

General information

Active interface modules are located in every system and available in several versions. Relay interface modules are meant to separate 2 different potential levels. The control side is galvanically isolated from the load and contact side to protect inadmissible voltage. Interfaces are able to adjust various signal levels for every occasion.

With the help of active modules expensive PLC output cards can be reduced into smaller output ratings. Separation level can be realized with single or multiple modules as relay or opto-coupler. They are used as amplifier- and protection modules for switched control electronics, as well as for level adaption. EMC problems at the load side of the relay modules wont be transmitted to the input side because of the galvanically isolation. Modular modules with a minus plug link and a potential rail comb allows a quick installation on the coupler level.

Murrelektronik offers simple modules, which are used as row terminals, modules for building management systems with "HAND-O-AUTO" switches, as well as pluggable relay- and time modules with a wide time range.

Relay features

Electromechanically relays are preferably used as interface modules between PLC and periphery components such as control,- alarm- and regulated installtions. A level and load adaption, as well as a galvanically isolation takes place at the same time.

At various possibilities, in different industrial areas, it is necessary to match a suitable contact material of the output side. Several contact loads denial the usage of universal materials. Dependent on the contact load different contact materials are corresponding to the "Contact material table".

Contact life / no. of operations

Each load comprises a resistive, capacitive and an inductive component. It is mainly the inductive component which affects the lifetime. Inductive loads such as solenoids, motors and contactors produce a voltage when switched off which is many times greater than supply voltage. This can quickly burn out the contact. In order to increase the lifetime of the contact, the load must be suppressed.

In theory, a varistor or resistor/capacitor network (RC) across the contact is possible, but dangerous leakage currents may flow to the load when the contact is open. In practice, it is better to fit the suppressor across the load, where it is not only safer but is closer to the source of interference. Murrelektronik can supply many types of universal or made-to-measure suppressors. These suppressors dampen the high voltage transient and reduce the arc at the contacts. Contact life depends upon voltage, current and the nature of the load.

More details about suppression of inductive loads in chapter 3.2

Contact material	Typical properties	Typical applications	Voltage and current levels
Silver-nickel 0.15 gold flashed (AgNi 0.15 hv)	Widely used general purpose material.	General purpose. Suitable for inductive loads.	≥ 12 V ≥ 10 mA
Silver, gold plated (Ag htv)	Gold plating resists contamination but switching loads greater than 30 V/0.2 A removes the gold. Performance reverts to silver.	General purpose. For low to mid-range loads.	≥ 100 mV ≥ 1 mA
Palladium silver, Gold/Rhodium (PdAg-AuRh)	High resistance against oxidation; hard material; stable transfer resistance	Low level signals to mid-range loads.	1 mV . . . 125 V 1 mA . . . 1 A
Silver Tin oxide (AgSnO)	Resists welding and burn-out at high voltages. minimal material erosion	Switching circuits with high on off loading.	≥ 12 V ≥ 10 mA
Silver Tin oxide, gold plated (AgSnO htv)	Gold plating resists contamination but switching loads greater than 30 V/50 mA removes the gold. Performance reverts to AgSnO contacts	General purpose. Suitable for small and large loads.	≥ 100 mV ≥ 1 mA

Relay



MIRO

The modules are offered in two sizes:
 6.2 mm module housing with integrated relay with 1 C/O contact and common bridge.
 12.4 mm module housing with integrated relay with 2 C/O contact and common bridges.
 Connection is via cage clamp terminals or screw terminal. The minus plug-in jumper saves space and wiring time.
 Snaps on to DIN-rail to EN 60715.

from page 3.3.4



MIRO 6.2 pluggable

6.2 mm module housing with integrated relay with 1 C/O contact and common bridge.
 Connection is via spring clamp terminals. The common bridges saves space and wiring time.
 Snap on to DIN-rail EN 60715.

page 3.3.7



RMM, RMME

Width 12 mm. Attractive and functional design.
 Separation between input and outputs is clearly defined. Each module can be individually labelled.
 LED indicator. Snaps on to DIN-rail to EN 60715 (TH35) or (G32).
 Versions with plug-in jumper on the input side simplify wiring, because no loop in of the A2 common is then necessary.

from page 3.3.10



RMMD/RMMDE/RMMDH

Compact design incorporating clever features. 1 relay with 1 C/O contact or 2 N/O contacts with a width of only 12 mm.
 Switching current of up to 8 A possible.
 Up to 50 modules can be linked using the plug-in jumper.
 The RMMDH also has a switch with 3 settings "HAND-O-AUTO" which allows manual operation or simulations to be carried out.
 Snaps on to DIN-rail to EN 60715 (TH35) or (G32).

from page 3.3.13



RM, RME

Width 22.5 mm. There are up to 4 relays in each housing. Each can be individually labelled.
 The modules are offered with screw terminal or plug in screw terminals. This allows them to be replaced in maintenance very quickly. Positive guided contacts are also on offer.
 Snaps on to DIN-rail to EN 60715 (TH35) or (G32).

from page 3.3.17

Relay socket



MKS-K

For cradle relays with wiring method via screw terminals.
 Integrated LED and suppression.
 Snaps onto DIN-rail to EN 60715 (TH35).

page 3.3.21



MKS-J

For industrial relays with wiring method via screw terminals.
 Integrated LED and suppression.
 Snaps onto DIN-rail to EN 60715 (TH35).

page 3.3.22

Relay socket



IR 4

For industrial relays with wiring method via screw terminals.
Snaps onto DIN-rail to EN 60715 (TH35).
Versions in protection IP40 and IP20.

