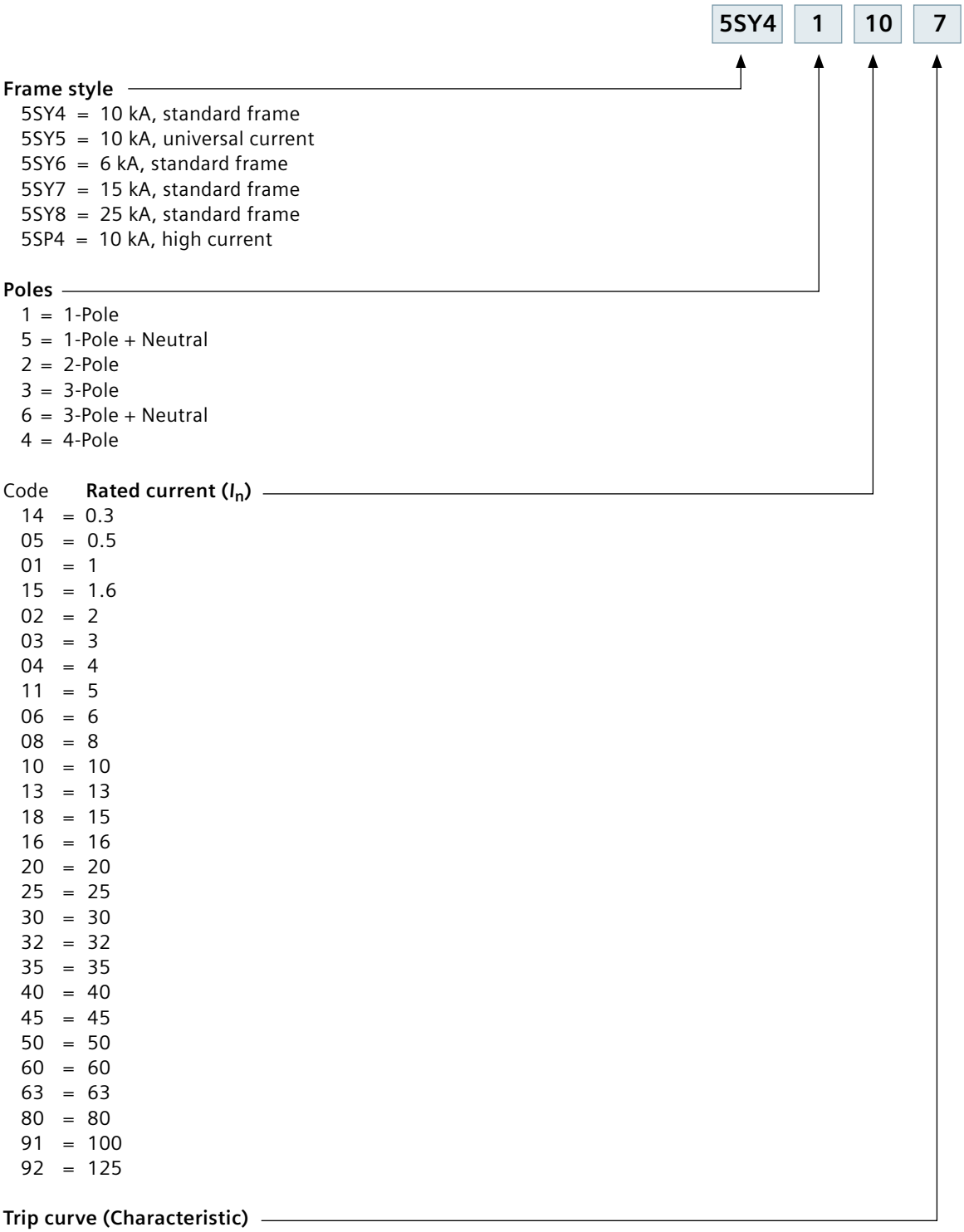
Particularly advantageous in lamp and motor circuits with higher starting currents.



Tripping characteristic D

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

Supplementary protector catalog number nomenclature



Product selection – 5SP4

Interrupting ratings / Rated switching capacity[1)]

- UL 1077 and CSA C22.2 No. 235:
(Maximum RMS Symmetrical)
240 VAC: 7.5 kA
480 VAC: 5 kA (3 Phase)

- IEC/EN 60898-1:
230 & 400 VAC: 10 kA

- IEC/EN 60947-2:
230 & 400 VAC: 20kA

No. of Poles [2)]	I_n (A)	Characteristic A Order No.	Characteristic B Order No.	Characteristic C Order No.	Characteristic D Order No.
*	80	—	**5SP4*80-6**	**5SP4*80-7**	**5SP4*80-8**
*	100	—	**5SP4*91-6**	**5SP4*91-7**	**5SP4*91-8**
*	125	—	**5SP4*92-6**	**5SP4*92-7**	**—**

1) Depending on the device selected. See Interrupting ratings / Rated switching capacity, page 26.
2) Substitute "*" with:
1 for 1-pole 3 for 3-pole
2 for 2-pole 4 for 4-pole

Product selection – 5SY4

Interrupting ratings / Rated switching capacity[1)]

- UL 1077 and CSA C22.2 No. 235:
(Maximum RMS Symmetrical)
240 VAC: 7.5 kA
480 VAC: 5 kA (3 Phase)

- IEC/EN 60898-1:
230 & 400 VAC: 10 kA

- IEC/EN 60947-2:
230 & 400 VAC: 35 kA

No. of Poles [2)]	I_n (A)	Characteristic A Order No.	Characteristic B Order No.	Characteristic C Order No.	Characteristic D Order No.
*	0 .3	—	—	**5SY4*14-7**	**5SY4*14-8**
*	0.5	**5SY4*05-5**	—	**5SY4*05-7**	**5SY4*05-8**
*	1	**5SY4*01-5**	—	**5SY4*01-7**	**5SY4*01-8**
*	1.6	**5SY4*15-5**	—	**5SY4*15-7**	**5SY4*15-8**
*	2	**5SY4*02-5**	—	**5SY4*02-7**	**5SY4*02-8**
*	3	**5SY4*03-5**	—	**5SY4*03-7**	**5SY4*03-8**
*	4	**5SY4*04-5**	—	**5SY4*04-7**	**5SY4*04-8**
*	5	—	—	**5SY4*11-7**	—
*	6	**5SY4*06-5**	**5SY4*06-6**	**5SY4*06-7**	**5SY4*06-8**
*	8	**5SY4*08-5**	—	**5SY4*08-7**	**5SY4*08-8**
*	10	**5SY4*10-5**	**5SY4*10-6**	**5SY4*10-7**	**5SY4*10-8**
*	13	**5SY4*13-5**	**5SY4*13-6**	**5SY4*13-7**	**5SY4*13-8**
*	15	—	—	**5SY4*18-7**	—
*	16	**5SY4*16-5**	**5SY4*16-6**	**5SY4*16-7**	**5SY4*16-8**
*	20	**5SY4*20-5**	**5SY4*20-6**	**5SY4*20-7**	**5SY4*20-8**
*	25	**5SY4*25-5**	**5SY4*25-6**	**5SY4*25-7**	**5SY4*25-8**
*	30	—	—	**5SY4*30-7**	—
*	32	**5SY4*32-5**	**5SY4*32-6**	**5SY4*32-7**	**5SY4*32-8**
*	35	—	—	**5SY4*35-7**	—
*	40	**5SY4*40-5**	**5SY4*40-6**	**5SY4*40-7**	**5SY4*40-8**
*	45	—	—	**5SY4*45-7**	—
*	50	**5SY4*50-5**	**5SY4*50-6**	**5SY4*50-7**	**5SY4*50-8**
*	60	—	—	**5SY4*60-7**	—
*	63	**5SY4*63-5**	**5SY4*63-6**	**5SY4*63-7**	**5SY4*63-8**
*	80	—	**5SY4*80-6**	**5SY4*80-7**	—

1) Depending on the device selected. See Interrupting ratings / Rated switching capacity, page 26.
2) Substitute "*" with:
1 for 1-pole 3 for 3-pole 5 for 1-pole + Neutral
2 for 2-pole 4 for 4-pole 6 for 3-pole + Neutral

Product selection – 5SY5

Interrupting ratings / Rated switching capacity[1)]

Not UL Rated

- **IEC/EN 60898-2:**
  230 & 400 VAC: 10 kA
- **IEC/EN 60947-2:**
  220 and 440 VDC: 15kA

No. of Poles [2)]	I_n (A)	Characteristic A Order No.	Characteristic B Order No.	Characteristic C Order No.	Characteristic D Order No.
*	0.3	—	—	**5SY5*14-7**	—
*	0.5	—	—	**5SY5*05-7**	—
*	1	—	—	**5SY5*01-7**	—
*	1.6	—	—	**5SY5*15-7**	—
*	2	—	**5SY5*02-6**	**5SY5*02-7**	—
*	3	—	—	**5SY5*03-7**	—
*	4	—	**5SY5*04-6**	**5SY5*04-7**	—
*	5	—	—	—	—
*	6	—	**5SY5*06-6**	**5SY5*06-7**	—
*	8	—	—	**5SY5*08-7**	—
*	10	—	**5SY5*10-6**	**5SY5*10-7**	—
*	13	—	**5SY5*13-6**	**5SY5*13-7**	—
*	15	—	—	—	—
*	16	—	**5SY5*16-6**	**5SY5*16-7**	—
*	20	—	**5SY5*20-6**	**5SY5*20-7**	—
*	25	—	**5SY5*25-6**	**5SY5*25-7**	—
*	30	—	—	—	—
*	32	—	**5SY5*32-6**	**5SY5*32-7**	—
*	35	—	—	—	—
*	40	—	**5SY5*40-6**	**5SY5*40-7**	—
*	45	—	—	—	—
*	50	—	**5SY5*50-6**	**5SY5*50-7**	—
*	60	—	—	—	—
*	63	—	**5SY5*63-6**	**5SY5*63-7**	—
•	80	—	—	**5SY5280-7**	—
•	100	—	—	**5SY5291-7**	—
•	125	—	—	**5SY5292-7**	—

1) Depending on the device selected. See Interrupting ratings / Rated switching capacity, page 26.
2) Substitute "*" with:
1 for 1-pole 2 for 2-pole

Product selection – 5SY6

Interrupting ratings / Rated switching capacity[1)]

- UL 1077 and CSA C22.2 No. 235:
(Maximum RMS Symmetrical)
240 VAC: 7.5 kA
480 VAC: 5 kA (3 Phase)

- IEC/EN 60898-1:
230 & 400 VAC: 6 kA

- IEC/EN 60947-2:
230 & 400VAC: 30kA

No. of Poles [2)]	I_n (A)	Characteristic A Order No.	Characteristic B Order No.	Characteristic C Order No.
*	0.3	—	—	**5SY6*14-7**
*	0.5	—	—	**5SY6*05-7**
*	1	—	—	**5SY6*01-7**
*	1.6	—	—	**5SY6*15-7**
*	2	—	**5SY6*02-6** [3)]	**5SY6*02-7**
*	3	—	—	**5SY6*03-7**
*	4	—	**5SY6*04-6** [3)]	**5SY6*04-7**
*	5	—	—	—
*	6	—	**5SY6*06-6**	**5SY6*06-7**
*	8	—	—	**5SY6*08-7**
*	10	—	**5SY6*10-6**	**5SY6*10-7**
*	13	—	**5SY6*13-6**	**5SY6*13-7**
*	15	—	—	—
*	16	—	**5SY6*16-6**	**5SY6*16-7**
*	20	—	**5SY6*20-6**	**5SY6*20-7**
*	25	—	**5SY6*25-6**	**5SY6*25-7**
*	30	—	—	—
*	32	—	**5SY6*32-6**	**5SY6*32-7**
*	35	—	—	—
*	40	—	**5SY6*40-6**	**5SY6*40-7**
*	45	—	—	—
*	50	—	**5SY6*50-6**	**5SY6*50-7**
*	60	—	—	—
*	63	—	**5SY6*63-6**	**5SY6*63-7**

1) Depending on the device selected. See Interrupting ratings / Rated switching capacity, page 26.
2) Substitute "*" with:
1 for 1-pole 3 for 3-pole 5 for 1-pole + N
2 for 2-pole 4 for 4-pole 6 for 3-pole + N
3) 1-Pole only.

