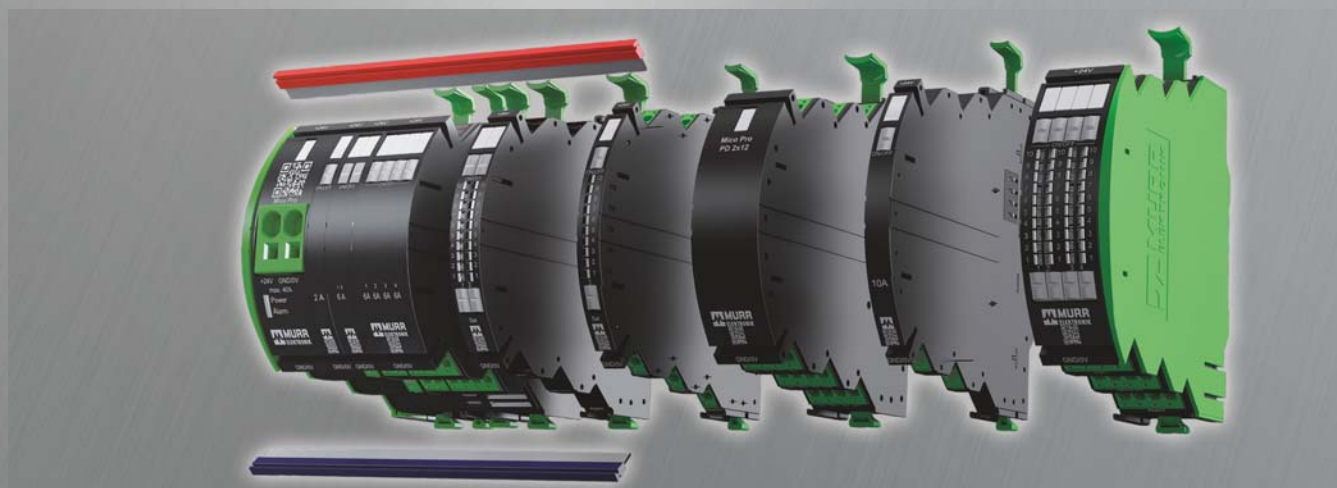


- Introduction
- For your safety
- Description
- Technical Data
- Mounting
- Installation
- Operation
- Appendix

MANUAL ENGLISH

Mico Pro[®] system and products



Document status

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This document is valid for the following products:

Mico Pro PM (power module) Power feeding module for system supply and control options	
Designation	Art.-No.
Mico Pro PM 24 V DC / 40 A	9000-41190-0000000

Mico Pro PD (power distribution) Potential distributor	
Designation	Art.-No.
Mico Pro PD 2x12	9000-41000-0000212

Plug-In link Continuous jumper for distributing the supply voltage	
Designation	Art.-No.
Mico Pro Plug-In link 2x blue	9000-41000-0000000
Mico Pro Plug-In link 2x red	9000-41000-0000001
Mico Pro Plug-In link 1x blue and 1x red	9000-41000-0000002

Fix-Modul Load circuit monitoring with preadjusted tripping current value	
Designation	Art.-No.
Mico Pro fix 1.2	9000-41011-0200000
Mico Pro fix 1.4	9000-41011-0400000
Mico Pro fix 1.6	9000-41011-0600000
Mico Pro fix 1.8	9000-41011-0800000
Mico Pro fix 1.10	9000-41011-1000000
Mico Pro fix 1.16	9000-41011-1600000
Mico Pro fix 2.2	9000-41012-0200000
Mico Pro fix 2.4	9000-41012-0400000
Mico Pro fix 2.6	9000-41012-0600000
Mico Pro fix 4.2	9000-41014-0200000
Mico Pro fix 4.4	9000-41014-0400000
Mico Pro fix 4.6	9000-41014-0600000

Flex-Modul Load circuit monitoring with adjustable tripping current and channel-specific diagnostics and control options	
Designation	Art.-No.
Mico Pro flex 1.10	9000-41091-0101000
Mico Pro flex 1.20	9000-41091-1102000
Mico Pro flex 2.10	9000-41092-0101000
Mico Pro flex 4.10	9000-41094-0101000

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1 Introduction

1.1 Symbols

This document includes information and notes that have to be observed for your own safety and to avoid injuries and material damage. They are marked as follows:



DANGER!

Immediate danger

→ Failure to observe this warning involves an imminent risk of death or serious injuries.



WARNING!

Possible danger

→ Failure to observe this warning can lead to death or serious injuries.



CAUTION!

Low-risk danger

→ Failure to observe this warning can lead to mild to moderate injuries.

NOTICE

Risk of material damage

→ Failure to observe this warning will lead to material damage.



NOTE

Other technical information and notes of Murrelektronik GmbH.



RECOMMENDATION

Notes with this symbol are recommendations of Murrelektronik GmbH.



Products and accessories

This symbol indicates accessories or product recommendations.

Instruction for use

→ An arrow marks instructions.

→ Read and observe the instructions.

1 | If they are numbered, it is absolutely necessary to follow them in the correct order.

2 | Read and observe the instructions.

1.2 Service and support

Service and support

Sales

Our sales staff in-house and in the field, and our technicians will support you at all times.

Sales support

Our sales support will assist you:

- with consultation during the development phase of your application,
- with extensive system design across all product groups,
- with visits from traveling sales representatives,
- with a system analysis.

For any further questions, please do not hesitate to contact our sales representatives!

Application support

Our application support will assist you:

- with product-related questions during commissioning,
- with product-related and customer-specific software components supporting your application, such as diagnostics.

For any further questions, please do not hesitate to contact our sales representatives!

Customer Service Center (CSC)

Our staff of the Customer Service Center will help you with all questions concerning installation and start-up. They support you, for example, if you have problems with combining hardware and software products from different manufacturers.

A number of support tools and measurement facilities are available for field bus systems and EMC interference.

Call us on +49 (0) 7191 47-2050 or send us an e-mail to: support@murrelektronik.de

Service addresses

Murrelektronik GmbH has a policy of customer proximity, both at the national and international level. Please visit our website to find your contact person:

www.murrelektronik.com

1.3 General notes

1.3.1 Purpose of this document

Purpose of this document

This document describes the use of the system Mico Pro. It instructs the technical staff of the machine manufacturer or machine operator on the assembly, parameterization, electrical installation, commissioning as well as operation of the system Mico Pro. It does not instruct on how to operate the machine into which the system Mico Pro is integrated or will be integrated. For such information refer to the operating manual of the machine.

1.3.2 Applicable documents

Document	Art.-No.	Location
Operating instruction Mico Pro PM module	9000-41190-0000000	Included in the scope of delivery or downloadable from http://shop.murrelektronik.com
Operating instruction Mico Pro fix module	9000-41011-0200000	
Operating instruction Mico Pro flex module	9000-41091-0101000	
Betriebsanleitung Mico Pro PD module	9000-41000-0000212	

1.3.3 Trademarks

Trademarks of the following companies and institutions are used in this documentation:

Murrelektronik GmbH	Mico Pro®
EPLAN Software & Service GmbH & Co. KG	EPLAN

1.3.4 Storage and transport

- Storage and transport**
- ➔ Avoid mechanical vibrations during transport of the system Mico Pro .
 - ➔ Adhere to the prescribed climatic conditions (see 'Technical Data' manual).

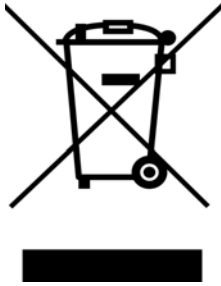
1.3.5 Environmentally friendly disposal

Comply with country-specific waste disposal regulations.

- ➔ Always dispose of scrap devices in compliance with the valid country-specific regulations for waste disposal (e.g., the European Waste Code 16 02 14).

Only qualified persons may sort scrap materials.

- ➔ Proceed with caution when dismantling the device since you could injure yourself.
- ➔ Sort the separated components into the correct recycling line.



Disposal

The product can be returned to Murrelektronik GmbH free of charge for disposal. The same is true for the original packaging and any batteries or power packs. Any units that have been contaminated with hazardous substances will not be accepted for repair or disposal.

Returns

- ➔ Label the product and the packaging with **"For disposal"**.
- ➔ Package the product.
- ➔ Send the package to:

Murrelektronik GmbH

Falkenstraße 3

71570 Oppenweiler | GERMANY

We will make sure that the items are disposed of in accordance with German legislation. The most recent owner is responsible for transport to the return point until items arrive at their destination.

2 For your safety

Safety for you and people around you!

- ➔ Read this chapter carefully.
- ➔ Only then can you work with the device.

Using your device

- ➔ Attend all regulations for safety and accident prevention during configuration, installation, commissioning, operation and testing of the device.
- ➔ Check the material resistance when using aggressive media.



NOTE

Interventions in the hardware and software of the device dare, if they are not described in this document, only be carried out by qualified personnel from Murrelektronik GmbH.



NOTE

The operating instructions must be always available to the operator of the machine where the device is used.

2.1 General safety instructions

Note:

- the relevant safety and accident prevention regulations;
- the EU Directives which apply to your application or national regulations;
- generally recognized safety rules.



NOTE

Work on the hardware and software of the system, Mico Pro unless described in the manual or other applicable documents, may only be performed by qualified personnel of Murrelektronik GmbH (see [ExternalLink: <mitgeltende Unterlagen>](#)).

Avoid consequential damages due to moving parts!

- Disconnect the system Mico Pro from the mains.
- Then carry out work.

Avoid personal injury and material damage due to malfunctions!

- Provide external circuit breakers.
- The system Mico Pro may only be operated within the specified tolerances.

Avoid undefined states!

- Select and install connection lines so that capacitive and inductive interferences do not have adverse effects on the system.
- Protect the Mico Pro system against improper and unintended use.

Check:

- the material resistance if aggressive media are used.

Spare parts

- Only use the original spare parts or spare parts by other manufacturers expressly authorized by Murrelektronik GmbH.
- Check the function of the Mico Prosystem after replacing parts.

Accessories

- The use of accessories may alter the Mico Prosystem's functionality. Use only accessories authorized by Murrelektronik GmbH.
- Note the enclosed instructions of the accessories when installing them.

2.2 Qualified personnel (target group)

The Mico Pro system may only be mounted, put into operation and operated by qualified personnel.

Personnel is considered qualified if they meet the following requirements:

- The personnel have undergone appropriate technical training
and
- have been trained for the operation of the machine/system as well as the relevant safety regulations
and
- have access to the manual and the other applicable documents (see 1.3.2 "Applicable documents").
and
- are familiar with the safety standards which are common practice in automation engineering.

2.3 Intended purpose

2.3.1 Mico Pro PM (power module)

Designated use

The device has been designed and manufactured for:

- power supply of Mico Pro system
- industrial use
- operation according to specified ambient conditions
- installation in a switch cabinet

2.3.2 Mico Pro Plug-In link

Designated use

The device has been designed and manufactured for:

- energy distribution
- industrial use
- operation according to specified ambient conditions
- installation in a switch cabinet

2.3.3 Mico Pro fix

Designated use

The device has been designed and manufactured for:

- current monitoring and for use as auxiliary circuit switch in load circuits
- industrial use
- operation according to specified ambient conditions
- installation in a switch cabinet

2.3.4 Mico Pro flex

Designated use

The device has been designed and manufactured for:

- current monitoring and for use as auxiliary circuit switch in load circuits
- industrial use
- operation according to specified ambient conditions
- installation in a switch cabinet

2.3.5 Mico Pro PD (power distribution)

Designated use

The device has been designed and manufactured for:

- energy distribution
- industrial use
- operation according to specified ambient conditions
- installation in a switch cabinet

2.4 Foreseeable misuse

Avoid misuse!

- ➔ Operate the Mico Pro system only in technically perfect condition.
- ➔ Ensure that only qualified and authorized personnel works with/on the system.
- ➔ Do not alter the design, engineering, or electrical features of the connected devices.
- ➔ Use the Mico Pro system only in the application fields described in this manual and other applicable documents.
(see 1.3.2 "Applicable documents")
- ➔ Use the Mico Pro system only with components approved by Murrelektronik.
- ➔ Install the modules in such a way that they cannot be used as climbing aid.
- ➔ Operate the Mico Pro system only in industrial environments or observe applicable standards for other environments.
- ➔ The system Mico Pro **must not** be used:
 - outdoors,
 - in potentially explosive atmospheres (EX zone)

2.5 Warranty and liability claims

Warranty and liability claims shall be lost if

- the Mico Prosystem is not used according to its designated use,
- damage is caused because the manual and other applicable documents have not been observed (see 1.3.2 "Applicable documents"),
- the personnel was/is not qualified.

2.6 Legal regulations

2.6.1 National/international legal regulations



Murrelektronik GmbH herewith declares that the products and systems comply with the basic requirements and directives:

- 2014/30/EU Electromagnetic compatibility
- 2011/65/EU RoHS

3 Description

Maximum system expansion



NOTE

The maximum possible expansion of the Mico Pro system depends on the following points:

- ➔ Maximum operating current of **40 A** per Mico Pro power module (PM).
- ➔ Maximum of **40 Mico Pro modules**, including Mico Pro power module (PM).

Scope of delivery



NOTE

Mico Pro continuous jumpers and designation labels are **not** included in the scope of delivery.

- ➔ Accessories are listed in the appendix.

