

SITOP 24 V 1-phase



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SITOP 24 V

1-phase

Output currents up to 2 A

Overview

Product	The smallest ones		LOGO!Power
Power supply, type	0.5 A	0.375 A	1.3 A
Order No.	6EP1 331-2BA10	6EP1 731-2BA00 ¹⁾	6EP1 331-1SH02
			
	The optimum power supply units for automation solutions in the lower performance range; with wide-range input for AC or DC voltages; thanks to their compact and slim design, they are particularly suitable for solutions where space is limited and in conjunction with low-voltage switchgear.	The optimum power supply units for automation solutions in the lower performance range; with wide-range input for AC or DC voltages; thanks to their compact and slim design, they are particularly suitable for solutions where space is limited and in conjunction with low-voltage switchgear.	The power supplies of the LOGO!Power range are optimally matched to the LOGO! logic modules in their functionality and design. With the wide-range input 85 V to 264 V AC and the possibility of mounting in small distribution boards, they can be used universally in the most diverse application areas in the low-end performance range.
Dimension drawing	Page 15/2, Dimension drawing 1	Page 15/2, Dimension drawing 1	Page 15/2, Dimension drawing 2

The product families are highlighted in the same color. For an explanation of the product groups, see Chapter 1, pages 1/6 to 1/10.

Technical specifications

Input			
Rated voltage value $V_{in\ rated}$	1-phase AC 120-230 V AC wide-range input	DC voltage 48-220 V DC wide-range input	1-phase AC 100-240 V AC Wide-range input
Voltage range	93 ... 264 V	30 ... 264 V (30 ... 187 V AC)	85 ... 264 V
Overvoltage resistance Mains buffering at $I_{out\ rated}$ Rated line frequency; range	$2.3 \times V_{in\ rated}$, 1.3 ms > 10 ms at $V_{in} = 230\text{ V}$ 50/60 Hz, 47 ... 63 Hz	> 10 ms at $V_{in} = 220\text{ V}$ –	$2.3 \times V_{in\ rated}/1.3\text{ ms}$ > 40 ms at $V_{in} = 187\text{ V}$ 50/60 Hz; 47 ... 63 Hz
Rated current value $I_{in\ rated}$ Making current limit (+25 °C) I_t^2	0.22-0.13 A < 23 A, typ. 1 ms 0.3 A ² s	0.3-0.06 A < 35 A, typ. 3 ms 1.2 A ² s	0.7-0.35 A < 15 A < 0.8 A ² s
Built-in incoming fuse Recommended miniature circuit breaker (IEC 898) in the mains power input	T 2 A/250 V (not accessible) From 3 A, Characteristic C	F 4 A/250 V (not accessible) From 6 A, Characteristic C, suitable for DC	Internal From 16 A, Characteristic B or from 10 A, Characteristic C
Output			
Rated voltage value $V_{out\ rated}$	Controlled, isolated DC voltage 24 V DC	Controlled, isolated DC voltage 24 V DC	Controlled, isolated DC voltage 24 V DC
Total tolerance • Static mains compensation • Static load balancing	±3 % Approx. 0.2 % Approx. 0.7 %	±3 % Approx. 0.1 % Approx. 0.1 %	±3 % Approx. 0.1 % Approx. 1.5 %
Residual ripple Spikes (bandwidth: 20 MHz)	< 150 mV _{pp} (typ. 50 mV _{pp}) < 240 mV _{pp} (typ. 150 mV _{pp})	< 150 mV _{pp} (typ. 50 mV _{pp}) < 240 mV _{pp} (typ. 50 mV _{pp})	< 200 mV _{pp} (typ. 10 mV _{pp}) < 300 mV _{pp} (typ. 20 mV _{pp})
Adjustment range Status display On/off behavior	– Green LED for 24 V OK No overshoot of V_{out} (soft start)	– Green LED for 24 V OK No overshoot of V_{out} (soft start)	22.2 ... 26.4 V Green LED for 24 V OK No overshoot of V_{out} (soft start)
Startup delay/voltage rise Rated current value $I_{out\ rated}$	< 1.5 s/typ. 20 ms 0.5 A	< 2.5 s/typ. 90 ms 0.375 A	< 0.5 s/typ. 15 ms 1.3 A
Current range • Up to +60 °C • Derating	0 ... 0.5 A 0 ... 0.5 A (up to +70 °C)	0 ... 0.375 A 0 ... 0.255 A (up to +70 °C)	0 ... 1.3 A (up to +55 °C) –
Dynamic overcurrent on • Power-up on short circuit • Short circuit during operation	Constant current approx. 0.6 A Constant current approx. 0.6 A	Typ. 2.7 A for 200 ms	
Parallel switching for enhanced performance	Not permitted	Not permitted	Yes, 2 units
Continuation of the table	Page 2/4, column 1	Page 2/4, column 2	Page 2/4, column 3

¹⁾ SIPLUS module 6AG1 931-2BA00-3AA0 for use under medial load (e.g. sulfur chloride atmosphere).

