

SITOP power supply

SITOP expansion modules

Equipment Manual

SITOP RED1200 redundancy module

6EP4346-7RB00-0AX0

SITOP RED1200 redundancy module

6EP4347-7RB00-0AX0

SITOP RED1200 redundancy module

6EP4348-7RB00-0AX0

SITOP PSE202U redundancy module

6EP1961-3BA21

SITOP PSE202U redundancy module

6EP1962-2BA00

SITOP PSE202U redundancy module

6EP1964-2BA00

SITOP CHO1400 chopper module

6EP4548-7XB00-3AX0

SITOP BUF1200 buffer module

6EP4231-7HB00-0AX0

SITOP PSE201U buffer module

6EP1961-3BA01

SITOP PBM1200 power boost module

6EP4240-7HB00-0AX0

Inrush current limiter Logo! ICL230

6EP4683-6LB00-0AY0

SITOP inrush current limiter

6EP1967-2AA00

SITOP RED1200 Ex redundancy module

6EP4347-7RC00-0AX0

SITOP BUF1200 Ex buffer module

6EP4231-7HC00-0AX0

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Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Overview

The quality of a power supply alone cannot guarantee a disturbance-free 24 V. Various risks, such as power failures, extreme line voltage fluctuations etc., can disturb plant or system operation and result in significant costs. Various SITOP expansion modules facilitate the completely flexible expansion of SITOP power supplies, and offer reliable protection against the widest range of risks. The following expansion modules are available to increase system availability.

SITOP RED1200 redundancy modules



The key benefits of this product include:

- Can be used for power supplies with output voltages 12 V up to 48 V
- High power supply reliability as a result of the redundant structure
- Reliable supply even if one power supply unit fails
- Compact redundancy modules for power supplies up to 40 A
- Simple commissioning using a push-in connection system
- Quick and simple rail mounting
- Own explosion protection variant available

SITOP PSE202U redundancy modules



The key benefits of this product include:

- High 24 V supply reliability as a result of the redundant structure
- Reliable supply even if one power supply unit fails
- Compact redundancy modules for power supplies up to 40 A
- 24 V/NEC Class 2 redundancy module with 100 VA limit
- Diagnostics signal using LED and signaling contacts
- Adjustable activation threshold for LED and signaling contacts
- Quick and simple rail mounting

Chopper module SITOP CHO1400



The key benefits of this product include:

- Safe protection of power supplies in the event of reverse polarity voltages, thereby increasing availability when energy recovery is used
- Suitable for applications with 24/48 V DC supply voltages (regardless of the performance class of the power supply)
- High availability thanks to reaction-free supply to other consumers
- Ability to be connected in parallel
- Fast diagnostics
 - LED status display on device
 - Signaling contact or diagnostics interface
- Flexible application
 - Response threshold adjustable to 2 or 4 V above the output voltage of the power supply
 - Two outputs can be connected in parallel to increase the power rating
- Simple commissioning using a push-in connection system
- Narrow design



- Only 2 cables are required to connect

- Only 2 cables are required to connect to the basic module
- Protection against brief power failures
- 300 ms up to max. 240 s buffer time depending on the load current
- The buffer time can be extended many times by connecting units in parallel
- Electrolytic capacitors are used for maintenance-free operation
- Diagnostic message via LED
- Quick and simple rail mounting
- Simple commissioning using a push-in connection system
- Own explosion protection variant available

SITOP PSE201U buffer module



The key benefits of this product include:

- Only 2 cables are required to connect to the basic module
- Protection against brief power failures
- 100 ms up to max. 10 s buffer time depending on the load current
- The buffer time can be extended many times by connecting units in parallel
- Electrolytic capacitors are used for maintenance-free operation
- Quick and simple rail mounting

Power boost module SITOP PBM1200



The key benefits of this product include:

- Safe electromagnetic tripping of miniature circuit-breakers C4/C6/C8/C10
- Suitable for applications with 24/48 V DC supply voltages
- Reverse polarity protection at the sockets
- Fast diagnosis via LED indicator on the device
- Quick and simple rail mounting
- Simple commissioning using a push-in connection system
- Narrow design

Inrush current limiter Logo! ICL230



The key benefits of this product include:

- Inrush currents are reliably reduced
- Can be used on 1-phase AC line supplies with rated voltages of 100 V, 120 V or 230 V
- Can be used on 2-phase AC line supplies with a rated voltage of 208 V
- Minimized power loss by bypassing the limiting resistor in operation
- Quick and simple rail mounting

SITOP inrush current limiter



The key benefits of this product include:

- Inrush currents are reliably reduced
- Can be used on 1-phase AC line supplies with rated voltages of 100 V, 120 V or 230 V
- Can be used on 2 and 3-phase AC line supplies with rated voltages of 208 V to 480 V
- Minimized power loss by bypassing the limiting resistor in operation
- Quick and simple rail mounting

Ordering data

The following device versions are available:

Expansion modules	
Type	Order number
Redundancy module SITOP RED1200 input/output 12 - 48 V DC/20 A	6EP4346-7RB00-0AX0
Redundancy module SITOP RED1200 input/output 12 - 48 V DC/40 A	6EP4347-7RB00-0AX0
Redundancy module SITOP RED1200 input/output 12 - 48 V DC/80 A	6EP4348-7RB00-0AX0
Redundancy module SITOP PSE202U input/output 24 V DC/40 A	6EP1961-3BA21
Redundancy module SITOP PSE202U NEC CLASS 2 input/output 24 V DC/4 A	6EP1962-2BA00
Redundancy module SITOP PSE202U input/output 24 V DC/10 A	6EP1964-2BA00
Chopper module SITOP CHO1400	6EP4548-7XB00-3AX0
Buffer module SITOP BUF1200	6EP4231-7HB00-0AX0
Buffer module SITOP PSE201U	6EP1961-3BA01
Power boost module SITOP PBM1200	6EP4240-7HB00-0AX0
Inrush current limiter Logo! ICL230	6EP4683-6LB00-0AY0
Inrush current limiter SITOP	6EP1967-2AA00

Expansion modules Ex	
Type	Order number
Redundancy module SITOP RED1200 Ex input/output 12 - 48 V DC/40 A	6EP4347-7RC00-0AX0
Buffer module SITOP BUF1200 Ex	6EP4231-7HC00-0AX0

Accessories for SITOP RED1200	
Type	Order number
Reference labeling plate (160 plates)	6ES7193-6LF30-0AW0

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Safety instructions

1.1 General safety instructions

 WARNING
Correct handling of the devices When operating electrical devices, it is inevitable that certain components will carry dangerous voltages. Therefore, failure to handle the units properly can result in death or serious physical injury as well as extensive property damage. Only appropriately qualified personnel may work on or in the vicinity of this equipment. Perfect, safe, and reliable operation of this equipment is dependent on proper transportation, storage, installation and mounting. Before installation or maintenance work can begin, the system's main switch must be switched off and measures taken to prevent it being switched on again. If this instruction is not observed, touching live parts can result in death or serious injury.

1.2 Safety instructions for hazardous zones

It is only permissible that the devices listed below are used in hazardous zones.

Type	Order number
Redundancy module SITOP RED1200 Ex	6EP4347-7RC00-0AX0
Buffer module SITOP BUF1200 Ex	6EP4231-7HC00-0AX0

The device complies with ATEX directive 2014/34/EU: EN IEC 60079-0; EN 60079-7;
UKSI 2016: 1107: BS EN IEC 60079-0; BS EN 60079-7;
CCC: GB3836.1; GB3836.3

UL: Suitable for Ex applications in CLASS I, DIVISION 2, GROUPS A, B, C and D - or in non-hazardous zones only; max. 2000 m

**WARNING**

EXPLOSION HAZARD – DO NOT CONNECT OR DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS

**WARNING**

EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2

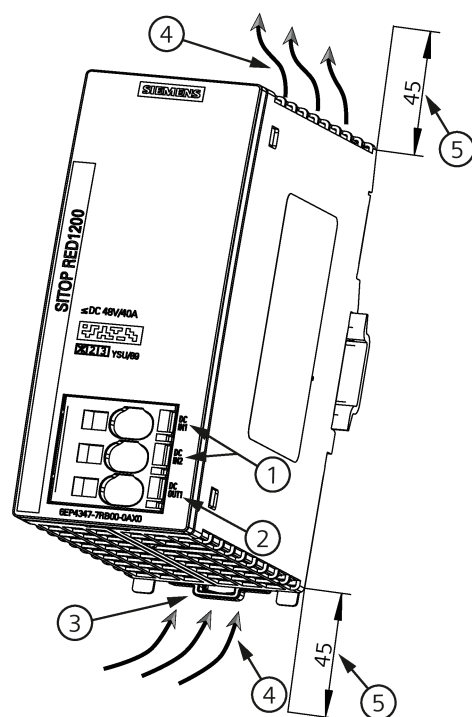
Description, device design, dimension drawing

2.1 Device description

2.1.1 Redundancy modules

2.1.1.1 SITOP RED1200

Redundancy modules SITOP RED1200 are the optimal addition to all 12 - 48 V power supplies to provide additional protection against failure of the 12 - 48 V supply. The redundancy module continuously monitors the feeding power supplies and when one device fails, the other one automatically takes over the complete 12 - 48 V supply.



- ① 12 - 48 V input – supply voltage from power supplies 1 and 2
- ② 12 - 48 V supply voltage output to the load
- ③ Mounting rail slider
- ④ Natural convection
- ⑤ Clearance above/below

Figure 2-1 Design

2.1 Device description

2.1.1.2 SITOP PSE202U

Redundancy modules SITOP PSE202U are the optimum addition to all 24 V power supplies to provide additional protection against failure of the 24 V supply. The redundancy module continuously monitors the feeding power supplies, and when one device fails, the other one automatically takes over the complete 24 V supply.

The failure of a 24 V power supply is signaled using an LED and a relay contact. The response threshold for this signal can be set between 20 V and 25 V using a potentiometer on the redundancy module. (when delivered, 20 V)

With redundancy module NEC class2, a redundant 24 V power supply can be implemented, where the output power is limited to 100 VA.

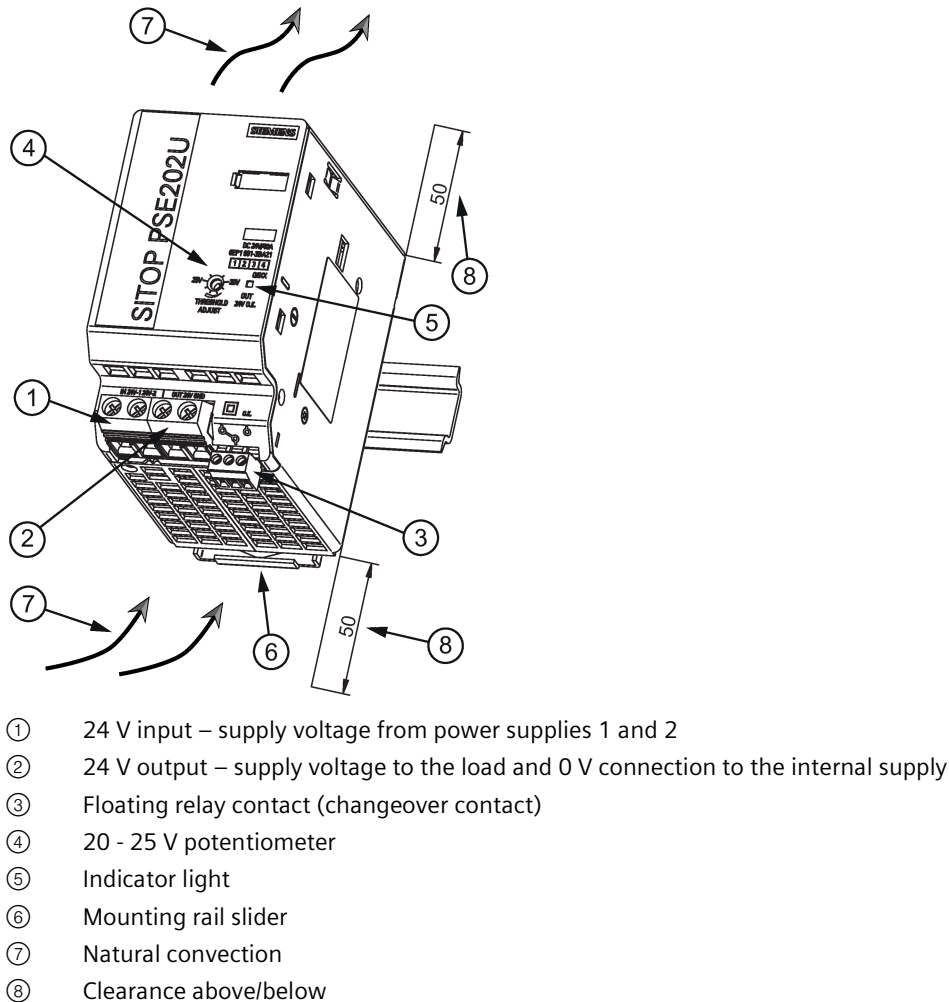
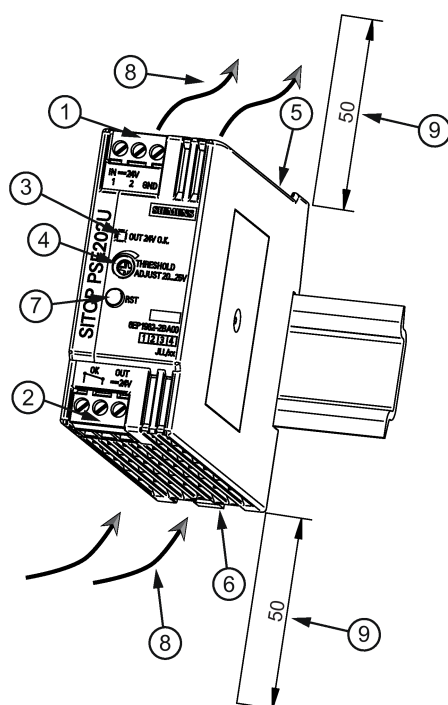


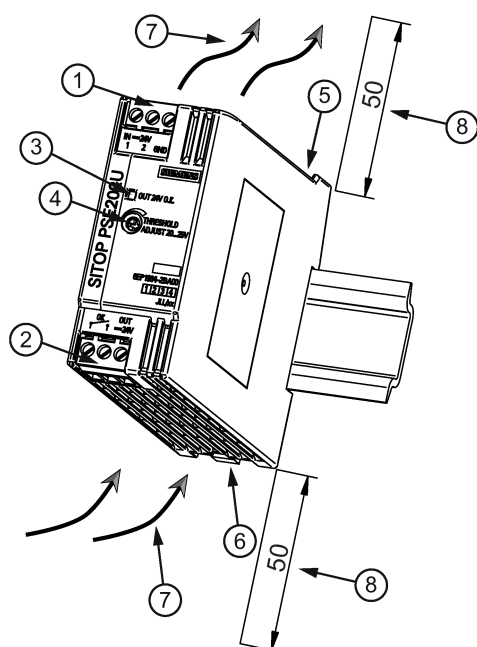
Figure 2-2 Design 6EP1961-3BA21



- ① 24 V input – supply voltage from power supplies 1 and 2 as well as 0 V connection to the internal supply
- ② 24 V output – supply voltage to the load and floating relay contact
- ③ Indicator light (LED)
- ④ Potentiometer for setting the signal threshold
- ⑤ Latch for manual unlocking
- ⑥ Lug for unlocking using a screwdriver
- ⑦ RST button to switch on again
- ⑧ Natural convection
- ⑨ Clearance above/below

Figure 2-3 Design 6EP1962-2BA00

2.1 Device description



- ① 24 V input – supply voltage from power supplies 1 and 2 as well as 0 V connection to the internal supply
- ② 24 V output – supply voltage to the load and floating relay contact
- ③ Indicator light (LED)
- ④ Potentiometer for setting the signal threshold
- ⑤ Latch for manual unlocking
- ⑥ Lug for unlocking using a screwdriver
- ⑦ Natural convection
- ⑧ Clearance above/below

Figure 2-4 Design 6EP1964-2BA00

2.1.2 Chopper module SITOP CHO1400

The chopper module is used in parallel with a 24/48 V power supply. If the load feeds back energy and therefore the voltage increases, after a specific voltage threshold is exceeded, the chopper module converts the energy fed back into heat and therefore limits the voltage (typical applications include DC motors that regenerate during braking). The response threshold of the chopper module is approx. 2 V above the output voltage of the power supply and can be increased by an additional 2 V using the DIP switch for active voltage limitation. When switching on, the chopper module requires approximately 10 seconds to adjust to the output voltage of the power supply as a reference value. When the output voltage of the power supply changes slowly, the reference voltage is automatically tracked within the voltage range of the chopper module. The chopper module can accept a maximum of 1 kW of power and 1.8 kW of energy. When this energy level is reached, the module deactivates itself and waits until it is again ready after a specified cooling time has elapsed. To increase the power rating, two chopper modules can be connected in parallel.

LEDs are installed on the front of the device to visualize the chopper operating states. In addition, the most important operating data can be transmitted to an I/O module via the diagnostic interface with the UDI protocol (Uni Directional Interface).

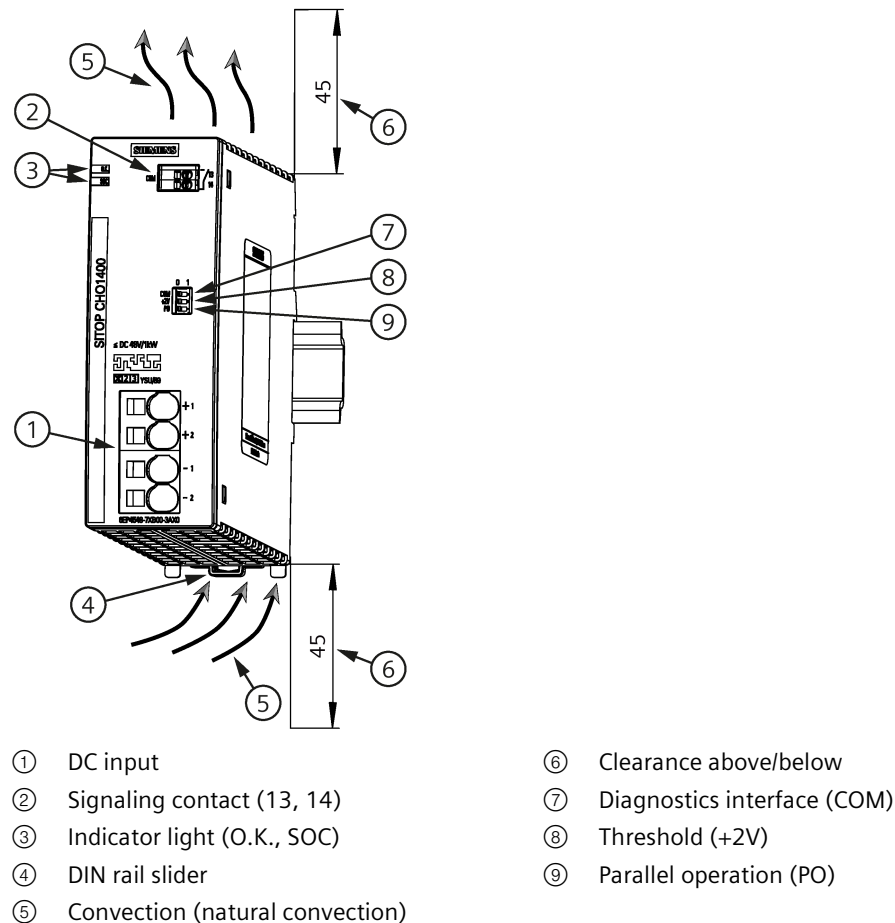


Figure 2-5 Design

2.1 Device description

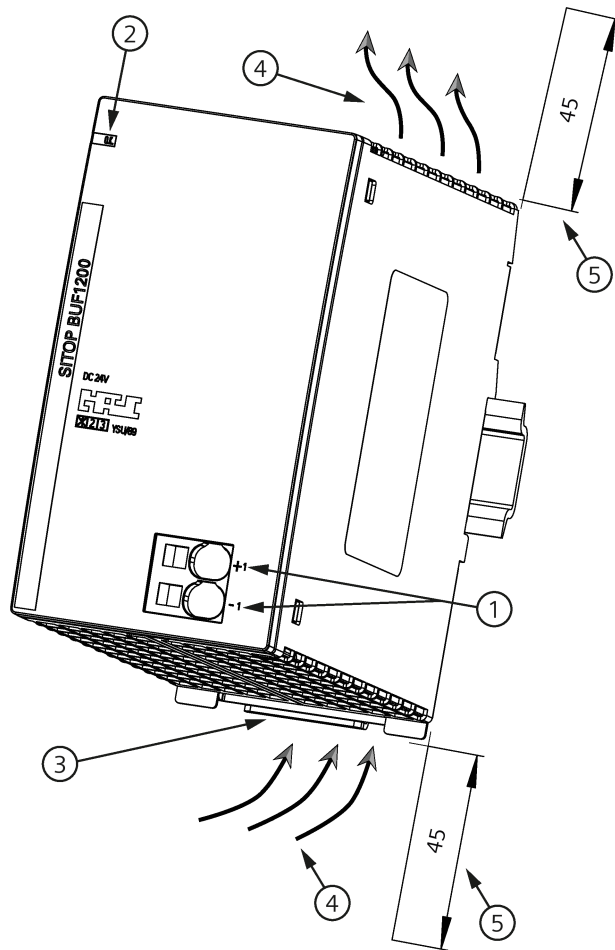
2.1.3 Buffer modules

2.1.3.1 SITOP BUF1200

The buffer module SITOP BUF1200 buffers brief power failures in the seconds range and can be used with all SITOP smart and SITOP modular 24 V power supplies. The buffer module uses maintenance-free capacitors as energy storage devices and automatically supplies 24 V in the event that the power supply voltage fails.

The buffer module is simply connected in parallel to the power supply output.

Several buffer modules can be connected in parallel to extend the buffer time.



- ① 24 V DC supply voltage
- ② Indicator light (O.K.)
- ③ Mounting rail slider
- ④ Natural convection
- ⑤ Clearance above/below

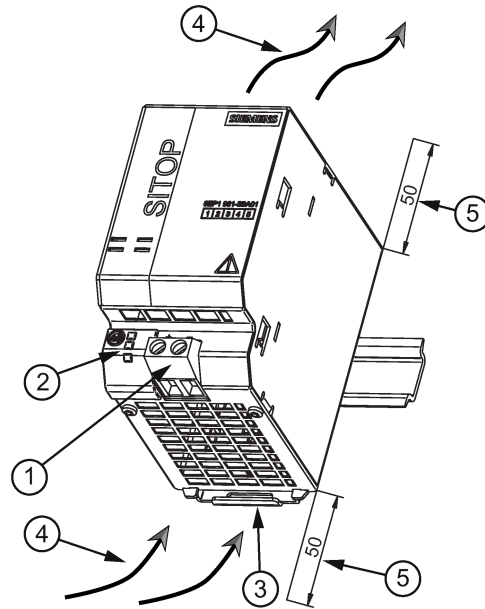
Figure 2-6 Design

2.1.3.2 SITOP PSE201U

The SITOP PSE201U buffer module buffers brief power failures in the seconds range and can be used with all SITOP smart and SITOP modular 24 V power supplies. The buffer module uses maintenance-free capacitors as energy storage devices and automatically supplies 24 V in the event that the power supply voltage fails.

The buffer module is simply connected in parallel to the power supply output.

To increase the buffer time (max. 10 s), several buffer modules can be connected in parallel.

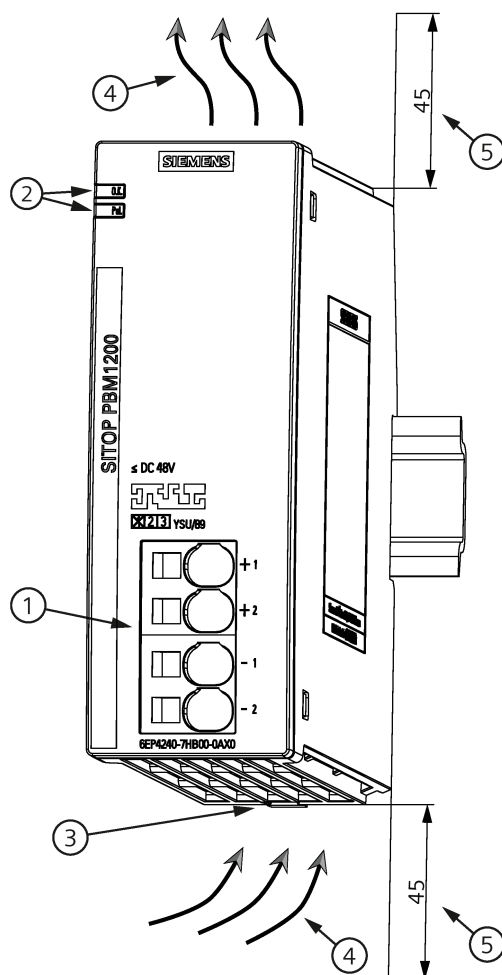


- ① 24 V DC supply voltage
- ② Indicator light (24 V OK)
- ③ Mounting rail slider
- ④ Natural convection
- ⑤ Clearance above/below

Figure 2-7 Design

2.1.4 Power boost module SITOP PBM1200

The power boost module SITOP PBM1200 is used in parallel to a 24/48 V power supply with a rated output current ≥ 20 A. In the case of a short-circuit, the SITOP PBM1200 delivers a current surge (a multiple of the rated power supply current) to trigger a circuit breaker within in a few milliseconds. The implemented reverse polarity protection protects the power boost module against electrical destruction.



- ① 24/48 V supply voltage
- ② Indicator light (O.K., Pol)
- ③ Mounting rail slider
- ④ Convection (natural convection)
- ⑤ Clearance above/below

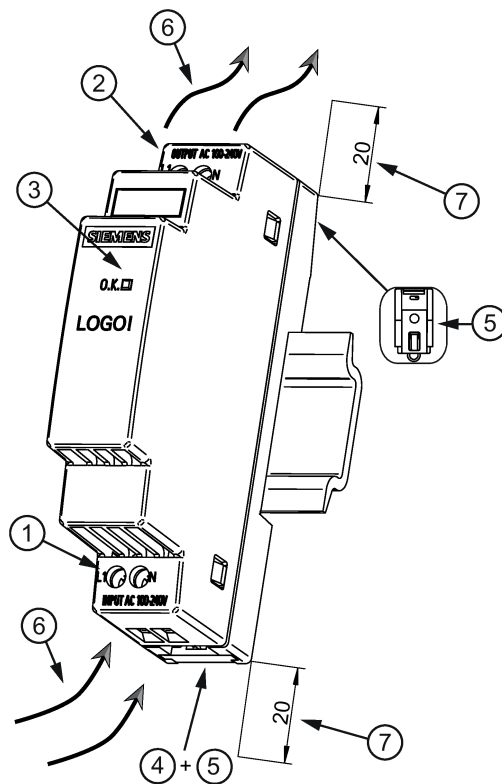
Figure 2-8 Design

2.1.5 Inrush current limiter

2.1.5.1 Logo! ICL230

The Logo! ICL230 inrush current limiter is used to reliably reduce inrush currents, e.g. caused by LEDs, transformers or switched-mode power supplies as a result of the rectifier circuit at the input with capacitor charging.

