YASKAWA

# System MICRO

## PS | M07-2BA00 | Manual

HB400 | PS | M07-2BA00 | en | 25-10

Power supply - PS M07

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M07-2BA00_000_PS M07,4,EN - © 2025

# Table of contents

# 1 General

## 1.1 About this manual

**Objective and contents**

The manual describes the power supply PS M07 of the System MICRO.

- It describes the structure, configuration and application.
- The manual is targeted at users with good basic knowledge in automation technology.
- The manual does not replace sufficient basic knowledge of automation technology or sufficient familiarity with the specific product.
- The manual consists of chapters. Each chapter describes a completed topic.
- For guidance, the manual provides:
  - An overall table of contents at the beginning of the manual
  - References with pages numbers

**Validity of the documentation**

| Product | Order no. | as of version: |
|---|---|---|
| PS M07 DC24V, 1.5A_AC120V-240V | M07-2BA00 | 01 |

**Documentation**

In the context of the use of the pertinent Yaskawa product, the manual is to be made accessible to the pertinent qualified personnel in:

- Project engineering
- Installation department
- Commissioning
- Operation

**Icons and headings**

Important passages in the text are highlighted by following icons and headings:

**DANGER**

- Immediate danger to life and limb of personnel and others.
- Non-compliance will cause death or serious injury.

**CAUTION**

- Hazardous situation to life and limb of personnel and others. Non-compliance may cause slight injuries.
- This symbol is also used as warning of damages to property.

**NOTICE**

- Designates a possibly harmful situation.
- Non-compliance can damage the product or something in its environment.

*Supplementary information and useful tips.*

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**Download Center**

By entering the product order number in the *'Download Center'* at www.yaskawa.eu.com, the pertinent manuals, data sheets, declarations of conformity, certificates and other helpful information for your product can be found.

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Tel.: +49 6196 569 500 (hotline)
Email: support@yaskawa.eu

## 1.3 Safety instructions

### General safety instructions

**DANGER**

**Danger to life due to non-compliance with safety instructions**

Non-compliance with the safety instructions in the manual can result in serious injury or death. The manufacturer is not responsible for any injuries or damage to the equipment.

**CAUTION**

**Before commissioning and operating the components described in this manual, it is essential to note the following:**

- Modifications to the automation system must only be done in a voltage-free state!
- Connection and modification only by trained electricians
- National regulations and guidelines in the respective country of use must be observed and complied with (installation, protective measures, EMC, etc.)

**DANGER**

**Warning symbol on the housing**

There is a warning symbol on the housing of the power supply. This indicates that all safety instructions listed in this manual must be observed before commissioning!

**Intended use**

- It is the customer's responsibility to comply with all pertinent standards, codes, or regulations applicable to the use of the product, including those that apply when the Yaskawa product is used in combination with other products.
- The customer must confirm that the Yaskawa product is suitable for the customer's plant, machinery and equipment.
- If the Yaskawa product is used in a manner not specified by this manual, the protection provided by the Yaskawa product may be impaired and the use may result in material or immaterial damage.
- Contact Yaskawa to determine whether use is permitted in the following applications. If the use in the respective application is permissible, the Yaskawa product is to be used by considering additional risk assessments and specifications, and safety measures are to be provided to minimise the dangers in the event of a fault. Special caution is required and protective measures must be taken in the case of:
  - Outdoor use, use with possible chemical contamination or electrical interference, or use under conditions or in environments which are not described in product catalogs or manuals
  - Nuclear control systems, combustion systems, railway systems, aviation systems, automotive systems, medical devices, amusement machines and equipment that is specifically regulated by industry or government
  - Systems, machines and devices that can pose a risk to life or property
  - Systems that require a high degree of reliability, such as gas, water or electricity supply systems or systems that operate 24 hours a day
  - Other systems that require a similarly high level of security
- Never use the Yaskawa product in an application where failure of the product could cause serious danger to life, limb, health or property without first ensuring that the system is designed to provide the required level of safety with risk warnings and redundancy to avoid the realisation of such dangers and that the Yaskawa product is properly designed and installed.
- The connection examples and other application examples described in the product catalogs and manuals of Yaskawa are for reference purposes. Check the functionality and safety of the devices and systems actually to be used before using the Yaskawa product.
- To avoid accidental harm to third parties, read and understand all prohibitions on use and precautions, and operate the Yaskawa product correctly.

## Field of application

**DANGER**

Failure to comply with the specification may affect the protective functions of the system!

The power supply is constructed and produced for:

- the DC 24V supply of components.
- operation within the environmental conditions specified in the technical data
- the installation on a 35mm profile rail in a control cabinet, which provides protection against fire, environmental influences and mechanical impact
- industrial applications
- The Yaskawa product is not suited for use in life-support machines or systems.
- Please contact your Yaskawa representative or Yaskawa distributor if considering the use of the Yaskawa product for special purposes, such as machines or systems used in passenger cars, in medical, aircraft and aerospace applications, for power supply of networks, for electrical power distribution or for underwater applications.

**DANGER**

The device is not permitted for use

- in explosive environments (EX zone)

The system is designed and manufactured for proper use and use in accordance with the user manual and is designed for:

- Communication and process control
- general control and automation tasks
- for industrial use
- operation within the environmental conditions specified in the technical data
- installation in a cabinet

**DANGER**

**If this Yaskawa product is used in applications where failure of the device can result in the loss of human life, a serious accident or physical injury, you must install appropriate safety devices.**

- Death or serious injury can result if you do not install the safety devices properly.

**CAUTION**

**The following conditions must be met before using or commissioning the components described in this manual:**

- Hardware modifications should only be carried out when the system has been disconnected from power!
- Installation and hardware modifications only by properly trained personnel.
- The national rules and regulations of the respective country must be satisfied (installation, safety, EMC ...)

**Disclaimer**

(1) The contractual and legal liability of Yaskawa and the legal representatives and vicarious agents of Yaskawa for compensation and reimbursement of expenses in relation to the content of this documentation is excluded or limited as follows:

a) For slightly negligent breaches of *Essential Contractual Duties* arising from the contractual obligation, for Yaskawa the amount of liability is limited to the foreseeable damage typical for the contract. *'Essential Contractual Duties'* are those duties that characterise the performance of the contract and on which the Yaskawa customer may reasonably rely.

(b) In each case, Yaskawa is not liable for (i) the slightly negligent breach of duties arising from the duties that are not *Essential Contractual Duties*, as well as (ii) force majeure, i.e. external events that have no operational connection and cannot be averted even by exercising the utmost care that can reasonably be expected.

