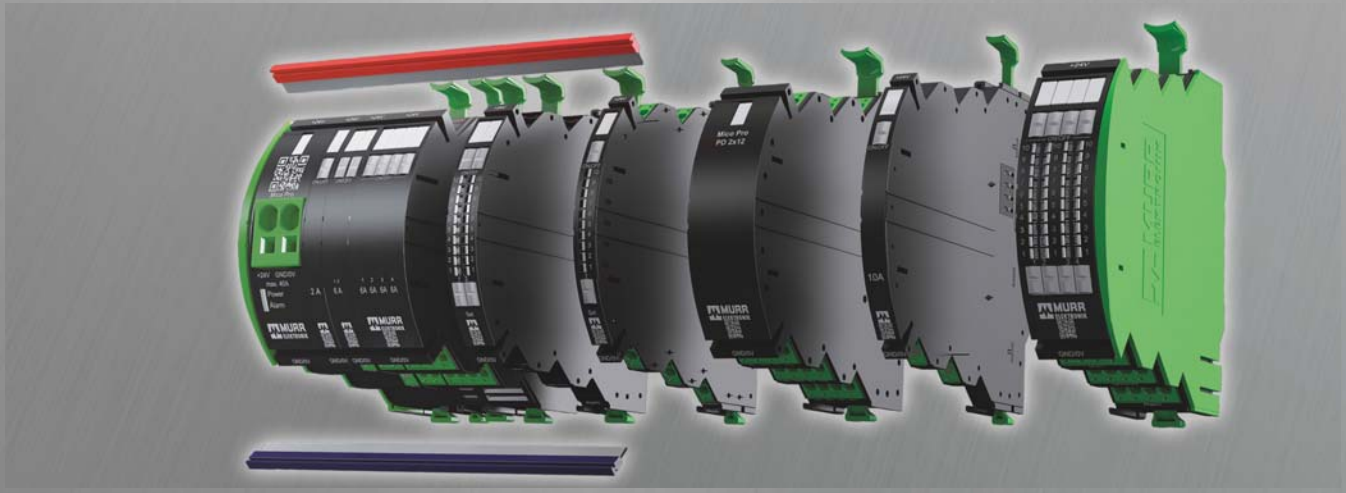
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MANUAL

Mico Pro®



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NOTE
Translation of the original instructions

This document is valid for the following products:

Mico Pro PS (power-supply)	
Designation	**Art.-No.**
Mico Pro PS 5-100-240/24	9000-41190-0000105
Mico Pro PS 10-100-240/24	9000-41190-0000110

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 PM 24 V DC / 40 A lite	9000-41190-0000001

Mico Pro PD (power distribution) **Potential distributor**	
Designation	**Art.-No.**
Mico Pro PD 2x12	9000-41000-0000212
Mico Pro PD 2x2x06	9000-41000-0002206

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 1.4 CL2	9000-41011-0400001
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 4.4 CL2	9000-41014-0400001
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 must be observed for your own safety and to avoid injuries and equipment 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 or moderate injuries.

NOTICE

Possible material damage.

➔ Failure to observe the warning may cause damage to the device and/or the system.



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 7191 47-2050 or send us an e-mail to: support@murrelektronik.com
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 PS	9000-41190-0000105	Included in the scope of delivery or downloadable from http://shop.murrelektronik.com
Operating instruction Mico Pro PM	9000-41190-0000000	
Operating instruction Mico Pro PD	9000-41000-0000212	
Operating instruction Mico Pro fix	9000-41011-0200000	
Operating instruction Mico Pro fix CL2	9000-41011-0400001	
Operating instruction Mico Pro flex	9000-41091-0101000	

1.3.3 Trademarks

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

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

1.3.4 Storage and transport

1.3.5 Environmentally friendly disposal

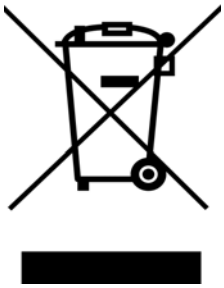
Comply with country-specific waste disposal regulations!

➔ Always dispose of scrap devices in compliance with the applicable country-specific regulations on 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.

Use of the device

➔ Comply with all safety and accident prevention regulations when conducting project engineering, installation, startup, operation, and testing of the device.

➔ Check material resistance if aggressive media are used.

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 always be 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

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.
- Have been trained for the operation of the machine/system as well as the relevant safety regulations.
- Have access to the manual and the other applicable documents (see chap. 1.3.2 "Applicable documents").
- Are familiar with the safety standards which are common practice in automation engineering.

2.3 Intended purpose

The power supply unit is designed and manufactured for:

- Industrial use.
- Installation and Operation within the specified environmental conditions.

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.

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 chap. 1.3.2 "Applicable documents"),
- the personnel was/is not qualified.

2.6 Legal regulations

2.6.1 National/international legal regulations

CE

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 **25 Mico Pro modules**, including Mico Pro power module (PM).
- ➔ Maximum of **3 Mico Pro power modules (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) **or**
PS module (power supply)
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

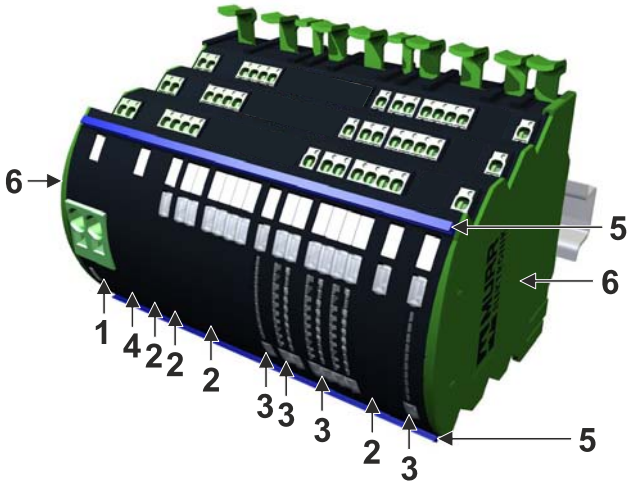


Fig. 3-1: Example of assembly

3.2 Products

3.2.1 Mico Pro PS (power supply)

Mico Pro Power-Supply (PS)		
Designation	**Article number**	**Function**
Mico Pro PS 5-100-240/24	9000-41190-0000105	■ Nominal voltage: 100 V∿ ... 240 V∿ ■ Voltage range: 90 V∿ ... 265 V∿
Mico Pro PS 10-100-240/24	9000-41190-0000110	■ Nominal voltage: 100 V∿ ... 240 V∿ ■ Voltage range: 90 V∿ ... 265 V∿

3.2.2 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 ⎓ / 40 A	9000-41190-0000000	■ Operating voltage: 12 V ⎓, 24 V ⎓ ■ Input voltage range: 9 V ... 30 V ⎓ ■ Total operating current ≤40 A ■ Control inputs and outputs ■
Mico Pro PM 24 V ⎓ / 40 A lite	9000-41190-0000001	■ Operating voltage: 12 V ⎓, 24 V ⎓ ■ Input voltage range: 9 V ... 30 V ⎓ ■ Total operating current ≤40 A ■ Control inputs and outputs ■ Slim cover plates



NOTE

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

3.2.3 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
Mico Pro PD 2x2x06	9000-41000-0002206	Group 1 ■ Operating voltage potential 6 clamps ■ GND / 0 V potential 6 clamps
		Group 2 ■ Operating voltage potential 6 clamps ■ GND / 0 V potential 6 clamps

3.2.4 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 ■ Color: blue ■ Total operating current continuous jumper: ≤40 A ■ Length: 500 mm
Mico Pro Plug-In link 2x red	9000-41000-0000001	■ 2 pieces ■ Farbe: red ■ Total operating current continuous jumper: ≤40 A ■ Length: 500 mm
Mico Pro Plug-In link 1x blue and 1x red	9000-41000-0000002	■ 1 piece blue and 1 piece red ■ Color: blue and red ■ Total operating current continuous jumper: ≤40 A ■ Length: 500 mm
Mico Pro Plug-In link 1x blue 1x red 250	9000-41000-0000003	■ 1 piece blue and 1 piece red ■ Color: blue and red ■ Total operating current continuous jumper: ≤40 A ■ Length: 250 mm

3.2.5 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 1.4 CL2	9000-41011-0400001	■ Number of channels: 1 ■ Tripping current: 3 ... 4 A (0 % ... +9 %)
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 4.4 CL2	9000-41014-0400001	■ Number of channels: 4 ■ Tripping current: 3 ... 4 A (0 % ... +9 %)
Mico Pro fix 4.6	9000-41014-0600000	■ Number of channels: 4 ■ Tripping current: 6 A (0 % ... +20 %)

3.2.6 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

Approvals

Article	CE	cULus LISTED IND. CONT. EQ. 61RM		CSA 165828	EAC	DNV-GL	Class 2 UL1310/NEC 725
Mico Pro PS 5 / 10	✓	✓	✓		✓		
Mico Pro PM	✓	✓	✓	✓	✓	✓	
Mico Pro fix 1.2	✓	✓	✓	✓	✓	✓	✓
Mico Pro fix 1.4	✓	✓	✓	✓	✓	✓	
Mico Pro fix 1.4 CL2	✓	✓	✓	✓	✓		✓
Mico Pro fix 1.6	✓	✓	✓	✓	✓	✓	
Mico Pro fix 1.8	✓	✓	✓	✓	✓	✓	
Mico Pro fix 1.10	✓	✓	✓	✓	✓	✓	
Mico Pro fix 2.2	✓	✓	✓	✓	✓	✓	✓
Mico Pro fix 2.4	✓	✓	✓	✓	✓	✓	
Mico Pro fix 2.6	✓	✓	✓	✓	✓	✓	
Mico Pro fix 4.2	✓	✓	✓	✓	✓	✓	✓
Mico Pro fix 4.4	✓	✓	✓	✓	✓	✓	
Mico Pro fix 4.4 CL2	✓	✓	✓	✓	✓		✓
Mico Pro fix 4.6	✓	✓	✓	✓	✓	✓	
Mico Pro flex 1.10	✓	✓	✓	✓	✓	✓	
Mico Pro flex 1.20	✓	✓	✓	✓	✓	✓	
Mico Pro flex 2.10	✓	✓	✓	✓	✓	✓	
Mico Pro flex 4.10	✓	✓	✓	✓	✓	✓	
Mico Pro PD 2x2x06	✓	✓		✓	✓	✓	
Mico Pro PD 2x12	✓	✓		✓	✓	✓	

DNV GL - Location classes		
	Temperature	D
	Humidity	B
	Vibration	A
	EMV	B
	Enclosure	A

PRODUCTS AND ACCESSORIES
You will find a wide range of products in our catalog or in our Murrelektronik online shop: shop.murrelektronik.com



Storage and transport

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

- ➔ Avoid mechanical vibrations during transport of the system Mico Pro.
- ➔ Adhere to the prescribed climatic conditions (see chap. 4 "Technical Data").

4 Technical Data

4.1 Mico Pro PS (Power Supply)

4.1.1 Electrical data

4.1.1.1 Input

Parameter	Conditions	Value
Nominal Voltage		100 ... 240 V ∿
Voltage range		90 ... 265 V ∿
Electric strength	≤30 seconds	300 V ∿
Power distribution system		TN, TT, IT
DC input operation		No
2-phase operation (phase-to-phase voltage)	Use external fuse for neutral side	100 ... 240 V ∿
Max. voltage L or N to PE		N/A
Nominal frequency		50/60 Hz ±6%
Leakage current		N/A

Variants Input: Nominal current, Inrush current, i^2t, Efficiency			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41190-0000105	Nominal current	115 V ∿	2.3 A
	Nominal current	230 V ∿	1.1 A
	Inrush current		≤30 A
	i^2t		1.6 A^2s
	Efficiency	115 V ∿	89,4%
	Efficiency	230 V ∿	90,8%
9000-41190-0000110	Nominal current	115 V ∿	3.7 A
	Nominal current	230 V ∿	1.7 A
	Inrush current		≤25 A
	i^2t		1.6 A^2s
	Efficiency	115 V ∿	91,8%
	Efficiency	230 V ∿	93,6%

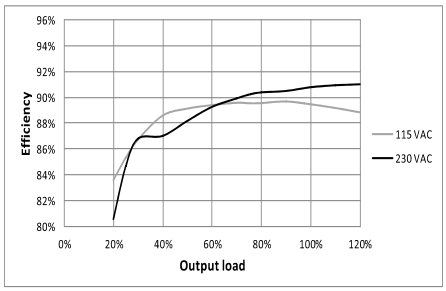


Fig. 4-1: Art.-No. 9000-41190-0000105

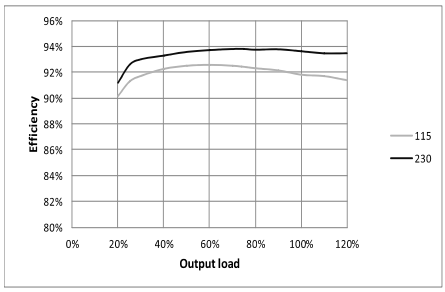


Fig. 4-2: Art.-No. 9000-41190-0000110

Variants Input: Power losses, No-load power losses, Power factor, Start-up voltage			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41190-0000105	Power losses	100% load /115 V ∿	14 W
	Power losses	100% load /230 V ∿	12 W
	Power losses	50% load /115 V ∿	7 W
	Power losses	50% load /230 V ∿	8 W
	No-load power losses	115 V ∿	1.2 W
	No-load power losses	230 V ∿	1.6 W
	Power factor	115 V ∿	0.56
	Power factor	230 V ∿	0.50
	Start-up voltage		80 V ∿
9000-41190-0000110	Power losses	100% load /115 V ∿	21 W
	Power losses	100% load /230 V ∿	16 W
	Power losses	50% load / 115 V ∿	10 W
	Power losses	50% load / 230 V ∿	8 W
	No-load power losses	115 V ∿	1.0 W
	No-load power losses	230 V ∿	1.4 W
	Power factor	115 V ∿	0.69
	Power factor	230 V ∿	0.62
	Start-up voltage		85 V ∿

