

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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Overview

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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

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.

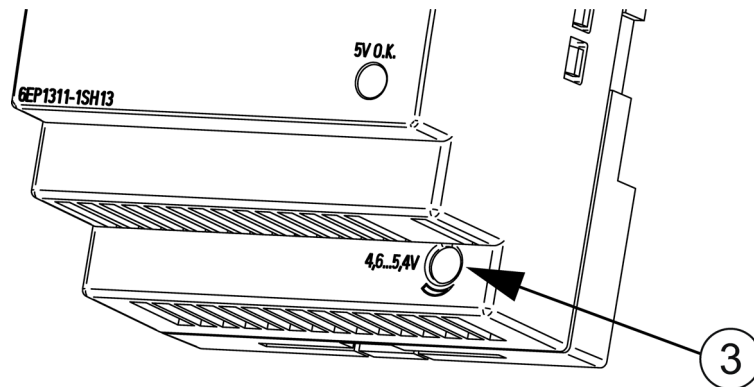


Figure 2-3 Potentiometer (example of 6EP1311-1SH13)

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

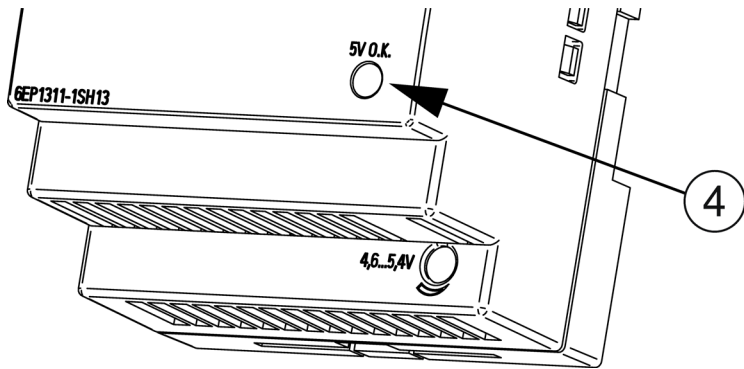


Figure 2-4 Operational displays and signals (example of 6EP1311-1SH13)

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
LED ④ off	Output voltage not present

