

SITOP power supply

SITOP PSU100L

Manual

SITOP PSU100L 24V/2.5A
6EP1332-1LB00
SITOP PSU100L 24V/5A
6EP1333-1LB00
SITOP PSU100L 24V/10A
6EP1334-1LB00
SITOP PSU100L 24V/20A
6EP1336-1LB00

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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

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

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

Description



The 1-phase SITOP PSU100L from the SITOP lite product line is the power supply series to address basic requirements in the industrial environment. It offers all of the important functions at a favorable price – and does not compromise when it comes to quality and reliability.

The key benefits of the product include:

- 1-phase input voltage range with manual switchover
- Narrow design
- Good efficiency
- Green LED for "24 V O.K."
- Can be connected in parallel
- No lateral installation clearances required
- Ambient temperature from 0 °C to 60 °C (exception, 6EP1336-1LB00: 0 °C to 70 °C) (from 45 °C with derating)
- Cooling through natural convection
- Short circuit and overload protection
- Certification according to CE and cULus

Ordering data

The following device options are available:

Regulated power supply unit SITOP PSU100L	
Type	Order number
Input, 120/230 V AC Output, 24 V DC/2.5 A	6EP1332-1LB00
Input, 120/230 V AC Output, 24 VDC/5 A	6EP1333-1LB00
Input, 120/230 V AC Output, 24 V DC/10 A	6EP1334-1LB00
Input, 120/230 V AC Output, 24 V DC/20 A	6EP1336-1LB00

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Safety instructions

1

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.

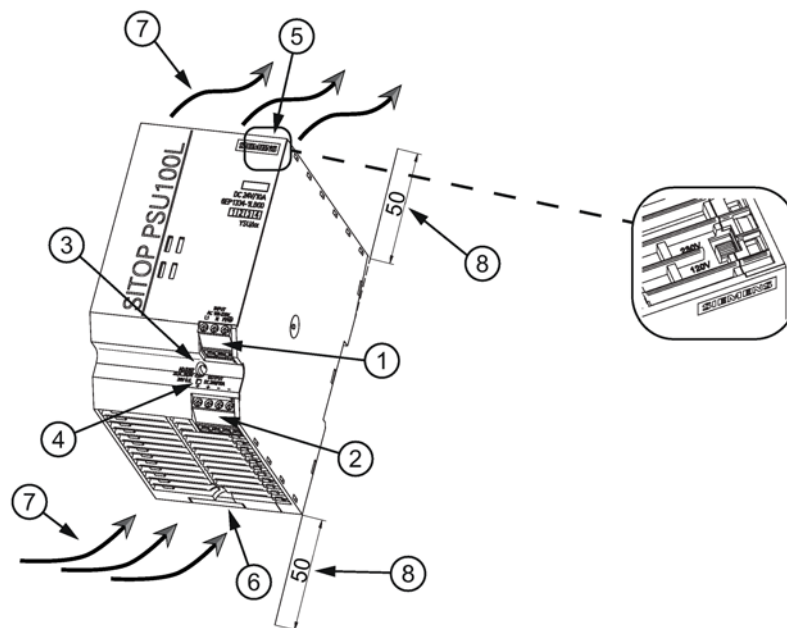
Before installation or maintenance work can begin, the system's main switch must be switched off and measures taken to prevent it being switched on again.

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

Description, device design, dimension drawing

2.1 Device description

SITOP PSU100L is a primary-clocked power supply for connection to a 1-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 display is used to signal the operating state.



- ① AC input
- ② DC output
- ③ Potentiometer U_{out}
- ④ Indicator light (24 V O.K.)
- ⑤ Voltage selector switch
- ⑥ DIN rail slider
- ⑦ Natural convection
- ⑧ Clearance above/below

Figure 2-1 Design (example, 6EP1334-1LB00)


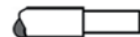


2.2 Connections and terminal designation

Note

UL requirement: Use suitable copper cables that are designed for operating temperatures of at least 65 °C/75 °C.





The line input terminals ① can be used to establish the connection to supply voltage. The output terminals ② are used to connect to the loads to be supplied (see also Section Installation (Page 31)).

Connections and terminal designations	
① Line input L1, N, PE	One screw terminal each
② Output +	2 screw terminals
② Output –	2 screw terminals

	① + ②	③
	SZS 0,6 x 3,5 / PZ1 / PH1	SZS 0,6 x 3,5 max. Ø 3,5 mm
	1 x 0,5 - 2,5 mm ²	-
	1 x 0,5 - 2,5 mm ²	-
AWG	22 - 14	-
Nm	0,5 - 0,6 Nm (5 - 7 lbf in)	0,04 Nm (0,35 lbf in) ^{*1)}
	8 mm	-

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

Figure 2-2 Terminal data for 6EP1332-1LB00, 6EP1333-1LB00 and 6EP-1334-1LB00

	①	②	③
	SZS 0,6 x 3,5 / PZ1 / PH1	SZS 0,6 x 3,5 / PZ1 / PH1	SZS 0,6 x 3,5 / max. Ø 4,5 mm
	1 x 0,5 - 2,5 mm ²	1 x 0,5 - 6 mm ²	-
	1 x 0,5 - 2,5 mm ²	1 x 0,5 - 4 mm ²	-
AWG	22 - 14	30 - 10	-
Nm	0,5 - 0,6 Nm	1 - 1,2 Nm	0,04 Nm ^{*1)}
	8 mm	7,5 mm	-

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

Figure 2-3 **Terminal data for 6EP1336-1LB00**

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 22.8 - 26.4 V (for 6EP1336-1LB00 22.8 - 28 V); for example, to compensate voltage drops across long supply lines to the connected load.

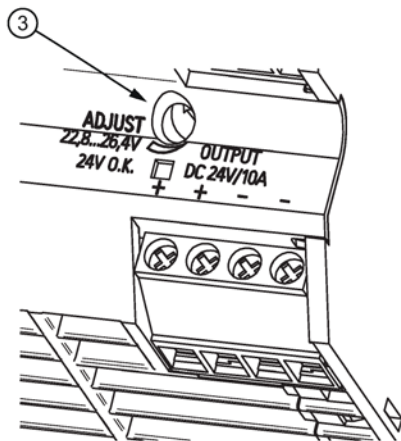


Figure 2-4 Potentiometer (example, 6EP1334-1LB00)

NOTICE

Thermal overload possible

When adjusting the output voltage to greater than the rated voltage, 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.

The end stop may be subject to a maximum load of 0.04 Nm (0.35 lbf in).

For information on actuating the potentiometer (screwdriver, torque), see Connections and terminal designation (Page 10).

2.4 Status displays and signaling

	6EP1332-1LB00 (24 V / 2.5 A)
	6EP1333-1LB00 (24 V / 5 A)
	6EP1334-1LB00 (24 V / 10 A)
	6EP1336-1LB00 (24 V/20 A)
Operating display	LED green for "24 V O.K."

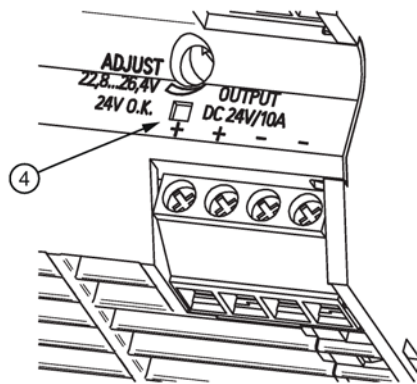


Figure 2-5 Operating display and signaling (example 6EP1334-1LB00)

Signaling	6EP1332-1LB00 (24 V / 2.5 A)
	6EP1333-1LB00 (24 V / 5 A)
	6EP1334-1LB00 (24 V / 10 A)
	6EP1336-1LB00 (24 V/20 A)
LED ④ lights up green	Normal operation, output voltage $> 20 \text{ V} \pm 0.5 \text{ V}$
LED ④ off	No supply voltage

2.5 Voltage selector switch

Selector switch for the input voltage range

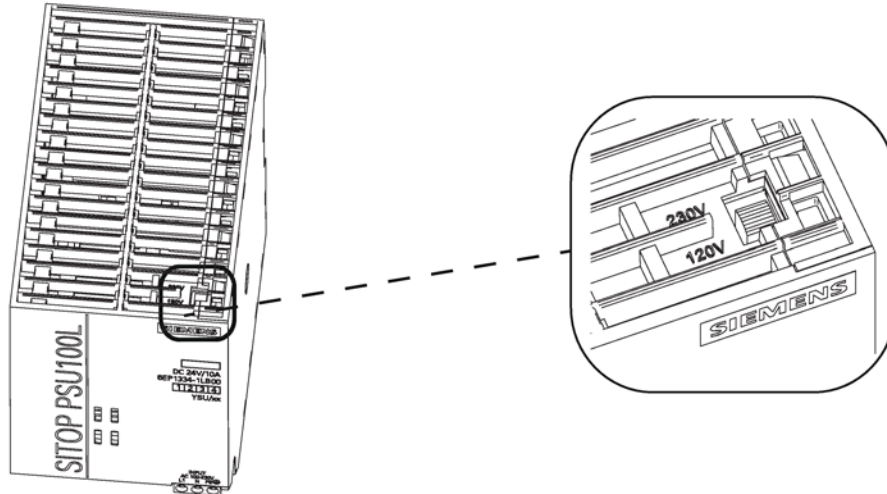
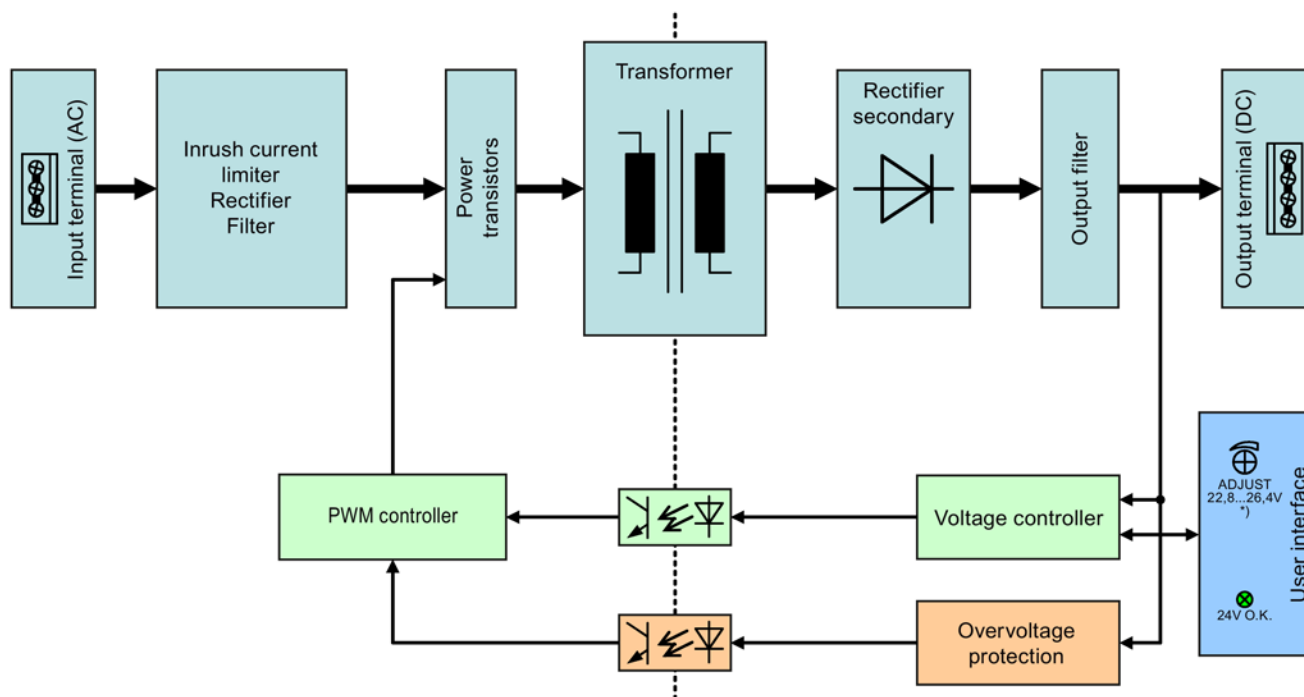


Figure 2-6 120 V/230 V voltage selector switch (example, 6EP1334-1LB00)

The selector switch as delivered (factory setting) is in the 230 V position. It must be moved to the appropriate position for operation in the 120 V range. The selector switch can only be actuated in the de-energized state.