(2) The aforementioned limitation of liability does not apply (i) in cases of mandatory statutory liability (in particular under the product liability law), (ii) if and to the extent that Yaskawa has assumed a guarantee or same as guaranteed procurement risk according to § 276 BGB, (iii) for culpably caused injuries to life, limb and/or health, also by representatives or vicarious agents, as well as (iv) in case of delay in the event of a fixed completion date.

(3) A reversal of the burden of proof is not associated with the provisions above.

**Disposal**

**National rules and regulations apply to the disposal of the unit!**

# 2 Basics and mounting

## 2.1 Safety notes for the user

**DANGER**

**Protection against dangerous voltages**

- When using System MICRO modules, the user must be protected from touching hazardous voltage.
- You must therefore create an insulation concept for your system that includes safe separation of the potential areas of ELV and hazardous voltage.
- Here, observe the insulation voltages between the potential areas specified for the System MICRO modules and take suitable measures, such as using PELV/SELV power supplies for System MICRO modules.

**Handling of electrostatic sensitive modules**

The modules are equipped with highly integrated components in MOS technology. These components are highly sensitive to over-voltages that occur, e.g. with electrostatic discharge. The following symbol is used to identify these hazardous modules:

The symbol is located on modules, module racks or on packaging and thus indicates electrostatic sensitive modules. Electrostatic sensitive modules can be destroyed by energies and voltages that are far below the limits of human perception. If a person who is not electrically discharged handles electrostatic sensitive modules, voltages can occur and damage components and thus impair the functionality of the modules or render the modules unusable. Modules damaged in this way are in most cases not immediately recognized as faulty. The error can only appear after a long period of operation. Components damaged by static discharge can show temporary faults when exposed to temperature changes, vibrations or load changes. Only the consistent use of protective devices and responsible observance of the handling rules can effectively prevent malfunctions and failures on electrostatic sensitive modules.

**Shipping of modules**

Please always use the original packaging for shipping.

**Measurement and modification of electrostatic sensitive modules**

For measurements on electrostatic sensitive modules the following must be observed:

- Floating measuring instruments must be discharged before use.
- Measuring instruments used must be grounded.

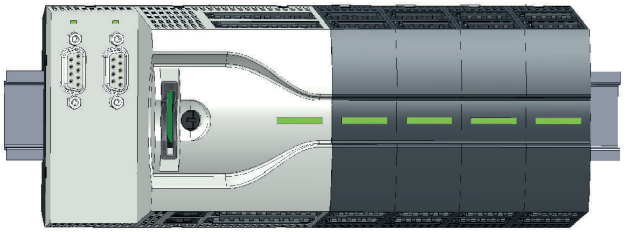
When modifying electrostatic sensitive modules, ensure that a grounded soldering iron is used.

**CAUTION**

When working with and on electrostatic sensitive modules, make sure that personnel and equipment are adequately grounded.

## 2.2 System conception

### Overview

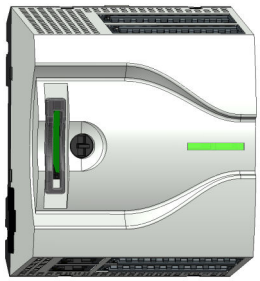


The System MICRO is a modular automation system for assembly on a 35mm profile rail. By means of periphery modules this system may be adapted matching to your automation tasks. In addition, it is possible to expand your CPU by appropriate interfaces. The wiring complexity is low, because the DC 24V electronic section supply is integrated to the backplane bus and this allows replacement with standing wire.

### Components

- CPU
- Extension module
- Power supply
- Periphery module

### CPU



With the CPU electronic, input/output components and power supply are integrated to one casing. In addition, up to 8 periphery modules of the System MICRO can be connected to the backplane bus. As head module via the integrated power module for power supply CPU electronic and the I/O components are supplied as well as the electronic of the periphery modules, which are connected via backplane bus. To connect the power supply of the I/O components and for DC 24V electronic power supply of the periphery modules, which are connected via backplane bus, the CPU has removable connectors. By installing of up to 8 periphery modules at the backplane bus of the CPU, these are electrically connected, this means these are assigned to the backplane bus and connected to the DC 24V electronic power supply.

### Extension module

By using extension modules you can extend the interfaces of the CPU. The attachment to the CPU is made by plugging on the left side of the CPU. You can only connect one extension module to the CPU at a time.

### Power supply

The power supply is mounted on the left side of the profile rail with the System MICRO modules. It serves for electronics and power supply.

### Periphery module

By means of up to 8 periphery modules, you can extend the internal I/O areas. The attachment to the CPU is made by plugging them on the right side of the CPU.

### Profile rail

| Order no. | Description |
|---|---|
| 290-1AF00 | 35 mm profile rail length 2000mm |
| 290-1AF30 | 35 mm profile rail length 530mm |

**NOTICE**

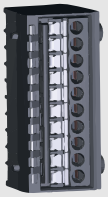
**To ensure EMC, the profile rail must be grounded!**

- Ensure that the profile rail is reliably and professionally grounded.
- By mounting them on the grounded profile rail, the modules are automatically connected to the grounding system.

*'Installation guidelines'...page 24*

### Spare parts

The following spare parts are available for the System MICRO:

| Spare part | Order no. | Description | Packaging unit |
|---|---|---|---|
|  | M92-9BC00 | 5-fold connector for System MICRO module. | 5 pieces |
|  | M92-9BH00 | 10-fold connector for System MICRO CPU. | 5 pieces |

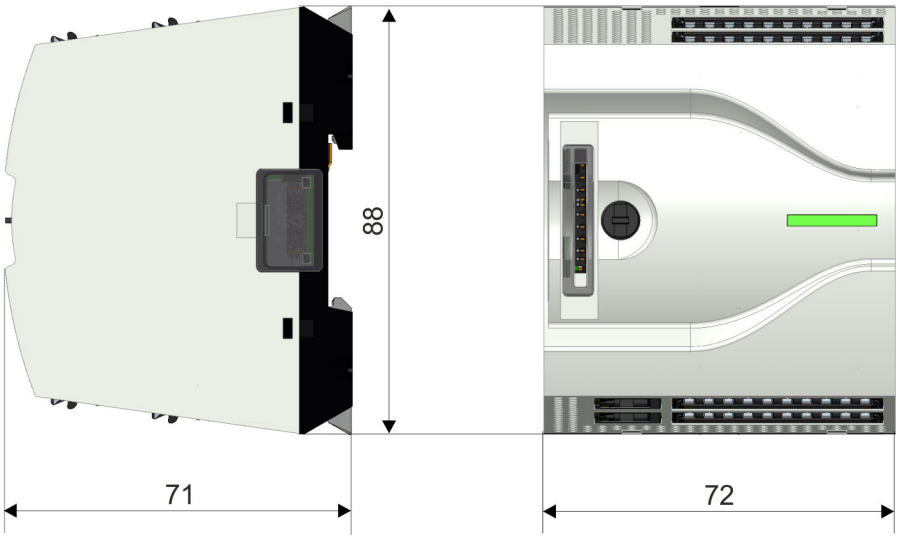
**CAUTION**

Please note that you may only use the spare parts with Yaskawa modules. Use with third-party modules is not allowed!

