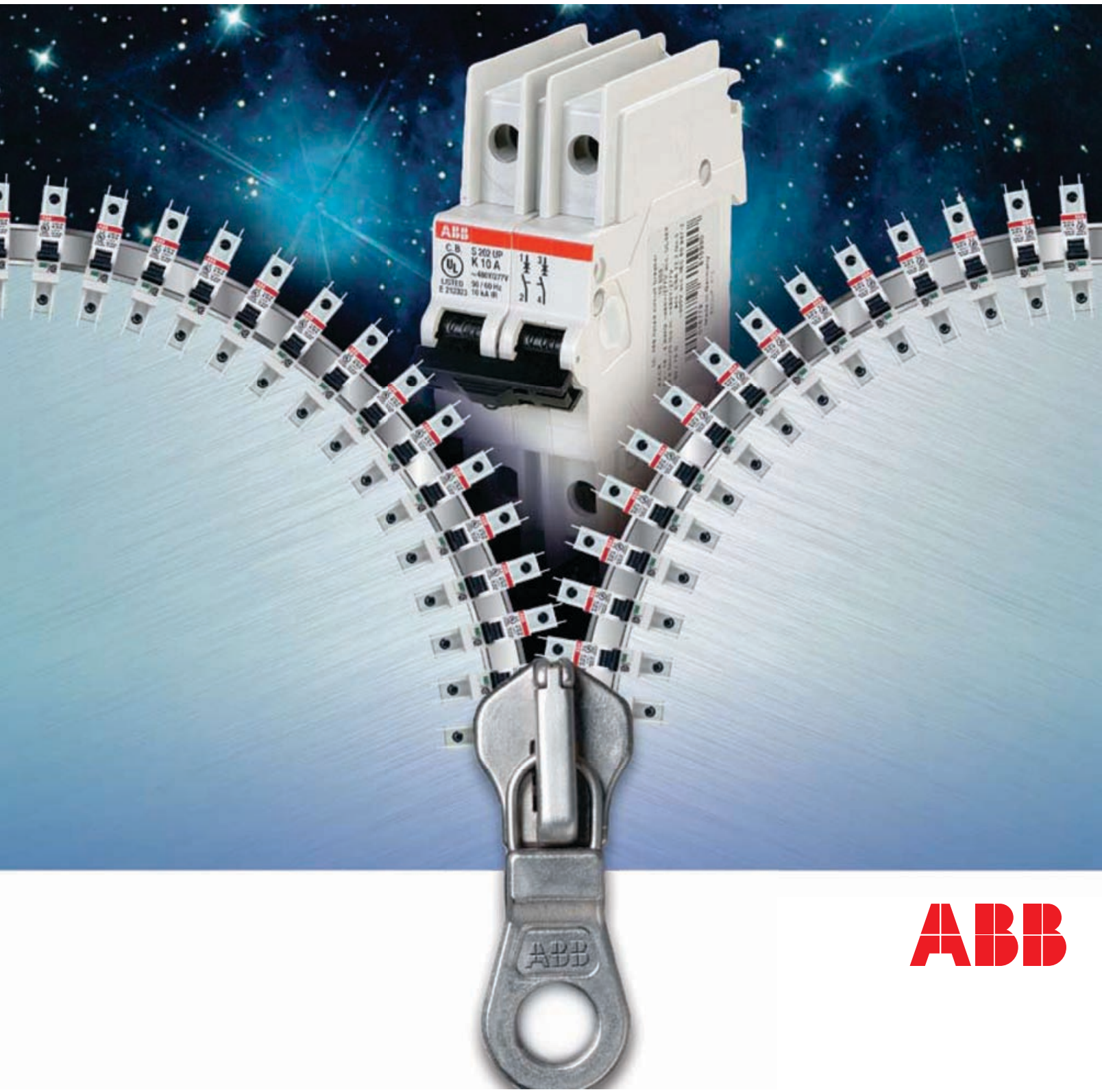
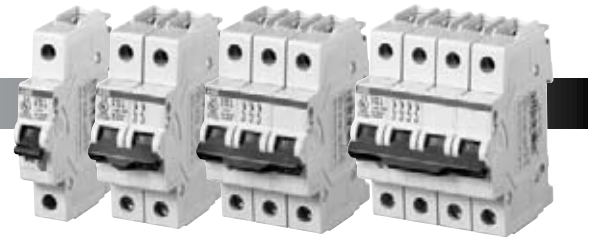
Miniature circuit breakers

Circuit protection guide



ABB

Miniature circuit breakers
Index



Miniature circuit breakers

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PS 1/12/16BP — S202U-K0.3

Alphanumeric

Alphanumeric

S202U-K0.5 — S204U-K2

S204U-K20 — S502UC-K45

Alphanumeric

S502UC-K5.8 — S804U-K90

S804U-Z10 — SZ-ESK2

Alphanumeric

S200 UL 489 Series
Miniature Circuit Breakers

S200
UL 489 Series

Description

The S200 Series miniature circuit breaker offers a compact solution for protection requirements. The S200 devices are UL tested current limiting and DIN rail mounted.
The S200 is available with application-specific trip characteristics to provide maximum circuit protection.
The breakers offer thermal-magnetic trip protection according to B, C, D, K and Z characteristics.

For the worldwide market, the breakers carry UL, CSA, IEC, CE and many other agency approvals and certifications.

Features

- Current limiting
- Fast breaking time (2.3 – 2.5 ms)
- Bus connection system
- Wide range of accessories
- Available with variable depth handle mechanism
- CE certified and marked
- DIN rail mounting
- Finger safe terminals
- Multi-function terminals
- Suitable for reverse feed
- UL 489 Listed - branch circuit protective device. UL File #E212323

	S200U	S200UP	S201DC
Amperage	0.2 – 63	0.2 – 25	1 – 25
Voltage	240 VAC	480Y/277VAC	60 VDC
Poles	1, 2, 3, 4	1, 2, 3, 4	1
Trip characteristics	K, Z	K, Z	K, Z
Interrupting ratings	10 kA: IEC 947-2 10 kA: UL 489 10 kA: CSA C22.2 No. 5	10 kA: IEC 947-2 10 kA: UL 489 10 kA: CSA C22.2 No. 5	10 kA: UL489 10 kA: CSA C22.2
Auxiliary contacts	Yes	Yes	Yes
Bell alarm	Yes	Yes	Yes
Shunt trip	Yes	Yes	Yes
Undervoltage release	No	No	No
Bus bar	Yes	Yes	Yes

S200U-K, 240 VAC
Branch circuit protection
UL 489, CSA C 22.2

K


S201U-K


S202U-K

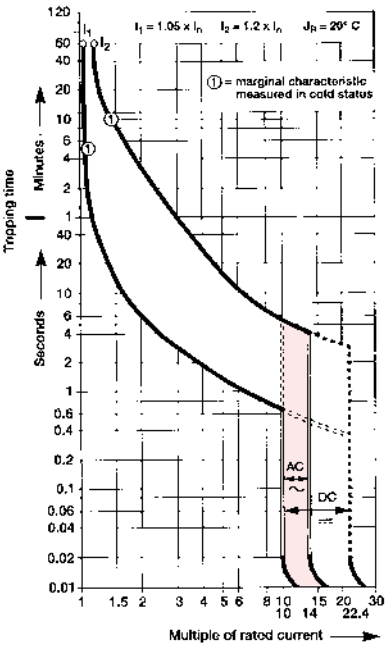

S203U-K


S204U-K

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	0.2	**S201U-K0.2**	3	0.2	**S203U-K0.2**
	0.3	**S201U-K0.3**		0.3	**S203U-K0.3**
	0.5	**S201U-K0.5**		0.5	**S203U-K0.5**
	0.75	**S201U-K0.75**		0.75	**S203U-K0.75**
	1	**S201U-K1**		1	**S203U-K1**
	1.6	**S201U-K1.6**		1.6	**S203U-K1.6**
	2	**S201U-K2**		2	**S203U-K2**
	3	**S201U-K3**		3	**S203U-K3**
	4	**S201U-K4**		4	**S203U-K4**
	5	**S201U-K5**		5	**S203U-K5**
	6	**S201U-K6**		6	**S203U-K6**
	8	**S201U-K8**		8	**S203U-K8**
	10	**S201U-K10**		10	**S203U-K10**
	15	**S201U-K15**		15	**S203U-K15**
	16	**S201U-K16**		16	**S203U-K16**
	20	**S201U-K20**		20	**S203U-K20**
	25	**S201U-K25**		25	**S203U-K25**
	30	**S201U-K30**		30	**S203U-K30**
	32	**S201U-K32**		32	**S203U-K32**
	40	**S201U-K40**		40	**S203U-K40**
	50	**S201U-K50**		50	**S203U-K50**
	60	**S201U-K60**		60	**S203U-K60**
	63	**S201U-K63**		63	**S203U-K63**
2	0.2	**S202U-K0.2**	4	0.2	**S204U-K0.2**
	0.3	**S202U-K0.3**		0.3	**S204U-K0.3**
	0.5	**S202U-K0.5**		0.5	**S204U-K0.5**
	0.75	**S202U-K0.75**		0.75	**S204U-K0.75**
	1	**S202U-K1**		1	**S204U-K1**
	1.6	**S202U-K1.6**		1.6	**S204U-K1.6**
	2	**S202U-K2**		2	**S204U-K2**
	3	**S202U-K3**		3	**S204U-K3**
	4	**S202U-K4**		4	**S204U-K4**
	5	**S202U-K5**		5	**S204U-K5**
	6	**S202U-K6**		6	**S204U-K6**
	8	**S202U-K8**		8	**S204U-K8**
	10	**S202U-K10**		10	**S204U-K10**
	15	**S202U-K15**		15	**S204U-K15**
	16	**S202U-K16**		16	**S204U-K16**
	20	**S202U-K20**		20	**S204U-K20**
	25	**S202U-K25**		25	**S204U-K25**
	30	**S202U-K30**		30	**S204U-K30**
	32	**S202U-K32**		32	**S204U-K32**
	40	**S202U-K40**		40	**S204U-K40**
	50	**S202U-K50**		50	**S204U-K50**
	60	**S202U-K60**		60	**S204U-K60**
	63	**S202U-K63**		63	**S204U-K63**

Tripping characteristic K
UL 489
240 VAC
10 kA

Inductive loads
- K Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers



Accessories & technical data
Accessories – See page 7
Technical data – See page 76 - 82

Note: This breaker for AC use only

S200U-Z, 240 VAC
Branch circuit protection
UL 489, CSA C 22.2

Z


S201U-Z


S202U-Z

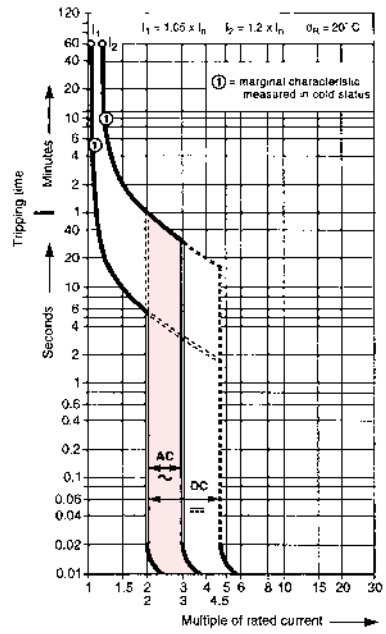

S203U-Z


S204U-Z

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	0.5	**S201U-Z0.5**	3	0.5	**S203U-Z0.5**
	1	**S201U-Z1**		1	**S203U-Z1**
	1.6	**S201U-Z1.6**		1.6	**S203U-Z1.6**
	2	**S201U-Z2**		2	**S203U-Z2**
	3	**S201U-Z3**		3	**S203U-Z3**
	4	**S201U-Z4**		4	**S203U-Z4**
	5	**S201U-Z5**		5	**S203U-Z5**
	6	**S201U-Z6**		6	**S203U-Z6**
	8	**S201U-Z8**		8	**S203U-Z8**
	10	**S201U-Z10**		10	**S203U-Z10**
	15	**S201U-Z15**		15	**S203U-Z15**
	16	**S201U-Z16**		16	**S203U-Z16**
	20	**S201U-Z20**		20	**S203U-Z20**
	25	**S201U-Z25**		25	**S203U-Z25**
	30	**S201U-Z30**		30	**S203U-Z30**
	32	**S201U-Z32**		32	**S203U-Z32**
	40	**S201U-Z40**		40	**S203U-Z40**
	50	**S201U-Z50**		50	**S203U-Z50**
	60	**S201U-Z60**		60	**S203U-Z60**
	63	**S201U-Z63**		63	**S203U-Z63**
2	0.5	**S202U-Z0.5**	4	0.5	**S204U-Z0.5**
	1	**S202U-Z1**		1	**S204U-Z1**
	1.6	**S202U-Z1.6**		1.6	**S204U-Z1.6**
	2	**S202U-Z2**		2	**S204U-Z2**
	3	**S202U-Z3**		3	**S204U-Z3**
	4	**S202U-Z4**		4	**S204U-Z4**
	5	**S202U-Z5**		5	**S204U-Z5**
	6	**S202U-Z6**		6	**S204U-Z6**
	8	**S202U-Z8**		8	**S204U-Z8**
	10	**S202U-Z10**		10	**S204U-Z10**
	15	**S202U-Z15**		15	**S204U-Z15**
	16	**S202U-Z16**		16	**S204U-Z16**
	20	**S202U-Z20**		20	**S204U-Z20**
	25	**S202U-Z25**		25	**S204U-Z25**
	30	**S202U-Z30**		30	**S204U-Z30**
	32	**S202U-Z32**		32	**S204U-Z32**
	40	**S202U-Z40**		40	**S204U-Z40**
	50	**S202U-Z50**		50	**S204U-Z50**
	60	**S202U-Z60**		60	**S204U-Z60**
	63	**S202U-Z63**		63	**S204U-Z63**

Tripping characteristic Z
UL 489
240 VAC
10 kA

Resistive loads
- Z Curve
- Designed to provide maximum protection with a very low short circuit trip setting
- Example: semiconductors
- Control circuits



Accessories & technical data
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Note: This breaker for AC use only

S200UP-K, 480Y/277 VAC
Branch circuit protection
UL 489, CSA C 22.2

K

S201UP-K

S202UP-K

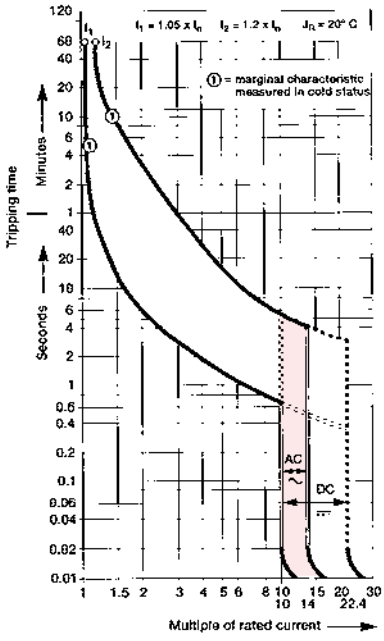
S203UP-K

S204UP-K

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	0.2	**S201UP-K0.2**	3	0.2	**S203UP-K0.2**
	0.3	**S201UP-K0.3**		0.3	**S203UP-K0.3**
	0.5	**S201UP-K0.5**		0.5	**S203UP-K0.5**
	0.75	**S201UP-K0.75**		0.75	**S203UP-K0.75**
	1	**S201UP-K1**		1	**S203UP-K1**
	1.6	**S201UP-K1.6**		1.6	**S203UP-K1.6**
	2	**S201UP-K2**		2	**S203UP-K2**
	3	**S201UP-K3**		3	**S203UP-K3**
	4	**S201UP-K4**		4	**S203UP-K4**
	5	**S201UP-K5**		5	**S203UP-K5**
	6	**S201UP-K6**		6	**S203UP-K6**
	8	**S201UP-K8**		8	**S203UP-K8**
	10	**S201UP-K10**		10	**S203UP-K10**
	15	**S201UP-K15**		15	**S203UP-K15**
	16	**S201UP-K16**		16	**S203UP-K16**
	20	**S201UP-K20**		20	**S203UP-K20**
	25	**S201UP-K25**		25	**S203UP-K25**
2	0.2	**S202UP-K0.2**	4	0.2	**S204UP-K0.2**
	0.3	**S202UP-K0.3**		0.3	**S204UP-K0.3**
	0.5	**S202UP-K0.5**		0.5	**S204UP-K0.5**
	0.75	**S202UP-K0.75**		0.75	**S204UP-K0.75**
	1	**S202UP-K1**		1	**S204UP-K1**
	1.6	**S202UP-K1.6**		1.6	**S204UP-K1.6**
	2	**S202UP-K2**		2	**S204UP-K2**
	3	**S202UP-K3**		3	**S204UP-K3**
	4	**S202UP-K4**		4	**S204UP-K4**
	5	**S202UP-K5**		5	**S204UP-K5**
	6	**S202UP-K6**		6	**S204UP-K6**
	8	**S202UP-K8**		8	**S204UP-K8**
	10	**S202UP-K10**		10	**S204UP-K10**
	15	**S202UP-K15**		15	**S204UP-K15**
	16	**S202UP-K16**		16	**S204UP-K16**
	20	**S202UP-K20**		20	**S204UP-K20**
	25	**S202UP-K25**		25	**S204UP-K25**

Tripping characteristic K
UL 489
480Y/277 VAC
10 kA

Inductive loads
- K Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers



Accessories & technical data
Accessories – See page 7
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Note: This breaker for AC use only

S200UP-Z, 277/480Y/277 VAC
Branch circuit protection
UL 489, CSA C 22.2

Z

S201UP-Z

S202UP-Z

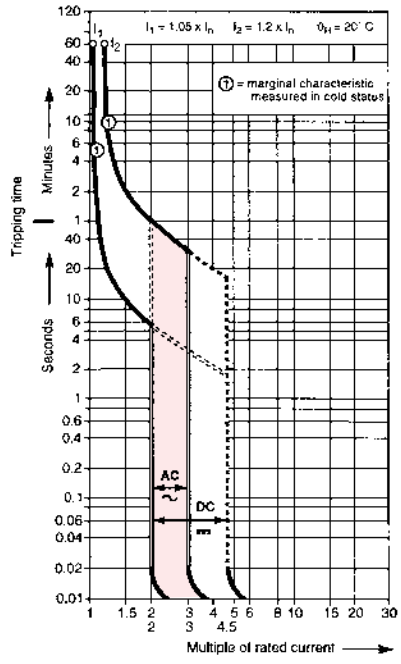
S203UP-Z

S204UP-Z

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	0.5	**S201UP-Z0.5**	3	0.5	**S203UP-Z0.5**
	1	**S201UP-Z1**		1	**S203UP-Z1**
	1.6	**S201UP-Z1.6**		1.6	**S203UP-Z1.6**
	2	**S201UP-Z2**		2	**S203UP-Z2**
	3	**S201UP-Z3**		3	**S203UP-Z3**
	4	**S201UP-Z4**		4	**S203UP-Z4**
	5	**S201UP-Z5**		5	**S203UP-Z5**
	6	**S201UP-Z6**		6	**S203UP-Z6**
	8	**S201UP-Z8**		8	**S203UP-Z8**
	10	**S201UP-Z10**		10	**S203UP-Z10**
	15	**S201UP-Z15**		15	**S203UP-Z15**
	16	**S201UP-Z16**		16	**S203UP-Z16**
	20	**S201UP-Z20**		20	**S203UP-Z20**
	25	**S201UP-Z25**		25	**S203UP-Z25**
2	0.5	**S202UP-Z0.5**	4	0.5	**S204UP-Z0.5**
	1	**S202UP-Z1**		1	**S204UP-Z1**
	1.6	**S202UP-Z1.6**		1.6	**S204UP-Z1.6**
	2	**S202UP-Z2**		2	**S204UP-Z2**
	3	**S202UP-Z3**		3	**S204UP-Z3**
	4	**S202UP-Z4**		4	**S204UP-Z4**
	5	**S202UP-Z5**		5	**S204UP-Z5**
	6	**S202UP-Z6**		6	**S204UP-Z6**
	8	**S202UP-Z8**		8	**S204UP-Z8**
	10	**S202UP-Z10**		10	**S204UP-Z10**
	15	**S202UP-Z15**		15	**S204UP-Z15**
	16	**S202UP-Z16**		16	**S204UP-Z16**
	20	**S202UP-Z20**		20	**S204UP-Z20**
	25	**S202UP-Z25**		25	**S204UP-Z25**

Tripping characteristic Z
UL 489
480Y/277 VAC
10 kA

Resistive loads
- Z Curve
- Designed to provide maximum protection with a very low short circuit trip setting
- Example: semiconductors
- Control circuits



Accessories & technical data
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Note: This breaker for AC use only

S201DC, 60 VDC
Branch circuit protection
UL 489, CSA C 22.2

K, Z

S201DC-K

S201DC-Z

No. of poles	Rated current	Catalog number
1	1	**S201DC-K1**
	1.6	**S201DC-K1.6**
	2	**S201DC-K2**
	3	**S201DC-K3**
	4	**S201DC-K4**
	6	**S201DC-K6**
	8	**S201DC-K8**
	10	**S201DC-K10**
	13	**S201DC-K13**
	16	**S201DC-K16**
	20	**S201DC-K20**
	25	**S201DC-K25**
1	1	**S201DC-Z1**
	1.6	**S201DC-Z1.6**
	2	**S201DC-Z2**
	3	**S201DC-Z3**
	4	**S201DC-Z4**
	6	**S201DC-Z6**
	8	**S201DC-Z8**
	10	**S201DC-Z10**
	16	**S201DC-Z16**
	20	**S201DC-Z20**
	25	**S201DC-Z25**

Tripping characteristic K
UL 489
60 VDC
10 kA

Inductive loads
- K Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers

Accessories & technical data
Accessories – See page 7
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Tripping characteristic Z
UL 489
60 VDC
10 kA

Resistive loads
- Z Curve
- Designed to provide maximum protection with a very low short circuit trip setting

Accessories & technical data
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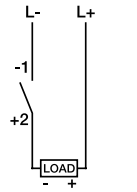
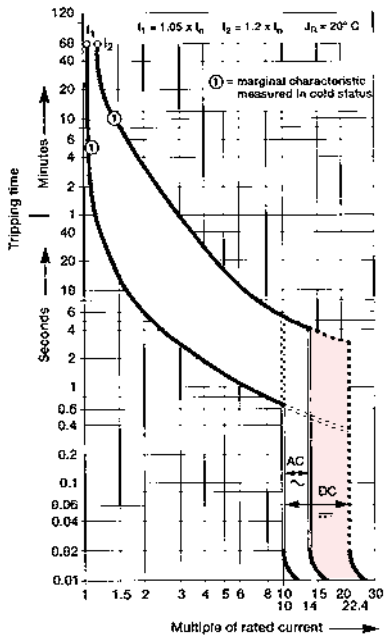
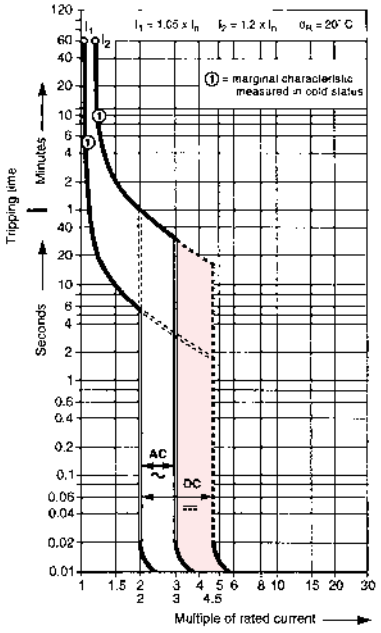
60 VDC

Single Pole
S201DC







Note: This breaker for DC use only.

Accessories
S200U, S200UP & S201DC
UL 489, CSA C 22.2

S2C-H6RU

S2C-S6RU

S2C-A1U

S2C-DH

Auxiliary contacts
The auxiliary contacts will signal whether the breaker is in the ON or OFF position.

Description	Catalog number
For field mounting: right side	**S2C-H6RU**

Bell alarm
The bell alarm includes a set of contacts that will only signal when the breaker has tripped. Typically the contacts would be connected to an alarm or bell to signal the operator that an overcurrent trip has occurred. The bell alarm also includes a test button for testing the alarm contacts without opening the breaker.

Description	Catalog number
For field mounting: right side	**S2C-S6RU**

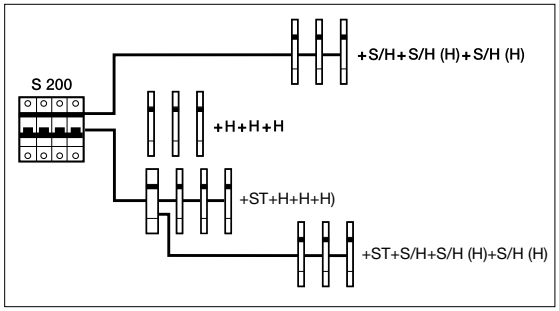
Rotary operating mechanism
Allows “through the door” operation.

Description	Catalog number
Handle mechanism	**S2C-DH**

Shunt trip
For remote tripping of breaker, a shunt trip device can be added to the MCB. The solenoid device opens the breaker after control voltage is applied.

Description	Catalog number
For field mounting: right side 12…60 VAC/DC	**S2C-A1U**
For field mounting: right side 110…415 VAC 110…250 VDC	**S2C-A2U**

Possible mounting arrangements of MCB accessories



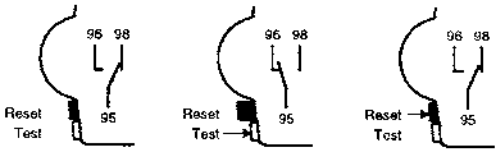
Legend	
Auxiliary contact	**H**
Bell alarm/Auxiliary contact	**S/H**
Bell alarm/Auxiliary contact used as auxiliary contact	**S/H (H)**
Shunt trip	**ST**

Accessories
S200U, S200UP & S201DC
UL 489, CSA C 22.2

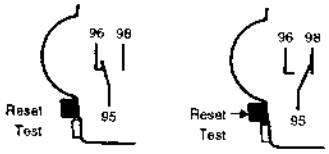
Connection drawings

Bell alarm S2C-S6RU

In ON and OFF position after hand operation

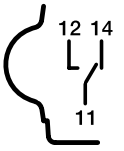


In OFF position after tripping

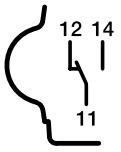


Auxiliary contact S2C-H6RU

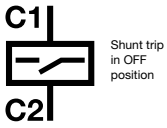
Auxiliary contact in ON position



Auxiliary contact in OFF position



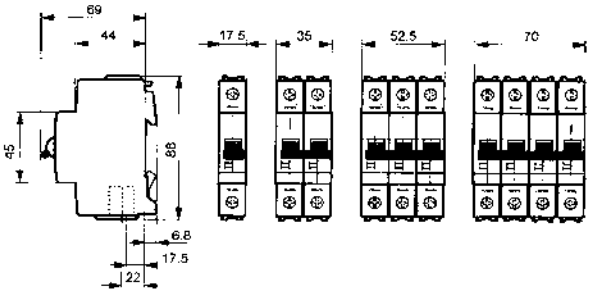
Shunt trip S2C-A...U



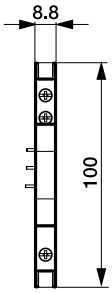
S2C-A1U
S2C-A2U

Approximate dimensions in mm

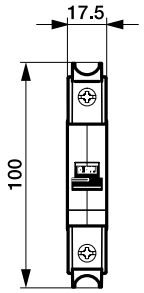
S200U



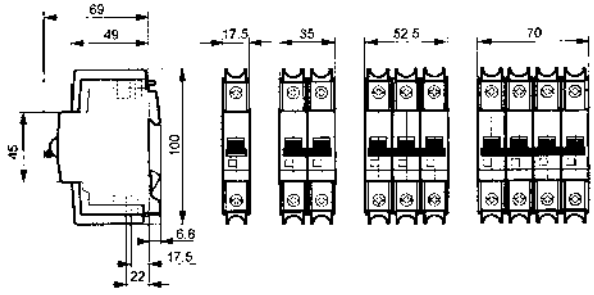
S2C-H6RU, S2C-S6RU



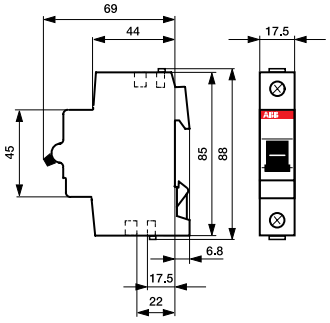
S2C-A..U



S200UP

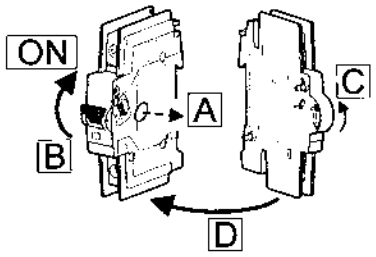


S201DC

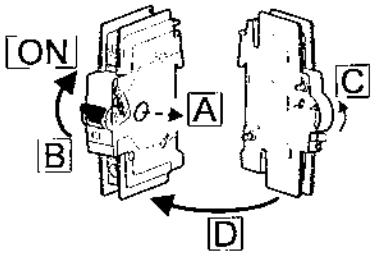


Mounting

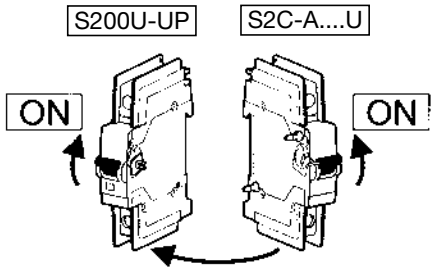
Addition of a S2C-H6RU auxiliary contact



Addition of a S2C-S6RU bell alarm contact

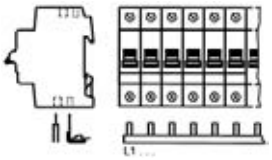


Addition of a S2C-A..U shunt trip

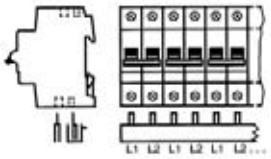


Accessories
S200U, S200UP & S201DC
UL 489, CSA C 22.2

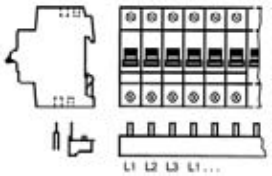
1 Phase



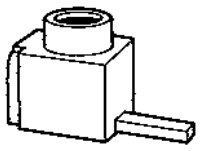
2 Phase



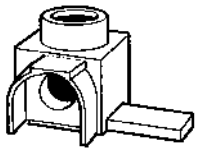
3 Phase



SZ-BSK



SZ-AST55U



SZ-AST50UP

UL approved busbars UL file # E250145

UL 489 busbar cannot be cut.