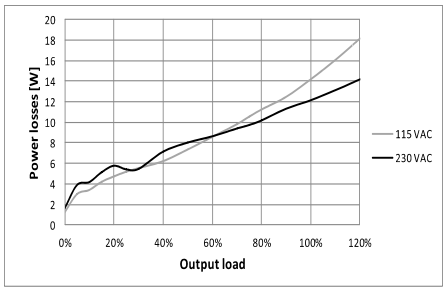


Fig. 4-3: Art.-No. 9000-41190-0000105

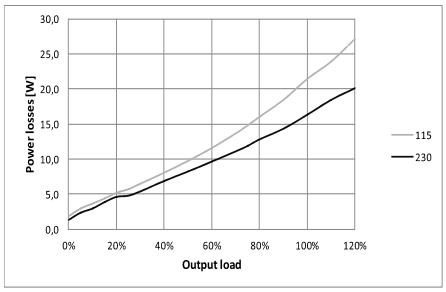


Fig. 4-4: Art.-No. 9000-41190-0000110

Parameter	Conditions	Value
PFC		Passive
Internal switching frequency		26 ... 100 kHz
Shutdown	undervoltage	65 V ∿
Shutdown	overvoltage	N/A

4.1.1.2 Output

Parameter	Conditions	Value
Parallel connection	only 9000-41190-0000110, max. 2 units	Yes
Nominal output voltage		24 V ⎓ ±1%
Factory setting		24.1 V ⎓ ±0.2%
Output voltage range		24 ... 28 V ⎓
Output voltage adjustment		potentiometer in the front plate
Dynamic regulation	<1ms	±5%
Current - Power Boost	24 V ⎓	N/A
Current - Power Boost	28 V ⎓	N/A

Parameter	Conditions	Value
Power Boost duration		N/A
Power Boost recovery time		N/A
Output power - Power Boost		N/A
Derating		N/A

Variants Output: Line regulation, Load regulation, Ripple, Spikes, Current, Output power			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41190-0000105	Line regulation		5 mV
	Load regulation		55 mV
	Ripple	Static	<15 mV rms
	Spikes	Static	<230 mV *p-p*
	Current	24 V ⎓	5.0 A
	Current	28 V ⎓	4.3 A
	Output power		120 W
9000-41190-0000110	Line regulation		1 mV
	Load regulation		650 mV
	Ripple	Static	<20 mV rms
	Spikes	Static	<380 mV *p-p*
	Current	24 V ⎓	10.0 A
	Current	28 V ⎓	8.6 A
	Output power		240 W
	Derating	90 ... 109 V ∿	≤207 W

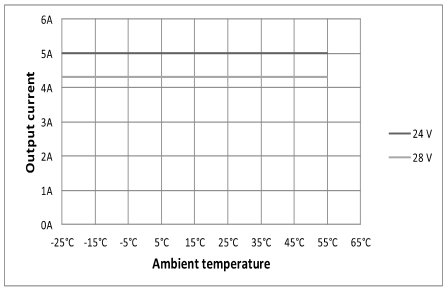


Fig. 4-5: Art.-No. 9000-41190-0000105

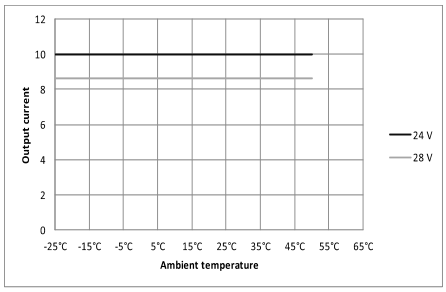


Fig. 4-6: Art.-No. 9000-41190-0000110 (90 ... 160 VAC)

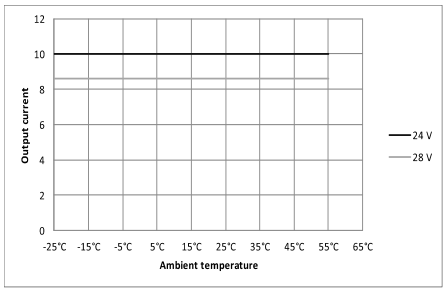


Fig. 4-7: Art.-No. 9000-41190-0000110 (161 ... 265 VAC)

Variants Output: Input failure bridging, Start-up time, Short-circuit current, Output capacitance, Return current when switched-off			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41190-0000105	Input failure bridging	115 V ∿	>20 ms
	Input failure bridging	230 V ∿	>65 ms
	Start-up time	115 V ∿	<300 ms
	Start-up time	230 V ∿	<300 ms
	Short-circuit current		7 A
	Output capacitance		4070 µF
	Return current when switched-off		27 mA
9000-41190-0000110	Input failure bridging	115 V ∿	>44 ms
	Input failure bridging	230 V ∿	>44 ms
	Start-up time	115 V ∿	<175 ms
	Start-up time	230 V ∿	<200 ms
	Short-circuit current		15 A
	Output capacitance		5270 µF
	Return current when switched-off		30 mA

Parameter	Conditions	Value
Output rise time		17 ms
Short-circuit energy	i^2t	Infinite A^2s
Extra current / hyper boost		No
Max. switchable capacity on the output		Infinite
Touch Current		<0.1 mA

4.1.2 Environmental characteristics

4.1.2.1 Climatic

Parameter	Conditions	Value
Operating temperature		-25 ... +55 °C
Operating temperature	Art.-Nr. 9000-41190-0000110 @90 ... 160 V∿	-25 ... +50 °C
Relative humidity	no condensation	5 ... 95 %
Storage temperature	short-term	-40 ... +85 °C
Storage temperature	long-term	+5 ... +35 °C
Climate class	EN 60721	3K3
Climate class	EN 60721	3C1
Installation height		-500 m ... 2000 m

4.1.2.2 Mechanical

Art.-No.	Parameter	Conditions	Value
9000-41190-0000105	Vibration test	3 axis, 60 minutes	2-17.8Hz: ±1.6 mm 17.8-500 Hz: 2,0g
	Shock test	1 shock/s, 3 axis, 3 pos. & 3 neg. per axis	15 g / 11ms
9000-41190-0000110	Vibration test	3 axis, 60 minutes	2-17.8Hz: ±1.6 mm 17.8-500 Hz: 2,0g
	Shock test	1 shock/s, 3 axis, 3 pos. & 3 neg. per axis	15 g / 11ms sinusoidal with single channel output; 20 g / 11ms sinusoidal with multi channel output

4.1.2.3 Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP20
Pollution degree		2
Overvoltage category	EN 60950-1	II
Overvoltage category	EN 50178	III

4.1.2.4 EMC-interference

Parameter	Conditions	Value
Low-voltage power supplies, d.c. output - Electromagnetic compatibility (EMC)	EN 61204-3	Emission class: **B** (residential,commercial and light industry) Immunity: **High severity level** (Industrial)

4.1.2.5 EMC-emissions

Parameter	Conditions	Value
Radiated emissions	EN 55022 CISPR 22 30 ... 1000 MHz	Class B
Conducted emissions	EN 55011 CISPR 11:2009 0.15 ... 30 MHz 0.01 ... 30 MHz	Class B
Harmonic currents		Class A
Voltage fluctiation, flicker		passed

4.1.2.6 EMC-immunity

Parameter	Conditions	Value
Electrostatic discharge	EN 61000-4-2	Contact: ±6 kV Criterion A Air: ±8 kV Criterion A
Electromagnetic RF Field	EN 61000-4-3	80 MHz ... 2 GHz, 10 V/m, Criterion A
Fast transient (Burst)	EN 61000-4-4	Input: ±2 kV Criterion A Output: ± 2kV Criterion A
Surge voltage	EN 61000-4-5	Line to Line (DM) ±0.5 kV / ±1 kV Criterion A
Conducted disturbances	EN 61000-4-6	0.15 ... 80 MHz, 10 Vemf Criterion A
Voltage dips and short interruptions	EN 61000-4-11	70% / 10 ms, Criterion A; 40% / 100 ms, Criterion A; 0% / 5 s, Criterion C

After installation in a system, the EMC emission values may vary (eg due to other ground connections). The installer is responsible for the EMC behavior of the entire system.

4.1.3 Protection

4.1.3.1 Input protections

Parameter	Conditions	Value
Branch circuit protection max.	in building installation	32 A (T)
Overvoltage protection (L ... N)	Metal-Oxide-Varistor	300 V ∿ / 6 kA
Overvoltage protection (L/N ... PE)		N/A
Undervoltage protection		Yes, electronic

Variants Input protection: Internal device protection			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41190-0000105	Internal device protection		3,15 A (T)
9000-41190-0000110	Internal device protection		6.3 A (T)

4.1.3.2 Recommended Branch Circuit Protections

Current	Miniature Circuit Breaker					Neozed fuse or equivalent	Power Switch
	A	B	C	D	K	gG	≤13 x I_{in}
2 A	-	-	-	-	-	-	-
4 A	-	-	-	-	-	X	X
6 A	-	-	X	X	X	X	X
8 A	-	X	X	X	X	X	X
10 A	X	X	X	X	X	X	X
16 A	X	X	X	X	X	X	X
20 A	X	X	X	X	X	X	X
24 A	X	X	X	X	X	X	X
32 A	X	X	X	X	X	X	X

Tab. 4-1: Art.-No. 9000-41190-0000105

Current	Miniature Circuit Breaker					Neozed fuse or equivalent	Power Switch
	A	B	C	D	K	gG	≤13 x I_{in}
2 A	-	-	-	-	-	-	-
4 A	-	-	-	-	-	-	-
6 A	-	-	-	-	-	X	X
8 A	-	-	X	X	X	X	X
10 A	-	X	X	X	X	X	X
16 A	X	X	X	X	X	X	X
20 A	X	X	X	X	X	X	X
24 A	X	X	X	X	X	X	X
32 A	X	X	X	X	X	X	X

Tab. 4-2: Art.-No. 9000-41190-0000110

4.1.3.3 Output protections

Parameter	Conditions	Value
Overload protection (OLP)		Yes, autorestart
Over temperature protection (OTP)		Yes, autorestart
Short-circuit protection (OCP)		Yes, constant current
Overvoltage protection from device to load (OVP)		Yes, type 31 V ⎓
Overvoltage protection from load to device		No
Resistance to back feeding loads		≤35 V ⎓, autostart
Reverse polarity protection		No
Input / Output separation		Double or reinforced galvanic isolation

4.1.3.4 Output protections with signal connector

Parameter	Conditions	Value
Overvoltage protection		-36 ... +36 V ⎓ / 600 W (10/1000 us)
Short-circuit protection		N/A
Reverse polarity protection		N/A
Overcurrent protection		No

4.1.4 Isolation voltages

4.1.4.1 Type testing

Parameter	Conditions	Value
Input-output		3000 V ∿
Input-PE		N/A
Output-PE		N/A
Output-Alarm		500 V ∿
Current limit		10 mA

4.1.4.2 Routine testing

Parameter	Conditions	Value
Input-output		3000 V ∿
Input-PE		N/A
Output-PE		N/A
Output-Alarm		N/A
Current limit		10 mA

4.1.4.3 Field testing

Parameter	Conditions	Value
Input-output		1750 V ∿
Input-PE		N/A
Output-PE		N/A
Output-Alarm		500 V ∿
Current limit		10 mA

4.1.4.4 Isolation resistance

Parameter	Conditions	Value
Input-output		>50 MOhm
Input-PE		N/A
Output-PE		N/A
Output-Alarm		N/A

4.1.4.5 PE resistance

Parameter	Conditions	Value
PE resistance		N/A

4.1.5 Mechanical data

4.1.5.1 Materials

Parameter	Conditions	Value
Flame resistance	UL 94	V-0
Housing material		PA
Protection class	IEC 61140	2

4.1.5.2 Mounting data

Art.-No. 9000-41190-0000105		
Parameter	**Conditions**	**Value**
Dimension	Depth (D)	114 mm
Dimension	Height with unlocking actuator (H)	130 mm
Dimension	Height without unlocking actuator (H2)	111 mm
Dimension	Width (W)	54 mm
Net weight		0.41 kg

Art.-No. 9000-41190-0000110		
Parameter	**Conditions**	**Value**
Dimension	Depth (D)	114 mm
Dimension	Height with unlocking actuator (H)	130 mm
Dimension	Height without unlocking actuator (H2)	111 mm
Dimension	Width (W)	74 mm
Net weight		0.67 kg

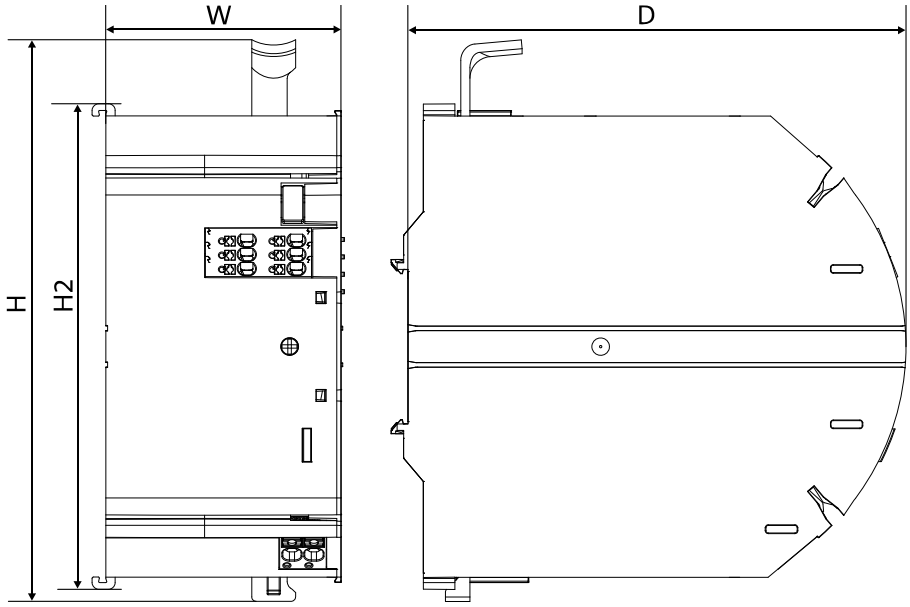


Fig. 4-8: Dimensions

4.1.6 Product reliability

Art.-No.	Parameter	Conditions	Value
9000-41190-0000105	MTBF	100% load, Ta: 40 °C DIN EN 61709:1999-01, SN 29500, DIN EN ISO 13849-1:2008-12	>1500000 h
9000-41190-0000110	MTBF	100% load, Ta: 40 °C DIN EN 61709:1999-01, SN 29500, DIN EN ISO 13849-1:2008-12	>800000 h