3.1 Product family

Mico Pro is a modular system consisting of electronic auxiliary current switches and a power module for current monitoring

Special features of the product family:

- System with modular structure
- Innovative bridging concept
See accessories
- Adjustable or fixed tripping current
- Integrated 0-V wiring concept
- Enormous space saving
- Potential distributor for connecting several loads to a Mico Pro channel
- Cascading of two Mico Pro load circuit monitoring one after the other
- Channel-specific or system-integrated control inputs and outputs (Mico Pro flex)
- Channel-specific switching function via CTRL input (Mico Pro flex)
- Quick connection with push-in spring-clamp terminals
- Manual connection and disconnection of channels via buttons
- Operating state memory device

Mico Pro system components:

- 1 **PM module** (power module)
Power feeding module for system supply and control options
- 2 **Fix module**
Load circuit monitoring with preset tripping current
- 3 **Flex module**
Load circuit monitoring with adjustable tripping current and channel-specific diagnostics and control options
- 4 **PD module** (power distribution)
Potential distributor
- 5 **Plug-In link**
Continuous jumper for distributing the supply voltage
- 6 **Cover plate**
Left and right

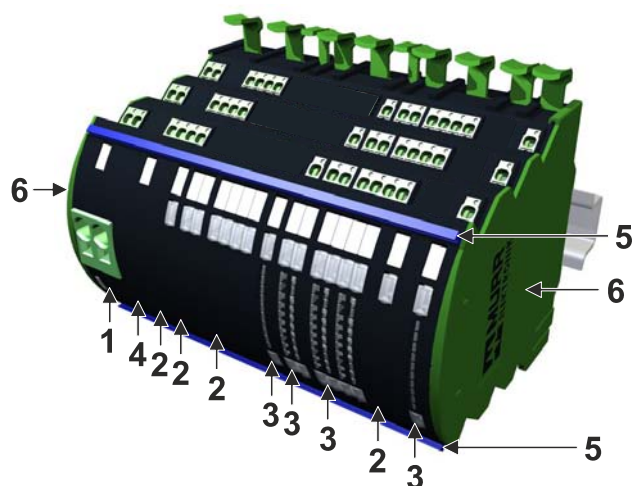


Fig. 3-1: Example of assembly

3.2 Products

3.2.1 Mico Pro PM (power module)

Mico Pro power module (PM) Power feeding module for system supply and control options		
Designation	Article number	Function
Mico Pro PM 24 V DC / 40 A	9000-41190-0000000	■ Operating voltage: 12 V DC or 24 V DC ■ Input voltage range: 9 V - 30 V DC ■ Total operating current 40 A ■ Control inputs and outputs

Tab. 3-1: Product description



NOTE

The cover plates for the left and right sides are attached to this module.



3.2.2 Mico Pro Plug-In link

Model overview Mico Pro Plug-In link Continuous jumper for distributing the supply voltage		
Designation	Article number	Function
Mico Pro Plug-In link 2x blue	9000-41000-0000000	■ 2 pieces ■ Farbe: blue ■ Total operating current continuous jumper: max. 40 A ■ Width freely dividable: 500 mm (19.69 in)
Mico Pro Plug-In link 2x red	9000-41000-0000001	■ 2 pieces ■ Farbe: red ■ Total operating current continuous jumper: max. 40 A ■ Width freely dividable: 500 mm (19.69 in)
Mico Pro Plug-In link 1 x blue and 1x red	9000-41000-0000002	■ 1 piece blue und 1 piece red ■ Farbe: blue und red ■ Total operating current continuous jumper: max. 40 A ■ Width freely dividable: 500 mm (19.69 in)

3.2.3 Mico Pro fix

Model overview		
Mico Pro fix load circuit monitoring with preadjusted tripping current value		
Designation	Article number	Function
Mico Pro fix 1.2	9000-41011-0200000	- Number of channels: 1 - Tripping current: 2 A (0 % ... +20 %)
Mico Pro fix 1.4	9000-41011-0400000	- Number of channels: 1 - Tripping current: 4 A (0 % ... +20 %)
Mico Pro fix 1.6	9000-41011-0600000	- Number of channels: 1 - Tripping current: 6 A (0 % ... +20 %)
Mico Pro fix 1.8	9000-41011-0800000	- Number of channels: 1 - Tripping current: 8 A (0 % ... +20 %)
Mico Pro fix 1.10	9000-41011-1000000	- Number of channels: 1 - Tripping current: 10 A (0 % ... +20 %)
Mico Pro fix 1.16	9000-41011-1600000	- Number of channels: 1 - Tripping current: 16 A (0 % ... +20 %)
Mico Pro fix 2.2	9000-41012-0200000	- Number of channels: 2 - Tripping current: 2 A (0 % ... +20 %)
Mico Pro fix 2.4	9000-41012-0400000	- Number of channels: 2 - Tripping current: 4 A (0 % ... +20 %)
Mico Pro fix 2.6	9000-41012-0600000	- Number of channels: 2 - Tripping current: 6 A (0 % ... +20 %)
Mico Pro fix 4.2	9000-41014-0200000	- Number of channels: 4 - Tripping current: 2 A (0 % ... +20 %)
Mico Pro fix 4.4	9000-41014-0400000	- Number of channels: 4 - Tripping current: 4 A (0 % ... +20 %)
Mico Pro fix 4.6	9000-41014-0600000	- Number of channels: 4 - Tripping current: 6 A (0 % ... +20 %)

Tab. 3-2: Product description model overview



3.2.4 Mico Pro flex

Model overview Mico Pro flex load circuit monitoring with adjustable tripping current and channel-specific diagnostics and control options		
Designation	Article number	Function
Mico Pro flex 1.10	9000-41091-0101000	- Number of channels: 1 - Tripping current setting range selectable via button: 1-2-3-4-5-6-7-8-9-10 A (0 % ... +20 %) - Control input and output
Mico Pro flex 1.20	9000-41091-1102000	- Number of channels: 1 - Tripping current setting range selectable via button: 11-12-13-14-15-16-17-18-19-20 A (-5 % ... +15 %) - Control input and output
Mico Pro flex 2.10	9000-41092-0101000	- Number of channels: 2 - Tripping current setting range selectable for each channel: 1-2-3-4-5-6-7-8-9-10 A (0 % ... +20 %) - Control inputs and outputs per channel
Mico Pro flex 4.10	9000-41094-0101000	- Number of channels: 4 - Tripping current setting range selectable for each channel: 1-2-3-4-5-6-7-8-9-10 A (0 % ... +20 %) - Control inputs and outputs per channel

Tab. 3-3: Product description model overview



3.2.5 Mico Pro PD (power distribution)

Mico Pro power distribution module (PD) Potential distributor		
Designation	Article number	Function
Mico Pro PD 2x12	9000-41000-0000212	- Operating voltage potential 12 clamps - GND / 0 V potential 12 clamps



3.3 Accessories



Products and accessories

You will find a wide range of products in our catalog or in the online shop of Murrelektronik GmbH "<http://shop.murrelektronik.com>"



RECOMMENDATION

Refer to the appendix for an overview of accessories, section 8.2 "Accessories".

4 Technical Data

4.1 Mico Pro PM (power module)

Edition
Date: 12.09.2017

4.1.1 Electrical data

Input

Parameter	Conditions	Value
Operating voltage		12 V DC, 24 V DC
Input voltage range		9 V - 30 V DC
Cut-in/cut-out frequency		0.5 Hz
Total operating current		40 A

Control input

Parameter	Conditions	Value
CTRL input voltage		Low 0 V ... 1 V, high 9 V ... 30 V
CTRL control current	n = Number of Mico Pro extensions	High n x 2 mA
CTRL signal		OFF: "high" 40±3 ms / 400±30 ms, ON: "high" 20±3 ms / 200±30 ms OFF: "high" >600 ms, ON: "high" CTRL & ON >500 ms
CTRL switching frequency		Max. 10 Hz
CTRL overvoltage protection		Suppressor diode 36 V
Remote switch-on (ON)		Possible
ON input voltage		Low 0 V ... 5 V, high 10 V ... 30 V
ON control current	n = Number of Mico Pro extensions	High n x 2 mA
ON pulse length	0 V and pulse	ON: high 120 ms
ON overvoltage protection		Suppressor diode 36 V

Output

Parameter	Conditions	Value
Parallel connection		Not possible
Total operating current continuous jumper	Plug-In link	40 A
Output current		40 A

Control output

Parameter	Conditions	Value
Alarm output voltage		Max. 30 V AC/DC - (NC) normally closed
Alarm control current		Max. 20 mA
90-% output voltage		Max. 30 V AC/DC - (NO) normally opened
90% control current		Max. 20 mA

4.1.2 Environmental characteristics

Climatic

Symbol	Parameter	Conditions	Value
	Relative humidity	No condensation	5 ... 85 %
	Storage temperature		-40 ... +80 °C (-40 ... +176 °F)
	Climate class	IEC/EN 60721-3-3	3K3
Ta	Surrounding air temperature range		-25 ... +55 °C (-13 ... +131 °F)
	Installation height	Above sea level, without any restrictions	-500 m ... 2000 m (-1640 ft ... 6561 ft)
	Installation height	Above sea level, max. 32 A total operating current	2000 m ... 4000 m (6561 ft ... 13123 ft)
	Installation height	Above sea level, max. 24 A total operating current	4000 m ... 6000 m (13123 ft ... 19685 ft)

Mechanical

Parameter	Conditions	Value
Vibration test	IEC 60068-2-6:2007 Test Fc; EN 60068-2-6:2008	sin 5 - 17.8 Hz: 1.6 mm; 17.8 - 500 Hz: 2.3 g 10x f
Shock test	IEC 60068-2-27:2008 Test Ea; EN 60068-2-27:2009	1/2 sin 30 g, 11 ms
Shocks caused by rough handling	(Drop test)	1 m

Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP 20
Pollution degree		2
Safe separation	External power supply unit	SELV/PELV
Overvoltage category		III
Insulation voltage input-output	Type testing / routine check test	50 V

EMC-interference

Parameter	Conditions	Value
Radio interference field strength housing	EN 61000-6-3	Industrial and residual areas

Parameter	Conditions	Value
Conducted emission DC inputs and outputs	EN 61000-6-3	Industrial and residual areas

EMC-immunity

Parameter	Conditions	Value
Electrostatic discharge housing	EN 61000-6-2, EN 61000-4-2	Contact ± 4 kV; air ± 8 kV
High-frequency electrical RF fields housing	EN 61000-6-2, EN 61000-4-3	80 MHz - 1.0 GHz: 10 V/m
Fast transients / burst DC inputs and outputs	EN 61000-6-2, EN 61000-4-4	± 2 kV / 5 kHz
Fast transients / burst signal connections	EN 61000-6-2, EN 61000-4-4	± 2 kV / 5 kHz
Surge voltage DC inputs and outputs	EN 61000-6-2, EN 61000-4-5	± 0.5 kV DM
Conducted HF DC connections	EN 61000-6-2, EN 61000-4-6	10 VRMS; 1 kHz, 80 % AM sine
Conducted HF control terminals	EN 61000-6-2, EN 61000-4-6	10 VRMS; 1 kHz, 80 % AM sine

4.1.3 Protection

Device protection

Parameter	Conditions	Value
Internal fuse		No
Short circuit protection		No
Reverse polarity protection		No
Overvoltage protection input		Suppressor diode 36 V
Voltage monitoring		No
Operating voltage protection	EN 61131-1	No
Overload protection		No (only via load circuit monitoring)

4.1.4 Mechanical data

Materials

Parameter	Conditions	Value
Flame resistance	EN 60695-2-1	Low flammability
Housing material		Plastic

Mounting data

Parameter	Conditions	Value
Dimension	Depth (D)	114 mm (4.49 in)
Dimension	Height with gate valve (H)	130 mm (5.12 in)
Dimension	Height without gate valve (H2)	111 mm (4.37 in)
Dimension	Width (W), 0.35 mm (0.014 in) are inserted into the adjacent module	24.35 mm (0.96 in)
Dimension	Mounting (a)	55.5 mm (2.19 in)

Parameter	Conditions	Value
Dimension	Mounting (b)	15.5 mm (0.61 in)
Dimension	Mounting (c)	3.5 mm (0.14 in)
Dimension	Mounting (d)	7.5 mm (0.3 in)
Dimension	Mounting rail (x)	See chapter Installation Mounting/Dismounting
Net weight		100 g (0.22 lb)

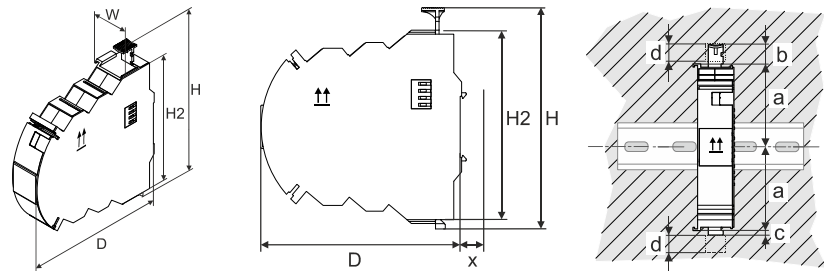


Fig. 4-1: Dimensions

4.1.5 Product reliability

Parameter	Conditions	Value
MTBF	40 °C (104 °F); DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	4727675 h
MTBF	55 °C (131 °F); DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	2954797 h
MTTF	40 °C (104 °F); DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	540 years

4.1.6 Conformity, Approvals

Parameter	Conditions	Value
Product standard	EN 61000-6-2 and EN 61000-6-3	Compliant
EMC Directive	2014/30/EU	Compliant
RoHS	2011/65/EU	Compliant
REACH	No. 1907/2006	Compliant
LoHS	ME list of banned substances	Compliant
EAC		Compliant
UL	UL508	NMTR.E200364
cUL	CSA C22.2 No. 14	NMTR7.E200364
UR	UL2367	QVRQ2.E321289
CSA	CSA C22.2 No. 14	CLASS 3211 07
CSAus	UL 508, Ed. 17	CLASS 3211 87

4.2 Mico Pro Plug-In link

Edition
Date 05.07.2017

4.2.1 Electrical data

Input

Parameter	Conditions	Value
Operating voltage		12 V DC, 24 V DC
Input voltage range		9 V - 30 V DC
Total operating current continuous jumper	Plug-In link	40 A
Output current		40 A

4.2.2 Environmental characteristics

Climatic

Symbol	Parameter	Conditions	Value
	Relative humidity	No condensation	5 ... 85 %
	Storage temperature		-40 ... +80 °C (-40 ... +176 °F)
	Climate class	IEC/EN 60721-3-3	3K3
Ta	Surrounding air temperature range		-25 ... +55 °C (-13 ... +131 °F)
	Installation height	Above sea level, without any restrictions	-500 m ... 2000 m (-1640 ft ... 6561 ft)
	Installation height	Above sea level, max. 32 A total operating current	2000 m ... 4000 m (6561 ft ... 13123 ft)
	Installation height	Above sea level, max. 24 A total operating current	4000 m ... 6000 m (13123 ft ... 19685 ft)

Mechanical

Parameter	Conditions	Value
Vibration test	IEC 60068-2-6:2007 Test Fc; EN 60068-2-6:2008	sin 5 - 17.8 Hz: 1.6 mm; 17.8 - 500 Hz: 2.3 g 10x f
Shock test	IEC 60068-2-27:2008 Test Ea; EN 60068-2-27:2009	1/2 sin 30 g, 11 ms
Shocks caused by rough handling	(Drop test)	1 m

Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP 20
Pollution degree		2
Overvoltage category		III

4.2.3 Mechanical data

Materials

Parameter	Conditions	Value
Flame resistance	EN 60695-2-1	Low flammability
Housing material		Plastic

Variants Color			
Modul	Designation	Parameter	Value
9000-41000-0000000	Mico Pro Plug-In link 2x blue	Color	Blue
9000-41000-0000001	Mico Pro Plug-In link 2x red	Color	Red
9000-41000-0000002	Mico Pro Plug-In link 1x blue and 1x red	Color	Blue, red