For use on:	Amp rating	Number of poles	Phases	Busbar length (mm)	Catalog number
S200U	80	6	1	103.2	**PS 1/6/16BP**
S200UP		12	1	208.8	**PS 1/12/16BP**
S201DC		18	1	314.4	**PS 1/18/16BP**
S200U	80	6	2	103.2	**PS 2/6/16BP**
S200UP		12	2	208.8	**PS 2/12/16BP**
S201DC		18	2	314.4	**PS 2/18/16BP**
S200U	80	6	3	103.2	**PS 3/6/16BP**
S200UP		12	3	208.8	**PS 3/12/16BP**
S201DC		18	3	314.4	**PS 3/18/16BP**

Busbar tooth covers

Description	Catalog number
Covers five unused poles of Busbar	**SZ-BSK**

Feeder terminals

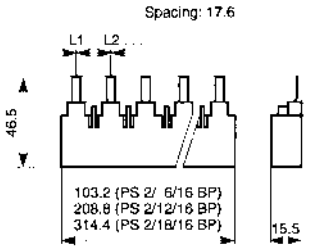
for S200U

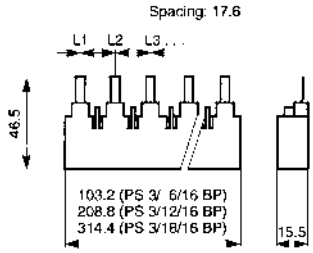
Max wire AWG	Description	Catalog number
1/0	angled feeding	**SZ-AST 50U**
1/0	straight feeding	**SZ-AST 55U**

for S200UP

Max wire AWG	Description	Catalog number
1/0	angled feeding	**SZ-AST 50UP**
1/0	straight feeding	**SZ-AST 55UP**

Dimension drawings in mm





BUSBARS MAY BE USED ON BOTH SIDES OF MCBS

Technical data
S200U, S200UP & S201DC
UL 489, CSA C 22.2

Miniature circuit breakers

Technical data	S200U	S200UP	S201DC
Specifications:	UL 489, CSA C 22.2 No. 5, IEC 60 947-2		UL 489, CSA C 22.2, VDE 0660
UL File-Number:	E 2123233, UL, Current limiting series ratings		
No. of poles:	1, 2, 3 & 4		1
Tripping characteristics:	K & Z		K, Z
Rated current:	0.2 (K) 0.5 (Z) ... 63 A	0.2 (K) 0.5 (Z) ... 25 A	1 - 25 A
Rated voltage:	1-pole: 240VAC Multi pole: 240VAC	1-pole: 277VAC Multi pole: 480Y/277VAC	
Short circuit capacity:	10 kA		10 kA
Frequency:	50/60 Hz		50/60 Hz
Degree of protection:	IP 20		IP 20
Mounting position:	Vertical and horizontal		Vertical and horizontal
Fixing:	35 mm DIN rail		35 mm DIN rail
Clamps only for Cu:	18 … 4 AWG (0.75 … 25 mm^2)		18 … 4 AWG (0.75 … 25 mm^2)
Service life, mech. and at rated load:	20,000 operations		10,000 operations
Tightening torque:	25 in. lbs (2.8 Nm)		4.5 in. lbs
Ambient temperature:	– 25 … + 55 °C/– 13 °F … + 131 °F		– 40 … + 70 °C/– 40 °F … + 158 °F
Shock resistance:	10 g at least 2 impacts shock duration 13 ms		10 g at least 2 impacts shock duration 13 ms

Auxiliary contact S2C-H6RL and S2C-S6RU

Rated current:	10
Rated voltage AC / DC:	24
Contact:	1 pole single throw
Connection capacity mm^2	18 – 14 AWG (0.75…2.5 mm2)
Tightening torque:	11 in.lbs (1.2 Nm)
Shock resistance acc. to DIN IEC 68-2-6:	5 g, 20 frequency cycles 5...150...5 Hz at 24 VAC/DC, 5 mA auto-reclosing < 10 ms
Mechanical service life:	10,000 operations

Shunt trip		Type	S2C-A1U	S2C-A2U
Rated voltage	AC DC	V V	12 ... 60 12 ... 60	110 ... 415 110 ... 250
Max. release duration		ms	<10	<10
Min. release voltage	AC DC	V V	7 10	55 80
Consumption on release	AC DC	VA VA	40 ... 200 40 ... 200	55 ... 210 55 ... 110
Coil resistance		Ω	3.7	225
Terminals		AWG/mm^2	18…6 / 0.75 – 16	18…6 / 0.75 – 16
Tightening torque		in.lbs/Nm	18 / 2	18 / 2

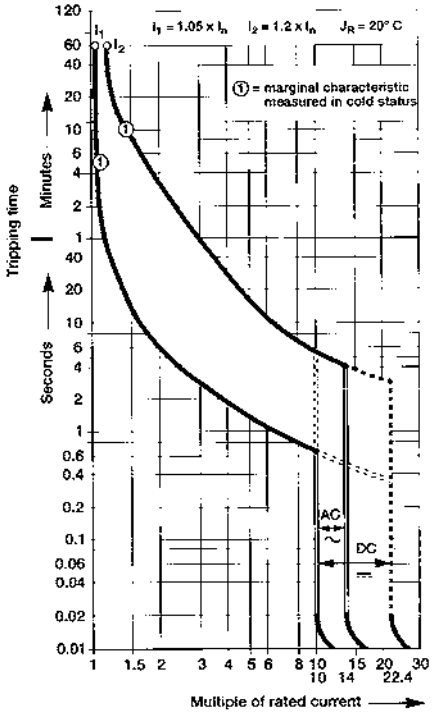
Technical data
S200U, S200UP & S201DC
UL 489, CSA C 22.2

Internal resistance and power loss
Internal resistance per pole in mΩ, power loss per pole in W.

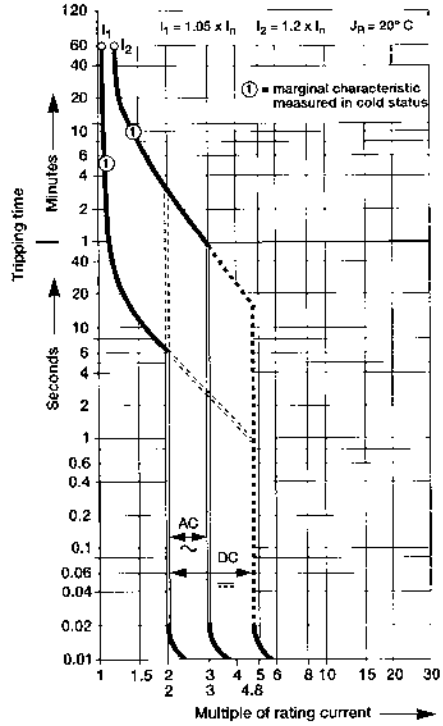
Type	Rated current	Device series K		Device series Z	
	A	mΩ	W	mΩ	W
S200U S200UP S201DC	0.2	42500	1.7	–	–
	0.3	20000	1.8	–	–
	0.5	6340	1.6	10100	2.5
	0.75	2500	1.4	–	–
	1	1400	1.4	2270	2.3
	1.6	625	1.6	1100	2.8
	2	460	1.8	619	2.5
	3	211	1.9	211	1.9
	4	163	2.6	163	2.6
	6	67	2.4	104	3.7
	8	45	2.9	55	3.5
	10	19	1.9	21	2.1
	13	–	–	–	–
	16	8.2	2.1	10.9	2.8
	20	7.3	2.9	7.3	2.9
	25	5.6	3.5	5.6	3.5
	32	4.1	4.2	4.1	4.2
	40	4.0	6.4	4.0	6.4
	50	1.2	3.0	1.8	4.4
	63	1.3	5.2	1.3	5.2

Technical data
S200U & S200UP
UL 489, CSA C 22.2

Tripping characteristic K (68 °F)
Breaker calibration temperature 68°F
See chart below for temperature DeRating



Tripping characteristic Z (68 °F)
Breaker calibration temperature 68°F
See chart below for temperature DeRating



Temperature derating
Max. operating current values depending on the ambient temperature for a circuit-breaker of characteristics type K and Z

K and Z	Ambient temperature T (°C/°F)											
I_n (A)	– 40/– 40	– 30/– 22	– 20/– 4	– 10/14	0/32	10/50	20/68	30/86	40/104	50/122	60/140	70/158
0.5	0.66	0.64	0.61	0.59	0.56	0.53	0.50	0.47	0.43	0.40	0.35	0.31
1.0	1.32	1.27	1.22	1.17	1.12	1.06	1.00	0.94	0.87	0.79	0.71	0.61
1.6	2.12	2.04	1.96	1.88	1.79	1.70	1.60	1.50	1.39	1.26	1.13	0.98
2.0	2.65	2.55	2.45	2.35	2.24	2.12	2.00	1.87	1.73	1.58	1.41	1.22
3.0	4.0	3.8	3.7	3.5	3.4	3.2	3.0	2.8	2.6	2.4	2.1	1.8
4.0	5.3	5.1	4.9	4.7	4.5	4.2	4.0	3.7	3.5	3.2	2.8	2.4
6.0	7.9	7.6	7.3	7.0	6.7	6.4	6.0	5.6	5.2	4.7	4.2	3.7
8.0	10.8	10.2	9.8	9.4	8.9	8.5	8.0	7.5	6.9	6.3	5.7	4.9
10.0	13.2	12.7	12.2	11.7	11.2	10.6	10.0	9.4	8.7	7.9	7.1	6.1
13.0	17.2	16.6	15.9	15.2	14.5	13.8	13.0	12.2	11.3	10.3	9.2	8.0
16.0	21.2	20.4	19.6	18.8	17.9	17.0	16.0	15.0	13.9	12.6	11.3	9.8
20.0	26.5	25.5	24.5	23.5	22.4	21.2	20.0	18.7	17.3	15.8	14.1	12.2
25.0	33.1	31.9	30.6	29.3	28.0	26.5	25.0	23.4	21.7	19.8	17.7	15.3
32.0	42.3	40.8	39.2	37.5	35.8	33.9	32.0	29.9	27.7	25.3	22.6	19.6
40.0	52.9	51.0	49.0	46.9	44.7	42.4	40.0	37.4	34.6	31.6	28.3	24.5
50.0	66.1	63.7	61.2	58.6	55.9	53.0	50.0	46.8	43.3	39.5	35.4	30.6
63.0	83.3	80.3	77.2	73.9	70.4	66.8	63.0	58.9	54.6	49.8	44.5	38.6

Notes

S200 Series Miniature Circuit Breakers

S200
UL 1077 Series

Description

The S200 Series miniature circuit breaker offers a compact solution for protection requirements. The S200 devices are UL tested current limiting and DIN rail mounted.
The S200 is available with application-specific trip characteristics to provide maximum circuit protection.
The breakers offer thermal-magnetic trip protection according to B, C, D, K and Z characteristics.

For the worldwide market, the breakers carry UL, CSA, IEC, CE and many other agency approvals and certifications.

Features

- Current limiting
- Fast breaking time (2.3 – 2.5 ms)
- Bus connection system
- Wide range of accessories
- Available with variable depth handle mechanism
- CE certified and marked
- DIN rail mounting
- Finger safe terminals
- Multi-function terminals
- Suitable for reverse feed
- UL1077 Listed-supplemental protective device. UL file # E76126

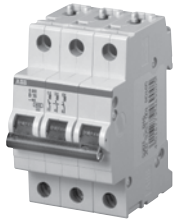
	S200	S200P	S280UC	S290
Amperage	0.5 – 63 A	0.2 – 63 A	0.2 – 63 A	80 - 125 A
Voltage	480Y/277 VAC	480Y/277 VAC	500 VDC	480Y/277 VAC
Poles	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3	1, 2, 3, 4
Trip characteristics	B, C, D, K	K, Z	K, Z	C
Interrupting ratings	6 kA: IEC 60898 6 kA: UL 1077 6 kA: CSA C22.2 #235	10kA: IEC 947-2 10kA: UL 1077	10kA: IEC 947 10kA: UL 1077	6 kA: IEC 898 6 kA: UL 1077
Auxiliary contacts	Yes	Yes	Yes	Yes
Bell alarm	Yes	Yes	Yes	Yes
Shunt trip	Yes	Yes	Yes	Yes
Undervoltage release	Yes	Yes	Yes	No
Bus bar	Yes	Yes	Yes	No

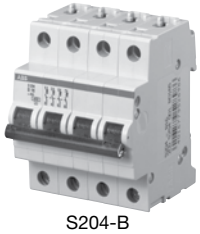
S200-B, 480Y/277 VAC
Supplemental protectors
UL 1077, CSA 22.2

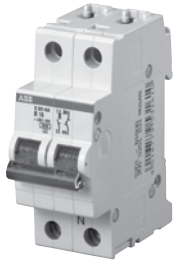
B


S201-B


S202-B


S203-B


S204-B

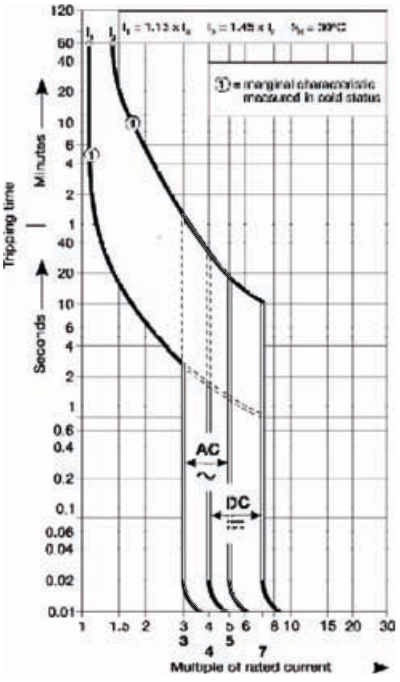

S201-BNA


S203-BNA

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	6	**S201-B6**	3	6	**S203-B6**
	10	**S201-B10**		10	**S203-B10**
	13	**S201-B13**		13	**S203-B13**
	16	**S201-B16**		16	**S203-B16**
	20	**S201-B20**		20	**S203-B20**
	25	**S201-B25**		25	**S203-B25**
	32	**S201-B32**		32	**S203-B32**
	40	**S201-B40**		40	**S203-B40**
	50	**S201-B50**		50	**S203-B50**
	63	**S201-B63**		63	**S203-B63**
1 + NA	6	**S201-B6NA**	3 + NA	6	**S203-B6NA**
	10	**S201-B10NA**		10	**S203-B10NA**
	13	**S201-B13NA**		13	**S203-B13NA**
	16	**S201-B16NA**		16	**S203-B16NA**
	20	**S201-B20NA**		20	**S203-B20NA**
	25	**S201-B25NA**		25	**S203-B25NA**
	32	**S201-B32NA**		32	**S203-B32NA**
	40	**S201-B40NA**		40	**S203-B40NA**
	50	**S201-B50NA**		50	**S203-B50NA**
	63	**S201-B63NA**		63	**S203-B63NA**
2	6	**S202-B6**	4	6	**S204-B6**
	10	**S202-B10**		10	**S204-B10**
	13	**S202-B13**		13	**S204-B13**
	16	**S202-B16**		16	**S204-B16**
	20	**S202-B20**		20	**S204-B20**
	25	**S202-B25**		25	**S204-B25**
	32	**S202-B32**		32	**S204-B32**
	40	**S202-B40**		40	**S204-B40**
	50	**S202-B50**		50	**S204-B50**
	63	**S202-B63**		63	**S204-B63**

Tripping characteristic B
UL 1077
480Y/277VAC
6 kA

Resistive loads
- B Curve
- Designed for use in cable protection applications
- Example: control circuits, lighting



Accessories & technical data
Accessories – See page 26
Technical data – See page 76 - 82

Note: This breaker for AC use only. Switching neutral is noted by “NA” in the catalog number.

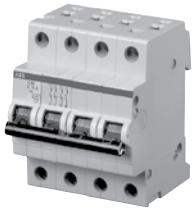
S200-C, 480Y/277 VAC
Supplemental protectors
UL 1077, CSA 22.2

C

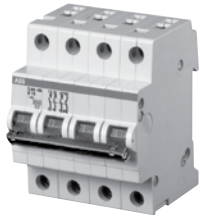

S201-C


S202-C


S203-C


S204-C

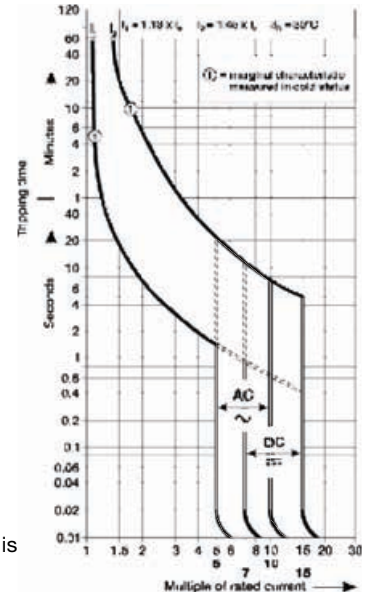

S201-CNA


S203-CNA

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	0.5	**S201-C0.5**	3	0.5	**S203-C0.5**
	1	**S201-C1**		1	**S203-C1**
	1.6	**S201-C1.6**		1.6	**S203-C1.6**
	2	**S201-C2**		2	**S203-C2**
	3	**S201-C3**		3	**S203-C3**
	4	**S201-C4**		4	**S203-C4**
	6	**S201-C6**		6	**S203-C6**
	8	**S201-C8**		8	**S203-C8**
	10	**S201-C10**		10	**S203-C10**
	13	**S201-C13**		13	**S203-C13**
	16	**S201-C16**		16	**S203-C16**
	20	**S201-C20**		20	**S203-C20**
	25	**S201-C25**		25	**S203-C25**
	32	**S201-C32**		32	**S203-C32**
	40	**S201-C40**		40	**S203-C40**
	50	**S201-C50**		50	**S203-C50**
	63	**S201-C63**		63	**S203-C63**
1 + NA	0.5	**S201-C0.5NA**	3 + NA	0.5	**S203-C0.5NA**
	1	**S201-C1NA**		1	**S203-C1NA**
	1.6	**S201-C1.6NA**		1.6	**S203-C1.6NA**
	2	**S201-C2NA**		2	**S203-C2NA**
	3	**S201-C3NA**		3	**S203-C3NA**
	4	**S201-C4NA**		4	**S203-C4NA**
	6	**S201-C6NA**		6	**S203-C6NA**
	8	**S201-C8NA**		8	**S203-C8NA**
	10	**S201-C10NA**		10	**S203-C10NA**
	13	**S201-C13NA**		13	**S203-C13NA**
	16	**S201-C16NA**		16	**S203-C16NA**
	20	**S201-C20NA**		20	**S203-C20NA**
	25	**S201-C25NA**		25	**S203-C25NA**
	32	**S201-C32NA**		32	**S203-C32NA**
	40	**S201-C40NA**		40	**S203-C40NA**
	50	**S201-C50NA**		50	**S203-C50NA**
	63	**S201-C63NA**		63	**S203-C63NA**
2	0.5	**S202-C0.5**	4	0.5	**S204-C0.5**
	1	**S202-C1**		1	**S204-C1**
	1.6	**S202-C1.6**		1.6	**S204-C1.6**
	2	**S202-C2**		2	**S204-C2**
	3	**S202-C3**		3	**S204-C3**
	4	**S202-C4**		4	**S204-C4**
	6	**S202-C6**		6	**S204-C6**
	8	**S202-C8**		8	**S204-C8**
	10	**S202-C10**		10	**S204-C10**
	13	**S202-C13**		13	**S204-C13**
	16	**S202-C16**		16	**S204-C16**
	20	**S202-C20**		20	**S204-C20**
	25	**S202-C25**		25	**S204-C25**
	32	**S202-C32**		32	**S204-C32**
	40	**S202-C40**		40	**S204-C40**
	50	**S202-C50**		50	**S204-C50**
	63	**S202-C63**		63	**S204-C63**

Tripping characteristic C
UL 1077
480Y/277 VAC
6 kA

Resistive loads
- C Curve
- Designed for use with medium magnetic start up currents
- Example: lighting, control panels



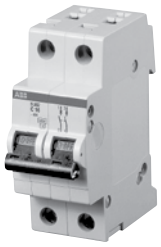
Accessories & technical data
Accessories – See page 26
Technical data – See page 76 - 82

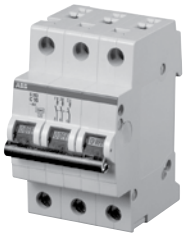
Note: This breaker for AC use only. Switching neutral is noted by “NA” in the catalog number.

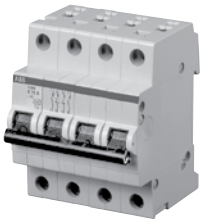
S200-D, 480Y/277 VAC
Supplemental protectors
UL 1077, CSA 22.2

D

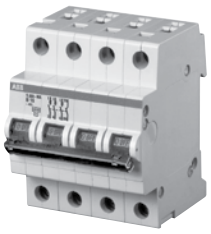

S201-D


S202-D


S203-D


S204-D

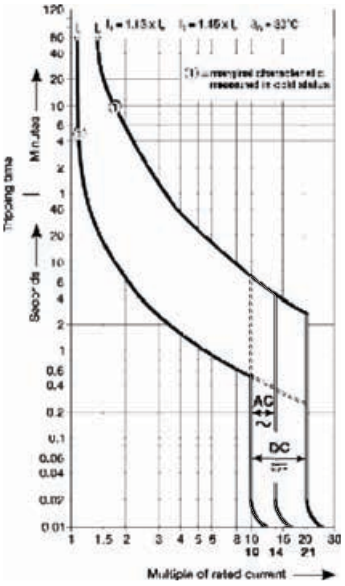

S201-DNA


S203-DNA

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	0.5	**S201-D0.5**	3	0.5	**S203-D0.5**
	1	**S201-D1**		1	**S203-D1**
	1.6	**S201-D1.6**		1.6	**S203-D1.6**
	2	**S201-D2**		2	**S203-D2**
	3	**S201-D3**		3	**S203-D3**
	4	**S201-D4**		4	**S203-D4**
	6	**S201-D6**		6	**S203-D6**
	8	**S201-D8**		8	**S203-D8**
	10	**S201-D10**		10	**S203-D10**
	13	**S201-D13**		13	**S203-D13**
	16	**S201-D16**		16	**S203-D16**
	20	**S201-D20**		20	**S203-D20**
	25	**S201-D25**		25	**S203-D25**
	32	**S201-D32**		32	**S203-D32**
	40	**S201-D40**		40	**S203-D40**
	50	**S201-D50**		50	**S203-D50**
	63	**S201-D63**		63	**S203-D63**
1 + NA	0.5	**S201-D0.5NA**	3 + NA	0.5	**S203-D0.5NA**
	1	**S201-D1NA**		1	**S203-D1NA**
	1.6	**S201-D1.6NA**		1.6	**S203-D1.6NA**
	2	**S201-D2NA**		2	**S203-D2NA**
	3	**S201-D3NA**		3	**S203-D3NA**
	4	**S201-D4NA**		4	**S203-D4NA**
	6	**S201-D6NA**		6	**S203-D6NA**
	8	**S201-D8NA**		8	**S203-D8NA**
	10	**S201-D10NA**		10	**S203-D10NA**
	13	**S201-D13NA**		13	**S203-D13NA**
	16	**S201-D16NA**		16	**S203-D16NA**
	20	**S201-D20NA**		20	**S203-D20NA**
	25	**S201-D25NA**		25	**S203-D25NA**
	32	**S201-D32NA**		32	**S203-D32NA**
	40	**S201-D40NA**		40	**S203-D40NA**
	50	**S201-D50NA**		50	**S203-D50NA**
	63	**S201-D63NA**		63	**S203-D63NA**
2	0.5	**S202-D0.5**	4	0.5	**S204-D0.5**
	1	**S202-D1**		1	**S204-D1**
	1.6	**S202-D1.6**		1.6	**S204-D1.6**
	2	**S202-D2**		2	**S204-D2**
	3	**S202-D3**		3	**S204-D3**
	4	**S202-D4**		4	**S204-D4**
	6	**S202-D6**		6	**S204-D6**
	8	**S202-D8**		8	**S204-D8**
	10	**S202-D10**		10	**S204-D10**
	13	**S202-D13**		13	**S204-D13**
	16	**S202-D16**		16	**S204-D16**
	20	**S202-D20**		20	**S204-D20**
	25	**S202-D25**		25	**S204-D25**
	32	**S202-D32**		32	**S204-D32**
	40	**S202-D40**		40	**S204-D40**
	50	**S202-D50**		50	**S204-D50**
	63	**S202-D63**		63	**S204-D63**

Tripping characteristic D
UL 1077
480Y/277 VAC
6 kA

Inductive loads
- D Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers



Accessories & technical data
Accessories – See page 26
Technical data – See page 76 - 82

Note: This breaker for AC use only

S200-K, 480Y/277 VAC
Supplemental protectors
UL 1077, CSA 22.2

K


S201-K


S202-K


S203-K


S204-K


S201-KNA

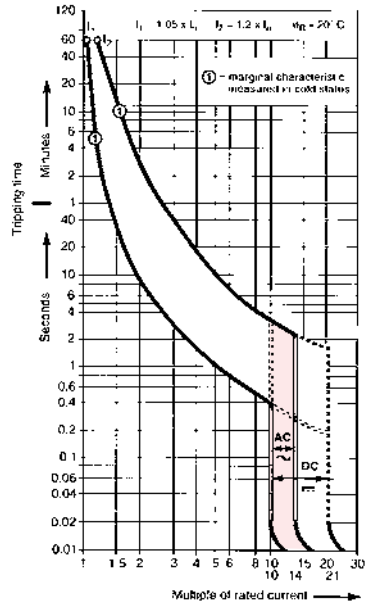

S203-KNA

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	0.5	**S201-K0.5**	3	0.5	**S203-K0.5**
	1	**S201-K1**		1	**S203-K1**
	1.6	**S201-K1.6**		1.6	**S203-K1.6**
	2	**S201-K2**		2	**S203-K2**
	3	**S201-K3**		3	**S203-K3**
	4	**S201-K4**		4	**S203-K4**
	6	**S201-K6**		6	**S203-K6**
	8	**S201-K8**		8	**S203-K8**
	10	**S201-K10**		10	**S203-K10**
	13	**S201-K13**		13	**S203-K13**
	16	**S201-K16**		16	**S203-K16**
	20	**S201-K20**		20	**S203-K20**
	25	**S201-K25**		25	**S203-K25**
	32	**S201-K32**		32	**S203-K32**
	40	**S201-K40**		40	**S203-K40**
	50	**S201-K50**		50	**S203-K50**
	63	**S201-K63**		63	**S203-K63**
1 + NA	0.5	**S201-K0.5NA**	3 + NA	0.5	**S203-K0.5NA**
	1	**S201-K1NA**		1	**S203-K1NA**
	1.6	**S201-K1.6NA**		1.6	**S203-K1.6NA**
	2	**S201-K2NA**		2	**S203-K2NA**
	3	**S201-K3NA**		3	**S203-K3NA**
	4	**S201-K4NA**		4	**S203-K4NA**
	6	**S201-K6NA**		6	**S203-K6NA**
	8	**S201-K8NA**		8	**S203-K8NA**
	10	**S201-K10NA**		10	**S203-K10NA**
	13	**S201-K13NA**		13	**S203-K13NA**
	16	**S201-K16NA**		16	**S203-K16NA**
	20	**S201-K20NA**		20	**S203-K20NA**
	25	**S201-K25NA**		25	**S203-K25NA**
	32	**S201-K32NA**		32	**S203-K32NA**
	40	**S201-K40NA**		40	**S203-K40NA**
	50	**S201-K50NA**		50	**S203-K50NA**
	63	**S201-K63NA**		63	**S203-K63NA**
2	0.5	**S202-K0.5**	4	0.5	**S204-K0.5**
	1	**S202-K1**		1	**S204-K1**
	1.6	**S202-K1.6**		1.6	**S204-K1.6**
	2	**S202-K2**		2	**S204-K2**
	3	**S202-K3**		3	**S204-K3**
	4	**S202-K4**		4	**S204-K4**
	6	**S202-K6**		6	**S204-K6**
	8	**S202-K8**		8	**S204-K8**
	10	**S202-K10**		10	**S204-K10**
	13	**S202-K13**		13	**S204-K13**
	16	**S202-K16**		16	**S204-K16**
	20	**S202-K20**		20	**S204-K20**
	25	**S202-K25**		25	**S204-K25**
	32	**S202-K32**		32	**S204-K32**
	40	**S202-K40**		40	**S204-K40**
	50	**S202-K50**		50	**S204-K50**
	63	**S202-K63**		63	**S204-K63**

Tripping characteristic K
UL 1077
480Y/277 VAC
6 kA

Inductive loads
- K Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers

Accessories & technical data
Accessories – See page 26
Technical data – See page 76 - 82



Note: This breaker for AC use only

S200P-K, 480Y/277 VAC
Supplemental protectors
UL 1077, CSA 22.2

K

S201P-K

S202P-K

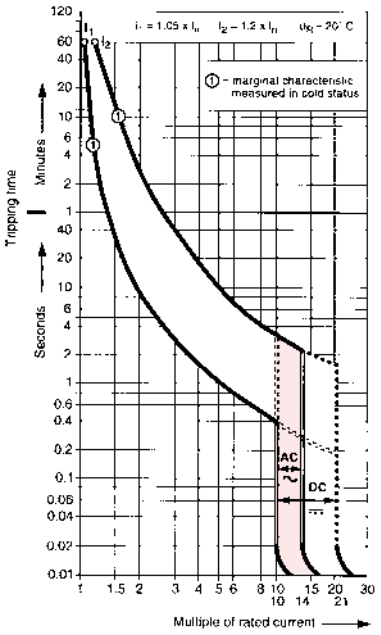
S203P-K

No. of poles	Rated current	Catalog number
1	0.2	**S201P-K0.2**
	0.3	**S201P-K0.3**
	0.5	**S201P-K0.5**
	0.75	**S201P-K0.75**
	1	**S201P-K1**
	1.6	**S201P-K1.6**
	2	**S201P-K2**
	3	**S201P-K3**
	4	**S201P-K4**
	6	**S201P-K6**
	8	**S201P-K8**
	10	**S201P-K10**
	13	**S201P-K13**
	16	**S201P-K16**
	20	**S201P-K20**
	25	**S201P-K25**
	32	**S201P-K32**
	40	**S201P-K40**
	50	**S201P-K50**
	63	**S201P-K63**
2	0.2	**S202P-K0.2**
	0.3	**S202P-K0.3**
	0.5	**S202P-K0.5**
	0.75	**S202P-K0.75**
	1	**S202P-K1**
	1.6	**S202P-K1,6**
	2	**S202P-K2**
	3	**S202P-K3**
	4	**S202P-K4**
	6	**S202P-K6**
	8	**S202P-K8**
	10	**S202P-K10**
	13	**S202P-K13**
	16	**S202P-K16**
	20	**S202P-K20**
	25	**S202P-K25**
	32	**S202P-K32**
	40	**S202P-K40**
	50	**S202P-K50**
	63	**S202P-K63**
3	0.2	**S203P-K0.2**
	0.3	**S203P-K0.3**
	0.5	**S203P-K0.5**
	0.75	**S203P-K0.75**
	1	**S203P-K1**
	1,6	**S203P-K1,6**
	2	**S203P-K2**
	3	**S203P-K3**
	4	**S203P-K4**
	6	**S203P-K6**
	8	**S203P-K8**
	10	**S203P-K10**
	13	**S203P-K13**
	16	**S203P-K16**
	20	**S203P-K20**
	25	**S203P-K25**
	32	**S203P-K32**
	40	**S203P-K40**
	50	**S203P-K50**
	63	**S203P-K63**

Tripping characteristic K
UL 1077
480Y/277 VAC
10 kA

Inductive loads
- K Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers

Accessories & technical data
Accessories – See page 26
Technical data – See page 76 - 82



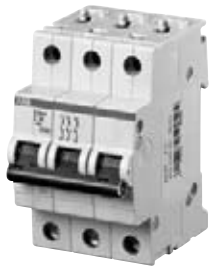
Note: This breaker for AC use only

S200P-Z, 480Y/277 VAC
Supplemental protectors
UL 1077, CSA 22.2

Z

S201P-Z

S202P-Z

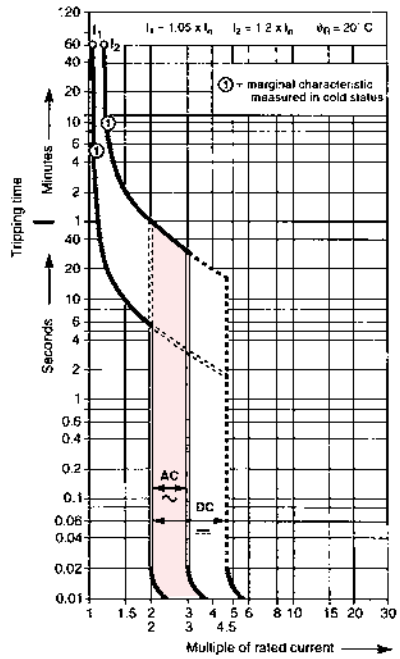


S203P-Z

No. of poles	Rated current	Catalog number
1	0.5	**S201P-Z0.5**
	1	**S201P-Z1**
	1.6	**S201P-Z1.6**
	2	**S201P-Z2**
	3	**S201P-Z3**
	4	**S201P-Z4**
	6	**S201P-Z6**
	8	**S201P-Z8**
	10	**S201P-Z10**
	16	**S201P-Z16**
	20	**S201P-Z20**
	25	**S201P-Z25**
	32	**S201P-Z32**
	40	**S201P-Z40**
	50	**S201P-Z50**
	63	**S201P-Z63**
2	0.5	**S202P-Z0.5**
	1	**S202P-Z1**
	1.6	**S202P-Z1.6**
	2	**S202P-Z2**
	3	**S202P-Z3**
	4	**S202P-Z4**
	6	**S202P-Z6**
	8	**S202P-Z8**
	10	**S202P-Z10**
	16	**S202P-Z16**
	20	**S202P-Z20**
	25	**S202P-Z25**
	32	**S202P-Z32**
	40	**S202P-Z40**
	50	**S202P-Z50**
	63	**S202P-Z63**
3	0.5	**S203P-Z0.5**
	1	**S203P-Z1**
	1.6	**S203P-Z1.6**
	2	**S203P-Z2**
	3	**S203P-Z3**
	4	**S203P-Z4**
	6	**S203P-Z6**
	8	**S203P-Z8**
	10	**S203P-Z10**
	16	**S203P-Z16**
	20	**S203P-Z20**
	25	**S203P-Z25**
	32	**S203P-Z32**
	40	**S203P-Z40**
	50	**S203P-Z50**
	63	**S203P-Z63**