page 3.3.23



RM

For plug in relays with 2, 4 or 8 plugged SNR-relays. Optionally with semiconductor relays.
Snaps onto DIN-rail to EN 60715 (TH35).

page 3.3.24



MRB

For plug-in relays with 1 or 2 C/O.
Snaps onto DIN-rail to EN 60715 (TH35).
Suitable for all plug-in relays and can be fitted with a suppressor.

page 3.3.25

Plug-in relays



Cardle relays

Plug-in cradle relay for base socket with 2 or 4 C/O contacts.

page 3.3.26



Industrial relay

Plug-in industrial relay for base socket with 4 C/O contacts.

page 3.3.26



Plug-in relay

Plug-in relay available in 1 or 2 contacts.
For use with MRB relay.

page 3.3.27



Plug-in relay

5 mm small, pluggable SNR-relay modules for MIRO 6.2 pluggable and RM base socket.

page 3.3.27

Terminal relays

Manual switch VDI 3814

with enhanced features

MIRO 6.2

Output relay
1 C/O contact



MIRO 6.2

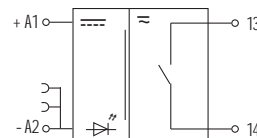
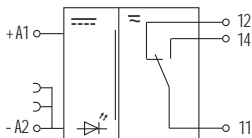
Output relay
1 N/O contact



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	Art.-No.	Art.-No.
Input voltage	spring clamp/screw terminals	spring clamp/screw terminals
12 V DC	cUL	6652050
24 V DC	UL + CSA	6652000
24 V AC/DC	UL + CSA	6652001
48 V DC	UL + CSA	6652020
110 V AC/DC	UL + CSA	6652030
230 V AC/DC	UL + CSA	6652040

Input		
Input voltage/-current	12 V DC	10 ... 15 V DC / approx. 20 mA
	24 V DC	19.2 ... 30 V DC / approx. 14 mA
	24 V AC/DC	19.2 ... 30 V AC/DC / approx. 17 mA
	48 V DC	40 ... 53 V DC / approx. 12 mA
	110 V AC/DC	95 ... 121 V AC/DC / approx. 4 mA
	230 V AC/DC	195 ... 253 V AC/DC / approx. 3 mA

Status indicator: green LED

Output	
Max. switched voltage	250 V AC/DC
Max. switched current	6 A (see table, switching capabilities to EN 60947-5-1)
Min. load current	10 mA/12 V DC
Max. power rating (voltage dependent)	1500 VA/120 W
Contact material	Ag Sn O ₂
Energize/release/contact bounce time	10/15/1.5 ms

General data	
Mech./elect. life	2 x 10 ⁷ / load dependent (for inductive loads we recommend interference suppression components connected parallel to the coil)
Max. switching frequency	10 Hz
Test isolation voltage	4 kV/AC; safe separation to EN 60947-1
Air and creepage distance	6/8 mm
Temperature range	-20...+55 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35)
Dimension H x B x T	90 x 6.2 x 65 mm

78 x 6.2 x 65 mm

Accessories	Art.-No.	Dimension drawing	Load limit curve	De-rating curve	Switching capabilities to EN 60947																
Bridging link max. 2 A	90961				<table border="1"> <thead> <tr> <th></th> <th>AC 1</th> <th>AC 15</th> <th>DC 13</th> </tr> </thead> <tbody> <tr> <td>24 V</td> <td>6 A</td> <td>3 A</td> <td>1 A</td> </tr> <tr> <td>110 V</td> <td>6 A</td> <td>3 A</td> <td>0.2 A</td> </tr> <tr> <td>230 V</td> <td>6 A</td> <td>3 A</td> <td>0.1 A</td> </tr> </tbody> </table>		AC 1	AC 15	DC 13	24 V	6 A	3 A	1 A	110 V	6 A	3 A	0.2 A	230 V	6 A	3 A	0.1 A
	AC 1					AC 15	DC 13														
24 V	6 A					3 A	1 A														
110 V	6 A					3 A	0.2 A														
230 V	6 A					3 A	0.1 A														
Bridging comb 10-pole, red	90976																				
End caps, 1 pair, red	90982																				
Bridging comb 10-pole, blue	90975																				
End caps, 1 pair, blue	90980																				
Wire chain 16-pole	90977																				
Label plate	90901																				

Notes

For screw-type terminal connection, the item number changes from 6652... to 52... (i.e. the prefix 66 is dropped).
 1) When the listed values are exceeded the gold plating is destroyed. The relay will then take on the properties of an output type.

Terminal relays
Input relays
with enhanced features

MIRO 6.2
Input relays
1 C/O contact



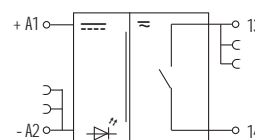
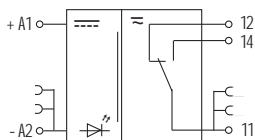
MIRO 6.2
Input relays
1 N/O contact



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

Input voltage	spring clamp/screw terminals	Art.-No.	Art.-No.
12 V DC			
24 V DC	UL + CSA	6652005	6652004
24 V AC/DC	UL + CSA	6652003	
48 V DC	UL + CSA	6652021	
110 V AC/DC	UL + CSA	6652031	
230 V AC/DC	UL + CSA	6652041	

Input

Input voltage/-current	12 V DC	10 ... 15 V DC / approx. 20 mA
	24 V DC	19.2 ... 30 V DC / approx. 14 mA
	24 V AC/DC	19.2 ... 30 V AC/DC / approx. 17 mA
	48 V DC	40 ... 53 V DC / approx. 12 mA
	110 V AC/DC	95 ... 121 V AC/DC / approx. 4 mA
	230 V AC/DC	195 ... 253 V AC/DC / approx. 3 mA

