MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6EP1436-3BA20

SEVENTEEN-AMPERE THREE-PHASE POWER SUPPLY

Used with the applicable SITOP PSU300B 24 V 17 A configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens SITOP PSU300M/300B Manual C98130-A7574-A2-2-7629, November 2014; PSU300B 24 V / 17 A variant, connections and technical tables.

Ordering data

The following device versions are available:

Regulated SITOP PSU300M/300B power supply	
Type	**Order number**
3-phase 400-500 V AC input, Output 24 V DC / 20 A	6EP1436-3BA10
3-phase 400-500 V AC input, Output 48 V DC / 10 A	6EP1456-3BA00
3-phase 400-500 V AC input, Output 12 V DC / 20 A	6EP1424-3BA00
3-phase 400-500 V AC input, Output 24 V DC / 17 A	6EP1436-3BA20
3-phase 400-500 V AC input, Output 24 V DC / 30 A	6EP1437-3BA20

Accessories	
Type	**Order number**
Device identification labels 20 mm × 7 mm, pastel turquoise	3RT1900-1SB20

2.2 Connections and terminal designation

The line input terminals ① can be used to establish the connection to the supply voltage. The output terminals ② are used to connect to the loads to be supplied (see also Section Installation (Page 35)).

Connections and terminal designations	
① Line input L1, L2, L3, PE	One screw terminal each
② output "+"	2 screw terminals
② output "–"	2 screw terminals
③ signaling contacts 13, 14	One screw terminal each

	① + ②	③	④
	SZS 0,6 x 3,5 / PZ1 / PH1	SZS 0,6 x 3,5	SZS 0,6 x 3 / PZ1 / PH1 max. ∅ 3,5 mm
	1 x 0,2 - 6 mm^2	1 x 0,14 - 1,5 mm^2	-
	1 x 0,2 - 4 mm^2	1 x 0,14 - 1,5 mm^2	-
AWG	26 - 10	28 - 16	-
Nm	0,5 - 0,6 Nm	0,22 Nm	0,04 Nm *1)
	8 mm	7 mm	-

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

Figure 2-2 Terminal data for 6EP1436-3BA10, 6EP1456-3BA00, 6EP1424-3BA00, 6EP1436-3BA20

	①	②	③	④
	SZS 0,6 x 3,5 / PZ1 / PH1	SZS 1,0 x 5,5	SZS 0,6 x 3,5	SZS 0,4 x 2,5 / max. ∅ 3,5 mm
	1 x 0,2 - 6 mm^2	1 x 0,5 - 16 mm^2	1 x 0,14 - 4,0 mm^2	-
	1 x 0,2 - 4 mm^2	1 x 0,5 - 10 mm^2	1 x 0,14 - 2,5 mm^2	-
AWG	26 - 10	26 - 6	22 - 12	-
Nm	0,5 - 0,6 Nm	1,2 - 1,5 Nm	0,5 - 0,6 Nm	0,04 Nm *1)
	8 mm	12 mm	7 mm	-

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

Figure 2-3 Terminal data for 6EP1437-3BA20

2.3 Potentiometer

The potentiometer ④ on the front of the device is used to adjust the output voltage. The output voltage is set to 12 V, 24 V or 48 V in the factory, and can be adjusted in the range 12 ... 14 V, 24 ... 28.8 V or 42 ... 56 V; for example, to compensate voltage drops across long supply lines to the connected load.

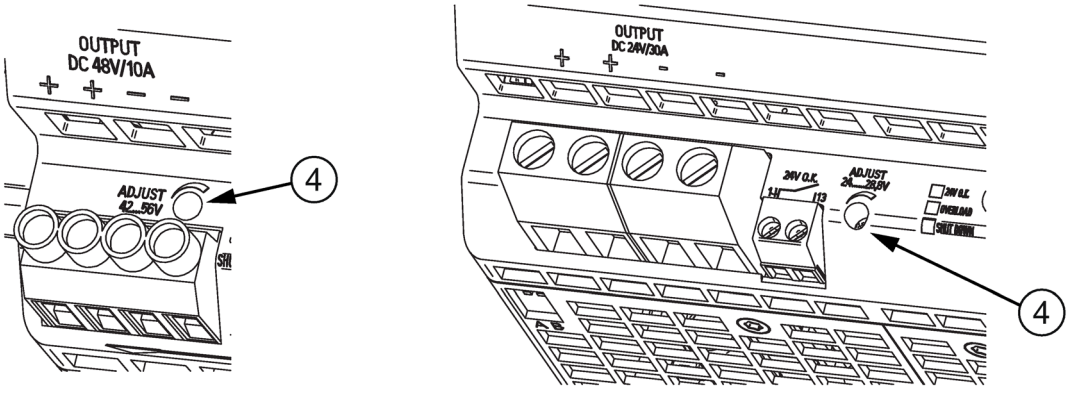


Figure 2-4 Potentiometer (example 6EP1456-3BA00 / 6EP1437-3BA20)

NOTICE
Thermal overload possible When adjusting the output voltage to >24 V (>48 V), the output current must be derated by 4 %/V or the permissible ambient temperature must be taken into account with 3 K/V (applies to PSU300M devices).

Note

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

For notes on actuating the potentiometer (screwdriver, torque), see Figure 2-2 Terminal data for 6EP1436-3BA10, 6EP1456-3BA00, 6EP1424-3BA00, 6EP1436-3BA20 (Page 10) and Figure 2-3 Terminal data for 6EP1437-3BA20 (Page 10).

2.4 Status displays and signaling

	6EP1436-3BA10 (24 V / 20 A)	6EP1456-3BA00 (48 V/10 A)
Operating display	LED green for "24 V O.K." Yellow LED for "overload" Red LED for "latching shutdown"	LED green for "48 V O.K." Yellow LED for "overload" Red LED for "latching shutdown"
Signaling contact	Relay contact (NO contact, rating 60 V DC / 0.3 A) for "24 V O.K."	Relay contact (NO contact, rating 60 V DC / 0.3 A) for "48 V O.K."

	6EP1424-3BA00 (12 V/20 A)	6EP1436-3BA20 (24 V/17 A) 6EP1437-3BA20 (24 V / 30 A)
Operating display	LED green for "12 V O.K." Yellow LED for "overload" Red LED for "latching shutdown"	LED green for "24 V O.K." Yellow LED for "overload" Red LED for "latching shutdown"
Signaling contact	Relay contact (NO contact, rating 60 V DC / 0.3 A) for "12 V O.K."	Relay contact (NO contact, rating 60 V DC / 0.3 A) for "24 V O.K."

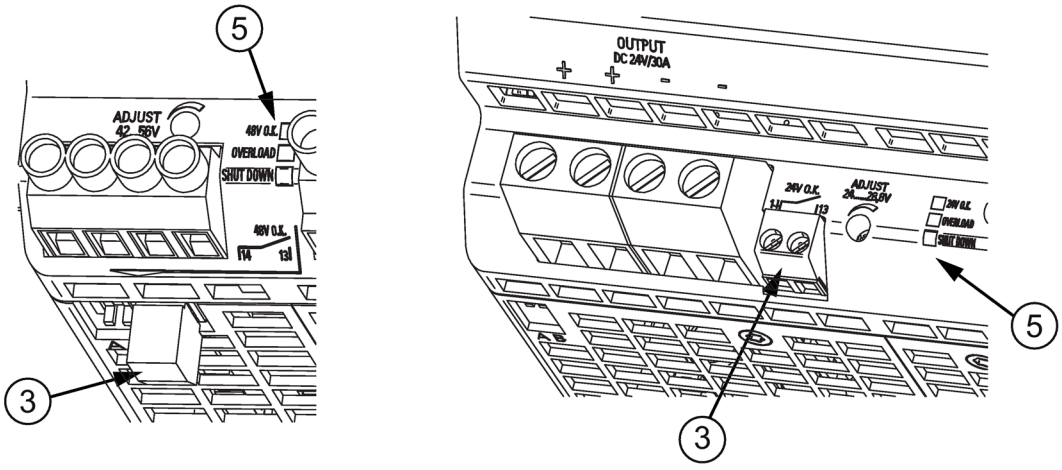


Figure 2-5 Operating display and signaling (example 6EP1456-3BA00 / 6EP1437-3BA20)

