

# TRIO-PS-2G/1AC/24DC/10 - Power supply unit



2903149

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Primary-switched TRIO POWER power supply with push-in connection for DIN rail mounting, input: single phase, output: 24 V DC/10 A

## Product description

TRIO POWER power supplies with standard functionality

The TRIO POWER power supply range with push-in connection has been perfected for use in machine building. All functions and the space-saving design of the single and three-phase modules are optimally tailored to the stringent requirements. Under challenging ambient conditions, the power supply units, which feature an extremely robust electrical and mechanical design, ensure the reliable supply of all loads.

## Your advantages

- Save time and costs, thanks to the Push-in connection and narrow design
- Increase system availability, thanks to dynamic boost with 150% of the nominal current for five seconds
- Maximum flexibility due to the wide temperature range from -25°C to +70°C and device startup at -40°C
- Rugged design

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## Technical data

### Input data

#### AC operation

Network type	Star network
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range	100 V AC ... 240 V AC -15 % ... +10 %
Switch-on voltage	> 75 V AC
Shut-down voltage	< 70 V AC
Electric strength, max.	300 V AC 15 s
Typical national grid voltage	120 V AC 230 V AC
Voltage type of supply voltage	AC/DC
Inrush current	≤ 25 A (typical)
Inrush current integral ( $I^2t$ )	< 0.5 A <sup>2</sup> s
Inrush current limitation	typ. 25 A (after 1 ms)
AC frequency range	50 Hz ... 60 Hz ±10 %
Mains buffering time	typ. 15 ms (120 V AC) typ. 20 ms (230 V AC)
Current consumption	3.1 A (100 V AC) 2.4 A (120 V AC) 1.3 A (230 V AC) 1.4 A (240 V AC)
Nominal power consumption	285 VA
Protective circuit	Transient surge protection; Varistor
Power factor (cos phi)	0.93
Typical response time	< 1 s
Input fuse	6.3 A (internal (device protection))
Recommended breaker for input protection	6 A ... 16 A (Characteristics B, C, D, K)
Discharge current to PE	< 3.5 mA
POWER factor	> 0.9 (120 V AC) > 0.9 (230 V AC)

#### DC operation

Nominal input voltage range	110 V DC ... 250 V DC
Input voltage range	110 V DC ... 250 V DC -10 % ... +10 %
Switch-on voltage	≥ 95 V DC
Shut-down voltage	< 70 V DC
Voltage type of supply voltage	AC/DC
Mains buffering time	> 15 ms (230 V AC)
Current consumption	2.5 A (110 V DC) 1.1 A (250 V DC)

## Output data

Efficiency	> 91 % (for 230 V AC and nominal values)
Output characteristic	U/I with dynamic load reserve
Nominal output voltage	24 V DC $\pm$ 1 %
Setting range of the output voltage ( $U_{Set}$ )	24 V DC ... 28 V DC (constant capacity)
Nominal output current ( $I_N$ )	10 A
Dynamic Boost ( $I_{Dyn.Boost}$ )	15 A (5 s)
Derating	> 60 °C ... 70 °C (2.5 %/K)
Feedback voltage resistance	$\leq$ 35 V DC
Protection against overvoltage at the output (OVP)	$\leq$ 30 V DC
Control deviation	< 1 % (change in load, static 10 % ... 90 %)
	< 3 % (Dynamic load change 10 % ... 90 %, 10 Hz)
	< 0.1 % (change in input voltage $\pm$ 10 %)
Residual ripple	< 10 mV <sub>PP</sub> (with nominal values)
Short-circuit-proof	yes
No-load proof	yes
Output power	240 W
	360 W
Maximum no-load power dissipation	< 5.1 W (230 V)
Power loss nominal load max.	< 25 W
Rise time	$\leq$ 12 ms ( $U_{OUT}$ (10 % ... 90 %))
Connection in parallel	yes, for redundancy and increased capacity
Connection in series	yes

Signal: DC OK

Maximum switching voltage	30 V AC/DC
Continuous load current	100 mA

## Connection data

### Input

Connection method	Push-in connection
Conductor cross section, rigid min.	0.2 mm <sup>2</sup>
Conductor cross section, rigid max.	4 mm <sup>2</sup>
Conductor cross section flexible min.	0.2 mm <sup>2</sup>
Conductor cross section flexible max.	2.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	12
Stripping length	10 mm

### Output

Connection method	Push-in connection
Conductor cross section, rigid min.	0.2 mm <sup>2</sup>
Conductor cross section, rigid max.	4 mm <sup>2</sup>
Conductor cross section flexible min.	0.2 mm <sup>2</sup>

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Conductor cross section flexible max.	2.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	12
Stripping length	8 mm

## Signal

Connection method	Push-in connection
Conductor cross section, rigid min.	0.2 mm <sup>2</sup>
Conductor cross section, rigid max.	1.5 mm <sup>2</sup>
Conductor cross section flexible min.	0.2 mm <sup>2</sup>
Conductor cross section flexible max.	1.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	16
Stripping length	8 mm