It is used for 1-phase AC line supplies with 100 V, 120 V or 230 V or for 2-phase line supplies with 208 V rated voltage on the line side, upstream of transformers, power supplies or LEDs. Using the integrated fixed resistor, it limits the inrush current to approx. 10 A at 230 V. In steady-state operation, the limiting resistor is bypassed after approx. 60 ms, therefore minimizing the associated power loss.



- ① AC input
- ② AC output
- ③ Indicator light
- ④ Mounting rail slider
- ⑤ Mounting lug to remove
- ⑥ Convection
- ⑦ Clearance above/below

Figure 2-9 Design

2.1.5.2 SITOP inrush current limiter

The SITOP inrush current limiter is used to reliably reduce inrush currents, e.g. caused by transformers or switched-mode power supplies as a result of the rectifier circuit at the input with capacitor charging.

It is used for 1-phase AC line supplies with 100 V, 120 V or 230 V or for 2 and 3- phase line supplies with 208 V to 480 V line voltage on the line side, upstream of transformers or power supplies. Using the integrated fixed resistor, it limits the inrush current to e.g. < 10 A at 230 V. In steady-state operation, the limiting resistor is bypassed after approx. 120 ms, therefore minimizing the associated power loss.

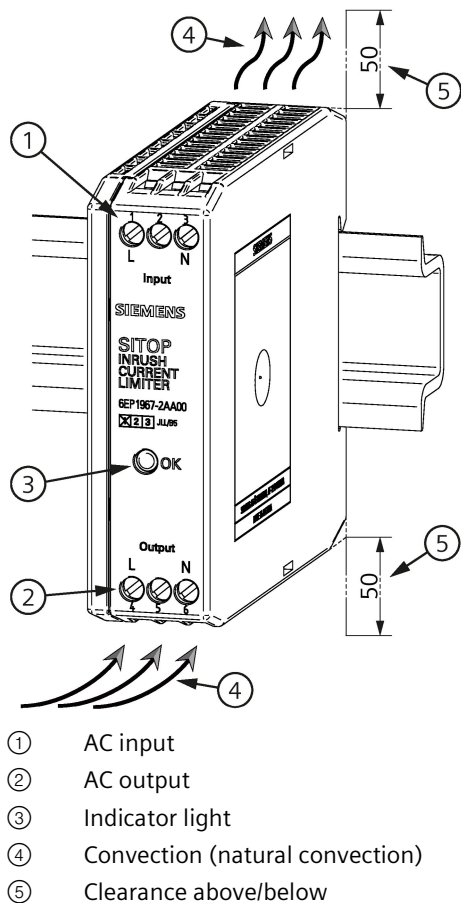


Figure 2-10 Design

2.2 Connections and terminal designation

2.2.1 Redundancy modules

2.2.1.1 SITOP RED1200

Note

Use suitable copper cables that are designed for operating temperatures of at least 90 °C (UL 508: 60/75 °C).

Connections and terminal designations of redundancy module 6EP4346-7RB00-0AX0	
① Input 12 - 48 V supply voltage of power supplies 1 and 2 "DC IN1", "DC IN2"	one spring-loaded terminal each
② Output 12 - 48 V supply voltage to the load / "DC OUT1"	one spring-loaded terminal each

	① + ②
	0,8 x 5,5
	1 x 0,2 - 10 mm ²
	1 x 0,2 - 10 mm ²
	1 x 0,25 - 6 mm ²
AWG	24 - 8
	13 - 15 mm

Figure 2-11 Terminal data 6EP4346-7RB00-0AX0

2.2 Connections and terminal designation

Connections and terminal designations of the redundancy modules 6EP4347-7RB00-0AX0, 6EP4348-7RB00-0AX0 and 6EP4347-7RC00-0AX0	
① Input 12 - 48 V supply voltage of power supplies 1 and 2 "DC IN1", "DC IN2"	one spring-loaded terminal each
② Output 12 - 48 V supply voltage to the load / "DC OUT1", "DC OUT2" (6EP4348-7RB00-0AX0 only)	one spring-loaded terminal each

	① + ②
	0,8 x 5,5
	1 x 0,75 - 16 mm ²
	1 x 0,75 - 25 mm ²
	1 x 0,25 - 16 mm ²
AWG	18 - 4
	18 - 20 mm

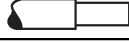
Figure 2-12 Terminal data 6EP4347-7RB00-0AX0, 6EP4348-7RB00-0AX0 and 6EP4347-7RC00-0AX0

2.2.1.2 SITOP PSE202U

Note

Use suitable copper cables that are designed for operating temperatures of at least 60/75 °C. The cables must be certified for at least 90 °C for the 6EP1964-2BA00 device.

Connections and terminal designations of redundancy module 6EP1961-3BA21	
① Input 24 V supply voltage of power supplies 1 and 2 "IN 24 V-1", "IN 24 V-2"	One screw terminal each
② Output 24 V supply voltage to the load / "OUT 24 V" 0 V connection to the internal supply "GND"	One screw terminal each
③ Floating relay contact (changeover contact) "OK"	Plug-in terminal 3 screw terminals

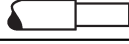
	① + ②	③	④
	1 x 5,5 / PZ1 / PH1	0,6 x 3,5 / PZ1 / PH1	0,6 x 3 / PZ1 / PH1 max. Ø 3,5 mm
	1 x 0,5 - 16 mm ²	1 x 0,2 - 2,5 mm ²	-
	1 x 0,5 - 16 mm ²	1 x 0,2 - 2,5 mm ²	-
	1 x 2,5 - 16 mm ² ^{*2)}	1 x 0,25 - 2,5 mm ²	-
AWG	26 - 6	24 - 12	-
Nm	1,2 - 1,5 Nm	0,5 - 0,6 Nm	0,04 Nm ^{*1)}
	12 mm	7 mm	-

*1) Do not subject the end stop to higher loads

*2) 16 mm² for square crimping, otherwise 10 mm²

Figure 2-13 Terminal data 6EP1961-3BA21

Connections and terminal designations of the redundancy modules 6EP1962-2BA00 and 6EP1964-2BA00	
① Input 24 V supply voltage from power supplies 1 and 2 "IN 24V-1", "IN 24V-2" 0 V connection to the internal supply "GND"	Plug-in terminal each with a screw terminal
② Output 24 V supply voltage to the load "OUT 24 V" floating relay contact "O.K."	Plug-in terminal with one screw terminal (output) and two screw terminals (relay contact)

	① + ②	④
	0,6 x 3,5 / PZ1 / PH1	0,6 x 3 / PZ1 / PH1 max. Ø 3,5 mm
	1 x 0,5 - 2,5 mm ²	-
	1 x 0,5 - 2,5 mm ²	-
	1 x 0,5 - 2,5 mm ²	-
AWG	28 - 12	-
Nm	0,5 Nm	0,04 Nm ^{*1)}
	7 - 8 mm	-

*1) Do not subject the end stop to higher loads

Figure 2-14 Terminal data 6EP1962-2BA00 and 6EP1964-2BA00

2.2.2 Chopper module SITOP CHO1400

Note

Use suitable copper cables that are designed for operating temperatures of at least 75 °C.

Connections and terminal designations of the chopper module 6EP4548-7XB00-3AX0	
① DC input "+", "-"	2 spring-loaded terminal each
② Signaling contact (13, 14)	one spring-loaded terminal each

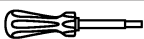
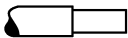
	①	②
	0,6 x 3,5	0,4 x 2,5
	1 x 0,75 - 16 mm ²	1 x 0,2 - 1,5 mm ²
	1 x 0,75 - 25 mm ²	1 x 0,2 - 1,5 mm ²
	1 x 0,75 - 16 mm ²	1 x 0,25 - 1,5 mm ²
AWG	18 - 4	24 - 16
	18 - 20 mm	10 mm

Figure 2-15 Terminal data

2.2.3 Buffer modules

2.2.3.1 SITOP BUF1200

Note

Use copper wire certified for at least 75 °C.

Connections and terminal designations	
① 24 V DC supply voltage "+", "-"	1 spring-loaded terminal each

	①
	0,8 x 5,5
	1 x 0,75 - 16 mm ²
	1 x 0,75 - 25 mm ²
	1 x 0,25 - 16 mm ²
AWG	18 - 4
	18 - 20 mm

Figure 2-16 Terminal data

2.2.3.2 SITOP PSE201U

Note

Use copper wire certified for at least 75 °C.

Connections and terminal designations	
① 24 V DC supply voltage "+", "-"	1 screw terminal each

	①
	1,0 x 5,5 / PZ1 / PH1
	1 x 0,5 - 16 mm ²
	1 x 0,5 - 16 mm ²
	1 x 2,5 - 16 mm ² * ¹⁾
AWG	26 - 6
Nm	1,2 - 1,5 Nm
	12 mm

*¹⁾ 16 mm² for square crimping, otherwise 10 mm²

Figure 2-17 Terminal data

2.2.4 Power boost module SITOP PBM1200

Note

Use suitable copper cables that are designed for operating temperatures of at least 75 °C.

Connections and terminal designations of the power boost module 6EP4240-7HB00-0AX0	
① DC input "+", "-"	2 spring-loaded terminal each

	①
	0,6 x 3,5
	1 x 0,75 - 16 mm ²
	1 x 0,75 - 25 mm ²
	1 x 0,75 - 16 mm ²
AWG	18 - 4
	18 - 20 mm

Figure 2-18 Terminal data

2.2.5 Inrush current limiter

2.2.5.1 Logo! ICL230

Note

Use copper cable certified for use at 90 °C.

Connections and terminal designations	
① Input "L1", "N"	One screw terminal each
② Output "L1", "N"	One screw terminal each

	① + ②
	0,5 x 3
	1 x 0,14 - 2,5 mm ²
	1 x 0,14 - 2,5 mm ²
	1 x 0,25 - 2,5 mm ²
AWG	26 - 14
Nm	0,5 - 0,6 Nm
	8 mm

Figure 2-19 Terminal data

2.2.5.2 SITOP inrush current limiter

Note

Use suitable copper cables that are designed for operating temperatures of at least 60/75 °C.

Connections and terminal designations	
① Input "L1", "N"	One screw terminal each
② Output "L1", "N"	One screw terminal each

	① + ②
	0,6 x 3,5 / PZ1 / PH1
	1 x 0,5 - 2,5 mm ²
	1 x 0,5 - 2,5 mm ²
	1 x 0,5 - 2,5 mm ²
AWG	22 - 12
Nm	0,5 - 0,7 Nm
	7 - 8 mm

Figure 2-20 Terminal data

2.3 Potentiometer

2.3.1 SITOP PSE202U redundancy modules

The potentiometer ④ at the front of the device is used to set the response threshold of the LED signal and the signaling contact; it can be set in the range from 20 V up to 25 V. (when delivered, 20 V)

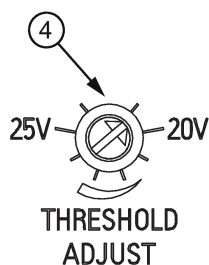


Figure 2-21 Potentiometer 6EP1961-3BA21

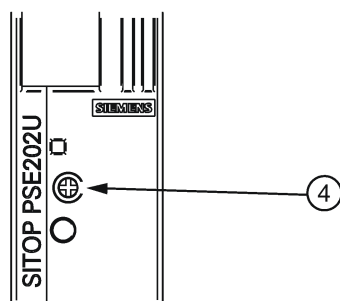


Figure 2-22 Potentiometer 6EP196x-2BA00 (example 6EP1962-2BA00)

Note

It is only permissible to use an insulated screwdriver when actuating the potentiometer.

For notes on actuating the potentiometer (screwdriver, torque), see Figure 2-13 Terminal data 6EP1961-3BA21 (Page 31) and Figure 2-14 Terminal data 6EP1962-2BA00 and 6EP1964-2BA00 (Page 31).

2.4 Status displays and signaling

2.4.1 SITOP PSE202U redundancy modules

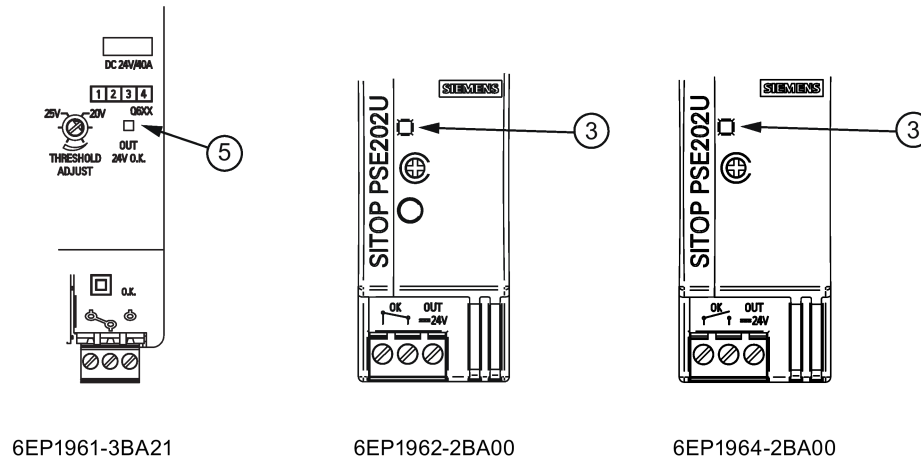


Figure 2-23 Operating display and signaling

Operating display and signaling	6EP1961-3BA21	
LED ⑤ lights up green	Both input voltages > switching threshold	
LED ⑤ lights up red	At least one input voltage < switching threshold	
O.K. (floating relay contact)	O.K. if both input voltages are > switching threshold (contact rating (SELV (ES1) must be maintained) 8 A/AC 240 V, 24 V DC)	
Operating display and signaling	6EP1962-2BA00	6EP1964-2BA00
LED ③ lights up green	Both input voltages > switching threshold	Both input voltages > switching threshold
LED ③ lights up red	At least one input voltage < switching threshold or the output is switched off	At least one input voltage < switching threshold
O.K. (floating relay contact)	Contact is closed if one or both input voltages is/are < the switching threshold, or if the output is switched off. (contact rating (SELV (ES1) must be maintained) 6 A/AC 42 V, 30 V DC, however 100 VA max.)	Contact is opened if one or both input voltages is/are < the switching threshold. (contact rating (SELV (ES1) must be maintained) 6 A/AC 42 V, 30 V DC)

2.4.2 Buffer modules

2.4.2.1 SITOP BUF1200

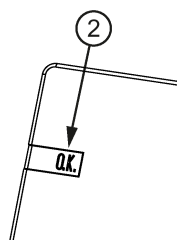


Figure 2-24 Signaling

Status indicator	6EP4231-7HB00-0AX0 and 6EP4231-7HC00-0AX0
LED ② "O.K." lights up green	Buffer module fully charged
LED ② "O.K." lights up green flashing (0.5 Hz)	Buffer module is being charged, buffer mode possible
LED ② "O.K." lights up green flashing (2 Hz)	Buffer module being charged, charge state insufficient for buffer operation or fault

2.4.2.2 SITOP PSE201U

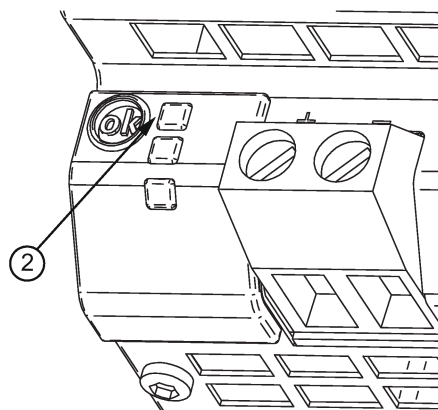


Figure 2-25 Status indicator

Status indicator	6EP1961-3BA01
LED ② lights up green	Supply voltage > 20.5 V
LED ② off	Supply voltage < 20.5 V

2.4.3 Inrush current limiter

2.4.3.1 Logo! ICL230

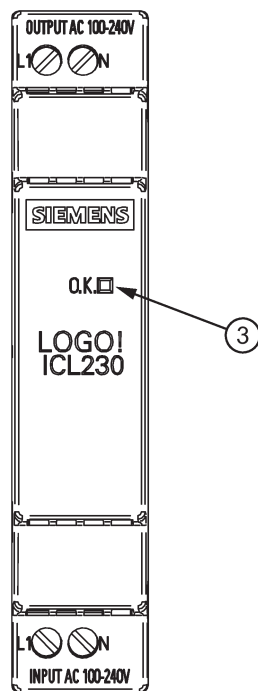


Figure 2-26 Status indicator

Status indicator	6EP4683-6LB00-0AY0
LED ③ lights up green	Normal operation
LED ③ off	Supply voltage missing

2.4.3.2 SITOP inrush current limiter

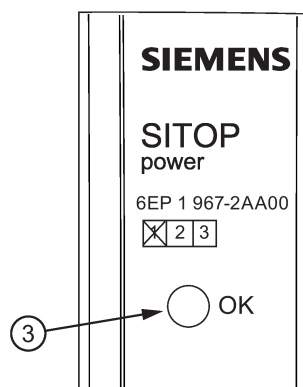


Figure 2-27 Status indicator

Status indicator	6EP1967-2AA00
LED ③ lights up green	Normal operation
LED ③ off	Supply voltage missing

2.5 Dimensions and weight

2.5.1 Redundancy modules

2.5.1.1 SITOP RED1200

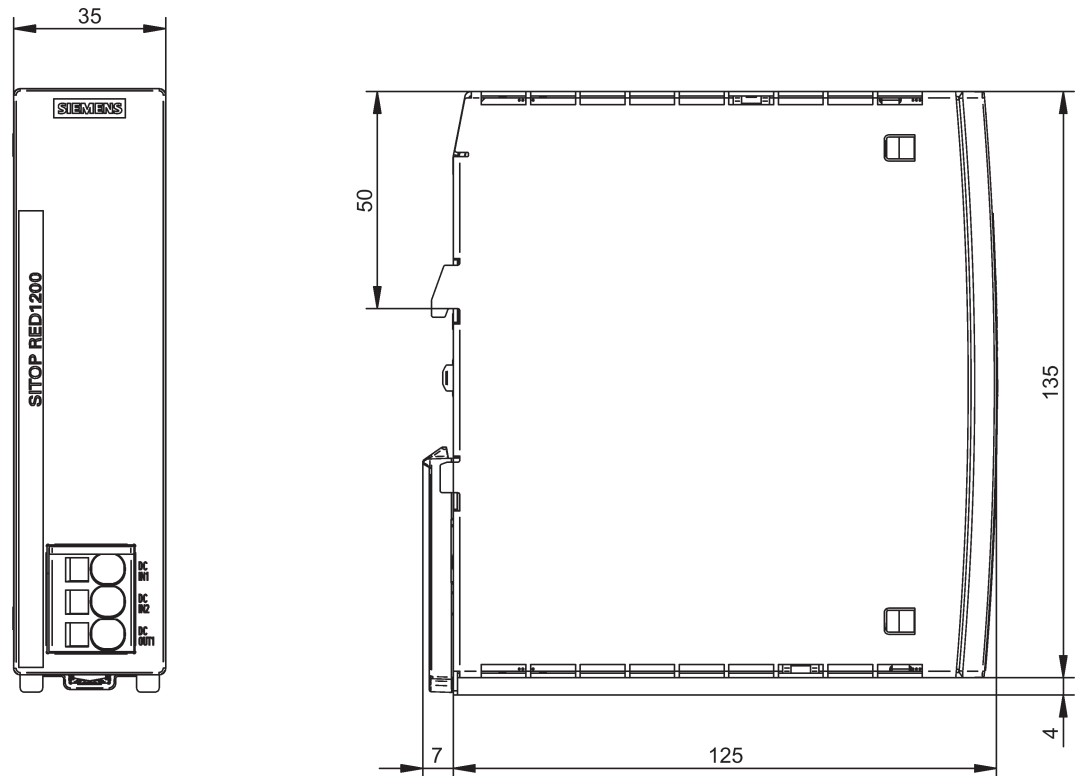


Figure 2-28 Dimension drawing 6EP4346-7RB00-0AX0

2.5 Dimensions and weight

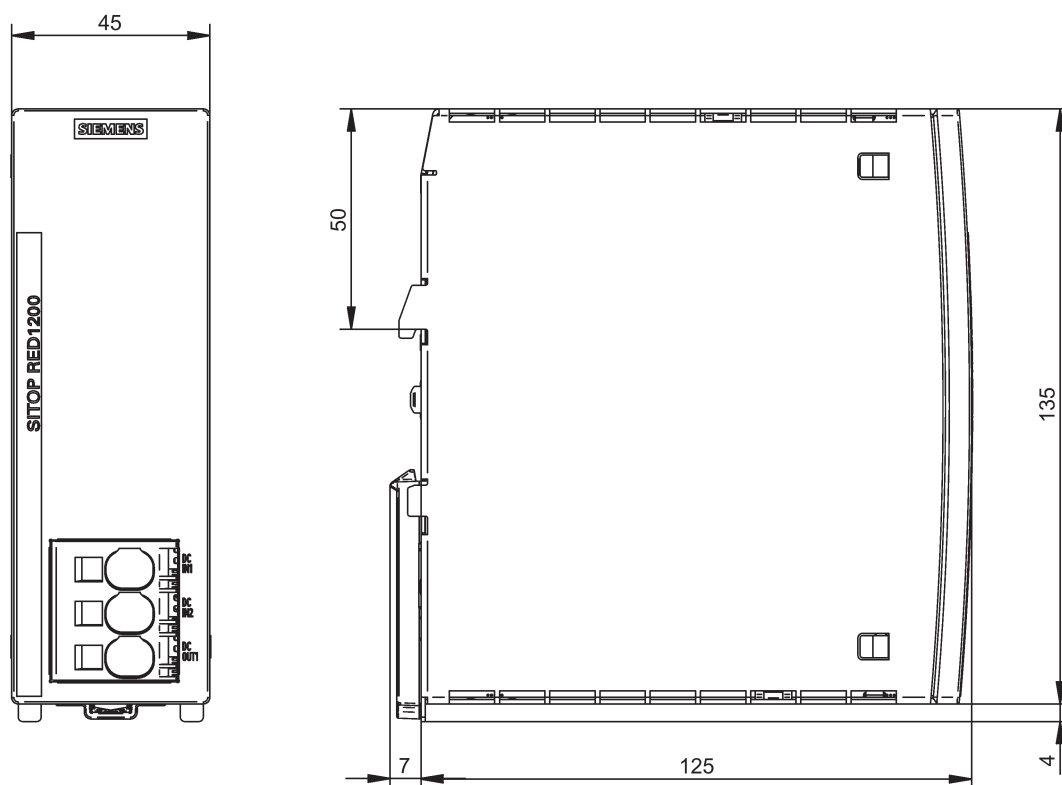


Figure 2-29 Dimension drawing 6EP4347-7RB00-0AX0 and 6EP4347-7RC00-0AX0

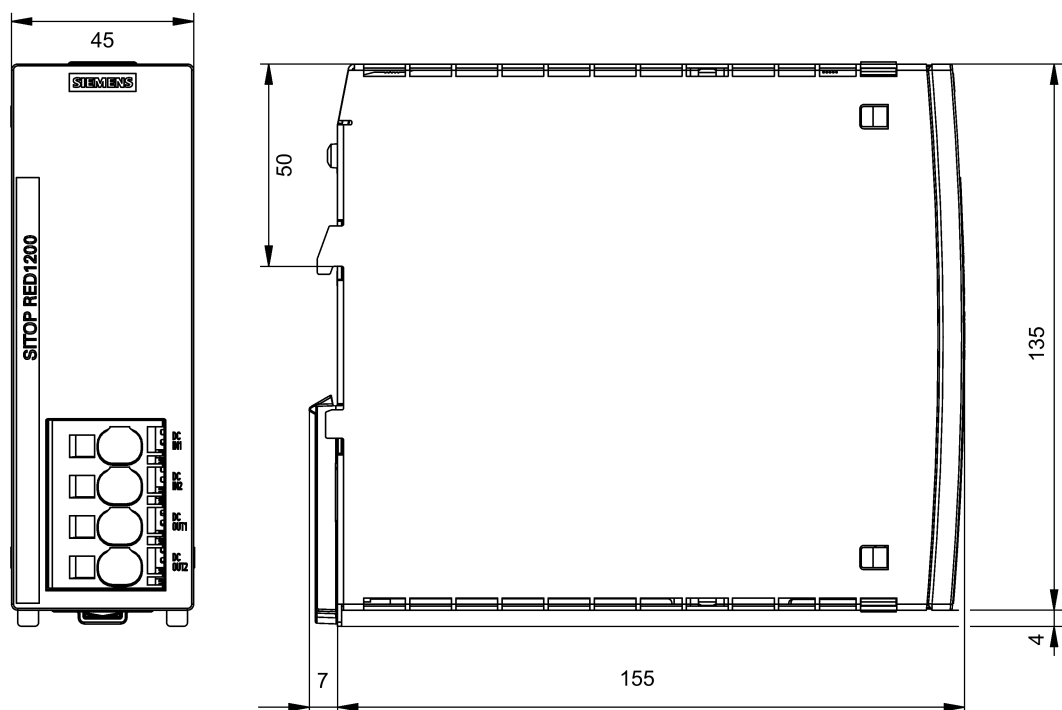


Figure 2-30 Dimension drawing 6EP4348-7RB00-0AX0

	6EP4346-7RB00-0AX0	6EP4347-7RB00-0AX0 6EP4347-7RC00-0AX0	6EP4348-7RB00-0AX0
Dimensions (W × H × D) in mm	35 × 135 × 125	45 × 135 × 125	45 × 135 × 155
Weight	0.47 kg	0.50 kg	1.01 kg

