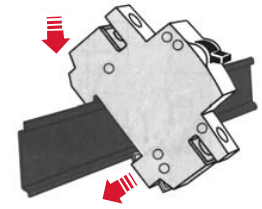
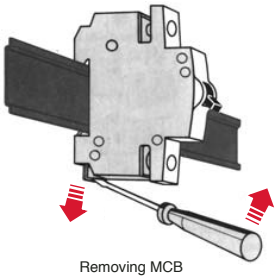


Mounting MCB



Removing MCB

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 type ME is available (see page 2.12).

Connection

Terminals are suitable for solid or flexible conductors from 18 to 4 AWG (0.75 to 25mm^2) with no busbar connected. When maximum busbar size of 36 mm^2 is used, maximum cable is 6 AWG (16 mm^2).

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.

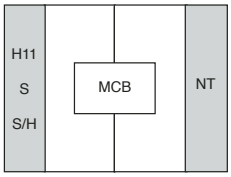
The "O" marking indicates that the breaker is in the "OFF" position. The MCB is now open and the load is disconnected from line power.

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".

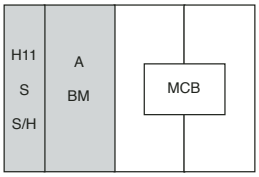
Maintenance

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

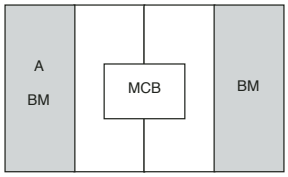
Possible mounting arrangements of MCB accessories



Auxiliary switch/bell alarm neutral disconnect

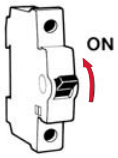


Shunt trip or undervoltage release mounted with auxiliary switch

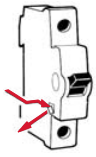


Shunt trip and/or undervoltage release

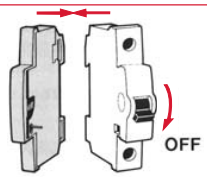
Auxiliary switch



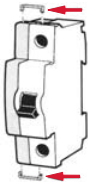
Set breaker to "ON" position



Break out opening on side of MCB

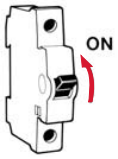


Set MCB to "OFF" position and mount auxiliary switch to side of breaker

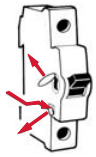


Attach with spring clamps

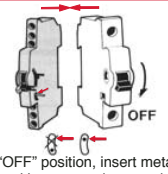
Bell alarm with auxiliary contact



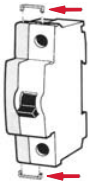
Set breaker to "ON" position



Break out opening on side of MCB and remove seal

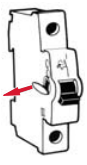


Set MCB to "OFF" position, insert metal pin as noted above with arrow and mount device to side of MCB

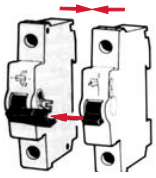


Attach with spring clamps

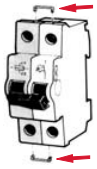
Shunt trip and undervoltage release



Remove seal

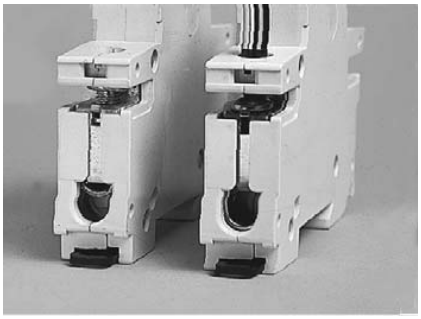


Add shunt trip to MCB

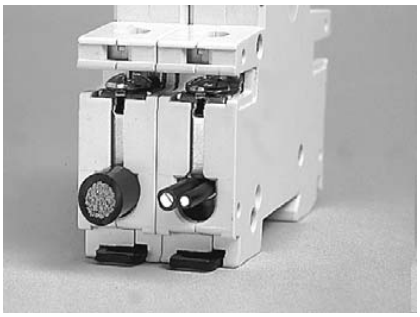


Attach with spring clamps

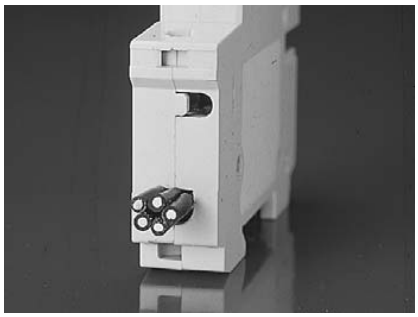
Technical data
Busbars & connectors
Connection methods



