

## Protective Devices for SINAMICS S210 (6SL5...)

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## General Notes

- The voltage rating of any protective device must be at least the voltage rating of the supply circuit.
- The tables on the following pages show a suitable current rating and the maximum current rating of the protective device that is suitable to protect the drive. Protective devices of the same type as specified in the tables with lower current ratings as permitted by NEC and/or CEC may be used, if suitable for the application.
- Protective devices of the same type with a lower SCCR / I<sub>cc</sub> rating may be used.
- The converters must be mounted in a suitable enclosure, while ensuring the minimum enclosure sizes are observed.
- When Line Filters are installed in combination with the Power Converter, the same protective devices as specified for the converter shall be used and the SCCR as specified for the converter is achieved

## Overview of the approved protective devices according to UL standards

- JDDZ: Fuses of any manufacturer.
- DIVQ: SIEMENS circuit breaker
- NKJH: SIEMENS Type E combination motor controllers

## ICC conditional short circuit current I<sub>cc</sub>

The maximum RMS value of a prospective short circuit current, available from a supply source.

## Short-Circuit Current Rating (SCCR)

The Short-Circuit Current Rating (SCCR) is the prospective symmetrical fault current at a nominal voltage to which an apparatus or system is able to be connected without sustaining damage exceeding defined acceptance criteria.

## UL Certificates

FSA ... FSC, 1 AC	UL-File E192450
FSA ... FSC, 3 AC	UL-File E192450

## Group Installation

SINAMICS S210 drives have been evaluated for group installation according to UL61800-5-1. In this case, one single overcurrent protective device is acting as branch circuit protective for multiple drives. This is also applicable in the IEC world.

## Design considerations for converters with line input 1 AC or 3AC

Select a protective device suitable for group installation from the following tables. The sum of the rated input currents of the connected inverters shall not be higher than 80 % of the rated current of the common protective device. Where appropriate, a simultaneity factor may be considered. Observe the local installation standards regarding the ampacity of the mains supply conductors and sizing of protective devices for these conductors.

# 1 Protective devices for Converters with line input 1 AC

## 1.1 Protective devices for IEC applications

### 1.1.1 IEC Fuses

Frame size	Power Module		Fuse			Min. enclosure volume	
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	Article no.	ICC @ 240 V	Metric	Imperial (USA)
FSA	0.1 kW	6SL5310-1BB10-1CF0	4 A	3NA3804	65 kA	0.03 m <sup>3</sup>	1.06 ft <sup>3</sup>
			16 A	3NA3805			
	0.2 kW	6SL5310-1BB10-2CF0	4 A	3NW6004-1	65 kA		
			16 A	3NW6005-1			
FSB	0.4 kW	6SL5310-1BB10-4CF0	6 A	3NA3801	65 kA		
			16 A	3NA3805			
			6 A	3NW6001-1	65 kA		
			16 A	3NW6005-1			
FSC	0.75 kW	6SL5310-1BB10-8CF0	10 A	3NA3803	65 kA		
			16 A	3NA3805			
			10 A	3NW6003-1	65 kA		
			16 A	3NW6005-1			
any	group installation <sup>1)</sup>		16 A	3NA3805	65 kA		
			32 A	3NA3812			
any	group installation <sup>1)</sup>		16 A	3NW6005-1	65 kA		
			32 A	3NW6012-1			
any	group installation <sup>1)</sup>		32 A	3NA3812	65 kA	0.03 m <sup>3</sup>	1.06 ft <sup>3</sup>

1) For details on group installation see section general notes

2) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

Note: SIEMENS 3NA low-voltage fuses are recommended.

## 1.1.2 IEC Motor Starter Protectors

Frame Size	Power Module		MSP			Min. enclosure volume	
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	Article no. <sup>3)</sup>	ICC @ 240 V	Metric	Imperial (USA)
FSA	0.1 kW	6SL5310-1BB10-1CF0	3.2 A	3RV2011-1DA..	65 kA	0.03 m <sup>3</sup>	1.06 ft <sup>3</sup>
			16 A	3RV2011-4AA..			
	0.2 kW	6SL5310-1BB10-2CF0	3.2 A	3RV6011-1DA..	65 kA		
			16 A	3RV6011-4AA..			
0.4 kW	6SL5310-1BB10-4CF0	5 A	3RV2011-1FA..	65 kA			
		16 A	3RV2011-4AA..				
0.75 kW	6SL5310-1BB10-8CF0	5 A	3RV6011-1FA..	65 kA			
		16 A	3RV6011-4AA..				
FSB	0.4 kW	6SL5310-1BB10-4CF0	10 A	3RV2011-1JA..	65 kA		
			16 A	3RV2011-4AA..			
FSC	0.75 kW	6SL5310-1BB10-8CF0	10 A	3RV6011-1JA..	65 kA		
			16 A	3RV6011-4AA..			
any	group installation <sup>1)</sup>		25 A	3RV2011-1KA..	65 kA		
				3RV6011-1KA..		65 kA	
			3RV2021-4DA..	65 kA	0.03 m <sup>3</sup>		1.06 ft <sup>3</sup>
			3RV6021-4DA..	55 kA			