Tripping characteristic Z
UL 1077
480Y/277 VAC
10 kA

Resistive loads
- Z Curve
- Designed to provide maximum protection with a very low short circuit trip setting
- Example: semiconductors



Accessories & technical data
Accessories – See page 26
Technical data – See page 76 - 82

Note: This breaker for AC use only

S280W-K 480Y/277 VAC
Supplemental protectors, ring tongue
UL 1077, CSA 22.2

K

S281-KW

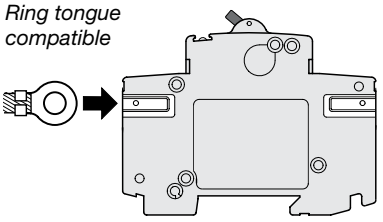
S282-KW

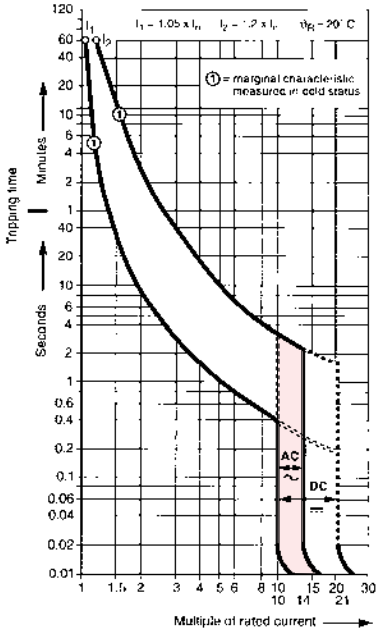
S283-KW

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	0.2	**S281-K0.2W**	3	0.2	**S283-K0.2W**
	0.3	**S281-K0.3W**		0.3	**S283-K0.3W**
	0.5	**S281-K0.5W**		0.5	**S283-K0.5W**
	0.75	**S281-K0.75W**		0.75	**S283-K0.75W**
	1	**S281-K1W**		1	**S283-K1W**
	1.6	**S281-K1.6W**		1,6	**S283-K1,6W**
	2	**S281-K2W**		2	**S283-K2W**
	3	**S281-K3W**		3	**S283-K3W**
	4	**S281-K4W**		4	**S283-K4W**
	6	**S281-K6W**		6	**S283-K6W**
	8	**S281-K8W**		8	**S283-K8W**
	10	**S281-K10W**		10	**S283-K10W**
	13	**S281-K13W**		13	**S283-K13W**
	16	**S281-K16W**		16	**S283-K16W**
	20	**S281-K20W**		20	**S283-K20W**
	25	**S281-K25W**		25	**S283-K25W**
	32	**S281-K32W**		32	**S283-K32W**
	40	**S281-K40W**		40	**S283-K40W**
	50	**S281-K50W**		50	**S283-K50W**
	63	**S281-K63W**		63	**S283-K63W**
2	0.2	**S282-K0.2W**			
	0.3	**S282-K0.3W**			
	0.5	**S282-K0.5W**			
	0.75	**S282-K0.75W**			
	1	**S282-K1W**			
	1.6	**S282-K1,6W**			
	2	**S282-K2W**			
	3	**S282-K3W**			
	4	**S282-K4W**			
	6	**S282-K6W**			
	8	**S282-K8W**			
	10	**S282-K10W**			
	13	**S282-K13W**			
	16	**S282-K16W**			
	20	**S282-K20W**			
	25	**S282-K25W**			
	32	**S282-K32W**			
	40	**S282-K40W**			
	50	**S282-K50W**			
	63	**S282-K63W**			

Tripping characteristic K

Ring tongue compatible





UL 1077
480Y/277 VAC
10 kA

Inductive loads
- K Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers

Accessories & technical data
Accessories – See page 26
Technical data – See page 76 - 82

Note: This breaker for AC use only

S280UC-K, 500 VDC
Supplemental protectors
UL 1077, CSA 22.2

K

S281UC-K

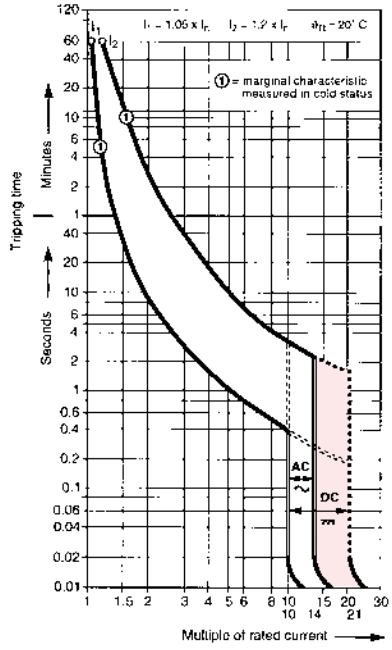
S282UC-K

S283UC-K

No. of poles	Rated current	Catalog number
1	0,2	**S281UC-K0,2**
	0,3	**S281UC-K0,3**
	0,5	**S281UC-K0,5**
	0,75	**S281UC-K0,75**
	1	**S281UC-K1**
	1,6	**S281UC-K1,6**
	2	**S281UC-K2**
	3	**S281UC-K3**
	4	**S281UC-K4**
	6	**S281UC-K6**
	8	**S281UC-K8**
	10	**S281UC-K10**
	16	**S281UC-K16**
	20	**S281UC-K20**
	25	**S281UC-K25**
	32	**S281UC-K32**
	40	**S281UC-K40**
	50	**S281UC-K50**
	63	**S281UC-K63**
2	0,2	**S282UC-K0,2**
	0,3	**S282UC-K0,3**
	0,5	**S282UC-K0,5**
	0,75	**S282UC-K0,75**
	1	**S282UC-K1**
	1,6	**S282UC-K1,6**
	2	**S282UC-K2**
	3	**S282UC-K3**
	4	**S282UC-K4**
	6	**S282UC-K6**
	8	**S282UC-K8**
	10	**S282UC-K10**
	16	**S282UC-K16**
	20	**S282UC-K20**
	25	**S282UC-K25**
	32	**S282UC-K32**
	40	**S282UC-K40**
	50	**S282UC-K50**
	63	**S282UC-K63**

No. of poles	Rated current	Catalog number
3	0.2	**S283UC-K0.2**
	0.3	**S283UC-K0.3**
	0.5	**S283UC-K0.5**
	0.75	**S283UC-K0.75**
	1	**S283UC-K1**
	1.6	**S283UC-K1.6**
	2	**S283UC-K2**
	3	**S283UC-K3**
	4	**S283UC-K4**
	6	**S283UC-K6**
	8	**S283UC-K8**
	10	**S283UC-K10**
	16	**S283UC-K16**
	20	**S283UC-K20**
	25	**S283UC-K25**
	32	**S283UC-K32**
	40	**S283UC-K40**
	50	**S283UC-K50**
	63	**S283UC-K63**

Tripping characteristic K
UL 1077
500 VDC
10 kA
Inductive loads
- K Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformer

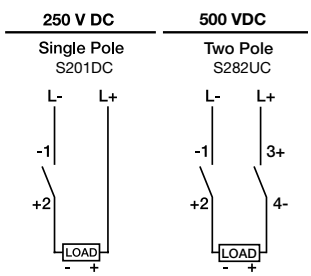


Accessories & technical data
Accessories – See page 26
Technical data – See page 76 - 82

Direct current applications
The S280UC differs from standard miniature circuit breakers in that the UC versions include a permanent magnet which aids in the extinguishing of the arc during medium and high level faults. It is necessary to observe the correct polarity and current direction when connecting the UC breakers. Two examples of correct connection are shown.

Termination points are marked on all UC type MCBs, points one (1) and four (4) are negative and points two (2) and three (3) are positive.

Note: This breaker for DC use only



S280UC-Z, 500 VDC
Supplemental protectors
UL 1077, CSA 22.2

Z

S281UC-Z

S282UC-Z

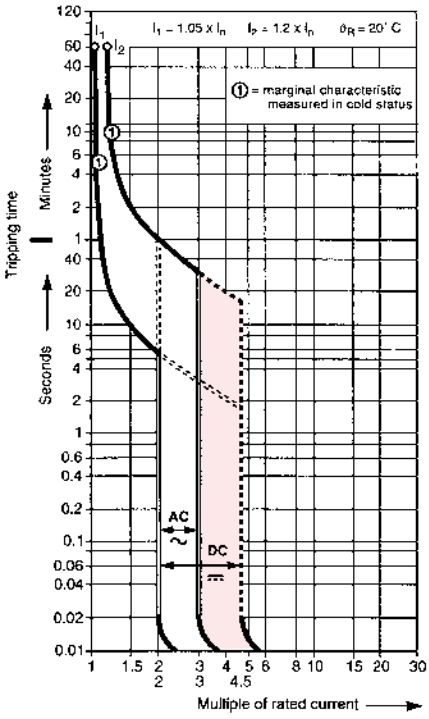
S283UC-Z

No. of poles	Rated current	Catalog number
1	0.5	**S281UC-Z0.5**
	1	**S281UC-Z1**
	1.6	**S281UC-Z1.6**
	2	**S281UC-Z2**
	3	**S281UC-Z3**
	4	**S281UC-Z4**
	6	**S281UC-Z6**
	8	**S281UC-Z8**
	10	**S281UC-Z10**
	16	**S281UC-Z16**
	20	**S281UC-Z20**
	25	**S281UC-Z25**
	32	**S281UC-Z32**
	40	**S281UC-Z40**
	50	**S281UC-Z50**
	63	**S281UC-Z63**
2	0.5	**S282UC-Z0.5**
	1	**S282UC-Z1**
	1.6	**S282UC-Z1.6**
	2	**S282UC-Z2**
	3	**S282UC-Z3**
	4	**S282UC-Z4**
	6	**S282UC-Z6**
	8	**S282UC-Z8**
	10	**S282UC-Z10**
	16	**S282UC-Z16**
	20	**S282UC-Z20**
	25	**S282UC-Z25**
	32	**S282UC-Z32**
	40	**S282UC-Z40**
	50	**S282UC-Z50**
	63	**S282UC-Z63**

No. of poles	Rated current	Catalog number
3	0.5	**S283UC-Z0.5**
	1	**S283UC-Z1**
	1.6	**S283UC-Z1.6**
	2	**S283UC-Z2**
	3	**S283UC-Z3**
	4	**S283UC-Z4**
	6	**S283UC-Z6**
	8	**S283UC-Z8**
	10	**S283UC-Z10**
	16	**S283UC-Z16**
	20	**S283UC-Z20**
	25	**S283UC-Z25**
	32	**S283UC-Z32**
	40	**S283UC-Z40**
	50	**S283UC-Z50**
	63	**S283UC-Z63**

Tripping characteristic Z
UL 1077
500 VDC
10 kA

Resistive loads
- Z Curve
- Designed to provide maximum protection with a very low short circuit trip setting
- Example: semiconductors

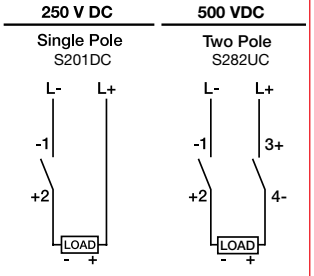


Accessories & technical data
Accessories – See page 26
Technical data – See page 76 - 82

Direct current applications
The S280UC differs from standard miniature circuit breakers in that the UC versions include a permanent magnet which aids in the extinguishing of the arc during medium and high level faults. It is necessary to observe the correct polarity and current direction when connecting the UC breakers. Two examples of correct connection are shown.

Termination points are marked on all UC type MCBs, points one (1) and four (4) are negative and points two (2) and three (3) are positive.

Note: This breaker for DC use only

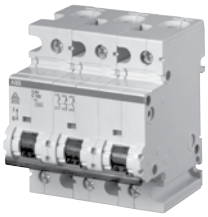


S290
480Y/277 VAC
UL 1077, CSA 22.2

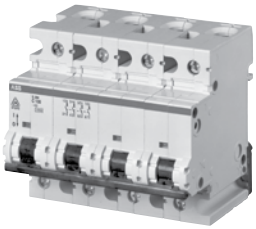
C

S291-C

S292-C



S293-C



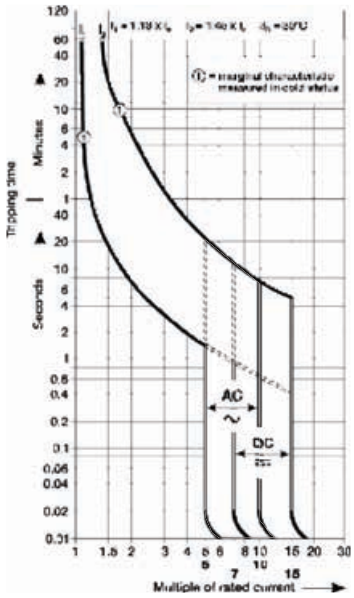
S294-C

No. of poles	Rated current	Catalog number
1	80	**S291-C80**
	100	**S291-C100**
	125	**S291-C125**
2	80	**S292-C80**
	100	**S292-C100**
	125	**S292-C125**
3	80	**S293-C80**
	100	**S293-C100**
	125	**S293-C125**
4	80	**S294-C80**
	100	**S294-C100**
	125	**S294-C125**

Tripping characteristic C
UL 1077
480Y/277 VAC
6 kA

Resistive loads
- C Curve
- Designed for use with medium magnetic start up currents
- Example: lighting, control panels

Accessories & technical data
Accessories – See page 27
Technical data – See page 76 - 82



Note: This breaker for AC use only

Accessories
S200, S200P, S280UC & S280W
UL 1077, CSA 22.2

S2C-H6R

S2C-A

S2C-UA

Auxiliary contacts
The auxiliary contacts will signal whether the breaker is in the ON or OFF position.

Description	Catalog number
For field mounting: right side	**S2C-H6R**

Bell alarm
The bell alarm includes a set of contacts that will only signal when the breaker has tripped. Typically the contacts would be connected to an alarm or bell to signal the operator that an overcurrent trip has occurred. The bell alarm also includes a test button for testing the alarm contacts without opening the breaker.

Description	Catalog number
For field mounting: right side	**S2C-S/H6R** ①

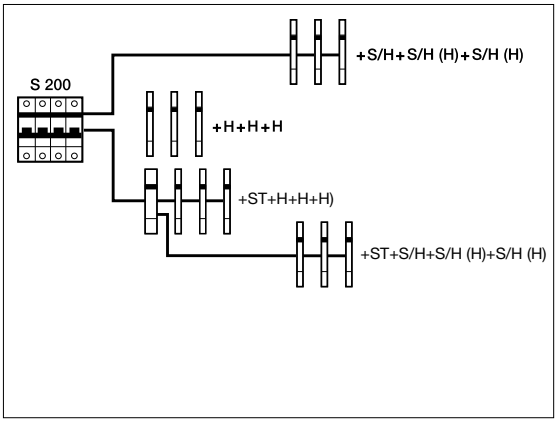
Shunt trip
For remote tripping of breaker, a shunt trip device can be added to the MCB. The solenoid device opens the breaker after control voltage is applied.

Description	Catalog number
For field mounting: right side	
A1-12-60 VAC (12 – 60 VDC)	**S2C-A1**
A2-110-415 VAC (110 – 250 VDC)	**S2C-A2**

Undervoltage release
When control voltage drops below approximately 50 % of rated voltage, the UVR opens the breaker. The breaker can not be operated unless proper control voltage is first applied to the UVR coil.

Description	Catalog number
For field mounting: right side	
12 VDC	**S2C-UA 12**
24 VAC/VDC	**S2C-UA 24**
48 VAC/VDC	**S2C-UA 48**
110 VAC/VDC	**S2C-UA 110**
220 VAC/VDC	**S2C-UA 230**
380 VAC	**S2C-UA 400**

Possible mounting arrangements of MCB accessories



Legend	
Auxiliary contact	**H**
Bell alarm/Auxiliary contact	**S/H**
Bell alarm/Auxiliary contact used as auxiliary contact	**S/H (H)**
Shunt trip	**ST**
Undervoltage release	**UR**

① Combination bell alarm/auxiliary contact.

Accessories
S290
UL 1077, CSA 22.2


S290-H11

Auxiliary contacts
The auxiliary contacts will signal whether the breaker is in the ON or OFF position.

Description	Catalog number
Auxiliary contact	**S290-H11**

Bell alarm
The bell alarm includes a set of contacts that will only signal when the breaker has tripped. Typically the contacts would be connected to an alarm or bell to signal the operator that an overcurrent trip has occured. The bell alarm also includes a test button for testing the alarm contacts without opening the breaker.

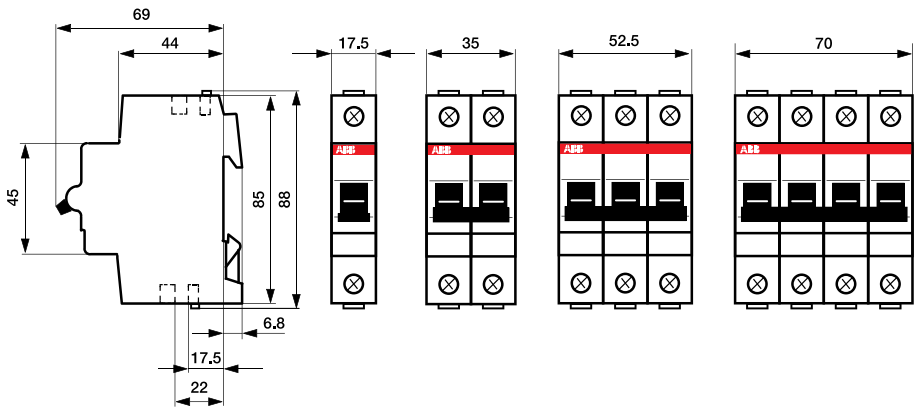
Description	Catalog number
Signal contact	**S290-S**

Shunt trip
For remote tripping of breaker, a shunt trip device can be added to the MCB. The solenoid device opens the breaker after control voltage is applied.

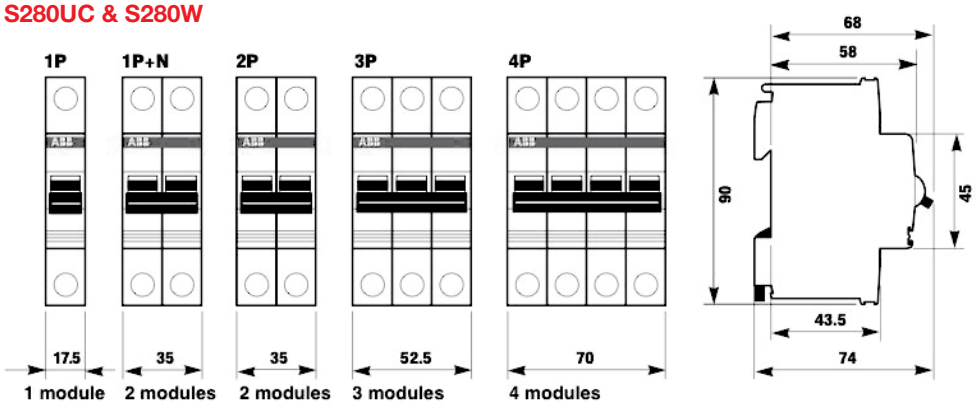
Description	Catalog number
For field mounting, left side	
110V – 415VAC	**S290-A1**
For field mounting, left side	
24 – 48VDC	**S290-A2**

Approximate dimensions
S200, S200P, S280UC, S280W, S290
UL 1077, CSA 22.2

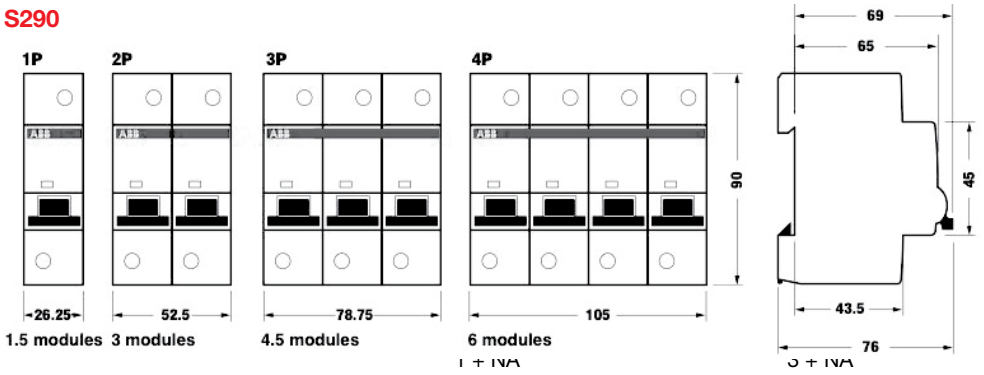
S200, S200P



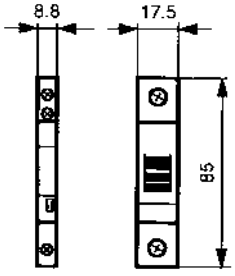
S280UC & S280W



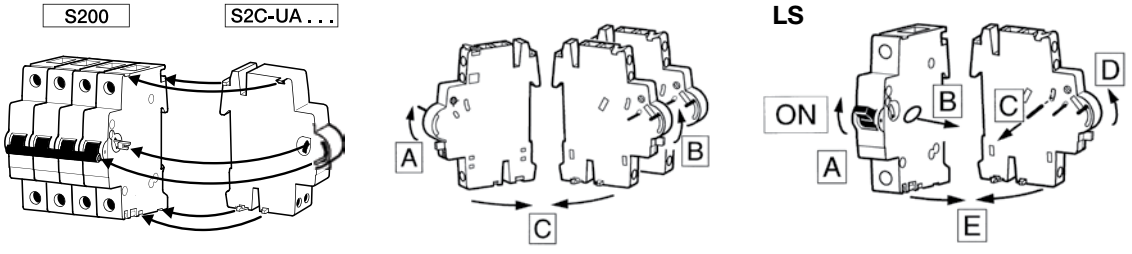
S290



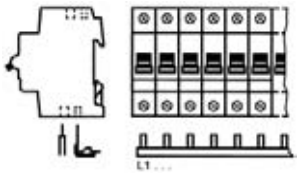
S2C-H6R, S2C-A... S2C



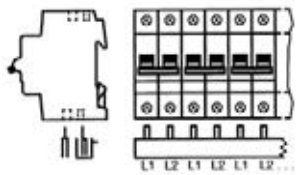
Addition of S2C-A...U



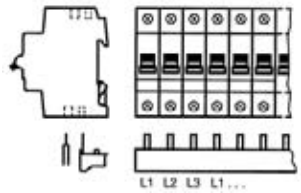
Accessories
S200, S200P, S280UC, S280W
UL 1077, CSA 22.2



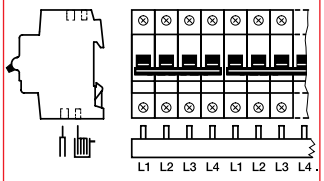
1 Phase



2 Phase



3 Phase



3 Phase + N

1 Phase

For use on:	Amp rating	Number of poles	Phases	Busbar length (mm)	End cap catalog number	Catalog number
S200 S200 P S280UC S280W	63 80	60 60	1 1	986 986	– –	**PS1/60** **PS1/60/16**

2 Phase

For use on:	Amp rating	Number of poles	Phases	Busbar length (mm)	End cap catalog number	Catalog number
S200 S200 P S280UC S280W	63 80	58 58	2 2	1035 1035	PS-END PS-END	**PS2/58SP** **PS2/58/16SP**

3 Phase

For use on:	Amp rating	Number of poles	Phases	Busbar length (mm)	End cap catalog number	Catalog number
S200 S200 P S280UC S280W	63 80	60 60	3 3	1065 1065	PSB-ENDSP PSB-ENDSP	**PS3/60SP** **PS3/60/16SP**

4 Phase

For use on:	Amp rating	Number of poles	Phases	Busbar length (mm)	End cap catalog number	Catalog number
S200 S200 P S280UC S280W	80 80	60 60	4 4	1056 1056	PS-END1 PS-END1	**PS4/60/16SP** **PS4/60/16SP**

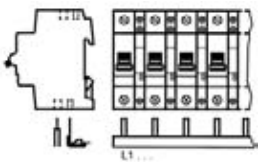
NOTE

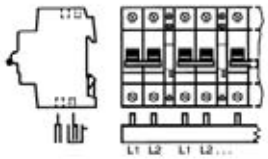
All busbars may be center fed in order to double the ampacity rating

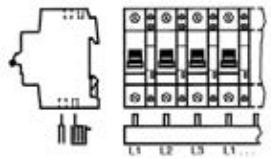
NOTE

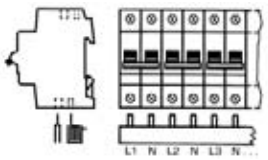
Busbars may be used on line or load side of MCBs

Accessories
S200, S200P, S280UC, S280W
UL 1077, CSA 22.2


1 Phase + Aux


2 Phase + Aux


3 Phase + Aux


3 Phase + N

1 Phase with 1 auxiliary

For use on:	Amp rating	Number of poles	Phases	Busbar length (mm)	End cap catalog number	Catalog number
S200 & S200 P	63 80	38 38	1 1	1044 1044	– –	**PS1/38H** **PS1/38/16H**

2 Phase with 1 auxiliary

For use on:	Amp rating	Number of poles	Phases	Busbar length (mm)	End cap catalog number	Catalog number
S200 & S200 P	80	48	2	1065	PS-ENDSP	**PS2/48/16SP**

3 Phase with 1 auxiliary

For use on:	Amp rating	Number of poles	Phases	Busbar length (mm)	End cap catalog number	Catalog number
S200 & S200 P	80	39	3	980	PS-ENDSP	**PS2/39/16SP**

3 Phase + N, for use with 2 pole-MCBs on 3 phase/4W system

For use on:	Amp rating	Number of poles	Phases	Busbar length (mm)	End cap catalog number	Catalog number
S200 & S200 P	80	58	4	1048	PS-END1SP	**PS4/58/16NSP**

NOTE

All busbars may be center fed in order to double the ampacity rating

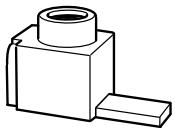
NOTE

Busbars may be used on line or load side of MCBs

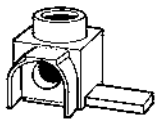
Accessories
S200, S200P, S280W, S280UC
UL 1077, CSA 22.2

SZ-BSK

SZ-ESK2



SZ-AST55I



SZ-AST50I

Busbar tooth covers

Description	Catalog number
Covers five unused poles of busbar	**SZ-BSK**

Busbar mounted terminal block

Description	Catalog number
Busbar mounted terminal block, 1 pole, for use on all busbars, Wire size: 14 AWG to 2 AWG	**SZ-ESK2**

Connection terminals

Description Cross section AWG/mm²		For use on:	Catalog number
AWG 1/0 (50 mm²)	Straight	S200 & S200P	**SZ-AST55I**
AWG 1/0 (50 mm²)	90°		**SZ-AST50I**

Technical data
S200, S200P, S280UC, S280W, S290
UL 1077, CSA 22.2

Technical data	S200	S200P	S290
Specifications:	UL 1077, CSA C 22.2, VDE 0660, IEC 898, 947		UL 1077, IEC 898
UL File-Number:	E 76126 UL CL		
No. of poles:	1, 2, 3 & 4		1, 2, 3 & 4
Tripping characteristics:	B,C & D	K & Z	C
Rated current:	0.5-63 A	0.2-63 A	80-125A
Rated voltage:	Multi pole: 480Y/277 VAC		230Y/440VAC
Short circuit capacity:	S200 6kA; S200P 10 kA		—
Frequency:	50/60 Hz		50/60 Hz
Degree of protection:	IP 20		IP 20
Mounting position:	Vertical, horizontal		Vertical, horizontal
Fixing:	35mm DIN rail		35mm DIN rail
Clamps only for Cu:	18 … 4 AWG		14-1/0 AWG
Service life, mech. and at rated load:	20,000 operations		10,000
Tightening torque:	17.5 in. lbs (1.978 Nm)		4.5 in. lbs
Ambient temperature:	– 25°C … – 13°F / 70°C … 158°F		-5°C... 23°F / 45°C... 113
Shock resistance:	10 g at least 2 impacts shock duration of13 ms		30g min. of 2 impacts, shock duration of 13 ms

Auxiliary contact S2C-H6RU and Signal contact S2C-S6RU for S200U and S200UP

Rated current:	10
Rated voltage AC / DC:	24
Contact:	1 pole, single throw
Connection capacity mm²	18 – 14 AWG (0.75…2.5)
Tightening torque:	11 in. lbs (1.2 Nm)
Shock resistance acc. to DIN IEC 68-2-6:	5 g, 20 frequency cycles 5...150...5 Hz at 24 VAC/DC, 5 mA auto-reclosing < 10 ms
Mechanical service life:	10,000 operations

Shunt trip		S2C-A1U	S2C-A2U
Rated voltage	AC DC	12 ... 60 V 12 ... 60 V	110 ... 415 V 110 ... 250 V
Max. release duration		<10 ms	<10 ms
Min. release voltage	AC DC	7 V 10 V	55 V 80 V
Consumption on release	AD DC	40 ... 200 VA 40 ... 200 VA	55 ... 210 VA 55 ... 110 VA
Coil resistance		3.7 Ω	225 Ω
Terminals		18…6/0.75 – 16 AWG/mm²	18…6/0.75 – 16 AWG/mm²
Tightening torque		18/2 in.lbs/Nm	18/2 in.lbs/Nm

Undervoltage release		S2C-UA 12 DC	S2C-UA 24 AC	S2C-UA 24 DC	S2C-UA 48 AC	S2C-UA 48 DC	S2C-UA 110 AC	S2C-UA 110 DC	S2C-UA 230 AC	S2C-UA 230 DC	S2C-UA 400 AC
Standards		IEC/EN 60947-1									
Rated voltage	AC DC	12 V	24 V	24 V	48 V	48 V	110 V	110 V	230 V	230 V	400 V
Frequency		50 ... 60 Hz									
Release trip		0.35 UnOVO 0.7 Un V									
Terminals		2 x 16/2 x 1.5 AWG/mm²									
Consumption		0.2 VA	3.6 VA	2 VA	3.6 VA	2.1 VA	3.5 VA	2.2 VA	3.7 VA	2.3 VA	2.4 VA
Resistance to corrosion		constant atmosphere: 23/83 – 40/93 – 55/20; variable atmosphere: 25/95 – 40/93 °C/RH									
Protection degree		IPXXB / IP2X									
Tightening torque		3.5/0.4 in.lbs/Nm									

Internal resistance and power loss

Internal resistance per pole in mΩ, power loss per pole in W

Type	Rated current	Device series B, C, D①		Device series K		Device series Z	
	A	mΩ	W	mΩ	W	mΩ	W
S200 & S200P	0.5	5500	1.4	6340	1.6	10100	2.5
	1	1440	1.4	1550	1.6	2270	2.3
	1.6	630	1.6	695	1.8	1100	2.8
	2	460	1.8	460	1.9	619	2.5
	3	150	1.3	165	1.5	202	1.8
	4	110	1.8	120	2.0	149	2.4
	6	55	2.0	52	1.9	104	3.7
	8	15	1.0	38	2.5	53.9	3.45
	10	13.3	1.3	12.6	1.26	17.5	1.7
	13	13.3	2.3	12.6	1.26	-	-
	16	7.0	1.8	7.7	2.0	10.9	2.8
	20	6.25	2.5	6.7	2.7	6.0	2.4
	25	5.0	3.2	4.6	2.9	4.1	2.6
	32	3.6	3.7	3.5	3.6	2.8	2.9
	40	3.0	4.8	2.8	4.5	2.5	4.1
	50	1.3	3.25	1.25	2.9	1.8	4.4
	63	1.2	4.8	0.7	5.2	1.3	5.2

