SIEMENS

SITOP power supply

SITOP modular 1ph/2ph

Equipment Manual

Overview

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2 Description, device design, dimension drawing

3 Mounting/removal

4 Mounting position, mounting clearances

5 Installation

6 Technical data

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8 Ambient conditions

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SITOP PSU200M 24 V/5 A
6EP1333-3BA10
SITOP PSU200M 24 V/10 A
6EP1334-3BA10
SITOP modular 24 V/20 A
6EP1336-3BA00
SITOP PSU100M 24 V/40 A
6EP1337-3BA00

04.2025
A5E52984737-5-76

Legal information

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.

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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.

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Overview



The 1-phase/2-phase power supply from the SITOP modular product line is a powerful, stabilized technology power supply for automated machines and systems.

The key benefits of the product include:

- Wide-range input, which allows it to be connected to almost any 1-phase/2-phase line supply around the world
- Output voltage can be adjusted in the range 24 - 28 V, for 6EP1336-3BA00 and 6EP1337-3BA00 up to 28.8 V
- Power boost during operation with 300% rated current for 25 ms
- No lateral mounting clearances are required
- Ambient temperature -25 ... 70 °C, for 6EP1336-3BA00 and 6EP1337-3BA00 0 ... 70 °C
- Selectable short-circuit response (constant current or latching shutdown)
- A soft characteristic can be selected for a parallel connection (for uniform load distribution of power supply units of the same type)
- Display of the operating state via 3 LEDs
- To increase the system availability, these reliable power supplies can be expanded using SITOP supplementary modules (redundancy module, selectivity module, buffer module, signaling module or signaling contact), as well as SITOP DC-UPS modules.

Ordering data

The following device options are available:

Controlled SITOP modular power supply 1ph/2ph	
Type	**Article number**
120-230/230-500 VAC input, 24 V/5 A output	6EP1333-3BA10
120-230/230-500 VAC input, 24 V/10 A output	6EP1334-3BA10
120/230 VAC input, 24 V/20 A output	6EP1336-3BA00
120/230 VAC input, 24 V /40 A output	6EP1337-3BA00

Validity

This manual provides information on the following products:

- SITOP PSU200M 24 V/5 A
  Article No.: 6EP1333-3BA10
  Product state: 4
  Changes with respect to the previous version (PS 3):
  – All approvals for explosion protection are no longer applicable
- SITOP PSU200M 24 V/10 A
  Article No.: 6EP1334-3BA10
  Product state: 4
  Changes with respect to the previous version (PS 3):
  – All approvals for explosion protection are no longer applicable
- SITOP modular 24 V/20 A
  Article No.: 6EP1336-3BA00
  Product state: 3
  Changes with respect to the previous version (PS 2):
  – All approvals for explosion protection are no longer applicable
- SITOP PSU100M 24 V/40 A
  Article No.: 6EP1337-3BA00
  Product state: 3
  Changes with respect to the previous version (PS 2):
  – All approvals for explosion protection are no longer applicable

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Safety instructions

1

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.

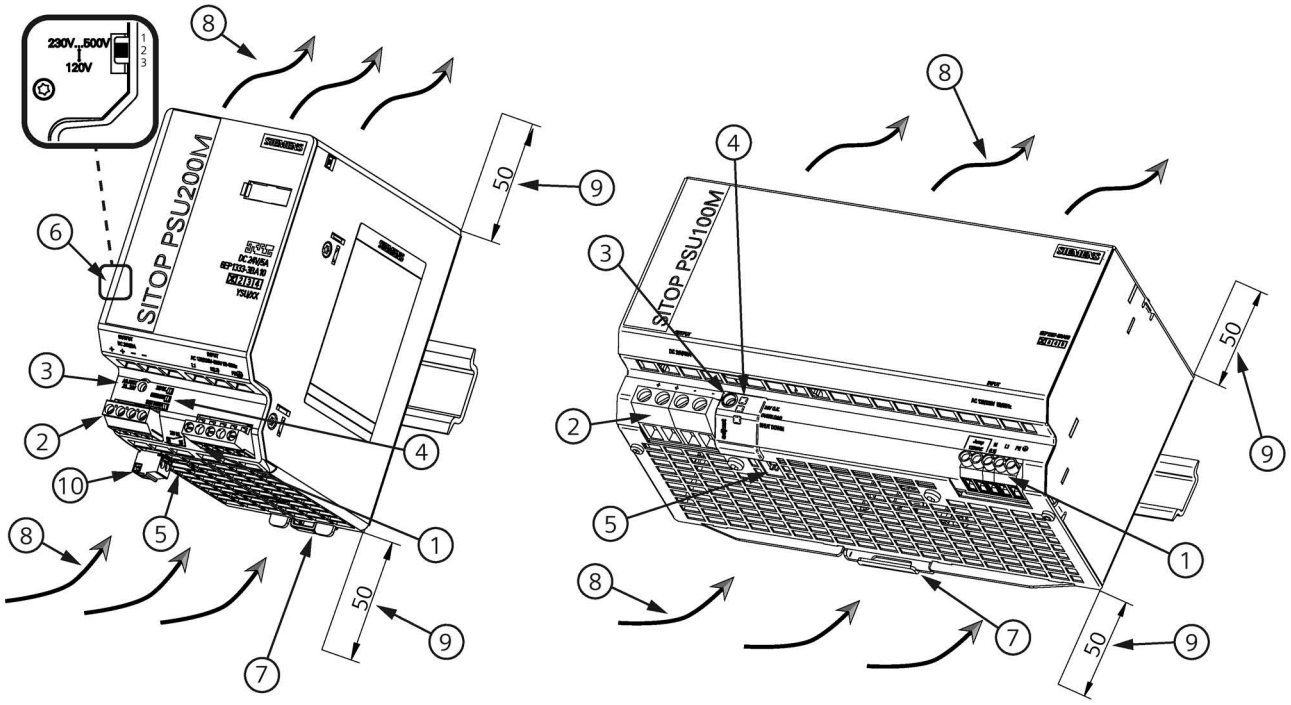
If this instruction is not observed, touching live parts can result in death or serious injury.

Description, device design, dimension drawing

2

2.1 Device description

SITOP modular is a primary-clocked power supply for connection to a 1-phase/2-phase AC line supply. An electronically regulated DC voltage that can be set via a potentiometer is available at the output of the device. The output of the device is isolated, no-load proof and short-circuit proof. The LED displays indicate the operating state. The integrated signaling contact (for 6EP1336-3BA00 and 6EP1337-3BA00 only when using the supplementary signaling module 6EP1961-3BA10) can be used to further process the operating state of the device.



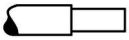
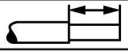
① Line input
② DC output
③ Potentiometer 24 - 28 V, for 6EP1336-3BA00 and 6EP1337-3BA00 up to 28.8 V
④ Pilot lamps (24 V OK, OVERLOAD, SHUTDOWN)
⑤ A/B selector switch
⑥ Voltage selector switch (only for 6EP1333-3BA10 and 6EP1334-3BA10)
⑦ DIN-rail slider
⑧ Natural convection
⑨ Clearance above/below
⑩ Signaling contact (only for 6EP1333-3BA10 and 6EP1334-3BA10)

Figure 2-1 Design (example 6EP1334-3BA10 and 6EP1337-3BA00)

2.2 Connections and terminal designation

The line input terminals ① can be used to establish the connection to the supply voltage. The output terminals ② are used to connect to the loads to be supplied (see also Section Installation (Page 33)).

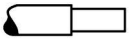
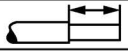
Connections and terminal designations for 6EP1333-3BA10 and 6EP1334-3BA10	
① Line input L1, N (L2), PE	One screw terminal each
② Output "+", "-"	2 screw terminals each
⑩ Signaling contact 13, 14	One screw terminal each

	① + ②	⑩	③
	0,6 x 3,5 / PZ1 / PH1	0,4 x 2,5	0,4 x 2
	1 x 0,5 - 2,5 mm²	1 x 0,2 - 1,5 mm²	-
	1 x 0,5 - 2,5 mm²	1 x 0,2 - 1,5 mm²	-
	1 x 0,25 - 2,5 mm²	1 x 0,25 - 1,5 mm²	-
AWG	28 - 12	28 - 16	-
Nm	0,5 Nm	0,22 Nm	0,04 Nm *1)
	8 mm	7 mm	-

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

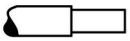
Figure 2-2 Terminal data for 6EP1333-3BA10 and 6EP1334-3BA10

Connections and terminal designations for 6EP1336-3BA00 and 6EP1337-3BA00	
① Line input L1, N (L2), PE, Jump 120 V AC	One screw terminal each
② Output "+", "-"	2 screw terminals each

	① + ②	③
	0,6 x 3,5 / PZ1 / PH1	0,6 x 3 / PZ1 / PH1 max. Ø 3,5 mm
	1 x 0,2 - 6 mm²	-
	1 x 0,2 - 4 mm²	-
	1 x 0,25 - 4 mm²	-
AWG	24 - 10	-
Nm	0,5 - 0,6 Nm	0,04 Nm *1)
	8 mm	-

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

Figure 2-3 Terminal data for 6EP1336-3BA00

	①	②	③
	0,6 x 3,5 / PZ1 / PH1	10 x 5,5 / PZ2 / PH2	0,6 x 3 / PZ1 / PH1 max. ∅ 3,5 mm
	1 x 0,2 - 6 mm^2	1 x 0,5 - 16 mm^2	-
	1 x 0,2 - 4 mm^2	1 x 0,5 - 10 mm^2	-
	1 x 0,25 - 4 mm^2	1 x 2,5 - 10 mm^2	-
AWG	24 - 10	22 - 8	-
Nm	0,5 - 0,6 Nm	1,2 Nm	0,04 Nm *1)
	8 mm	12 mm	-

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

Figure 2-4 Terminal data for 6EP1337-3BA00

2.3 Potentiometer

The potentiometer ③ on the front of the device is used to set the output voltage. The output voltage is set to 24 V in the factory, and can be adjusted in the range 24 - 28 (28.8) V; for example, to compensate voltage drops across long supply lines to the connected load.

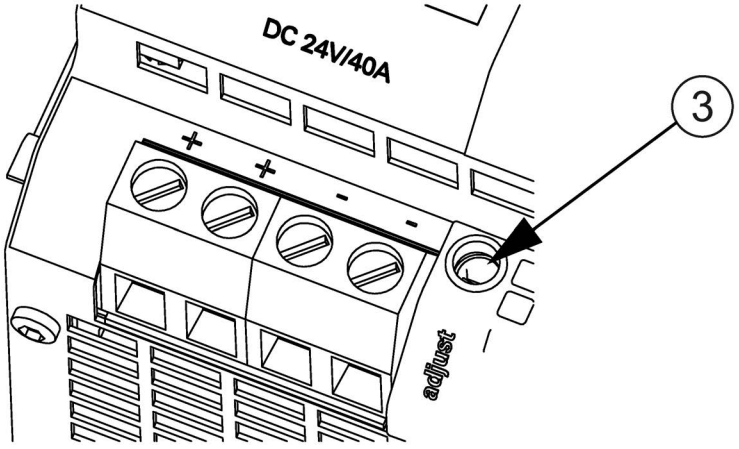


Figure 2-5 Potentiometer (example of 6EP1337-3BA00)

NOTICE
Thermal overload possible When adjusting the output voltage to > 24 V, the output current must be derated by 4 %/V, or the permissible ambient temperature must be taken into account with 3 °C/V.

Note

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

For notes on actuating the potentiometer (screwdriver, torque), see Figure 2-2 Terminal data for 6EP1333-3BA10 and 6EP1334-3BA10 (Page 10), Figure 2-3 Terminal data for 6EP1336-3BA00 (Page 10) and Figure 2-4 Terminal data for 6EP1337-3BA00 (Page 11).

2.4 Status displays and signaling

	6EP1333-3BA10 (24 V/5 A) **6EP1334-3BA10 (24 V/10 A)**	**6EP1336-3BA00 (24 V/20 A)** **6EP1337-3BA00 (24 V/40 A)**
Operating display	Green LED for 24 V O.K. Yellow LED for overload in "constant current" mode Red LED for latching shutdown in "shut down" mode	
Signaling contact 13, 14 ⑩	Relay contact (NO contact, contact rating (SELV (ES1) must be complied with) 30 V DC/0.1 A) for 24 V O.K	Remote switch off when using the signaling module (6EP1961-3BA10)

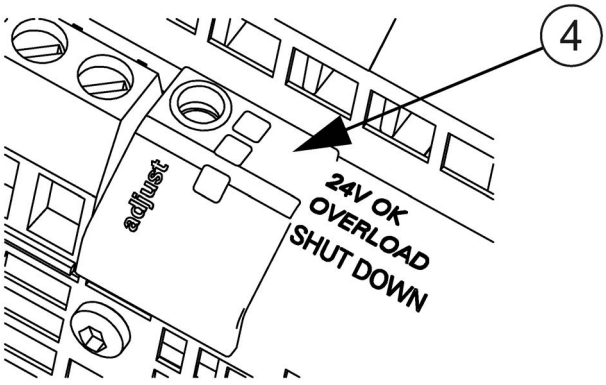


Figure 2-6 Status indicators and signals (example of 6EP1337-3BA00)

Signaling	**6EP1333-3BA10 (24 V/5 A)** **6EP1334-3BA10 (24 V/10 A)** **6EP1336-3BA00 (24 V/20 A)** **6EP1337-3BA00 (24 V/40 A)**
Green LED ④ lights up	Normal operation, output voltage > 20 V ±0.5 V
Yellow LED ④ lights up	Overload (U_{out} < 20 V ± 0.5 V)
Red LED ④ lights up	Latching shutdown or remote switch-off for 6EP1336-3BA00 and 6EP1337-3BA00 (only when the supplementary signaling module 6EP1961-3BA10 is used)
Green LED ④ off	No supply voltage

2.5 Change-over switch

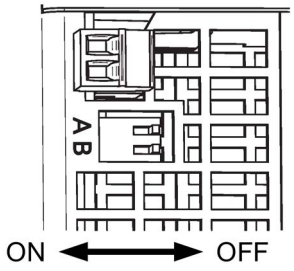


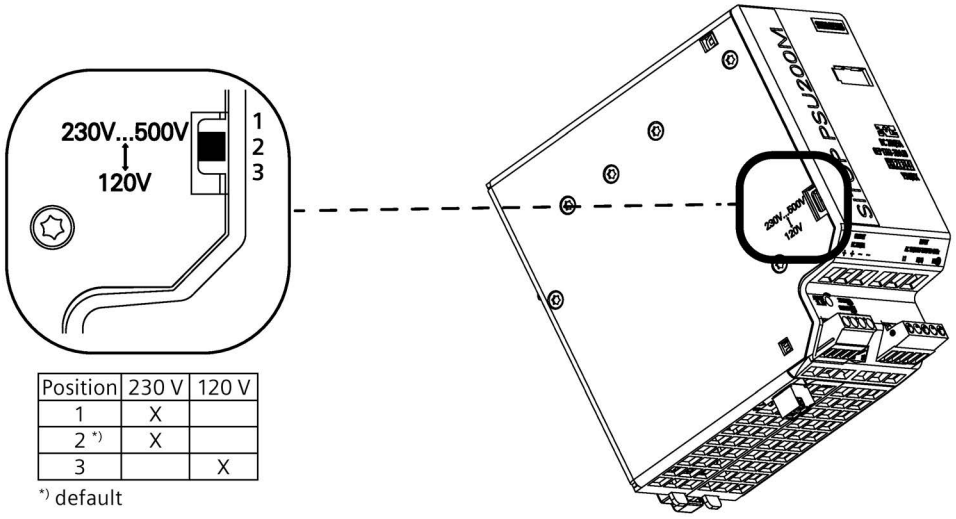
Figure 2-7 A/B selector switch

The two switches A and B are used to influence the output characteristic:

Switch	ON	OFF
A influences the output characteristic in the load range	**Parallel operation:** 'Soft' characteristic curve (see, e.g. Figure 6-10 6EP1333-3BA10 parallel operation output characteristic (Page 43)) for the parallel operation of two or more devices: The output voltage falls with increasing output current (namely, also for the overcurrent pulse!). This means that for full output current the highest output voltage can normally no longer be attained.	**Single operation:** *Delivery state* 'Hard' characteristic curve (see, e.g. Figure 6-3 6EP1333-3BA10 single operation output characteristic (Page 40)) for normal operation (single operation): The output voltage is independent of the output current.
B influences the output characteristic in the overload range	**Latching shutdown:** If the output current rises above the rated value and above the current limit, the device reduces the output voltage (see, e.g. Figure 6-14 6EP1333-3BA10 latching shutdown output characteristic (Page 44)). If the output voltage falls below 20 V, the device shuts down latching, the red LED lights up. This limit voltage of 20 V is independent of the set output voltage. The 'Short-time overload current' feature is not available in this operating mode. To also permit charging of large capacitances in this operating mode at the output, a shutdown is performed during the first 10 s after power on or remote switch on in conjunction with the non-latching signaling module. During these first 10 s, the device responds for overload as if the switch is OFF.	**Constant current:** *Delivery state* If the output current rises above the rated value and above the current limit, the device reduces the output voltage. The yellow LED lights up if the output voltage falls below 20 V.