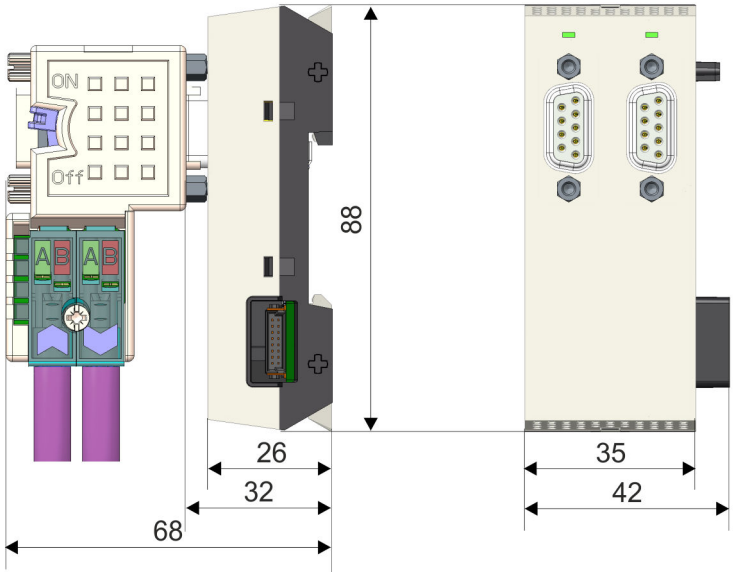
## 2.3 Dimensions

**Dimensions CPU M13C**

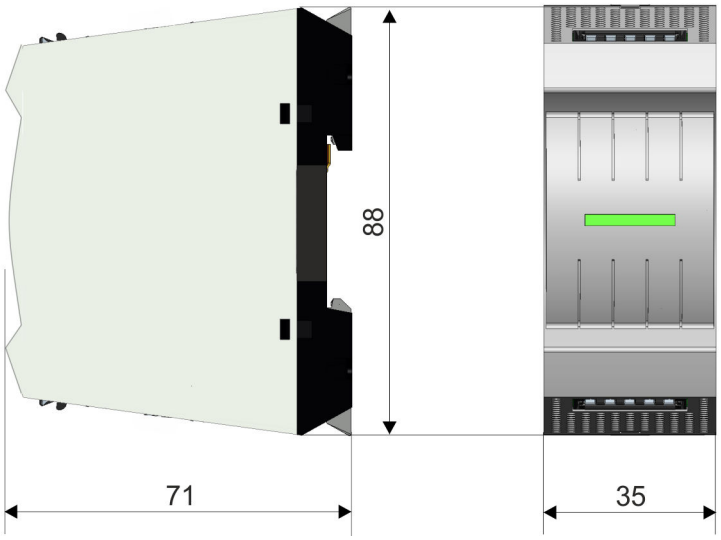
All dimensions are in mm.



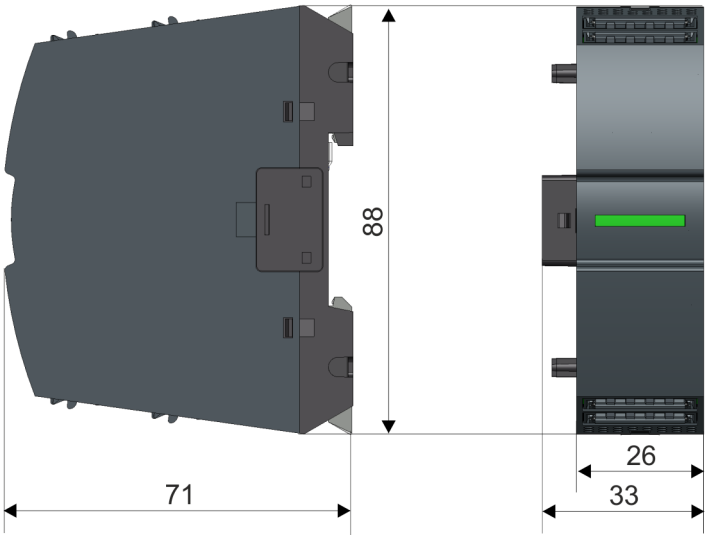

**Dimensions extension module EM M09**



## Dimensions power supply




## Dimensions periphery module



## 2.4 Mounting

***Observe minimum distance!***

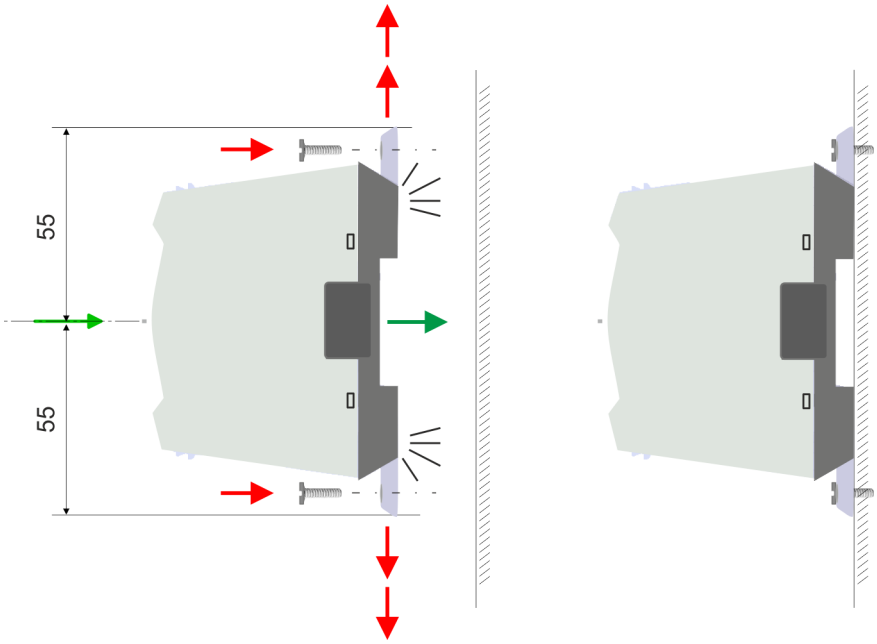
*For operation within the specified nominal values, they must comply with a minimum distance of 30 mm on one side of the module!*


Dimensions in mm

### 2.4.1 Mounting without profile rail

**Proceeding**

You can screw the power supply to the back wall by means of screws via the locking levers. The happens with the following proceeding:




Dimensions in mm

1. The power supply has a locking lever on the upper and lower side. Pull these levers outwards as shown in the figure, until these engage 2x audible.