Mounting data

Parameter	Conditions	Value
Dimension	Depth (D)	3,46 mm (0.14 in)
Dimension	Height (H)	11,4 mm (0.45 in)
Dimension	Width (W), Width freely dividable	500 mm (19.69 in)
Net weight	Per Mico Pro Plug-In link	44 g (0.1 lb)

4.2.4 Conformity, Approvals

Parameter	Conditions	Value
Product standard	EN 61000-6-2 and EN 61000-6-3	Compliant
EMC Directive	2014/30/EU	Compliant
REACH	No. 1907/2006	Compliant
RoHS	2011/65/EU	Compliant
LoHS	ME list of banned substances	Compliant
Lead-free	JESD97	Compliant
Halogen-free	JEDEC JS709A	Compliant

4.3 Mico Pro fix module

Edition
Date: 05.07.2017

4.3.1 Electrical data

Input

Parameter	Conditions	Value
Operating voltage		12 V DC, 24 V DC
Input voltage range		9 V - 30 V DC
Total operating current continuous jumper	Plug-In link	40 A

Output

Parameter	Conditions	Value
Circuit element		Static switch
Module initialization time		250 ms
Parallel connection		Not possible
Series connection		Cascading in 2 steps (see chapter Operation)
Disconnecting characteristics accuracy	Current	0 % ... +20 %
Nominal output voltage		Same as input

Variants Turn-on capacity		
Art.-No.	Conditions	Value
9000-41011-0200000, 9000-41011-0400000, 9000-41012-0200000, 9000-41012-0400000, 9000-41014-0200000, 9000-41014-0400000	1 channel, dependent on: component tolerance, wire length, used power supply, load current, selected current range	Max. 20 mF
9000-41011-0600000, 9000-41011-0800000, 9000-41011-1000000, 9000-41011-1600000, 9000-41012-0600000, 9000-41014-0600000	1 channel, dependent on: component tolerance, wire length, used power supply, load current, selected current range	Max. 30 mF

Variants Output: Number of channels, Tripping current (I_N), Output current (I_Σ), Power-up delay			
Art.-No.	Parameter	Conditions	Value
9000-41011-0200000, 9000-41011-0400000, 9000-41011-0600000, 9000-41011-0800000, 9000-41011-1000000, 9000-41011-1600000	Number of channels		1
9000-41012-0200000, 9000-41012-0400000, 9000-41012-0600000	Number of channels		2

Variants Output: Number of channels, Tripping current (I_N), Output current (I_Σ), Power-up delay			
Art.-No.	Parameter	Conditions	Value
9000-41014-0200000, 9000-41014-0400000, 9000-41014-0600000	Number of channels		4
9000-41011-0200000	Tripping current (I_N)	Full load	2 A (+20%)
9000-41011-0400000	Tripping current (I_N)	Full load	4 A (+20%)
9000-41011-0600000	Tripping current (I_N)	Full load	6 A (+20%)
9000-41011-0800000	Tripping current (I_N)	Full load	8 A (+20%)
9000-41011-1000000	Tripping current (I_N)	Full load	10 A (+20%)
9000-41011-1600000	Tripping current (I_N)	Full load	16 A (+20%)
9000-41012-0200000	Tripping current (I_N)	Full load per channel	2 A (+20%)
	Output current (I_Σ)	Full load all channels	4 A
	Power-up delay	Per channel to avoid inrush current peaks	75 ms
9000-41012-0400000	Tripping current (I_N)	Full load per channel	4 A (+20%)
	Output current (I_Σ)	Full load all channels	8 A
	Power-up delay	Per channel to avoid inrush current peaks	75 ms
9000-41012-0600000	Tripping current (I_N)	Full load per channel	6 A (+20%)
	Output current (I_Σ)	Full load all channels	12 A
	Power-up delay	Per channel to avoid inrush current peaks	75 ms
9000-41014-0200000	Tripping current (I_N)	Full load per channel	2 A (+20%)
	Output current (I_Σ)	Full load all channels	8 A
	Power-up delay	Per channel to avoid inrush current peaks	75 ms
9000-41014-0400000	Tripping current (I_N)	Full load per channel	4 A (+20%)
	Output current (I_Σ)	Full load all channels	16 A
	Power-up delay	Per channel to avoid inrush current peaks	75 ms
9000-41014-0600000	Tripping current (I_N)	Full load per channel	6 A (+20%)
	Output current (I_Σ)	Full load all channels	24 A
	Power-up delay	Per channel to avoid inrush current peaks	75 ms



NOTE

A high-energy impulse (surge) applied to the output of the Mico Pro modules can cause short-term voltage interruption (max. 3 ms). This protects the connected loads. Mico Pro detects within this time, whether a faulty short circuit or a high-energy impulse occurred. If there is no short circuit, Mico Pro will be switched on again.

Characteristics: Disconnecting characteristics | Tripping current (I_N)

For Mico Pro fix Tripping current (I_N) 2 A to 10 A

■ Disconnection time at short circuit: approx. 5 ms

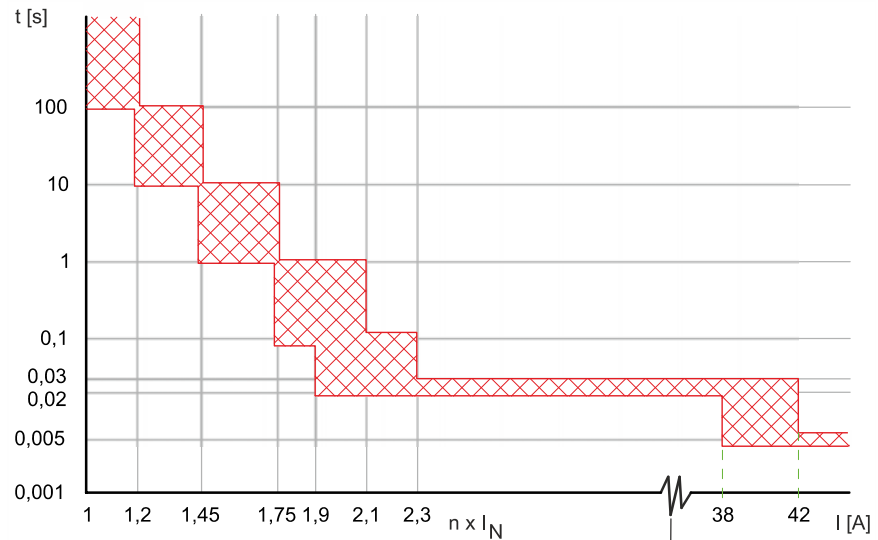


Fig. 4-2: Disconnecting characteristics | Tripping current

Characteristics: Disconnecting characteristics | Tripping current (I_N)

For Mico Pro fix Tripping current (I_N) 16 A

■ Disconnection time at short circuit: approx. 5 ms

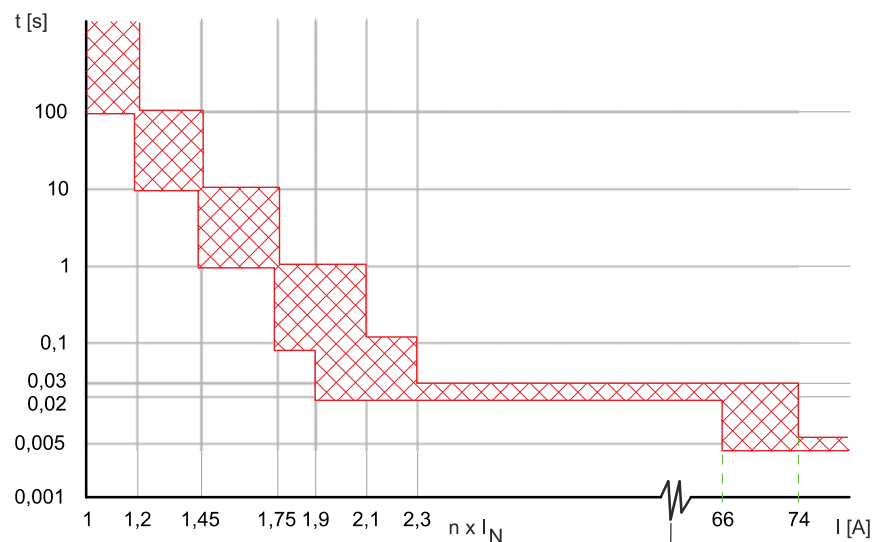


Fig. 4-3: Disconnecting characteristics | Tripping current

Performance record

Parameter	Conditions	Value
Voltage drop	per channel, at 25!°C	0,1 V
Efficiency	At 24 V	99,5%

4.3.2 Environmental characteristics

Climatic

Parameter	Conditions	Value
Relative humidity		5 ... 85 %
Storage temperature		-40 ... +80 °C (-40 ... +176 °F)
Climate class	IEC/EN 60721-3-3	3K3
Surrounding air temperature range (T_a)		-25 ... +55 °C (-13 ... +131 °F)

Variants installation height		
Art.-No.	Conditions	Value
9000-41011-0200000, 9000-41011-0400000, 9000-41011-0600000, 9000-41012-0200000, 9000-41012-0400000, 9000-41012-0600000, 9000-41014-0200000, 9000-41014-0400000, 9000-41014-0600000	Above sea level, without any restric- tions	-500 m ... 6000 m (-1640 ft ... 19685 ft)
9000-41011-0800000, 9000-41011-1600000	Above sea level, without any restric- tions	-500 m ... 4000 m (-1640 ft ... 13123 ft)
9000-41011-1000000	Above sea level, without any restric- tions	-500 m ... 2000 m (-1640 ft ... 6561 ft)

Characteristics:

Tripping current (I_N) | Surrounding air temperatur (T_a)

Art.-No. 9000-41011-1600000 Mico Pro fix 1.16

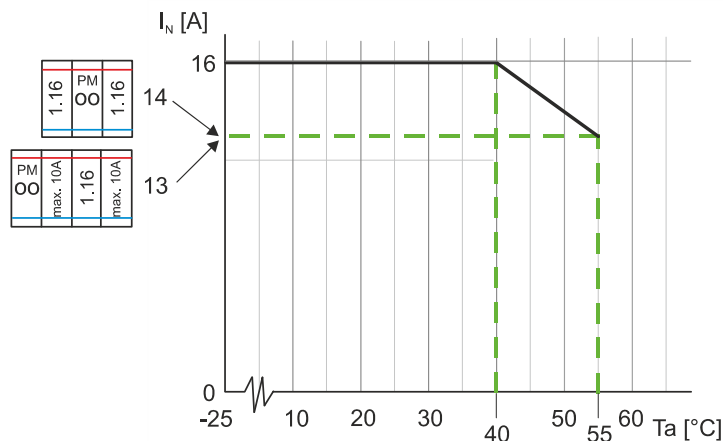


Fig. 4-4: Tripping current (I_N) | Surrounding air temperatur (T_a)

Mechanical

Parameter	Conditions	Value
Vibration test	IEC 60068-2-6:2007 Test Fc; EN 60068-2-6:2008	sin 5 - 17.8 Hz: 1.6 mm; 17.8 - 500 Hz: 2.3 g 10x f
Shock test	IEC 60068-2-27:2008 Test Ea; EN 60068-2-27:2009	1/2 sin 30 g, 11 ms

Parameter	Conditions	Value
Shocks caused by rough handling	(Drop test)	1 m

Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP 20
Pollution degree		2
Overvoltage category		III
Insulation voltage input-output	Type testing / routine check test	50 V

EMC-interference

Parameter	Conditions	Value
Radio interference field strength housing	EN 61000-6-3	Industrial and residual areas
Conducted emission DC inputs and outputs	EN 61000-6-3	Industrial and residual areas

EMC-immunity

Parameter	Conditions	Value
Fast transients / burst DC inputs and outputs	EN 61000-6-2, EN 61000-4-4	±2 kV / 5 kHz
Fast transients / burst signal connections	EN 61000-6-2, EN 61000-4-4	±2 kV / 5 kHz
Surge voltage DC inputs and outputs	EN 61000-6-2, EN 61000-4-5	±0.5 kV DM
Electrostatic discharge housing	EN 61000-6-2, EN 61000-4-2	Contact ± 4 kV; air ± 8 kV
Conducted HF DC connections	EN 61000-6-2, EN 61000-4-6	10 VRMS; 1 kHz, 80 % AM sine
Conducted HF control terminals	EN 61000-6-2, EN 61000-4-6	10 VRMS; 1 kHz, 80 % AM sine
High-frequency electrical RF fields housing	EN 61000-6-2, EN 61000-4-3	80 MHz - 1.0 GHz: 10 V/m

4.3.3 Protection

Device protection

Parameter	Conditions	Value
Short circuit protection		Short circuit-proof
Reverse polarity protection		No
Overvoltage protection input		Suppressor diode 36 V
Overvoltage protection output		Suppressor diode 36 V
Overload protection		See Disconnecting characteristics
Voltage monitoring		No

Safety fuse variants: Internal fuse (Fail-Safe-Element), per channel			
Art.-No.	Designation	Tripping current	Fuse
9000-41011-0200000	Mico Pro fix 1.2	2 A	Safety fuse 4 A (T) time-lag fuse

Safety fuse variants: Internal fuse (Fail-Safe-Element), per channel			
Art.-No.	Designation	Tripping current	Fuse
9000-41011-0400000	Mico Pro fix 1.4	4 A	Safety fuse 4 A (T) time-lag fuse
9000-41011-0600000	Mico Pro fix 1.6	6 A	Safety fuse 6,3 A (T) time-lag fuse
9000-41011-0800000	Mico Pro fix 1.8	8 A	Safety fuse 10 A (T) time-lag fuse
9000-41011-1000000	Mico Pro fix 10	10 A	Safety fuse 15 A (F) fast-blow fuse
9000-41011-1600000	Mico Pro fix 16	16 A	Safety fuse 25 A (F) fast-blow fuse
9000-41012-0200000	Mico Pro fix 2.2	2 A	Safety fuse 4 A (T) time-lag fuse
9000-41012-0400000	Mico Pro fix 2.4	4 A	Safety fuse 4 A (T) time-lag fuse
9000-41012-0600000	Mico Pro fix 2.6	6 A	Safety fuse 6,3 A (T) time-lag fuse
9000-41014-0200000	Mico Pro fix 4.2	2 A	Safety fuse 4 A (T) time-lag fuse
9000-41014-0400000	Mico Pro fix 4.4	4 A	Safety fuse 6,3 A (T) time-lag fuse
9000-41014-0600000	Mico Pro fix 4.6	6 A	Safety fuse 6,3 A (T) time-lag fuse

