2.4 Status displays and signaling

	6EP1433-2BA20 (24 V/5 A) **6EP1434-2BA20 (24 V/10 A)** **6EP1436-2BA10 (24 V/20 A)** **6EP1437-2BA20 (24 V/40 A)**
Status display	LED green for "24V O.K."
Signaling contact	Relay contact (NO contact, contact rating 30 V AC/0.5 A, 60 V DC/0.3 A, 30 V DC/1 A) for "24V O.K."

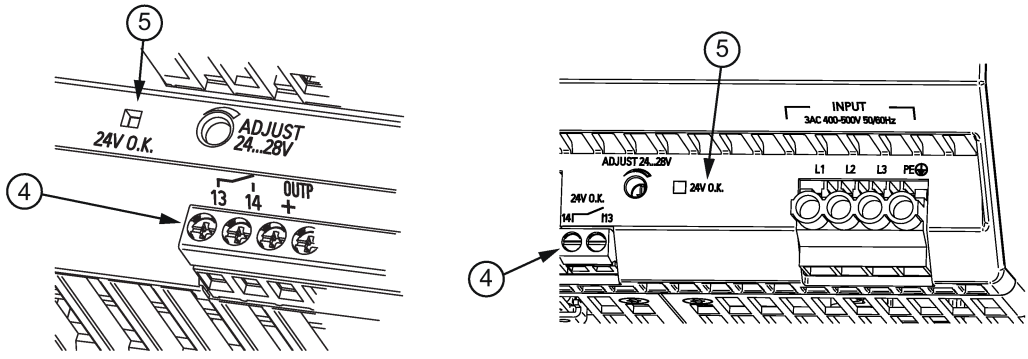


Figure 2-6 Operating display and signaling

Signaling	**6EP1433-2BA20 (24 V/5 A)** **6EP1434-2BA20 (24 V/10 A)** **6EP1436-2BA10 (24 V/20 A)** **6EP1437-2BA20 (24 V/40 A)**
LED ⑤ lights up green Signaling contact ④, contact 13 - 14 closed	Normal operation, output voltage >20 V ±0.5 V
LED ⑤ dark Signaling contact ④, contact 13 - 14 opened (quiescent position)	Overload / hiccup operation or power supply missing - or the device has tripped due to an overtemperature or overvoltage condition (caused by an external voltage at the output) (reset after approximately 120 s by switching off and on again). When 6EP1433-2BA20 and 6EP1433-2BA20 devices trip as a result of an overtemperature condition, these devices automatically start again after they have cooled down.

Mounting position, mounting clearances

4

4.1 Standard mounting position

The device is mounted on standard mounting rails. 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 (6EP1433-2BA20 and 6EP1434-2BA20) – or 40 mm (6EP1436-2BA10 and 6EP1437-2BA20), must 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

