

# TRIO-PS-2G/1AC/24DC/20 - Power supply unit



2903151

<https://www.phoenixcontact.com/in/products/2903151>

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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/20 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 5 seconds
- Maximum flexibility due to the wide temperature range from -25°C to +70°C and device startup at -40°C
- Rugged design

## Commercial data

|                                      |                     |
|--------------------------------------|---------------------|
| Item number                          | 2903151             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Sales key                            | CMP                 |
| Product key                          | CMPO13              |
| Catalog page                         | Page 257 (C-4-2019) |
| GTIN                                 | 4046356960939       |
| Weight per piece (including packing) | 1,614.1 g           |
| Weight per piece (excluding packing) | 1,321.8 g           |
| Customs tariff number                | 85044095            |
| Country of origin                    | CN                  |

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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 %                                        |
| Electric strength, max.                  | ≤ 300 V AC 15 s                                                              |
| Typical national grid voltage            | 120 V AC<br>230 V AC                                                         |
| Voltage type of supply voltage           | AC/DC                                                                        |
| Inrush current                           | ≤ 20 A (typical)                                                             |
| Inrush current integral ( $I^2t$ )       | < 0.9 A <sup>2</sup> s                                                       |
| Inrush current limitation                | typ. 20 A (after 1 ms)                                                       |
| AC frequency range                       | 50 Hz ... 60 Hz ±10 %                                                        |
| Mains buffering time                     | typ. 10 ms (120 V AC)<br>typ. 15 ms (230 V AC)                               |
| Current consumption                      | 5.6 A (100 V AC)<br>4.3 A (120 V AC)<br>2.4 A (230 V AC)<br>2.4 A (240 V AC) |
| Nominal power consumption                | 534.7 VA                                                                     |
| Protective circuit                       | Transient surge protection; Varistor                                         |
| Power factor (cos phi)                   | 0.98                                                                         |
| Typical response time                    | < 1 s                                                                        |
| Input fuse                               | 10 A (internal (device protection))                                          |
| Recommended breaker for input protection | 10 A ... 16 A (Characteristics B, C, D, K)                                   |
| Discharge current to PE                  | < 3.5 mA                                                                     |
| POWER factor                             | > 0.9 (120 V AC)<br>> 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 %          |
| Extended input voltage range in operation | > 99 V DC                            |
| Switch-on voltage                         | ≥ 96 V DC                            |
| Shut-down voltage                         | < 95 V DC                            |
| Mains buffering time                      | > 15 ms (230 V AC)                   |
| Current consumption                       | 4.9 A (110 V DC)<br>2.1 A (250 V DC) |

### Output data

|            |                        |
|------------|------------------------|
| Efficiency | typ. 91.4 % (120 V AC) |
|------------|------------------------|

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|                                                    |                                                                                                                                                  |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                    | typ. 92.9 % (230 V AC)                                                                                                                           |
| 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 (> 24 V DC, constant capacity restricted)                                                                                    |
| Nominal output current ( $I_N$ )                   | 20 A                                                                                                                                             |
| Dynamic Boost ( $I_{Dyn.Boost}$ )                  | 30 A (5 s)                                                                                                                                       |
| Derating                                           | > 60 °C ... 70 °C (2.5 %/K)                                                                                                                      |
| POWER factor                                       | > 0.9 (120 V AC)<br>> 0.9 (230 V AC)                                                                                                             |
| 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 %)<br>< 3 % (Dynamic load change 10 % ... 90 %, 10 Hz)<br>< 0.1 % (change in input voltage $\pm 10$ %) |
| Residual ripple                                    | < 100 mV <sub>pp</sub> (with nominal values)                                                                                                     |
| Short-circuit-proof                                | yes                                                                                                                                              |
| No-load proof                                      | yes                                                                                                                                              |
| Output power                                       | 480 W<br>720 W                                                                                                                                   |
| Maximum no-load power dissipation                  | < 2.9 W (120 V AC)<br>< 2.8 W (230 V AC)                                                                                                         |
| Power loss nominal load max.                       | < 44.8 W (120 V AC)<br>< 36.8 W (230 V AC)                                                                                                       |
| Rise time                                          | 20 ms ( $U_{OUT}$ (10 % ... 90 %))                                                                                                               |
| Connection in parallel                             | yes, for redundancy and increased capacity                                                                                                       |
| Connection in series                               | yes                                                                                                                                              |

