

LOGO! logic module

LOGO!Power

2

LOGO!Power

Application



The power supplies of the LOGO!Power range are primary switched-mode devices that are optimally matched to the LOGO! logic modules in their functionality and design.

Depending on the power rating required, the LOGO!Power units are available in two sizes and the new generation is now even more compact despite increased functionality. The width of the small version is only 54 mm instead of 72 mm and the large size has shrunk from 126 mm to 72 mm. An extremely compact 4-A power supply with a width of only 90 mm now supplements the

24 V line. An LED indicates whether the output voltage is o.k., and in the event of an overload or short-circuit, the primary switched-mode regulators supply a constant current, that is, without restart attempts.

LOGO!Power naturally supplies the small LOGO! control modules. But these power supplies can also be used elsewhere. As well as being system power supplies, the LOGO!Power modules are also suitable for supplying other loads in the low-end performance range. With the wide-range input 85 V to 264 V AC and radio interference level B, they can be used universally in the most diverse application areas in the low-end performance range. Because the benefits of the primary switched-mode regulators convince all along the line.

For example:

- Improved protection of connected loads through the regulated output voltage
- Low power losses in the control cabinet thanks to high efficiency
- Compact design and low weight.

And LOGO!Power is also predestined for networking devices in standard low-voltage distribution boards

- Can be installed on 35-mm mounting rail
- Low installation depth and stepped profile of the design.

The power supplies naturally comply with the relevant European and American regulations.

Technical specifications LOGO!power 12 V

Power supply, type	12 V/1.9 A	12 V/4.5 A
Order No.	6EP1 321-1SH02	6EP1 322-1SH02
Input	Single-phase AC	Single-phase AC
Rated voltage $V_{in \text{ rated}}$	100 to 240 V AC wide-range input	100 to 240 V AC wide-range input
Voltage range	85 to 264 V AC	85 to 264 V AC
Overvoltage strength	$2.3 \times V_{in \text{ rated}}/1.3 \text{ ms}$	$2.3 \times V_{in \text{ rated}}/1.3 \text{ ms}$
Mains buffering at $I_{out \text{ rated}}$	> 40 ms at $V_{in} = 187 \text{ V}$	> 40 ms at $V_{in} = 187 \text{ V}$
Rated line frequency; range	50/60 Hz; 47 to 63 Hz	50/60 Hz; 47 to 63 Hz
Rated current $I_{in \text{ rated}}$	0.53 to 0.3 A	1.13 to 0.61 A
Inrush current limitation (+25 °C)	< 15 A	< 30 A
I^2t	< 0,8 A ² s	< 3 A ² s
Integrated line-side fuse	Internal	Internal
Recommended circuit-breaker (IEC 898) in mains supply line	From 16 A Characteristic B or from 10 A Characteristic C	From 16 A Characteristic B or from 10 A Characteristic C
Output	Stabilized, floating direct voltage	Stabilized, floating direct voltage
Rated voltage $V_{out \text{ rated}}$	12 V DC	12 V DC
Total tolerance, static	±3%	±3%
• Static mains compensation	Approx. 0.2%	Approx. 0.1%
• Static load compensation	Approx. 1.5%	Approx. 1.5%
Residual ripple (clock frequency approx. 90 kHz)	< 200 m V_{pp}	< 200 m V_{pp}
Spikes (bandwidth approx. 20 MHz)	< 300 m V_{pp}	< 300 m V_{pp}
Setting range	10.5 to 16.1 V	10.5 to 16.1 V
Status display	Green LED for output voltage OK	Green LED for output voltage OK
Power ON/OFF behavior	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)
Starting delay/voltage rise	< 0.5 s/typ. 15 ms	< 0.5 s/typ. 10 ms

Technical specifications LOGO!power 12 V (continued)

