



## Low Voltage Power Distribution and Electrical Installation Technology

Miniature Circuit Breakers  
Residual Current Protective Devices  
Combined MCB/RCD (RCBO)  
Metal Modular Enclosures



Approved  
Distribution Partner

SIEMENS



**PENTA ENGINEERING SERVICES SDN BHD** (986496-A)

CASTELLO ENERGY CENTRE - LEVEL 1



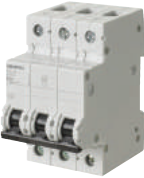
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### Miniature Circuit Breakers 5SJ6 series

#### Selection and ordering data

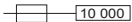


	$I_n$	Width	Order No.	NETT Price per PU (RM)	PS*/P. unit Unit(s)	Weight per PU approx. kg
	A	MW <sup>1)</sup>				
	MCB 6000 A					
	1P; 230/400 V 1					
	6		5SJ6 106-7SC	6.90	12	0.165
	10		5SJ6 110-7SC	6.90	12	0.165
	16		5SJ6 116-7SC	6.90	12	0.165
	20		5SJ6 120-7SC	6.90	12	0.165
	25		5SJ6 125-7SC	6.90	12	0.165
	32		5SJ6 132-7SC	7.30	12	0.165
	40		5SJ6 140-7SC	9.70	12	0.165
	50		5SJ6 150-7SC	16.80	12	0.165
63		5SJ6 163-7SC	16.80	12	0.165	
	2P; 400 V 2					
	6		5SJ6 206-7SC	24.30	6	0.330
	10		5SJ6 210-7SC	24.30	6	0.330
	16		5SJ6 216-7SC	24.30	6	0.330
	20		5SJ6 220-7SC	24.30	6	0.330
	32		5SJ6 232-7SC	24.30	6	0.330
	40		5SJ6 240-7SC	24.30	6	0.330
	63		5SJ6 263-7SC	46.70	6	0.330
	3P; 400 V 3					
	6		5SJ6 306-7SC	34.00	4	0.465
	10		5SJ6 310-7SC	34.00	4	0.465
	20		5SJ6 320-7SC	34.00	4	0.465
	25		5SJ6 325-7SC	34.00	4	0.465
	32		5SJ6 332-7SC	34.00	4	0.465
	40		5SJ6 340-7SC	34.00	4	0.465
	63		5SJ6 363-7SC	50.30	4	0.465

<sup>1)</sup> 1 MW (modular width) = 18 mm.

### Residual Current Protective Devices

#### 5SM3 series

#### Selection and ordering data

	Rated residual current	Rated current	Max. permissible short-circuit series fuse	Width	Order No.	NETT Price per PU (RM)	PS*/P. unit Unit(s)	Weight per PU approx. kg
	$I_{\Delta n}$ mA	$I_n$ A	 A	MW				
	RCCBs, type AC / A instantaneous							
	2P; 125 ... 230 V AC, 50 ... 60 Hz							
	30	25 40	63	2	5SM3 312-0 5SM3 314-0	85.00 78.00	1 unit 1 unit	0.230 0.230
	100	40 63		2.5	5SM3 414-0 5SM3 416-0	58.00 74.00	1 unit 1 unit	0.230 0.230
	4P; 230 ... 400 V AC, 50 ... 60 Hz							
		100	40 63 100	125	4	5SM3 444-0 5SM3 446-0 5SM3 448-6	117.00 156.00 278.00	1 unit 1 unit 1 unit
300		40 63 100			5SM3 644-0 5SM3 646-0 5SM3 648-6	89.00 133.00 289.00	1 unit 1 unit 1 unit	0.515 0.515 0.538

1 MW (modular width) = 18 mm.

\* You can order this quantity or a multiple thereof.