Conditioned when delivered: A - OFF; B - OFF

Selector switch for the input voltage range for 6EP1333-3BA10 (24 V/5 A) and 6EP1334-3BA10 (24 V/10 A)



Position	230 V	120 V
1	X	
2 *)	X	
3		X

*) default

Figure 2-8 Voltage selector switch (example, 6EP1334-3BA10)

The input voltage range can be set between 230 V and 120 V using the voltage range selector switch located on the side of the device. Switch positions 1 and 2 are for 230 V and switch position 3 is for 120 V. When delivered, the selector switch is in position 2 (230 V). It must be moved to the appropriate position (3) for operation in the 120 V range. The selector switch can only be actuated in the de-energized state.

To switch the input voltage range for 6EP1336-3BA00 (24 V/20 A) and 6EP1337-3BA00 (24 V/40 A) to 120 V, a wire jumper must be connected to the input terminal, Jump 120 V AC. This must be dimensioned as for the power supply cable with regard to cross-section and insulation. The length must not exceed 100 mm.

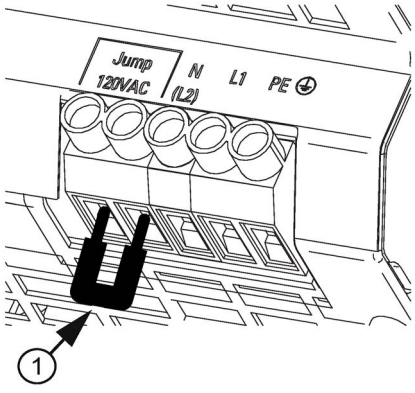


Figure 2-9 Wire jumper (example, 6EP1337-3BA00)

2.6 Block diagram

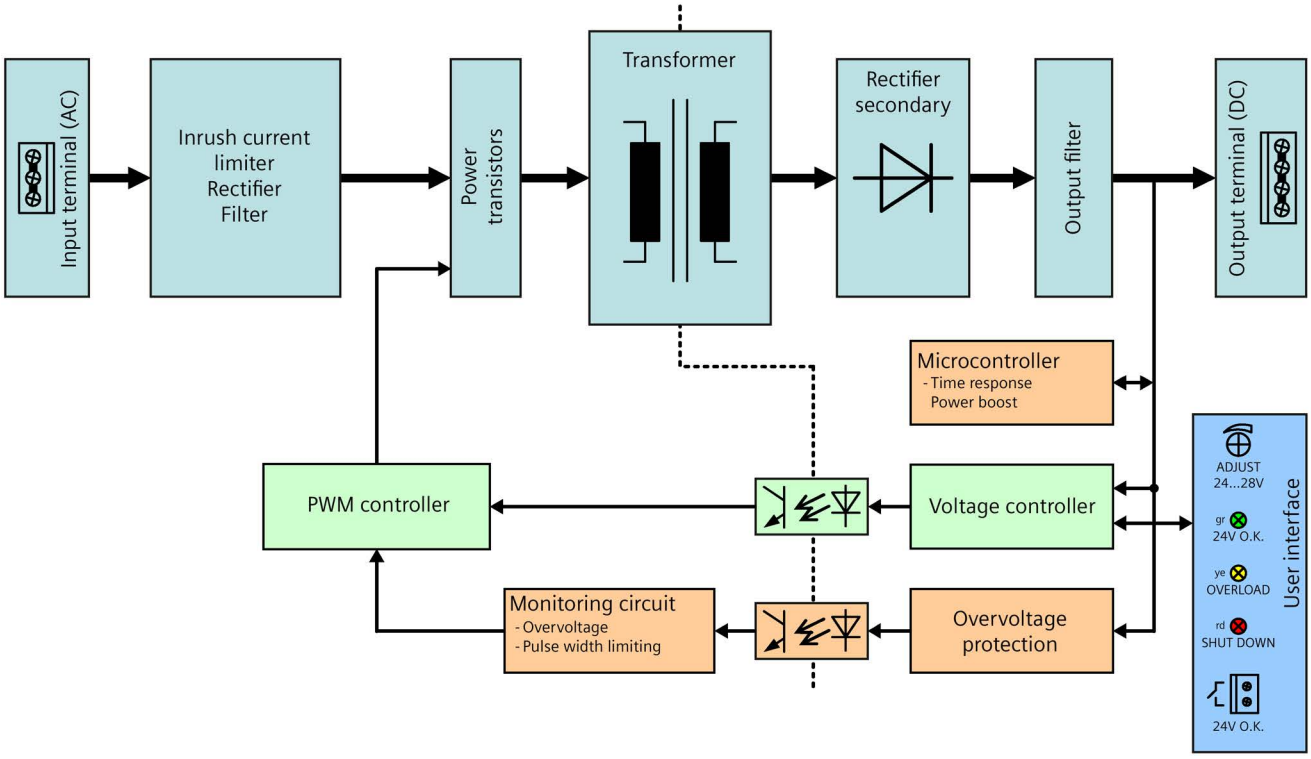


Figure 2-10 Block diagram for 6EP1333-3BA10 and 6EP1334-3BA10

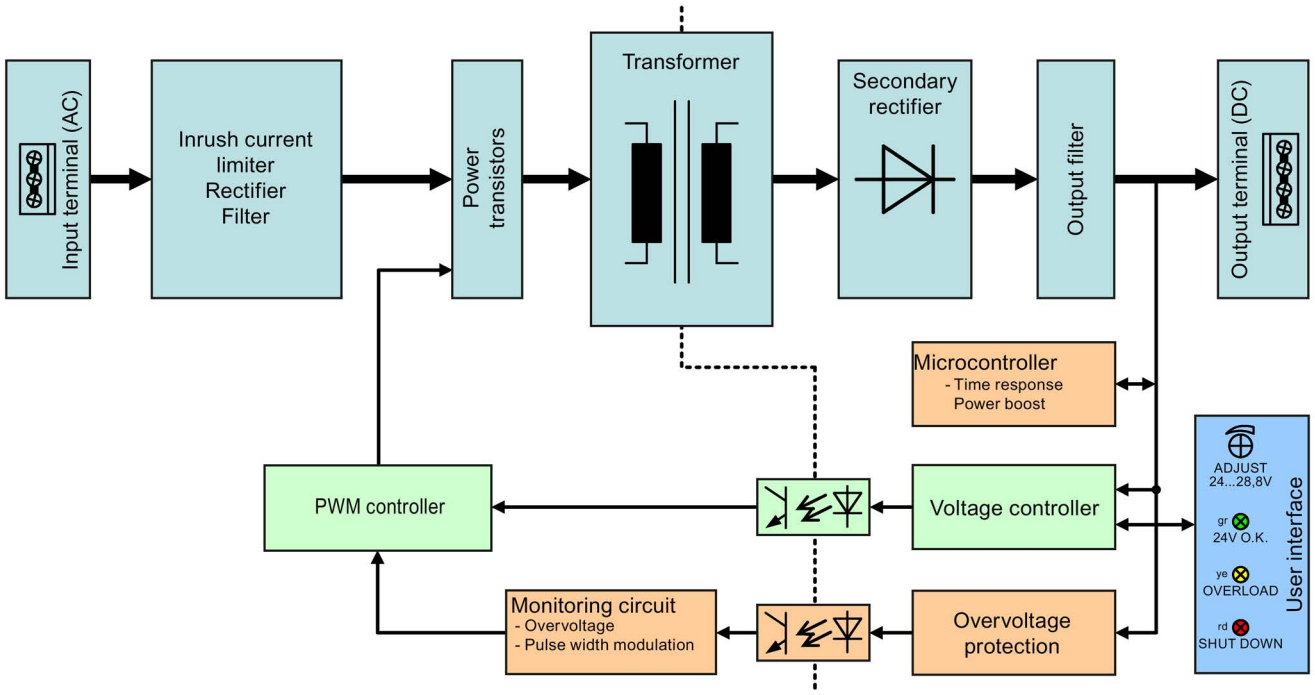


Figure 2-11 Block diagram for 6EP1336-3BA00 and 6EP1337-3BA00

2.7 Dimensions and weight

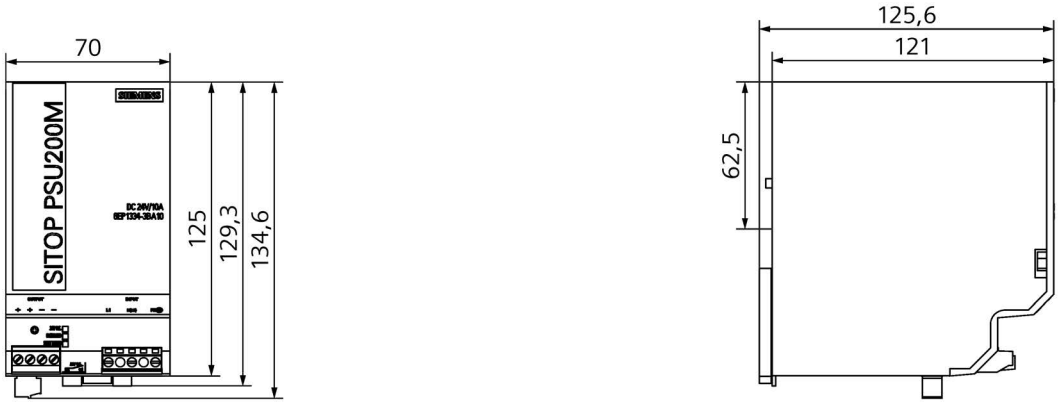


Figure 2-12 Dimension drawing 6EP1333-3BA10 and 6EP1334-3BA10 (example 6EP1334-3BA10)

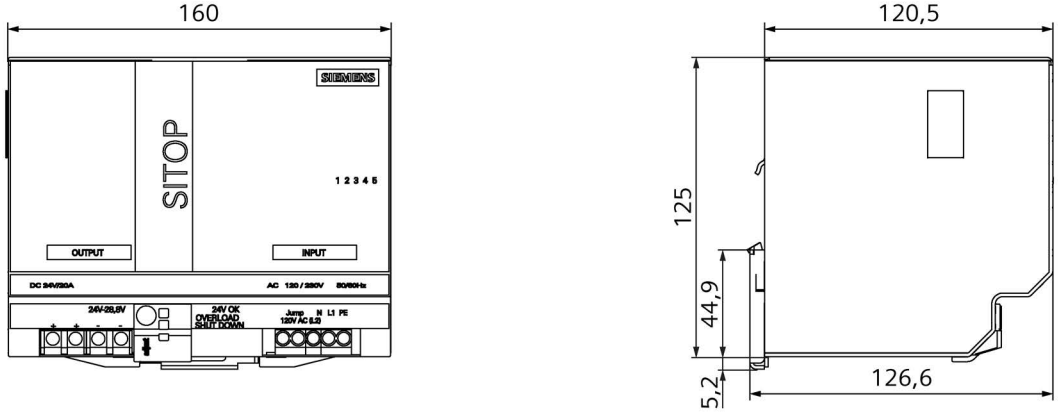


Figure 2-13 Dimension drawing 6EP1336-3BA00

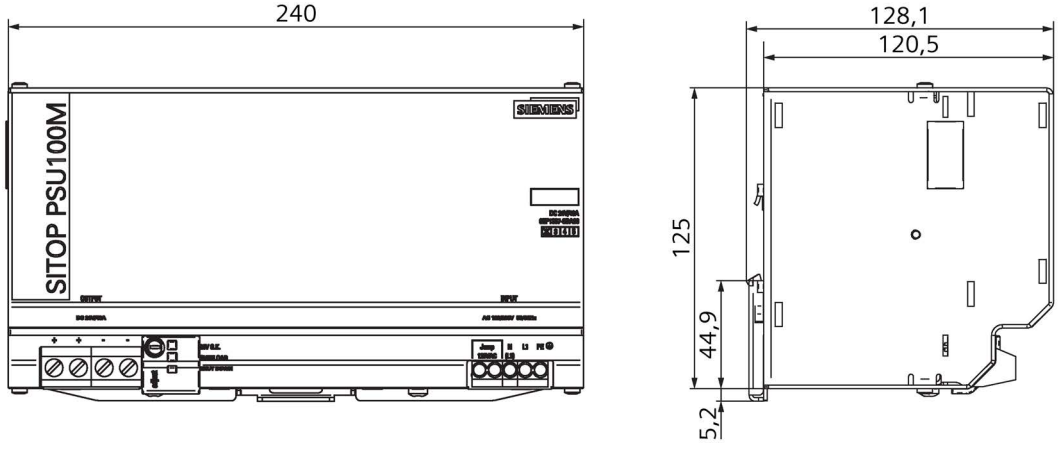


Figure 2-14 Dimension drawing 6EP1337-3BA00

	6EP1333-3BA10 (24 V/5 A)	**6EP1334-3BA10 (24 V/10 A)**	**6EP1336-3BA00 (24 V/20 A)**	**6EP1337-3BA00 (24 V/40 A)**
Dimensions (W × H × D) in mm	70 × 125 × 121	70 × 125 × 121	160 × 125 × 120.5	240 × 125 × 120.5
Weight	Approx. 0.6 kg	Approx. 0.8 kg	Approx. 2.2 kg	Approx. 2.9 kg

Mounting/removal

3

⚠ WARNING

Installing the device in a housing or a control cabinet

The SITOP modular power supply is a built-in device. It must be installed in a housing or control cabinet, to which only qualified personnel have access.

The device can be mounted in a control cabinet on standard mounting rails (see Chapter Mechanical system (Page 49))

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 ① at the same time, as described under "Removal".

Removing

To remove, pull up the slider ① using a screwdriver ② 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.

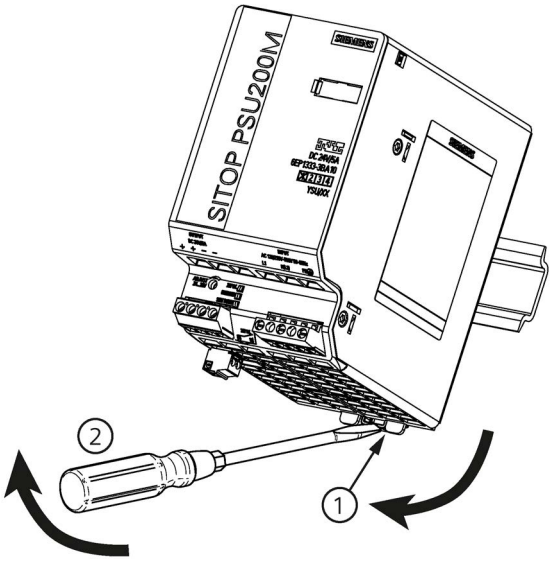


Figure 3-1 Removal (example, 6EP1334-3BA10)

Mounting position, mounting clearances

4

4.1 Standard mounting position

The device is mounted on DIN rails. The certified standard mounting position of the device is vertical, and to ensure correct cooling, it must 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).

Lateral clearances do not have to be maintained.