2.6 Block diagram



*) Setting range for 6EP1336-1LB00: 22.6 - 28 V

Figure 2-7 Block diagram

2.7 Dimensions and weight

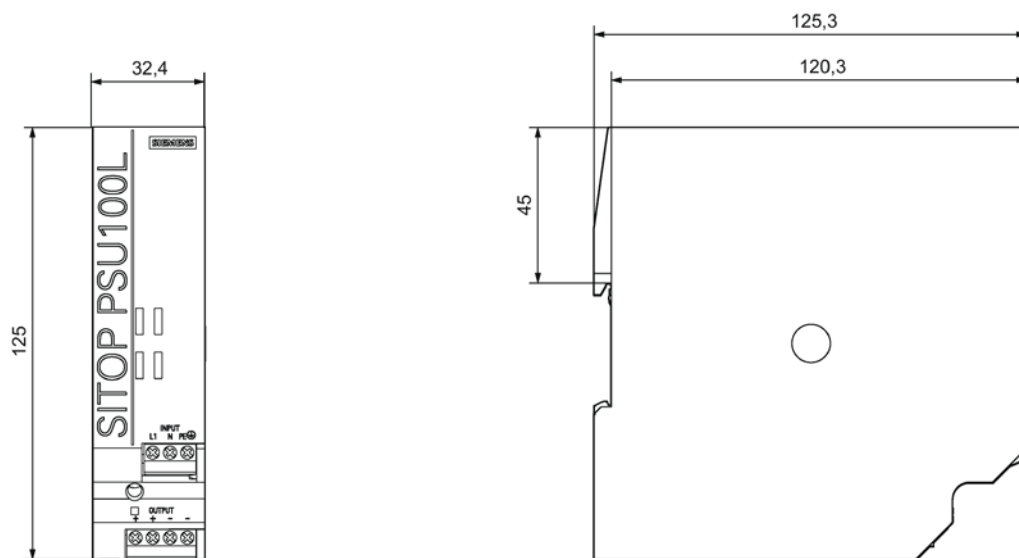


Figure 2-8 Dimension drawing 6EP1332-1LB00

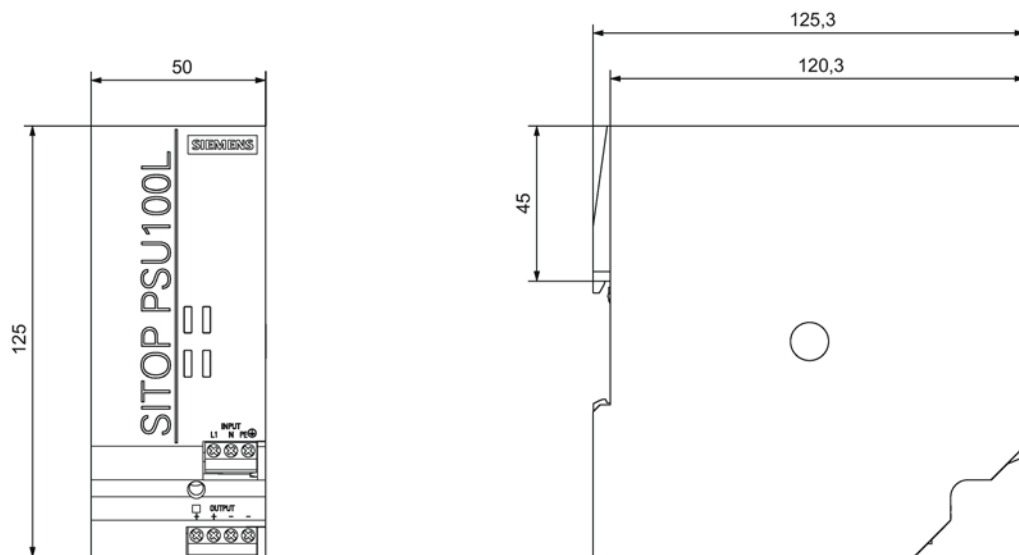


Figure 2-9 Dimension drawing 6EP1333-1LB00

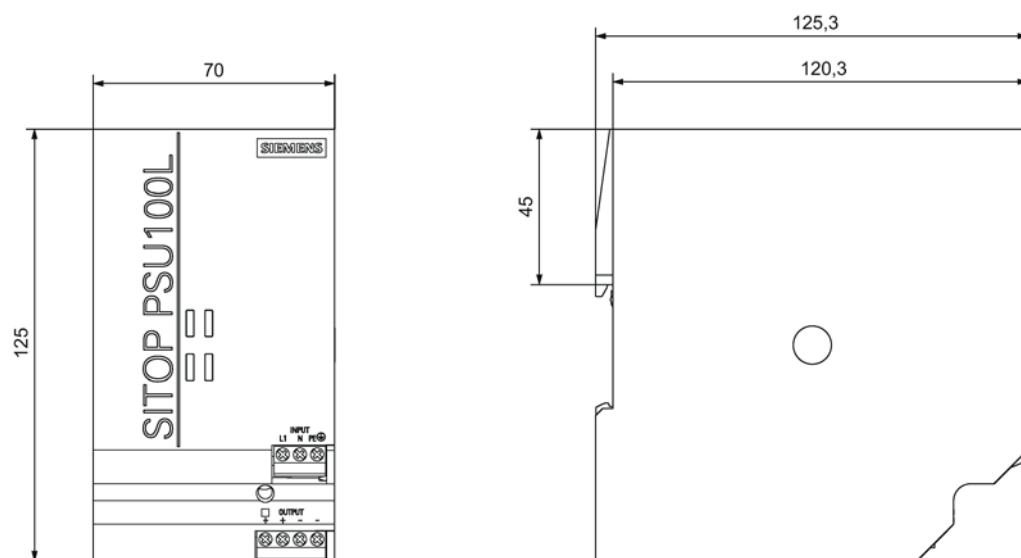


Figure 2-10 Dimension drawing 6EP1334-1LB00

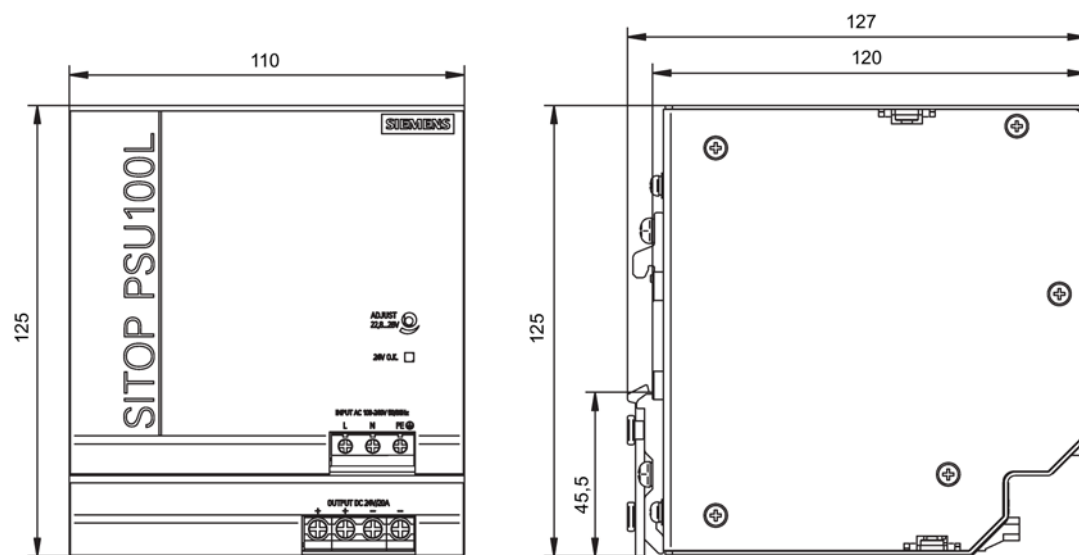


Figure 2-11 Dimension drawing 6EP1336-1LB00

	6EP1332-1LB00 (24 V/2.5 A)	6EP1333-1LB00 (24 V/5 A)	6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Dimensions (W × H × D) in mm	32.5 × 125 × 120.3	50 × 125 × 120.3	70 × 125 × 120.3	110 × 125 × 125
Weight	approx. 0.32 kg	Approx. 0.5 kg	Approx. 0.75 kg	1.65 kg

Mounting/removal

WARNING

Installing the device in a housing or a control cabinet

SITOP PSU100L power supplies are built-in devices. They must be installed in a housing or control cabinet where only qualified personnel have access.

The device can be mounted in a control cabinet on standard mounting rails TH35-15/7,5 (EN 60715).

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".

Removal

To remove, pull up the slider ⑥ using a screwdriver (see Figure 3-1 Removal (example, 6EP1334-1LB00) (Page 19)) 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.

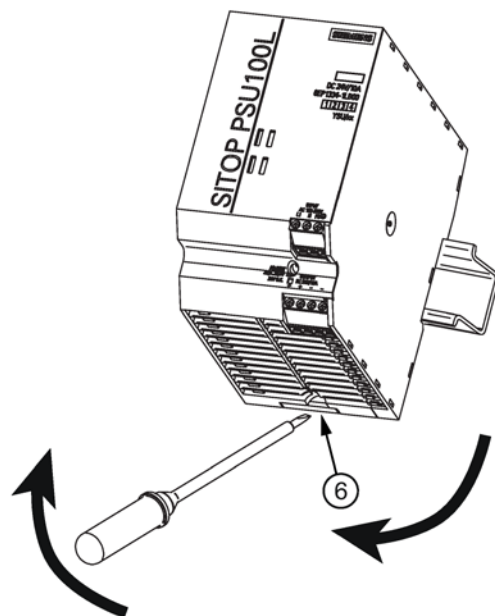


Figure 3-1 Removal (example, 6EP1334-1LB00)

Mounting position, mounting clearances

4.1 Standard mounting position

The device is mounted on standard mounting rails according to EN 60715 35×7,5/15. The device must be mounted vertically in such a way that the input terminals and the output terminals are at the bottom to ensure correct cooling.

A clearance of at least 50 mm should be maintained above and below the device.

No space is required at the side.

