

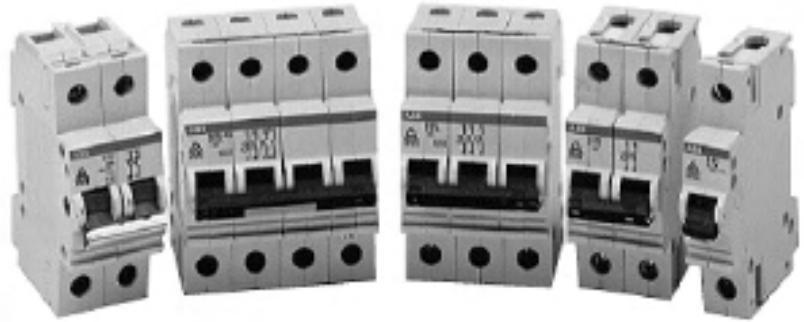
## Miniature circuit breakers

# UL 1077

## Interrupting ratings

**Description**

Miniature circuit breakers (MCBs) are used throughout the world in all types of electrical installations. ABB MCBs are recognized for use by Underwriters Laboratories Standard UL1077 for supplementary circuit protectors in systems rated 240VAC, 480VAC and 600VAC. Devices are certified per CSA C22.2.


**Miniature circuit breaker UL 1077 interrupting ratings**

Voltage	Rated interrupting capacity	Rated current	Item
120/240 VAC	10kA	6 – 40A	S190-B, C
		6 – 63A	S260-B, C
		0.5 – 63A	S270-K, Z
	18kA	32 – 63A	S500-B, C, D
		26 – 45A	S500-K
	30kA	6 – 25A	S500-B, C, D
	0.15 – 25A	S500-K	
240VAC	5kA	40 – 63A	S260-B, C
		40 – 63A	S270-K, Z
	6kA	6 – 32A	S260-B, C
		0.5 – 32A	S270-K, Z
		40 – 63A	S280-K, Z
	10kA	0.2 – 32A	S280-K, Z
	18kA	32 – 63A	S500-B, C, D
		26 – 45A	S500-K
	30kA	6 – 25A	S500-B, C, D
		0.15 – 25A	S500-K
277/480VAC	5kA	40 – 63A	S260-B, C
		40 – 63A	S270-K, Z
	6kA	6 – 32A	S260-B, C
		0.5 – 32A	S270-K, Z
		40 – 63A	S280-K, Z
	10kA	0.2 – 32A	S280-K, Z
	14kA	6 – 63A	S500-B, C, D
		0.15 – 45A	S500-K
600VAC	6kA	6 – 63A	S500-B, C, D
		0.15 – 45A	S500-K



## Technical data S260, S270, & S280

Item	S260-B	S270-K	S280-K	S280UC-K
Approvals: UL CSA VDE IEC	1077 C22.2 - No.235 0641, 0660 898, 947	1077 C22.2 - No. 235 0660 898, 947	1077 C22.2 - No. 235 0660 898, 947	1077 C22.2 - No. 235 0660 898, 947
No. of poles:	1,2,3,4 1+N,3+N	1,2,3,4, 1+N,3+N	1,2,3,4,1+N,3+N	1,2,3
Tripping characteristic:	B	K	K	K
Rated currents:	6 to 63A	0.5 to 63A	0.2 to 63A	0.2 to 63A
Rated voltage: UL/CSA single pole UL/CSA multi pole	277VAC 480VAC / 125VDC	277VAC, 60VDC 480VAC, 125VDC	277VAC 480VAC	277VAC, 250VDC 480VAC, 500VDC
IEC single pole	240/415VAC 60VDC	240/415VAC 60VDC	240/415VAC 60VDC	240/415VAC 220VDC
IEC multi-pole	415VAC 110VDC	415VAC 110VDC	415VAC 110VDC	415VAC 440VDC
Minimum operating voltage:	12V	12V	12V	12V
Rated interrupting capacity:	10 kA IC at up to 240VAC 6kA IC at 480VAC (6 to 32A) 5kA IC at 480VAC (40 to 63A)	10 kA IC at up to 240VAC/125VDC 6kA IC at 480VAC (0.5 to 32A) 5kA IC at 480VAC (40 to 63A)	Up to 32A - 10kA IC at 277/480VAC 40-63A - 6kA IC at 480VAC	Up to 32A - 6 kA IC at 277/480VAC 4.5kA IC at 250/500VDC 40-63A - 6kA IC at 480VAC
Frequency:	50/60Hz (See pg. 1.22)	50/60Hz (see pg. 1.22)	50/60Hz (see pg.1.22)	50/60Hz (see pg.1.22)
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
Terminals:	Conductors from 18-4AWG (0.75-25sq mm)  50A and above Conductors from 18-2AWG (0.75-35sq mm)	Conductors from 18-4AWG (0.75-25sq mm)  50A and above Conductors from 18-2AWG (0.75-35sq mm)	Conductors from 18-4AWG (0.75-25sq mm)  50A and above Conductors from 18-2AWG (0.75-35sq mm)	Conductors from 18-4AWG (0.75-25sq mm)  50A and above Conductors from 18-2AWG (0.75-35sq mm)
Service life at rated load:	20,000 operations	20,000 operations	20,000 operations	20,000 operations
Ambient temperatures:	-25°C to +55°C	-25°C to +55°C	-25°C to +55°C	-25°C to +55°C
Shock resistance:	10g minimum of 20 impacts, shock duration of 13ms	10g minimum of 20 impacts, shock duration of 13ms	10g minimum of 20 impacts, shock duration of 13ms	10g minimum of 20 impacts, shock duration of 13ms
Vibration resistance:	5g, minimum of 30 minutes	5g, minimum of 30 minutes	5g, minimum of 30 minutes	5g, minimum of 30 minutes
Disconnecting neutral rating:	6kA switching	6kA switching	—	—