Combined MCB / RCD (RCBO)  
5SU9(1P+N) series

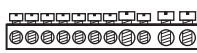
Selection and ordering data

	Rated residual current $I_{\Delta n}$ mA	Rated current $I_n$ A	Width MW	Order No.	NETT Price per PU (RM)	
	10	20	2	5SU91567VK20	65.00	
		25		5SU91567VK25	65.00	
		32		5SU91567VK32	65.00	
		30	40	2	5SU93561KK40	75.00
			63		5SU93561KK63	120.00

1 MW (modular width) = 18 mm.

\* You can order this quantity or a multiple thereof.

#### Selection and ordering data

Designation		Order No.	NETT price (RM)	Modules	Row
1 row, 13 w.400 x h.200 x d.100	N : 12 X 16mm <sup>2</sup> E : 12 X 16mm <sup>2</sup>	PE13	65.00	13	1
2 row, 26 w.400 x h.350 x d.100	N : 12 X 16mm <sup>2</sup> (x2) E : 24 x 16mm <sup>2</sup>	PE26	90.00	26	2
3 row, 39 w.400 x h.500 x d.100	N : 12 X 16mm <sup>2</sup> (x3) E : 36 x 16mm <sup>2</sup>	PE39	115.00	39	3
4 row, 52 w.400 x h.650 x d.100	N : 12 X 16mm <sup>2</sup> (x4) E : 48 X 16mm <sup>2</sup>	PE52	145.00	52	4
5 row, 65 w.400 x h.800 x d.100	N : 12 x 16mm <sup>2</sup> (x5) E : 60 x 16mm <sup>2</sup>	PE65	165.00	65	5
1 row, 18 w.470 x h.200 x d.100	N : 12 X 16mm <sup>2</sup> E : 12 x 16mm <sup>2</sup>	PE18	80.00	18	1
2 row, 36 w.470 x h.350 x d.100	N : 12 X 16mm <sup>2</sup> (x2) E : 24 X 16mm <sup>2</sup>	PE36	110.00	36	2
3 row, 54 w.470 x h.500 x d.100	N : 12 X 16mm <sup>2</sup> (x3) E : 36 X 16mm <sup>2</sup>	PE54	145.00	54	3
4 row, 72 w.470 x h.650 x d.100	N : 12 X 16mm <sup>2</sup> (x4) E : 48 X 16mm <sup>2</sup>	PE72	165.00	72	4
5 row, 90 w.470 x h.800 x d.100	N : 18 X 16mm <sup>2</sup> (x5) E : 60 X 16mm <sup>2</sup>	PE90	190.00	90	5
2 row, 18 w.470 x h.350 x d.125	N : 12 X 16mm <sup>2</sup> (x2) E : 24 x 16mm <sup>2</sup>	PEM18	115.00	18	2
3 row, 36 w.470 x h.500 x d.125	N : 12 X 16mm <sup>2</sup> (x3) E : 36 X 16mm <sup>2</sup>	PEM36	150.00	36	3
4 row, 54 w.470 x h.650 x d.125	N : 12 X 16mm <sup>2</sup> (x4) E : 48 X 16mm <sup>2</sup>	PEM54	195.00	54	4
5 row, 72 w.470 x h.800 x d.125	N : 18 X 16mm <sup>2</sup> (x5) E : 60 X 16mm <sup>2</sup>	PEM72	230.00	72	5
6 row, 90 w.470 x h.940 x d.125	N : 18 X 16mm <sup>2</sup> (x6) E : 60 X 16mm <sup>2</sup>	PEM90	265.00	90	6



# Technical Data



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# Miniature Circuit Breakers