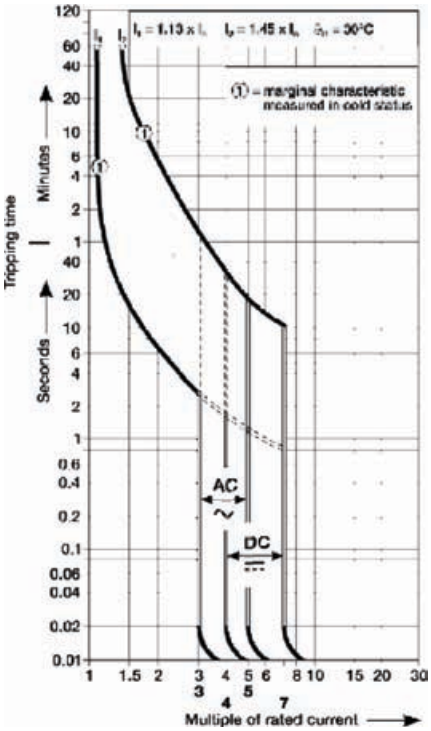
① Current intensities 0.5 - 4 apply exclusively to C-type trip characteristics

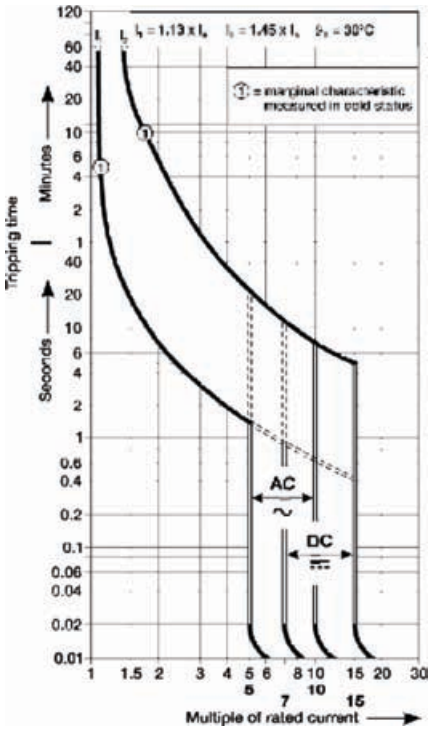
Temperature derating

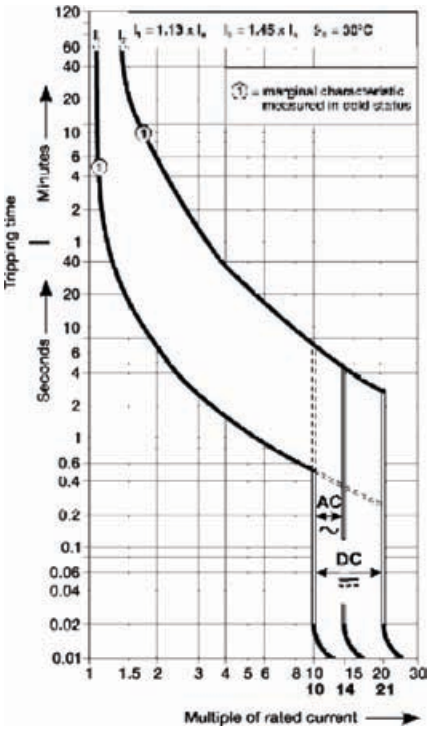
Max operating current depending on the ambient temperature of a circuit breaker characteristics type B, C and D

B,C & D	Ambient Temperatures T (C°/F°)											
	-40/-40	-30/-22	-20/-4	-10/14	0/32	10/50	20/68	30/86	40/104	50/122	60/140	70/158
Amps	0.67	0.65	0.62	0.60	0.58	0.55	0.53	0.50	0.47	0.44	0.41	0.37
	1.33	1.29	1.25	1.20	1.15	1.11	1.05	1.00	0.94	0.88	0.82	0.75
	2.13	2.07	2.00	1.92	1.85	1.77	1.69	1.60	1.51	1.41	1.31	1.19
	2.67	2.58	2.49	2.40	2.31	2.21	2.11	2.00	1.89	1.76	1.63	1.49
	4.0	3.9	3.7	3.6	3.5	3.3	3.2	3.0	2.8	2.6	2.4	2.2
	5.3	5.2	5.0	4.8	4.6	4.4	4.2	4.0	3.8	3.5	3.3	3.0
	8.0	7.7	7.5	7.2	6.9	6.6	6.3	6.0	5.7	5.3	4.9	4.5
	10.7	10.3	10.0	9.6	9.2	8.8	8.4	8.0	7.5	7.1	6.5	6.0
	13.3	12.9	12.5	12.0	11.5	11.1	10.5	10.0	9.4	8.8	8.2	7.5
	17.3	16.8	16.2	15.6	15.0	14.4	13.7	13.0	12.3	11.5	10.6	9.7
	21.3	20.7	20.0	19.2	18.5	17.7	16.9	16.0	15.1	14.1	13.1	11.9
	26.7	25.8	24.9	24.0	23.1	22.1	21.1	20.0	18.9	17.6	16.3	14.9
	33.3	32.3	31.2	30.0	28.9	27.6	26.4	25.0	23.6	22.0	20.4	18.6
	42.7	41.3	39.9	38.5	37.0	35.4	33.7	32.0	30.2	28.2	26.1	23.9
	53.3	51.6	49.9	48.1	46.2	44.2	42.2	40.0	37.7	35.3	32.7	29.8
	66.7	64.5	62.4	60.1	57.7	55.3	52.7	50.0	47.1	44.1	40.8	37.3
	84.0	81.3	78.6	75.7	72.7	69.6	66.4	63.0	59.4	55.6	51.4	47.0
	112.6	107.2	102.1	97.2	92.6	88.2	84.0	80.0	76.0	72.2	68.6	65.2
	140.7	134.0	127.6	121.6	115.8	110.3	105.0	100.0	95.0	90.3	85.7	81.5
	175.9	167.5	159.5	151.9	114.7	137.8	131.3	125.0	118.8	112.8	107.2	101.8

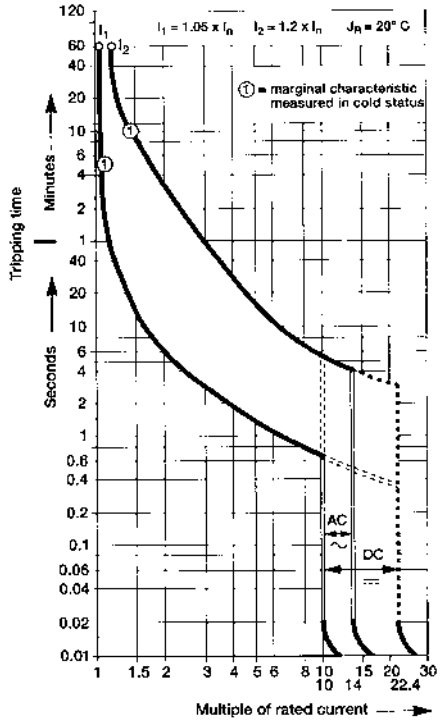
Tripping characteristic D



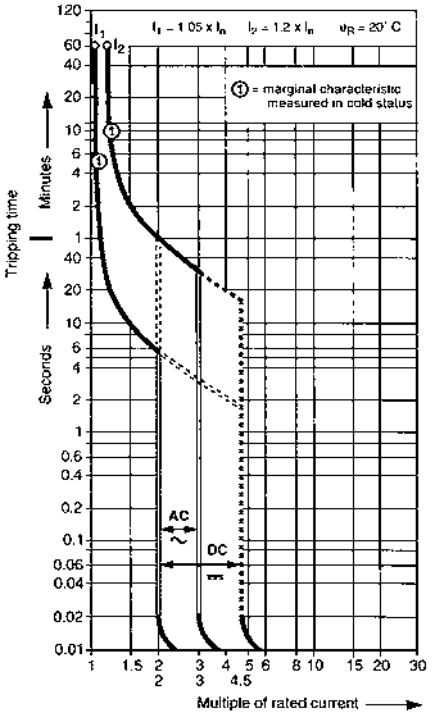




Tripping characteristic K



Tripping characteristic Z



Miniature circuit breaker Application guide

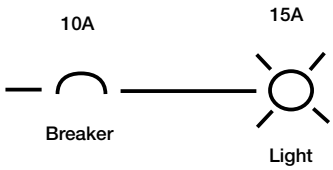
Introduction

The circuit breaker plays an important role in providing over-current protection and a disconnect means in electrical networks. Recent advancements in circuit breaker technology has increased breaker performance and protection.

Overload

A slow and small overcurrent situation that causes the ampacity and temperature of the circuit to gradually increase over time. This type of event is characterized by a slight increase in the load (ampacity) on the circuit and is interrupted by the thermal trip unit of the breaker.

Thermal Example

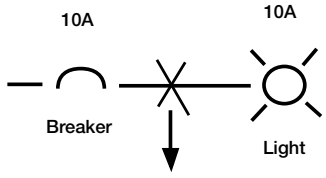


The light draws more than 10 amps for an extended period of time creating a thermal overload.

Short circuit

A rapid and intense overcurrent situation that causes the ampacity of the circuit to increase. This type of event is characterized by a dramatic increase in the load (ampacity) on the circuit and is interrupted by the magnetic trip unit of the breaker.

Magnetic Example

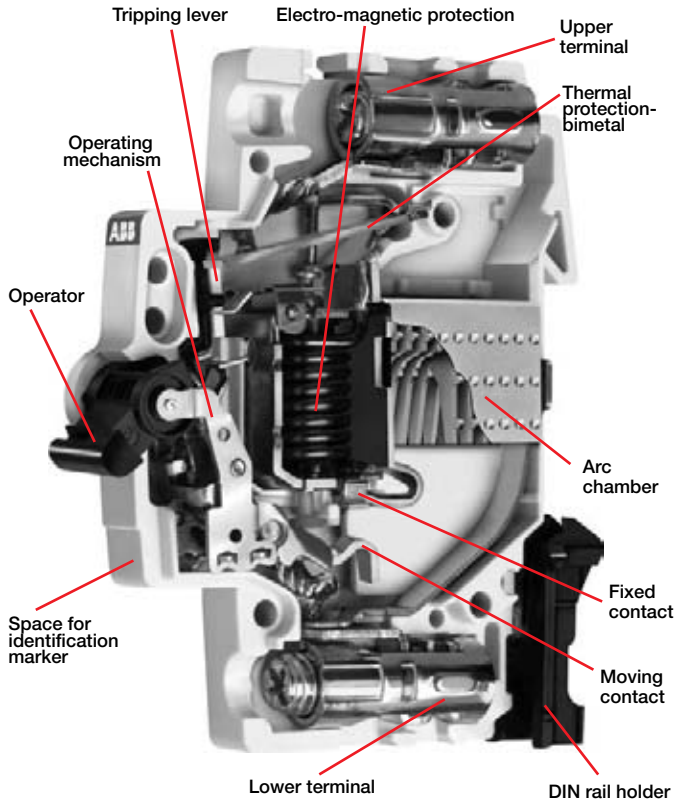


The wire connected between the light and breaker is cut and shorted to ground creating a short circuit.

Breaker definition

A breaker is a device designed to isolate a circuit during an overcurrent event without the use of a fusible element. A breaker is a resettable protective device that protects against two types of overcurrent situations; Overload and Short Circuit.

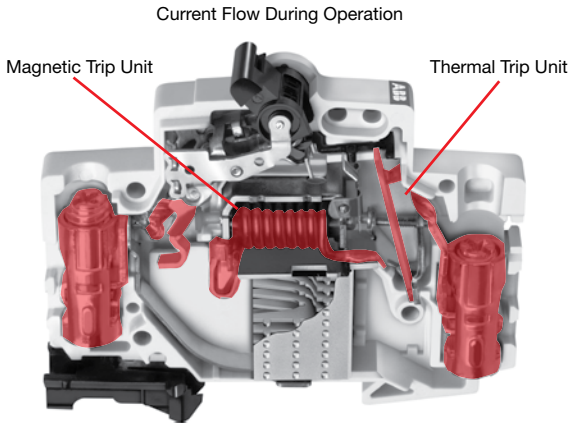
ABB current limiting breaker



Circuit breaker construction

Thermal / Magnetic trip units definition

ABB Current Limiting Breakers use an electromechanical (Thermal / Magnetic) trip unit to open the breaker contacts during a overcurrent event. The thermal trip unit is temperature sensitive and the magnetic trip unit is current sensitive. Both units act independently and mechanically with the breaker's trip mechanism to open the breaker's contacts.



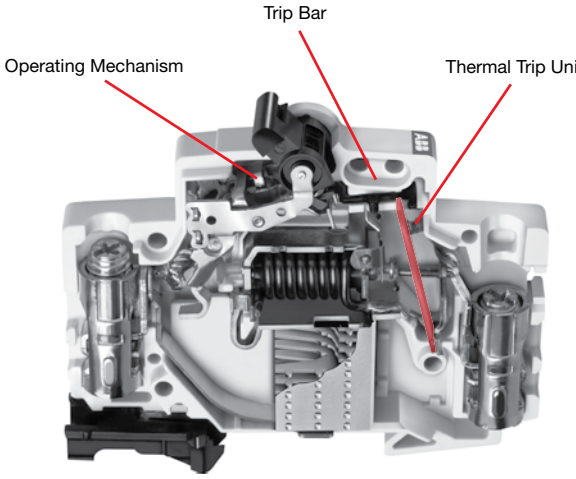
All highlighted components are energized during operation

Overload protection

The thermal trip unit protects against a continuous overload. The thermal unit is comprised of a bimetal element located behind the circuit breaker trip bar and is part of the breaker's current carrying path. When there is an overload, the increased current flow heats the bimetal causing it to bend. As the bimetal bends it pulls the trip bar which opens the breaker's contacts.

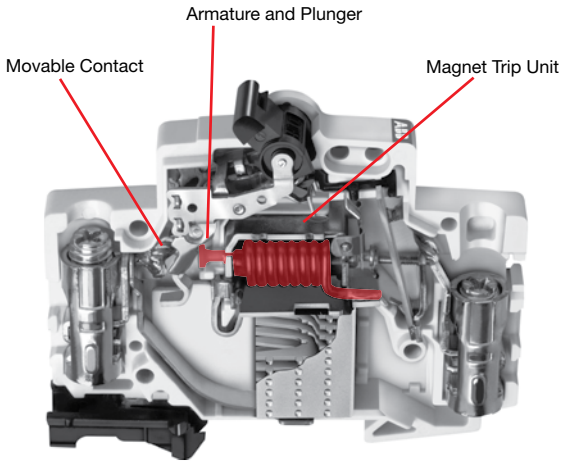
The time required for the bimetal to bend and trip the breaker varies inversely with the current. Because of this, the tripping time becomes quicker as current increases in magnitude.

Overload protection is applicable to any installation, conductor, or component which can be subjected to low-magnitude but long-time over-currents. Low-magnitude, long-time over-currents can be dangerous because they reduce the life of the electrical installation, conductor, and components and if left unchecked could result in fire.



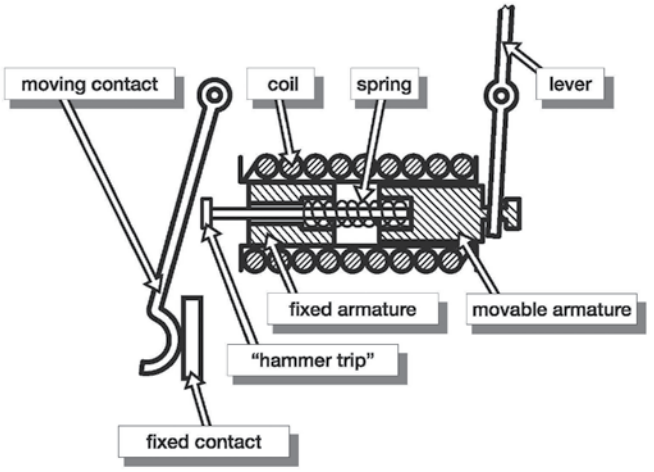
Magnetic trip units (short circuit protection)

The Magnetic trip unit protects against a short circuit. The magnetic trip unit is comprised of an electromagnet and an armature.



Components of a magnetic trip unit

When there is a short circuit, a high magnitude of current passes through the coils creating a magnetic field that attracts the movable armature towards the fixed armature. The hammer trip is pushed against the movable contact and the contacts are opened. The opening of the breakers contacts during a short circuit is complete in .5 milli-seconds.

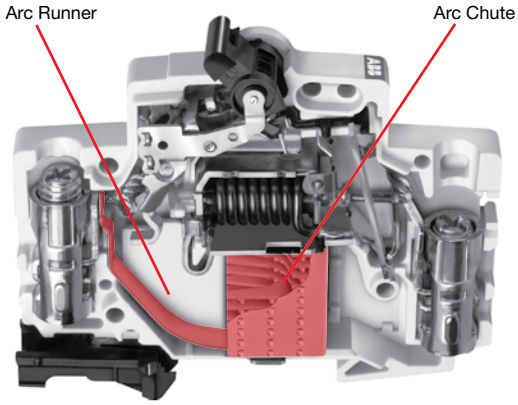


Circuit breaker construction

Arc runners / Arc chutes

The arc runner and arc chute limit and dissipate the arc energy during the interruption of an overload or short circuit event.

During an overload or short circuit event, the contacts of the breaker separate and an electrical arc is formed between the contacts through air. The arc is moved into the arch chute by “running” the arc down the interior of the breaker along the arc runner. When the arc reaches the arc chute it is broken into small segmented arcs. The segmented arcs split the overall energy level into segments less than 25V. Each 25V segment does not have a high enough energy level to maintain an arc and all energy is naturally dissipated.



Breaker curves

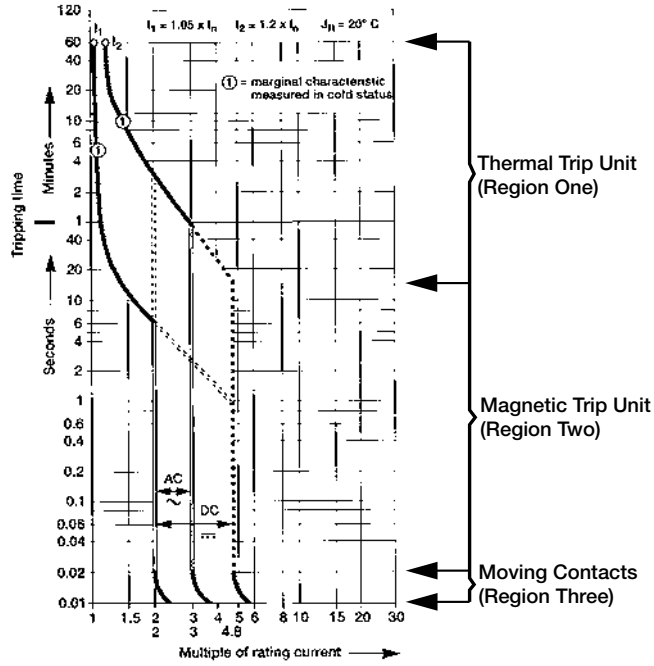
Thermal Trip Unit (region one)
The first sloping region of the breaker curve is a graphical representation of the tripping characteristics of the thermal trip unit. This portion of the curve is sloped due to the nature of the thermal trip unit. The trip unit bends to trip the breaker’s trip bar in conjunction with a rise in amperage (temperature) over time. As the current on the circuit increases, the temperature rises, the faster the thermal element will trip.

Example using the curve below: If you had a 10A breaker and the circuit was producing 30 amps of current, the breaker would trip between 2 seconds and 1 minute. In this example you would find the circuit current on the bottom of the graph (Multiples of rated current). The first line is 10 amps (10 amp breaker x a multiple of one), the second line is 20 amps (10 amp breaker x multiple of 2), and the third line is 30 amps (10amp breaker x multiple of 3). Next you would trace the vertical 30A line up until it intersects the red portion of the breaker thermal curve. If you follow the horizontal lines, on both sides of the red curve, to the left you will see that the breaker can trip as fast as 2 seconds and no slower than 1 minute.

Magnetic Trip Unit (region two)
This region of the breaker curve is the instantaneous trip unit. ABB’s miniature circuit breaker’s instantaneous trip unit interrupts a short circuit in 2.3 to 2.5 milliseconds. Because of this the curve has no slope and is graphically represented as a vertical straight line.

Example using the curve above: If you had a 10 amp breaker the magnetic trip element would interrupt a short circuit between 10 and 30 amps (10 amp breaker x multiple of 2 and 3) in 2.3 to 2.5 milliseconds.

Breaker Contacts (region three)
This region of the curve is the time required for the contacts of the breaker to begin to separate. The contacts will open in less than .5 milliseconds and is graphically represented by the bottom vertical portion of the curve.



Circuit breaker current limitation

Current limiting definitions

All ABB Miniature Circuit Breakers are UL tested and certified as current limiting protective devices. Current limiting circuit breakers provide a higher level of circuit protection than a typical zero point external breakers.

UL AC 60Hz cycle

UL defines an AC cycle as the potential energy of the wave form traveling from Zero-to-Positive amplitude, Positive-to-Zero amplitude, Zero-to-Negative amplitude, Negative-to-Zero amplitude 60 times in one second. One cycle is completed every 16.6 milliseconds.

UL breaker current limiting

UL defines breaker current limitation as a breaker that interrupts and isolates a fault in less than 1/2 of an AC cycle. 1/2 a cycle is completed in 8.3 milliseconds.

NEC240.2 current limiting

A device that, when interrupting current in its current-limiting range, reduces the current flowing in the faulted circuit to a magnitude substantially less than that obtainable in the same circuit if the device were replaced with a solid conductor having comparable impedance.

IEC 60947-2 current limiting circuit breaker

A circuit breaker with sufficiently short trip time to prevent the short-circuit current from reaching the peak value which would otherwise be reached.

ABB current limiting breakers

ABB current limiting breakers can interrupt and isolate a fault in 1/8 of an AC cycle. The breaker fault interruption is completed in 2.3 to 2.5 milliseconds.

Zero point extinguishing breakers

A typical zero point extinguishing breaker interrupts a fault and does not isolate the energy. The breaker allows an arc to be present between the open contacts until the AC wave form crosses zero. When the wave form crosses zero, the potential energy is zero and the arc (fault) naturally extinguishes. The arc could be present for up to 8.3 milliseconds.

Current limiting breakers and electrical networks

Current Limitation

When a short-circuit condition occurs, the “ideal” current limiting circuit breaker opens before the current waveform can reach its full potential magnitude which occurs at ¼ cycle (4.17ms). ABB’s current limiting breakers can interrupt a fault in about ½ cycle or 2.3ms to 2.5ms.

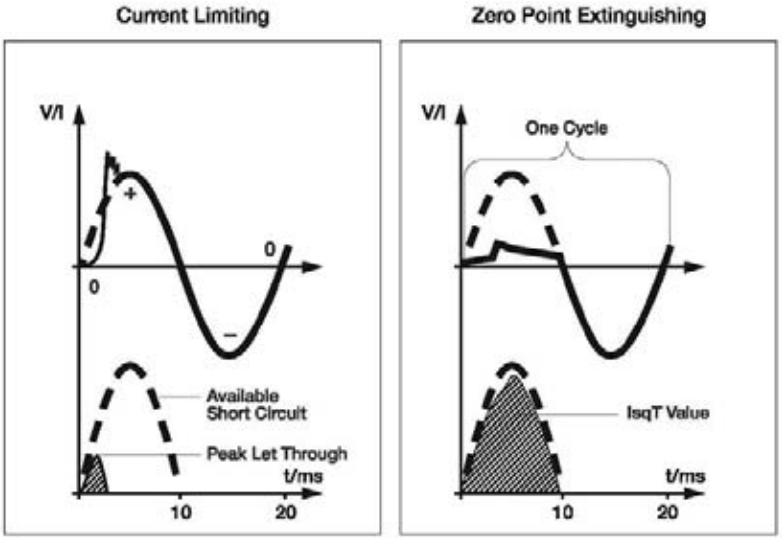
ABB’s current limiting breakers interrupt a short circuit in less than 1/8 cycle and limit the amount of current that can reach a circuit. Limiting the available current on the circuit provides additional protection against network, breaker, or bus damage and prevents the tripping of upstream breakers (selective coordination).

IsqT

The true destructive nature of a short circuit is measured by the time it is available combined with the peak value of the short circuit. The IsqT (Amps Squared over Time) value represents the amount of energy available on a network during a short circuit and is represented by the shaded area on the graph below.

During a short circuit both magnetic forces and thermal energy combine to damage devices on the electrical network. The level of thermal energy and magnetic forces are directly proportional to the square of the current. The magnetic forces vary as a square of the peak current available and the thermal energy varies as a square of the RMS (root mean square) current available. ABB’s current limiting breakers will limit the let-through energy to a fraction (1/100th) of the value which is available from the network. By comparison, a Zero Crossing breaker would let-through approximately 100 times as much destructive energy as the current limiting circuit breaker [(100,000A / 10,000A) squared – 100X].

ABB’s current limiting breakers limit the short circuit current to a relatively small magnitude in a extremely short time, which dramatically limits a short circuit’s destructive energy.



Circuit breaker current limitation

Current limiting and zero crossing breakers

During the initial stages of a short circuit a breaker's contacts open to interrupt the circuit. After the contacts open an arc forms in the air between the contacts on both the current limiting and zero crossing breaker contacts. What distinguishes a current limiting breaker from a zero crossing breaker is what each breaker does after an arc is formed between the open contacts.

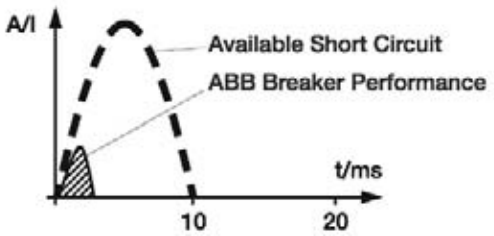
A current limiting breaker "runs" the arc down the breaker arc runner into an arc chute that extinguishes the arc.

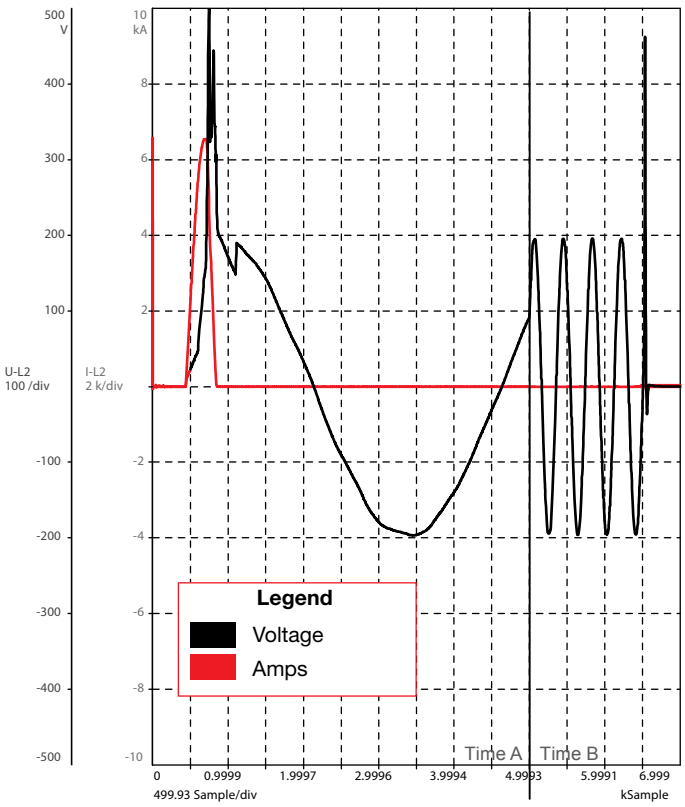
A zero crossing breaker does not attempt to extinguish the arc. The breaker is designed to withstand the energy of the arc long enough for the waveform to cross zero. When the wave form crosses zero the potential energy is zero and the arc naturally extinguishes itself.

ABB's current limiting breakers interrupt the arc energy in 2.3ms to 2.5ms (1/8 cycle) and a zero crossing breaker allows the arc to be present for up to 8.3ms (1/2 cycle). A zero crossing breaker will let through 100 times as much energy as an ABB current limiting breaker.

Current limiting example

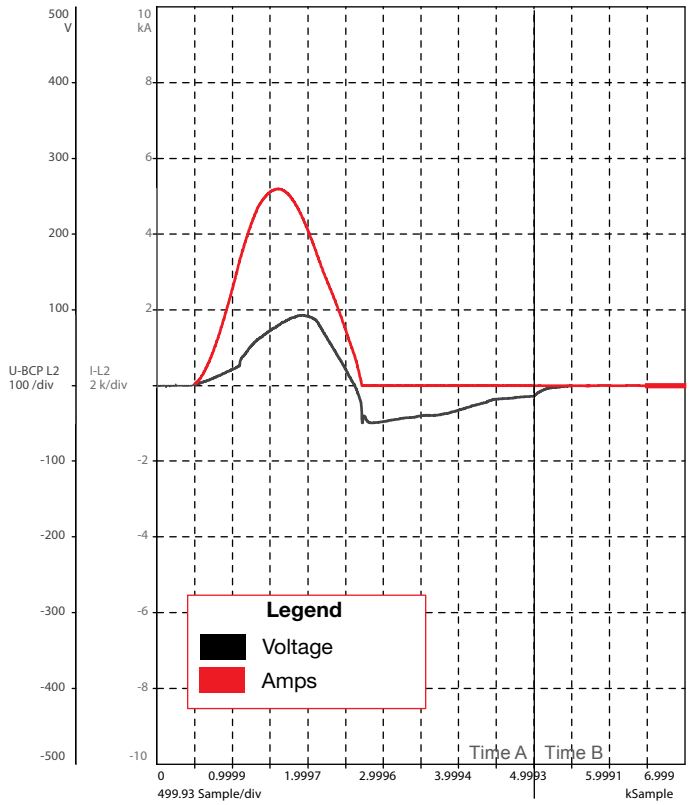
The lab test report below details a 20A S200 series current limiting breaker interrupting a 28kA fault in 1.7 milliseconds. The total "I Square T" value is 32.0kA.

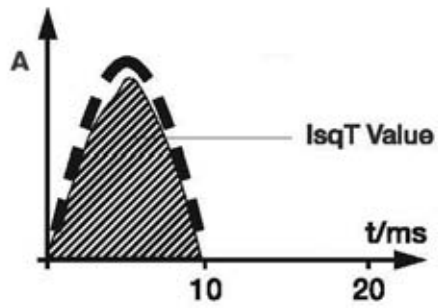




Zero crossing example

The test report below details a 20A Zero Point Extinguishing breaker interrupting a 9kA fault in 9 milliseconds. The total "I Square T" value is 104.0kA.

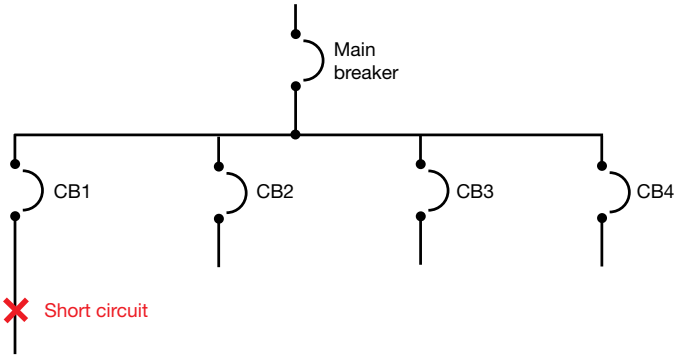




Selective coordination and series ratings

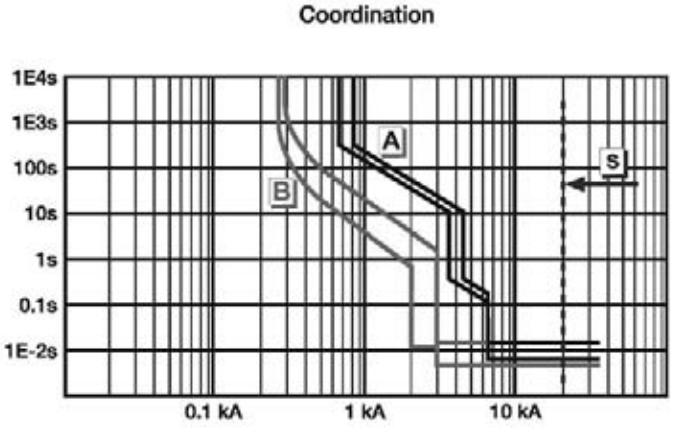
IEC 60497-1 selective coordination definition

Coordination between the operating characteristics of two or more over-current protection devices, so that when an over-current within established limits occurs, the device designated to operate within those limits trips whereas the other do not trip.