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

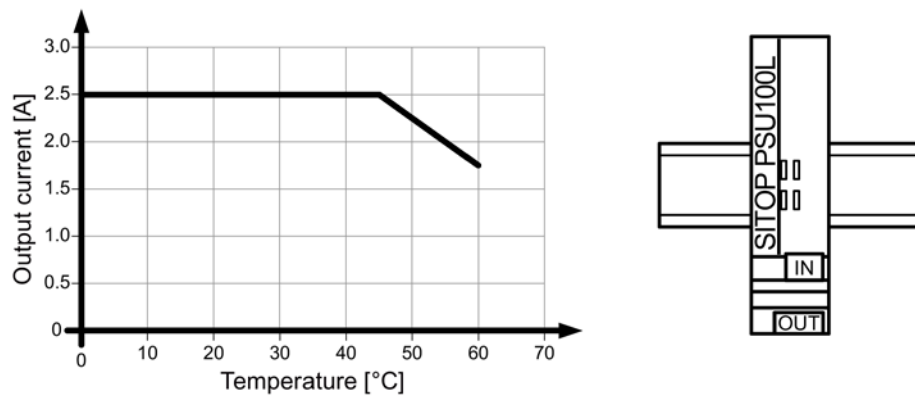


Figure 4-1 6EP1332-1LB00 mounting position

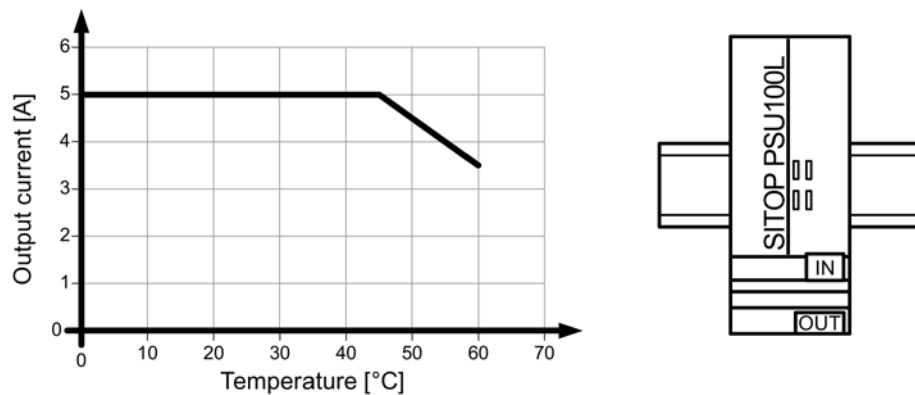


Figure 4-2 6EP1333-1LB00 mounting position

4.1 Standard mounting position

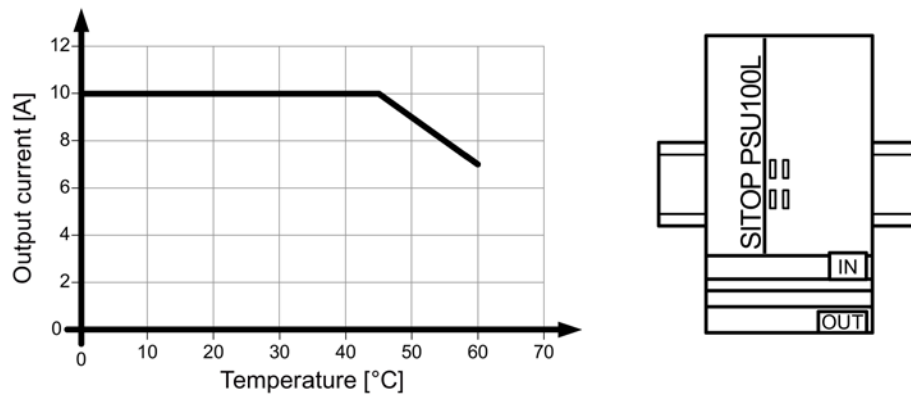


Figure 4-3 6EP1334-1LB00 mounting position

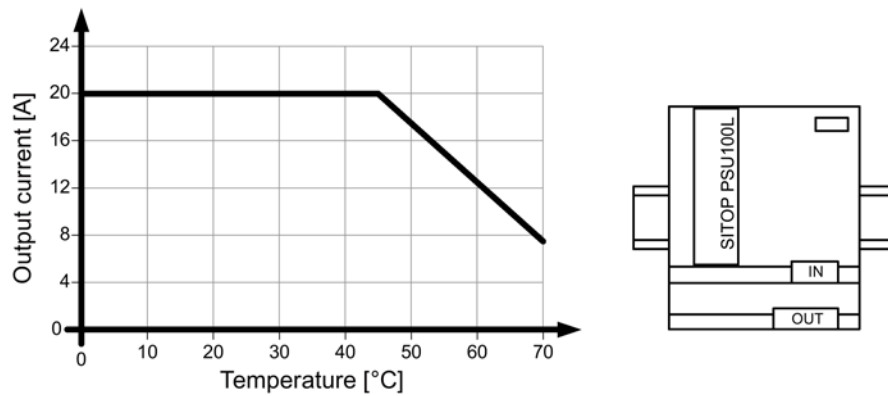


Figure 4-4 6EP1336-1LB00 mounting position

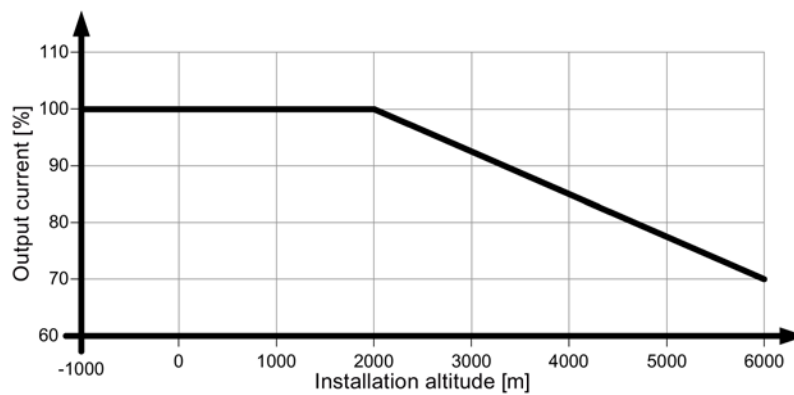


Figure 4-5 Mounting height derating

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 6EP1332-1LB00

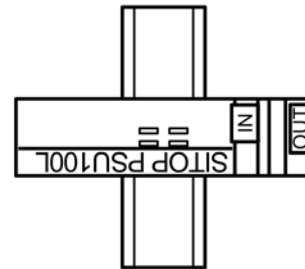
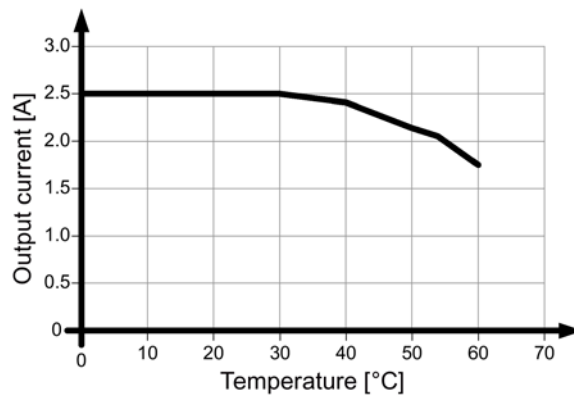


Figure 4-6 6EP1332-1LB00 mounting position (1)

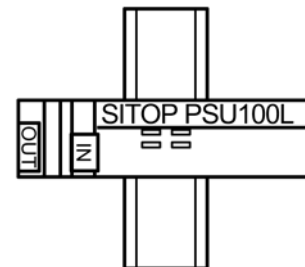
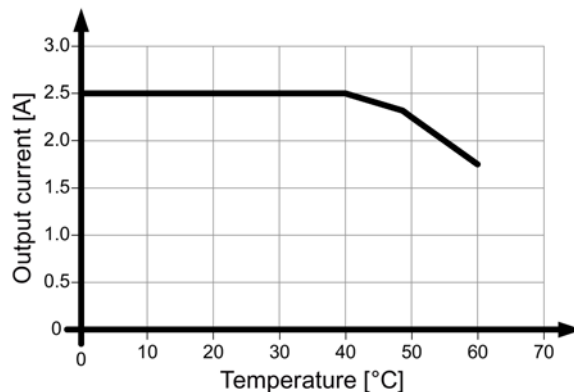


Figure 4-7 6EP1332-1LB00 mounting position (2)

4.2 Other mounting positions

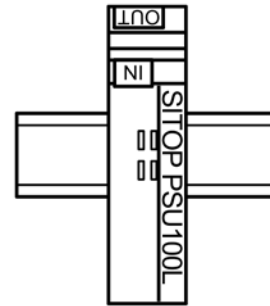
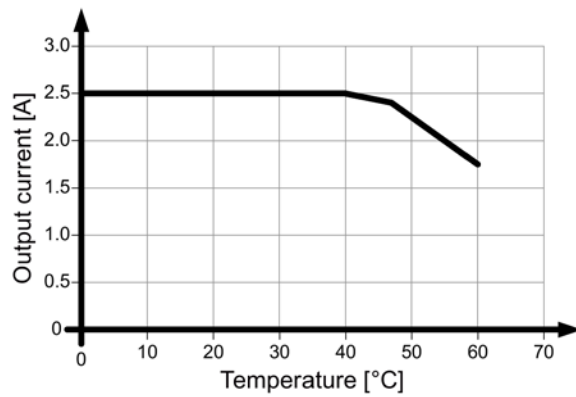


Figure 4-8 6EP1332-1LB00 mounting position (3)

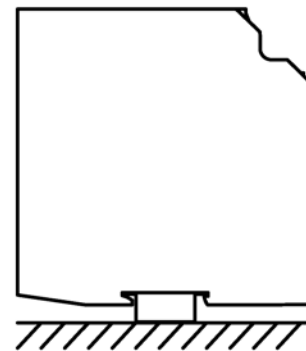
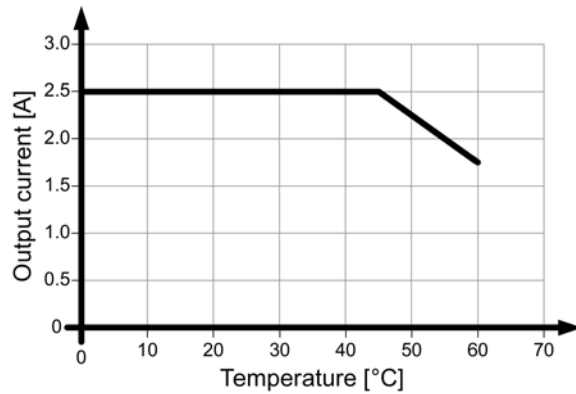


Figure 4-9 6EP1332-1LB00 mounting position (4)

