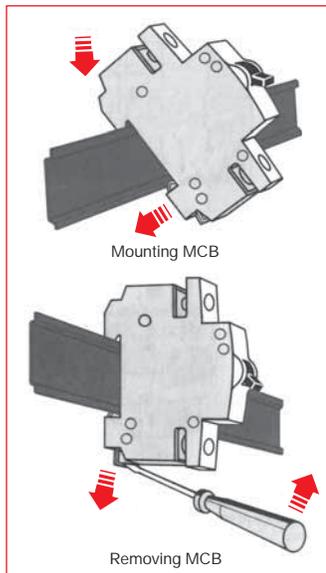


Technical data

Mounting and operating instructions



Mounting

Universal mounting position using snap-on mounting to standard 35x7.5mm DIN rail.

Miniature circuit breakers (MCBs) can also be mounted to front of door using a panel cut-out with breaker handle protruding through panel opening for external operation. Special front mounting kit page 23.

Connection

Terminals are suitable for solid or flexible conductors from 18 to 4 AWG (0.75 to 25mm²) with no busbar connected. When maximum busbar size of 36 mm² is used, maximum cable is 6 AWG (16 mm²).

Maximum tightening torque of 17.5 in-lb (2 Nm) for line/load terminals and 4.5 in-lb (0.5Nm) for accessory device terminals.

Operation

MCBs are switched on by moving the handle to the upper position. Stamped onto the handle switch, a "I" is visible confirming that the breaker is closed.

The MCBs are "trip-free," if the handle is being forced to the "ON" position, the breaker will still trip under fault conditions.

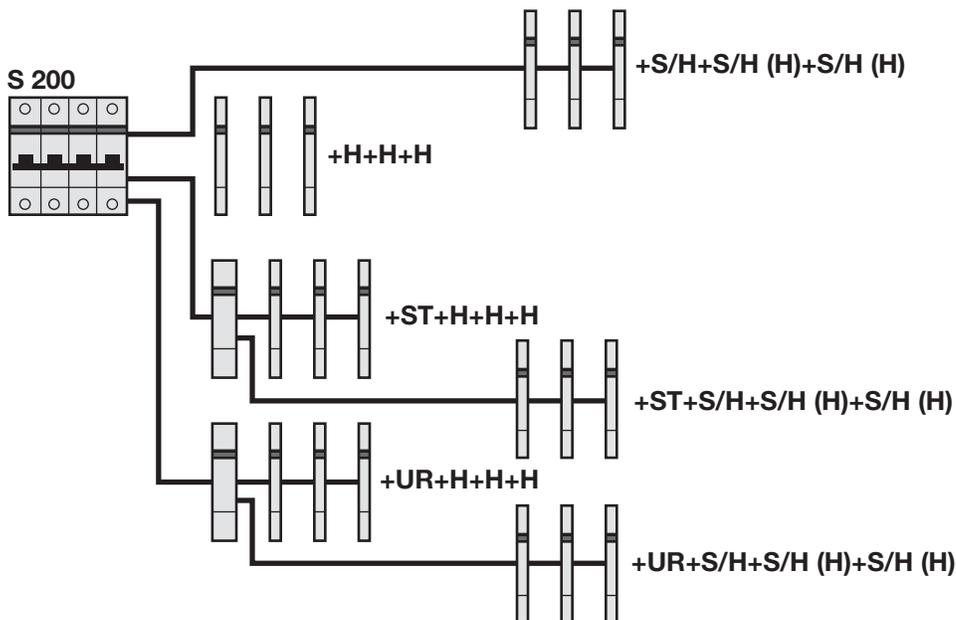
The "O" marking indicates that the breaker is in the "OFF" position. The MCB is now open and the load is disconnected from line power.

When a breaker has tripped, the MCB handle should first be set to the full "OFF" position to make certain the trip mechanism has been reset. Once the fault has been determined and cleared the MCB can again be switched "ON".

Maintenance

ABB miniature circuit breakers require no special maintenance; only normal electrical system maintenance procedures are required.