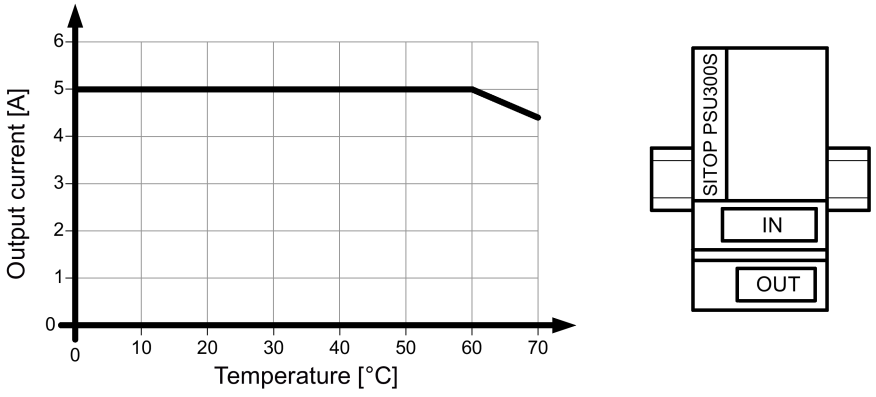


Figure 4-1 6EP1433-2BA20: Output current in the standard mounting position

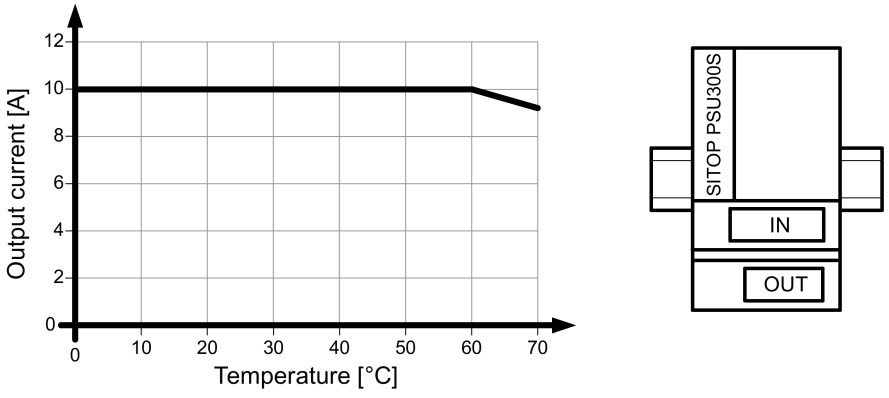


Figure 4-2 6EP1434-2BA20: Output current in the standard mounting position

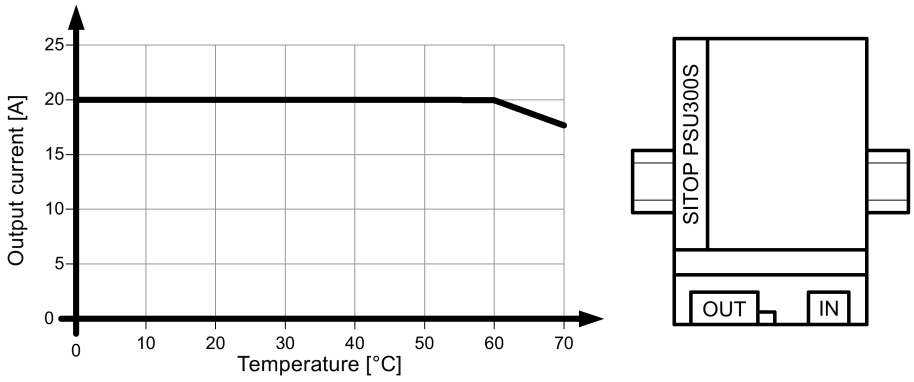


Figure 4-3 6EP1436-2BA10: Output current in the standard mounting position

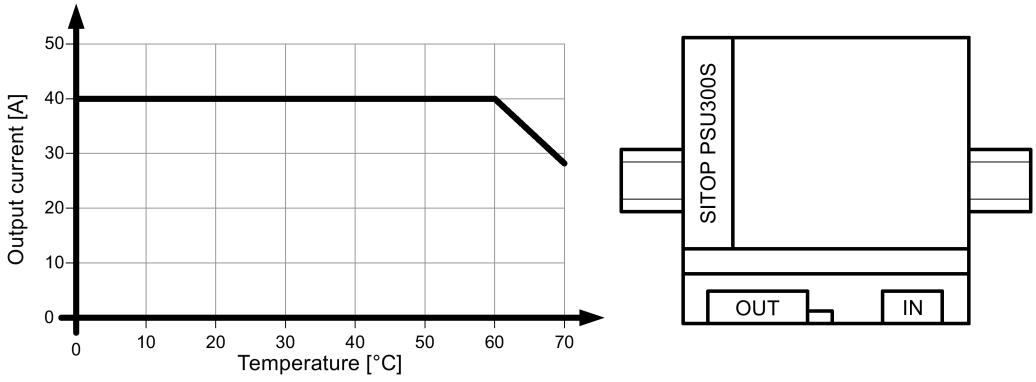


Figure 4-4 6EP1437-2BA20: Output current in the standard mounting position

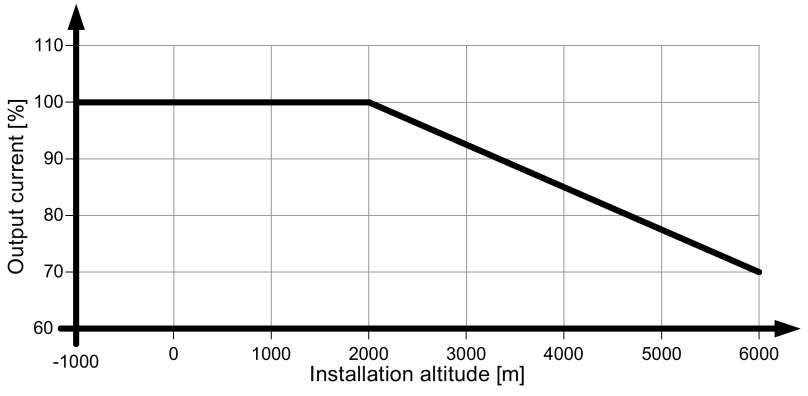


Figure 4-5 Altitude derating

Details see chapter Ambient conditions (Page 51)