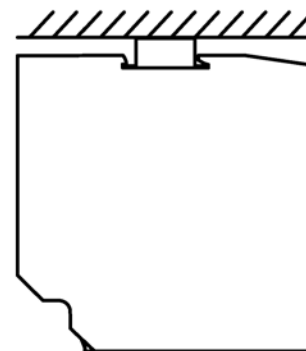
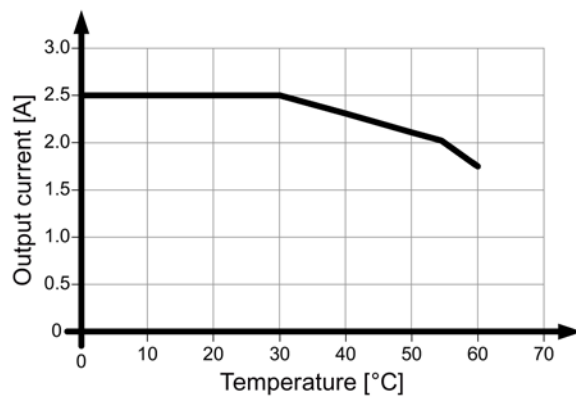


Figure 4-10 6EP1332-1LB00 mounting position (5)

4.2.2 6EP1333-1LB00

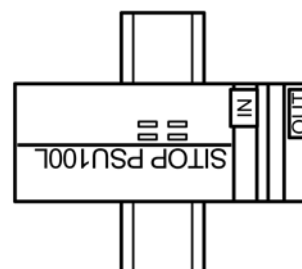
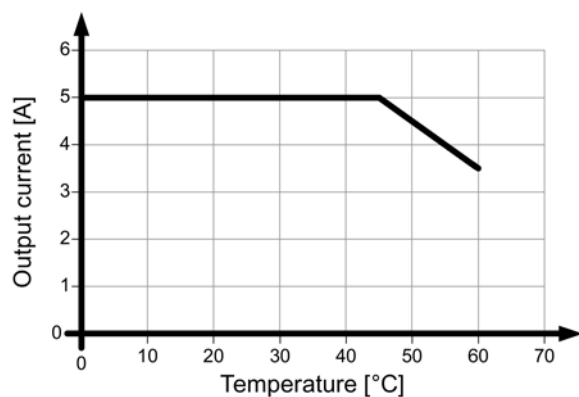


Figure 4-11 6EP1333-1LB00 mounting position (1)

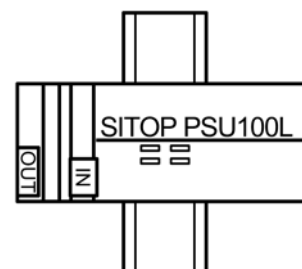
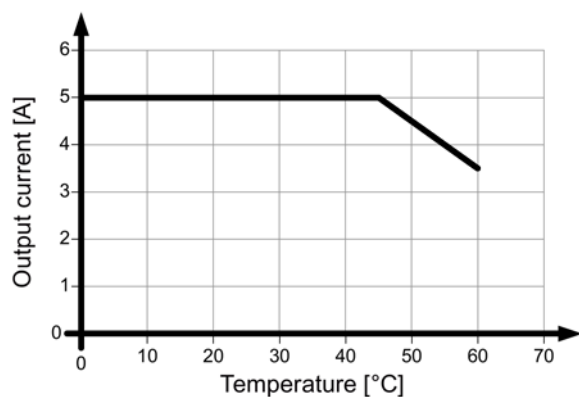


Figure 4-12 6EP1333-1LB00 mounting position (2)

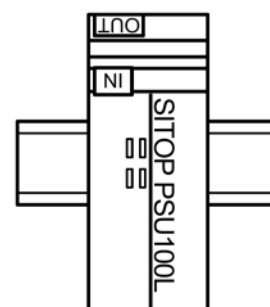
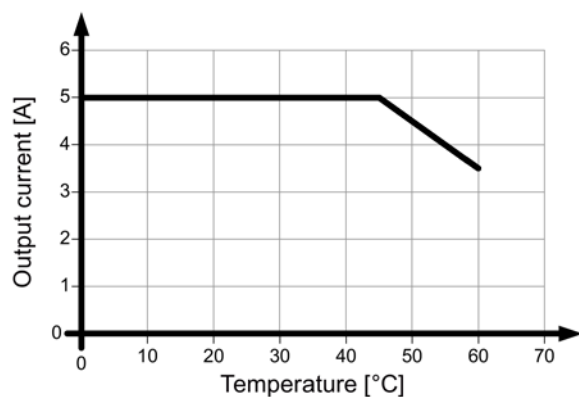


Figure 4-13 6EP1333-1LB00 mounting position (3)

4.2 Other mounting positions

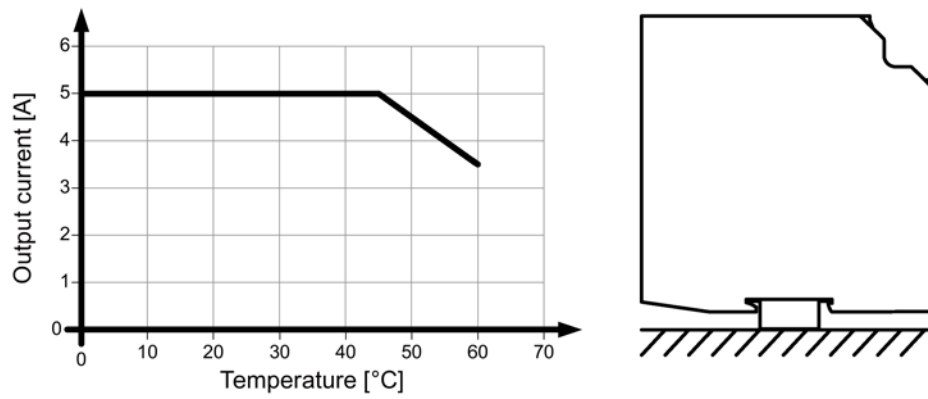


Figure 4-14 6EP1333-1LB00 mounting position (4)

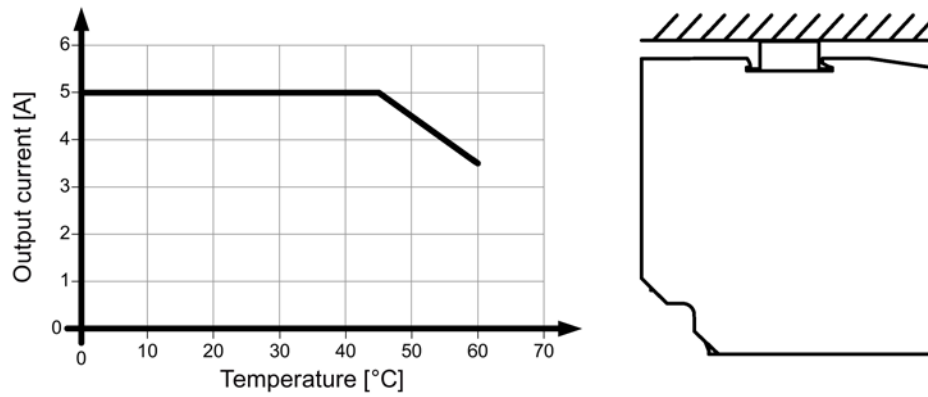


Figure 4-15 6EP1333-1LB00 mounting position (5)

4.2.3 6EP1334-1LB00

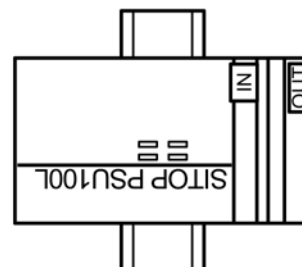
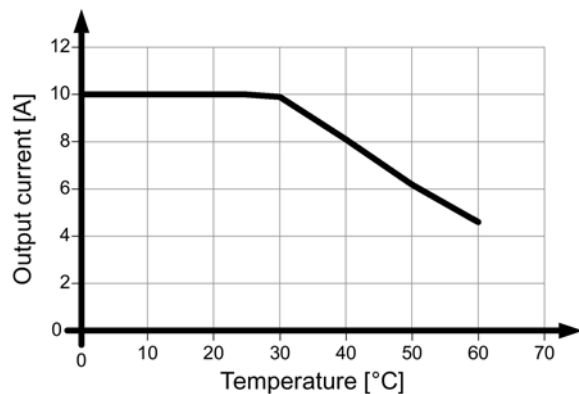


Figure 4-16 6EP1334-1LB00 mounting position (1)

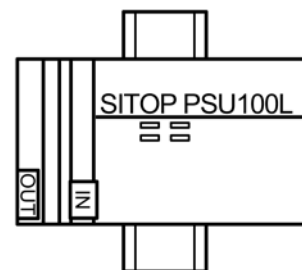
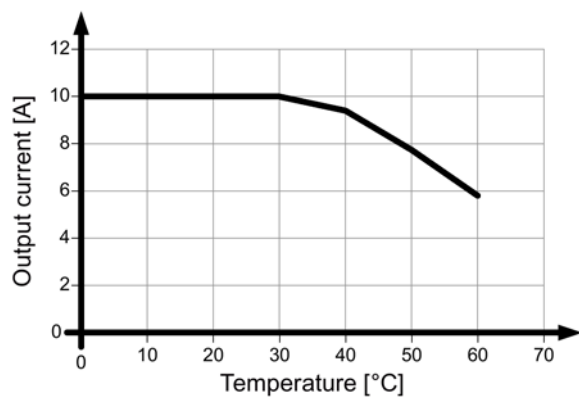


Figure 4-17 6EP1334-1LB00 mounting position (2)

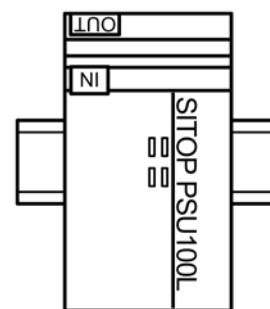
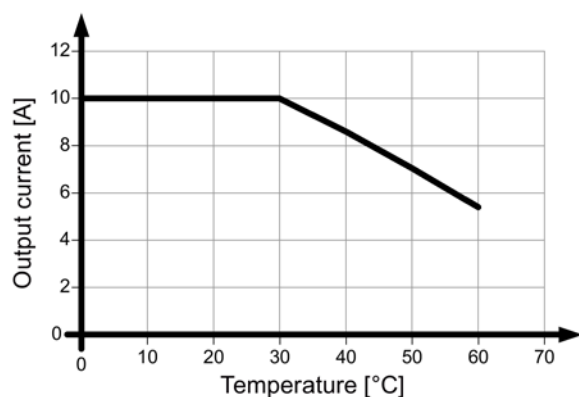


Figure 4-18 6EP1334-1LB00 mounting position (3)

4.2 Other mounting positions

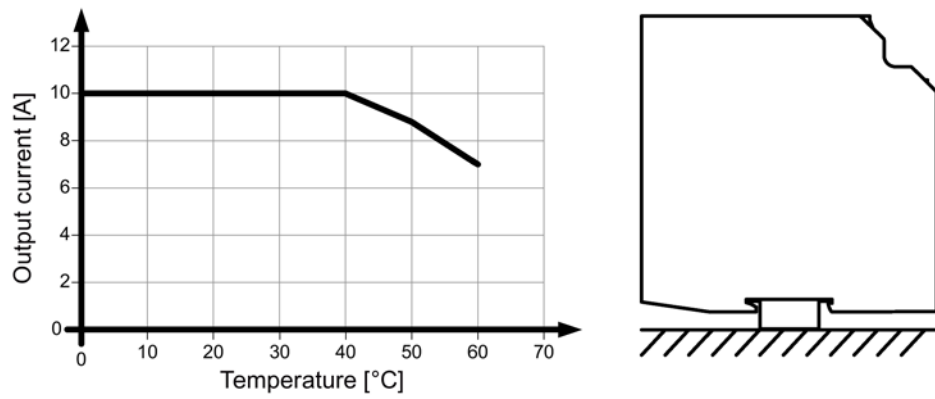


Figure 4-19 6EP1334-1LB00 mounting position (4)

