Switching and controlling in the control cabinet

- Relays
- Opto-coupler
- Solid state relays
- Active interface technology
- Safety Realys
MIRO – Interface Technology
MARKET REQUIREMENT

The intelligent modularity saves space and provides easy, flexible replaceability.

Be it in the manufacturing industry, building automation or process technology, the signals that are transferred between process peripherals and control systems must always be transmitted reliably and potential-free. These control concepts can be achieved in extremely confined spaces using Murrelektronik relay and opto-coupler modules.

These products ensure that your costs are reduced by increasing interference immunity and therefore improving the availability of machinery and system components. Slimline housing designs require less space and therefore reduce the size of your control cabinet. The intelligent modularity of MIRO relays and opto-couplers using plug-on modules makes the replacement of switching elements both easy and low cost.

The MIRO product range has been complemented by MIRO Safe safety relays. MIRO Safe helps reduce downtime and optimize outages since MIRO Safe relays are intentionally applied to protect both workers and machines.
SWITCHING AND CONTROLLING IN THE CONTROL CABINET – ALL FROM A SINGLE SOURCE

**RELAYS**
- Single and multiple channels
- Potential bridging link
- Input/output relays
- Control 5…230 V AC/DC
- Slimline housing design
- Pluggable version
- Galvanic separation

**OPTO-COUPLER**
- Single and multiple channels
- Potential bridging link
- Overload and short circuit protection
- 0,5…10 A DC
- Up to 500 kHz switching frequency
- Slimline housing design
- Pluggable version
- Galvanic separation
SOLID STATE RELAYS

- For AC voltage
- Single and multiple phases
- Zero voltage switch
- 0.5…30 A AC
- Pluggable version

ACTIVE INTERFACE MODULES

- Ethernet Switches
- Timer
- Analog converters
- Comparator modules
- Temperature converters
- Pole changing switches
- Motor temperature monitoring

SAFETY RELAYS

- Emergency stop and guard door applications
- Two-hand controls
- Optional automatic start
- Light barrier applications
- Safety mat applications
- Optional automatic start
- Safety mat applications
- Optional automatic start
RELAYS

**MIRO 6.2** pluggable
- 6.2 mm slimline, pluggable relays
- Push-in connection technology
- Potential bridging link to input and output
- Sockets and plug modules available separately
- Input/output relays
- CSA-approvals

**MIRO 6.2**
- 6.2 mm slimline coupling relays
- Potential bridging link to input and output
- H-O-A versions
- Input/output relays
- Different input voltages
- UL-approvals

**MIRO 12.4**
- 12.4 mm slimline, compact coupling relays
- Multi-channel variants
- Input/output relays
- Different input voltages

---

**Did You Know?**

The small, pluggable modules of the MIRO 6.2 product line are available as different models. For example:

- Input and output relay
- Optocoupler 3 A
- Optocoupler 4 A with short circuit protection
- Solid state relay 230 V/0,5 A
- Pulse lengthening device 40 ms
- Pulse divider 10:1
- Motor-Guard
MIRO – compact & functional

MIRO – the coupling module in terminal block format
Coupling modules in the form of relay and opto-coupler modules are indispensable in controller and system construction. Coupling modules are needed for signal amplification, signal adaptation, potential separation, potential-free transfers to other parts of the system and for increasing interference immunity.

Using the MIRO range of modules will cut your costs and block out interference and overvoltage from PLC boards and construction cards. MIRO interface modules will increase the operational reliability of your system and reduce the size of your switch cabinet.

MIRO – a wide range of products in the housing
Regardless of whether they are relays (input and output relays), opto-couplers or intelligent converter modules – all modules are available with the same housing concept.

MIRO – terminal relay – just 6.2 mm wide
1 relay, 1 C/O contact with bridging link just 6.2 mm wide. The modules are suitable for clipping onto a 35 mm DIN-rail in accordance with EN 60175. The screw terminal or spring clamp terminal connection (Cage Clamp') leaves nothing to be desired.

MIRO – easy access
The terminals are arranged in such a way that the connecting terminals are easy to access, even with high-level cable ducts.

MIRO – pluggable
MIRO 6.2 pluggable
• 6,2 mm slim, pluggable optocouplers
• 3 A and 4 A optocouplers
• Short circuit protection (4 A)
• Base and pluggable module separately available
• Common bridges at input and output

MIRO 6.2
• 6,2 mm slim optocouplers
• 0.5...10 A
• Potential bridging link
• Up to 500 kHz switching frequency

SPECIAL VERSIONS
• 10 A / 1 KHz power opto-coupler
• Multiple voltage versions

OPTO-COUPLER

MIRO – terminal relay – just 6.2 mm wide
1 relay, 1 C/O contact with bridging link just 6.2 mm wide. The modules are suitable for clipping onto a 35 mm DIN-rail in accordance with EN 60175. The screw terminal or spring clamp terminal connection (Cage Clamp') leaves nothing to be desired.

MIRO – easy access
The terminals are arranged in such a way that the connecting terminals are easy to access, even with high-level cable ducts.