2.5.1.2 SITOP PSE202U

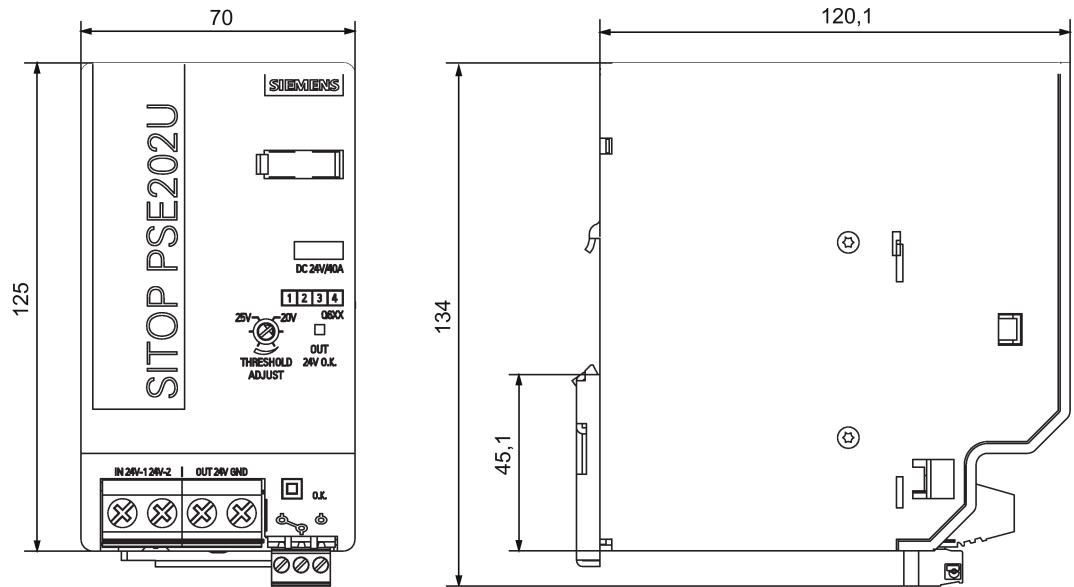


Figure 2-31 Dimension drawing 6EP1961-3BA21

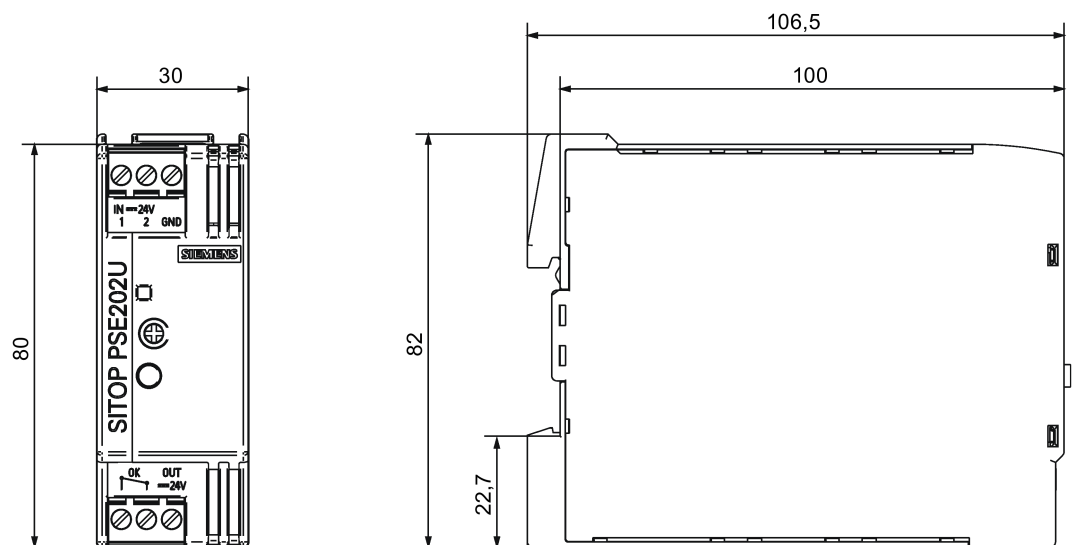


Figure 2-32 Dimension drawing 6EP1962-2BA00

2.5 Dimensions and weight

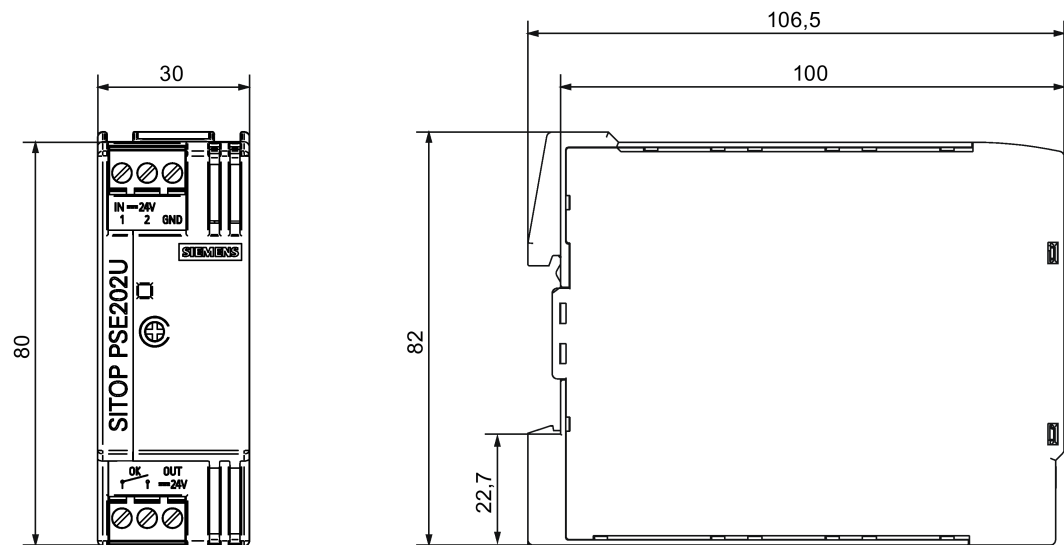


Figure 2-33 Dimension drawing 6EP1964-2BA00

	6EP1961-3BA21	6EP1962-2BA00	6EP1964-2BA00
Dimensions (W × H × D) in mm	70 × 125 × 120.1	30 × 80 × 100	30 × 80 × 100
Weight	0.5 kg	0.125 kg	0.125 kg

2.5.2 Chopper module SITOP CHO1400

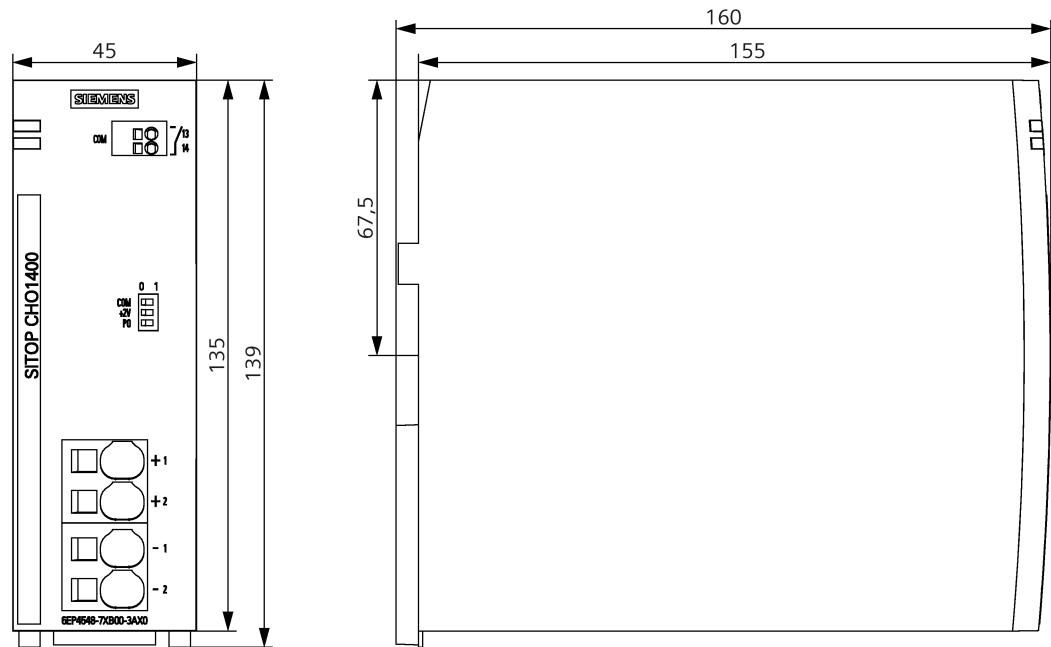


Figure 2-34 Dimension drawing

6EP4548-7XB00-3AX0	
Dimensions (W × H × D) in mm	45 × 135 × 155
Weight	Approx. 0.79 kg

2.5 Dimensions and weight

2.5.3 Buffer modules

2.5.3.1 SITOP BUF1200

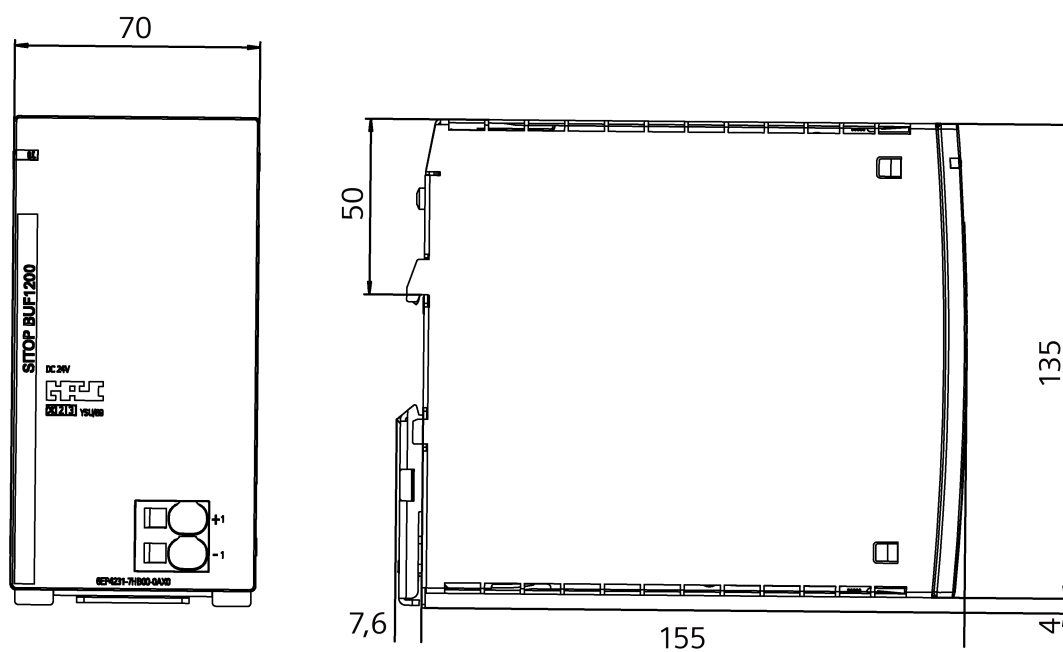


Figure 2-35 Dimension drawing

6EP4231-7HB00-0AX0 and 6EP4231-7HC00-0AX0	
Dimensions (W × H × D) in mm	70 × 135 × 155
Weight	Approx. 1.5 kg

2.5.3.2 SITOP PSE201U

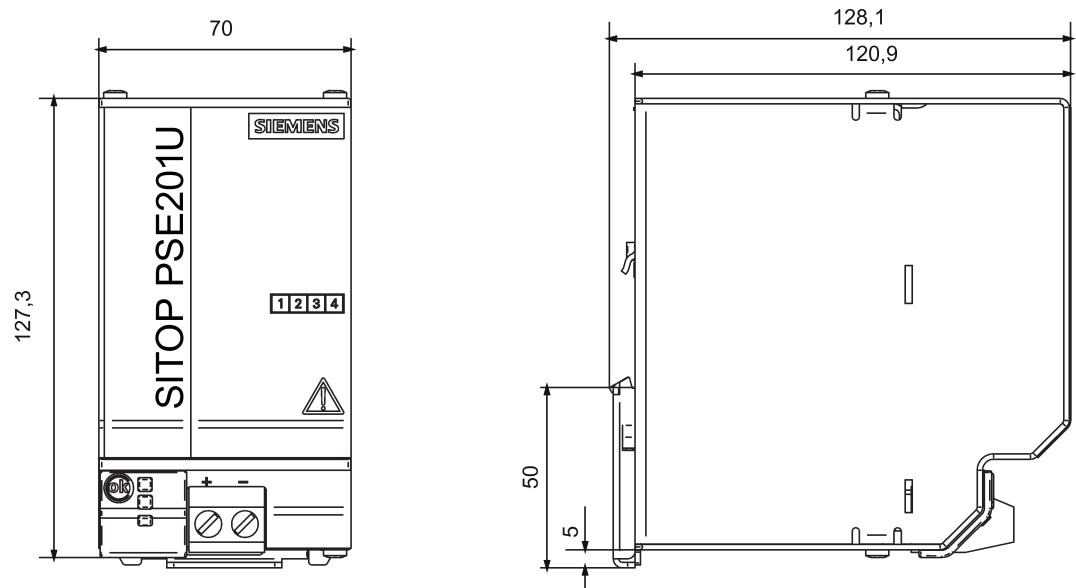


Figure 2-36 Dimension drawing

6EP1961-3BA01	
Dimensions (W × H × D) in mm	70 × 125 × 120.9
Weight	approx. 1.2 kg

2.5 Dimensions and weight

2.5.4 Power boost module SITOP PBM1200

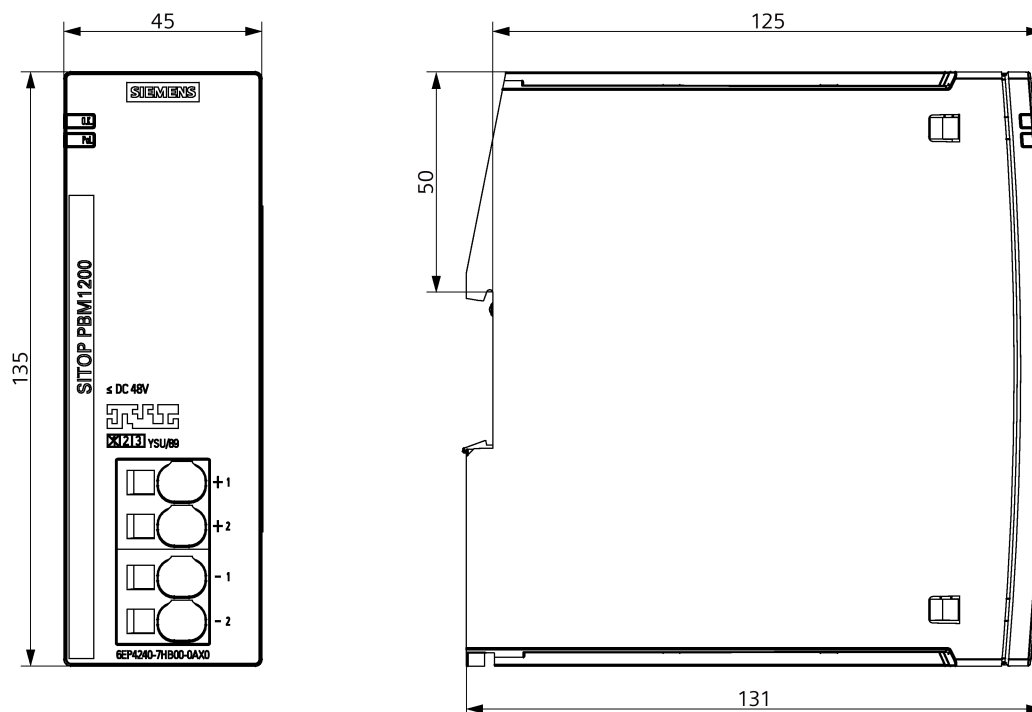


Figure 2-37 Dimension drawing

6EP4240-7HB00-0AX0	
Dimensions (W × H × D) in mm	45 × 135 × 155
Weight	Approx. 0.38 kg

2.5.5 Inrush current limiter

2.5.5.1 Logo! ICL230

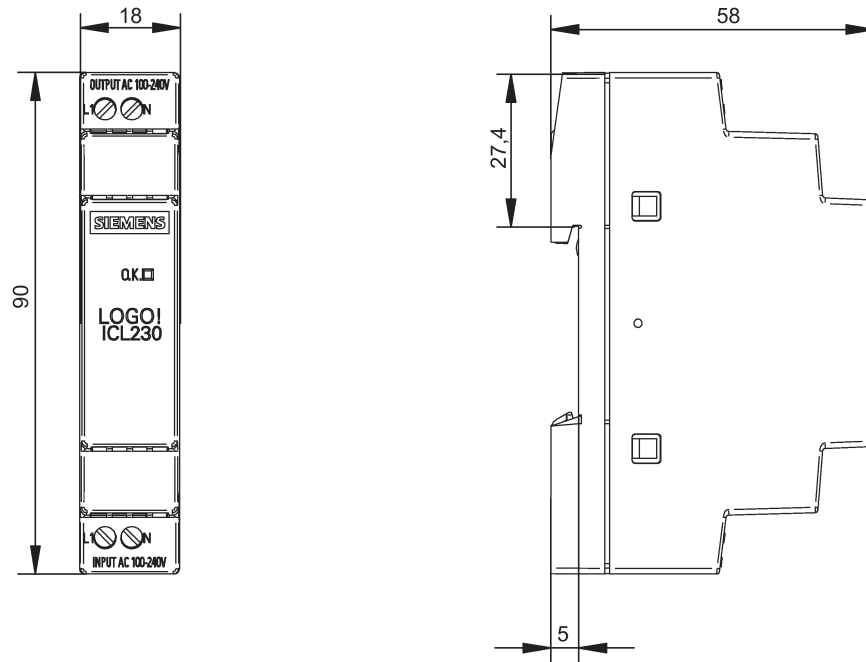


Figure 2-38 Dimension drawing

6EP4683-6LB00-0AY0	
Dimensions (W × H × D) in mm	18 × 90 × 53
Weight	0.14 kg

2.5 Dimensions and weight

2.5.5.2 SITOP inrush current limiter

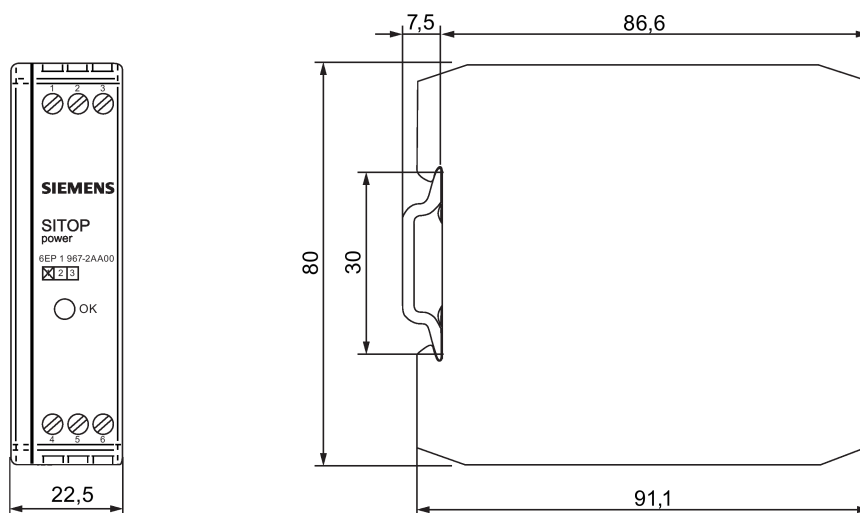


Figure 2-39 Dimension drawing

6EP1967-2AA00	
Dimensions (W × H × D) in mm	22.5 × 80 × 86.6
Weight	0.12 kg

Mounting/removal

WARNING
Installing the device in a housing or a control cabinet
SITOP expansion modules are chassis devices. They must be installed in a housing or control cabinet where only qualified personnel have access.

3.1 Redundancy modules

3.1.1 SITOP RED1200

The device can be mounted in a control cabinet on standard mounting rails (see Chapter Mechanical system (Page 107)).

The device should be mounted so that the terminals are at the bottom. A clearance of at least 45 mm must be maintained above and below the device (max. cable duct depth 50 mm).

Mounting

To mount the device, position it with the mounting rail guide at the upper edge of the standard mounting rail and press down to lock it into place. If this is too difficult, press the slider ③ at the same time, as described under "Removal".

Removing

To remove, pull up the slider ③ using a screwdriver (see Figure 3-1 Mounting/removal (Page 54)) and disengage the device at the bottom edge of the standard mounting rail. Then you can remove the device from the upper edge of the standard mounting rail.

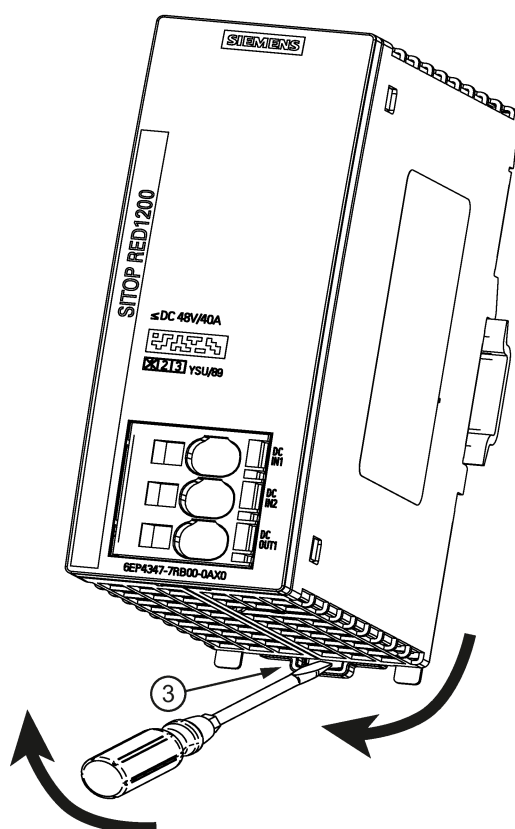


Figure 3-1 Mounting/removal

! WARNING

Use in hazardous zones

If the SITOP RED1200 Ex device (6EP4347-7RC00-0AX0) is installed in an environment exposed to explosion hazard (II 3G Ex ec IIC T4 Gc) it must be installed in a distribution box with degree of protection IP54 or higher. This distribution box must comply with the requirements of IEC/EN 60079-0/GB3836.1 and must require a tool for opening.

3.1.2 6EP1961-3BA21

The device can be mounted in a control cabinet on standard mounting rails (see Chapter Mechanical system (Page 107)).

The device should be mounted so that the terminals are at the bottom. A clearance of at least 50 mm must be maintained above and below the device (max. cable duct depth 50 mm).

Mounting

To mount the device, position it with the mounting rail guide at the upper edge of the standard mounting rail and press down to lock it into place. If this is too difficult, press slider ⑥ at the same time, as described under "Removal".

Removing

To remove, pull up the slider ⑥ using a screwdriver (see Figure 3-2 Mounting/removal (Page 55)) and disengage the device at the bottom edge of the standard mounting rail. Then you can remove the device from the upper edge of the standard mounting rail.

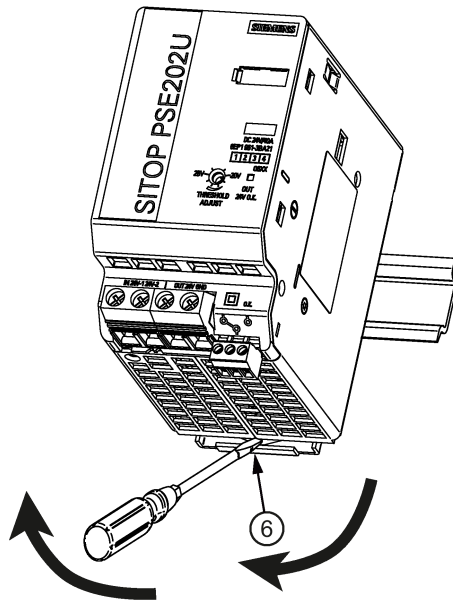


Figure 3-2 Mounting/removal

3.1.3 6EP1962-2BA00 and 6EP1964-2BA00

The device can be mounted in a control cabinet on standard mounting rails (see Chapter Mechanical system (Page 107)).

It must be mounted in such a way that the input terminals are at the top and the output terminals at the bottom. Clearances must be maintained above and below the device.

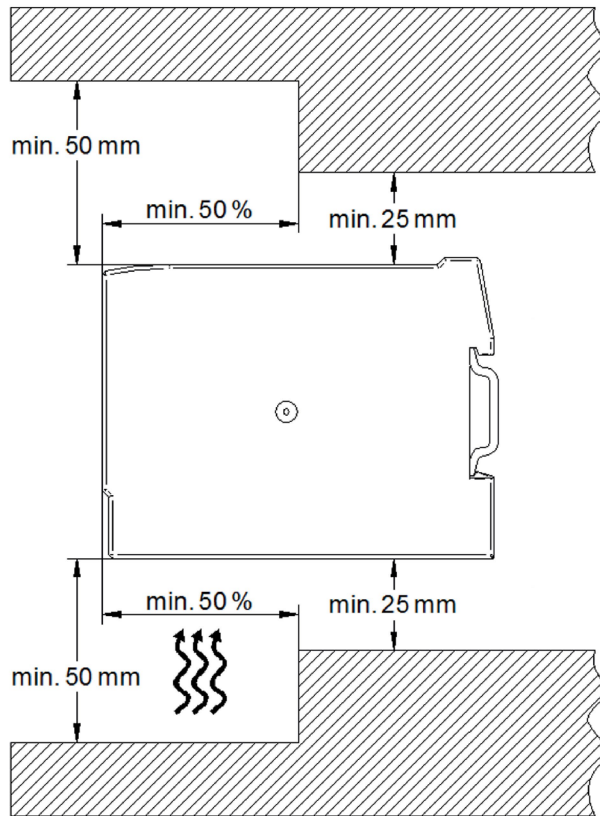


Figure 3-3 Clearances

Mounting

To mount the device, position it with the mounting rail guide at the upper edge of the standard mounting rail and press down to lock it into place. If this is too difficult, press slider ⑥ at the same time, as described under "Removal".

Removing

To remove, pull up the slider ⑥ using a screwdriver (see Figure 3-4 Mounting/removal (Page 57)) and disengage the device at the bottom edge of the standard mounting rail. Then you can remove the device from the upper edge of the standard mounting rail.

Note

As an alternative to using a screwdriver, the mounting rail interlocking can be manually actuated from the top using the latch ⑤, and therefore no tools are required when mounting and removing.

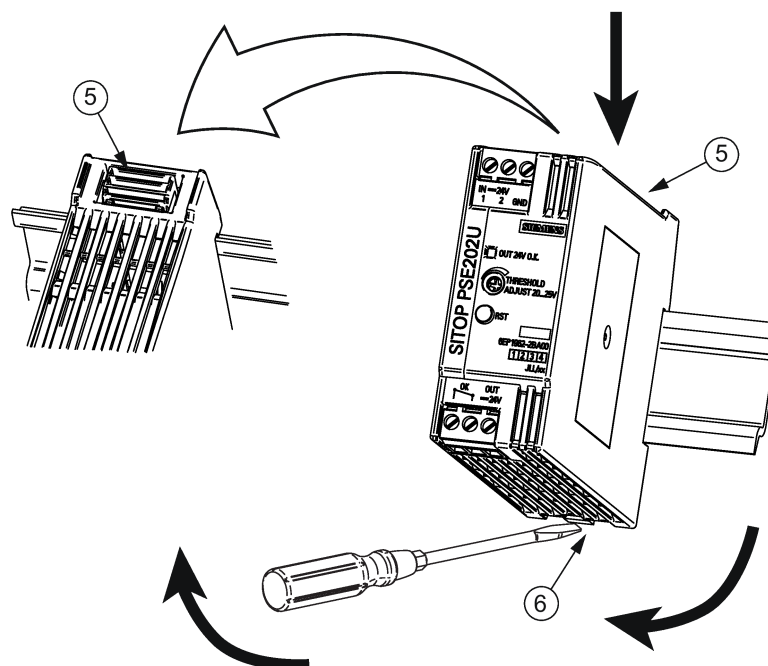


Figure 3-4 Mounting/removal

3.2 Chopper module

The device can be mounted in a control cabinet on standard mounting rails (see Chapter Mechanical system (Page 107)).

It must be mounted in such a way that the input terminals are at the bottom and the signaling contact terminals at the top. A clearance of at least 45 mm must be maintained above and below the device (max. cable duct depth 50 mm).