## 5SJ6 miniature circuit breakers

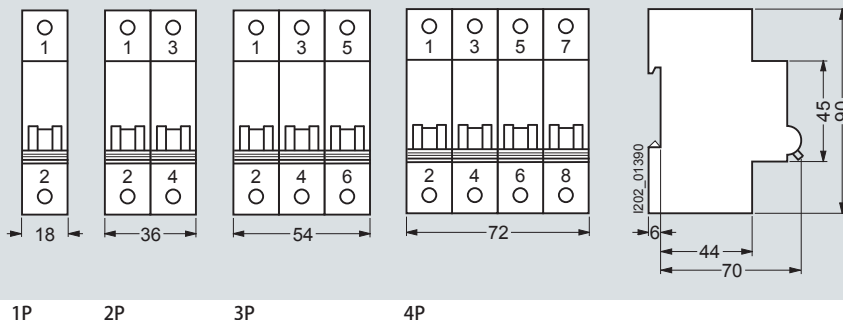
### Technical specifications

		5SJ6	
Standards		EN 60 898-1	
Approvals			
Tripping characteristic			
Rated voltage $U_n$		V AC	230/400
Operational voltage			
• Min.		V AC/DC	24
• Max.		V AC	250/440
• Max.		V DC/pole	60 <sup>1)</sup>
Rated breaking capacity $I_{cn}$	Acc. to EN 60898	kA AC	6
Insulation coordination			
• Rated insulation voltage		V AC	250/440
• Degree of pollution for overvoltage category			2/III
Touch protection	Acc. to EN 50274		Yes
Handle end position, sealable			Yes
Degree of protection			IP20
CFC and silicone-free			Yes
Conductor cross-sections			
• Solid and stranded		mm <sup>2</sup>	0.75 ... 35
• Finely stranded, with end sleeve		mm <sup>2</sup>	0.75 ... 25
Terminals			
• Terminal tightening torque		Nm	2.5 ... 3
Mounting position			Any
Service life on average, with rated load			20 000 actuations
Ambient temperature		° C	-25 ... +45, occasionally +55, max. 95 % humidity, storage temperature: -40 ... +75
Resistance to climate	Acc. to IEC 60068-2-30		6 cycles
Resistance to vibrations	Acc. to IEC 60068-2-6	m/s <sup>2</sup>	60 at 10 Hz ... 150 Hz

<sup>1)</sup> The operational voltage 60 V DC/pole takes into account a battery charging voltage with a peak value of 72 V.

### Dimensional drawings

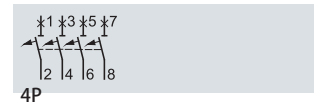
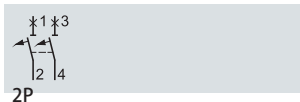
5SJ6



### Schematics

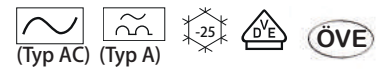
#### Symbols

5SJ6



# Residual Current Protective Devices

## 5SM3 residual current protective devices



### Technical specifications

		Instantaneous	SIGRES	Super resistant	Selective
Standards		IEC/EN 61008-1 (VDE 0664-10), IEC/EN 61008-2-1 (VDE 0664-11); IEC/EN 61543 (VDE 0664-30)			0664-11);
Approvals		IEC 61008-1, IEC 61008-2-1; EN 61008-1, EN 61008-2-1			
Surge current withstand capability with current waveform 8/20 $\mu$ s	Acc. to DIN VDE 0432-2	kA	> 1	> 3	> 5
Minimum operational voltage for test function operation		V AC	100		
Insulation coordination • Overvoltage category		III			
Terminal conductor cross-sections					
• For 2 MW	At $I_n = 16$ A, 25 A, 40 A At $I_n = 100$ A, 125 A	mm <sup>2</sup> mm <sup>2</sup>	1.0 ... 16 1.5 ... 50	--	--
• For 2.5 MW	At $I_n = 63$ A, 80 A	mm <sup>2</sup>	1.5 ... 25	--	--
• For 4 MW	At $I_n = 25$ A, 40 A, 63 A, 80 A At $I_n = 125$ A	mm <sup>2</sup> mm <sup>2</sup>	1.5 ... 25 2.5 ... 50	--	2.5 ... 50
Terminal tightening torque					
• Up to $I_n = 80$ A		Nm	2.5 ... 3.0	--	--
• At $I_n = 100$ A, 125 A		Nm	3.0 ... 3.5	--	3.0 ... 3.5
Mains connection			Top or bottom	Bottom	Top or bottom
Mounting position			Any		
Degree of protection	Acc. to EN 60529 (VDE 0470-1)		IP20, if the distribution board is installed, with connected conductors		
Touch protection	Acc. to EN 50274 (VDE 0660-514)		Finger and back-of-hand safe		
Service life	Test cycle acc. to IEC/EN 61008	Switching cycles	> 10000		
Storage temperature		° C	-40 ... +75		
Ambient temperature		° C	-25 ... +45, marked with		
Resistance to climate	Acc. to IEC 60068-2-30		28 cycles (55 ° C; 95 % rel. air humidity)		
CFC and silicone-free			Yes		