Technical data

6

Note

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

6.1 Input

	6EP1433-2BA20 (24 V/5 A)	6EP1434-2BA20 (24 V/10 A)	6EP1436-2BA10 (24 V/20 A)	6EP1437-2BA20 (24 V/40 A)
Input	3-phase, AC			
Rated voltage $U_{in\ rated}$	400 - 500 V			
Voltage range	340 - 550 V			
Wide-range input	Yes			
Line failure buffering at $I_{out\ rated}$, min	18 ms	7 ms	6 ms	6 ms
Power-failure buffering	At U_{in} = 400 V			
Rated line frequency	50 - 60 Hz			
Line frequency range	47 - 63 Hz			
Input current / at rated value of input voltage 400 V	0.45 A	0.7 A	1.2 A	2 A
Input current / at rated value of input voltage 500 V	0.4 A	0.6 A	1 A	1.7 A
Inrush current limiting (25 °C), max.	20 A	20 A	36 A	60 A
I^2t, max	0.5 A^2s	0.5 A^2s	0.9 A^2s	3.4 A^2s
Integrated input fuse	None			
Protection in the line feeder cable (IEC 898)	required: 3-pole, coupled miniature circuit breaker 3 - 16 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489-listed, DIVQ)		required: 3-pole, coupled miniature circuit breaker 6 - 16 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 6 A) or 3RV2711-1DD10 (UL 489-listed, DIVQ)	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-listed, DIVQ)
Overvoltage strength	-	-	2.3 × $U_{in\ rated}$ 1.3 ms	-

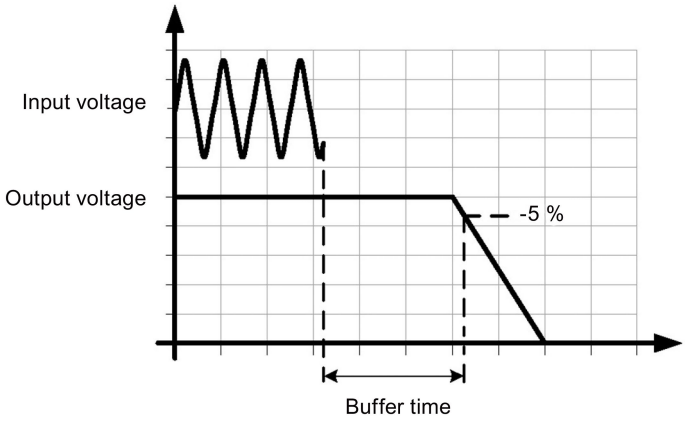


Figure 6-1 Power-failure buffering

6.2 Output

	6EP1433-2BA20 (24 V/5 A)	6EP1434-2BA20 (24 V/10 A)	6EP1436-2BA10 (24 V/20 A)	6EP1437-2BA20 (24 V/40 A)
Output	Regulated, isolated DC voltage			
Rated voltage $U_{out\ rated}$ DC	24 V			
Total tolerance, static ±	3 %	3 %	3 %	3 %
Static line regulation, approx.	0.1 %	0.1 %	0.5 %	1 %
Static load regulation, approx.	0.1 %	0.15 %	1 %	2 %
Residual ripple in the load range peak-peak, max.	200mV: 0 - 1.1 A 150mV: >1.1 A	200mV: 0 - 1.1 A 150mV: >1.1 A	150 mV	150 mV
Spikes peak-peak, max. (bandwidth, 20 MHz)	240 mV	240 mV	240 mV	240 mV
Adjustment range	24 - 28 V			
Product function / output voltage can be adjusted	Yes			
Output voltage setting	Using a potentiometer			
• Remark	Max. 120 W	Max. 240 W	Max. 480 W	Max. 960 W
Status display	LED green for "24V O.K."			
Signaling	Relay contact (NO contact, rating 60 VDC/0.3 A) for "24V O.K."			