MIRO – pluggable
MIRO 6.2 pluggable
• 6,2 mm slim, pluggable optocouplers
• 3 A and 4 A optocouplers
• Short circuit protection (4 A)
• Base and pluggable module separately available
• Common bridges at input and output

MIRO 6.2
• 6,2 mm slim optocouplers
• 0.5...10 A
• Potential bridging link
• Up to 500 kHz switching frequency

SPECIAL VERSIONS
• 10 A / 1 KHz power opto-coupler
• Multiple voltage versions
AC voltages can be switched without causing wear using triacs or thyristors as semiconductor switches. Solid state power switches are often a substitute for contactors in cases where frequent switching occurs. Zero voltage switches minimize the in-rush current and reduce the number of switching torque faults. Example applications are: plastic processing, rubber processing, building heating, industrial furnace construction, the automotive industry and the food and drink industry.
In measuring and control technology, many measuring signals occur that are needed for monitoring and indicating the status of mechanical processes. Before these measuring variables can be used by programmable logical controllers and process computers they must be converted into digital informationen or standardized signals (0...20 mA, 4...20 mA or 0...10 V).

### ACTIVE INTERFACE TECHNOLOGY

**MIRO** analog modules
- U/U, U/I, I/I and I/U converters
- Comparator modules
- Temperature converters for PT100
- Potentiometer modules
- Pole-changing switches for DC motors

**MIRO 6.2** Timer
- Relay output and opto-coupler output
- Multifunctional modules
- Galvanic separation
- Adjustment per potentiometer and DIP-switch

**TREE** plug module
- Input/output relays
- Opto-coupler 2 A
- Opto-coupler 4 A with current limiting
- Solid state relays 230 V/0.5 A
- Impulse expansion module
SAFETY RELAYS

MIRO SAFE SWITCH HCS/HA
Emergency-stop and guard door applications
- TÜV and UL approved for reliability
- Applicable up to safety category 4/PLe
- Minimum space required (22.5 mm) and optimum ease of connection
- With and without monitoring of the start button
- 3 N/O-1 N/C contacts
- 24 V AC/DC and 230 V AC
- Pluggable spring clamp terminals

MIRO SAFE SWITCH BCS/BA
Emergency-stop and guard door applications
- TÜV and UL approved for reliability
- Applicable up to safety category 3/PLd
- Minimum space required (22.5 mm) and optimum ease of connection
- With and without monitoring of the start button
- 2 N/O contact
- 24 V AC/DC and 230 V AC
- Pluggable spring clamp terminal with quick connection technology

MIRO SAFE HAND
Two-hand control
- TÜV and UL approved for reliability
- Applicable up to safety category type IIIc
- Minimum space required (22.5 mm) and optimum ease of connection
- 2 N/O contacts / 1 N/C contact / 1 PLC output
- 24 V AC/DC and 230 V AC
- Pluggable spring clamp terminal with quick connection technology
MIRO SAFE STEP
For safety mat applications
• TÜV and UL approved for reliability
• Applicable up to safety category 3/PLd
• Minimum space required (22.5 mm) and optimum ease of connection
• With automatic start
• 3 N/O-1 N/C contacts
• 24 V AC/DC
• Pluggable spring clamp terminal with quick connection technology

MIRO SAFE LIGHT
for light barrier / array applications
• TÜV- and UL approved for reliability
• Applicable up to safety category 4/PLe
• Minimum space required (22.5 mm) and ease of connection
• 3 N/O contacts
• 24 V DC
• Pluggable spring clamp terminal with quick connection technology

MIRO SAFE T
Emergency-Stop and guard door applications with time delay
• TÜV- and UL approved for reliability
• Applicable up to safety category 4/PLe
• Minimum space required (35 mm) and ease of connection
• 2 N/O / 1 N/C and 2 N/Os delayed
• Time delay 0.05 – 600 s
• Automatic / manual and monitored start-up
• 24 V AC/DC
• Pluggable spring clamp terminal with quick connection technology
SAFETY RELAYS

MIRO SAFE SSO
Emergency-Stop and guard door applications (with solid state outputs)
- TÜV- and UL approved for reliability
- Applicable up to safety category 4/PLe
- Minimum space required (22.5 mm) and ease of connection
- 4 Safe solid state outputs „N/O“ (safety relay outputs)
- Total switching current for all 4 outputs 2.7A/24DC
- Outputs that never wear out, no bouncing, high resistance to shock and vibration
- Pluggable spring clamp terminal with quick connection technology

MIRO SAFE FLEX
Emergency-Stop/guard door, two-hand operation, light barriers and pulsing safety switches
- TÜV approved for reliability
- Applicable up to safety category 4/PLe
- Minimum space required (22.5 mm) and ease of connection
- For flexible use in many applications
- 2 N/O/1 N/C
- 24 V DC
- Pluggable spring clamp terminal with quick connection technology

MIRO SAFE E/EQ
Expansion module for contact multiplication
- TÜV- and UL approved for reliability
- Applicable up to safety category 4/PLe
- Minimum space required (22.5 mm) and ease of connection
- 4 N/O/1 N/C
- With or without cross circuit monitoring
- 24 V AC/DC
- Pluggable spring clamp terminal with quick connection technology
The MIRO modules are equipped with spring clamp terminals that allow quick cable connections. The ferrule ends of the rigid or flexible connectors are directly plugged into the contact without requiring the use of an opening lever. This creates an automatic connection – in line with our plug-and-play concept.

MIRO SAFE – A SAFE PRODUCT!