Signaling	6EP1436-3BA10 (24 V / 20 A)	6EP1456-3BA00 (48 V/10 A)
Green LED ⑤ lit Signaling contact ③, contacts 13-14 closed	Normal operation, output voltage > 20.5 V	Normal operation, output voltage > 41 V
LED ⑤ off Signaling contact ③, contacts 13-14 open (quiescent position)	No supply voltage	No supply voltage

Signaling	6EP1436-3BA10 (24 V / 20 A)	6EP1456-3BA00 (48 V/10 A)
Yellow LED ⑤ lit Signaling contact ③, contacts 13-14 open (quiescent position)	Overload, output voltage < 20.5 V (only in "constant current" mode)	Overload, output voltage < 41 V (only in "constant current" mode)
Yellow and green LED lights Signaling contact ③, contacts 13-14 closed	Phase failure, output voltage O.K.	Phase failure, output voltage O.K.
Red LED ④ lit Signaling contact ③, contacts 13-14 open (quiescent position)	Latching shutdown (only in "Shutdown" mode)	Latching shutdown (only in "Shutdown" mode)
Red LED ④ flashes Signaling contact ③, contacts 13-14 open (quiescent position)	Overtemperature → power OFF/ON after 3 min	Overtemperature → power OFF/ON after 3 min

Signaling	6EP1424-3BA00 (12 V / 20 A)	6EP1436-3BA20 (24 V / 17 A)	6EP1437-3BA20 (24 V / 30 A)
Green LED ⑤ lit Signaling contact ③, contacts 13-14 closed	Normal operation Output voltage > 10.0 V	Normal operation, output voltage > 20.5 V	Normal operation, output voltage > 20.5 V
LED ⑤ off Signaling contact ③, contacts 13-14 open (quiescent position)	No supply voltage	No supply voltage	No supply voltage
Yellow LED ⑤ lit Signaling contact ③, contacts 13-14 open (quiescent position)	Overload, output voltage < 10.0 V (only in "constant current")	Overload, output voltage < 20.5 V (only in "constant current" mode)	Overload, output voltage < 20.5 V (only in "constant current" mode)
Yellow and green LED lights Signaling contact ③, contacts 13-14 open (quiescent position)	Phase failure, output voltage O.K.	Phase failure, output voltage O.K.	-

Signaling	6EP1424-3BA00 (12 V / 20 A)	6EP1436-3BA20 (24 V / 17 A)	6EP1437-3BA20 (24 V / 30 A)
Red LED ④ lit Signaling contact ③, contacts 13-14 open (quiescent position)	Latching shutdown (only in "Shutdown" mode)	Latching shutdown (only in "Shutdown" mode)	Latching shutdown (only in "Shutdown" mode)
Red LED ④ flashes Signaling contact ③, contacts 13-14 closed	Overtemperature → power OFF/ON after 3 minutes	Overtemperature → power OFF/ON after 3 minutes	Overtemperature → power OFF/ON after 3 minutes

2.5 Change-over switch

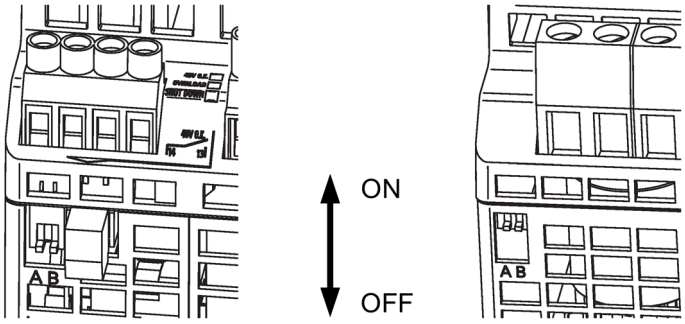


Figure 2-6 Selector switch (example 6EP1456-3BA00 / 6EP1437-3BA20)

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

Switch	ON	OFF
A influences the output characteristic in the load range	**Parallel operation:** 'Soft' characteristic curve (see, e.g. Figure 6-8 6EP1436-3BA10 parallel operation output characteristic curve (Page 46)) for the parallel operation of two or more devices: The output voltage falls with increasing output current (namely, also for the overcurrent pulse!). This means that for full output current the highest output voltage can normally no longer be attained.	**Single operation:** *Delivery state* 'Hard' characteristic curve (see, e.g. Figure 6-3 6EP1436-3BA10 single operation output characteristic curve (Page 44)) for normal operation (single operation): The output voltage is independent of the output current.
B influences the output characteristic in the overload range	**Latching shutdown:** If the output current rises above the rated value and above the current limit, the device reduces the output voltage (see, e.g. Figure 6-13 6EP1436-3BA10 latching shutdown output characteristic curve (Page 48)). If the output voltage falls below (10 V), (20 V), (40 V), the device shuts down latching, the red LED lights. This limit voltage of (10 V), (20 V), (40 V) is independent of the set output voltage. The 'Short-time overload current' feature is not available in this operating mode. In order to also be able to charge large capacitances in this operating mode at the output, non-latching shutdown is performed during the first ten seconds after power on. During these first 10 s, the device responds for overload as if the switch is OFF.	**Constant current:** *Delivery state* If the output current rises above the rated value and above the current limit, the device reduces the output voltage. The yellow LED lights if the output voltage falls below (10 V), (20 V), (40 V).

Delivery state: A-OFF; B-OFF

2.7 Dimensions and weight

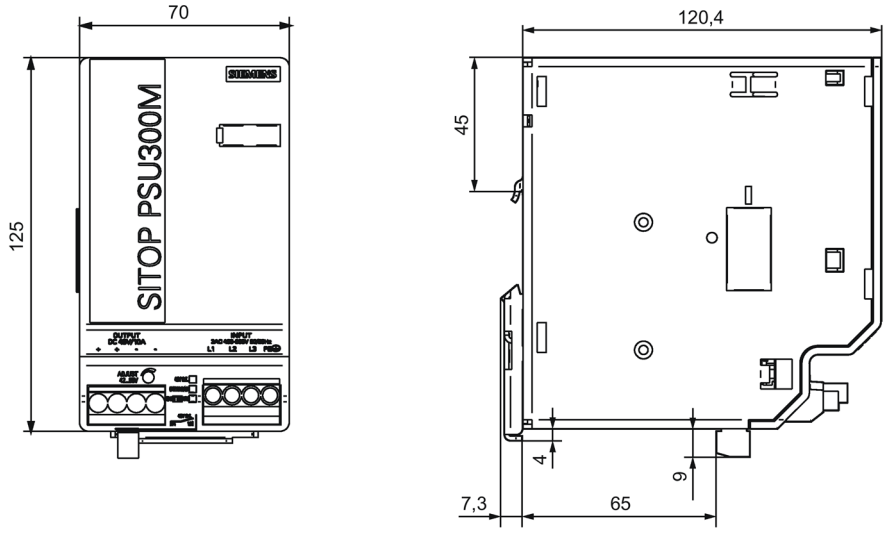


Figure 2-8 6EP1424-3BA00, 6EP1436-3BA20, 6EP1436-3BA10, 6EP1456-3BA00 dimensioned drawing