MCBs are approved per IEC-898 and VDE 0641, and certified under IEC-947 and VDE 0660 standards for use in systems rated 415VAC or 690VAC (S500 series).

MCBs can be applied to 50Hz – 400Hz and DC power systems.

Special direct current version MCBs include a permanent magnet for DC fault current interruption. These "UC" versions are rated 250/500VDC under UL1077/CSA 22.2 No. 235.

Continuous current ratings are as low as 0.2 amperes and up to 125 amperes maximum.

MCBs are of compact size and can be quickly mounted on standard 35mm DIN rail or can be front mounted by use of a front mounting kit.

MCB breakers include line and load side terminals for conductors from 18 through 4AWG (0.75 – 25mm<sup>2</sup>) for 40 amperes; up to 2AWG for 50 and 63 amperes.

MCBs can also be connected via busbar conductors which can be either upper or lower mounted. Dual function terminals allow busbars to be connected with main incoming line conductors without separate lugs.

### Accessories

Auxiliary devices that can be added to S260, S270 and S280 series MCBs include:

- Shunt trips
- Auxiliary contacts
- Trip contacts
- Aux/trip contacts
- Undervoltage release

Accessory device modules can be field mounted to all above listed ABB MCBs. Auxiliary contacts are also available for the S500 series MCB.

### Applications

MCBs can be used for equipment protection, in commercial appliances, protection of control circuits against overcurrent faults,

computer equipment and other computer peripheral devices.

### UL 1077

MCBs are recognized as supplementary protectors and are intended for use as overcurrent protection within an appliance or other electrical equipment where branch circuit overcurrent protection is already provided or not required. MCBs and accessories are recognized under UL File E76126.

### CSA C22.2

MCBs and accessories are certified under CSA C22.2 No. 235 per File LR98793.

# 6-CIRCUIT BREAKERS & FUSES

## Technical data S280-Z, S280UC-Z, S290-C

Item	S280-Z	S280UC-Z	S290-C
Approvals:			
UL	1077	1077	—
CSA	C22.2 - No.235	C22.2 - No. 235	—
VDE	0660	0660	0660
IEC	898, 947	898, 947	898
No.of poles:	1,2,3,4	1,2,3	1,2,3,4
Tripping characteristic:	Z	Z	C
Rated currents:	0.5 to 63A	0.5 to 63A	80 to 125A
Rated voltage:			
UL/CSA single pole	277VAC	277VAC, 250VDC	①
UL/CSA multi pole	480VAC	480VAC, 500VDC	①
IEC single pole	240/415VAC	240/415VAC	230/440VAC
	60VDC	220VDC	60VDC
IEC multi-pole	415VAC	415VAC	440VAC
	110VDC	440VDC	110VDC
Minimum operating voltage:	12V	12V	12V
Rated interrupting capacity:	Up to 32A - 10kA IC at 480VAC 40-63A - 6kA IC at 480VAC	Up to 32A - 6kA IC at 480VAC 40-63A - 5kA IC at 480VAC 0.2-63A - 4.5kA IC at 250/500VDC	10kA IC at 440 VAC
Frequency:	50/60 Hz (See pg. 1.22)	50/60Hz (see pg. 1.22)	50/60Hz
Protection category:	IP20	IP20	IP20
Depth of unit per DIN 43880:	68mm	68mm	70mm
Mounting position:	optional	optional	optional
Standard mounting:	35mm DIN rail	35mm DIN-rail	35mm DIN-rail
Terminals:	Conductors from 18-4AWG (0.75-25sq mm)	Conductors from 18-4AWG (0.75-25sq mm)	Conductors from 14-1/0AWG (1.5-50sq mm)
	50A and above Conductors from 18-2AWG (0.75-35sq mm)	50A and above Conductors from 18-2AWG (0.75-35sq mm)	— — —
Service life at rated load:	20,000 operations	20,000 operations	10,000 operations
Ambient temperatures:	-25°C to +55°C	-25°C to +55°C	-5°C to +45°C
Shock resistance:	10g minimum of 20 impacts, shock duration of 13ms	10g minimum of 20 impacts, shock duration of 13ms	30g minimum of 20 impacts, shock duration of 13ms
Vibration resistance:	5g, minimum of 30 minutes	5g, minimum of 30 minutes	60m/s <sup>2</sup> ,

