

### 5SY and 5SP supplementary protection

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16

#### Application

Siemens' UL 1077 Supplementary Protectors are designed to provide additional protection along with a branch circuit protection device. Since our Supplementary protectors are made to trip faster than a standard UL 489 Circuit Breaker they are able to provide additional protection for more sensitive devices inside the panel. Supplementary protectors can be used in a number of industrial applications such as to provide selectivity for multiple motor control circuits on the secondary side of a control transformer or power supply by allowing the user to quickly find the problem circuit should a fault occur without having to shut down all of the other control circuits. Supplementary protectors may also be used as a local disconnecting means inside the panel when a branch circuit protection device is already present.

Always remember to follow the National Electric code when wiring your panel for applications within the United States.

#### Design

Supplementary protectors are equipped with a delayed overload/time-dependent thermal release (thermal bimetal) for low overcurrents and with an instantaneous electromagnetic release for high overload and short-circuit currents.

The special contact materials used virtually guarantee a long service life and offer a high degree of protection against contact welding.

#### Mode of operation

Thanks to the extremely fast contact separation in cases of failures and the rapid quenching of the arc consequently generated in the arcing chamber, supplementary protectors assure a safe and current-limiting off-switching.

The permissible limit- $I^2t$ -values of the energy limitation class 3 specified in EN 60 898 are generally undercut. This guarantees an excellent selectivity towards upstream overcurrent protection devices.

#### Features

- High rated breaking capacity of up to 10,000 A acc. to EN 60 898 / up to 15 kA acc. to EN 60 947-2
- Excellent current limiting and selectivity characteristics
- Tripping characteristic A, B, C and D
- Terminals offer protection against contact with fingers or the back of the hand acc. to the German accident prevention regulations VBG 4/ BGV A2
- Combined terminals enable a simultaneous connection of busbars and feeder cables
- Uniform components that can be quickly mounted individually, thanks to their snap-on technique
- The handle locking device virtually prevents any unauthorized operation of the handle

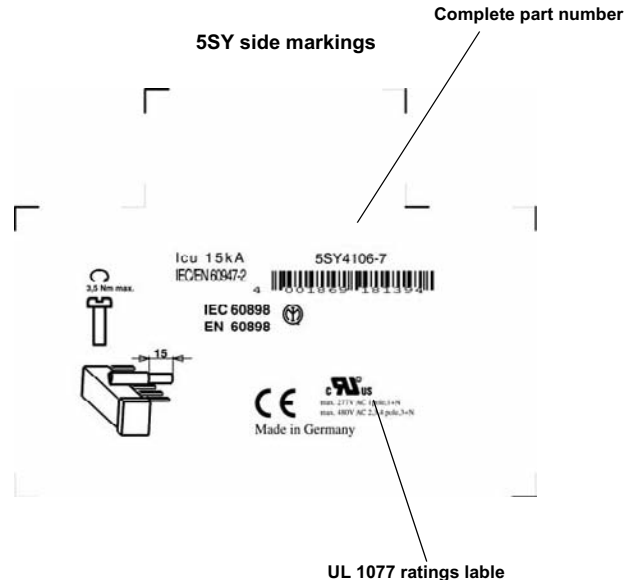
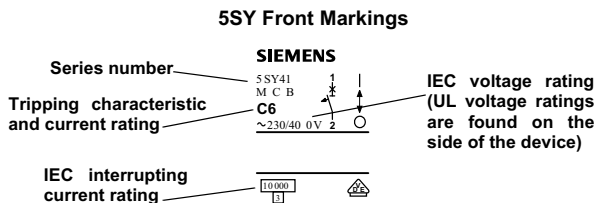
#### Features of 5SY

- Rapid connection of the feeder cable in front of the busbar
- Identical terminals at both sides for an optional infeed from the top or the bottom
- No tool required for mounting or dismounting
- Supports a fast and comfortable removal from the assembly
- Trip indication

#### Features of 5SP4

- Disconnection characteristics acc. to EN 60947-3 (DIN VDE 0660 Part 107)
- Main switch characteristics acc. to EN 60 204-1
- Can be screwed onto bases
- Separate switch position indication.