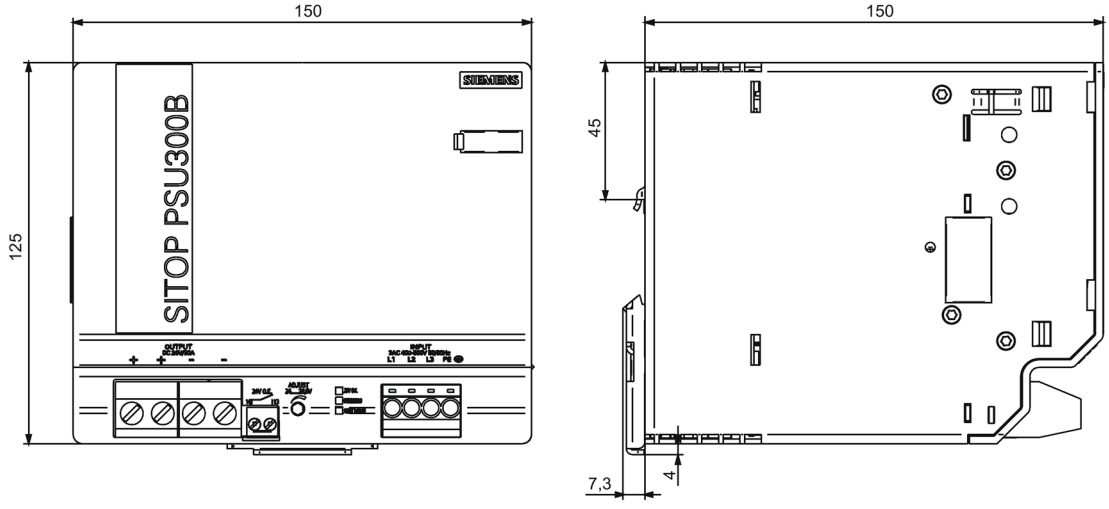


Figure 2-9 Dimension drawing 6EP1437-3BA20

	6EP1424-3BA00 (12 V / 20 A) **6EP1436-3BA20 (24 V / 17 A)** **6EP1436-3BA10 (24 V / 20 A)** **6EP1456-3BA00 (48 V / 10 A)**	**6EP1437-3BA20 (24 V / 30 A)**
Dimensions (W × H × D) in mm	70 × 125 × 125	150 × 125 × 150
Weight	approx. 1.2 kg	approx. 3.4 kg

Mounting/disassembly

3

⚠ WARNING

Installing the device in a housing or a control cabinet

The SITOP PSU300M/300B power supply is a built-in device. It must be installed in a housing or control cabinet, to which only qualified personnel have access.

The device can be mounted in a control cabinet on standard mounting rails according to 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 ① at the same time, as described under "Removal".

Removal

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

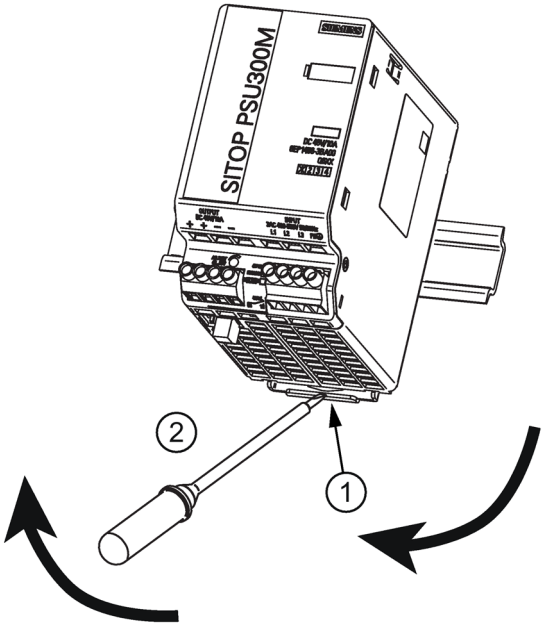


Figure 3-1 Mounting/removal (example 6EP1456-3BA00)

⚠ WARNING

Use in hazardous zones

If the devices are to be used in hazardous zones (Ex II 3G Ex nA nC IIC T4) they must be installed in a distribution box with degree of protection IP54 or higher.

Mounting position, mounting clearances

4

4.1 Standard mounting position

The device is mounted on standard mounting rails according to EN 60715. 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 (maximum depth of the cable duct, 50 mm).

No space is required at the side.