Status indicator

yellow LED

Output

Max. switched voltage	30 V AC/36 V DC ¹⁾
Max. switched current	50 mA ¹⁾
Min. load current	1 mA/12 V DC
Max. power rating (voltage dependent)	1500 VA/120 W
Contact material	Ag Sn O ₂ gold plated
Energize/release/contact bounce time	10/15/1.5 ms

General data

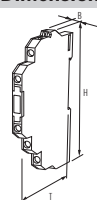
Mech./elect. life	2 x 10 ⁷ /load dependent (for inductive loads we recommend interference suppression components connected parallel to the coil)
Max. switching frequency	10 Hz
Test isolation voltage	4 kV/AC; safe separation to EN 60947-1
Air and creepage distance	6/8 mm
Temperature range	-20 ... +55 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35)
Dimension H x B x T	90 x 6.2 x 65 mm

Accessories

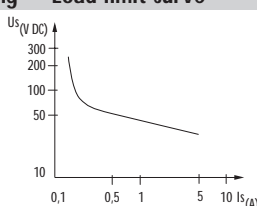
Art.-No.

Bridging link max. 2 A	90961
Bridging comb 10-pole, red	90976
End caps, 1 pair, red	90982
Bridging comb 10-pole, blue	90975
End caps, 1 pair, blue	90980
Wire chain 16-pole	90977
Label plate	90901

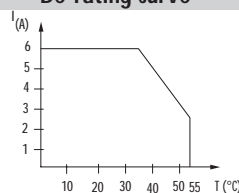
Dimension drawing



Load limit curve



De-rating curve



Switching capabilities to EN 60947

	AC 1	AC 15	DC 13
24 V	6 A	3 A	1 A
110 V	6 A	3 A	0.2 A
230 V	6 A	3 A	0.1 A

Notes

For screw-type terminal connection, the item number changes from 6652... to 52... (i.e. the prefix 66 is dropped).

¹⁾ When the listed values are exceeded the gold plating is destroyed. The relay will then take on the properties of an output type

Terminal relays with enhanced features

MIRO 6.2

Output relay
1 N/O contact
with protected H-O-A switch



MIRO 6.2

Output relay
1 C/O contact
with isolation function

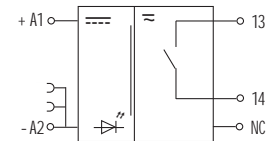
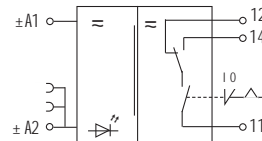
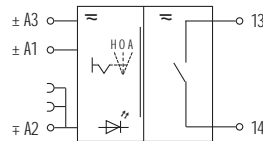
MIRO 6.2

Output relay
1 N/O contact
with soldering terminal

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



common return for NC

Ordering data	Art.-No.	Art.-No.	Art.-No.
Input voltage	spring clamp/screw terminals	spring clamp/screw terminals	spring clamp/screw terminals
24 V DC			UL + CSA
24 V AC/DC	UL + CSA	6652007	6652010
48 V DC			
110 V AC/DC			
230 V AC/DC			

Input			
Input voltage/-current	24 V DC	19.2 ... 30 V DC	/ approx. 14 mA
	24 V AC/DC	19.2 ... 30 V AC/DC	/ approx. 17 mA
	48 V DC		
	110 V AC/DC		
	230 V AC/DC		

Status indicator: green LED

Output	
Max. switched voltage	250 V AC/DC
Max. switched current	6 A (see table)
Min. load current	10 mA/12 V DC
Max. power rating (voltage dependent)	1500 VA/120 W
Contact material	Ag Sn O ₂
Energize/release/contact bounce time	10/15/1.5 ms

General data	
Mech./elect. life	2 x 10 ⁷ /load dependent (for inductive loads we recommend interference suppression components connected parallel to the coil)
Max. switching frequency	10 Hz
Test isolation voltage	4 kV/AC; safe separation to EN 60947-1
Air and creepage distance	6/8 mm
Temperature range	-20 ... +55 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35)
Dimension H x B x T	90 x 12.4 x 65 mm

Accessories	Art.-No.	Dimension drawing	Load limit curve	De-rating curve	Switching capabilities to EN 60947																
Bridging link max. 2 A	90961				<table border="1"> <thead> <tr> <th></th> <th>AC 1</th> <th>AC 15</th> <th>DC 13</th> </tr> </thead> <tbody> <tr> <td>24 V</td> <td>6 A</td> <td>3 A</td> <td>1 A</td> </tr> <tr> <td>110 V</td> <td>6 A</td> <td>3 A</td> <td>0.2 A</td> </tr> <tr> <td>230 V</td> <td>6 A</td> <td>3 A</td> <td>0.1 A</td> </tr> </tbody> </table>		AC 1	AC 15	DC 13	24 V	6 A	3 A	1 A	110 V	6 A	3 A	0.2 A	230 V	6 A	3 A	0.1 A
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110 V	6 A					3 A	0.2 A														
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End caps, 1 pair, blue	90980																				
Wire chain 16-pole	90977																				
Label plate	90901																				

Notes
For screw-type terminal connection, the item number changes from 6652... to 52... (i.e. the prefix 66 is dropped).
1) When the listed values are exceeded the gold plating is destroyed. The relay will then take on the properties of an output type

