MURR ELEKTRONIK

stay connected

MICO

Solutions for Intelligent Power Distribution

- Monitor
- Detect
- Switch Off

VITAL TO YOUR SYSTEM

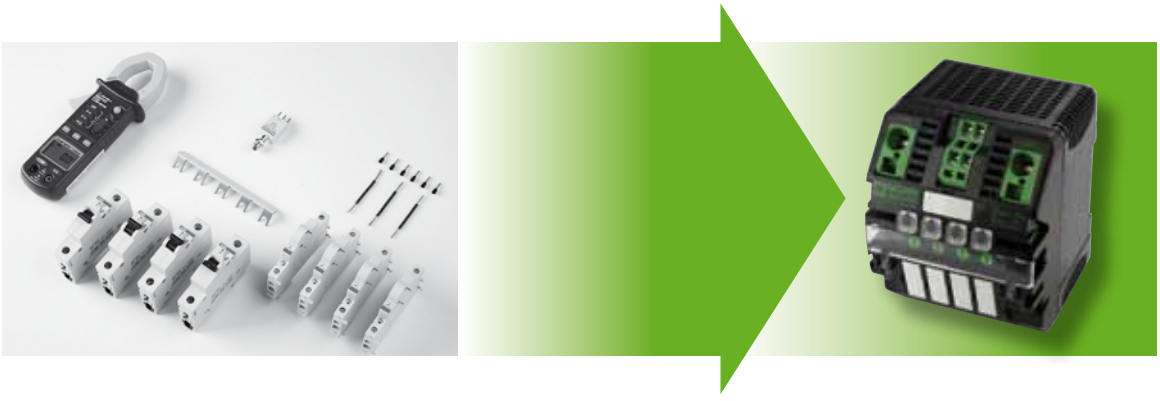
THOUSANDS OF SATISFIED CUSTOMERS

- Control cabinet construction
- Machine tools
- Packaging industry
- Logistics
- Process automation
- Food&Beverage

MURRELEKTRONIK OFFERS YOU...

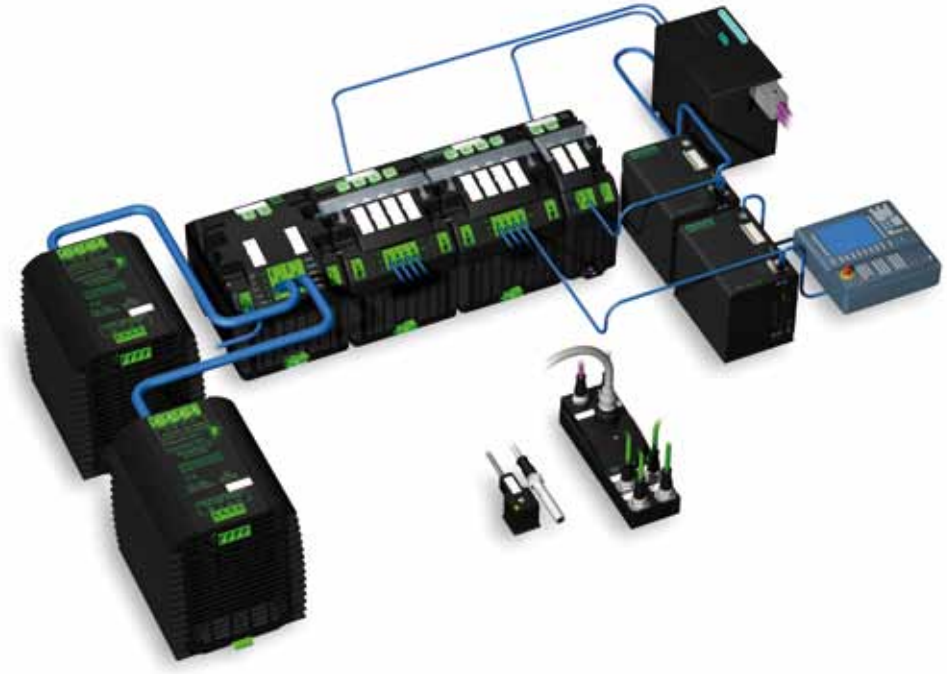
- Transformers
- Switch mode power supplies
- Intelligent power distribution
- Buffer module
- Redundancy modules

SOLUTIONS FOR INTELLIGENT POWER DISTRIBUTION



Complex power supply systems with many components require reliable load protection. Switch mode power supplies are the core of these systems since they electronically monitor output voltage and output current. If there is a short circuit or an overload, protective devices downstream (for example circuit breakers) react slower than the power supply and do not ensure selectivity. This can cause critical situations like voltage drops or even cable fires.