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

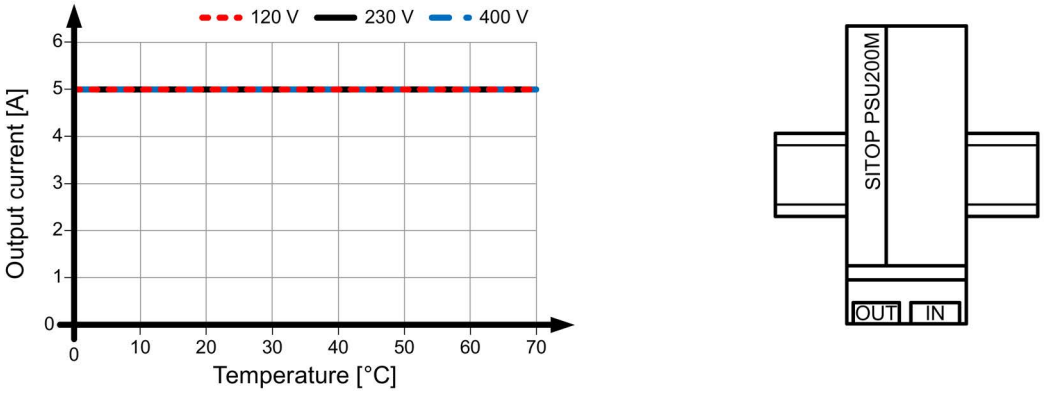


Figure 4-1 6EP1333-3BA10 output current for a standard mounting position

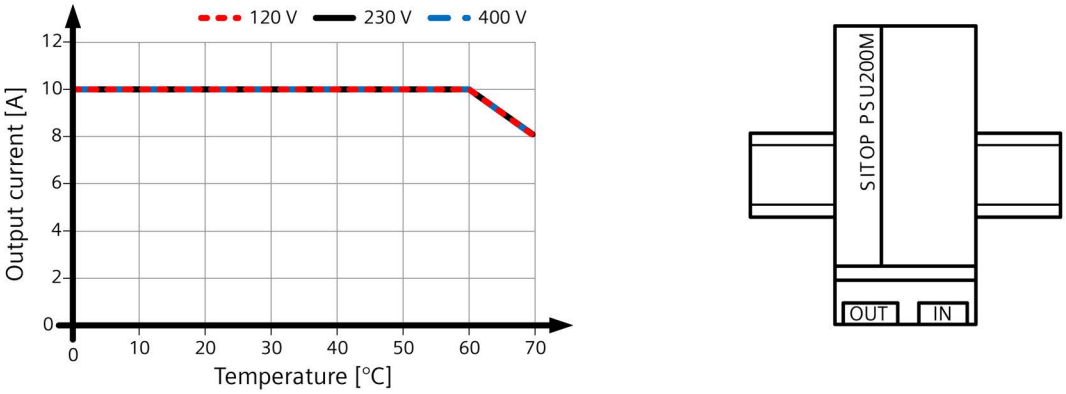


Figure 4-2 6EP1334-3BA10 output current for a standard mounting position

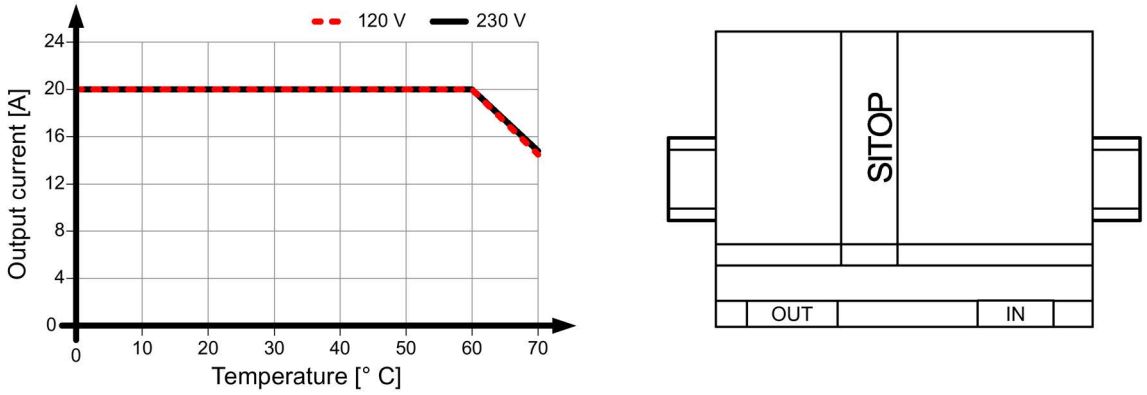


Figure 4-3 6EP1336-3BA00: Output current in the standard mounting position

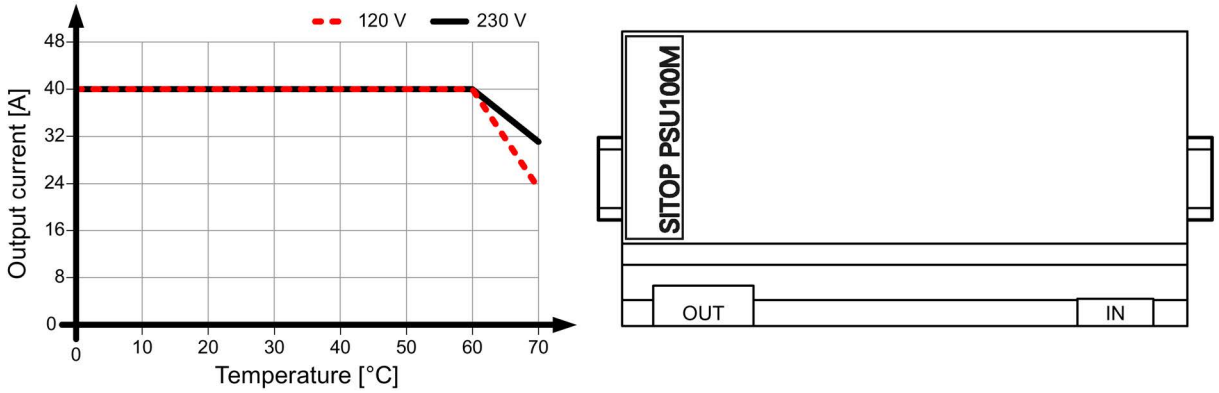


Figure 4-4 6EP1337-3BA00: Output current in the standard mounting position

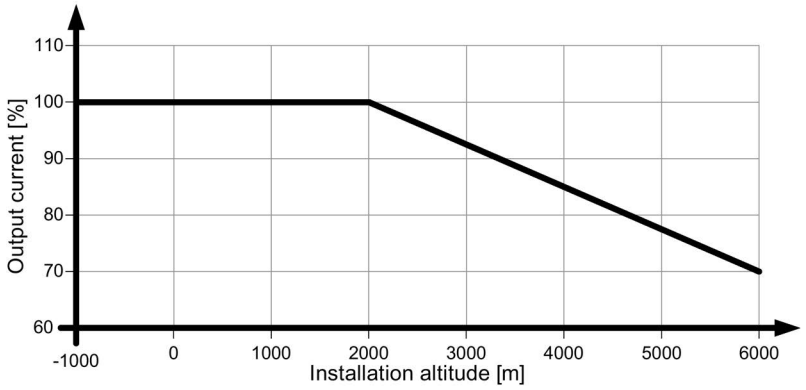


Figure 4-5 Installation height derating

For details, see Chapter Ambient conditions (Page 55)

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.

Particularly 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 6EP1333-3BA10

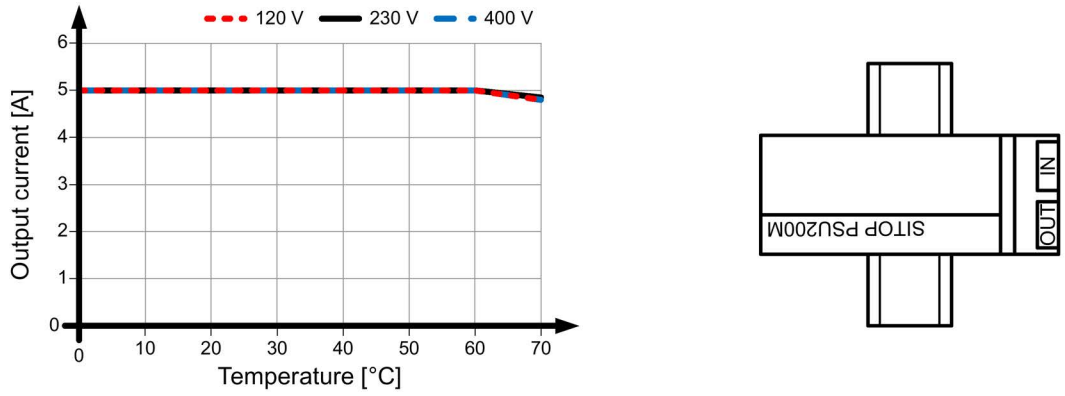


Figure 4-6 Mounting position 1

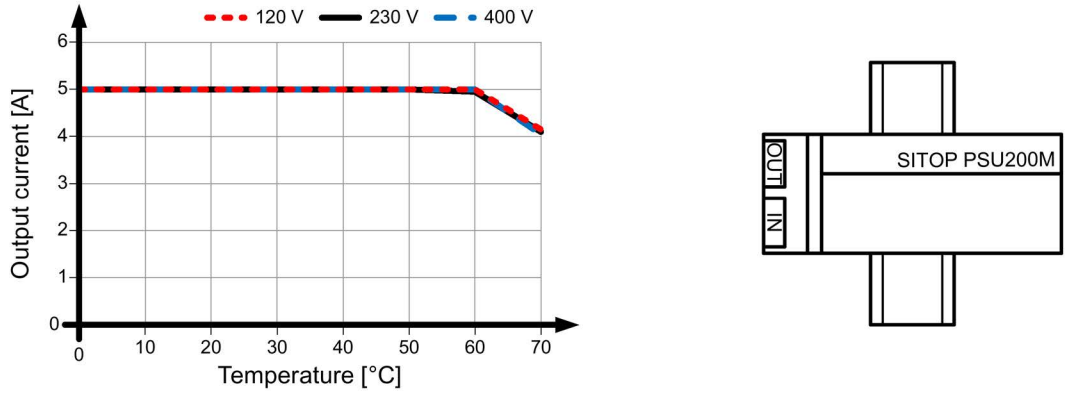
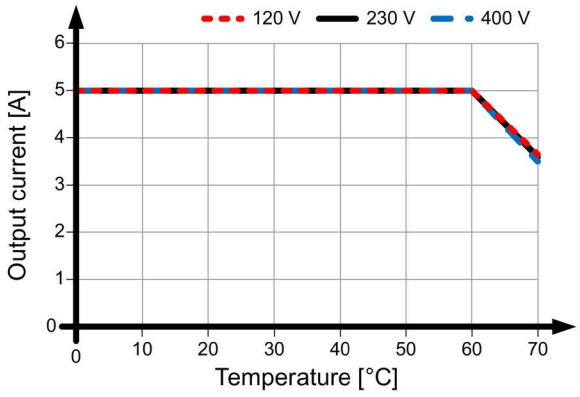


Figure 4-7 Mounting position 2



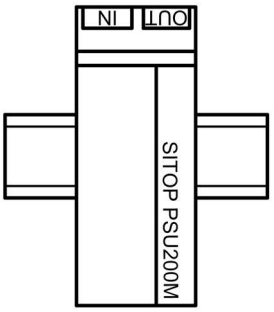
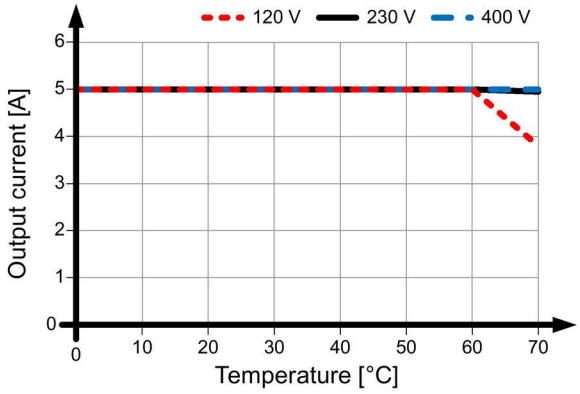


Figure 4-8 Mounting position 3



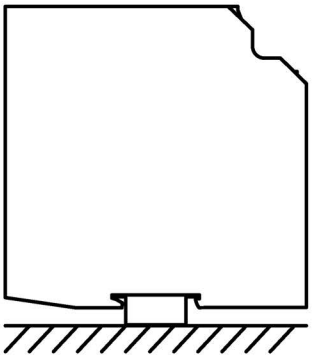
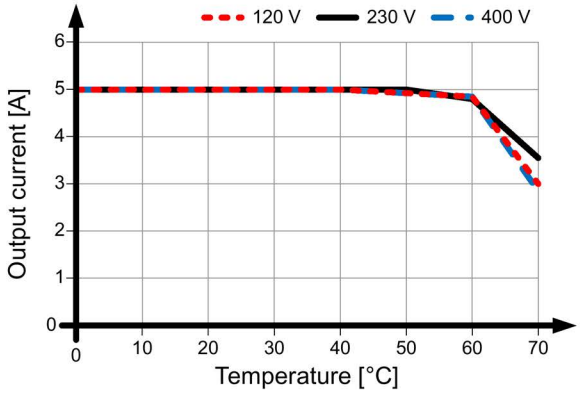


Figure 4-9 Mounting position 4



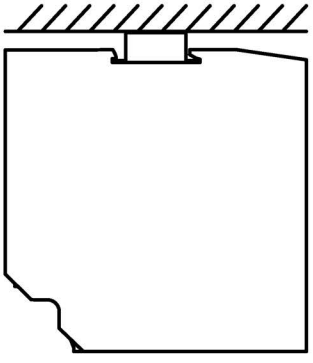


Figure 4-10 Mounting position 5

4.2.2 6EP1334-3BA10

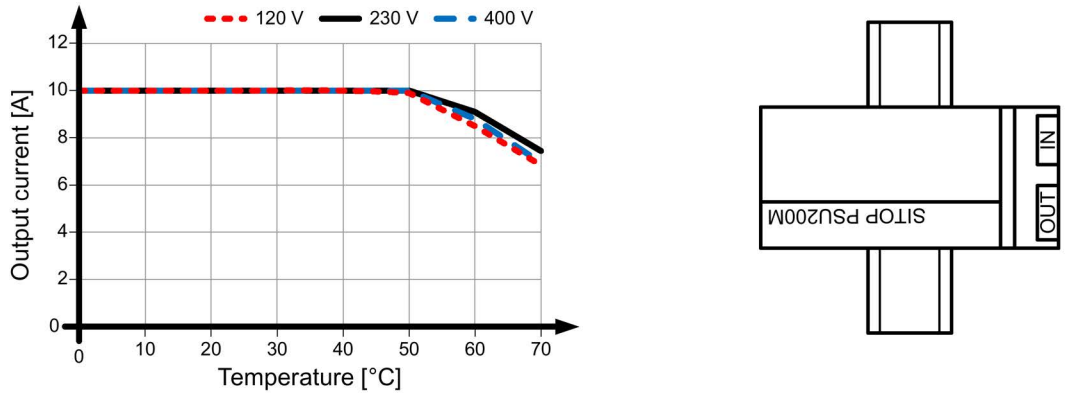


Figure 4-11 Mounting position 1

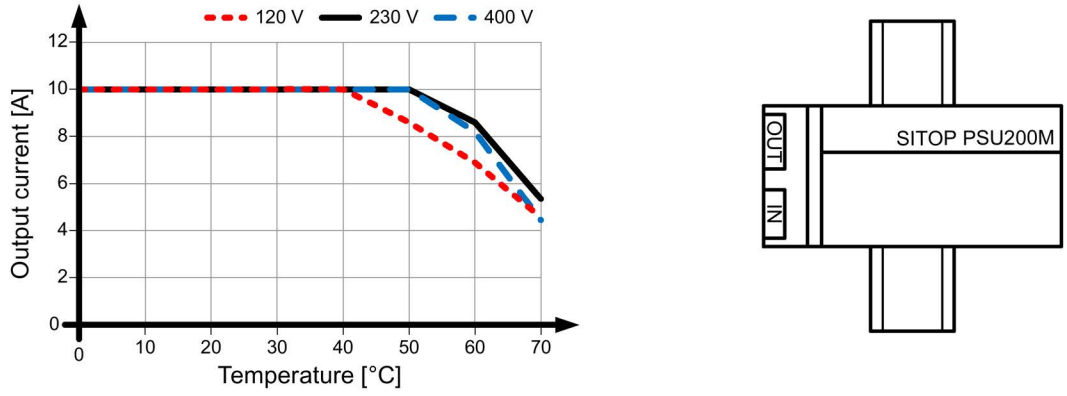


Figure 4-12 Mounting position 2

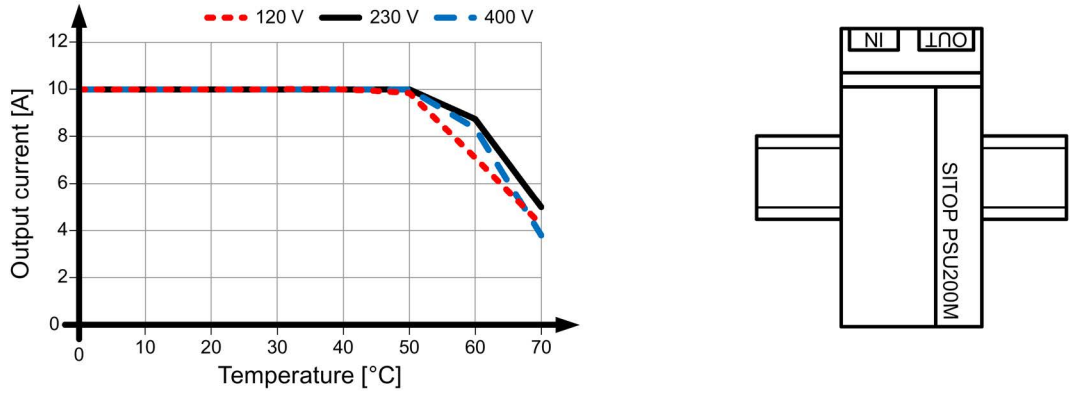
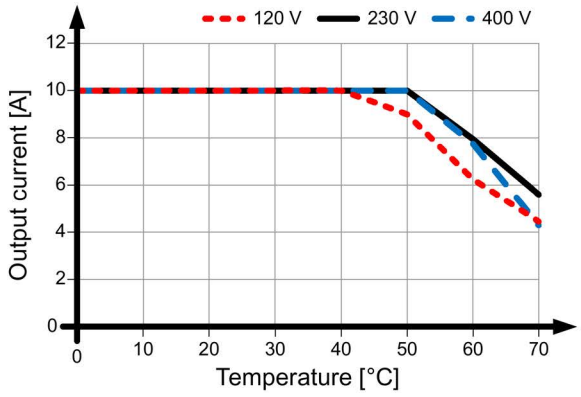


