MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6EP1333-1LB00

SITOP 24 V POWER SUPPLY

Used with the applicable SITOP PSU100L configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens SITOP PSU100L Manual, August 2016; 6EP1333-1LB00 model column

Ordering data

The following device options are available:

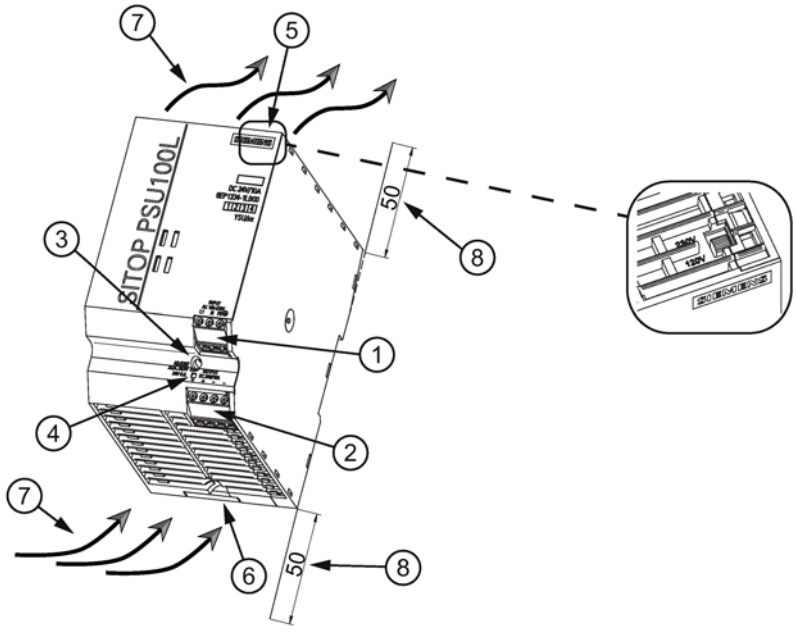
Regulated power supply unit SITOP PSU100L	
Type	**Order number**
Input, 120/230 V AC Output, 24 V DC/2.5 A	6EP1332-1LB00
Input, 120/230 V AC Output, 24 VDC/5 A	6EP1333-1LB00
Input, 120/230 V AC Output, 24 V DC/10 A	6EP1334-1LB00
Input, 120/230 V AC Output, 24 V DC/20 A	6EP1336-1LB00

Description, device design, dimension drawing

2

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. ∅ 3,5 mm
	1 x 0,5 - 2,5 mm²	-
	1 x 0,5 - 2,5 mm²	-
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. ∅ 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.

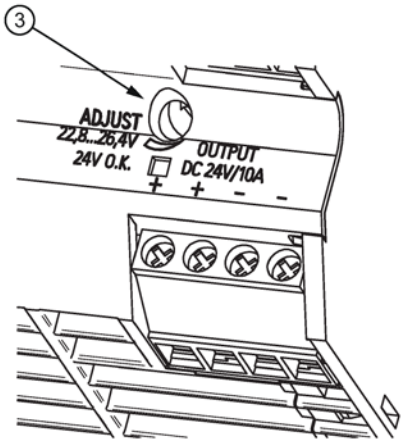


Figure 2-4 Potentiometer (example, 6EP1334-1LB00)

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).