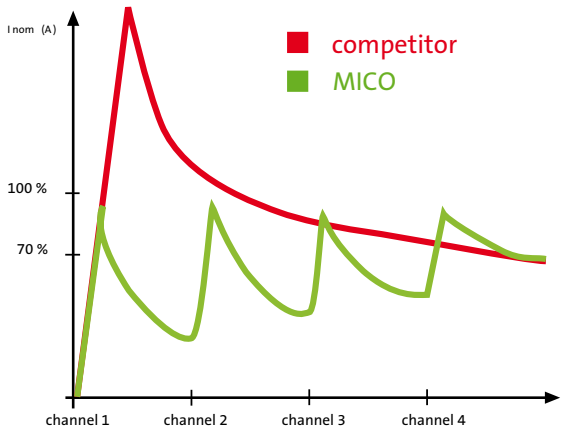
Our compact MICO modules help eliminate these problems: MICO is an essential component for protecting power supply systems!



MICO – SOLUTIONS FOR INTELLIGENT POWER DISTRIBUTION

CASCADING START

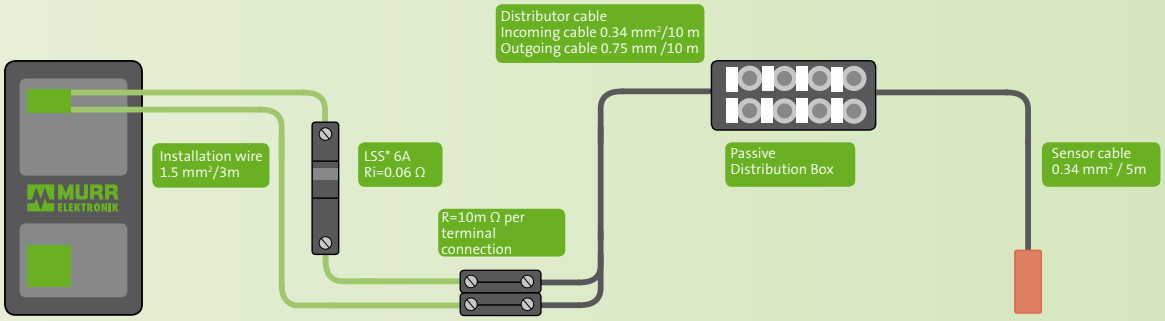
MICO eliminates start-up peaks with a time-delayed (cascading) start of individual current paths. Advantage: Now you can use power supplies with lower output current.



Target-oriented protection is a big challenge for modern power supply systems. MICO is an intelligent power distribution system that meets this challenge! Errors are found quickly while availability remains high.

- **MICO Monitors Currents:** You can select a maximum, individual current value for each channel and MICO monitors this value. The LED is green when the current is OK.
- **MICO Indicates When Approaching the Maximum Load:** There is a visual alarm when 90 % of the selected current load is reached. The LED blinks green.
- **MICO Detects Stress:** When there are short circuits or if the selected load current is exceeded, MICO switches the affected channel off. The LED blinks red.
- **MICO Provides Flexibility:** Each channel can be individually switched off by pressing a button. Here, the LED is red. Of course, you also can switch all channels on manually.

EXAMPLE FOR A 6 A CIRCUIT BREAKER IN A 24 V DC SYSTEM



* Circuit breaker

Specific resistance of copper (ρ) = 0.0178 (Ω x mm² /m)

Wire resistance:	R=	$\frac{\rho \times l}{A}$	=	$\frac{0.0178 \times (2x3\ m)}{1.5\ mm^2}$	= 0.07 Ω
Distributor cable resistance:	R=	$\frac{\rho \times l}{A}$	=	$\frac{0.0178 \times (2x10\ m)}{(0.34 + 0.75\ mm^2)/2}$	= 0.65 Ω
Sensor cable resistance:	R=	$\frac{\rho \times l}{A}$	=	$\frac{0.0178 \times (2x5\ m)}{0.34\ mm^2}$	= 0.52 Ω
Inner resistance of circuit breaker and connection terminals					= 0.08 Ω
Total loop resistance					= 1.32 Ω