1) For details on group installation see section general notes

2) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

3) 3RV6 Motor Starter Protectors are orderable and available only in Asia with reduced approvals and certificates

### 1.1.3 IEC Circuit Breakers

Frame Size	Power Module		Circuit Breaker			Min. enclosure volume	
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	Type	ICC @ 240 V	Metric	Imperial (USA)
FSA	0.1 kW	6SL5310-1BB10-1CF0	3 A	5SJ4103-8HG41	15 kA	0.03 m <sup>3</sup>	1.06 ft <sup>3</sup>
			16 A	5SJ4316-8HG42			
			16 A	3VA1196-4ED1...	36 kA		
			16 A	3VA1096-4ED3...	55 kA		
	0.2 kW	6SL5310-1BB10-2CF0	16 A	3VA1196-6E...	65 kA		
			5 A	5SJ4111-8HG41	15 kA		
			16 A	5SJ4316-8HG42			
			16 A	3VA1196-4ED1...	36 kA		
FSB	0.4 kW	6SL5310-1BB10-4CF0	16 A	3VA1096-4ED3...	55 kA		
			16 A	3VA1196-6E...	65 kA		
			10 A	5SJ4110-8HG41	15 kA		
			16 A	5SJ4316-8HG42			
FSC	0.75 kW	6SL5310-1BB10-8CF0	16 A	3VA1196-4ED1...	36 kA		
			16 A	3VA1096-4ED3...	55 kA		
			13 A	5SJ4113-8HG41	15 kA		
			16 A	5SJ4316-8HG42			
any	group installation <sup>1)</sup>		30 A	5SJ4130-8HG41	15 kA	0.03 m <sup>3</sup>	1.06 ft <sup>3</sup>
			32 A	5SY7432-7 <sup>3)</sup>	15 kA		

- 1) For details on group installation see section general notes
- 2) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application
- 3) Provides overload protection for the neutral conductor

## 1.2 Protective devices for UL/CSA applications

### 1.2.1 UL/CSA non-semiconductor fuses

Frame Size	Power Module		Fuse		Min. enclosure volume	
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	SCCR @ 240 V	Metric	Imperial (USA)
FSA	0.1 kW	6SL5310-1BB10-1CF0	3.5 A	65 kA	0.03 m <sup>3</sup>	1.06 ft <sup>3</sup>
			15 A			
FSB	0.4 kW	6SL5310-1BB10-4CF0	6 A	65 kA		
			15 A			
FSC	0.75 kW	6SL5310-1BB10-8CF0	10 A	65 kA		
			15 A			
any	group installation <sup>1)</sup>		20 A	65 kA	0.03 m <sup>3</sup>	1.06 ft <sup>3</sup>

1) For details on group installation see section general notes

2) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

Note:

Any non-semiconductor fuses equal or better than Class RK5, e.g. Class J, CC, T, G or CF (JDDZ/7) from any manufacturer may be used

### 1.2.2 UL/CSA Type E Combination Motor Controllers

Frame Size	Power Module		CMC				Min. enclosure volume	
	Rated Power	Article no.	Max. rated current <sup>1)</sup>	Rated power @ 1AC 230 V	Article no. <sup>2)</sup>	SCCR @ 240 V	Metric	Imperial (USA)
FSA	0.1 kW	6SL5310-1BB10-1CF0	3.2 A	1/4 HP	3RV2011-1DA..	65 kA	0.03 m <sup>3</sup>	1.06 ft <sup>3</sup>
			16 A	2 HP	3RV2011-4AA..			
	0.2 kW	6SL5310-1BB10-2CF0	3.2 A	1/4 HP	3RV6011-1DA..	65 kA		
			16 A	2 HP	3RV6011-4AA..			
FSB	0.4 kW	6SL5310-1BB10-4CF0	5 A	1/2 HP	3RV2011-1FA..	65 kA		
			16 A	2 HP	3RV2011-4AA..			
	0.75 kW	6SL5310-1BB10-8CF0	10 A	1 1/2 HP	3RV2011-1JA..	65 kA		
			16 A	2 HP	3RV2011-4AA..			
FSC	0.75 kW	6SL5310-1BB10-8CF0	12.5 A	2 HP	3RV2011-1KA..	65 kA		
			16 A	2 HP	3RV2011-4AA..			
			12.5 A	2 HP	3RV6011-1KA..	65 kA		
			16 A	2 HP	3RV6011-4AA..			

1) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

2) 3RV6 CMCs are orderable and available only in Asia with reduced approvals and certificates

3RV20 motor starter protectors are approved in accordance with UL 508/UL60947-4-1 in combination with the terminal block 3RV2928-1H

Not necessary for CSA

### 1.2.3 UL/CSA Circuit Breakers

Frame Size	Power Module		Circuit Breaker				Min. enclosure volume	
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	UL/CSA Type	Article no. Example	SCCR @ 240 V	Metric	Imperial (USA)
FSA	0.1 kW	6SL5310-1BB10-1CF0	3 A 15 A	5SJ4	5SJ4203-8HG41 5SJ4318-8HG42	14 kA	0.03 m <sup>3</sup>	1.06 ft <sup>3</sup>
			3.2 A 15 A	3RV2711	3RV2711-1ED.. 3RV2711-4AD..	65 kA		
			15 A	SEAS	3VA5195-4E#*.. <sup>3)</sup>	65 kA		
			15 A	MEAS	3VA5195-5E#*.. <sup>3)</sup>	65 kA		
			15 A	HEAS	3VA5195-6E#*.. <sup>3)</sup>	65 kA		
			15 A	SEAB	3VA4195-4ED*.. <sup>3)</sup>	65 kA		
			15 A	MEAB	3VA4195-5ED*.. <sup>3)</sup>	65 kA		
	0.2 kW	6SL5310-1BB10-2CF0	3 A 15 A	5SJ4	5SJ4203-8HG41 5SJ4318-8HG42	14 kA		
			5 A 15 A	3RV2711	3RV2711-1FD.. 3RV2711-4AD..	65 kA		
			15 A	SEAS	3VA5195-4E#*.. <sup>3)</sup>	65 kA		
			15 A	MEAS	3VA5195-5E#*.. <sup>3)</sup>	65 kA		
			15 A	HEAS	3VA5195-6E#*.. <sup>3)</sup>	65 kA		
			15 A	SEAB	3VA4195-4ED*.. <sup>3)</sup>	65 kA		
			15 A	MEAB	3VA4195-5ED*.. <sup>3)</sup>	65 kA		
FSB	0.4 kW	6SL5310-1BB10-4CF0	3 A 15 A	5SJ4	5SJ4203-8HG41 5SJ4318-8HG42	14 kA		
			10 A 15 A	3RV2711	3RV2711-1JD.. 3RV2711-4AD..	65 kA		
			15 A	SEAS	3VA5195-4E#*.. <sup>3)</sup>	65 kA		
			15 A	MEAS	3VA5195-5E#*.. <sup>3)</sup>	65 kA		
			15 A	HEAS	3VA5195-6E#*.. <sup>3)</sup>	65 kA		
			15 A	SEAB	3VA4195-4ED*.. <sup>3)</sup>	65 kA		
			15 A	MEAB	3VA4195-5ED*.. <sup>3)</sup>	65 kA		
			15 A	HEAB	3VA4195-6ED*.. <sup>3)</sup>	65 kA		
FSC	0.75 kW	6SL5310-1BB10-8CF0	13 A 16 A	5SJ4	5SJ4213-8HG41 5SJ4316-8HG42	14 kA		
			12.5 A 15 A	3RV2711	3RV2711-1KD.. 3RV2711-4AD..	65 kA		
			15 A	SEAS	3VA5195-4E#*.. <sup>3)</sup>	65 kA		
			15 A	MEAS	3VA5195-5E#*.. <sup>3)</sup>	65 kA		
			15 A	HEAS	3VA5195-6E#*.. <sup>3)</sup>	65 kA		
			15 A	SEAB	3VA4195-4ED*.. <sup>3)</sup>	65 kA		
			15 A	MEAB	3VA4195-5ED*.. <sup>3)</sup>	65 kA		
any	group installation <sup>1)</sup>		20 A	5SJ4	5SJ4220-8HG41	14 kA		
			20 A	3RV2742	3RV2742-5CD..	65 kA		
			15 A	SEAS	3VA5120-4E#*.. <sup>3)</sup>	65 kA		
			15 A	MEAS	3VA5120-5E#*.. <sup>3)</sup>	65 kA		
			15 A	HEAS	3VA5120-6E#*.. <sup>3)</sup>	65 kA		
			15 A	SEAB	3VA4120-4ED*.. <sup>3)</sup>	65 kA		
			15 A	MEAB	3VA4120-5ED*.. <sup>3)</sup>	65 kA		
15 A	HEAB	3VA4120-6ED*.. <sup>3)</sup>	65 kA					