Possible mounting arrangements of MCB accessories



Legend

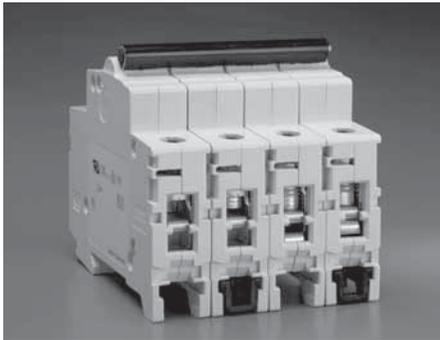
Auxiliary contact	H
Bell alarm/Auxiliary contact	S/H
Bell alarm/Auxiliary contact used as auxiliary contact	S/H (H)
Shunt trip	ST
Undervoltage release	UR

Technical data

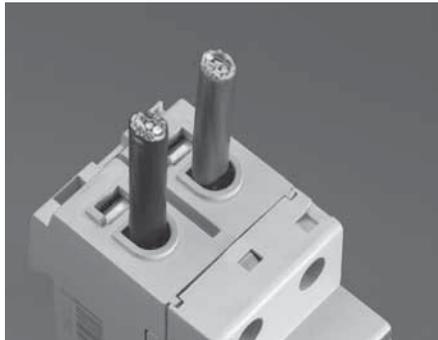
Busbars & connectors

Connection methods

System pro M
S200 Series



Top and bottom dual function terminals provided in open position for connection to busbars or cable.



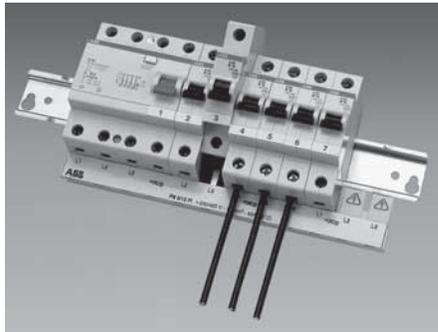
Terminals allow for connection of cable 18-4 AWG [top row] and 18-8 AWG [bottom row].



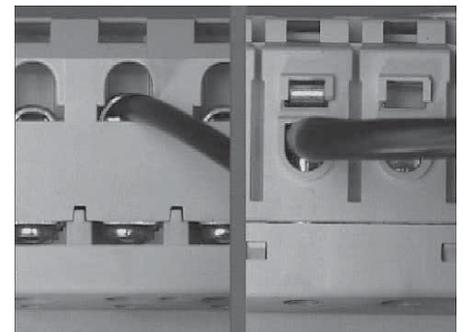
Two slots per terminal offer the ability to connect, independently, two conductors. This may be cables or bus bar.



Top and bottom terminals may be bussed together with single phase or multi-phase busbars as shown. Both line and load side terminals can be bus bar connected.



Easy removal of devices from an assembly when using bus bar in the bottom, load side terminals.



Conductors may only be inserted into open terminals, preventing mis-wiring and potential problems.

Technical data

Item	S200-B		S200-C, -D		S200-K		S200P-K	
Approvals:								
UL	1077		1077		1077		1077	
CSA	C22.2 — No. 235		C22.2 — No. 235		C22.2 — No. 235		—	
VDE	0641, 0660		0660		0660		0660	
IEC	898, 947		898, 947		898, 947		898, 947	
No. of poles:	1,2,3,4 1+N,3+N		1,2,3, 1+N,3+N		1,2,3,4, 1+N,3+N		1,2,3,4,1+N,3+N	
Tripping characteristic:	B		C,D		K		K	
Rated currents:	6 to 63A		0.5 to 63A		0.5 to 63A		0.2 to 63A	
Minimum operating voltage:	12V		12V		12V		12V	
UL/CSA rated voltage & interrupting capacity	Single pole	Multi pole						
120VAC	10kA	—	10kA	—	10kA	—	10kA	—
240VAC	6kA	10kA	6kA	10kA	6kA	10kA	10kA	10kA
277VAC	6kA	—	6kA	—	6kA	—	10kA	—
277/480 VAC	—	6kA	—	6kA	—	6kA	—	10kA
60VDC	10kA	10kA	10kA	10kA	10kA	10kA	—	—
125VDC	—	10kA	—	10kA	—	10kA	—	—
Frequency:	50/60Hz (See below)							
Rated voltage								
IEC single pole	240/415VAC 60VDC		240/415VAC 60VDC		240/415VAC 60VDC		240/415VAC 60VDC	
IEC multi-pole	415VAC 110VDC		415VAC 110VDC		415VAC 110VDC		415VAC 110VDC	
Protection category:	IP20		IP20		IP20		IP20	
Depth of unit per DIN 43880:	68mm		68mm		68mm		68mm	
Mounting position:	optional		optional		optional		optional	
Standard mounting:	35mm DIN rail							
Main and shunt trip terminals:								
Wire size	18-4 AWG [top] 18-8 [bottom]							
Torque	17.5 in.-lbs.		17.5 in.-lbs.		17.5 in.-lbs.		17.5 in.-lbs.	
Tool	#2 Posidrive		#2 Posidrive		#2 Posidrive		#2 Posidrive	
Accessory terminals								
Wire size	18-16 AWG		18-16 AWG		18-16 AWG		18-16 AWG	
Torque	4.5 in.-lbs.		4.5 in.-lbs.		4.5 in.-lbs.		4.5 in.-lbs.	
Tool	#1 Posidrive		#1 Posidrive		#1 Posidrive		#1 Posidrive	
Service life at rated load:	$I_n < 32$ A, 20,000 operations $I_n > 32$ A, 10,000 operations		$I_n < 32$ A, 20,000 operations $I_n > 32$ A, 10,000 operations		$I_n < 32$ A, 20,000 operations $I_n > 32$ A, 10,000 operations		$I_n < 32$ A, 20,000 operations $I_n > 32$ A, 10,000 operations	
Ambient temperatures:	-25°C to +70°C							
Storage temperatures	-40°C to +70°C							
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 @ 0.8 - I_n		5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 - I_n		5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 - I_n		5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 - I_n	
Disconnecting neutral rating:	6kA switching		6kA switching		6kA switching		—	