MIRO SAFE – Proven relay technology for maximum safety
MIRO SAFE relays are an important component of a consistent safety chain. MIRO SAFE safety relays can be used for emergency stop and guard-door monitoring, two-hand controls, and for safety mat and light barrier applications.

With the safety-related application of MIRO SAFE, designed for the protection of workers and machines, you reduce downtime and outages.

MIRO SAFE – Maximum safety
MIRO SAFE safety relays are applicable up to the maximum safety category 4 (EN 954-1). All MIRO SAFE safety relays are TÜV and UL approved.

MIRO SAFE – Proven relay technology
MIRO SAFE safety relays are based on proven relay technology. Thus no conversion to new, complex technologies is required and existing knowledge can be used during start-up, operation and in case of maintenance.

MIRO SAFE – Safe and installation friendly
Pluggable spring clamp terminals or double spring clamp terminals allow simple and quick installation and start-up. Application friendly circuit diagrams attached to the MIRO SAFE relays help reduce the risk of mis-wiring. MIRO SAFE stands for easy connectivity with maximum functionality and a slim design of 22.5 mm.

MIRO SAFE – Safe and cost-efficient
From an economic point of view, the application of proven relay technology on a high level shows positive results. Thanks to the preventive functioning of MIRO SAFE, fatal danger for workers and machines are detected immediately and can be avoided. MIRO SAFE eliminates negative effects. Using MIRO SAFE shortens downtime and production outages, thus reducing your costs and increasing efficiency.
# RELAY MODULES

## Output relays

**MIRO 6.2**  
1 C/O contact

<table>
<thead>
<tr>
<th>Connection voltage</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V DC cUL</td>
<td>6652050</td>
</tr>
<tr>
<td>24 V DC UL + CSA</td>
<td>6652000</td>
</tr>
<tr>
<td>24 V AC/DC UL + CSA</td>
<td>6652001</td>
</tr>
<tr>
<td>48 V DC</td>
<td>6652020</td>
</tr>
<tr>
<td>110 V AC/DC UL + CSA</td>
<td>6652030</td>
</tr>
<tr>
<td>230 V AC/DC UL + CSA</td>
<td>6652040</td>
</tr>
</tbody>
</table>

### Technical data

- **Switching voltage**: 12...250 V AC/DC  
- **Switching current**: 10 mA...6 A (switching capabilities to EN 60947-5-1)

### Circuit diagram

Common connection up to max. 50 V AC/DC  
At connection voltages of 110 and 230 V A2 does not feature potential sockets

## Input relays

**MIRO 6.2**  
1 C/O contact

<table>
<thead>
<tr>
<th>Connection voltage</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC UL + CSA</td>
<td>6652005</td>
</tr>
<tr>
<td>24 V AC/DC UL + CSA</td>
<td>6652003</td>
</tr>
<tr>
<td>48 V DC</td>
<td>6652021</td>
</tr>
<tr>
<td>110 V AC/DC UL + CSA</td>
<td>6652031</td>
</tr>
<tr>
<td>230 V AC/DC UL + CSA</td>
<td>6652041</td>
</tr>
</tbody>
</table>

### Technical data

- **Switching voltage**: 12...250 V AC/DC  
- **Switching current**: 1 mA...50 mA (when the listet values are exceeded the gold plating is destroyed, then will take on the properties of an output type)

### Circuit diagram

Common connection up to max. 50 V AC/DC  
At connection voltages of 110 and 230 V A2 does not feature potential sockets
**RELAY MODULES**

**Output relays**

MIRO 6.2
1 N/O contact
with protected H-O-A switch

MIRO 6.2
1 C/O contact
with isolation function

MIRO 6.2
1 N/O contact
with soldering terminal

Common return for NC

**Circuit diagram**

Common connection up to max. 50 V AC/DC

At connection voltages of 110 and 230 V A2 does not feature potential sockets

**Ordering data**

<table>
<thead>
<tr>
<th>Connection voltage</th>
<th>MIRO 6.2</th>
<th>MIRO 6.2</th>
<th>MIRO 6.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>spring clamp/screw terminals</td>
<td>spring clamp/screw terminals</td>
<td>spring clamp/screw terminals</td>
</tr>
<tr>
<td>24 V AC/DC</td>
<td>UL + CSA</td>
<td>6652007</td>
<td>UL + CSA</td>
</tr>
</tbody>
</table>

**Technical data**

Switching voltage: 12…250 V AC/DC

Switching current: 10 mA…6 A (switching capabilities to EN 60947-5-1)