1) For details on group installation see section general notes

2) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

3) # might be C or D; \* might be 2 or 3

## 2 Protective devices for Converters with line input 3 AC

### 2.1 Protective devices for IEC applications

#### 2.1.1 IEC Fuses

Frame size	Power Module		Fuse			Min. enclosure volume	
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	Article no.	ICC @ 400 V	Metric	Imperial (USA)
FSA	0.4 kW	6SL5310-1BE10-4DF0	4 A	3NA3804	65 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>
			16 A	3NA3805			
	0.75 kW	6SL5310-1BE10-8DF0	4 A	3NW6004-1	65 kA		
			16 A	3NW6005-1			
	1.0 kW	6SL5310-1BE11-0DF0	6 A	3NA3801	65 kA		
			16 A	3NA3805			
1.5 kW	6SL5310-1BE11-5DF0	6 A	3NW6001-1	65 kA			
		16 A	3NW6005-1				
FSB	1.5 kW	6SL5310-1BE11-5DF0	10 A	3NA3803	65 kA		
			32 A	3NA3812			
	2.0 kW	6SL5310-1BE12-0DF0	10 A	3NW6003-1	65 kA		
			32 A	3NW6012-1			
	3.5 kW	6SL5310-1BE13-5DF0	16 A	3NA3805	65 kA		
			32 A	3NA3812			
FSC	3.5 kW	6SL5310-1BE13-5DF0	16 A	3NW6005-1	65 kA		
			32 A	3NW6012-1			
	5.0 kW	6SL5310-1BE15-0DF0	25 A	3NA3810	65 kA		
			63 A	3NA3822			
	7.0 kW	6SL5310-1BE17-0DF0	25 A	3NW6010-1	65 kA		
			32 A	3NW6012-1			
any	group installation <sup>1)</sup>	32 A	3NA3812	65 kA			
		63 A	3NA3822				
any	group installation <sup>1)</sup>	32 A	3NW6012-1	65 kA			
		63 A	3NW6222-1				
any	group installation <sup>1)</sup>	100 A	3NA3830	65 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>	
		80 A	3NW6224-1				

1) For details on group installation see section general notes

2) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

Note: SIEMENS 3NA low-voltage fuse series is recommended.

## 2.1.2 IEC Motor Starter Protectors

Frame Size	Power Module		MSP			Min. enclosure volume	
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	Article no. <sup>3)</sup>	ICC @ 400 V	Metric	Imperial (USA)
FSA	0.4 kW	6SL5310-1BE10-4DF0	3.2 A	3RV2011-1DA..	65 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>
			16 A	3RV2011-4AA..	55 kA		
			3.2 A	3RV6011-1DA..	65 kA		
	0.75 kW	6SL5310-1BE10-8DF0	16 A	3RV6011-4AA..	55 kA		
			5 A	3RV2011-1FA..	65 kA		
			16 A	3RV2011-4AA..	55 kA		
	1.0 kW	6SL5310-1BE11-0DF0	5 A	3RV6011-1FA..	65 kA		
			16 A	3RV6011-4AA..	55 kA		
			16 A	3RV6011-4AA..	55 kA		
FSB	1.5 kW	6SL5310-1BE11-5DF0	8 A	3RV2011-1HA..	65 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>
			16 A	3RV2011-4AA..	55 kA		
			10 A	3RV2011-1JA..	65 kA		
	2.0 kW	6SL5310-1BE12-0DF0	16 A	3RV2011-4AA..	55 kA		
			16 A	3RV6011-4AA..	55 kA		
			16 A	3RV6011-4AA..	55 kA		
FSC	3.5 kW	6SL5310-1BE13-5DF0	10 A	3RV2011-1JA..	65 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>
			16 A	3RV2011-4AA..	55 kA		
			25 A	3RV2021-4DA..	55 kA		
	5.0 kW	6SL5310-1BE15-0DF0	32 A	3RV2021-4EA..	55 kA		
			25 A	3RV6021-4DA..	55 kA		
			32 A	3RV6021-4EA..	55 kA		
	7.0 kW	6SL5310-1BE17-0DF0	28 A	3RV2021-4NA..	55 kA		
			32 A	3RV2021-4EA..	55 kA		
			32 A	3RV6021-4NA..	55 kA		
any	group installation <sup>1)</sup>		32 A	3RV6021-4EA..	55 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>
			40 A	3RV2021-4FA..	20 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>
			40 A	3RV2031-4UA..	65 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>
			80 A	3RV2031-4RA..	65 kA	0.23 m <sup>3</sup>	7.62 ft <sup>3</sup>

1) For details on group installation see section general notes

2) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

3) 3RV6 Motor Starter Protectors are orderable and available only in Asia with reduced approvals and certificates