Mounting

To mount the device, position it with the mounting rail guide at the upper edge of the standard mounting rail and press down to lock it into place. If this is too difficult to snap on, press the slider ④ at the same time, as described under "Removal".

Removing

To remove, pull up the slider ④ using a screwdriver (see Figure 3-5 Mounting/removal (Page 58)) and disengage the device at the bottom edge of the standard mounting rail. Then you can remove the device from the upper edge of the standard mounting rail.

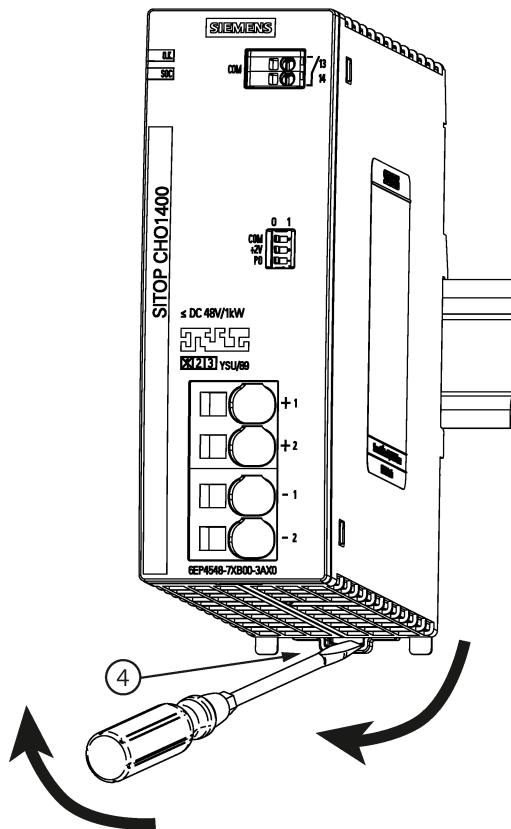


Figure 3-5 Mounting/removal

3.3 Buffer modules

3.3.1 SITOP BUF1200

The device can be mounted in a control cabinet on standard mounting rails (see Chapter Mechanical system (Page 107)).

The device should be mounted so that the terminals are at the bottom. A clearance of at least 45 mm must be maintained above and below the device (max. cable duct depth 50 mm).

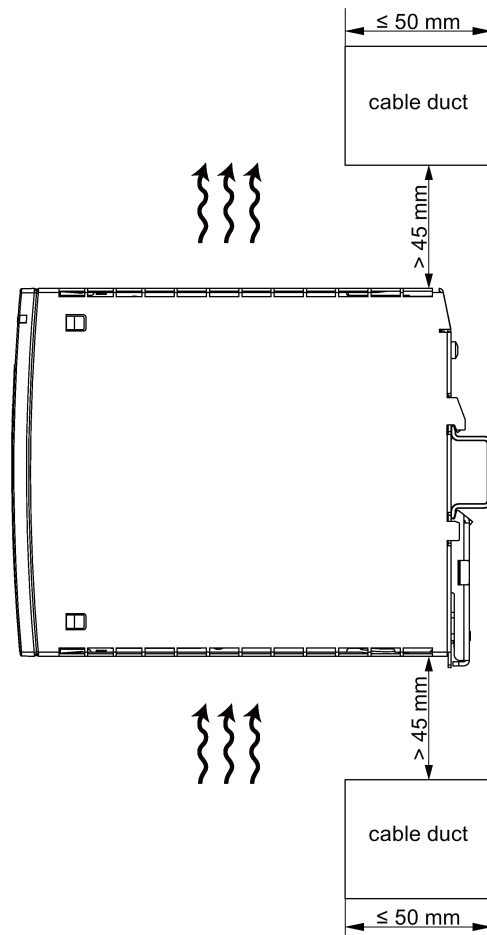


Figure 3-6 Clearances

Mounting

To mount the device, position it with the mounting rail guide at the upper edge of the standard mounting rail and press down to lock it into place. If this is too difficult, press the slider ③ at the same time, as described under "Removal".

Removing

To remove, pull up the slider ③ using a screwdriver (see Figure 3-7 Mounting/removal (Page 60)) and disengage the device at the bottom edge of the standard mounting rail. Then you can remove the device from the upper edge of the standard mounting rail.

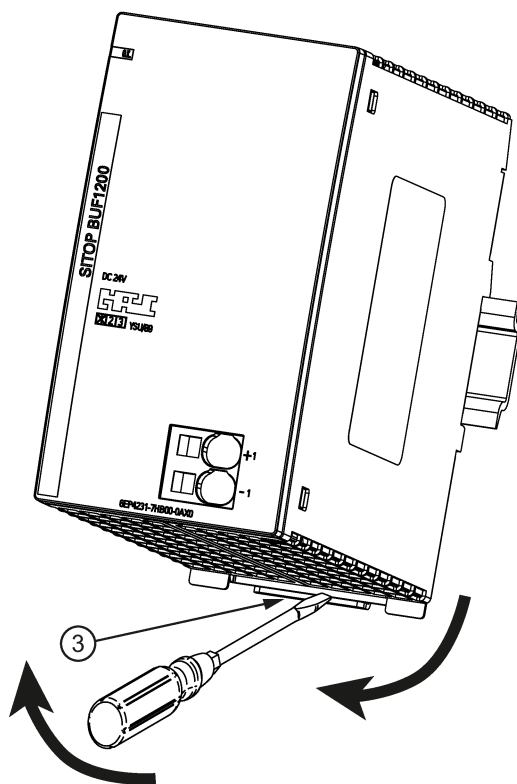


Figure 3-7 Mounting/removal

! WARNING

Use in hazardous zones

If device SITOP BUF1200 Ex (6EP4231-7HC00-0AX0) is installed in a hazardous zone (II 3G Ex ec IIC T4 Gc) then it must be installed in a distribution box with degree of protection IP54 or higher. This distribution box must comply with the requirements of IEC/EN 60079-0/GB3836.1 and must require a tool for opening.

3.3.2 SITOP PSE201U

The device can be mounted in a control cabinet on standard mounting rails (see Chapter Mechanical system (Page 107)).

The device should be mounted so that the terminals are at the bottom. A clearance of at least 50 mm must be maintained above and below the device (max. cable duct depth 50 mm).

Mounting

To mount the device, position it with the mounting rail guide at the upper edge of the standard mounting rail and press down to lock it into place. If this is too difficult, press the slider ③ at the same time, as described under "Removal".

Removing

To remove, pull up the slider ③ using a screwdriver (see Figure 3-8 Mounting/removal (Page 61)) and disengage the device at the bottom edge of the standard mounting rail. Then you can remove the device from the upper edge of the standard mounting rail.

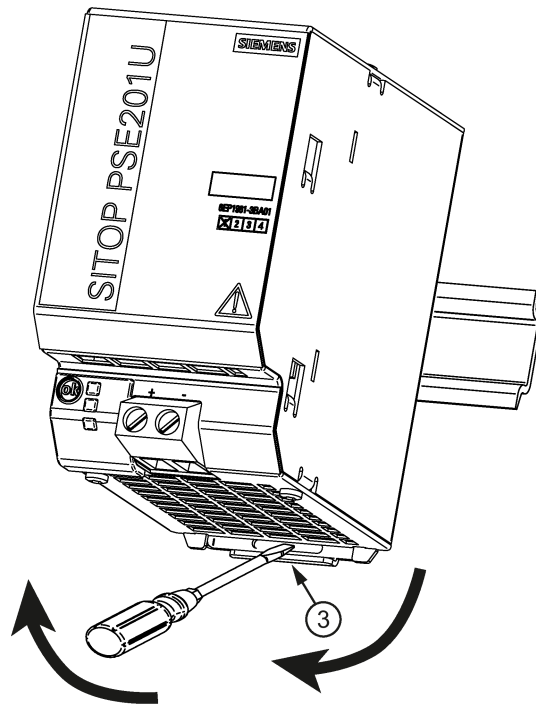


Figure 3-8 Mounting/removal

3.4 Power boost module

The device can be mounted in a control cabinet on standard mounting rails (see Chapter Mechanical system (Page 107)).

The device should be mounted so that the terminals are at the bottom. A clearance of at least 45 mm must be maintained above and below the device (max. cable duct depth 50 mm).

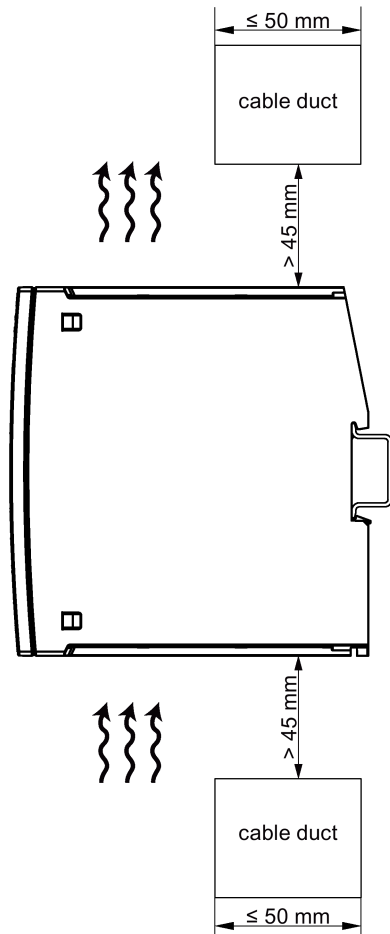


Figure 3-9 Clearances

Mounting

To mount the device, position it with the mounting rail guide at the upper edge of the standard mounting rail and press down to lock it into place. If this is too difficult, press the slider ③ at the same time, as described under "Removal".

Removing

To remove, pull up the slider ③ using a screwdriver (see Figure 3-10 Mounting/removal (Page 63)) and disengage the device at the bottom edge of the standard mounting rail. Then you can remove the device from the upper edge of the standard mounting rail.

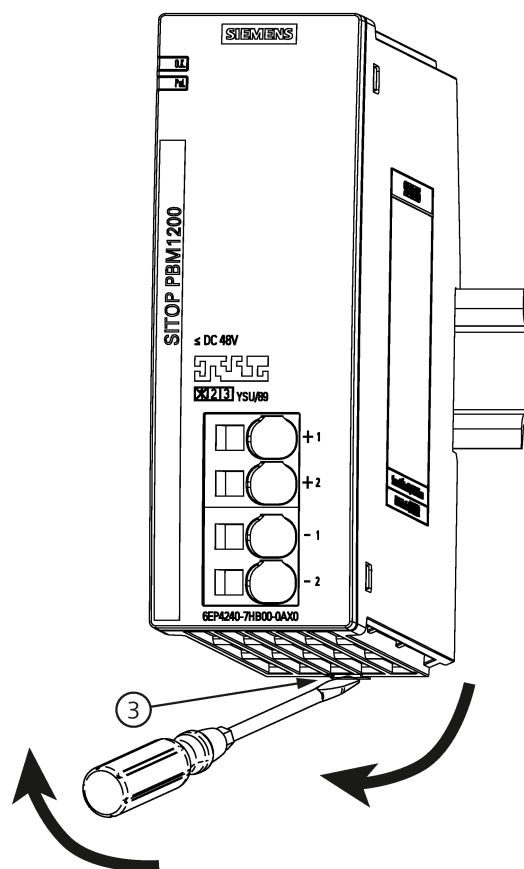


Figure 3-10 Mounting/removal

3.5 Inrush current limiter

3.5.1 Logo! ICL230

The device can be mounted in a control cabinet and snapped onto standard mounting rails (see Chapter Mechanical system (Page 107)), or can be mounted on walls and panels using the withdrawable mounting lug (see Figure 3-12 Wall/panel mounting (Page 65)).

It must be mounted in such a way that the output terminals are at the top and the input terminals at the bottom. A clearance of at least 20 mm must be maintained above and below the device (max. cable duct depth 50 mm).

Mounting

To mount the device, position it with the mounting rail guide at the upper edge of the standard mounting rail and press down to lock it into place. If this is too difficult, press the slider ④ at the same time, as described under "Removal".

Removing

To remove, pull up the slider ④ using a screwdriver (see Figure 3-11 Mounting/removal (Page 64)) and disengage the device at the bottom edge of the standard mounting rail. Then you can remove the device from the upper edge of the standard mounting rail.

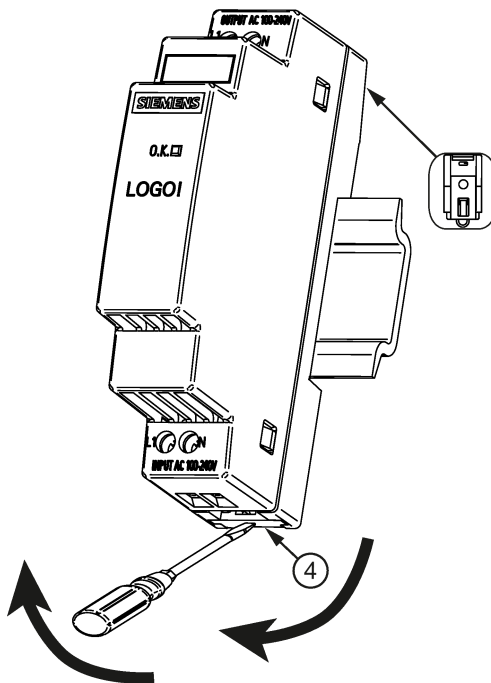


Figure 3-11 Mounting/removal

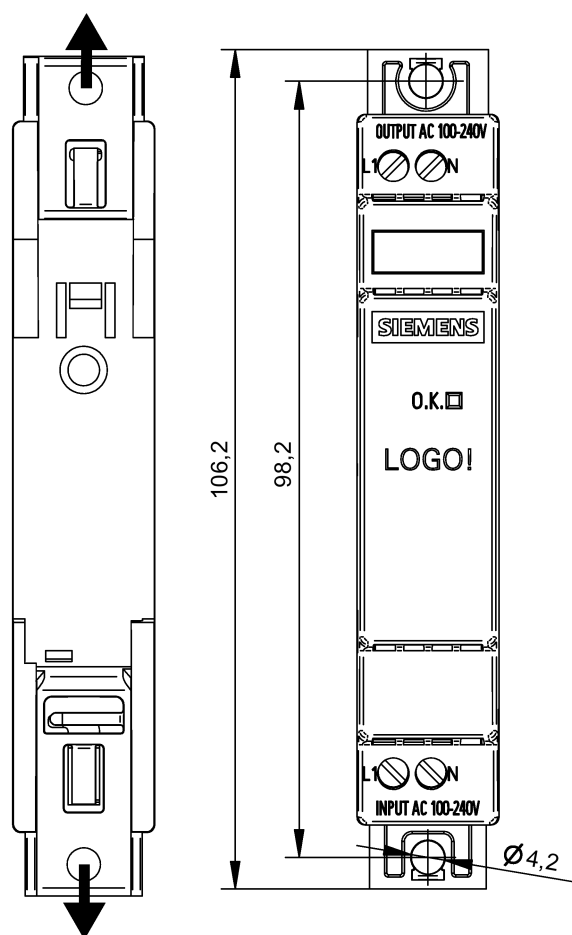


Figure 3-12 Wall/panel mounting

3.5.2 SITOP inrush current limiter

The device can be mounted in a control cabinet on standard mounting rails (see Chapter Mechanical system (Page 107)).

It must be mounted in such a way that the input terminals are at the top and the output terminals at the bottom. A clearance of at least 50 mm must be maintained above and below the device (max. cable duct depth 50 mm).

Mounting

To snap on, attach the device to the top of the mounting rail (I), press down gently (II), press in the lower side (III) and snap it into place (IV).

Removing

To remove the device, press it downwards and release it from the mounting rail.

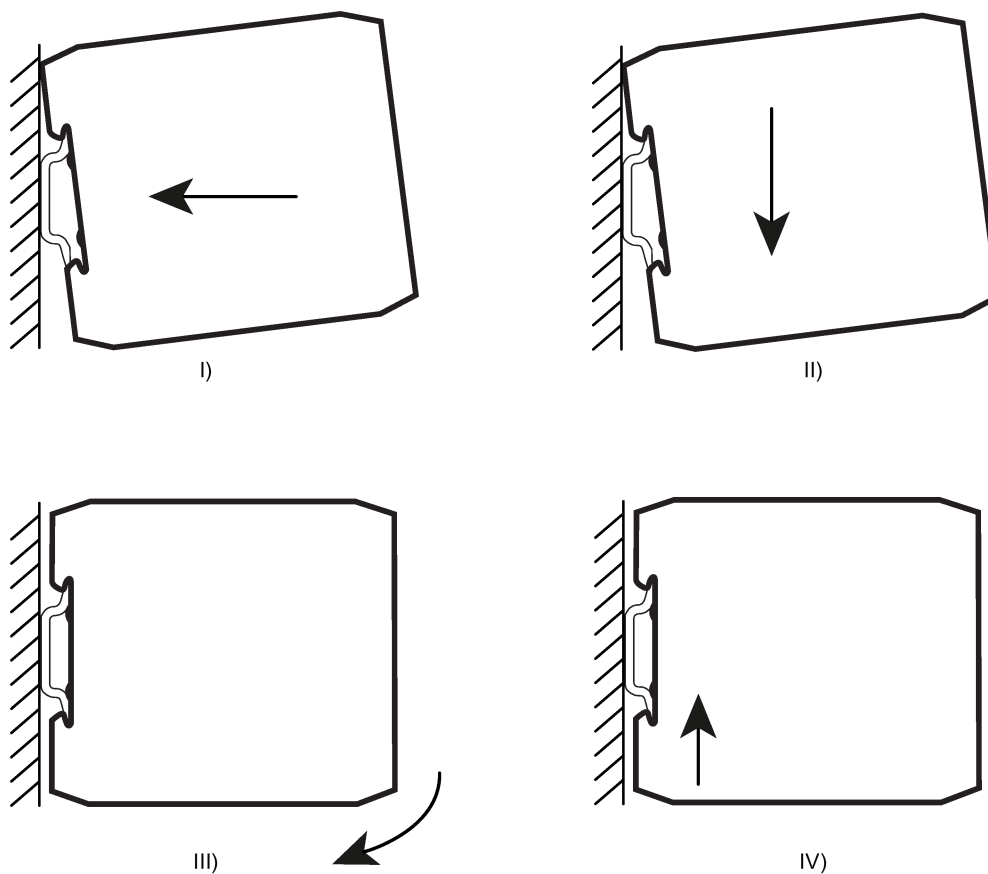


Figure 3-13 Mounting/removal

Mounting position, mounting clearances

4.1 Standard mounting position

The expansion modules are mounted on standard mounting rails. The certified standard mounting position of the devices is vertical, and to ensure correct cooling they must be mounted in such a way that

- for the RED1200 devices (6EP4346-7RB00-0AX0, 6EP4347-7RB00-0AX0, 6EP4347-7RC00-0AX0, 6EP4348-7RB00-0AX0) the terminals are at the bottom. A clearance of at least 45 mm must be maintained above and below the devices (max. cable channel depth, 50 mm).
- for the PSE202U 2 x 20 A (6EP1961-3BA21) the terminals are at the bottom. A clearance of at least 50 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the PSE202U NEC Class 2 (6EP1962-2BA00) and PSE202U 2 x 5 A (6EP1964-2BA00) the input terminals are at the top and the output terminals at the bottom. Clearances must be maintained above and below the device (see Figure 3-3 Clearances (Page 56)).
- for the CHO1400 (6EP4548-7XB00-3AX0) the input terminals are at the bottom and the signaling contact terminals at the top. A clearance of at least 45 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the BUF1200 (6EP4231-7HB00-0AX0, 6EP4231-7HC00-0AX0) the terminals are at the bottom. A clearance of at least 45 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the PSE201U (6EP1961-3BA01) the terminals are at the bottom. A clearance of at least 50 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the PBM1200 (6EP4240-7HB00-0AX0) the terminals are at the bottom. A clearance of at least 45 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the Logo! ICL230 (6EP4683-6LB00-0AY0) the output terminals are at the top and the input terminals at the bottom. A clearance of at least 20 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the inrush current limiter SITOP (6EP1967-2AA00) the input terminals are at the top and the output terminals at the bottom. A clearance of at least 50 mm must be maintained above and below the device (max. cable duct depth 50 mm).

Lateral clearances do not have to be maintained.

4.1 Standard mounting position

Output current as a function of the ambient temperature and mounting height

Buffer module 6EP4231-7HB00-0AX0: -25 ... 70 °C without derating
 Power boost module 6EP4240-7HB00-0AX0: -40 ... 70 °C without derating
 Buffer module 6EP1961-3BA01: -25 ... 70 °C without derating
 Inrush current limiter 6EP1967-2AA00: -25 ... 60 °C without derating
 Inrush current limiter 6EP4683-6LB00-0AY0: -40 ... 70 °C without derating
 Chopper module 6EP4548-7XB00-3AX0: 3% $I_{out rated}/K$ derating at > 60 °C

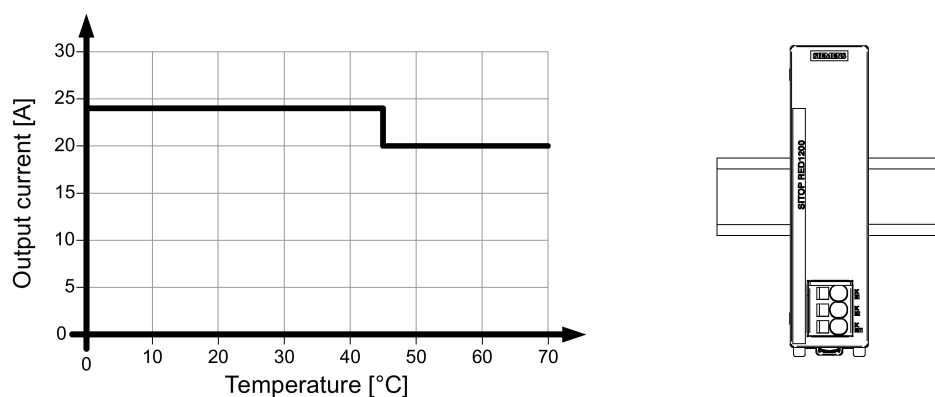


Figure 4-1 6EP4346-7RB00-0AX0: Output current in the standard mounting position

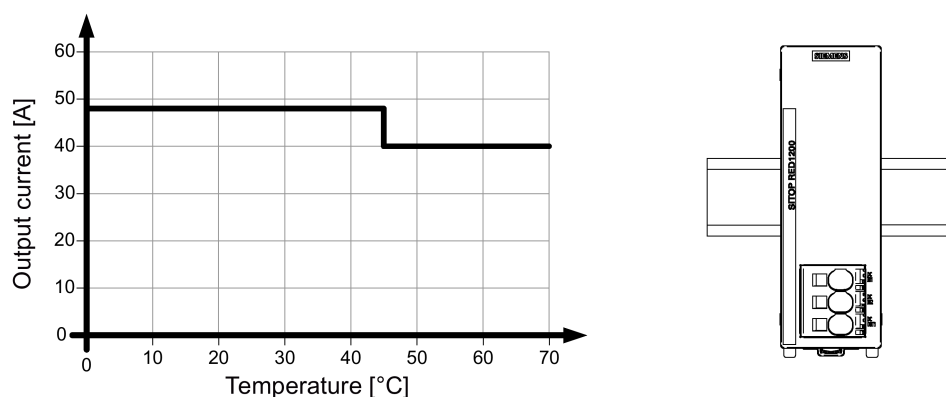


Figure 4-2 6EP4347-7RB00-0AX0 and 6EP4347-7RC00-0AX0: Output current in the standard mounting position

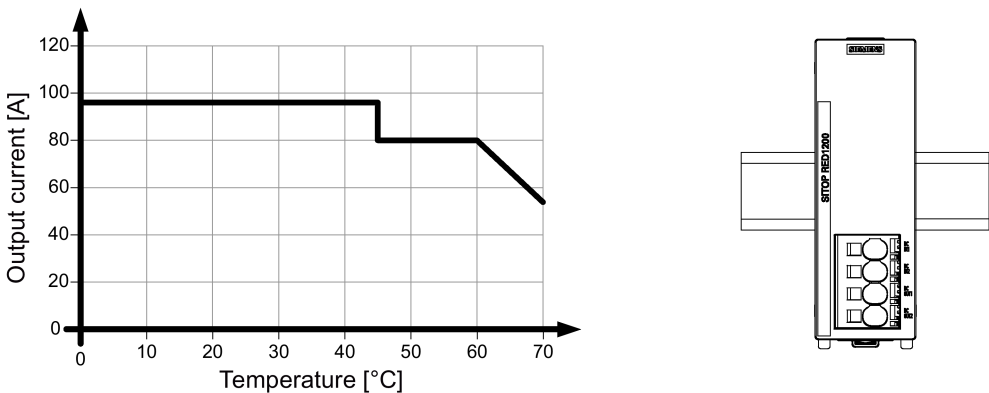


Figure 4-3 6EP4348-7RB00-0AX0: Output current in the standard mounting position

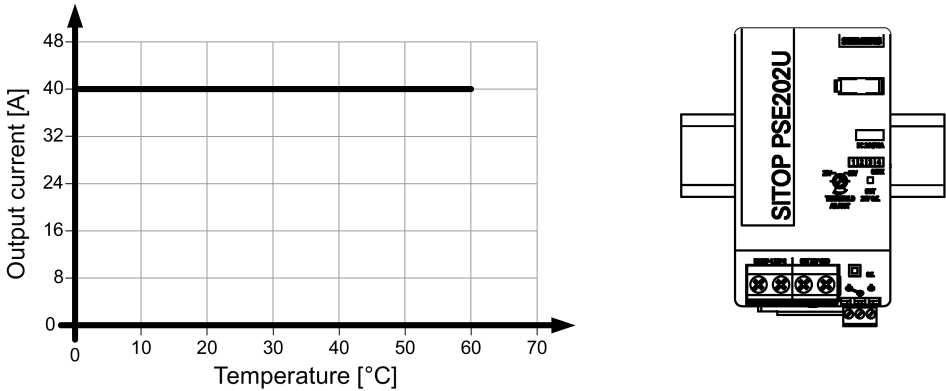


Figure 4-4 6EP1961-3BA21: Output current in the standard mounting position

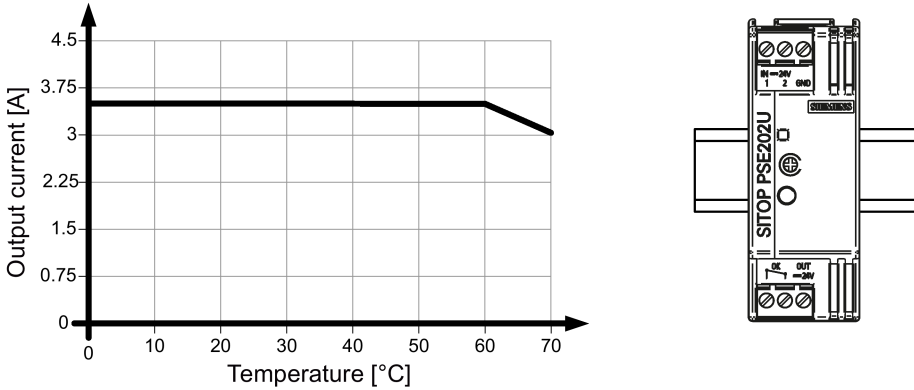


Figure 4-5 6EP1962-2BA00: Output current in the standard mounting position

4.1 Standard mounting position

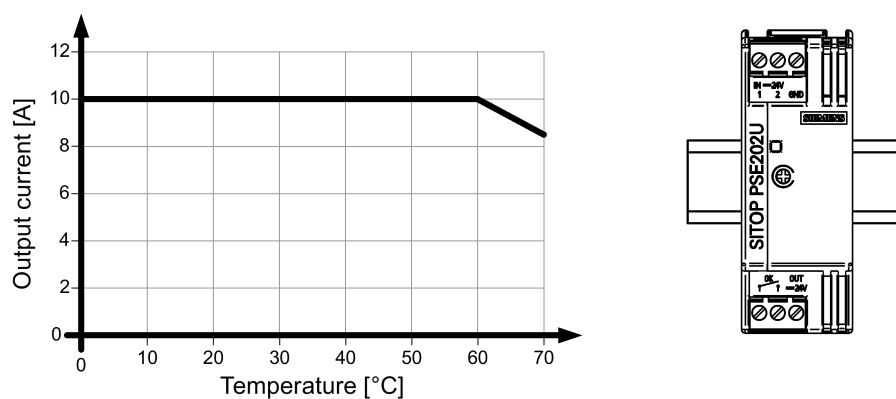


Figure 4-6 6EP1964-2BA00: Output current in the standard mounting position

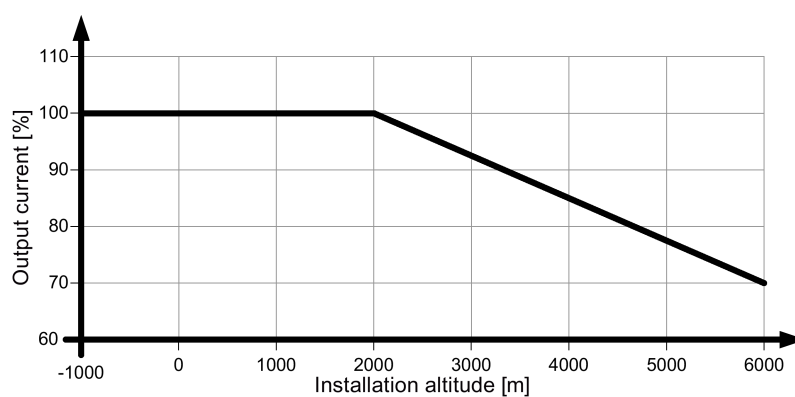


Figure 4-7 Altitude derating

For details, see Chapter Ambient conditions (Page 123)

4.2 Other mounting positions

For mounting positions that deviate from the standard mounting position, derating factors (reduction of the output power or the permissible ambient temperature) must be observed in accordance with the following diagrams.