Operator protection

Parameter	Conditions	Value
Operating state memory device		Yes

4.3.4 Mechanical data

Materials

Parameter	Conditions	Value
Flame resistance	EN 60695-2-1	Low flammability
Housing material		Plastic

Mounting data

Parameter	Conditions	Value
Dimension	Depth (D)	114 mm (4.49 in)
Dimension	Height with gate valve (H)	130 mm (5.12 in)
Dimension	Height without gate valve (H2)	111 mm (4.37 in)
Dimension	Mounting rail (x)	See chapter Installation Mounting/Dis- mounting
Dimension	Mounting (a)	55.5 mm (2.19 in)
Dimension	Mounting (b)	15.5 mm (0.61 in)
Dimension	Mounting (c)	3.5 mm (0.14 in)
Dimension	Mounting (d)	7.5 mm (0.3 in)

Variants Dimension Width (W)			
Art.-No.	Parameter	Conditions	Value
9000-41011-0200000, 9000-41011-0400000, 9000-41011-0600000, 9000-41011-0800000, 9000-41011-1000000	Dimension	Width (W), 0.35 mm (0.014 in) are inserted into the adja- cent module	8,35 mm (0.329 in)
9000-41011-1600000, 9000-41012-0200000, 9000-41012-0400000, 9000-41012-0600000	Dimension		12,35 mm (0.487 in)
9000-41014-0200000, 9000-41014-0400000, 9000-41014-0600000	Dimension		24,35 mm (0.96 in)

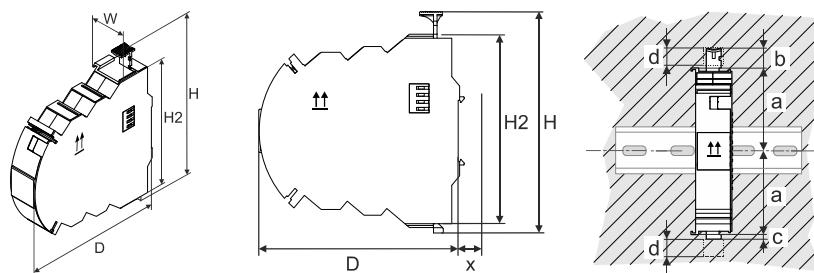


Fig. 4-5: Dimensions

Variants Net weight			
Art.-No.	Parameter	Conditions	Value
9000-41011-0200000, 9000-41011-0400000, 9000-41011-0600000, 9000-41011-0800000, 9000-41011-1000000	Net weight		53 g (0.12 lb)
9000-41011-1600000	Net weight		60 g (0.14 lb)
9000-41012-0200000, 9000-41012-0400000, 9000-41012-0600000	Net weight		64 g (0.15 lb)
9000-41014-0200000, 9000-41014-0400000, 9000-41014-0600000	Net weight		96 g (0.22 lb)

4.3.5 Product reliability

Variants MTBF, MTTF			
Art.-No.	Parameter	Conditions	Value
9000-41011-0200000, 9000-41011-0400000, 9000-41011-0600000, 9000-41011-0800000, 9000-41011-1000000	MTBF	40 °C (104 °F); DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849- 1:2008-12	2430719 h
9000-41011-0200000, 9000-41011-0400000, 9000-41011-0600000, 9000-41011-0800000, 9000-41011-1000000	MTBF	55 °C (131 °F); DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849- 1:2008-12	1519199 h

Variants MTBF, MTTF

Art.-No.	Parameter	Conditions	Value
9000-41011-0200000, 9000-41011-0400000, 9000-41011-0600000, 9000-41011-0800000, 9000-41011-1000000	MTTF	40 °C (104 °F); DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	277 Years

4.3.6 Conformity, Approvals

Parameter	Conditions	Value
Product standard	EN 61000-6-2 and EN 61000-6-3	Compliant
EMC Directive	2014/30/EU	Compliant
RoHS	2011/65/EU	Compliant
REACH	No. 1907/2006	Compliant
LoHS	ME list of banned substances	Compliant
EAC		Compliant
UL	UL508	NMTR.E200364
cUL	CSA C22.2 No. 14	NMTR7.E200364
UR	UL2367	QVRQ2.E321289
CSA	CSA C22.2 No. 14	CLASS 3211 07
CSAus	UL 508, Ed. 17	CLASS 3211 87

4.4 Mico Pro flex module

Edition
Date: 12.09.2017

4.4.1 Electrical data

Input

Parameter	Conditions	Value
Operating voltage		12 V DC, 24 V DC
Input voltage range		9 V - 30 V DC
Total operating current continuous jumper	Plug-In link	40 A

Control input

Parameter	Conditions	Value
CTRL input voltage		Low 0 V ... 1 V, high 9 V ... 30 V
CTRL control current		High max. 6 mA
CTRL signal		OFF: "high" 40±3 ms / 400±30 ms, ON: "high" 20±3 ms / 200±30 ms OFF: "high" >600 ms, ON: "high" CTRL & ON >500 ms
CTRL switching frequency		Max. 10 Hz
CTRL overvoltage protection		Suppressor diode 36 V
Remote switch-on (ON)		Possible
ON input voltage		Low 0 V ... 1 V, high 9 V ... 30 V
ON control current		High max. 6 mA
ON pulse length	0 V and pulse	ON: "high" 120 ms
ON overvoltage protection		Suppressor diode 36 V

Output

Parameter	Conditions	Value
Circuit element		Static switch
Module initialization time		250 ms
Parallel connection		Not possible
Series connection		Cascading in 2 steps (see chapter Operation)
Disconnecting characteristics accuracy	Current	0 % ... +20 % (-5% ... +15%)
Nominal output voltage		Same as input

Variants turn-on capacity		
Art.-No.	Conditions	Value
9000-41094-0101000	1 channel, dependent on: component tolerance, wire length, used power supply, load current, selected current range	Max. 20 mF
9000-41091-0101000; 9000-41092-0101000, 9000-41092-1102000	1 channel, dependent on: component tolerance, wire length, used power supply, load current, selected current range	Max. 30 mF

Output variants: Number of channels, Tripping current (I_N), Output current (I_Σ), Tripping current setting range, Power-up delay			
Art.-No.	Parameter	Conditions	Value
9000-41091-0101000	Number of channels		1
	Tripping current (I_N)	Full load	10 A (+20%)
	Tripping current setting range	Selectable for each channel	1 A, 2 A, 3 A, 4 A, 5 A, 6 A, 7 A, 8 A, 9 A, 10 A
9000-41091-1102000	Number of channels		1
	Tripping current (I_N)	Full load	20 A (-5% ... +15%)
	Tripping current setting range	Selectable for each channel	11 A, 12 A, 13 A, 14 A, 15 A, 16 A, 17 A, 18 A, 19 A, 20 A
9000-41092-0101000	Number of channels		2
	Tripping current (I_N)	Full load per channel	10 A (+20%)
	Output current (I_Σ)	Full load all channels	20 A
	Tripping current setting range	Selectable for each channel	1 A, 2 A, 3 A, 4 A, 5 A, 6 A, 7 A, 8 A, 9 A, 10 A
	Power-up delay	Per channel to avoid inrush current peaks	75 ms
9000-41094-0101000	Number of channels		4
	Tripping current (I_N)	Full load per channel	10 A (+20%)
	Output current (I_Σ)	Full load all channels	40 A
	Tripping current setting range	Selectable for each channel	1 A, 2 A, 3 A, 4 A, 5 A, 6 A, 7 A, 8 A, 9 A, 10 A
	Power-up delay	Per channel to avoid inrush current peaks	75 ms



NOTE

A high-energy impulse (surge) applied to the output of the Mico Pro modules can cause short-term voltage interruption (max. 3 ms). This protects the connected loads. Mico Pro detects within this time, whether a faulty short circuit or a high-energy impulse occurred. If there is no short circuit, Mico Pro will be switched on again.

Characteristics: Disconnecting characteristics | Tripping current (I_N)

For Mico Pro flex Tripping current (I_N): 1 A to 10 A

■ Disconnection time at short circuit: approx. 5 ms

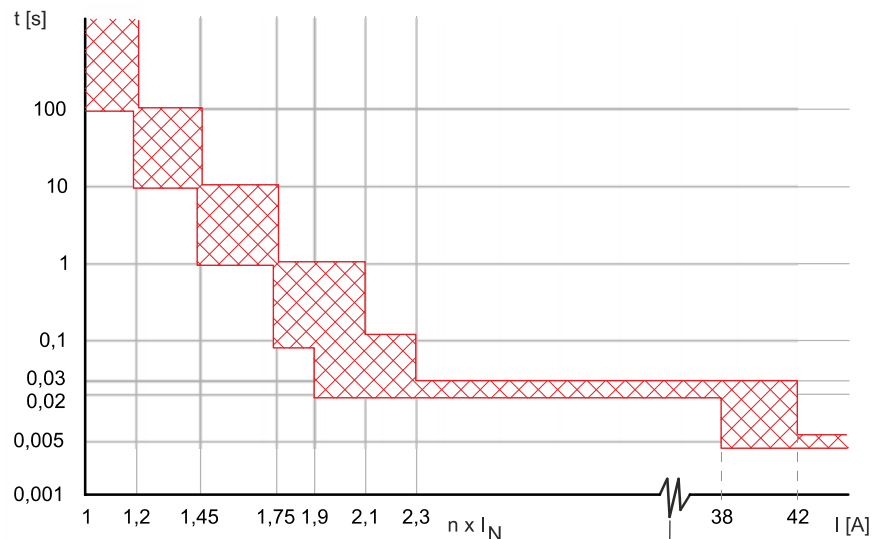


Fig. 4-6: Disconnecting characteristics | Tripping current

Characteristics: Disconnecting characteristics | Tripping current (I_N)

For Mico Pro flex Tripping current (I_N): 11 A to 20 A

■ Disconnection time at short circuit: approx. 5 ms

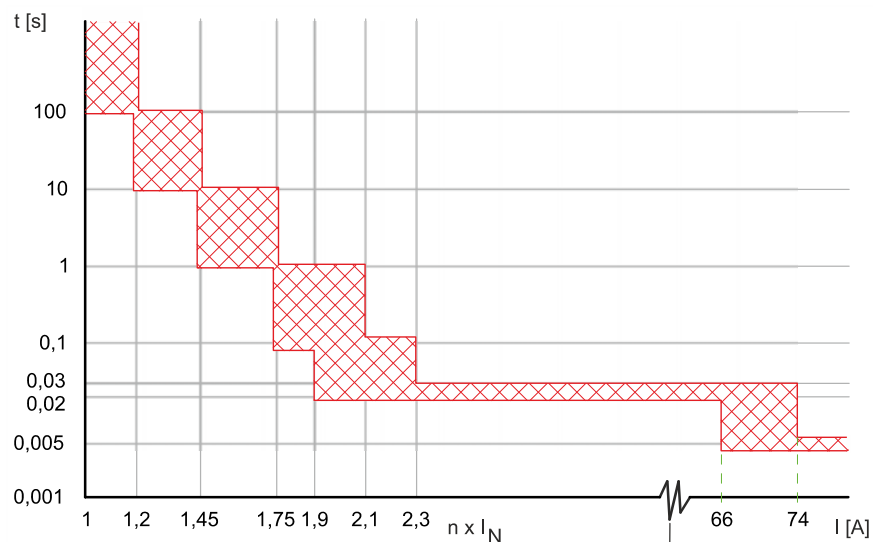


Fig. 4-7: Disconnecting characteristics | Tripping current

Control output

Parameter	Conditions	Value
Alarm output voltage		Same as operating voltage - (Nc) normally closed
Alarm control current	Not short circuit-proof	Max. 20 mA

Parameter	Conditions	Value
90-% output voltage		Same as operating voltage - (NO) normally opened
90-% control current	Not short circuit-proof	Max. 20 mA

Performance record

Parameter	Conditions	Value
Voltage drop	Per channel, at 25 °C	0,1 V
Efficiency	At 24 V	99,5%

4.4.2 Environmental characteristics

Climatic

Parameter	Conditions	Value
Relative humidity		5 ... 85 %
Storage temperature		-40 ... +80 °C (-40 ... +176 °F)
Climate class	IEC/EN 60721-3-3	3K3

Variants Installation height			
Art.-No.	Parameter	Conditions	Value
9000-41091-0101000, 9000-41091-1102000, 9000-41092-0101000, 9000-41094-0101000	Installation height	Above sea level, without any restrictions	-500 m ... 2000 m (-1640 ft ... 6561 ft)
9000-41091-0101000, 9000-41092-0101000	Installation height	Above sea level, max. 8 A tripping current full load per channel	2000 m ... 4000 m (6561 ft ... 13123 ft)
9000-41091-0101000, 9000-41092-0101000	Installation height	Above sea level, max. 6 A tripping current full load per channel	4000 m ... 6000 m (13123 ft ... 19685 ft)
9000-41091-1102000	Installation height	Above sea level, max. 16 A tripping current full load per channel	2000 m ... 4000 m (6561 ft ... 13123 ft)
9000-41091-1102000	Installation height	Above sea level, max. 12 A tripping current full load per channel	4000 m ... 6000 m (13123 ft ... 19685 ft)
9000-41094-0101000	Installation height	Above sea level, max. 8 A tripping current full load per channel, max. +40°C (+104 °F) Ta	2000 m ... 4000 m (6561 ft ... 13123 ft)
9000-41094-0101000	Installation height	Above sea level, max. 6 A tripping current full load per channel, max. +55°C (+131 °F) Ta	2000 m ... 4000 m (6561 ft ... 13123 ft)
9000-41094-0101000	Installation height	Above sea level, max. 6 A tripping current full load per channel, max. +40°C (+104 °F) Ta	4000 m ... 6000 m (13123 ft ... 19685 ft)

Variants Installation height			
Art.-No.	Parameter	Conditions	Value
9000-41094-0101000	Installation height	Above sea level, max. 4 A tripping current full load per channel, max. +55 °C (+131 °F) Ta	4000 m ... 6000 m (13123 ft ... 19685 ft)

Variants Surrounding air temperature range (T _a)			
Art.-No.	Designation	Parameter	Value
9000-41091-0101000, 9000-41092-0101000	Mico Pro flex 1.10, Mico Pro flex 2.10	Surrounding air temperature range (T _a)	-25 ... +55 °C (-13 ... +131 °F)
9000-41094-0101000	Mico Pro flex 4.10	Surrounding air temperature range (T _a), take notice of Characteristics: Tripping current Surrounding air temperature	-25 ... +55 °C (-13 ... +131 °F)
9000-41091-1102000	Mico Pro flex 1.20	Surrounding air temperature range (T _a)	-25 ... +50 °C (-13 ... +122 °F)