**Pluggable relays**

MIRO 6.2 pluggable
Output relay, 1 C/O contact

MIRO 6.2 Plug module
Output relay, 1 C/O contact

MIRO 6.2 pluggable
Output relay, 1 C/O contact

MIRO 6.2 Plug module
Input relay, 1 C/O contact

**Ordering data**

<table>
<thead>
<tr>
<th>Connection voltage</th>
<th>MIRO 6.2</th>
<th>MIRO 6.2</th>
<th>MIRO 6.2</th>
<th>MIRO 6.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 V AC/DC</td>
<td>CSA</td>
<td>3000-16023-3100022</td>
<td>3000-16023-2100000</td>
<td></td>
</tr>
<tr>
<td>12 V AC/DC</td>
<td>CSA</td>
<td>3000-16023-3100005</td>
<td>3000-16023-2100005</td>
<td></td>
</tr>
<tr>
<td>24 V DC</td>
<td>CSA</td>
<td>3000-16013-3100010</td>
<td>3000-16023-2100010</td>
<td></td>
</tr>
<tr>
<td>24 V AC/DC</td>
<td>CSA</td>
<td>3000-16013-3100020</td>
<td>3000-16023-2100010</td>
<td></td>
</tr>
<tr>
<td>24 V AC/DC</td>
<td>CSA</td>
<td>3000-16013-3100020</td>
<td>3000-16023-2100010</td>
<td></td>
</tr>
<tr>
<td>48 V AC/DC</td>
<td>CSA</td>
<td>3000-16023-3100000</td>
<td>3000-16023-2100000</td>
<td></td>
</tr>
<tr>
<td>60 V AC/DC</td>
<td>CSA</td>
<td>3000-16023-3100022</td>
<td>3000-16023-2100020</td>
<td></td>
</tr>
<tr>
<td>115 V AC/DC</td>
<td>CSA</td>
<td>3000-16013-3100025</td>
<td>3000-16023-2100020</td>
<td></td>
</tr>
<tr>
<td>230 V AC/DC</td>
<td>CSA</td>
<td>3000-16013-3100030</td>
<td>3000-16023-2100020</td>
<td></td>
</tr>
</tbody>
</table>

**Technical data**

Switching voltage: 12…250 V AC/DC

Switching current: 10 mA…6 A (switching capabilities to EN 60947-5-1)  
1 mA…50 mA (when the listed values are exceeded the gold plating is destroyed, then will take on the properties of an output type)

**Accessories**

Bridging link, blue
for connecting terminals, up to max. 20 modules
3000-90000-0300010

Bridging link, black
for connecting terminals, up to max. 20 modules
3000-90000-0300020
**RELAY MODULES**

### Output relays

- **MIRO 12.4**
  - 2 C/O contacts with enhanced features

### Circuit diagram

At connection voltages of 110 and 230 V, A2 does not feature potential sockets.

### Ordering data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>cUL</td>
<td>6652102</td>
<td>6652106</td>
<td>6652104</td>
<td>6652140</td>
</tr>
<tr>
<td>24 V AC/DC</td>
<td>cUL</td>
<td>6652103</td>
<td>6652106</td>
<td>6652104</td>
<td>6652140</td>
</tr>
<tr>
<td>48 V DC</td>
<td>cUL</td>
<td>6652120</td>
<td>6652126</td>
<td>6652126</td>
<td>6652126</td>
</tr>
<tr>
<td>110 V AC/DC</td>
<td>cUL</td>
<td>6652130</td>
<td>6652136</td>
<td>6652136</td>
<td>6652136</td>
</tr>
<tr>
<td>230 V AC/DC</td>
<td>cUL</td>
<td>6652140</td>
<td>6652146</td>
<td>6652146</td>
<td>6652146</td>
</tr>
</tbody>
</table>

### Technical data

- Switching voltage: 12…250 V AC/DC
- Switching current: 10 mA...6 A (switching capabilities to EN 60947-5-1)
- Max. power rating (voltage dependent): 1500 VA/120 W

### Input relays

- **MIRO 12.4**
  - 2 C/O contacts with enhanced features

### Circuit diagram

At connection voltages of 110 and 230 V, A2 does not feature potential sockets.

### Ordering data

<table>
<thead>
<tr>
<th>Connection voltage</th>
<th>spring clamp/screw terminals</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>cUL</td>
<td>6652110</td>
</tr>
<tr>
<td>24 V AC/DC</td>
<td>cUL</td>
<td>6652111</td>
</tr>
<tr>
<td>48 V DC</td>
<td>cUL</td>
<td>6652126</td>
</tr>
<tr>
<td>110 V AC/DC</td>
<td>cUL</td>
<td>6652136</td>
</tr>
<tr>
<td>230 V AC/DC</td>
<td>cUL</td>
<td>6652146</td>
</tr>
</tbody>
</table>

### Technical data

- Switching voltage: 12…250 V AC/DC
- Switching current: 1 mA...50 mA (switching capabilities to EN 60947-5-1) (when the listed values are exceeded, the gold plating is destroyed, then will take on the properties of an output type)
- Max. power rating (voltage dependent): 1500 VA/120 W
**OPTO-COUPLER MODULES**

### Terminal opto-coupler

- **MIRO 6,2**
  - Transistor 1 A
  - Transistor 2 A
  - Transistor 6 A
  - Transistor 10 A

#### Circuit diagram

Common connection up to max. 50 V AC/DC

#### Ordering data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5 V DC</td>
<td>spring clamp</td>
<td>6652502</td>
<td>6652502</td>
<td>6652502</td>
<td>6652502</td>
</tr>
<tr>
<td>24 V DC</td>
<td>UL + CSA</td>
<td>6652515</td>
<td>6652515</td>
<td>6652515</td>
<td>6652515</td>
</tr>
<tr>
<td>48 V AC/DC</td>
<td>UL + CSA</td>
<td>6652505</td>
<td>6652505</td>
<td>6652505</td>
<td>6652505</td>
</tr>
</tbody>
</table>