Figure 4-13 Mounting position 3



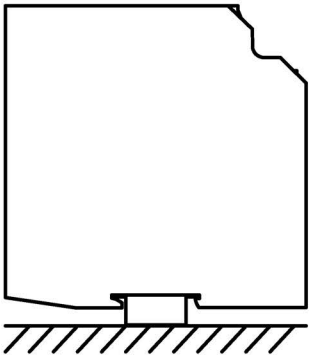
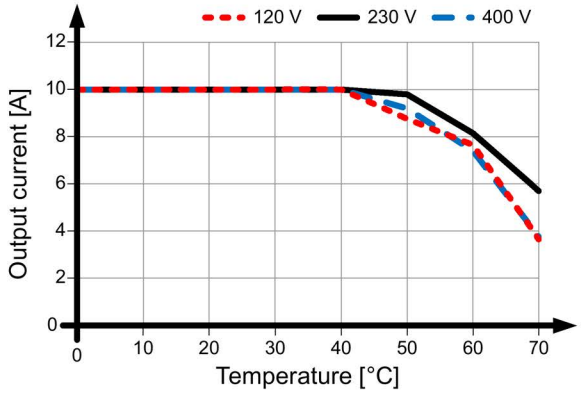


Figure 4-14 Mounting position 4



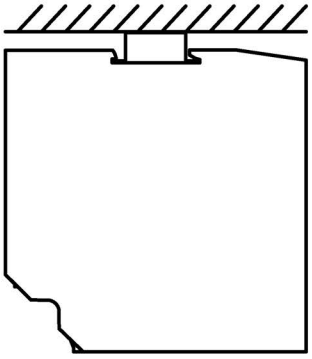
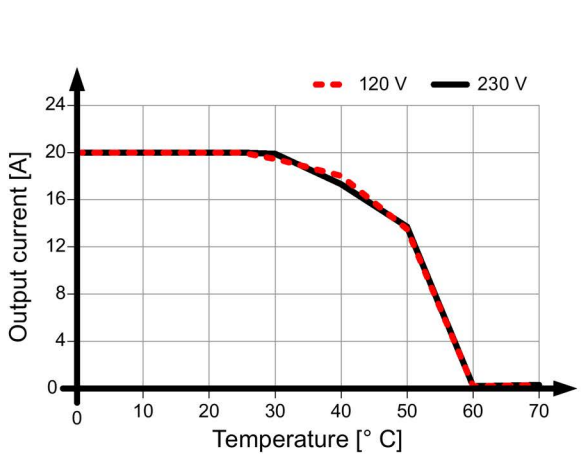


Figure 4-15 Mounting position 5

4.2.3 6EP1336-3BA00



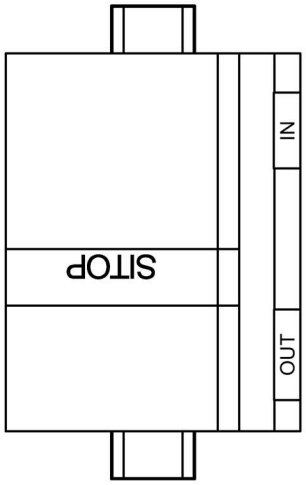
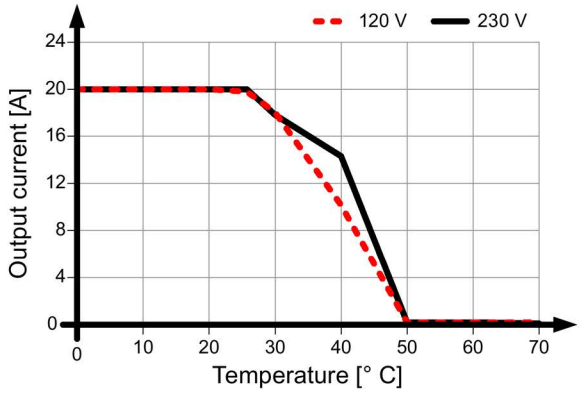


Figure 4-16 Mounting position 1



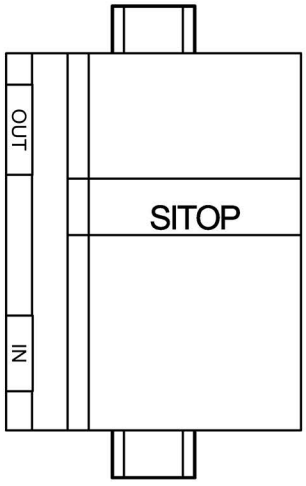
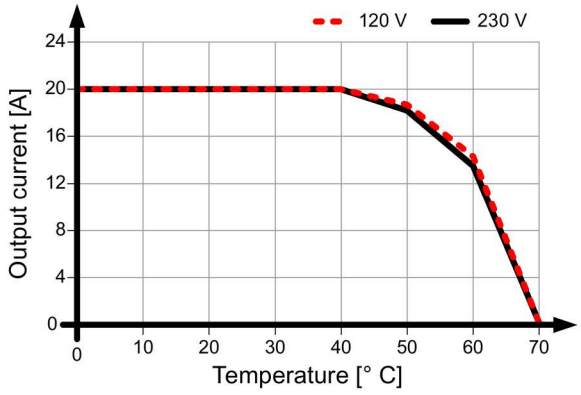


Figure 4-17 Mounting position 2



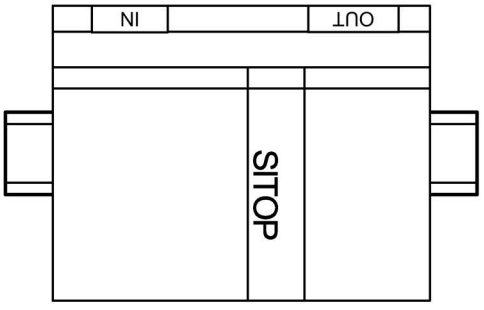
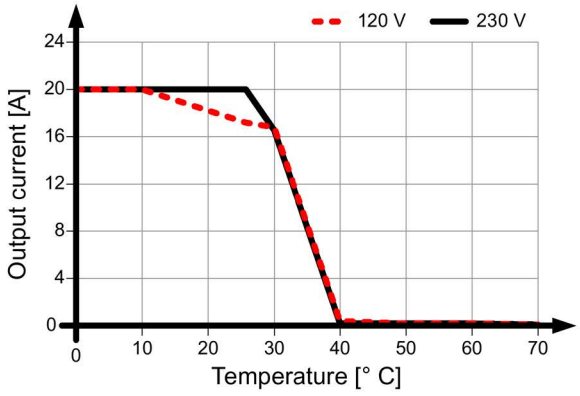


Figure 4-18 Mounting position 3



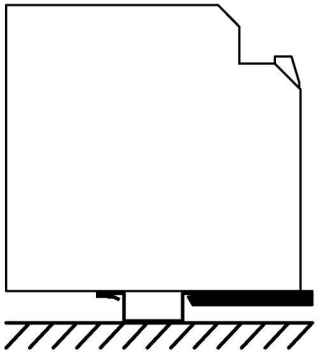
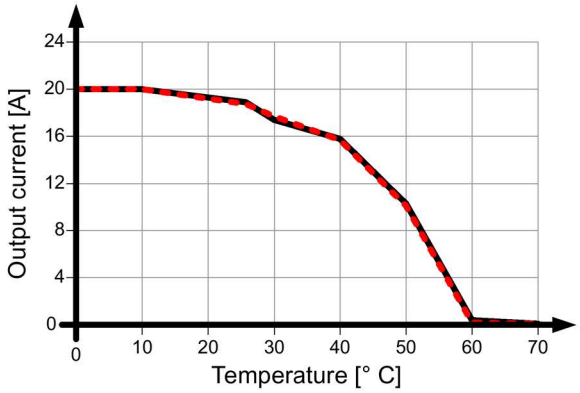


Figure 4-19 Mounting position 4



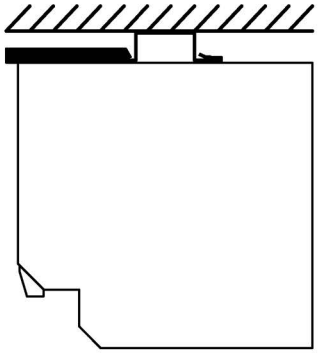


Figure 4-20 Mounting position 5

4.2.4 6EP1337-3BA00

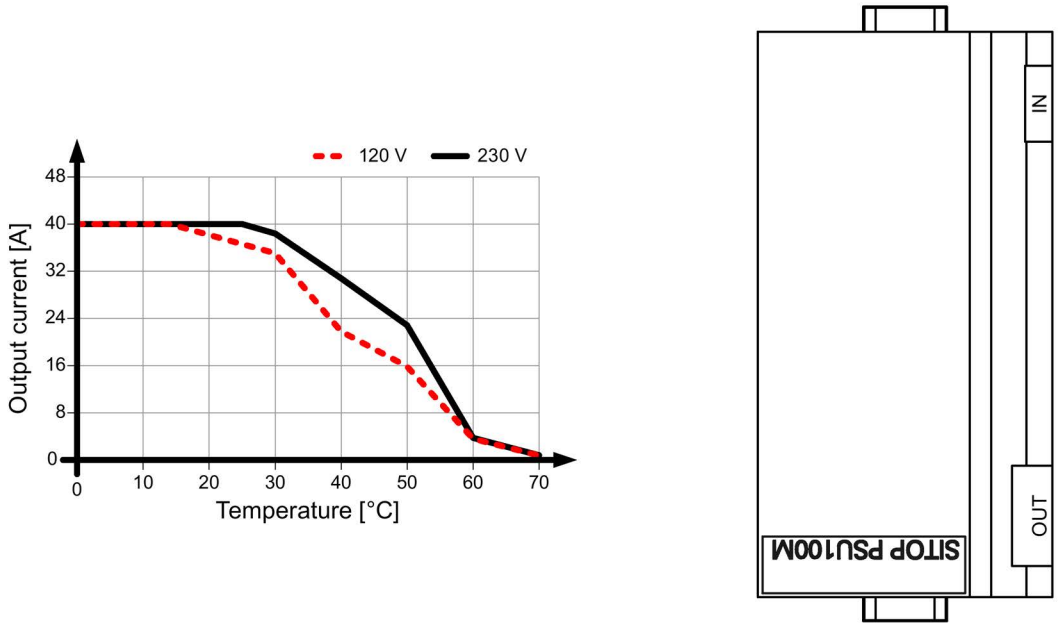


Figure 4-21 Mounting position 1

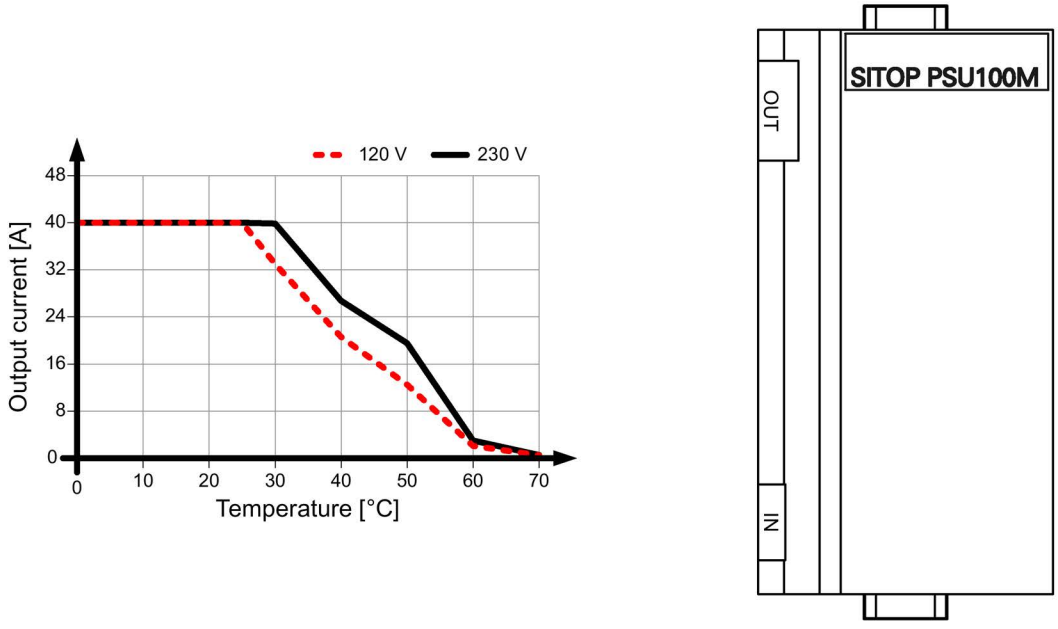


Figure 4-22 Mounting position 2

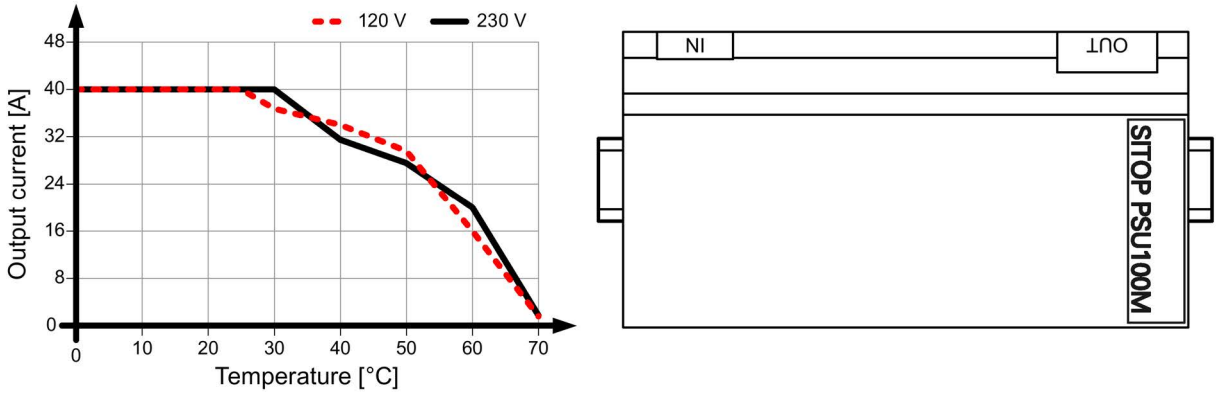


Figure 4-23 Mounting position 3

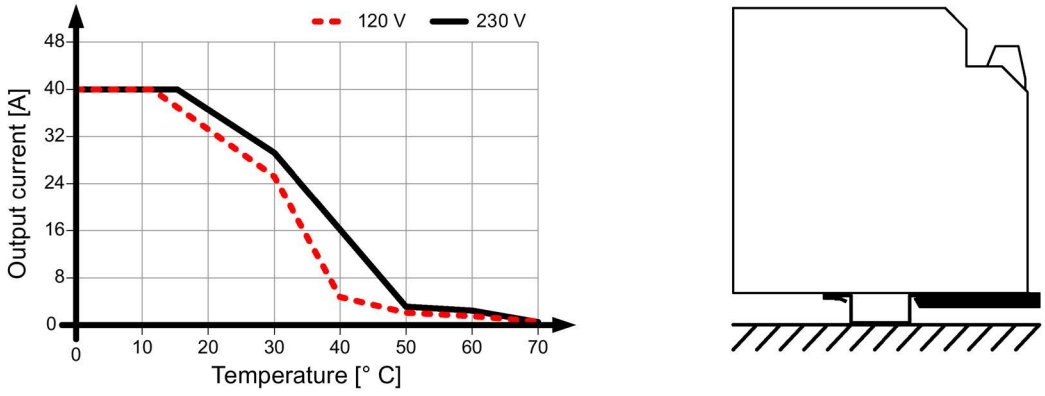


Figure 4-24 Mounting position 4

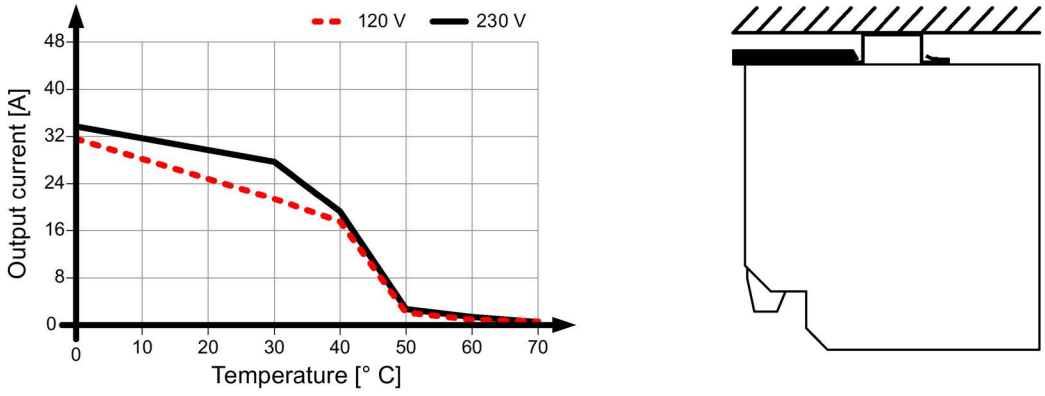


Figure 4-25 Mounting position 5

Installation

5

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.

Use copper wire approved for 90 °C for the wiring.

5.1 Line-side connection

The SITOP modular power supply is designed for connection to a 1-phase/2-phase AC line supply (TN or TT system according to IEC 60364-1, IT line supply according to IEC 60364-1 in IEC 61204-7 applications) with a rated voltage of 120-230/230-500 V AC or 120/230 V AC, 50 - 60 Hz.