4.1.7 Conformity, Approvals

Parameter	Conditions	Value
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	UL 508	
UR	UL 60950-1	
CB Scheme	IEC 60950-1	

4.2 Mico Pro PM (power module)

4.2.1 Electrical data

4.2.1.1 Input

Parameter	Conditions	Value
Operating voltage		12 V ⎓, 24 V ⎓
Input voltage range		9 V ... 30 V ⎓
Cut-in/cut-out frequency		0.5 Hz
Total operating current		40 A
Supply current		≥5 A

4.2.1.2 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	Ctrl functions 2 & 3 are available from software version **1.06a** onwards. (XXXXXX-X.XX-1.06a)	1 | OFF: "high" 40±3 ms ON: "high" 20±3 ms 2 | OFF: "high" 400±30 ms ON: "high" 200±30 ms 3 | OFF: "high" >600 ms, ON: "high" CTRL & ON >600 ms
CTRL switching frequency		≤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

4.2.1.3 Output

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

4.2.1.4 Control output

Parameter	Conditions	Value
Ohmic resistance terminals "Alarm"	Input voltage 0 V	100 kOhm ±1 kOhm
Ohmic resistance terminals "Alarm"	Input voltage ≥9 V Min. 1 channel in composite off	100 kOhm ±1 kOhm
Ohmic resistance terminals "Alarm"	Input voltage ≥9 V all channel in composite off	35 Ohm ±15 Ohm
Adjustable voltage terminals "Alarm"		≤30 V ∿/⎓
Current at terminal "Alarm"		≤20 mA

Parameter	Conditions	Value
Ohmic resistance terminals "90 %"	Input voltage 0 V	100 kOhm ±1 kOhm
Ohmic resistance terminals "90 %"	Input voltage ≥9 V all channel with output current ≥90 % trigger current	100 kOhm ±1 kOhm
Ohmic resistance terminals "90 %"	Input voltage ≥9 V min. 1 channel with output current ≥90 % trigger current	35 Ohm ±15 Ohm
Adjustable voltage terminals "90 %"		≤30 V ∿/⎓
Current at terminal "90 %"		≤20 mA

4.2.1.5 Performance record

Art.-No.	Percentage load	Power loss	Efficiency	Voltage drop per channel
9000-41190-0000000	25 %	0,58 W	99,8 %	-
	50 %	1,28 W	99,7 %	0,04 V
	75 %	1,50 W	99,8 %	-
	100 %	3,26 W	99,7 %	-

4.2.2 Environmental characteristics

4.2.2.1 Climatic

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

4.2.2.2 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	**9000-41190-0000000:** 1/2 sin 40 g, 11 ms **9000-41190-0000001:** 1/2 sin 30 g, 11 ms
Shocks caused by rough handling	(Drop test)	1 m

4.2.2.3 Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP20
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

4.2.2.4 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

4.2.2.5 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

4.2.3 Protection

4.2.3.1 Device protection

Parameter	Conditions	Value
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)

4.2.4 Mechanical data

4.2.4.1 Materials

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

4.2.4.2 Mounting data

Parameter	Conditions	Value
Dimension	Depth (D)	114 m
Dimension	Height with unlocking actuator (H)	130 mm
Dimension	Height without unlocking actuator (H2)	111 mm
Dimension	Width (W), 0.35 mm are inserted into the adjacent module	24.35 mm
Dimension	Mounting (a)	55.5 mm
Dimension	Mounting (b)	15.5 mm
Dimension	Mounting (c)	3.5 mm
Dimension	Mounting (d)	7.5 mm
Net weight		100 g

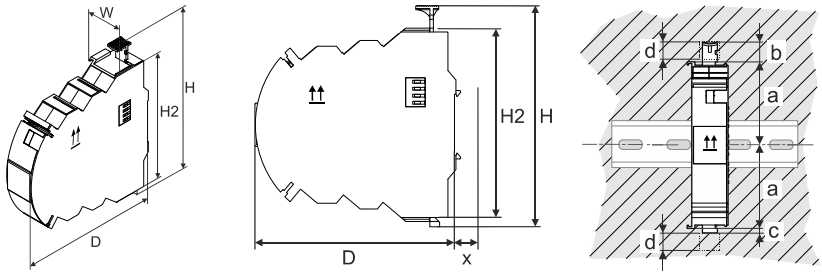


Fig. 4-9: Dimensions

4.2.5 Product reliability

Parameter	Conditions	Value
MTBF	40 °C; DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	4727675 h
MTBF	55 °C; DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	2954797 h

4.2.6 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

4.3 Mico Pro PD (power distribution)

4.3.1 Electrical data

4.3.1.1 Input

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

Variants input current			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41000-0000212	Max. input current	Total	20 A
9000-41000-0002206	Max. input current	Total	2x20 A

4.3.1.2 Output

Variants output current			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41000-0000212	Output current (I_{Σ})	Total	≤20 A
	Output current	Per clamp (U+ / 0 V)	≤20 A
9000-41000-0002206	Output current (I_{Σ})	Total	≤2x20 A
	Output current	Per clamp (U1 / U2 / 0 V)	≤20 A

4.3.1.3 Performance record

Art.-No.	Percentage load	Power loss	Efficiency	Voltage drop per channel
9000-41000-0000212	25 %	0,66 W	99,5 %	-
	50 %	2,78 W	98,8 %	0,23 V
	75 %	5,04 W	98,6 %	-
	100 %	8,91 W	98,1 %	-
9000-41000-0002206	25 %	1,11 W	99,1 %	-
	50 %	4,20 W	98,2 %	0,37 V
	75 %	7,94 W	97,7 %	-
	100 %	11,31 W	97,6 %	-

4.3.2 Environmental characteristics

4.3.2.1 Climatic

Symbol	Parameter	Conditions	Value
	Relative humidity	No condensation	5 ... 85 %
	Storage temperature		-40 ... +80 °C
	Climate class	IEC/EN 60721-3-3	3K3
Ta	Surrounding air temperature range		-25 ... +55 °C

Variants installation height			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41000-0000212	Installation height	Above sea level, without any restrictions	-500 m ... 2000 m
	Installation height	Above sea level, max. 16 A total operating current	2000 m ... 4000 m
	Installation height	Above sea level, max. 12 A total operating current	4000 m ... 6000 m
9000-41000-0002206	Installation height	Above sea level, without any restrictions	-500 m ... 2000 m
	Installation height	Above sea level, max. 2x16 A total operating current	2000 m ... 4000 m
	Installation height	Above sea level, max. 2x12 A total operating current	4000 m ... 6000 m

4.3.2.2 Mechanical

Parameter	Conditions	Value
Vibration test		see Power Module
Shock test		see Power Module
Shocks caused by rough handling	(Drop test)	1 m

4.3.2.3 Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP20
Pollution degree		2
Overvoltage category		III
Insulation voltage input-output	Type testing / routine check test	50 V

4.3.2.4 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

4.3.2.5 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

Parameter	Conditions	Value
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

4.3.3.1 Device protection

Parameter	Conditions	Value
Short circuit protection		Short circuit-proof
Overvoltage protection input		Suppressor diode 36 V

4.3.4 Mechanical data

4.3.4.1 Materials

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

4.3.4.2 Mounting data

Parameter	Conditions	Value
Dimension	Depth (D)	114 mm
Dimension	Height with unlocking actuator (H)	130 mm
Dimension	Height without unlocking actuator (H2)	111 mm
Dimension	Width (W), 0.35 mm are inserted into the adjacent module	24.35 mm
Dimension	Mounting (a)	55.5 mm
Dimension	Mounting (b)	15.5 mm
Dimension	Mounting (c)	3.5 mm
Dimension	Mounting (d)	7.5 mm
Net weight		105 g

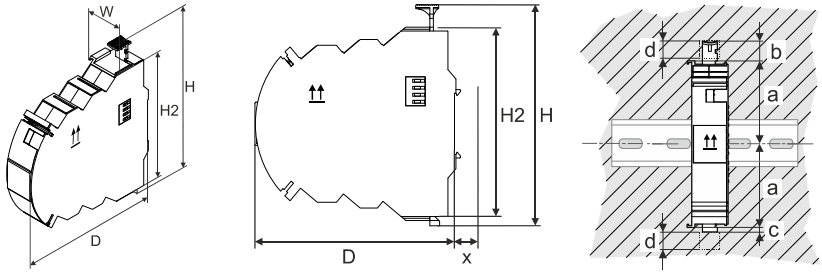


Fig. 4-10: Dimensions

4.3.5 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

4.4 Mico Pro Plug-In link

4.4.1 Electrical data

4.4.1.1 Input

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

4.4.2 Environmental characteristics

4.4.2.1 Climatic

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

4.4.2.2 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

4.4.2.3 Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP20
Pollution degree		2
Overvoltage category		III

4.4.3 Mechanical data

4.4.3.1 Materials

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

Variants Color			
Art.-No.	**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

4.4.3.2 Mounting data

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

4.4.4 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

4.5 Mico Pro fix module

4.5.1 Electrical data

4.5.1.1 Input

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

4.5.1.2 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 7 "Operation")
Disconnecting characteristics accuracy	Current	0 % … +20 %
Nominal output voltage		Same as input
Turn-on capacity	1 channel, dependent on: component tolerance, wire length, used power supply, load current, selected current range	≤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
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

Variants Output: Number of channels, Tripping current (I_N), Output current (I_Σ), Power-up delay			
Art.-No.	**Parameter**	**Conditions**	**Value**
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