Terminal relays with enhanced features

MIRO 6.2

Output relay
1 N/O contact
with H-O-A switch



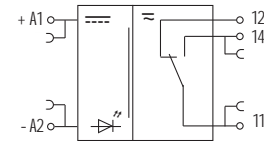
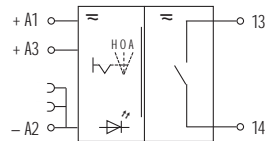
MIRO 6.2 pluggable

Output relay
1 C/O contact



Circuit diagram

Common connection up to
max. 50 V AC/DC



Ordering data		Art.-No.	Art.-No.
Input voltage		screw terminals	spring clamp terminals
24 V DC		UL + CSA	¹⁾ 3000-16013-2100010
24 V AC/DC		UL + CSA	¹⁾ 3000-16013-3100020
48 V DC			
110 V AC/DC			
230 V AC/DC			UL + CSA
			²⁾ 3000-16013-3100030
Input			
Input voltage/-current	24 V DC		19.2 ... 26.8 V AC/DC / approx. 10 mA
	24 V AC/DC	19.2 ... 28 V AC/DC / approx. 7 mA	19.2 ... 28.8 V AC/DC / approx. 12 mA
	48 V DC		
	110 V AC/DC		
	230 V AC/DC		184 ... 264 V AC/DC / approx. 4 mA
Status indicator	green LED for relay activation red LED for manual made		green LED
Output			
Max. switched voltage		250 V AC/DC	
Max. switched current		6 A (see table)	
Min. load current		10 mA / 12 V DC	
Max. power rating (voltage dependent)		1500 VA / 120 W	
Contact material		Ag Sn O ₂	
Energize/release/contact bounce time		8/20/2 ms	
General data			
Mech./elect. life		2 x 10 ⁷ / load dependent (for inductive loads we recommend interference suppression components connected parallel to the coil)	
Max. switching frequency		10 Hz	
Test isolation voltage		4 kV/AC; safe separation to EN 60947-1	
Air and creepage distance		6/8 mm	
Temperature range		-20 ... +55 °C	
Mounting method		DIN-rail mounting to EN 60715 (TH35)	
Dimension H x B x T		90 x 6.2 x 65 mm	93 x 6.2 x 75.6 mm
Accessories		Art.-No.	Art.-No.
Bridging link max. 2 A		90961	Bridging link, blue 3000-90000-0300010
Bridging comb 10-pole, red		90976	Bridging link, black 3000-90000-0300020
End caps, 1 pair, red		90982	Removable relay ¹⁾ 3000-16023-2100010
Bridging comb 10-pole, blue		90975	²⁾ 3000-16023-2100020
End caps, 1 pair, blue		90980	Isolation plate 3000-90000-0300030
Wire chain 6-pole		90977	
Label plate		90901	
Notes		For screw-type terminal connection, the item number changes from 6652... to 52... (i.e. the prefix 66 is dropped). Load limit curve, de-rating curve and switching capabilities see page 3.3.6	

Terminal relays

MIRO 12.4

Output relay
2 C/O contact
with enhanced features



MIRO 12.4

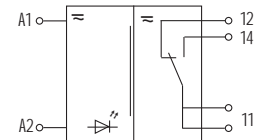
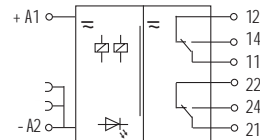
Input relays
2 C/O contact
with enhanced features

MIRO 12.4

Input relays
1 C/O contact
Multi-voltage input

Circuit diagram

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



Ordering data	Art.-No.	Art.-No.	Art.-No.
Input voltage	spring clamp/screw terminals	spring clamp/screw terminals	screw terminals
24 V DC	cUL 6652102	cUL 6652110	52160
24 V AC/DC	cUL 6652103	cUL 6652111	52160
48 V DC	cUL 6652120	cUL 6652126	52160
110 V AC/DC	cUL 6652130	cUL 6652136	52160
230 V AC/DC	cUL 6652140	cUL 6652146	52160

Input	Input voltage/-current	Input voltage/-current	Input voltage/-current
Status indicator	24 V DC	19.2 ... 30 V DC / approx. 18 mA	
	24 V AC/DC	19.2 ... 30 V AC/DC / approx. 20 mA	min. 21.6 V AC/DC/appr. 6 mA max. 12 mA for 1 s)
	48 V DC	40 ... 53 V DC / approx. 14 mA	approx. 27 mA (max. 60 mA for 180 s)
	110 V AC/DC	95 ... 121 V AC/DC / approx. 7 mA	approx. 10 mA (max. 300 mA for 60 s)
	230 V AC/DC	195 ... 253 V AC/DC / approx. 5 mA	max. 253 V AC/DC/appr. 6 mA (max. 900 mA for 15 ms)

Output	Output	Output
Max. switched voltage	250 V AC/DC	30 V AC/36 V DC ¹⁾
Max. switched current	6 A (see table)	50 mA ¹⁾
Min. load current	10 mA/12 V DC	1 mA/12 V DC
Max. power rating (voltage dependent)	1500 VA/120 W	
Contact material	Ag Sn O ₂	Ag Sn O ₂ gold plated
Energize/release/contact bounce time	10/15/1.5 ms	

General data	General data
Mech./elect. life	2 x 10 ⁷ /load dependent (for inductive loads we recommend interference suppression components connected parallel to the coil)
Max. switching frequency	10 Hz
Test isolation voltage	4 kV/AC; safe separation to EN 60947-1
Air and creepage distance	6/8 mm
Temperature range	-20 ... +55 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35)
Dimension H x B x T	90 x 12.4 x 65 mm