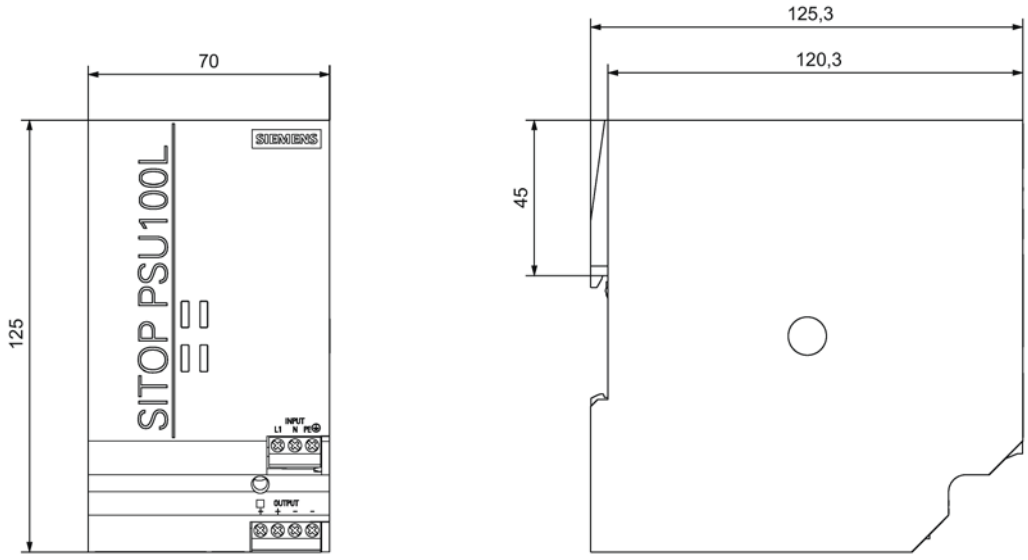


Figure 2-10 Dimension drawing 6EP1334-1LB00

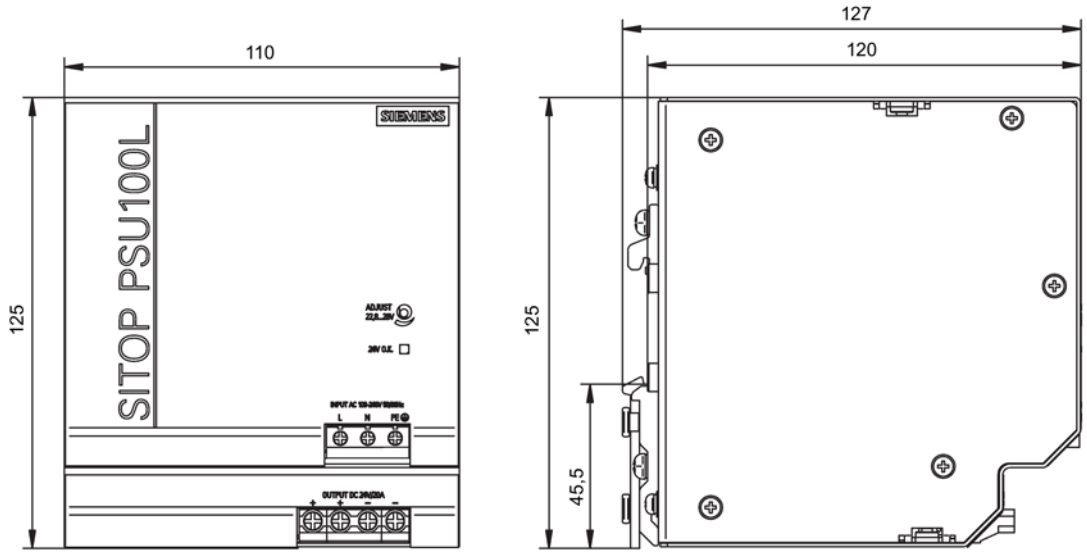


Figure 2-11 Dimension drawing 6EP1336-1LB00

	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

4.2.2 6EP1333-1LB00

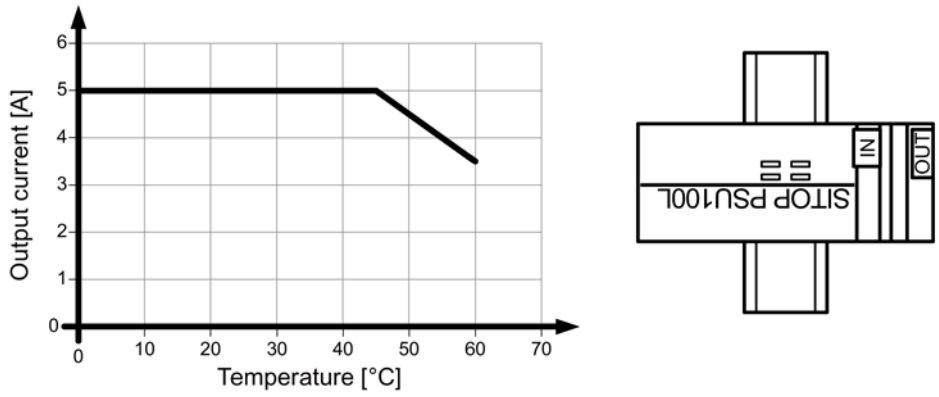


Figure 4-11 6EP1333-1LB00 mounting position (1)

