DC/DC converters for the reliable supply of 12 V DC and 24 V DC

Plants and systems with safety-related applications are often equipped with a battery back-up. These include applications in industry, power plants, water treatment plants and vehicle on-board power supplies. In order to reliably supply the loads involved in this type of application with their rated input voltage, SITOP offers a range of different DC/DC converters with a 24 V DC output voltage and a compact DIN rail unit for 12 V DC loads.

To supply an uninterruptible 24 V DC input voltage and therefore also the 12 V DC level, SITOP offers DC-UPS systems with maintenance-free, lead-gel batteries or long-life capacitors for energy storage.

DC/DC converters with 12 V DC output voltage

- Output voltage adjustable between 12 and 14 V DC
- Extremely slim construction
- Simple DIN rail mounting
- Radio suppression level class B
- Input voltage 24 V DC, backed up e.g. by SITOP DC UPS: www.siemens.com/sitop-ups

DC/DC converters with 24 V DC output voltage

- Rated output currents from 0.375 to 10 A
- Input voltages from 10 to 350 V DC
- Suitable for use under extreme environmental conditions
- Can be connected in parallel to boost output
- Electronic short-circuit protection
- For mounting on DIN rail, S7 rail or directly on wall
- Variants based on SIMATIC S7-300 design

SITOP DC/DC converter

Answers for industry.

SIEMENS

Selection table DC/DC converter SITOP



Output voltage/current	12 V DC / 2.5 A	24 V DC / 0.375 A	Outdoor, S7-300 Design, 24 V DC / 2 A
Order No.	**6EP1621-2BA00**	**6EP1731-2BA00** [1]	**6ES7305-1BA80-0AA0** [2]
Input voltage - rated value - range	24 V DC 18.5 ... 30.2 V DC	48 ... 220 V DC 30 ... 264 V DC (30...187 V AC)	24 ... 110 V DC 16.8 ...138 V DC
Mains buffering	> 5 ms	> 10 ms	> 10 ms
Line frequency rated value	–	0/50/60 Hz	–
Input current - rated value - Inrush current (25 °C) - recommended primary side protection (suitable for DC)	1.6 A < 20 A for 20 ms 10 A Characteristic B	0.3 ... 0.06 A < 35 A, typ 3 ms From 6 A Characteristic C	2.7/0.6 A < 20 A, < 10 ms From 10 A Characteristic C
Output voltage - rated value - Tolerance - Setting range	**12 V DC** ± 3 % 12 ...14 A	**24 V DC** ± 3 % –	**24 V DC** ± 3 % –
Output current - rated value	**2.5 A**	**0.375 A**	**2 A (3 A at U_i > 24 V DC)**
Efficiency at rated value	80 %	66 %	75 %
Parallel operation	yes, 2 devices	no	yes, 2 devices
Electronic short-circuit protection	Constant current characteristic approx. 3.3 A	electronic shutdown, automatic restart	electronic shutdown, automatic restart
RI specification (EN 55022)	Class B	Class B	Class A
Degree of protection (EN 60529)	IP20	IP20	IP20
Ambient temperature	0 ... +60 °C	–25 ... +70 °C	–25 ... +70 °C
Dimensions (W x H x D) in mm	32.5 x 125 x 125 mm	22.5 x 80 x 91 mm	80 x 125 x 120 mm
Weight approx.	0.26 kg	0.14 kg	0.75 kg
Installation	Snaps onto DIN rail	Snaps onto DIN rail	Snaps onto S7 rail and DIN rail [3]
Approvals	CE, cULus	CE, cULus	CE, UL, CSA

[1] SIPLUS module 6AG1 931-2BA00-3AA0 for use under medial load (e.g. sulfur chloride atmosphere or condensation).
[2] SIPLUS module 6AG1 305-1BA80-2AA0 for use under medial load.
This SIPLUS power supply conforms with standards for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1)
[3] Mounting adapter for DIN rail (6ES7390-6BA00-0AA0) and PS-CPU (6ES7390-7BA00-0AA0) connection comb