#### Technical data

- **Switching voltage**: 5…48 V DC
- **Switching current**: 0,5 mA…1 A
- **Control current**: 0,1 mA
- **max. switching frequency**: 20 kHz

### Fast transistor output

- **MIRO 6,2**
  - Transistor 0,5 A
  - Transistor 2 A
  - Transistor 2 A
  - Transistor 0,1 A

#### Circuit diagram

Common connection up to max. 50 V DC

#### Ordering data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>spring clamp</td>
<td>6652511</td>
<td>6652503</td>
<td>526071</td>
</tr>
</tbody>
</table>

#### Technical data

- **Switching voltage**: 5…48 V DC
- **Switching current**: 0,1 mA…0,5 A
- **Control current**: 0,1 mA
- **max. switching frequency**: 20 kHz
### OPTO-COUPLER MODULES

<table>
<thead>
<tr>
<th>Transistor output</th>
<th>MIRO 6.2 pluggable</th>
<th>MIRO 6.2 plug module</th>
<th>MIRO 6.2 pluggable</th>
<th>MIRO 6.2 plug module</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transistor 2 A</td>
<td>Transistor 2 A</td>
<td>Transistor 4 A</td>
<td>Transistor 4 A</td>
</tr>
<tr>
<td></td>
<td>Complete module</td>
<td>Replacement module</td>
<td>Complete module</td>
<td>Replacement module</td>
</tr>
</tbody>
</table>

#### Circuit diagram

#### Ordering data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>cUL 3000-32512-2100010</td>
<td>^ 3000-32522-2100010</td>
<td>3000-32512-2100020</td>
<td>^ 3000-69012-2100050</td>
</tr>
<tr>
<td>24 V DC</td>
<td>3000-32512-2100010</td>
<td>^ 3000-32522-2100010</td>
<td>3000-32512-2100020</td>
<td>^ 3000-69012-2100050</td>
</tr>
</tbody>
</table>

#### Technical data

- Switching voltage: 5...48 V DC
- Switching current: 1 mA...2 A
- Short-circuit protected

### SOLID STATE RELAYS

<table>
<thead>
<tr>
<th>Triac output</th>
<th>MIRO 6.2 pluggable</th>
<th>MIRO 6.2 plug module</th>
<th>MIRO 6.2</th>
<th>MIRO 6.2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Triac 0.5 A</td>
<td>Triac 0.5 A</td>
<td>Triac 0.5 A</td>
<td>Triac 1 A</td>
</tr>
<tr>
<td></td>
<td>Complete module</td>
<td>Replacement module</td>
<td>Complete module</td>
<td>Replacement module</td>
</tr>
</tbody>
</table>

#### Circuit diagram

#### Ordering data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5 V DC</td>
<td>UL 6652551</td>
<td>UL 6652571</td>
<td>UL 6652550</td>
<td>UL 6652556</td>
<td>UL 6652571</td>
</tr>
<tr>
<td>24 V DC</td>
<td>3000-34013-2100010</td>
<td>^ 3000-69011-2100060</td>
<td>3000-34013-2100010</td>
<td>^ 3000-69011-2100060</td>
<td></td>
</tr>
<tr>
<td>115 V AC</td>
<td>UL 6652556</td>
<td>UL 6652556</td>
<td>UL 6652556</td>
<td>UL 6652556</td>
<td>UL 6652556</td>
</tr>
<tr>
<td>230 V AC</td>
<td>6652556</td>
<td>6652556</td>
<td>6652556</td>
<td>6652556</td>
<td>6652556</td>
</tr>
</tbody>
</table>

#### Technical data

- Switching voltage: 12...250 V AC
- Switching current: 0.01 mA...0.5 A
- Switching current: 0.1 mA...0.5 A
- Switching current: 10 mA...1.0 A
SOLID STATE RELAYS

<table>
<thead>
<tr>
<th>Triac output</th>
<th>AMMOS triac</th>
<th>MIRO triac</th>
<th>MIRO triac</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Triac 2 A</td>
<td>Triac 5 A</td>
<td>Triac 10 A</td>
</tr>
<tr>
<td>Zero voltage switch</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Circuit diagram

### Ordering data
<table>
<thead>
<tr>
<th>Control voltage input</th>
<th>Art.-No.</th>
<th>Art.-No.</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC UL</td>
<td>50092</td>
<td>3000-36001-2000020</td>
<td>3000-36001-2000025</td>
</tr>
<tr>
<td>115 V AC</td>
<td>3000-36001-2000022</td>
<td>3000-36001-2000027</td>
<td></td>
</tr>
<tr>
<td>230 V AC</td>
<td>3000-36001-3000023</td>
<td>3000-36001-3000028</td>
<td></td>
</tr>
</tbody>
</table>

### Technical data
<table>
<thead>
<tr>
<th>Switching voltage</th>
<th>24 V AC 24…280 V AC</th>
<th>120 V AC 12…400 V AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching current</td>
<td>1 mA…2 A</td>
<td>10 mA…5 A</td>
</tr>
<tr>
<td>Surge current</td>
<td>70 A</td>
<td></td>
</tr>
</tbody>
</table>

### Triac output

<table>
<thead>
<tr>
<th>Triac output</th>
<th>MIRO triac</th>
<th>MIRO triac</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Triac 30 A</td>
<td>Triac 3 x 20 A</td>
</tr>
<tr>
<td>Zero voltage switch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Circuit diagram