## Signaling

Types of signaling	LED
	Floating signal contact

## Signal output: LED status indicator

Signalization designation	DC OK
Status display	LED
Color	green
DC OK	$U_{OUT} > 0.9 \times U_N$

## Electrical properties

Number of phases	1.00
Insulation voltage input/output	3 kV AC (type test)
	1.5 kV AC (routine test)

## Product properties

Product type	Power supply
Product family	TRIO POWER
MTBF (IEC 61709, SN 29500)	> 1800000 h (25 °C)
	> 1000000 h (40 °C)
	> 480000 h (60 °C)

## Insulation characteristics

Protection class	I (in closed control cabinet)
Degree of pollution	2

## Dimensions

Width	42 mm
Height	130 mm
Depth	160 mm

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## Installation dimensions

Installation distance right/left	0 mm / 0 mm
Installation distance top/bottom	50 mm / 50 mm

## Mounting

Mounting type	DIN rail mounting
Assembly instructions	alignable: horizontally 0 mm ( $\leq 40\text{ }^{\circ}\text{C}$ ) 10 mm ( $\leq 70\text{ }^{\circ}\text{C}$ ), vertically 50 mm
Mounting position	horizontal DIN rail NS 35, EN 60715
With protective coating	No

## Material specifications

Flammability rating according to UL 94 (housing / terminal blocks)	V0
Housing material	Metal
Type of housing	Aluminum (AlMg3)
Hood version	Polycarbonate

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Ambient temperature (start-up type tested)	-25 °C
Maximum altitude	$\leq 5000\text{ m}$ (> 2000 m, Derating: 10 %/1000 m)
Climatic class	3K3 (in acc. with EN 60721)
Max. permissible relative humidity (operation)	$\leq 95\%$ (at 25 °C, non-condensing)
Shock	18 ms, 30g, in each space direction (according to IEC 60068-2-27)
Vibration (operation)	< 15 Hz, amplitude $\pm 2.5\text{ mm}$ (according to IEC 60068-2-6) 15 Hz ... 150 Hz, 4g, 90 min. DNV GL CG-0339 / Class B 2 Hz - 100 Hz resonance search, 90 min. in resonance, 2 Hz - 25 Hz, $\pm 1.6\text{ mm}$ amplitude, 25 Hz - 100 Hz, 4g acceleration

## Standards and regulations

Rail applications	EN 50121-4
Standard – Electronic equipment for use in electrical power installations and their assembly into electrical power installations	EN 50178/VDE 0160 (PELV)
Standard – Limitation of mains harmonic currents	EN 61000-3-2
Standard - Electrical safety	IEC 62368-1 (SELV)
Standard – Safety extra-low voltage	IEC 62368-1 (SELV) und EN 60204-1 (PELV)
Standard - Safe isolation	DIN VDE 0100-410
Standard - Safety of transformers	EN 61558-2-16 (air clearances and creepage distances only)

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## Approvals

UL approvals	UL Listed UL 508
	UL/C-UL Recognized UL 60950-1
	UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location)

## Conformity/Approvals

SIL in accordance with IEC 61508	0
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## EMC data

Low Voltage Directive	Conformance with Low Voltage Directive 2014/35/EC
EMC requirements for noise emission	EN 61000-6-3
	EN 61000-6-4
EMC requirements for noise immunity	EN 61000-6-1
	EN 61000-6-2
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Noise emission	EN 55011 (EN 55022)

## Electrostatic discharge

Standards/regulations	EN 61000-4-2
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## Electrostatic discharge

Contact discharge	6 kV (Test Level 4)
Discharge in air	8 kV (Test Level 4)
Comments	Criterion A

## Electromagnetic HF field

Standards/regulations	EN 61000-4-3
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## Electromagnetic HF field

Frequency range	80 MHz ... 1 GHz
Test field strength	10 V/m (Test Level 3)
Frequency range	1 GHz ... 2 GHz
Test field strength	10 V/m (Test Level 3)
Frequency range	2 GHz ... 3 GHz
Test field strength	10 V/m (Test Level 3)
Comments	Criterion A

## Fast transients (burst)

Standards/regulations	EN 61000-4-4
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## Fast transients (burst)

Input	4 kV (Test Level 4 - asymmetrical)
Output	2 kV (Test Level 3 - asymmetrical)
Signal	1 kV (Test Level 2 - asymmetrical)
Comments	Criterion A

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## Surge voltage load (surge)

Standards/regulations	EN 61000-4-5
Input	3 kV (Test Level 3 - symmetrical)
	6 kV (Test Level 4 - asymmetrical)
Output	1 kV (Test Level 2 - symmetrical)
	2 kV (Test Level 1 - asymmetrical)
Signal	1 kV (Test Level 2 - asymmetrical)
Comments	Criterion B

## Conducted interference

Standards/regulations	EN 61000-4-6
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## Conducted interference

Input/Output	asymmetrical
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V (Test Level 3)

## Emitted interference

Standards/regulations	EN 61000-6-3
Radio interference voltage in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential
Emitted radio interference in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential

## Criteria

Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

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