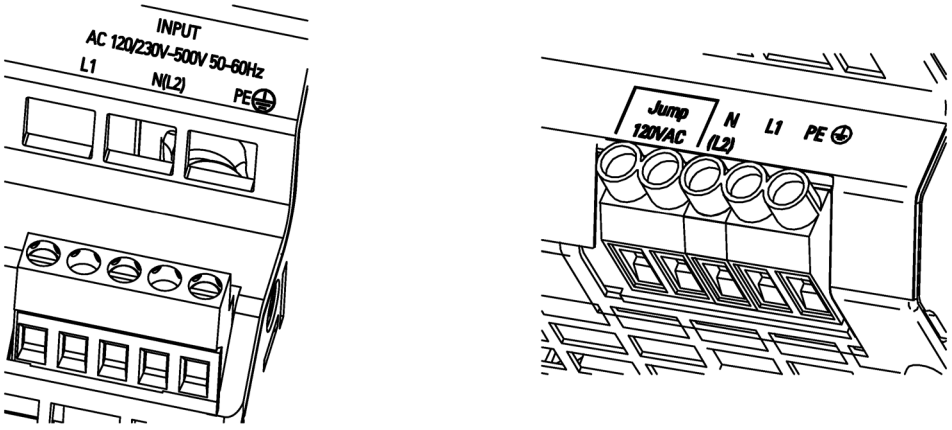


Figure 5-1 Line connection (example, 6EP1334-3BA10 and 6EP1337-3BA00)

The line supply is connected via terminals L1, L2(N) and PE (see Figure 5-1 Line connection (example, 6EP1334-3BA10 and 6EP1337-3BA00) (Page 33)) and must be implemented according to IEC 60364.

For operation with an input voltage of 120 V, for 6EP1333-3BA10 and 6EP1334-3BA10 the switch (see Figure 2-8 Voltage selector switch (example, 6EP1334-3BA10) (Page 15)) must be switched over. For 6EP1336-3BA00 and 6EP1337-3BA00, a wire jumper must be connected to input terminal Jump 120 V AC (see Figure 2-9 Wire jumper (example, 6EP1337-3BA00) (Page 15)).

A protective device (miniature circuit breaker or circuit breaker) and a disconnection unit for the power supply must be provided. A ground-fault circuit interrupter is not permissible

against indirect contact as the only protective measure. This applies for the complete line supply protected by the ground-fault circuit interrupter. If the power supply is operated between line conductors L1 and L2 and an RCD is used as protection against direct or indirect contact, then only an AC/DC-sensitive RCD type B is permitted.

Protection

SITOP modular	Line-side protection required for operation
6EP1333-3BA10 (24 V/5 A)	• 1-phase operation: Miniature circuit breaker (IEC 898), characteristic C (B), 6 A • 2-phase operation: 2-pole coupled miniature circuit breaker (IEC 898), characteristic C (B), 6 A or for 230 V 3RV2011-1EA10 circuit breaker, setting of the thermal overcurrent release: 3.8 A or 3RV2711-1ED10 circuit breaker (branch circuit protection according to UL 489-listed, DIVQ) or for 400/500 V 3RV2011-1DA10 circuit breaker, setting of the thermal overcurrent release: 3 A or 3RV2711-1DD10 circuit breaker (branch circuit protection according to UL 489-listed, DIVQ)
6EP1334-3BA10 (24 V/10 A)	• 1-phase operation: Miniature circuit breaker (IEC 898), characteristic C (B), 10 A • 2-phase operation: 2-pole coupled miniature circuit breaker (IEC 898), characteristic C (B), 10 A or for 230 V 3RV2011-1EA10 circuit breaker, setting of the thermal overcurrent release: 3.8 A or 3RV2711-1ED10 circuit breaker (branch circuit protection according to UL 489-listed, DIVQ) or for 400/500 V 3RV2011-1DA10 circuit breaker, setting of the thermal overcurrent release: 3 A or 3RV2711-1DD10 circuit breaker (branch circuit protection according to UL 489-listed, DIVQ)
6EP1336-3BA00 (24 V/20 A)	• 1-phase operation: Miniature circuit breaker (IEC 898), characteristic C, 10 A • 2-phase operation: 2-pole coupled miniature circuit breaker (IEC 898), characteristic C, 10 A or for 120 V 3RV2411-1JA10 circuit breaker or for 230 V 3RV2411-1FA10 circuit breaker
6EP1337-3BA00 (24 V/40 A)	• 1-phase operation: Miniature circuit breaker (IEC 898), characteristic C, 20 A • 2-phase operation: 2-pole coupled miniature circuit breaker (IEC 898), characteristic C, 20 A or for 120 V 3RV2421-4BA10 circuit breaker or for 230 V 3RV2411-1JA10 circuit breaker

The protective conductor of the line supply must be connected at the PE terminal.

NOTICE
Country-specific regulations must be observed when installing.

5.2 Output-side connection

The SITOP modular power supply provides at its output an isolated (= non-grounded) SELV (ES1) output voltage (Safety Extra Low Voltage (Electrical energy source class 1)). The output of the power supply is no-load, overload, and short-circuit proof. If an overload occurs, the electronic current limiting function limits the output current to a maximum value (see Chapter Technical data (Page 37)).

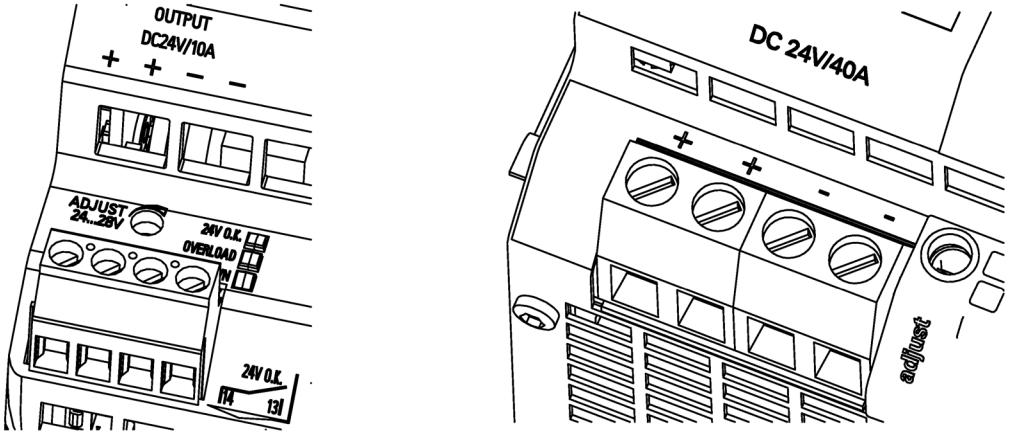


Figure 5-2 Output connection (example, 6EP1334-3BA10 and 6EP1337-3BA00)

The output voltage is connected via the + and - terminals at the output of the power supply (see Figure Output connection (example, 6EP1334-3BA10 and 6EP1337-3BA00) (Page 35)). Ensure that the output cables are dimensioned correctly for the maximum output current rms value and fused accordingly.

Note

If the safety concept of the plant or system specifies that the DC output circuit should be grounded (PELV, Protected Extra Low Voltage), then it is permissible that the output voltage of the SITOP power supply is grounded. In this case, ideally, the grounding at the output should be directly connected from terminal "-" of the power supply to a suitable connection point of the protective conductor system (PE) of the plant or system.

Technical data

6

Note

Technical data is applicable for a rated input voltage of 230 V AC, rated load and 25 °C ambient temperature (if nothing else is specified).

6.1 Input

	6EP1333-3BA10 (24 V/5 A)	6EP1334-3BA10 (24 V/10 A)	6EP1336-3BA00 (24 V/20 A)	6EP1337-3BA00 (24 V/40 A)
Input	1-phase and 2-phase AC			
Rated voltage $U_{in\ rated}$	120 - 230/230 - 500 V	120 - 230/230 - 500 V	120/230 V	120/230 V
Voltage range	85 - 264/176 - 550 V	85 - 264/176 - 550 V	85 - 132/176 - 264 V	85 - 132/176 - 264 V
• Remark	Setting via selector switch on the device; starting from U_{in} > 90/180 V Derating for U_{in} < 100 V/< 200 V: $I_{out\ max}$: 90 % $I_{out\ rated}$	Setting via selector switch on the device; starting from U_{in} > 90/180 V Derating for U_{in} < 100 V/< 200 V: $I_{out\ max}$: 90 % $I_{out\ rated}$	Setting via selector switch on the device; starting from U_{in} > 93/183 V	Setting via selector switch on the device; starting from U_{in} > 95/190 V
Wide-range input	Yes		No	
Line failure buffering at $I_{out\ rated}$, min	25 ms	25 ms	20 ms	20 ms
Power-failure buffering	at U_{in} = 120/230 V, typ. 150 ms for U_{in} = 500 V	at U_{in} = 120/230 V, typ. 150 ms for U_{in} = 500 V	at U_{in} = 230 V	at U_{in} = 230 V
Rated line frequency	50 - 60 Hz			
Line frequency range	47 - 63 Hz			
Input current at rated input voltage 120 V	2.2 A	4.4 A	7.9 A	15.5 A
Input current at rated input voltage 230 V	1.2 A	2.4 A	3.5 A	9.5 A
Input current at rated input voltage 500 V	0.6 A	1.1 A	-	-
Inrush current limiting (25 °C), max.	35 A	35 A	60 A	125 A
I^2t, max	1.7 A^2s	4 A^2s	9.9 A^2s	26 A^2s

	6EP1333-3BA10 (24 V/5 A)	**6EP1334-3BA10 (24 V/10 A)**	**6EP1336-3BA00 (24 V/20 A)**	**6EP1337-3BA00 (24 V/40 A)**
Integrated input fuse	Fuse T 3.15 A	Fuse T 6.3 A	Fuse T 10 A	Fuse T 16 A
Protection/fusing in the line feeder cable (IEC 898)	for single-phase operation: Miniature circuit breaker characteristic C (B), 6 A;	for single-phase operation: Miniature circuit breaker characteristic C (B), 10 A;	for single-phase operation: Miniature circuit breaker, characteristic C, 10 A;	for single-phase operation: Miniature circuit breaker, characteristic C, 20 A;
	Required for 2-phase operation: 2-pole coupled miniature circuit breaker, characteristic C (B), 6 A or for 230 V 3RV2011-1EA10 circuit breaker, (setting 3.8 A) or 3RV2711-1ED10 circuit breaker or for 400/500 V 3RV2011-1DA10 circuit breaker, (setting 3 A) or 3RV2711-1DD10 circuit breaker according to UL489-listed, DIVQ.	Required for 2-phase operation: 2-pole coupled miniature circuit breaker, characteristic C (B), 10 A or for 230 V 3RV2011-1EA10 circuit breaker, (setting 3.8 A) or 3RV2711-1ED10 circuit breaker or for 400/500 V 3RV2011-1DA10 circuit breaker, (setting 3 A) or 3RV2711-1DD10 circuit breaker according to UL489-listed, DIVQ.	Required for 2-phase operation: 2-pole coupled miniature circuit breaker, characteristic C, 10 A or for 120 V 3RV2411-1JA10 circuit breaker or for 230 V 3RV2411-1FA10 circuit breaker	Required for 2-phase operation: 2-pole coupled miniature circuit breaker, characteristic C, 20 A or for 120 V 3RV2421-4BA10 circuit breaker or for 230 V 3RV2411-1JA10 circuit breaker

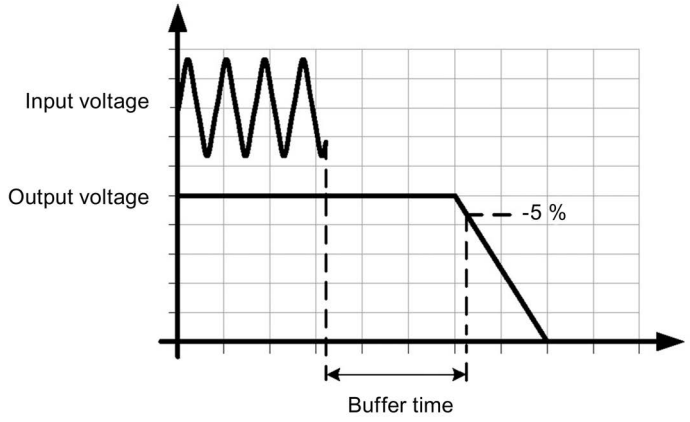


Figure 6-1 Power failure buffering

6.2 Output

	6EP1333-3BA10 (24 V/5 A)	**6EP1334-3BA10 (24 V/10 A)**	**6EP1336-3BA00 (24 V/20 A)**	**6EP1337-3BA00 (24 V/40 A)**
Output	Regulated, isolated DC voltage			
Rated voltage $U_{out\ rated}$ DC	24 V			
Total tolerance, static ±	3 %	3 %	3 %	3 %
Static line regulation, approx.	0.1 %	0.1 %	0.1 %	0.1 %
Static load regulation, approx.	0.1 %	0.1 %	0.1 %	0.1 %
Residual ripple in the load range peak-peak, max.	50 mV	50 mV	100 mV	100 mV
Spikes peak-peak, max. (bandwidth, approx. 20 MHz)	200 mV	200 mV	200 mV	200 mV
Adjustment range	24 - 28 V	24 - 28 V	24 - 28.8 V	24 - 28.8 V
Output voltage can be adjusted	Yes			
Output voltage setting	Via potentiometer			
• Remark	Max. 120 W	Max. 240 W	Max. 480 W	Max. 960 W
Output derating U_{out}/T	See Figure 6-7 Output derating depending on the ambient temperature at Iout rated (Page 42)			
Output derating U_{out}/I_{out}	See Figure 6-8 Output derating depending on the output current at 60° C (Page 42)			
Output derating U_{out}/U_i	-	-	-	See Figure 6-9 Output derating depending on the input voltage (Page 42)
• Remark				For 85 to 93 V AC, it is not permissible that the output voltage is set higher than 24 V.
Response when switching on/off	U_{out} overshoots by approximately 3 %			
Starting delay, max.	1 s	1 s	1 s	1 s
Voltage rise time, typ.	50 ms	50 ms	50 ms	50 ms
Rise time of the output voltage, max.	500 ms	500 ms	500 ms	500 ms
Rated current $I_{out\ rated}$	5 A	10 A	20 A	40 A
Current range	0 - 5 A	0 - 10 A	0 - 20 A	0 - 40 A
• Remark		60 - 70 °C derating: approx. 2 % $I_{out\ rated}$/K	60 - 70 °C derating: approx. 3 % $I_{out\ rated}$/K	60 - 70 °C derating: approx. 3 % $I_{out\ rated}$/K
Active power output, typ.	120 W	240 W	480 W	960 W
Constant overload current for a short circuit when powering up, typ.	6 A	12 A	23 A	46 A
Short-time overload current for a short circuit in operation, typ.	15 A	30 A	60 A	120 A

	6EP1333-3BA10 (24 V/5 A)	**6EP1334-3BA10 (24 V/10 A)**	**6EP1336-3BA00 (24 V/20 A)**	**6EP1337-3BA00 (24 V/40 A)**
Duration of the overload capability for an overcurrent condition caused by a short circuit in operation.	25 ms	25 ms	25 ms	25 ms
• Remark	Every 1 min	Every 1 min	Every 1 min	Every 1 min
Can be connected in parallel to increase the power rating	Yes			
• Remark	Switchable characteristic curve with switch A (see Status displays and signaling (Page 13))			
Number of devices that can be connected in parallel to increase the power rating, quantity	2			
Output characteristic	See Figure 6-3 6EP1333-3BA10 single operation output characteristic (Page 40)	See Figure 6-4 6EP1334-3BA10 single operation output characteristic (Page 41)	See Figure 6-5 6EP1336-3BA00 single operation output characteristic (Page 41)	See Figure 6-6 6EP1337-3BA00 single operation output characteristic (Page 41)