2.5 Block diagram

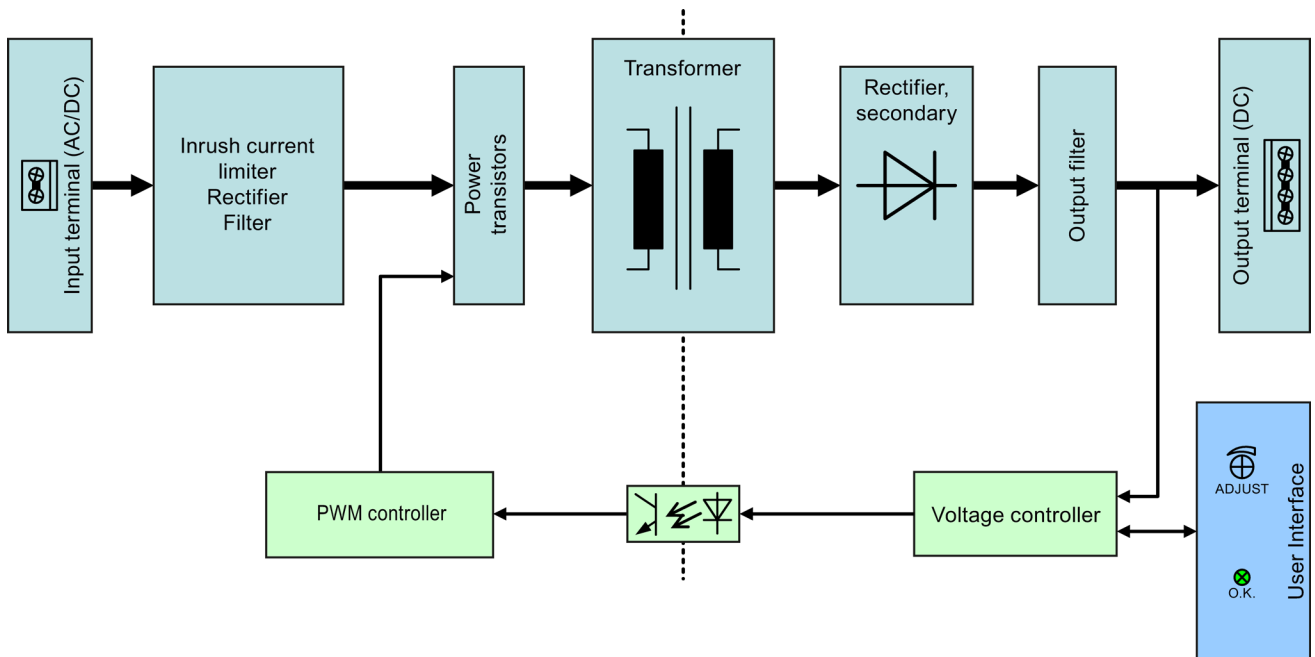


Figure 2-5 Block diagram

2.6 Dimensions and weight

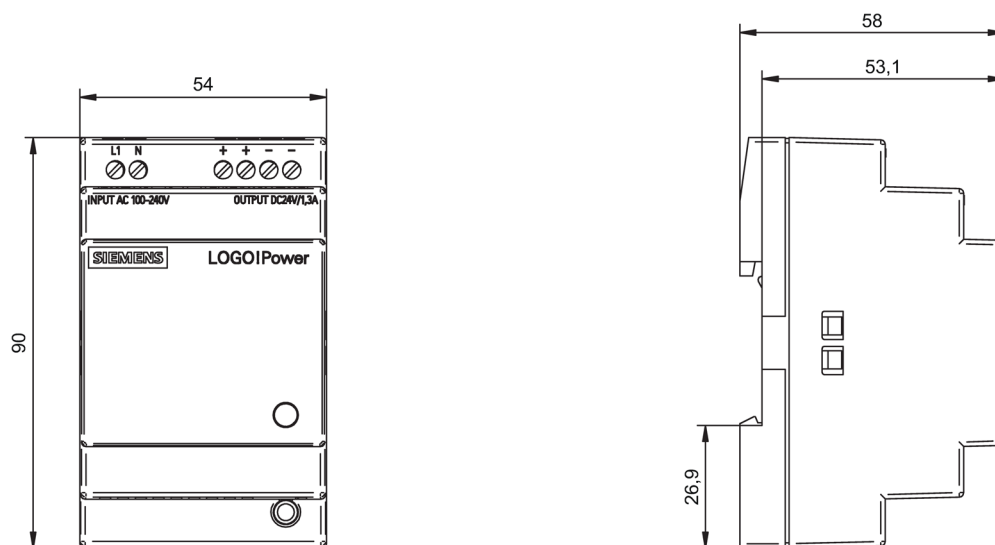


Figure 2-6 Dimension drawing 6EP1311-1SH03, 6EP1321-1SH03, 6EP1351-1SH03, 6EP1331-1SH03