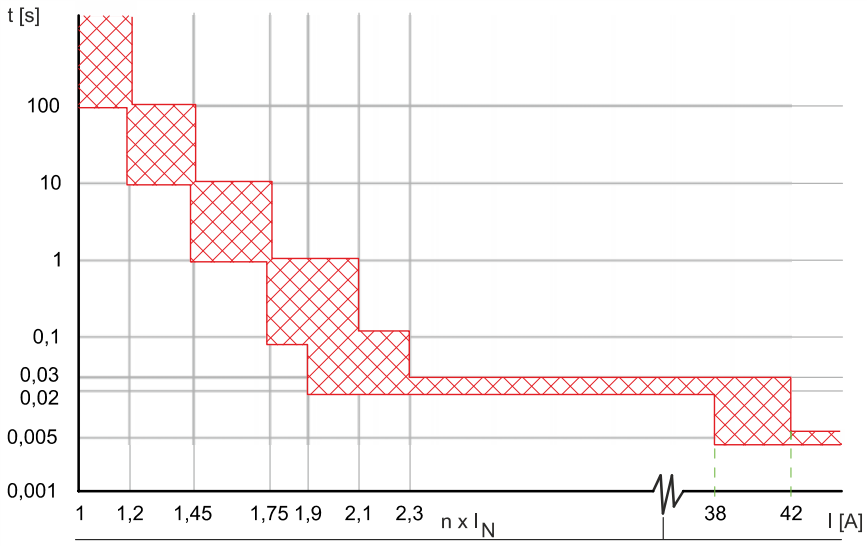


Fig. 4-11: Disconnecting characteristics | Tripping current

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

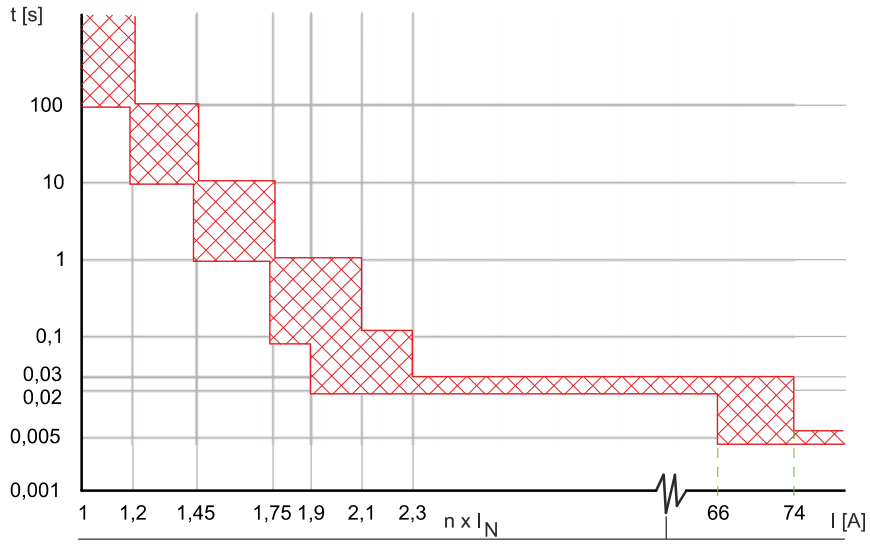


Fig. 4-12: Disconnecting characteristics | Tripping current

4.5.1.3 Performance record

Art.-No.	Percentage load	Power loss (W)	Efficiency	Voltage drop per channel
9000-41011-0200000	25 %	0,25 W	98,0 %	-
	50 %	0,26 W	99,0 %	0,23 V
	75 %	0,32 W	99,1 %	-
	100 %	0,27 W	99,5 %	-
9000-41011-0400000	25 %	0,59 W	97,6 %	-
	50 %	0,64 W	99,4 %	0,16 V
	75 %	0,79 W	98,9 %	-
	100 %	1,09 W	98,9 %	-
9000-41011-0600000	25 %	0,90 W	97,6 %	-
	50 %	1,05 W	99,5 %	0,13 V
	75 %	1,22 W	98,9 %	-
	100 %	1,56 W	98,9 %	-
9000-41011-0800000	25 %	0,37 W	99,2 %	-
	50 %	0,33 W	99,5 %	0,11 V
	75 %	0,97 W	99,4 %	-
	100 %	1,52 W	99,2 %	-
9000-41011-1000000	25 %	0,24 W	99,6 %	-
	50 %	0,41 W	99,6 %	0,10 V
	75 %	1,07 W	99,4 %	-
	100 %	1,84 W	99,2 %	-
9000-41011-1600000	25 %	0,40 W	99,6 %	-
	50 %	0,66 W	99,6 %	0,09 V
	75 %	2,28 W	99,2 %	-
	100 %	3,76 W	99,0 %	-
9000-41012-0200000	25 %	0,32 W	98,7 %	-
	50 %	0,42 W	99,3 %	0,18 V
	75 %	0,51 W	99,3 %	-
	100 %	0,39 W	99,6 %	-
9000-41012-0400000	25 %	0,47 W	99,0 %	-
	50 %	0,61 W	99,3 %	0,17 V
	75 %	0,94 W	99,4 %	-
	100 %	1,33 W	99,3 %	-
9000-41012-0600000	25 %	0,77 W	99,0 %	-
	50 %	0,95 W	99,4 %	0,15 V
	75 %	1,44 W	99,3 %	-
	100 %	1,79 W	99,4 %	-
9000-41014-0200000	25 %	1,02 W	97,9 %	-
	50 %	0,83 W	99,1 %	0,21 V
	75 %	1,13 W	99,2 %	-
	100 %	1,46 W	99,2 %	-
9000-41014-0400000	25 %	1,32 W	98,7 %	-
	50 %	1,65 W	99,4 %	0,16 V
	75 %	2,48 W	99,2 %	-
	100 %	3,92 W	99,0 %	-

Art.-No.	Percentage load	Power loss (W)	Efficiency	Voltage drop per channel
9000-41014-0600000	25 %	1,16 W	99,2 %	-
	50 %	2,11 W	99,4 %	0,15 V
	75 %	3,82 W	99,1 %	-
	100 %	6,41 W	98,9 %	-

4.5.2 Environmental characteristics

4.5.2.1 Climatic

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

Variants installation height		
Art.-No.	**Conditions**	**Value**
9000-41011-0200000	Above sea level, without any restrictions	-500 m ... 6000 m
9000-41011-0400000		
9000-41011-0600000		
9000-41012-0200000		
9000-41012-0400000		
9000-41012-0600000		
9000-41014-0200000		
9000-41014-0400000		
9000-41014-0600000		
9000-41011-0800000	Above sea level, without any restrictions	-500 m ... 4000 m
	Above sea level, max. 6 A trigger current full load per channel	4000 m ... 6000 m
9000-41011-1000000	Above sea level, without any restrictions	-500 m ... 2000 m
	Above sea level, max. 8 A trigger current full load per channel	2000 m ... 4000 m
	Above sea level, max. 6 A trigger current full load per channel	4000 m ... 6000 m
9000-41011-1600000	Above sea level, without any restricitons	-500 m ... 4000 m
	Above sea level, max. 12 A trigger current full load per channel	4000 m ... 6000 m

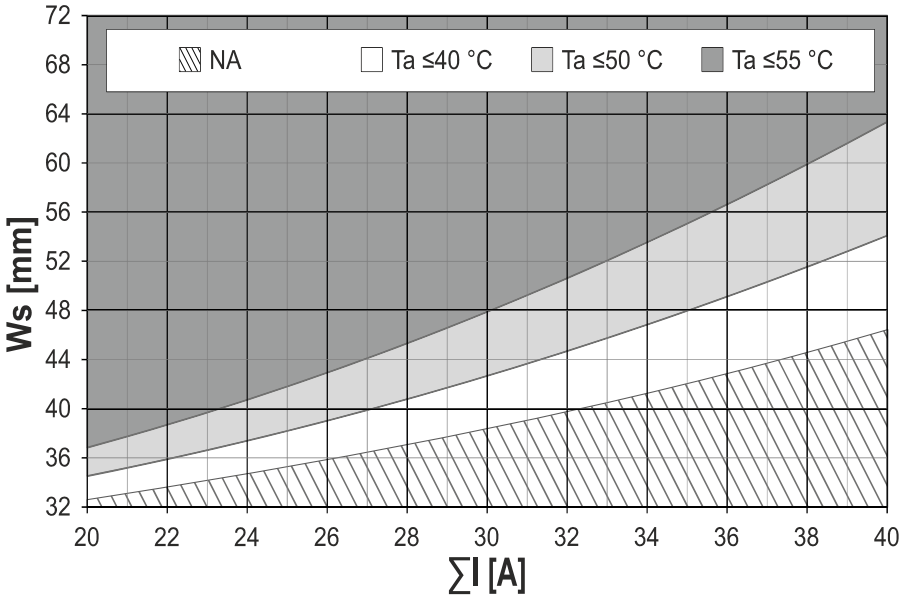


Fig. 4-13: Temperature derating

Ws System width

∑I Total current

NA Not allowed

4.5.2.2 Mechanical

Parameter	Conditions	Value
Vibration test		see Power Module
Shock test		see Power Module
Shocks caused by rough handling	(Drop test)	1 m

4.5.2.3 Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP20
Pollution degree		2
Overvoltage category		III
Insulation voltage input-output	Type testing / routine check test	50 V

4.5.2.4 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

4.5.2.5 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

4.5.3.1 Device protection

Parameter	Conditions	Value
Short circuit protection		Short circuit-proof
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
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 1.10	10 A	Safety fuse 15 A (F) fast-blow fuse
9000-41011-1600000	Mico Pro fix 1.16	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 4 A (T) time-lag fuse
9000-41014-0600000	Mico Pro fix 4.6	6 A	Safety fuse 6,3 A (T) time-lag fuse

4.5.4 Mechanical data

4.5.4.1 Materials

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

4.5.4.2 Mounting data

Parameter	Conditions	Value
Dimension	Depth (D)	114 mm
Dimension	Height with unlocking actuator (H)	130 mm
Dimension	Height without unlocking actuator (H2)	111 mm
Dimension	Mounting (a)	55.5 mm
Dimension	Mounting (b)	15.5 mm
Dimension	Mounting (c)	3.5 mm
Dimension	Mounting (d)	7.5 mm

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 are inserted into the adjacent module	8,35 mm
9000-41011-1600000, 9000-41012-0200000, 9000-41012-0400000, 9000-41012-0600000	Dimension		12,35 mm
9000-41014-0200000, 9000-41014-0400000, 9000-41014-0600000	Dimension		24,35 mm

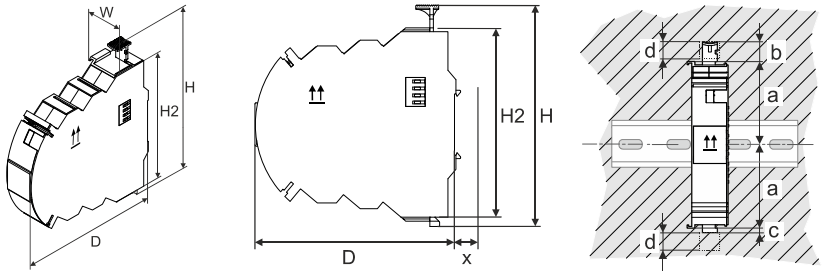


Fig. 4-14: Dimensions

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

Variants Net weight			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41011-1600000	Net weight		60 g
9000-41012-0200000, 9000-41012-0400000, 9000-41012-0600000	Net weight		64 g
9000-41014-0200000, 9000-41014-0400000, 9000-41014-0600000	Net weight		96 g

4.5.5 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; 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; DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	1519199 h

4.5.6 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

4.6 Mico Pro fix CL2 module

4.6.1 Electrical data

4.6.1.1 Input

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

4.6.1.2 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 7 "Operation")
Disconnecting characteristics accuracy	Current	0 % … +9 %
Nominal output voltage		Same as input
Turn-on capacity	Until SW 1.01; 1 channel, dependent on: component tolerance, wire length, used power supply, load current, selected current range	≤20 mF
Turn-on capacity	1 channel, dependent on: component tolerance, wire length, used power supply, load current, selected current range	≤30 mF

Variants Output: Number of channels, Tripping current (I_N), Output current (I_Σ), Power-up delay			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41011-0400001	Number of channels		1
	Tripping current (I_N)	Full load	3 ... 4 A (+9%)
9000-41014-0400001	Number of channels		4
	Tripping current (I_N)	Full load per channel	3 ... 4 A (+9%)
	Output current (I_Σ)	Full load all channels	16 A
	Power-up delay	Per channel to avoid inrush current peaks	75 ms

Characteristics: Tripping current

For Mico Pro fix 1.4 CL2 / 4.4 CL2

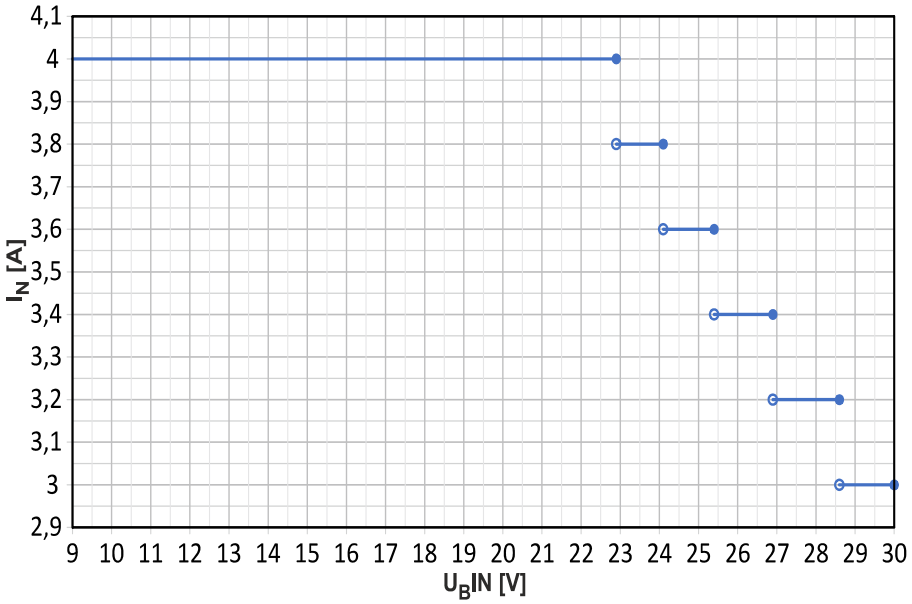


Fig. 4-15: Tripping current for Mico Pro fix 1.4 CL2 and Mico Pro fix 4.4 CL2

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

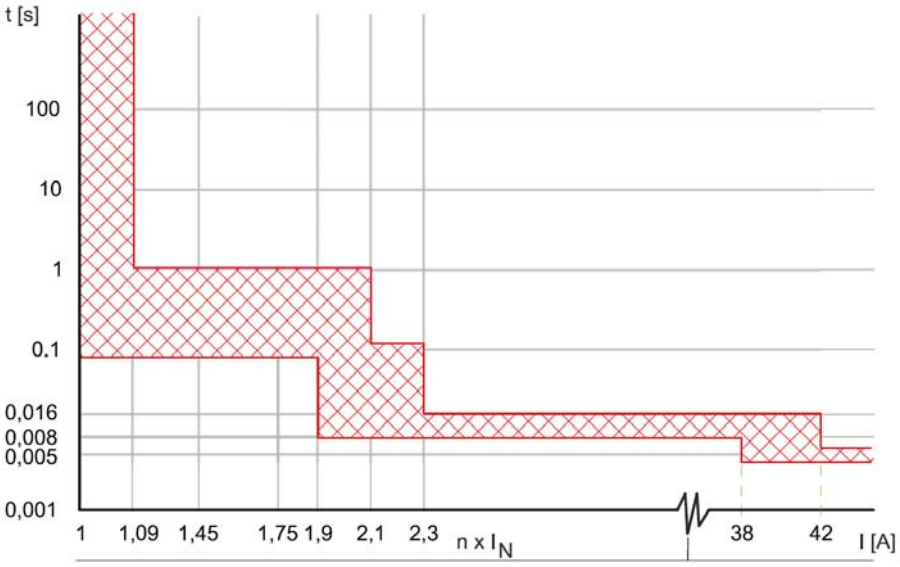


Fig. 4-16: Disconnecting characteristics | Tripping current

4.6.1.3 Performance record

Art.-No.	Percentage load	Power loss	Efficiency	Voltage drop per channel
9000-41011-0400001	25 %	0,33 W	98,7 %	-
	50 %	0,41 W	99,6 %	0,06 V
	75 %	0,72 W	99,0 %	-
	100 %	0,92 W	99,0 %	-
9000-41014-0400001	25 %	1,28 W	98,7 %	-
	50 %	1,72 W	99,6 %	0,06 V
	75 %	2,57 W	99,1 %	-
	100 %	4,49 W	98,8 %	-

4.6.2 Environmental characteristics

4.6.2.1 Climatic

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

Variants installation height		
Art.-No.	**Conditions**	**Value**
9000-41011-0400001	Above sea level, without any restrictions	-500 m ... 6000 m
9000-41014-0400001		