① For UL and 480VAC ratings, consult Relay Specialties technical sales department.

### Tripping characteristics

#### Time-current curves

ABB miniature circuit breakers are available with different trip characteristics, allowing for maximum system protection.

The "B" trip designation is offered with the S260 series and is specifically designed for control circuit conductor protection. The "K" trip designation, offered with the S270, S280 and S500 covers a much broader range of applications including equipment, motor and cable protection. The "Z" trip designation offered in both AC and DC versions with the S280 is intended for applications where very low instantaneous trip times are required such as for SCR (rectifier) protection.

#### B Characteristic

Available with the S260 series has rated currents of 6 through 63 amperes in 10 steps. The "B" time-current curve is designed

primarily for use in cable protection applications. Instantaneous tripping occurs between approximately 3 to 5 times rated current in 50/60Hz systems. This quick trip curve maximizes protection of control circuits under low short circuit fault levels that could damage control wiring.

#### C Characteristic

Available with the S290 series has rated currents of 80, 100 and 125 amperes. The "C" time-current curve is designed for high magnetic start-up currents. Instantaneous tripping occurs between 5 and 10 times rated current in 50/60 Hz systems. The "C" characteristic is also available in other S2 Series MCBs.

#### K Characteristic

The "K" time-current characteristic considers high magnetic start-up currents from motors, transformers and other equipment. Instantaneous tripping occurs between 8

and 12 times rated current in 50/60Hz systems. The "K" characteristic is available up through 63 amperes.

The "K" curve offers the best protection for the broadest range of electrical systems. The higher magnetic trip settings maximizes protection while allowing for higher in-rush currents during system start-up.

#### Z Characteristic

Also available up through 63 amperes, the "Z" characteristic offers instantaneous tripping between 2 and 3 times rated current in 50/60Hz systems. This trip characteristic is available in the S280 series with both the 480VAC and 250/500VDC ratings.

Many applications require a very low short circuit trip settings in order to protect semiconductor or other sensitive devices and the "Z" trip characteristic may provide

## Technical data Time current trip curves

### Description

Many different time-current trip characteristics are available from ABB in the various versions of miniature circuit breakers. These various trip characteristics may meet the special electrical standards of specific countries and agencies or be specially suited for application oriented protection systems.

The three most common and UL approved trip curves are the types "B", "K" and "Z". These are shown below for a typical 16 through 25 ampere rated breaker. Curves apply to both AC and DC versions.

The "B" curve is for cable protection, with an instantaneous trip point of approximately 3.3 to 5 times breaker continuous rating.

The "K" curve is cable and equipment protection including motors, transformers and other inductive loads where significant levels of in-rush current are possible. Most industrial applications are best protected with the "K" type trip characteristic. The instantaneous trip point is approximately 8 to 12 times the continuous rating of the breaker.

The "Z" curve is designed for the protection of semi-conductors or other devices

where a low instantaneous trip characteristic is desired. The instantaneous trip point is approximately 2 to 3 times the continuous rating of the breaker. For full size time-current trip characteristic curves, please contact ABB Control.

Version	Rated	Trip Curve
S270K	0.5-8A	TD9705
10-40A	TD9706	
50-63A	TD9707	
S280K	0.2-8A	TD9708
10-40A	TD9709	
50-63A	TD9710	
S280Z	0.5-63A	TD9711
S260B	6-63A	TD9723

### Time-current trip curves