Characteristics:

Tripping current (I_N) | Surrounding air temperature (T_a)

Art.-No. 9000-41094-0101000 Mico Pro flex 4.10

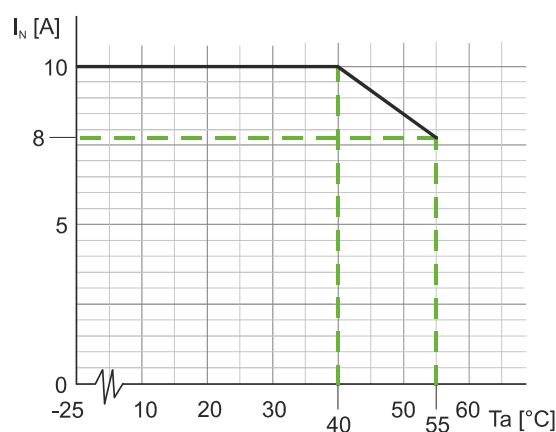


Fig. 4-8: Tripping current (I_N) | Surrounding air temperature (T_a)

Mechanical

Parameter	Conditions	Value
Vibration test	IEC 60068-2-6:2007 Test Fc; EN 60068-2-6:2008	sin 5 - 17.8 Hz: 1.6 mm; 17.8 - 500 Hz: 2.3 g 10x f
Shock test	IEC 60068-2-27:2008 Test Ea; EN 60068-2-27:2009	1/2 sin 30 g, 11 ms
Shocks caused by rough handling	(Drop test)	1 m

Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP 20
Pollution degree		2

Parameter	Conditions	Value
Overvoltage category		III
Insulation voltage input-output	Type testing / routine check test	50 V

EMC-interference

Parameter	Conditions	Value
Radio interference field strength housing	EN 61000-6-3	Industrial and residual areas
Conducted emission DC inputs and outputs	EN 61000-6-3	Industrial and residual areas

EMC-immunity

Parameter	Conditions	Value
Fast transients / burst DC inputs and outputs	EN 61000-6-2, EN 61000-4-4	±2 kV / 5 kHz
Fast transients / burst signal connections	EN 61000-6-2, EN 61000-4-4	±2 kV / 5 kHz
Surge voltage DC inputs and outputs	EN 61000-6-2, EN 61000-4-5	±0.5 kV DM
Electrostatic discharge housing	EN 61000-6-2, EN 61000-4-2	Contact ± 4 kV; air ± 8 kV
Conducted HF DC connections	EN 61000-6-2, EN 61000-4-6	10 VRMS; 1 kHz, 80 % AM sine
Conducted HF control terminals	EN 61000-6-2, EN 61000-4-6	10 VRMS; 1 kHz, 80 % AM sine
High-frequency electrical RF fields housing	EN 61000-6-2, EN 61000-4-3	80 MHz - 1.0 GHz: 10 V/m

4.4.3 Protection

Device protection

Parameter	Conditions	Value
Short circuit protection		Short circuit-proof
Reverse polarity protection		No
Overvoltage protection input		Suppressor diode 36 V
Overvoltage protection output		Suppressor diode 36 V
Overload protection		See Disconnecting characteristics
Voltage monitoring		No

Safety fuse variants: Internal fuse (fail-safe element), per channel			
Art.-No.	Designation	Tripping current	Fuse
9000-41091-0101000	Mico Pro flex 1.10	1 A ... 10 A	Fast-blow safety fuse 15 A (F)
9000-41091-1102000	Mico Pro flex 1.20	11 A ... 20 A	Fast-blow safety fuse 30 A (F)
9000-41092-0101000	Mico Pro flex 2.10	1 A ... 10 A	Fast-blow safety fuse 15 A (F)
9000-41094-0101000	Mico Pro flex 4.10	1 A ... 10 A	Fast-blow safety fuse 15 A (F)

Operator protection

Parameter	Conditions	Value
Operating state memory device		Yes

4.4.4 Mechanical data

Materials

Parameter	Conditions	Value
Flame resistance	EN 60695-2-1	Low flammability
Housing material		Plastic

Mounting data

Parameter	Conditions	Value
Dimension	Depth (D)	114 mm (4.49 in)
Dimension	Height with gate valve (H)	130 mm (5.12 in)
Dimension	Height without gate valve (H2)	111 mm (4.37 in)
Dimension	Mounting rail (x)	See chapter Installation Mounting/Dis-mounting
Dimension	Mounting (a)	55.5 mm (2.19 in)
Dimension	Mounting (b)	15.5 mm (0.61 in)
Dimension	Mounting (c)	3.5 mm (0.14 in)
Dimension	Mounting (d)	7.5 mm (0.3 in)

Variants Dimension Width (W)			
Art.-No.	Parameter	Conditions	Value
9000-41091-0101000	Dimension	Width (W), 0.35 mm (0.014 in) are inserted into the adjacent module	8,35 mm (0.329 in)
9000-41091-1102000, 9000-41092-0101000	Dimension		12,35 mm (0.487 in)
9000-41094-0101000	Dimension		24,35 mm (0.96 in)

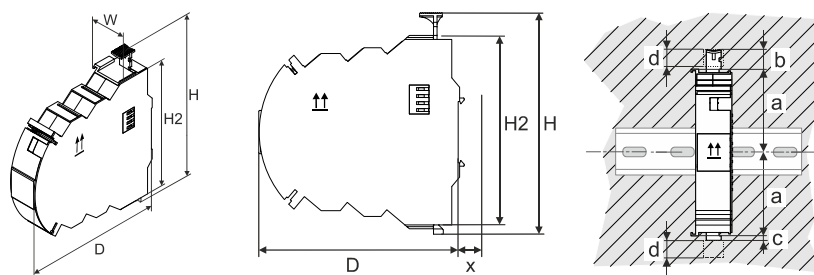


Fig. 4-9: Dimensions

Variants Net weight			
Art.-No.	Parameter	Conditions	Value
9000-41091-0101000	Net weight		62 g (0.14 lb)
9000-41091-1102000	Net weight		68 g (0.15 lb)
9000-41092-0101000	Net weight		82 g (0.19 lb)
9000-41094-0101000	Net weight		132 g (0.3 lb)

4.4.5 Product reliability

Variants MTBF, MTTF			
Art.-No.	Parameter	Conditions	Value
9000-41091-0101000	MTBF	40 °C (104 °F); DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	2013689 h
9000-41091-0101000	MTBF	55 °C (131 °F); DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	1258555 h
9000-41091-0101000	MTTF	40 °C (104 °F); DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	230 Years

4.4.6 Conformity, Approvals

Parameter	Conditions	Value
Product standard	EN 61000-6-2 and EN 61000-6-3	Compliant
EMC Directive	2014/30/EU	Compliant
RoHS	2011/65/EU	Compliant
REACH	No. 1907/2006	Compliant
LoHS	ME list of banned substances	Compliant
EAC		Compliant
UL	UL508	NMTR.E200364
cUL	CSA C22.2 No. 14	NMTR7.E200364
UR	UL2367	QVRQ2.E321289
CSA	CSA C22.2 No. 14	CLASS 3211 07
CSAus	UL 508, Ed. 17	CLASS 3211 87

4.5 Mico Pro PD (power distribution)

Edition
Date: 12.09.2017

4.5.1 Electrical data

Input

Parameter	Conditions	Value
Operating voltage		12 V DC, 24 V DC
Input voltage range		9 V - 30 V DC
Total operating current continuous jumper	Plug-In link	Max. 20 A

Output

Symbol	Parameter	Conditions	Value
	Parallel connection		Not possible
	Series connection		Not possible
I_{Σ}	Output current	Total	Max. 20 A
	Output current	Per clamp pair (U+ / 0 V)	Max. 20 A

4.5.2 Environmental characteristics

Climatic

Symbol	Parameter	Conditions	Value
	Relative humidity	No condensation	5 ... 85 %
	Storage temperature		-40 ... +80 °C (-40 ... +176 °F)
	Climate class	IEC/EN 60721-3-3	3K3
Ta	Surrounding air temperature range		-25 ... +55 °C (-13 ... +131 °F)
	Installation height	Above sea level, without any restrictions	-500 m ... 2000 m (-1640 ft ... 6561 ft)
	Installation height	Above sea level, max. 16 A total operating current	2000 m ... 4000 m (6561 ft ... 13123 ft)
	Installation height	Above sea level, max. 12 A total operating current	4000 m ... 6000 m (13123 ft ... 19685 ft)

Mechanical

Parameter	Conditions	Value
Vibration test	IEC 60068-2-6:2007 Test Fc; EN 60068-2-6:2008	sin 5 - 17.8 Hz: 1.6 mm; 17.8 - 500 Hz: 2.3 g 10x f
Shock test	IEC 60068-2-27:2008 Test Ea; EN 60068-2-27:2009	1/2 sin 30 g, 11 ms

Parameter	Conditions	Value
Shocks caused by rough handling	(Drop test)	1 m

Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP 20
Pollution degree		2
Overvoltage category		III
Insulation voltage input-output	Type testing / routine check test	50 V

EMC-interference

Parameter	Conditions	Value
Radio interference field strength housing	EN 61000-6-3	Industrial and residual areas
Conducted emission DC inputs and outputs	EN 61000-6-3	Industrial and residual areas

EMC-immunity

Parameter	Conditions	Value
Fast transients / burst DC inputs and outputs	EN 61000-6-2, EN 61000-4-4	±2 kV / 5 kHz
Fast transients / burst signal connections	EN 61000-6-2, EN 61000-4-4	±2 kV / 5 kHz
Surge voltage DC inputs and outputs	EN 61000-6-2, EN 61000-4-5	±0.5 kV DM
Electrostatic discharge housing	EN 61000-6-2, EN 61000-4-2	Contact ±4 kV; air ±8 kV
Conducted HF DC connections	EN 61000-6-2, EN 61000-4-6	10 VRMS; 1 kHz, 80 % AM sine
Conducted HF control terminals	EN 61000-6-2, EN 61000-4-6	10 VRMS; 1 kHz, 80 % AM sine
High-frequency electrical RF fields housing	EN 61000-6-2, EN 61000-4-3	80 MHz - 1.0 GHz: 10 V/m

4.5.3 Protection

Device protection

Parameter	Conditions	Value
Internal fuse		No
Short circuit protection		No
Reverse polarity protection		No
Overvoltage protection input		Suppressor diode 36 V
Voltage monitoring		No
Overload protection		No (only via load circuit monitoring)

4.5.4 Mechanical data

Materials

Parameter	Conditions	Value
Flame resistance	EN 60695-2-1	Low flammability
Housing material		Plastic

Mounting data

Parameter	Conditions	Value
Dimension	Depth (D)	114 mm (4.49 in)
Dimension	Height with gate valve (H)	130 mm (5.12 in)
Dimension	Height without gate valve (H2)	111 mm (4.37 in)
Dimension	Width (W), 0.35 mm (0.014 in) are inserted into the adjacent module	24.35 mm (0.96 in)
Dimension	Mounting (a)	55.5 mm (2.19 in)
Dimension	Mounting (b)	15.5 mm (0.61 in)
Dimension	Mounting (c)	3.5 mm (0.14 in)
Dimension	Mounting (d)	7.5 mm (0.3 in)
Dimension	Mounting rail (x)	See chapter Installation Mounting/Dismounting
Net weight		105 g (0.23 lb)

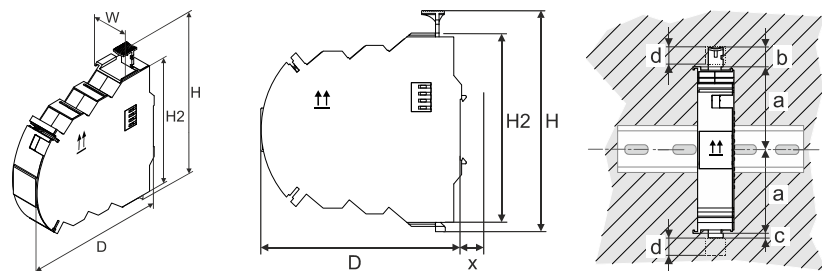


Fig. 4-10: Dimensions

4.5.5 Conformity, Approvals

Parameter	Conditions	Value
Product standard	EN 61000-6-2 and EN 61000-6-3	Compliant
EMC Directive	2014/30/EU	Compliant
RoHS	2011/65/EU	Compliant
REACH	No. 1907/2006	Compliant
LoHS	ME list of banned substances	Compliant
EAC		Compliant
UL	UL508	NMTR.E200364
cUL	CSA C22.2 No. 14	NMTR7.E200364
UR	UL2367	QVRQ2.E321289
CSA	CSA C22.2 No. 14	CLASS 3211 07
CSAus	UL 508, Ed. 17	CLASS 3211 87

5 Mounting



NOTE

The cooling of the device ensued by natural air circulation.

- ➔ During installation let much space for air circulation
- ➔ The installation location have to be in accordance with the requirements of EN 60950-1 point 4.7 and 4.6.1 (Housing protection class IP20, EN 60529)

5.1 Installation distances

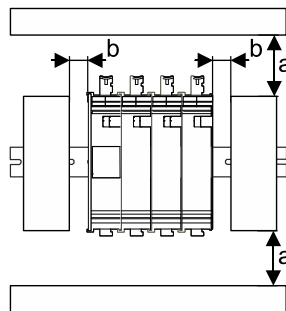


Fig. 5-1: Installation distances

a | > 40 mm (> 1.6 in)

b | > 6 mm (> 0.24 in)

5.2 Installation position

The device must be installed in the intended position in order to ensure sufficient cooling and mechanical stability.

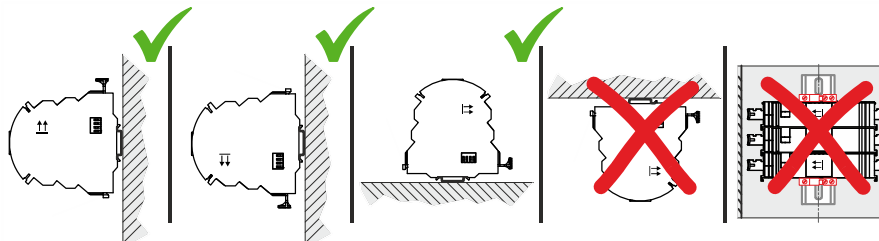


Fig. 5-2: Installation position



CAUTION!

Material damage caused by wrong installation position!

→ Module **Mico Pro fix 1.16** (9000-41011-1600000) and **Mico Pro flex 1.20** (9000-41091-1102000) may only be installed horizontally.