Power supply, type	12 V/1.9 A	12 V/4.5 A
Order No.	6EP1 321-1SH02	6EP1 322-1SH02
Rated current I_{outrated}	1.9 A	4.5 A
Current range up to +55 °C	0 to 1.9 A	0 to 4.5 A
Parallel connection for increased output	Yes	Yes
Efficiency		
Efficiency at $V_{\text{outrated}}, I_{\text{out rated}}$	typ. 80%	typ. 85%
Power loss at $V_{\text{outrated}}, I_{\text{out rated}}$	typ. 5 W	typ. 10 W
Control		
Dyn. mains compensation ($V_{\text{out rated}} \pm 15\%$)	< 0,2% U_a	< 0,2% U_a
Dyn. load compensation ($I_{\text{out}}: 10/90/10\%$)	$\pm 3\% U_a$	$\pm 4,2\% U_a$
Settling time		
• Load step from 10 to 90%	typ. 20 ms	typ. 20 ms
• Load step from 90 to 10%	typ. 20 ms	typ. 20 ms
Protection and monitoring		
Current limitation	typ. 2.5 A	typ. 5.9 A
Short-circuit protection	Stabilized current characteristic	Stabilized current characteristic
RMS sustained short-circuit current	< 4 A	< 8 A
Overload/short-circuit indicator	-	-
Safety		
Galvanic isolation primary/secondary	Yes, SELV output voltage V_{out} acc. to EN 60950 and EN 50178	Yes, SELV output voltage V_{out} acc. to EN 60950 and EN 50178
Protective class	Class II (without PE conductor)	Class II (without PE conductor)
CE marking	Yes	Yes
UL/cUL (CSA) approval	Yes, cULus listed (UL 508, CSA 22.2 No. 14-M95), File E197259; cURus recognized (UL 60950, CSA 22.2 No. 60950), File E151273	Yes, cULus listed (UL 508, CSA 22.2 No. 14-M95), File E197259; cURus recognized (UL 60950, CSA 22.2 No. 60950), File E151273
FM approval	Yes, Class I Div. 2, Group A, B, C, D T4	Yes, Class I Div. 2, Group A, B, C, D T4
Appr. for use in marine vessels	Yes, GL, ABS	Yes, GL, ABS
Degree of protection (EN 60529)	IP20	IP20
EMC		
Interference emission	EN 55022 Class B	EN 55022 Class B
Line harmonics limitation	Not applicable	Not applicable
Interference immunity	EN 61000-6-2	EN 61000-6-2
Operating specifications		
Ambient temperature range	-20 to +55 °C with natural convection	-20 to +55 °C with natural convection
Transportation and storage temperature range	-40 to +70 °C	-40 to +70 °C
Humidity rating	Climatic class 3K3 acc. to EN 60721, no condensation	Climatic class 3K3 acc. to EN 60721, no condensation
Mechanical specifications		
Connections		
• Mains input L1, N	One screw-type terminal each for 0.5 to 2.5 mm ² single-core/finely stranded	One screw-type terminal each for 0.5 to 2.5 mm ² single-core/finely stranded
• Output +		
• Output -	2 screw-type terminals each for 0.5 to 2.5 mm ²	2 screw-type terminals each for 0.5 to 2.5 mm ²
Dimensions (W x H x D) in mm	54 x 90 x 55	72 x 90 x 55
Weight	Approx. 0.17 kg	Approx. 0.25 kg
Mounting	Snap-mounting on DIN rail EN 50022-35x7.5/15	Snap-mounting on DIN rail EN 50022-35x7.5/15

Technical specifications LOGO!power 24 V

Typ	24 V/1.3 A	24 V/2.5 A	24 V/4 A
Order number	6EP1 331-1SH02	6EP1 332-1SH42	6EP1 332-1SH51
Input	Single-phase AC	Single-phase AC	Single-phase AC
Rated voltage $U_{in rated}$	100 V - 240 V AC wide-range input	100 V - 240 V AC wide-range input	100 V - 240 V AC wide-range input
Voltage range	85 V to 264 V AC	85 V to 264 V AC	85 V to 264 V AC
Overvoltage strength	$2.3 \times U_{in rated}/1.3$ ms	$2.3 \times U_{in rated}/1.3$ ms	$2.3 \times U_{in rated}/1.3$ ms
Line buffering at $I_{out rated}$	> 40 ms at $U_{in} = 187$ V	> 40 ms at $U_{in} = 187$ V	> 40 ms at $U_{in} = 187$ V
Rated line frequency, rated line-frequency range	50/60 Hz; 47 Hz to 63 Hz	50/60 Hz; 47 Hz to 63 Hz	50/60 Hz; 47 Hz to 63 Hz
Rated current $I_{in rated}$	0.7-0.35 A	1.22-0.66 A	1.95-0.97 A
Switch-on current limit (+25 °C)	< 15 A	< 30 A	< 30 A
I^2t	< 0.8 A ² s	< 3 A ² s	< 2.5 A ² s
Built-in line-side fuse	Internal	Internal	Internal
Recommended miniature circuit-breaker (IEC 898) in the supply feeder	At and above 16 A, B characteristic or at and above 10 A, C characteristic	At and above 16 A, B characteristic or at and above 10 A, C characteristic	At and above 16 A, B characteristic or at and above 10 A, C characteristic
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out rated}$	24 V DC	24 V DC	24 V DC
Total tolerance, static	±3%	±3%	±3%
• Static line smoothing	Approx. 0.1%	Approx. 0.1%	Approx. 0.1%
• Static load smoothing	Approx. 1.5%	Approx. 1.5%	Approx. 1.5%
Ripple content (clock frequency approx. 90 kHz)	< 200 mV _{pp}	< 200 mV _{pp}	< 200 mV _{pp}
Spikes (bandwidth approx. 20 MHz)	< 300 mV _{pp}	< 300 mV _{pp}	< 300 mV _{pp}
Adjustment range	22.2 V to 26.4 V	22.2 V to 26.4 V	22.2 V to 26.4 V
Operation indicator	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK
Response on activation/deactivation	No overshoot of U_{out} (soft start)	No overshoot of U_{out} (soft start)	No overshoot of U_{out} (soft start)
Startup delay/voltage rise	< 0.5 s/typ. 15 ms	< 0.5 s/typ. 10 ms	< 0.5 s/typ. 35 ms
Rated current $I_{out rated}$	1.3 A	2.5 A	4 A
Current range up to +55 °C	0 A to 1.3 A	0 A to 2.5 A	0 A to 4 A
Parallel switching for enhanced performance	Yes	Yes	Yes
Efficiency			
Efficiency at $U_{out rated}$, $I_{out rated}$	Typically 82%	Typically 87%	Typically 89%
Heat loss at $U_{out rated}$, $I_{out rated}$	Typically 7 W	Typically 9 W	Typically 12 W
Control			
Dynamic line smoothing ($U_{in rated} \pm 15\%$)	< 0.2% U_{out}	< 0.2% U_{out}	< 0.2% U_{out}
Dynamic load smoothing (I_{out} : 10/90/10%)	±1.5% U_{out}	±1.5% U_{out}	±1.5% U_{out}
Load-step settling time			
• 10 at 90%	Typically 20 ms	Typically 20 ms	Typically 20 ms
• 90 at 10%	Typically 20 ms	Typically 20 ms	Typically 20 ms
Protection and monitoring			
Current limit	Typically 2 A	Typically 3.4 A	Typically 4.7 A
Short-circuit protection	Constant-current characteristic	Constant-current characteristic	Constant-current characteristic
Sustained-short-circuit-current rms value	< 4 A	< 8 A	< 10 A
Overload/short-circuit indicator	-	-	-