### Ordering data
<table>
<thead>
<tr>
<th>Control voltage input</th>
<th>Art.-No.</th>
<th>Art.-No.</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC UL/cUL</td>
<td>3000-36001-2000040</td>
<td>3000-36001-2000050</td>
<td>3000-36001-2000060</td>
</tr>
</tbody>
</table>

### Technical data
<table>
<thead>
<tr>
<th>Switching voltage</th>
<th>42 V AC 42 V…660 V AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching current</td>
<td>30 A</td>
</tr>
<tr>
<td>Surge current</td>
<td>400 A</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Analog converters

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Art.-No. 1</th>
<th>Art.-No. 2</th>
<th>Art.-No. 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>MU..W 6,2</td>
<td>INPUT 0…10 V DC</td>
<td>6644205</td>
<td>6644212</td>
<td>6644213</td>
</tr>
<tr>
<td>MI..W 6,2</td>
<td>INPUT 0…20 mA</td>
<td>6644232</td>
<td>6644226</td>
<td>6644228</td>
</tr>
<tr>
<td>MI..W 6,2</td>
<td>INPUT 4…20 mA</td>
<td>6644233</td>
<td>6644228</td>
<td>6644228</td>
</tr>
</tbody>
</table>

#### Technical data

- **Supply voltage**: 24 V DC
- **Input resistance; input voltage/current**: approx. 200 kOhm; approx. 250 Ohm
- **Output load**: $R_L \geq 500$ Ohm at output voltage; $R_L \leq 500$ Ohm at output current

### Comparator modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Art.-No. 1</th>
<th>Art.-No. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAK</td>
<td>Input signal, voltage DC</td>
<td>6644110</td>
<td>3000-62004-820010</td>
</tr>
<tr>
<td>MIRO 12,4</td>
<td>Potentiometer</td>
<td>6644110</td>
<td></td>
</tr>
</tbody>
</table>

#### Technical data

- **Supply voltage**: 24 V DC
- **Input resistance**: 100 kOhm
- **Input range**: –
- **Output**: 3 transistor outputs
- **Output voltage**: 0…10 V

#### Description

The DC or AC-voltage comparator for analog voltage, which, i.e. will generate from pressure, temperature, or other sensors. The analog input values are compared to internal or external reference voltages to over or underflow.

### Potentiometer converter

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Art.-No. 1</th>
<th>Art.-No. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Input signal, voltage DC</td>
<td>spring clamp/screw terminals</td>
<td>screw terminals</td>
</tr>
</tbody>
</table>

#### Technical data

- **Supply voltage**: 24 V DC
- **Input resistance**: > 2.5 MOhm
- **Input range**: 470 Ohm … 10 kOhm
- **Output**: 0…10 V

#### Description

The potentiometer converter is used to convert resistive load into a voltage signal. A higher linearity will be achieved due to lower loop stream. The sensor cables are monitored for line breaks and short-circuits.
ACTIVE INTERFACE TECHNOLOGY

Temperature converters for PT100 sensors

MTW 12,4
2-/3-wire

Pole-changing switches for DC motors
Motor Guard
Complete module

Motor protection relays
MIRO 12,4
Pole-changing switches for DC motors
MIRO 6,2 pluggable
Motor Guard
Complete module
MIRO 6,2 Plug module
Motor Guard
Replacement module

Ordering data

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>6650140</td>
</tr>
</tbody>
</table>

Technical data

Switched voltage
24 V DC

Switched current
3 A

Release temperature
PTC dependend

Ordering data

<table>
<thead>
<tr>
<th>Art.-No.</th>
<th>Spring clamp/screw terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000-18522-8100000</td>
<td>6644330</td>
</tr>
<tr>
<td>3000-69012-6100061</td>
<td>6644331</td>
</tr>
<tr>
<td>3000-69026-6100000</td>
<td>6644332</td>
</tr>
<tr>
<td>3000-69032-6100000</td>
<td>6644334</td>
</tr>
<tr>
<td>3000-69036-6100000</td>
<td>6644336</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Art.-No.</th>
<th>Spring clamp terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000-18522-8100000</td>
<td>6650140</td>
</tr>
<tr>
<td>3000-69012-6100000</td>
<td>6644330</td>
</tr>
<tr>
<td>3000-69026-6100000</td>
<td>6644331</td>
</tr>
<tr>
<td>3000-69032-6100000</td>
<td>6644332</td>
</tr>
<tr>
<td>3000-69036-6100000</td>
<td>6644334</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Art.-No.</th>
<th>Spring clamp terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000-18522-8100000</td>
<td>6650140</td>
</tr>
<tr>
<td>3000-69012-6100000</td>
<td>6644330</td>
</tr>
<tr>
<td>3000-69026-6100000</td>
<td>6644331</td>
</tr>
<tr>
<td>3000-69032-6100000</td>
<td>6644332</td>
</tr>
<tr>
<td>3000-69036-6100000</td>
<td>6644334</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Art.-No.</th>
<th>Spring clamp terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000-18522-8100000</td>
<td>6650140</td>
</tr>
<tr>
<td>3000-69012-6100000</td>
<td>6644330</td>
</tr>
<tr>
<td>3000-69026-6100000</td>
<td>6644331</td>
</tr>
<tr>
<td>3000-69032-6100000</td>
<td>6644332</td>
</tr>
<tr>
<td>3000-69036-6100000</td>
<td>6644334</td>
</tr>
</tbody>
</table>