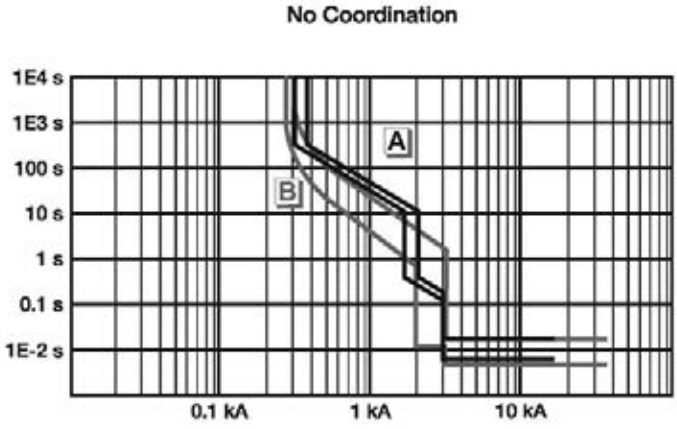
Example of breaker coordination

When an over-current event occurs at the branch breaker level (CB1), and the event is within the operating characteristics of the breaker, then the branch breaker should interrupt the circuit (open) and the main breaker should remain closed and energized. The chart below gives a graphical representation of a down stream branch breaker (B curve) and a main breaker (A curve) with coordination. The separation between the curves allows the branch breaker to react to the fault and the main breaker remain closed and energized.



Example of no breaker coordination

Selective breaker coordination is not achieved when there is an overload event at the branch breaker level (MCB1) and both the branch breaker and main breaker interrupt the circuit (open). When there is no breaker coordination several circuits lose power that should remain operational during and after the overload event. The chart below gives a graphical representation of a down stream branch breaker (B curve) and a main breaker (A curve) without coordination. There is no separation between the curves. The branch breaker will react to a fault and the main breaker will open and de-energize all circuits down stream.



Problems in coordination occur when the branch breaker allows the "I Square T" value of the short circuit to rise to a level that is in the operating range of the up-stream main breaker. Proper breaker coordination is easier to achieve with the use of current limiting breakers at the branch level.

Selective coordination and current limiting breakers

Recent improvements in ABB circuit breaker technology has pushed the performance of breakers to the same level as fuses. The reaction time and tripping characteristics of current limiting breakers are now on par with fuses. This allows ABB to provide a high level of coordination between branch breakers and the main. A current limiting branch breaker will limit the “I Square T” value well below the level of the operating range of the up-stream main breaker.

ABB’s current limiting branch breakers can coordinate between the main breaker up to 35kA.

Selective coordination and zero crossing breakers

Zero crossing breakers do not limit the “I Square T” value. They wait for the wave form to cross zero and allow a high level of let-through energy to pass through the system. The “I Square T” value of a zero crossing breaker is high enough that the main breaker will likely trip during a short circuit. With zero crossing breakers it is extremely difficult to coordinate between branch and main breakers.

A typical zero crossing breaker’s coordination level is below 10kA. There are a few manufactures that have achieved coordination between a branch zero crossing breaker and the main by slowing the performance (protection) of the main breaker.

Selective coordination and series ratings

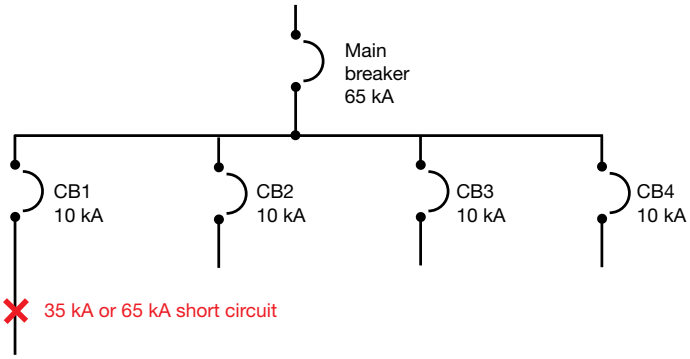
Series ratings –vs- selective coordination

Selective coordination

Selective coordination is achieved when there is a short circuit on a branch circuit breaker, the branch breaker opens and isolates the fault, and the main breaker remains closed. The rating is usually a value above the “stand alone” interrupting rating of the branch breaker and the “stand alone” rating of the main breaker.

Example:
65kA rated main breaker
10kA rated branch breaker
Coordination between the two breakers up to 35kA

There can be a short circuit on the branch breaker up to 35kA where the branch will open (CB1) and the main breaker will remain closed. Although the branch has a 10kA “stand alone” rating both the breakers work together to limit the available short circuit to allow the branch (CB1) to isolate the fault.



Series ratings

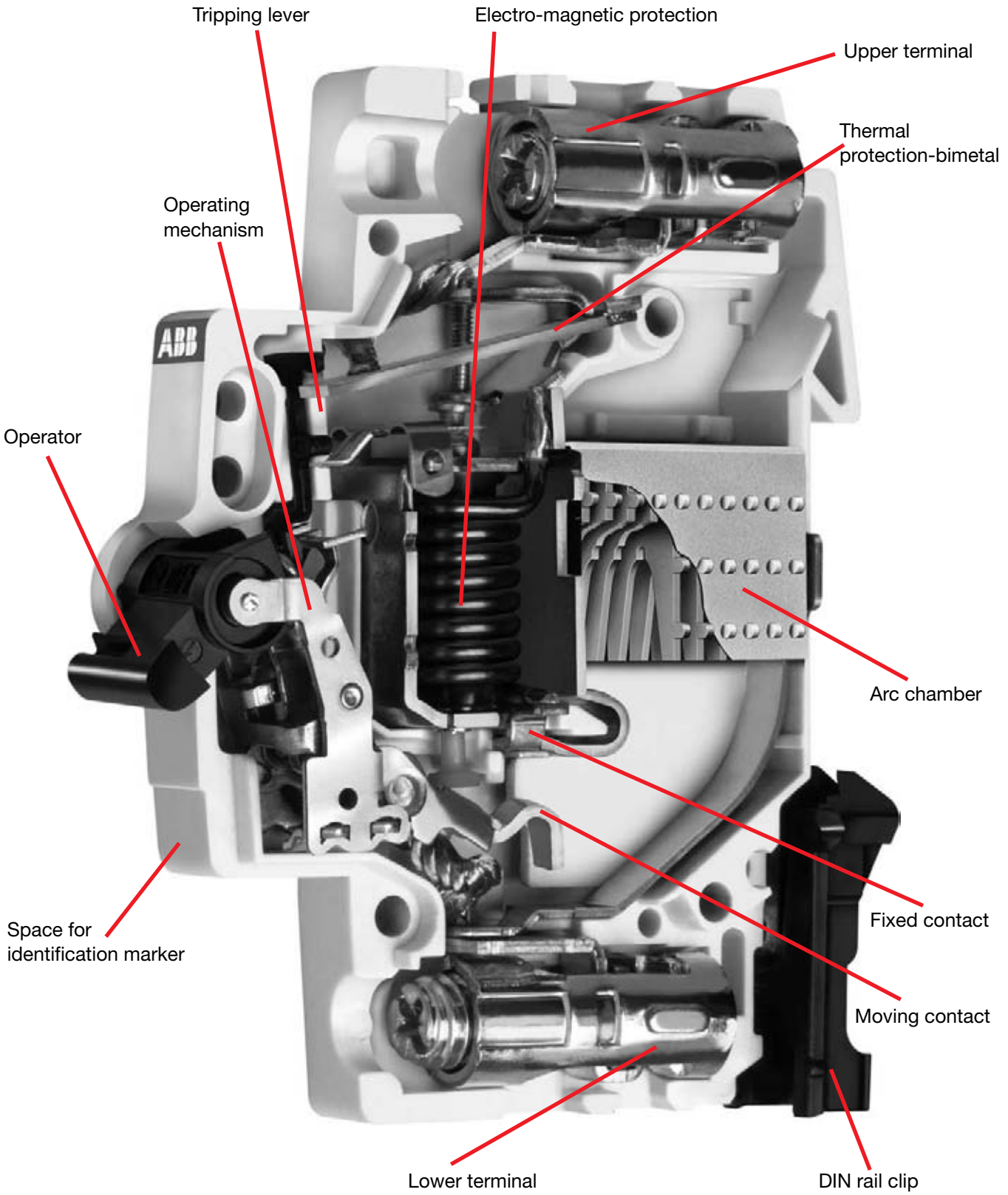
Series ratings are different from coordination ratings. Unlike coordination ratings where the branch opens and the main remains closed, a series rated combination is one where both the branch and main breakers open and work together to isolate the fault.

The series rating combination of two breakers is equal to the “stand alone” interrupting value of the main breaker. This is a result of the main breaker let-through value being lower than the “stand alone” interrupting value of the branch breaker. During a short circuit the main breaker will limit the energy to a level that is below the “stand alone” value of the branch breaker.

Example:
65kA rated main breaker
10kA rated branch breaker
Series combination rating between the two breakers up to 65kA

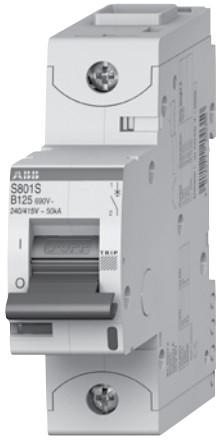
There can be a short circuit on the branch breaker up to 65kA where the branch will open and the main breaker will open. Although the branch breaker (CB1) has a 10kA “stand alone” rating the main breaker has a let-through value below 10kA. If there is a fault up to 65kA on the network the main breaker will limit the energy to a value less than the rating of the branch breaker (CB1). Both breakers will trip (no coordination) but the network can safely withstand a fault of 65kA.

Miniature circuit breaker cutaway



S800 Series
High Performance Circuit Breakers

S800
UL 489 Series



Description

The S800 high performance MCB offers a compact solution to circuit protection. The S800 devices are UL tested current limiting and DIN rail mounted. The S800 is available with application-specific trip characteristics to provide maximum circuit protection.

The breakers offer thermal-magnetic trip protection according to Z and K characteristics.

For the worldwide market, the breakers carry CSA, IEC, CE and many other agency approvals.

Features

- Current limiting
- Fast breaking time (2.3 – 2.5 ms)
- Wide range of accessories
- DIN rail mounting
- Finger safe terminals
- Multi-function terminals
- Ring tongue compatible
- UL489 File # E312425

	S800U
Amperage	10 – 100 A
Voltage	240 VAC
Poles	1, 2, 3, 4 poles
Trip characteristics	Z, K
Interrupting ratings	50kA: UL 489
Auxiliary contacts	Yes
Bell alarm	Yes
Shunt trip	Yes
Undervoltage release	Yes
Ring tongue	Yes

S800U-K, 240 VAC
Branch circuit protection
UL 489

K

S801U-K

S802U-K

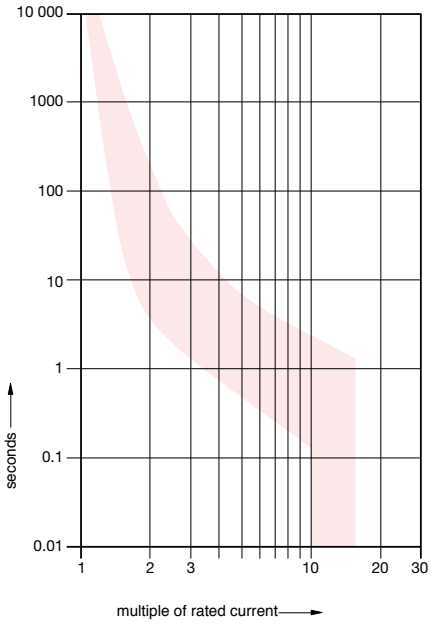
S803U-K

S804U-K

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	10	**S801U-K10**	3	10	**S803U-K10**
	15	**S801U-K15**		15	**S803U-K15**
	20	**S801U-K20**		20	**S803U-K20**
	25	**S801U-K25**		25	**S803U-K25**
	30	**S801U-K30**		30	**S803U-K30**
	40	**S801U-K40**		40	**S803U-K40**
	50	**S801U-K50**		50	**S803U-K50**
	60	**S801U-K60**		60	**S803U-K60**
	70	**S801U-K70**		70	**S803U-K70**
	80	**S801U-K80**		80	**S803U-K80**
	90	**S801U-K90**		90	**S803U-K90**
	100	**S801U-K100**		100	**S803U-K100**
2	10	**S802U-K10**	4	10	**S804U-K10**
	15	**S802U-K15**		15	**S804U-K15**
	20	**S802U-K20**		20	**S804U-K20**
	25	**S802U-K25**		25	**S804U-K25**
	30	**S802U-K30**		30	**S804U-K30**
	40	**S802U-K40**		40	**S804U-K40**
	50	**S802U-K50**		50	**S804U-K50**
	60	**S802U-K60**		60	**S804U-K60**
	70	**S802U-K70**		70	**S804U-K70**
	80	**S802U-K80**		80	**S804U-K80**
	90	**S802U-K90**		90	**S804U-K90**
	100	**S802U-K100**		100	**S804U-K100**

Tripping characteristic K
UL 489
240 VAC
50 kA

Resistive loads
- K Curve
- Designed for use in cable protection applications
- Example: control circuits, lighting



Accessories & technical data
Accessories – See page 52
Technical data – See page 76 - 82

S800U-Z, 240 VAC
Branch circuit protection
UL 489

Z

S801U-Z

S802U-Z

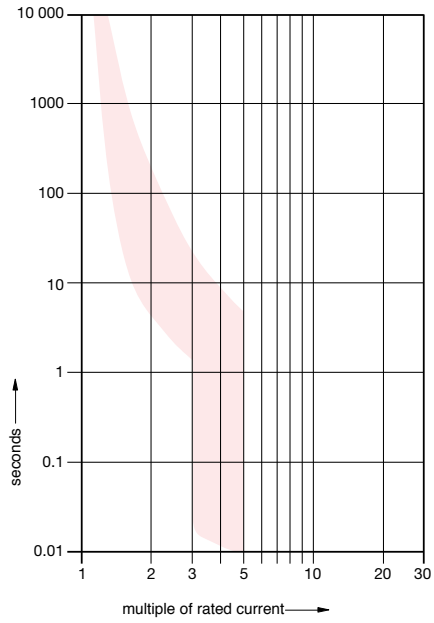
S803U-Z

S804U-Z

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	10	**S801U-Z10**	3	10	**S803U-Z10**
	15	**S801U-Z15**		15	**S803U-Z15**
	20	**S801U-Z20**		20	**S803U-Z20**
	25	**S801U-Z25**		25	**S803U-Z25**
	30	**S801U-Z30**		30	**S803U-Z30**
	40	**S801U-Z40**		40	**S803U-Z40**
	50	**S801U-Z50**		50	**S803U-Z50**
	60	**S801U-Z60**		60	**S803U-Z60**
	70	**S801U-Z70**		70	**S803U-Z70**
	80	**S801U-Z80**		80	**S803U-Z80**
	90	**S801U-Z90**		90	**S803U-Z90**
	100	**S801U-Z100**		100	**S803U-Z100**
2	10	**S802U-Z10**	4	10	**S804U-Z10**
	15	**S802U-Z15**		15	**S804U-Z15**
	20	**S802U-Z20**		20	**S804U-Z20**
	25	**S802U-Z25**		25	**S804U-Z25**
	30	**S802U-Z30**		30	**S804U-Z30**
	40	**S802U-Z40**		40	**S804U-Z40**
	50	**S802U-Z50**		50	**S804U-Z50**
	60	**S802U-Z60**		60	**S804U-Z60**
	70	**S802U-Z70**		70	**S804U-Z70**
	80	**S802U-Z80**		80	**S804U-Z80**
	90	**S802U-Z90**		90	**S804U-Z90**
	100	**S802U-Z100**		100	**S804U-Z100**

Tripping characteristic Z
UL 489
240 VAC
50 kA

Resistive loads
- Z Curve
- Designed for use in cable protection applications
- Example: control circuits, lighting

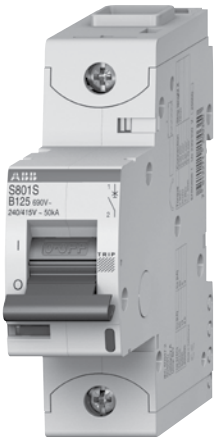


Accessories & technical data
Accessories – See page 15.52
Technical data – See page 15.76 - 82

Notes

S800 Series
High Performance Circuit Breakers

S800
IEC Series



Description

The S800 high performance MCB offers a compact solution to circuit protection. The S800 devices are IEC tested current limiting and DIN rail mounted. The S800 is available with application-specific trip characteristics to provide maximum circuit protection.

The breakers offer thermal-magnetic trip protection according to B, C, D & K characteristics.

For the worldwide market, the breakers carry CSA, IEC, CE and many other agency approvals.

Features

- Current limiting
- Fast breaking time (2.3 – 2.5 ms)
- Wide range of accessories
- DIN rail mounting
- Finger safe terminals
- Multi-function terminals
- Ring tongue compatible

	S800S
Amperage	10 – 125 A
Voltage	690 VAC
Poles	1, 2, 3, 4
Trip characteristics	B, C, D, K
Interrupting ratings	50 kA: IEC
Auxiliary contacts	Yes
Bell alarm	Yes
Shunt trip	Yes
Undervoltage release	Yes
Ring tongue	Yes

S800S-B, 690 VAC
IEC

B

S801U-B

S802U-B

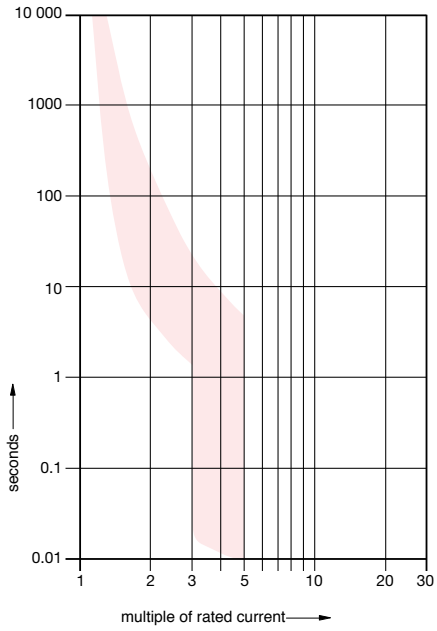
S803U-B

S804U-B

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	10	**S801S-B10**	3	10	**S803S-B10**
	13	**S801S-B13**		13	**S803S-B13**
	16	**S801S-B16**		16	**S803S-B16**
	20	**S801S-B20**		20	**S803S-B20**
	25	**S801S-B25**		25	**S803S-B25**
	32	**S801S-B32**		32	**S803S-B32**
	40	**S801S-B40**		40	**S803S-B40**
	50	**S801S-B50**		50	**S803S-B50**
	63	**S801S-B63**		63	**S803S-B63**
	80	**S801S-B80**		80	**S803S-B80**
	100	**S801S-B100**		100	**S803S-B100**
	125	**S801S-B125**		125	**S803S-B125**
2	10	**S802S-B10**	4	10	**S804S-B10**
	13	**S802S-B13**		13	**S804S-B13**
	16	**S802S-B16**		16	**S804S-B16**
	20	**S802S-B20**		20	**S804S-B20**
	25	**S802S-B25**		25	**S804S-B25**
	32	**S802S-B32**		32	**S804S-B32**
	40	**S802S-B40**		40	**S804S-B40**
	50	**S802S-B50**		50	**S804S-B50**
	63	**S802S-B63**		63	**S804S-B63**
	80	**S802S-B80**		80	**S804S-B80**
	100	**S802S-B100**		100	**S804S-B100**
	125	**S802S-B125**		125	**S804S-B125**

Tripping characteristic B
IEC
690 VAC
50 kA

Resistive loads
- B Curve
- Designed for use in cable protection applications
- Example: control circuits, lighting



Accessories & technical data
Accessories – See page 52
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S800S-C, 690 VAC
IEC

C

S801S-C

S802S-C

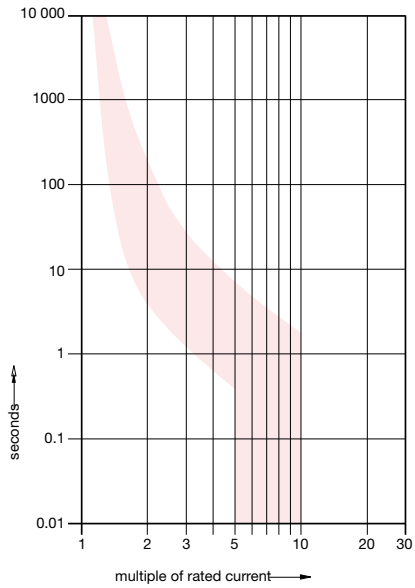
S803S-C

S804S-C

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	10	**S801S-C10**	3	10	**S803S-C10**
	13	**S801S-C13**		13	**S803S-C13**
	16	**S801S-C16**		16	**S803S-C16**
	20	**S801S-C20**		20	**S803S-C20**
	25	**S801S-C25**		25	**S803S-C25**
	32	**S801S-C32**		32	**S803S-C32**
	40	**S801S-C40**		40	**S803S-C40**
	50	**S801S-C50**		50	**S803S-C50**
	63	**S801S-C63**		63	**S803S-C63**
	80	**S801S-C80**		80	**S803S-C80**
	100	**S801S-C100**		100	**S803S-C100**
	125	**S801S-C125**		125	**S803S-C125**
2	10	**S802S-C10**	4	10	**S804S-C10**
	13	**S802S-C13**		13	**S804S-C13**
	16	**S802S-C16**		16	**S804S-C16**
	20	**S802S-C20**		20	**S804S-C20**
	25	**S802S-C25**		25	**S804S-C25**
	32	**S802S-C32**		32	**S804S-C32**
	40	**S802S-C40**		40	**S804S-C40**
	50	**S802S-C50**		50	**S804S-C50**
	63	**S802S-C63**		63	**S804S-C63**
	80	**S802S-C80**		80	**S804S-C80**
	100	**S802S-C100**		100	**S804S-C100**
	125	**S802S-C125**		125	**S804S-C125**

Tripping characteristic C
IEC
690 VAC
50 kA

Resistive loads
- C Curve
- Designed for use with medium magnetic start up currents
- Example: lighting, control panels



Accessories & technical data
Accessories – See page 52
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S800S-D, 690 VAC
IEC

D

S801S-D

S802S-D

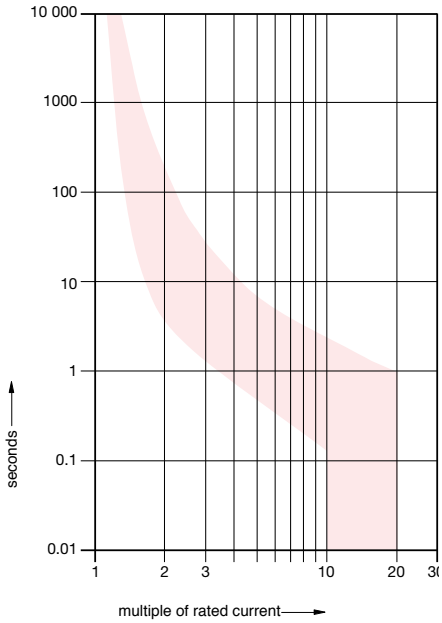
S803S-D

S804S-D

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	10	**S801S-D10**	3	10	**S803S-D10**
	13	**S801S-D13**		13	**S803S-D13**
	16	**S801S-D16**		16	**S803S-D16**
	20	**S801S-D20**		20	**S803S-D20**
	25	**S801S-D25**		25	**S803S-D25**
	32	**S801S-D32**		32	**S803S-D32**
	40	**S801S-D40**		40	**S803S-D40**
	50	**S801S-D50**		50	**S803S-D50**
	63	**S801S-D63**		63	**S803S-D63**
	80	**S801S-D80**		80	**S803S-D80**
	100	**S801S-D100**		100	**S803S-D100**
	125	**S801S-D125**		125	**S803S-D125**
2	10	**S802S-D10**	4	10	**S804S-D10**
	13	**S802S-D13**		13	**S804S-D13**
	16	**S802S-D16**		16	**S804S-D16**
	20	**S802S-D20**		20	**S804S-D20**
	25	**S802S-D25**		25	**S804S-D25**
	32	**S802S-D32**		32	**S804S-D32**
	40	**S802S-D40**		40	**S804S-D40**
	50	**S802S-D50**		50	**S804S-D50**
	63	**S802S-D63**		63	**S804S-D63**
	80	**S802S-D80**		80	**S804S-D80**
	100	**S802S-D100**		100	**S804S-D100**
	125	**S802S-D125**		125	**S804S-D125**

Tripping characteristic D
IEC
690 VAC
50 kA

Inductive loads
- D Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers



Accessories & technical data
Accessories – See page 52
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S800S-K, 690 VAC
IEC

K

S801S-K

S802S-K

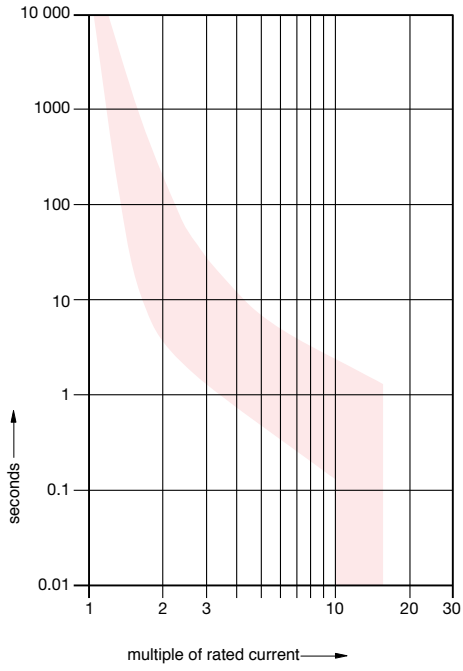
S803S-K

S804S-K

No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	10	**S801S-K10**	3	10	**S803S-K10**
	13	**S801S-K13**		13	**S803S-K13**
	16	**S801S-K16**		16	**S803S-K16**
	20	**S801S-K20**		20	**S803S-K20**
	25	**S801S-K25**		25	**S803S-K25**
	32	**S801S-K32**		32	**S803S-K32**
	40	**S801S-K40**		40	**S803S-K40**
	50	**S801S-K50**		50	**S803S-K50**
	63	**S801S-K63**		63	**S803S-K63**
	80	**S801S-K80**		80	**S803S-K80**
	100	**S801S-K100**		100	**S803S-K100**
	125	**S801S-K125**		125	**S803S-K125**
2	10	**S802S-K10**	4	10	**S804S-K10**
	13	**S802S-K13**		13	**S804S-K13**
	16	**S802S-K16**		16	**S804S-K16**
	20	**S802S-K20**		20	**S804S-K20**
	25	**S802S-K25**		25	**S804S-K25**
	32	**S802S-K32**		32	**S804S-K32**
	40	**S802S-K40**		40	**S804S-K40**
	50	**S802S-K50**		50	**S804S-K50**
	63	**S802S-K63**		63	**S804S-K63**
	80	**S802S-K80**		80	**S804S-K80**
	100	**S802S-K100**		100	**S804S-K100**
	125	**S802S-K125**		125	**S804S-K125**

Tripping characteristic K
IEC
690 VAC
50 kA

Inductive loads
- K Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers



Accessories & technical data
Accessories – See page 52
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Accessories
S800 & S800S

S800-SOR

S800-UVR

S800-AUX

S800-AUX/ALT

Shunt trip
For remote tripping of breaker, a shunt trip device can be added to the MCB. The device opens the breaker after control voltage is applied.

Description (for field mounting, left side)	Catalog number
Shunt operation release 24 VAC/DC	**S800-SOR24**
Shunt operation release 48...130 VAC/DC	**S800-SOR130**
Shunt operation release 110...250 VAC/DC	**S800-SOR250**

Undervoltage release
When control voltage drops below approximately 50 % of rated voltage, the UVR opens the breaker. The breaker can not be operated unless proper control voltage is first applied to the UVR coil.

Description	Catalog number
Under voltage release 24...36 VAC/DC	**S800-UVR36**
Under voltage release 48...60 VAC/DC	**S800-UVR60**
Under voltage release 110...130 VAC/DC	**S800-UVR130**
Under voltage release 220...250 VAC/DC	**S800-UVR250**

Auxiliary contacts
The auxiliary contacts will signal whether the breaker is in the ON or OFF position.

Description	Catalog number
Auxiliary contact	**S800-AUX**

Bell alarm
The bell alarm includes a set of contacts that will only signal when the breaker has tripped. Typically the contacts would be connected to an alarm or bell to signal the operator that an overcurrent trip has occurred. The bell alarm also includes a test button for testing the alarm contacts without opening the breaker.

Description	Catalog number
Bell alarm	**S800-AUX/ALT**

Accessories
S800U & S800S


S800-RT2125


S800-RD


S800-RHE-H


S800-RHE-EM


S800-RHE-S

Ring tongue adaptor

Description	Catalog number
Ring terminal cable connection	**S800-RT2125**

Rotary operating mechanism
Allows “through the door” operation.

Description	Catalog number
Handle mechanism	**S800-RD**

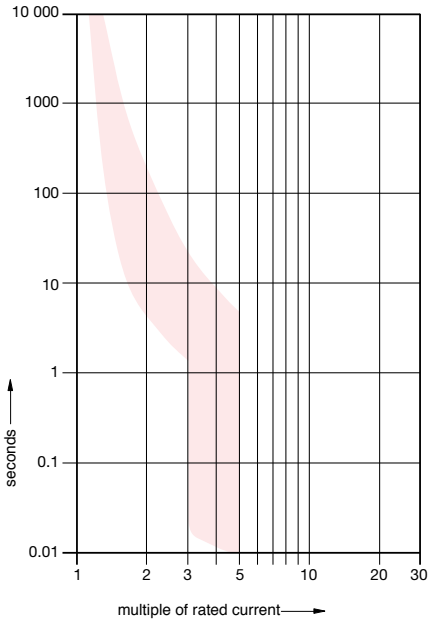
Description	Catalog number
Grey rotary handle	**S800-RHE-H**

Description	Catalog number
Red rotary handle	**S800-RHE-EM**

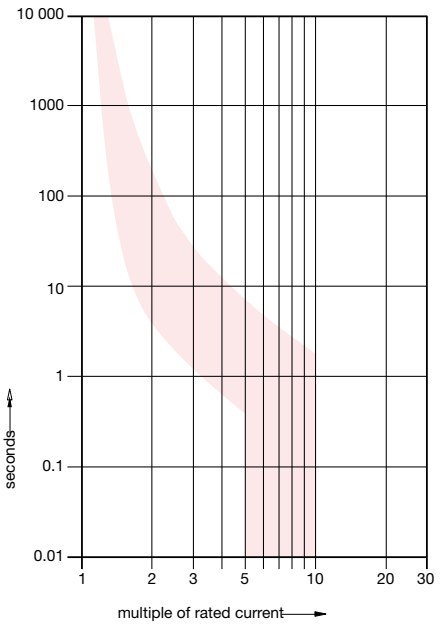
Description	Catalog number
Shaft extension	**S800-RHE-S**

Technical data
S800S
IEC

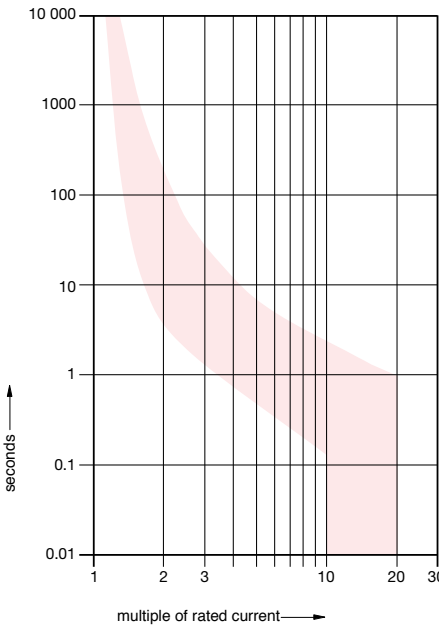
Tripping Characteristic B



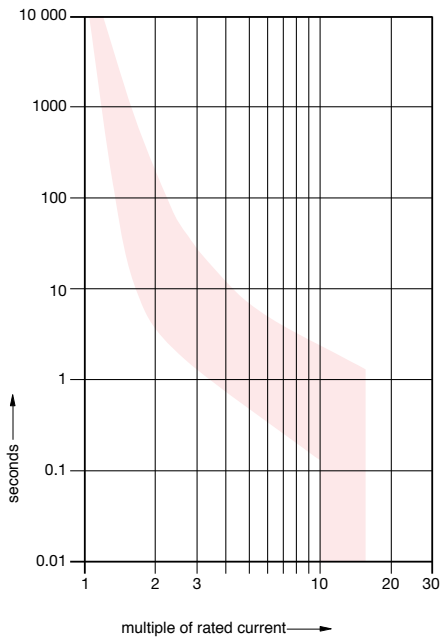
Tripping Characteristic C



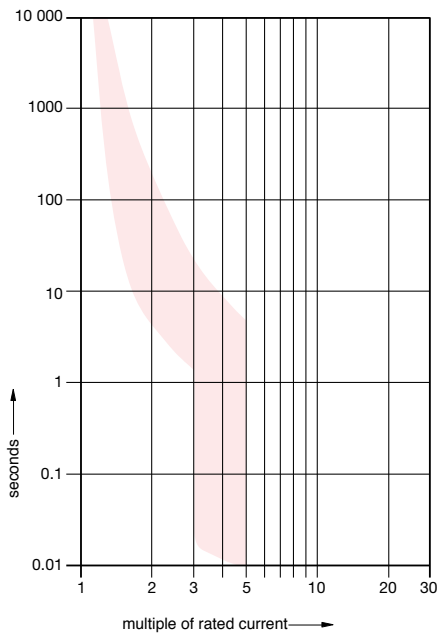
Tripping Characteristic D



Tripping Characteristic K



Tripping Characteristic Z



Internal resistance and power loss

Internal resistance per pole in mΩ, power loss per pole in W

Type	Rated current A	Device series B C D K mΩ	Power loss B C D K W
S800S	10	15.2	1.5
	13	12.1	2.0
	16	12.1	3.1
	20	8.7	3.5
	25	6.8	4.2
	32	3.1	3.1
	40	2.3	3.7
	50	1.7	4.3
	63	1.6	6.2
	80	1.0	6.4
	100	0.8	8.3
	125	0.6	9.4

Temperature derating

Max. operating current values depending on the ambient temperature for a circuit-breaker in load circuit of type B, C, D, & K characteristics.