The S7-300 version

2 A

6ES7 307-1BA01-0AA0



The proven power supply in SIMATIC S7-300 design; with PS-CPU connecting comb and for mounting direct on S7 rail.

The DC/DC converter

2 A

6EP1 732-0AA00



The DC/DC converter for supply from battery and DC systems; with a wide input voltage range from 38 V to 121 V DC.

The outdoor version

2 A

6ES7 305-1BA80-0AA0²⁾

The power supply unit for extreme environmental conditions in SIMATIC S7-300 design; can be snapped onto S7 rail; with PS-CPU connecting comb.

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1-phase AC
120/230 V AC
automatic
range switch-over
85 ... 132 V/170 ... 264 V

$2.3 \times V_{in \text{ rated}}$, 1.3 ms
> 20 ms at $V_{in} = 93/187 \text{ V}$
50/60 Hz, 47 ... 63 Hz

0.9/0.5 A
< 22 A, < 3 ms
< 1.0 A²s

T 1.6 A/250 V (not accessible)
3 A, Characteristic C

DC voltage
48-110 V DC
wide-range input
38 ... 121 V

> 5 ms at $V_{in} = 48 \text{ V}$
–

1.2-0.5 A
< 33 A

T 2.5 A (not accessible)
10 to 25 A, Characteristic B,
or 6 to 25 A, Characteristic C,
suitable for DC

DC voltage
24-110 V DC
wide-range input
16.8 ... 138 V

154 V; 0.1 s
> 10 ms at $V_{in \text{ rated}}$
–

2.7-0.6 A (4.0-0.9 A)
< 20 A, < 10 ms
< 5 A²s

T 6.3 A/250 V (not accessible)
From 10 A, Characteristic C,
suitable for DC

Controlled, isolated DC voltage
24 V DC

±3 %
Approx. 0.1 %
Approx. 0.2 %

< 50 mV_{pp} (typ. < 5 mV_{pp})
< 150 mV_{pp} (typ. < 20 mV_{pp})

–
Green LED for 24 V OK
No overshoot of V_{out}
(soft start)

< 2 s/typ. 10 ms
2 A

0 ... 2 A

–

Typ. 9 A for 90 ms
Typ. 9 A for 90 ms

Yes

Controlled, isolated DC voltage
24 V DC

±1 %
Approx. 0.1 %
Approx. 0.4 %

< 100 mV_{pp}
< 300 mV_{pp}

23.5 ... 26.5 V
Green LED for 24 V OK
Overshoot of V_{out} on startup
max. 25 V

< 3 s/typ. 30 ms
2 A

0 ... 2 A

0 ... 2 A (up to +70 °C)

Yes, 2 units

Controlled, isolated DC voltage
24 V DC

±3 %
Approx. 0.2 %
Approx. 0.4 %

< 150 mV_{pp} (typ. < 30 mV_{pp})
< 240 mV_{pp} (typ. < 150 mV_{pp})

–
Green LED for 24 V OK
No overshoot of V_{out}
(soft start)

< 3 s/typ. 5 ms
2 A (3 A at $V_{in} > 24 \text{ V}$)

0 ... 2 A (3 A)

–

Typ. 9 A for 270 ms
Typ. 9 A for 270 ms

Yes, 2 units

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²⁾ SIPLUS module 6AG1 305-1BA80-2AA0 for temperature range –25 to +60 °C and use under medial load (e.g. sulfur chloride atmosphere). This SIPLUS power supply conforms with standards for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).