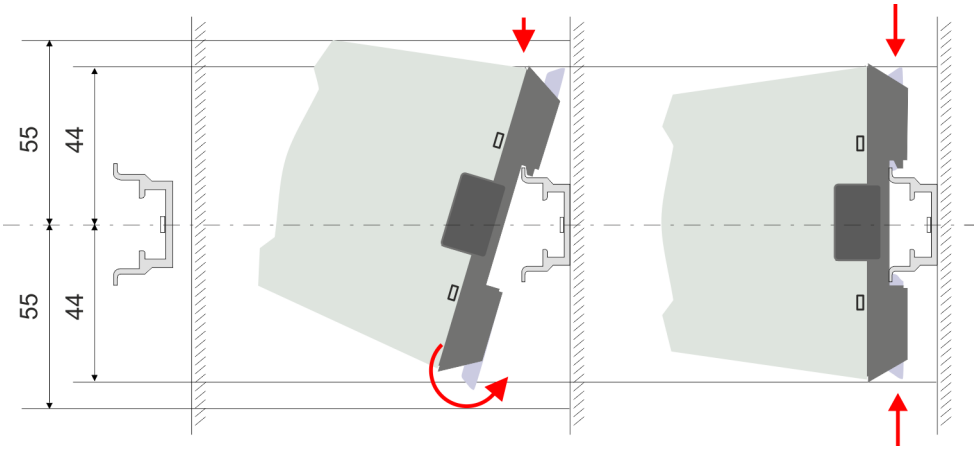
   ➡ By this openings on the locking levers get visible.

2. Use this openings to fix your power supply to your back wall with appropriate screws. Consider the installation clearances for the power supply.

   ➡ The power supply is now mounted and can be wired.

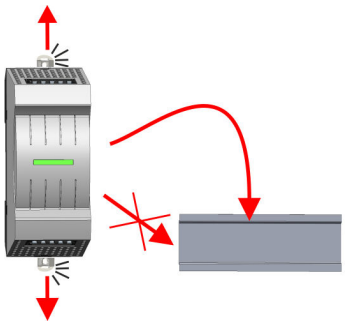
## 2.4.2 Mounting with profile rail

**Proceeding**




Dimensions in mm

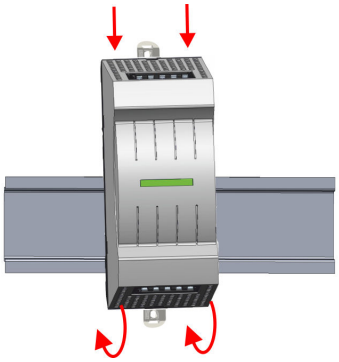
1. Mount the profile rail. Please consider that a clearance from the middle of the profile rail of at least 44mm respectively 55mm above and below exists.



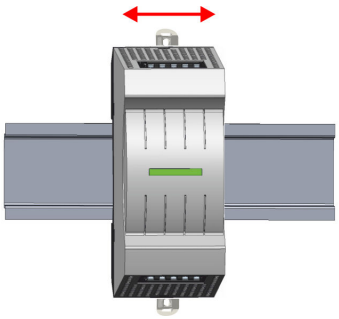
2. The power supply has a locking lever on the upper and lower side. Pull these levers outwards as shown in the figure, until these engage audible.

**CAUTION**

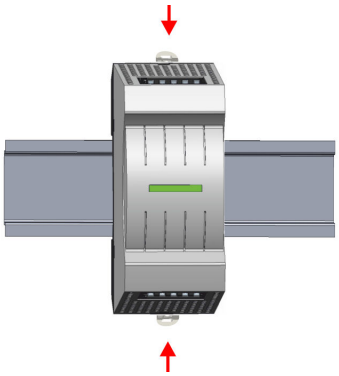
It is not allowed to mount the module sideways on the profile rail, as otherwise the module may be damaged.



3. Plug the power supply from the top onto the profile rail and turn the power supply downward until it rests on the profile rail.



4. Move the power supply on the profile rail at its position.



5. To fix the power supply at the profile rail, move the locking levers back to the initial position.

   ➡ The power supply is now mounted and can be wired.

## 2.5 Wiring

**Notes and guidelines**

**DANGER**

**Consider strain relief of the supply lines!**

Since the plug for the supply lines of the input voltage has no (double) insulation, not permanently fixed supply lines must be relieved from push and pull!

**CAUTION**

**Consider temperature for external cables!**

Cables may experience temperature increase due to system heat dissipation. Thus the cabling specification must be chosen 25°C above ambient temperature!

**CAUTION**

**Separate insulation areas!**

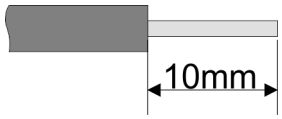
The system is specified for SELV/PELV environment. Devices, which are attached to the system must meet theses specifications. Installation and cable routing other than SELV/PELV specification must be separated from the system's equipment!

### 2.5.1 Wiring power supply

**Connectors**

For wiring the power supply has removable connectors. With the wiring of the connectors a "push-in" spring-clip technique is used. This allows a quick and easy connection of your supply lines. The clamping off takes place by means of a screwdriver.

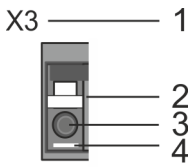
**Data**




| | |
|---|---|
| $U_{max}$ | 240V AC / 30V DC |
| $I_{max}$ | 2A |
| Cross section | 0.2 ... 1.5mm² (AWG 24 ... 16) |
| Stripping length | 10mm |

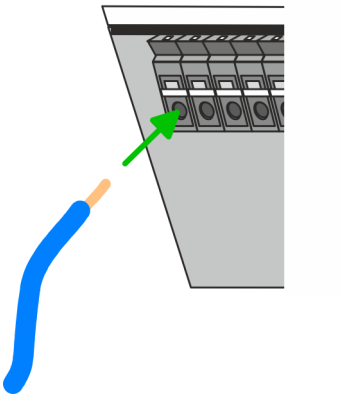
Use for wiring rigid wires respectively use wire sleeves. When using stranded wires you have to press the release button with a screwdriver during the wiring.