Output voltage/current	24 V DC / 2 A	24 V DC / 2.5 A	24 V DC / 4 A	24 V DC / 10 A
Order No.	**6EP1732-0AA00**	**6EP1332-1SH12**	**6EP1332-1SH22**	**6EP1334-1SH01**
Input voltage - rated value - range	48 ... 110 V DC 38 ...121 V DC	120 ... 230 V DC 110 ... 350 V DC (93 ...264 V AC)		120 ... 230 V DC 110 ...350 V DC (93 ... 264 V AC)
Mains buffering	> 5 ms at 48 V	> 20 ms at 120 V, >80 ms at 187 V		> 20 ms at 93/187 V
Line frequency rated value	–	0/50/60 Hz		0/50/60 Hz
Input current - rated value - Inrush current (25 °C) - recommended primary side protection (suitable for DC)	1.2-0.5 A < 33 A 10 - 25 A Charact. B or 6 - 25 A Characteristic C	1.3-0.7 A < 33 A, <3 ms at 230 V Two-pole circuit breaker from 10 A, Characteristic C, or from 6 A, Characteristic D		2.5-1.3 A < 20 A, < 3 ms up to 16 A Charact. C
Output voltage - rated value - Tolerance - Setting range	**24 V DC** ± 1 % 23.5 ... 26.5 A	**24 V DC** ± 1 % –		**24 V DC** ± 1 % –
Output current - rated value	**2 A**	**2.5 A**	**4 A**	**10 A**
Efficiency at rated value	84 %	85 %		85 %
Parallel operation	yes, 2 units	yes, up to 10 units		yes, 2 units
Electronic short-circuit protection	electronic shutdown, automatic restart	Constant current characteristic		Constant current characteristic approx. 11 A
RI specification (EN 55022)	Class B	Class B		Class B
Degree of protection (EN 60529)	IP20	IP20		IP20
Ambient temperature	0 ... +70 °C	0 ... +60 °C	0 ... +50 °C	0 ... +60 °C
Dimensions (W x H x D) in mm	80 x 135 x 120 mm	80 x 135 x 120 mm		200 x 125 x 135 mm
Weight approx.	0.5 kg	0.5 kg		1.8 kg
Installation	Snaps onto DIN rail	Snaps onto DIN rail or wall mounting		Snaps onto DIN rail
Approvals	CE, cULus	CE, cULus		CE, cULus

Siemens AG
Industry Sector
Industry Automation
P.O. Box 23 55
90713 FÜRTH
GERMANY

www.siemens.com/sitop

Subject to change without prior notice
BR 0609 PDF VOG 2 En / X.8122.03.02

6EP1332-1SH12 (EAN: 4025515150114)

SITOP POWER 24 V/2.5 A

Technical data

	SITOP POWER 24 V/2.5 A ********* spare part ********** SITOP power 2.5 A, Univ. Line stabilized power supply input: 120-230 V AC (110-350 V DC) output: 24 V DC/2.5 A,
Input	
type of the power supply network	1-phase AC or DC
supply voltage at AC	
• minimum rated value	120 V
• maximum rated value	230 V
• initial value	93 V
• full-scale value	264 V
input voltage	
• at DC	110 ... 350 V
design of input wide range input	Yes
overvoltage overload capability	2.3 × Vin rated, 1.3 ms
operating condition of the mains buffering	at Vin = 120 V, > 80 ms (typ. 100 ms) at Vin = 187 V
buffering time for rated value of the output current in the event of power failure minimum	20 ms
operating condition of the mains buffering	at Vin = 120 V, > 80 ms (typ. 100 ms) at Vin = 187 V
line frequency	
• 1 rated value	50 Hz
• 2 rated value	60 Hz
line frequency	47 ... 63 Hz
input current	
• at rated input voltage 120 V	1.3 A
• at rated input voltage 230 V	0.7 A
current limitation of inrush current at 25 °C maximum	33 A
duration of inrush current limiting at 25 °C	
• maximum	3 ms
I2t value maximum	3.5 A²·s
fuse protection type	T 3.15 A (not accessible)
• in the feeder	Recommended: 2-pole miniature circuit breaker from 10 A characteristic C or from 6 A characteristic D
Output	
voltage curve at output	Controlled, isolated DC voltage
output voltage at DC rated value	24 V
output voltage	
• at output 1 at DC rated value	24 V
relative overall tolerance of the voltage	1 %
relative control precision of the output voltage	
• on slow fluctuation of input voltage	0.1 %
• on slow fluctuation of ohm loading	0.2 %
residual ripple	
• maximum	50 mV
• typical	40 mV
voltage peak	
• maximum	100 mV
• typical	40 mV
product function output voltage adjustable	No
type of output voltage setting	-
display version for normal operation	Green LED for 24 V OK
behavior of the output voltage when switching on	No overshoot of Vout (soft start)
response delay maximum	0.6 s
voltage increase time of the output voltage	
• typical	20 ms
output current	
• rated value	2.5 A
• rated range	0 ... 2.5 A
supplied active power typical	60 W
constant overload current	