The device must be installed in the intended position in order to ensure sufficient cooling and mechanical stability.

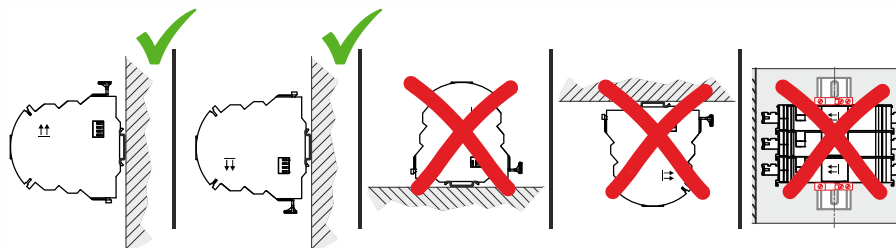


Fig. 5-3: Installation position for Mico Pro fix 1.16 and Mico Pro flex 1.20

5.3 Mounting/Dismounting

Mounting rail



NOTE

The device snaps onto a DIN mounting rail TH 35 according to EN 60715.

- ➔ The mounting rail must be fastened in a way that it is not twisted during mounting and dismounting
- ➔ Observe the maximum permissible load of the DIN mounting rail according to EN 60715

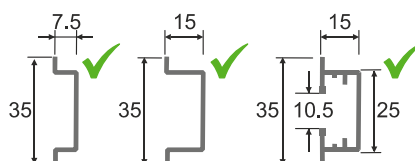
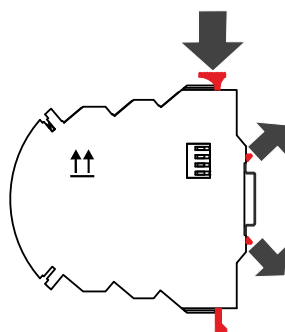


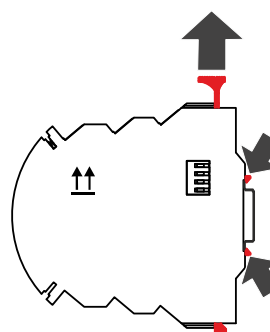
Fig. 5-4: Mounting rails

Locking on mounting rail

Locking device open

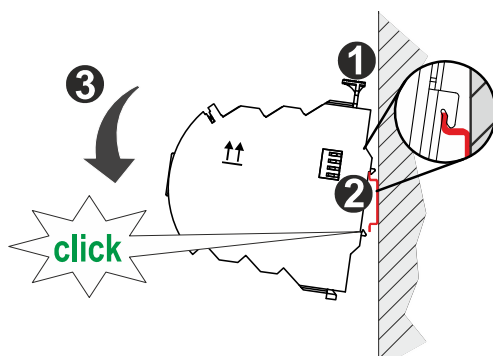


Locking device closed

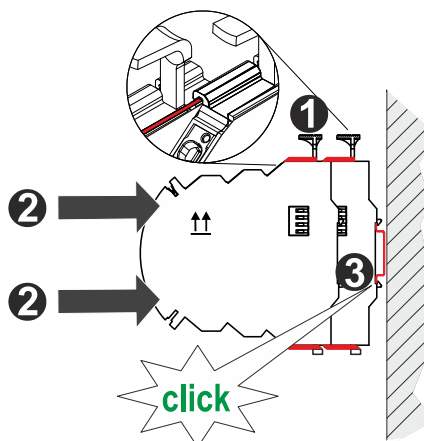


Mounting on mounting rail

1. Mounting the power module



2. Mounting the expansion modules



Mounting on mounting rail

1. Mounting the power module

Mounting the power module:

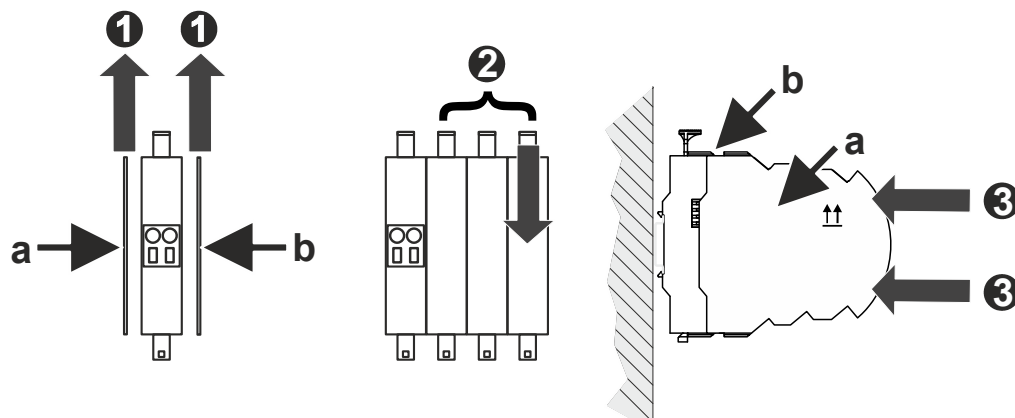
- ✓ The power module can be located anywhere in the system
- 1 | Locking device closed
- 2 | Place the module mounting rail guide on the upper edge of the mounting rail
- 3 | Snap the module down until it engages

2. Mounting the expansion modules

Expansion modules:

- ✓ Place additional modules on the left or right side of the previous modules side by side
- 1 | Locking device closed
- 2 | Place the modules parallel to the previous module and insert them uniformly into the mounting rail
- 3 | They snap into place with an audible click and the system's front side is flush

3. Mounting the system cover plates

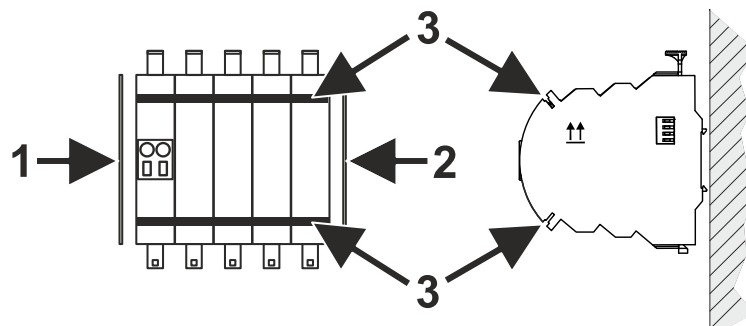


- a | Cover plate for left side
- b | Cover plate for right side

To mount the cover plate:

- 1 | Remove the left **a** and right **b** cover plate from Mico Pro PM (power module)
- 2 | Align modules
- 3 | Place the left **a** and right **b** cover plate parallel to the previous module and press uniformly until the system's front side is flush

4. Mounting the plug-in link continuous jumpers



To mount the plug-in link:

- ✓ Measure the length between cover plates **1** and **2**
- 1 | Use side-cutting pliers to cut the plug-in link (continuous jumper) to the desired length
- 2 | Insert the plug-in link (continuous jumper) into position **3** between the cover plates and press it in as far as it will go

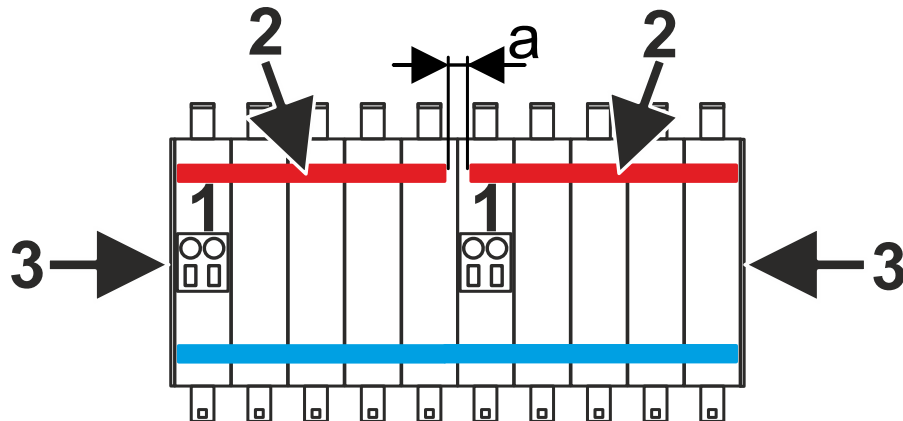


NOTE

To ensure proper contact of all devices or modules:

- ➔ Press the plug-in link (continuous jumper) into the contacts as far as it will go.
- ➔ The plug-in link (continuous jumper) must cover all contacts over the entire area.

Several power modules (power feeding modules) in one system



ATTENTION:

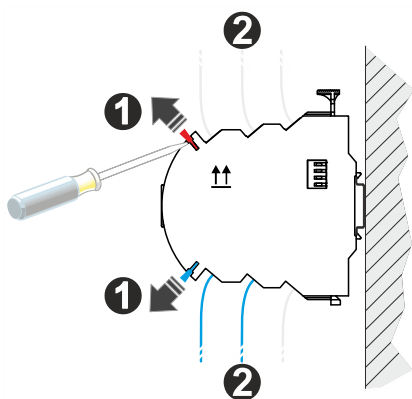
If several Mico Pro power modules (PM) 1 are used in one system.

- ➔ The plug-In links (continuous jumpers) 2 at the **+24V bridging contact** must not touch each other, $a \geq 5 \text{ mm}$ (0.2 in).
- ➔ Connect the GND/0V of the power supply units to the same potential.
- ➔ Use a maximum of 3 Mico Pro power modules (PM).

The control and signal functions of the power modules (power feeding modules) 1 are joined.

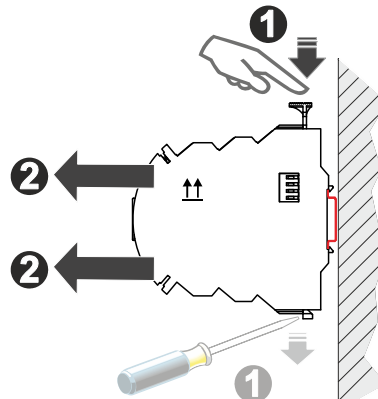
It is not necessary to mount cover plates and to observe minimum distances between the supply sections.

Dismounting



Disconnecting the wiring:

- 1 | Insert a slotted screwdriver into position 1 on the module and pull the plug-in link (continuous jumper) out
- 2 | Remove any connected stranded wires from the part to be dismantled



To dismount:

- 1 | Press the actuator on the top side of the module or place the slotted screwdriver between the housing and the lug on the bottom of the module and pull downwards
- 2 | Pull out uniformly, parallel with the previous module

6 Installation



CAUTION!

Risk of hot surfaces due to short circuit or overload

Missing cover plates or improper installation of cover plates may lead to overheating of the modules or devices and connecting cables and cause hot surfaces.

→ Install cover plates according to instructions



CAUTION!

Risk of hot surfaces due to overload

Excessive total operating current > 40 A may lead to overheating of the modules or devices and connecting cables and cause hot surfaces.

→ Power feeding max. 40 A



NOTE

Do not carry out any work on the devices, if it is under electrical power.



NOTE

GND/0V of the consumers can be connected directly to the MICO PRO modules. GND/0V terminals are thus no longer necessary.



For this product **EPLAN macros are available:**

→ EPLAN macros are in Murrelektronik Onlineshop
["http://shop.murrelektronik.com"](http://shop.murrelektronik.com), associated with the item number

6.1 Overview

6.1.1 Mico Pro PM (power module)

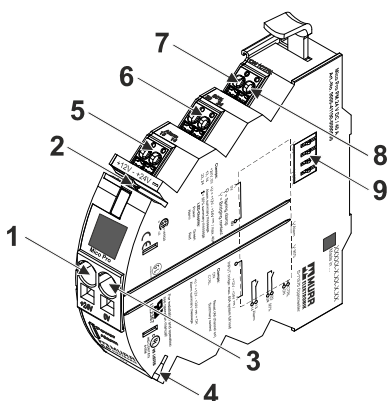


Fig. 6-1: Installation overview

- 1 **+24V** terminal power input
- 2 **+24V** $\equiv$ bridging contact supply **Plug-In link** continuous jumper for additional system components
- 3 **GND/0V** terminal power input
- 4 **GND/0V** bridging contact supply **Plug-In link** continuous jumper for additional system components
- 5 **Alarm 13, 14** terminals for control output (potential-free signal output)
- 6 **90-% 23, 24** terminals for control output (potential-free signal output)
- 7 **ON** terminal for control input
- 8 **CTRL** terminal for control input
- 9 Internal system connection

6.1.2 Mico Pro fix

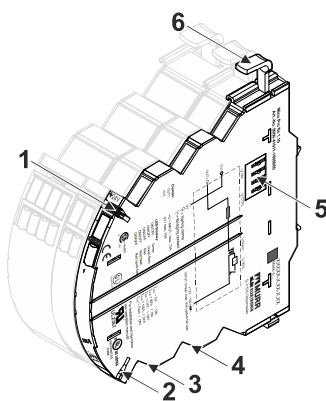


Fig. 6-2: Installation overview

- 1 **+24V** bridging contact supply
Plug-in link continuous jumper
- 2 **GND/0V** bridging contact supply
Plug-in link continuous jumper
- 3 **OUT** terminal for connecting the consumer circuit
- 4 **GND/0V** terminal for connecting the consumer circuit
- 5 Internal system connection
- 6 Unlocking

6.1.3 Mico Pro flex

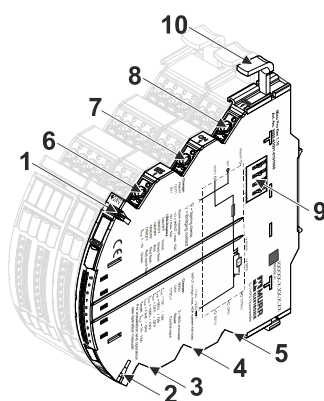


Fig. 6-3: Installation overview

- 1 **+24V** bridging contact supply
Plug-in link continuous jumper
- 2 **GND/0V** bridging contact supply
Plug-in link continuous jumper
- 3 **OUT** terminal for connecting the consumer circuit
- 4 **GND/0V** terminal for connecting the consumer circuit
- 5 **Alarm** terminals for control output
- 6 **90%** terminals for control output
- 7 **ON** terminal for control input
- 8 **CTRL** terminal for control input
- 9 Internal system connection
- 10 Unlocking