Calculation of maximum possible current flow (limited by loop resistance) $I = \frac{U}{R} = \frac{24\ V}{1.32\Omega} = 18.18\ A$

Required tripping current of the 6 A circuit breaker Type C

$14 \times I_{Nom} = 14 \times 6\ A = 84\ A$

Tripping current 84 A > Max. current flow 18.18 A

| THE PERFECT MICO FOR ANY APPLICATION

Description	MICO+	MICO CLASSIC	MICO BASIC	MICO FUSE
Electronic current monitoring	x	x	x	
Monitoring with glass tube fuse				x
2 output channels		x		
4 output channels	x	x	x	
8 output channels			x	x
Adjustable current ranges	x	x		
Spring clamp terminals	x	x	x	x
Bridge system on both sides	x	x		
Bridge system left			x	
90 % warning notice with blinking LED	x	x	x	
90 % warning notice as digital signal	x			
Channel switch off by signal	x			
Group alarm contact (potential-free)		x		
Group alarm contact (digital output)	x		x	x
Cascading start of the individual current paths	x	x	x	
UL Approval	x	x	x	x

MICO+ – APPEALING FEATURES AND EVEN MORE OPTIONS

- **MICO saves energy:** When loads are switched on, they need energy. Often current is already flowing, even though no productive activity is carried out. For example during pause times: Energy is consumed as stand-by power, pumps are running, displays lighten, loads are heating ...

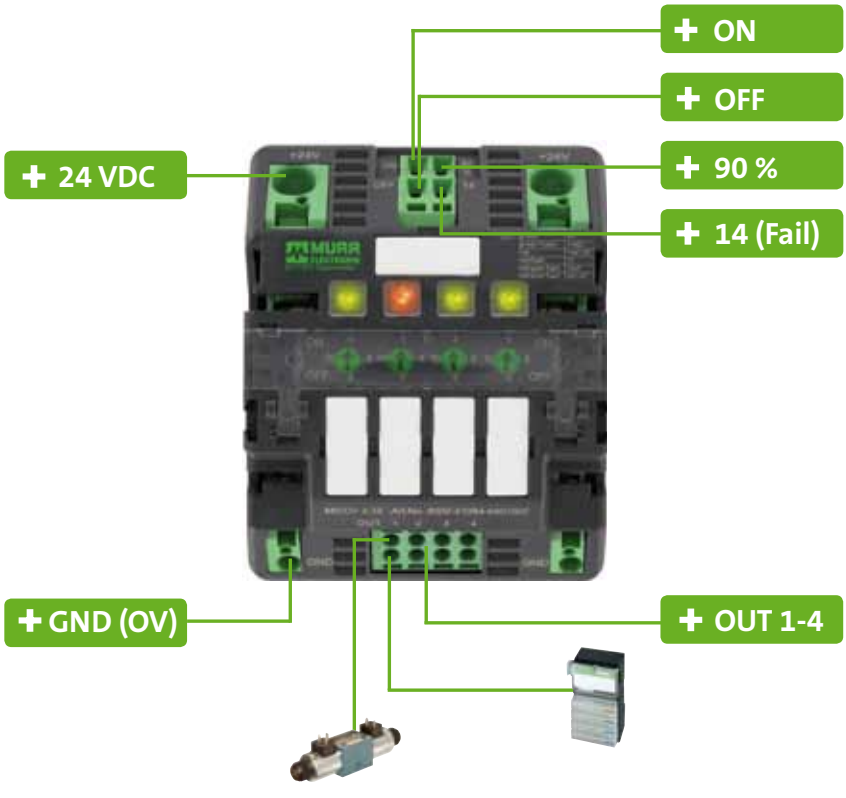
  With MICO+ you can switch off all 4 output channels from a control input during idle times. This way, only those loads that actually require energy are supplied. This saves energy, results in fewer losses, increases lifetime and productivity. If the part of the machine that was switched off is needed again, it can be immediately reactivated with MICO+.