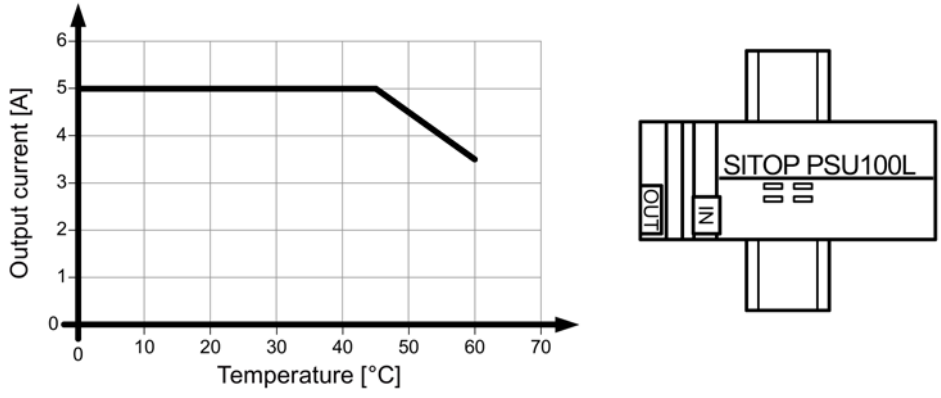


Figure 4-12 6EP1333-1LB00 mounting position (2)

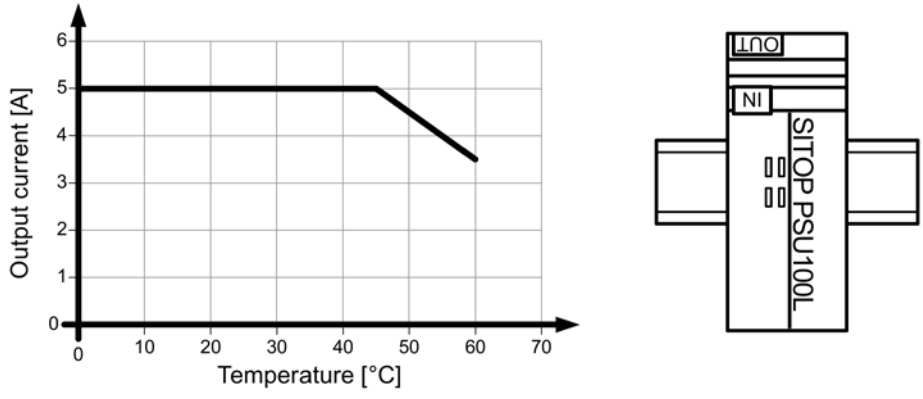


Figure 4-13 6EP1333-1LB00 mounting position (3)

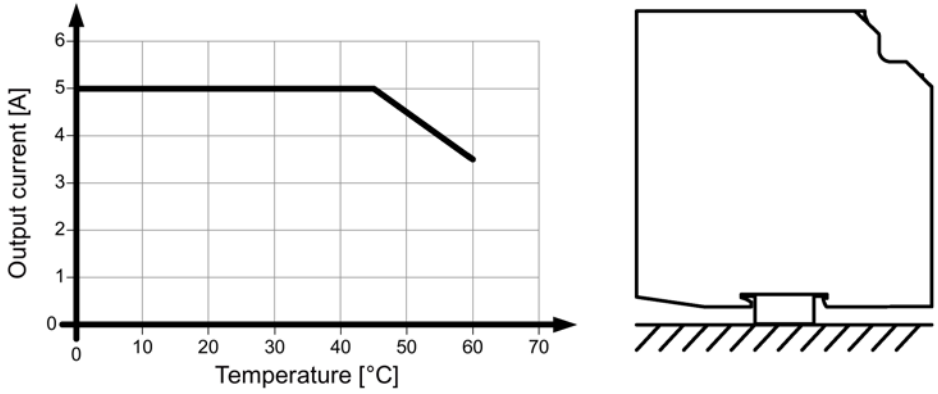


Figure 4-14 6EP1333-1LB00 mounting position (4)