Accessories	Art.-No.	Dimension drawing	Load limit curve	De-rating curve	Switching capabilities to EN 60947																
Bridging link max. 2 A	90961				<table border="1"> <thead> <tr> <th></th> <th>AC 1</th> <th>AC 15</th> <th>DC 13</th> </tr> </thead> <tbody> <tr> <td>24 V</td> <td>6 A</td> <td>3 A</td> <td>1 A</td> </tr> <tr> <td>110 V</td> <td>6 A</td> <td>3 A</td> <td>0.2 A</td> </tr> <tr> <td>230 V</td> <td>6 A</td> <td>3 A</td> <td>0.1 A</td> </tr> </tbody> </table>		AC 1	AC 15	DC 13	24 V	6 A	3 A	1 A	110 V	6 A	3 A	0.2 A	230 V	6 A	3 A	0.1 A
	AC 1					AC 15	DC 13														
24 V	6 A					3 A	1 A														
110 V	6 A	3 A	0.2 A																		
230 V	6 A	3 A	0.1 A																		
Wire chain 16-pole	90977																				
Label plate	90901																				

Notes
For screw-type terminal connection, the item number changes from 6652 ... to 52 ... (i.e. the prefix 66 is dropped).
¹⁾ When the listed values are exceeded the gold plating is destroyed. The relay will then take on the properties of an output type.

Terminal relays with enhanced features

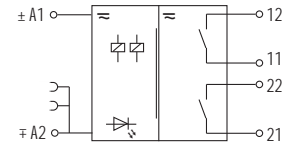
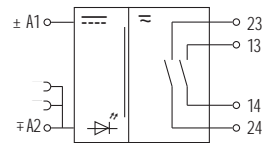
MIRO 12.4
Output relay
2 N/O contact/with enhanced features
for use in control cabinets in builing installations



MIRO 12.4
Output relay
2 N/O contacts



Circuit diagram



Ordering data

Art.-No.

Art.-No.

Input voltage	spring clamp/screw terminals	spring clamp/screw terminals
24 V DC		
24 V AC/DC	6652106	6652104
48 V DC		
110 V AC/DC		
230 V AC/DC		

Input

Input voltage/-current	24 V DC	
	24 V AC/DC	19.2 ... 30 V AC/DC /approx. 17 mA
	48 V DC	
	110 V AC/DC	
	230 V AC/DC	195 ... 253 V AC/DC /approx. 3 mA (hold voltage \geq 70 V/hold current \geq 0.3 mA)

Status indicator

green LED

Output

Max. switched voltage	250 V AC/DC
Max. switched current	6 A (see table)
Min. load current	10 mA/12 V DC
Max. power rating (voltage dependent)	1500 VA/120 W
Contact material	Ag Sn O ₂
Energize/release/contact bounce time	10/15/1.5 ms

General data

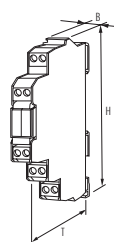
Mech./elect. life	2 x 10 ⁷ /load dependent (for inductive loads we recommend interference suppression components connected parallel to the coil)
Max. switching frequency	10 Hz
Test isolation voltage	4 kV/AC; safe separation to EN 60947-1
Air and creepage distance	6/8 mm
Temperature range	-20 ... +55 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35)
Dimension H x B x T	90 x 12.4 x 65 mm

Accessories

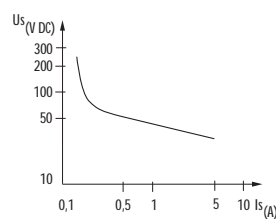
Art.-No.

Bridging link max. 2 A	90961
Wire chain 16-pole	90977
Label plate	90901

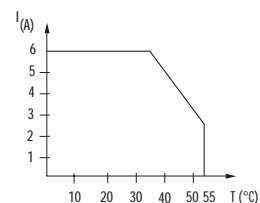
Dimension drawing



Load limit curve



De-rating curve



Switching capabilities to EN 60947

	AC 1	AC 15	DC 13
24 V	6 A	3 A	1 A
110 V	6 A	3 A	0.2 A
230 V	6 A	3 A	0.1 A

Notes

For screw-type terminal connection, the item number changes from 6652... to 52... (i.e. the prefix 66 is dropped).

Mini relay modules

RMM

Output relay
with minus plug-in jumper

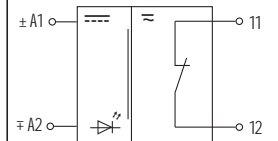
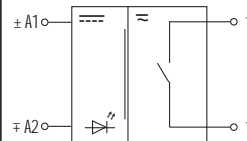
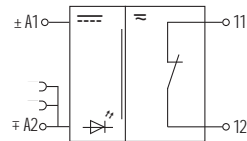
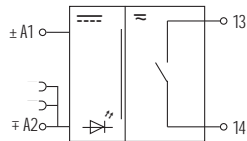


RMM

Output relay
without minus plug-in jumper



Circuit diagram



Ordering data

	Art.-No.	Art.-No.	Art.-No.	Art.-No.
Input voltage	1 relay; 1 N/O contact	1 relay; 1 N/C contact	1 relay; 1 N/O contact	1 relay; 1 N/C contact
24 V DC	51851	51808	51551	51508
48 V DC	51850		51550	
110 V AC			51552	
230 V AC			51515	51562

Input

Input voltage/-current	24 V AC/DC ±10 %/15 mA
	48 V AC/DC ±10 %/10 mA
	110 V AC +10 % -15 %/3.5 mA
	230 V AC +10 % -15 %/3.5 mA