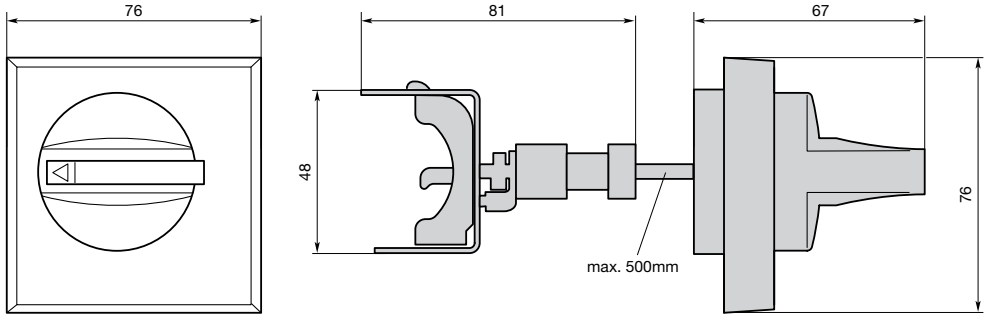
S800S-B, -C, -D	Ambient temperature T (°C/°F)										
In [A]	10/50	15/59	20/68	25/77	30/86	35/95	40/104	45/113	50/122	55/131	60/140
10	11.2	11.0	10.7	10.4	10.0	9.6	9.3	9.0	8.7	8.4	8.0
13	14.6	14.3	13.9	13.5	13.0	12.5	12.1	11.7	11.3	10.9	10.4
16	17.9	17.6	17.1	16.6	16.0	15.4	14.9	14.4	13.9	13.4	12.8
20	22.4	22.0	21.4	20.8	20.0	19.2	18.6	18.0	17.4	16.8	16.0
25	28.0	27.5	26.8	26.0	25.0	24.0	23.3	22.5	21.8	21.0	20.0
32	35.8	35.2	34.2	33.3	32.0	30.7	29.8	28.8	27.8	26.9	25.6
40	44.8	44.0	42.8	41.6	40.0	38.4	37.2	36.0	34.8	33.6	32.0
50	56.0	55.0	53.5	52.0	50.0	48.0	46.5	45.0	43.5	42.0	40.0
63	70.6	69.3	67.4	65.5	63.0	60.5	58.6	56.7	54.8	52.9	50.4
80	89.6	88.0	85.6	83.2	80.0	76.8	74.4	72.0	69.6	67.2	64.0
100	112.0	110.0	107.0	104.0	100.0	96.0	93.0	90.0	87.0	84.0	80.0
125	140.0	137.5	133.8	130.0	125.0	120.0	116.3	112.5	108.8	105.0	100.0

S800S-K	Ambient temperature T (°C/°F)										
In [A]	10/50	15/59	20/68	25/77	30/86	35/95	40/104	45/113	50/122	55/131	60/140
10	11.9	11.6	11.2	11.0	10.7	10.4	10.0	9.6	9.3	9.0	8.7
13	15.6	15.1	14.6	14.3	13.9	13.5	13.0	12.5	12.1	11.7	11.3
16	19.1	18.6	17.9	17.6	17.1	16.6	16.0	15.4	14.9	14.4	13.9
20	23.9	23.2	22.4	22.0	21.4	20.8	20.0	19.2	18.6	18.0	17.4
25	29.9	29.1	28.0	27.5	26.8	26.0	25.0	24.0	23.3	22.5	21.8
32	38.2	37.2	35.8	35.2	34.2	33.3	32.0	30.7	29.8	28.8	27.8
40	47.8	46.5	44.8	44.0	42.8	41.6	40.0	38.4	37.2	36.0	34.8
50	59.7	58.1	56.0	55.0	53.5	52.0	50.0	48.0	46.5	45.0	43.5
63	75.3	73.2	70.6	69.3	67.4	65.5	63.0	60.5	58.6	56.7	54.8
80	95.6	93.0	89.6	88.0	85.6	83.2	80.0	76.8	74.4	72.0	69.6
100	119.5	116.2	112.0	110.0	107.0	104.0	100.0	96.0	93	90.0	87.0
125	149.4	145.3	140.0	137.5	133.8	130.0	125.0	120.0	116.3	112.5	108.8

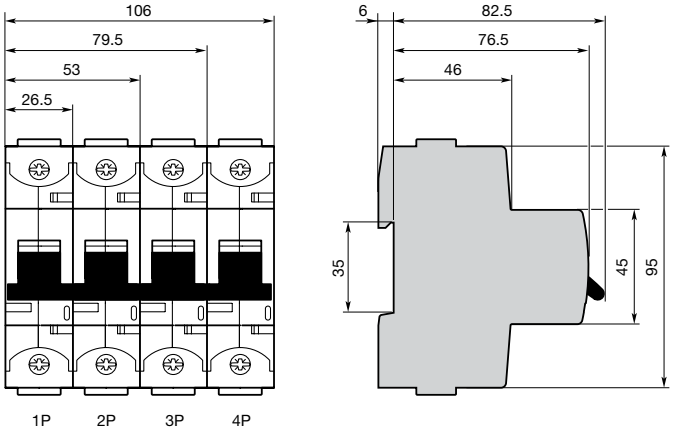
Approximate dimensions
S800U & S800S

Dimension drawings in mm

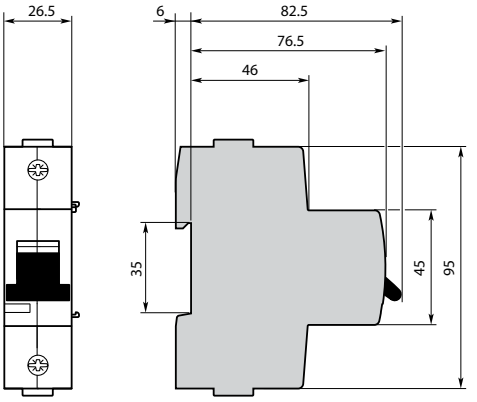
S800-RD & S800-RHE



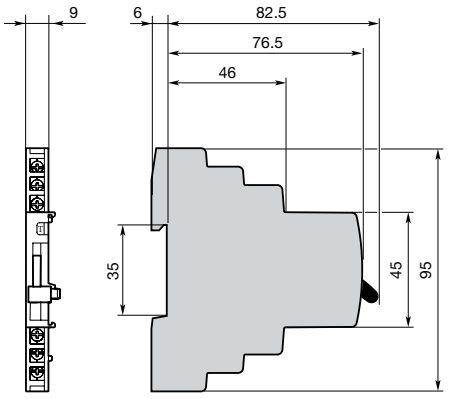
S800S & S800U



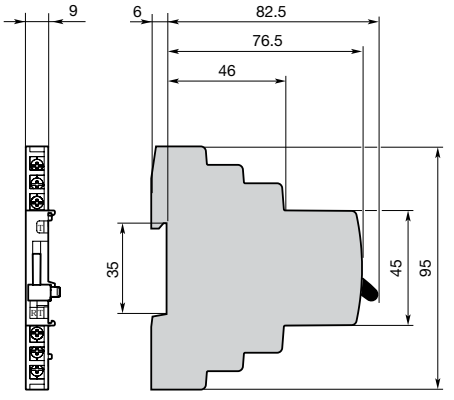
S800-SOR & S800-UVR



S800-AUX



S800-AUX/ALT



Auxiliary contact S800-AUX

	S800-AUX
Usage category	AC15 400/2 A-UL AC15 240/ -UL DC13 250/0.55 A125 V/1.1A-IEC DC13 125 V/1.1A DC13 60 V/2A DC13 24 V/4A
Continuous thermal current **I_n**	6 A
Rated insulation voltage **U_i**	690 V
Number of contacts	2
Surge **U_{test}** (1.2/50µs)	6 kV
Degree of protection	3
Function of contact	Changeover contacts
Connection Cu	1 x 2.5 mm² 2 x 1.5 mm²
Tightening torque	1 Nm
Ensured contacts during shake test	5g, 20 frequency cycle
acc. to IEC 68-2-6	at 24 VAC/DC, 5mA brief interrupt <10 ms
AC/DC supply	any EN 60715
Mounting on DIN top hat rail	EN 60715 IP20
Type of protection	IP20
Permissible ambient temperature for operations	-25...+60 °C; -13 °F... 140 °F
Storage temperature	-40...+70 °C; -40 °F... 158 °F
Mechanical device service life	6000 switching cycles
I_{cu} with S450E	1000 A
Resistance to vibration	IEC 60068-2-27; IEC 60068-2; EN 61373 Cat.1/class B

Undervoltage release S800-UVR

	S800-UVR36	S800-UVR60	S800-UVR130	S800-UVR250
Rated voltage U_e	24...36 VAC/DC	48...60 VAC/DC	110...130 VAC/DC	220...250 VAC/DC
Operating range				
Operating opening	35...70% Ue			
Operating clothing	85% Ue			
Rated insulation voltage U_i	690 V			
Coil pull in consumption	1 W, 14 vA	1 W, 25 vA	1 W, 41 vA	1 W, 91 vA
Rated frequency	DC; 50/60 Hz			
Protection degree	3			
Connection Cu	1...35 cable			
Tightening torque	min.3/ max.4 Nm			
AC/DC supply	any			
DIN top hat rail	EN 60715			
Type of protection	IP20 IP40 (only actuation side)			
Permissible ambient temperature of operations	-25...+60 °C; -13 °F... 140 °F			
Storage temperature	-40...+70 °C; -40 °F... 158 °F			
Resistance to vibration	IEC 60068-2-27; IEC 60068-2; EN61373 Cat.1/class B			

Technical data
S800U & S800S
Accessories

Combined auxiliary and bell alarm

Usage category	AC15 400/2A-UL AC15 240/6A-UL DC13 250/0.55A125V/1.1A-IEC DC13 125V/1.1A-IEC DC13 60V/2A DC13 24V/4A
Continuous thermal current $\mathbf{I_n}$	6 A
Rated insulation voltage $\mathbf{U_i}$	690 V
Number of contacts	2 (1x AUX, 1 x AUX/ALT)
Surge $\mathbf{U_{test}}$ (1.2/50µs)	6 kV
Degree of protection	3
Function of contact	Changeover contacts
Connection Cu	1 x 2.5 mm² 2 x 1.5 mm²
Tightening torque	1 Nm
Ensured contacts during shake test	5g, 20 frequency cycle
acc. to IEC 68-2-6	5...150...5Hz at 24VAC/DC, 5mA brief interrupt <10ms
AC/DC supply	any EN 60715
Mounting on DIN top hat rail	EN 60715
Type of protection	IP20
Permissible ambient temperature for operations	-25 °C... 60 °C; -13 °F... 140 °F
Storage temperature	-40 °C... 70 °C; -40 °F... 150 °F
mech. Device service life	6000 switching cycles
I_{cu} with S450E	1000 A
Resistance to vibration	IEC 60068-2-27; IEC 60068-2; EN 61373 Cat.1/class B

Shunt operation release – S800-SOR

	S800-SOR24	S800-SOR130	S800-SOR250	S800-SOR400
Rated voltage U_e	24 VAC/DC	48...130 VAC/DC	110...250 VAC/DC	220...250
Operating range	70... 110% Ue			
Rated insulation voltage U_i	690 V			
Coil pull in consumption	19.2 W/vA	On request		
Rated frequency	DC; 50/60 Hz			
Degree of protection	3			
Connection Cu	1...35 AWG			
Tightening torque	min.3/ max.4 Nm			
AC/DC supply	any			
DIN top hat rail	EN 60715			
Type of protection	IP20; IP40 (only actuation side)			
Permissible ambient temperature of operations	-25 °C... 60 °C; -13 °F... 140 °F			
Storage temperature	-40 °C... 70 °C; -40 °F... 158 °F			
Resistance to vibration	IEC 60068-2-27; IEC 60068-2; EN61373 Cat.1/class B			

Technical data
Backup
S800S - S200 @ 230/400 V

		E.	S800S							
	Char.		B, C, D, K							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S200	B	6	6	50	50	50	50	50	50	50	50
			10	50	50	50	50	50	50	50	50
			13	50	50	50	50	50	50	50	50
			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

		E.	S800S							
	Char.		B, C, D, K							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S200	C	6	0.5…6	50	50	50	50	50	50	50	50
			8	50	50	50	50	50	50	50	50
			10	50	50	50	50	50	50	50	50
			13	50	50	50	50	50	50	50	50
			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

		E.	S800S							
	Char.		B, C, D, K							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S200P	B	25	6…16	50	50	50	50	50	50	50	50
			20		50	50	50	50	50	50	50
			25			50	50	50	50	50	50
		15	32				50	50	50	50	50
			40					50	50	50	50
			50						50	50	50
			63							50	50

		E.	S800S							
	Char.		B, C, D, K							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S200P	C	25	0.5…16	50	50	50	50	50	50	50	50
			20		50	50	50	50	50	50	50
			25			50	50	50	50	50	50
		15	32				50	50	50	50	50
			40					50	50	50	50
			50						50	50	50
			63							50	50

LEGEND

E. = supply side
L. = load side
Back-up limit values are specified in kA

Technical data
Selectivity
S800S - S200 @ 230/400 V

		E.	S800S							
	Char.		B							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S200	B	6	6			0.4	0.5	0.7	1	1.5	2.6
			10				0.4	0.6	0.7	1	1.4
			13					0.5	0.7	0.9	1.3
			16						0.7	0.9	1.3
			20							0.9	1.3
			25							0.9	1.3
			32							0.8	1.1
			40							0.8	1.1
			50								1
			63								0.9

		E.	S800S							
	Char.		B							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S200	C	6	0.5	T	T	T	T	T	T	T	T
			1	3.3	T	T	T	T	T	T	T
			1.6	0.6	1.3	T	T	T	T	T	T
			2	0.4	0.7	1.3	T	T	T	T	T
			3		0.4	0.6	0.7	1.1	2.6	T	T
			4		0.4	0.6	0.7	1	1.7	3.1	T
			6			0.4	0.5	0.7	1	1.5	2.6
			8				0.4	0.6	0.7	1	1.4
			10				0.4	0.6	0.7	1	1.4
			13					0.5	0.7	0.9	1.3
			16						0.7	0.9	1.3
			20							0.9	1.3
			25							0.9	1.3
			32							0.8	1.1
			40							0.8	1.1
			50								1
			63								0.9

		E.	S800S							
	Char.		B							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S200	D	6	0.5	T	T	T	T	T	T	T	T
			1	0.8	4.5	T	T	T	T	T	T
			1.6	0.5	1	2.3	T	T	T	T	T
			2	0.3	0.5	0.7	2.3	T	T	T	T
			3		0.4	0.5	0.7	1.2	2.5	T	T
			4		0.4	0.4	0.7	1	1.7	3	T
			6				0.6	0.8	1.2	2	3.6
			8					0.7	0.9	1.3	2
			10						0.9	1.3	2
			13							1	1.5
			16								1.5
			20								
			25								
			32								
			40								
			50								
			63								

		E.	S800S							
	Char.		B							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S200	K	6	0.5	T	T	T	T	T	T	T	T
			1	0.8	5	T	T	T	T	T	T
			1.6	0.5	1	2.1	T	T	T	T	T
			2	0.3	0.5	0.7	2.1	T	T	T	T
			3		0.4	0.5	0.7	1.2	2.5	T	T
			4		0.4	0.4	0.7	1	1.7	3	T
			6				0.6	0.8	1.2	2	3.6
			8					0.7	0.9	1.3	2
			10						0.9	1.3	2
			13							1	1.5
			16								1.5
			20								
			25								
			32								
			40								
			50								
			63								

LEGEND

E. = supply side
L. = load side
Back-up limit values are specified in kA

Technical data
Selectivity
S800S - S200 @ 230/400 V

L.	Char.	Icu [kA]	E.	S800S C 50							
			In [A]	25	32	40	50	63	80	100	125
S200	B	6	6		0.4	0.5	0.7	0.9	1.4	2.4	4.8
			10		0.3	0.4	0.5	0.7	0.9	1.3	2
			13		0.3	0.4	0.5	0.7	0.9	1.3	1.9
			16		0.3	0.4	0.5	0.7	0.9	1.3	1.9
			20			0.4	0.5	0.7	0.9	1.2	1.8
			25			0.4	0.5	0.7	0.9	1.2	1.8
			32				0.5	0.6	0.8	1	1.4
			40					0.6	0.8	1	1.4
			50						0.7	0.9	1.3
			63							0.9	1.2

L.	Char.	Icu [kA]	E.	S800S C 50							
			In [A]	25	32	40	50	63	80	100	125
S200	C	6	0.5	T	T	T	T	T	T	T	T
			1	T	T	T	T	T	T	T	T
			1.6	0.6	T	T	T	T	T	T	T
			2	0.5	1	T	T	T	T	T	T
			3	0.3	0.5	0.7	1.2	2.1	T	T	T
			4	0.3	0.4	0.7	1	1.5	2.6	T	T
			6		0.4	0.5	0.7	0.9	1.4	2.4	4.8
			8		0.3	0.4	0.5	0.7	0.9	1.3	2
			10		0.3	0.4	0.5	0.7	0.9	1.3	2
			13		0.3	0.4	0.5	0.7	0.9	1.3	1.9
			16		0.3	0.4	0.5	0.7	0.9	1.3	1.9
			20			0.4	0.5	0.7	0.9	1.2	1.8
			25			0.4	0.5	0.7	0.9	1.2	1.8
			32				0.5	0.6	0.8	1	1.4
			40					0.6	0.8	1	1.4
			50						0.7	0.9	1.3
			63							0.9	1.2

L.	Char.	Icu [kA]	E.	S800S C 50							
			In [A]	25	32	40	50	63	80	100	125
S200	D	6	0.5	T	T	T	T	T	T	T	T
			1	2.1	T	T	T	T	T	T	T
			1.6	0.8	2.3	T	T	T	T	T	T
			2	0.4	0.7	2.3	T	T	T	T	T
			3	0.3	0.5	0.7	1.2	2.2	T	T	T
			4	0.3	0.4	0.7	1	1.4	2.6	T	T
			6		0.4	0.6	0.8	1.1	1.8	3.2	T
			8			0.5	0.7	0.9	1.2	1.8	2.8
			10				0.7	0.9	1.2	1.8	2.8
			13					0.7	1	1.4	2
			16						1	1.4	2
			20							1	1.4
			25								1.4
			32								
			40								
			50								
			63								

L.	Char.	Icu [kA]	E.	S800S C 50							
			In [A]	25	32	40	50	63	80	100	125
S200	K	6	0.5	T	T	T	T	T	T	T	T
			1	2.1	T	T	T	T	T	T	T
			1.6	0.8	2.3	T	T	T	T	T	T
			2	0.4	0.7	2.3	T	T	T	T	T
			3	0.3	0.5	0.7	1.2	2.2	T	T	T
			4	0.3	0.4	0.7	1	1.4	2.6	T	T
			6		0.4	0.6	0.8	1.1	1.8	3.2	T
			8			0.5	0.7	0.9	1.2	1.8	2.8
			10				0.7	0.9	1.2	1.8	2.8
			13					0.7	1	1.4	2
			16						1	1.4	2
			20							1	1.4
			25								1.4
			32								
			40								
			50								
			63								

LEGEND

E. = supply side
L. = load side
Back-up limit values are specified in kA

Technical data
Selectivity
S800S - S200 @ 230/400 V

		E.	S800S							
	Char.		D							
L.		I_{cu} [kA]	50							
		I_n [A]	25	32	40	50	63	80	100	125
S200	B	6	6	0.5	1	1.2	2	2.8	T	T	T
			10	0.4	0.6	0.8	1.1	1.4	2.8	3.9	T
			13	0.4	0.6	0.8	1.1	1.4	2.5	3.3	T
			16		0.6	0.8	1.1	1.4	2.5	3.3	5.6
			20			0.8	1.1	1.3	2.3	3	4.7
			25			0.8	1.1	1.3	2.3	3	4.7
			32				0.9	1.1	1.9	2.4	3.7
			40					1.1	1.9	2.4	3.7
			50						1.5	1.9	2.3
			63							1.7	2.3

		E.	S800S							
	Char.		D							
L.		I_{cu} [kA]	50							
		I_n [A]	25	32	40	50	63	80	100	125
S200	C	6	0.5	T	T	T	T	T	T	T	T
			1	T	T	T	T	T	T	T	T
			1.6	T	T	T	T	T	T	T	T
			2	T	T	T	T	T	T	T	T
			3	0.7	2.2	4.4	T	T	T	T	T
			4	0.7	1.3	2.2	4.4	T	T	T	T
			6	0.5	1	1.2	2	2.8	T	T	T
			8	0.4	0.6	0.8	1.1	1.4	2.8	3.9	T
			10	0.4	0.6	0.8	1.1	1.4	2.8	3.9	T
			13	0.4	0.6	0.8	1.1	1.4	2.5	3.3	5.6
			16		0.6	0.8	1.1	1.4	2.5	3.3	5.6
			20			0.8	1.1	1.3	2.3	3	4.7
			25			0.8	1.1	1.3	2.3	3	4.7
			32				0.9	1.1	1.9	2.4	3.7
			40					1.1	1.9	2.4	3.7
			50						1.5	1.9	2.3
			63							1.7	2.3

		E.	S800S							
	Char.		D							
L.		I_{cu} [kA]	50							
		I_n [A]	25	32	40	50	63	80	100	125
S200	D	6	0.5	T	T	T	T	T	T	T	T
			1	T	T	T	T	T	T	T	T
			1.6	T	T	T	T	T	T	T	T
			2	2.3	T	T	T	T	T	T	T
			3	0.7	1.3	4.4	T	T	T	T	T
			4	0.7	1	2.2	4.4	T	T	T	T
			6	0.6	0.8	1.5	2.5	3.6	T	T	T
			8	0.5	0.7	1.1	1.5	2	4	5.5	T
			10	0.5	0.7	1.1	1.5	2	4	5.5	T
			13		0.6	0.9	1.2	1.5	2.6	3.4	5.2
			16			0.9	1.2	1.5	2.6	3.4	5.2
			20				0.9	1.1	1.8	2.2	3.2
			25					1.1	1.8	2.2	3.2
			32						1.7	2	2.9
			40							1.9	2.6
			50								2.2
			63								

		E.	S800S							
	Char.		D							
L.		I_{cu} [kA]	50							
		I_n [A]	25	32	40	50	63	80	100	125
S200	K	6	0.5	T	T	T	T	T	T	T	T
			1	T	T	T	T	T	T	T	T
			1.6	T	T	T	T	T	T	T	T
			2	2.3	T	T	T	T	T	T	T
			3	0.7	1.3	4.4	T	T	T	T	T
			4	0.7	1	2.2	4.4	T	T	T	T
			6	0.6	0.8	1.5	2.5	3.6	T	T	T
			8	0.5	0.7	1.1	1.5	2	4	5.5	T
			10	0.5	0.7	1.1	1.5	2	4	5.5	T
			13		0.6	0.9	1.2	1.5	2.6	3.4	5.2
			16			0.9	1.2	1.5	2.6	3.4	5.2
			20				0.9	1.1	1.8	2.2	3.2
			25					1.1	1.8	2.2	3.2
			32						1.7	2	2.9
			40							1.9	2.6
			50								2.2
			63								

LEGEND

E. = supply side
L. = load side
Back-up limit values are specified in kA

Technical data
Selectivity
S800S - S200 @ 230/400 V

L.	Char.	Icu [kA]	E.	S800S B 50							
			In [A]	25	32	40	50	63	80	100	125
S200P	B	25	6			0.4	0.5	0.7	1	1.5	2.6
			10				0.4	0.6	0.7	1	1.4
			13					0.5	0.7	0.9	1.3
			16						0.7	0.9	1.3
			20							0.9	1.3
			25							0.9	1.3
		15	32							0.8	1.1
			40							0.8	1.1
			50								1
			63								0.9

L.	Char.	Icu [kA]	E.	S800S C 50							
			In [A]	25	32	40	50	63	80	100	125
S200P	B	25	6			0.4	0.5	0.7	1	1.5	2.6
			10				0.4	0.6	0.7	1	1.4
			13					0.5	0.7	0.9	1.3
			16						0.7	0.9	1.3
			20							0.9	1.3
			25							0.9	1.3
		15	32							0.8	1.1
			40							0.8	1.1
			50								1
			63								0.9

L.	Char.	Icu [kA]	E.	S800S B 50							
			In [A]	25	32	40	50	63	80	100	125
S200P	C	25	0.5	T	T	T	T	T	T	T	T
			1	3.3	T	T	T	T	T	T	T
			1.6	0.6	1.3	T	T	T	T	T	T
			2	0.4	0.7	1.2	T	T	T	T	T
			3			0.6	0.7	1.1	2.6	8.8	T
			4			0.6	0.7	1	1.7	3.1	7
			6			0.4	0.5	0.7	1	1.5	2.6
			8				0.4	0.6	0.7	1	1.4
			10				0.4	0.6	0.7	1	1.4
			13					0.5	0.7	0.9	1.3
			16						0.7	0.9	1.3
			20							0.9	1.3
			25							0.9	1.3
		15	32							0.8	1.1
			40							0.8	1.1
			50								1
			63								0.9

L.	Char.	Icu [kA]	E.	S800S C 50							
			In [A]	25	32	40	50	63	80	100	125
S200P	C	25	0.5	T	T	T	T	T	T	T	T
			1	3.3	T	T	T	T	T	T	T
			1.6	0.6	1.3	T	T	T	T	T	T
			2	0.4	0.7	1.3	T	T	T	T	T
			3		0.4	0.6	0.7	1.1	2.6	8.8	T
			4		0.4	0.6	0.7	1	1.7	3.1	7
			6			0.4	0.5	0.7	1	1.5	2.6
			8				0.4	0.6	0.7	1	1.4
			10				0.4	0.6	0.7	1	1.4
			13					0.5	0.7	0.9	1.3
			16						0.7	0.9	1.3
			20							0.9	1.3
			25							0.9	1.3
		15	32							0.8	1.1
			40							0.8	1.1
			50								1
			63								0.9

L.	Char.	Icu [kA]	E.	S800S B 50							
			In [A]	25	32	40	50	63	80	100	125
S200P	K	25	0.2	T	T	T	T	T	T	T	T
			0.3	T	T	T	T	T	T	T	T
			0.5	T	T	T	T	T	T	T	T
			0.75	T	T	T	T	T	T	T	T
			1	0.8	5	T	T	T	T	T	T
			1.6	0.5	1	2.3	T	T	T	T	T
			2	0.3	0.5	0.7	2.1	T	T	T	T
			3		0.4	0.5	0.7	1.2	2.5	8.6	T
			4		0.4	0.4	0.7	1	1.7	3	7.7
			6				0.6	0.8	1.2	2	3.6
			8					0.7	0.9	1.3	2
			10						0.9	1.3	2
			13							1	1.5
			16								1.5
			20								
			25								
		15	32								
			40								
			50								
			63								

L.	Char.	Icu [kA]	E.	S800S C 50							
			In [A]	25	32	40	50	63	80	100	125
S200P	K	25	0.2	T	T	T	T	T	T	T	T
			0.3	T	T	T	T	T	T	T	T
			0.5	T	T	T	T	T	T	T	T
			0.75	T	T	T	T	T	T	T	T
			1	0.8	5	T	T	T	T	T	T
			1.6	0.5	1	2.3	T	T	T	T	T
			2	0.3	0.5	0.7	2.3	T	T	T	T
			3		0.4	0.5	0.7	1.2	2.5	8.6	T
			4		0.4	0.4	0.7	1	1.7	3	7.7
			6				0.6	0.8	1.2	2	3.6
			8					0.7	0.9	1.3	2
			10						0.9	1.3	2
			13							1	1.5
			16								1.5
			20								
			25								
		15	32								
			40								
			50								
			63								

LEGEND

E. = supply side
L. = load side
Back-up limit values are specified in kA

Technical data
Selectivity
S800S - S200P @ 230/400 V

			E.	S800S							
	Char.			D							
L.		I_{cu} [kA]		50							
			I_n [A]	25	32	40	50	63	80	100	125
S200P	B	25	6	0.5	1	1.2	2	2.8	9.9	21.3	T
			10	0.4	0.6	0.8	1.1	1.4	2.8	3.9	7.4
			13	0.4	0.6	0.8	1.1	1.4	2.5	3.3	5.6
			16		0.6	0.8	1.1	1.4	2.5	3.3	5.6
			20			0.8	1.1	1.3	2.3	3	4.7
			25			0.8	1.1	1.3	2.3	3	4.7
		15	32				0.9	1.1	1.9	2.4	3.7
			40					1.1	1.9	2.4	3.7
			50						1.5	1.9	2.3
			63							1.7	2.3

			E.	S800S							
	Char.			D							
L.		I_{cu} [kA]		50							
			I_n [A]	25	32	40	50	63	80	100	125
S200P	C	25	0.5	T	T	T	T	T	T	T	T
			1	T	T	T	T	T	T	T	T
			1.6	T	T	T	T	T	T	T	T
			2	T	T	T	T	T	T	T	T
			3	0.7	2.2	4.4	T	T	T	T	T
			4	0.7	1.3	2.2	4.4	7.7	T	T	T
			6	0.5	1	1.2	2	2.8	9.9	22	T
			8	0.4	0.6	0.8	1.1	1.4	2.8	3.9	7.4
			10	0.4	0.6	0.8	1.1	1.4	2.8	3.9	7.4
			13	0.4	0.6	0.8	1.1	1.4	2.5	3.3	5.6
			16		0.6	0.8	1.1	1.4	2.5	3.3	5.6
			20			0.8	1.1	1.3	2.3	3	4.7
			25			0.8	1.1	1.3	2.3	3	4.7
		15	32				0.9	1.1	1.9	2.4	3.7
			40					1.1	1.9	2.4	3.7
			50						1.5	1.9	2.3
			63							1.7	2.3

			E.	S800S							
	Char.			D							
L.		I_{cu} [kA]		50							
			I_n [A]	25	32	40	50	63	80	100	125
S200P	K	25	0.2	T	T	T	T	T	T	T	T
			0.3	T	T	T	T	T	T	T	T
			0.5	T	T	T	T	T	T	T	T
			0.75	T	T	T	T	T	T	T	T
			1	T	T	T	T	T	T	T	T
			1.6	T	T	T	T	T	T	T	T
			2	2.3	T	T	T	T	T	T	T
			3	0.7	1.3	4.4	T	T	T	T	T
			4	0.7	1	2.2	4.4	7.7	T	T	T
			6	0.6	0.8	1.5	2.5	3.6	12.1	24.2	T
			8	0.5	0.7	1.1	1.5	2	4	5.5	9.9
			10	0.5	0.7	1.1	1.5	2	4	5.5	9.9
			13		0.6	0.9	1.2	1.5	2.6	3.4	5.2
			16			0.9	1.2	1.5	2.6	3.4	5.2
			20				0.9	1.1	1.8	2.2	3.2
			25						1.8	2.2	3.2
		15	32						1.7	2	2.9
			40							1.9	2.6
			50								2.2
			63								

LEGEND

E. = supply side
L. = load side
Back-up limit values are specified in kA

Technical data
Selectivity
S800S - S280 @ 230/400 V

		E.	S800S							
	Char.		B, C, D, K							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S280	B	10	6	50	50	50	50	50	50	50	50
		25	10	50	50	50	25	20	16	16	16
			13	50	50	50	25	20	16	16	16
			16	50	50	50	25	20	16	16	16
			20		50	50	25	20	16	16	16
			25			50	25	20	16	16	16
		15	32				25	20	16	16	16
			40					20	16	16	16
		10	50						16	16	16
			63							16	16

		E.	S800S							
	Char.		B, C, D, K							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S400E	B	6	6	50	50	50	50	50	50	50	50
			10	50	50	50	50	50	50	50	50
			13	50	50	50	50	50	50	50	50
			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

		E.	S800S							
	Char.		B, C, D, K							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S280	C	10	3	50	50	50	50	50	50	50	50
			4	50	50	50	50	50	50	50	50
			6	50	50	50	50	50	50	50	50
			8	50	50	50	25	20	16	16	16
		25	10	50	50	50	25	20	16	16	16
			13	50	50	50	25	20	16	16	16
			16	50	50	50	25	20	16	16	16
			20		50	50	25	20	16	16	16
			25			50	25	20	16	16	16
		15	32				25	20	16	16	16
			40					20	16	16	16
		10	50						16	16	16
			63							16	16

		E.	S800S							
	Char.		B, C, D, K							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S400E	C	6	0.5…6	50	50	50	50	50	50	50	50
			8	50	50	50	50	50	50	50	50
			10	50	50	50	50	50	50	50	50
			13	50	50	50	50	50	50	50	50
			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

		E.	S800S							
	Char.		B, C, D, K							
L.		Icu [kA]	50							
		In [A]	25	32	40	50	63	80	100	125
S280	K, Z	10	3	50	50	50	50	50	50	50	50
			4	50	50	50	50	50	50	50	50
			6	50	50	50	50	50	50	50	50
			8	50	50	50	25	20	16	16	16
		25	10	50	50	50	25	20	16	16	16
			13	50	50	50	25	20	16	16	16
			16	50	50	50	25	20	16	16	16
			20		50	50	25	20	16	16	16
			25			50	25	20	16	16	16
		15	32				25	20	16	16	16
			40					20	16	16	16
		10	50						16	16	16
			63							16	16

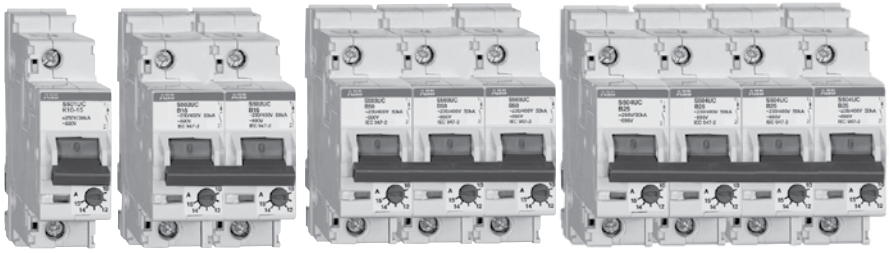
LEGEND

E. = supply side
L. = load side
Back-up limit values are specified in kA

Notes

S500 Miniature Circuit Breakers

S500 Series
UL 1077



Description

The S500 high performance MCB offers a compact solution to circuit protection. The S500 devices are UL tested current limiting and DIN rail mounted. The S500 is available with application-specific trip characteristics to provide maximum circuit protection.