Note

In the case of mounting positions that deviate from the standard mounting position, reduced mechanical resistance of the devices against vibration and shock must be expected.

Especially when installing on a vertically fastened standard mounting rail, additional measures may be required, e.g. to prevent the device from slipping on the standard mounting rail.

4.2.1 SITOP RED1200

4.2.1.1 6EP4346-7RB00-0AX0

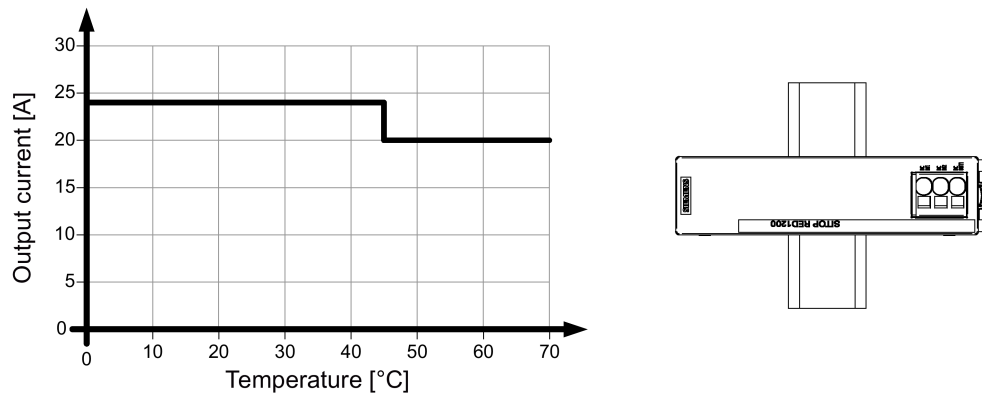


Figure 4-8 Mounting position 1

4.2 Other mounting positions

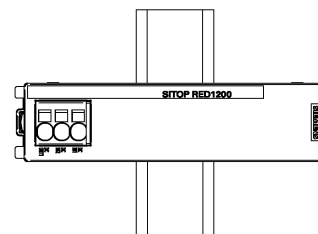
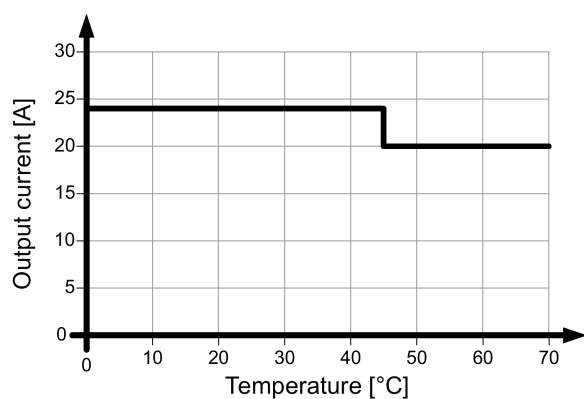


Figure 4-9 Mounting position 2

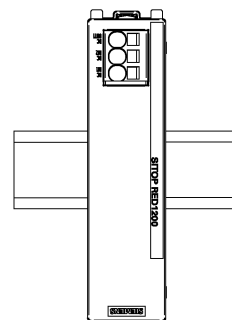
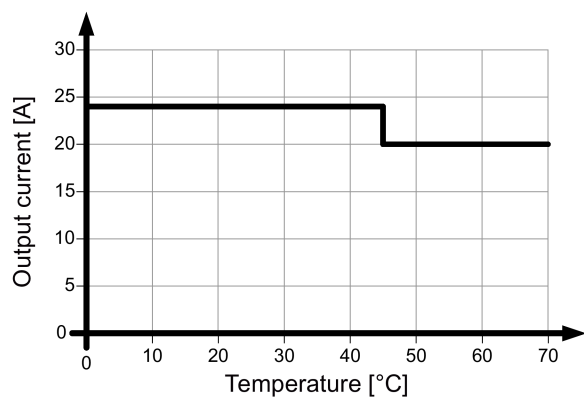


Figure 4-10 Mounting position 3

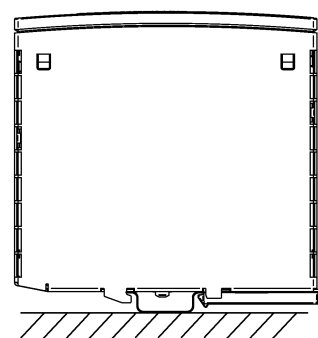
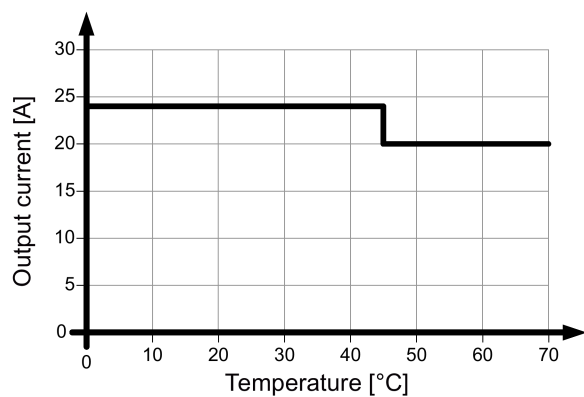


Figure 4-11 Mounting position 4

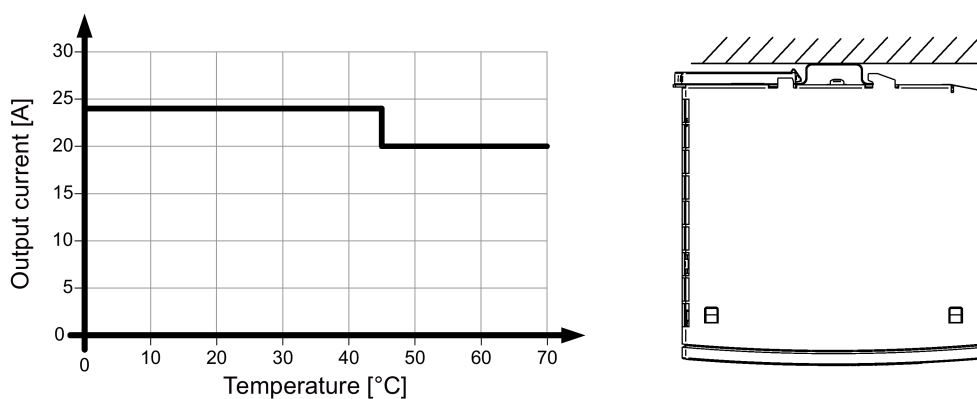


Figure 4-12 Mounting position 5

4.2.1.2 6EP4347-7RB00-0AX0 and 6EP4347-7RC00-0AX0

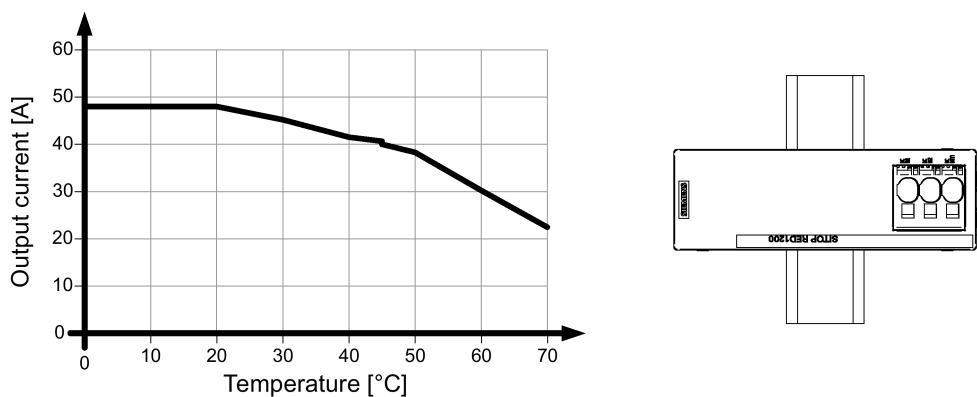


Figure 4-13 Mounting position 1

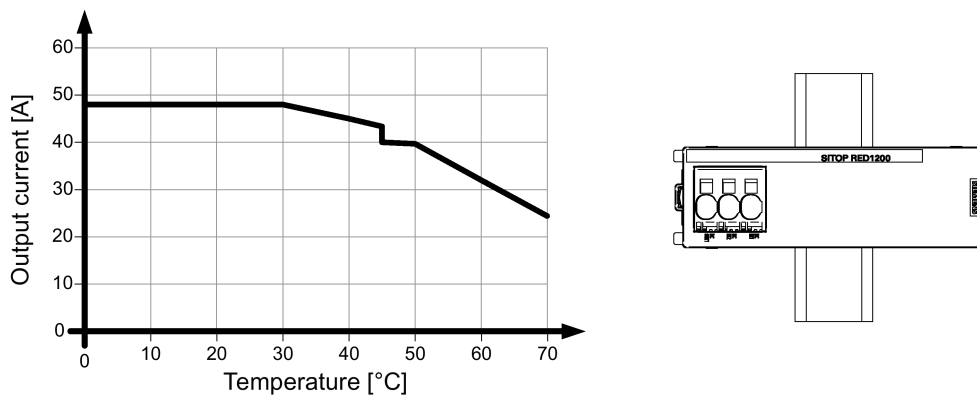


Figure 4-14 Mounting position 2

4.2 Other mounting positions

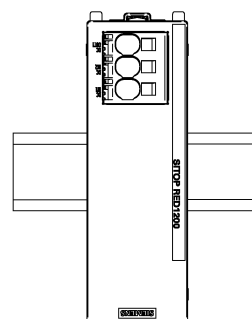
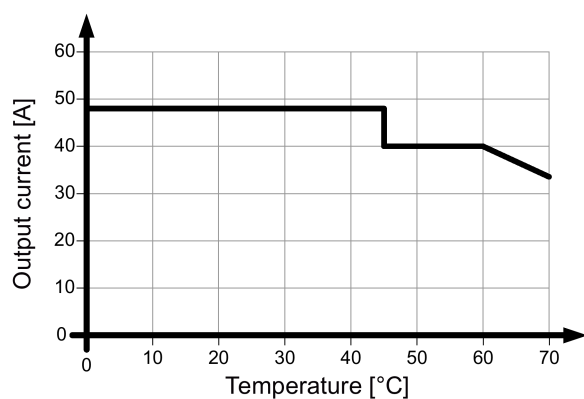


Figure 4-15 Mounting position 3

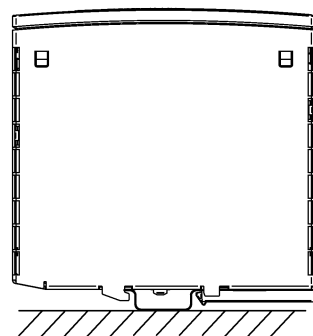
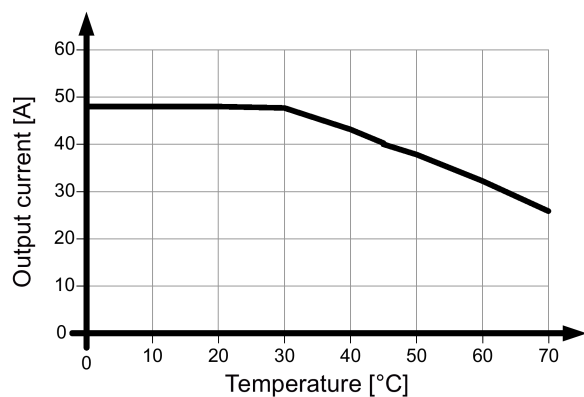


Figure 4-16 Mounting position 4

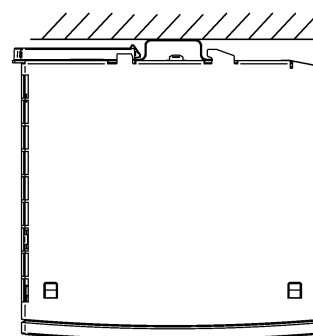
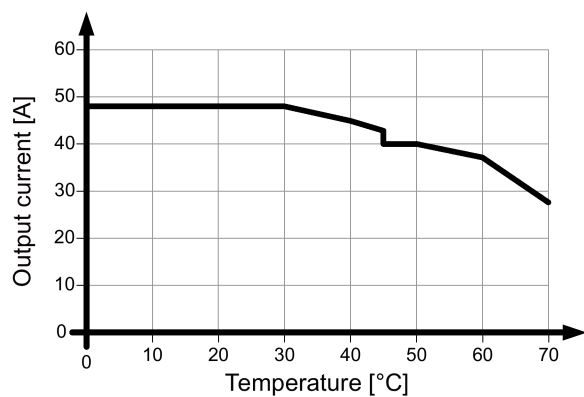


Figure 4-17 Mounting position 5

4.2.1.3 6EP4348-7RB00-0AX0

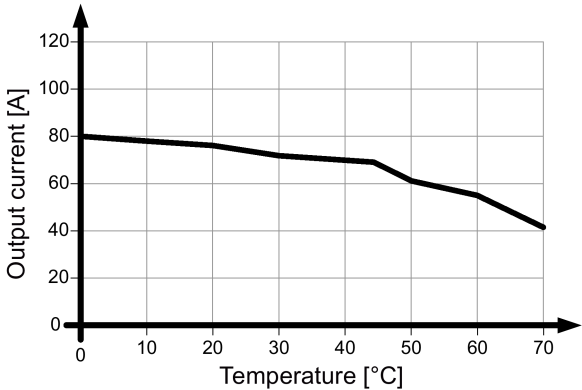


Figure 4-18 Mounting position 1

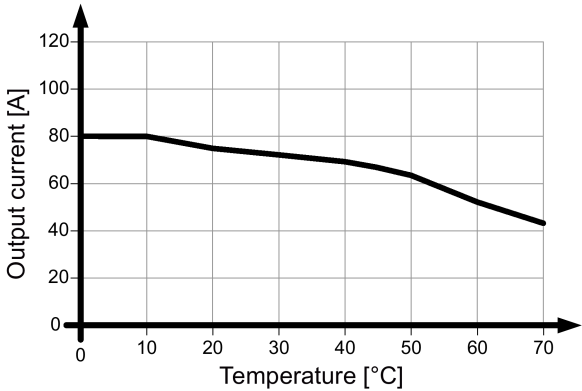
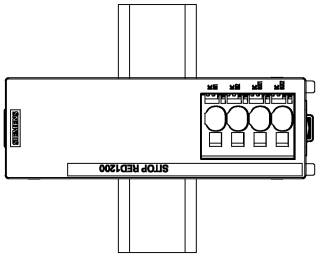


Figure 4-19 Mounting position 2

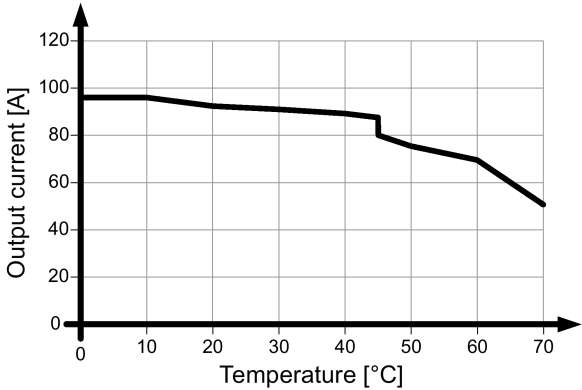
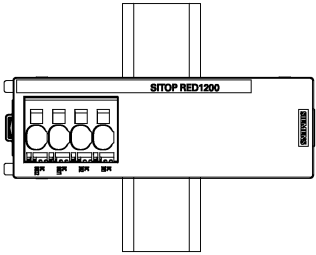
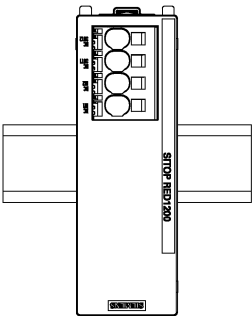


Figure 4-20 Mounting position 3



4.2 Other mounting positions

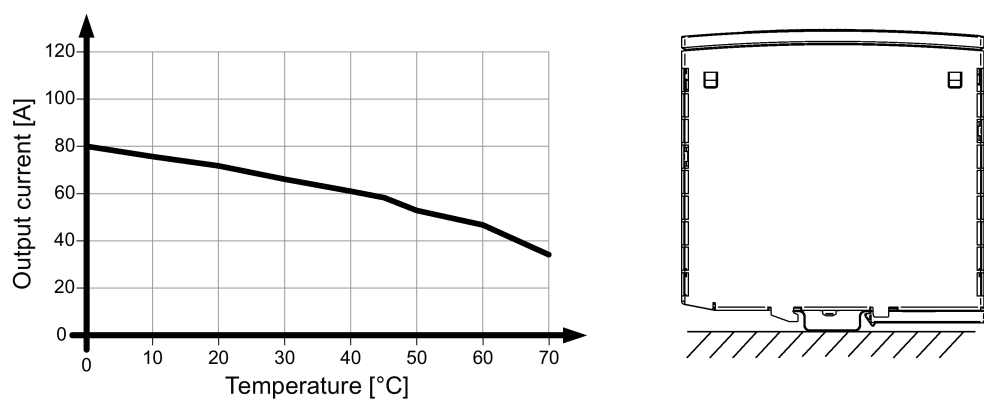


Figure 4-21 Mounting position 4

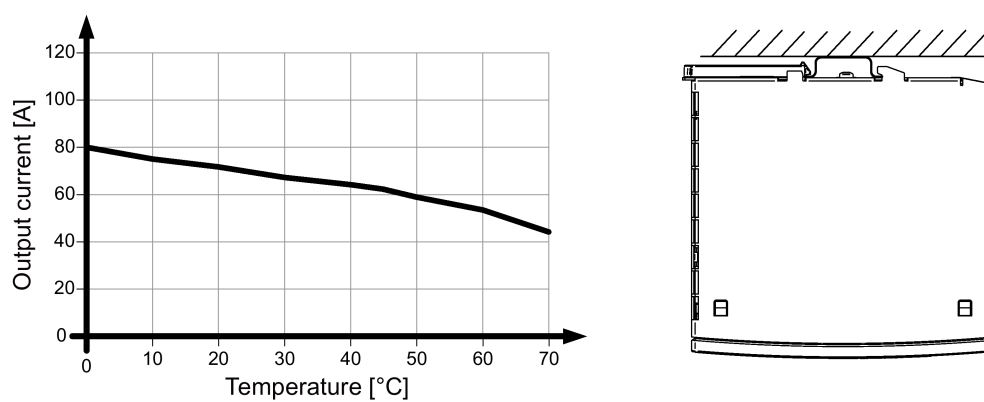


Figure 4-22 Mounting position 5

4.2.2 SITOP PSE202U

4.2.2.1 6EP1961-3BA21

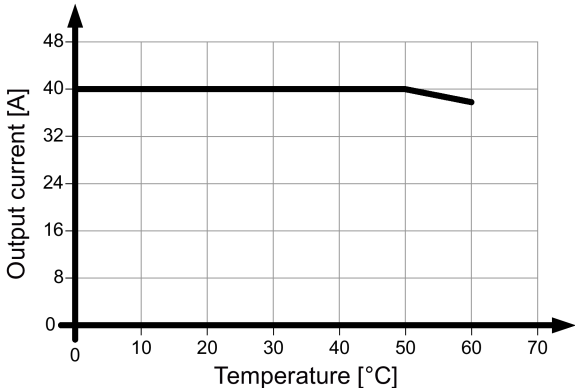


Figure 4-23 Mounting position 1

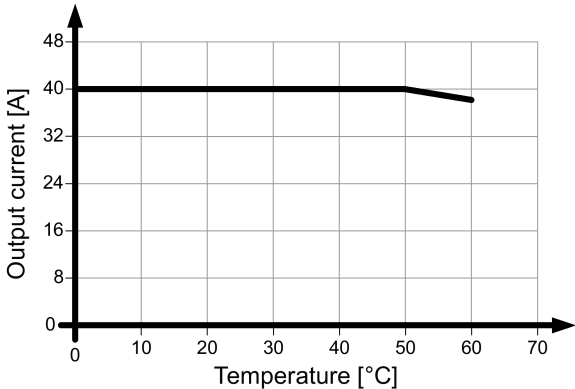
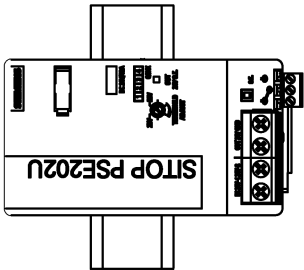
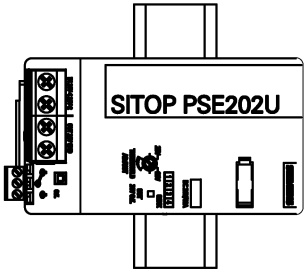


Figure 4-24 Mounting position 2



4.2 Other mounting positions

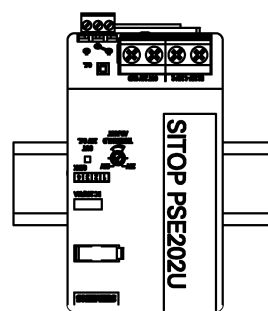
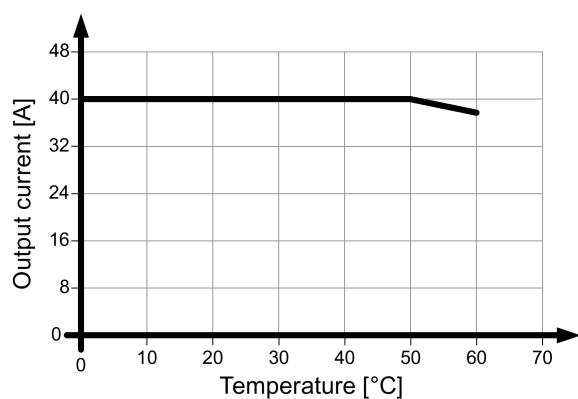


Figure 4-25 Mounting position 3

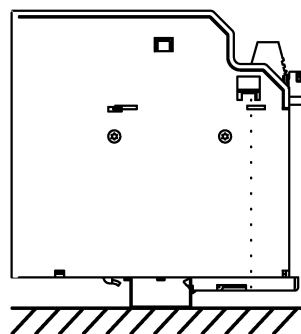
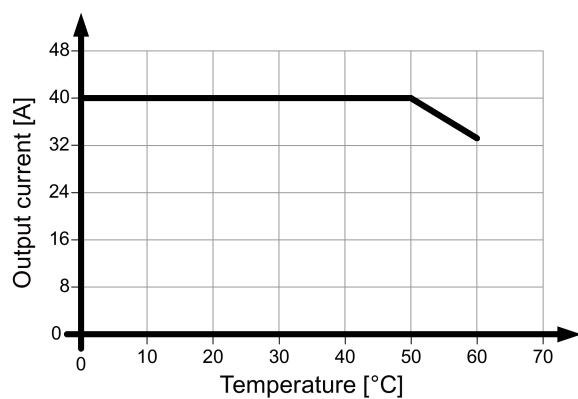


Figure 4-26 Mounting position 4

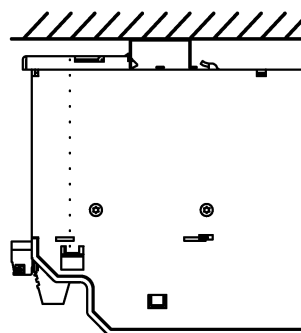
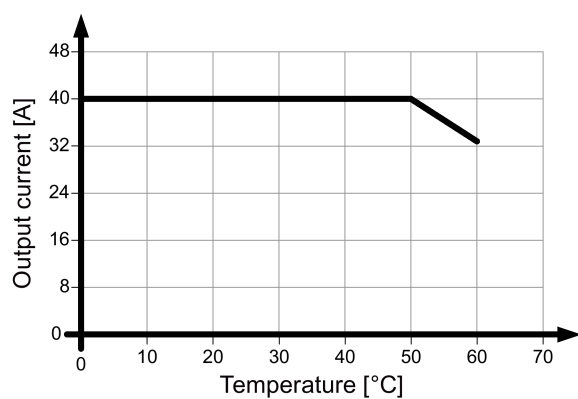


