

Power supply

LOGO!Power

Operating Instructions

LOGO!Power 5 V / 3 A
6EP1311-1SH03
LOGO!Power 5 V / 6.3 A
6EP1311-1SH13
LOGO!Power 12 V / 1.9 A
6EP1321-1SH03
LOGO!Power 12 V / 4.5 A
6EP1322-1SH03
LOGO!Power 15 V / 1.9 A
6EP1351-1SH03
LOGO!Power 15 V / 4 A
6EP1352-1SH03
LOGO!Power 24 V / 1.3 A
6EP1331-1SH03
LOGO!Power 24 V / 2.5 A
6EP1332-1SH43
LOGO!Power 24 V / 4 A
6EP1332-1SH52




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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.

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



LOGO!Power are powerful power supplies that can be extremely flexibly used in a host of applications – in installation distribution boards for example – as a result of their flat, stepped profile. The 12 V and 24 V versions are ideal as power supplies for the LOGO! logic modules.

The key benefits of the product include:

- Flat LOGO! mechanical design
- Wide-range input for voltages from 85 to 264 VAC and operation with DC voltage
- Adjustable output voltage
- Green LED for "Output voltage OK"
- Ambient temperature $-20^{\circ}\text{C} \dots +70^{\circ}\text{C}$ (derating from $+55^{\circ}\text{C}$)
- Constant current under overload conditions for reliable connection of difficult loads
- When you turn on the power supply, a power reserve of 1.5 times rated current is available for typ. 200 ms
- Export benefits thanks to global certifications

Ordering data

The following device options are available:

LOGO!Power stabilized power supply	
Type	Order number
Input 85 to 264 VAC 110 to 300 VDC Output 5 VDC / 3 A	6EP1311-1SH03
Input 85 to 264 VAC 110 to 300 VDC Output 5 VDC / 6.3 A	6EP1311-1SH13
Input 85 to 264 VAC 110 to 300 VDC Output 12 VDC / 1.9 A	6EP1321-1SH03
Input 85 to 264 VAC 110 to 300 VDC Output 12 VDC / 4.5 A	6EP1322-1SH03
Input 85 to 264 VAC 110 to 300 VDC Output 15 VDC / 1.9 A	6EP1351-1SH03
Input 85 to 264 VAC 110 to 300 VDC Output 15 VDC / 4 A	6EP1352-1SH03
Input 85 to 264 VAC 110 to 300 VDC Output 24 VDC / 1.3 A	6EP1331-1SH03
Input 85 to 264 VAC 110 to 300 VDC Output 24 VDC / 2.5 A	6EP1332-1SH43
Input 85 to 264 VAC 110 to 300 VDC Output 24 VDC / 4 A	6EP1332-1SH52


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Safety instructions

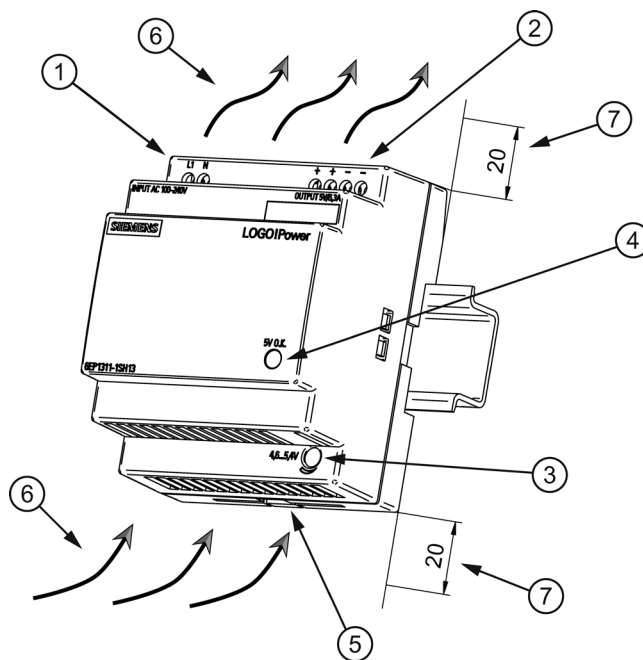
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 WARNING
Correct handling of the devices
When operating electrical devices, it is inevitable that certain components will carry dangerous voltages.
Therefore, failure to handle the units properly can result in death or serious physical injury as well 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

LOGO!Power are primary switched-mode power supplies for connection to a 1-phase AC system or to DC systems. 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 indicates the operating status.



- ① Line input
- ② DC output
- ③ Potentiometer
- ④ Indicator light (output voltage OK)
- ⑤ Lug for unlocking with a screwdriver
- ⑥ Natural convection
- ⑦ Clearance above/below

Figure 2-1 Design (example of 6EP1311-1SH13)


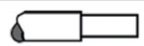

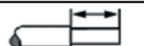
2.2 Connections and terminal designation

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 23)).

Connections and terminal designations	
① line input L1, N	One screw terminal each
② Output +	Two screw terminals
② Output -	Two screw terminals

	① + ②	③
	SZS 0,5 x 3 max. Ø 3,5 mm	SZS 0,4 x 2 / PZ0 / PH0 max. Ø 3,5 mm
	1 x 0,5 - 4 mm ²	-
	1 x 0,5 - 2,5 mm ²	-
AWG	22 - 12	-
Nm	0,5 - 0,6 Nm (4.4 lbf in)	0,04 Nm (0.35 lbf in) * ¹⁾
	7 mm	-

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

Figure 2-2 Terminal data

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 the rated value at the factory and can be set within certain limits; for example, to compensate voltage drops across long supply lines to the connected load.

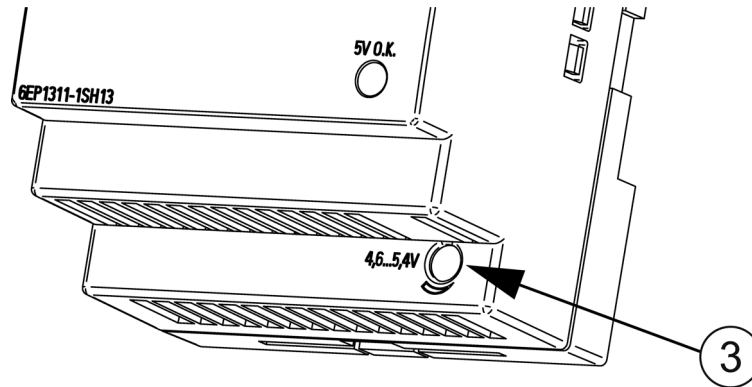


Figure 2-3 Potentiometer (example of 6EP1311-1SH13)

Type	Factory setting	Setting range
6EP1311-1SH03 (5 V / 3 A)	5 V	4.6...5.4 V
6EP1311-1SH13 (5 V / 6.3 A)		
6EP1321-1SH03 (12 V / 1.9 A)	12 V	10.5...16.1 V
6EP1322-1SH03 (12 V / 4.5 A)		
6EP1351-1SH03 (15 V / 1.9 A)	15 V	10.5...16.1 V
6EP1352-1SH03 (15 V / 4 A)		
6EP1331-1SH03 (24 V / 1.3 A)	24 V	22.2...26.4 V
6EP1332-1SH43 (24 V / 2.5 A)		
6EP1332-1SH52 (24 V / 4 A)		

NOTICE

Thermal overload possible

When adjusting the output voltage to > 24 V / > 15 V / > 12 V or > 5 V, the output current must be derated by 4%/V.

Note

Actuation of the potentiometer is allowed only by means of an insulated screwdriver.

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

For notes on actuating the potentiometer (screwdriver, torque), see Figure 2-2 Terminal data (Page 10).

2.4 Status displays and signaling

- 6EP1311-1SH03 (5 V / 3 A)
- 6EP1311-1SH13 (5 V / 6.3 A)
- 6EP1321-1SH03 (12 V / 1.9 A)
- 6EP1322-1SH03 (12 V / 4.5 A)
- 6EP1351-1SH03 (15 V / 1.9 A)
- 6EP1352-1SH03 (15 V / 4 A)
- 6EP1331-1SH03 (24 V / 1.3 A)
- 6EP1332-1SH43 (24 V / 2.5 A)
- 6EP1332-1SH52 (24 V / 4 A)

Status display	Green LED for output voltage OK
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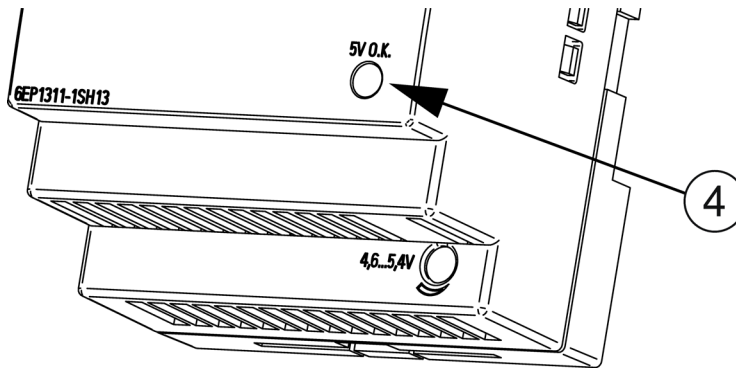


Figure 2-4 Operational displays and signals (example of 6EP1311-1SH13)

Signaling	6EP1311-1SH03 (5 V / 3 A)
	6EP1311-1SH13 (5 V / 6.3 A)
	6EP1321-1SH03 (12 V / 1.9 A)
	6EP1322-1SH03 (12 V / 4.5 A)
	6EP1351-1SH03 (15 V / 1.9 A)
	6EP1352-1SH03 (15 V / 4 A)
	6EP1331-1SH03 (24 V / 1.3 A)
	6EP1332-1SH43 (24 V / 2.5 A)
	6EP1332-1SH52 (24 V / 4 A)