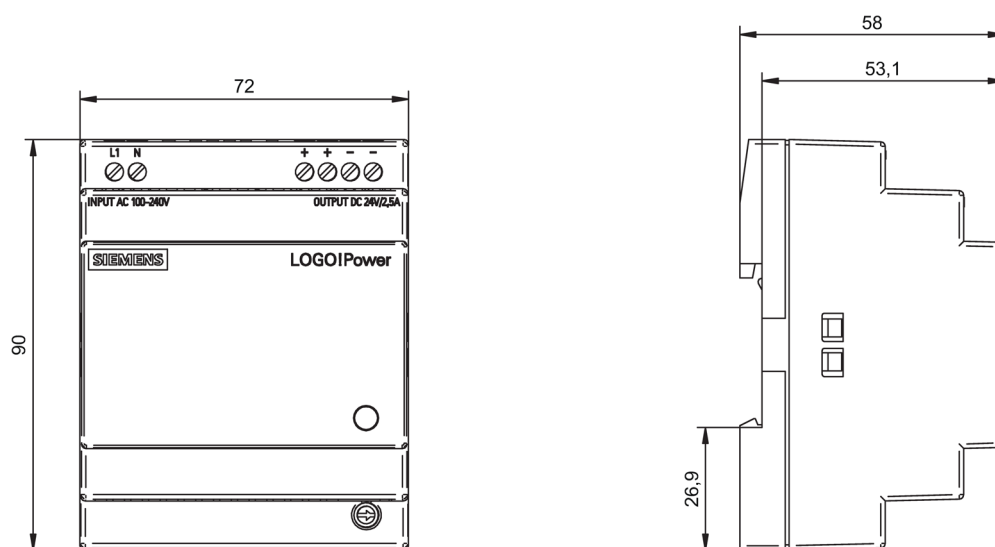


Figure 2-7 Dimension drawing 6EP1311-1SH13, 6EP1322-1SH03, 6EP1352-1SH03, 6EP1332-1SH43

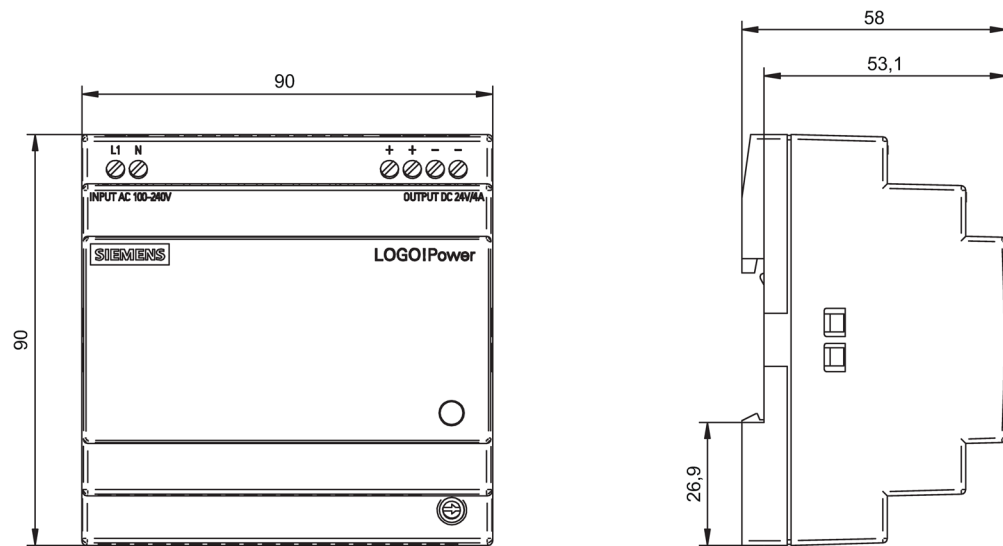


Figure 2-8 Dimension drawing 6EP1332-1SH52

	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

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.

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				

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)				