Figure 4-27 Mounting position 5

4.2.2.2 6EP1962-2BA00

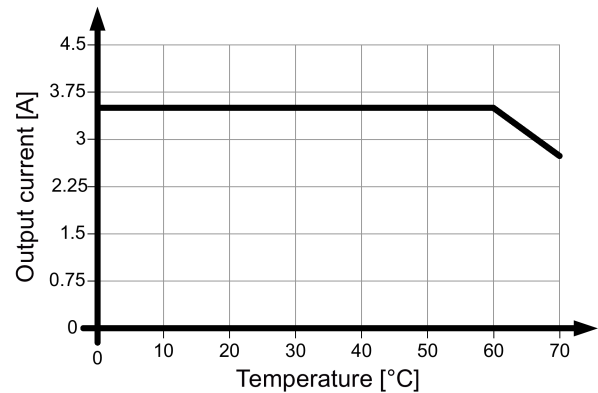


Figure 4-28 Mounting position 1

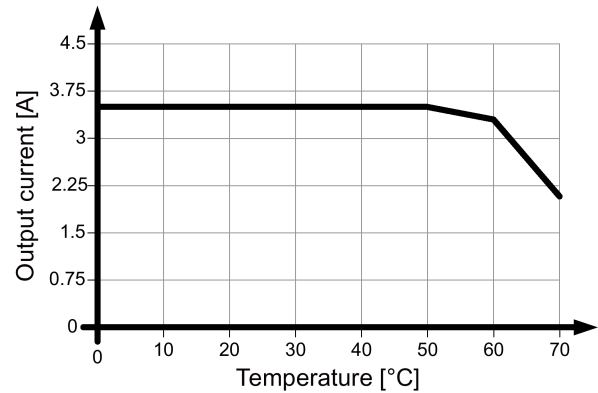
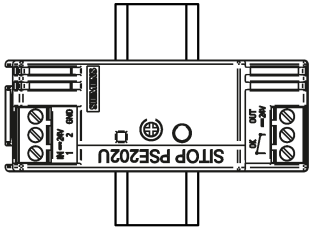


Figure 4-29 Mounting position 2

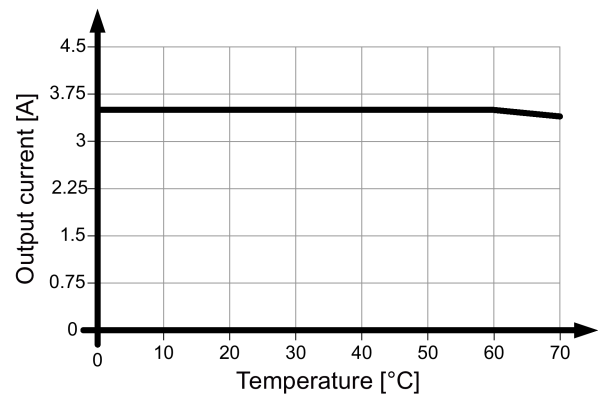
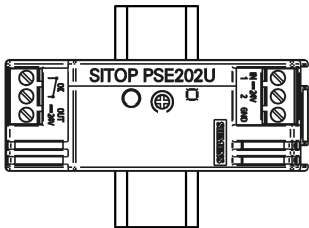
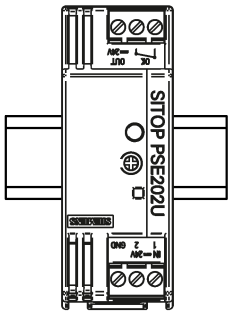


Figure 4-30 Mounting position 3



4.2 Other mounting positions

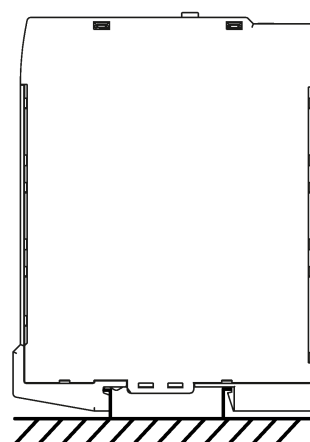
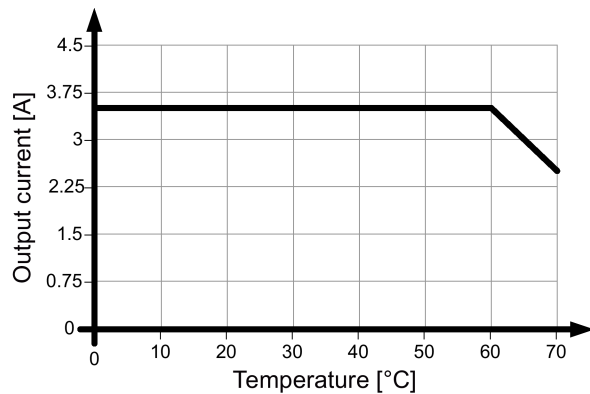


Figure 4-31 Mounting position 4

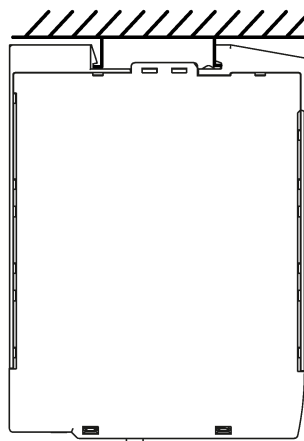
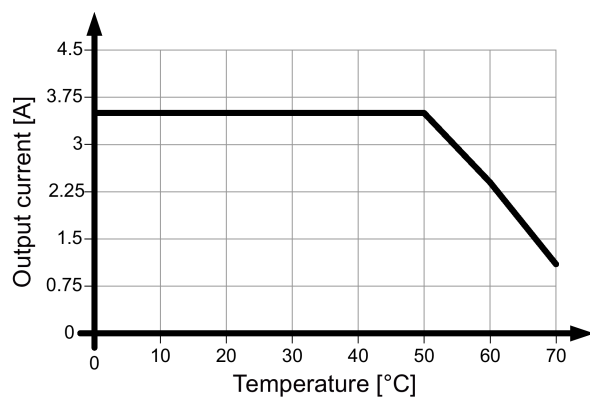


Figure 4-32 Mounting position 5

4.2.2.3 6EP1964-2BA00

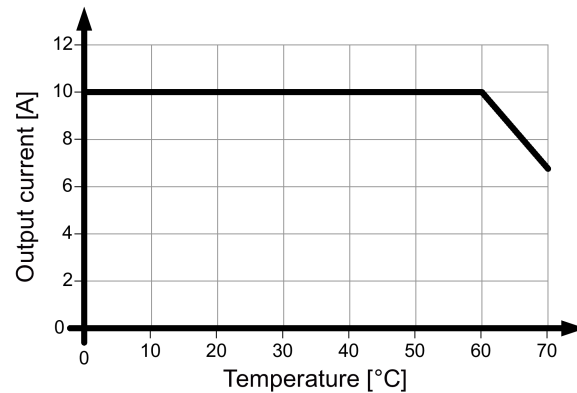


Figure 4-33 Mounting position 1

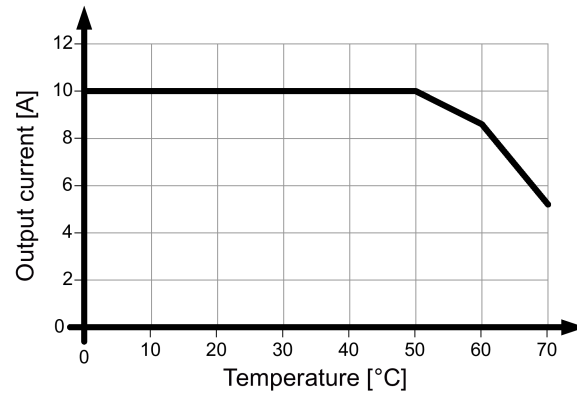
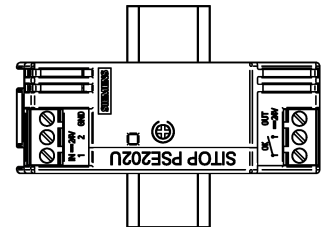


Figure 4-34 Mounting position 2

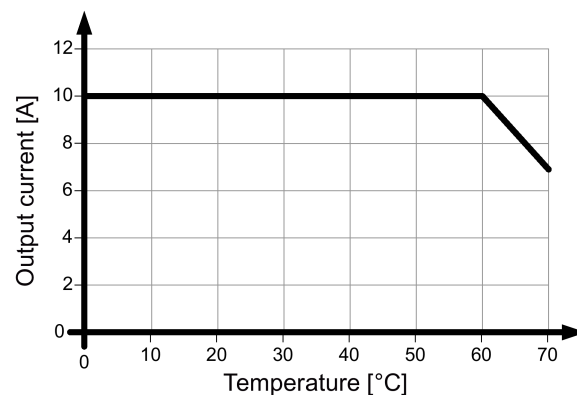
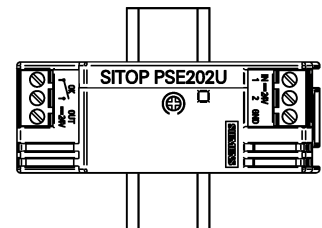
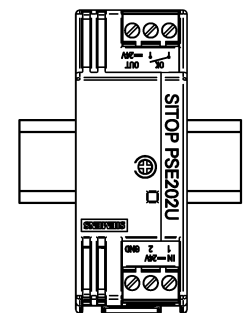


Figure 4-35 Mounting position 3



4.2 Other mounting positions

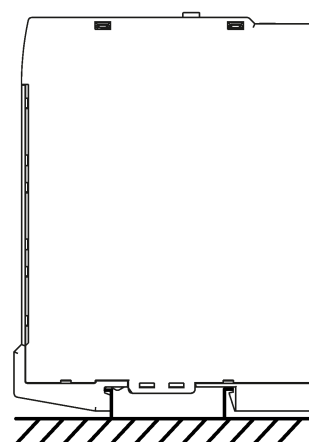
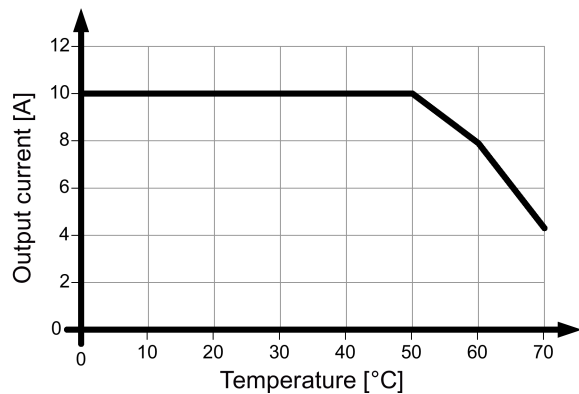


Figure 4-36 Mounting position 4

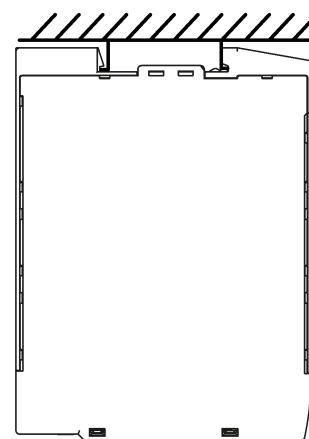
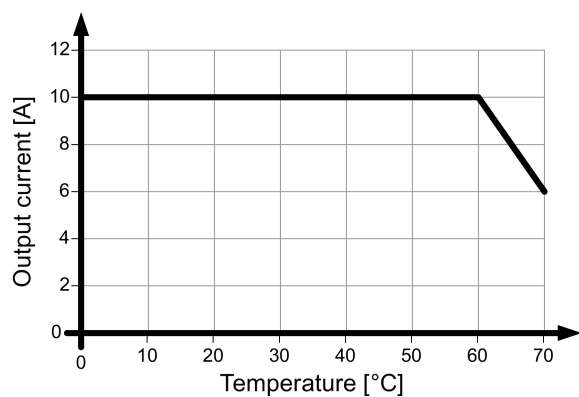


Figure 4-37 Mounting position 5

4.2.3 SITOP CHO1400

The following applies for the chopper module 6EP4548-7XB00-3AX0: 3% $I_{out rated}/K$ derating at $> 60\text{ °C}$ for all mounting positions.

4.2.4 Buffer modules

4.2.4.1 SITOP BUF1200 (6EP4231-7HB00-0AX0 and 6EP4231-7HC00-0AX0)

For buffer modules 6EP4231-7HB00-0AX0 and 6EP4231-7HC00-0AX0, the following applies: $-25 \dots 70\text{ °C}$ without derating for all mounting positions.

4.2.4.2 SITOP PSE201U (6EP1961-3BA01)

For buffer module 6EP1961-3BA01, the following applies: $-25 \dots 70\text{ °C}$ without derating for all mounting positions.

4.2.5 SITOP PBM1200

For the power boost module 6EP4240-7HB00-0AX0 the following applies: $-40 \dots 70\text{ °C}$ without derating for all mounting positions.

4.2.6 Inrush current limiter

The following applies for the 6EP1967-2AA00 and 6EP4683-6LB00-0AY0 inrush limiters: Mounting position rotated through 180° without derating, for all other mounting positions, maximum switch-on frequency once every 15 min.

4.2 Other mounting positions

WARNING

Hazard due to electric shock

Before installation or maintenance work can begin, the system's main switch must be switched off and measures taken to prevent it being switched on again. If this instruction is not observed, touching live parts can result in death or serious injury.

Copper wire that as a minimum must comply with the subsequent temperature requirement must be used to wire the devices.

Expansion modules		
Type	Article number	Temperature
Redundancy module SITOP RED1200 (2 × 10 A)	6EP4346-7RB00-0AX0	90 °C (UL 508: 60/75 °C)
Redundancy module SITOP RED1200 (2 × 20 A)	6EP4347-7RB00-0AX0	90 °C (UL 508: 60/75 °C)
Redundancy module SITOP RED1200 (2 × 40 A)	6EP4348-7RB00-0AX0	90 °C (UL 508: 60/75 °C)
Redundancy module SITOP PSE202U (2 × 20 A)	6EP1961-3BA21	60/75 °C
Redundancy module SITOP PSE202U NEC CLASS 2 (4 A)	6EP1962-2BA00	60/75 °C
Redundancy module SITOP PSE202U (2 × 5 A)	6EP1964-2BA00	90 °C
Chopper module SITOP CHO1400	6EP4548-7XB00-3AX0	75 °C
Buffer module SITOP BUF1200	6EP4231-7HB00-0AX0	75 °C
Buffer module SITOP PSE201U	6EP1961-3BA01	75 °C
Power boost module SITOP PBM1200	6EP4240-7HB00-0AX0	75 °C
Inrush current limiter Logo! ICL230	6EP4683-6LB00-0AY0	90 °C
Inrush current limiter SITOP	6EP1967-2AA00	60/75 °C

Expansion modules Ex		
Type	Article number	Temperature
Redundancy module SITOP RED1200 Ex (2 × 20 A)	6EP4347-7RC00-0AX0	90 °C (UL 508: 60/75 °C)
Buffer module SITOP BUF1200 Ex	6EP4231-7HC00-0AX0	75 °C

5.1 Input connections

NOTICE

Country-specific regulations must be observed when installing.

5.1.1 Redundancy modules

5.1.1.1 SITOP RED1200

Inputs "DC IN1" and "DC IN2" of the redundancy module must be connected with outputs "+" of the power supplies.

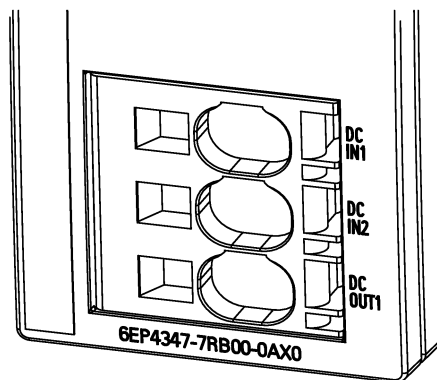


Figure 5-1 Input/output

5.1.1.2 SITOP PSE202U

Inputs "IN 24 V-1" and "IN 24 V-2" of the redundancy module must be connected with outputs "+" of the power supplies and input "GND" of the redundancy module with outputs "-" of the power supplies.

NOTICE

It is not permissible to operate the device without the GND cable being connected. It is not permissible that cables IN 24V-1 or IN 24V-2 and cable GND are interchanged.

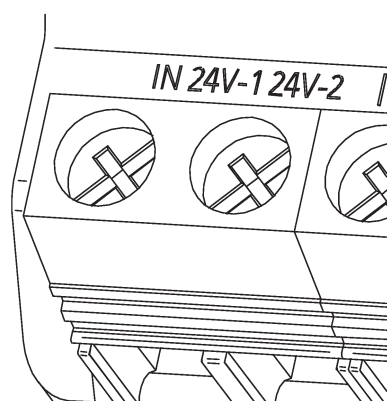


Figure 5-2 Input 6EP1961-3BA21

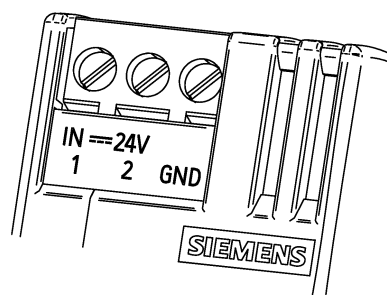


Figure 5-3 Input 6EP1962-2BA00 and 6EP1964-2BA00

5.1.2 Chopper module

Input "+" of the chopper module is connected with output "+" of the power supply, and input "-" of the chopper module with output "-" of the power supply.

The chopper module should be wired with the same conductor cross-section as the output cable of the power supply.

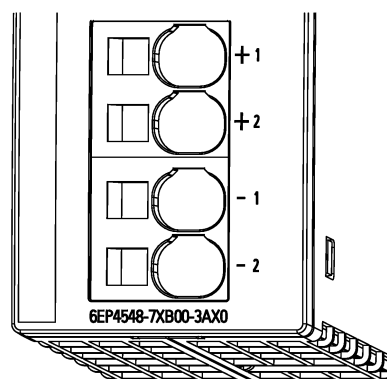


Figure 5-4 Input

5.1.3 Buffer modules

5.1.3.1 SITOP BUF1200

The buffer module is connected in parallel with the SITOP power supply. To do this, input/output "+" of the buffer module must be connected with output "+" of the power supply, and input/output "-" of the buffer module, with output "-" of the power supply. The buffer module should be wired with the same conductor cross-section as the output cable of the power supply.

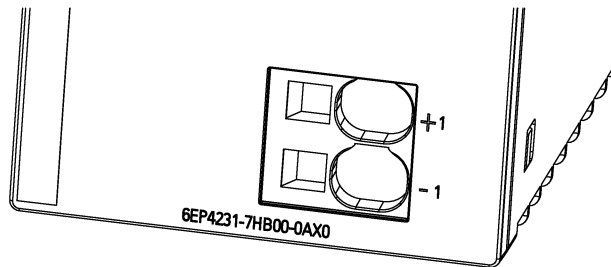


Figure 5-5 Input/output

5.1.3.2 SITOP PSE201U

The buffer module is connected in parallel with the SITOP power supply. To do this, input/output "+" of the buffer module must be connected with output "+" of the power supply, and input/output "-" of the buffer module, with output "-" of the power supply. The buffer module should be wired with the same conductor cross-section as the output cable of the power supply.

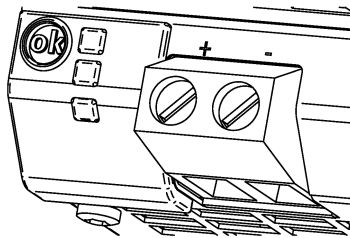


Figure 5-6 Input/output

5.1.4 Power boost module

The input "+1" of the power boost module is to be connected with the output "+" of the power supply and the input "-1" of the power boost module without the output "-" of the power supply. The load should be connected to the terminals "+2" and "-2" of the power boost module.

The power boost module should be wired with the same cable cross-section as the output cable of the power supply.

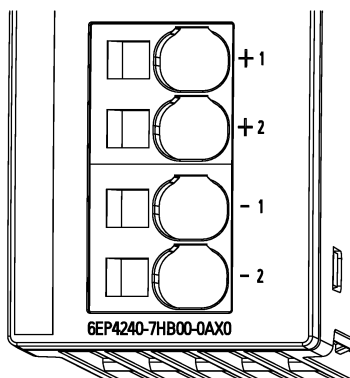


Figure 5-7 Input

5.1.5 Inrush current limiter

5.1.5.1 Logo! ICL230

The inrush current limiter is connected between the line supply and the power supply to be supplied. It is suitable for connection to 1-phase AC line supplies with 100 V, 120 V or 230 V 50-60 Hz or to 2-phase line supplies with 208 V line voltage on the line side, upstream of transformers, power supplies or LEDs, and using the integrated fixed resistor, it limits the inrush current to approx. 10 A at 230 V. In steady-state operation, the limiting resistor is bypassed after approx. 60 ms, therefore minimizing the associated power loss.

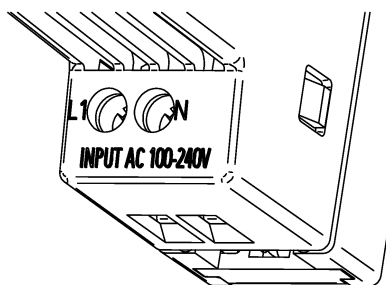


Figure 5-8 Input

5.1.5.2 SITOP inrush current limiter

The inrush current limiter is connected between the line supply and the power supply to be supplied. It is suitable for connection to 1-phase AC line supplies with 100 V, 120 V or 230 V 50-60 Hz or to 2-phase or 3-phase 208 - 480 V AC line supplies. The switch-on current pulse at 230 V is limited to approximately 8 A. In steady-state operation, the limiting element is bypassed.

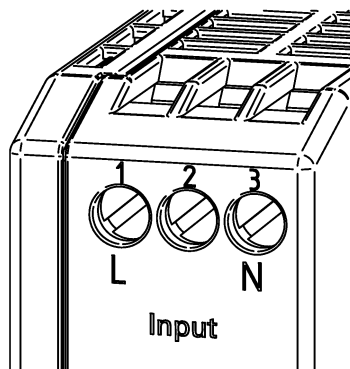


Figure 5-9 Input

Depending on the particular application, the input terminals should be connected as shown in the following wiring diagram:

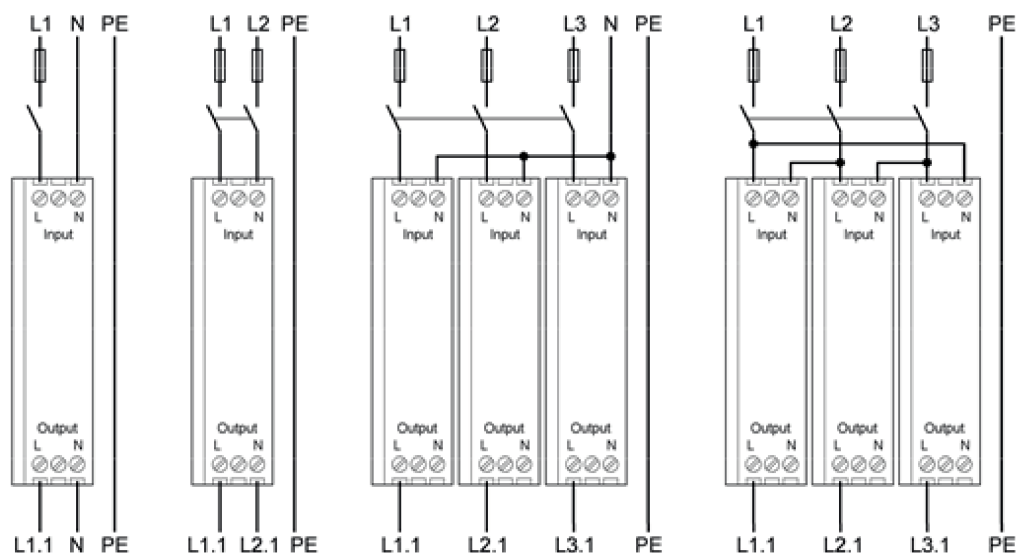


Figure 5-10 Wiring diagram

5.2 Output connections

5.2.1 Redundancy modules

5.2.1.1 SITOP RED1200

Output "DC OUT1" of the redundancy module must be connected to the load.
See Figure 5-1 Input/output (Page 86).

The subsequent wiring is recommended to guarantee safe and reliable operation of the power supplies in all operating states:

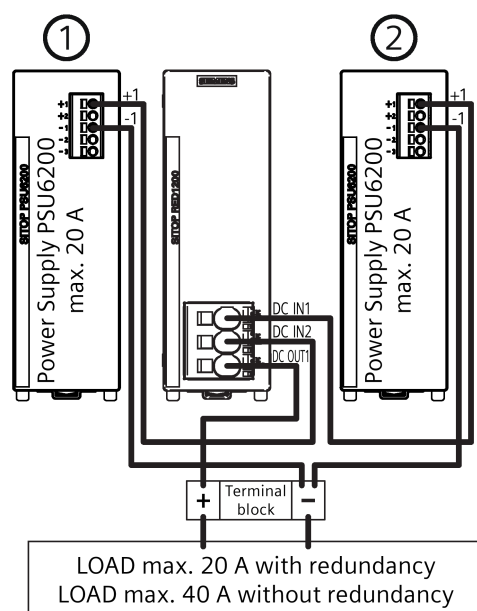


Figure 5-11 Wiring: 1 redundancy module (2 x 20 A) with 2 x 20 A power supply

5.2 Output connections

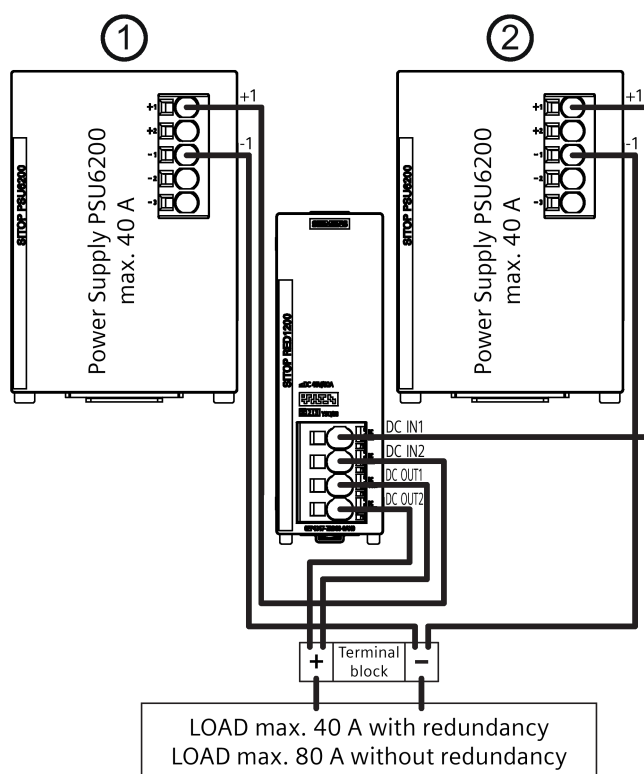


Figure 5-12 Wiring: 1 redundancy module (2 x 40 A) with 2 x 40 A power supply

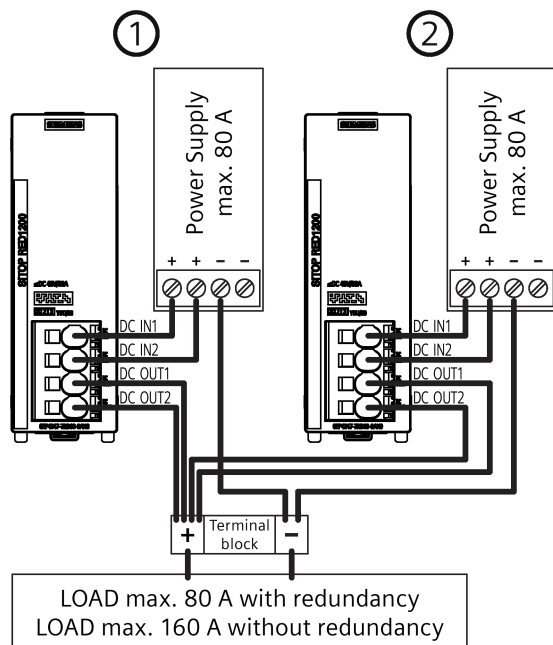


Figure 5-13 Wiring: 2 redundancy modules (2 x 40 A) with 2 x 80 A power supply

To achieve an output voltage of 24/48/96 V DC, **two 12/24/48 V SITOP power supplies of the same type** can be connected in series. Depending on the grounding point of the secondary output voltage, voltages of +24/48/96 V, $\pm 12/24/48$ V or -24/48/96 V can be realized. To guarantee safe and reliable operation of the power supplies in all operating states, for the series connection, the subsequent wiring using two redundancy modules SITOP RED1200 is recommended.