LED ④ lights up green	Normal operation, output voltage present
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LED ④ off	Output voltage not present
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2.5 Block diagram

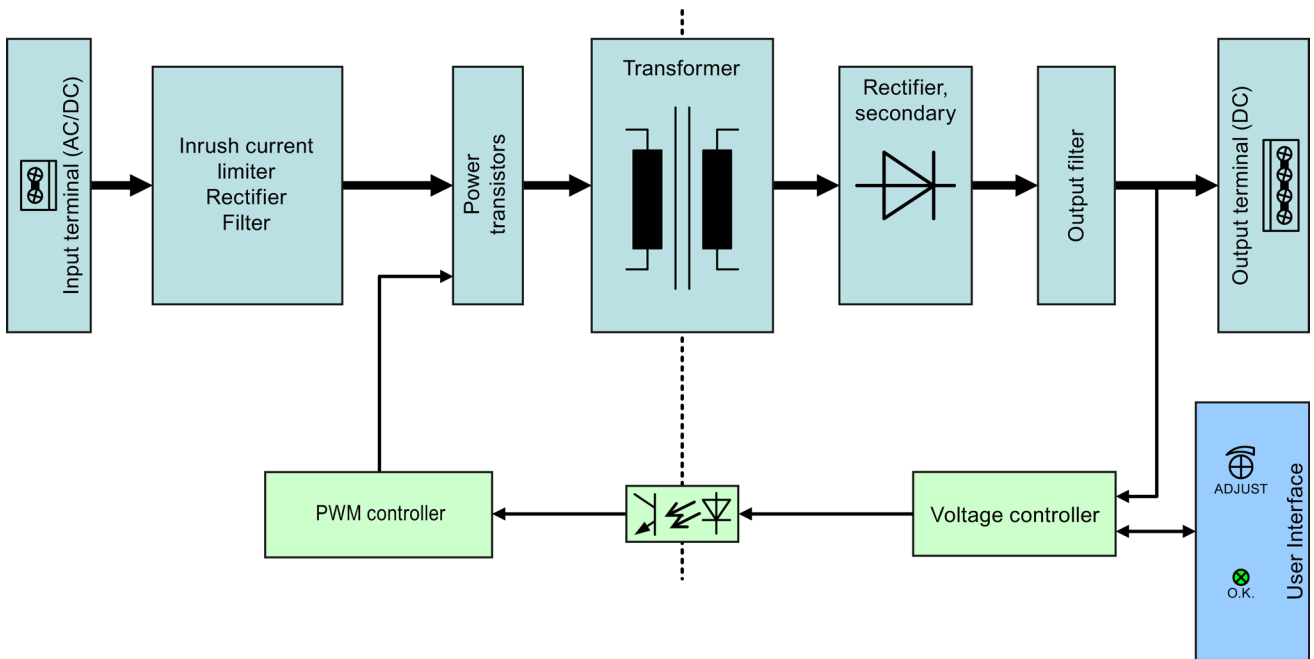


Figure 2-5 Block diagram

2.6 Dimensions and weight

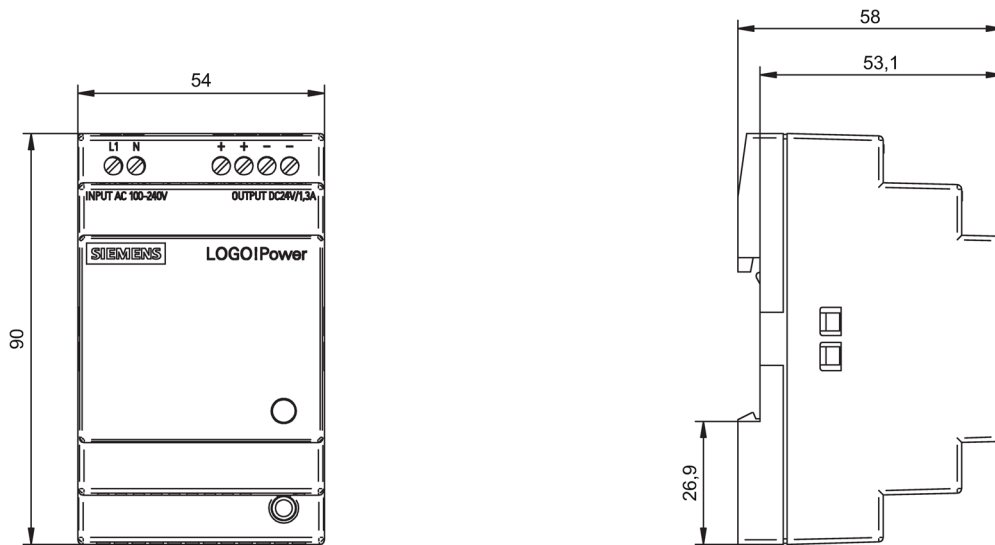


Figure 2-6 Dimension drawing 6EP1311-1SH03, 6EP1321-1SH03, 6EP1351-1SH03, 6EP1331-1SH03

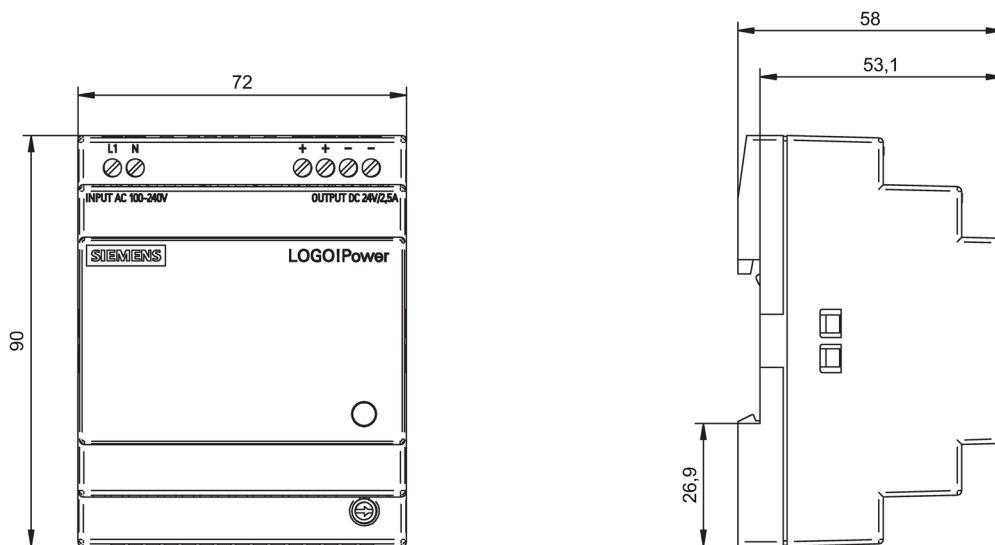


Figure 2-7 Dimension drawing 6EP1311-1SH13, 6EP1322-1SH03, 6EP1352-1SH03, 6EP1332-1SH43

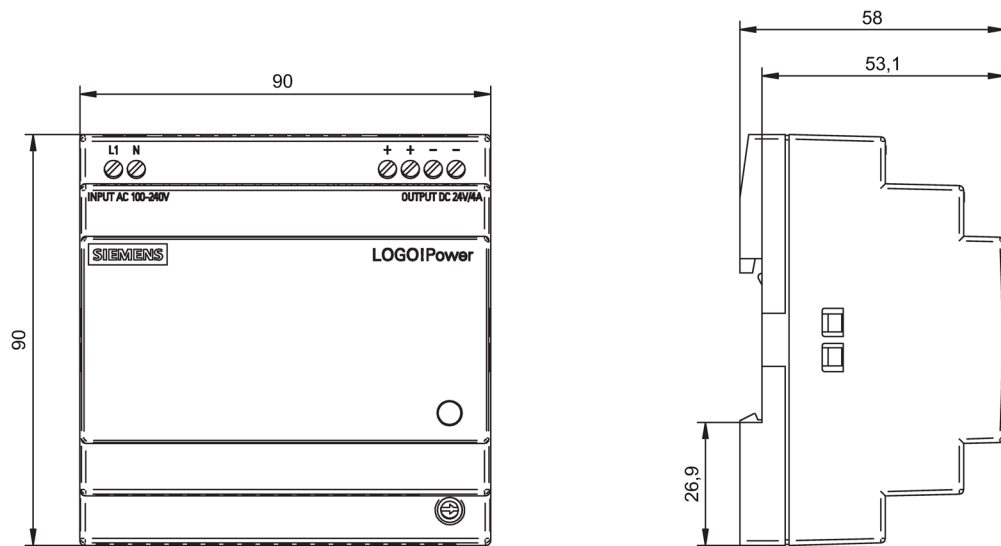


Figure 2-8 Dimension drawing 6EP1332-1SH52

	6EP1311-1SH03 (5 V / 3 A)	6EP1311-1SH13 (5 V / 6.3 A)	6EP1332-1SH52 (24 V / 4 A)
	6EP1321-1SH03 (12 V / 1.9 A)	6EP1322-1SH03 (12 V / 4.5 A)	
	6EP1351-1SH03 (15 V / 1.9 A)	6EP1352-1SH03 (15 V / 4 A)	
	6EP1331-1SH03 (24 V / 1.3 A)	6EP1332-1SH43 (24 V / 2.5 A)	
Dimensions (W × H × D) in mm	54 × 90 × 53,1	72 × 90 × 53,1	90 × 90 × 53,1
Weight	Approx. 0.17 kg	Approx. 0.25 kg	Approx. 0.34 kg

Mounting/disassembly

⚠ WARNING

Installing the device in a housing or a control cabinet

The LOGO!Power power supplies are built-in units. They must be installed in a casing or control cabinet to which only qualified personnel have access.