**Wiring procedure**




1 Labeling on the casing
2 Release area
3 Connection hole for wire
4 Pin 1 of the connector is labelled by a white line.

**Insert wire**

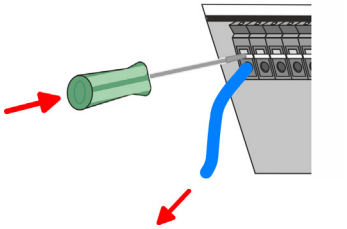


The wiring happens without a tool.

→ Determine according to the casing labelling the connection position and insert through the round connection hole of the according contact your prepared wire until it stops, so that it is fixed.

➡ By pushing the contact spring opens, thus ensuring the necessary contact pressure.

**Remove wire**



The wire is to be removed by means of a screwdriver with 2.5mm blade width.

1. Press with your screwdriver vertically at the release button.
   ➡ The contact spring releases the wire.
2. Pull the wire from the round hole.

**Fusing**

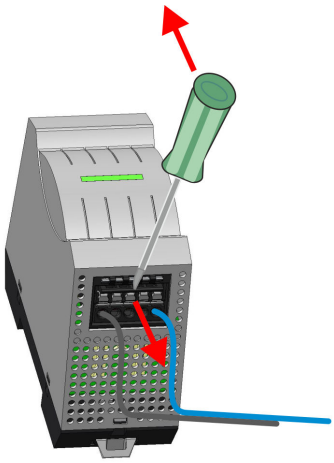
**CAUTION**

To protect the power supply lines, you should use a circuit breaker with the following characteristics:

- Rated current at AC 230V: 4A
- Tripping characteristic: C

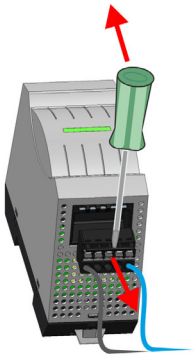
## 2.6 Demounting

**Remove connector**



By means of a screwdriver there is the possibility to remove the connectors e.g. for module exchange with a fix wiring. For this each connector has indentations for unlocking at the top. Unlocking takes place by the following proceeding:

1. Remove connector:
   Insert your screwdriver from above into one of the indentations.



2. Push the screwdriver backwards:
   ➡ The connector is unlocked and can be removed.

**CAUTION**

Via wrong operation such as pressing the screwdriver downward, the release lever may be damaged.

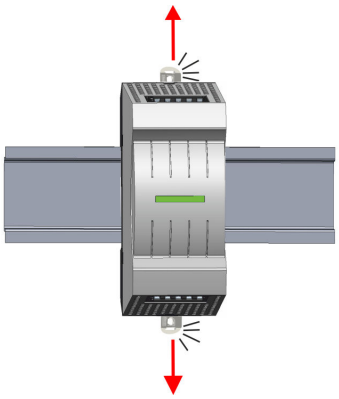
3. In this way, remove all plugged connectors on the power supply.

**Power supply replacement**

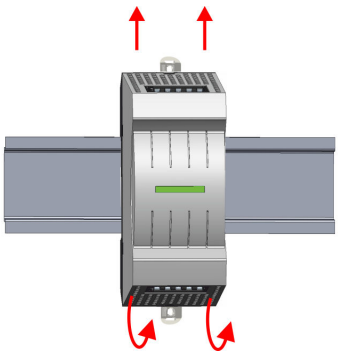
**Replacement on profile rail**

The replacement of the power supply on the profile rail happens with the following proceeding:

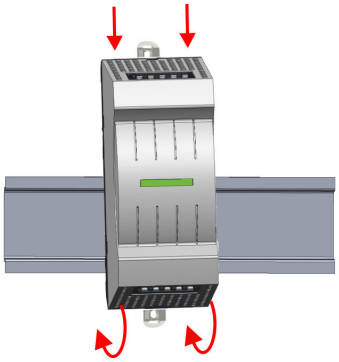
Demounting



1. Use a screwdriver to pull the locking levers of the power supply outwards until these engage audible.



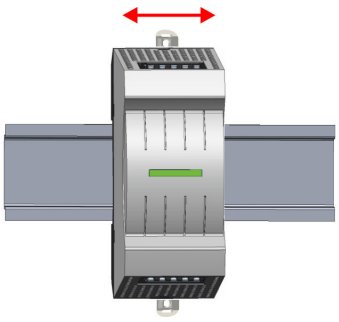
2. Remove the power supply with a rotation upwards from the profile rail.



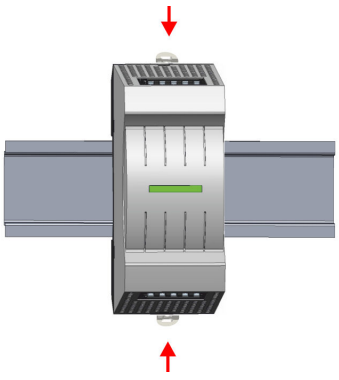
3. Pull the locking levers of the new power supply outwards until these engage audible. Plug the power supply from the top onto the profile rail and turn the power supply downward until it rests on the profile rail.

**CAUTION**

It is not allowed to mount the module sideways on the profile rail, as otherwise the module may be damaged!



4. Move the power supply on the profile rail at its position.

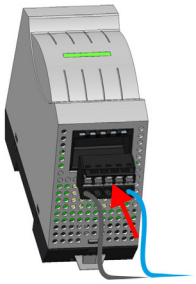


5. To fix the power supply at the profile rail, move the locking levers back to the initial position.

➡ The power supply is now mounted and can be wired.

### Plug connector

1. Remove the connectors, which are not necessary at the power supply.



2. Plug again the wired connectors.
   ➡ Now you can bring your system back into operation.

# 2.7 Industrial security and installation guidelines

## 2.7.1 Industrial security in information technology

**Latest version**

This chapter can also be found as a guide *'Industrial IT Security'* in the *'Download Center'* of www.yaskawa.eu.com

**Hazards**

The topic of data security and access protection has become increasingly important in the industrial environment. The increased networking of entire industrial systems to the network levels within the company together with the functions of remote maintenance have all served to increase vulnerability. Hazards can arise from:

- Internal manipulation such as technical errors, operating and program errors and deliberate program or data manipulation.
- External manipulation such as software viruses, worms and trojans.
- Human carelessness such as password phishing.