SITOP 24 V

1-phase

Output currents up to 2 A

Continued from	Page 2/2, column 1	Page 2/2, column 2	Page 2/2, column 3
Power supply, type (repeated)	0.5 A	0.375 A	1.3 A
Order No. (repeated)	6EP1 331-2BA10	6EP1 731-2BA00	6EP1 331-1SH02
Efficiency			
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$	Approx. 74 %	Approx. 66 %	Approx. 82 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$	Approx. 4.2 W	Approx. 4.6 W	Approx. 7 W
Closed-loop control			
Dyn. mains compensation ($V_{in\ rated} \pm 15\%$)	Typ. $\pm 0.3\%$ V_{out}	Typ. $\pm 0.3\%$ V_{out}	$< 0.2\%$ V_{out}
Dynamic load smoothing (I_{out} : 50/100/50 %)	Typ. $\pm 0.7\%$ V_{out}	Typ. $\pm 0.4\%$ V_{out}	Typ. $\pm 1.5\%$ V_{out} (I_{out} : 10/90/10 %)
Load step settling time			
• 50 to 100 %	Typ. 1.5 ms	Typ. 2 ms	Typ. 20 ms (10 to 90 %)
• 100 to 50 %	Typ. 1.5 ms	Typ. 2 ms	Typ. 20 ms (90 to 10 %)
Protection and monitoring			
Output overvoltage protection	Yes, according to EN 60950	Yes, according to EN 60950	Yes, according to EN 60950
Current limitation	0.55 ... 0.65 A	0.41 ... 0.49 A	Typ. 2 A
Short-circuit protection	Constant current characteristic up to 0 V	Electronic shutdown, automatic restart	Constant current characteristic
Sustained short-circuit current rms value	< 0.65 A	< 0.9 A	< 4 A
Overload/short-circuit indicator	–	–	–
Safety			
Primary/secondary isolation	Yes, safety extra low output voltage V_{out} according to EN 60950 and EN 50178	Yes, safety extra low output voltage V_{out} according to EN 60950 and EN 50178	Yes, safety extra low output voltage V_{out} according to EN 60950 and EN 50178
Protection class	Class I	Class I	Class II (without protective conductor)
Leakage current	< 3.5 mA	< 3.5 mA	
German Technical Inspectorate approval	Yes	Yes	Yes; CB scheme
CE mark	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273	cULus-listed (UL 508, CSA C22.2 No. 14), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273
Explosion protection	–	–	ATEX EX II 3G Ex nA IIC T3
FM approval	–	–	Class I Div. 2, Group A, B, C, D T4
Marine approval	–	–	GL, ABS
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	Not applicable	Not applicable	Not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature range	$-25 \dots +70$ °C with natural convection	$-25 \dots +70$ °C with natural convection	$-20 \dots +55$ °C with natural convection
Transport/storage temperature range	$-40 \dots +70$ °C	$-40 \dots +70$ °C	$-40 \dots +70$ °C
Humidity class	Climate class 3K3 according to EN 60721, no condensation	Climate class 3K3 according to EN 60721, no condensation	Climate class 3K3 according to EN 60721, no condensation
Mechanics			
Connections			
• Supply input L, N, PE (DC input: L+1, M1, PE)	1 screw terminal each for $0.5 \dots 2.5$ mm ² single-core/finely stranded	1 screw terminal each for $0.5 \dots 2.5$ mm ² single-core/finely stranded	1 screw terminal each for $0.5 \dots 2.5$ mm ² single-core/finely stranded
• Output +	1 screw terminal for $0.5 \dots 2.5$ mm ²	1 screw terminal for $0.5 \dots 2.5$ mm ²	2 screw terminals for $0.5 \dots 2.5$ mm ²
• Output –	2 screw terminals for $0.5 \dots 2.5$ mm ²	2 screw terminals for $0.5 \dots 2.5$ mm ²	2 screw terminals for $0.5 \dots 2.5$ mm ²
Dimensions (W × H × D) in mm	22.5 × 80 × 91	22.5 × 80 × 91	54 × 90 × 55
Weight, approx.	0.11 kg	0.14 kg	0.17 kg
Installation	Snaps onto DIN rail EN 60715 35×7.5/15	Snaps onto DIN rail EN 60715 35×7.5/15	Snaps onto DIN rail EN 60715 35×7.5/15
Accessories			
	–	–	–