Plug-in jumper	Art.-No. 90960 (included with relay)	-
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Status indicator	red LED
------------------	---------

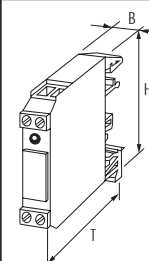
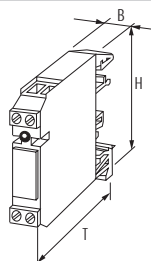
Output

Max. switched voltage	250 V AC/300 V DC
Max. switched current	5 A
Min. load current	100 mA
Max. power rating (voltage dependent)	1250 VA/240 W
Contact material	Ag Ni 0.15 hv; Ag hv
Energize/release/contact bounce time	10/15/1.5 ms

General data

Mech./elect. life	2 x 10 ⁷ /load dependent
Max. switching frequency	10 Hz
Test isolation voltage	4 kV/AC
Temperature range	-20...+50 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35) or (G32)
Dimension H x B x T	56 x 12 x 64 mm

Dimension drawing



Notes

Accessories can be found in chapter 3.13

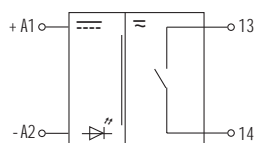
Mini relay modules

RMM

Output relay



Circuit diagram



Ordering data

Art.-No.

Input voltage	1 relay; 1 N/O contact	
24 V DC		512764
48 V DC		
110 V AC		
230 V AC		

Input

Input voltage/-current	24 V DC \pm 10 %/15 mA

Status indicator	green LED
Connection	screw terminals

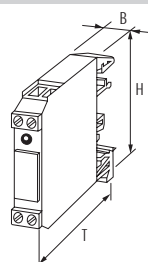
Output

Max. switched voltage	250 V AC/300 V DC
Max. switched current	5 A
Min. load current	100 mA
Max. power rating (voltage dependent)	1250 VA/240 W
Contact material	Ag Ni 0.15 hv; Ag hv
Energize/release/contact bounce time	10/15/1.5 ms
Connection	screw terminals

General data

Mech./elect. life	2×10^7 /load dependent
Max. switching frequency	10 Hz
Test isolation voltage	4.0 kV AC
Temperature range	-20...+50 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35) or (G32)
Dimension H x B x T	56 x 12 x 64 mm

Dimension drawing



Notes

Accessories can be found in chapter 3.13
VW Id.Nr.: 1 232252

Mini relay modules

RMME

Input relays
with minus plug-in jumper

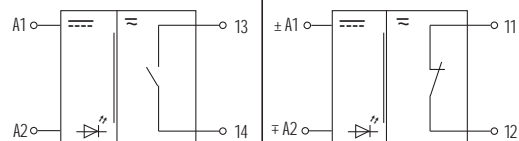
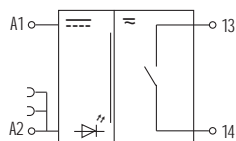


RMME

Input relays
without minus plug-in jumper



Circuit diagram



Ordering data

	Art.-No.	Art.-No.	Art.-No.
Input voltage	1 relay; 1 N/O contact	1 relay; 1 N/O contact	1 relay; 1 N/C contact
24 V AC/DC	51860	51560	51571
48 V AC/DC		51553	
110 V AC		51526	
230 V AC		51517	

Input

Input voltage/-current	24 V AC/DC ±10 %/7 mA
	48 V AC/DC ±10 %/7 mA
	110 V AC +10 % -15 %/7 mA
	230 V AC +10 % -15 %/7 mA

Plug-in jumper Art.-No. 90960 (included with relay) —

Status indicator yellow LED

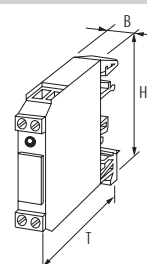
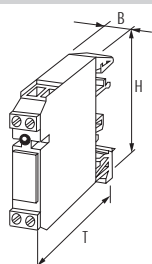
Output

Max. switched voltage	125 V AC/DC
Max. switched current	1 A
Min. load current	1 mA
Max. power rating (voltage dependent)	60 VA/30 W
Contact material	Pd Ni-Au Rh
Energize/release/contact bounce time	10/10/1 ms

General data

Mech./elect. life	1 x 10 ⁸ /load dependent
Max. switching frequency	15 Hz
Test isolation voltage	1.5 kV AC
Temperature range	-20...+60 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35) or (G32)
Dimension H x B x T	56 x 12 x 64 mm

Dimension drawing



Notes

Accessories can be found in chapter 3.13

Relay modules with minus plug-in jumper

RMMD

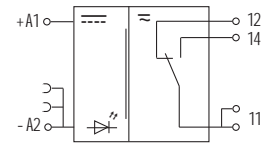
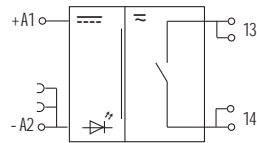
Output relay with minus plug-in jumper



RMMD

Output relay with minus plug-in jumper

Circuit diagram



Ordering data

Art.-No.

Art.-No.