#### Device markings

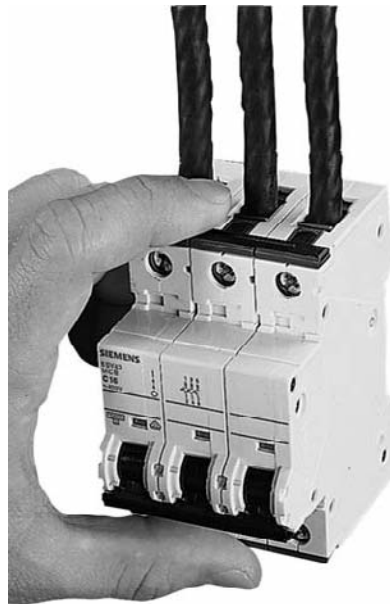
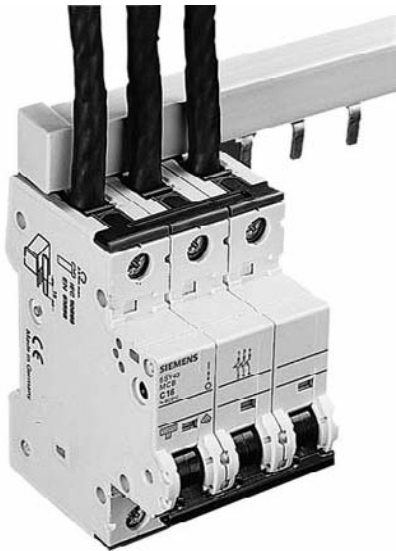


# Control Circuit Protection

## 5SY4 Supplementary Protection

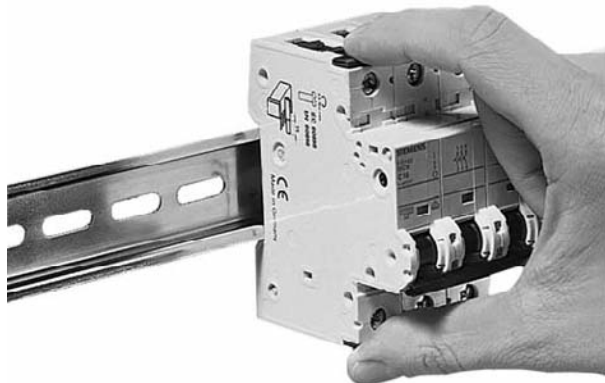
### Overview

#### Features of 5SY supplementary protectors



#### Easier, faster, enlarged wiring space

- Identical top and bottom terminals
- Connection of incoming cables vis-à-vis of the busbar
- Enlarged and easily accessible wiring space for the feeder cables
- Comfortable insertion of the incoming cables into the terminal
- Defined, visible and controllable connection of the feeder cables
- Universal infeed with top and bottom busbar mounting options.

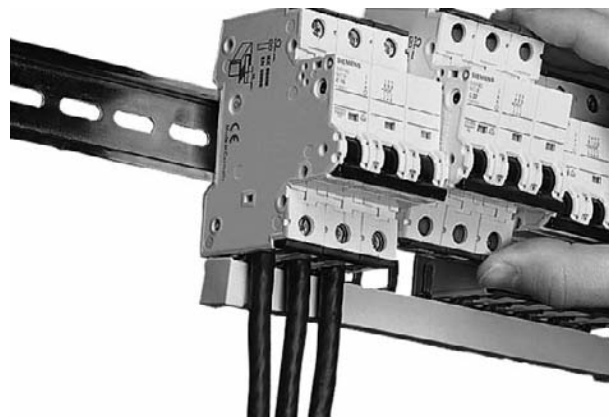


#### Flexible and no use of tools required

- Manually operable quick-assembly and disassembly systems requiring no use of tools
- Fast assembly and disassembly of 5SY supplementary protectors to and from the standard mounting rail.
- All devices can be easily and comfortably replaced at any time.