Product selection – 5SY7

Interrupting ratings / Rated switching capacity[1)]
- UL 1077 and CSA C22.2 No. 235:
(Maximum RMS Symmetrical)
240 VAC: 7.5 kA
480 VAC: 5 kA (3 Phase)

- IEC/EN 60898-1:
230 & 400 VAC: 15 kA

- IEC/EN 60947-2:
230 & 400 VAC: 50kA

No. of Poles [2)]	I_n (A)	Characteristic A Order No.	Characteristic B Order No.	Characteristic C Order No.	Characteristic D Order No.
*	0.3	—	—	**5SY7*14-7**	**5SY7*14-8**
*	0.5	—	—	**5SY7*05-7**	**5SY7*05-8**
*	1	—	—	**5SY7*01-7**	**5SY7*01-8**
*	1.6	—	—	**5SY7*15-7**	**5SY7*15-8**
*	2	—	—	**5SY7*02-7**	**5SY7*02-8**
*	3	—	—	**5SY7*03-7**	**5SY7*03-8**
*	4	—	—	**5SY7*04-7**	**5SY7*04-8**
*	5	—	—	—	—
*	6	—	**5SY7*06-6**	**5SY7*06-7**	**5SY7*06-8**
*	8	—	—	**5SY7*08-7**	**5SY7*08-8**
*	10	—	**5SY7*10-6**	**5SY7*10-7**	**5SY7*10-8**
*	13	—	**5SY7*13-6**	**5SY7*13-7**	**5SY7*13-8**
*	15	—	—	—	—
*	16	—	**5SY7*16-6**	**5SY7*16-7**	**5SY7*16-8**
*	20	—	**5SY7*20-6**	**5SY7*20-7**	**5SY7*20-8**
*	25	—	**5SY7*25-6**	**5SY7*25-7**	**5SY7*25-8**
*	30	—	—	—	—
*	32	—	**5SY7*32-6**	**5SY7*32-7**	**5SY7*32-8**
*	35	—	—	—	—
*	40	—	**5SY7*40-6**	**5SY7*40-7**	**5SY7*40-8**
*	45	—	—	—	—
*	50	—	**5SY7*50-6**	**5SY7*50-7**	**5SY7*50-8**
*	60	—	—	—	—
*	63	—	**5SY7*63-6**	**5SY7*63-7**	**5SY7*63-8**

1) Depending on the device selected. See Interrupting ratings / Rated switching capacity, page 26.
2) Substitute "*" with:
1 for 1-pole 3 for 3-pole 5 for 1-pole + N
2 for 2-pole 4 for 4-pole 6 for 3-pole + N

Product Selection – 5SY8

Interrupting ratings / Rated switching capacity[1)]

- UL 1077 and CSA C22.2 No. 235:
(Maximum RMS Symmetrical)
240 VAC: 7.5 kA
480 VAC: 5 kA (3 Phase)

- IEC/EN 60898-1:
230 & 400 VAC: Not Rated

- IEC/EN 60947-2:
230 & 400 VAC: 70kA

No. of Poles [2)]	I_n (A)	Characteristic A Order No.	Characteristic B Order No.	Characteristic C Order No.	Characteristic D Order No.
*	0.3	—	—	**5SY8*14-7**	**5SY8*14-8**
*	0.5	—	—	**5SY8*05-7**	**5SY8*05-8**
*	1	—	—	**5SY8*01-7**	**5SY8*01-8**
*	1.6	—	—	**5SY8*15-7**	**5SY8*15-8**
*	2	—	—	**5SY8*02-7**	**5SY8*02-8**
*	3	—	—	**5SY8*03-7**	**5SY8*03-8**
*	4	—	—	**5SY8*04-7**	**5SY8*04-8**
*	5	—	—	—	—
*	6	—	—	**5SY8*06-7**	**5SY8*06-8**
*	8	—	—	**5SY8*08-7**	**5SY8*08-8**
*	10	—	—	**5SY8*10-7**	**5SY8*10-8**
*	13	—	—	**5SY8*13-7**	**5SY8*13-8**
*	15	—	—	—	—
*	16	—	—	**5SY8*16-7**	**5SY8*16-8**
*	20	—	—	**5SY8*20-7**	**5SY8*20-8**
*	25	—	—	**5SY8*25-7**	**5SY8*25-8**
*	30	—	—	—	—
*	32	—	—	**5SY8*32-7**	**5SY8*32-8**
*	35	—	—	—	—
*	40	—	—	**5SY8*40-7**	**5SY8*40-8**
*	45	—	—	—	—
*	50	—	—	**5SY8*50-7**	**5SY8*50-8**
*	60	—	—	—	—
*	63	—	—	**5SY8*63-7**	**5SY8*63-8**

1) Depending on the device selected. See Interrupting ratings / Rated switching capacity, page 26.
2) Substitute "*" with:
1 for 1-pole 3 for 3-pole 5 for 1-pole + N
2 for 2-pole 4 for 4-pole 6 for 3-pole + N

Product selection – Accessories

	Rated voltage U_n V	MW	DT	Order No.	PG	PU Unit(s)	PS*/ P. unit Unit(s)	Weight per PU approx. kg
	**Auxiliary switches (AS)** For SP4 and 5SY miniature circuit breakers							
	1 NO + 1 NC	0.5	▶	**5ST3-010**	027	1	1	0.050
	For small output		▶	**5ST3-013**	027	1	1	0.050
	2 NO		A	**5ST3-011**	027	1	1	0.050
	For small output		B	**5ST3-014**	027	1	1	0.050
	2 NC		A	**5ST3-012**	027	1	1	0.050
	For small output		B	**5ST3-015**	027	1	1	0.050
	**Fault signal contacts (FC)** For SP4 and 5SY miniature circuit breakers							
	1 NO + 1 NC	0.5	▶	**5ST3-020**	027	1	1	0.050
	2 NO		B	**5ST3-021**	027	1	1	0.050
	2 NC		A	**5ST3-022**		1	1	0.050
	**Undervoltage releases (UR)** For SP4 and 5SY miniature circuit breakers but not for 5SY6 0..							
	230 AC	1	A	**5ST3-040**	027	1	1	0.115
	110 DC		B	**5ST3-041**	027	1	1	0.115
	24 DC		B	**5ST3-042**	027	1	1	0.115
	230 DC	1	A	**5ST3-043**	027	1	1	0.115
	110 DC		B	**5ST3-044**	027	1	1	0.115
	24 DC		A	**5ST3-045**	027	1	1	0.115
	**Shunt trips (ST)** For SP4 and 5SY miniature circuit breaker but not for 5SY6 0.							
	110 DC	1	▶	**5ST3-030**	027	1	1	0.098
	24 DC	1	▶	**5ST3-031**	027	1	11	0.098

5ST30 accessories are intended for use with 5SP4 and 5SY supplementary protectors.

Auxiliary Switches are available with One Normally Open + One Normally Closed, Two Normally Open or Two Normally Closed contacts. They are primarily used to signal the miniature circuit breaker's trip mechanism position.

Fault Signal Contacts are available with One Normally Open + One Normally Closed, Two Normally Open or Two Normally Closed contacts. They are primarily used to signal the automatic tripping of the supplementary protector's trip mechanism; and trip position.

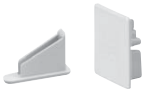
Shunt Trips (ST) are available in voltages of 110 to 415 VAC and 24 to 48 V AC/DC. They are used for remote tripping of a supplementary protector.

Undervoltage Releases (UR) are available in voltages of 24 VDC, 110 VDC and 230 VAC. They are typically integrated into an EMERGENCY STOP loop ensuring that the supplementary protector trips in the event of an emergency, which in turn ensures disconnection of the control circuit according to EN 60204. In the event that the voltage is interrupted or too low, it also trips. I.E. prevents the supplementary protector from switching on.

Product selection – Busbar & busbar accessories to UL 508

Refer to mounting diagram on page 23 for mounting combinations.

Selection and ordering data

		Length	For use with 5SY		For use with 5SP [3]	
			Order No.	Weight 1 item	Order No.	Weight 1 item
		mm		kg		kg
	**Busbars** [2] without end caps (can be cut)					
	1-pole 1-pole + AS or FC [1]	1000	**5ST3-701-0HG** **5ST3-703-0HG**	0.330	**5ST3-701-2HG** —	0.450
	2-pole 2-pole + AS or FC [1]	1000	**5ST3-705-0HG** **5ST3-707-0HG**	0.508	**5ST3-705-2HG** —	0.690
	3-pole 3-pole + AS or FC [1]	1000	**5ST3-710-0HG** **5ST3-712-0HG**	0.800	**5ST3-710-2HG** —	1.090
	**Busbar end caps** 1-pole		**5ST3-748-0HG**	0.001	**5ST3-748-0HG**	0.001
	2- & 3-pole		**5ST3-750-0HG**		**5ST3-750-0HG**	
	**Connection terminals** Infeed - MCBs	Wire Size 6 - 35 mm² 10 -1/0 AWG	**5ST3-770-0HG**	0.035	**5ST3-770-0HG**	0.035
	Infeed - busbars	1.5 - 50 mm² 14 -1 AWG	**5ST3-770-1HG**	0.016	**5ST3-770-1HG**	0.016
	**Touch protection covers** [2] 5 x 1 pin		**5ST3-655-0HG**	0.003	**5ST3-655-0HG**	0.003

[1] Used with appropriate pole supplementary protector + 1 auxiliary switch (AS) or 1 fault signal contact (FC).
[2] Always cover all exposed terminal with touch protection covers 5ST3655-0HG.
[3] Maximum 100 A for infeed at the start of a busbar.

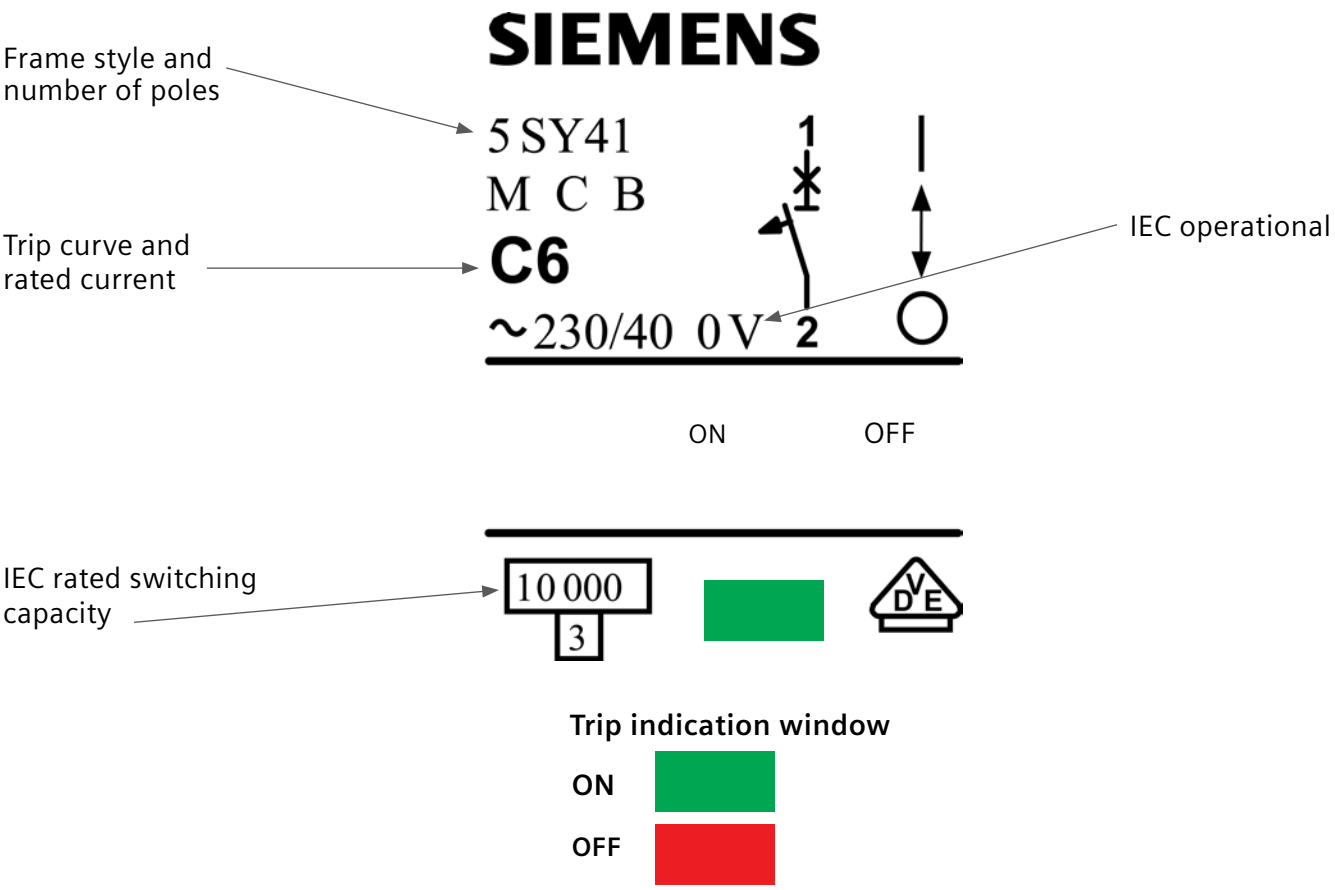
Product selection – Busbar & busbar accessories – Not UL rated