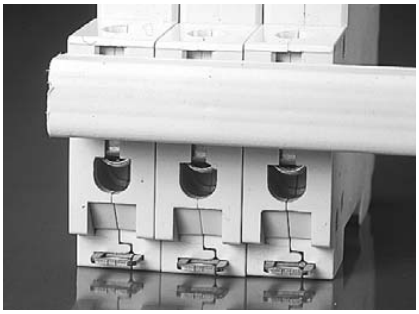
Dual function terminals provided in open position for connection to busbars. Pressing on screw head opens box terminal for cable insertion. Only the lower terminal is dual function.



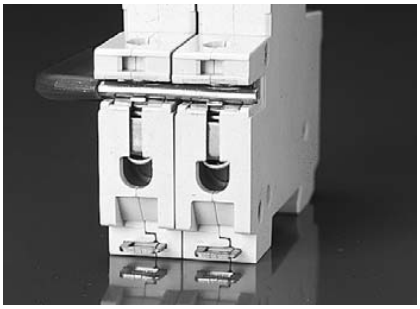
Terminals allow for connection of cable 18-4 AWG. Conductors of different sizes may also be used in same terminal.



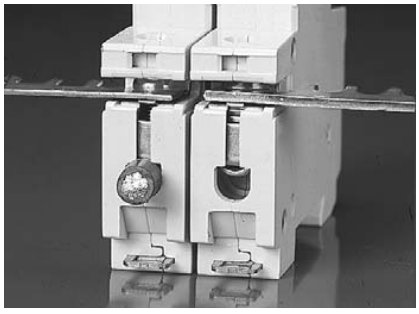
Up to five conductors, 16 AWG each, can be safely connected per terminal.



Lower terminals can be bussed together with single phase or multi-phase busbars as shown. Upper terminals can also be busbar connected.



Lower terminal can also be bussed with solid round conductor.



Cables can be connected to box terminals in addition to busbar connections on lower, dual function terminals.

Technical data
S260, S270, & S280

Item	S260-B	S260-C, -D	S270-K	S280-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	1,2,3,4, 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	Single pole / Multi pole	Single pole / Multi pole	Single pole / Multi pole
120VAC	10kA / —	10kA / —	10kA / —	10kA for 0.2-40A, 6kA for 50-63A / —
240VAC	6kA / 10kA	6kA / 10kA	6kA / 10kA	10kA for 0.2-40A, 6kA for 50-63A / 10kA for 0.2-32A, 6kA for 40-63A
277VAC	6kA / —	6kA / —	6kA / —	10kA for 0.2-40A / —
277/480 VAC	— / 6kA	— / 6kA	— / 6kA	— / 10kA
60VDC	10kA / 10kA	10kA / 10kA	10kA / 10kA	— / —
125VDC	— / 10kA	— / 10kA	— / 10kA	— / —
Frequency:	50/60Hz (See below)	50/60Hz (see below)	50/60Hz (see below)	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	35mm DIN rail	35mm DIN rail	35mm DIN rail
Main and shunt trip terminals:				
Wire size	6-40A 18-4 AWG; 50A & above 18-2 AWG	0.5-40A 18-4 AWG; 50A & above 18-2 AWG	0.5-40A 18-4 AWG; 50A & above 18-2 AWG	0.2-40A 18-4 AWG; 50A & above 18-2 AWG
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 +55°C	-25°C to +55°C	-25°C to +55°C	-25°C to +55°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
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.

① Available for purchase. See page 14.19.