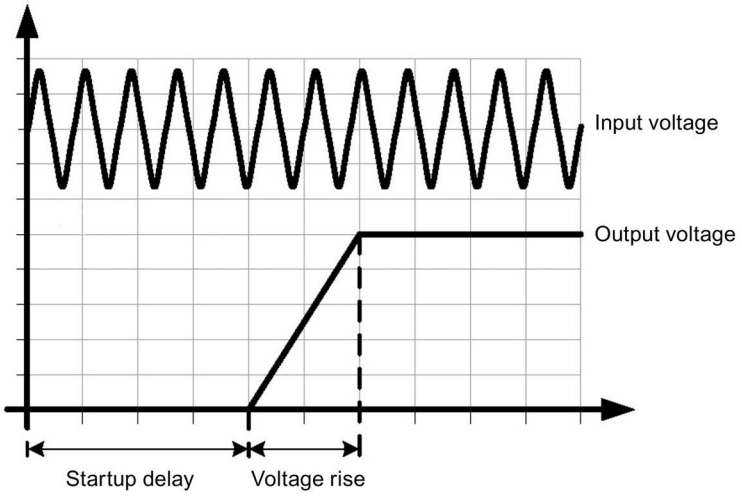


Figure 6-2 Startup delay/voltage rise

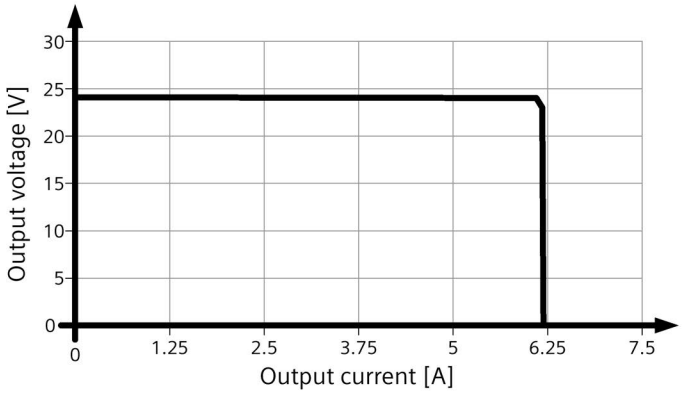


Figure 6-3 6EP1333-3BA10 single operation output characteristic

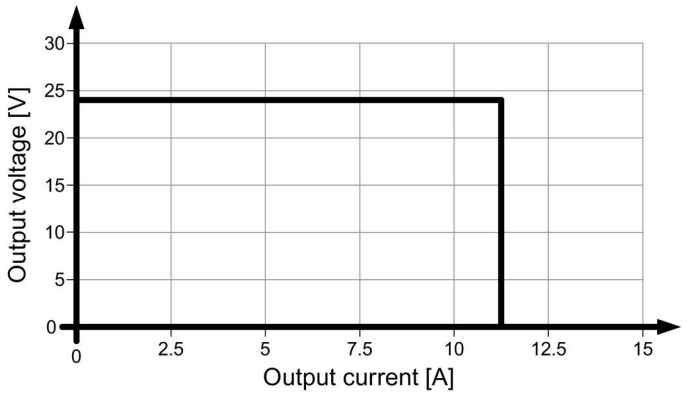


Figure 6-4 6EP1334-3BA10 single operation output characteristic

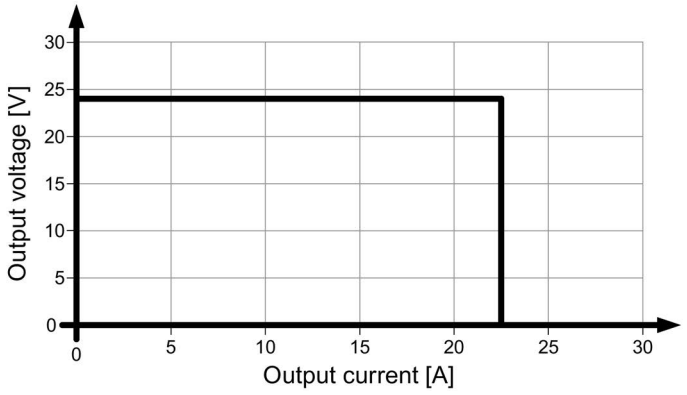


Figure 6-5 6EP1336-3BA00 single operation output characteristic

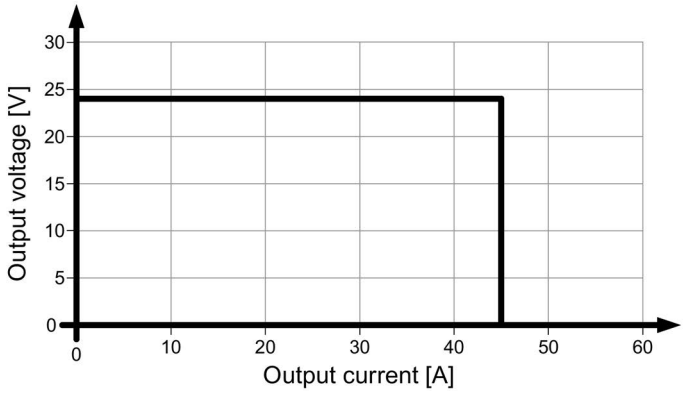


Figure 6-6 6EP1337-3BA00 single operation output characteristic

The device supplies a constant output voltage until the current limit is reached. In the event of an overload, the output current and the output voltage are reduced.

Derating for U_{out} > 24 V:

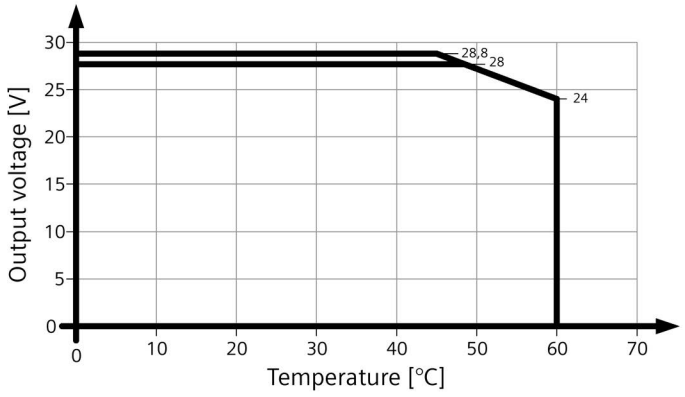


Figure 6-7 Output derating depending on the ambient temperature at $I_{out\ rated}$

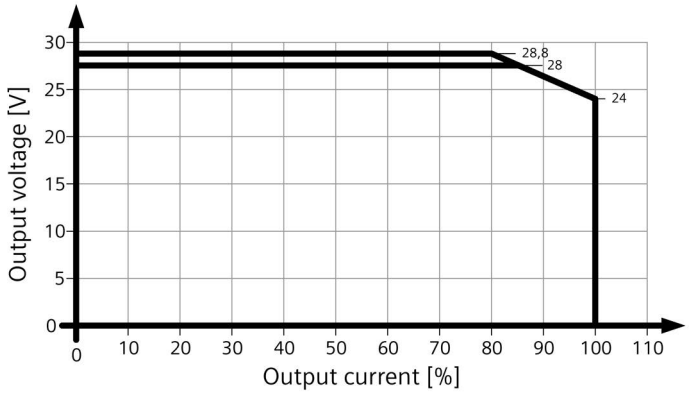


Figure 6-8 Output derating depending on the output current at 60° C

Derating for U_{out} > 24 V depending on the input voltage (only valid for 6EP1337-3BA00):

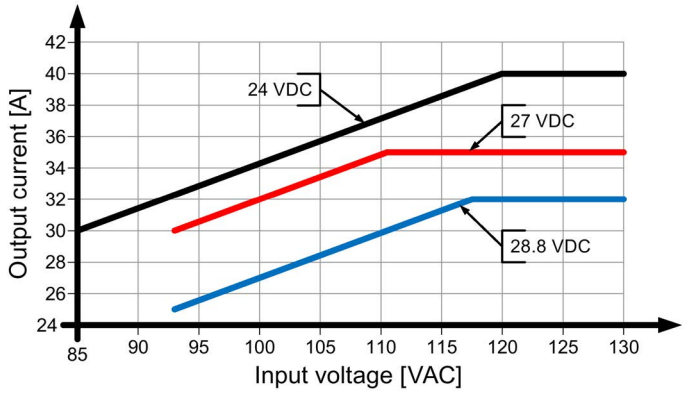


Figure 6-9 Output derating depending on the input voltage

For 85 to 93 V AC, it is not permissible that the output voltage is set higher than 24 V.

Selector switch A closed:

Parallel operation The output voltage falls with increasing output current.

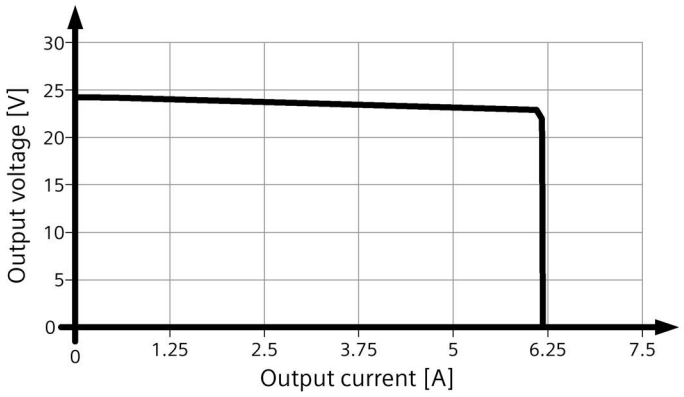


Figure 6-10 6EP1333-3BA10 parallel operation output characteristic

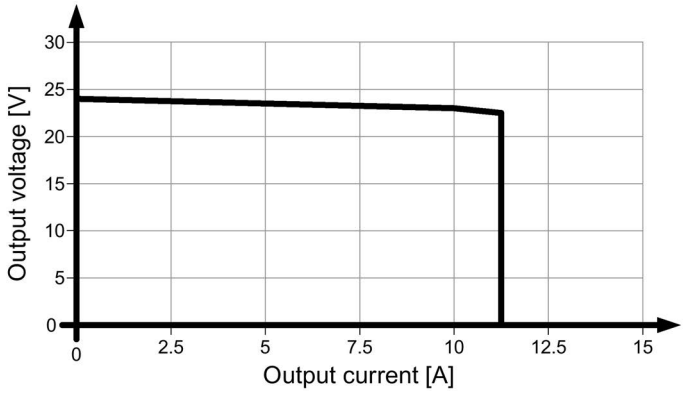


Figure 6-11 6EP1334-3BA10 parallel operation output characteristic

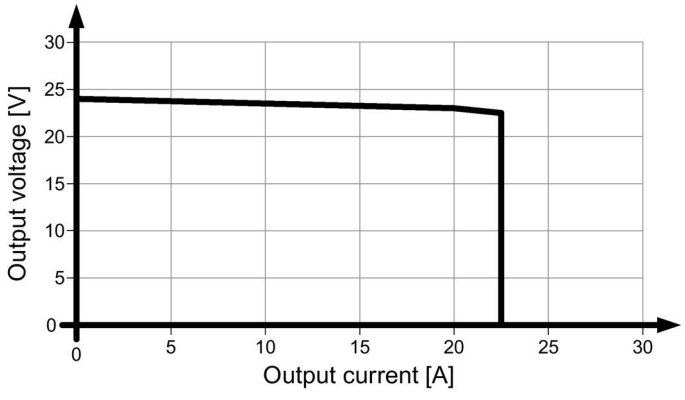


Figure 6-12 6EP1336-3BA00 parallel operation output characteristic

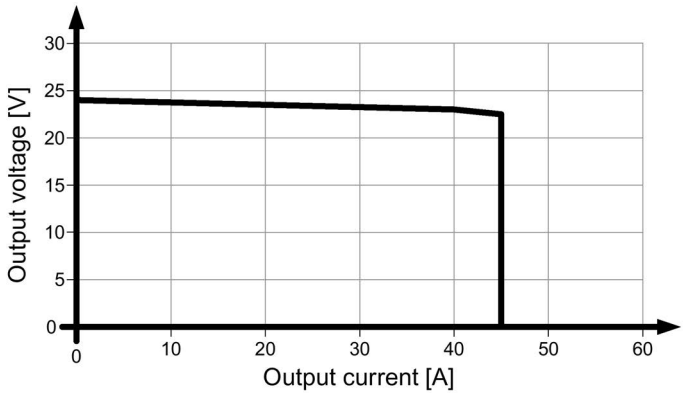


Figure 6-13 6EP1337-3BA00 parallel operation output characteristic

Selector switch B closed:

Latching shutdown. The device is shutdown if the overload lasts longer than 100 ms. Turning the power supply off for longer than 5 s causes a reset.

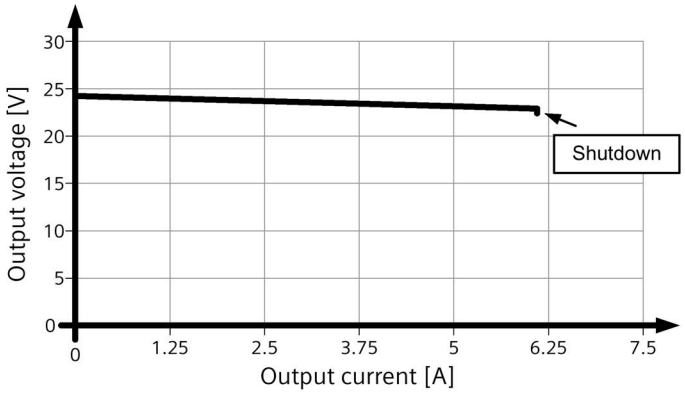


Figure 6-14 6EP1333-3BA10 latching shutdown output characteristic

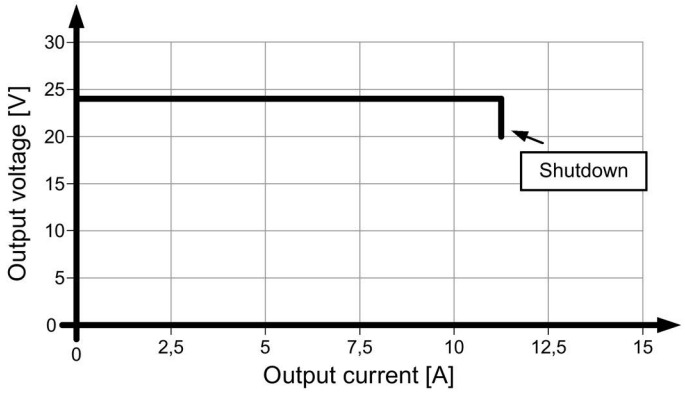


Figure 6-15 6EP1334-3BA10 latching shutdown output characteristic

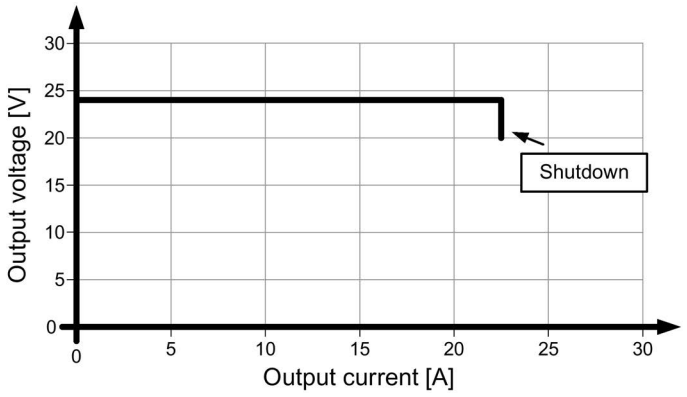


Figure 6-16 6EP1336-3BA00 latching shutdown output characteristic

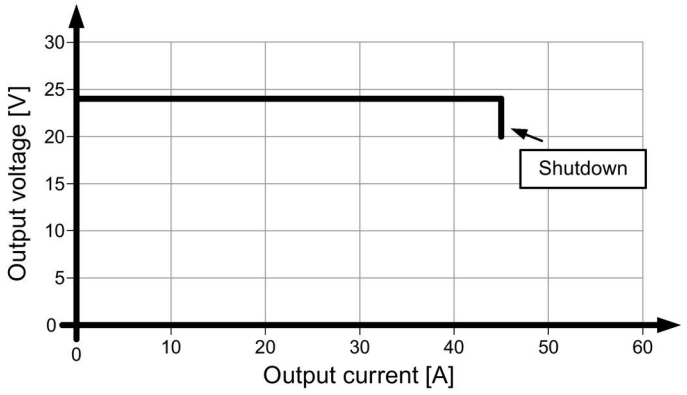


Figure 6-17 6EP1337-3BA00 latching shutdown output characteristic

6.3 Efficiency

	6EP1333-3BA10 (24 V/5 A)	**6EP1334-3BA10 (24 V/10 A)**	**6EP1336-3BA00 (24 V/20 A)**	**6EP1337-3BA00 (24 V/40 A)**
Efficiency at $U_{out\ rated}$, $I_{out\ rated}$, approx.	88 %	91 %	89 %	88 %
Power loss at $U_{out\ rated}$, $I_{out\ rated}$, approx.	17 W	24 W	59 W	131 W
No-load operation power loss, approx.	4 W	6 W	3 W	20 W
Power loss in the "latching shutdown" state	2 W	2 W	3 W	3 W