6.1.4 Mico Pro PD (power distribution)

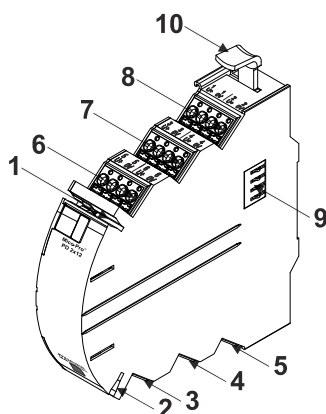


Fig. 6-4: Installation overview

- 1 Not contacted
- 2 **GND/0V** bridging contact supply
Plug-In link continuous jumper
- 3 **U+/0V** terminal
- 4 **U+/0V** terminal
- 5 **U+/0V** terminal
- 6 **U+/0V** terminal
- 7 **U+/0V** terminal
- 8 **U+/0V** terminal
- 9 Internal system connection
- 10 Unlocking

6.2 Terminal

6.2.1 Mico Pro PM (power module)

			INPUT	Controlling and signaling
Symbol	Parameter	Conditions	Value	Value
	Contact		+24 V, GND/0 V	ON, CTRL, Alarm (13, 14), 90% (23, 24)
	Connection type		Terminal: Push-in spring force	Terminal: Push-in spring force
	Connection cross-section	Flexible, with core end ferrule	0.75 ... 10 mm ² (AWG 20 ... 8)	0.25 ... 2.5 mm ² (AWG 23 ... 14)
	Connection cross-section	Flexible, mit TWIN core end ferrule	0.75 ... 4 mm ² (AWG 20 ... 12)	0.5 ... 1.0 mm ² (AWG 20 ... 18)
	Connection cross-section	Flexible, without core end ferrule	0.75 ... 16 mm ² (AWG 20 ... 4)	0.2 ... 4 mm ² (AWG 24 ... 12)
	Connection cross-section	Rigid	0.75 ... 16 mm ² (AWG 20 ... 4)	0.2 ... 2.5 mm ² (AWG 24 ... 14)
	Stripping length	Without core end ferrule	18 mm (0.71 in)	10 mm (0.4 in)
	Stripping length	From 2.5 mm ² (AWG 14) and TWIN core end ferrule	18 mm (0.71 in)	-
	Stripping length	With 10 mm (0.39 in) core end ferrule, without plastic collar	-	12 mm (0.47 in)
	Stripping length	With 10 mm (0.39 in) core end ferrule, with plastic collar	-	12 mm (0.47 in)
	Test point		-	Ø 2.3 mm (0.09 in)

6.2.2 Mico Pro fix

			OUTPUT
Symbol	Parameter	Conditions	Value
	Contact		OUT, GND/0 V
	Connection type		Terminal: Push-in spring force
	Connection cross-section	Flexible, with core end ferrule	0.25 ... 2.5 mm ² (AWG 23 ... 14)
	Connection cross-section	Flexible, with TWIN core end ferrule	0.5 ... 1.0 mm ² (AWG 20 ... 18)
	Connection cross-section	Flexible, without core end ferrule	0.2 ... 4 mm ² (AWG 24 ... 12)
	Connection cross-section	Rigid	0.2 ... 2.5 mm ² (AWG 24 ... 14)
	Stripping length	Without core end ferrule	10 mm (0.4 in)
	Stripping length	With 10 mm (0.39 in) core end ferrule, without plastic collar	12 mm (0.47 in)
	Stripping length	With 10 mm (0.39 in) core end ferrule, with plastic collar	12 mm (0.47 in)
	Test point		Ø 2.3 mm (0.09 in)

6.2.3 Mico Pro flex

			OUTPUT	Controlling and signaling
Symbol	Parameter	Conditions	Value	Value
	Contact		OUT, GND/0 V	ON, CTRL, 90 %, Alarm
	Connection type		Terminal: Push-in spring force	
	Connection cross-section	Flexible, with core end ferrule	0.25 ... 2.5 mm ² (AWG 23 ... 14)	
	Connection cross-section	Flexible, with TWIN core end ferrule	0.5 ... 1.0 mm ² (AWG 20 ... 18)	
	Connection cross-section	Flexible, without core end ferrule	0.2 ... 4 mm ² (AWG 24 ... 12)	
	Connection cross-section	Rigid	0.2 ... 2.5 mm ² (AWG 24 ... 14)	
	Stripping length	Without core end ferrule	10 mm (0.4 in)	
	Stripping length	With 10 mm (0.39 in) core end ferrule, without plastic collar	12 mm (0.47 in)	
	Stripping length	With 10 mm (0.39 in) core end ferrule, with plastic collar	12 mm (0.47 in)	
	Test point		Ø 2.3 mm (0.09 in)	

6.2.4 Mico Pro PD (power distribution)

Symbol	Parameter	Conditions	Potential Value
	Contact		U+, GND/0 V
	Connection type		Terminal: Push-in spring force
	Connection cross-section	Flexible, with core end ferrule	0.25 ... 2.5 mm ² (AWG 23 ... 14)
	Connection cross-section	Flexible, with TWIN core end ferrule	0.5 ... 1.0 mm ² (AWG 20 ... 18)
	Connection cross-section	Flexible, without core end ferrule	0.2 ... 4 mm ² (AWG 24 ... 12)
	Connection cross-section	Rigid	0.2 ... 2.5 mm ² (AWG 24 ... 14)
	Stripping length	Without core end ferrule	10 mm (0.4 in)
	Stripping length	With 10 mm (0.39 in) core end ferrule, without plastic collar	12 mm (0.47 in)
	Stripping length	With 10 mm (0.39 in) core end ferrule, with plastic collar	12 mm (0.47 in)
	Test point		Ø 2.3 mm (0.09 in)

6.3 Connecting cable



NOTE

All connecting cables have to be selected according to the prevailing currents and ambient characteristics

6.3.1 Mico Pro PM (power module)



NOTE

The connection cable at the INPUT terminals (+ 24V, GND/0V) must be approved for the following operating temperatures:

- min. 75 °C (min. 167 °F)
with surrounding air temperature ≤ 40 °C (≤ 104 °F)
 - min. 90 °C (min. 194 °F)
with surrounding air temperature 40 °C (104 °F) to 55 °C (131 °F)
-

6.3.2 Mico Pro fix and flex

For Mico Pro fix and flex modules with 1 A to 16 A tripping current

NOTE

The connection cable at the OUTPUT terminals (OUT, GND/0V) must be approved for the following operating temperatures:

- min. 75 °C (min. 167 °F)
with surrounding air temperature ≤ 50 °C (≤ 122 °F)
 - min. 90 °C (min. 194 °F)
with surrounding air temperature 50 °C (122 °F) to 55 °C (131 °F)
-

For Mico Pro flex modules with 11 A to 20 A tripping current

NOTE

The connection cable at the terminals must be approved for the following operating temperatures:

- min. 90 °C (min. 194 °F)
with surrounding air temperature ≤ 50 °C (≤ 122 °F)
-

7 Operation



NOTE

Use a short circuit-proof power supply unit!



NOTE

The voltage generated at the output is not allowed to remain higher than the input voltage.



NOTE

Parallel connection of multiple load branches for increase of power is not permitted.



NOTE

Use only in connection with Mico Pro system components!



NOTE

Technical data and characteristic curves can be found in chapter "Technical data".



NOTE

Surrounding air temperature range (Ta): Max. +50°C (+122 °F)
at article: 9000-41091-1102000 Mico Pro flex 1.20



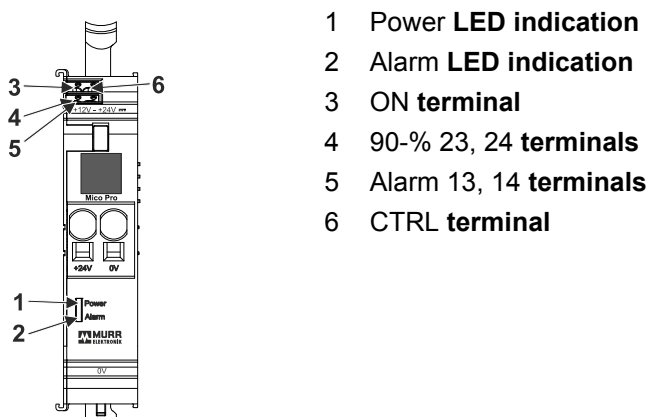
NOTE

Observe characteristics, derating:
Tripping current | Surrounding air temperatur
for article: 9000-41094-0101000 Mico Pro flex 4.10

Can be found in chapter "Technical data / Environmental characteristics / Climatic".

7.1 Overview

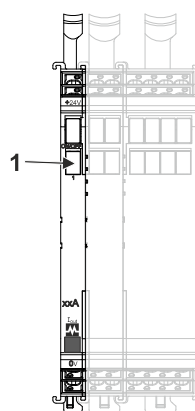
7.1.1 Mico Pro PM (power module)



- 1 Power **LED** indication
- 2 Alarm **LED** indication
- 3 **ON** terminal
- 4 90-% 23, 24 **terminals**
- 5 Alarm 13, 14 **terminals**
- 6 CTRL **terminal**

Fig. 7-1: Operation overview

7.1.2 Mico Pro fix



1 ON/OFF LED indication
ON/OFF button

Fig. 7-2: Operation overview

Schematic wiring diagram

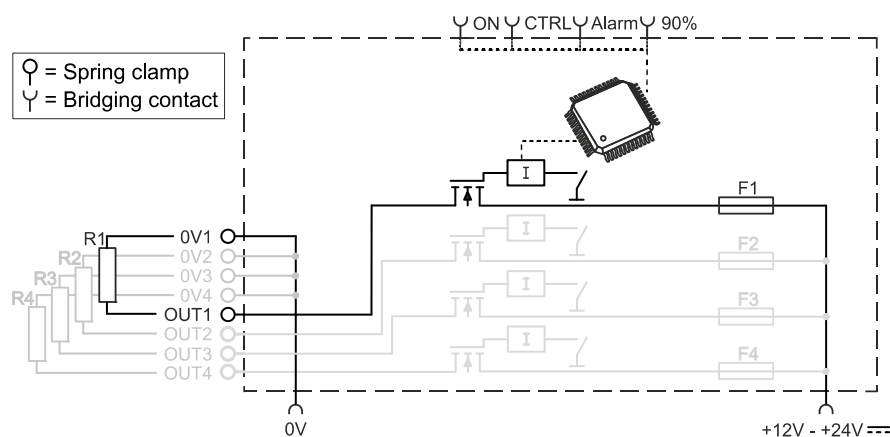
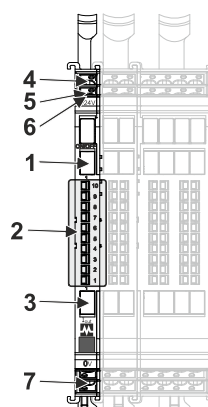


Fig. 7-3: Schematic wiring diagram

7.1.3 Mico Pro flex



- 1 ON/OFF **LED indication**
ON/OFF **button**
- 2 **LED indication**
1 ... 10 I_{out} or 11 ... 20 I_{out}
markable optical fiber
1 ... 10 I_{out} or 11 ... 20 I_{out}
- 3 **Set button**
- 4 **CTRL terminal**
- 5 **ON terminal**
- 6 **90-% terminal**
- 7 **Alarm terminal**

Fig. 7-4: Operation overview

Schematic wiring diagram

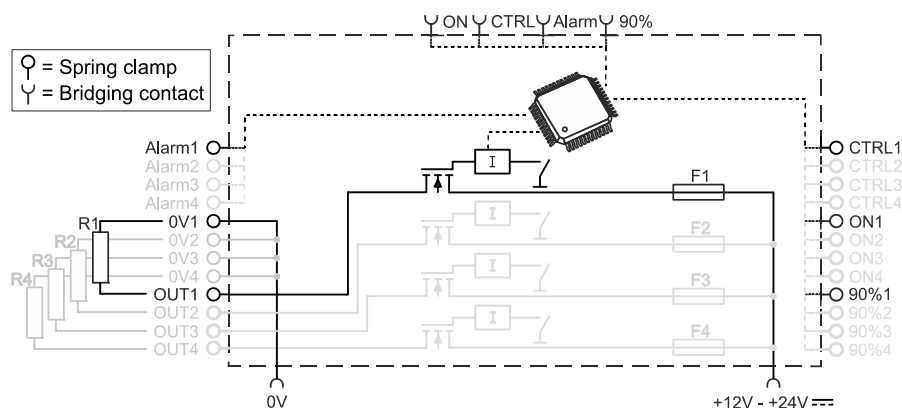


Fig. 7-5: Schematic wiring diagram

7.1.4 Mico Pro PD (power distribution)

Schematic wiring diagram

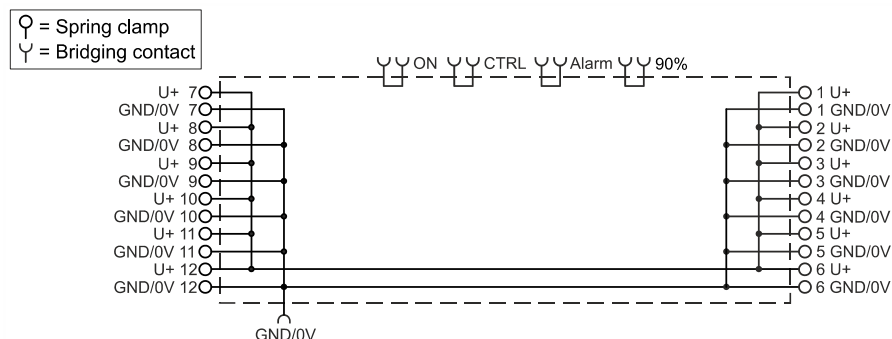


Fig. 7-6: Schematic wiring diagram

7.2 Adjust

7.2.1 Mico Pro fix

Connecting and disconnecting consumer circuits

There are 3 options

ATTENTION:

- If a consumer circuit (channel) is disconnected manually using the **"ON/OFF" button**, it can only be reconnected manually by means of the **"ON/OFF" button**.
- If a consumer circuit (channel) is disconnected via the **"CTRL" terminal**, it can only be reconnected via the **"CTRL" terminal**.
- Manually
 - Connect and disconnect by means of the **"ON/OFF" button** directly on the consumer circuit (channel)
- Signals via control inputs
 - On the Mico Pro PM module, connect all consumer circuits (channels) after an overload in the complete system via the **"ON" terminal**
 - On the Mico Pro PM module, disconnect and connect all consumer circuits (channels) via the **"CTRL" terminal**

7.2.2 Mico Pro flex

Connecting and disconnecting consumer circuits

There are 5 options

ATTENTION:

- If a consumer circuit (channel) is disconnected manually using the **"ON/OFF" button**, it can only be reconnected manually by means of the **"ON/OFF" button**.
- If a consumer circuit (channel) is disconnected via the **"CTRL" terminal**, it can only be reconnected via the **"CTRL" terminal**.
- Manually
 - Disconnect and connect directly on the consumer circuit (channel) by means of the **"ON/OFF" button**
- Signals via control inputs
 - Connect a consumer circuit after an overload directly on the consumer circuit (channel) via the **"ON" terminal**
 - Disconnect and connect a consumer circuit after an overload directly on the consumer circuit (channel) via the **"CTRL" terminal**
 - On the Mico Pro PM module, connect all consumer circuits (channels) after an overload in the complete system via the **"ON" terminal**
 - On the Mico Pro PM module, disconnect and connect all consumer circuits (channels) via the **"CTRL" terminal**

Tripping current

Set via the "Set" (I_{out}) and "ON/OFF" buttons

- 1 | Switch on the voltage supply of the module.
- 2 | Select the desired **OUT channel (load branch)**.
- 3 | The **"Set" button has to be pressed for 3 s** to switch to the tripping current setting mode.
- 4 | The **OUT channel (load branch)** switches off, the LED indication "ON/OFF" lights up red.
- 5 | The LED indication "1 ... 10" (I_{out}) or "11 ... 20" (I_{out}) flashes green.
- 6 | Use the **"Set" button** to set the desired tripping current. Each press of the button moves the tripping current one position up.
- 7 | The LED indication "1 ... 10" (I_{out}) or "11 ... 20" (I_{out}) shows the currently selected tripping current in A. (E.g. LED-1 = 1 A)

- 8 | The LED indication flashes green as long as you are in the tripping current setting mode.
- 9 | The tripping current will be applied, if **5 s pass without any operation performed** or if the **"ON/OFF" button** is pressed.
- 10 | For subsequent verifications we recommend marking the selected tripping current. To do so, the optical fiber lighting green at the LED indication "1 ... 10" (I_{out}) or "11 ... 20" (I_{out}) has to be pushed aside. The optical fiber engages on the side.