	Length	Order No.	Weight 1 item
	mm		kg
Accessories for 5SY4, 5SY5 miniature circuit breakers			
 **Busbars 16mm²** Fully insulated (Do not cut)			
1-phase 1-phase + AS	214	**5ST3-700** **5ST3-702**	0.040
2-phase 2-phase + AS		**5ST3-704** **5ST3-706**	0.060
3-phase 3-phase + AS 3 x (1-phase + AS)		**5ST3-708** **5ST3-711** **5ST3-713**	0.100
4-phase Without end caps (Can be cut)		**5ST3-715**	0.290
1-phase 1-phase + AS	1016	**5ST3-701** **5ST3-703**	0.190
2-phase 2-phase + AS		**5ST3-705** **5ST3-707**	0.290
3-phase 3-phase + AS 3 x (1-phase + AS)		**5ST3-710** **5ST3-712** **5ST3-714**	0.430
4-phase		**5ST3-716**	0.700
 **End Caps** For lateral insulation of cut-to-length busbars			
1-phase		**5ST3-748**	0.001
2- and 3-phase		**5ST3-750**	0.001
4-phase		**5ST3-718**	0.001

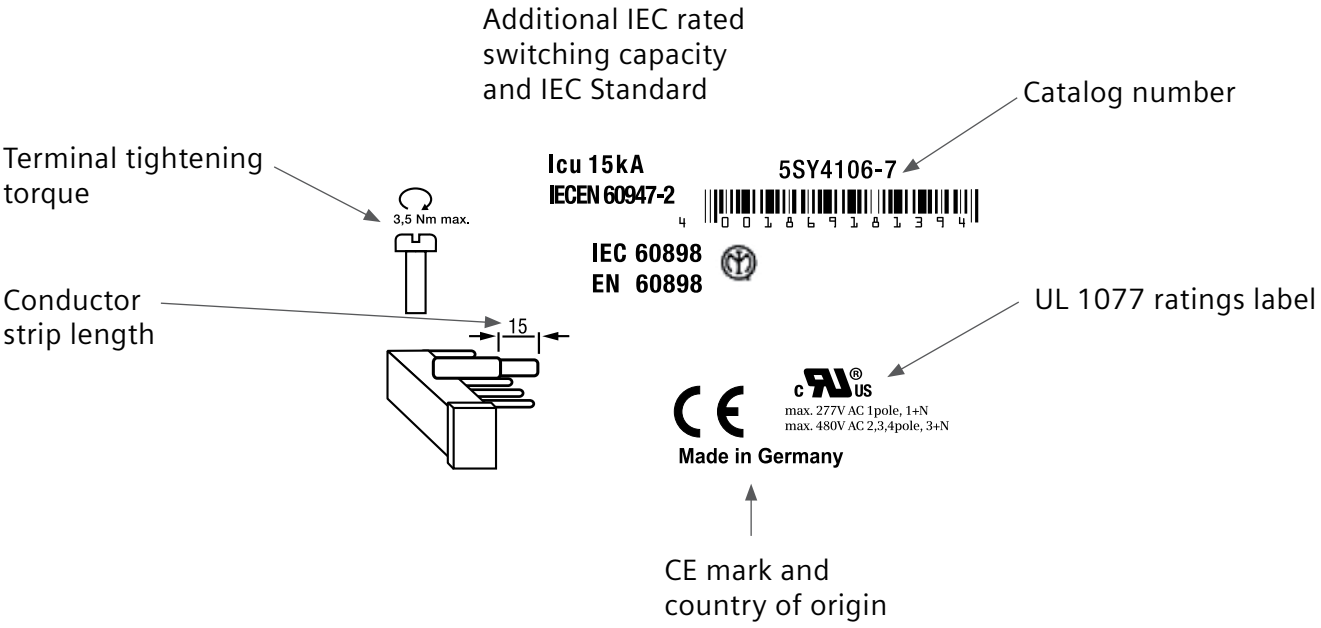
Product selection – Other components

		Order No.	Weight 1 item
			kg
Accessories for 5SY4, 5SY5, 5SP4 supplementary protectors			
	**Handle locking device** Applicable with all types of poles; sealable against unintended on- and off-switching: padlock with a shackle of max. 3 mm	**5ST3-801**	0.008
	**Terminal cover** Applicable with all types of poles; as an additional cover for screw openings; prevents removal of the device from the standard mounting rail; sealable	**5ST3-800**	0.001
	**Padlock** For handle locking device 5ST3 801	**5ST3-802**	0.027
	Locking mechanism Consisting of 5ST3 801 handle locking device and 5ST3 802 padlock	**5ST3-803**	0.035
	**Inscription labels (white) for** **5SY4, 5SY5, 5SP4** **miniature circuit breakers** 15 x 9 mm, 3 frames containing 44 labels each, attachable to the lower casing collar • Self-adhesive	**5ST3-173**	0.038

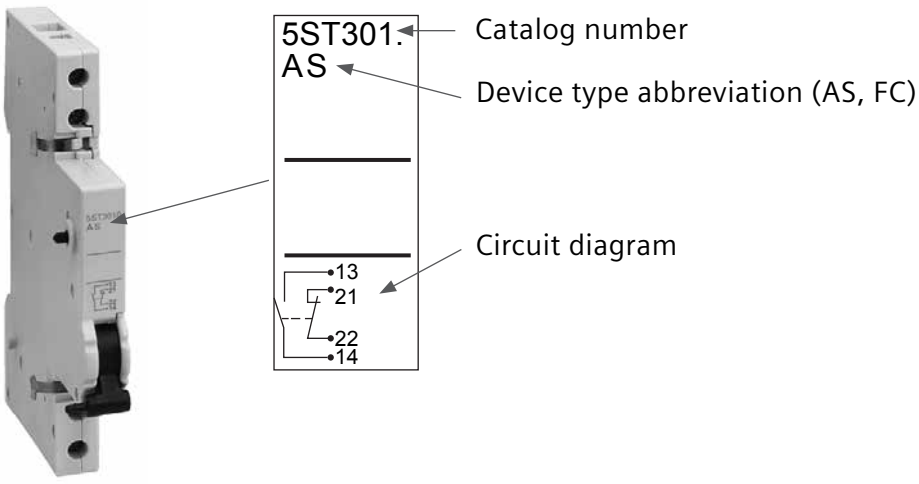
Typical supplementary protector front markings

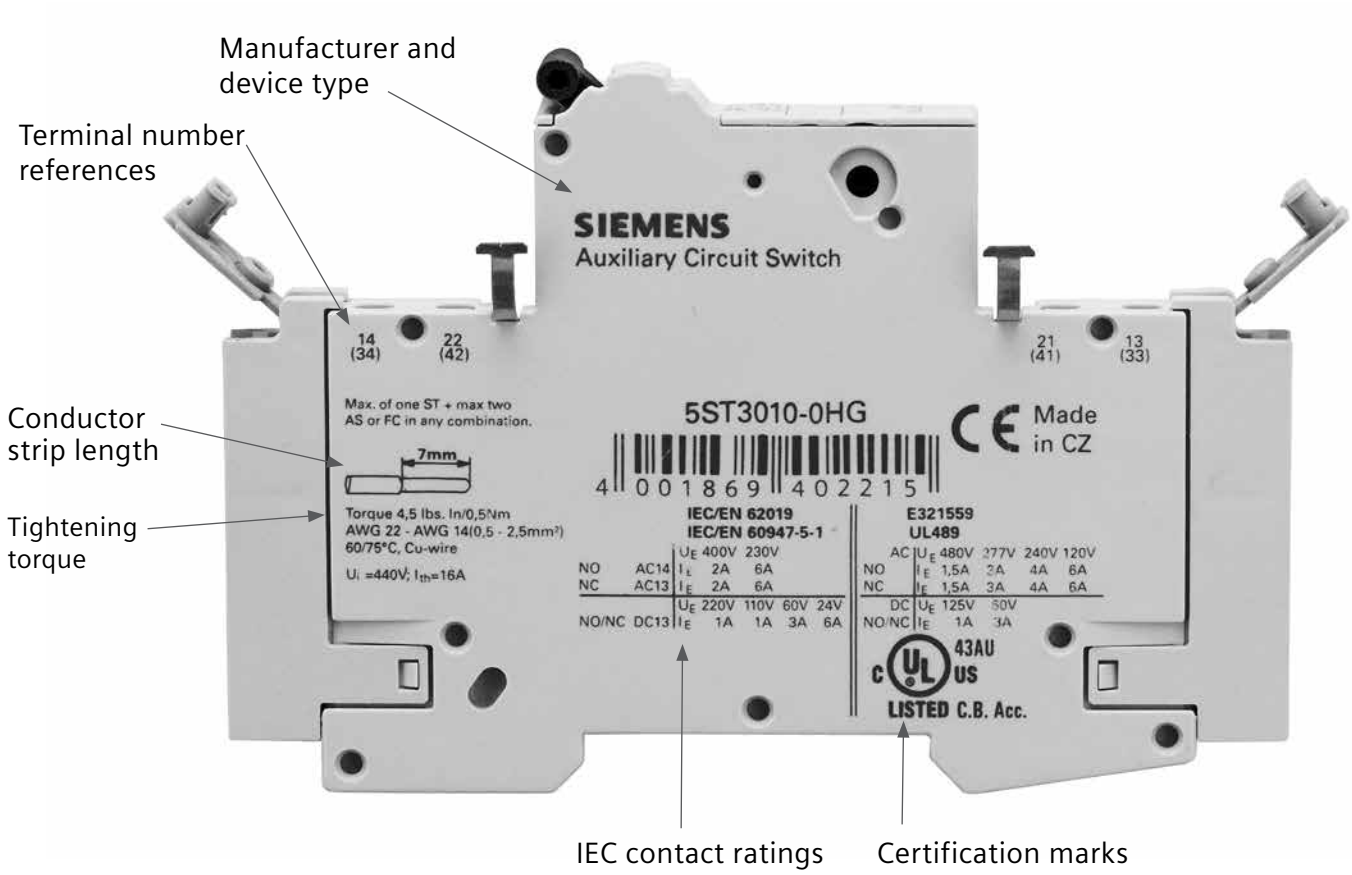


Typical supplementary protector left side markings



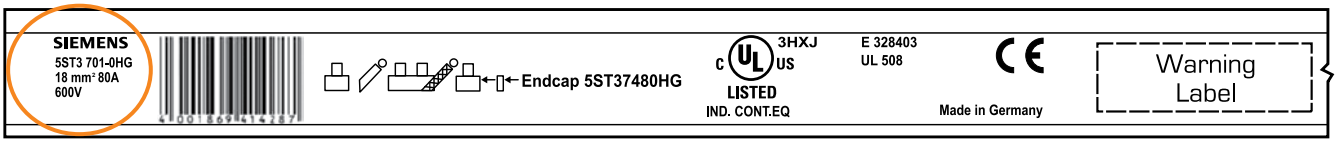
Typical auxiliary switch (AS) and fault signal contact (FC) markings