### Applications

- Personnel and fire protection
  - $I_{\Delta n} \leq 30$  mA: additional protection in case of direct contact
  - $I_{\Delta n} \leq 300$  mA: preventative fire protection in the case of ground fault currents
- Product standards: ÖVE/ ÖNORM EN 61008; ÖVE/ ÖNORM E 8601
- $U_n$  230/400 V; 50 to 60 Hz; can be used in systems up to: 240/415 V AC
- G type: at least 10 ms trip delayed. High surge current withstand capability: > 3 kA.



# Residual Current Protective Devices

## 5SM3 residual current protective devices

### Overview

RCCBs of type A are used in all systems up to 240/4 15 V AC. They trip in the event of both sinusoidal AC residual currents and pulsating DC residual currents.

RCCBs with a rated residual current of maximum 30 mA are used for personnel, material and fire protection, as well as for protection against direct contact. RCCBs with a rated residual current of 10 mA are primarily used in areas that represent an increased risk for personnel.

Since DIN VDE 0100-410 came into effect in June 2007, all socket outlet current circuits up to 20 A must now also be fitted with residual current protective devices with a rated residual current of max. 30 mA. This also applies to outdoor electrical circuits up to 32 A for the connection of portable equipment.

Devices with a rated residual current of maximum 300 mA are used as preventative fire protection in case of insulation faults. RCCBs with a rated residual current of 100 mA are primarily used outside Europe.

### SIGRES

SIGRES RCCBs were developed for use in harsh ambient conditions, such as swimming baths as protection against chlorine and ozone, in the agricultural sector (ammonia), on building sites and in the chemical industry (nitrogen oxide, sulfur dioxide, solvents), in the food processing industry (hydrogen sulfide) and in unheated rooms (dampness). The patented active condensation protection requires a continuous power supply and bottom infeed if the RCCB is switched off.

By use in ambient conditions in acc. with product standard EN 61008-1, the operation interval for pressing the test button can be extended to 1x a year.

### Super resistant

Super resistant (short-time delayed) RCCBs meet the maximum permissible break times for instantaneous devices. However, by implementing a short-time delay they prevent unnecessary trippings, and thus plant faults, when pulse-shaped leakage currents occur - as is the case when capacitors are switched on.

### Selective

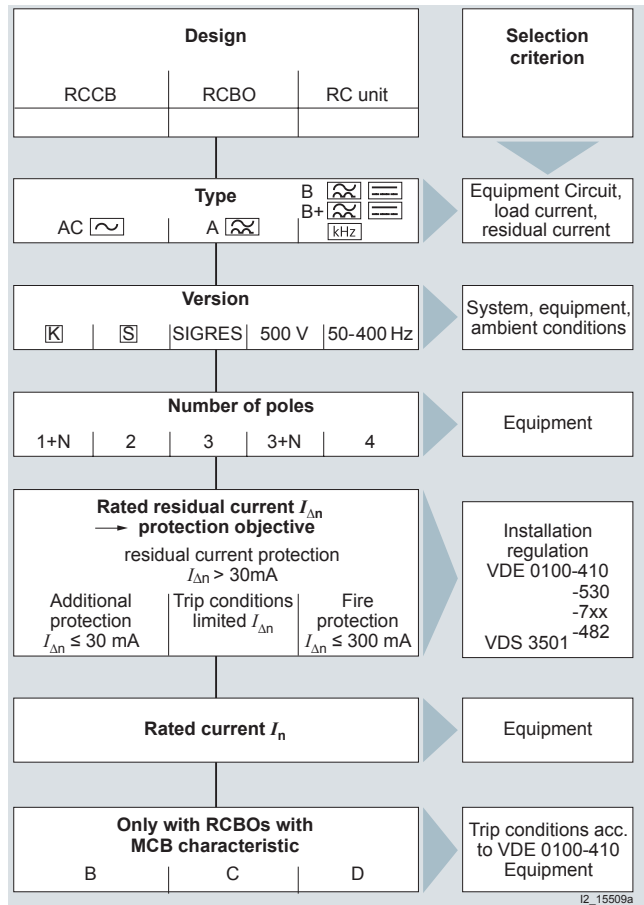
Can be used as upstream group switch for selective tripping contrary to a downstream, instantaneous or super resistant RCCB.