MODEL OVERVIEW

Art. No.	Description	Current ranges *(adjustable)*
9000-41084-0100400	MICO+ 4.4 *(4 channels)*	1A/2A/3A/4A
9000-41084-0100600	MICO+ 4.6 *(4 channels)*	1A/2A/4A/6A
9000-41084-0401000	MICO+ 4.10 *(4 channels)*	4A/6A/8A/10A

- **90 % warning notice – now available as digital signal:** MICO's visual 90 % warning notice is a perfect tool for setting up machines and systems. If channels are near the limit, the LED starts blinking. Often the total current needed increases during operation. This happens for example, because valves and motors wear out. Therefore, the MICO+ 90 % warning notice is additionally available as signal. The signal is transferred to the control, the control sets off the alarm – and counter-measures can be immediately taken.

- **New connection terminals on the outputs:** Two connection options are available per channel. With MICO+ you can connect twice as many loads compared to MICO Classic. It's also easy to create features such as single channel monitoring: one wire to the load, the other wire to the control's input – it doesn't get any easier than that!

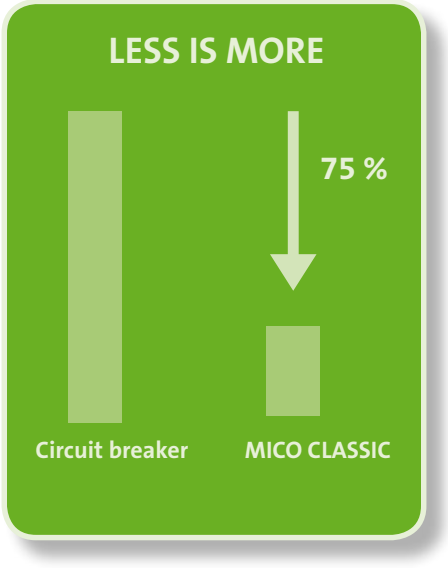


YOUR BENEFITS

- Save energy during idle times
- React early to creeping failures
- Create single channel diagnostics
- Ideal switch off behavior
- Flexibly adjustable current ranges
- Capacitive load per channel 20,000 µF
- Group alarm contact
- 90 % warning notice, shown by a blinking LED
- Unique bridge system
- Cascading start of individual current paths
- Non-volatile error memory
- Manual switch-off and -on by pressing a button

MICO CLASSIC – TOP CLASS POWER DISTRIBUTION

- Allows remote start with 24 V DC signal
- Manually switch on each channel for start-up and shut-down
- LED status indication for each channel
- Proven bridge concept connects several MICOs
- Minimum output resistance, almost no power loss
- Optimum labeling options, for device location and channels
- Maintenance-free with spring clamp terminals
- Adjustable current range for each channel
- Perfect shut-down function: as late as possible, as early as necessary
- Visual warning notice when 90 % of the load current set is reached
- Potential-free alarm output
- Temperature does not affect MICO
- No current limits



MICO CLASSIC 4.10 SPEED-START – READY TO GO AT ANY TIME

With its optimized start-up behavior, MICO CLASSIC 4.10 Speed-Start powers very sensitive loads without any noticeable interruption, for example with: fieldbus systems, industrial computers, controls or drive controls. This eliminates any problems that happen when loads are switched off automatically.

DID YOU KNOW?

With MICO CLASSIC 4.10 Speed-Start, you can handle capacitive loads of up to 30,000 µF per channel. It can protect up to 15 drive controls per channel without any problems!

MICO CLASSIC 4.4.10 ACTUATOR SENSOR – FOR ANY APPLICATION

MICO CLASSIC 4.4.10 Actuator-Sensor features two channels to protect sensors (current range 1 to 4 A) and two channels to protect actuators (4 to 10 A). It covers the complete current range from 1 - 10 A in one compact device!

PERFECT FIT

MICO CLASSIC is available in a two channel and four channel version: The modules can be installed in any combination to ensure a cost-effective and space-saving system design.
They are linked with a bridge set. This minimizes wiring efforts.