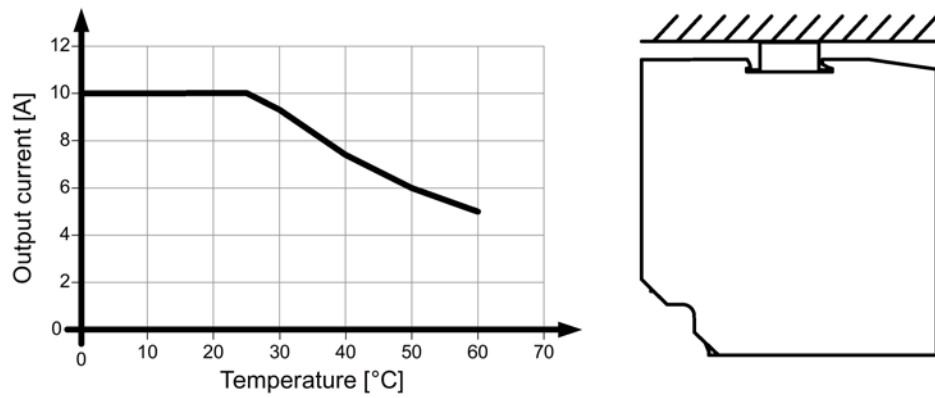


Figure 4-20 6EP1334-1LB00 mounting position (5)

4.2.4 6EP1336-1LB00

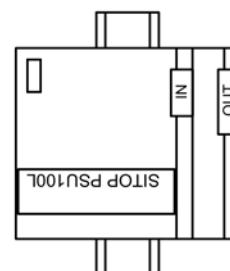
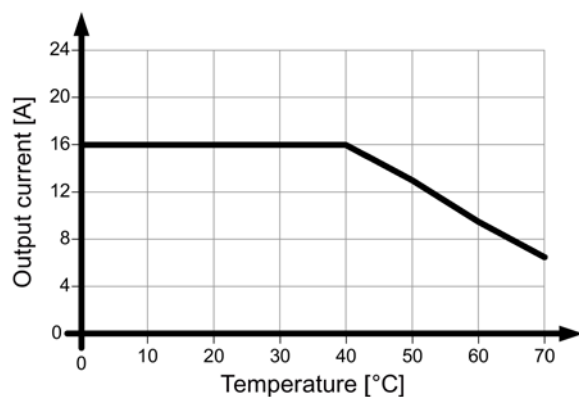


Figure 4-21 6EP1336-1LB00 mounting position (1)

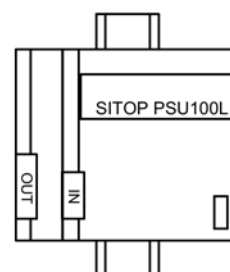
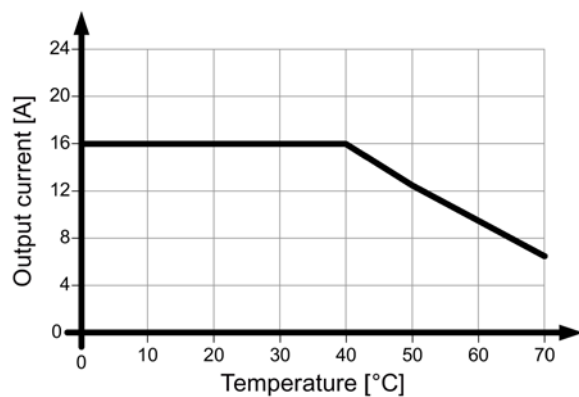


Figure 4-22 6EP1336-1LB00 mounting position (2)

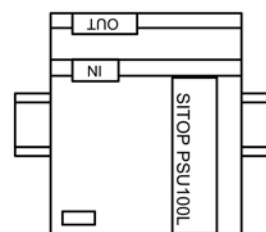
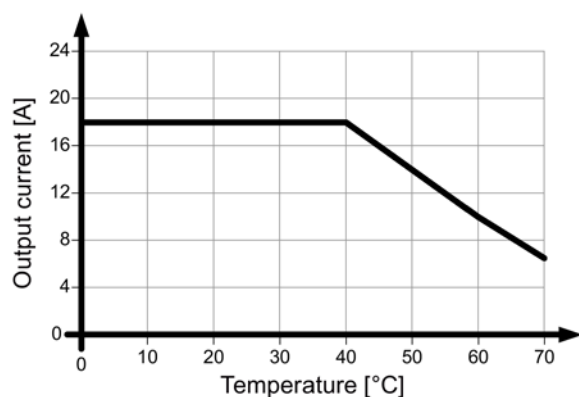


Figure 4-23 6EP1336-1LB00 mounting position (3)

4.2 Other mounting positions

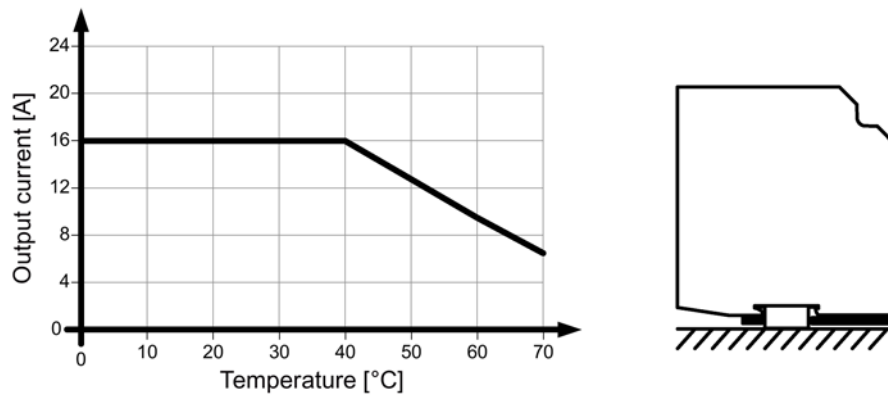


Figure 4-24 6EP1336-1LB00 mounting position (4)

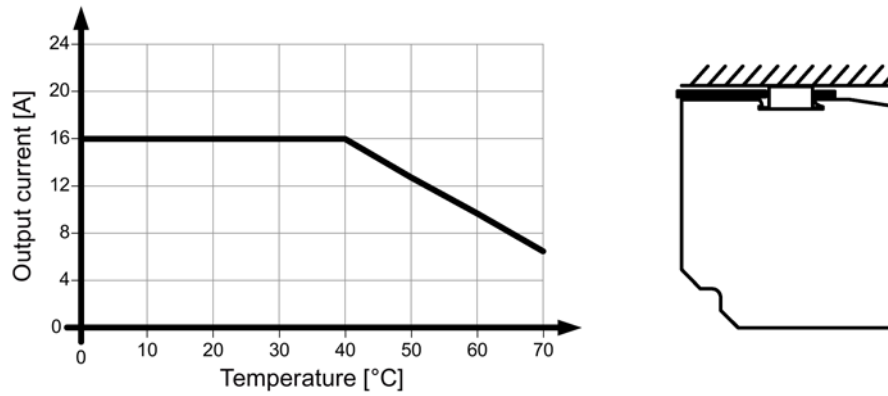


Figure 4-25 6EP1336-1LB00 mounting position (5)

⚠ 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.

5.1 Line-side connection

SITOP PSU100L power supplies are designed for connection to a 1-phase AC line supply (TN or TT system according to VDE 0100 T 300/IEC 364-3) with a rated voltage of 120/230 V AC, 50 - 60 Hz.

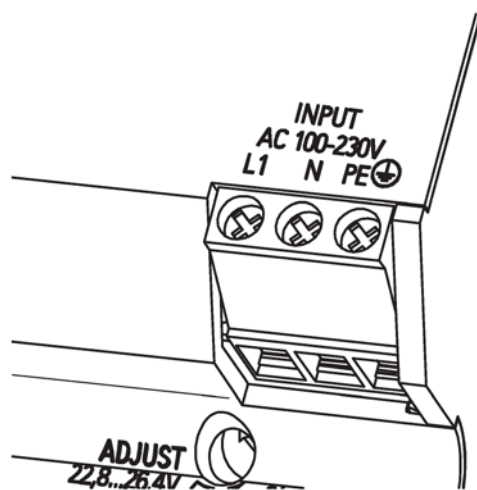


Figure 5-1 Line connection (example, 6EP1334-1LB00)

The line supply is connected using terminals L1, N and PE (see Figure 5-1 Line connection (example, 6EP1334-1LB00) (Page 31)), and must be implemented according to IEC 60364 and EN 50178 . 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 is true for the complete line supply protected by the ground-fault circuit interrupter.

Protection

SITOP PSU100L	Required line-side protection
6EP1332-1LB00 (24 V/2.5 A)	Miniature circuit breaker (IEC 898), characteristic C, 3 A
6EP1333-1LB00 (24 V/5 A)	Miniature circuit breaker (IEC 898), characteristic C, 6 A
6EP1334-1LB00 (24 V/10 A)	Miniature circuit breaker (IEC 898), characteristic C, 10 A
6EP1336-1LB00 (24 V/20 A)	Miniature circuit breaker (IEC 898), characteristic C, 10 A

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

Other country-specific regulations may have to be observed when installing the device.

5.2 Output-side connection

SITOP PSU100L power supply provides an isolated (= non-grounded) SELV output voltage (Safety Extra Low Voltage). 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 (refer to Chapter Technical data (Page 33)).

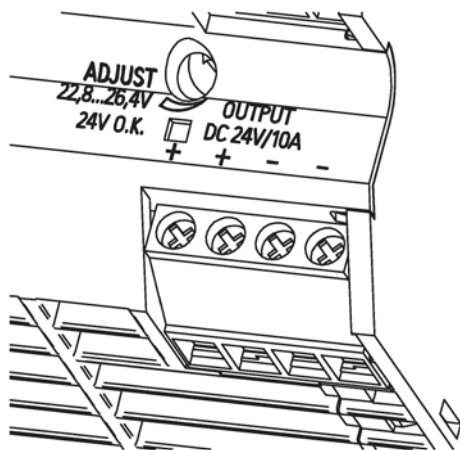


Figure 5-2 Connection of the output voltage (example: 6EP1334-1LB00)

The output voltage is connected via the + and - terminals at the output of the power supply (see Figure 5-2 Connection of the output voltage (example: 6EP1334-1LB00) (Page 32)). 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), 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