Note: The Icc values are valid for TN and TT grids with grounded star point

## 2.1.3 IEC Circuit Breakers

Frame Size	Power Module		Circuit Breaker			Min. enclosure volume		
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	Type	ICC @ 400 V	Metric	Imperial (USA)	
FSA	0.4 kW	6SL5310-1BE10-4DF0	3 A	5SY7303-7	15 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>	
			16 A	5SY7316-7				
			3 A	5SJ4303-8HG42	15 kA			
			16 A	5SJ4316-8HG42				
	0.75 kW	6SL5310-1BE10-8DF0	16 A	3VA1096-4ED3...	36 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>	
			16 A	3VA1196-6E#3... <sup>3)</sup>	65 kA			
			6 A	5SY7306-7	15 kA	0.08 m <sup>3</sup>		2.65 ft <sup>3</sup>
			16 A	5SY7316-7				
	5 A	5SJ4311-8HG42	15 kA					
	16 A	5SJ4316-8HG42						
	1.0 kW	6SL5310-1BE11-0DF0	16 A	3VA1096-4ED3...	36 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>	
			16 A	3VA1196-6E#3... <sup>3)</sup>	65 kA			
8 A			5SY7308-7	15 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>		
16 A			5SY7316-7					
8 A	5SJ4308-8HG42	15 kA						
16 A	5SJ4316-8HG42							
FSB	1.5 kW	6SL5310-1BE11-5DF0	16 A	3VA1096-4ED3...	36 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>	
			16 A	3VA1196-6E#3... <sup>3)</sup>	65 kA			
			10 A	5SY7310-7	15 kA	0.08 m <sup>3</sup>		2.65 ft <sup>3</sup>
			16 A	5SY7316-7				
	10 A	5SJ4310-8HG42	15 kA					
	16 A	5SJ4316-8HG42						
	2.0 kW	6SL5310-1BE12-0DF0	16 A	3VA1096-4ED3...	36 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>	
			16 A	3VA1196-6E#3... <sup>3)</sup>	65 kA			
			16 A	5SY7316-7	15 kA	0.08 m <sup>3</sup>		2.65 ft <sup>3</sup>
			16 A	5SJ4316-8HG42	15 kA			
	16 A	3VA1096-4ED3...	36 kA					
	16 A	3VA1196-6E#3... <sup>3)</sup>	65 kA					
FSC	3.5 kW	6SL5310-1BE13-5DF0	25 A	5SY7325-7	15 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>	
			32 A	5SY7332-7				
			25 A	5SJ4325-8HG42	15 kA			
			32 A	5SJ4332-8HG42				
	5.0 kW	6SL5310-1BE15-0DF0	32 A	3VA1032-4ED3...	36 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>	
			32 A	3VA1132-6E#3... <sup>3)</sup>	65 kA			
			32 A	5SY7332-7	15 kA	0.08 m <sup>3</sup>		2.65 ft <sup>3</sup>
			30 A	5SJ4330-8HG42	15 kA			
	32 A	5SJ4332-8HG42	15 kA					
	32 A	3VA1032-4ED3...		36 kA				
	32 A	3VA1132-6E#3... <sup>3)</sup>	65 kA					
	7.0 kW	6SL5310-1BE17-0DF0	32 A	5SY7332-7	15 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>	
32 A			5SJ4332-8HG42	15 kA				
32 A			3VA1032-4ED3...		36 kA			
32 A			3VA1132-6E#3... <sup>3)</sup>	65 kA				
all	group installation <sup>1)</sup>		63 A	5SY7363-7	15 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>	
			32 A	3VA1032-4ED3... <sup>1)</sup>	36 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>	
			80 A	3VA1180-6E#3... <sup>3)</sup>	65 kA	0.23 m <sup>3</sup>	7.62 ft <sup>3</sup>	

1) For details on group installation see section general notes

2) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

3) # might be D, E or F

Note: 5SY73...-7 Circuit Breaker is in characteristic C. Characteristic B is also possible if it is suitable for the overload condition of the application

## 2.2 Protective devices for UL/CSA applications

### 2.2.1 UL/CSA non-semiconductor fuses

Frame Size	Power Module		Fuse		Min. enclosure volume	
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	SCCR @ 480 V	Metric	Imperial (USA)
FSA	0.4 kW	6SL5310-1BE10-4DF0	3.5 A	65 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>
			15 A			
	0.75 kW	6SL5310-1BE10-8DF0	5 A			
			15 A			
	1.0 kW	6SL5310-1BE11-0DF0	8 A			
			15 A			
FSB	1.5 kW	6SL5310-1BE11-5DF0	10 A			
			30 A			
	2.0 kW	6SL5310-1BE12-0DF0	15 A			
			30 A			
FSC	3.5 kW	6SL5310-1BE13-5DF0	25 A			
			70 A			
	5.0 kW	6SL5310-1BE15-0DF0	30 A			
			70 A			
	7.0 kW	6SL5310-1BE17-0DF0	30 A			
			70 A			
all	group installation <sup>1)</sup>		70 A	65 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>