The breakers offer thermal-magnetic trip protection according to B and K characteristics.

For the worldwide market, the breakers carry CSA, IEC, CE and many other agency approvals.

Features

- High breaking capacity
- Fast breaking time (2.3 - 2.5 ms)
- Adjustable trip unit
- DIN rail mounting
- Finger safe terminals
- Multi-functional terminals
- Wide range of accessories
- UL 1077 recognized 600 VAC and 600 VDC versions
- UL1077 AC adjustable K
- UL1077 DC adjustable B, K
- UL File # E167556
- IEC #E60497-2

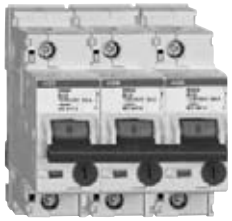
	S500	S500UC
Amperage	0.1 – 45 A	0.1 – 63 A
Voltage	UL: 600Y/277 VAC IEC: 690 VDC	UL: 600 VDC IEC: 750 VDC
Poles	1, 2, 3	1, 2, 3, 4
Trip characteristics	K	B, K
Interrupting ratings	30 kA: UL 1077 30 kA: CSA C22.2	30 kA: UL 1077 30 kA: CSA C22.2
Auxiliary contacts	Yes	Yes
Bell alarm	Yes	Yes
Shunt trip	No	No
Undervoltage release	No	No
Bus bar	Yes	Yes

S500-K, UL 600Y/277 VAC / IEC 690 VDC
Supplemental protection
UL 1077, CSA 22.2, IEC

K


S501-K


S502-K

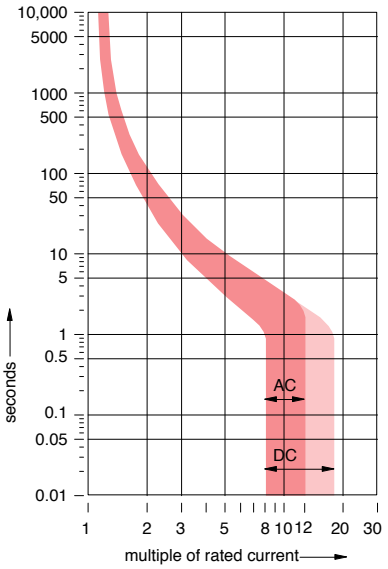

S503-K

No. of poles	Rated current	Catalog number
1	0.1 – 0.15	**S501-K0.15**
	0.14 – 0.21	**S501-K0.21**
	0.2 – 0.3	**S501-K0.3**
	0.28 – 0.42	**S501-K0.42**
	0.38 – 0.58	**S501-K0.58**
	0.53 – 0.8	**S501-K0.8**
	0.73 – 1.1	**S501-K1.1**
	1 – 1.5	**S501-K1.5**
	1.4 – 2.1	**S501-K2.1**
	2 – 3	**S501-K3**
	2.8 – 4.2	**S501-K4.2**
	3.8 – 5.8	**S501-K5.8**
	5.3 – 8	**S501-K8**
	7.3 – 11	**S501-K11**
	10 – 15	**S501-K15**
	14 – 20	**S501-K20**
	18 – 26	**S501-K26**
	23 – 32	**S501-K32**
	29 – 37	**S501-K37**
	34 – 41	**S501-K41**
	38 – 45	**S501-K45**
2	0.1 – 0.15	**S502-K0.15**
	0.14 – 0.21	**S502-K0.21**
	0.2 – 0.3	**S502-K0.3**
	0.28 – 0.42	**S502-K0.42**
	0.38 – 0.58	**S502-K0.58**
	0.53 – 0.8	**S502-K0.8**
	0.73 – 1.1	**S502-K1.1**
	1 – 1.5	**S502-K1.5**
	1.4 – 2.1	**S502-K2.1**
	2 – 3	**S502-K3**
	2.8 – 4.2	**S502-K4.2**
	3.8 – 5.8	**S502-K5.8**
	5.3 – 8	**S502-K8**
	7.3 – 11	**S502-K11**
	10 – 15	**S502-K15**
	14 – 20	**S502-K20**
	18 – 26	**S502-K26**
	23 – 32	**S502-K32**
	29 – 37	**S502-K37**
	34 – 41	**S502-K41**
	38 – 45	**S502-K45**
3	0.1 – 0.15	**S503-K0.15**
	0.14 – 0.21	**S503-K0.21**
	0.2 – 0.3	**S503-K0.3**
	0.28 – 0.42	**S503-K0.42**
	0.38 – 0.58	**S503-K0.58**
	0.53 – 0.8	**S503-K0.8**
	0.73 – 1.1	**S503-K1.1**
	1 – 1.5	**S503-K1.5**
	1.4 – 2.1	**S503-K2.1**
	2 – 3	**S503-K3**
	2.8 – 4.2	**S503-K4.2**
	3.8 – 5.8	**S503-K5.8**
	5.3 – 8	**S503-K8**
	7.3 – 11	**S503-K11**
	10 – 15	**S503-K15**
	14 – 20	**S503-K20**
	18 – 26	**S503-K26**
	23 – 32	**S503-K32**
	29 – 37	**S503-K37**
	34 – 41	**S503-K41**
	38 – 45	**S503-K45**

Tripping characteristic K

UL 1077	IEC
600 VAC	690 VAC
30 kA	30 kA

Inductive loads
- K Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers



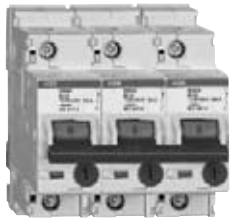
Accessories & technical data
Accessories – See page 71
Technical data – See page 76 - 82

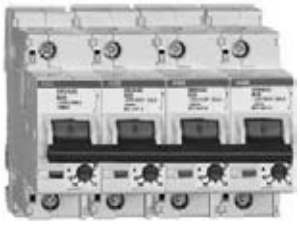
S500UC-B, UL 600 VDC / IEC 750 VDC
Supplemental protectors
UL1077, CSA 22.2, IEC

B


S501UC-B


S502UC-B


S503UC-B


S504UC-B

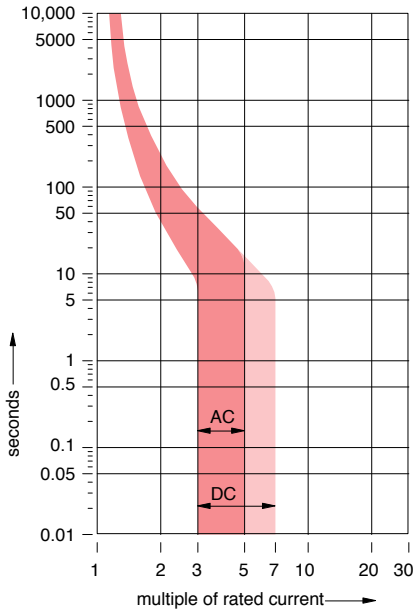
No. of poles	Rated current	Catalog number	No. of poles	Rated current	Catalog number
1	6	**S501UC-B6**	3	6	**S503UC-B6**
	10	**S501UC-B10**		10	**S503UC-B10**
	13	**S501UC-B13**		13	**S503UC-B13**
	16	**S501UC-B16**		16	**S503UC-B16**
	20	**S501UC-B20**		20	**S503UC-B20**
	25	**S501UC-B25**		25	**S503UC-B25**
	32	**S501UC-B32**		32	**S503UC-B32**
	40	**S501UC-B40**		40	**S503UC-B40**
	50	**S501UC-B50**		50	**S503UC-B50**
	63	**S501UC-B63**		63	**S503UC-B63**
2	6	**S502UC-B6**	4	6	**S504UC-B6**
	10	**S502UC-B10**		10	**S504UC-B10**
	13	**S502UC-B13**		13	**S504UC-B13**
	16	**S502UC-B16**		16	**S504UC-B16**
	20	**S502UC-B20**		20	**S504UC-B20**
	25	**S502UC-B25**		25	**S504UC-B25**
	32	**S502UC-B32**		32	**S504UC-B32**
	40	**S502UC-B40**		40	**S504UC-B40**
	50	**S502UC-B50**		50	**S504UC-B50**
	63	**S502UC-B63**		63	**S504UC-B63**

Tripping characteristic B

UL 1077	IEC
600 VAC	750 VAC
30 kA	30 kA

Inductive loads

- B Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers



Accessories & technical data

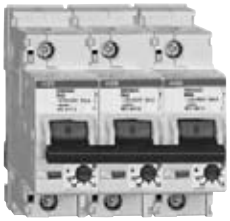
Accessories – See page 71
Technical data – See page 76 - 82

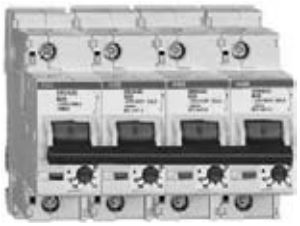
S500UC-K, UL 600 VDC / IEC 750 VDC
Supplemental protectors
UL1077, CSA 22.2, IEC

K


S501UC-K


S502UC-K


S503UC-K

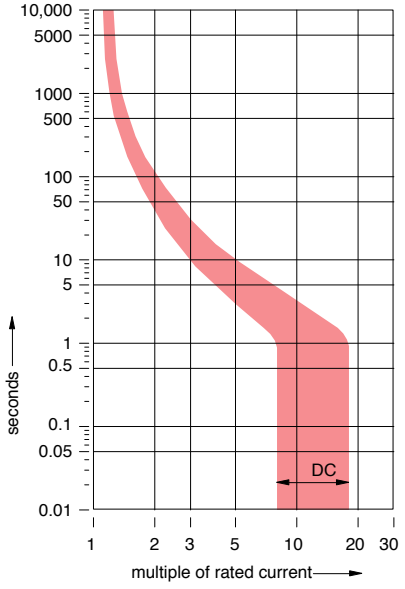

S504UC-K

No. of poles	Rated current	Catalog number
1	0.1 – 0.15	**S501UC-K0.15**
	0.14 – 0.21	**S501UC-K0.21**
	0.2 – 0.3	**S501UC-K0.3**
	0.28 – 0.42	**S501UC-K0.42**
	0.38 – 0.58	**S501UC-K0.58**
	0.53 – 0.8	**S501UC-K0.8**
	0.73 – 1.1	**S501UC-K1.1**
	1 – 1.5	**S501UC-K1.5**
	1.4 – 2.1	**S501UC-K2.1**
	2 – 3	**S501UC-K3**
	2.8 – 4.2	**S501UC-K4.2**
	3.8 – 5.8	**S501UC-K5.8**
	5.3 – 8	**S501UC-K8**
	7.3 – 11	**S501UC-K11**
	10 – 15	**S501UC-K15**
	14 – 20	**S501UC-K20**
	18 – 26	**S501UC-K26**
	23 – 32	**S501UC-K32**
	29 – 37	**S501UC-K37**
	34 – 41	**S501UC-K41**
	38 – 45	**S501UC-K45**
2	0.1 – 0.15	**S502UC-K0.15**
	0.14 – 0.21	**S502UC-K0.21**
	0.2 – 0.3	**S502UC-K0.3**
	0.28 – 0.42	**S502UC-K0.42**
	0.38 – 0.58	**S502UC-K0.58**
	0.53 – 0.8	**S502UC-K0.8**
	0.73 – 1.1	**S502UC-K1.1**
	1 – 1.5	**S502UC-K1.5**
	1.4 – 2.1	**S502UC-K2.1**
	2 – 3	**S502UC-K3**
	2.8 – 4.2	**S502UC-K4.2**
	3.8 – 5.8	**S502UC-K5.8**
	5.3 – 8	**S502UC-K8**
	7.3 – 11	**S502UC-K11**
	10 – 15	**S502UC-K15**
	14 – 20	**S502UC-K20**
	18 – 26	**S502UC-K26**
	23 – 32	**S502UC-K32**
	29 – 37	**S502UC-K37**
	34 – 41	**S502UC-K41**
	38 – 45	**S502UC-K45**
3	0.1 – 0.15	**S503UC-K0.15**
	0.14 – 0.21	**S503UC-K0.21**
	0.2 – 0.3	**S503UC-K0.3**
	0.28 – 0.42	**S503UC-K0.42**
	0.38 – 0.58	**S503UC-K0.58**
	0.53 – 0.8	**S503UC-K0.8**
	0.73 – 1.1	**S503UC-K1.1**
	1 – 1.5	**S503UC-K1.5**
	1.4 – 2.1	**S503UC-K2.1**
	2 – 3	**S503UC-K3**
	2.8 – 4.2	**S503UC-K4.2**
	3.8 – 5.8	**S503UC-K5.8**
	5.3 – 8	**S503UC-K8**
	7.3 – 11	**S503UC-K11**
	10 – 15	**S503UC-K15**
	14 – 20	**S503UC-K20**
	18 – 26	**S503UC-K26**
	23 – 32	**S503UC-K32**
	29 – 37	**S503UC-K37**
	34 – 41	**S503UC-K41**
	38 – 45	**S503UC-K45**
4	0.1 – 0.15	**S504UC-K0.15**
	0.14 – 0.21	**S504UC-K0.21**
	0.2 – 0.3	**S504UC-K0.3**
	0.28 – 0.42	**S504UC-K0.42**
	0.38 – 0.58	**S504UC-K0.58**
	0.53 – 0.8	**S504UC-K0.8**
	0.73 – 1.1	**S504UC-K1.1**
	1 – 1.5	**S504UC-K1.5**
	1.4 – 2.1	**S504UC-K2.1**
	2 – 3	**S504UC-K3**
	2.8 – 4.2	**S504UC-K4.2**
	3.8 – 5.8	**S504UC-K5.8**
	5.3 – 8	**S504UC-K8**
	7.3 – 11	**S504UC-K11**
	10 – 15	**S504UC-K15**
	14 – 20	**S504UC-K20**
	18 – 26	**S504UC-K26**
	23 – 32	**S504UC-K32**
	29 – 37	**S504UC-K37**
	34 – 41	**S504UC-K41**
	38 – 45	**S504UC-K45**

Tripping characteristic K

UL 1077	IEC
600 VAC	750 VAC
30 kA	30 kA

Inductive loads
- K Curve
- Designed for allowing higher in-rush currents during system start up
- Example: motors, transformers



Accessories & technical data
Accessories – See page 71
Technical data – See page 76 - 82

Accessories
S500 UL1077


S500-H11

Auxiliary contacts
The auxiliary contacts will signal whether the breaker is in the ON or OFF position.

Description	Catalog number
For field mounting: left side	
1 N.O./1 N.C.	**S500-H11**
2 N.O.	**S500-H20**
2 N.C.	**S500-H02**

Bell alarm
The bell alarm includes a set of contacts that will only signal when the breaker has tripped.
Typically the contacts would be connected to an alarm or bell to signal the operator that an overcurrent trip has occurred. The bell alarm also includes a test button for testing the alarm contacts without opening the breaker.

Description	Catalog number
For field mounting: left side	
1 N.O./1 N.C.	**S500-S11**
2 N.O.	**S500-S20**
2 N.C.	**S500-S02**

Handle mechanism

Description	Catalog number
Handle mechanism	**S500-RD3**

For use with 1-4 pole S500 MCBs and disconnect switch selector handles with 5mm shafts.

Power feed terminal - Accepts into 2/0 AWG

Description	Catalog number
Power feed terminal	**S500-K2**

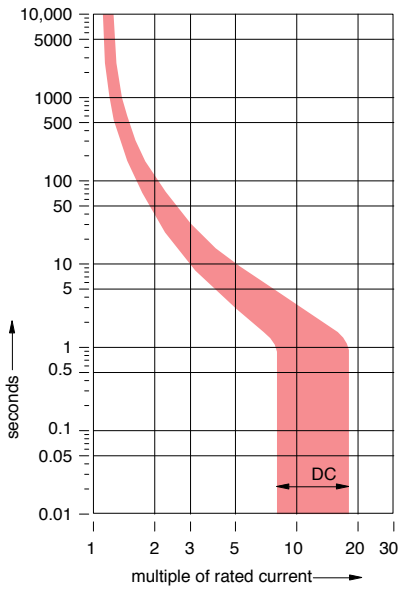
Busbars – 3 phase L1, L2, L3

Amp rating	Number of poles	Busbar length (mm)	End cap catalog number	Catalog number
150	2	145	-	**S500-BB23**
	3	218	-	**S500-BB33**
	4	290	-	**S500-BB43**
	5	363	-	**S500-BB53**
	6	435	-	**S500-BB63**

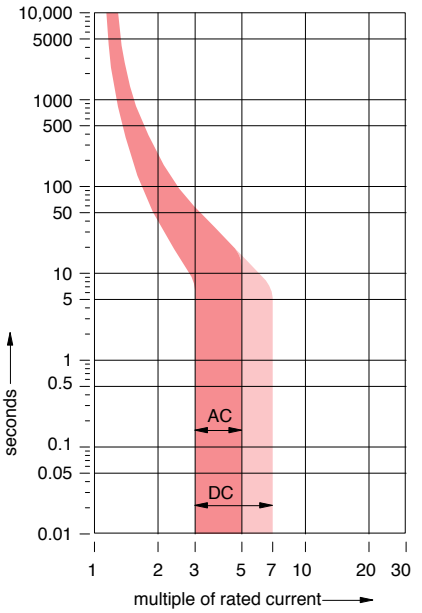
Technical data
S500-B & S500-K

Technical data	S500-B	S500-K
Approvals		
UL	1077	1077
CSA	C22.2 - No. 235	C22.2
Number of poles	1, 2, 3, +N, +NA	1, 2, 3, 4
Tripping characteristic	B, K	B, K
Rated currents	0.1 to 63 A	B: 6 - 63 A; K: 0.15 - 45 A
Rated voltage	277 VAC	277 VAC / 250 VDC
Frequency	50/60 Hz	50/60 Hz
Mounting position	vertical, horizontal	vertical, horizontal
Standard mounting	35mm DIN rail	35mm DIN rail
Clamps only for CU	16 - 4 AWG	16 - 4 AWG
Service life, mechanical at rated load	20,000	20,000
Ambient temperature	40°C... 104°F	40°C... 104°F

Tripping characteristic K

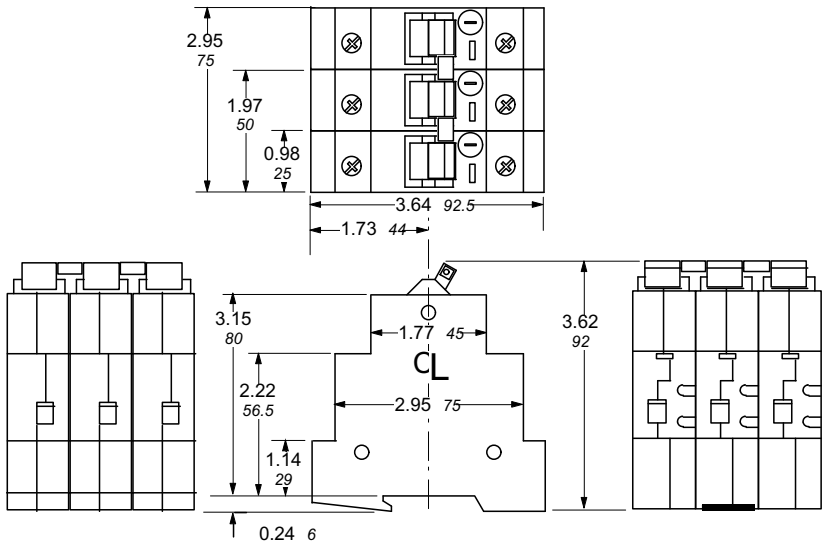


Tripping characteristic B

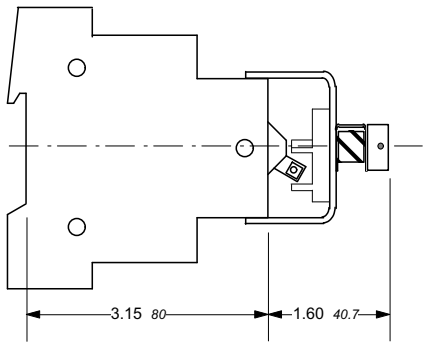


Approximate dimensions
S500 & Accessories

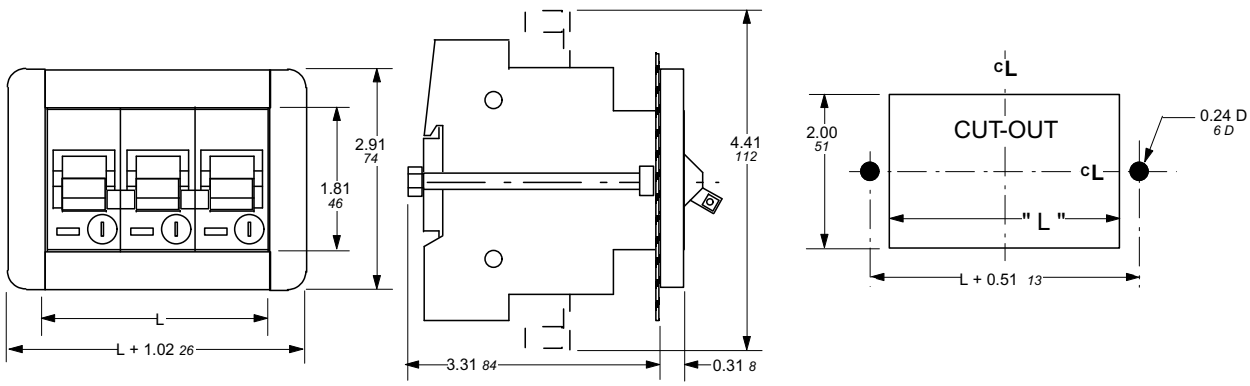
S500



S500-RD3 Handle mechanism



S500 Front mounting kit



Notes

Miniature circuit breakers

Technical data

Miniature circuit breakers
Technical data

S201UP-K

S201-B

S801U-B

S501-K

Technical data
S200U-K, S200U-Z, S200UP-K, S200UP-Z

Item	S200U-K	S200U-Z	S200UP-K	S200UP-Z
Approvals:				
UL	489	489	489	489
CSA	C22.2 No. 5	C22.2 No. 5	C22.2 No. 5	C22.2 No. 5
VDE	0660	0660	0660	0660
IEC	898, 947	898, 947	898, 947	898
Number of Poles:	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Tripping Characteristic:	K	Z	K	Z
Rated Currents:	0.2 to 63A	0.2 to 63A	0.2 to 25A	0.2 to 25A
Minimum Operating Voltage:	12V	12V	12V	12V
UL/CSA Rated Voltage & Interrupting Capacity:				
Frequency:	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
120VAC	10kA	10kA	10kA	10kA
240 VAC	10kA	10kA	10kA	10kA
277 VAC	—	—	—	—
277/480 VAC	—	—	—	—
60VDC	—	—	—	—
125VDC	—	—	—	—
250VDC	—	—	—	—
500VDC	—	—	—	—
IEC Rated Voltage				
Frequency:	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Rated Voltage				
IEC Single Pole	—	—	—	—
IEC Multi-Pole	—	—	—	—
Production Category:	IP20	IP20	IP20	IP20
Depth of Unit Per DIN 43880:	68mm/ 2.68 in.	68mm/ 2.68 in.	68mm/ 2.68 in.	68mm/ 2.68 in.
Mounting Position:	Vertical / horizontal	Vertical / horizontal	Vertical / horizontal	Vertical / horizontal
Standard Mounting:	35mm DIN rail	35mm DIN rail	35mm DIN rail	35mm DIN rail
Main and Shunt Trip Terminals:				
Wire Size	18-4 AWG/.82-21.2mm²	18-4 AWG/.82-21.2mm²	18-4 AWG/.82-21.2mm²	18-4 AWG/.82-21.2mm²
Torque	17.5 in-lbs. / 1.978 Nm	17.5 in-lbs. / 1.978 Nm	17.5 in-lbs. / 1.978 Nm	17.5 in-lbs. / 1.978 Nm
Tool	# 2 Posidrive	# 2 Posidrive	# 2 Posidrive	# 2 Posidrive
Accessory Terminals				
Wire Size	18-16 AWG/.82-1.3mm²	18-16 AWG/.82-1.3mm²	18-16 AWG/.82-1.3mm²	18-16 AWG/.82-1.3mm²
Torque	4.5 in-lbs./.51nm	4.5 in-lbs./.51nm	4.5 in-lbs./.51nm	4.5 in-lbs./.51nm
Tool	# 1 Posidrive	# 1 Posidrive	# 1 Posidrive	# 1 Posidrive
Service Life at Rated Load:	No Load 20,000 operations	No Load 20,000 operations Full Load 10,000 operations	No Load 20,000 operations Full Load 10,000 operations	No Load 20,000 operations Full Load 10,000 operations
Ambient Temperatures:				
Minimum	-25°C... -13°F	-25°C... -13°F	-25°C... -13°F	-25°C... -13°F
Maximum	70°C... 158°F	70°C... 158°F	70°C... 158°F	70°C... 158°F
Storage Temperatures:				
Minimum	-40°C... -40°F	-40°C... -40°F	-40°C... -40°F	-40°C... -40°F
Maximum	70°C... 158°F	70°C... 158°F	70°C... 158°F	70°C... 158°F
Shock Resistance:	30g minimum of 2 impacts, shock duration of 13ms	30g minimum of 2 impacts, shock duration of 13ms	30g minimum of 2 impacts, shock duration of 13ms	30g minimum of 2 impacts, shock duration of 13ms
Vibration Resistance:	5g, 20 cycles, 5 Hz, 150 Hz	5g, 20 cycles, 5 Hz, 150 Hz	5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 ~ In	5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 ~ In
Disconnecting Neutral Rating:	—	—	—	—

Technical data
S200DC-K, S201DC-Z, S200-B, S200-C,D

Item	S201DC-K	S201DC-Z	S200-B	S200-C, D
Approvals:				
UL	489	489	1077	1077
CSA	C22.2 No. 5	C22.2 No. 5	C22.2 No. 235	C22.2 No. 235
VDE	0660	0660	0641, 0660	0660
IEC	—	—	898, 947	898, 947
Number of Poles:	1	1	1,2,3,4, 1+N, 3+N	1,2,3, 1+N, 3+N
Tripping Characteristic:	K	Z	B	C, D
Rated Currents:	1 to 25A	1 to 25A	6 to 63A	0.5 to 63A
Minimum Operating Voltage:	—	—	12V	12V
UL/CSA Rated Voltage & Interrupting Capacity:			Single pole Multi pole	Single pole Multi pole
Frequency:	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
120VAC	—	—	10 kA —	10 kA —
240 VAC	—	—	6 kA 10 kA	6 kA 10 kA
277 VAC	—	—	6 kA —	6 kA —
277/480 VAC	—	—	— 6 kA	— 6 kA
60VDC	10 kA	10 kA	10 kA 10 kA	10 kA 10 kA
125VDC	—	—	— 10 kA	— 10 kA
250VDC	—	—	— —	— —
500VDC	—	—	— —	— —
IEC Rated Voltage Frequency:	—	—	50/60 Hz	50/60 Hz
Rated Voltage				
IEC Single Pole	—	—	240/415 VAC, 60 VDC	240/415 VAC, 60 VDC
IEC Multi-Pole	—	—	415 VAC, 110 VDC	415 VAC, 110 VDC
Production Category:	IP20	IP20	IP20	IP20
Depth of Unit Per DIN 43880:	—	—	68mm/ 2.68 in.	68mm/ 2.68 in.
Mounting Position:	Vertical / horizontal	Vertical / horizontal	Vertical / horizontal	Vertical / horizontal
Standard Mounting:	35mm DIN rail	35mm DIN rail	35mm DIN rail	35mm DIN rail
Main and Shunt Trip Terminals:				
Wire Size	—	—	18-4 AWG/.82-21.2 mm^2	18-4 AWG/.82-21.2 mm^2
Torque	—	—	17.5 in-lbs. / 1.978 Nm	17.5 in-lbs. / 1.978 Nm
Tool	—	—	# 2 Posidrive	# 2 Posidrive
Accessory Terminals				
Wire Size	—	—	18-16 AWG/.82-1.3 mm^2	18-16 AWG/.82-1.3 mm^2
Torque	—	—	4.5 in-lbs./.51 Nm	4.5 in-lbs./.51 Nm
Tool	—	—	# 1 Posidrive	# 1 Posidrive
Service Life at Rated Load:	—	—	No Load 20,000 operations Full Load 10,000 operations	No Load 20,000 operations Full Load 10,000 operations
Ambient Temperatures:				
Minimum	—	—	-25°C... -13°F	-25°C... -13°F
Maximum	—	—	70°C... 158°F	70°C... 158°F
Storage Temperatures:				
Minimum	—	—	-40°C... -40°F	-40°C... -40°F
Maximum	—	—	70°C... 158°F	70°C... 158°F
Shock Resistance:	—	—	30g minimum of 2 impacts, shock duration of 13 ms	30g minimum of 2 impacts, shock duration of 13 ms
Vibration Resistance:	—	—	5g, 20 cycles, 5 Hz, 150 Hz	5g, 20 cycles, 5 Hz, 150 Hz
Disconnecting Neutral Rating:	—	—	6 kA switching	6 kA switching