Note

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

6.1 Input

	6EP1332-1LB00 (24 V/2.5 A)	6EP1333-1LB00 (24 V/5 A)	6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Input	1-phase, AC			
Rated voltage $U_{in rated}$	120/230 V			100 - 240 V
Voltage range	93 - 132 V/187 - 264 V			85 - 264 V AC
• Remark	Setting via selector switch at the device			88 - 370 V DC
Switch-in/switch-off threshold, typ.	72 V/61 V or 144 V/106 V	68 V/64 V or 136 V/106 V	82 V/71 V or 166 V/131 V	81 V/72 V AC 112 V/65 V DC
Overvoltage strength	$2.3 \times U_{in rated}$, 1.3 ms			
Line failure buffering at $I_{out rated}$, min.	20 ms	20 ms	20 ms	20 ms
Power failure buffering	at 93/187 V			at 85/170 V
Rated line frequency	50 - 60 Hz			
Line frequency range	47 - 63 Hz			
Input current / at rated value of input voltage 120 V	1.1 A	2.1 A	4.1 A	5.55 A
Input current/at rated value of input voltage 230 V	0.65 A	1.15 A	2 A	2.35 A
Inrush current limiting (25 °C), max.	27 A	32 A	65 A	45 A
I^2t , max.	0.3 A ² s	0.8 A ² s	3.3 A ² s	-
Duration of the switch-on current limiting / at 25 °C/typical	3 ms	3 ms	3 ms	-
Integrated input fuse	T 2 A/250 V (not accessible)	T 3.15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)	T 10 A/250 V (not accessible)
Protection in the line feeder cable (IEC 898)	Recommended miniature circuit-breaker: from 3 A, characteristic C	Recommended miniature circuit-breaker: from 6 A, characteristic C	Recommended miniature circuit-breaker: from 10 A, characteristic C	Recommended miniature circuit-breaker: from 10 A, characteristic C

6.2 Output

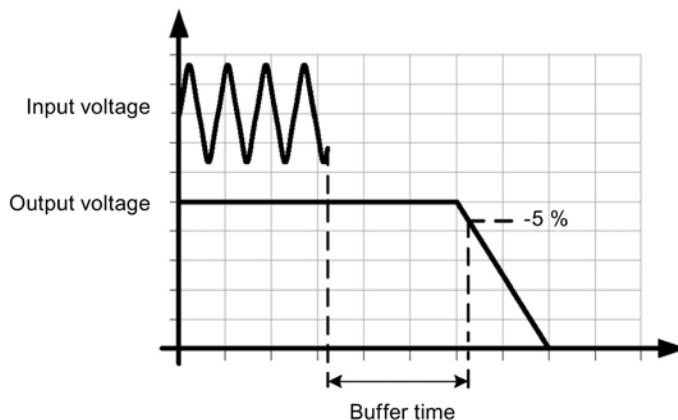


Figure 6-1 Power failure buffering

6.2 Output

	6EP1332-1LB00 (24 V/2.5 A)	6EP1333-1LB00 (24 V/5 A)	6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Output	Regulated, isolated DC voltage			
Rated voltage $U_{out rated DC}$	24 V			
Total tolerance, static \pm	3 %	3 %	3 %	3 %
Static line regulation, approx. \pm	0.1 %	0.1 %	0.1 %	0.1 %
Static load regulation, approx. \pm	0.5 %	0.5 %	0.5 %	0.5 %
Residual ripple Peak-peak, max.	150 mV	150 mV	150 mV	150 mV for a bandwidth of 20 MHz
Residual ripple peak-peak, typ.	10 mV	50 mV	50 mV	80 mV for a bandwidth of 20 MHz
Spikes peak-peak, max. (bandwidth, 200 MHz)	240 mV	240 mV	240 mV	-
Spikes peak-peak, typ. (bandwidth, approx. 20 MHz)	50 mV	150 mV	150 mV	200 mV
Adjustment range	22.8 - 26.4 V			22.8 - 28 V
Product function/output voltage can be adjusted	Yes			
Adjusting the output voltage	Using a potentiometer	Using a potentiometer	Using a potentiometer	Using a potentiometer
Operating display	LED green for "24 V O.K."			
Response when switching on/off	U_{out} overshoots by approximately 4 %			

	6EP1332-1LB00 (24 V/2.5 A)	6EP1333-1LB00 (24 V/5 A)	6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Starting delay, max.	1.5 s	1.5 s	1.5 s	1.5 s
Start delay, typ.	150 ms	150 ms	1.5 s	1 s
Voltage rise 120 V/230 V AC max.	500 ms	500 ms	500 ms	500 ms
Voltage rise, typ.	150 ms	130 ms	170 ms	150 ms
Rated current $I_{out rated}$	2.5 A	5 A	10 A	20 A
Current range	0 - 2.5 A	0 - 5 A	0 - 10 A	0 - 20 A
• Remark	2.5 A to 45 °C 1.75 A to 60 °C	5 A to 45 °C 3.5 A to 60 °C	10 A to 45 °C 7 A to 60 °C	20 A to 45 °C 12.5 A to 70 °C
Output active power/typical	60 W	120 W	240 W	480 W
Can be connected in parallel to increase the power rating	Yes			
Number of devices that can be connected in parallel to increase the power rating, units	2			
Output characteristic	See Figure 6-3 Output characteristic 6EP1332-1LB00 (Page 36)	See Figure 6-4 Output characteristic 6EP1333-1LB00 (Page 36)	See Figure 6-5 Output characteristic 6EP1334-1LB00 (Page 36)	See Figure 6-6 6EP1336-1LB00 output characteristic (Page 37)
Capacitive load, max.	2 mF/A			

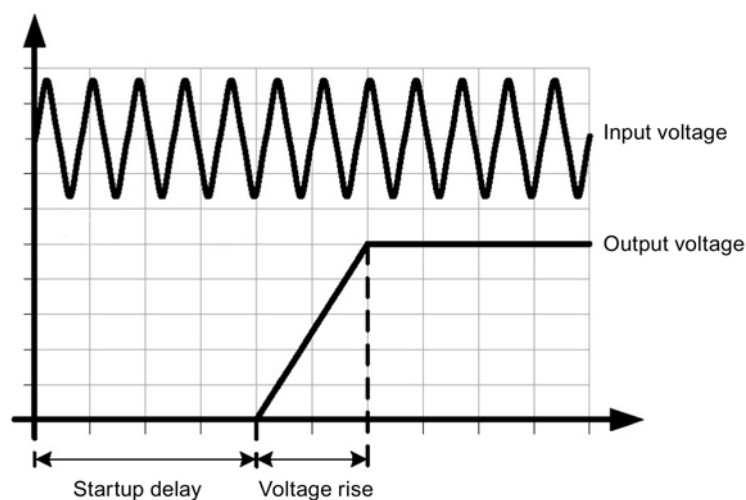


Figure 6-2 Startup delay/voltage rise

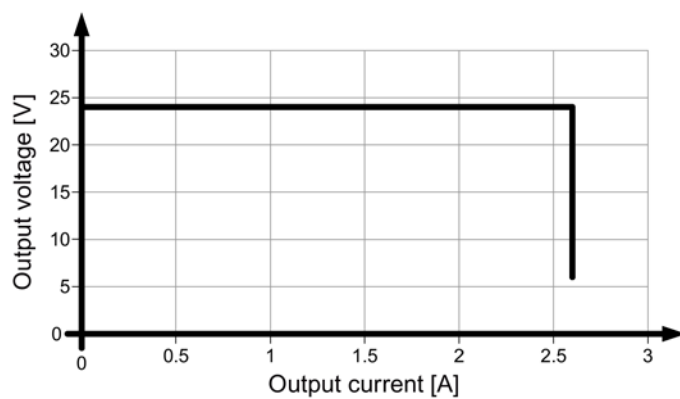


Figure 6-3 Output characteristic 6EP1332-1LB00

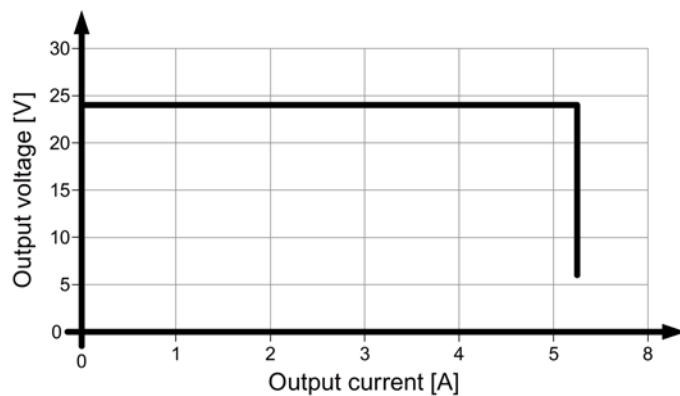


Figure 6-4 Output characteristic 6EP1333-1LB00

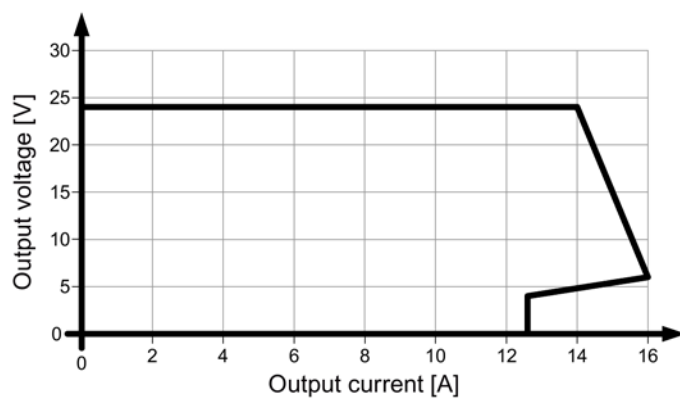


Figure 6-5 Output characteristic 6EP1334-1LB00

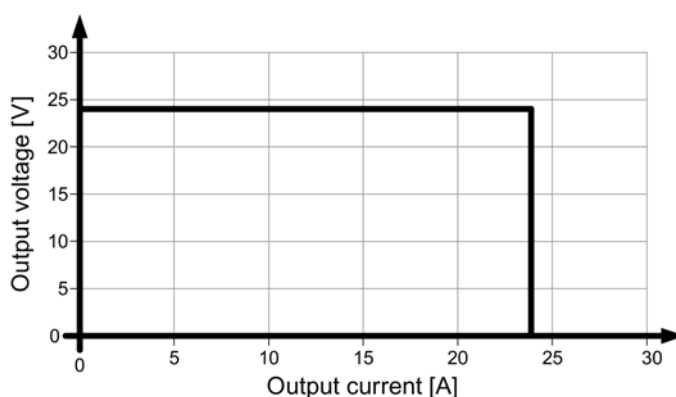


Figure 6-6 6EP1336-1LB00 output characteristic

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. When the output voltage falls below approx. 10 V, the device switches off, and automatically restarts (see Figure 6-3 Output characteristic 6EP1332-1LB00 (Page 36) and Figure 6-4 Output characteristic 6EP1333-1LB00 (Page 36)). This behavior is repeated as long as the overload condition is present (only for 6EP1332-1LB00 and 6EP1333-1LB00). The 6EP1334-1LB00 device has a U-I characteristic (see Figure 6-5 Output characteristic 6EP1334-1LB00 (Page 36)) The 6EP1336-1LB00 device has a U-I characteristic (see Figure 6-6 6EP1336-1LB00 output characteristic (Page 37))

6.3 Efficiency

	6EP1332-1LB00 (24 V/2.5 A)	6EP1333-1LB00 (24 V/5 A)	6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Efficiency at U_{out} rated, I_{out} rated, approx.	85 %	86 %	89 %	93 %
Power loss at U_{out} rated, I_{out} rated, approx.	9 W	17 W	34 W	33.6 W