**Precautions**

The most important precautions to prevent manipulation and loss of data security in the industrial environment are:

- Encrypting the data traffic by means of certificates.
- Filtering and inspection of the traffic by means of VPN - "Virtual Private Networks".
- Identification of the user by "Authentication" via save channels.
- Segmenting in protected automation cells, so that only devices in the same group can exchange data.
- Deactivation of unnecessary hardware and software.

**Further Information**

You can find more information about the measures on the following websites:

- Federal Office for Information Technology ➦ *www.bsi.bund.de*
- Cybersecurity & Infrastructure Security Agency ➦ *us-cert.cisa.gov*
- VDI / VDE Society for Measurement and Automation Technology ➦ *www.vdi.de*

### 2.7.1.1 Protection of hardware and applications

**Precautions**

- Do not integrate any components or systems into public networks.
  - Use VPN "Virtual Private Networks" for use in public networks. This allows you to control and filter the data traffic accordingly.
- Always keep your system up-to-date.
  - Always use the latest firmware version for all devices.
  - Update your user software regularly.
- Protect your systems with a firewall.
  - The firewall protects your infrastructure internally and externally.
  - This allows you to segment your network and isolate entire areas.
- Secure access to your plants via user accounts.
  - If possible, use a central user management system.
  - Create a user account for each user for whom authorization is essential.
  - Always keep user accounts up-to-date and deactivate unused user accounts.
- Secure access to your plants via secure passwords.
  - Change the password of a standard login after the first start.
  - Use strong passwords consisting of upper/lower case, numbers and special characters. The use of a password generator or manager is recommended.
  - Change the passwords according to the rules and guidelines that apply to your application.
- Deactivate inactive communication ports respectively protocols.
  - Only the communication ports that are used for communication should be activated.
  - Only the communication protocols that are used for communication should be activated.
- Consider possible defence strategies when planning and securing the system.
  - The isolation of components alone is not sufficient for comprehensive protection. An overall concept is to be drawn up here, which also provides defensive measures in the event of a cyber attack.
  - Periodically carry out threat assessments. Among others, a comparison is made here between the protective measures taken and those required.
- Limit the use of external storage media.
  - Via external storage media such as USB memory sticks or SD memory cards, malware can get directly into a system while bypassing a firewall.
  - External storage media or their slots must be protected against unauthorized physical access, e.g. by using a lockable control cabinet.
  - Make sure that only authorized persons have access.
  - When disposing of storage media, make sure that they are safely destroyed.
- Use secure access paths such as HTTPS or VPN for remote access to your plant.
- Enable security-related event logging in accordance with the applicable security policy and legal requirements for data protection.

#### 2.7.1.2 Protection of PC-based software

**Precautions**

Since PC-based software is used for programming, configuration and monitoring, it can also be used to manipulate entire systems or individual components. Particular caution is required here!

- Use user accounts on your PC systems.
  - If possible, use a central user management system.
  - Create a user account for each user for whom authorization is essential.
  - Always keep user accounts up-to-date and deactivate unused user accounts.
- Protect your PC systems with secure passwords.
  - Change the password of a standard login after the first start.
  - Use strong passwords consisting of upper/lower case, numbers and special characters. The use of a password generator or manager is recommended.
  - Change the passwords according to the rules and guidelines that apply to your application.
- Enable security-related event logging in accordance with the applicable security policy and legal requirements for data protection.
- Protect your PC systems by security software.
  - Install virus scanners on your PC systems to identify viruses, trojans and other malware.
  - Install software that can detect phishing attacks and actively prevent them.
- Always keep your software up-to-date.
  - Update your operating system regularly.
  - Update your software regularly.
- Make regular backups and store the media at a safe place.
- Regularly restart your PC systems. Only boot from storage media that are protected against manipulation.
- Use encryption systems on your storage media.
- Perform security assessments regularly to reduce the risk of manipulation.
- Use only data and software from approved sources.
- Uninstall software which is not used.
- Disable unused services.
- Activate a password-protected screen lock on your PC systems.
- Always lock your PC systems as soon as you leave your PC workstation.
- Do not click any links that come from unknown sources. If necessary ask, e.g. on e-mails.
- Use secure access paths such as HTTPS or VPN for remote access to your PC system.

### 2.7.2 Installation guidelines

**General**

The installation guidelines contain information about the interference free deployment of a PLC system. There is the description of the ways, interference may occur in your PLC, how you can make sure the electromagnetic compatibility (EMC), and how you manage the isolation.

**What does EMC mean?**

Electromagnetic compatibility (EMC) means the ability of an electrical device, to function error free in an electromagnetic environment without being interfered respectively without interfering the environment.

The components are developed for the deployment in industrial environments and meets high demands on the EMC. Nevertheless you should project an EMC planning before installing the components and take conceivable interference causes into account.

### Possible interference causes

Electromagnetic interferences may interfere your control via different ways:

- Electromagnetic fields (RF coupling)
- Magnetic fields with power frequency
- Bus system
- Power supply
- Protected ground conductor

Depending on the spreading medium (lead bound or lead free) and the distance to the interference cause, interferences to your control occur by means of different coupling mechanisms.

There are:

- galvanic coupling
- capacitive coupling
- inductive coupling
- radiant coupling

### Basic rules for EMC

In the most times it is enough to take care of some elementary rules to guarantee the EMC. Please regard the following basic rules when installing your PLC.

- Take care of a correct area-wide grounding of the inactive metal parts when installing your components.
  - Connect all inactive metal extensive and impedance-low.
  - Please try not to use aluminium parts. Aluminium is easily oxidizing and is therefore less suitable for grounding.
- When cabling, take care of the correct line routing.
  - Organize your cabling in line groups (high voltage, current supply, signal and data lines).
  - Always lay your high voltage lines and signal respectively data lines in separate channels or bundles.
  - Route the signal and data lines as near as possible beside ground areas (e.g. suspension bars, metal rails, tin cabinet).
- Proof the correct fixing of the lead isolation.
  - Data lines must be shielded.
  - Analog lines must be shielded. When transmitting signals with small amplitudes the one sided laying of the isolation may be favourable.
  - Cables for frequency inverters, servo and stepper motors must be shielded.
  - Lay the line isolation extensively on an isolation/protected ground conductor rail directly after the cabinet entry and fix the isolation with cable clamps.
  - Make sure that the isolation/protected ground conductor rail is connected impedance-low with the cabinet.
  - Use metallic or metallised plug cases for isolated data lines.
- In special use cases you should appoint special EMC actions.
  - Consider to wire all inductivities with erase links.
  - Please consider luminescent lamps can influence signal lines.
- Create a homogeneous reference potential and ground all electrical operating supplies when possible.
  - Please take care for the targeted employment of the grounding actions. The grounding of the PLC serves for protection and functionality activity.
  - Connect installation parts and cabinets with your PLC in star topology with the isolation/protected ground conductor system. So you avoid ground loops.
  - If there are potential differences between installation parts and cabinets, lay sufficiently dimensioned potential compensation lines.