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

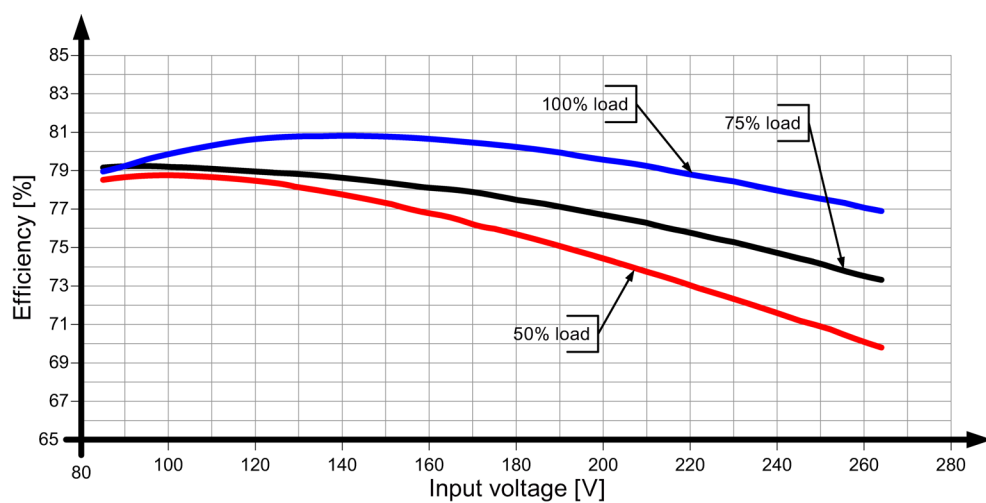


Figure 6-4 Efficiency 6EP1311-1SH03

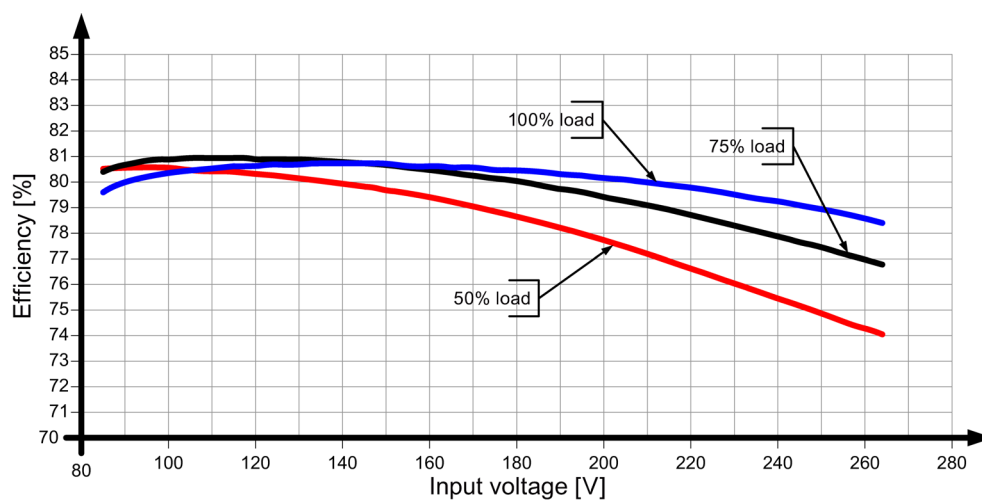


Figure 6-5 Efficiency 6EP1311-1SH13

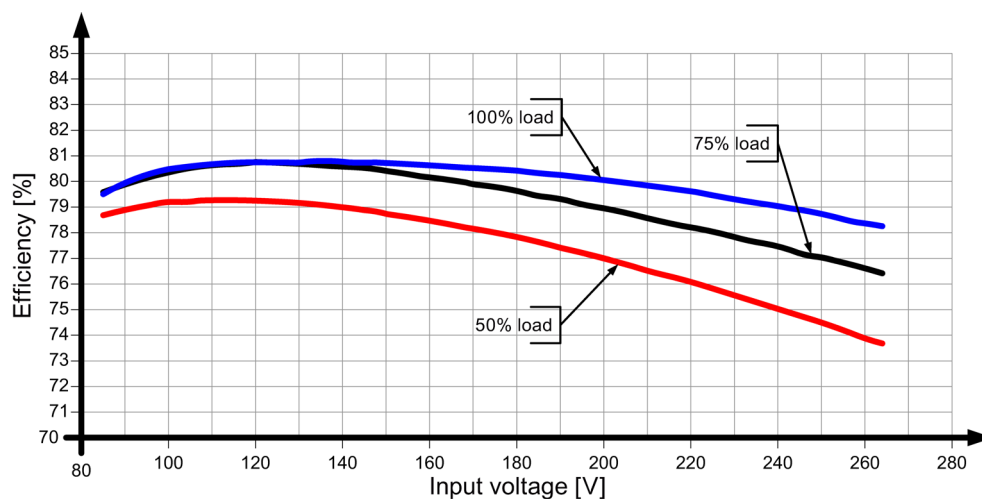


Figure 6-6 Efficiency 6EP1321-1SH03

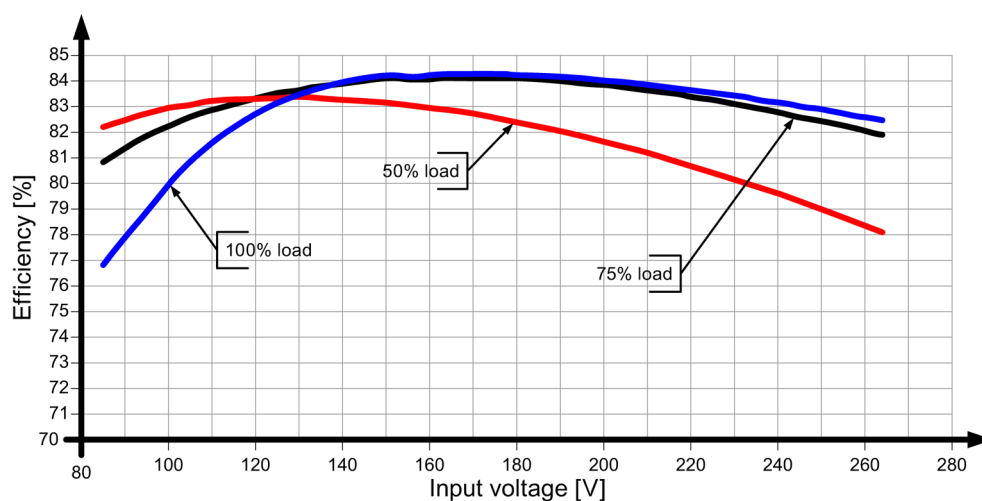


Figure 6-7 Efficiency 6EP1322-1SH03

6.3 Efficiency and power loss

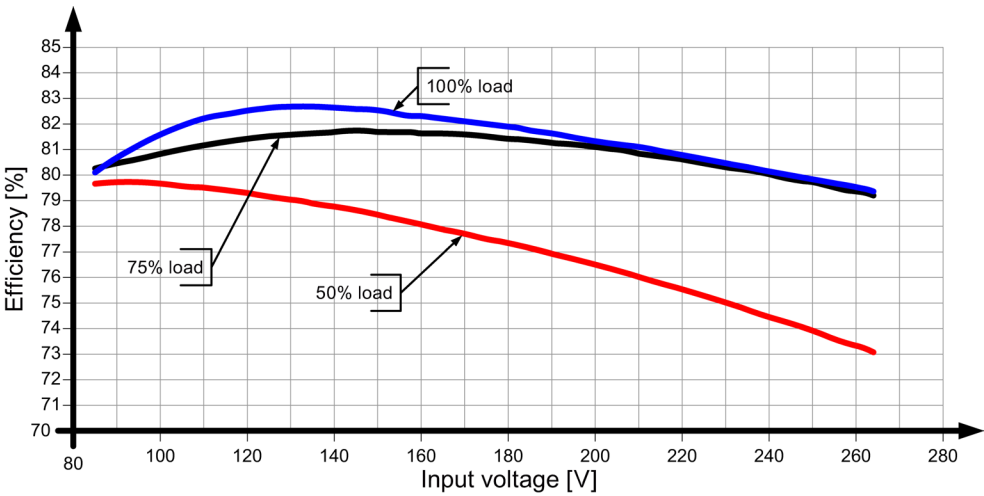