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

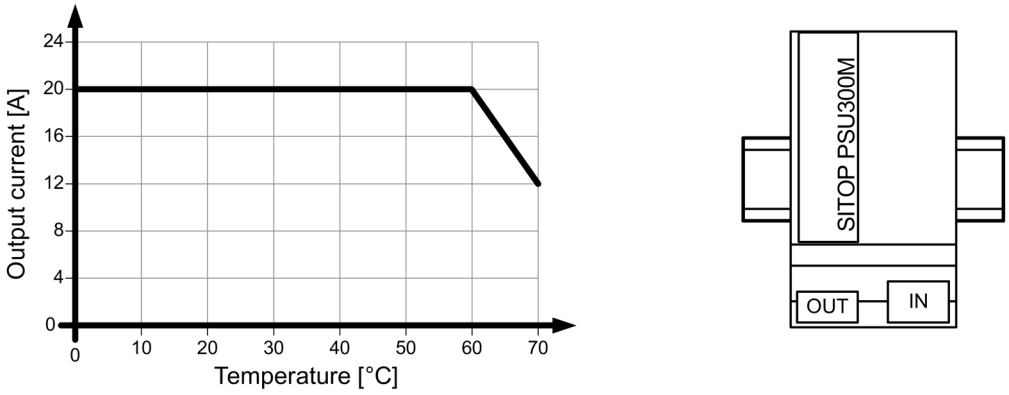


Figure 4-1 6EP1436-3BA10: Output current in the standard mounting position

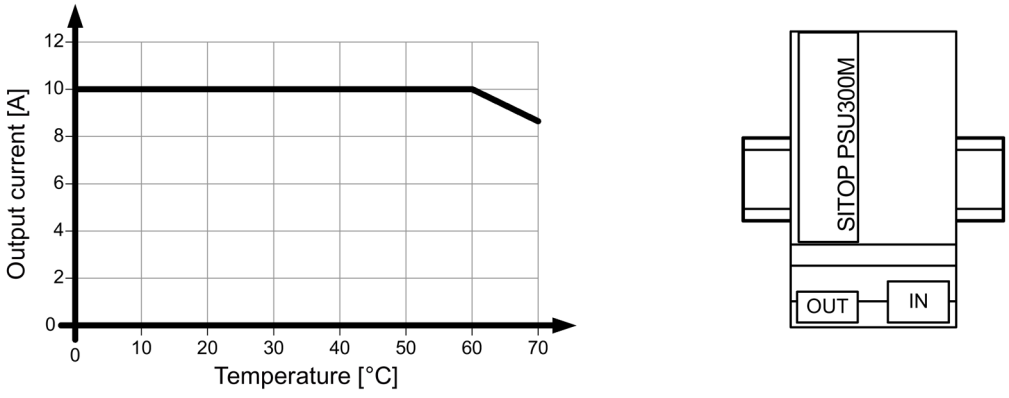


Figure 4-2 6EP1456-3BA00: Output current in the standard mounting position

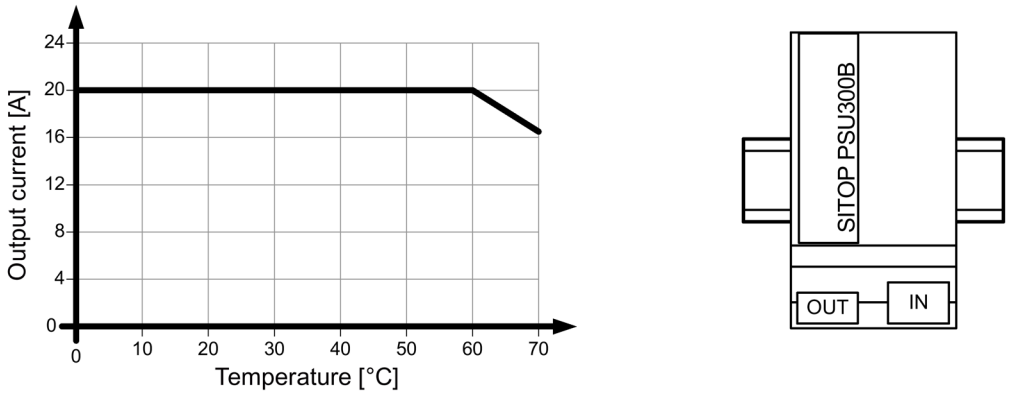


Figure 4-3 6EP1424-3BA00: Output current in the standard mounting position

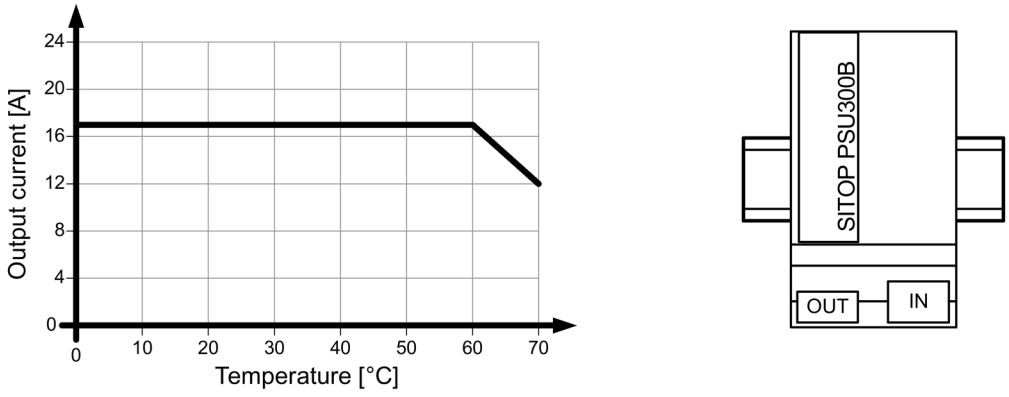


Figure 4-4 6EP1436-3BA20: Output current in the standard mounting position

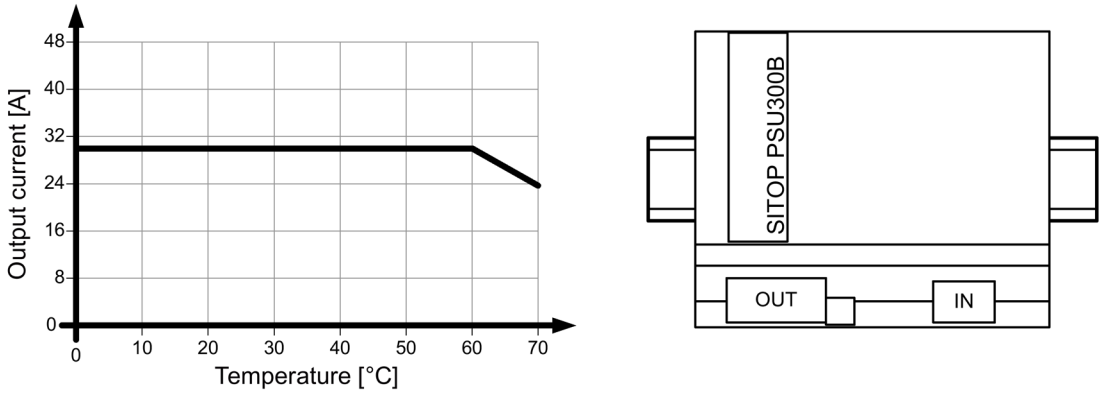


Figure 4-5 6EP1437-3BA20: Output current in the standard mounting position

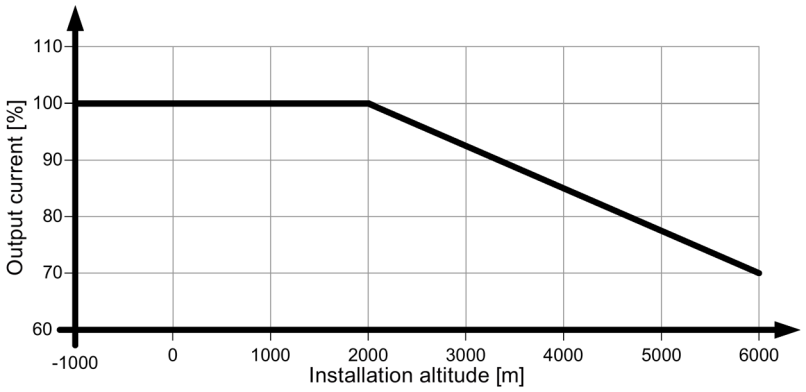


Figure 4-6 Mounting height derating

4.2.4 6EP1436-3BA20

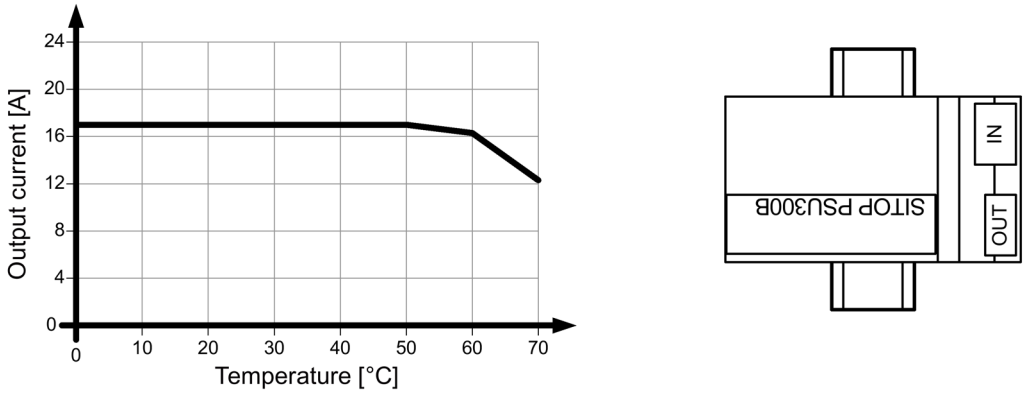


Figure 4-22 6EP1436-3BA20 mounting position (1)

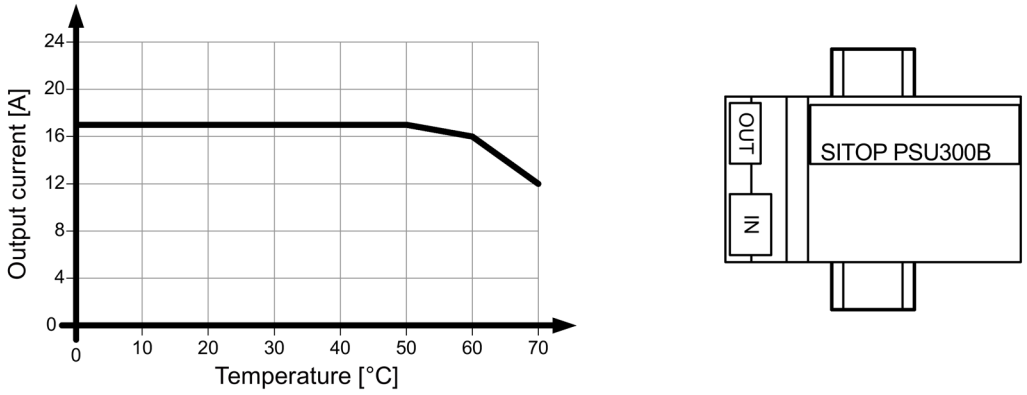


Figure 4-23 6EP1436-3BA20 mounting position (2)

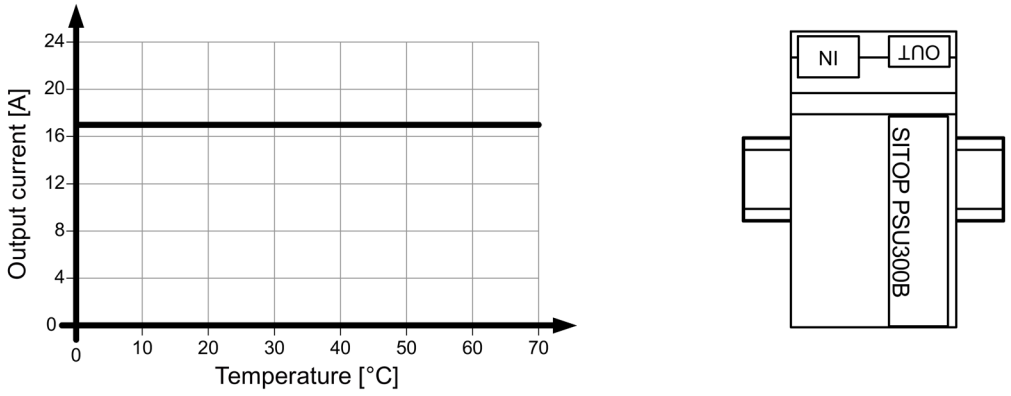
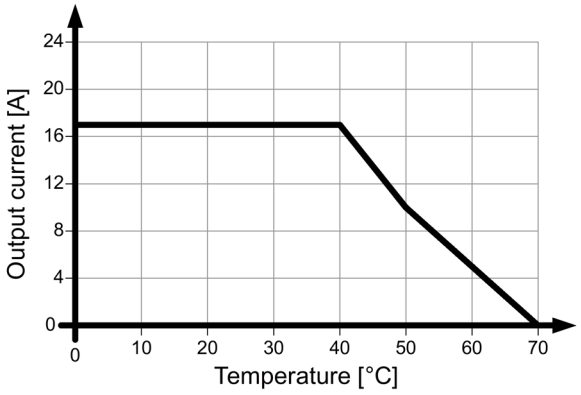


