

# MINI-PS- 12- 24DC/48DC/0.7 - DC/DC converter



2320021

<https://www.phoenixcontact.com/us/products/2320021>

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Please use the following item in new systems: 1098676.

Primary-switched MINI DC/DC converter for DIN rail mounting, input: 12 - 24 V DC, output: 48 V DC/0.7 A

## Product description

MINI DC/DC converter for MCR technology.

DC/DC converters alter the voltage level, regenerate the voltage at the end of long cables or enable the creation of independent supply systems by means of electrical isolation.

## Your advantages

- Electrical isolation: for setting up independent supply systems
- Support conversion to various voltage levels
- Constant voltage: output voltage regenerated even at the end of long cables

## Commercial data

|                                      |                     |
|--------------------------------------|---------------------|
| Item number                          | 2320021             |
| Packing unit                         | 1 pc                |
| Sales key                            | CM03                |
| Product key                          | CMDM44              |
| Catalog page                         | Page 299 (C-4-2019) |
| GTIN                                 | 4046356479448       |
| Weight per piece (including packing) | 231.9 g             |
| Weight per piece (excluding packing) | 200 g               |
| Customs tariff number                | 85044095            |
| Country of origin                    | CN                  |

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## Technical data

### Input data

#### DC operation

|                                    |                                             |
|------------------------------------|---------------------------------------------|
| Nominal input voltage range        | 12 V DC ... 24 V DC                         |
| Input voltage range                | 10 V DC ... 32 V DC (> 10.5 V DC start)     |
| Wide-range input                   | yes                                         |
| Input voltage range DC             | 10 V DC ... 32 V DC (> 10.5 V DC start)     |
| Voltage type of supply voltage     | DC                                          |
| Inrush current                     | < 10 A (typical)                            |
| Inrush current integral ( $I^2t$ ) | 0.3 A <sup>2</sup> s                        |
| Frequency range DC                 | 0 Hz                                        |
| Mains buffering time               | typ. 2 ms (12 V DC)<br>typ. 12 ms (24 V DC) |
| Current consumption                | 3.2 A (12 V DC)<br>1.6 A (24 V DC)          |
| Typical response time              | < 0.5 s                                     |
| Input fuse                         | 6.3 A (slow-blow, internal)                 |

### Output data

|                                                    |                                                                 |
|----------------------------------------------------|-----------------------------------------------------------------|
| Efficiency                                         | > 87 % (at 24 V DC and nominal values)                          |
| Output characteristic                              | U/I                                                             |
| Nominal output voltage                             | 48 V DC $\pm$ 1 %                                               |
| Setting range of the output voltage ( $U_{Set}$ )  | 30 V DC ... 56 V DC (> 48 V DC, constant capacity restricted)   |
| Nominal output current ( $I_N$ )                   | 0.7 A (-25 °C ... 60 °C)                                        |
| Derating                                           | 60 °C ... 70 °C (2.5%/K)                                        |
| Feedback voltage resistance                        | 60 V DC                                                         |
| Protection against overvoltage at the output (OVP) | < 60 V DC                                                       |
| Residual ripple                                    | < 20 mV <sub>PP</sub> (20 MHz)                                  |
| Output power                                       | 33.6 W                                                          |
| Peak switching voltages nominal load               | < 10 mV <sub>PP</sub> (20 MHz)                                  |
| Maximum no-load power dissipation                  | < 1.5 W                                                         |
| Power loss nominal load max.                       | < 4.5 W                                                         |
| Connection in parallel                             | yes, for assembling redundant systems and increasing efficiency |
| Connection in series                               | yes                                                             |

#### Signal: DC OK active

|                         |                                          |
|-------------------------|------------------------------------------|
| Output description      | $U_{OUT} > 0.9 \times U_N$ : High signal |
| Output voltage          | + 24 V (Signal)                          |
| Continuous load current | $\leq$ 20 mA                             |

### Connection data

#### Input

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|                                       |                            |
|---------------------------------------|----------------------------|
| Connection method                     | Pluggable screw connection |
| Conductor cross section, rigid min.   | 0.2 mm <sup>2</sup>        |
| Conductor cross section, rigid max.   | 2.5 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.      | 14                         |
| Stripping length                      | 7 mm                       |
| Screw thread                          | M3                         |
| Tightening torque, min                | 0.5 Nm                     |
| Tightening torque max                 | 0.6 Nm                     |

## Output

|                                       |                            |
|---------------------------------------|----------------------------|
| Connection method                     | Pluggable screw connection |
| Conductor cross section, rigid min.   | 0.2 mm <sup>2</sup>        |
| Conductor cross section, rigid max.   | 2.5 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.      | 14                         |
| Stripping length                      | 7 mm                       |
| Screw thread                          | M3                         |
| Tightening torque, min                | 0.5 Nm                     |
| Tightening torque max                 | 0.6 Nm                     |

## Signal

|                                       |                     |
|---------------------------------------|---------------------|
| Conductor cross section, rigid min.   | 0.2 mm <sup>2</sup> |
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| Conductor cross section flexible min. | 0.2 mm <sup>2</sup> |
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| Conductor cross section AWG min.      | 24                  |
| Conductor cross section AWG max.      | 14                  |
| Screw thread                          | M3                  |
| Tightening torque, min                | 0.5 Nm              |
| Tightening torque max                 | 0.6 Nm              |