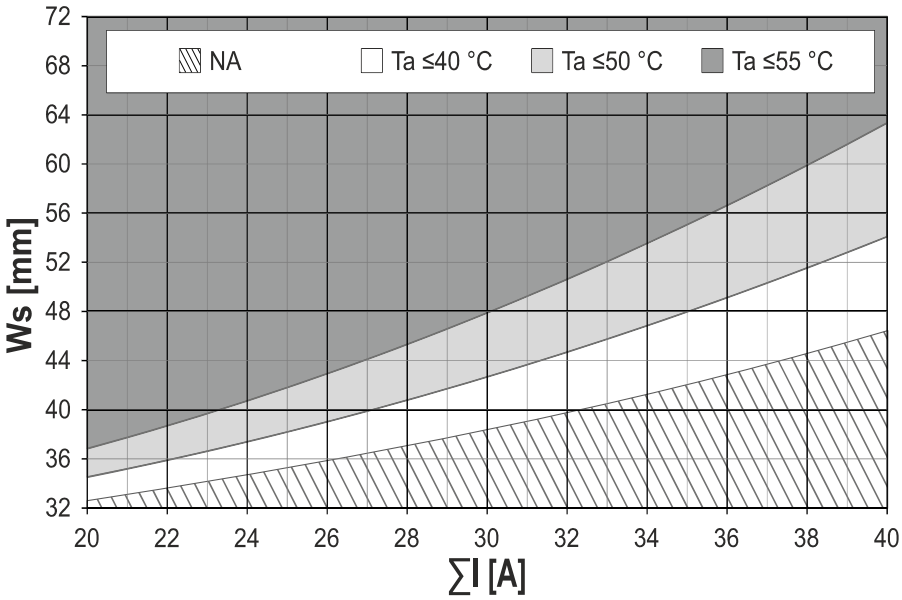


Fig. 4-17: Temperature derating

Ws System width

∑I Total current

NA Not allowed

4.6.2.2 Mechanical

Parameter	Conditions	Value
Vibration test		see Power Module
Shock test		see Power Module
Shocks caused by rough handling	(Drop test)	1 m

4.6.2.3 Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP20
Pollution degree		2
Overvoltage category		III
Insulation voltage input-output	Type testing / routine check test	50 V

4.6.2.4 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

4.6.2.5 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

4.6.3 Protection

4.6.3.1 Device protection

Parameter	Conditions	Value
Short circuit protection		Short circuit-proof
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**
9000-41011-0400001	Mico Pro fix 1.4 CL2	4 A	Safety fuse 4 A (T) time-lag fuse
9000-41014-0400001	Mico Pro fix 4.4 CL2	4 A	Safety fuse 4 A (T) time-lag fuse

4.6.4 Mechanical data

4.6.4.1 Materials

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

4.6.4.2 Mounting data

Parameter	Conditions	Value
Dimension	Depth (D)	114 mm
Dimension	Height with unlocking actuator (H)	130 mm
Dimension	Height without unlocking actuator (H2)	111 mm
Dimension	Mounting (a)	55.5 mm

Parameter	Conditions	Value
Dimension	Mounting (b)	15.5 mm
Dimension	Mounting (c)	3.5 mm
Dimension	Mounting (d)	7.5 mm

Variants Dimension Width (W)			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41011-0400001	Dimension	Width (W), 0.35 mm are inserted into the adjacent module	8,35 mm
9000-41014-0400001	Dimension		24,35 mm

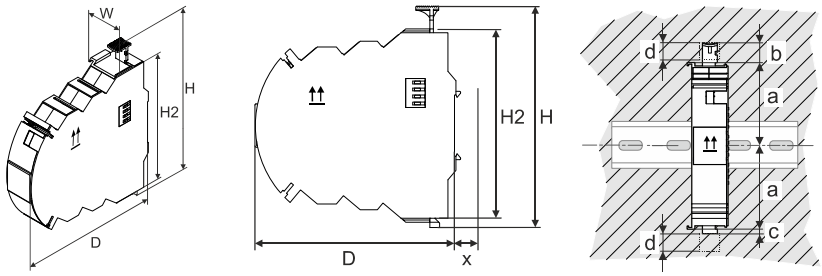


Fig. 4-18: Dimensions

Variants Net weight			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41011-0400001	Net weight		56 g
9000-41014-0400001	Net weight		108 g

4.6.5 Product reliability

Variants MTBF, MTTF			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41011-0400001	MTBF	40 °C; DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	2426001 h
	MTBF	55 °C; DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	1076888 h
9000-41014-0400001	MTBF	40 °C; DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	1516251 h
	MTBF	55 °C; DIN EN 61709:1999-01; SN 29500; DIN EN ISO 13849-1:2008-12	673055 h

4.6.6 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

Parameter	Conditions	Value
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

4.7 Mico Pro flex module

4.7.1 Electrical data

4.7.1.1 Input

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

4.7.1.2 Control input

Parameter	Conditions	Value
CTRL input voltage		Low 0 V … 1 V, high 9 V … 30 V
CTRL control current		High ≤6 mA
CTRL signal	Ctrl functions 2 & 3 are available from software version **1.06a** onwards. (XXXXXX-X.XX-1.06a)	1 | OFF: "high" 40±3 ms ON: "high" 20±3 ms 2 | OFF: "high" 400±30 ms ON: "high" 200±30 ms 3 | OFF: "high" >600 ms, ON: "high" CTRL & ON >600 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 ≤6 mA
ON pulse length	0 V and pulse	ON: "high" 120 ms
ON overvoltage protection		Suppressor diode 36 V

4.7.1.3 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 7 "Operation")
Disconnecting characteristics accuracy	Current	0 % … +20 % (-5% ... +15%)
Nominal output voltage		Same as input
Turn-on capacity	1 channel, dependent on: component tolerance, wire length, used power supply, load current, selected current range	≤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

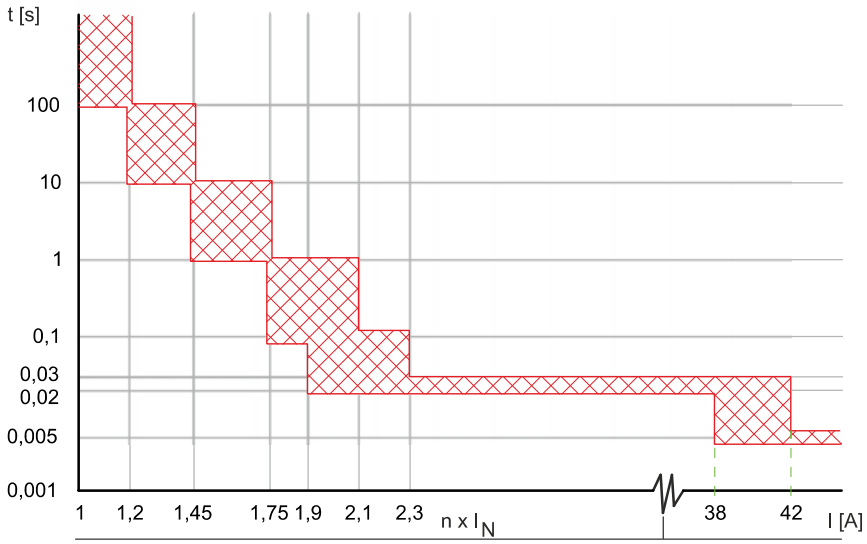


Fig. 4-19: Disconnecting characteristics | Tripping current

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

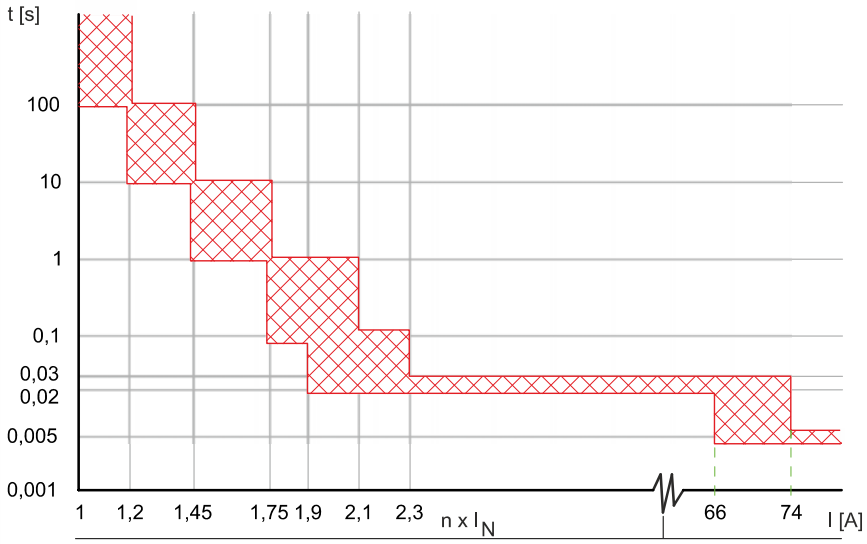


Fig. 4-20: Disconnecting characteristics | Tripping current

4.7.1.4 Control output

Parameter	Conditions	Value
Output voltage terminal "Alarm"	Channel off	0 V
Output voltage terminal "Alarm"	Channel on	Input voltage
Current terminal "Alarm"		≤20 mA

Parameter	Conditions	Value
Output voltage terminal "90 %"	Channel with output current ≤90 % trigger current	0 V
Output voltage terminal "90 %"	Channel with output current ≤90 % trigger current	Input voltage
Current terminal		≤20 mA

4.7.1.5 Performance record

Art.-No.	Percentage load	Power loss	Efficiency	Voltage drop per channel
9000-41091-0101000	25 %	0,34 W	99,4 %	-
	50 %	0,69 W	99,8 %	0,04V
	75 %	1,30 W	99,3 %	-
	100 %	1,60 W	99,3 %	-
9000-41091-1102000	25 %	0,49 W	99,6 %	-
	50 %	0,77 W	99,6 %	0,09 V
	75 %	1,94 W	99,5 %	-
	100 %	3,53 W	99,3 %	-
9000-41092-0101000	25 %	0,35 W	99,7 %	-
	50 %	1,23 W	99,6 %	0,09 V
	75 %	2,13 W	99,4 %	-
	100 %	3,83 W	99,2 %	-
9000-41094-0101000	25 %	1,74 W	99,3 %	-
	50 %	3,30 W	99,3 %	0,16 V
	75 %	6,86 W	99,0 %	-
	100 %	10,60 W	98,9 %	-

4.7.2 Environmental characteristics

4.7.2.1 Climatic

Parameter	Conditions	Value
Relative humidity		5 ... 85 %
Storage temperature		-40 ... +80 °C
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
9000-41091-0101000, 9000-41092-0101000	Installation height	Above sea level, max. 8 A tripping current full load per channel	2000 m ... 4000 m
9000-41091-0101000, 9000-41092-0101000	Installation height	Above sea level, max. 6 A tripping current full load per channel	4000 m ... 6000 m
9000-41091-1102000	Installation height	Above sea level, max. 16 A tripping current full load per channel	2000 m ... 4000 m
9000-41091-1102000	Installation height	Above sea level, max. 12 A tripping current full load per channel	4000 m ... 6000 m
9000-41094-0101000	Installation height	Above sea level, max. 8 A tripping current full load per channel, max. +40°C Ta	2000 m ... 4000 m
9000-41094-0101000	Installation height	Above sea level, max. 6 A tripping current full load per channel, max. +55°C Ta	2000 m ... 4000 m
9000-41094-0101000	Installation height	Above sea level, max. 6 A tripping current full load per channel, max. +40°C Ta	4000 m ... 6000 m
9000-41094-0101000	Installation height	Above sea level, max. 4 A tripping current full load per channel, max. +55°C Ta	4000 m ... 6000 m

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 (Ta)	-25 ... +55 °C
9000-41094-0101000	Mico Pro flex 4.10	Surrounding air temperature range (Ta), take notice of Characteristics: Tripping current | Surrounding air temperatur	-25 ... +55 °C
9000-41091-1102000	Mico Pro flex 1.20	Surrounding air temperature range (Ta)	-25 ... +50 °C

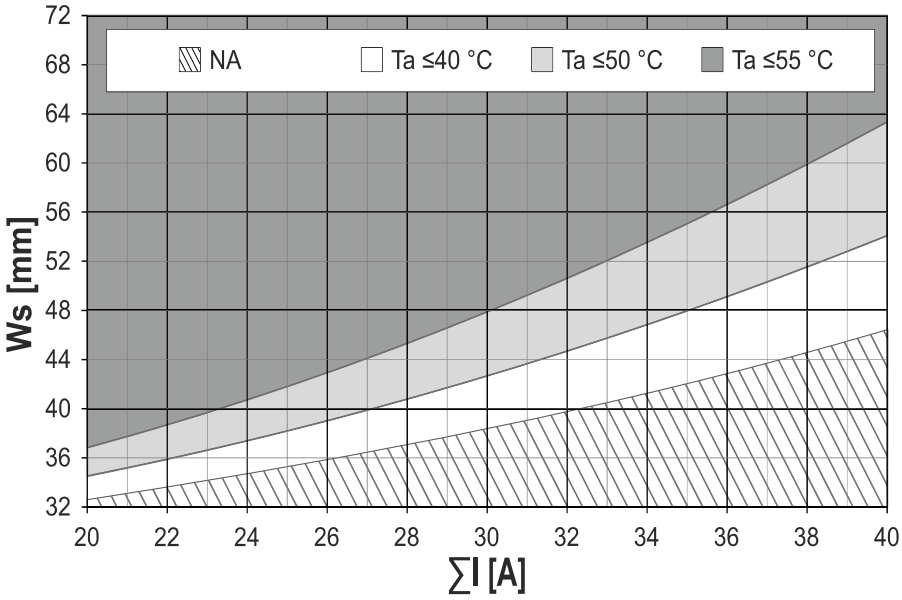


Fig. 4-21: Temperature derating

Ws System width
∑I Total current
NA Not allowed

4.7.2.2 Mechanical

Parameter	Conditions	Value
Vibration test		see Power Module
Shock test		see Power Module
Shocks caused by rough handling	(Drop test)	1 m