Signal: DC OK

|                         |        |
|-------------------------|--------|
| Continuous load current | 100 mA |
|-------------------------|--------|

Signal relay 13/14

|         |                        |
|---------|------------------------|
| Default | closed                 |
| Digital | 30 V AC 30 V DC 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> |
| Single conductor/terminal point, stranded, with ferrule, min. | 0.2 mm <sup>2</sup> |
| Single conductor/terminal point, stranded, with ferrule, max. | 2.5 mm <sup>2</sup> |
| Conductor cross section AWG min.                              | 24                  |

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|                                  |       |
|----------------------------------|-------|
| 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.                           | 10 mm <sup>2</sup>  |
| Conductor cross section flexible min.                         | 0.2 mm <sup>2</sup> |
| Conductor cross section flexible max.                         | 6 mm <sup>2</sup>   |
| Single conductor/terminal point, stranded, with ferrule, min. | 0.2 mm <sup>2</sup> |
| Single conductor/terminal point, stranded, with ferrule, max. | 6 mm <sup>2</sup>   |
| Conductor cross section AWG min.                              | 24                  |
| Conductor cross section AWG max.                              | 8                   |
| Stripping length                                              | 15 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> |
| Single conductor/terminal point, stranded, with ferrule, min. | 0.2 mm <sup>2</sup> |
| Single conductor/terminal point, stranded, with ferrule, 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                     | $U_{OUT} > 0.9 \times U_N$ ( $U_N = 24 \text{ V DC}$ ) |

## 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          |
|                | > 1800000 h (25 °C) |

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|                            |                     |
|----------------------------|---------------------|
| MTBF (IEC 61709, SN 29500) | > 1000000 h (40 °C) |
|                            | > 480000 h (60 °C)  |

## Data management status

|                  |    |
|------------------|----|
| Article revision | 07 |
|------------------|----|

## Insulation characteristics

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

## Dimensions

|        |        |
|--------|--------|
| Width  | 68 mm  |
| Height | 130 mm |
| Depth  | 160 mm |

## 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 note           | alignable: horizontally 0 mm ( $\leq 40$ °C) 10 mm ( $\leq 70$ °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)     | -40 °C                                                            |
| Maximum altitude                               | $\leq 4000$ 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 $\pm 2.5$ mm (according to IEC 60068-2-6)      |
|                                                | 15 Hz ... 150 Hz, 4g, 90 min.                                     |

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## 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 60950-1/VDE 0805 (SELV)                                |
| Standard – Safety extra-low voltage                                                                                              | IEC 60950-1 (SELV) and 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) |

## Approvals

|                       |                                                                                  |
|-----------------------|----------------------------------------------------------------------------------|
| Shipbuilding approval | DNV GL                                                                           |
| 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 |
|----------------------------------|---|

## EMC data

|                                     |                                                   |
|-------------------------------------|---------------------------------------------------|
| Electromagnetic compatibility       | Conformance with EMC Directive 2014/30/EU         |
| 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                                      |
| Conducted noise emission            | EN 55016                                          |
|                                     | EN 61000-6-3 (Class B)                            |
| Noise emission                      | EN 55011 (EN 55022)                               |
| Noise emission                      | EN 55016                                          |
|                                     | EN 61000-6-3 (Class B)                            |

## Harmonic currents

|                 |            |
|-----------------|------------|
| Frequency range | Class A, B |
|-----------------|------------|

## Flicker

|                 |                 |
|-----------------|-----------------|
| Frequency range | 0 kHz ... 2 kHz |
|-----------------|-----------------|

## Electrostatic discharge

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-2 |
|-----------------------|--------------|

## Electrostatic discharge

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

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## Electromagnetic HF field

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-3 |
|-----------------------|--------------|