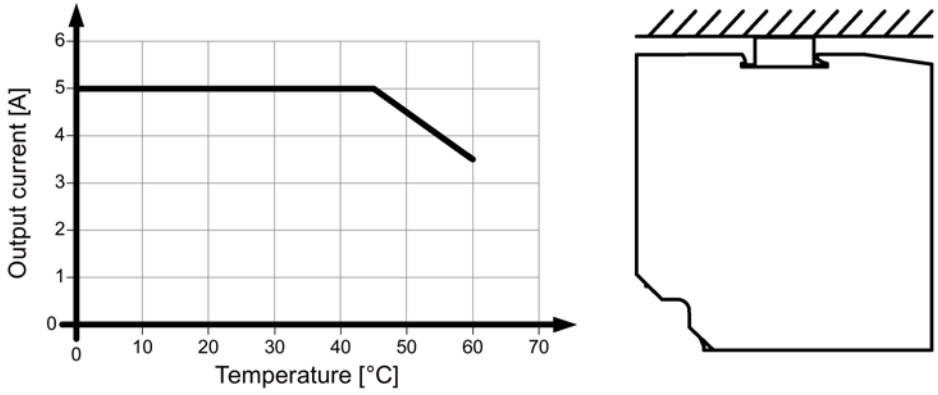


Figure 4-15 6EP1333-1LB00 mounting position (5)

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.

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.

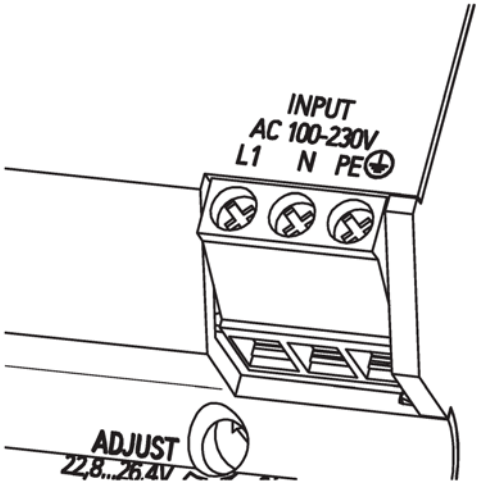


Figure 5-1 Line connection (example, 6EP1334-1LB00)

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)).

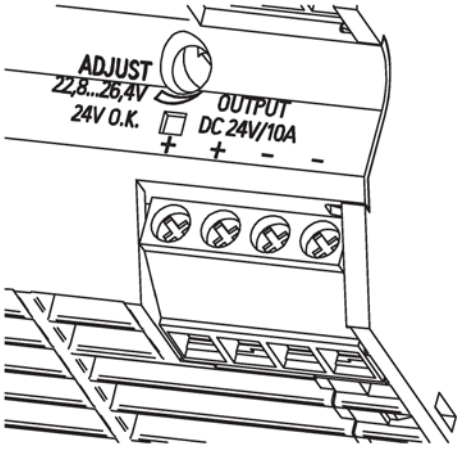


Figure 5-2 Connection of the output voltage (example: 6EP1334-1LB00)

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

6

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 × $U_{in\ rated}$, 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^2s	0.8 A^2s	3.3 A^2s	-
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

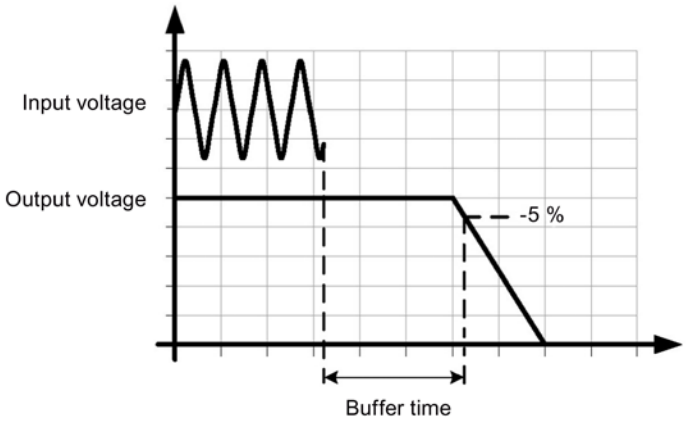


Figure 6-1 Power failure buffering

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 ±	3 %	3 %	3 %	3 %
Static line regulation, approx. ±	0.1 %	0.1 %	0.1 %	0.1 %
Static load regulation, approx. ±	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			