The devices can be mounted in a control cabinet on standard mounting rails according to EN 60715 35x7,5/15.

Mounting

To mount the device, position it with the mounting rail guideway at the upper edge of the DIN rail and press down to lock it into place. If this is too difficult, press slider ① at the same time, as described for "Disassembly".

Disassembly

To remove, pull up the slider ① using a screwdriver ② and disengage the device at the bottom edge of the DIN rail. Then you can remove the device from the upper edge of the DIN rail.

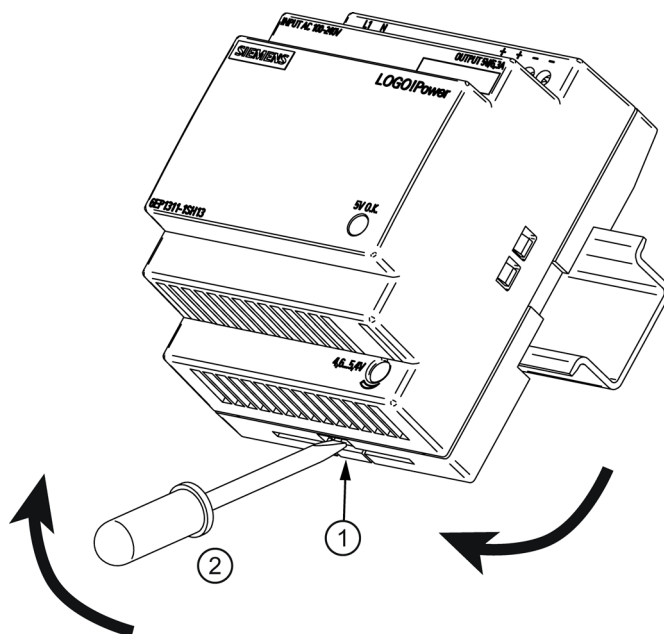


Figure 3-1 Disassembly (example of 6EP1311-1SH13)

 **WARNING**

Use in hazardous zones

If the device is to be used in a hazardous zone (Ex II 3G Ex nA IIC T3) it must be installed in a distributor box with degree of protection IP54 or higher.

Mounting position, mounting clearances

4.1 Standard mounting position

The device is mounted on standard mounting rails according to EN 60715 35x7,5/15. The device must be mounted vertically in such a way that the input terminals and the output terminals are at the top to ensure correct cooling.

A clearance of at least 20 mm should be maintained above and below the device.

No space is required at the side.

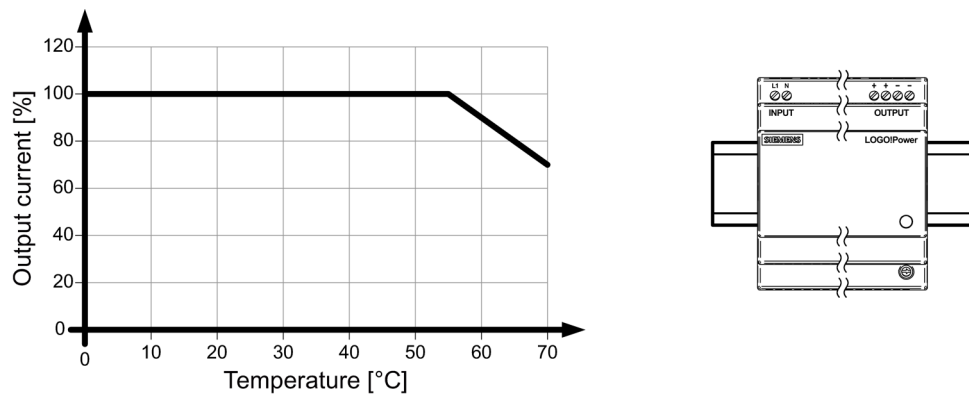


Figure 4-1 Output current in the standard mounting position

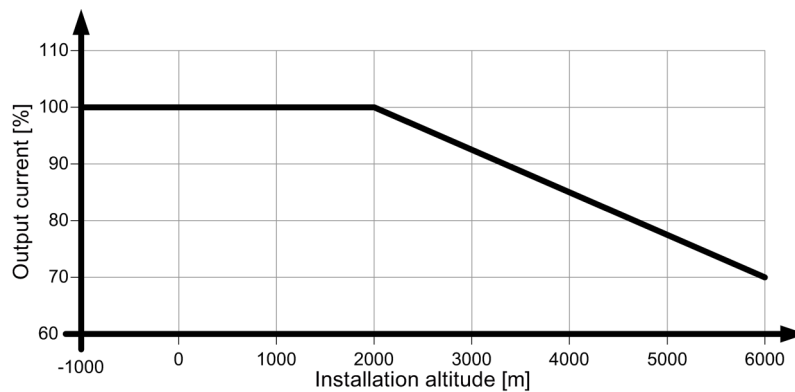


Figure 4-2 Mounting height derating

For details, see Section Ambient conditions (Page 45)

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.

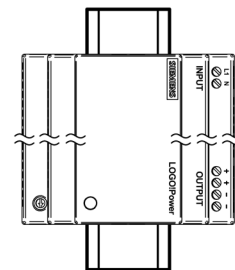
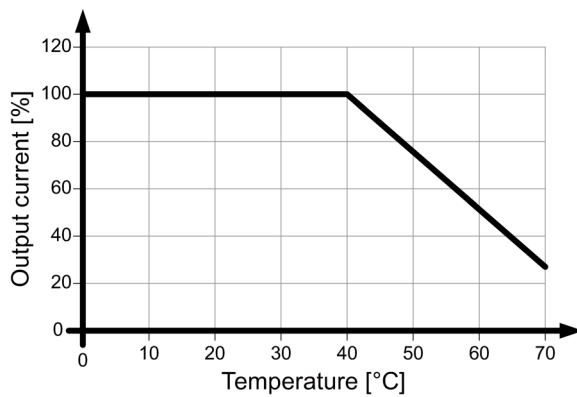


Figure 4-3 Mounting position (1)

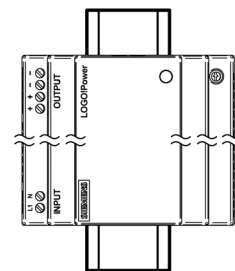
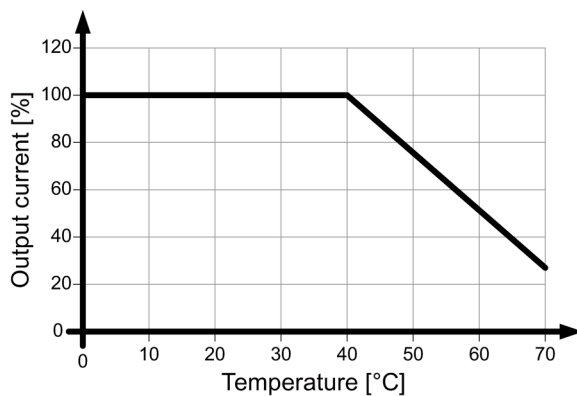


Figure 4-4 Mounting position (2)

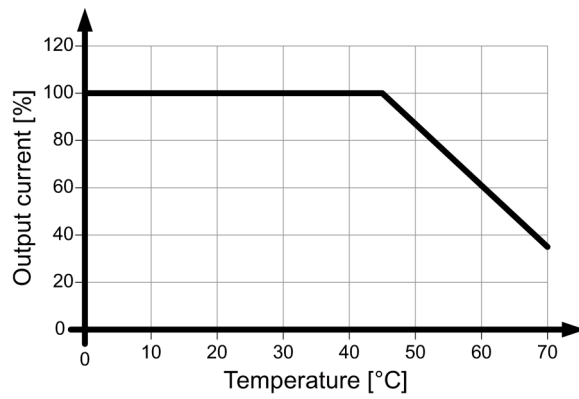


Figure 4-5 Mounting position (3)

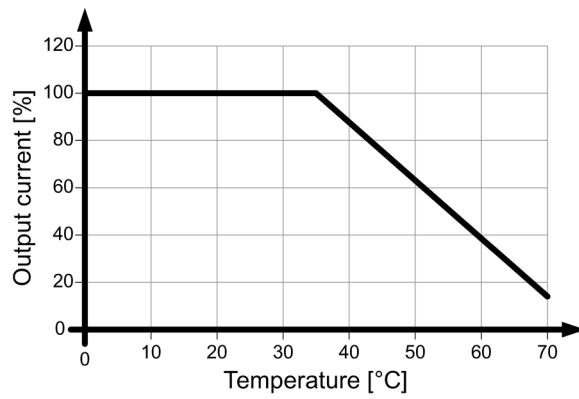
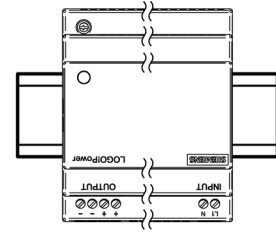


Figure 4-6 Mounting position (4)

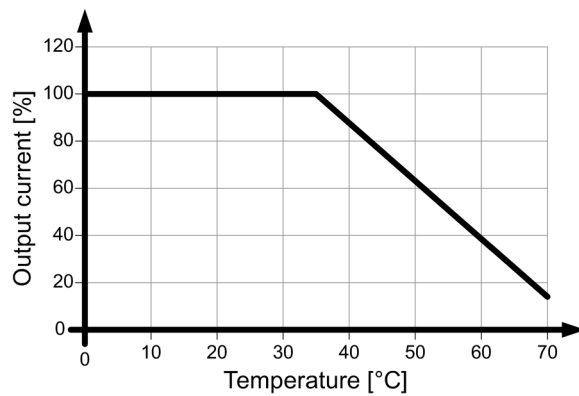
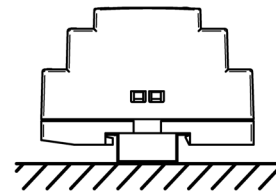
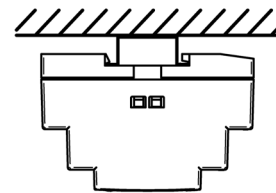


Figure 4-7 Mounting position (5)



<p>⚠ WARNING</p> <p>Hazard due to electric shock</p> <p>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.</p>
--

5.1 Line-side connection

The LOGO!Power power supplies are power packs according to safety class II (without protective conductor or equivalent without PE). LOGO!Power are designed for connection to a 1-phase AC supply network (TN or TT system according to VDE 0100 T 300 / IEC 364-3) with rated voltage 1-phase 100-240 VAC, 50/60 Hz or to a power supply with 110-300 VDC.