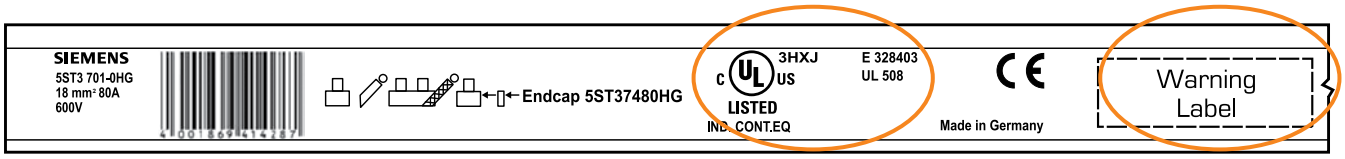


Typical shunt trip (ST) markings

Typical busbar markings – UL 508



Typical Busbar Markings – UL 508 (continued)



UL Mark

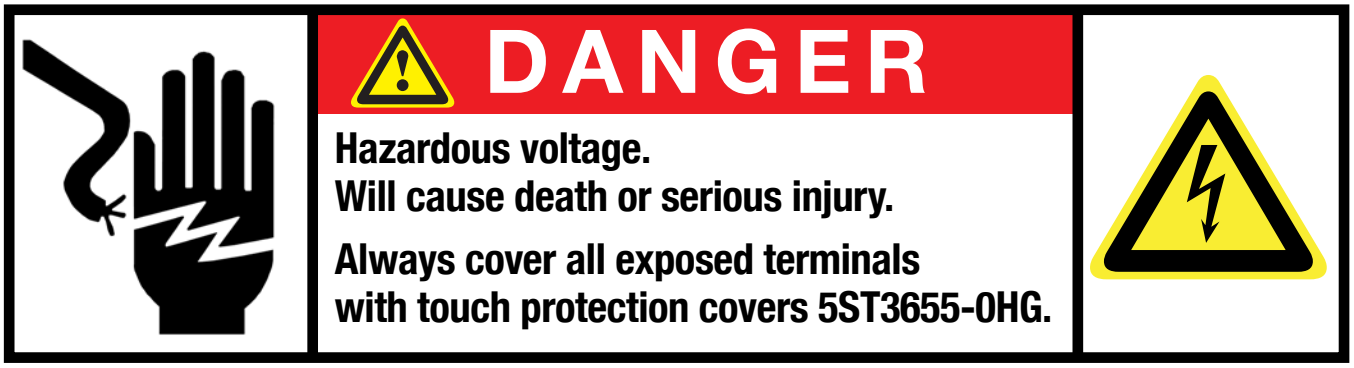
c UL 3HXJ US
LISTED
IND. CONT.EQ

UL File Number

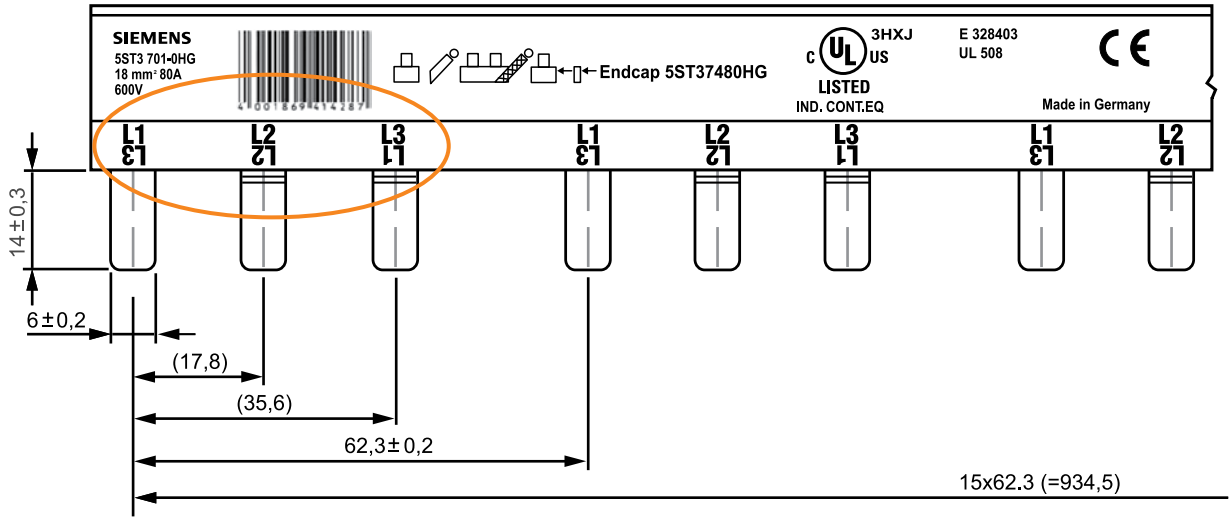
E 328403
UL 508

CE

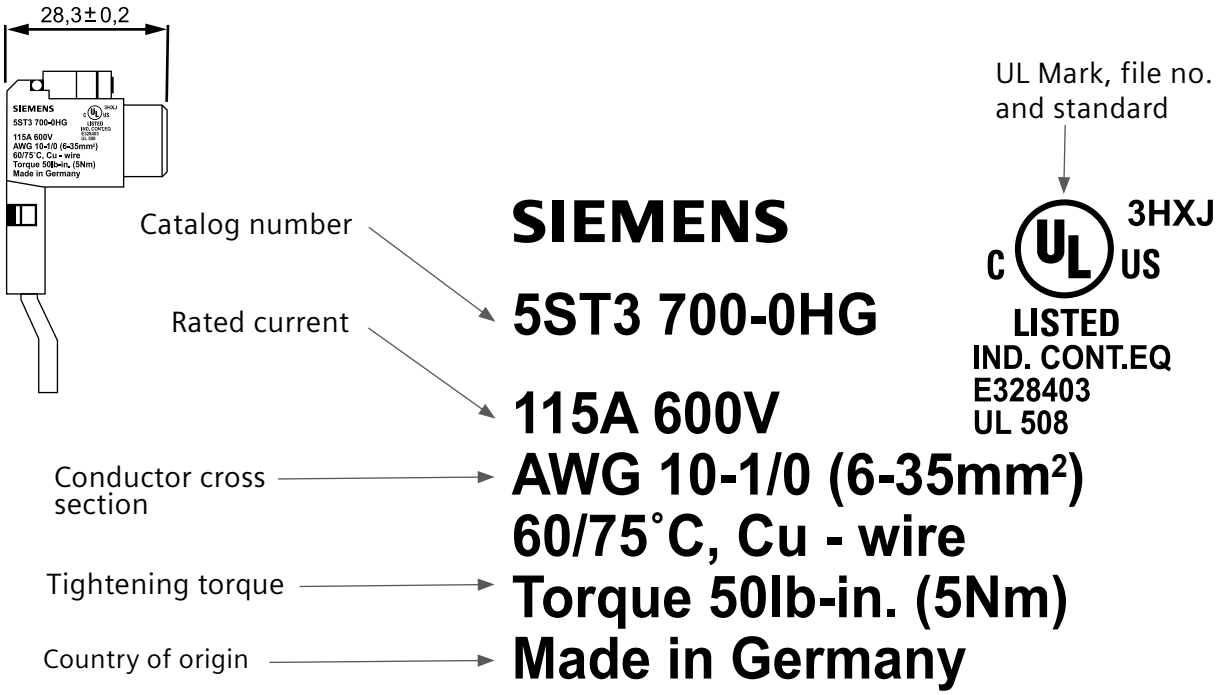
Made in Germany
Country of origin



Typical Busbar Markings – UL 508 (continued)



Typical connector markings – UL 508



Technical specifications – Supplementary protectors

			5SY6	5SY4	5SY5	5SY7	5SY8	5SP4	5SP5
Standards			EN 60898	EN 60898; EN 60947-2			—	EN 60898; EN 60947-2	
Approved acc. to			EN60898; UL 1077; CSA C22.2 No 235; UL File No. E 116386		—	EN 60898; UL 1077, CSA C22.2 No 235; UL File No. E 116386			—
Operational voltage	min.	V AC/DC	24	24	24	24	24	24	24
Acc. to EN 60898 and EN 60947-2	max.	V DC/pole	60 [1]	60 [1]	220	60 [1]	60 [1]	60 [1]	220 [1]
	max	V AC	440	440	440	440	440	440	440
Acc. to UL 1077 and CSA22.2 [3]	max	V AC	480	480	—	480	480	480	—
No.235		V DC/pole	60	60	—	60	60	60	—
Rated switching capacity									
• I_{cn} to IEC/EN 60898-1		kA AC	6	10	10	15	—	10	3
• I_{cu} to IEC/EN 60898-2		kA DC	10	10	10	15	—	10	10
• I_{cn} to IEC/EN 60947-2		kA AC	—	—	—	—	25	—	—
• Acc. to UL 1077 and CSA C22.2 No. 235[2]		kA AC	5	5	—	5	5	5	—
Insulation coordination									
• Rated insulation voltage		VAC	250/440						
• Degree of pollution for overvoltage category			3/III						
Touch protection Acc. to EN 50274-1			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					—	
• Standard mounting rail and screw fixing			—					Yes	
Terminals									
• Tunnel terminals at both ends			—					Yes	
• Combined terminals at both ends			Yes					—	
• Terminal solid, stranded or finely stranded, with end sleeve		mm^2	0.75 ... 25						
• Terminal tightening torque		Nm	2.5 ... 3					2.5 ... 3.5	
		lb. in.	22 ... 26					22 ...31	
Conductor cross-sections									
• Solid and stranded		mm^2	0.75 ... 35					0.75 ... 50	
• Finely stranded with end sleeve		mm^2	0.75 ... 25					0.75 ... 35	
• AWG cables		AWB	14 ... 4					14 ... 2	
Mains connection			Any						
Mounting position			Any						
Service life		Operations	20000						
On average, with rated load		Operations	For 5SY5 at 40 A, 60 A and 63 A 10 000						
Ambient temperature		°C	-25 ... +45, occasionally +55 max. 95% humidity, storage temperature: -40 ... +75						
Resistance to climate Acc. to IEC 60068-2-30			6 cycles						
Resistance to vibrations Acc. to IEC 60068-2-6		m/s^2	60 at 10 ... 150 Hz						

1) The operational voltage 60 V DC/pole takes into account a battery charging voltage with peak value of 72 V.
2) See page 26 for additional Interrupting ratings / Rated switching capacity data.
3) 277 VAC, 1-Pole, 1-Pole+N
480 VAC, 2-, 3-, 4-Pole, 3-Pole+N

Technical specifications – Auxiliary devices

			Auxiliary switches		Fault signal contacts
			5ST3 010 5ST3 011 5ST3 012	5ST3 013 5ST3 014 5ST3 015	5ST3 020 5ST3 021 5ST3 022
Standards **Approved acc. to**			EN 62019; UL 1077; CSA C22.2 No. 235 EN 62019; UL 1077; UL FIle No. E 106582; CSA C22.2 No. 235		
Short-circuit protection			B6 miniature circuit breaker, C6 or fuse gG 6 A		
Contact load	Mn.		50 mA, 24 V	1 mA/5 V DC	50 mA, 24 V
Contact load	Max.		—	50 mA/30 V DC	—
• 400 V AC, AC-14, NO contact		A	2	—	2
• 230 V AC, AC-14, NO contact		A	6	—	6
• 400 V AC, AC-13, NC contact		A	2	—	2
• 230 V AC, AC-13, NC contact		A	6	—	6
•220 V DC, DC-13, NO + NC contact		A	1	—	1
• 110 VDC, DC-13, NO + NC contact		A	1	—	1
• 60 V DC, DC-13, NO + NC contact		A	3	—	3
• 24 V DC, DC-13, NO + NC contact		A	6	—	6