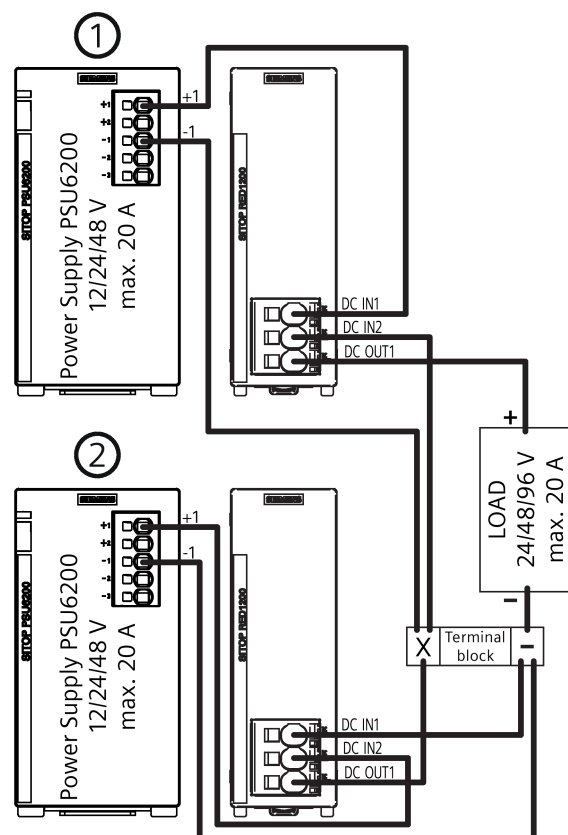


Figure 5-14 Variant 1: 2 power supplies (12/24/48 V, max. 20 A) and 2 redundancy modules 2 x 20 A

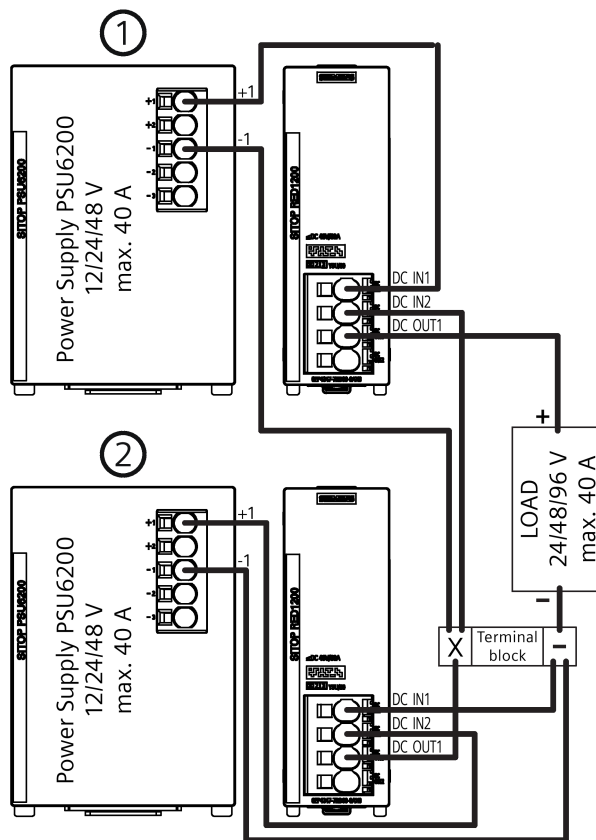


Figure 5-15 Variant 2: 2 power supplies (12/24/48 V, max. 40 A) and 2 redundancy modules 2 x 40 A

! WARNING

SELV (ES1) cannot be guaranteed in the case of a fault

When connecting two power supplies in series, the continuous, permissible SELV (ES1) voltage of maximum 60 V DC according to EN 61204-7 cannot be guaranteed in the case of a fault.

! WARNING

SELV (ES1) is not given for a series connection of 48 V devices

When connecting two 48 V power supplies in series, the continuous, permissible SELV (ES1) voltage of maximum 60 V DC according to EN 61204-7 is exceeded.

5.2.1.2 SITOP PSE202U

Output "Out 24 V" of the redundancy module must be connected with the load.

Note

The output cable of the redundancy module must have a cable cross-section that can conduct the maximum total current of both supplying power supplies.

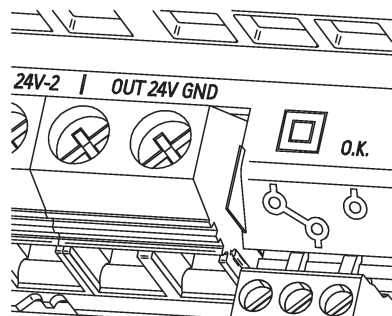


Figure 5-16 Output 6EP1961-3BA21

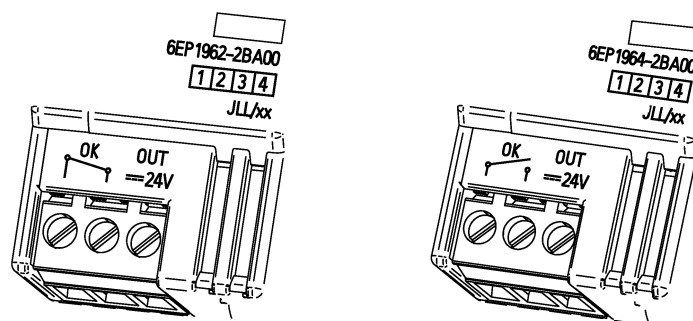


Figure 5-17 Output 6EP1962-2BA00 and 6EP1964-2BA00

The subsequent wiring is recommended for the 6EP1961-3BA21 to guarantee safe and reliable operation of the power supplies in all operating states:

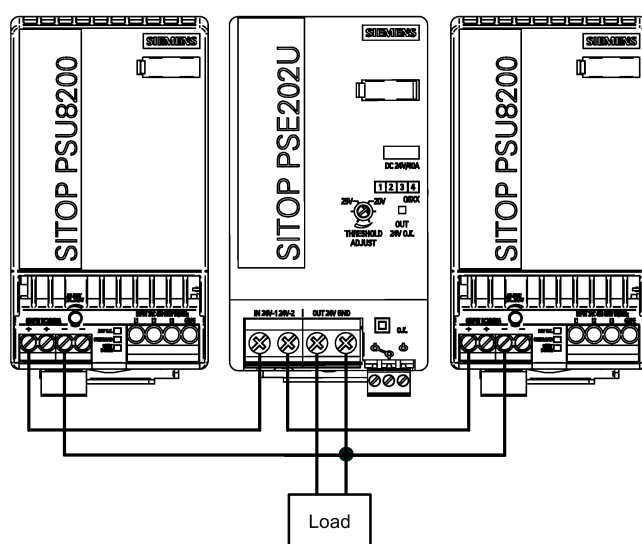


Figure 5-18 Wiring: 2 power supplies (24 V, max. 20 A) and 1 PSE202U redundancy module (2 x 20 A)

5.2.2 Chopper module

See Chapter Chopper module (Page 87)

5.2.3 Buffer modules

5.2.3.1 SITOP BUF1200

See SITOP BUF1200 (Page 88)

5.2.3.2 SITOP PSE201U

See SITOP PSE201U (Page 88)

5.2.4 Power boost module

See Chapter Power boost module (Page 89)

5.2.5 Inrush current limiter

5.2.5.1 Logo! ICL230

The power supply to be supplied is connected at the output terminals of the inrush current limiter.

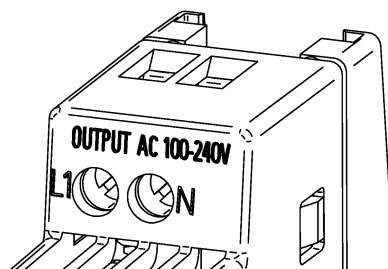


Figure 5-19 Output

5.2.5.2 SITOP inrush current limiter

The power supply to be supplied is connected at the output terminals of the inrush current limiter.

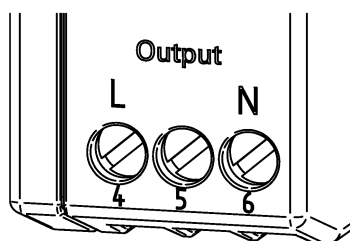


Figure 5-20 Output

Depending on the particular application, the output terminals should be connected as shown in the wiring diagram (see Figure 5-10 Wiring diagram (Page 90))

Note

For 3-phase applications, the N conductor is only connected on the input side to supply the inrush current limiter itself. It is not permissible that N is connected on the output side.

Technical data

Note

Technical data apply for a rated input voltage, rated load and 25 °C ambient temperature, if nothing else is specified.

6.1 Input

6.1.1 Redundancy modules

	6EP4346-7RB00-0AX0 6EP4347-7RB00-0AX0 6EP4348-7RB00-0AX0 6EP4347-7RC00-0AX0	6EP1961-3BA21	6EP1962-2BA00 6EP1964-2BA00
Input	DC voltage	DC voltage	DC voltage
Rated input voltage $U_{in rated}$	12 - 48 V	24 V	24 V
Voltage range	10 - 58 V	24 - 28.8 V	19 - 29 V

6.1.2 Chopper module

	6EP4548-7XB00-3AX0
Rated input voltage $U_{in rated}$	24 - 28 V DC or 48 - 56 V DC
Operating voltage range	20.5 - 29 V or 41 - 57 V DC
Input power	0 - 1000 W
Chopper time at 1000 W	max. 1.8 s
Derating temperature	at > 60 °C: 3% $I_{out rated}/K$

6.1 Input

6.1.3 Buffer modules

	6EP4231-7HB00-0AX0 6EP4231-7HC00-0AX0	6EP1961-3BA01
Input	DC voltage	DC voltage
Rated input voltage $U_{in rated}$	24 - 28 V DC	24 V
Voltage range	20 - 30 V DC	24 - 28.8 V
Charging time	Max. 100 s, charging current < 0.5 A	Approx. 60 s

6.1.4 Power boost module

	6EP4346-7RB00-0AX0
Rated input voltage $U_{in rated}$	24 - 28 V DC or 48 - 56 V DC
Operating voltage range	20.5 - 29 V or 41 - 57 V DC Suitable for tripping miniature circuit breakers 4 - 13 A characteristic B/C.

6.1.5 Inrush current limiter

	6EP4683-6LB00-0AY0	6EP1967-2AA00
Input	1 and 2-phase AC	1, 2 and 3-phase AC
Rated input voltage $U_{in rated}$	100 - 240 V	100 - 480 V
Voltage range	85 - 264 V	85 - 575 V
Line frequency range	47 - 63 Hz	47 - 63 Hz
Maximum input current I_{in}	5 A	10 A
Own consumption	1.5 W/16 mA _{rms} at 230 V	1.5 W/16 mA _{rms} at 230 V
Recommended protection/fusing in the line feeder cable (IEC 898)	Generally, the protective element to be connected upstream can be dimensioned independent of the tripping characteristics, just above the sum of the rated currents of the connected loads. It is not permissible that the rated current of the upstream protective element exceeds 10 A! Please also refer to the operating instructions for the connected device!	For rated input voltages of 120 V and 230 V, generally the miniature circuit breaker can now be dimensioned independent of the tripping characteristics, just above the sum of the rated currents of the connected loads. For rated input voltages of 400 V or 480 V, for characteristic B, the miniature circuit breaker should be dimensioned as a minimum with 5 A and for characteristic C, with 3 A. The rated current of the miniature circuit breaker should not exceed 10 A! Please also refer to the operating instructions for the connected device!

6.2 Output

6.2.1 Redundancy modules

	6EP4346-7RB00-0AX0	6EP4347-7RB00-0AX0 6EP4347-7RC00-0AX0	6EP4348-7RB00-0AX0
Output	DC voltage		
Rated output voltage $U_{\text{out rated}}$	12 - 48 V	12 - 48 V	12 - 48 V
Output voltage	U_{in} - approx. 0.6 V	U_{in} - approx. 0.6 V	U_{in} - approx. 0.6 V
Output current I_{out}	0 - 20 A	0 - 40 A	0 - 80 A
• Remark	120 % $I_{\text{out rated}}$ in the range -40 ... 45 °C	120 % $I_{\text{out rated}}$ in the range -40 ... 45 °C	120 % $I_{\text{out rated}}$ in the range -40 ... 45 °C 60 ... 70 °C derating: 3 % $I_{\text{out rated}}/K$

	6EP1961-3BA21	6EP1962-2BA00	6EP1964-2BA00
Output	DC voltage		
Rated output voltage $U_{\text{out rated}}$	24 V	24 V	24 V
Output voltage	U_{in} - approx. 0.5 V	U_{in} - approx. 0.5 V	U_{in} - approx. 0.5 V
Output current I_{out}	0 - 40 A	0 - 4.3 A (at 19 V U_{out}) 0 - 3.5 A (at 24 V U_{out}) 0 - 2.8 A (at 28.5 V U_{out})	0 - 10 A
• Remark		Max. output power (NEC Class2): 100 VA	

6.2.2 Chopper module

See Chapter Chopper module (Page 99)

6.2.3 Buffer modules

SITOP BUF1200

	6EP4231-7HB00-0AX0
	6EP4231-7HC00-0AX0
Output	DC voltage
Output voltage	$U_{in} - 0.5 \text{ V } (\pm 0.2 \text{ V})$
Output current (rated value)	40 A

Buffer time:

for 40 A load current: > 300 ms

The maximum possible buffer time is 240 s.

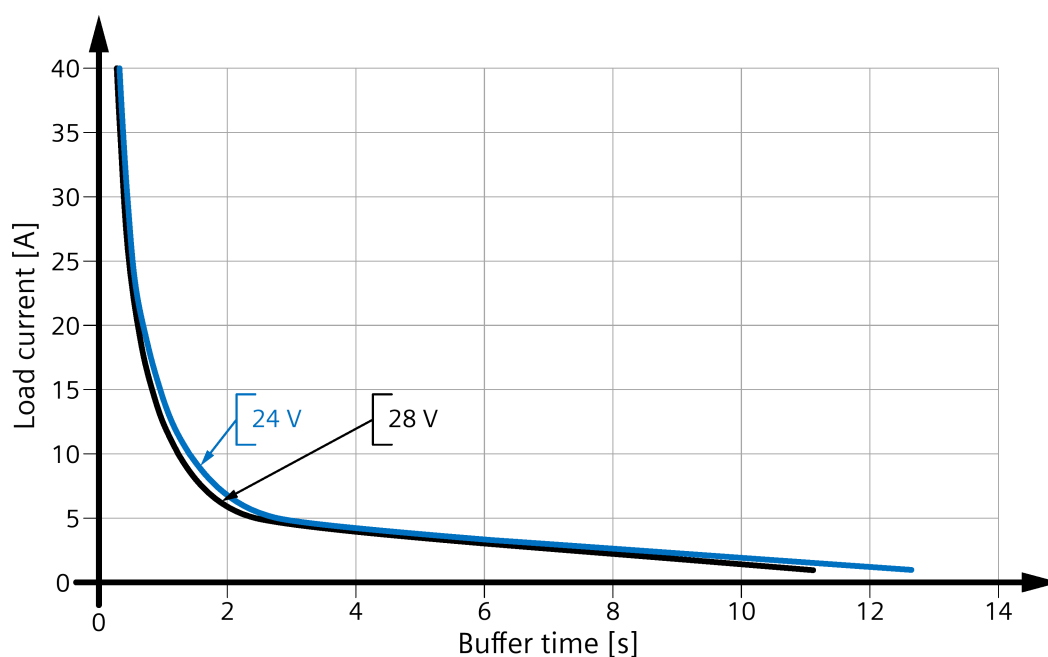


Figure 6-1 Buffer capacity SITOP BUF1200

SITOP PSE201U

6EP1961-3BA01

Output	DC voltage
Output voltage	U_{in} - approx. 1 V
Output current (rated value)	40 A

Buffer time:

for 40 A load current: 200 ms

for 20 A load current: 400 ms

for 10 A load current: 800 ms

for 5 A load current: 1.6 s

When using 6EP1437-3BA10 the buffer time is reduced by 100 ms.

A longer buffer time is achieved for lower load currents. The maximum possible buffer time is 10 seconds.

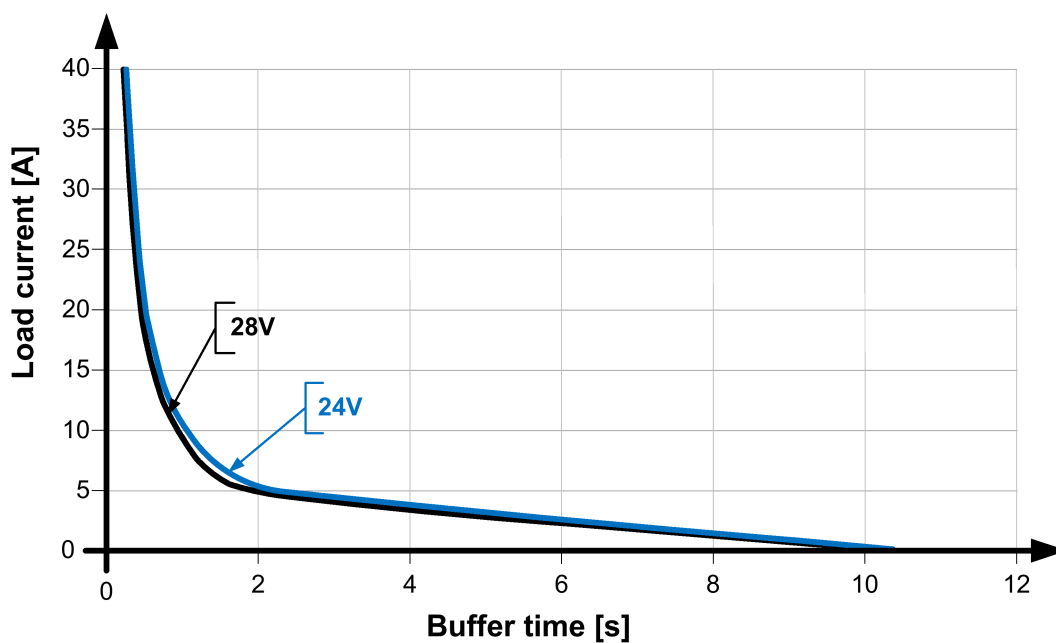


Figure 6-2 Buffer capacity 6EP1961-3BA01

6.2.4 Power boost module

See Chapter Power boost module (Page 100)

6.2 Output

6.2.5 Inrush current limiter

	6EP4683-6LB00-0AY0	6EP1967-2AA00
Output	corresponding to the supply voltage	
Rated output voltage $U_{out rated}$	corresponding to the supply voltage	
Can be connected in parallel to increase the power rating	No	
Maximum operating current	5 A	10 A
Limiting value starting current	Approx. 10 A at 230 V AC	Approx. 8 A at 230 V AC
Recommended device combinations	All SITOP power supplies	
Several power supplies connected in parallel at an inrush current limiter, 1/2 phase line supply (100 - 230 V AC)	A parallel connection is permissible. It is not permissible that the sum of the maximum operating currents of all of the connected loads exceeds 5 A. The permitted switching frequency is limited to 2 events per minute; whereby, once per hour for the duration of one minute an increased switching frequency is permissible (typically, 30 events per minute). The internal temperature protection may respond if this is not complied with.	A parallel connection is permissible. It is not permissible that the sum of the maximum operating currents of the power supplies exceed 10 A.
2/3 phase line supply (400 - 480 V AC) (3 ph: observe the wiring notes)	-	A parallel connection is permissible. It is not permissible that the sum of the maximum operating currents of the power supplies exceed 10 A. The permitted switching frequency is limited to 1 event per minute. (The internal temperature protection may respond if this is not complied with)

6.3 Protection and monitoring

6.3.1 Redundancy modules

6EP1962-2BA00	
Current limiting	The output switches off for an overload condition. Can be switched on again using the RST button, or by switching both load power supplies off and on again.

6.3.2 Chopper module

6EP4548-7XB00-3AX0	
Reverse polarity protection	Yes
Input power	max. 1000 W

6.3.3 Buffer modules

	6EP4231-7HB00-0AX0 6EP4231-7HC00-0AX0	6EP1961-3BA01
Static current limiting, typ.	40 A	40 A
Reverse polarity protection	Yes	Yes

6.3.4 Power boost module

6EP4240-7HB00-0AX0	
Reverse polarity protection	Yes

6.3.5 Inrush current limiter

6EP4683-6LB00-0AY0	
Short-circuit protection	Ensure by using an upstream protective element
Type of response threshold value setting	Switching frequency is max. 2 events per minute. Increased switching frequency limited from a time perspective to once per hour for one minute (typ. 30 events per minute).
Characteristic of the electronic overload shutdown	Non-reversible thermal protection
6EP1967-2AA00	
Short-circuit protection	Ensure by using an upstream protective element

6.4 Mechanical system

6.4.1 Redundancy modules

	6EP4346-7RB00-0AX0	6EP4347-7RB00-0AX0 6EP4347-7RC00-0AX0	6EP4348-7RB00-0AX0	6EP1961-3BA21	6EP1962-2BA00 6EP1964-2BA00
Connection system	Spring-loaded terminal	Spring-loaded terminal	Spring-loaded terminal	Screw connection	Screw connection
Connections	Input, output: 1 spring-loaded terminal each for 0.2 - 10 mm ² solid/finely stranded	Input, output: 1 spring-loaded terminal each for 0.75 - 16 mm ² solid and 0.75 - 25 mm ² finely stranded	Input, output: 1 spring-loaded terminal each for 0.75 - 16 mm ² solid and 0.75 - 25 mm ² finely stranded	Input, output and ground: 1 screw terminal each for 0.5 - 16 mm ² solid/finely stranded	Input, output and ground: removable screw terminal, 1 screw terminal each for 0.5 - 2.5 mm ² solid/finely stranded
Connections: Auxiliary contacts	-	-	-	Relay contact: 1 screw terminal each for 0.2 - 2.5 mm ² solid/finely stranded	Relay contact: 1 screw terminal each (removable) for 0.5 to 2.5 mm ² solid/finely stranded
Width of the housing	35 mm	45 mm	45 mm	70 mm	30 mm
Height of the housing	135 mm	135 mm	135 mm	125 mm	80 mm
Depth of the housing	125 mm	125 mm	155 mm	120.1 mm	100 mm
Mounting width	35 mm	45 mm	45 mm	70 mm	30 mm
Mounting height	225 mm	225 mm	225 mm	225 mm	180 mm
Weight, approx.	0.47 kg	0.50 kg	1.01 kg	0.5 kg	0.125 kg
Product feature of the housing: housings can be lined up next to one another	Yes	Yes	Yes	Yes	Yes
Mounting type: Wall/panel mounting	No	No	No	No	No
Mounting type: Rail mounting	Yes	Yes	Yes	Yes	Yes
Mounting type: S7-300 rail mounting	No	No	No	No	No
Mounting	Can be snapped onto a standard mounting rail TH35-15/7.5 (EN 60715)	Can be snapped onto a standard mounting rail TH35-15/7.5 (EN 60715)	Can be snapped onto a standard mounting rail TH35-15/7.5 (EN 60715)	Can be snapped onto a standard mounting rail TH35-15/7.5 (EN 60715)	Can be snapped onto a standard mounting rail TH35-15/7.5 (EN 60715)

6.4.2 Chopper module

6EP4548-7XB00-3AX0	
Connection system	Spring-loaded terminal
Connections: DC input	+, -: 2 spring-loaded terminals for 0.75 - 16 mm ² (0.75 - 25 mm ²) solid/finely stranded
Connections: Signaling contact	13, 14: one spring-loaded terminal each for 0.2 - 1.5 mm ² solid/finely stranded
Width of the housing	45 mm
Height of the housing	135 mm
Depth of the housing	155 mm
Mounting width	45 mm
Mounting height	225 mm
Weight, approx.	0.79 kg
Product feature of the housing: housings can be lined up next to one another	Yes
Mounting type: Wall mounting	No
Mounting type: Rail mounting	Yes
Mounting type: S7-300 rail mounting	No
Mounting	Can be snapped onto standard TH35-15/7,5 mounting rails (EN 60715)

6.4.3 Buffer modules

	6EP4231-7HB00-0AX0 6EP4231-7HC00-0AX0	6EP1961-3BA01
Connection system	Spring-loaded terminal	Screw connection
Connections: Input	+: 1 spring-loaded terminal for 0.75 - 16 mm ² solid/finely stranded	+: 1 screw terminal for 0.5 - 16 mm ² solid/finely stranded
Connections: Output	-: 1 spring-loaded terminal for 0.75 - 16 mm ² solid/finely stranded	-: 1 screw terminal for 0.5 - 16 mm ² solid/finely stranded
Width of the housing	70 mm	70 mm
Height of the housing	135 mm	125 mm
Depth of the housing	155 mm	120.9 mm
Mounting width	70 mm	70 mm
Mounting height	225 mm	225 mm
Weight, approx.	1.5 kg	1.2 kg
Product feature of the housing: housings can be lined up next to one another	Yes	Yes
Mounting type: Wall/panel mounting	No	No
Mounting type: Rail mounting	Yes	Yes
Mounting type: S7-300 rail mounting	No	No
Mounting	Can be snapped onto standard TH35-15/7,5 mounting rails (EN 60715)	Can be snapped onto standard TH35-15/7,5 mounting rails (EN 60715)

6.4.4 Power boost module

6EP4240-7HB00-0AX0	
Connection system	Spring-loaded terminal
Connections: DC input	+, -: 2 spring-loaded terminals for 0.75 - 16 mm ² (0.75 - 25 mm ²) solid/finely stranded
Width of the housing	45 mm
Height of the housing	135 mm
Depth of the housing	155 mm
Mounting width	45 mm
Mounting height	225 mm
Weight, approx.	0.79 kg
Product feature of the housing: housings can be lined up next to one another	Yes
Mounting type: Wall mounting	No
Mounting type: Rail mounting	Yes
Mounting type: S7-300 rail mounting	No
Mounting	Can be snapped onto standard TH35-15/7,5 mounting rails (EN 60715)