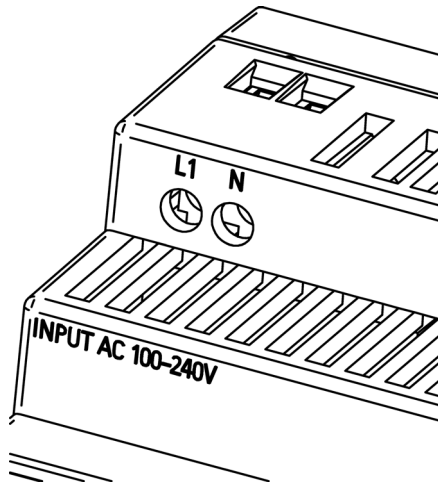


Figure 5-1 Line connection

The line supply is connected using terminal L1 and N (see Figure 5-1 Line connection (Page 23)), 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 must not be used as the only protective measure against indirect contact; this applies to the entire supply system that is protected by the residual current operated circuit-breaker.

Note

For operation on a direct voltage network (DC), the plus pole (+) must be connected to L1 and the minus pole (-) to N.

Protection

LOGO!Power	Recommended line-side protection
6EP1311-1SH03 (5 V / 3 A)	Miniature circuit-breaker (IEC 898): Characteristic B from 16 A or characteristic C from 10 A
6EP1311-1SH13 (5 V / 6.3 A)	Miniature circuit-breaker (IEC 898): Characteristic B from 16 A or characteristic C from 10 A
6EP1321-1SH03 (12 V / 1.9 A)	Miniature circuit-breaker (IEC 898): Characteristic B from 16 A or characteristic C from 10 A
6EP1322-1SH03 (12 V / 4.5 A)	Miniature circuit-breaker (IEC 898): Characteristic B from 16 A or characteristic C from 10 A
6EP1351-1SH03 (15 V / 1.9 A)	Miniature circuit-breaker (IEC 898): Characteristic B from 16 A or characteristic C from 10 A
6EP1352-1SH03 (15 V / 4 A)	Miniature circuit-breaker (IEC 898): Characteristic B from 16 A or characteristic C from 10 A
6EP1331-1SH03 (24 V / 1.3 A)	Miniature circuit-breaker (IEC 898): Characteristic B from 16 A or characteristic C from 10 A
6EP1332-1SH43 (24 V / 2.5 A)	Miniature circuit-breaker (IEC 898): Characteristic B from 16 A or characteristic C from 10 A
6EP1332-1SH52 (24 V / 4 A)	Miniature circuit-breaker (IEC 898): Characteristic B from 16 A or characteristic C from 10 A

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

5.2 Output-side connection

LOGO!Power power supplies provide an isolated (= non-grounded) SELV (Safety Extra Low Voltage) output voltage at the output. The output of the power supplies 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 Section Technical data (Page 27)).

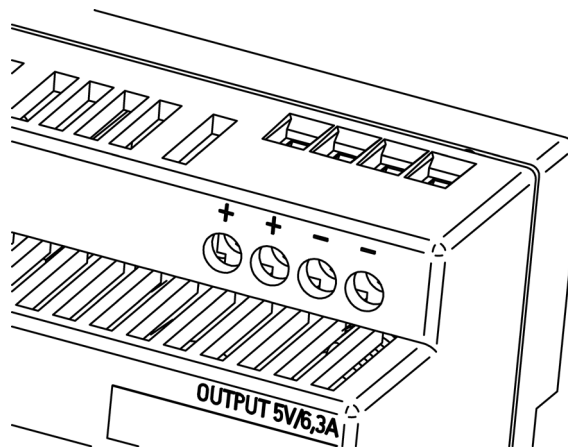


Figure 5-2 Connection of the output voltage (example of 6EP1311-1SH13)

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 of 6EP1311-1SH13) (Page 25)). Make sure that the output cables are dimensioned correctly for the maximum output current rms value and fused accordingly.

Note

When using LOGO!Power in conjunction with devices of the protection class I (with protective conductor), a connection must be established between "-" and "PE" with at least 1.5 mm².

Technical data

Note

For an AC input voltage, the technical data is applicable for rated input voltage, rated load and +25° C ambient temperature (if nothing else is specified).

6.1 Input

	6EP1311-1SH03 (5 V / 3 A)	6EP1311-1SH13 (5 V / 6.3 A)	6EP1321-1SH03 (12 V / 1.9 A)	6EP1322-1SH03 (12 V / 4.5 A)	6EP1351-1SH03 (15 V / 1.9 A)
Input	1-phase AC or DC				
Rated voltage <i>U_e</i> rated / for AC	100...240 V				
Voltage range / for AC	85...264 V				
Input voltage / for DC	110...300 V				
Wide-range input	Yes				
Overvoltage resistance	2.3 x <i>U_e</i> rated, 1.3 ms				
Mains buffering at <i>I_a</i> rated, min.	40 ms	40 ms	40 ms	40 ms	40 ms
Mains buffering	at <i>U_e</i> = 187 V				
Rated line frequency	50/60 Hz				
Line frequency range	47...63 Hz				
Input current / at rated value of input voltage 120 V	0.36 A	0.71 A	0.53 A	1.13 A	0.63 A
Input current / at rated value of input voltage 230 V	0.22 A	0.37 A	0.3 A	0.61 A	0.33 A
Switch-on current limitation (+ 25° C), max.	26 A	50 A	25 A	55 A	25 A
<i>I</i> ² <i>t</i> , max.	0.8 A ² ·s	3 A ² ·s	0.8 A ² ·s	3 A ² ·s	0.8 A ² ·s
Built-in line-side fuse	Internal				
Protection in the line feeder cable (IEC 898)	Recommended miniature circuit-breaker: Characteristic B from 16 A or characteristic C from 10 A				

Technical data

6.1 Input

	6EP1352-1SH03 (15 V / 4 A)	6EP1331-1SH03 (24 V / 1.3 A)	6EP1332-1SH43 (24 V / 2.5 A)	6EP1332-1SH52 (24 V / 4 A)
Input	1-phase AC or DC			
Rated voltage U_e rated / for AC	100...240 V			
Voltage range / for AC	85...264 V			
Input voltage / for DC	110...300 V			
Wide-range input	Yes			
Overvoltage resistance	2.3 x U_e rated, 1.3 ms			
Mains buffering at I_a rated, min.	40 ms	40 ms	40 ms	40 ms
Mains buffering	at $U_e = 187$ V			
Rated line frequency	50/60 Hz			
Line frequency range	47...63 Hz			
Input current / at rated value of input voltage 120 V	1.24 A	0.7 A	1.22 A	1.95 A
Input current / at rated value of input voltage 230 V	0.68 A	0.35 A	0.66 A	0.97 A
Switch-on current limitation (+ 25° C), max.	55 A	25 A	46 A	30 A
I^2t , max.	3 A ² ·s	0.8 A ² ·s	3 A ² ·s	2.5 A ² ·s
Built-in line-side fuse	Internal			
Protection in the line feeder cable (IEC 898)	Recommended miniature circuit-breaker: Characteristic B from 16 A or characteristic C from 10 A			