			Undervoltage releases	Shunt type	Remote controlled mechanisms
			5ST3 04.	5ST3 030 5ST3 031	5ST3 050
Standards			EN 60898; EN 60947-1		
Rated voltage U_n		Vac	230	24 ... 48 110 ... 413	230
• Rated frequency I_n		Hz	—	50 ... 60	50 ... 60
		V DC	24, 110	24 ... 48, 110	—
Response limits					
• Acc. to EN 60947-1, 7.2.1.3	Releases		< 0.35 ... 0.7 x U_n	—	—
	Permissible fluctuations of the power supply		0.85 ... 1.1 x U_n	—	—
• Acc. to EN 60947-1, 7.2.1.4			—	0.7 ... 1.1 x U_n	—

Technical specifications – Busbar and busbar accessories to UL 508

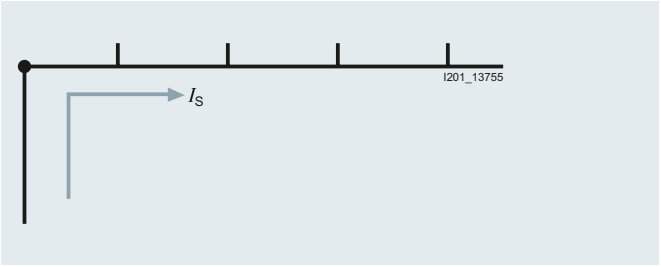
		5ST3 7..-0HG	5ST3 7..-2HG	5ST3 770-0HG	5ST3 770-1HG
Standards **Approvals**		UL 508, CSA C22.2 No. 14-M 95, UL 508 File No. E328403 CSA			
Operational voltage					
• Acc. to IEC	V AC	690			
• Acc. to UL 508	V AC	600			
Rated conditional short-circuit current	kA	10 (RMS symmetrical 600 V for three cycles)			
• Dielectric strength	kV/mm	25			
• Surge strength	kV	> 9.5			
Rated current	A	—	—	115	
Maximum busbar current I_s per phase					
• Infeed at the start of the busbar	A	80	100	—	—
• Infeed at the center of the busbar	A	160	200	—	—
Insulation coordination					
• Degree of pollution		2			
• Overvoltage category		III			
Busbar cross-section	mm^2 Cu	18	25	—	—
Infeed		Any			
Conductor cross-sections	AWG	—	—	10-1/0	14-1
	mm^2	—	—	6-35	1.5-50
Terminals – terminal tightening torque	Nm	—	—	5	3.5
	lbs/in	—	—	50	35

Technical specifications – Busbar and busbar accessories (Not UL rated)

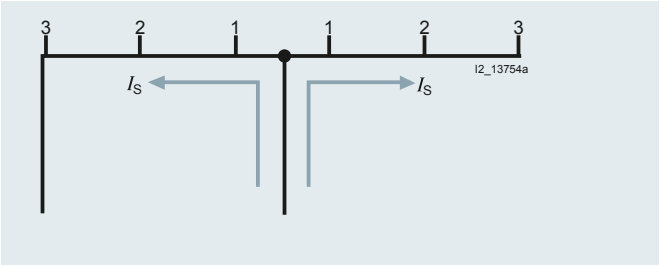
			5ST3
Standards			EN 60439-1 (VDE 0660-500): 2005-01
Busbar material			SF-Cu F 24
Partition material			Plastic, Cycoloy 3600 heat-resistant to more than 90 °C flame retardant and self-extinguishing, dioxin and halogen-free
Rated operational voltage U_c		V AC	400
Rated current I_n			
• Cross-section 10 mm^2		A	63
• Cross-section 16 mm^2		A	80
Rated impulse withstand voltage U_{imp}		kV	4
Test pulse voltage (1.2/50)		kV	6.2
Rated conditional short-circuit current I_{cc}		kA	25
Resistance to climate			
• Constant atmosphere	Acc. to DIN 50015		23/83; 40/92; 55/20
• Humid heat	Acc. to IEC 60068-2-30		28 cycles
Insulation coordination			
• Overvoltage category			III
• Degree of pollution			2
Maximum busbar current I_s/phase			
• Infeed at the start of the busbar			
- Cross-section 10 mm^2		A	63
- Cross-section 16 mm^2		A	80
• Infeed at the center of the busbar			
- Cross-section 10 mm^2		A	100
- Cross-section 16 mm^2		A	130

Busbar application example – All busbar types

Infeed at the start or end of the busbar



Infeed along the busbar or midpoint infeed

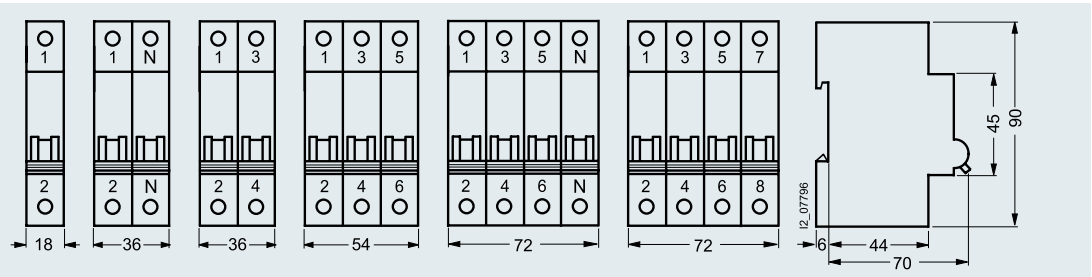


The sum of the output current per branch (1, 2, 3 ... n) must not be greater than the max. busbar current I_s / phase.

Dimensions

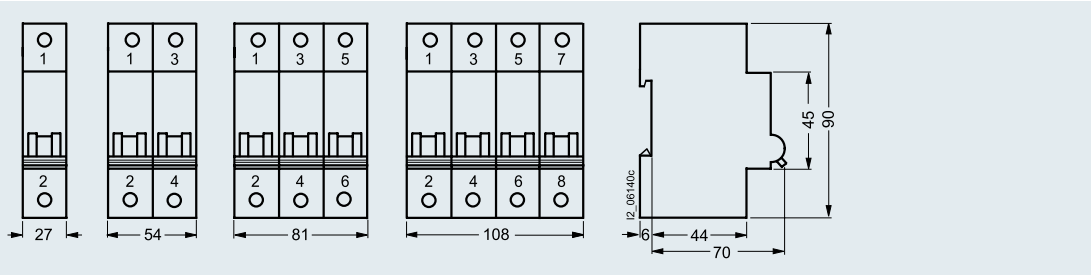
Supplementary protectors

5SY



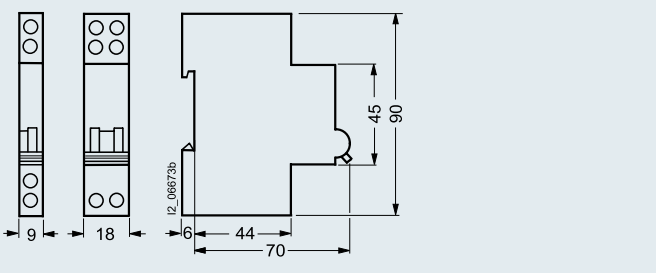
1P 1P+N 2P 3P 3P+N 4P

5SP



1P 2P 3P 4P

Accessories

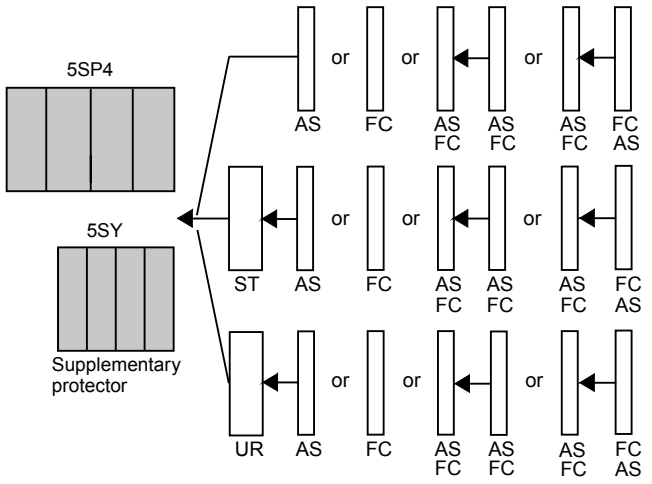


AS UR
FC ST

AS: auxiliary switch
FC: fault signal contacts
ST: shunt trip
UR: undervoltage release

Accessory mounting

Using this mounting concept, all additional 5ST30..-0HG components can be combined with supplementary protectors 5SP, 5SY. The chart shows additional components that can be mounted to the right.



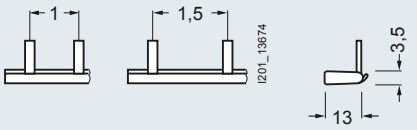
Maximum of 2 accessories, AS or FC, in any combination.

Maximum of one ST + Maximum of two accessories, AS or FC in any combination.

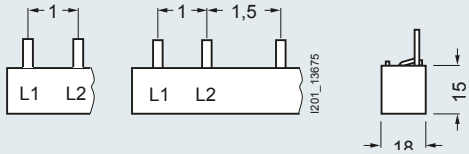
Maximum of one UR + Maximum of two accessories, AS or FC in any combination.

Dimensions

5ST3 7
Pin spacing in MW
Dimensions of side view in mm (approx)

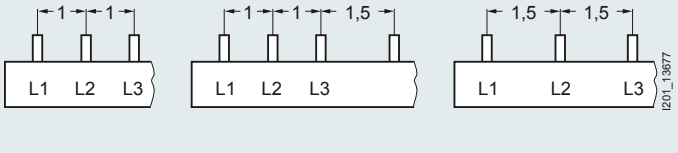


5ST3 700 5ST3 702
5ST3 701 5ST3 703

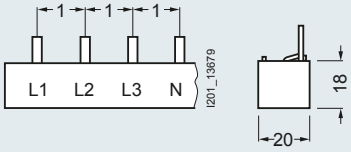


5ST3 704 5ST3 706
5ST3 701 5ST3 707

Busbars – Not UL rated



5ST3 708 5ST3 711 5ST3 713
5ST3 711 5ST3 712 5ST3 714

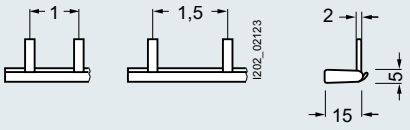


5ST3 715
5ST3 716

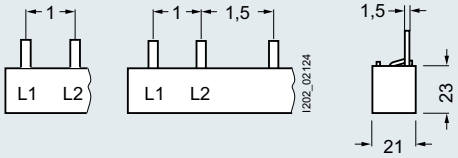
Dimensions (continued)

Busbars and busbar accessories to UL 508

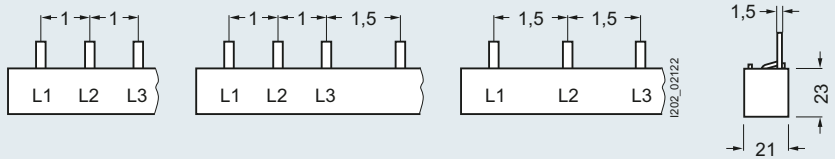
5ST3 7
Pin spacing in MW (modular width 1 MW = 18 mm)
Dimensions of side view in mm (approx)