	6EP1433-2BA20 (24 V/5 A)	6EP1434-2BA20 (24 V/10 A)	6EP1436-2BA10 (24 V/20 A)	6EP1437-2BA20 (24 V/40 A)
Response when switching on/off	Overshoot, 1.05 × $U_{out\ rated}$	Overshoot, 1.05 × $U_{out\ rated}$	No overshoot of U_{out} (soft start)	
Starting delay, max.	1.5 s	1.5 s	1.5 s	1.5 s
Voltage rise, typ.	60 ms	50 ms	30 ms	15 ms
Voltage rise time / of the output voltage / maximum	500 ms	500 ms	500 ms	500 ms
Rated current $I_{out\ rated}$	5 A	10 A	20 A	40 A
Current range	0 - 5 A	0 - 10 A	0 - 20 A	0 - 40 A
• Remark	6 A to 45 °C 60 ... 70 °C derating: 5 % $I_{out\ rated}$/K	12 A to 45 °C 60 ... 70 °C derating: 5 % $I_{out\ rated}$/K	24 A to 45 °C 60 ... 70 °C derating: 2 % $I_{out\ rated}$/K	48 A to 45 °C 60 ... 70 °C derating: 3 % $I_{out\ rated}$/K
Output active power / typical	120 W	240 W	480 W	960 W
Short-time overload current / for a short circuit when powering up / typical	-	-	35 A	65 A
Duration of the overload capability, overcurrent / for a short circuit while powering up	-	-	100 ms	100 ms
Short-time overload current / for a short circuit in operation / typical	-	-	35 A	65 A
Duration of the overload capability, overcurrent / for a short circuit in operation	-	-	100 ms	100 ms
• Remark			every 2.5 s	every 2.5 s
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			
Overload capability (Extra Power)	7.5 A for 5 s/min	15 A for 5 s/min	30 A for 5 s/min	60 A for 5 s/min
Output characteristic	See Figure 6-3 Output characteristic 6EP1433-2BA20 (Page 38)	See Figure 6-4 Output characteristic 6EP1434-2BA20 (Page 38)	See Figure 6-5 Output characteristic 6EP1436-2BA10 (Page 39)	See Figure 6-6 Output characteristic 6EP1437-2BA20 (Page 39)

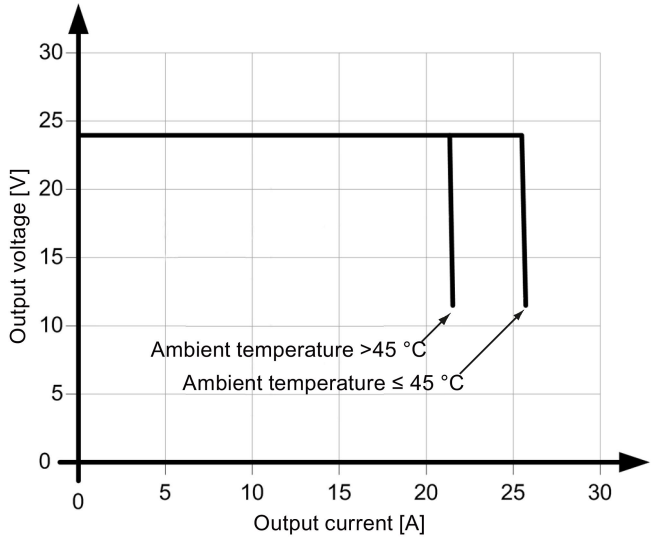


Figure 6-5 Output characteristic 6EP1436-2BA10

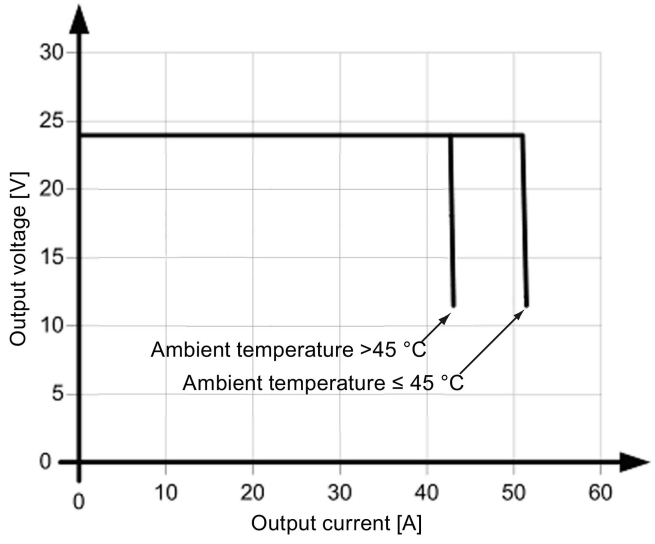


Figure 6-6 Output characteristic 6EP1437-2BA20

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.

For 6EP1436-2BA10 and 6EP1437-2BA20, the following applies: When the output voltage falls below approx. 10 V, the device switches off, and initiates an automatic restart. This response is repeated as long as the overload condition is present.