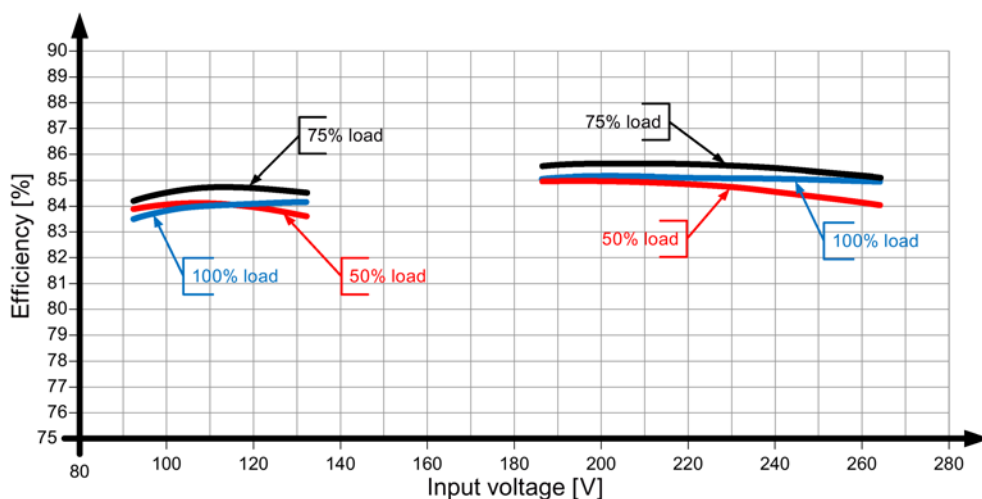


Figure 6-7 Efficiency 6EP1332-1LB00

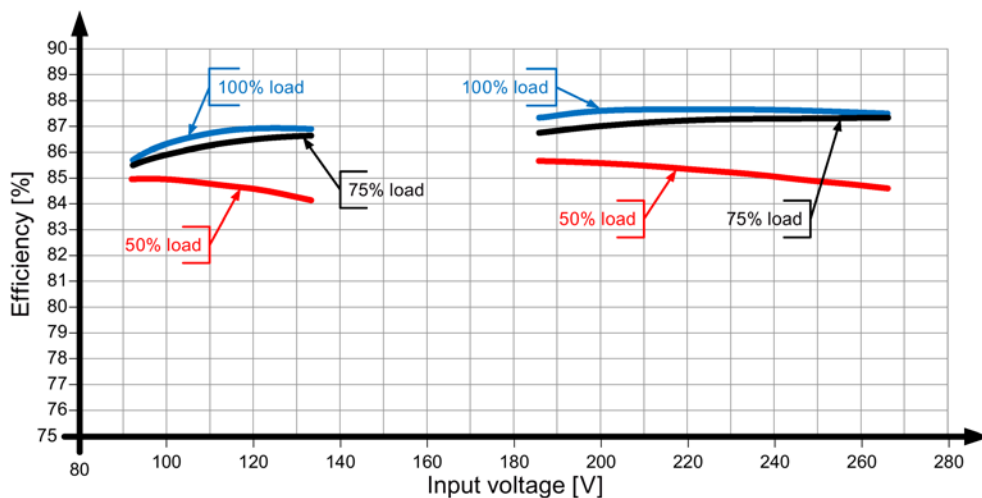


Figure 6-8 Efficiency 6EP1333-1LB00

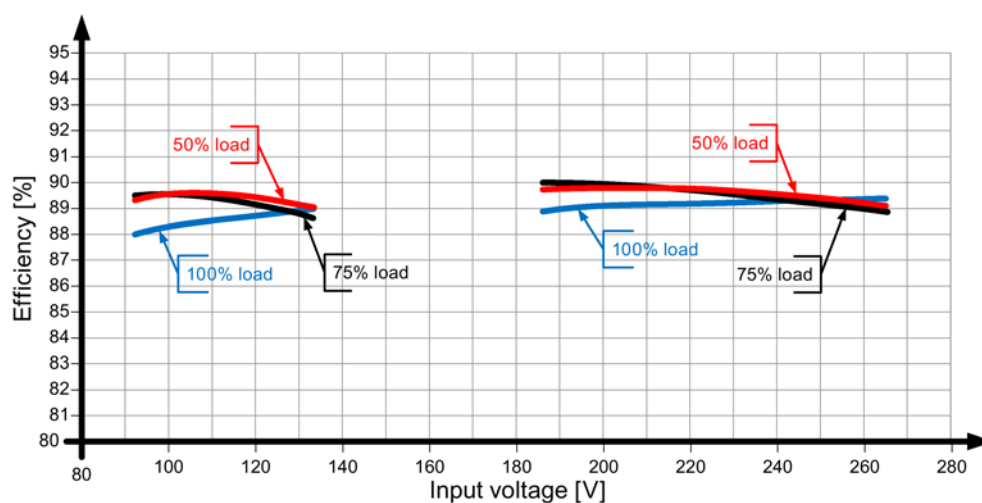


Figure 6-9 Efficiency 6EP1334-1LB00

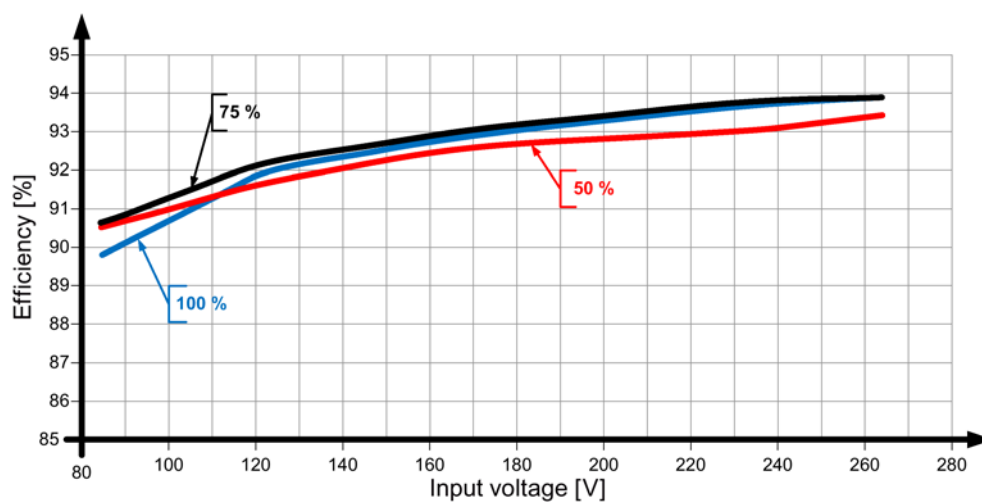


Figure 6-10 Efficiency 6EP1336-1LB00

6.4 Closed-loop control

	6EP1332-1LB00 (24 V/2.5 A)	6EP1333-1LB00 (24 V/5 A)	6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Dyn. line regulation ($U_{in rated} \pm 15\%$), max.	0.3 %	0.3 %	0.3 %	0.1 %
Dyn. load regulation ($I_{out: 10/90/10\%}$), max.	3 %	3 %	3 %	3 %
Dyn. load regulation ($I_{out: 10/90/10\%}$), $U_{out} \pm \text{typ.}$	2 %	2 %	2 %	1 %
Load-step settling time 10 to 90 %, typ.	0.5 ms	0.4 ms	0.5 ms	1 ms
Load-step settling time 90 to 10 %, typ.	0.7 ms	0.4 ms	0.7 ms	1 ms

6.5 Protection and monitoring

	6EP1332-1LB00 (24 V/2.5 A)	6EP1333-1LB00 (24 V/5 A)	6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Output overvoltage protection	< 33 V	< 33 V	< 33 V	< 33 V
Current limitation, typ.	2.6 A	5.25 A	-	23.4 A
Properties of the output/short-circuit proof	Yes			
Short-circuit protection	Electronic trip, automatic restart	Electronic trip, automatic restart	U-I characteristic	U-I characteristic
Continuous short-circuit current / rms value / typical	-	-	12.6 A	23.9 A

6.6 MTBF

	6EP1332-1LB00 (24 V/2.5 A)	6EP1333-1LB00 (24 V/5 A)	6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Mean Time Between Failures	SN29500: > 2100000 h at 40 °C, rated load, 24-hour operation	SN29500: > 1600000 h at 40 °C, rated load, 24-hour operation	SN29500: > 1400000 h at 40 °C, rated load, 24 h operation	SN29500: > 500000 h at 40 °C, rated load, 24-hour operation

6.7 Mechanical system

	6EP1332-1LB00 (24 V/2.5 A)	6EP1333-1LB00 (24 V/5 A)	6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Connection system	Screw-type terminal			
Connections/line input	L, N, PE: 1 screw terminal each for 0.5 - 2.5 mm ² solid/finely stranded			
Connections/output	+, -: 2 screw terminals each for 0.5 - 2.5 mm ²			
Housing width	32.5 mm	50 mm	70 mm	110 mm
Height/of the housing	125 mm	125 mm	125 mm	125 mm
Depth/of the housing	120.3 mm	120.3 mm	120.3 mm	125 mm
Installation width	32.5 mm	50 mm	70 mm	110 mm
Mounting height	225 mm	225 mm	225 mm	225 mm
Weight, approx.	0.32 kg	0.5 kg	0.75 kg	1.65 kg
Product properties/of the housing/housing that can be lined up next to other housings	Yes			
Type of mounting / panel mounting	No			
Type of mounting /rail mounting	Yes			
Type of mounting/ S7-300 rail mounting	No			
Mounting	Can be snapped onto standard TH35-15/7,5 (EN 60715) mounting rails			

6.8 Dimension drawing

See chapter Dimensions and weight (Page 16)

CAD data that can be downloaded from the Internet:

6EP1332-1LB00

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00677)

6EP1333-1LB00

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00674)

6EP1334-1LB00

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00671)

6EP1336-1LB00

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01216)

Safety, approvals, EMC

7.1 Safety

	6EP1332-1LB00 (24 V/2.5 A)	6EP1333-1LB00 (24 V/5 A)	6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Primary/secondary galvanic isolation	Yes			
Galvanic isolation	SELV output voltage U_{out} acc. to EN 60950-1 and EN 50178			
Protection class	Class I			
Degree of protection (EN 60529)	IP20			
Leakage current, typ.	0.4 mA	0.4 mA	0.8 mA	0.52 mA
Leakage current, max.	3.5 mA			
Test voltage	see Table Test voltage (Page 44)			

7.2 Test voltage

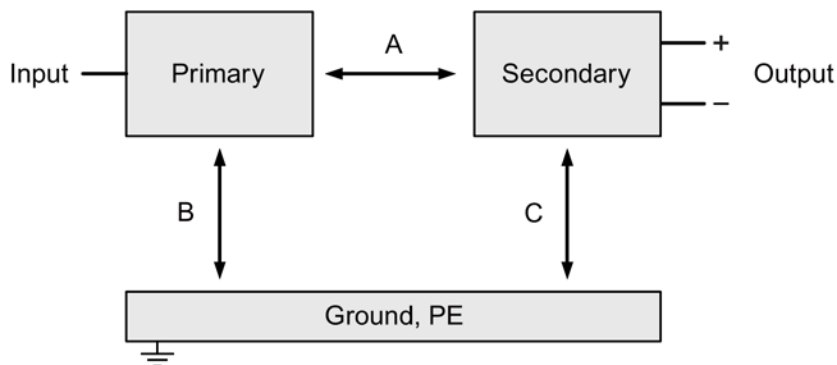


Figure 7-1 Test voltage without auxiliary contact diagram

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 (L, N)
- Connect the output terminals and PE together