## Signaling

|                    |                         |
|--------------------|-------------------------|
| Types of signaling | LED                     |
|                    | Active switching output |

## Signal output: DC OK active

|                        |                                     |
|------------------------|-------------------------------------|
| Status display         | "DC OK" LED green                   |
| Note on status display | $U_{OUT} > 0.9 \times U_N$ : LED ON |
| Color                  | green                               |
| Note on status display | LED on                              |

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## Electrical properties

|                                 |                     |
|---------------------------------|---------------------|
| Number of phases                | 1.00                |
| Insulation voltage input/output | 1.5 kV (type test)  |
|                                 | 1 kV (routine test) |

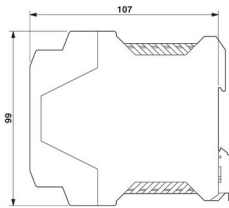
## Product properties

|                            |                     |
|----------------------------|---------------------|
| Product type               | DC/DC converters    |
| MTBF (IEC 61709, SN 29500) | > 1993000 h (40 °C) |

## Insulation characteristics

|                     |     |
|---------------------|-----|
| Protection class    | III |
| Degree of pollution | 2   |

## Dimensions

|                     |                                                                                     |
|---------------------|-------------------------------------------------------------------------------------|
| Dimensional drawing |  |
| Width               | 22.5 mm                                                                             |
| Height              | 99 mm                                                                               |
| Depth               | 107 mm                                                                              |

## Installation dimensions

|                                  |                                       |
|----------------------------------|---------------------------------------|
| Installation distance right/left | 0 mm / 0 mm ( $\leq 70\text{ °C}$ )   |
| Installation distance top/bottom | 50 mm / 50 mm ( $\leq 70\text{ °C}$ ) |

## Mounting

|                         |                                                |
|-------------------------|------------------------------------------------|
| Assembly instructions   | alignable: horizontally 0 mm, vertically 50 mm |
| Mounting position       | horizontal DIN rail NS 35, EN 60715            |
| With protective coating | No                                             |

## Material specifications

|                  |                            |
|------------------|----------------------------|
| Housing material | Plastic                    |
| Type of housing  | Polyamide PA, color: green |
| Housing material | Polyamide (PA)             |

## Environmental and real-life conditions

### Ambient conditions

|                                         |                                     |
|-----------------------------------------|-------------------------------------|
| Degree of protection                    | IP20                                |
| Ambient temperature (operation)         | -25 °C ... 70 °C (> +60°C derating) |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C                    |

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|                                                |                                                                                   |
|------------------------------------------------|-----------------------------------------------------------------------------------|
| Climatic class                                 | 3K3 (in acc. with EN 60721)                                                       |
| Max. permissible relative humidity (operation) | ≤ 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 ±2.5 mm (according to IEC 60068-2-6)<br>15 Hz ... 150 Hz, 2.3g |

## 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 - Electrical safety                                                                                                     | EN 60950-1/VDE 0805 (SELV)           |
| Standard - Safe isolation                                                                                                        | DIN VDE 0100-410<br>DIN VDE 0106-101 |

## Approvals

|              |                                                                                                                                            |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| CSA          | CSA-C22.2 No. 107.1-01                                                                                                                     |
| UL approvals | UL/C-UL listed UL 508<br>UL/C-UL Recognized UL 60950-1<br>UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (Hazardous Location) |

## EMC data

|                                     |                                                   |
|-------------------------------------|---------------------------------------------------|
| Low Voltage Directive               | Conformance with Low Voltage Directive 2014/35/EC |
| EMC requirements for noise emission | EN 61000-6-3<br>EN 61000-6-4                      |
| EMC requirements for noise immunity | EN 61000-6-1<br>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 |
| Housing               | > Level 3    |

### Electrostatic discharge

|                   |                          |
|-------------------|--------------------------|
| Contact discharge | 8 kV (Contact discharge) |
| Discharge in air  | 8 kV (Air discharge)     |
| Comments          | Criterion B              |

### Electromagnetic HF field

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

### Electromagnetic HF field

|                     |                  |
|---------------------|------------------|
| Frequency range     | 80 MHz ... 3 GHz |
| Test field strength | 10 V/m           |
| Comments            | Criterion A      |

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## Fast transients (burst)

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

## Fast transients (burst)

|          |                                                    |
|----------|----------------------------------------------------|
| Input    | 4 kV (level 4 - asymmetrical: conductor to ground) |
| Output   | 2 kV (level 3 - asymmetrical: conductor to ground) |
| Signal   | 1 kV (Level 2 - asymmetrical cable to ground)      |
| Comments | Criterion B                                        |

## Surge voltage load (surge)

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

## Conducted interference

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

## Conducted interference

|                 |                            |
|-----------------|----------------------------|
| Input/Output    | Level 3                    |
| Frequency range | 0.15 MHz ... 80 MHz (10 V) |

## Voltage dips

|                       |               |
|-----------------------|---------------|
| Standards/regulations | EN 61000-4-11 |
|-----------------------|---------------|

## 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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