Input voltage	1 relay; 1 N/O contact		1 relay; 1 N/C contact
24 V DC		¹⁾ 51100	¹⁾ 51120
48 V AC/DC			
110 V AC			
230 V AC		51108	

Input

Input voltage/-current 24 V DC $\pm 10\%$ /17 mA

230 V AC $+10\%$ - 15% /5 mA (without Plug-in jumper)

Plug-in jumper Art.-No. 90960 (included with relay) plug-in jumper not possible with 230 V version

Status indicator red LED

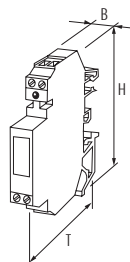
Output

Max. switched voltage	250 V AC/DC
Max. switched current	8 A (6 A at 230 V-type)
Min. load current	100 mA
Max. power rating (voltage dependent)	2000 VA/240 W
Contact material	Ag Ni 0.15 hv; Ag hv
Energize/release/contact bounce time	10/15/2 ms

General data

Mech./elect. life	2×10^7 /load dependent
Max. switching frequency	10 Hz
Test isolation voltage	5 kV AC; at Art.-No. 51108: 4.0 kV AC
Temperature range	-20...+50 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35) or (G32)
Dimension H x B x T	82 x 12 x 68 mm

Dimension drawing



Notes

Accessories can be found in chapter 3.13

¹⁾Units with safe separation to VDE 0106, part 101/VDE 0160

Minus plug-in jumper

RMMD

Output relay
with low connection current

RMMDE

Input relays
with enhanced features

RMMDE

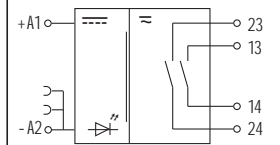
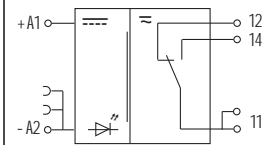
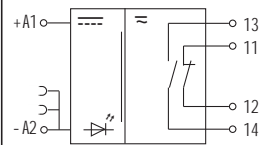
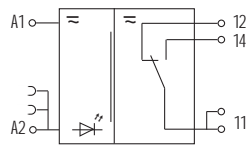
Input relays
with enhanced features

RMMDE

Input relays
with enhanced features



Circuit diagram



Ordering data

Art.-No.

Art.-No.

Art.-No.

Art.-No.

Input voltage	1 relay; 1 C/O contact	1 relay; 1 N/O contact/1 N/C contact	1 relay; 1 C/O contact	1 relay; 2 N/O contacts
24 V AC/DC	¹⁾ 51125			
24 V DC		516014	51130	51140
110 V AC				
230 V AC			51138	
Input				
Input voltage/-current	24 V AC/DC ± 10 %/max. 10 mA	24 V DC ± 10 %/max. 20 mA	24 V DC ± 10 %/max. 15 mA	24 V DC ± 10 %/max. 15 mA
			230 V AC + 10 % - 15 %/5 mA	

Plug-in jumper Art.-No. 90960 (included with relay) plug-in jumper not possible with 230 V version

Status indicator red LED yellow LED

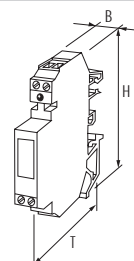
Output

Max. switched voltage	250 V AC/DC	250 V AC/DC	250 V AC/DC	250 V AC/DC
Max. switched current	8 A	3 A	5 A	2 A
Min. load current	100 mA	1 mA	1 mA	5 mA
Max. power rating (voltage dependent)	2000 VA/240 W	90 W/VA	60 VA/30 W	250 VA/150 W
Contact material	Ag Ni 0.15 hv; Ag hv	Ag-htv	Ag Ni 0.15 hv; Ag hv	Ag Au
Energize/release/contact bounce time	10/15/2 ms	6/3/2 ms	10/10/1 ms	10/10/1 ms

General data

Mech./elect. life	2 x 10 ⁷ /load dependent	2 x 10 ⁷ /load dependent	1 x 10 ⁸ /load dependent	2 x 10 ⁷ /load dependent
Max. switching frequency	10 Hz	10 Hz	15 Hz	15 Hz
Test isolation voltage	5 kV AC	2.5 kV AC	4 kV AC	1.5 kV AC
Temperature range	-20...+50 °C	-20...+60 °C	-20...+60 °C	-20...+50 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35) or (G32)			
Dimension H x B x T	82 x 12 x 68 mm			

Dimension drawing



Notes

Accessories can be found in chapter 3.13
¹⁾Units with safe separation to VDE 0106, part 101/VDE 0160

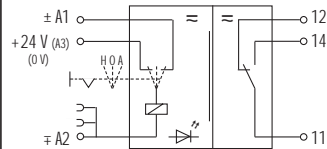
for use in Building Management Systems

RMMDH

Output relay with negative plug-in jumper and toggle switch for HAND-O-AUTO control



Circuit diagram



Ordering data

Art.-No.

Input voltage	1 relay; 1 C/O contact
24 V DC	
24 V AC/DC	
110 V AC	
230 V AC	
	51152

Input

Input voltage/-current	24 V AC/DC $\pm 10\%$ /16 mA
------------------------	------------------------------

Plug-in jumper	Art.-No. 90960 (included with relay)
Status indicator	red LED

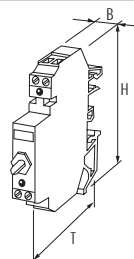
Output

Max. switched voltage	250 V AC/DC
Max. switched current	8 A
Min. load current	100 mA
Max. power rating (voltage dependent)	2000 VA/240 W
Contact material relay (switch)	Ag Ni 0.15 hv
Energize/release/contact bounce time	10/10/2 ms

General data

Mech./elect. life	3×10^7 /load dependent
Max. switching frequency	15 Hz
Test isolation voltage	3 kV AC
Temperature range	-20...+50 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35) or (G32)
Dimension H x B x T	82 x 12 x 82 mm

Dimension drawing/description



Notes

Accessories can be found in chapter 3.13

with HAND-O-AUTO

RMMDH

Output relay with negative plug-in and toggle switch for HAND-O-AUTO control has auxiliary alarm contact when in "HAND" position



RMMDH

Output relay with negative plug-in jumper and toggle switch to bridge working contact.