#### Protection against contact with clear advantages

- Integrated movable terminal covers located at the feeder cable input
- The terminals are completely closed when screws are fully tightened
- Effective protection against contact, also when the device is fully grabbed



#### Removal from the assembly

Thanks to the combination of the various features stated above, 5SY supplementary protectors can be easily and rapidly removed from the assembly when circuits need to be changed - with these devices, removal of the busbar is no longer necessary.

# Control Circuit Protection

## Supplementary Protection, General Data

### Tripping characteristics and breaking capacity

#### Tripping characteristics

##### Tripping performance at an ambient temperature of 30 °C

Tripping characteristic	Standards	Thermal release				Electromagnetic release		
		Test currents:		tripping time		hold	trips at the latest at	tripping time
		low test current $I_1$	high test current $I_2$	$63 A \geq I_n$ $t$	$63 A \leq I_n$	$I_4$	$I_5$	$t$
A		$1.13 \times I_n$	$1.45 \times I_n$	> 1 h < 1 h	> 2 h < 2 h	$2 \times I_n$	$3 \times I_n$	$\geq 0.1$ s < 0.1 s
B	IEC 60 898/EN 60 898 DIN VDE 0641 Part 11	$1.13 \times I_n$	$1.45 \times I_n$	> 1 h < 1 h	> 2 h < 2 h	$3 \times I_n$	$5 \times I_n$	$\geq 0.1$ s < 0.1 s
C		$1.13 \times I_n$	$1.45 \times I_n$	> 1 h < 1 h	> 2 h < 2 h	$5 \times I_n$	$10 \times I_n$	$\geq 0.1$ s < 0.1 s
D		$1.13 \times I_n$	$1.45 \times I_n$	> 1 h < 1 h	> 2 h < 2 h	$10 \times I_n$	$20 \times I_n$	$\geq 0.1$ s < 0.1 s

(IEC 60 898:  $50 \times I_n$ )

#### Breaking capacity

Breaking capacity ratings for UL1077 are broken down in four main line voltages that are tested. These voltages shown in the table below.

For IEC ratings, there are special requirements with regard to the breaking capacity.

The values are standardized and determined according to the testing conditions of EN 60 898 and DIN VDE 0641 Part 11.

The most usual values are  $6\,000$  and  $10\,000$ .

For other test conditions, other values can be specified which lie above those of EN 60 898 and DIN VDE 0641 Part 11.

An example of another standard is EN 60 947-2 or DIN VDE 0660 Part 101 for MCBs.

#### Interrupting Rating

		UL 1077 1-pole 120/240 V AC (in pairs) 240 V AC		1-pole 240 V AC		1-pole 277 V AC		2-, 3-, 4-pole 480 V AC (3-phase)	
Rated current	$I_n$ [A]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]
5SP4	80 - 125	14	7.5	5	5	5	5	5	5
5SY4	0.3 - 63	14	7.5	5	5	5	5	5	5

		UL 1077 1-pole 65 V DC		2-pole 125 V DC	
Rated current	$I_n$ [A]	$I_{cn}$ [A]	$I_{cn}$ [A]	$I_{cu}$ [A]	$I_{cu}$ [A]
5SP4	80 - 125	400	600		
5SY4	0.3 - 63	400	600		

		EN 60 898 (IEC 60 898)		EN 60 947-2 (IEC 60 947-2)	
		1-pole 230 V AC	2-, 3-, 4-pole 400 V AC	1-pole 230 V AC	2-, 3-, 4-pole 400 V AC
Rated current	$I_n$ [A]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cu}$ [kA]	$I_{cu}$ [kA]
5SP4	80 - 125	10	10	15	15
5SY4	0.3 ...6	10	10	35	35
	8 ...32	10	10	20	20
	40 ...63	10	10	15	15

		EN 60 898-2		EN 60 898-2	
		1-pole 230 V AC	2-pole 400 V AC	1-pole 220 V DC	2-pole 440 V DC
Rated current	$I_n$ [A]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cn}$ [kA]	$I_{cn}$ [kA]
5SY5	0.5 - 63	10	10	15	15