Figure 4-24 6EP1436-3BA20 mounting position (3)



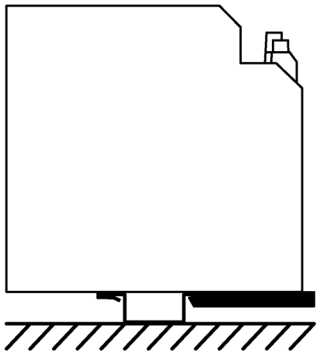
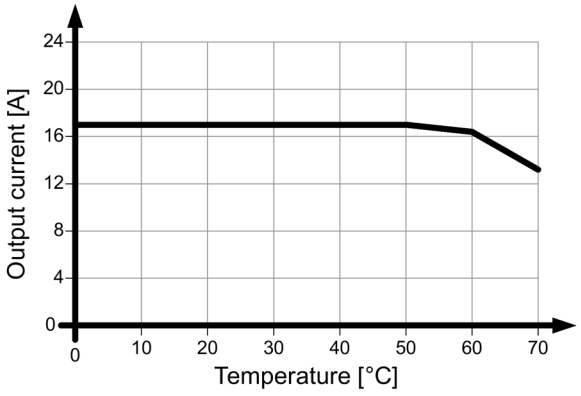


Figure 4-25 6EP1436-3BA20 mounting position (4)



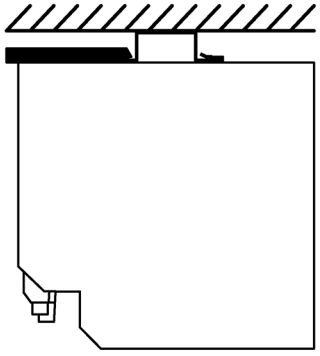


Figure 4-26 6EP1436-3BA20 mounting position (5)

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

The SITOP PSU300M/300B power supply is designed for connection to a 3-phase AC line supply (TN or TT system according to VDE 0100 T 300/IEC 364-3) with a rated voltage of 3-phase 400-500 V AC, 50/-60 Hz, IT system with rated voltages 3-phase 400-480 V AC.

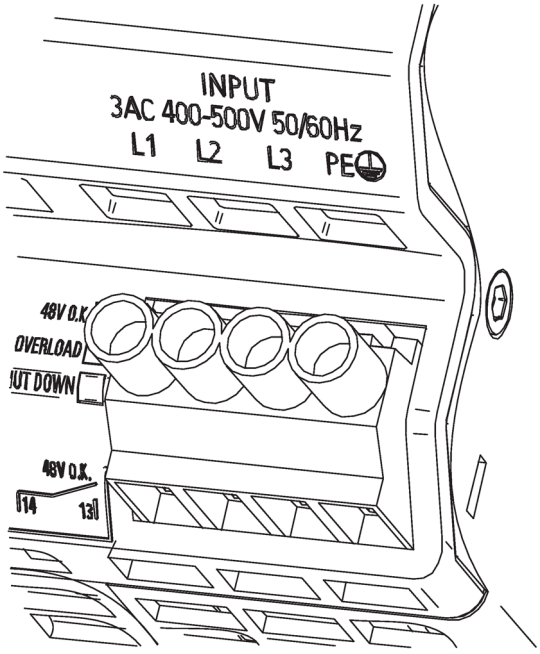


Figure 5-1 Line connection (example: 6EP1456-3BA00)

The line supply is connected using terminals L1, L2, L3 and PE (see Figure 5-1 Line connection (example: 6EP1456-3BA00) (Page 35)), 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 applies for the complete line supply protected by the ground-fault circuit interrupter.

Protection

SITOP PSU300M/300B	Recommended line-side protection
6EP1436-3BA10 (24 V / 20 A)	3-pole coupled miniature circuit breaker (IEC 898), characteristic C, 6-16 A or 3RV2011-1EA10 circuit breaker, setting of the thermal overcurrent trip: 3 A or 3RV2711-1DD10 circuit breaker (branch circuit protection according to UL 489)
6EP1456-3BA00 (48 V / 10 A)	3-pole coupled miniature circuit breaker (IEC 898), characteristic C, 6-16 A or 3RV2011-1EA10 circuit breaker, setting of the thermal overcurrent trip: 3 A or 3RV2711-1DD10 circuit breaker (branch circuit protection according to UL 489)
6EP1424-3BA00 (12 V / 20 A)	3-pole coupled miniature circuit breaker (IEC 898), characteristic C, 6-10 A or 3RV2011-1EA10 circuit breaker, setting of the thermal overcurrent trip: 3 A or 3RV2711-1DD10 circuit breaker (branch circuit protection according to UL 489)
6EP1436-3BA20 (24 V / 17 A)	3-pole coupled miniature circuit breaker (IEC 898), characteristic C, 6-16 A or 3RV2011-1EA10 circuit breaker, setting of the thermal overcurrent trip: 3 A or 3RV2711-1DD10 circuit breaker (branch circuit protection according to UL 489)
6EP1437-3BA20 (24 V / 30 A)	3-pole coupled miniature circuit breaker (IEC 898), characteristic C, 10-16 A or 3RV2011-1EA10 circuit breaker, setting of the thermal overcurrent trip: 3 A or 3RV2711-1DD10 circuit breaker (branch circuit protection according to UL 489)

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

At its output, the SITOP PSU300M/300B 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 (see Section Technical data (Page 39)).

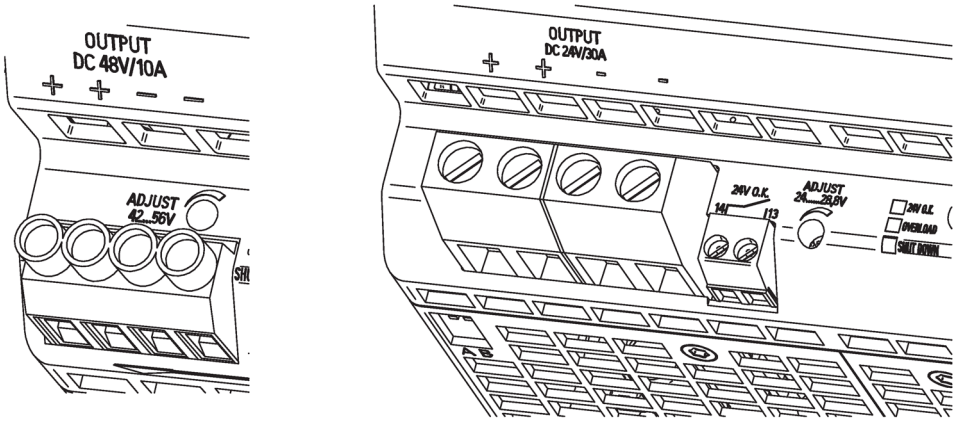


Figure 5-2 Output connection (example 6EP1456-3BA00 / 6EP1437-3BA20)

The output voltage is connected via the + and - terminals at the output of the power supply (see Figure 5-2 Output connection (example 6EP1456-3BA00 / 6EP1437-3BA20) (Page 37)). 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.