- 2 channels, width 36 mm
- 4 channels, width 70 mm

MODEL OVERVIEW

Art. No.	Description	Current ranges *(adjustable)*
9000-41042-0100400	MICO CLASSIC 2.4 *(2 channels)*	1A/2A/3A/4A
9000-41042-0100600	MICO CLASSIC 2.6 *(2 channels)*	1A/2A/4A/6A
9000-41042-0401000	MICO CLASSIC 2.10 *(2 channels)*	4A/6A/8A/10A

Art. No.	Description	Current ranges *(adjustable)*
9000-41034-0100400	MICO CLASSIC 4.4 *(4 channels)**	1A/2A/3A/4A
9000-41034-0100600	MICO CLASSIC 4.6 (4 channels)*	1A/2A/4A/6A
9000-41034-0401000	MICO CLASSIC 4.10 *(4 channels)**	4A/6A/8A/10A

Art. No.	Description	Current ranges *(adjustable)*
9000-41034-0101000	MICO CLASSIC 4.4.10 Actuator-Sensor	2 x 1A/2A/3A/4A, 2 x 4A/6A/8A/10A
9000-41034-0401005	MICO CLASSIC 4.10 Speed-Start	4A/6A/8A/10A

* GL approval

ACCESSORIES

Art. No.	Description	Other
9000-41034-0000002	Bridge set	1 set
9000-41034-0000001	Bridge set	10 sets
9000-41034-0000003	Shortened button	4 buttons

MICO BASIC – INTELLIGENT SWITCH OFF

As early as necessary, as late as possible – MICO BASIC features intelligent switch off characteristics! The modules are suitable for any application that requires protection of a great number of sensors and actuators with similar demands. The current ranges for the individual circuits are fixed. The compact modules secure either four or eight channels with 2, 4, or 6 A. LEDs show the operating conditions of the individual channels and, when blinking, indicate that a maximum load of 90 % is reached. If there is an overload or short circuit, MICO BASIC switches the affected channel off and the LED blinks red. A group alarm contact sends the current status to the control.

- Switch off supported by microprocessor
- Preset tripping currents (the same for all channels) – 2 A / – 4 A / – 6 A
- 4 channels – width 36 mm / 8 channels – width 70 mm
- Less space required compared to conventional solutions
- Spring clamp terminals with bridging option on the left side (24 V and GND)
- Group alarm contact through digital output
- 20,000 µF maximum capacitive load per channel
- Labeling options for each channel and for the module
- Visual warning notice when 90 % of the load current set is reached
- Cascading start of the individual current paths

MODEL OVERVIEW

Art. No.	Description	Current range *(preset)*
9000-41064-0200000	MICO BASIC 4.2 *(4 channels)*	2 A
9000-41064-0400000	MICO BASIC 4.4 *(4 channels)*	4 A
9000-41064-0600000	MICO BASIC 4.6 *(4 channels)*	6 A

Art. No.	Description	Current range *(preset)*
9000-41068-0200000	MICO BASIC 8.2 *(8 channels)*	2 A
9000-41068-0400000	MICO BASIC 8.4 *(8 channels)*	4 A
9000-41068-0600000	MICO BASIC 8.6 *(8 channels)*	6 A

MICO FUSE – COST-EFFECTIVE MONITORING WITH GLAS TUBE FUSES

Protecting sensors and actuators is very important. However, using individual safety terminals requires time-consuming efforts. Now MICO FUSE makes this protection more convenient! The compact module features eight sockets for glass tube fuses that can be accessed from the front. It protects eight channels.

MICO FUSE 24 LED has additional LEDs that indicate the operating condition of each channel in red and green. A group alarm contact sends the current status to the control.

- 8 Sockets for glass tube fuses (5 x 20 mm) – accessible from the front
- Minimum space required per channel
- MICO FUSE 24 LED
  - Operating voltage: 24 V DC
  - Channel-specific LED indicator
    Green = fuse OK
    Red = fuse defective
  - Group alarm contact through digital output
- MICO FUSE 250 – Operating voltage: 0...250 V AC/DC
- Common voltage for all channels – reduces wiring efforts
- Max. total current 40 A
- Spring clamp terminals – maintenance-free and vibration proof
- Labeling options for each channel and for the module

MODEL OVERVIEW

Art. No.	Description	Other
9000-41078-0600001	MICO FUSE 24 LED	Delivered without fuses With LED indicator and alarm contact
9000-41078-0600002	MICO FUSE 250	Delivered without fuses Universal model from 0...250 V AC/DC

ACCESSORIES

Art. No.	Description	Other
9000-41078-0000002	MICO FUSE Spare fuse – 2 A*	8 pcs.
9000-41078-0000004	MICO FUSE Spare fuse – 4 A*	8 pcs.
9000-41078-0000006	MICO FUSE Spare fuse – 6 A*	8 pcs.
9000-41078-0000010	MICO FUSE Fuse socket cover	8 pcs.

*Slow blow

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