Technical specifications LOGO!power 24 V (continued)

Type	24 V/1.3 A	24 V/2.5 A	24 V/4 A
Order number	6EP1 331-1SH02	6EP1 332-1SH42	6EP1 332-1SH51
Security			
Primary/secondary galvanic isolation	Yes, safety extra-low output voltage U _{out} to EN 60950 and EN 50178	Yes, safety extra-low output voltage U _{out} to EN 60950 and EN 50178	Yes, safety extra-low output voltage U _{out} to EN 60950 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)
CE marking	Yes	Yes	Yes
UL/cUL (CSA) approval	Yes, cULus-listed (UL 508, CSA 22.2), file E197259; cURus-recognized (UL 60950, CSA 22.2), file E151273	Yes, cULus-listed (UL 508, CSA 22.2), file E197259; cURus-recognized (UL 60950, CSA 22.2), file E151273	Yes, cULus-listed (UL 508, CSA 22.2), file E197259; cURus-recognized (UL 60950, CSA 22.2), file E151273
FM approval	Yes, Class I Div. 2, Group A, B, C, D T4	Yes, Class I Div. 2, Group A, B, C, D T4	Yes, Class I Div. 2, Group A, B, C, D T4
Marine Type Approval	Yes, GL, ABS	Yes, GL, ABS	Yes, 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	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature range	-20 °C to +55 °C with natural convection	-20 °C to +55 °C with natural convection	-20 °C to +55 °C with natural convection
Transport/storage temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
Humidity class	Climate class 3K3 to EN 60721, no condensation	Climate class 3K3 to EN 60721, no condensation	Climate class 3K3 to EN 60721, no condensation
Mechanical system			
Supply-input connections L1, N	Solid/finely-stranded per screw-type terminal for 0.5 mm to 2.5 mm ²	Solid/finely-stranded per screw-type terminal for 0.5 mm to 2.5 mm ²	Solid/finely-stranded per screw-type terminal for 0.5 mm to 2.5 mm ²
Connections			
• Output +	Per 2 screw-type terminals for 0.5 mm to 2.5 mm ²	Per 2 screw-type terminals for 0.5 mm to 2.5 mm ²	Per 2 screw-type terminals for 0.5 mm to 2.5 mm ²
• Output -			
Dimensions (W x H x D) in mm	54 x 90 x 55	72 x 90 x 55	90 x 90 x 55
Weight	Approx. 0.17 kg	Approx. 0.25 kg	Approx. 0.34 kg
Mounting	Snaps onto DIN rail DIN EN 50022-35x15/7.5	Snaps onto DIN rail DIN EN 50022-35x15/7.5	Snaps onto DIN rail DIN EN 50022-35x15/7.5

Ordering data

Ordering data	Order No.	Ordering data	Order No.
LOGO!Power 12 V 1.9 A Input 100-240 V AC Output 12 V DC, 1.9 A	6EP1 321-1SH02	LOGO!Power 24 V 1.3 A Input 100-240 V AC Output 24 V DC, 1.3 A	6EP1 331-1SH02
LOGO!Power 12 V 4.5 A Input 100-240 V AC Output 12 V DC, 4.5 A	6EP1 322-1SH02	LOGO!Power 24 V 2.5 A Input 100-240 V AC Output 24 V DC, 2.5 A	6EP1 332-1SH42
		LOGO!Power 24 V 4 A Input 100-240 V AC Output 24 V DC, 4 A	6EP1 332-1SH51