## 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 |
|-----------------------|--------------|

## 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                        |

## Surge voltage load (surge)

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-5 |
|-----------------------|--------------|

## Surge voltage load (surge)

|          |                                      |
|----------|--------------------------------------|
| Input    | 1 kV (Test Level 1 - symmetrical)    |
|          | 2 kV (Test Level 1 - asymmetrical)   |
| Output   | 0.5 kV (Test Level 1 - symmetrical)  |
|          | 0.5 kV (Test Level 1 - asymmetrical) |
| Signal   | 1 kV (Test Level 2 - asymmetrical)   |
| Comments | Criterion B                          |

## Conducted interference

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-6 |
|-----------------------|--------------|

## 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 |

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## 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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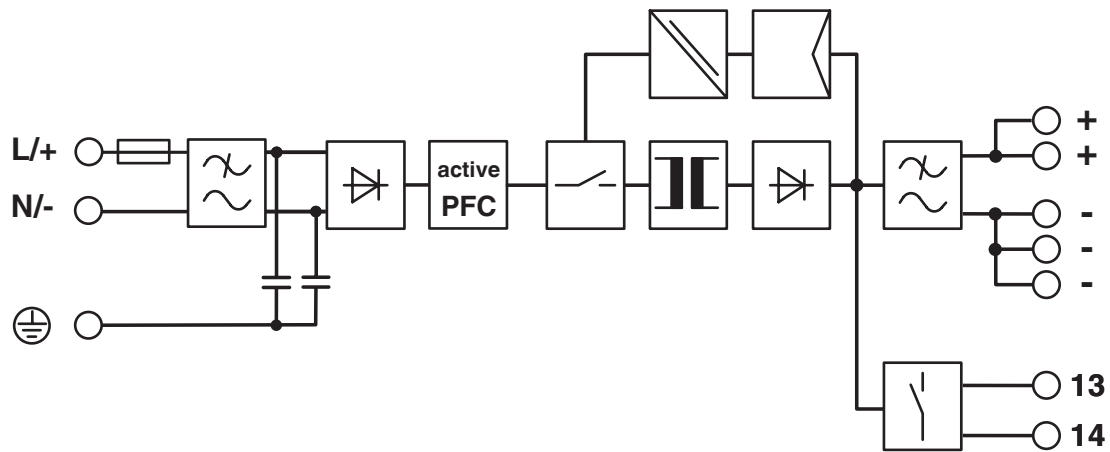


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## Drawings

Block diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/in/products/2903151>



**cUL Recognized**

Approval ID: E211944



**UL Recognized**

Approval ID: E211944



**IECEE CB Scheme**

Approval ID: DK-45301-A1-UL



**EAC**

Approval ID: RU S-DE.BL08.W.00764



**EAC**

Approval ID: RU S-DE.BL08.W.00764



**UL Listed**

Approval ID: E123528



**cUL Listed**

Approval ID: E123528

**DNV**

Approval ID: TAA00000BM



**IECEE CB Scheme**

Approval ID: DE/PTZ/0036/A1

**BIS Licence Document**

Approval ID: R-41214701



**cUL Listed**

Approval ID: E199827

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**UL Listed**  
Approval ID: E199827

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-11.0 | 27040701 |
| ECLASS-13.0 | 27040701 |
| ECLASS-12.0 | 27040701 |

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC002540 |
|----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121000 |
|-------------|----------|

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## Environmental product compliance

### EU RoHS

|                                         |              |
|-----------------------------------------|--------------|
| Fulfills EU RoHS substance requirements | Yes          |
| Exemption                               | 7(a), 7(c)-I |

### China RoHS

|                                        |                                                                                                                                                                                                                                   |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environment friendly use period (EFUP) | EFUP-25                                                                                                                                                                                                                           |
|                                        | An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required. |

### EU REACH SVHC

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| REACH candidate substance (CAS No.) | Lead(CAS: 7439-92-1)                 |
| SCIP                                | 8d771142-0713-4241-93a4-eabfe265e0e4 |

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