Technical data
S280, S280UC, S290

Item	S280UC-K		S280-Z		S280UC-Z		S290-C
Approvals:							
UL	1077		1077		1077		—
CSA	—		—		—		—
VDE	0660		0660		0660		0660
IEC	898,947		898, 947		898, 947		898
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	6kA for 0.2-40A 5kA for 50-63A	—	10kA for 0.2-40A 6kA for 50-63A	—	6kA for 0.2-40A 5kA for 50-63A	—	—
240VAC	6kA for 0.2-40A 5kA for 50-63A	6kA for 0.2-40A 5kA for 50-63A	10kA for 0.2-40A 6kA for 50-63A	10kA for 0.2-32A 6kA for 40-63A	6kA for 0.2-40A 5kA for 50-63A	6kA for 0.2-40A 5kA for 50-63A	—
277VAC	4.5kA for 0.2-40A 5kA for 50-63A	—	10kA for 0.2-40A 6kA for 50-63A	—	4.5kA for 0.2-40A 5kA for 50-63A	—	—
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							
IEC single pole	240/415VAC 220VDC		240/415VAC 60VDC		240/415VAC 220VDC		230/440VAC 60VDC
IEC multi-pole	415VAC 440VDC		415VAC 110VDC		415VAC 440VDC		440VAC 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:							
Wire size	0.2-40A 18-4 AWG 50A & above 18-2 AWG		0.5-40A 18-4 AWG 50A & above 18-2 AWG		0.5-40A 18-4 AWG 50A & above 18-2 AWG		80-125A 14-1/0 AWG
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		10,000 operations —
Ambient temperatures: Storage temperatures	-25°C to +55°C -40°C to + 70°C		-25°C to +55°C -40°C to + 70°C		-25°C to +55°C -40°C to + 70°C		-5°C to +45°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/s², 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:

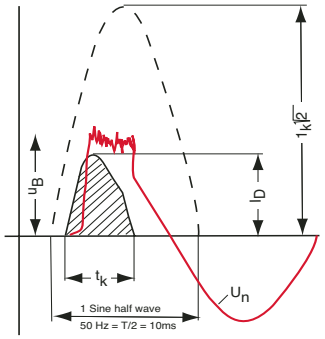
	16 2/3 - 60Hz	100Hz	200Hz	400Hz	DC
Approx. factor	1	1.1	1.2	1.5	1.5

Thermal tripping is independent of frequency.

Description

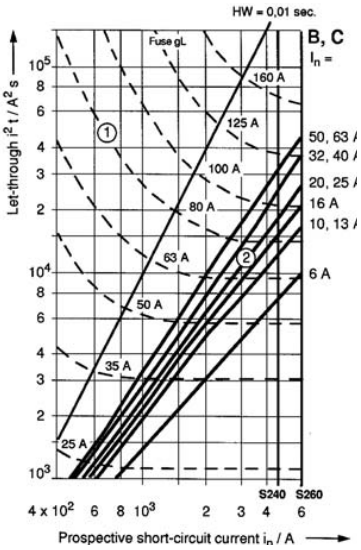
All ABB miniature circuit breakers substantially reduce the maximum let-through current from the peak available short circuit current.

I_K - RMS current of fault
I_D - Max let-through of MCB
V_n - System voltage
V_B - Arc voltage of MCB
t_k - Breaking time of MCB