6.5 Protection and monitoring

	6EP1433-2BA20 (24 V/5 A)	6EP1434-2BA20 (24 V/10 A)	6EP1436-2BA10 (24 V/20 A)	6EP1437-2BA20 (24 V/40 A)
Output overvoltage protection	in the case of an internal fault U_{out} < 35 V			
Current limitation, typ.	6.6 A	13 A	25.5 A	50 A
Property of the output/short-circuit proof	Yes			
Short-circuit protection	Constant current characteristic		Electronic trip, automatic restart	
Continuous short-circuit current / rms value / maximum	8 A	16 A	7 A	14 A
Continuous short-circuit current / rms value / typical	6.6 A	13 A	-	-
• Remark	Overload capability 150 % $I_{out\ rated}$ up to 5 s/min	Overload capability 150 % $I_{out\ rated}$ up to 5 s/min	Overload capability 150 % $I_{out\ rated}$ up to 5 s/min	Overload capability 150 % $I_{out\ rated}$ up to 5 s/min

6.6 MTBF

	6EP1433-2BA20 (24 V/5 A)	6EP1434-2BA20 (24 V/10 A)	6EP1436-2BA10 (24 V/20 A)	6EP1437-2BA20 (24 V/40 A)
Mean Time Between Failures	SN29500: > 500000 h (typ. 1500000 h) at 40 °C, rated load, 24 hour operation	SN29500: > 500000 h (typ. 1450000 h) at 40 °C, rated load, 24 hour operation	SN29500: > 800000 h at 40 °C, rated load, 24 hour operation	SN29500: > 500000 h (typ. 700000 h) at 40 °C, rated load, 24 hour operation

Ambient conditions

8

	6EP1433-2BA20 (24 V/5 A) 6EP1434-2BA20 (24 V/10 A) 6EP1436-2BA10 (24 V/20 A) 6EP1437-2BA20 (24 V/40 A)
Ambient temperature	-25 ... 70 °C for natural convection (self convection) Remark: for 6EP1437-2BA20 with EZ 1: -10 … 70 °C
	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 Humidity heat, cyclic
Humidity class	Climatic class 3K3 according to EN 60721, 5 - 95 % no condensation
Degree of pollution	2
Mechanical stressing in operation	• Tested according to EN 60068-2-6 vibration, test Fc:
	3.5 mm deflection in the range 5 - 8.4 Hz 2 g acceleration in the range 8.4 - 150 Hz Comment: for 6EP1437-2BA20 with EZ 1: 1.3 g acceleration in the range 8.4 - 150 Hz
	• Tested according to EN 60068-2-27 shock, test Ea: acceleration 150 m/s^2, test duration 11 ms

Applications

9

9.1 Parallel connection to increase the power rating

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

The following must be observed:

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

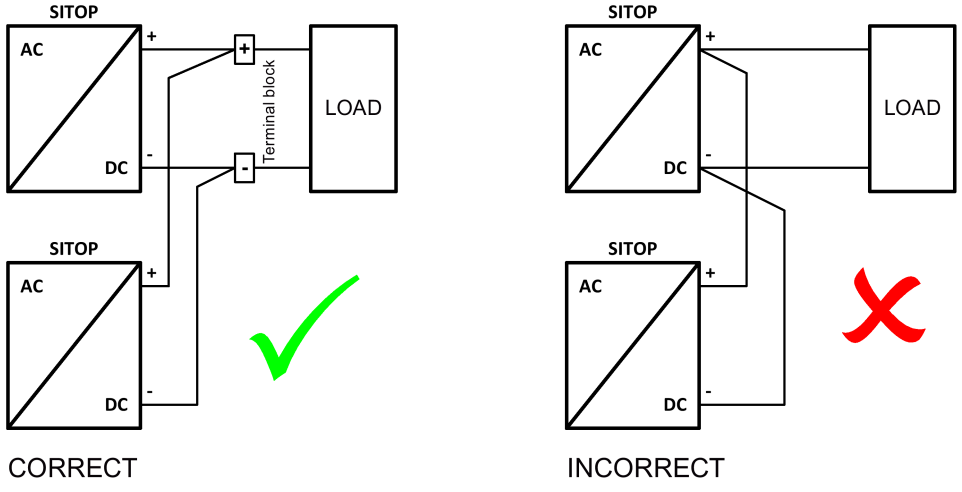


Figure 9-1 Parallel connection

Note

It is not permissible to take into account simultaneous overload capability (Extra-Power 150% for 5 s/min) of several power supplies connected in parallel when configuring the power supply system.