The tripping current for this channel has thus been changed. If more channels are available, the tripping current has to be checked and set!

7.3 Module/device

7.3.1 Mico Pro fix and flex

Fields of application

The following applications are checked with this device:

Condition	Application
Direct Current	Non-inductive or slightly inductive loads, resistance furnaces
	Switching of filament lamps
	Control of electromagnets
	Switching on and off without load
	Switching resistive loads including low overloads
	Switching mixed resistive and inductive loads including low overloads
	Switching highly inductive loads

Operating state memory device

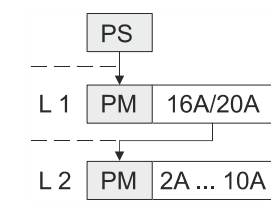
Stores the state of each consumer circuit (channel) beyond any voltage reset.

Cascading the expansion modules



NOTE

- The admissible total current may not be exceeded during cascading.
- Cascading on level 3 (L 3) is not allowed.

 Fig. 7-7: Cascading		Legend	
PS		PS	Power supply unit
L		L	Level
PM		PM	Power module (power feeding module)
16 A / 20 A		16 A / 20 A	Fix module or flex module (load circuit monitoring) with 16 A or 20 A
2 A ... 10 A		2 A ... 10 A	Fix module or flex module (load circuit monitoring) with 2 A to 10 A

7.4 Control and signals

7.4.1 Mico Pro PM (power module)

ON terminal (restart) control input	The control and diagnostic functions described on the Mico Pro PM (power modul) are group signals from or for the entire Mico Pro system (Mico Pro PM with added system components). Signal for control via a PLC ATTENTION: - If a consumer circuit (channel) is disconnected manually using the "ON/OFF" button, it can only be reconnected manually by means of the "ON/OFF" button. - If a consumer circuit (channel) is disconnected via the "CTRL" terminal, it can only be reconnected via the "CTRL" terminal. ■ ON signal level: "low" (0 V ... 1 V DC) ■ ON signal level: "high" (9 V ... 30 V DC), min. 120 ms Consumer circuits disconnected due to overload can be reconnected with this signal.
Control input CTRL terminal	Signal for control via a PLC ATTENTION: - If a consumer circuit (channel) is disconnected manually using the "ON/OFF" button, it can only be reconnected manually by means of the "ON/OFF" button. - If a consumer circuit (channel) is disconnected via the "CTRL" terminal, it can only be reconnected via the "CTRL" terminal. ■ CTRL signal: "low" (0 V ... 1 V DC) ■ CTRL signal: "high" (9 V ... 30 V DC), 40±3 ms / 400±30 ms, Consumer circuits (channels) are disconnected. ■ CTRL signal: "high" (9 V ... 30 V DC), 20±3 ms / 200±30 ms, Consumer circuits (channels) are connected. ■ CTRL signal: "high" (9 V ... 30 V DC), >600 ms, Consumer circuits (channels) are disconnected. ■ CTRL signal: "high" (9 V ... 30 V DC), CTRL&ON >500 ms, Consumer circuits (channels) are connected.
Control output Alarm 13, 14 Terminals Potential-free	Terminal contact group signal output max. 30 V AC/DC, 20 mA ■ Alarm contact: contact closed All consumer circuits (channels) in the system are connected. ■ Alarm contact: contact open At least one channel in the system is disconnected.
Control output 90% 23, 24 Terminals Potential-free	Terminal contact group signal output max. 30 V AC/DC, 20 mA ■ 90% contact: contact closed A load of >90% of the tripping current is measured on at least one consumer circuit (channel) in the system. ■ 90% contact: contact open All consumer circuits (channels) in the system are measured with a load of <90% of the tripping current.

7.4.2 Mico Pro fix

Group signals can be used via the Mico Pro power module (power feeding module). These functions are described in the manual of the Mico Pro power module.

7.4.3 Mico Pro flex

ON terminal (restart) control input	Group signals can be used via the Mico Pro power module (power feeding module). These functions are described in the manual of the Mico Pro power module. Signal for control via a PLC ATTENTION: - If a consumer circuit (channel) is disconnected manually using the "ON/OFF" button, it can only be reconnected manually by means of the "ON/OFF" button. - If a consumer circuit (channel) is disconnected via the "CTRL" terminal, it can only be reconnected via the "CTRL" terminal. ■ ON signal level: "low" (0 V ... 1 V DC) ■ ON signal level: "high" (9 V ... 30 V DC), min. 120 ms Consumer circuits disconnected due to overload can be reconnected with this signal.
Control input CTRL terminal	Signal for control via a PLC ATTENTION: - If a consumer circuit (channel) is disconnected manually using the "ON/OFF" button, it can only be reconnected manually by means of the "ON/OFF" button. - If a consumer circuit (channel) is disconnected via the "CTRL" terminal, it can only be reconnected via the "CTRL" terminal. ■ CTRL signal: "low" (0 V ... 1 V DC) ■ CTRL signal: "high" (9 V ... 30 V DC), 40±3 ms / 400±30 ms, Consumer circuits (channels) are disconnected. ■ CTRL signal: "high" (9 V ... 30 V DC), 20±3 ms / 200±30 ms, Consumer circuits (channels) are connected. ■ CTRL signal: "high" (9 V ... 30 V DC), >600 ms, Consumer circuits (channels) are disconnected. ■ CTRL signal: "high" (9 V ... 30 V DC), CTRL&ON >500 ms, Consumer circuits (channels) are connected.
Control output Alarm terminal	Signal output signal for connection to PLC inputs ■ Alarm signal level: "high" $U_{in} / 20 \text{ mA}$ When the consumer circuit (channel) is connected. ■ Alarm signal level: "low" 0 V DC When the consumer circuit (channel) is disconnected.
Control output 90-% terminal	Signal output signal for connection to PLC inputs ■ 90-% signal level: "high" U_{in} A load of >90 % of the tripping current is measured on the consumer circuit (channel). ■ 90-% signal level: "low" 0 V DC A load of <90 % of the tripping current is measured on the consumer circuit (channel).

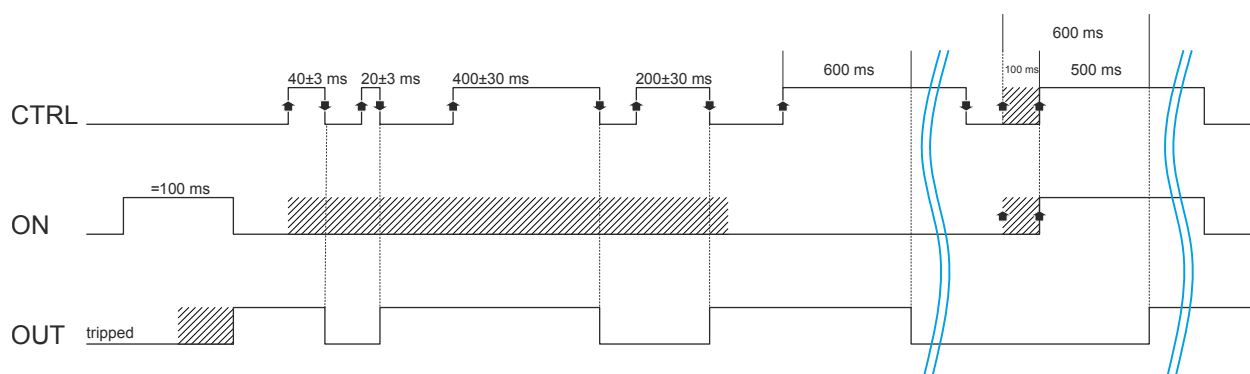


Fig. 7-8: CTRL signal diagram

7.5 Diagnostics

7.5.1 Mico Pro PM (power module)

Power

LED indication	LED state	Description
 Off	Off	Power off
 Green	Permanently lit	Power on

Tab. 7-1: Power

Alarm

LED indication	LED state	Description
 Off	Off	 No error  All channels are connected
 Red	Permanently lit	At least one channel has been disconnected through: overload, short circuit or manual switching

Tab. 7-2: Alarm

7.5.2 Mico Pro fix

ON/OFF

LED indication	LED state	Description
 Off	Off	Device is switched off (no power supply available on the input side)
 Green	Permanently lit	Channel connected, function OK
 Green	Flashing	Channel in the limit range, load >90 % of the tripping current
 Orange	Permanently lit	Channel disconnected, via CTRL control input
 Red	Permanently lit	Channel disconnected, manually via the ON/OFF button
 Red	Flashing (1 Hz)	Channel disconnected, overload, short circuit
 Red	Rapidly flashing (5 Hz)	Channel defective, external voltage available

Tab. 7-3: ON/OFF

7.5.3 Mico Pro flex

ON/OFF

LED indication	LED state	Description
 Off	Off	Device is switched off (no power supply available on the input side)
 Green	Permanently lit	Channel connected, function OK
 Green	Flashing	Channel in the limit range, load >90 % of the tripping current
 Orange	Permanently lit	Channel disconnected, via CTRL control input
 Red	Permanently lit	Channel disconnected, manually via the ON/OFF button
 Red	Flashing (1 Hz)	Channel disconnected, overload, short circuit
 Red	Rapidly flashing (5 Hz)	Channel defective, external voltage available

Tab. 7-4: ON/OFF

1 ... 10 I_{out} or 11 ... 20 I_{out}

LED indication	LED state	Description
 Off	Off	Not relevant
 Green	Permanently lit	Currently set tripping current in A (e.g. LED-1 = 1 A)
 Green	Flashing	Tripping current setting mode (See chapter Operation/Setting)

Tab. 7-5: Power

7.6 Maintenance and cleaning

NOTICE

Defective and damaged devices

They can cause material damage. The correct function of the devices is not guaranteed.

- ➔ Replace defective and damaged devices.
- ➔ Clean soiled contacts using a leather cloth only.
- ➔ Do not use contact spray.

8 Appendix

8.1 Components

Mico Pro PM (power module) Power feeding module for system supply and control options	
Designation	Art.-No.
Mico Pro PM 24 V DC / 40 A	9000-41190-0000000

Mico Pro PD (power distribution) Potential distributor	
Designation	Art.-No.
Mico Pro PD 2x12	9000-41000-0000212

Plug-In link Continuous jumper for distributing the supply voltage	
Designation	Art.-No.
Mico Pro Plug-In link 2x blue	9000-41000-0000000
Mico Pro Plug-In link 2x red	9000-41000-0000001
Mico Pro Plug-In link 1x blue and 1x red	9000-41000-0000002

Fix-Modul Load circuit monitoring with preadjusted tripping current value	
Designation	Art.-No.
Mico Pro fix 1.2	9000-41011-0200000
Mico Pro fix 1.4	9000-41011-0400000
Mico Pro fix 1.6	9000-41011-0600000
Mico Pro fix 1.8	9000-41011-0800000
Mico Pro fix 1.10	9000-41011-1000000
Mico Pro fix 1.16	9000-41011-1600000
Mico Pro fix 2.2	9000-41012-0200000
Mico Pro fix 2.4	9000-41012-0400000
Mico Pro fix 2.6	9000-41012-0600000
Mico Pro fix 4.2	9000-41014-0200000
Mico Pro fix 4.4	9000-41014-0400000
Mico Pro fix 4.6	9000-41014-0600000

Flex-Modul Load circuit monitoring with adjustable tripping current and channel-specific diagnostics and control options	
Designation	Art.-No.
Mico Pro flex 1.10	9000-41091-0101000
Mico Pro flex 1.20	9000-41091-1102000
Mico Pro flex 2.10	9000-41092-0101000
Mico Pro flex 4.10	9000-41094-0101000

8.2 Accessories



Products and accessories

You will find a wide range of products in our catalog or in the online shop of Murrelektronik GmbH "<http://shop.murrelektronik.com>"

Accessories	Type	Article number	Packaging unit
Designation label	White 10 x 5 mm (0.39 x 0.19 in)	996078	1 PU = 64 pieces

Accessories	Type	Article number	Packaging unit
Mico Pro Plug-In link 2x blue (continuous jumper)	Blue bridge 500 mm (19.69 in)	9000-41000-0000000	1 PU = 1 piece
Mico Pro Plug-In link 2x red (continuous jumper)	Red bridge 500 mm (19.69 in)	9000-41000-0000001	1 PU = 1 piece
Mico Pro Plug-In link 1x blue and 1x red (continuous jumper)	Blue and red bridge 500 mm (19.69 in)	9000-41000-0000002	1 PU = 1 piece blue and 1 piece red

Accessories	Type	Article number	Packaging unit
Cover plate left and right	green	9000-41000-0000006	1 PU = 2 piece

Accessories	Type	Article number	Packaging unit
Heavy Duty Clip	12 mm (0.47 in)	9000-41000-0000008	1 PU = 10 piece
Heavy Duty Clip	24 mm (0.94 in)	9000-41000-0000009	1 PU = 10 piece



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