Test (C)

- Measure the output terminals with respect to PE

Table 7- 1 Test voltage

	Test time	Prim ↔ sec (A)	Prim ↔ PE (B)	Sec ↔ PE (C)
Type test	60 s	4200 VDC	2200 VDC	700 VDC
	60 s	3000 VAC	1500 VAC	500 VAC
Production test	1 s	2200 VDC	2200 VDC	500 VDC
	1 s	1500 VAC	1500 VAC	350 VAC
Field test	1 s	2200 VDC	2200 VDC	500 VDC
	1 s	1500 VAC	1500 VAC	350 VAC

Remark:

Tripping current for DC measurement: 0 mA

Tripping current for AC measurement: <100 mA

7.3 Approvals

	6EP1332-1LB00 (24 V / 2.5 A) 6EP1333-1LB00 (24 V / 5 A) 6EP1334-1LB00 (24 V / 10 A) 6EP1336-1LB00 (24 V / 20 A)
CE marking	Yes
UL/CSA approval	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259
CB approval	Yes

7.4 EMC

		6EP1332-1LB00 (24 V/2.5 A) 6EP1333-1LB00 (24 V/5 A) 6EP1334-1LB00 (24 V/10 A) 6EP1336-1LB00 (24 V/20 A)
Electrostatic discharge	EN 61000-4-2	6 kV contact, 8 kV air
Electromagnetic fields	EN 61000-4-3	80 - 6000 MHz 10 V/m 895 - 905 MHz and 1.89 GHz 10 V/m
High-speed transient disturbance variables (burst)	EN 61000-4-4	2 kV at line connection 1 kV at DC output
Surge voltages	EN 61000-4-5	1 kV symmetrical on line connections 2 kV asymmetrical on line 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
Voltage dips	EN 61000-4-11	100 % for 10 ms 60 % for 200 ms 30% for 500 ms
Voltage interruptions	EN 61000-4-11	100% for 5000 ms
Emitted interference	EN 55022	Class A
Generic standards	EN 61000-6-2	Immunity for industrial environments
	EN 61000-6-4	Noise emission for industrial environments

Ambient conditions

	6EP1332-1LB00 (24 V/2.5 A) 6EP1333-1LB00 (24 V/5 A) 6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Ambient temperature	0 ... 60 °C for natural convection (self convection) Tested according to: <ul style="list-style-type: none"> • EN 60068-2-1 cold • EN 60068-2-2 dry heat • EN 60068-2-78 humid heat, constant • EN 60068-2-14 temperature change 	0 ... 70 °C for natural convection (self convection)
Transport and storage temperature	-40 ... 85 °C Tests (packed for shipping) according to: <ul style="list-style-type: none"> • 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, without condensation	
Degree of pollution	2	
Mechanical stressing in operation	Tested according to: <ul style="list-style-type: none"> • 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 	

	6EP1332-1LB00 (24 V/2.5 A) 6EP1333-1LB00 (24 V/5 A) 6EP1334-1LB00 (24 V/10 A)	6EP1336-1LB00 (24 V/20 A)
Damaging gases	Tested according to: <ul style="list-style-type: none"> • EN 60068-2-42 sulfur dioxide • EN 60068-2-43 hydrogen sulfide 	
Atmospheric pressure	Operation: <ul style="list-style-type: none"> • 1080 - 795 hPa (-1000 - 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 4-5 Mounting height derating (Page 22) • Overvoltage category: III to 2000 m (EN 50178) II from 2000 m to 6000 m (EN 50178) II to 2000 m (EN 60950-1) I from 2000 m to 6000 m (EN 60950-1) Storage: <ul style="list-style-type: none"> • 1080 - 660 hPa (-1000 - 3500 m) 	

Applications

9.1 Parallel connection to increase power rating

To increase the power rating, SITOP PSU100L power supplies of the same type can be directly connected in parallel.

The following must be observed:

- The cables connected to each power supply at terminals "+" and "-" must have identical lengths and the same cable cross-sections (or the same impedance) up to a common external connection point (terminal strip) if possible.
- 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 output voltages measured in no-load operation for the power supplies that are not yet connected in parallel should not deviate more than a maximum of 50 mV. This usually corresponds to the factory setting. If the output voltage is changed, you should connect the "-" terminals and then, in no-load operation, measure the voltage difference between the "+" terminals that have not yet been connected. The voltage difference should not exceed 50 mV.

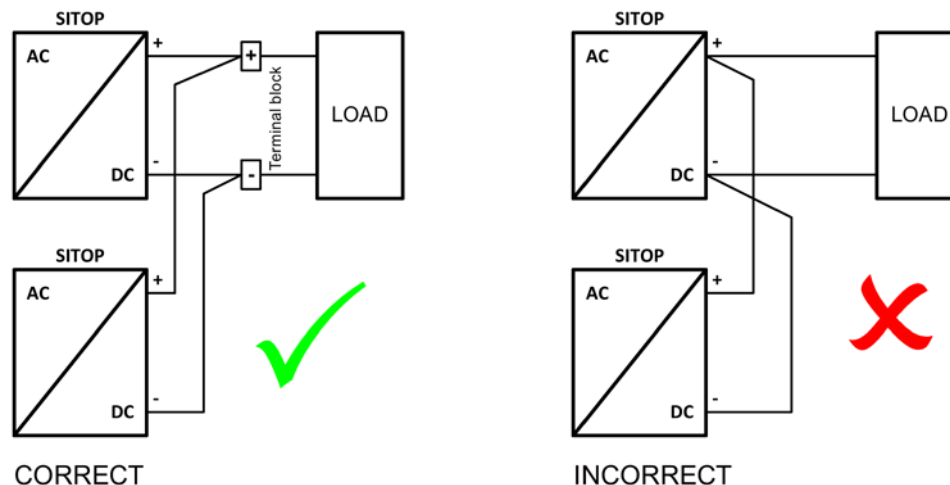


Figure 9-1 Parallel connection, correct and incorrect

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

9.2 Parallel connection for redundancy

Connecting several SITOP PSU100L power supplies in parallel for redundancy purposes is required if especially high demands are placed regarding the availability of a reliable 24 V power supply.

Using the SITOP PSE202U redundancy module, two 24 V power supplies of the same type up to 20 A can be decoupled (Figure 9-2 Redundant configuration with two power supplies and SITOP PSE202U redundancy module (Page 51)). When one of the devices fails, then the other automatically takes over the power supply. If one of the power supplies fails, then this is signaled using an LED on the redundancy module as well as an isolated relay contact.

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 protected separately on the line side and, if possible, be connected to different power supply networks.

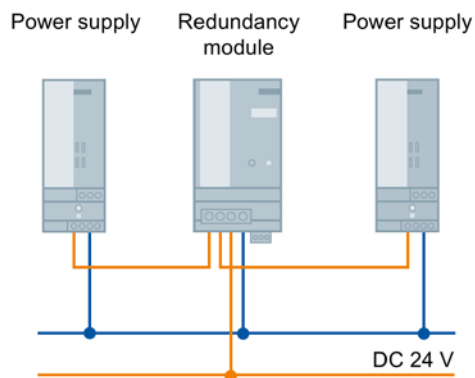


Figure 9-2 Redundant configuration with two power supplies and SITOP PSE202U redundancy module

You can find additional information at:

SITOP PSE202U manual (<http://support.automation.siemens.com/WW/view/en/42248598>)

9.3 Series connection for increased voltage

To achieve an output voltage of 48 V DC, two 24 V SITOP PSU100L power supplies of the same type can be connected in series. In this case, connect the "-" terminal of the first power supply to the "+" terminal of the second power supply. The "+" terminal of the first power supply and the "-" terminal of the second power supply are routed to the load.

Depending on the grounding point of the secondary output voltages, voltages of +48 V, ± 24 V or -48 V can be realized.

In the case of an asymmetric load distribution, it is not possible to guarantee correct functionality.



WARNING

SELV is not guaranteed in the case of a fault

When connecting two power supplies in series, the continuous, permissible SELV voltage of a maximum of 60 V DC according to EN 60950 cannot be guaranteed in the case of a fault.

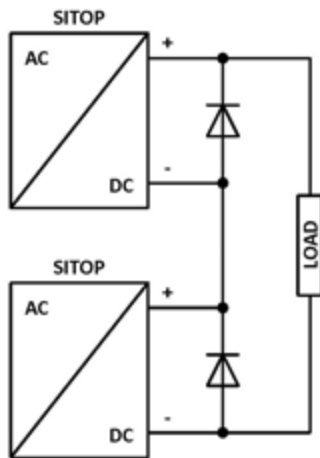


Figure 9-3 Series connection

9.4 Protection against short-time voltage dips

For a drop in the line-side supply voltage, the SITOP PSU100L power supply still maintains the output voltage for a short time in the millisecond range (see Chapter Technical data (Page 33)).

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 using an additional SITOP PSE201U buffer module.

The SITOP PSE201U buffer module, based on electrolytic capacitors, is connected in parallel to the 24 V power supply output SITOP PSE201U manual (<http://support.automation.siemens.com/WW/view/en/41129219>). The buffer time is 200 ms at 40 A up to 1.6 s for a load current of 5 A. This time can be increased a multiple number of times by connecting buffer modules in parallel; the maximum buffer time is 10 s.

You can find additional information at:

SITOP PSE201U manual (<http://support.automation.siemens.com/WW/view/en/41129219>)

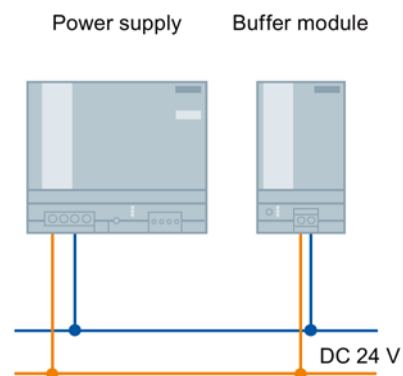


Figure 9-4 Buffering brief power failures using the SITOP PSE201U buffer module

Environment

The devices are in conformance with RoHS.

As a rule, only non-silicon precipitating materials are used.

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

Technical support

Technical support for all IA/DT products can be accessed through the following communication channels:

- Phone: + 49 (0) 911 895 7222
- E-Mail (<mailto:support.automation@siemens.com>)
- Internet:
Online support request form (<http://www.siemens.de/automation/support-request>)

Technical documentation on the Internet

Operating instructions and manuals for SITOP are available in the Internet:

Operating instructions/manuals (<http://www.siemens.de/sitop/manuals>)

SITOP power supply homepage

General news about our power supplies is available in the Internet at the SITOP homepage:
SITOP (<http://www.siemens.de/sitop>)

Information material

SITOP information can be downloaded from the Internet:

Information and download center (<http://www.siemens.de/sitop-infomaterial>)

CAX data

2D/3D data and circuit diagram macros can be downloaded from the Internet:

Siemens image database (<http://www.siemens.de/sitop-cax>)

Request all CAX data via the CAX download manager:

CAX shopping cart (<http://www.siemens.de/cax>)

SITOP Selection Tool

Simply and quickly select the optimum the power supply or DC-UPS:

SITOP Selection Tool (<http://www.siemens.de/sitop-selection-tool>)

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:

- On the Internet (<http://www.siemens.de/automation/partner>)
- In Catalog CA 01