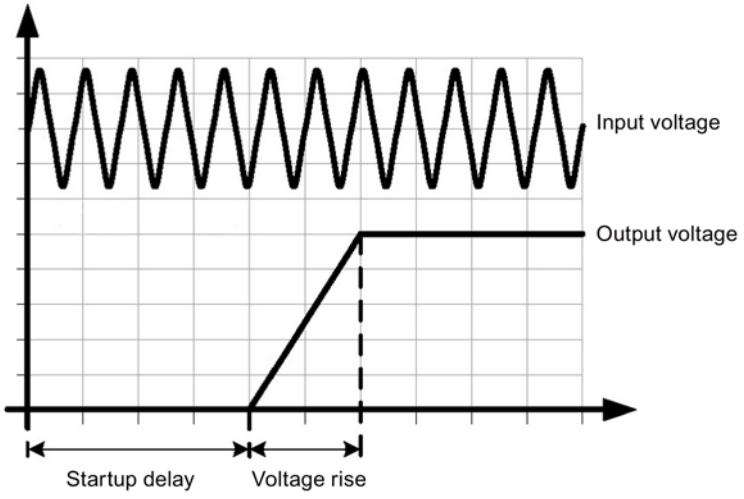


Figure 6-2 Startup delay/voltage rise

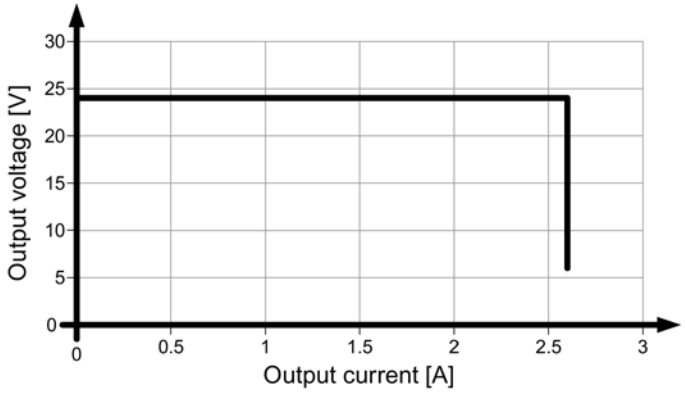


Figure 6-3 Output characteristic 6EP1332-1LB00

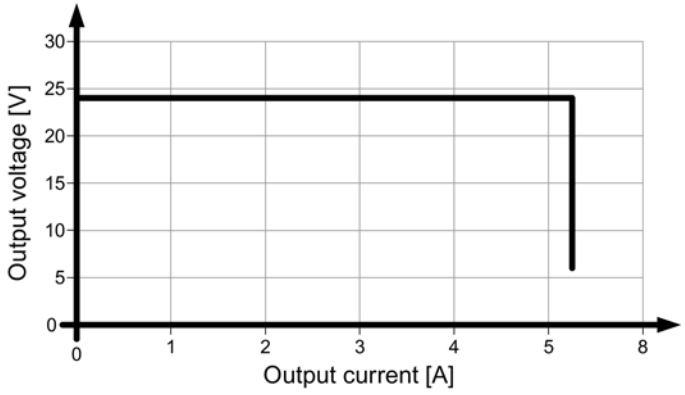


Figure 6-4 Output characteristic 6EP1333-1LB00

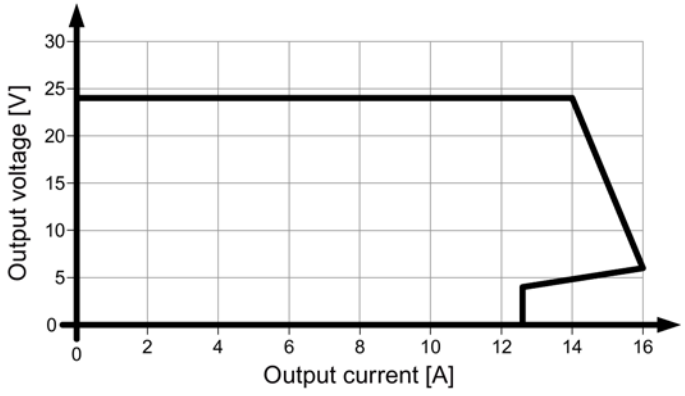


Figure 6-5 Output characteristic 6EP1334-1LB00

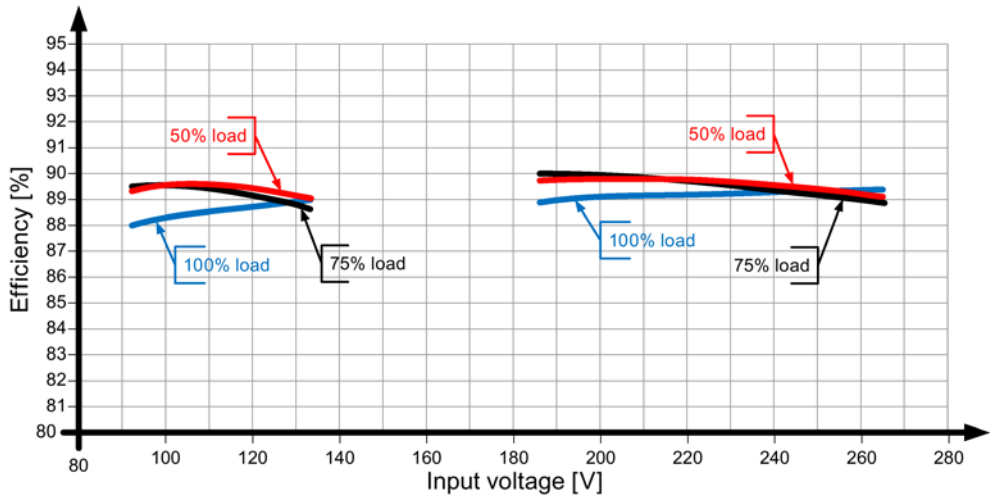


Figure 6-9 Efficiency 6EP1334-1LB00

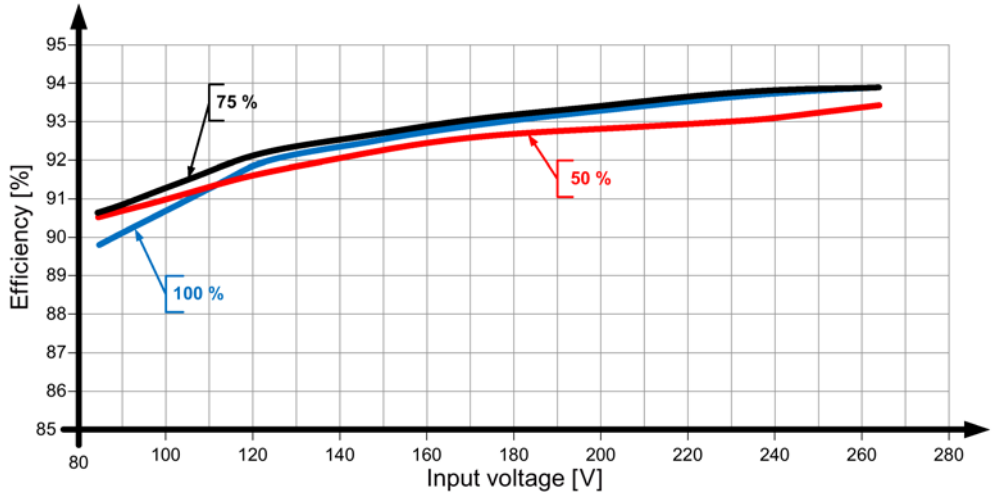


Figure 6-10 Efficiency 6EP1336-1LB00

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 ($U_{in\ rated}$ ±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} ± 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 **T**ime **B**etween **F**ailures	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 mm² solid/finely stranded			
Connections/output	+, -: 2 screw terminals each for 0.5 - 2.5 mm²			
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 mount-ing / 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)