## Isolation of conductors

Electrical, magnetically and electromagnetic interference fields are weakened by means of an isolation, one talks of absorption. Via the isolation rail, that is connected conductive with the rack, interference currents are shunt via cable isolation to the ground. Here you have to make sure, that the connection to the protected ground conductor is impedance-low, because otherwise the interference currents may appear as interference cause.

When isolating cables you have to regard the following:

- If possible, use only cables with isolation tangle.
- The hiding power of the isolation should be higher than 80%.
- Normally you should always lay the isolation of cables on both sides. Only by means of the both-sided connection of the isolation you achieve high quality interference suppression in the higher frequency area. Only as exception you may also lay the isolation one-sided. Then you only achieve the absorption of the lower frequencies. A one-sided isolation connection may be convenient, if:
  - the conduction of a potential compensating line is not possible.
  - analog signals (some mV respectively µA) are transferred.
  - foil isolations (static isolations) are used.
- With data lines always use metallic or metallised plugs for serial couplings. Fix the isolation of the data line at the plug rack. Do not lay the isolation on the PIN 1 of the plug bar!
- At stationary operation it is convenient to strip the insulated cable interruption free and lay it on the isolation/protected ground conductor line.
- To fix the isolation tangles use cable clamps out of metal. The clamps must clasp the isolation extensively and have well contact.
- Lay the isolation on an isolation rail directly after the entry of the cable in the cabinet.

**CAUTION**

**Please regard at installation!**

At potential differences between the grounding points, there may be a compensation current via the isolation connected at both sides.

Remedy: Potential compensation line

## 2.8 General data

| Conformity and approval | | |
|---|---|---|
| Conformity | | |
| CE | 2014/35/EU | Low Voltage Directive |
| | 2014/30/EU | EMC Directive |
| RoHS (EU) | 2011/65/EU | Restriction of the use of certain hazardous substances in electrical and electronic equipment |
| UKCA | 2016 No. 1101 | Electrical Equipment (Safety) Regulations |
| | 2016 No. 1091 | Electromagnetic Compatibility Regulations |
| RoHS (UK) | 2012 No. 3032 | Use of Certain Hazardous Substances |
| Approval | | |
| UL | - | Refer to Technical data |

| Protection of persons and device protection | | |
|---|---|---|
| Type of protection | - | IP20 |
| Electrical isolation | | |
| Safe insulation | - | between primary and secondary side |
| Insulation voltage to reference earth | | |
| Inputs / outputs | - | |
| Protective measures | - | against short circuit |

| Environmental conditions to EN 61131-2 | | |
|---|---|---|
| Climatic | | |
| Storage / transport | EN 60068-2-14 | -40…+80°C |
| Operation | | |
| Horizontal installation hanging | EN 61131-2 | 0…+60°C |
| Vertical installation | EN 61131-2 | 0…+50°C |
| Air humidity | EN 60068-2-30 | RH1 (without condensation, rel. humidity 5…95%) |
| Pollution | EN 61131-2 | Degree of pollution 2 |
| Installation altitude max. | - | 2000m |
| Mechanical | | |
| Oscillation | EN 60068-2-6 | 1g, 9Hz ... 150Hz |
| Shock | EN 60068-2-27 | 15g, 11ms |

| Mounting conditions | | |
|---|---|---|
| Mounting place | - | In the control cabinet |
| Mounting position | - | Horizontal and vertical |

| EMC | Standard | | Comment |
|---|---|---|---|
| Overvoltage category | EN 50178 | | III |
| | UL 61010-1 | | II |
| Emitted interference | EN 61000-6-4 | | Class A (Industrial area) |
| Noise immunity zone B | EN 61000-6-2 | | Zone B (Industrial area) |
| | | EN 61000-4-2 | ESD<br>8kV at air discharge (degree of severity 3),<br>6kV at contact discharge (degree of severity 3) |
| | | EN 61000-4-3 | HF field immunity (casing)<br>80MHz … 1000MHz, 10V/m, 80% AM (1kHz)<br>1.4GHz ... 6.0GHz, 3V/m, 80% AM (1kHz) |
| | | EN 61000-4-6 | HF conducted<br>150kHz … 80MHz, 10V, 80% AM (1kHz) |
| | | EN 61000-4-4 | Burst |
| | | EN 61000-4-5 | Surge |
| | | EN 61000-4-11 | Mains voltage dips and interruptions |

## 2.8.1 Use in difficult operating conditions

***Without additional protective measures, the products must not be used in locations with difficult operating conditions; e.g. due to:***

- *dust generation*
- *chemically active substances (corrosive vapors or gases)*
- *strong electric or magnetic fields*

# 3 Power supply

## 3.1 Safety instructions

**Mounting**

For the power supply applies:

- It is mounted together with your System MICRO modules on a profile rail. In this case, the power supply must always be mounted only on the outer edge of your System MICRO, otherwise the backplane bus is interrupted. The power supply has no connection to the backplane bus.
- When selecting the mounting location, please note that the power supply is sufficiently cooled during operation.

Below are the precautions to take when using the power supply.

**CAUTION**

- The power supply may only be installed in dry rooms, which are only accessible by the maintenance engineer!
- The power supply is not approved for use in potentially explosive environments (EX zone)!
- Before you start to work on at the power supply for installation or maintenance, you have to disconnect it from the main power source, i.e. the power line is to be switched off (unplug the plug, with permanent connection the associated fuse must be removed)!
- Only properly qualified electrical staff is allowed to install, connect and/or modify electrical equipment!
- Due to the compact design, the contact and fire protection can not be maintained to ensure sufficient cooling. For this reason, fire protection must be ensured by the construction of the environment of the installed power supply unit (e.g. installation in a control cabinet that complies with the fire protection regulations)!
- Please adhere to the national rules and regulations of the location and/or country where the units are installed (installation, safety precautions, EMC ...).