Output currents up to 2 A






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2 A	2 A	2 A
6ES7 307-1BA01-0AA0	6EP1 732-0AA00	6ES7 305-1BA80-0AA0
Approx. 84 % Approx. 9 W	Approx. 84 % Approx. 9 W	Approx. 75 % Approx. 16 W (24 W)
Typ. $\pm 0.1\%$ V_{out}	Typ. $\pm 0.3\%$ V_{out}	Typ. $\pm 0.3\%$ V_{out}
Typ. $\pm 0.8\%$ V_{out}	Typ. $\pm 0.8\%$ V_{out}	Typ. $\pm 2.5\%$ V_{out}
< 1 ms (typ. 0.5 ms) < 1 ms (typ. 0.5 ms)	< 5 ms (typ. 2.5 ms) < 5 ms (typ. 2.5 ms)	< 5 ms (typ. 2.5 ms) < 5 ms (typ. 2.5 ms)
Additional control loop, shutdown at < 28.8 V, automatic restart 2.2 ... 2.6 A	Yes, suppressor diode at output 2.1 ... 3 A	Additional control loop, shutdown at approx. 30 V, automatic restart 3.3 ... 3.9 A
Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
< 2 A	< 2 A	< 2 A
–	–	–
Yes, safety extra low output voltage V_{out} according to EN 60950-1 and EN 50178	Yes, safety extra low output voltage V_{out} according to EN 60950	Yes, safety extra low output volt- age V_{out} according to EN 60950 and EN 50178, creepage dis- tances and clearances > 5 mm
Class I	Class I	Class I
< 3.5 mA (typ. 0.5 mA) Yes	< 3.5 mA (typ. 0.7 mA) Yes	< 3.5 mA (typ. 0.7 mA) Yes
Yes	Yes	Yes
cULus-listed (UL 508, CSA C22.2 No. 142), File E143289	cULus-listed (UL 508, CSA C22.2 No. 142), File E179336	UL-listed (UL 508), File E143289, CSA (CSA C22.2 No. 14)
ATEX 94/9/EC EX II 3G; EEx, nA, II, T4 U UL 1604 Class I Div. 2 Group A, B, C, D Class I Div. 2 Group A, B, C, D T4 In S7-300 system IP20	– – – IP20	– – GL IP20
EN 55022 Class B Not applicable EN 61000-6-2	EN 55022 Class B Not applicable EN 61000-6-2	EN 55011 Class A Not applicable EN 61000-6-2
0 ... +60 °C with natural convection –40 ... +85 °C Climate class 3K3 according to EN 60721, no condensation	0 ... +70 °C with natural convection –40 ... +70 °C Climate class 3K3 according to EN 60721, no condensation	–25 ... +70 °C with natural convection –40 ... +85 °C Climate class 3K5 according to EN 60721, transient condensation permitted
1 screw terminal each for 0.5 ... 2.5 mm ² single-core/finely stranded 2 screw terminals for 0.5 ... 2.5 mm ² 2 screw terminals for 0.5 ... 2.5 mm ²	1 screw terminal each for 2 × 0.5 ... 2.5/1.5 mm ² single-core/finely stranded 1 screw terminal for 2 × 0.5 ... 2.5 mm ² 1 screw terminal for 2 × 0.5 ... 2.5 mm ²	1 screw terminal each for 0.5 ... 2.5 mm ² single-core/finely stranded 3 screw terminals for 0.5 ... 2.5 mm ² 3 screw terminals for 0.5 ... 2.5 mm ²
40 × 125 × 120 0.4 kg Can be mounted onto S7 rail	80 × 135 × 120 0.5 kg Snaps onto DIN rail EN 60715 35 × 15	80 × 125 × 120 0.75 kg Can be mounted onto S7 rail
Mounting adapter for standard mounting rail (6EP1 971-1BA00)	–	Mounting adapter for standard mounting rail (6ES7390-6BA00-0AA0)

SITOP 24 V

1-phase

Output currents up to 2 A

Selection and ordering data

Product	Input Voltage V_{in} rated	Output Voltage V_{out} rated	Current I_{out} rated	Order No.	Price in euros per PU
The smallest ones					
	120-230 V AC 48-220 V DC	24 V DC 24 V DC	0.5 A 0.375 A	6EP1 331-2BA10 6EP1 731-2BA00	
LOGO!Power					
	100-240 V AC	24 V DC	1.3 A	6EP1 331-1SH02	
The S7-300 version					
	120/230 V AC	24 V DC	2 A	6ES7 307-1BA01-0AA0	
The DC/DC converter					
	48-110 V DC	24 V DC	2 A	6EP1 732-0AA00	
The outdoor version					
	24-110 V DC	24 V DC	2 A	6ES7 305-1BA80-0AA0	