	6EP1424-3BA00 (12 V / 20 A)	6EP1436-3BA20 (24 V / 17 A)	6EP1437-3BA20 (24 V / 30 A)
Input	3-phase, AC	3-phase, AC	3-phase, AC
Rated voltage value Ue rated	400-500 V	400-500 V	400-500 V
Voltage range	320 ... 575 V	320 ... 575 V	320 ... 575 V
Wide-range input	Yes	Yes	Yes
Overvoltage strength	2.3 × Ue rated, 1.3 ms	2.3 × Ue rated, 1.3 ms	2.3 × Ue rated, 1.3 ms
Power failure buffering at Ia rated, min • Remark: at Ue = 400 V	20 ms	20 ms	20 ms
Rated line frequency	50-60 Hz	50-60 Hz	50-60 Hz
Line frequency range	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
Input current / at rated value of input voltage 400 V	0.7 A	1.2 A	1.6 A
Input current / at rated value of input voltage 500 V	0.6 A	1 A	1.3 A
Inrush current limiting (+25° C), max.	18 A	18 A	56 A
I^2t, max	0.8 A^2s	0.8 A^2s	2.24 A^2s
Integrated input fuse	None	None	None
Protection in the line feeder cable (IEC 898)	Required: 3-pole, coupled miniature circuit breaker 6 ... 10 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489)		Required: 3-pole, coupled miniature circuit breaker 10 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489)

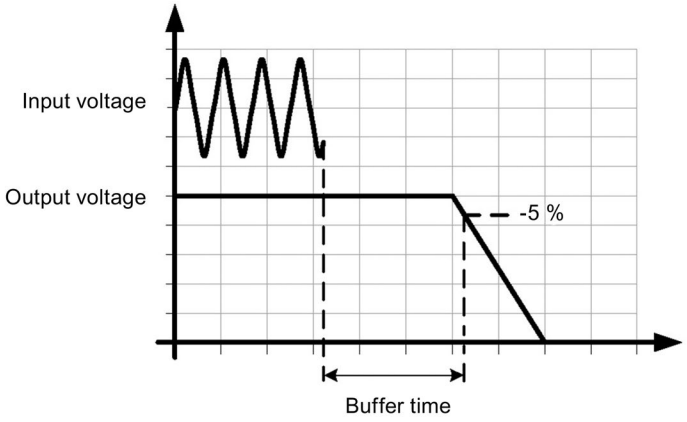


Figure 6-1 Power failure buffering

	6EP1436-3BA10 (24 V/20 A)	6EP1456-3BA00 (48 V/10 A)
Number of units connected in parallel to increase the power rating, units	2	2
Output characteristic	See Figure 6-3 6EP1436-3BA10 single operation output characteristic curve (Page 44)	See Figure 6-4 6EP1456-3BA00 single operation output characteristic curve (Page 44)

	6EP1424-3BA00 (12 V / 20 A)	6EP1436-3BA20 (24 V / 17 A)	6EP1437-3BA20 (24 V / 30 A)
Output	Regulated, isolated DC voltage	Regulated, isolated DC voltage	Regulated, isolated DC voltage
Rated voltage value Ua rated DC	12 V	24 V	24 V
Total tolerance, static ±	3 %	3 %	3 %
Static line regulation, approx.	2 %	0,1 %	0,1 %
Static load regulation, approx.	4 %	0,2 %	0,1 %
Residual ripple in the load range peak-peak, max.	100 mV	100 mV	100 mV
Spikes peak-peak, max. (bandwidth, approx. 20 MHz)	200 mV	200 mV	200 mV
Adjustment range	12 ... 14 V	24 … 28.8 V	24 … 28.8 V
Product function / output voltage can be adjusted	Yes	Yes	Yes
Output voltage setting	Via potentiometer	Via potentiometer	Via potentiometer
• Remark	-	Max. 480 W	-
Operating display	LED green for "12 V O.K."	LED green for "24 V O.K."	LED green for "24 V O.K."
Signaling	Relay contact (NO contact, rating 60 V DC / 0.3 A) for "12 V O.K."	Relay contact (NO contact, rating 60 V DC / 0.3 A) for "24 V O.K."	
Response when switching on/off	No overshoot of Ua (Soft-Start)	No overshoot of Ua (Soft-Start)	No overshoot of Ua (Soft-Start)
Starting delay, max.	2.5 s	2.5 s	2.5 s
Voltage rise, typ.	20 ms	40 ms	20 ms
Voltage rise time of the output voltage, maximum	500 ms	500 ms	500 ms
Rated current value Ia rated	20 A	20 A	30 A
Current range	0 … 20 A	0 … 17 A	0 … 30 A
• Remark	20 A to +70° C	14 A to +70 °C	25 A to +70° C
Output active power / typical	240 W	408 W	720 W
Constant overload current for a short-circuit when powering up, typical	22 A	19 A	32 A

	6EP1424-3BA00 (12 V / 20 A)	6EP1436-3BA20 (24 V / 17 A)	6EP1437-3BA20 (24 V / 30 A)
Short-time overload current for a short-circuit during operation, typical	60 A	-	-
Duration of the current overload capability for a short-circuit during operation	25 ms	-	-
Can be connected in parallel to increase the power rating	Yes	Yes	Yes
• Remark	Switchable characteristic curve (see Figure 2-6 Selector switch (example 6EP1456-3BA00 / 6EP1437-3BA20) (Page 15))	Switchable characteristic curve (see Figure 2-6 Selector switch (example 6EP1456-3BA00 / 6EP1437-3BA20) (Page 15))	Switchable characteristic curve (see Figure 2-6 Selector switch (example 6EP1456-3BA00 / 6EP1437-3BA20) (Page 15))
Number of devices that can be connected in parallel to increase the power rating, units	2	2	2
Output characteristic	See Figure 6-5 6EP1424-3BA00 single operation output characteristic curve (Page 44)	See Figure 6-6 6EP1436-3BA20 single operation output characteristic curve (Page 45)	See Figure 6-7 6EP1437-3BA20 single operation output characteristic curve (Page 45)