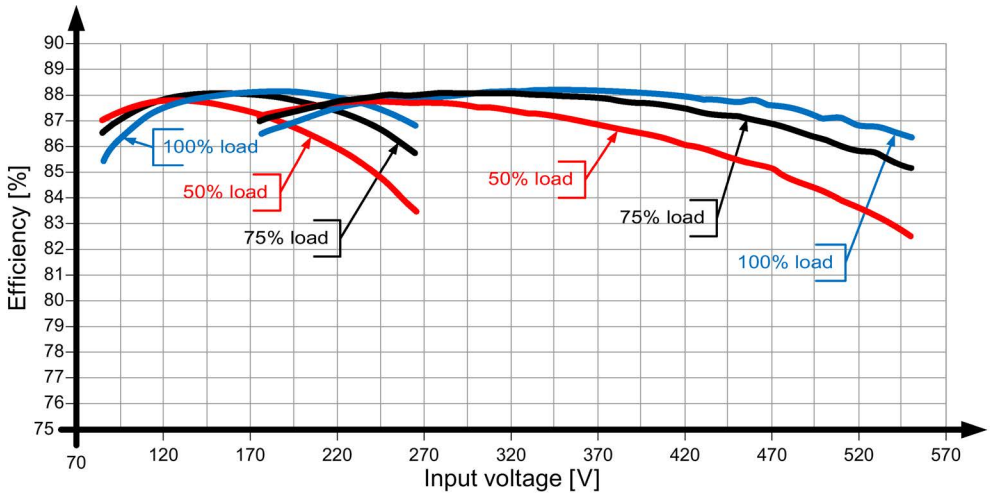


Figure 6-18 6EP1333-3BA10 efficiency

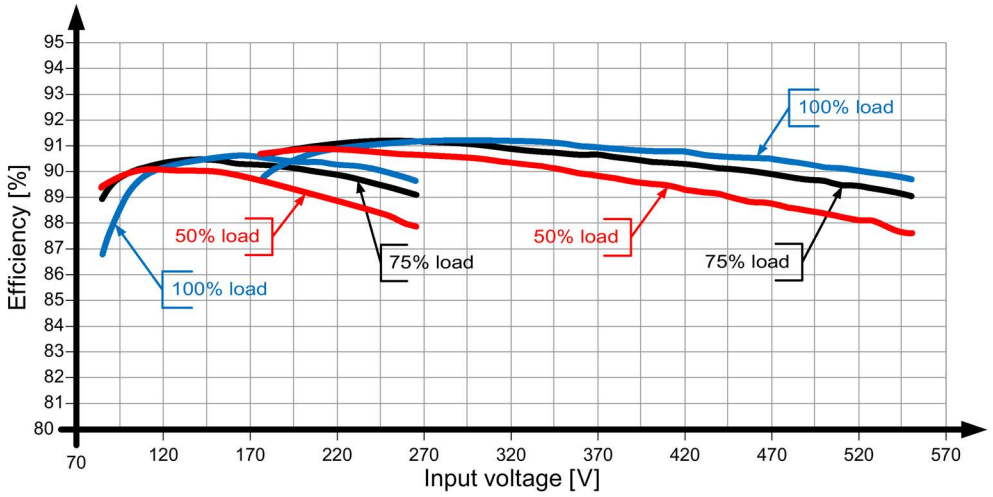


Figure 6-19 6EP1334-3BA10 efficiency

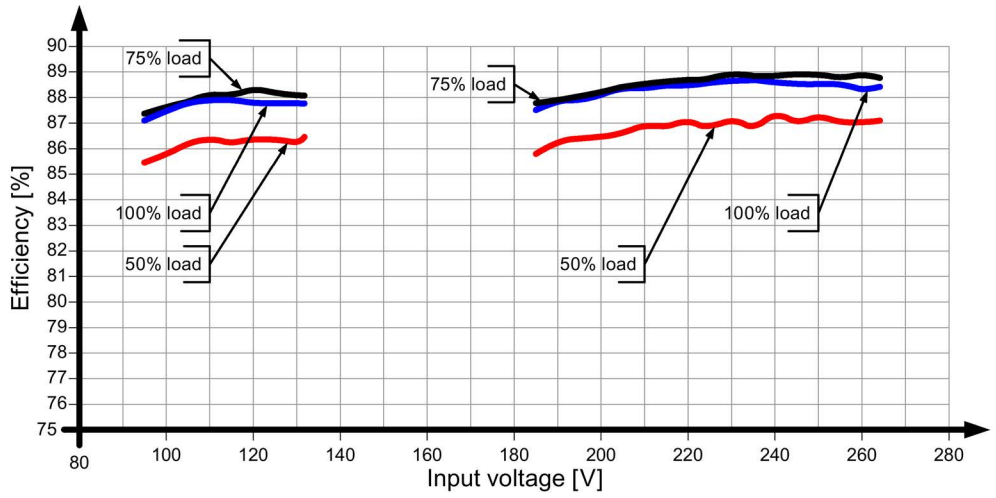


Figure 6-20 6EP1336-3BA00 efficiency

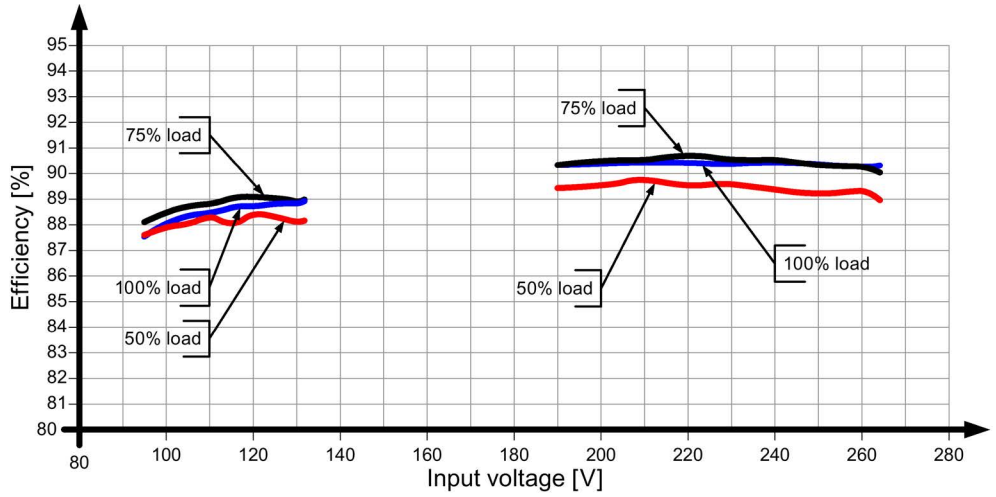


Figure 6-21 6EP1337-3BA00 efficiency

6.4 Closed-loop control

	6EP1333-3BA10 (24 V/5 A)	6EP1334-3BA10 (24 V/10 A)	6EP1336-3BA00 (24 V/20 A)	6EP1337-3BA00 (24 V/40 A)
Dyn. line regulation ($U_{in\ rated}$ ±15 %), max.	0.1 %	0.1 %	1 %	1 %
Dyn. load regulation (I_{out}: 50/100/50 %), U_{out} ± typ.	3 %	3 %	2 %	2 %
Load step regulation time 50 to 100%, typ.	2 ms	2 ms	2 ms	2 ms
Load step regulation time 100 to 50%, typ.	2 ms	2 ms	2 ms	2 ms
Regulation time, max.	5 ms	5 ms	5 ms	5 ms

6.5 Protection and monitoring

	6EP1333-3BA10 (24 V/5 A)	6EP1334-3BA10 (24 V/10 A)	6EP1336-3BA00 (24 V/20 A)	6EP1337-3BA00 (24 V/40 A)
Output overvoltage protection	< 31.8 V	< 31.8 V	< 35 V	< 35 V
Current limitation, typ.	6 A	12 A	23 A	46 A
Property of the output: short-circuit proof	Yes			
Short-circuit protection	Optional constant current characteristic curve or latching shutdown			
Continuous short-circuit current: rms value, typ.	6 A	12 A	23 A	46 A
Overload / short-circuit display	Yellow LED for "overload", red LED for "latching shutdown"			

6.6 MTBF

	6EP1333-3BA10 (24 V/5 A) 6EP1334-3BA10 (24 V/10 A)	6EP1336-3BA00 (24 V/20 A) 6EP1337-3BA00 (24 V/40 A)
Mean Time Between Failures	SN29500: > 700000 h at 40 °C, rated load, 24 h operation	SN29500: > 500000 h (typ. 700000 h) at 40 °C, rated load, 24 hour operation

6.7 Mechanical system

	6EP1333-3BA10 (24 V/5 A)	**6EP1334-3BA10 (24 V/10 A)**	**6EP1336-3BA00 24 V/20 A)**	**6EP1337-3BA00 (24 V/40 A)**
Connection system	Screw-type terminal			
Connections: Line input	L1, N (L2), PE: 1 screw terminal each for 0.5 - 2.5 mm² solid/finely stranded		L1, N (L2), PE, Jump 120 V AC: 1 screw terminal each for 0.2 - 6 (4) mm² solid (finely stranded)	
Connections: Output	+, -: 2 screw terminals each for 0.5 - 2.5 mm² solid/finely stranded		+, -: 2 screw terminals each for 0.2 - 6 (4) mm² solid (finely stranded)	+, -: 2 screw terminals each for 0.5 - 16 (10) mm² solid (finely stranded)
Connections: Auxiliary contacts	Signaling contact (13, 14): 1 screw terminal each for 0.2 - 1.5 mm² solid/finely stranded		-	-
Width: of the enclosure	70 mm	70 mm	160 mm	240 mm
Height: of the enclosure	125 mm	125 mm	125 mm	125 mm
Depth: of the enclosure	121 mm	121 mm	120.5 mm	120.5 mm
Mounting width	70 mm	70 mm	164 mm	244 mm
Mounting height	225 mm	225 mm	225 mm	225 mm
Weight, approx.	0.6 kg	0.8 kg	2.2 kg	2.9 kg
Product feature of the housing: housing that can be lined up next to one another	Yes			
Type of mounting: Rail mounting	Yes			
Mounting	Can be snapped onto standard EN 60715 35x7,5/15 mounting rails			Can be snapped onto standard EN 60715 35x15 mounting rails

6.8 Accessories

	6EP1333-3BA10 (24 V/5 A) **6EP1334-3BA10 (24 V/10 A)**	**6EP1336-3BA00 (24 V/20 A)** **6EP1337-3BA00 (24 V/40 A)**
Electrical accessories	Functionality can be expanded using supplementary modules – redundancy module, buffer module, selectivity module and DC USV.	Functionality can be expanded using supplementary modules – signaling module, redundancy module, buffer module, selectivity module and DC USV.

6.9 Dimension drawing

See Section Dimensions and weight (Page 18)

CAD data that can be downloaded from the Internet:

6EP1333-3BA10
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00972)

6EP1334-3BA10
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00975)

6EP1336-3BA00
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00578)

6EP1337-3BA00
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00562)

Safety, approvals, EMC

7

7.1 Safety

	6EP1333-3BA10 (24 V/5 A) **6EP1334-3BA10 (24 V/10 A)**	**6EP1336-3BA00 (24 V/20 A)** **6EP1337-3BA00 (24 V/40 A)**
Primary/secondary galvanic isolation	Yes	
Galvanic isolation	SELV (ES1) output voltage U_{out} according to EN 61204-7 transformer according to EN 61558-2-16	SELV (ES1) output voltage U_{out} according to EN 61204-7
Protection class	Class I	
Degree of protection (EN 60529)	IP20	
Leakage current, typ.	2.5 mA	1 mA
Leakage current, max.	3.5 mA	
Test voltage	See Table 7-1 Test voltages for 6EP1333-3BA10 and 6EP1334-3BA10 (Page 52)	See Table 7-2 Test voltages for 6EP1336-3BA00 and 6EP1337-3BA00 (Page 52)

7.2 Test voltage

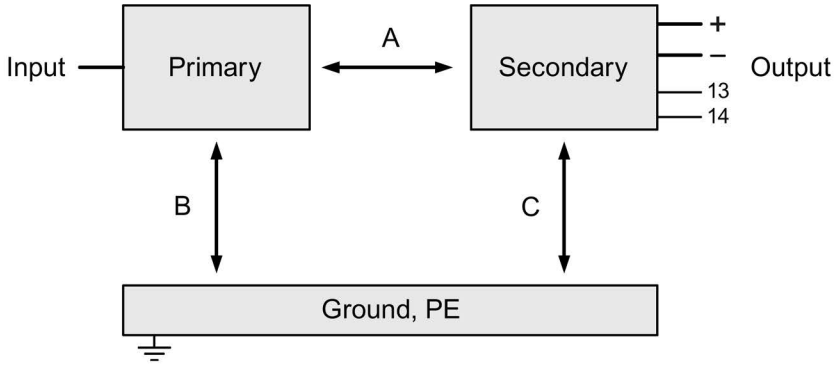


Figure 7-1 Test voltage diagram

Only the manufacturer can perform the type test and production test; users can also perform the field test.

Preconditions for performing the field test:

Tests (A) & (B)

- Connect the input terminals with one another
- Connect the output terminals, signaling contact and PE with one another

Test (C)

- Connect the output terminals and signaling contact with one another and measure with respect to PE

Table 7- 1 Test voltages for 6EP1333-3BA10 and 6EP1334-3BA10

	Test time	**Prim ↔ sec (A)**	**Prim ↔ PE (B)**	**Sec ↔ PE (C)**
Type test	60 s	5000 V DC	2500 V DC	-
Production test	1 s	4500 V DC	4500 V DC	500 V DC
Field test	1 s	4500 V DC	2250 V DC	500 V DC

Remark:
Tripping current for DC measurement: max. 10 mA

Table 7- 2 Test voltages for 6EP1336-3BA00 and 6EP1337-3BA00

	Test time	**Prim ↔ sec (A)**	**Prim ↔ PE (B)**	**Sec ↔ PE (C)**
Type test	60 s	4000 V DC	2500 V DC	-
Production test	1 s	3600 V DC	2250 V DC	500 V DC
Field test	1 s	3600 V DC	2250 V DC	500 V DC

Remark:
Tripping current for DC measurement: max. 10 mA

7.3 Approvals

	6EP1333-3BA10 (24 V/5 A) **6EP1334-3BA10 (24 V/10 A)**	**6EP1336-3BA00 (24 V/20 A)**	**6EP1337-3BA00 (24 V/40 A)**
CE marking	Yes (2014/35/EU, 2014/30/EU and 2011/65/EU)		
CB certificate	Yes (IEC 62368-1)	-	-
UL/cUL approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259		
cCSAus approval	cCSAus (CSA C22.2 No. 62368-1, UL 62368-1)	-	-
cURus approval	-	cURus-Recognized (UL 60950-1, CSA C22.2 No. 60950-1) File E151273	-
SEMI F47	Yes (IEC 61000-4-11)		
Marine approvals	DNV, ABS	DNV, ABS	-
UKCA marking	Yes		
RCM approval	Yes		
EAC approval	Yes		
BIS certificate	Yes	-	-
IRAM certificate	Yes	-	-

7.4 EMC

		6EP1333-3BA10 (24 V/5 A) **6EP1334-3BA10 (24 V/10 A)** **6EP1336-3BA00 (24 V/20 A)**	**6EP1337-3BA00 (24 V/40 A)**
Electrostatic discharge	EN 61000-4-2	8 kV contact, 8 kV air	
Electromagnetic fields	EN 61000-4-3	80 - 1000 MHz 25 V/m 1000 - 2700 MHz 10 V/m	
High-speed transient disturbance variables (burst)	EN 61000-4-4	4 kV at line supply connections 2 kV at the DC output	
Surge voltages	EN 61000-4-5	3 kV symmetrical at the line supply connections	
		6 kV symmetrical at the line supply connections	
		500 V symmetrical/asymmetrical on DC output cables	
High-frequency fields	EN 61000-4-6	10 V; 0.15 - 80 MHz	
Magnetic fields	EN 61000-4-8	30 A/m; 50 Hz	
Emitted interference	EN 55032	Class B	
Line harmonics limitation	EN 61000-3-2	Class A	-
Generic standards	EN 61000-6-2	Immunity for industrial environments	
	EN 61000-6-3	Emission for residential areas	

Ambient conditions

8

	6EP1333-3BA10 (24 V/5 A) 6EP1334-3BA10 (24 V/10 A)	6EP1336-3BA00 (24 V/20 A) 6EP1337-3BA00 (24 V/40 A)
Ambient temperature	-25 ... 70 °C for natural convection (self convection)	0 ... 70 °C for natural convection (self convection)
	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	
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 acc. to EN 60721, 5 - 95 % no condensation	
Degree of pollution	2	
Mechanical stress 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 • EN 60068-2-27 shock, test Ea: acceleration 150 m/s², test duration 11 ms	
Damaging gases	Tested according to: • EN 60068-2-42 sulfur dioxide • EN 60068-2-43 hydrogen sulfide	
Atmospheric pressure	Operation: • 1080 - 795 hPa (≤ 2000 m) • For operation at altitudes of 2000 - 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 4-5 Installation height derating (Page 24)) • 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 (≤ 3500 m)	

Applications

9

9.1 Parallel connection to increase the power rating

A parallel connection to increase the power is required if one power supply alone cannot supply the total power of a system. To increase the power, in most cases, identical power supplies can be electrically connected directly in parallel (see Chapter Technical data/ Output (Page 39) / Parallel connection to increase power).

The following general measures should be observed:

- The power supplies connected in parallel must be switched on simultaneously with a common switch in the line feeder cable (e.g. with the main switch available in control cabinets).
- The conductors connected to each power supply at terminals "+" and "-" must have the same impedance up to a common external connection point (terminal strip), i.e. they must have the same length and the same cross-section.