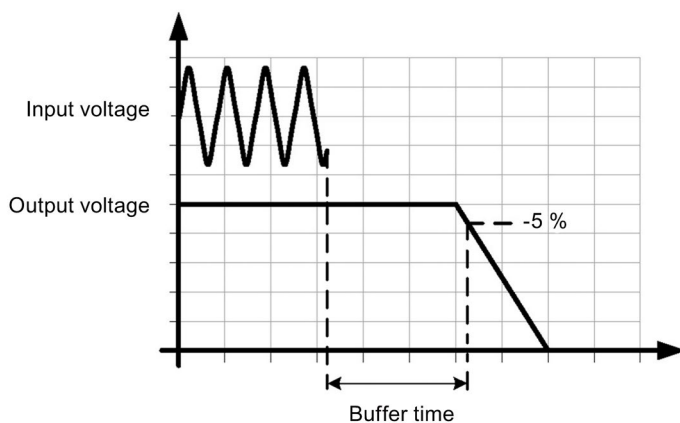


Figure 6-1 Mains buffering

6.2 Output

	6EP1311-1SH03 (5 V / 3 A)	6EP1311-1SH13 (5 V / 6.3 A)	6EP1321-1SH03 (12 V / 1.9 A)	6EP1322-1SH03 (12 V / 4.5 A)	6EP1351-1SH03 (15 V / 1.9 A)
Output	Regulated, isolated DC voltage				
Rated voltage value U _a rated DC	5 V	5 V	12 V	12 V	15 V
Total tolerance, static ±	3%	3%	3%	3%	3%
Static line regulation, approx.	0.2%	0.1%	0.1%	0.1%	0.1%
Static load regulation, approx.	1.5%	2%	1.5%	1.5%	1.5%
Residual ripple peak- peak, max.	100 mV	100 mV	200 mV	200 mV	200 mV
Residual ripple peak- peak, typ.	10 mV	15 mV	10 mV	10 mV	10 mV
Spikes peak-peak, max. (bandwidth, approx. 20 MHz)	100 mV	100 mV	300 mV	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth, approx. 20 MHz)	20 mV	70 mV	20 mV	70 mV	30 mV
Setting range	4.6...5.4 V	4.6...5.4 V	10.5...16.1 V	10.5...16.1 V	10.5...16.1 V
Product function / output voltage can be adjusted	Yes				
Output voltage setting	Using a potentiometer				
Status display	Green LED for output voltage OK				
Response when switching on/off	No overshoot of U _a (soft start)				
Starting delay, max.	0.5 s	0.5 s	0.5 s	0.5 s	0.5 s
Voltage rise, typ.	20 ms	10 ms	10 ms	10 ms	15 ms
Rated current I _a rated	3 A	6.3 A	1.9 A	4.5 A	1.9 A
Current range	0...3 A	0...6.3 A	0...1.9 A	0...4.5 A	0...1.9 A
• Remark	3 A to +55° C, 2.1 A to +70° C	6.3 A to +55° C, 4.4 A to +70° C	1.9 A to +55° C, 1.3 A to +70° C	4.5 A to +55° C, 3.1 A to +70° C	1.9 A to +55° C, 1.3 A to +70° C
Output active power / typical	15 W	30 W	23 W	50 W	23 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 (Page 31)				

Technical data

6.2 Output

	6EP1352-1SH03 (15 V / 4 A)	6EP1331-1SH03 (24 V / 1.3 A)	6EP1332-1SH43 (24 V / 2.5 A)	6EP1332-1SH52 (24 V / 4 A)
Output	Regulated, isolated DC voltage			
Rated voltage value U _a rated DC	15 V	24 V	24 V	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.	1.5%	1.5%	1.5%	1.5%
Residual ripple peak- peak, max.	200 mV	200 mV	200 mV	200 mV
Residual ripple peak- peak, typ.	10 mV	10 mV	10 mV	30 mV
Spikes peak-peak, max. (bandwidth, approx. 20 MHz)	300 mV	300 mV	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth, approx. 20 MHz)	70 mV	20 mV	50 mV	60 mV
Setting range	10.5...16.1 V	22.2...26.4 V	22.2...26.4 V	22.2...26.4 V
Product function / output voltage can be adjusted	Yes			
Output voltage setting	Using a potentiometer			
Status display	Green LED for output voltage OK			
Response when switching on/off	No overshoot of U _a (soft start)			
Starting delay, max.	0.5 s	0.5 s	0.5 s	0.5 s
Voltage rise, typ.	15 ms	15 ms	10 ms	15 ms
Rated current I _a rated	4 A	1.3 A	2.5 A	4 A
Current range	0...4 A	0...1.3 A	0...2.5 A	0...4 A
• Remark	4 A to +55° C, 2.8 A to +70° C	1.3 A to +55° C, 0.9 A to +70° C	2.5 A to +55° C, 1.7 A to +70° C	4 A to +55° C, 2.8 A to +70° C
Output active power / typical	50 W	30 W	60 W	96 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 (Page 31)			

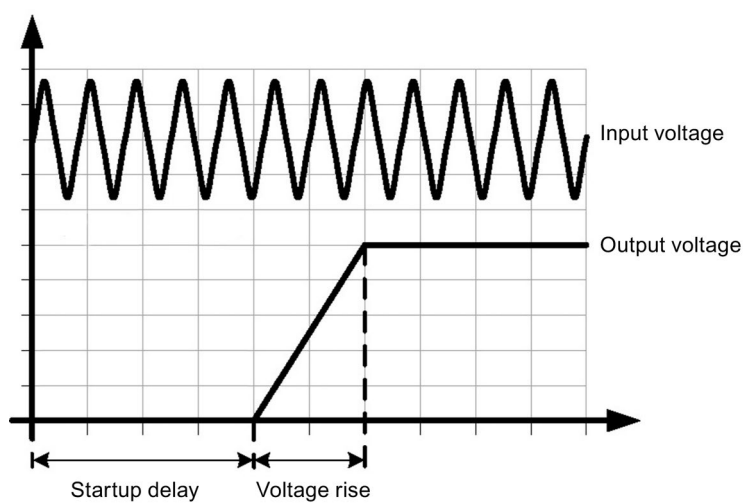


Figure 6-2 Startup delay/voltage rise

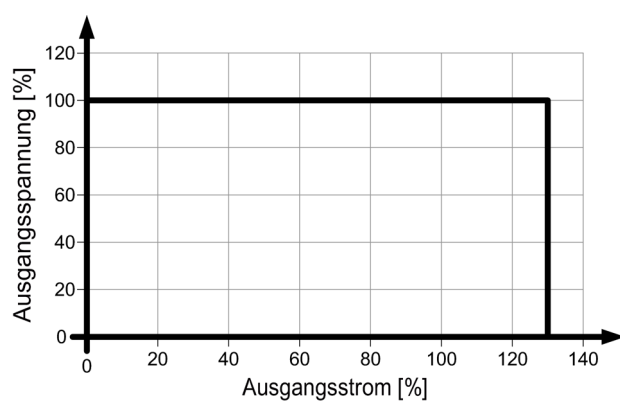


Figure 6-3 Output characteristic

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. The device does not switch off.

6.3 Efficiency and power loss

	6EP1311-1SH03 (5 V / 3 A)	6EP1311-1SH13 (5 V / 6.3 A)	6EP1321-1SH03 (12 V / 1.9 A)	6EP1322-1SH03 (12 V / 4.5 A)	6EP1351-1SH03 (15 V / 1.9 A)
Efficiency at U_a rated, I_a rated, approx.	79 %	80 %	80 %	84 %	81 %
Power loss at U_a rated, I_a rated, approx.	4 W	6 W	5 W	10 W	7 W

	6EP1352-1SH03 (15 V / 4 A)	6EP1331-1SH03 (24 V / 1.3 A)	6EP1332-1SH43 (24 V / 2.5 A)	6EP1332-1SH52 (24 V / 4 A)
Efficiency at U_a rated, I_a rated, approx.	85 %	84 %	88 %	87 %
Power loss at U_a rated, I_a rated, approx.	11 W	6 W	8 W	12 W