### Note:

You will find further information on the subject of residual current protective devices in the technology primer "Residual current protective devices", Order No.: E10003-E38-9T-B3011 and in the Technology Manual under: [www.siemens.com/lowvoltage/manuals](http://www.siemens.com/lowvoltage/manuals).

### Benefits

- Instantaneous RCCBs with the N connection on the left-hand side enable simple bus mounting with standard pin busbars with miniature circuit breakers installed on the right-hand side
- Instantaneous RCCBs with the N connection on the right-hand side can be bus-mounted with miniature circuit breakers using a special pin busbar
- Instantaneous devices have a surge current withstand capability with current waveform 8/20  $\mu$ s of > 1 kA, super resistant of > 3 kA and selective of > 5 kA. This ensures safe operation
- SIGRES has an extremely long service life due to patented active condensation protection and the same dimensions for the quick and easy replacement of instantaneous RCCBs already installed
- Super resistant devices increase plant availability, as unnecessary tripping is prevented in systems with short-time glitches
- Selective RCCBs increase plant availability, as in the event of a fault, a staggered tripping time enables the selective tripping of RCCBs connected in series
- Auxiliary switches or remote controlled mechanisms are also available as additional components
- The operating handle and the test button can be locked by means of a handle locking device.



Selection aid for finding the suitable residual current protective device



# Combined MCB / RCD (RCBO)

## 5SU9 (1P+N) combined MCB / RCD (RCBO)

### Technical specifications

- Rated voltage: 230V AC
- Rated current: 6 to 63A
- Residual current category: AC/A
- Breaking capacity: 6/10kA
- Tripping characteristic: C/D
- Current limiting class: 3
- Operating environment temperature: -25°C to +45° C, maximum relative humidity 95%
- Mechanical life: 20,000 cycles
- Snapped on 35mm rail, 2 modulus width (36mm)
- Prevent misoperation caused by surge (lightning, power grid operation etc)
- Strap lift type terminals
- Can be connected with cables and busbars of 25mm<sup>2</sup> simultaneously
- Surge current withstand (8/20 s)

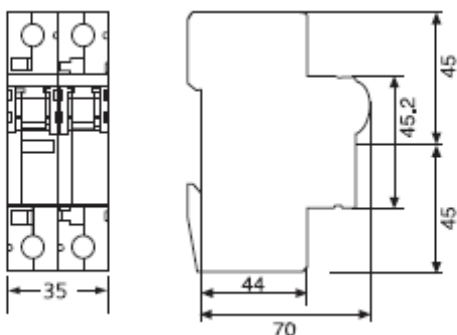
### Overview

IEC 61009/GB 16917 10/30mA AC  A 

### Function

- Overload and short-circuit protection
- Leakage protection
- Protection against direct contact
- Protection against indirect contact
- Overvoltage protection (280 VAC+/-5%...-1KN)
- Isolation