Figure 6-8 Efficiency 6EP1351-1SH03

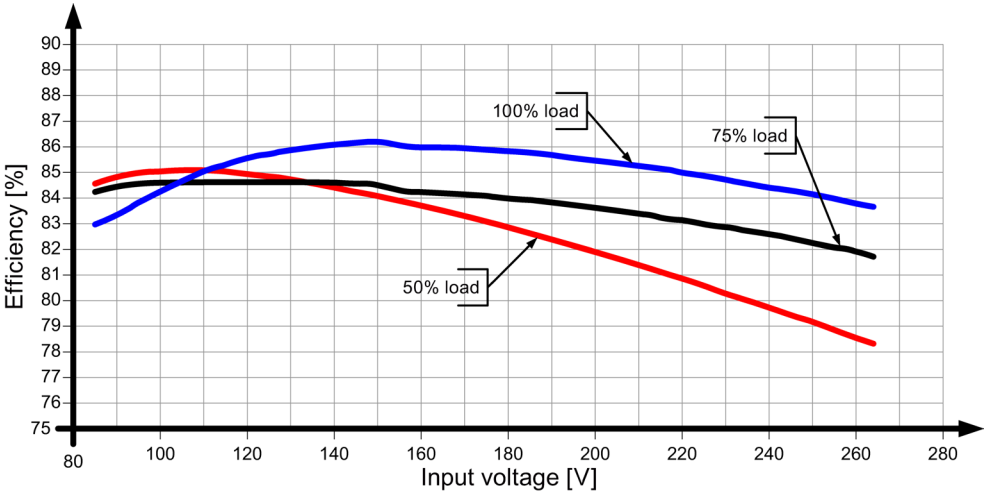


Figure 6-9 Efficiency 6EP1352-1SH03

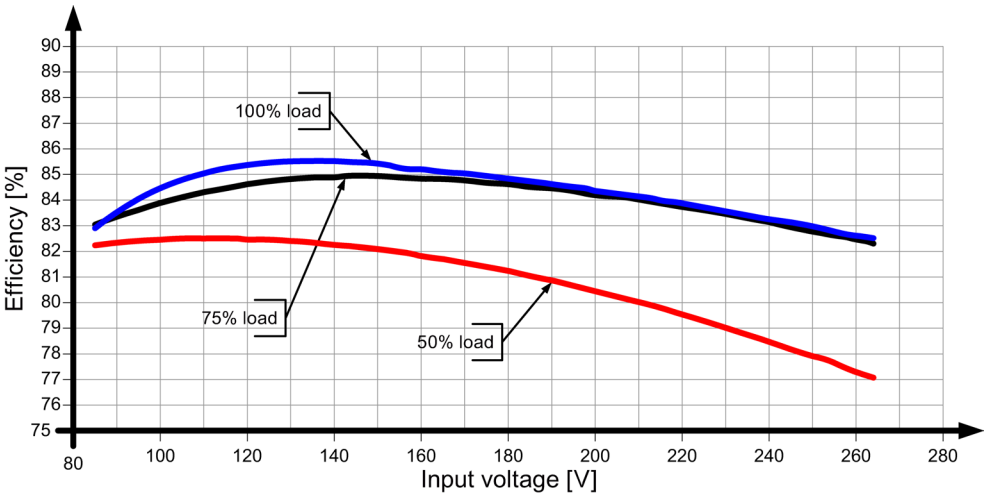


Figure 6-10 Efficiency 6EP1331-1SH03

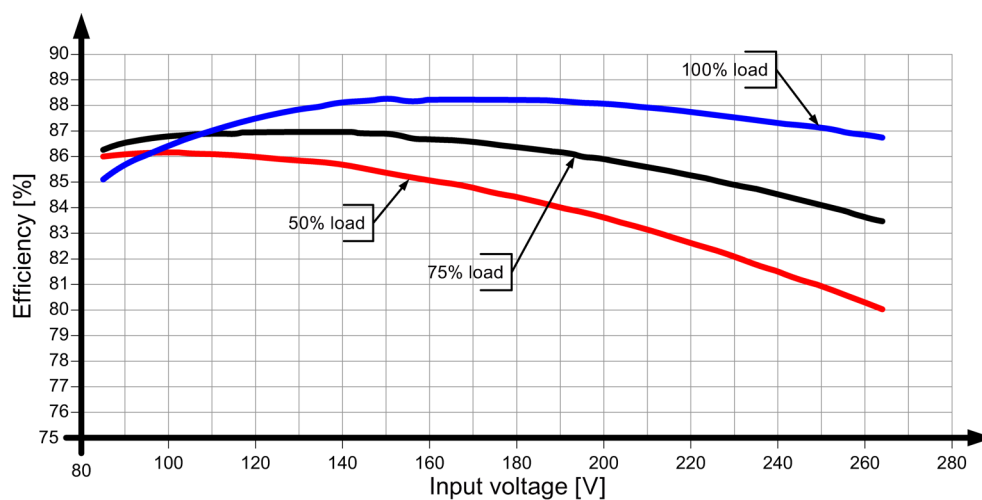


Figure 6-11 Efficiency 6EP1332-1SH43

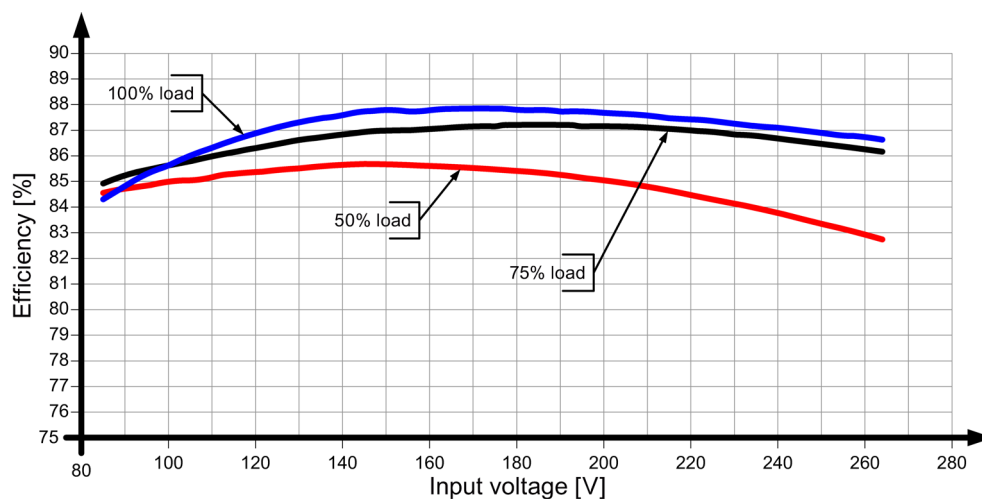


Figure 6-12 Efficiency 6EP1332-1SH52

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)

7.3 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 cURus-Recognized (UL60950, CSA C22.2 No. 60950) File E151273 NEC class2 (acc. to UL 60950/UL 1310)	cULus-Listed (UL 508, CSA C22.2 No.107.1), File E197259 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: • EN 60068-2-1 cold • EN 60068-2-2 dry heat • EN 60068-2-78 humid heat, constant • EN 60068-2-14 temperature change
Transport and storage temperature	-40 ... +85° C Tests (packed for shipping) according to: • EN 60068-2-1 cold • EN 60068-2-2 dry heat • EN 60068-2-30 humid heat, cyclic
Humidity class	Climate class 3K3 according to EN 60721, without condensation
Degree of pollution	2
Mechanical stressing in operation	Tested according to: • EN 60068-2-6 vibration, test Fc – 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 – 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)