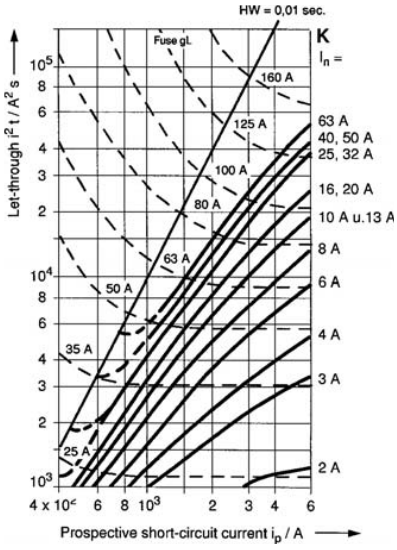


Let-through values I^2t

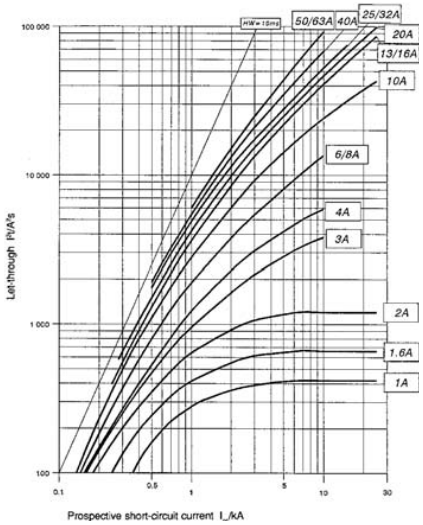
S260-B



S270-K



S280-K

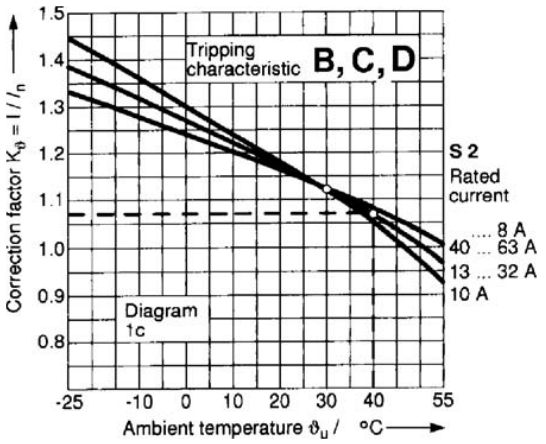
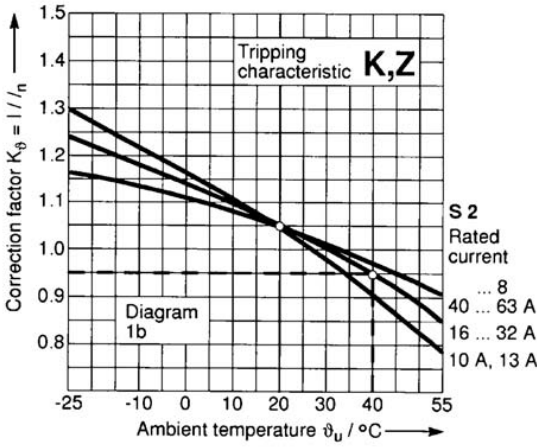


For other curves, please contact ABB Control.

Version	I^2t	I Peak
S260B	TD9980	—
S260C	TD9981	—
S260D	TD9982	—
S270K	TD9972	TD9950
S280K	TD9978	—
S280Z	TD9979	—
S290C	TD9985	—

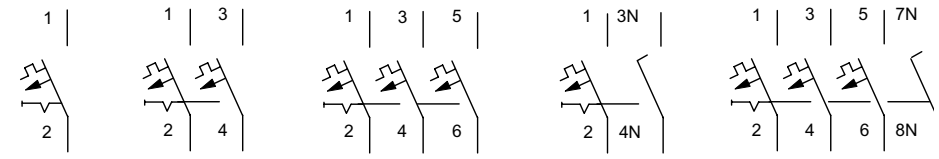
Version	Amps	Time-current trip
S260B	6 - 63	TD9725
S270K	0.5 - 8	TD9705
	10 - 40	TD9706
	50 - 63	TD9707
S280K	0.2 - 8	TD9708
	10 - 40	TD9709
	50 - 63	TD9710
S280Z	0.5 - 63	TD9711

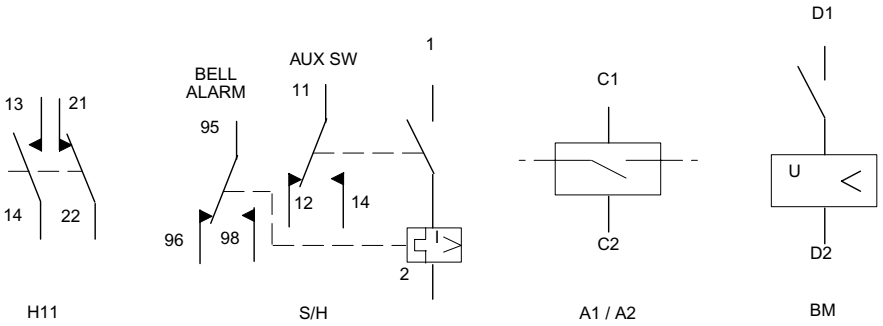
Technical data
Temperature derating factors
Terminal markings

Type B, C, D	Type K, Z
	

Current carrying capacity of type “B”, “C”, “D”, “K” and “Z” thermal trip characteristics as a function of ambient temperature.

Terminal markings
Input optional from top or bottom.





Miniature circuit breaker resistance values

Ampere rating	Milliohms S260-B	S270-K	S280-K	S280-Z
0.2	—	—	33300	—
0.3	—	—	19700	—
0.5	—	6340	5020	10100
0.75	—	—	2400	—
1.0	—	1550	1390	2270
1.6	—	695	612	1100
2	—	460	450	619
3	—	165	147	202
4	—	120	112	149
6	55	52	54.1	104
8	15	38	33.8	53.9
10	13.3	12.6	15.1	17.5
12	13.3	12.6	—	—
16	7.0	7.7	8.1	10.9
20	6.25	6.7	5.27	6.0
25	5.0	4.6	3.97	4.1
32	3.6	3.5	2.65	2.81
40	3.0	2.8	2.44	2.55
50	1.2	1.15	1.15	1.77
63	1.4	0.70	0.70	1.31

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 futher detail and information.