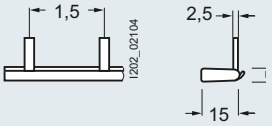
5ST3 701-0HG 5ST3 703-0HG



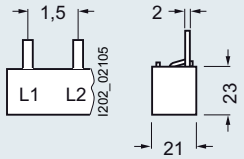
5ST3 705-0HG 5ST3 707-0HG



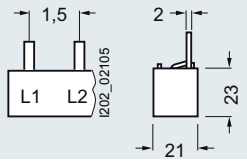
5ST3 710-0HG 5ST3 712-0HG 5ST3 714-0HG



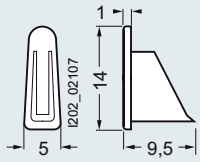
5ST3 701-2HG



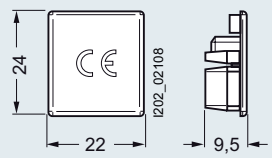
5ST3 705-2HG



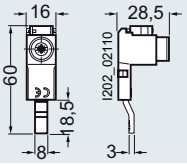
5ST3 710-2HG



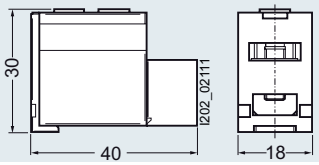
5ST3 748-0 HG



5ST3 750-0HG

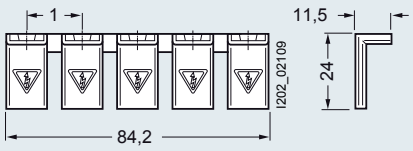


5ST3 770-0HG



5ST3 770-1HG

5ST3 6
Pin spacing in MW (modular width 1 MW = 18 mm)
Dimensions of side view in mm (approx)



5ST3 655-0HG

Interrupting ratings / Rated switching capacity

Interrupting ratings to UL 1077

Series	Characteristic	I_n (A)	1-Phase 277 VAC kA	1-Phase 240 VAC kA	3-Phase 480 VA kA	In pairs 240 VAC 120/240 VAC kA
5SY4 ...-5A	A	1...63	5	7.5	5	14
5SY4 ...-6	B	6...63	5	7.5	5	14
5SY4 ...-7	C	0,3...63	5	7.5	5	14
5SY4 ...-8	D	0,3...63	5	7.5	5	14
5SY6 ...-6 *)	B	6...63	5	7.5	5	14
5SY6 ...-7 *)	C	0,3...63	5	7.5	5	14
5SY6 ...-8	D	0,3...63	5	7.5	5	14
5SY7 ...-6	B	6...63	5	7.5	5	14
5SY7 ...-7	C	0,3...63	5	7.5	5	14
5SY7 ...-8	D	0,3...63	5	7.5	5	14
5SY8 ...-6	B	6...63	5	7.5	5	14
5SY8 ...-7	C	0,3...63	5	7.5	5	14
5SY8 ...-8	D	0,3...63	5	7.5	5	14

Rated switching Capacity

5SP4 and 5SY4, 5SY6, 5SY7 and 5SY8 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	
5SY4	0.3 ... 6	10		35	
	8 ... 32	10		20	
	40 ... 63	10		15	
5SY7	0.3 ... 2	15		50	
	3 ... 6	15		40	
	8 ... 10	15		30	
	13 ... 32	15		25	
	40 ... 63	15		20 [1]	
5SY8	0.3 ... 2	—		70	
	3 ... 6	—		50	
	8 ... 10	—		40	
	13 ... 32	—		30	
	40 ... 63	—		25 [2]	
5SP4	80 ... 125	10		20 [3]	

1) D50 and D63: I_{cu} = 15 kA.
2) D50 and D63: I_{cu} = 20 kA.
3) D50 and D100 I_{cu} = 15 kA.

5SP5 and 5SY5 miniature circuit breakers

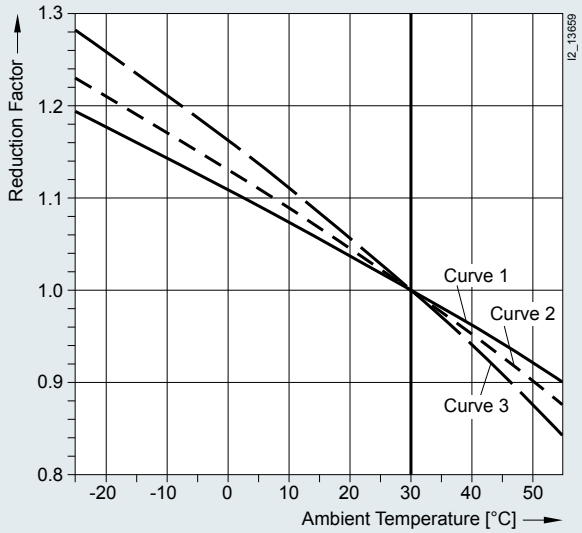
Miniature circuit breaker, universal current		IEC/EN 60898-1		IEC/EN 60898-2	
		1-pole 230 V AC	2-pole 400 V AC	1-pole 220 V DC	2-pole 440 V DC
	I_n (A)	I_{cn} (kA)	I_{cn} (kA)	I_{cn} (kA)	I_{cn} (kA)
5SY5	0.3 ... 63	10		15	
5SP5	80 ... 125	3		10	

Tripping characteristics at an ambient temperature of 30°C (86°F)

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	$I_n \leq 63$ A t	Hold I_4	Latest Tripping instant I_5	Tripping time t
A		1.13 x I_n	1.45 x I_n	> 1 h < 1 h	> 2 h < 2 h	2 x I_n	3 x I_n	≥ 0.1 s < 0.1 s
B	IEC/EN 60898 DIN VDE 0641-11	1.13 x I_n	1.45 x I_n	> 1 h < 1 h	> 2 h < 2 h	3 x I_n	5 x I_n	≥ 0.1 s < 0.1 s
C		1.13 x I_n	1.45 x I_n	> 1 h < 1 h	> 2 h < 2 h	5 x I_n	20 x I_n	≥ 0.1 s < 0.1 s
D		1.13 x I_n	1.45 x I_n	> 1 h < 1 h	> 2 h < 2 h	10 x I_n	20 x I_n (IEC 60898: 50 x I_n)	≥ 0.1 s < 0.1 s

Correction factors for rated current at different ambient temperatures

Dependence of permissible continuous load current on ambient temperature.



Curve for correction factor (for curves, see the diagram above)

Rated current (A) Characteristic	Pole type	03	0.5	1	1.6	2	3	4	6	8	10	13	16	20	25	32	40	50	63
A	1P/2P	3	3	2	2	2	3	3	3	2	3	2	2	3	2	2	3	2	3
	3P/4P	2	2	2	1	2	2	2	2	2	2	1	1	2	1	1	1	1	2
B	1P/2P	—	—	—	—	—	—	—	3	—	3	2	2	3	3	2	3	2	3
	3P/4P	—	—	—	—	—	—	—	2	—	2	1	2	2	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
	3P/4P	2	2	2	1	2	2	2	2	3	3	2	2	2	2	1	1	1	2
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

Correction factors for rated current in the case of bundling

If more than one electrical circuit is loaded in series of supplementary protectors, the resulting increase in ambient temperature affects the characteristic curve. In this case it is necessary to take into account an additional correction factor specific to the rated current of the supplementary protector.

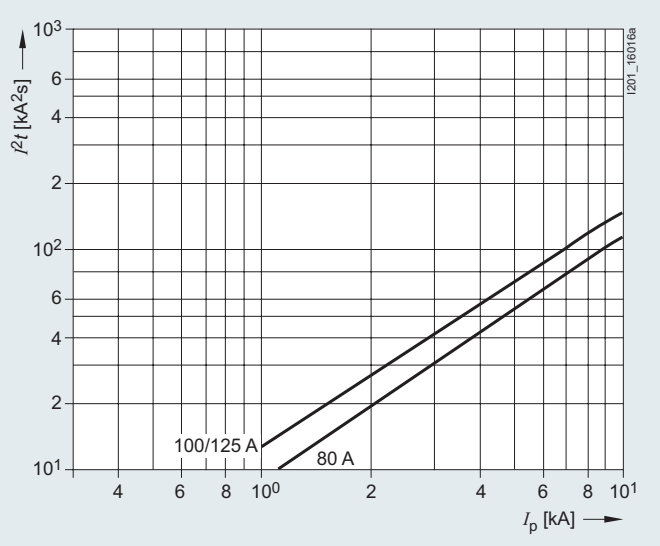
Number of MCBs	1	2 ... 3	4 ... 6	>7
Correction factor K	1.0	0.90	0.88	0.85