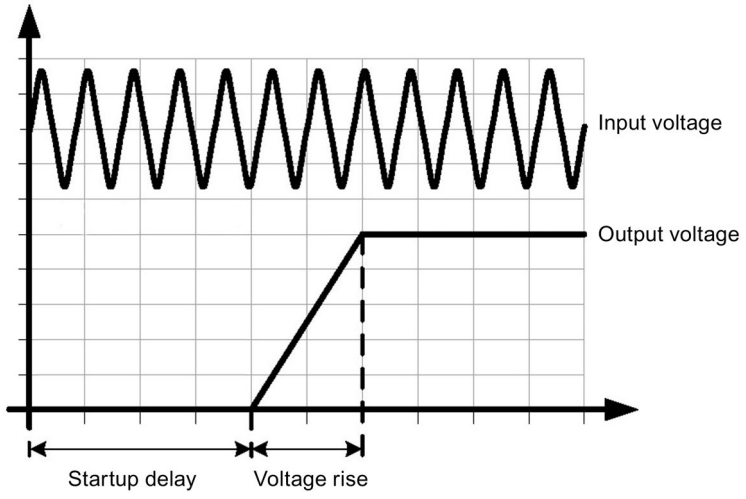


Figure 6-2 Starting delay/voltage rise

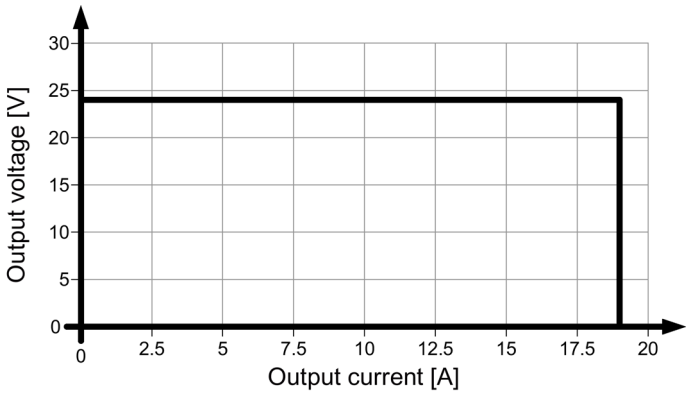


Figure 6-6 6EP1436-3BA20 single operation output characteristic curve

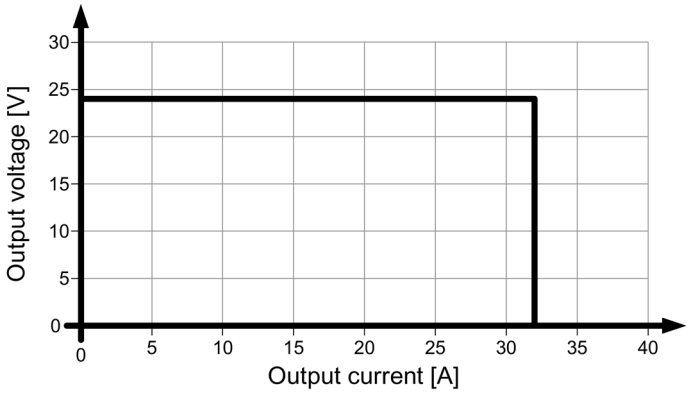


Figure 6-7 6EP1437-3BA20 single operation output characteristic curve

The device supplies a constant output voltage until the current limit is reached. If overload occurs, the output current is limited and the output voltage lowered.

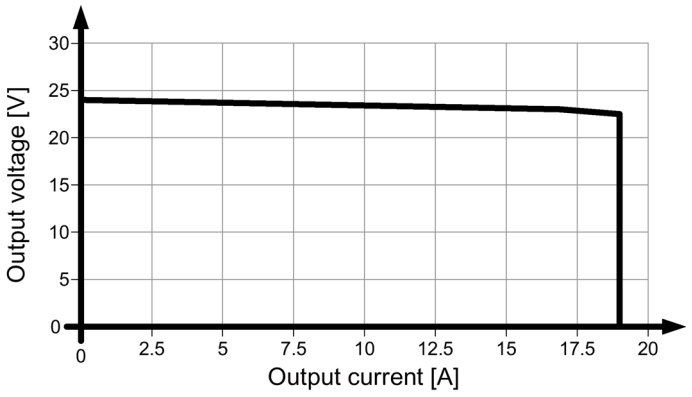


Figure 6-11 6EP1436-3BA20 parallel operation output characteristic curve

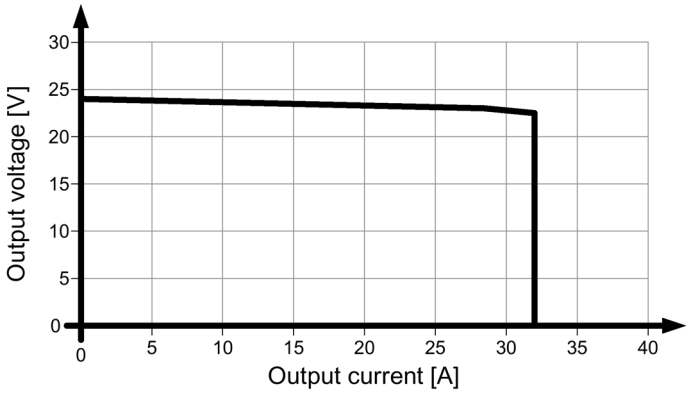


Figure 6-12 6EP1437-3BA20 parallel operation output characteristic curve

6.3 Efficiency

	6EP1436-3BA10 (24 V/20 A)	6EP1456-3BA00 (48 V/10 A)
Efficiency at Ua rated, Ia rated, approx.	93 %	93 %
Power loss at Ua rated, Ia rated, approx.	36 W	36 W

	6EP1424-3BA00 (12 V / 20 A)	6EP1436-3BA20 (24 V / 17 A)	6EP1437-3BA20 (24 V / 30 A)
Efficiency at Ua rated, Ia rated, approx.	88 %	93 %	93 %
Power loss at Ua rated, Ia rated, approx.	20 W	31 W	50 W

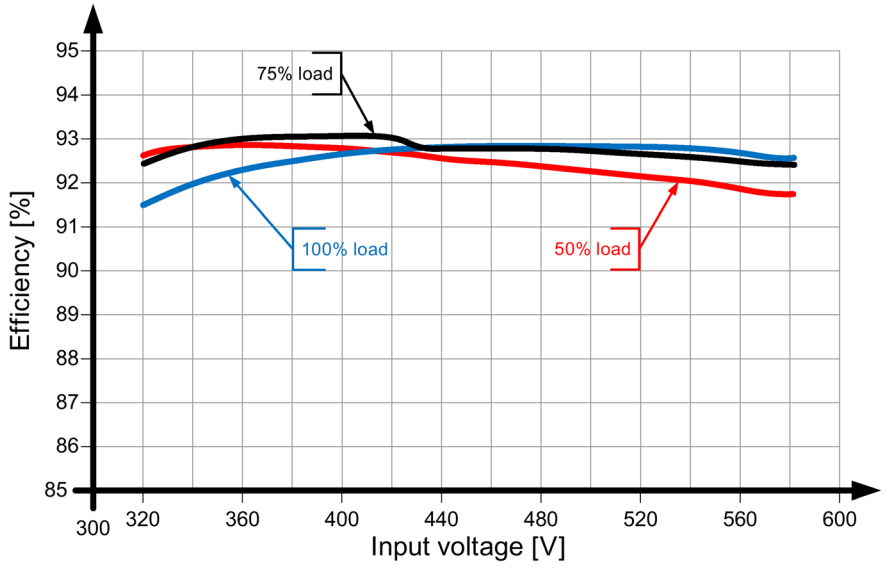


Figure 6-18 6EP1436-3BA10 efficiency

6.5 Protection and monitoring

	6EP1436-3BA10 (24 V/20 A)	6EP1456-3BA00 (48 V/10 A)
Output overvoltage protection	< 35 V	Yes, according to EN 60950
Current limitation, typ.	23 A	11 A
Property of the output / short-circuit proof	Yes	Yes
Short-circuit protection	Optional constant current characteristic approx. 23 A or "latching shutdown"	Optional constant current characteristic approx. 11 A or "latching shutdown"
Continuous short-circuit current / rms value / typical	23 A	11 A
• Remark	Overload capability 150% Ia rated up to 5 s/min	Overload capability 150% Ia rated up to 5 s/min
Overload/short-circuit indicator	Yellow LED for "overload", red LED for "latching shutdown"	Yellow LED for "overload", red LED for "latching shutdown"

	6EP1424-3BA00 (12 V / 20 A)	6EP1436-3BA20 (24 V / 17 A)	6EP1437-3BA20 (24 V / 30 A)
Output overvoltage protection	< 35 V	< 35 V	< 35 V
Current limitation, typ.	22 A	19 A	32 A
Property of the output / short-circuit proof	Yes	Yes	Yes
Short-circuit protection	Optional constant current characteristic approx. 22 A or "latching shutdown"	Optional constant current characteristic approx. 19 A or "latching shutdown"	Optional constant current characteristic approx. 32 A or "latching shutdown"
Continuous short-circuit current / rms value / typical	22 A	19 A	32 A
• Remark	Overload capability 150% Ia rated up to 5 s/min	-	-
Overload / short-circuit display	Yellow LED for "overload", red LED for "latching shutdown"	Yellow LED for "overload", red LED for "latching shutdown"	Yellow LED for "overload", red LED for "latching shutdown"