1) For details on group installation see section general notes

2) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

**Note:**

Any non-semiconductor fuse equal or better than Class J, e.g. Class CC, T, G or CF (JDDZ/7) from any manufacturer may be used

## 2.2.2 UL/CSA Type E Combination Motor Controllers

Power Module			CMC				Min. enclosure volume	
Frame Size	Rated Power	Article no.	Max. rated current <sup>1)</sup>	Rated power @ 3AC 480 V	Article no. <sup>2)</sup>	SCCR @ 480 Y / 277 V	Metric	Imperial (USA)
FSA	0.4 kW	6SL5310-1BE10-4DF0	3.2 A	2 HP	3RV2011-1DA..	65 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>
			16 A	10 HP	3RV2011-4AA..			
	0.75 kW	6SL5310-1BE10-8DF0	3.2 A	2 HP	3RV6011-1DA..	65 kA		
			16 A	10 HP	3RV6011-4AA..			
	1.0 kW	6SL5310-1BE11-0DF0	5 A	3 HP	3RV2011-1FA..	65 kA		
			16 A	10 HP	3RV2011-4AA..			
1.0 kW	6SL5310-1BE11-0DF0	5 A	3 HP	3RV6011-1FA..	65 kA			
		16 A	10 HP	3RV6011-4AA..				
FSB	1.5 kW	6SL5310-1BE11-5DF0	10 A	5 HP	3RV2011-1JA..	65 kA		
			16 A	10 HP	3RV2011-4AA..			
	2.0 kW	6SL5310-1BE12-0DF0	10 A	5 HP	3RV6011-1JA..	65 kA		
			16 A	10 HP	3RV6011-4AA..			
FSC	3.5 kW	6SL5310-1BE13-5DF0	25 A	15 HP	3RV2021-4DA..	65 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>
			32 A	20 HP	3RV2021-4EA..	50 kA		
			25 A	15 HP	3RV6021-4DA..	65 kA		
			32 A	20 HP	3RV6021-4EA..	50 kA		
	5.0 kW	6SL5310-1BE15-0DF0	28 A	20 HP	3RV2021-4NA..	50 kA		
			32 A	20 HP	3RV2021-4EA..			
			28 A	20 HP	3RV6021-4NA..	50 kA		
			32 A	20 HP	3RV6021-4EA..			
7.0 kW	6SL5310-1BE17-0DF0	32 A	20 HP	3RV2021-4EA..	50 kA			
		32 A	20 HP	3RV6021-4EA..				

1) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

2) 3RV6 CMCs are orderable and available only in Asia with reduced approvals and certificates

3RV20 motor starter protectors are approved in accordance with UL 508/UL60947-4-1 in combination with the terminal blocks listed below:

- 3RV2011 and 3RV2021 with 3RV2928-1H

For CSA not necessary

## 2.2.3 UL/CSA Circuit Breakers

Frame Size	Power Module		Circuit Breaker					Min. enclosure volume			
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	UL/CSA Type	Article no. Example (European) <sup>4)</sup>	SCCR @		Metric	Imperial (USA)		
						480 V	480 Y / 277 V				
FSA	0.4 kW	6SL5310-1BE10-4DF0	3 A	5SJ4	5SJ4303-8HG42		10 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>		
			16 A							5SJ4316-8HG42	
			3.2 A	3RV2711	3RV2711-1ED..		65 kA				
			15 A							3RV2711-4AD..	
			10 A	3RV27	3RV2742-5AD..	65 kA	0.13 m <sup>3</sup>				4.31 ft <sup>3</sup>
			15 A							3RV2742-5BD..	
			15 A	SEAS	3VA5195-4ED3..	25 kA					
			15 A	MEAS	3VA5195-5ED3..	35 kA				<sup>3)</sup>	
	15 A	HEAS	3VA5195-6ED3..	65 kA	<sup>3)</sup>						
	15 A	SEAB	3VA4195-4ED3..	25 kA	<sup>3)</sup>						
	15 A	MEAB	3VA4195-5ED3..	35 kA	<sup>3)</sup>						
	15 A	HEAB	3VA4195-6ED3..	65 kA	<sup>3)</sup>						
	0.75 kW	6SL5310-1BE10-8DF0	5 A	5SJ4	5SJ4311-8HG42		10 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>		
			16 A							5SJ4316-8HG42	
			5 A	3RV2711	3RV2711-1FD..		65 kA				
			15 A							3RV2711-4AD..	
			10 A	3RV27	3RV2742-5AD..	65 kA	0.13 m <sup>3</sup>				4.31 ft <sup>3</sup>
			15 A							3RV2742-5BD..	
			15 A	SEAS	3VA5195-4ED3..	25 kA					
			15 A	MEAS	3VA5195-5ED3..	35 kA				<sup>3)</sup>	
	15 A	HEAS	3VA5195-6ED3..	65 kA	<sup>3)</sup>						
	15 A	SEAB	3VA4195-4ED3..	25 kA	<sup>3)</sup>						
	15 A	MEAB	3VA4195-5ED3..	35 kA	<sup>3)</sup>						
	15 A	HEAB	3VA4195-6ED3..	65 kA	<sup>3)</sup>						
	1.0 kW	6SL5310-1BE11-0DF0	8 A	5SJ4	5SJ4308-8HG42		10 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>		
			16 A							5SJ4316-8HG42	
			8 A	3RV2711	3RV2711-1HD..		65 kA				
			15 A							3RV2711-4AD..	
10 A			3RV27	3RV2742-5AD..	65 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>				
15 A										3RV2742-5BD..	
15 A			SEAS	3VA5195-4ED3..	25 kA						<sup>3)</sup>
15 A			MEAS	3VA5195-5ED3..	35 kA					<sup>3)</sup>	
15 A	HEAS	3VA5195-6ED3..	65 kA	<sup>3)</sup>							
15 A	SEAB	3VA4195-4ED3..	25 kA	<sup>3)</sup>							
15 A	MEAB	3VA4195-5ED3..	35 kA	<sup>3)</sup>							
15 A	HEAB	3VA4195-6ED3..	65 kA	<sup>3)</sup>							
FSB	1.5 kW	6SL5310-1BE11-5DF0	10 A	5SJ4	5SJ4310-8HG42		10 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>		
			16 A							5SJ4316-8HG42	
			10 A	3RV2711	3RV2711-1JD..		65 kA				
			15 A							3RV2711-4AD..	
			25 A	3RV27	3RV2742-5DD..	65 kA	0.13 m <sup>3</sup>				4.31 ft <sup>3</sup>
			30 A							3RV2742-5ED..	
			15 A	SEAS	3VA5195-4ED3..	25 kA					
			15 A	MEAS	3VA5195-5ED3..	35 kA				<sup>3)</sup>	
	15 A	HEAS	3VA5195-6ED3..	65 kA	<sup>3)</sup>						
	15 A	SEAB	3VA4195-4ED3..	25 kA	<sup>3)</sup>						
	15 A	MEAB	3VA4195-5ED3..	35 kA	<sup>3)</sup>						
	15 A	HEAB	3VA4195-6ED3..	65 kA	<sup>3)</sup>						
	2.0 kW	6SL5310-1BE12-0DF0	16 A	5SJ4	5SJ4316-8HG42		10 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>		
			15 A	3RV2711	3RV2711-4AD..		65 kA				
			15 A	3RV27	3RV2742-5BD..	65 kA	<sup>3)</sup>				
			15 A	SEAS	3VA5195-4ED3..	25 kA	<sup>3)</sup>				
15 A			MEAS	3VA5195-5ED3..	35 kA	<sup>3)</sup>					
15 A			HEAS	3VA5195-6ED3..	65 kA	<sup>3)</sup>					
15 A			SEAB	3VA4195-4ED3..	25 kA	<sup>3)</sup>					
15 A			MEAB	3VA4195-5ED3..	35 kA	<sup>3)</sup>					
15 A	HEAB	3VA4195-6ED3..	65 kA	<sup>3)</sup>							