● on short-circuiting during the start-up typical	2.8 A
● at short-circuit during operation typical	2.8 A
product feature	
● bridging of equipment	Yes
number of parallel-switched equipment resources for increasing the power	10
Efficiency	
efficiency in percent	85 %
power loss [W]	
● at rated output voltage for rated value of the output current typical	11 W
Closed-loop control	
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.3 %
relative control precision of the output voltage load step of resistive load 50/100/50 % typical	0.5 %
setting time	
● load step 50 to 100% typical	1 ms
● load step 100 to 50% typical	1 ms
setting time	
● maximum	2 ms
Protection and monitoring	
design of the overvoltage protection	Yes, according to EN 60950
● typical	2.8 A
property of the output short-circuit proof	Yes
design of short-circuit protection	Constant current characteristic
enduring short circuit current RMS value	
● maximum	3 A
display version for overload and short circuit	-
Safety	
galvanic isolation between input and output	Yes
galvanic isolation	Safety extra low output voltage Vout according to EN 60950-1
operating resource protection class	Class I
leakage current	
● maximum	3.5 mA
protection class IP	IP20
Approvals	
certificate of suitability	
● CE marking	Yes
● UL approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
● CSA approval	Yes; cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
● NEC Class 2	No
● EAC approval	Yes
type of certification	
● CB-certificate	No
certificate of suitability	
● IECEx	No
● ATEX	No
● ULhazloc approval	No
● cCSAus, Class 1, Division 2	No
● FM registration	No
certificate of suitability shipbuilding approval	No
Marine classification association	
● American Bureau of Shipping Europe Ltd. (ABS)	No
● French marine classification society (BV)	No
● Lloyds Register of Shipping (LRS)	No
● Nippon Kaiji Kyokai (NK)	No
EMC	
standard	
● for emitted interference	EN 55022 Class B
● for mains harmonics limitation	not applicable
● for interference immunity	EN 61000-6-2
environmental conditions	
ambient temperature	
● during operation	0 ... 60 °C; with natural convection
● during transport	-25 ... +85 °C
● during storage	-25 ... +85 °C
environmental category according to IEC 60721	Climate class 3K3, 5 … 95% no condensation
Mechanics	
type of electrical connection	screw-type terminals
● at input	L, N, PE: 1 screw terminal each for 2 x 0.5 ... 1.5 mm² finely stranded, 2 x 0.5 ... 2.5 mm² single-core

● at output	L+, M: 1 screw terminal each for 2 x 0.5 ... 2.5 mm²
● for auxiliary contacts	-
width of the enclosure	80 mm
height of the enclosure	135 mm
depth of the enclosure	120 mm
required spacing	
● top	100 mm
● bottom	100 mm
● left	0 mm
● right	0 mm
net weight	0.5 kg
product feature of the enclosure housing can be lined up	Yes
fastening method	Snaps onto DIN rail EN 60715 35x15, wall mounting
MTBF at 40 °C	645 161 h
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Last changes: 11/07/2023