4.7.2.3 Electrical safety

Parameter	Conditions	Value
Degree of protection	EN 60529	IP20
Pollution degree		2
Overvoltage category		III
Insulation voltage input-output	Type testing / routine check test	50 V

4.7.2.4 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

4.7.2.5 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

4.7.3 Protection

4.7.3.1 Device protection

Parameter	Conditions	Value
Short circuit protection		Short circuit-proof
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)

4.7.4 Mechanical data

4.7.4.1 Materials

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

4.7.4.2 Mounting data

Parameter	Conditions	Value
Dimension	Depth (D)	114 mm
Dimension	Height with unlocking actuator (H)	130 mm
Dimension	Height without unlocking actuator (H2)	111 mm

Parameter	Conditions	Value
Dimension	Mounting (a)	55.5 mm
Dimension	Mounting (b)	15.5 mm
Dimension	Mounting (c)	3.5 mm
Dimension	Mounting (d)	7.5 mm

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

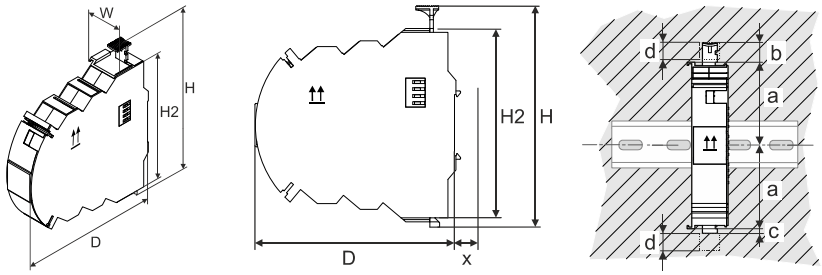


Fig. 4-22: Dimensions

Variants Net weight			
Art.-No.	**Parameter**	**Conditions**	**Value**
9000-41091-0101000	Net weight		62 g
9000-41091-1102000	Net weight		68 g
9000-41092-0101000	Net weight		82 g
9000-41094-0101000	Net weight		132 g

4.7.5 Product reliability

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

4.7.6 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

5 Mounting

NOTE

The cooling of the device ensued by natural 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

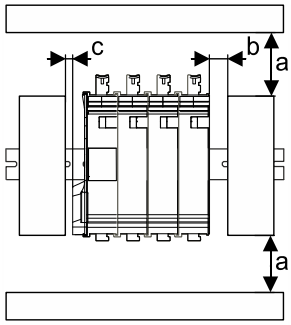


Fig. 5-1: Installation distances

a | >40 mm
b | >6 mm
c | >2 mm

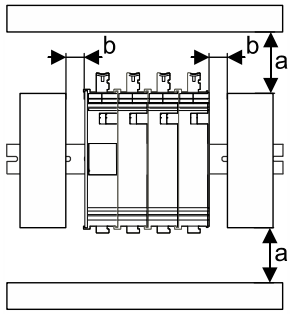


Fig. 5-2: Installation distances with slim cover plates

a | >40 mm
b | >6 mm

5.2 Installation position

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

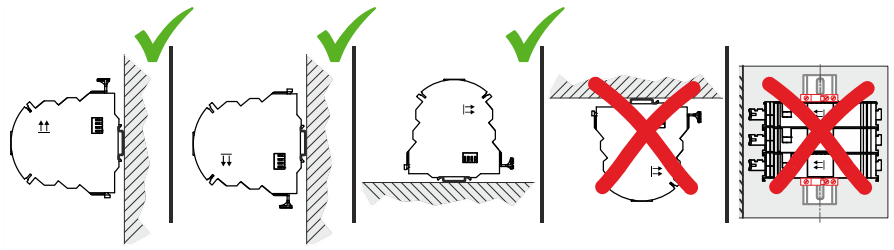


Fig. 5-3: Installation position

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 in the following positions.

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

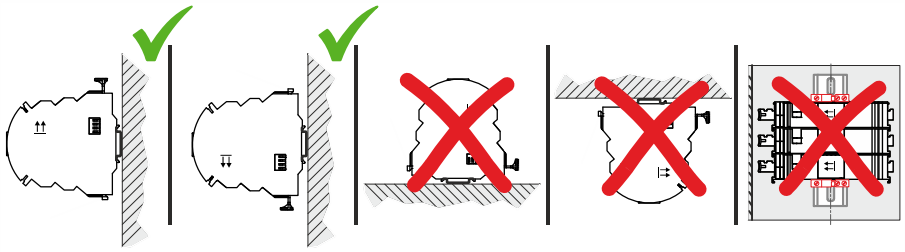


Fig. 5-4: Installation position for Mico Pro fix 1.16 and Mico Pro flex 1.20

CAUTION!

Material damage caused by wrong installation position!

➔ The **Mico Pro PS** (power supply) may only be installed in the following position.

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

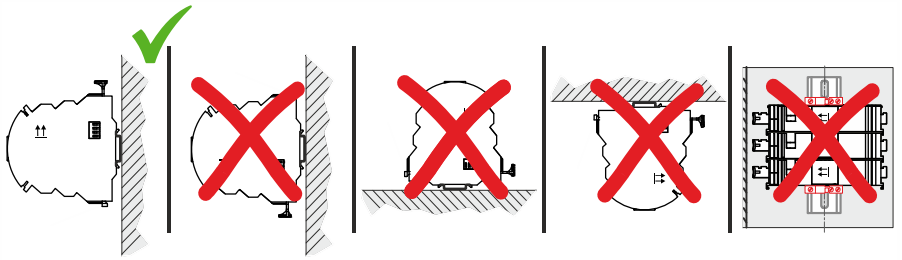


Fig. 5-5: Installation position for Mico Pro PS (9000-41190-0000105 & 9000-41190-0000110)

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**

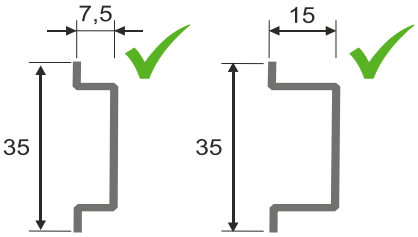
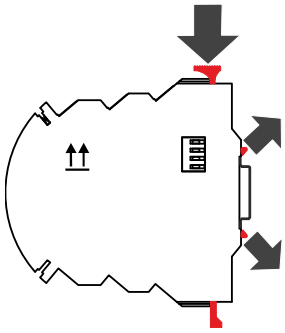


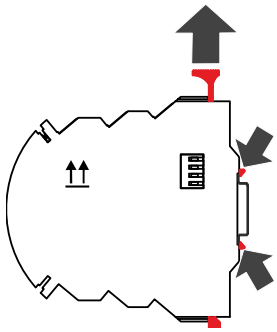
Fig. 5-6: Mounting rails

Locking on mounting rail

Locking device open

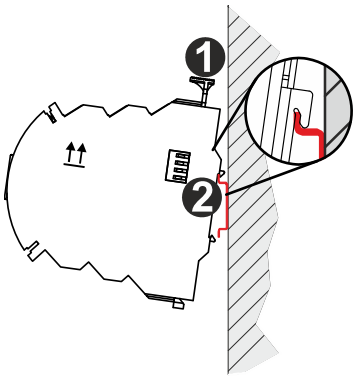


Locking device closed



Mounting on mounting rail

1. Mounting the power module



Mounting the power module:

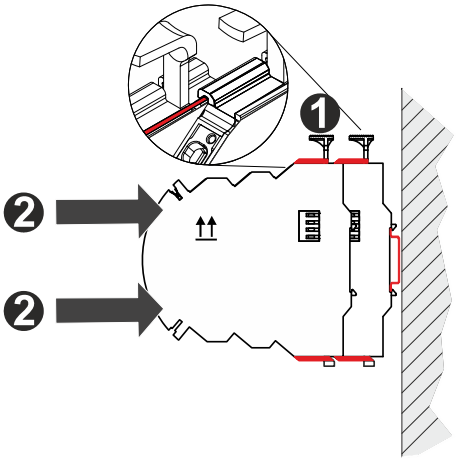
✓ The power module can be located anywhere in the system

1 | Open the locking device before the device is mounted on the DIN rail.

2 | Place the device on the mounting rail and close the locking device

Avoid frequent mounting and dismounting

2. Mounting the expansion modules



Expansion modules:

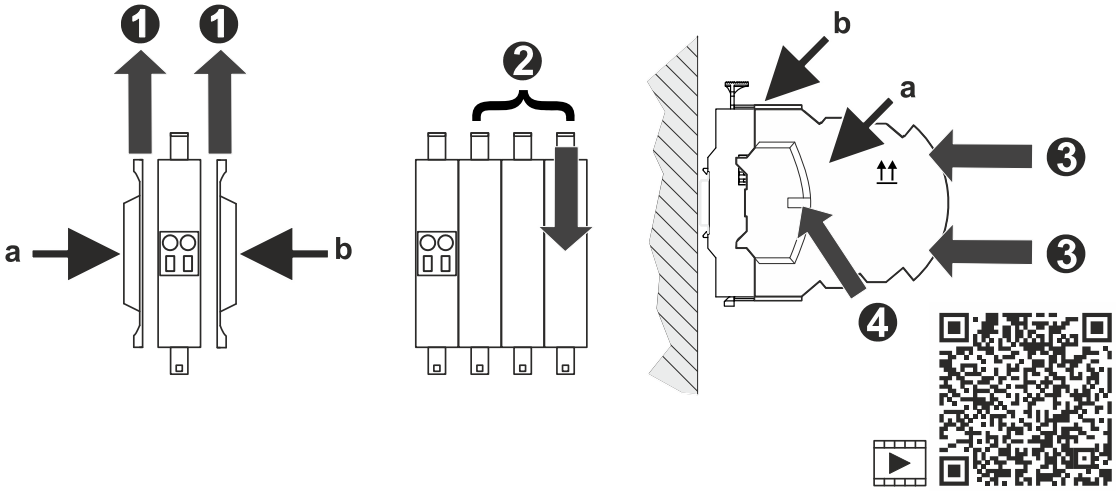
✓ Place additional modules on the left or right side of the previous modules side by side

1 | Open the locking device before the device is mounted on the DIN rail.

2 | Position parallel to the previous module and slide evenly onto the mounting rail, then close the locking device

Avoid frequent mounting and dismounting

3.1 Mounting the system cover plates



a | Cover plate for left side

b | Cover plate for right side

To mount the cover plate:

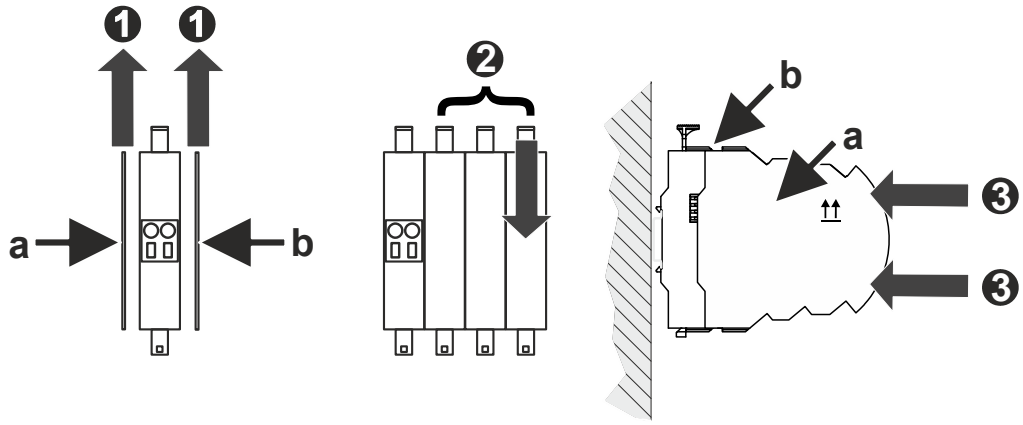
1 | Remove the left **a** and right **b cover plate** from Mico Pro PM (power module)

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 | Tighten the M3 screw with 1.1 ± 0.1 Nm

3.2 Mounting the system cover plates (Slim cover plates)

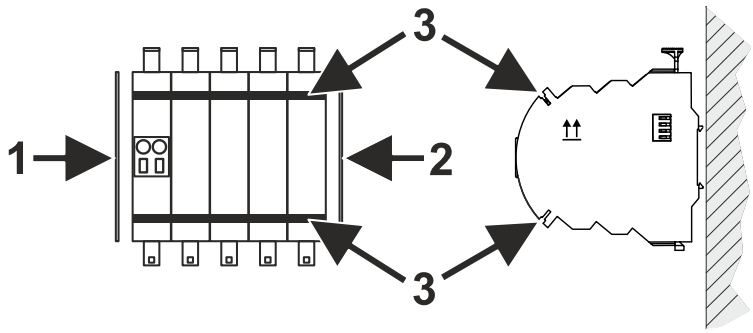


a | Cover plate (slim) for left side
b | Cover plate (slim) for right side

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

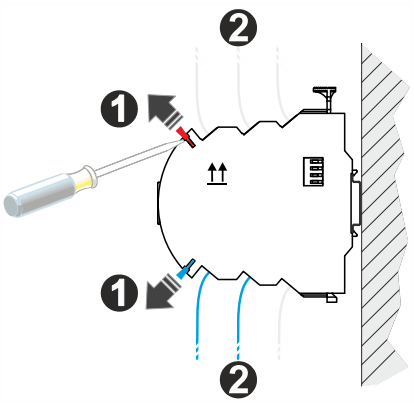
4. Mounting the plug-in link continuous jumpers