Influence of frequency on electro-magnetic trips

Magnetic trip values shown on trip curves are valid for 50/60Hz applications. For frequencies other than 50/60Hz, the magnetic (instantaneous) trip values are increased by the factor given below:

	16 2/3 - 60Hz	100Hz	200Hz	400Hz	DC
Approx. factor	1	1.1	1.2	1.5	1.5

Thermal tripping is independent of frequency.

Technical data

System pro M
S200 Series

Item	S280UC-K		S200P-Z		S280UC-Z		S290-C	
Approvals:	1077		1077		1077		—	
UL	—		—		—		—	
CSA	0660		0660		0660		0660	
VDE	898,947		898, 947		898, 947		898	
IEC	—		—		—		—	
No. of poles:	1,2,3		1,2,3,4		1,2,3		1,2,3,4	
Tripping characteristic:	K		Z		Z		C	
Rated currents:	0.2 to 63A		0.5 to 63A		0.5 to 63A		80 to 125A	
Minimum operating voltage:	12V		12V		12V		12V	
UL/CSA rated voltage & interrupting capacity	Single pole	Multi pole	Single pole	Multi pole	Single pole	Multi pole		
120VAC	10kA	—	10kA	—	10kA	—	—	
240VAC	10kA	10kA	10kA	10kA	10kA	10kA	—	
277VAC	10kA	—	10kA	—	10kA	—	—	
277/480 VAC	—	4.5kA for 0.2-40A 5kA for 50-63A	—	10kA	—	4.5kA for 0.2-40A 5kA for 50-63A	—	
60VDC	10kA	10kA	—	—	10kA	10kA	—	
125VDC	10kA	10kA	—	—	10kA	10kA	—	
250VDC	4.5kA	4.5kA	—	—	4.5kA	4.5kA	—	
500VDC	—	4.5kA	—	—	—	4.5kA	—	
Frequency:	50/60Hz (see below)		50/60 Hz (see below)		50/60Hz (see below)		50/60Hz (see below)	
Rated voltage	240/415VAC		240/415VAC		240/415VAC		230/440VAC	
IEC single pole	220VDC		60VDC		220VDC		60VDC	
IEC multi-pole	415VAC		415VAC		415VAC		440VAC	
	440VDC		110VDC		440VDC		110VDC	
Protection category:	IP20		IP20		IP20		IP20	
Depth of unit per DIN 43880:	68mm		68mm		68mm		70mm	
Mounting position:	optional		optional		optional		optional	
Standard mounting:	35mm DIN rail		35mm DIN rail		35mm DIN-rail		35mm DIN-rail	
Main and shunt trip terminals:	0.2-40A 18-4 AWG		18-4 AWG [top]		0.5-40A 18-4 AWG		80-125A 14-1/0 AWG	
Wire size	50A & above 18-2 AWG		18-8 AWG [bottom]		18-2 AWG		17.5 in-lbs.	
Torque	17.5 in-lbs.		17.5 in-lbs.		17.5 in-lbs.		17.5 in-lbs.	
Tool	#2 Posidrive		#2 Posidrive		#2 Posidrive		#2 Posidrive	
Accessory terminals	18-16 AWG		18-16 AWG		18-16 AWG		18-16 AWG	
Wire size	4.5 in-lbs.		4.5 in-lbs.		4.5 in-lbs.		4.5 in-lbs.	
Torque	#1 Posidrive		#1 Posidrive		#1 Posidrive		#1 Posidrive	
Tool								
Service life at rated load:	$I_n < 32$ A, 20,000 operations		$I_n < 32$ A, 20,000 operations		$I_n < 32$ A, 20,000 operations		10,000 operations	
	$I_n > 32$ A, 10,000 operations		$I_n > 32$ A, 10,000 operations		$I_n > 32$ A, 10,000 operations		—	
Ambient temperatures:	-25°C to +55°C		-25°C to +70°C		-25°C to +55°C		-5°C to +45°C	
Storage temperatures	-40°C to +70°C		-40°C to +70°C		-40°C to +70°C		-40°C to +70°C	
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 @ 0.8 - I_n		5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 - I_n		5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 - I_n		60m/s ² , at 10 - 150 Hz	