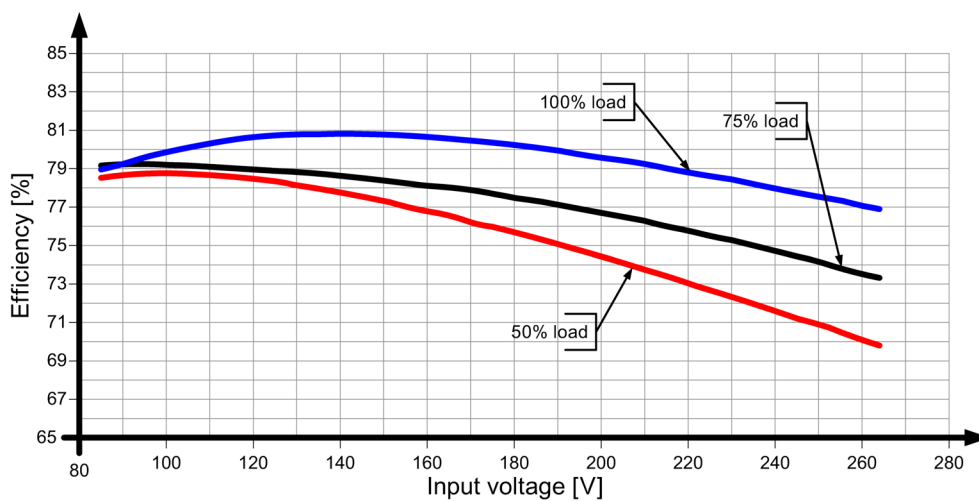


Figure 6-4 Efficiency 6EP1311-1SH03

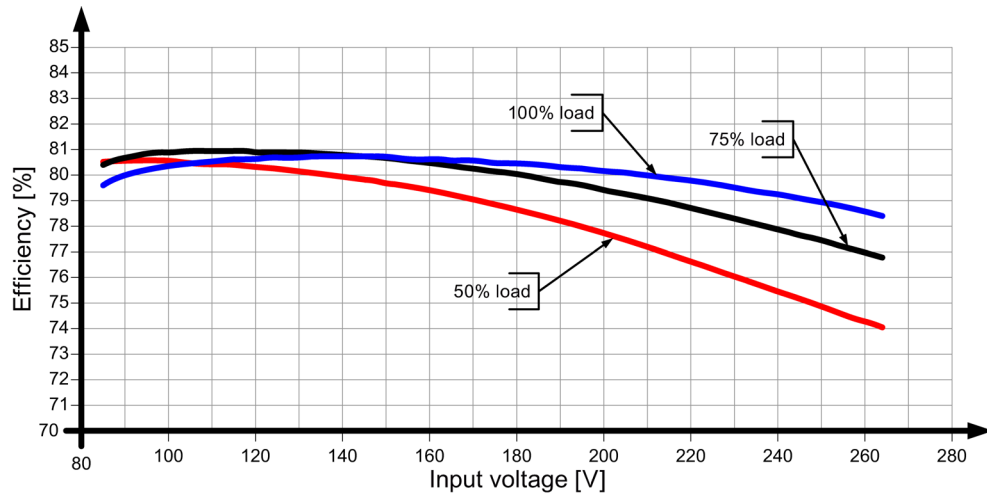


Figure 6-5 Efficiency 6EP1311-1SH13

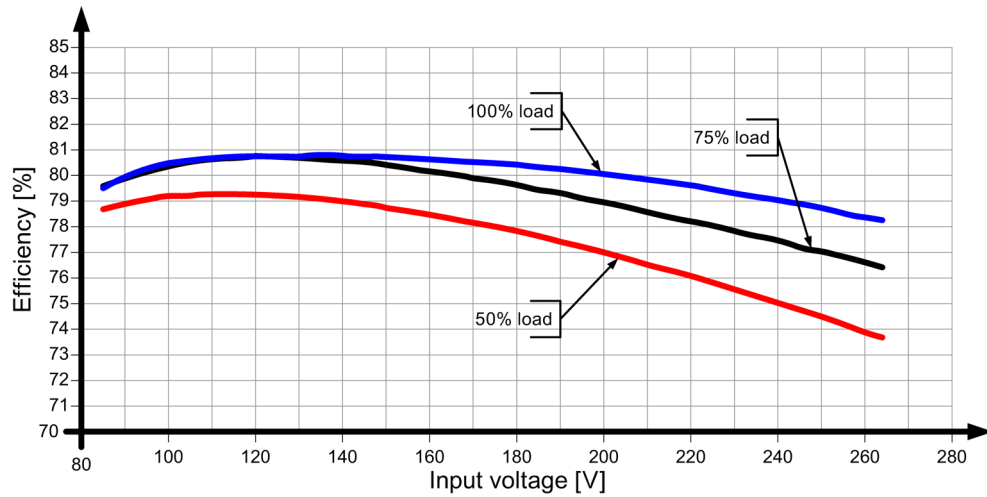


Figure 6-6 Efficiency 6EP1321-1SH03

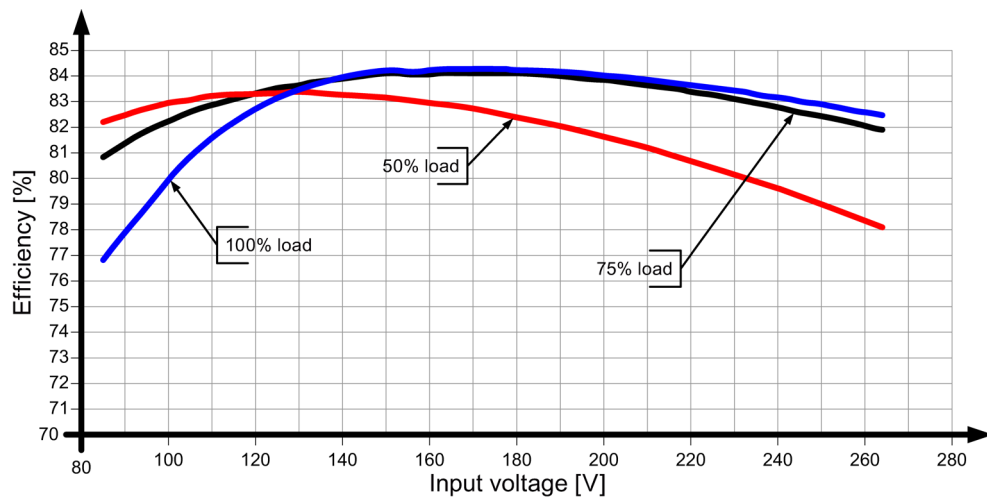


Figure 6-7 Efficiency 6EP1322-1SH03

6.3 Efficiency and power loss

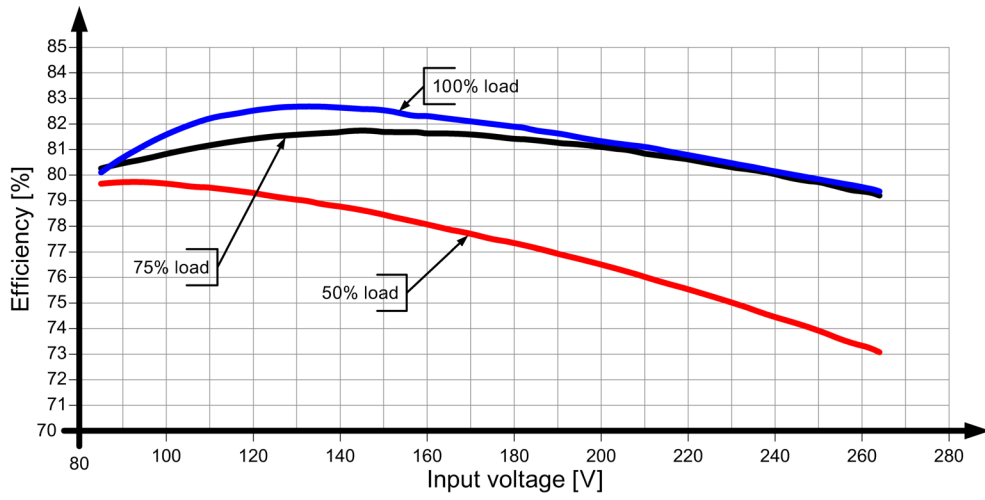


Figure 6-8 Efficiency 6EP1351-1SH03

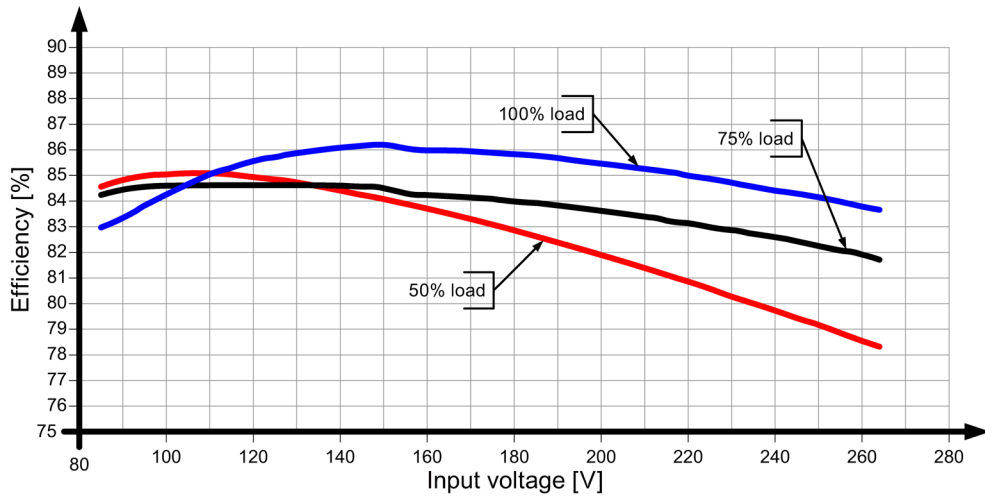


Figure 6-9 Efficiency 6EP1352-1SH03

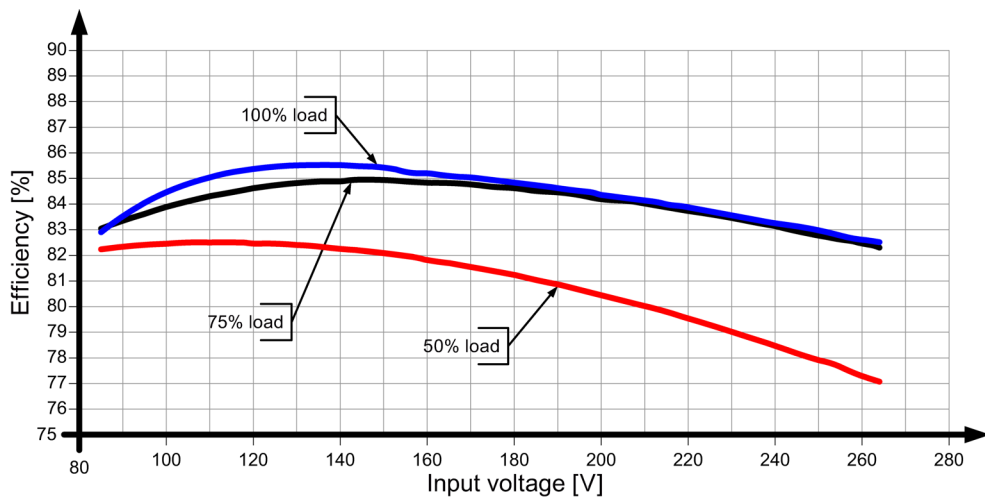


Figure 6-10 Efficiency 6EP1331-1SH03

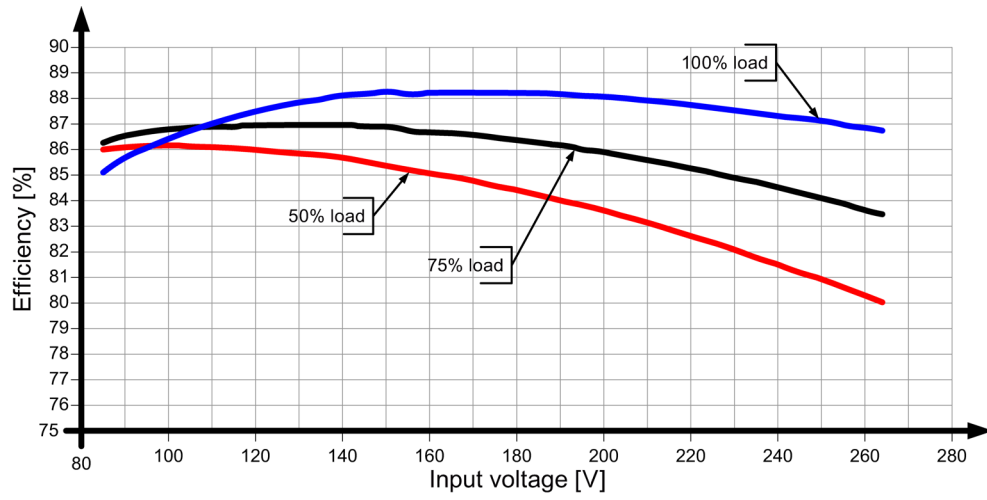


Figure 6-11 Efficiency 6EP1332-1SH43

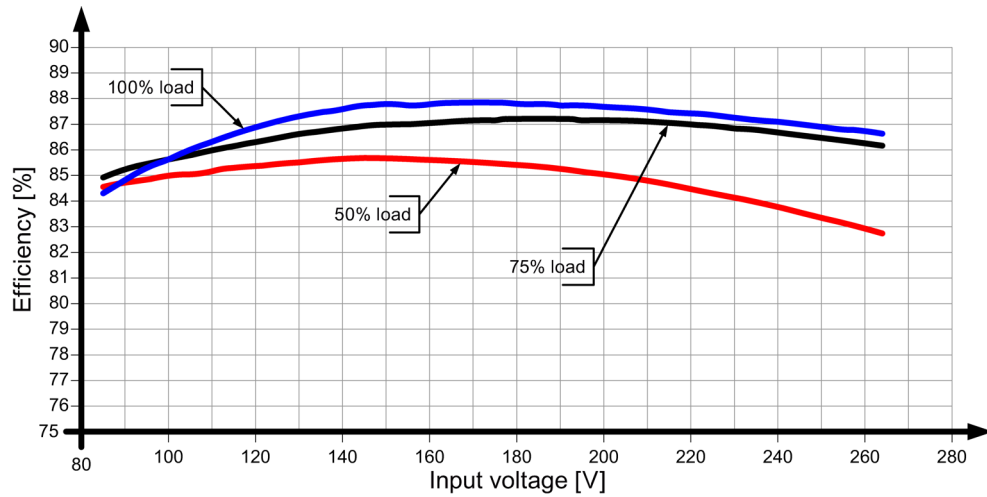


Figure 6-12 Efficiency 6EP1332-1SH52

6.4 Closed-loop control

	6EP1311-1SH03 (5 V / 3 A)	6EP1311-1SH13 (5 V / 6.3 A)	6EP1321-1SH03 (12 V / 1.9 A)	6EP1322-1SH03 (12 V / 4.5 A)	6EP1351-1SH03 (15 V / 1.9 A)
Dyn. mains compensation (U _e rated ±□15%)	0.2%	0.2%	0.2%	0.2%	0.2%
Dyn. load compensation (I _a : 10/90/10%), U _a ± typ.	3%	3%	3%	4%	2.8%
Load step regulation time 10 to 90%, typ.	2 ms	2 ms	1 ms	1 ms	1 ms
Load step regulation time 90 to 10%, typ.	2 ms	2 ms	1 ms	1 ms	1 ms

	6EP1352-1SH03 (15 V / 4 A)	6EP1331-1SH03 (24 V / 1.3 A)	6EP1332-1SH43 (24 V / 2.5 A)	6EP1332-1SH52 (24 V / 4 A)
Dyn. mains compensation (U _e rated ±□15%)	0.2%	0.2%	0.2%	0.2%
Dyn. load compensation (I _a : 10/90/10%), U _a ± typ.	3%	1%	2%	1.5%
Load step regulation time 10 to 90%, typ.	1 ms	1 ms	1 ms	1 ms
Load step regulation time 90 to 10%, typ.	1 ms	1 ms	1 ms	1 ms

6.5 Protection and monitoring

	6EP1311-1SH03 (5 V / 3 A)	6EP1311-1SH13 (5 V / 6.3 A)	6EP1321-1SH03 (12 V / 1.9 A)	6EP1322-1SH03 (12 V / 4.5 A)	6EP1351-1SH03 (15 V / 1.9 A)
Output overvoltage protection	Yes, according to EN 60950-1				
Current limitation, typ.	3.8 A	8.2 A	2.8 A	5.8 A	2.7 A
Property of the output/short-circuit proof	Yes				
Short-circuit protection	Constant current characteristic				
Continuous short-circuit current / rms value / maximum	5 A	10 A	3.6 A	7 A	3.6 A

	6EP1352-1SH03 (15 V / 4 A)	6EP1331-1SH03 (24 V / 1.3 A)	6EP1332-1SH43 (24 V / 2.5 A)	6EP1332-1SH52 (24 V / 4 A)
Output overvoltage protection	Yes, according to EN 60950-1			
Current limitation, typ.	5.7 A	1.7 A	3.3 A	5.2 A
Property of the output/short-circuit proof	Yes			
Short-circuit protection	Constant current characteristic			
Continuous short-circuit current / rms value / maximum	7 A	2.4 A	4.8 A	7.9 A

6.6 MTBF

	6EP1311-1SH03 (5 V / 3 A)
	6EP1311-1SH13 (5 V / 6.3 A)
	6EP1321-1SH03 (12 V / 1.9 A)
	6EP1322-1SH03 (12 V / 4.5 A)
	6EP1351-1SH03 (15 V / 1.9 A)
	6EP1352-1SH03 (15 V / 4 A)
	6EP1331-1SH03 (24 V / 1.3 A)
	6EP1332-1SH43 (24 V / 2.5 A)
	6EP1332-1SH52 (24 V / 4 A)
Mean Time Between Failures	According to SN29500 >3500000 h at 40° C, rated load, 24-h operation