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

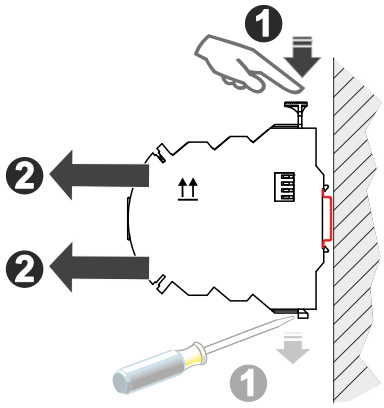
Dismounting



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 dismounted



To dismount:

1 | Press the unlocking 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 overload

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

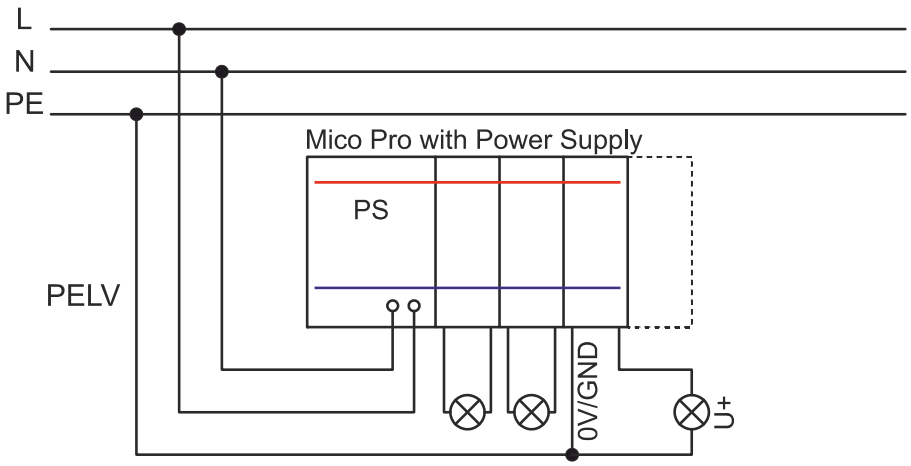
➔ Power feeding ≤40 A

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

➔ EPLAN macros are in Murrelektronik Onlineshop "http://shop.murrelektronik.com", associated with the item number

PELV

➔ All channels can be grounded by connecting any GND/0V terminal to PE (Earth)



Battery operation

For battery operation, the following conditions must be met:

➔ Operating voltage of the battery pack ≥10 V ⎓

➔ Supply line between the battery and Mico Pro ≤6 m

➔ Use a suitable backup fuse or a short-circuit proof battery pack

WARNING!

Risk of fire due to short circuit

Without suitable backup fuse or short-circuit protection measures, fires can occur.

➔ Use a suitable backup fuse or a short-circuit proof battery pack

6.1 Overview

6.1.1 Mico Pro PS (power supply)

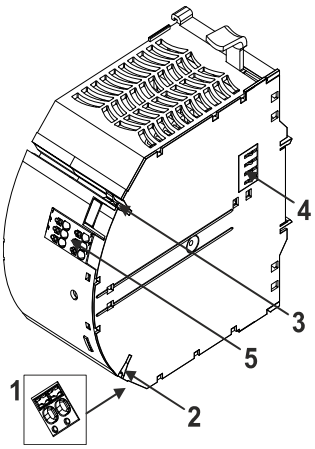


Fig. 6-1: Installation overview

1 **Input terminal**
2 **GND/0V** bridging contact supply
Plug-in link continuous jumper
3 **+24V** ⎓ bridging contact supply
Plug-in link continuous jumper
4 Internal system connection
5 **I/O signals- CTRL** control input
- ON control input
- 90% 23, 24 control output
- Alarm 13, 14 control output

6.1.2 Mico Pro PM (power module)

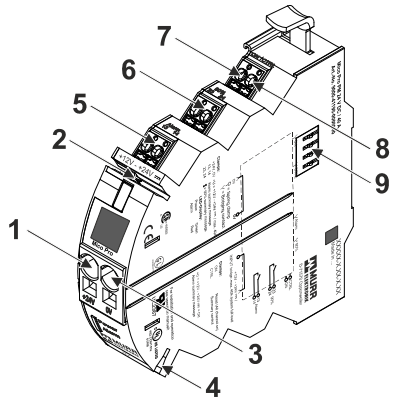


Fig. 6-2: Installation overview

1 **+24V** terminal power input
2 **+24V** ⎓ 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

6.1.3 Mico Pro PD (power distribution)

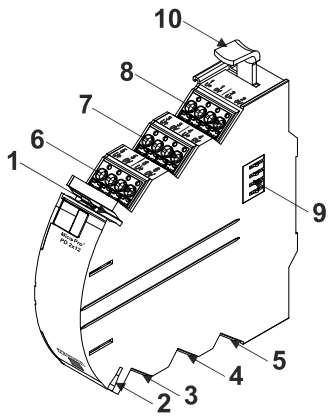


Fig. 6-3: Installation overview

PD 2x12
(Art.-No. 9000-41000-0000212)

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 actuator

PD 2x2x06
(Art.-No. 9000-41000-0002206)

1 Not contacted
2 **GND/0V** bridging contact supply
Plug-In link continuous jumper
3 **U1/U2/0V** terminal
4 **U1/U2/0V** terminal
5 **U1/U2/0V** terminal
6 **U1/U2/0V** terminal
7 **U1/U2/0V** terminal
8 **U1/U2/0V** terminal
9 Internal system connection
10 Unlocking actuator

6.1.4 Mico Pro fix

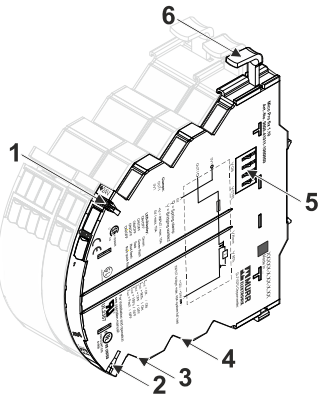


Fig. 6-4: Installation overview

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 actuator

6.1.5 Mico Pro flex

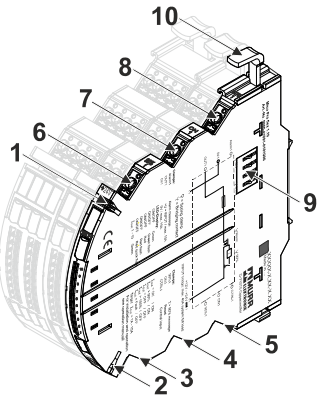
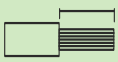
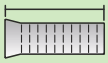


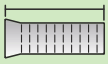
Fig. 6-5: Installation overview

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 actuator

6.2 Terminal

Symbol	Conditions	Ø		
	Flexible, with core end ferrule and plastic collar	0,25 ... 2,5 mm² (AWG 23 ... 14)	12 mm	10 mm
	Flexible, with core end ferrule	0,25 ... 2,5 mm² (AWG 20 ... 18)	12 mm	10 mm
	Flexible, mit TWIN core end ferrule	0,5 ... 1,0 mm² (AWG 23 ... 14)	12 mm	10 mm
	Flexible, without core end ferrule	0,2 ... 4,0 mm² (AWG 24 ... 12)	10 mm	-
	Rigid	0,2 ... 2,5 mm² (AWG 24 ... 14)	10 mm	-

Additional for Mico Pro PM

Symbol	Conditions	Ø		
	Flexible, with core end ferrule and plastic collar	0,75 ... 10 mm² (AWG 19 ... 8)	18 mm	18 mm
	Flexible, with core end ferrule	0,75 ... 16 mm² (AWG 19 ... 6)	18 mm	18 mm
	Flexible, mit TWIN core end ferrule	0,75 ... 4,0 mm² (AWG 19 ... 12)	18 mm	18 mm
	Flexible, without core end ferrule	0,75 ... 16 mm² (AWG 19 ... 6)	18 mm	-
	Rigid	0,75 ... 16 mm² (AWG 19 ... 6)	18 mm	-

6.3 Connecting cable

6.3.1 Mico Pro PS (power supply)

NOTE

The connection cables must be approved for the following operating temperatures:

≥75 ºC

6.3.2 Mico Pro PM (power module)

NOTE

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

≥75 ºC with surrounding air temperature ≤40 °C

≥90 ºC with surrounding air temperature 40 °C ... 55 °C

6.3.3 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:

≥75 ºC with surrounding air temperature ≤50 °C

≥90 ºC with surrounding air temperature 50 °C ... 55 °C

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:

≥90 ºC with surrounding air temperature ≤50 °C

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 with fix or flex modules.

NOTE
5 seconds after a shutdown due to overload, the consumer circuit (channel) can be switched on again.

NOTE
Use only in connection with Mico Pro system components!

NOTE
The product may cause audible noise.

7.1 Overview

7.1.1 Mico Pro PS (power supply)

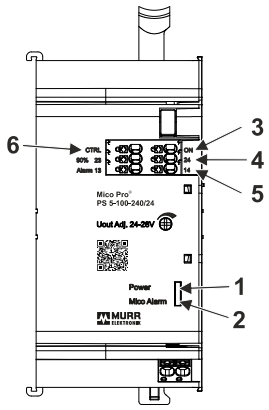


Fig. 7-1: Operation overview

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

Block diagram

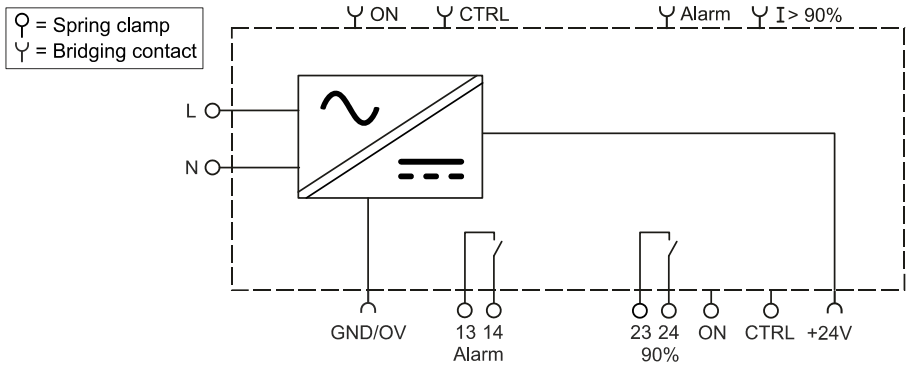
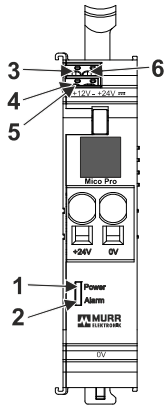


Fig. 7-2: Block diagram

7.1.2 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. 7-3: Operation overview

7.1.3 Mico Pro PD (power distribution)

Schematic wiring diagram

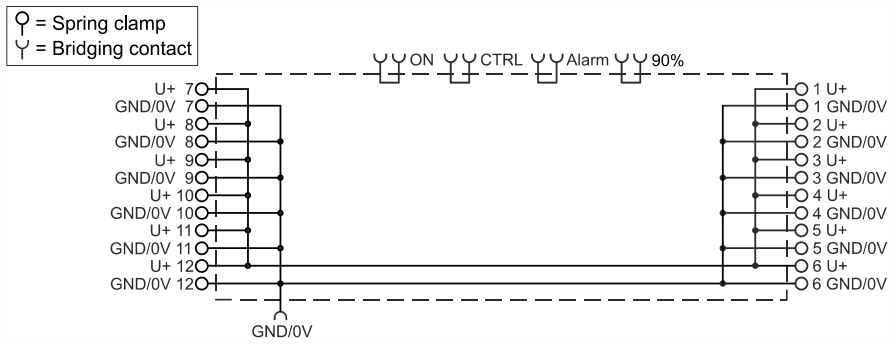


Fig. 7-4: Schematic wiring diagram PD 2x12 (Art.-No. 9000-41000-0000212)

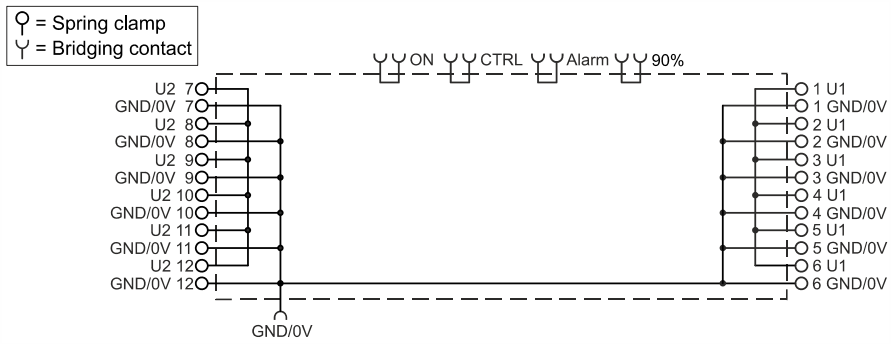
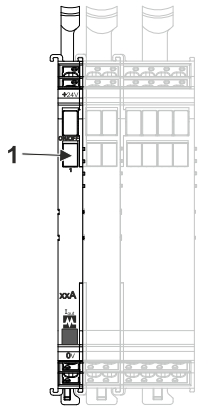


Fig. 7-5: Schematic wiring diagram PD 2x2x06 (Art.-No. 9000-41000-0002206)