Technical data
S200-K, S200P-K, S200P-Z, S280W-K

Item	S200-K	S200P-K	S200P-Z	S280W-K
Approvals:				
UL	1077	1077	1077	1077
CSA	C22.2 No. 235	—	—	C22.2 No. 235
VDE	0660	0660	0660	0660
IEC	898, 947	898, 947	898, 947	—
Number of Poles:	1,2,3,4, 1+N, 3+N	1,2,3,4, 1+N, 3+N	1,2,3,4	1,2,3
Tripping Characteristic:	K	K	Z	K
Rated Currents:	0.5 to 63A	0.2 to 63A	0.5 to 63A	0.2 to 63A
Minimum Operating Voltage:	12 V	12 V	12 V	12 V
UL/CSA Rated Voltage & Interrupting Capacity:	Single pole / Multi pole	Single pole / Multi pole	Single pole / Multi pole	
Frequency:	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
120VAC	10 kA / —	10 kA / —	10 kA / —	—
240 VAC	6 kA / 10 kA	10 kA / 10 kA	10 kA / 10 kA	—
277 VAC	6 kA / —	10 kA / —	10 kA / —	—
277/480 VAC	— / 6 kA	— / 10 kA	— / —	10 kA
60VDC	10 kA / 10 kA	— / —	— / —	—
125VDC	— / 10 kA	— / —	— / —	—
250VDC	— / —	— / —	— / —	—
500VDC	— / —	— / —	— / —	—
IEC Rated Voltage Frequency:	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Rated Voltage				
IEC Single Pole	240/415 VAC, 60 VDC	240/415 VAC, 60 VDC	—	—
IEC Multi-Pole	415 VAC, 110 VDC	415 VAC, 110 VDC	—	—
Production Category:	IP20	IP20	IP20	IP20
Depth of Unit Per DIN 43880:	68mm/ 2.68 in.	68mm/ 2.68 in.	68mm/ 2.68 in.	68mm/ 2.68 in.
Mounting Position:	Vertical / horizontal	Vertical / horizontal	Vertical / horizontal	Vertical / horizontal
Standard Mounting:	35mm DIN rail	35mm DIN rail	35mm DIN rail	35mm DIN rail
Main and Shunt Trip Terminals:				
Wire Size	18-4 AWG/.82-21.2 mm²	18-4 AWG/.82-21.2 mm²	18-4 AWG/.82-21.2 mm²	18-4 AWG/.82-21.2 mm²
Torque	17.5 in-lbs. / 1.978 Nm	17.5 in-lbs. / 1.978 Nm	17.5 in-lbs. / 1.978 Nm	17.5 in-lbs. / 1.978 Nm
Tool	# 2 Posidrive	# 2 Posidrive	# 2 Posidrive	# 2 Posidrive
Accessory Terminals				
Wire Size	18-16 AWG/.82-1.3 mm²	18-16 AWG/.82-1.3 mm²	18-16 AWG/.82-1.3 mm²	18-16 AWG/.82-1.3 mm²
Torque	4.5 in-lbs./.51 Nm	4.5 in-lbs./.51 Nm	4.5 in-lbs./.51 Nm	4.5 in-lbs./.51 Nm
Tool	# 1 Posidrive	# 1 Posidrive	# 1 Posidrive	# 1 Posidrive
Service Life at Rated Load:	No Load 20,000 operations Full Load 10,000 operations	No Load 20,000 operations Full Load 10,000 operations	No Load 20,000 operations Full Load 10,000 operations	No Load 20,000 operations Full Load 10,000 operations
Ambient Temperatures:				
Minimum	-25°C... -13°F	-25°C... -13°F	-25°C... -13°F	-25°C... -13°F
Maximum	70°C... 158°F	70°C... 158°F	70°C... 158°F	55°C... 131°F
Storage Temperatures:				
Minimum	-40°C... -40°F	-40°C... -40°F	-40°C... -40°F	-40°C... -40°F
Maximum	70°C... 158°F	70°C... 158°F	70°C... 158°F	70°C... 158°F
Shock Resistance:	30g minimum of 2 impacts, shock duration of 13 ms	30g minimum of 2 impacts, shock duration of 13 ms	30g minimum of 2 impacts, shock duration of 13 ms	30g minimum of 2 impacts, shock duration of 13 ms
Vibration Resistance:	5g, 20 cycles, 5 Hz, 150 Hz	5g, 20 cycles, 5 Hz, 150 Hz	5g, 20 cycles, 5 Hz, 150 Hz	5g, 20 cycles, 5 Hz, 150 Hz
Disconnecting Neutral Rating:	6 kA switching	—	—	—

Technical data
S280UC-K, S280UC-Z, S290-C, S800U-K

Item	S280UC-K	S280UC-Z	S280U-Z	S290-C
Approvals:				
UL	1077	1077	489	489
CSA	—	—	22.2 No. 5.1	22.2
VDE	0660	0660	—	0660
IEC	898, 947	898, 947	—	—
Number of Poles:	1,2,3	1,2,3	1,2,3,4	1
Tripping Characteristic:	K	Z	Z	Z
Rated Currents:	0.2 to 63A	0.5 to 63A	10 to 100A	1 to 25A
Minimum Operating Voltage:	12 V	12 V	—	—
UL/CSA Rated Voltage & Interrupting Capacity:	Single pole / Multi pole	Single pole / Multi pole		
Frequency:	50/60 Hz	50/60 Hz	50/60 Hz	—
120VAC	10 kA / 10 kA	10 kA / —	—	—
240 VAC	10 kA / 6 kA	10 kA / 10 kA	50 kA	—
277 VAC	10 kA / 6 kA	10 kA / —	—	—
277/480 VAC	— / 4.5 kA for 0.2-40 A, 5 kA for 50-63 A	— / 4.5 kA for 0.2-40 A, 5 kA for 50-63 A	—	—
60VDC	10 kA / 10 kA	10 kA / 10 kA	—	—
125VDC	10 kA / —	10 kA / 10 kA	—	—
250VDC	4.5 kA / 4.5 kA	4.5 kA / 4.5 kA	—	—
500VDC	— / 4.5 kA	— / 4.5 kA	—	—
IEC Rated Voltage Frequency:	50/60 Hz	50/60 Hz	—	50/60 Hz
Rated Voltage				
IEC Single Pole	—	—	—	230/440 VAC, 60 VDC
IEC Multi-Pole	—	—	—	440 VAC, 110 VDC
Production Category:	IP20	IP20	IP20	IP20
Depth of Unit Per DIN 43880:	68mm/ 2.68 in.	68mm/ 2.68 in.	—	—
Mounting Position:	Vertical / horizontal	Vertical / horizontal	Vertical / horizontal	Vertical / horizontal
Standard Mounting:	35mm DIN rail	35mm DIN rail	35mm DIN rail	35mm DIN rail
Main and Shunt Trip Terminals:				
Wire Size	18-4 AWG/.82-21.2 mm² for 0.2 - 40A 18-2 AWG for 50 A & above	18-4 AWG/.82-21.2 mm² for 0.5 - 40A 18-2 AWG for 50 A & above	1... 25	14-1 AWG
Torque	17.5 in-lbs. / 1.978 Nm	17.5 in-lbs. / 1.978 Nm	35 in-lbs. / 4 Nm	4.5 in-lbs.
Tool	# 2 Posidrive	# 2 Posidrive	—	# 1 Posidrive
Accessory Terminals				
Wire Size	18-16 AWG/.82-1.3 mm²	18-16 AWG/.82-1.3 mm²	1... 35	18-16 AWG/.82-1.3 mm²
Torque	4.5 in-lbs./.51 Nm	4.5 in-lbs./.51 Nm	35 in-lbs./4 Nm	4.5 in-lbs./.51 Nm
Tool	# 1 Posidrive	# 1 Posidrive	—	# 1 Posidrive
Service Life at Rated Load:	No Load 20,000 operations Full Load 10,000 operations	No Load 20,000 operations Full Load 10,000 operations	6,000 operations	10,000 operations
Ambient Temperatures:				
Minimum	-25°C... -13°F	-25°C... -13°F	-25°C... -13°F	-23°C... -23°F
Maximum	55°C... 131°F	55°C... 131°F	60°C... 140°F	45°C... 113°F
Storage Temperatures:				
Minimum	-40°C... -40°F	-40°C... -40°F	-40°C... -40°F	-40°C... -40°F
Maximum	70°C... 158°F	70°C... 158°F	70°C... 158°F	70°C... 158°F
Shock Resistance:	30g minimum of 2 impacts, shock duration of 13 ms	30g minimum of 2 impacts, shock duration of 13 ms	—	30g minimum of 2 impacts, shock duration of 13 ms
Vibration Resistance:	5g, 20 cycles, 5 Hz, 150 Hz	5g, 20 cycles, 5 Hz, 150 Hz	—	60 ms @ 10-150 Hz
Disconnecting Neutral Rating:	—	—	—	—

Technical data
S280U-Z, S800S-B, S800S-C, S800S-D

Item	S800U-K, Z	S800S-B	S800S-C	S800S-D
Approvals:				
UL	489	—	—	—
CSA	22.2 No. 5.1	—	—	—
VDE	—	—	—	—
IEC	—	60947-2	60947-2	60947-2
Number of Poles:	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Tripping Characteristic:	K	B	C	D
Rated Currents:	10 to 100A	10 to 125A	10 to 125A	10 to 125A
Minimum Operating Voltage:	—	—	—	—
UL/CSA Rated Voltage & Interrupting Capacity:				
Frequency:	50/60 Hz	—	—	—
120VAC	—	—	—	—
240 VAC	50 kA	—	—	—
277 VAC	—	—	—	—
277/480 VAC	—	—	—	—
60VDC	—	—	—	—
125VDC	—	—	—	—
250VDC	—	—	—	—
500VDC	—	—	—	—
IEC Rated Voltage Frequency:	—	50/60 Hz	50/60 Hz	50/60 Hz
Rated Voltage				
IEC Single Pole	—	690 VAC	690 VAC	690 VAC
IEC Multi-Pole	—	—	—	—
Production Category:	IP20	IP20	IP20	IP20
Depth of Unit Per DIN 43880:	—	—	—	—
Mounting Position:	Vertical / horizontal	Vertical / horizontal	Vertical / horizontal	Vertical / horizontal
Standard Mounting:	35mm DIN rail	35mm DIN rail	35mm DIN rail	35mm DIN rail
Main and Shunt Trip Terminals:				
Wire Size	1... 25	1... 25	1... 25	1... 25
Torque	35 in-lbs. / 4 Nm	35 in-lbs. / 4 Nm	35 in-lbs. / 4 Nm	35 in-lbs. / 4 Nm
Tool	—	—	—	—
Accessory Terminals				
Wire Size	1... 35	1... 35	1... 35	1... 35
Torque	35 in-lbs./4 Nm	35 in-lbs./4 Nm	35 in-lbs./4 Nm	35 in-lbs./4 Nm
Tool	—	—	—	—
Service Life at Rated Load:	6,000 operations	6,000 operations	6,000 operations	6,000 operations
Ambient Temperatures:				
Minimum	-25°C... -13°F	-25°C... -13°F	-25°C... -13°F	-25°C... -13°F
Maximum	60°C... 140°F	60°C... 140°F	60°C... 140°F	60°C... 140°F
Storage Temperatures:	-40°C... -40°F			
Minimum	70°C... 158°F	-40°C... -40°F	-40°C... -40°F	-40°C... -40°F
Maximum	—	70°C... 158°F	70°C... 158°F	70°C... 158°F
Shock Resistance:	—	—	—	—
Vibration Resistance:	—	—	—	—
Disconnecting Neutral Rating:	—	—	—	—

Technical data
S800S-K

Item	S800S-K
Approvals:	
UL	—
CSA	—
VDE	—
IEC	60947-2
Number of Poles:	1,2,3,4
Tripping Characteristic:	K
Rated Currents:	10 to 125A
Minimum Operating Voltage:	—
UL/CSA Rated Voltage & Interrupting Capacity:	
Frequency:	—
120VAC	—
240 VAC	—
277 VAC	—
277/480 VAC	—
60VDC	—
125VDC	—
250VDC	—
500VDC	—
IEC Rated Voltage Frequency:	50/60 Hz
Rated Voltage	
IEC Single Pole	690 VAC
IEC Multi-Pole	—
Production Category:	IP20
Depth of Unit Per DIN 43880:	—
Mounting Position:	Vertical / horizontal
Standard Mounting:	35mm DIN rail
Main and Shunt Trip Terminals:	
Wire Size	1... 25
Torque	35 in-lbs. / 4 Nm
Tool	—
Accessory Terminals	
Wire Size	1... 35
Torque	35 in-lbs./4 Nm
Tool	—
Service Life at Rated Load:	6,000 operations
Ambient Temperatures:	
Minimum	-25°C... -13°F
Maximum	60°C... 140°F
Storage Temperatures:	
Minimum	-40°C... -40°F
Maximum	70°C... 158°F
Shock Resistance:	—
Vibration Resistance:	—
Disconnecting Neutral Rating:	—

Technical data
S500-K, Z; S500UC-B, K

Item	S500-K, Z
Approvals: UL CSA VDE IEC	 1077 C22.2 - No. 235 0641/6.78 –
No. of poles:	1,2,3, +N, +NA
Tripping characteristic:	K
Rated currents:	0.1 to 45A
Rated voltage: UL/CSA single pole UL/CSA multi pole IEC single pole	 277VAC 600YVAC 690VAC
Rated interrupting capacity: Single pole Multi-pole	 0.15-25A – 30KA/240VAC 14KA/277VAC 26-45A – 18KA/240VAC 14KA/277VAC 0.15-45A – 14KA/480VAC 6KA/600VAC
Frequency:	50/60Hz
Mounting position:	Vertical / horizontal
Standard mounting:	35mm DIN rail
Terminals:	Conductors from 16-4AWG
Service life at rated load:	20,000 operations
Calibration temperature:	40°C

Item	S500UC-B, K
Approvals: UL CSA VDE	 1077 C22.2 0660
No. of poles:	1,2,3, 4
Tripping characteristic:	B, K
Rated currents:	B: 6 to 63A K: 0.15 to 45A
Rated voltage: UL single pole UL multi pole IEC multi pole	 277VAC/250VDC 600VAC/600VDC 690VAC/750VDC
Rated interrupting capacity:	B single pole: 6 – 25A 18KA/240VAC 14KA/277VAC 30KA/250VDC 32 – 63A 30KA/240VAC 14KA/277VAC 30KA/250VDC B two-pole: 6 – 63A 14KA/480VAC 6KA/600VAC 30KA/500VDC B three-pole: 6 – 63A 14KA/480VAC 6KA/600VAC 30KA/600VDC K single pole: 0.15 – 25A 30KA/240VAC 14KA/277VAC 30KA/250VDC 32 – 45A 18KA/240VAC 14KA/277VAC 30KA/250VDC K two-pole: 0.15 – 45A 14KA/480VAC 6KA/600VAC 30KA/500VDC K three-pole: 0.5 – 45A 14KA/480VAC 6KA/600VAC 30KA/600VDC
Frequency:	50/60Hz
Mounting position:	Vertical / horizontal
Standard mounting:	35mm DIN-rail
Terminals:	Conductors from 16 to 4AWG (1-25sq mm)
Service life at rated load:	20,000 operations

F200 Series
Residual Current Devices

Residual current devices
F200 Series
UL 1053

Description
The F200 Series residual current devices offer a wide range of product for all of your fault protection needs.

A & AC
A large offering for standard instantaneous and selective AC and A types.

All sizes up to 63 mA with sensitivity thresholds up to 1 A are offered in all possible pole configurations.

ABB RCDs carry many marks and approvals for the worldwide market.

Features
RCDs assure protection to equipment against current leakage to earth.

	F200A	F200AC
Type	AC	A
Amperage	16, 25, 40, 63, 80, 100, 125	16, 25, 40, 63, 80, 100, 126
Voltage	480Y/277 VAC	480Y/277 VAC
Sensitivity	0.01-0.03 / 0.1-0.3-0.5	0.01-0.03 / 0.1-0.3-0.6

F200AC
F200 Series
AC Type

AC

F202AC

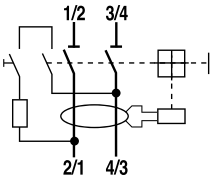
F204AC

No. of poles	Rated residual current mA	Rated current A	Catalog number
2	10	16	**F202AC-16/0.01**
	30	25	**F202AC-25/0.03**
		40	**F202AC-40/0.03**
		63	**F202AC-63/0.03**
		80	**F202AC-80/0.03**
		100	**F202AC-100/0.03**
	100	25	**F202AC-25/0.1**
		40	**F202AC-40/0.1**
		63	**F202AC-63/0.1**
		80	**F202AC-80/0.1**
		100	**F202AC-100/0.1**
	300	25	**F202AC-25/0.3**
		40	**F202AC-40/0.3**
		63	**F202AC-63/0.3**
		80	**F202AC-80/0.3**
		100	**F202AC-100/0.3**
	500	25	**F202AC-25/0.5**
		40	**F202AC-40/0.5**
		63	**F202AC-63/0.5**
		80	**F202AC-80/0.5**
		100	**F202AC-100/0.5**

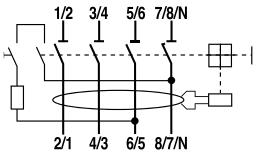
No. of poles	Rated residual current mA	Rated current A	Catalog number
4	30	25	**F204AC-25/0.03**
		40	**F204AC-40/0.03**
		63	**F204AC-63/0.03**
		80	**F204AC-80/0.03**
		100	**F204AC-100/0.03**
		125	**F204AC-125/0.03**
	100	25	**F204AC-25/0.1**
		40	**F204AC-40/0.1**
		63	**F204AC-63/0.1**
		80	**F204AC-80/0.1**
		100	**F204AC-100/0.1**
		125	**F204AC-125/0.1**
	300	25	**F204AC-25/0.3**
		40	**F204AC-40/0.3**
		63	**F204AC-63/0.3**
		80	**F204AC-80/0.3**
		100	**F204AC-100/0.3**
		125	**F204AC-125/0.3**
	500	25	**F204AC-25/0.5**
		40	**F204AC-40/0.5**
		63	**F204AC-63/0.5**
		80	**F204AC-80/0.5**
		100	**F204AC-100/0.5**
		125	**F204AC-125/0.5**

Type AC
- Suitable for alternating current
- 2 & 4 poles
- 16-100 A range
- Can be used as a main device providing ground fault protection against earth leakage for several MCB branch devices

Technical data
Technical data – See page 15.90



F202AC



F204AC

F200A
F200 Series
A Type

A

F202A

F204A

No. of poles	Rated residual current mA	Rated current A	Catalog number
2	10	16	**F202A-16/0.01**
	30	25	**F202A-25/0.03**
		40	**F202A-40/0.03**
		63	**F202A-63/0.03**
		80	**F202A-80/0.03**
		100	**F202A-100/0.03**
	100	25	**F202A-25/0.1**
		40	**F202A-40/0.1**
		63	**F202A-63/0.1**
		80	**F202A-80/0.1**
		100	**F202A-100/0.1**
	300	25	**F202A-25/0.3**
		40	**F202A-40/0.3**
		63	**F202A-63/0.3**
		80	**F202A-80/0.3**
		100	**F202A-100/0.3**
	500	25	**F202A-25/0.5**
		40	**F202A-40/0.5**
		63	**F202A-63/0.5**
		80	**F202A-80/0.5**
		100	**F202A-100/0.5**

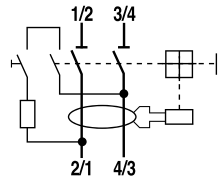
No. of poles	Rated residual current mA	Rated current A	Catalog number
4	30	25	**F204A-25/0.03**
		40	**F204A-40/0.03**
		63	**F204A-63/0.03**
		80	**F204A-80/0.03**
		100	**F204A-100/0.03**
		125	**F204A-125/0.03**
	100	25	**F204A-25/0.1**
		40	**F204A-40/0.1**
		63	**F204A-63/0.1**
		80	**F204A-80/0.1**
		100	**F204A-100/0.1**
		125	**F204A-125/0.1**
	300	25	**F204A-25/0.3**
		40	**F204A-40/0.3**
		63	**F204A-63/0.3**
		80	**F204A-80/0.3**
		100	**F204A-100/0.3**
		125	**F204A-125/0.3**
	500	25	**F204A-25/0.5**
		40	**F204A-40/0.5**
		63	**F204A-63/0.5**
		80	**F204A-80/0.5**
		100	**F204A-100/0.5**
		125	**F204A-125/0.5**

Type A

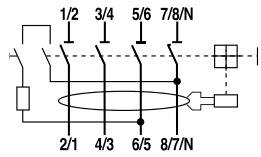
- Suitable for alternating and pulsating current
- 2 & 4 poles
- 16-100 A range
- Can be used as a main device providing ground fault protection against earth leakage for several MCB branch devices

Technical data

Technical data – See page 15.90



F202A



F204A

Technical data
Functions and classification criteria
RCDs

Power loss of RCDs
RCCBs F200 series

Rated Current in [A]	Power loss [W]	
	2P	4P
16	1.5	-
25	2.0	4.8
40	4.8	8.4
63	7.2	13.2

Performance in altitude of RCDs
Up to the height of 2000 m, ABB RCDs do not undergo any alterations in their rated performances. Over this height the properties of the atmosphere change in terms of composition, dielectric capacity, cooling capacity and pressure, therefore the performances of the RCDs undergo derating, which can basically be measured in terms of variations in significant parameters, such as the maximum operating voltage and the rated current.

F200

Altitude [m]	**2000**	**3000**	**4000**
Rated service voltage Ue [V]	400	380	380
Rated current in	In	0.96xIn	0.93xIn

Application guide
Residual current devices

Introduction

Residual current devices (RCD) have always played an important role in circuit protection by detecting leakage to ground for equipment in many installations. RCD's are used in unison with a circuit protective device in industrial applications in the United States. The following guide will give an insight to the construction, mechanical operation, and applications of RCD's.

RCD Definitions

Important definitions:

Earth leakage current
Current that flows between line to line or line to earth.

Residual current
The sum of the values of the electric currents in all live conductors

Fault current
Current that flows between line to line or line to earth.

Earth fault
When a conductive path is accidentally induced between a line and the earth

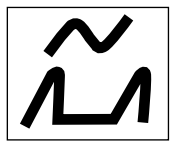
RCD Definition
RCD's provide ground fault protection to equipment by monitoring the leakage of current to ground. An RCD will trip when a ground fault is detected in excess of the trip rating of the device. An RCD is designed to disconnect a circuit whenever it detects that the electrical current is unbalanced between the phase conductor and the neutral conductor. An imbalance may be caused by phase leaking to ground.

Difference between type A and AC

Types of RCD's

Type AC
Must be used for protection against AC earth leakage current.

Type A
Must be used for protection against AC and pulsating DC (rectified AC) earth leakage current. The type A RCD must be installed in any circuit where the main supply is likely to be rectified. Some examples of applications where this would apply are motor speed controllers (drives) and power tools.



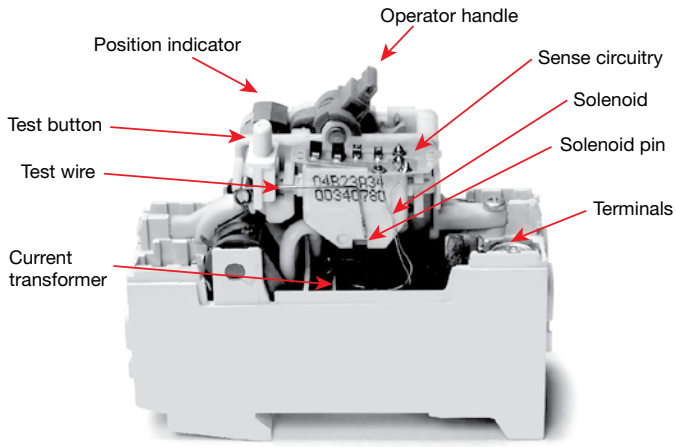
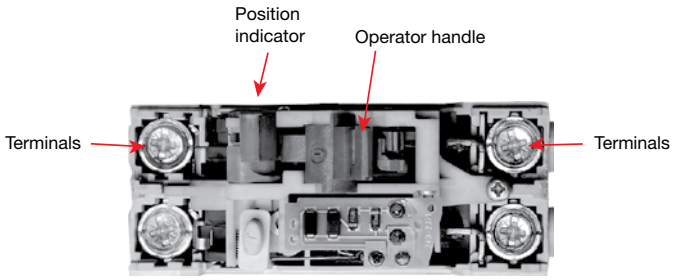


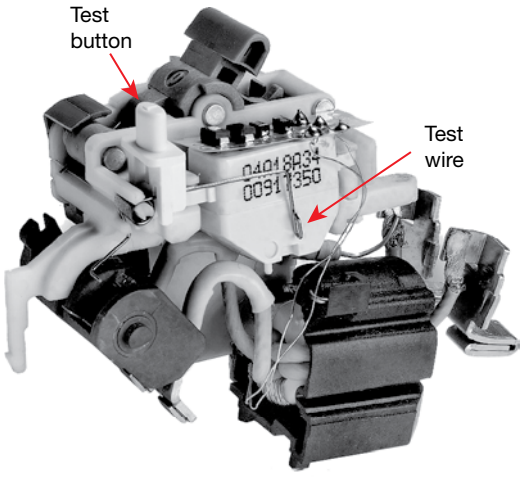
ABB Residual Current Device

RCD Mechanical operation

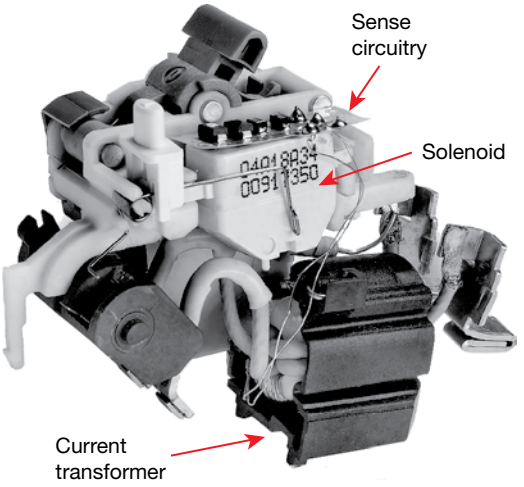
Main Incoming Supply and Terminals
The main incoming and the grounded neutrals are connected to the terminals. The operator handle places the RCD in the on and off position as the position indicator shows.



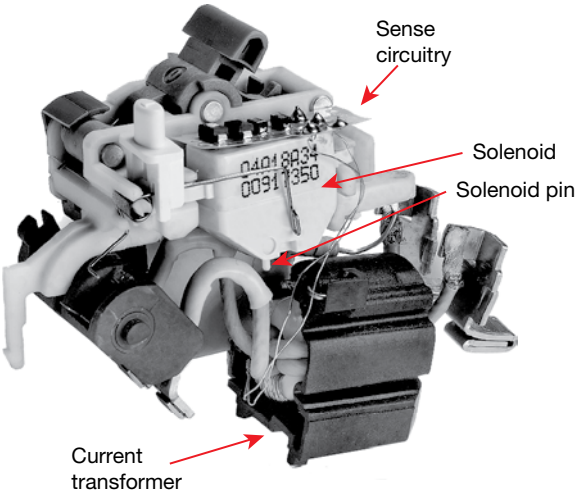
Test button and Test Wire
When the test button is pressed it allows the correct operation of the device to be verified by passing a small current through the test wire. This simulates a leakage to ground by creating an imbalance in the current transformer (CT).



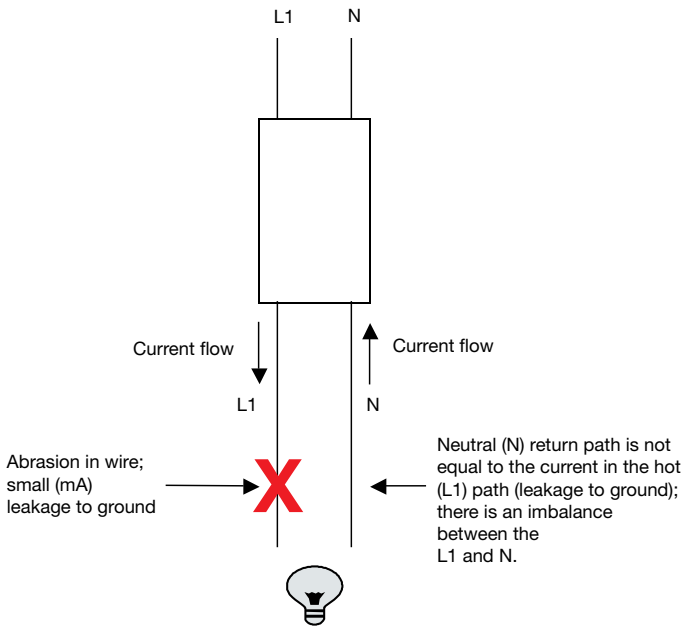
Current Transformer and Sense Circuitry
The current transformer surrounds the neutral and L1 conductors. During normal operation, all of the current being carried through the L1 conductor returns up through the neutral conductor. Therefore the currents in the two conductors are equal and opposite. When a leakage to ground occurs it causes some of the current to take a path to ground and creates an imbalance in the current between the two conductors. This imbalance in current induces a current in the current transformer (CT) which is then picked up by the sense circuitry. The sense circuitry then actuates the solenoid and the contacts are forced apart by a spring, terminating the electricity supply to the device.



Solenoid
Once an imbalance has been detected by the CT, there is voltage induced on the CT. The voltage travels through the connected copper wires to the sense circuitry and the solenoid is actuated. The plunger at the bottom of the solenoid is then pushed out to trip the breaker.



Example of current leakage to ground



Difference between RCD and MCB

Miniature Circuit Breaker (MCB)
A miniature circuit breaker (MCB) is a device designed to isolate a circuit during an overcurrent event without the use of a fusible element. A breaker is a resettable protective device that protects against two types of overcurrent situations; overload and short circuit.

Residual Current Device (RCD)
A residual current device (RCD) is a device designed to provide protection against voltage leakage to ground. *RCD's are sensitive to a 30-300mA. RCD's are mechanical devices that contain a CT and a solenoid.* RCD's are designed to protect equipment, not wires against overload and short circuit situations. For this reason, an RCD should always be used in conjunction with an MCB in order to provide full protection from overload and leakage to ground.

Ground Fault Interrupter (GFI)
GFI Definition (NEC): A device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds the values established for a Class A device.

A ground fault interrupter (GFI) is a device designed to measure the current between the hot wire and neutral wire. Like the RCD, the GFI will open the closed contacts in order to protect against damage. A GFI is sensitive to 5mA and higher and is designed to protect people, not equipment.

A GFI is an electric device that contains a printed circuit board (PCB). GFI's have a "pigtail" wire at the end that carries a signal to the PCB that tells the contacts to open when a current imbalance is detected between the two conductors.

Technical data
F200AC, F200A

Item	F200AC	F200A
Approvals:		
UL	1053	1053
CSA	-	-
VDE	-	-
IEC	-	-
Number of Poles:	2,4	2,4
Rated Currents:	16,25,40,63,80,100,125	16,25,40,63,80,100,125
Operating Voltage:	480Y/277 VAC	480Y/277 VAC
Production Category:	IP20	IP20
Depth of Unit Per DIN 43880:	68mm/ 2.68 in.	68mm/ 2.68 in.
Mounting Position:	vertical, horizontal	vertical, horizontal
Standard Mounting:	35mm DIN rail	35mm DIN rail
Main and Shunt Trip Terminals:		
Wire Size	18-4 AWG/.82-21.2mm²	18-4 AWG/.82-21.2mm²
Torque	17.5 in-lbs./1.978 nm	17.5 in-lbs./1.978 nm
Tool	#2 Posidrive	#2 Posidrive
Accessory Terminals		
Wire Size	18-16 AWG/.82-1.3mm²	18-16 AWG/.82-1.3mm²
Torque	4.5 in-lbs./.51nm	4.5 in-lbs./.51nm
Tool	# 1 Posidrive	# 1 Posidrive
Service Life at Rated Load:	No Load 20,000 operations Full Load 10,000 operations	No Load 20,000 operations Full Load 10,000 operations
Shock Resistance:	30g minimum of 2 impacts, shock duration of 13ms	30g minimum of 2 impacts, shock duration of 13ms
Vibration Resistance:	5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 ~ In	5g, 20 cycles, 5 Hz, 150 Hz

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