6.4.5 Inrush current limiter

	6EP4683-6LB00-0AY0	6EP1967-2AA00
Connection system	Screw connection	Screw connection
Connections: Line input	L, N 1 screw terminal each for 0.5 - 2.5 mm ² solid/finely stranded	L, N 1 screw terminal each for 0.5 - 2.5 mm ² solid/finely stranded
Connections: Output	+, -, N 1 screw terminal each for 0.5 - 2.5 mm ² solid/finely stranded	L, N 1 screw terminal each for 0.5 - 2.5 mm ² solid/finely stranded
Width of the housing	18 mm	22.5 mm
Height of the housing	90 mm	80 mm
Depth of the housing	53 mm	86.6 mm
Mounting width	18 mm	22.5 mm
Mounting height	130 mm	180 mm
Weight, approx.	0.14 kg	0.12 kg
Product feature of the housing: housings can be lined up next to one another	Yes	Yes
Mounting type: Wall/panel mount- ing	Yes	No
Mounting type: Rail mounting	Yes	Yes
Mounting type: S7-300 rail mount- ing	No	No
Mounting	Can be snapped onto a standard mounting rail TH35-15/7,5 (EN 60715) or for wall/panel mounting with withdrawable mounting lugs	Can be snapped onto standard TH35-15/7,5 mounting rails (EN 60715)

6.5 Accessories

6.5.1 Redundancy modules

6EP1962-2BA00	
6EP1964-2BA00	
Electrical accessories	Removable 6EP1971-5BA00 spring-loaded terminal

6.6 Dimension drawing

6.6.1 Redundancy modules

See chapter Redundancy modules (Page 43)

CAD data that can be downloaded from the Internet:

6EP4346-7RB00-0AX0

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01519)

6EP4347-7RB00-0AX0

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01522)

6EP4348-7RB00-0AX0

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01880)

6EP4347-7RC00-0AX0

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01877)

6EP1961-3BA21

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00529)

6EP1962-2BA00

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00710)

6EP1964-2BA00

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00713)

6.6.2 Chopper module

See Chapter Chopper module SITOP CHO1400 (Page 47)

CAD data that can be downloaded from the Internet:

6EP4548-7XB00-3AX0

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_02067)

6.6.3 Buffer modules

See chapter Buffer modules (Page 48)

CAD data that can be downloaded from the Internet:

6EP4231-7HB00-0AX0

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01682)

6EP4231-7HC00-0AX0

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01874)

6EP1961-3BA01

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00532)

6.6.4 Power boost module

See Chapter Power boost module SITOP PBM1200 (Page 50)

CAD data that can be downloaded from the Internet:

6EP4240-7HB00-0AX0

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_02070)

6.6.5 Inrush current limiter

See chapter Inrush current limiter (Page 51)

CAD data that can be downloaded from the Internet:

6EP4683-6LB00-0AY0

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01483)

6EP1967-2AA00

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00349)

Safety, approvals, EMC

7.1 Safety

	6EP4346-7RB00-0AX0 6EP4347-7RB00-0AX0 6EP4348-7RB00-0AX0 6EP4347-7RC00-0AX0	6EP1961-3BA21 6EP1962-2BA00 6EP1964-2BA00
Electrical isolation	-	Yes, SELV (ES1) acc. to EN 61204-7 (relay contact)
Protection class	Class III	Class III
Degree of protection (EN 60529)	IP 20	IP 20
	6EP4231-7HB00-0AX0 6EP4231-7HC00-0AX0 6EP1961-3BA01	6EP4683-6LB00-0AY0 6EP1967-2AA00
Electrical isolation	-	-
Protection class	Class III	Class II
Degree of protection (EN 60529)	IP 20	IP 20
	6EP4548-7XB00-3AX0 6EP4240-7HB00-0AX0	
Electrical isolation	-	
Protection class	Class III	
Degree of protection (EN 60529)	IP 20	

7.2 Approvals

7.2.1 SITOP RED1200

	6EP4346-7RB00-0AX0 6EP4347-7RB00-0AX0 6EP4348-7RB00-0AX0	6EP4347-7RC00-0AX0
CE marking	Yes, (2014/30/EU and 2011/65/EU)	Yes, (2014/30/EU, 2011/65/EU and 2014/34/EU)
CB certificate	Yes	
CB scheme	IEC 62368-1	
UL/cUL approval	cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259	
cCSAus approval	Yes, CSA C22.2 No. 62368-1	
Explosion protection	-	Yes
ATEX approval	-	II 3G Ex ec IIC T4 Gc (EPS 21 ATEX 1 194 X)
IECEx approval	-	Yes (IECEx EPS 21.0059X)
cULus HazLoc approval	-	cULus HazLoc Class I, Div 2, Group A,B,C,D T4
CCC HazLoc approval	-	Ex ec IIC T4 Gc (2023322303005007)
UKCA HazLoc approval	-	Yes
Marine approvals	DNV, ABS	
UKCA marking	Yes	
RCM approval	Yes	
EAC approval	Yes	

7.2.2 SITOP PSE202U

	6EP1961-3BA21	6EP1962-2BA00	6EP1964-2BA00
CE marking	Yes, (2014/30/EU and 2011/65/EU)		
UL/cUL approval	cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259	cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259 UL-R/C (UL 60950-1, NEC class 2), File E151273	cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259
Marine approvals	DNV, ABS	-	-
UKCA marking	Yes		
RCM approval	Yes		
EAC approval	Yes		

7.2.3 Chopper module

	6EP4548-7XB00-3AX0
CE marking	Yes, (2014/30/EU and 2011/65/EU)
CB certificate	Yes
CB scheme	IEC 62368-1
UL/cUL approval	cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259
cCSAus approval	Yes, CSA C22.2 No. 62368-1, UL 62368-1
Marine approval	Available soon
UKCA marking	Yes
RCM approval	Yes
EAC approval	Yes

7.2.4 Buffer modules

	6EP4231-7HB00-0AX0	6EP1961-3BA01	6EP4231-7HC00-0AX0
CE marking	Yes, (2014/30/EU and 2011/65/EU)		Yes, (2014/30/EU, 2011/65/EU and 2014/34/EU)
CB certificate	Yes		
CB scheme	IEC 62368-1		
UL/cUL approval	cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259		
cCSAus approval	Yes, CSA C22.2 No. 62368-1		
Explosion protection	-	-	Yes
ATEX approval	-	-	II 3G Ex ec IIC T4 Gc (EPS 21 ATEX 1 194 X)
IECEx approval	-	-	Yes (IECEx EPS 21.0059X)
cULus HazLoc approval	-	-	cULus HazLoc Class I, Div 2, Group A,B,C,D T4
CCC HazLoc approval	-	-	Ex ec IIC T4 Gc (2023322303005007)
UKCA HazLoc approval	-	-	Yes
Marine approvals	DNV, ABS	DNV, ABS	DNV, ABS
UKCA marking	Yes		
RCM approval	Yes		
EAC approval	Yes		

7.2.5 Power boost module

	6EP4240-7HB00-0AX0
CE marking	Yes, (2014/30/EU and 2011/65/EU)
CB certificate	Yes
CB scheme	IEC 62368-1
UL/cUL approval	cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259
cCSAus approval	Yes, CSA C22.2 No. 62368-1, UL 62368-1
Marine approval	Available soon
UKCA marking	Yes
RCM approval	Yes
EAC approval	Yes

7.2.6 Inrush current limiter

	6EP4683-6LB00-0AY0 6EP1967-2AA00
CE marking	Yes, (2014/35/EU, 2014/30/EU and 2011/65/EU)
UL/cUL approval	cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259
UKCA marking	Yes
EAC approval	Yes

7.3 EMC

7.3.1 SITOP RED1200

		6EP4346-7RB00-0AX0 6EP4347-7RB00-0AX0 6EP4348-7RB00-0AX0 6EP4347-7RC00-0AX0
Electrostatic discharge	EN 61000-4-2	8 kV contact, 8 kV air
High-speed transient disturbance variables (burst)	EN 61000-4-4	2 kV at DC input 2 kV at DC output
Surge voltages	EN 61000-4-5	0.5 kV asymmetrical on DC output cables
Generic standards	EN 61000-6-2	Interference immunity for industrial environments (only for tests applicable for the device)

7.3.2 PSE202U

		6EP1961-3BA21	6EP1962-2BA00 6EP1964-2BA00
Electrostatic discharge	EN 61000-4-2	4 kV contact	6 kV contact, 8 kV air
Electromagnetic fields	EN 61000-4-3	30 - 2000 MHz 3 V/m	80 - 6000 MHz 10 V/m, 1000 - 2700 MHz 10 V/m
High-speed transient disturbance variables (burst)	EN 61000-4-4	1 kV at the DC output 1 kV on the signal cable	2 kV at the DC input 2 kV at the DC output 2 kV on the signal cable
Surge voltages	EN 61000-4-5	1 kV at the DC output 1 kV on the signal cable	
High-frequency fields	EN 61000-4-6	3 V; 0.15 - 80 MHz	10 V; 0.15 - 80 MHz
Magnetic fields	EN 61000-4-8	30 A/m; 50 Hz	30 A/m; 50 Hz
Emitted interference	EN 55032	Class B	-
Generic standards	EN 61000-6-2	-	Noise immunity for industrial environments
	EN 61000-6-3	-	Interference emission for residential areas

7.3 EMC

7.3.3 SITOP CHO1400

6EP4548-7XB00-3AX0		
Electrostatic discharge	EN 61000-4-2	8 kV contact, 8 kV air
Electromagnetic fields	EN 61000-4-3	80 - 6000 MHz 10 V/m, 1000 - 2700 MHz 10 V/m
High-speed transient disturbance variables (burst)	EN 61000-4-4	2 kV DC terminal
Surge voltages	EN 61000-4-5	0.5 kV on DC terminal 1 kV on signal line
High-frequency fields	EN 61000-4-6	10 V; 0.15 - 80 MHz
Generic standards	EN 61000-6-2	Immunity for industrial environments
	EN 61000-6-3	Interference emission for residential areas

7.3.4 Buffer modules

		6EP4231-7HB00-0AX0 6EP4231-7HC00-0AX0	6EP1961-3BA01
Electrostatic discharge	EN 61000-4-2	8 kV contact, 8 kV air	
Electromagnetic fields	EN 61000-4-3	80 - 1000 MHz 10 V/m, 900 MHz $\pm$ 5 MHz 10 V/m	80 - 1000 MHz 50 V/m, 900 MHz $\pm$ 5 MHz 10 V/m
High-speed transient disturbance variables (burst)	EN 61000-4-4	2 kV at DC output	Tested with power supply 6EP1436-3BA00: 4 kV at upstream power supply 2 kV at DC output
Surge voltages	EN 61000-4-5	0.5 kV symmetrical/asymmetrical on DC output cables	Tested with power supply 6EP1436-3BA00: 3 kV symmetrical at the power supply input 3 kV asymmetrical at the power supply input 0.5 kV symmetrical/asymmetrical on DC output cables/conductors
High-frequency fields	EN 61000-4-6	10 V; 0.15 - 80 MHz	
Generic standards	EN 61000-6-2	Noise immunity for industrial environments	

7.3.5 SITOP PBM1200

6EP4240-7HB00-0AX0		
Electrostatic discharge	EN 61000-4-2	8 kV contact, 8 kV air
High-speed transient disturbance variables (burst)	EN 61000-4-4	2 kV DC terminal
Surge voltages	EN 61000-4-5	0.5 kV asymmetrical on DC output cables
Generic standards	EN 61000-6-2	Interference immunity for industrial environments (only for tests applicable for the device)

7.3.6 Inrush current limiter

		6EP4683-6LB00-0AY0	6EP1967-2AA00
Electrostatic discharge	EN 61000-4-2	8 kV contact, 8 kV air	
Electromagnetic fields	EN 61000-4-3	80 - 1000 MHz 10 V/m, 1400 - 2000 MHz 3 V/m, 2000 - 2700 MHz 1 V/m, 900 MHz ± 5 MHz and 1.89 GHz 10 V/m	80 - 1000 MHz 20 V/m, 1400 - 2000 MHz 3 V/m, 2000 - 2700 MHz 1 V/m, 900 MHz ± 5 MHz 10 V/m
High-speed transient disturbance variables (burst)	EN 61000-4-4	2 kV at input/output	4 kV at input/output
Surge voltages	EN 61000-4-5	1 kV symmetrical at input/output	3 kV symmetrical at input/output
High-frequency fields	EN 61000-4-6	10 V; 0.15 - 80 MHz	
Magnetic fields	EN 61000-4-8	-	30 A/m; 50 Hz
Line harmonics limit	EN 61000-3-2	Class A	
Generic standards	EN 61000-6-2	Noise immunity for industrial environments	
	EN 61000-6-3	Interference emission for residential areas	

Ambient conditions

	6EP4346-7RB00-0AX0 6EP4347-7RB00-0AX0 6EP4348-7RB00-0AX0 6EP4347-7RC00-0AX0 6EP4231-7HB00-0AX0 6EP4231-7HC00-0AX0 6EP1961-3BA01 6EP4548-7XB00-3AX0 6EP4240-7HB00-0AX0	6EP1961-3BA21 6EP1967-2AA00	6EP4683-6LB00-0AY0	6EP1962-2BA00 6EP1964-2BA00
Ambient temperature	-40 ... 70 °C for natural convection (self con- vection) Tested according to: • EN 60068-2-1 Cold • EN 60068-2-2 Dry heat • EN 60068-2-78 Humid heat, constant • EN 60068-2-14 Temperature change	-25 ... 60 °C for natural convection (self con- vection)	-40 ... 70 °C for natural convection (self con- vection)	-20 ... 70 °C for natural convection (self con- vection)
Transport and storage temperature	-40 ... 85 °C Tests (packed for shipping) according to: • EN 60068-2-1 Cold • EN 60068-2-2 Dry heat • EN 60068-2-30 Humid heat, cyclic			
Humidity class	Climatic class 3K3 according to EN 60721, 5 - 95 % no condensation			
Degree of pollution	2			
Mechanical stressing in operation	• Tested according to EN 60068-2-6 vibration, test Fc: 3.5 mm deflection in the range 5 - 8.4 Hz 2 g acceleration in the range 8.4 - 150 Hz 3.5 mm deflection in the range 5 - 8.4 Hz 1.3 g acceleration in the range 8.4 - 50 Hz • Tested according to EN 60068-2-27 shock, test Ea: acceleration 150 m/s², test duration 11 ms			

	6EP4346-7RB00-0AX0 6EP4347-7RB00-0AX0 6EP4348-7RB00-0AX0 6EP4347-7RC00-0AX0 6EP4231-7HB00-0AX0 6EP4231-7HC00-0AX0 6EP1961-3BA01 6EP4548-7XB00-3AX0 6EP4240-7HB00-0AX0	6EP1961-3BA21 6EP1967-2AA00	6EP4683-6LB00-0AY0 6EP1962-2BA00 6EP1964-2BA00
Damaging gases	Tested according to: • EN 60068-2-42 sulfur dioxide • EN 60068-2-43 hydrogen sulfide		
Atmospheric pressure	Operation: • 1080 - 795 hPa ($\leq$ 2000 m) • For operation at altitudes of 2000 m up to 6000 m above sea level: output must be derated by -7.5% / 1000 m or the ambient temperature must be reduced by 5 K / 1000 m see Figure 4-7 Altitude derating (Page 70) • Overvoltage category: II up to 2000 m (EN 61204-7) I from 2000 m up to 6000 m (EN 61204-7) Storage: • 1080 - 660 hPa ($\leq$ 3500 m)		

Applications

9.1 Redundancy circuit for increased system availability

SITOP PSE202U redundancy modules provide additional protection against the failure of 24 V supplies. By decoupling two power supplies through a redundancy module, a power supply that fails does not influence the 24 V supply. The redundancy module continuously monitors the feeding power supplies, and when one device fails, the other one automatically takes over the complete load circuit supply. In addition, a signal contact sends a signal, which can be evaluated by a controller, a PC or a control system.

Note

To implement 100% redundancy, the supply via the primary side of the power supply must also be redundantly implemented; this means that each power supply must be separately protected using a fuse or a miniature circuit breaker.

When using 1-phase power supplies, the supply should be implemented using different phases, e.g. if a three-phase line supply is available.

Redundancy of two power supplies with maximum rated output currents of 5 A

Two power supplies with maximum rated output currents of 5 A can be decoupled through a SITOP PSE202U 10 A redundancy module (6EP1964-2BA00). To do this, outputs "+" of the power supplies are connected to inputs "IN 24 V-1" and "IN 24 V-2" of the redundancy module, output "OUT 24 V" of the redundancy module is connected to the load circuit.

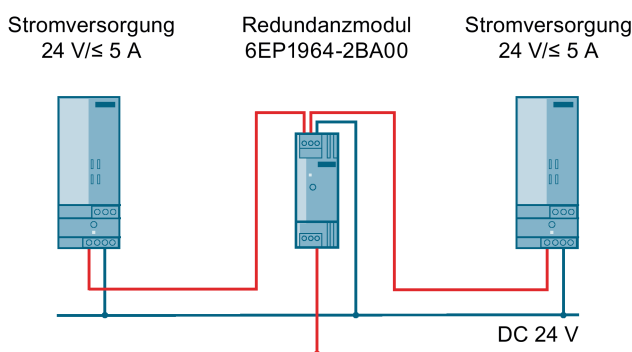


Figure 9-1 Redundancy of two power supplies with maximum rated output currents of 5 A

Redundancy of two power supplies with maximum rated output currents of 10 A

Two power supplies with maximum rated output currents of 10 A can be decoupled through two SITOP PSE202U 10 A redundancy modules (6EP1964-2BA00). To do this, output "+" of each power supply is connected to both inputs of a redundancy module ("IN 24 V-1" and "IN 24 V-2" jumpered); outputs "OUT 24 V" of the two redundancy modules must be connected in parallel through an external connection (terminal) and connected to the load circuit.

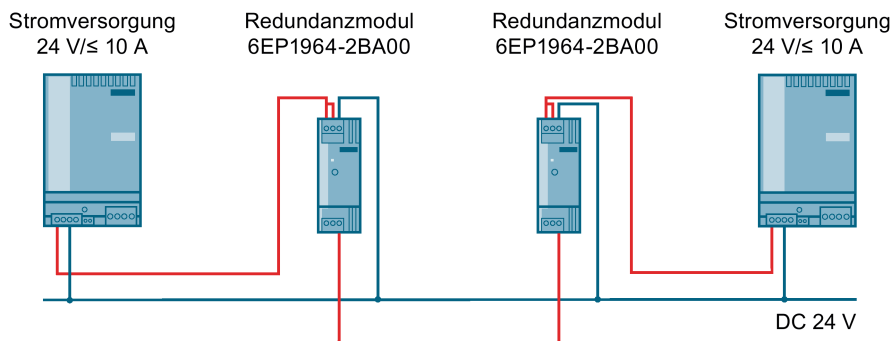


Figure 9-2 Redundancy of two power supplies with maximum rated output currents of 10 A

Redundancy of two power supplies with maximum rated output currents of 20 A

Two power supplies with maximum rated output currents of 20 A can be decoupled through a SITOP PSE202U 40 A redundancy module (6EP1961-3BA21). To do this, outputs "+" of the power supplies are connected to inputs "IN 24 V-1" and "IN 24 V-2" of the redundancy module, output "OUT 24 V" of the redundancy module is connected to the load circuit.

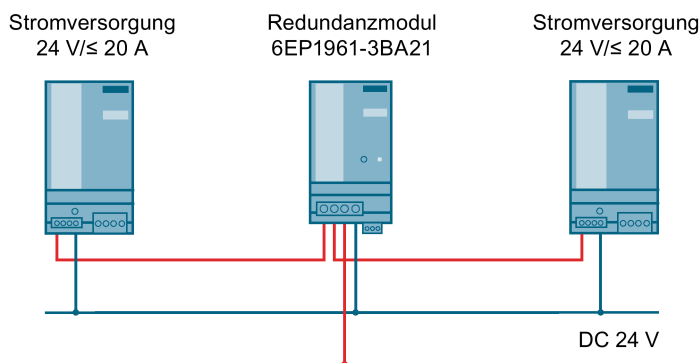


Figure 9-3 Redundancy of two power supplies with maximum rated output currents of 20 A

Redundancy of two power supplies with maximum rated output currents of 40 A

Two power supplies with maximum rated output currents of 40 A can be decoupled through two SITOP PSE202U 40 A redundancy modules (6EP1961-3BA21). To do this, output "+" of each power supply is connected to both inputs of a redundancy module ("IN 24 V-1" and "IN 24 V-2" jumpered); outputs "OUT 24 V" of the two redundancy modules must be connected in parallel through an external connection (terminal) and connected to the load circuit.

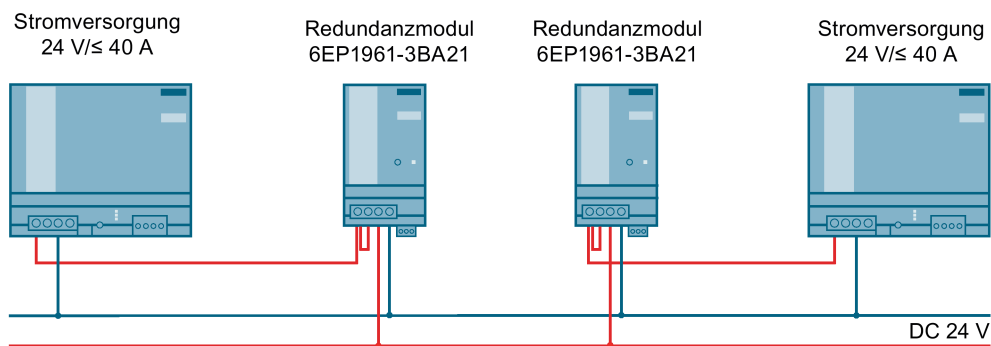


Figure 9-4 Redundancy of two power supplies with maximum rated output currents of 40 A

9.2 Design of 24 V load feeders with power limiting according to NEC class2

A 24 V power supply with power limiting according to NEC class2 can be implemented using a SITOP PSE202U Class2 redundancy module (6EP1962-2BA00). To do this, output "+" of the power supply is connected to both inputs of a redundancy module ("IN 24 V-1" and "IN 24 V-2" jumpered); the output power of the load circuit at output "OUT 24 V" of the redundancy module is limited to 100 VA. Several load circuits connected in parallel, whose output power is limited, can be implemented with several redundancy modules.

Stromversorgung < 100 W

Redundanzmodule 6EP1962-2BA00

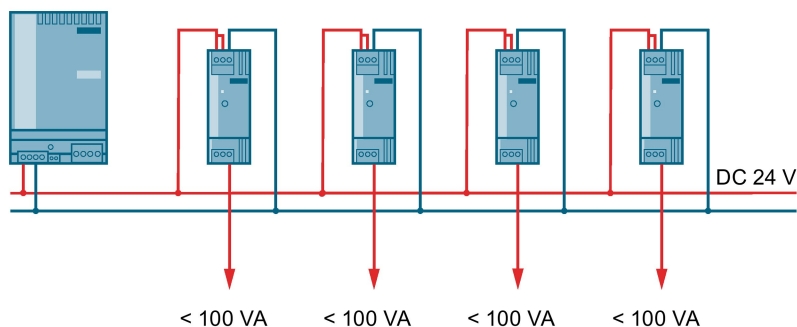


Figure 9-5 Design of 24 V load feeders with power limiting according to NEC class2

Note

The feeding SITOP power supply must be certified according to UL60950-1.

9.3 Protection against short-time voltage dips

For a drop in the line-side supply voltage, the 24 V power supply still maintains the output voltage for a short time in the millisecond range (see Chapter Technical data (Page 99)).

For line supplies that manifest frequent brief voltage dips, in order to increase the power supply reliability, it may make sense to increase the line buffering time in the device by using an additional SITOP buffer module.

The SITOP buffer module is simply connected in parallel to the power supply output using two conductors.

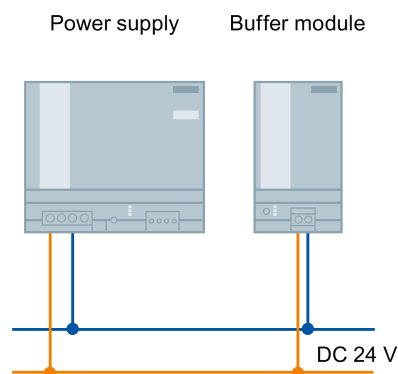


Figure 9-6 Buffering brief power failures using the SITOP PSE201U buffer module

As energy storage device, it uses maintenance-free capacitors and automatically supplies 24 V if the line voltage fails. The load is buffered without any interruption. Several buffer modules can be connected in parallel to extend the buffer time.

You can find additional information at:

Manual SITOP Expansion Modules

(<https://support.industry.siemens.com/cs/ww/en/view/109768676>)

Environment

The devices are in conformance with RoHS.

Only substances in conformance with PWIS are used (paint-wetting impairment substances).

Disposal guidelines



Packaging and packaging aids can and should always be recycled. The product itself may not be disposed of as domestic refuse.

Service & Support

Service & Support Portal

On the main support page, you can find a wealth of useful information about the range of services we offer, documents, downloads and much more:
Industry Online Support (<https://support.industry.siemens.com>)

Technical support

You can access technical support through the following communication channels:

- Internet:
Web form for support request (<http://www.siemens.com/SupportRequest>)
- Smartphone:
Siemens Industry Online Support App
(<https://support.industry.siemens.com/cs/ww/en/sc/2067>)

Technical documentation on the Internet

Operating instructions and manuals for SITOP are available in the Internet:
Operating instructions/manuals (<https://www.siemens.com/sitop-manuals>)

SITOP power supply homepage

Current information about our power supplies is available in the Internet at the SITOP home page:
SITOP (<http://www.siemens.com/sitop>)

Texts for invitation to tender

You can find invitation to tender texts for SITOP power supplies here:
Link to the portal (<http://www.siemens.de/ausschreibungstexte>)

CAX data

You can find 2D-/3D data, devices circuit diagrams according to IEC and ANSI as well as EPLAN macros as download in the Internet:
Siemens image database (<http://www.siemens.com/sitop-cax>)
Request all CAX data via the CAX download manager:
CAX shopping cart (<http://www.siemens.com/cax>)

TIA Selection Tool

Simply and quickly select the optimum power supply, add-on modules and DC-UPS:
TIA Selection Tool cloud (<http://www.siemens.com/tst-powersupply>)

In addition, the 24 V load view in the TIA Selection Tool allows you to simply select the power supply for your particular project as the current demand of the automation products being supplied is automatically calculated.
Download the TIA Selection Tool (<http://www.siemens.de/tia-selection-tool-standalone>)

Online catalog and ordering system

The online catalog and the online ordering system are available through the Industry Mall homepage:

Industry Mall (<http://www.siemens.com/industrymall/de>)

Contact persons

If you have any questions regarding the use of our products, then contact the Siemens contact person in your regional Siemens sales office.

You can find these addresses as follows:

- Internet (<http://www.automation.siemens.com/partner>)
- Industry Mall (<http://www.siemens.com/industrymall/de>)