Ordering data

<table>
<thead>
<tr>
<th>Art.-No.</th>
<th>Spring clamp terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000-18522-8100000</td>
<td>6650140</td>
</tr>
<tr>
<td>3000-69012-6100000</td>
<td>6644330</td>
</tr>
<tr>
<td>3000-69026-6100000</td>
<td>6644331</td>
</tr>
<tr>
<td>3000-69032-6100000</td>
<td>6644332</td>
</tr>
<tr>
<td>3000-69036-6100000</td>
<td>6644334</td>
</tr>
</tbody>
</table>
ACTIVE INTERFACE TECHNOLOGY

**Timer**

**MIRO 6.2 pluggable**
- Impulse expansion
- Complete module

**MIRO 6.2 plug module**
- Impulse expansion
- Replacement module

---

**Circuit diagram**

---

**Ordering data**

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>Art.-No.</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>3000-18512-0100010</td>
<td>3000-69012-2100020</td>
</tr>
</tbody>
</table>

**Technical data**

- Switching voltage: 24 V DC
- Switching current: 0.1 mA - 100 mA
- Time range: Set on 40 ms

---

**Timer**

**MIB 6.2 mm**
- Transistor output
- One shot

**MIRO 6.2 Timer**
- Relay output
- Switch on delay

**MIRO 6.2 Timer**
- Relay output
- Switch off delay

---

**Circuit diagram**

---

**Ordering data**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>6652320</td>
<td>6652300</td>
<td>6652310</td>
</tr>
</tbody>
</table>

**Technische Daten**

- Switching voltage: 12...250 V AC/DC
- Switching current: 1 mA...100 mA
- Time range: 100 ms...10 sek
ACTIVE INTERFACE TECHNOLOGY

Timer
- One shot
- Switch on delay
- Switch off delay
- Modulation

Circuit diagram

Ordering data
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>3000-18512-0200010</td>
<td>3000-18513-0200013</td>
<td>6652350</td>
</tr>
<tr>
<td>24 V DC</td>
<td>3000-18502-0200010</td>
<td>3000-18503-0200012</td>
<td></td>
</tr>
</tbody>
</table>

Technical data
<table>
<thead>
<tr>
<th>Switching voltage</th>
<th>Switching current</th>
<th>Time range</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>1 mA…100 mA</td>
<td>10 ms…10 sek</td>
</tr>
<tr>
<td>12…250 V AC/DC</td>
<td>10 mA…6 A</td>
<td>100 ms…100 sek</td>
</tr>
<tr>
<td>24 V DC</td>
<td></td>
<td>100 ms…300 sek</td>
</tr>
</tbody>
</table>

Switches

Unmanaged

Circuit diagram

Ordering data
<table>
<thead>
<tr>
<th>Fieldbus</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 x RJ45</td>
<td>58154</td>
</tr>
</tbody>
</table>

Technical data
<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>Supply voltage</th>
<th>Transfer rate</th>
<th>Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 12…32 V DC, Redundanz</td>
<td>2 x 12…32 V DC, Redundanz</td>
<td>10/100 MBit/s Full Duplex</td>
<td>Autocrossing, Autonegotiation</td>
</tr>
</tbody>
</table>
SAFETY RELAYS

Emergency-stop and guard-door applications

– Relays positively driven

MIRO SAFE Switch HCS
With start button monitoring
3 N/O / 1 N/C

MIRO SAFE Switch HA
Without start button monitoring
3 N/O / 1 N/C

Ordering data

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>Art.-No.</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V AC/DC</td>
<td>3000-33013-3020010</td>
<td>3000-33013-3020015</td>
</tr>
<tr>
<td>230 V AC</td>
<td>3000-33013-1020010</td>
<td>3000-33013-1020015</td>
</tr>
</tbody>
</table>

Technical data

<table>
<thead>
<tr>
<th>Input voltage/-current</th>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V AC/DC ± 10 %/approx. 200 mA</td>
<td>Max. switching voltage 250 V AC</td>
</tr>
<tr>
<td>230 V AC ± 10 %/approx. 16 mA</td>
<td>Max. current 5 A</td>
</tr>
<tr>
<td>Achievable safety class</td>
<td>Achievable safety class up to 4 (EN 954-1)</td>
</tr>
</tbody>
</table>

Approvals:

MIRO SAFE Switch BCS
With start button monitoring
2 N/O

MIRO Switch BA
Without start button monitoring
2 N/O

Ordering data

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>Art.-No.</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V AC/DC</td>
<td>3000-33013-3020020</td>
<td>3000-33013-3020025</td>
</tr>
</tbody>
</table>

Technical data

<table>
<thead>
<tr>
<th>Input voltage/-current</th>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V AC/DC ± 10 %/approx. 70 mA</td>
<td>Max. switching voltage 250 V AC</td>
</tr>
<tr>
<td></td>
<td>Max. current 6 A</td>
</tr>
<tr>
<td></td>
<td>Achievable safety class up to 3 (EN 954-1)</td>
</tr>
</tbody>
</table>
## SAFETY RELAYS