Let-through I^2t values

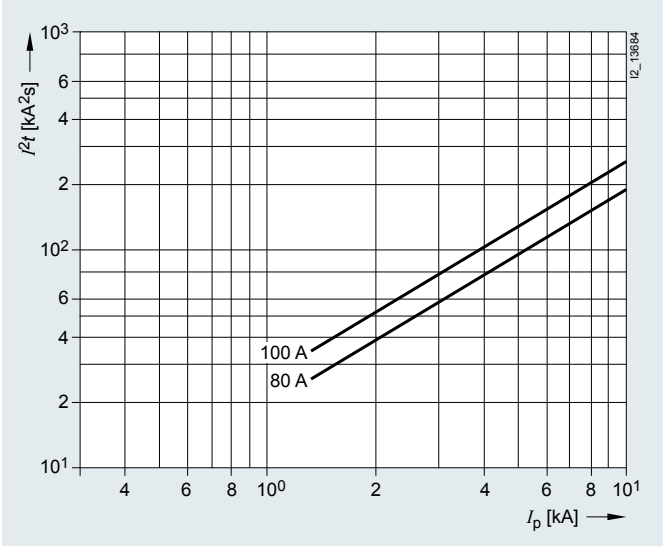
Characteristic curves 5SP4

Let-through I^2t values

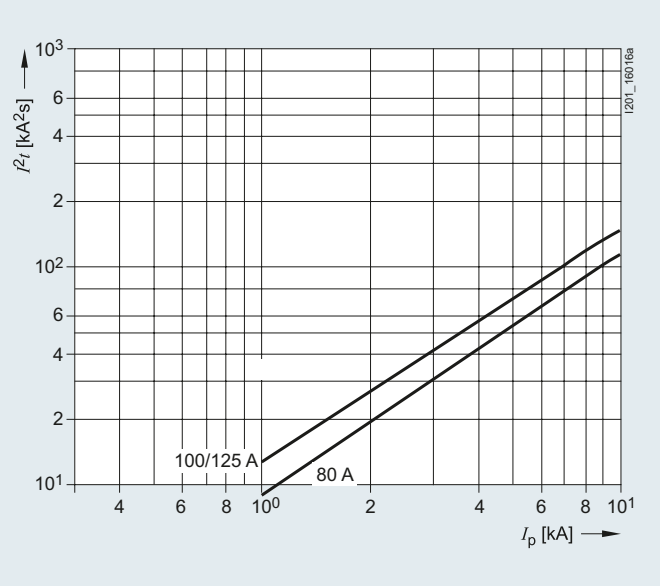
Characteristic B



Characteristic D



Characteristic C

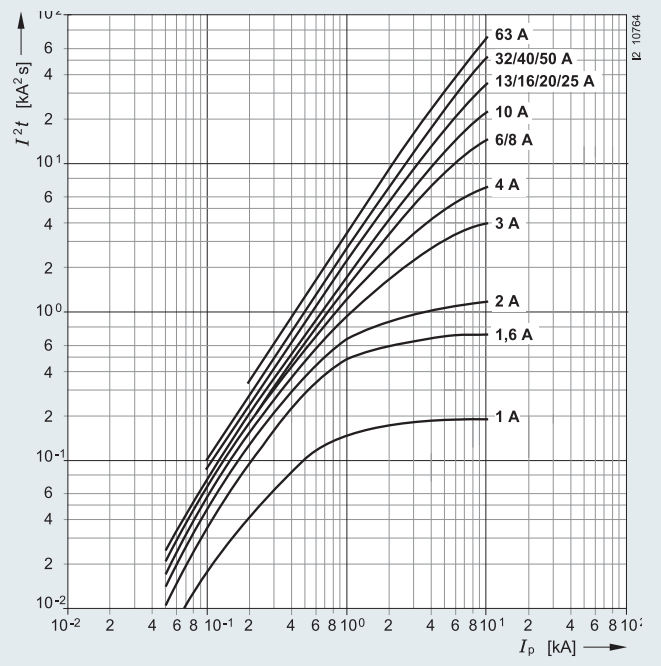


Correction factors for rated current in the case of bundling

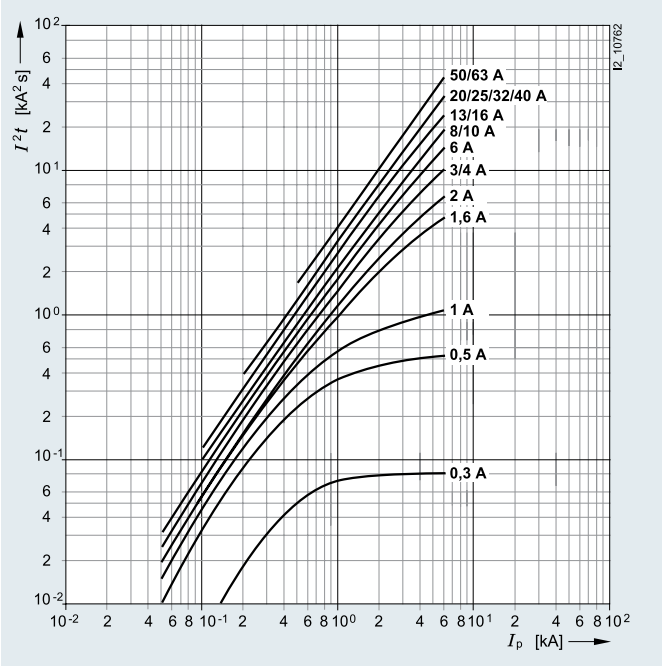
Characteristic curves 5SY4

Let-through I^2t values

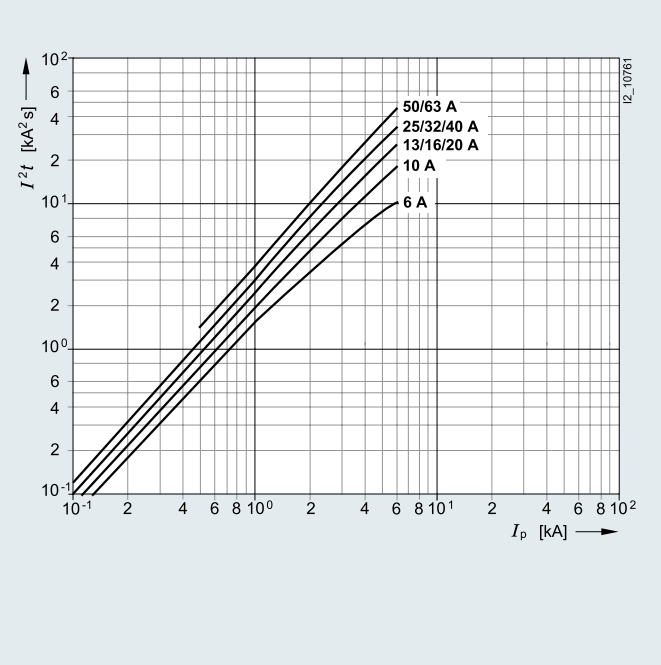
Characteristic A



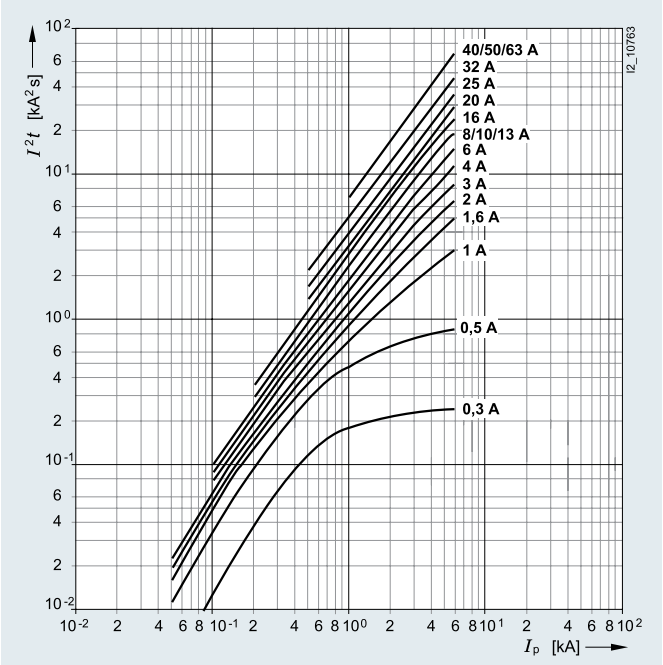
Characteristic C



Characteristic B



Characteristic D

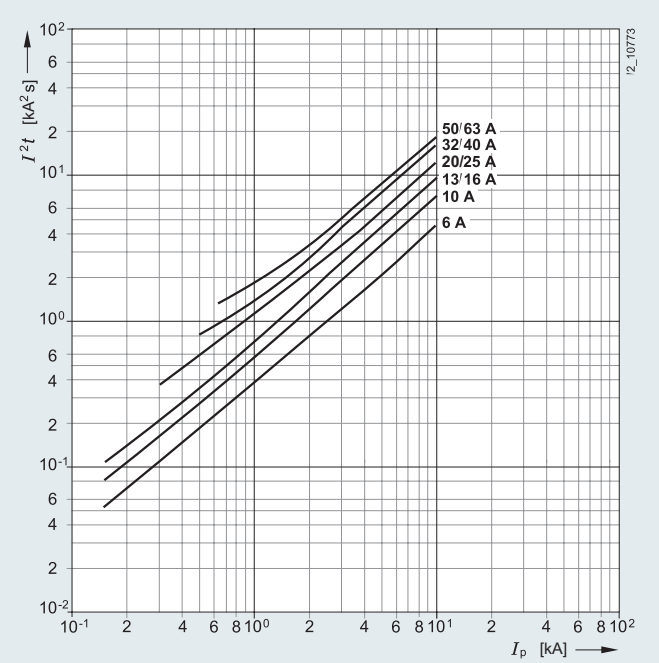


Correction factors for rated current in the case of bundling

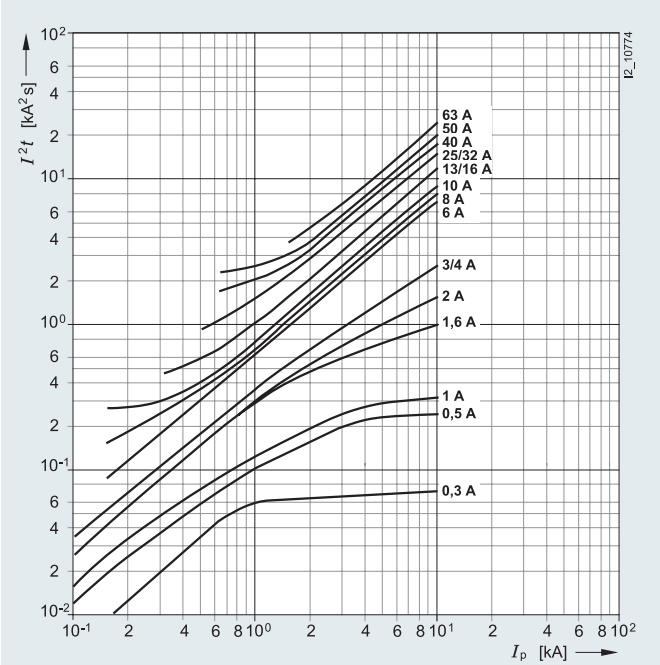
Characteristic curves 5SY5, 5SP5

Let-through I^2t values

Characteristic B



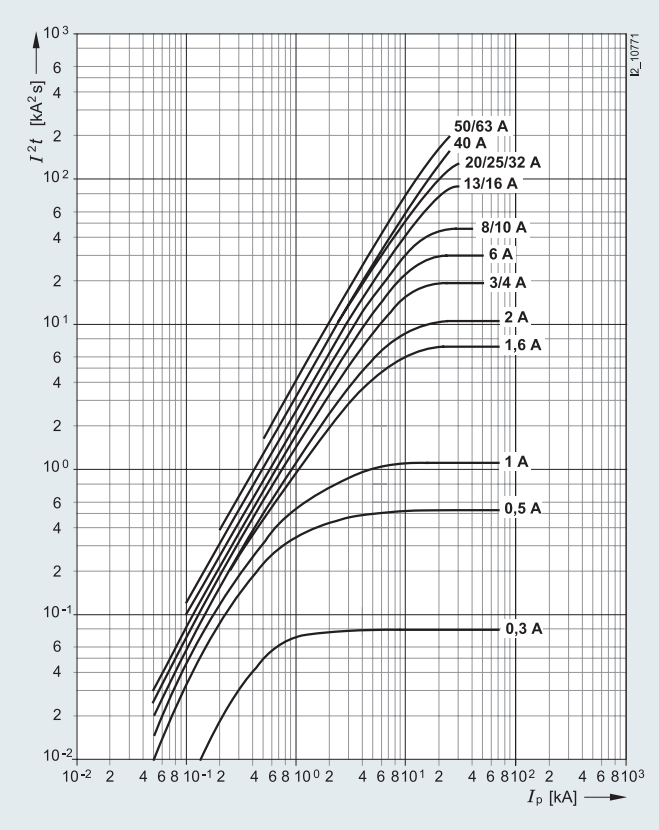
Characteristic C



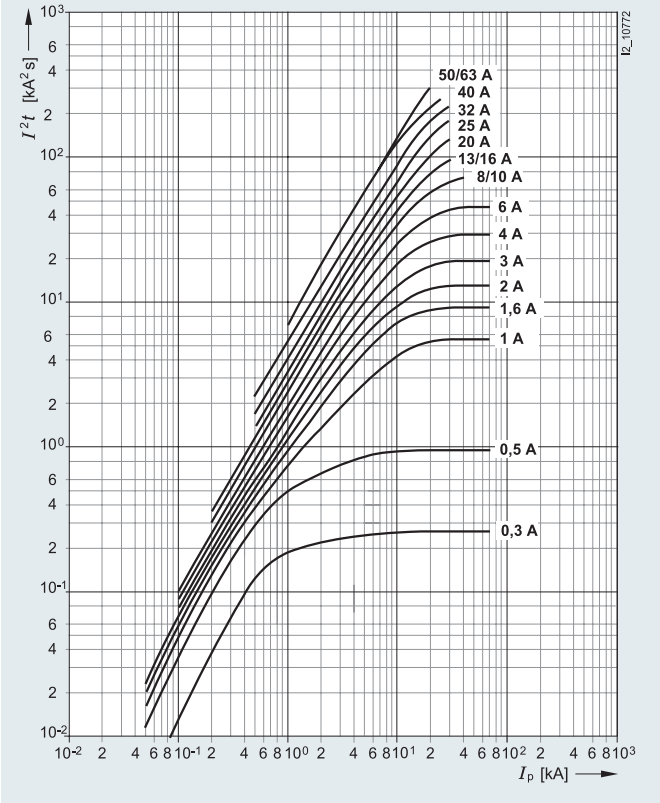
Characteristic curves 5SY8

Let-through I^2t values

Characteristic C



Characteristic D

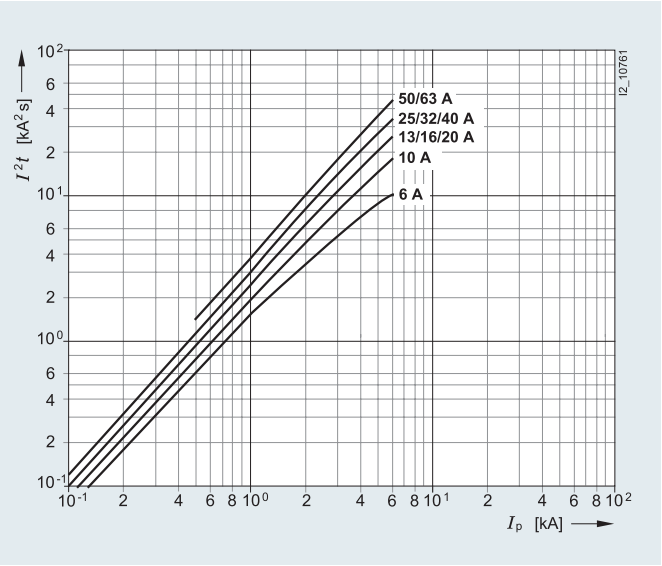


Correction factors for rated current in the case of bundling

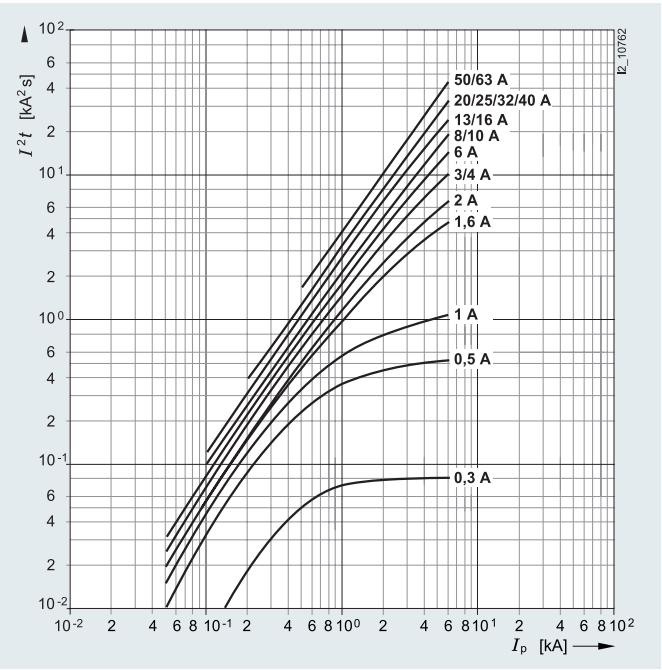
Characteristic curves 5SY6

Let-through I²t values

Characteristic B



Characteristic C

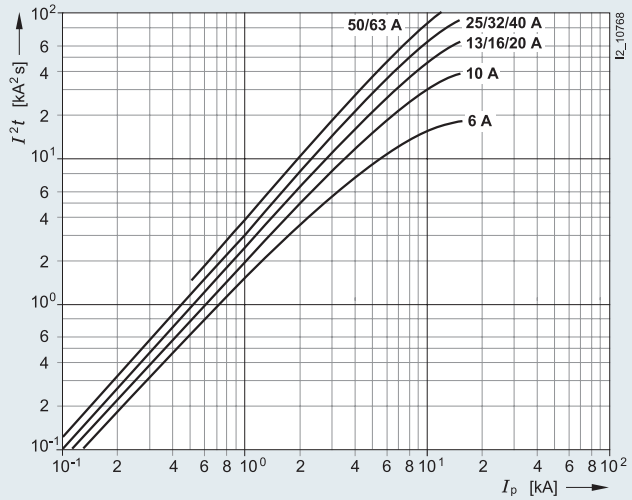


Correction factors for rated current in the case of bundling

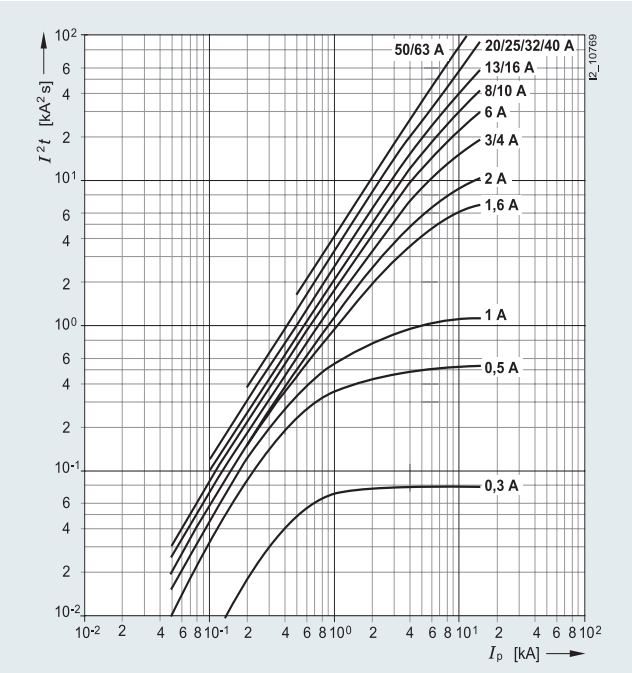
Characteristic curves 5SY7

Let-through I^2t values

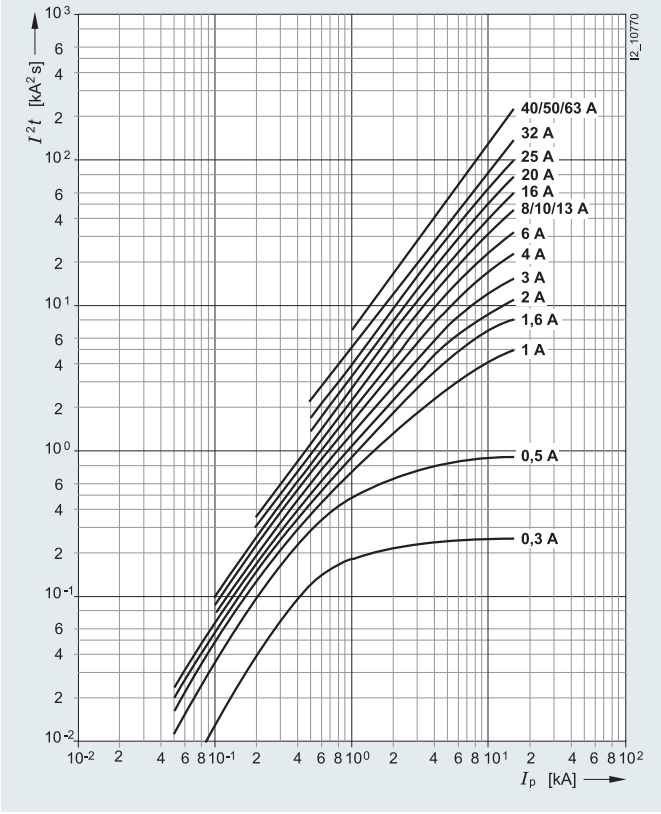
Characteristic B



Characteristic C



Characteristic D



Internal resistances and power loss (per pole with I_n)

	I_n (A)	Type A		Type B		Type C		Type D	
		R_1 mΩ	P_v W	R_1 mΩ	P_v W	R_1 mΩ	P_v W	R_1 mΩ	P_v W
5SY6, 5SY4, 5SY7, 5SY8, 5SY5	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
	5	—	—	—	—	86	2.1	—	—
	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
	15	—	—	—	—	6.3	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
	30	—	—	—	—	2.4	2.2	—	—
	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
	45	—	—	—	—	1.4	2.9	—	—
	50	1.7	4.3	1.5	3.8	1.4	3.5	1.4	3.5
	60	—	—	—	—	1.1	4.1	—	—
	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	—	—
5SP4, 5SP5	80	—	—	1.1	7.0	1.1	6.7	1.1	6.7