7.1.4 Mico Pro fix



1 ON/OFF **LED indication**
ON/OFF **button**

Fig. 7-6: Operation overview

Schematic wiring diagram

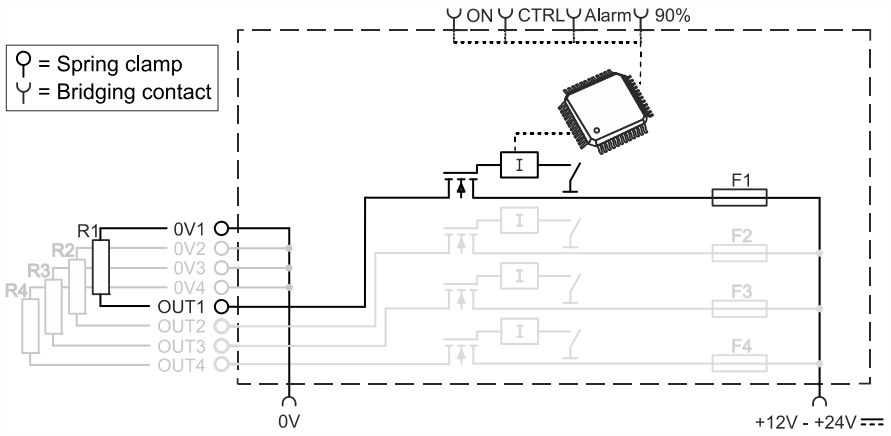
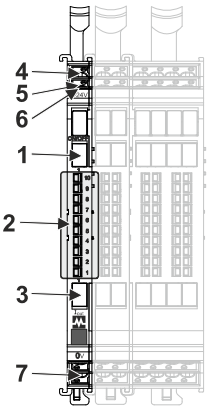


Fig. 7-7: Schematic wiring diagram

7.1.5 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. 7-8: Operation overview

Schematic wiring diagram

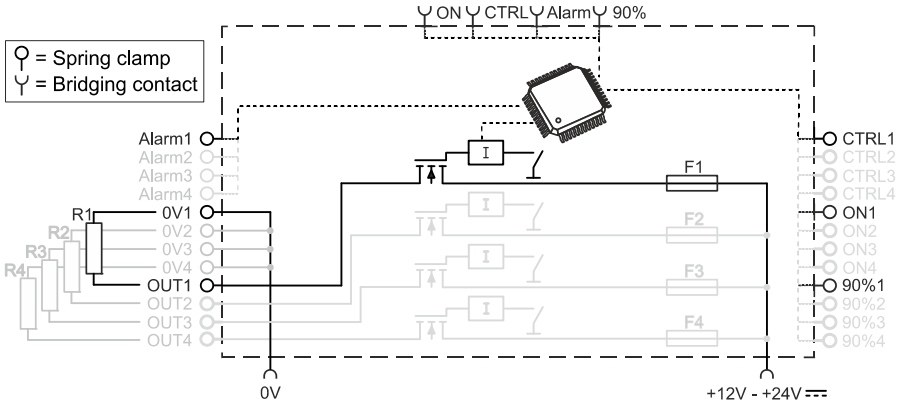


Fig. 7-9: Schematic wiring diagram

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}) fhas 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

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.

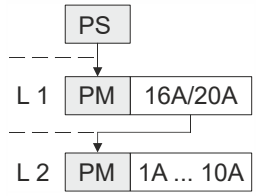


Fig. 7-10: Cascading

Legend	
PS	Power supply unit
L	Level
PM	Power module (power feeding module)
16 A / 20 A	Fix module or flex module (load circuit monitoring) with 16 A or 20 A
1 A ... 10 A	Fix module or flex module (load circuit monitoring) with 1 A to 10 A

Cascading with buffer module

Note

- A voltage interruption of up to 4 ms may occur at the output. For sensitive loads such as safety-related modules, it is recommended to install a buffer module (ME article number: 85394) on level 2 (L 2) to bridge the voltage interruption.

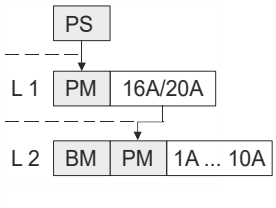


Fig. 7-11: Cascading with buffer module

Legend	
PS	Power supply unit
L	Level
PM	Power module (power feeding module)
BM	Buffer module
16 A / 20 A	Fix module or flex module (load circuit monitoring) with 16 A or 20 A
1 A ... 10 A	Cascading with buffer module, fix module or flex module (load circuit monitoring for sensitive loads) with 1 A to 10 A

7.4 Control and signals

7.4.1 Mico Pro PS / Mico Pro PM

The control and diagnostic functions described on the Mico Pro PS (power supply) / Mico Pro PM (power module) are group signals from or for the entire Mico Pro system (Mico Pro PS / Mico Pro PM with added system components). If Mico Pro PS (Art.-No. 9000-41190-0000110) is used in parallel mode, signals are available only on the power supply next to the Mico Pro channels.

ON terminal (restart) control input

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 >600 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

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.

ON terminal (restart) control input

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 >600 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 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).

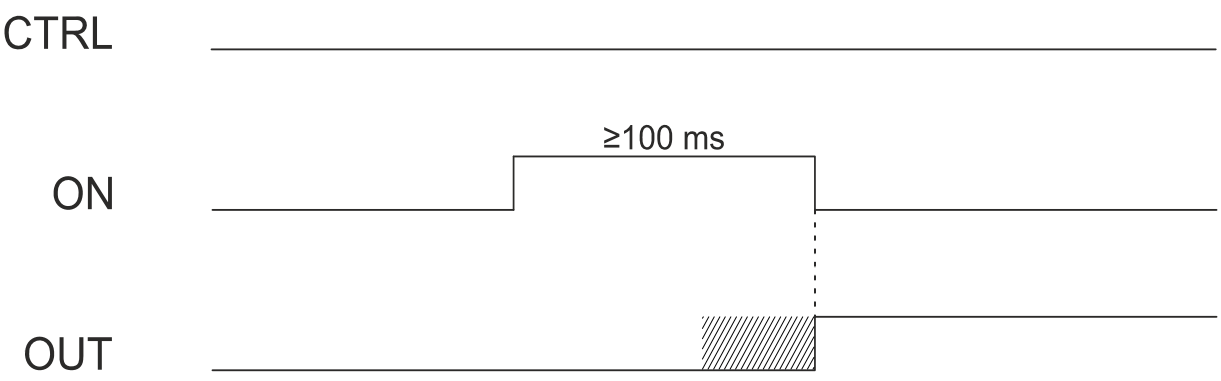


Fig. 7-12: Turn on after short circuit

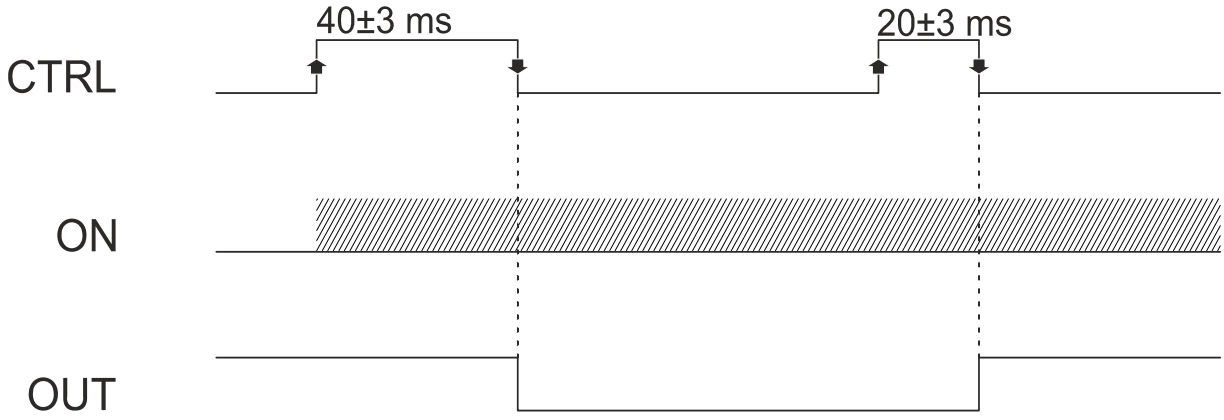


Fig. 7-13: CTRL signal variant 1

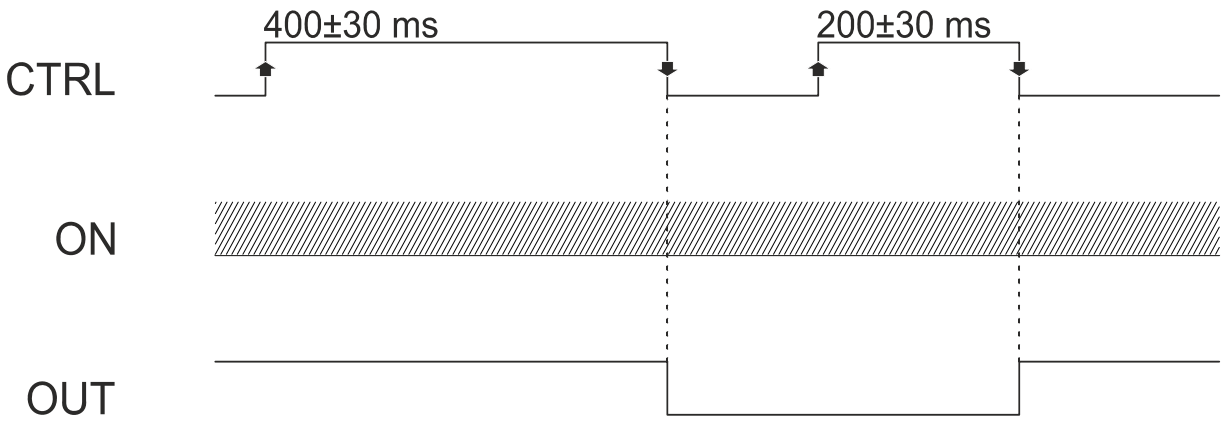


Fig. 7-14: CTRL signal variant 2

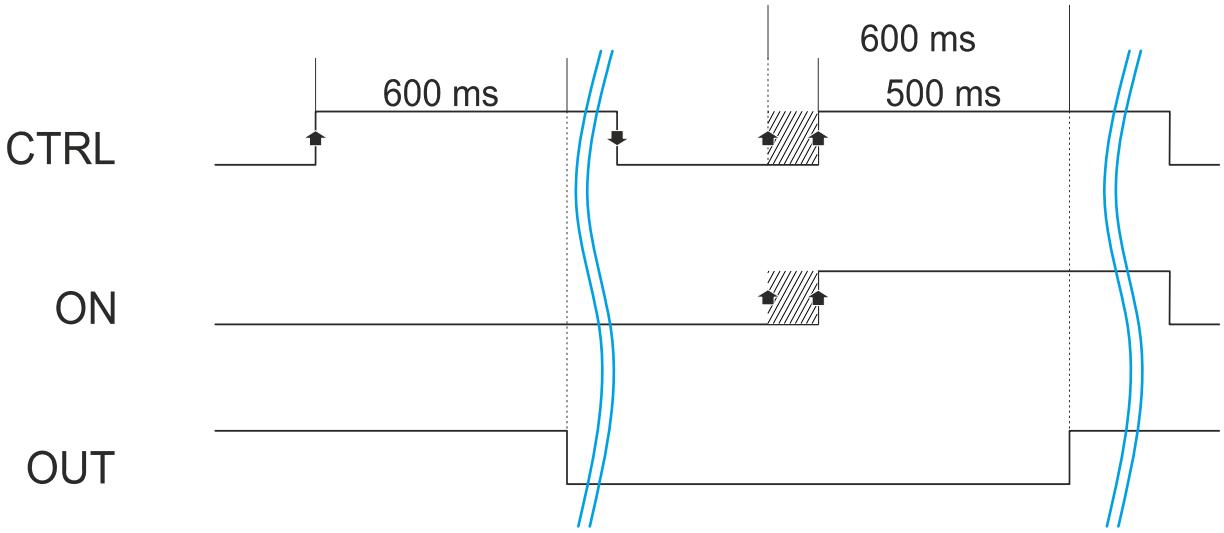


Fig. 7-15: CTRL signal variant 3

7.5 Diagnostic

7.5.1 Mico Pro PS (power supply)

Power

LED indication	LED state	Description
OFF		Input voltage not connected
Green	Permanently lit	Output voltage OK (≥21 V⎓)
Red	Permanently lit	Power supply alarm; Output voltage too low (<21 V⎓)

Tab. 7-1: Power

Alarm

LED indication	LED state	Description
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 PM (power module)

Power

LED display	State	Description
Off		Power OFF
Green	Permanently lit	Power ON

Tab. 7-3: Power

Alarm

LED indication	LED state	Description
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. 7-4: Alarm

7.5.3 Mico Pro fix and flex

ON/OFF

LED indication	LED state	Description
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
Orange / Red	Flashing (1 Hz)	Module defective

Tab. 7-5: ON/OFF

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

LED indication	LED state	Description
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 7 "Operation")

Tab. 7-6: 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 PS (power-supply)	
Designation	**Art.-No.**
Mico Pro PS 5-100-240/24	9000-41190-0000105
Mico Pro PS 10-100-240/24	9000-41190-0000110

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 PM 24 V DC / 40 A lite	9000-41190-0000001

Mico Pro PD (power distribution) **Potential distributor**	
Designation	**Art.-No.**
Mico Pro PD 2x12	9000-41000-0000212
Mico Pro PD 2x2x06	9000-41000-0002206

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 1.4 CL2	9000-41011-0400001
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 4.4 CL2	9000-41014-0400001
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 our Murrelektronik online shop: shop.murrelektronik.com

Accessories	Type	Article number	Packaging unit
Designation label	White 10 x 5 mm	996078	1 PU = 64 pieces
Mico Pro Plug-In link 2x blue (continuous jumper)	Blue bridge 500 mm	9000-41000-0000000	1 PU = 1 piece
Mico Pro Plug-In link 2x red (continuous jumper)	Red bridge 500 mm	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	9000-41000-0000002	1 PU = 1 piece blue and 1 piece red
Cover plate left and right	green	9000-41000-0000006	1 PU = 2 piece
Inverted button		9000-41000-0000007	1 PU = 8 piece (4 x left,4 x right)

8.2.1 Legal notes

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