### Two-hand switching operations
- MIRO SAFE Hand
- 2 N/O / 1 N/C

#### Circuit diagram

#### Ordering data

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V AC/DC</td>
<td>3000-33013-3020030</td>
</tr>
<tr>
<td>230 V AC</td>
<td>3000-33013-3020040</td>
</tr>
</tbody>
</table>

#### Technical data

- Input voltage / current: 24 V AC/DC ± 10 % / approx. 85 mA
- 230 V AC ± 10 % / approx. 10 mA
- Max. switching voltage: 250 V AC
- Max. current: 6 A
- Achievable safety class: up to type IIIc (EN 574-1), up to 4 (EN 954-1)

#### Accessories

<table>
<thead>
<tr>
<th>Accessory Description</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIRO SAFE Step</td>
<td>3 N/O / 1 N/C</td>
</tr>
<tr>
<td>Two-hand switching operations</td>
<td></td>
</tr>
<tr>
<td>MIRO SAFE Light</td>
<td>3 N/O</td>
</tr>
</tbody>
</table>

### Approvals:

- TÜV NORD

---

### MIRO SAFE Hand

- 2 N/O / 1 N/C

### MIRO SAFE Step

- for safety mats
- 3 N/O / 1 N/C

### MIRO SAFE Light

- Light barrier monitoring
- 3 N/O

---

### Circuit diagram

#### Ordering data

<table>
<thead>
<tr>
<th>Input voltage</th>
<th>Art.-No.</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V AC/DC</td>
<td>3000-33013-3020030</td>
<td>3000-33013-3020040</td>
</tr>
<tr>
<td>230 V AC</td>
<td>3000-33013-3020040</td>
<td>3000-33013-3020050</td>
</tr>
</tbody>
</table>

#### Technical data

- Input voltage / current: 24 V AC/DC ± 10 % / approx. 200 mA
- 24 V AC/DC ± 10 % / approx. 100 mA
- Max. switching voltage: 250 V AC
- Max. current: 6 A
- Achievable safety class: up to 3 (EN 954-1), up to 4 (EN 954-1)

#### Accessories

- Double spring clamp terminals: 3000-33010-000000
- Label plate: 3000-33030-000000
SAFETY RELAYS

Emergency-stop/guard-door applications

– with delay time 0.05...600 s

– Relays positively driven

Approvals:

Circuit diagram

<table>
<thead>
<tr>
<th>Ordering data</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>24 V AC/DC</td>
</tr>
<tr>
<td>Spring clamp plug-in terminals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3000-33013-3020060</td>
</tr>
</tbody>
</table>

Technical data

- Input voltage/-current: 24 V AC/DC -20/+25 %/ca. 200 mA
- Max. switching voltage: 250 V AC
- Max. power rating: 6 A
- Achievable safety class: up to 4/PLe (EN ISO 13849-1)/ SIL3 (EN 61508)

MIRO SAFE T

2 N/O contacts (with switch-off delay) 1N/C contact

Circuit diagram

Ordering data

Input voltage: 24 V DC
Spring clamp plug-in terminals: 3000-33013-3020080

Technical data

- Input voltage/-current: 24 V DC -20/+25 %/ca. 10 mA
- Max. current: –
- Total current: max 2.7 A
- Achievable safety class: up to 4/PLe (EN ISO 13849-1)/ SIL3 (EN 61508)

MIRO SAFE SSO

Emergency-stop/guard-door applications

– 4 safe solid state output

Approvals:

Circuit diagram

Ordering data

Input voltage: 24 V DC
Spring clamp plug-in terminals: 3000-33013-3020080

Technical data

- Input voltage/-current: 24 V DC -20/+25 %/ca. 10 mA
- Max. current: –
- Total current: max 2.7 A
- Achievable safety class: up to 4/PLe (EN ISO 13849-1)/ SIL3 (EN 61508)
SAFETY RELAYS

Emergency-stop/guard-door applications/two-hand control light barriers/light curtains

- Relay positively driven

MIRO SAFE Flex
Emergency-stop/guard-door applications/two-hand control Light barriers/light curtains, 2 N/O contacts, 1 auxiliary output

Input circuit
Micro controller 1
K2

Power
Output circuit
Micro controller 2
K1

Circuit diagram

Ordering data
Input voltage
Spring clamp plug-in terminals
24 V DC
3000-33013-3020090

Technical data
Input voltage/-current
24 V DC -20/+25 %/ca. 8 mA
Max. switching voltage
24 V AC
Max. power rating
6 A
Achievable safety class
up to 4/PLe (EN ISO 13849-1)/ SIL3 (EN 62061)/(EN 574-1)

Expansion modules
MIRO SAFE EQ
4 N/O contacts 1 feedback loop
Cross-link safe

MIRO SAFE E
4 N/O contacts 1 feedback loop

Approvals:

Circuit diagram

Ordering data
Connection voltage
Spring clamp plug-in terminals
24 V AC/DC
3000-33013-3020070
3000-33013-3020075

Technical data
Input voltage/-current
24 V AC/DC -15/+10 %/ca. 200 mA
Max. switching voltage
250 V AC
Max. current
6 A
Achievable safety class
up to 4/PLe (EN ISO 13849-1)
Switching and controlling in the control cabinet

Art.-No. 9853012