	100	—	—	0.8	8.0	0.88	8	0.8	8
	125	—	—	0.7	10.1	0.7	10.9	—	—

Correction factor for power loss

• Direct current and alternation current up to	60 Hz x 1.0
• Alternating current	200 Hz x 1.1 400 Hz x 1.15 1100 Hz x 1.3

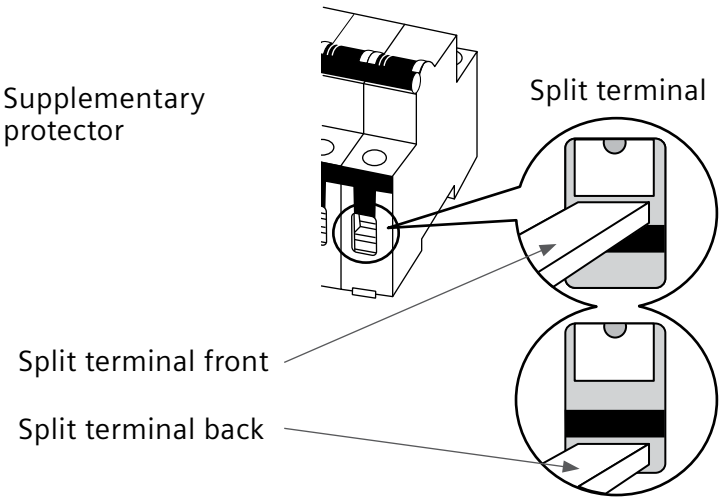
Internal resistance R_i and power loss P_v of the miniature circuit breaker compact range 1+N In 1 MW, 5SY6 0
(Data per pole with I_n)

Rated current I_n	**Characteristic B**				**Characteristic C**			
	Phase-pole		**N pole**		**Phase-pole**		**N pole**	
A	R_1 mΩ	P_v W	R_1 mΩ	P_v W	R_1 mΩ	P_v W	R_1 mΩ	P_v W
2	—	—	—	—	290	1161	3.8	15
4	—	—	—	—	110	1766	4.0	64
6	30	1092	4.2	150	26	931	4.3	154
8	—	—	—	—	19.8	1264	3.9	249
10	15	1539	4.1	407	13	1297	4.1	406
13	9.5	1508	4.1	692	9.1	1531	4.4	742
16	8.7	2219	4.0	1018	7.5	1926	3.3	852
20	5.2	2082	1.1	436	5.3	2118	1.2	478
25	3.3	2065	1.3	804	3.0	1906	1.1	674
32	2.6	2625	1.2	1192	2.7	2718	1.3	1310
40	2.3	3619	1.1	1789	2.2	3531	1.1	1820

Terminal range for multiple conductors

For non-UL, CSA and IEC applications, more than one conductor per terminal can be used. Utilizing Siemens split terminal design, the following maximum conductor sizes and terminal locations are provided in the following table.

Split terminal number and Location of conductors	Solid or stranded conductor Split terminal		Finely stranded conductor with end sleeve Split terminal	
	Front	Back	Front	Back
1 conductor, front	≤35 mm² 2 AWG	—	≤25 mm² 4 AWG	—
1 conductor, back	—	≤25 mm² 4 AWG	—	≤16 mm² 6 AWG
2 conductors, front	≤10 mm² 8 AWG	—	≤6 mm² 10 AWG	—
2 conductors, back	—	≤6 mm² 10 AWG	—	≤4 mm² 12 AWG
1 conductor, front 1 conductor, back	≤35 mm², 2 AWG ≤25 mm², 4 AWG ≤16 mm², 6 AWG	≤10 mm², 8 AWG ≤16 mm², 6 AWG ≤25 mm², 4 AWG	≤25 mm², 4 AWG ≤16 mm², 6 AWG	≤6 mm², 10 AWG ≤16 mm², 6 AWG
1 conductor, front 2 conductors, back	≤35 mm², 2 AWG	≤6 mm², 10 AWG	≤25 mm², 4 AWG ≤16 mm², 6 AWG	≤2.5 mm², 14 AWG ≤4 mm², 12 AWG
2 conductors, front 1 conductor, back	≤10 mm² 8 AWG	≤25 mm² 4 AWG	≤6 mm² 10 AWG	≤16 mm² 6 AWG
2 conductors, front 2 conductors, back	≤10 mm² 8 AWG	≤6 mm² 10 AWG	≤6 mm² 10 AWG	≤4mm² 12 AWG



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