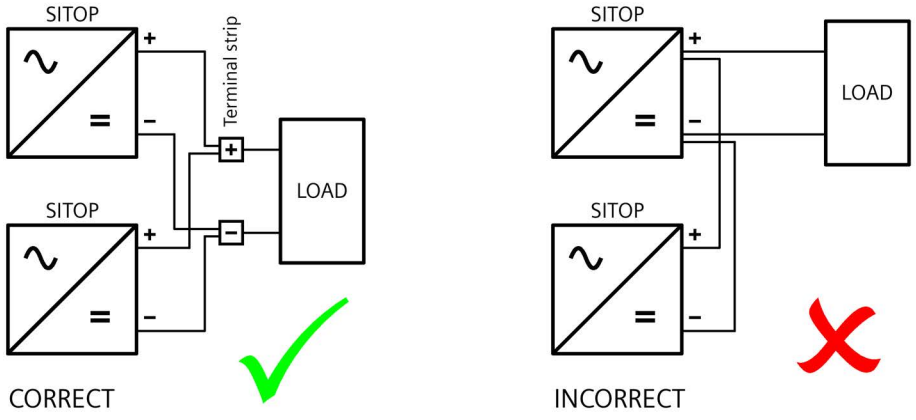


Figure 9-1 Parallel connection of two power supplies

- The power supplies connected in parallel must be adjusted to have the same output voltage.
- It is not permissible that dynamic power reserves, such as *Extra Power* and *Power Boost*, are taken into account a multiple number times when configuring the system.

NOTICE
Protective circuit when connecting more than two power supplies in parallel When connecting more than two power supplies in parallel, additional measures must be taken to prevent high reverse currents in the event of a secondary device fault. For this purpose, a suitable protective circuit (e.g. decoupling diode or DC-capable circuit breaker) must be installed between each "+" terminal of the power supply and the common connection point.

For a direct electrical parallel connection without support of the current distribution, the output voltages measured in no-load operation for the power supplies that are not yet connected in parallel should not deviate by more than a maximum of 50 mV. This usually corresponds to the factory setting.

Procedure to precisely align the output voltages:

1. Connect the "–" terminals of the devices to be connected in parallel
2. When the devices are operating under no load, measure the voltage difference between the "+" terminals that have not yet been connected.
3. Adjust the output voltages of the devices so that the voltage difference between the devices is less than 50 mV

Parallel connection with passive current distribution using an inclined output characteristic

In a parallel connection, to avoid that one power supply is continually operating with full load and the other only with partial load, for some device types, a passive current distribution can be realized using an output characteristic that can be switched over. For the inclined output characteristic for parallel operation, the output voltage is reduced as the output current increases. If, in a parallel connection, the output voltage of one device falls below the output voltage of the other, then the other device also participates in supplying the load. This prevents a device from being operated continuously at full load. The more precisely the output voltages of the devices connected in parallel are aligned to one another, the more even the current distribution among the devices. However, as a result of the inclined output characteristic, the output voltage of the parallel connection does not remain constant across the complete load range.

Procedure for the parallel connection with passive current distribution:

1. Align the output voltages of all devices as precisely as possible with one another when operating without any load
2. For all devices, select the inclined output characteristic for parallel operation
3. Switch off the devices
4. Establish the parallel wiring at the output terminals
5. Switch on all of the devices using one common switch

Assuming that the function is supported by the devices, more information to switch over the output characteristic is provided in Chapter Change-over switch (Page 14).

9.2 Parallel connection for redundancy

Two power supplies must be connected in parallel to provide 1+1 redundancy if especially high demands are placed on the safe and secure supply of a system. Two identical power supplies can be coupled with one another using SITOP redundancy modules. When one of the devices fails, then the other automatically takes over supplying the load.

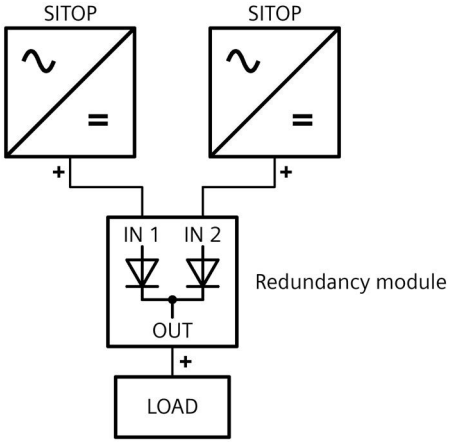


Figure 9-2 Redundant configuration with two power supplies and one redundancy module

Note

When dimensioning the system, it must be ensured that n+1 redundant connected power supplies can handle the total power requirement of the remaining n power supplies.

Note

For a high reliability of the supply, it is recommended that the redundant switched power supplies are fused separately on the line-side and, if possible, be connected to different line supplies. Single-phase power supplies should be connected to different phases of a supply system.

You can find additional information at:

Manual SITOP Expansion Modules
(https://support.industry.siemens.com/cs/ww/en/view/109768676)

9.3 Series connection for increased voltage

To implement an output voltage of 48 V DC, two identical 24 V power supplies can be connected in series. Depending on the grounding point of the secondary output voltage, voltages of +48 V, ±24 V or -48 V can therefore 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.

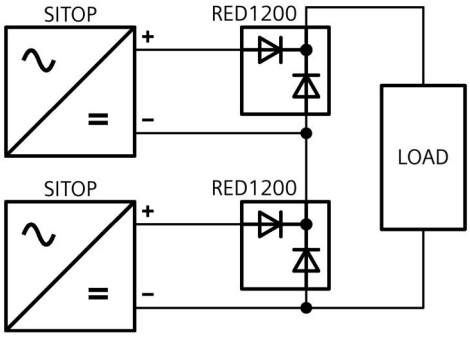


Figure 9-3 Two power supplies in a series connection with SITOP RED1200 redundancy module

WARNING

SELV (ES1) in the case of fault, not guaranteed

When connecting two power supplies in series, SELV (ES1) according to EN 61204-7, cannot be guaranteed in the case of a fault.

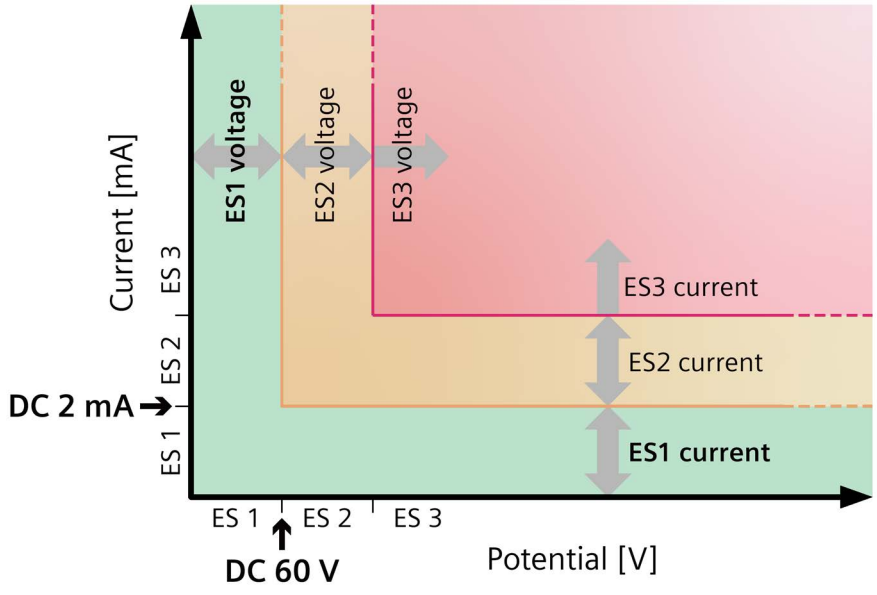


Figure 9-4 Representation of the ES limit values for voltage and current

9.4 Overload protection in the 24 V output circuit

If an overload occurs, the electronic current limiting function of the 24 V power supply limits the output current to a maximum value (see Chapter Technical data (Page 37)). The output cables are protected against a thermal overload if they are dimensioned corresponding to the maximum rms output current, or protected using additional components (for example, miniature circuit breaker, fuses).

However, a load circuit that fails as a result of overload, for instance, should frequently be reliably and quickly identified and specifically switched off before the power supply goes into current-limiting mode (in current-limiting mode, the supply voltage would also be reduced for all of the remaining 24 V loads).

SITOP PSE200U, SITOP SEL1200 and SITOP SEL1400 selectivity modules and the SITOP SEL1600 selectivity system are available to monitor 24 V branches for overload and short-circuit.

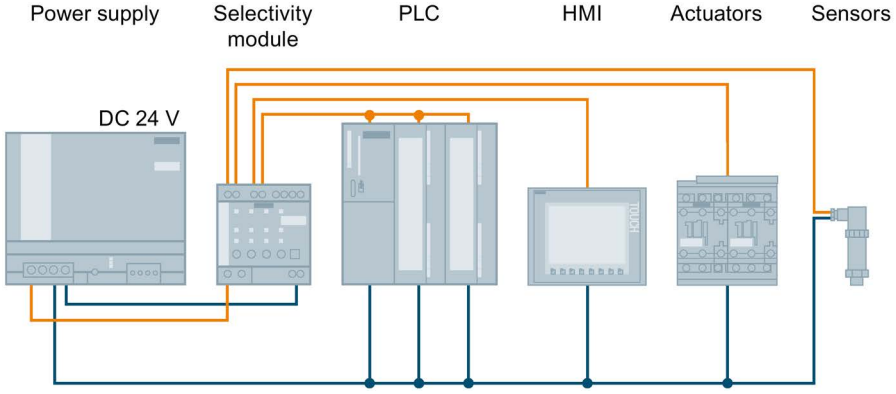


Figure 9-5 Electronic protection of 24 V loads shown as example with the SITOP PSE200U selectivity module

Brief current peaks, e.g. as a result of a high inrush current, are permitted, and branches with a longer overload are switched into a no-current condition. This is also ensured for cables in a high-ohmic condition and for short circuits that slowly develop over time.

When an output fails, the fault is signaled using a group signal contact or as a single channel signal (PSE200U, SEL1200, SEL1400) as well as via an IO-Link interface (SEL1600) and the branch of the module involved is signaled using an LED.

For variants with single-channel signaling, function blocks for evaluation purposes are available for SIMATIC S7-1200/1500/300/400, for STEP 7 Classic and TIA Portal at no charge.

You can find more information at:

Manual SITOP PSE200U selectivity module
(https://support.industry.siemens.com/cs/ww/en/view/108989004)

Manual SITOP SEL1200 and SEL1400 selectivity modules
(https://support.industry.siemens.com/cs/ww/en/view/109768675)

Manual SITOP selectivity system SEL1600
(https://support.industry.siemens.com/cs/ww/en/view/109815738)

9.5 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 37)).

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

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

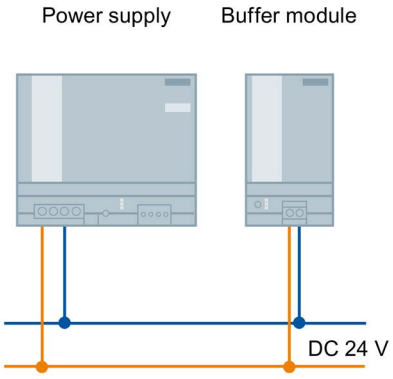


Figure 9-6 Buffering brief power failures shown as example using the SITOP PSE201U buffer module

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 more information at:

Manual SITOP Expansion Modules
(https://support.industry.siemens.com/cs/ww/en/view/109768676)

9.6 Protecting against longer power failures

Sudden and longer failures of the line supply voltage can result in undefined states and significant danger as a result of the associated failure of the plant or system control. The SITOP power supply product portfolio includes various DC-UPS solutions to prevent the failure of the 24 V power supply voltage.

Power supply failures up into the minutes range can be buffered using the maintenance-free SITOP UPS500 DC-UPS modules based on capacitors (Figure 9-7 24 V buffering shown as example to allow process data to be saved and controlled shutdown of PCs (Page 63)).

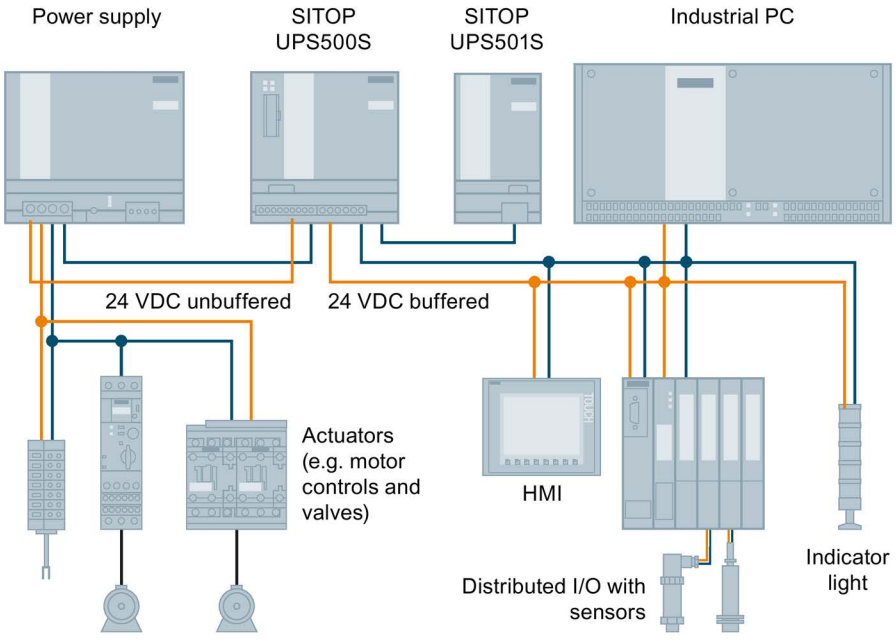


Figure 9-7 24 V buffering shown as example to allow process data to be saved and controlled shutdown of PCs

Using the free-of-charge SITOP DC-UPS software tool, DC-UPS systems can be simply integrated into PC-based automation solutions. This supports further processing of the status signals and safely running down the PC.

You can find more information at:

Manual, DC UPS with capacitors
(http://support.automation.siemens.com/WW/view/en/48932766/133300)

Using the SITOP UPS1600 DC UPS and battery modules SITOP BAT1600 or SITOP UPS1100, buffer times in the range of hours can be implemented. Intelligent battery management using Energy Storage Link automatically detects the energy storage device, and ensures optimum temperature-controlled charging and continuous monitoring. The UPS1600 with its digital inputs/outputs as well as optional USB interface or Ethernet/PROFINET port can be flexibly integrated into the widest range of automation applications.

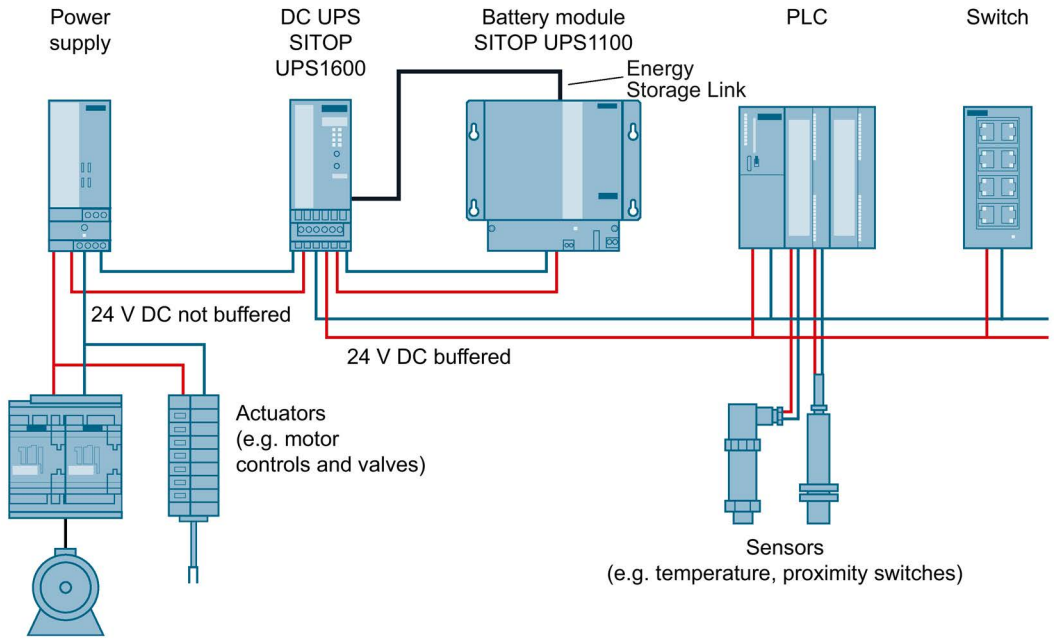


Figure 9-8 24 V buffering shown as example with SITOP UPS1600 to maintain communications, signaling functions, sensor measured values and position values

For open, PC-based automation systems, configuration and monitoring is realized using the free-of-charge SITOP Manager, or for devices with an older software release, using PC software SITOP UPS Manager (compatibility list, see DC-UPS Manual SITOP UPS1600/BAT1600/UPS1100 (http://support.automation.siemens.com/WW/view/en/84977415)). This allows PC responses to the operating states of the DC UPS to be freely selected – and offers comprehensive diagnostic functions.

For TIA-based automation systems, the UPS1600 is engineered using the TIA Portal. Special function blocks for SIMATIC S7-300/400/1200 and S7-1500 are available at no charge, and make it easy to integrate operating and diagnostics information into STEP 7 user programs. Preconfigured UPS faceplates for WinCC visualization can be downloaded at no charge.

You can find more information at:

Manual DC-USV SITOP UPS1600/BAT1600/UPS1100 (http://support.automation.siemens.com/WW/view/en/84977415)

Environment

10

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

11

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/cs/ww/en/sc/2067)

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)