Frame Size	Power Module		Circuit Breaker					Min. enclosure volume	
	Rated Power	Article no.	Max. rated current <sup>2)</sup>	UL/CSA Type	Article no. Example (European) <sup>4)</sup>	SCCR @		Metric	Imperial (USA)
						480 V	480 Y / 277 V		
FSC	3.5 kW	6SL5310-1BE13-5DF0	25 A	5SJ4	5SJ4325-8HG42		10 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>
			32 A		5SJ4332-8HG42				
			22 A	3RV2721	3RV2721-4CD..		50 kA	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>
			10 A	3RV27	3RV2742-5AD..	65 kA	<sup>3)</sup>	0.23 m <sup>3</sup>	7.62 ft <sup>3</sup>
			15 A		3RV2742-5BD..				
			30 A	SEAS	3VA5130-4ED3..	25 kA	<sup>3)</sup>	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>
			30 A	MEAS	3VA5130-5ED3..	35 kA	<sup>3)</sup>		
			30 A	HEAS	3VA5130-6ED3..	65 kA	<sup>3)</sup>		
	30 A	SEAB	3VA4130-4ED3..	25 kA	<sup>3)</sup>				
	30 A	MEAB	3VA4130-5ED3..	35 kA	<sup>3)</sup>				
	30 A	HEAB	3VA4130-6ED3..	65 kA	<sup>3)</sup>				
	5.0 kW	6SL5310-1BE15-0DF0	30 A	5SJ4	5SJ4330-8HG42		10 kA	0.08 m <sup>3</sup>	2.65 ft <sup>3</sup>
			32 A		5SJ4332-8HG42				
			25 A	3RV27	3RV2742-5DD..	65 kA	<sup>3)</sup>	0.23 m <sup>3</sup>	7.62 ft <sup>3</sup>
			30 A		3RV2742-5ED..				
	30 A	HEAS	3VA5130-6ED3..	65 kA	<sup>3)</sup>	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>		
	30 A	HEAB	3VA4130-6ED3..	65 kA	<sup>3)</sup>				
	7.0 kW	6SL5310-1BE17-0DF0	32 A	5SJ4	5SJ4332-8HG42		10 kA	0.08 m <sup>3</sup>	2.65ft <sup>3</sup>
			30 A	3RV27	3RV2742-5ED..	65 kA	<sup>3)</sup>	0.23 m <sup>3</sup>	7.62 ft <sup>3</sup>
			30 A	SEAS	3VA5130-4ED3..	25 kA	<sup>3)</sup>	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>
			30 A	MEAS	3VA5130-5ED3..	35 kA	<sup>3)</sup>		
30 A			HEAS	3VA5130-6ED3..	65 kA	<sup>3)</sup>			
30 A			SEAB	3VA4130-4ED3..	25 kA	<sup>3)</sup>			
30 A			MEAB	3VA4130-5ED3..	35 kA	<sup>3)</sup>			
30 A	HEAB	3VA4130-6ED3..	65 kA	<sup>3)</sup>					
all	group installation <sup>1)</sup>	35 A	SEAS	3VA5135-4ED3..	25 kA	<sup>3)</sup>	0.13 m <sup>3</sup>	4.31 ft <sup>3</sup>	
		35 A	MEAS	3VA5135-5ED3..	35 kA	<sup>3)</sup>			
		35 A	HEAS	3VA5135-6ED3..	65 kA	<sup>3)</sup>			
		35 A	SEAB	3VA4135-4ED3..	25 kA	<sup>3)</sup>			
		35 A	MEAB	3VA4135-5ED3..	35 kA	<sup>3)</sup>			
		35 A	HEAB	3VA4135-6ED3..	65 kA	<sup>3)</sup>			
		70 A	SEAS	3VA5170-4ED3..	25 kA	<sup>3)</sup>	0.23 m <sup>3</sup>	7.62 ft <sup>3</sup>	
		70 A	MEAS	3VA5170-5ED3..	35 kA	<sup>3)</sup>			
		70 A	HEAS	3VA5170-6ED3..	65 kA	<sup>3)</sup>			
		70 A	SEAB	3VA4170-4ED3..	25 kA	<sup>3)</sup>			
		70 A	MEAB	3VA4170-5ED3..	35 kA	<sup>3)</sup>			
		70 A	HEAB	3VA4170-6ED3..	65 kA	<sup>3)</sup>			

1) For details on group installation see section general notes

2) If two values are shown, nominal current can be between those two values. Protective devices with even lower current ratings may be used, if suitable for the application

3) The SCCR shown in the table for 3 phase straight rated 480V AC supply systems can also be applied to a 3 phase center point grounded (slash rated) supply systems of 480Y/277 V AC. However, vice versa or conversely CANNOT be done i.e., the SCCR shown in the table for a 3 phase center point grounded (slash rated) supply systems CANNOT be applied to a straight rated supply systems.

4) For more breaker article numbers, please refer to the documents mentioned on the next page.

Note: 5SJ43..-8 Circuit Breaker is in characteristic D. Characteristic B or C is also possible if it is suitable for the overload condition of the application

## More Information

For more information, see the following links:



- Manuals  
<https://support.industry.siemens.com/cs/ww/en/view/109818069>
- SIEMENS SENTRON fuses / 3NA fuses  
<https://support.industry.siemens.com/cs/ww/en/view/45314810>
- 3RV60 Motor Starter Protectors:  
<https://support.industry.siemens.com/cs/ww/en/ps/3rv60>
- IEC Circuit Breakers, 3VA1 series  
<https://support.industry.siemens.com/cs/ww/en/view/109743932>
- UL Molded Case Circuit Breakers, 3VA5 series Circuit Breakers  
<https://support.industry.siemens.com/cs/ww/en/view/109744301>
- UL Molded Case Circuit Breakers, SENTRON & VL series, see SIEMENS SPEEDFAX Product Catalog Section 7  
<http://w3.usa.siemens.com/powerdistribution/us/en/speedfax-product-catalog/Documents/2017>