### Dimensional drawings



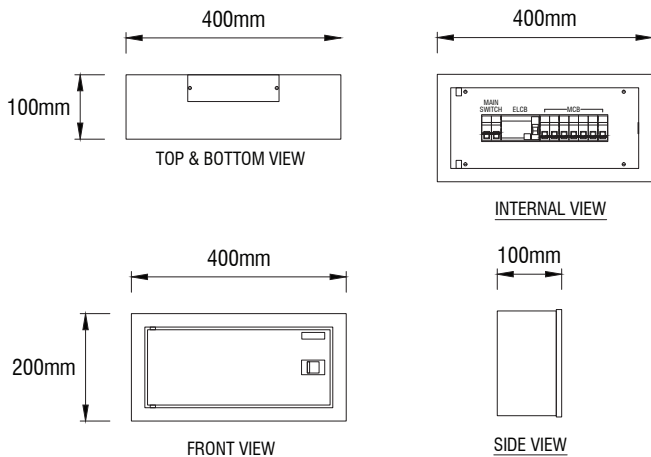
# Metal Modular Enclosures

## PE series metal modular enclosures

### Technical specifications

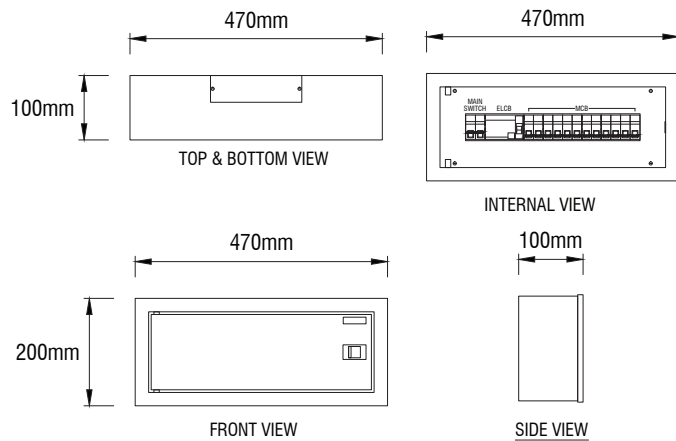
- PE metal enclosure IP41
- With rectangular knock-out
- Reversible door
- Removable top and bottom plates
- Powder coating to RAL 9002
- 1mm sheet steel, epoxy for trunking

### Dimensional drawings



PE 13

Reference	No of Row	Dimension (mm)		
		W	H	D
PE13	1	400	200	100
PE26	2	400	350	100
PE39	3	400	500	100
PE52	4	400	650	100
PE65	5	400	800	100



PE 18

Reference	No of Row	Dimension (mm)		
		W	H	D
PE18	1	470	200	100
PE36	2	470	350	100
PE54	3	470	500	100
PE72	4	470	650	100
PE90	5	470	800	100

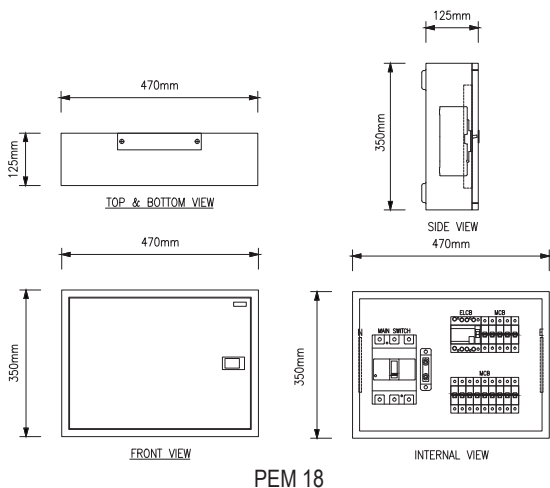
# Metal Modular Enclosures

## PEM series metal modular enclosures

### Technical specifications

- PEM metal enclosure IP41
- With rectangular knock-out
- Reversible door
- Removable top and bottom plates
- Powder coating to RAL 9002
- 1mm sheet steel, epoxy for trunking

### Dimensional drawings



Reference	No of Row	Dimension (mm)		
		W	H	D
PEM18	2	470	350	125
PEM36	3	470	500	125
PEM54	4	470	650	125
PEM72	5	470	800	125
PEM90	6	470	940	125