6.7 Mechanical system

	6EP1311-1SH03 (5 V / 3 A)	6EP1311-1SH13 (5 V / 6.3 A)	6EP1332-1SH52 (24 V / 4 A)
	6EP1321-1SH03 (12 V / 1.9 A)	6EP1322-1SH03 (12 V / 4.5 A)	
	6EP1351-1SH03 (15 V / 1.9 A)	6EP1352-1SH03 (15 V / 4 A)	
	6EP1331-1SH03 (24 V / 1.3 A)	6EP1332-1SH43 (24 V / 2.5 A)	
Connection system	screw-type terminal		
Connections / line supply	L, N: 1 screw terminal each for 0.5 ... 4 (2.5) mm ² solid (finely stranded)		
Connections / output	+, -: 2 screw terminals each for 0.5 ... 4 (2.5) mm ² solid (finely stranded)		
Connections / auxiliary contacts	-		
Width of the housing	54 mm	72 mm	90 mm
Height of the housing	90 mm	90 mm	90 mm
Depth of the housing	53.1 mm	53.1 mm	53.1 mm
Installation width	54 mm	72 mm	90 mm
Mounting height	130 mm	130 mm	130 mm
Weight, approx.	0.17 kg	0.25 kg	0.34 kg
Product feature of the housing / housing that can be lined up next to one another	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 EN 60715 35x7,5/15 mounting rails		

6.8 Accessories

No accessories.

6.9 Dimension drawing

See Section Dimensions and weight (Page 14)

CAD data that can be downloaded from the Internet:

6EP1311-1SH03

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00535)

6EP1311-1SH13

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00538)

6EP1322-1SH03

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00544)

6EP1321-1SH03

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00541)

6EP1351-1SH03

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00556)

6EP1352-1SH03

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00559)

6EP1331-1SH03

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00547)

6EP1332-1SH43

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00550)

6EP1332-1SH52

(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00553)

Safety, approvals, EMC

7.1 Safety

	6EP1311-1SH03 (5 V / 3 A)
	6EP1311-1SH13 (5 V / 6.3 A)
	6EP1321-1SH03 (12 V / 1.9 A)
	6EP1322-1SH03 (12 V / 4.5 A)
	6EP1351-1SH03 (15 V / 1.9 A)
	6EP1352-1SH03 (15 V / 4 A)
	6EP1331-1SH03 (24 V / 1.3 A)
	6EP1332-1SH43 (24 V / 2.5 A)
	6EP1332-1SH52 (24 V / 4 A)
Primary/secondary galvanic isolation	Yes
Galvanic isolation	SELV output voltage U _a according to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)
Degree of protection (EN 60529)	IP20
Test voltage	See Table 7-1 Test voltage (Page 42)

7.2 Test voltage

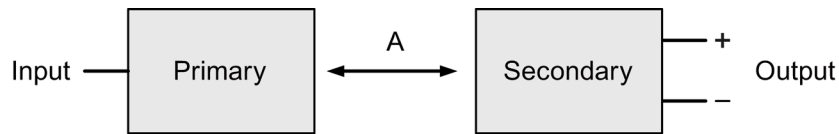


Figure 7-1 Test voltage diagram

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

Preconditions for performing the field test:

Test (A)

- Connect the input terminals to one another
- Connect the output terminals to one another

Table 7- 1 Test voltage

	Test time	Prim ↔ sec (A)
Type test	60 s	4200 VDC
	60 s	3000 VAC
Production test	1 s	2200 VDC
	1 s	1500 VAC
Field test	1 s	2200 VDC
	1 s	1500 VAC

Remark:

Tripping current for DC measurement: 0 mA

Tripping current for AC measurement: <100 mA

7.3 Certifications

Certifications	6EP1311-1SH03 (5 V / 3 A)	6EP1311-1SH13 (5 V / 6.3 A)
	6EP1321-1SH03 (12 V / 1.9 A)	6EP1322-1SH03 (12 V / 4.5 A)
	6EP1351-1SH03 (15 V / 1.9 A)	6EP1332-1SH52 (24 V / 4 A)
	6EP1352-1SH03 (15 V / 4 A)	
	6EP1331-1SH03 (24 V / 1.3 A)	
	6EP1332-1SH43 (24 V / 2.5 A)	
CE marking	Yes (2004/108/EG and 2006/95/EG)	
UL/cUL approval	cULus-Listed (UL 508, CSA C22.2 No.107.1), File E197259	cULus-Listed (UL 508, CSA C22.2 No.107.1), File E197259
	cURus-Recognized (UL60950, CSA C22.2 No. 60950) File E151273 NEC class2 (acc. to UL 60950/UL 1310)	cURus-Recognized (UL60950, CSA C22.2 No. 60950) File E151273
FM	Class I, Div. 2, Groups ABCD; T4	
CB scheme	IEC 60950-1	
Explosion protection	ATEX II 3G Ex nA IIC T3	
	cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	
SEMI F47 compliance 208 - 240 V	IEC 61000-4-11	
Marine approval	Germanischer Lloyd (GL)	
	6EP1352-1SH52: Cert. No.:24184-04HH	
	All other types: Cert. No.:47994-03HH	
	ABS, DNV, LRS, BV	

7.4 EMC

		6EP1311-1SH03 (5 V / 3 A) 6EP1311-1SH13 (5 V / 6.3 A) 6EP1321-1SH03 (12 V / 1.9 A) 6EP1322-1SH03 (12 V / 4.5 A) 6EP1351-1SH03 (15 V / 1.9 A) 6EP1352-1SH03 (15 V / 4 A) 6EP1331-1SH03 (24 V / 1.3 A) 6EP1332-1SH43 (24 V / 2.5 A)	6EP1332-1SH52 (24 V / 4 A)
Generic standards	EN 61000-6-2	Immunity for industrial environments	
	EN 61000-6-3	Emission for residential areas	
Electrostatic discharges	EN 61000-4-2	6 kV contact, 8 kV air	6 kV contact, 8 kV air
Electromagnetic fields	EN 61000-4-3	80...1000 MHz 10 V/m	80...1000 MHz 10 V/m
		1000...2000 MHz 3 V/m	1000...2000 MHz 3 V/m
		2000...2700 MHz 1 V/m	2000...2700 MHz 1 V/m
High-speed transient disturbance variables (burst)	EN 61000-4-4	4 kV on line connections	4 kV on line connections
		2 kV at DC output	2 kV at DC output
Power surges	EN 61000-4-5	2 kV symmetrical on line connections	2 kV symmetrical on line connections
		4 kV asymmetrical on line connections	4 kV asymmetrical on line connections
		500 V symmetrical/asymmetrical on DC output cables	500 V symmetrical/asymmetrical on DC output cables
High-frequency fields	EN 61000-4-6	10 V; 0.15...80 MHz	10 V; 0.15...80 MHz
Voltage dips	EN 61000-4-11	100% for 20 ms	100% for 20 ms
		60% for 200 ms	60% for 200 ms
		30% for 500 ms	30% for 500 ms
Voltage interruptions	EN 61000-4-11	100% for 5000 ms	100% for 5000 ms
Emitted interference	EN 55022	Class B	Class B
Line harmonics limitation		Not applicable	EN 61000-3-2

Ambient conditions

	6EP1311-1SH03 (5 V / 3 A) 6EP1311-1SH13 (5 V / 6.3 A) 6EP1321-1SH03 (12 V / 1.9 A) 6EP1322-1SH03 (12 V / 4.5 A) 6EP1351-1SH03 (15 V / 1.9 A) 6EP1352-1SH03 (15 V / 4 A) 6EP1331-1SH03 (24 V / 1.3 A) 6EP1332-1SH43 (24 V / 2.5 A) 6EP1332-1SH52 (24 V / 4 A)
Ambient temperature	-20...+70° C with natural 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
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	Climate 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 <ul style="list-style-type: none"> – 7 mm deflection in the range 5...9 Hz – 2 g acceleration in the range 9...150 Hz • EN 60068-2-27 shock, test Ea <ul style="list-style-type: none"> – Acceleration 150 m/s², test duration 11 ms

6EP1311-1SH03 (5 V / 3 A)
6EP1311-1SH13 (5 V / 6.3 A)
6EP1321-1SH03 (12 V / 1.9 A)
6EP1322-1SH03 (12 V / 4.5 A)
6EP1351-1SH03 (15 V / 1.9 A)
6EP1352-1SH03 (15 V / 4 A)
6EP1331-1SH03 (24 V / 1.3 A)
6EP1332-1SH43 (24 V / 2.5 A)
6EP1332-1SH52 (24 V / 4 A)

Damaging gases

Tested according to:

- EN 60068-2-42 Sulfur dioxide: 10 cm³/m³, 4 days
 - EN 60068-2-43 Hydrogen sulfide: 1 cm³/m³, 4 days
-

Atmospheric pressure

Operation:

- 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 4-2 Mounting height derating (Page 19)
- Overvoltage category:
III up to 2000 m (EN 50178)
II from 2000 m up to 6000 m (EN 50178)

Storage:

- 1080 ... 660 hPa (-1000 ... +3500 m)
-

Applications

9.1 Parallel connection to increase power rating

To enhance performance, two LOGO!Power power supplies of the same type can be galvanically 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 network junction (terminal strip) if possible.
- The parallel-switched power supplies must be switched on simultaneously with a common switch in the mains supply line (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 0.2%. 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 0.2%.

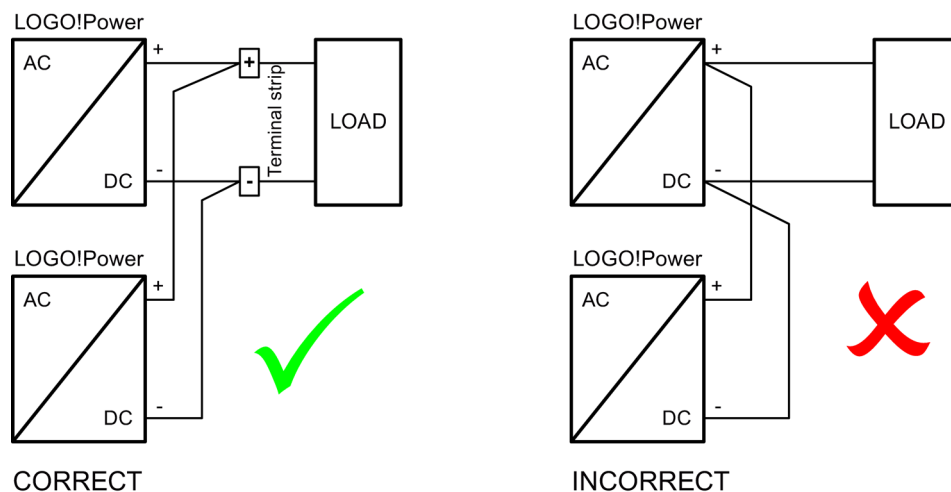


Figure 9-1 Parallel connection, correct and incorrect

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

The parallel switching of several LOGO!Power power supplies of the same type for redundancy is required when the demands for reliability of the supply are particularly high.

If a component in the redundant supply fails, the power supply for the loads must be fully accommodated by the remaining component. It is therefore important when dimensioning the system to make sure that $n+1$ redundant switched power supplies can handle the total power requirement of the remaining n power supplies.

To prevent loading of the remaining power supplies in the event of a secondary-side error when one power supply fails, the respective "+" terminals of the power supplies must be decoupled via diodes.

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 power supply networks.

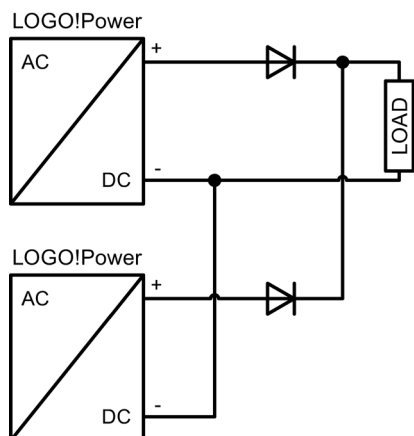


Figure 9-2 Parallel connection for redundancy

9.3 Series connection for increased voltage

To achieve a higher output voltage, two LOGO!Power 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 grounding point of the secondary output voltage, voltages of $+2 \times U_A$, $\pm U_A$ or $-2 \times U_A$ can be implemented.

In the case of asymmetric load distribution, it is not possible to ensure 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 VDC according to EN 60950 cannot be guaranteed in the case of a fault.

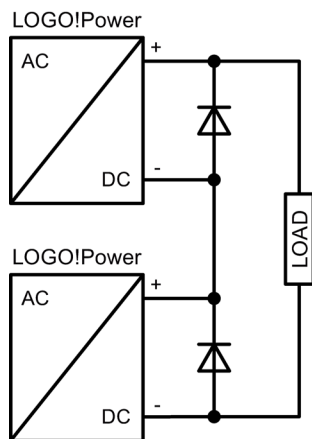


Figure 9-3 Series connection

9.4 Protection against short-time voltage dips

During a drop in the primary-side supply voltage, the LOGO!Power power supplies still maintain the output voltage over a short millisecond period (see Section Technical data (Page 27)).

Environment

The device is 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 and 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