*Information about assembly and cabling* *'Basics and mounting'...page 10*.

## 3.2 PS M07 DC24V, 1.5A_AC120V-240V

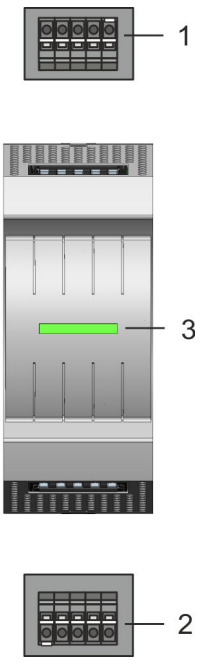
### Properties

- Output current 1.5A
- Rated output voltage DC 24V
- Connection to single-phase AC mains wide-range input AC 120...240V without manual switching
- Protection against short circuit and overload
- Can be used together with System MICRO on the profile rail
- Safe electrical isolation according to EN 60950
- Overtemperature protection
- Efficiency typ. 90% at $I_{nominal}$
- Can be used as electronic and power section supply

### Ordering data

| Type | Order number | Description |
|---|---|---|
| PS M07 DC24V, 1.5A_AC120V-240V | M07-2BA00 | Power supply<br>primary AC 120...240V, secondary DC 24V, 1.5A |

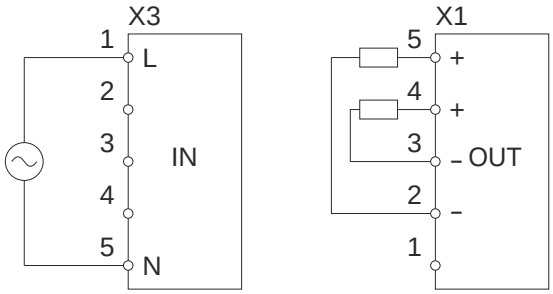
### Structure




1 X1: Terminal DC 24V output, max. 1.5A
2 X3: Terminal AC 120...240V input, 47...63Hz, max. 0.9A
3 Status bar power module

**CAUTION**

- The power supplies must be released before installation and repair tasks, i.e. before handling with the power supply or with the cabling you must disconnect current/voltage (pull plug, at fixed connection switch off the concerning fuse)!
- Installation and modifications only by properly trained personnel!

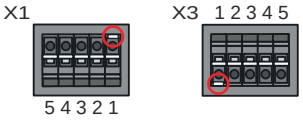



### Status bar

| LED | Description |
|---|---|
| | LEDs off: Input voltage too low, power supply does not start. |
| | LEDs green on: OK: There is no fault and the DC 24V power supply is ensured. |
| | LED red on: Overload: The module is overheated or overloaded (short circuit). |

## Connection


- The power supply is to be supplied with AC 120 ... 240V via plug connector X3.
- A melting fuse protects the input against overload.
- The DC 24V output plug connector X1 is divided into 2 connectors each. Here you can connect your components, which are to be supplied externally with DC 24V.
- The DC 24V output is short-circuit proof with an output voltage of DC 24V at a total current of max. 1.5A
- Pin 1 of the connector is labelled by a white line.




***To protect the power supply lines, you should use a circuit breaker with the following characteristics:***

- *Rated current at AC 230V: 4A*
- *Tripping characteristic: C*

*So that the circuit breaker can be easily replaced or reset, this should be mounted easily accessible.*

*You can also supply the power supply with DC 120 ... 240V. Please note that use with DC 120 ... 240V does not correspond to UL-compliant operation.*

## Operation outside the nominal values

*In applications according to CE approval, operation outside the nominal values is permissible, but not in applications according to UL approval!*

**Regarding the following temperature ranges, operation outside the nominal values is possible**

| Output current | 1.5A | 2A | |
|---|---|---|---|
| Input voltage AC | 100 ... 119V | 100 ... 119V | 120 ... 240V |
| Ambient temperature (horizontal installation) | 0 ... 55°C | 0 ... 35°C | 0 ... 45°C |
| Ambient temperature (vertical installation) | 0 ... 50°C | 0 ... 30°C | 0 ... 40°C |

| Output current | 1.5A | 2A | |
|---|---|---|---|
| Input voltage DC | 110 ... 119V | 110 ... 119V | 120 ... 345V |
| Ambient temperature (horizontal installation) | 0 ... 55°C | 0 ... 35°C | 0 ... 45°C |
| Ambient temperature (vertical installation) | 0 ... 50°C | 0 ... 30°C | 0 ... 40°C |

## 3.3 Technical data

| Order no. | M07-2BA00 |
|---|---|
| Type | PS M07- Power supply |
| Module ID | - |
| **Technical data power supply** | |
| Input voltage (rated value) | AC 120...240V |
| Input voltage (permitted range) | AC 90...264 V |
| Mains frequency (rated value) | 50...60 Hz |
| Mains frequency (permitted range) | 47...63 Hz |
| Input current (at 120 V) | 0.9 A |
| Input current (at 230 V) | 0.6 A |
| Inrush current (at 25 °C) | 30 A |
| $I^2t$ | - |
| Power consumption typ. | 41 W |
| Output voltage (rated value) | 24 V |
| Output current (rated value) | 1.5 A |
| Power supply parallel switchable | - |
| Protect type | short circuits, overload |
| Ripple of output voltage (max.), BW=20 MHz | 25 mV |
| Efficiency typ. | 88 % |
| Power loss typ. | 5 W |
| **Status information, alarms, diagnostics** | |
| Status display | yes |
| Interrupts | no |
| Process alarm | no |
| Diagnostic interrupt | no |
| Diagnostic functions | no |
| Diagnostics information read-out | none |
| Supply voltage display | none |
| Group error display | none |
| Channel error display | none |
| **Housing** | |
| Material | PC / PPE GF10 |
| Mounting | Profile rail 35 mm |
| **Mechanical data** | |
| Dimensions (WxHxD) | 35 mm x 88 mm x 71 mm |
| Net weight | 155 g |
| Weight including accessories | 155 g |

| Order no. | M07-2BA00 |
|---|---|
| Gross weight | 170 g |
| **Environmental conditions** | |
| Operating temperature | 0 °C to 60 °C |
| Storage temperature | -40 °C to 80 °C |
| **Certifications** | |
| UL certification | yes |
| KC certification | - |
| UKCA certification | yes |
| ChinaRoHS certification | yes |