	6EP1424-3BA00 (12 V / 20 A)	6EP1436-3BA20 (24 V / 17 A)	6EP1437-3BA20 (24 V / 30 A)
Connection system	Screw-type terminal	Screw-type terminal	Screw-type terminal
Connections / line supply	L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 6 (4) mm² solid (finely stranded)	L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 6 (4) mm² solid (finely stranded)	L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 6 (4) mm² solid (finely stranded)
Connections / output	+, -: 2 screw terminals each for 0.2 ... 6 (4) mm² solid (finely stranded)	+, -: 2 screw terminals each for 0.2 ... 6 (4) mm² solid (finely stranded)	+, -: 2 screw terminals each for 0.5 ... 16 (10) mm² solid (finely stranded)
Connections/auxiliary contacts 13, 14 (signaling contact)	1 screw terminal each for 0.14 ... 1.5 mm² solid (finely stranded)	1 screw terminal each for 0.14 ... 1.5 mm² solid (finely stranded)	1 screw terminal each for 0.14 ... 4 (2.5) mm² solid (finely stranded)
Width of the housing	70 mm	70 mm	150 mm
Height of the housing	125 mm	125 mm	125 mm
Depth of the housing	125 mm	125 mm	150 mm
Mounting width	70 mm	70 mm	150 mm
Mounting height	225 mm	225 mm	225 mm
Weight, approx.	1.2 kg	1.2 kg	3.4 kg
Product feature of the housing / housing that can be lined up next to one another	Yes	Yes	Yes
Type of mounting / panel mounting	No	No	No
Type of mounting / rail mounting	Yes	Yes	Yes
Type of mounting / S7-300 rail mounting	No	No	No
Mounting	Can be snapped onto standard EN 60715 35x7,5/15 mounting rails		Can be snapped onto standard EN 60715 35x15 mounting rails

Safety, approvals, EMC

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7.1 Safety

	6EP1436-3BA10 (24 V/20 A)	6EP1456-3BA00 (48 V/10 A)
Primary/secondary galvanic isolation	Yes	Yes
Electrical isolation	SELV output voltage Ua according to EN 60950-1 and EN 50178	SELV output voltage Ua according to EN 60950-1 and EN 50178
Protection class	Class I	Class I
Degree of protection (EN 60529)	IP 20	IP 20
Leakage current, typ.	0.9 mA	0.9 mA
Leakage current, max.	3.5 mA	3.5 mA
Test voltage	See Table 7-1 Test voltage (Page 60)	See Table 7-1 Test voltage (Page 60)

	6EP1424-3BA00 (12 V / 20 A)	6EP1436-3BA20 (24 V / 17 A)	6EP1437-3BA20 (24 V / 30 A)
Primary/secondary galvanic isolation	Yes	Yes	Yes
Electrical isolation	SELV output voltage Ua according to EN 60950-1 and EN 50178	SELV output voltage Ua according to EN 60950-1 and EN 50178	SELV output voltage Ua according to EN 60950-1 and EN 50178
Protection class	Class I	Class I	Class I
Degree of protection (EN 60529)	IP20	IP20	IP20
Leakage current, typ.	0.9 mA	0.9 mA	0.4 mA
Leakage current, max.	3.5 mA	3.5 mA	3.5 mA
Test voltage	See Table 7-1 Test voltage (Page 60)	See Table 7-1 Test voltage (Page 60)	See Table 7-1 Test voltage (Page 60)

7.3 Approvals

	6EP1436-3BA10 (24 V/20 A)	6EP1456-3BA00 (48 V/10 A)
CE marking	Yes, (2004/108/EG and 2006/95/EG)	Yes, (2004/108/EG and 2006/95/EG)
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259 cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	
Explosion protection	EPS 12 ATEX 1 442 X IECEx EPS 14.0062X II 3G Ex nA nC IIC T4 Gc cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01-2007)	
CB approval	Yes	Yes
SEMI F47 compliance	Fulfilled	-
Marine approvals	GL, ABS	GL, ABS

	6EP1424-3BA00 (12 V / 20 A)	6EP1436-3BA20 (24 V / 17 A)	6EP1437-3BA20 (24 V / 30 A)
CE marking	Yes, (2004/108/EG and 2006/95/EG)	Yes, (2004/108/EG and 2006/95/EG)	Yes, (2004/108/EG and 2006/95/EG)
UL/cUL (CSA) 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	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259
Marine approvals	-	GL	-

7.4 EMC

		6EP1436-3BA10 (24 V / 20 A) 6EP1456-3BA00 (48 V / 10 A) 6EP1424-3BA00 (12 V / 20 A) 6EP1436-3BA20 (24 V / 17 A) 6EP1437-3BA20 (24 V / 30 A)
Electrostatic discharge	EN 61000-4-2	8 kV contact, 8 kV air
Electromagnetic fields	EN 61000-4-3	80 … 1000 MHz 25 V/m 1000 … 2700 MHz 10 V/m
High-speed transient disturbances (burst)	EN 61000-4-4	4 kV at line supply connections, 2 kV at the DC output
Surge voltages	EN 61000-4-5	3 kV symmetrical at the line connections 6 kV unsymmetrical at the line connections 500 V symmetrical/unsymmetrical at DC output cables
High-frequency fields	EN 61000-4-6	10 V; 0.15 … 80 MHz
Magnetic fields	EN 61000-4-8	30 A/m; 50 Hz
Emitted interference	EN 55022	Class B

Ambient conditions

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	6EP1436-3BA10 (24 V/20 A) 6EP1424-3BA00 (12 V/20 A) 6EP1436-3BA20 (24 V/17 A) 6EP1437-3BA20 (24 V/30 A)	6EP1456-3BA00 (48 V/10 A)
Ambient temperature	-25°...+70° C with natural convection	-10 ...+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	Climatic class 3K3 according to EN 60721, without condensation	
Mechanical stressing during operation	Tested according to: • EN 60068-2-6 vibration, test Fc: 0.075 mm deflection in the range 10 ... 58 Hz 1 g acceleration in the range 58 ... 150 Hz • EN 60068-2-27 shock, test Ea: Acceleration 150 m/s^2, test duration 11 ms	

	6EP1436-3BA10 (24 V/20 A) **6EP1424-3BA00 (12 V/20 A)** **6EP1436-3BA20 (24 V/17 A)** **6EP1437-3BA20 (24 V/30 A)**	**6EP1456-3BA00 (48 V/10 A)**
Damaging gases	Tested according to: • EN 60068-2-42 sulfur dioxide • EN 60068-2-43 hydrogen sulfide	
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 4-6 Mounting height derating (Page 23)) • 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: • 1080 ... 660 hPa (-1000 ...+3500 m)	

9.7 Battery charging with SITOP PSU300B

The SITOP PSU300B power supplies are optimized for charging lead accumulators. For a U-I characteristic curve set to parallel operation (DIP switch "A" at "ON", see Section Figure 2-6 Selector switch (example 6EP1456-3BA00 / 6EP1437-3BA20) (Page 15)), the battery to be charged is charged with a constant current until approximately 95% of the set SITOP output voltage is reached (set using a potentiometer, see Section Figure 2-4 Potentiometer (example 6EP1456-3BA00 / 6EP1437-3BA20) (Page 11)). The charging current then decreases continuously from 1.2 × rated current at 95% of the set voltage to approx. 0 A or the self-discharging current of the accumulator at 100% of the set output voltage, i.e. the resistance characteristic curve in this range (see Figure 6-10 6EP1424-3BA00 parallel operation output characteristic curve (Page 46), Figure 6-11 6EP1436-3BA20 parallel operation output characteristic curve (Page 47), Figure 6-12 6EP1437-3BA20 parallel operation output characteristic curve (Page 47)).

Note

The value recommended by the battery manufacturer (dependent on the accumulator temperature) must be set as end-of-charge voltage. A lead accumulator temperature of +20° to 30° C is ideal; in this case, the recommended end-of-charge voltage is normally approx. 13.5 or 27 V.

Note

As protection against back e.m.f. and as polarity reversal protection, we recommend that a suitable diode for at least 1.2 × rated current of the power supply with at least 40 V blocking voltage is connected in series to the "+" output (connect the anode with "+" output of the SITOP PSU300B and the cathode with the plus pole of the accumulator). The output voltage of the power supply under no load must be set to the end-of-charge voltage plus the voltage drop at the diode. For an end-of-charge voltage of, for example, 27.0 VDC (usual for 20° C to 30° C accumulator temperature, although the specifications of the accumulator manufacturer must always be observed!) and 0.8 V voltage drop at the diode, the power supply without load should be set to 27.8 V.