Influence of frequency on electro-magnetic trips

Magnetic trip values shown on trip curves are valid for 50/60Hz applications.

For frequencies other than 50/60Hz, the magnetic (instantaneous) trip values are increased by the factor given below:

	16 2/3 - 60Hz	100Hz	200Hz	400Hz	DC
Approx. factor	1	1.1	1.2	1.5	1.5

Thermal tripping is independent of frequency.

Technical data

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
No. 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				
120VAC	10kA	10kA	10kA	10kA
240VAC	10kA	10kA	10kA	10kA
277VAC	10kA	10kA		
480/277 VAC	—	—	10kA	10kA
Frequency:	50/60Hz (see below)	50/60 Hz (see below)	50/60Hz (see below)	50/60Hz (see below)
Rated voltage				
IEC single pole	240/415VAC	240/415VAC	240/415VAC	240/415VAC
	220VDC	60VDC	220VDC	220VDC
IEC multi-pole	415VAC	415VAC	415VAC	415VAC
	440VDC	110VDC	440VDC	440VDC
Protection category:	IP20	IP20	IP20	IP20
Depth of unit per DIN 43880:	68mm	68mm	68mm	68mm
Mounting position:	optional	optional	optional	optional
Standard mounting:	35mm DIN rail	35mm DIN rail	35mm DIN-rail	35mm DIN-rail
Main and shunt trip terminals:				
Wire size	18-4 AWG [top] 18-8 AWG [bottom]			
Torque	17.5 in-lbs.	17.5 in-lbs.	17.5 in-lbs.	17.5 in-lbs.
Tool	#2 Posidrive	#2 Posidrive	#2 Posidrive	#2 Posidrive
Accessory terminals				
Wire size	18-16 AWG	18-16 AWG	18-16 AWG	18-16 AWG
Torque	4.5 in-lbs.	4.5 in-lbs.	4.5 in-lbs.	4.5 in-lbs.
Tool	#1 Posidrive	#1 Posidrive	#1 Posidrive	#1 Posidrive
Service life at rated load:	$I_n < 32 A$, 20,000 operations $I_n > 32 A$, 10,000 operations	$I_n < 32 A$, 20,000 operations $I_n > 32 A$, 10,000 operations	$I_n < 32 A$, 20,000 operations $I_n > 32 A$, 10,000 operations	$I_n < 32 A$, 20,000 operations $I_n > 32 A$, 10,000 operations
Ambient temperatures:	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C
Storage temperatures	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C	-40°C to +70°C
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 @ 0.8 ~ I_n	5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 ~ I_n	5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 ~ I_n	5g, 20 cycles, 5 Hz, 150 Hz @ 0.8 ~ I_n

Influence of frequency on electro-magnetic trips

Magnetic trip values shown on trip curves are valid for 50/60Hz applications. For frequencies other than 50/60Hz, the magnetic (instantaneous) trip values are increased by the factor given below:

	16 2/3 - 60Hz	100Hz	200Hz	400Hz	DC
Approx. factor	1	1.1	1.2	1.5	1.5

Thermal tripping is independent of frequency.

Technical data

Wire size comparison



Comparison of IEC and AWG wire sizes

mm	AWG (mm)	Amps / UL	Amps / IEC
1.0	—	—	8
—	16 (1.3)	10	—
1.5	—	—	12
—	14 (2.1)	15	—
2.5	—	—	20
—	12 (3.3)	20	—
4	—	—	25
—	10 (5.3)	30	—
6	—	—	32
—	8 (8.4)	50	—
10	—	—	50
—	6 (13.3)	65	—
16	—	—	65
—	4 (21.2)	85	—
25	—	—	85
—	3 (26.7)	100	—
—	2 (33.6)	115	—
35	—	—	115

Ampacities for AWG wire are based on copper cable rated 75° C, except for 16AWG which is based on 60° C wire. Taken from UL508 Table 52.2.

Consult applicable standards for further detail and information.