Relays

Circuit diagram		
Ordering data	Art.-No.	Art.-No.
Input voltage	1 relay; 1 C/O contact	1 relay; 1 C/O contact
24 V DC	51153	51101
48 V DC		
110 V AC		
230 V AC		
Input		
Input voltage/-current	24 V DC \pm 10 %/16 mA	24 V DC \pm 10 %/10 mA
Plug-in jumper	Art.-No. 90960 (included with relay)	
Status indicator	red LED	
Output		
Max. switched voltage	250 V AC/DC; CTL-alarm signal 24 V DC	250 V AC/30 V DC
Max. switched current	8 A; CTL-alarm signal 10 mA	6 A
Min. load current	100 mA	100 mA
Max. power rating (voltage dependent)	2000 VA/240 W	750 VA/90 W
Contact material relay (switch)	Ag Ni 0.15 hv	Ag Cd O (Ag)
Energize/release/contact bounce time	10/10/2 ms	
General data		
Mech./elect. life	3×10^7 /load dependent	
Max. switching frequency	15 Hz	
Test isolation voltage	4 kV AC	3 kV AC
Temperature range	-20...+50 °C	
Mounting method	DIN-rail mounting to EN 60715 (TH35) or (G32)	
Dimension H x B x T	82 x 12 x 82 mm	
Dimension drawing		<p>This relay enables the load to be controlled by a PLC with the added facility to manually switch the load on or off using the toggle switch. Art.-No. 51101 differs in that the relay contact is bridged by the hand operated switch.</p>
Notes	Accessories can be found in chapter 3.13	

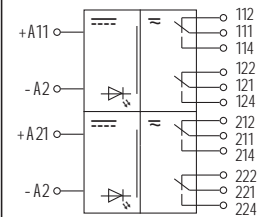
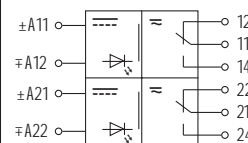
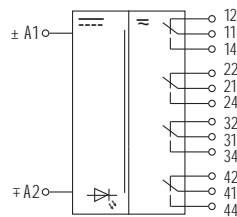
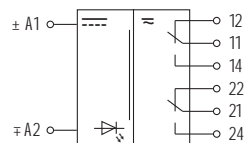
MCVO Relays

RM

Output relay



Circuit diagram



Terminal layout different for Art.-No. 510676

Ordering data	Art.-No.	Art.-No.	Art.-No.	Art.-No.
Input voltage	1 relay; 2 C/O contacts	1 relay; 4 C/O contacts	2 relays; each 1 C/O contact	2 relays; each 2 C/O contacts
24 V DC	51540	51410	51485	51465
48 V DC				
110 V AC				
230 V AC		51413	51412	
Input				
Input voltage/-current	24 V DC $\pm 10\%$ / 28 mA		24 V DC $\pm 10\%$ / 10 mA	24 V DC $\pm 10\%$ / 14 mA
	230 V AC $+10\%$ - 15% / 15 mA		230 V AC $+10\%$ - 15% / 10 mA	
Status indicator	red LED			
Output				
Max. switched voltage	250 V AC/DC	250 V AC/DC	250 V AC/DC	250 V AC/DC
Max. switched current	5 A	2 A	5 A	5 A
Min. load current	100 mA			
Max. power rating (voltage dependent)	1250 VA/240 W	125 VA/60 W	1250 VA/240 W	
Contact material	Ag Ni 0.15	Ag hv	Ag Ni 0.15 hv; Ag hv	Ag Ni 0.15
Energize/release/contact bounce time	10/10/2 ms	10/20/2 ms	10/10/2 ms	
General data				
Mech./elect. life	5×10^7 / load dependent	5×10^7 / load dependent	2×10^7 / load dependent	
Max. switching frequency	10 Hz	10 Hz	10 Hz	
Test isolation voltage	4 kV AC	1.0 kV AC	4 kV AC	
Temperature range	-20...+50 °C			
Mounting method	DIN-rail mounting to EN 60715 (TH 35) or (G 32)			
Dimensions H x B x T	75 x 22.5 x 102 mm			
Dimension drawing				
Notes	Accessories can be found in chapter 3.13			

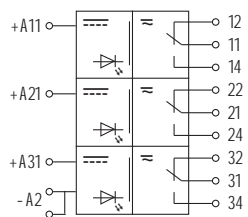
MCVO Relays

RM
Output relay

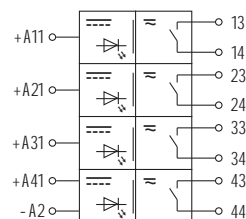
RM
Output relay



Circuit diagram



Common minus potential for all inputs = - A2



Common minus potential for all inputs = - A2

Ordering data	Art.-No.	Art.-No.
Input voltage	3 relays; each 1 C/O contact	4 relays; each 1 N/O contact
24 V DC	51403	512498
48 V DC		
110 V AC		
230 V AC		
Input		
Input voltage/-current	24 V DC \pm 10 %/16 mA	
Status indicator	red LED	
Output		
Max. switched voltage	250 V AC/DC	
Max. switched current	5 A	
Min. load current	100 mA	
Max. power rating (voltage dependent)	1250 VA/240 W	
Contact material	Ag Ni 0.15 hv; Ag hv	
Energize/release/contact bounce time	10/10/2 ms	
General data		
Mech./elect. life	2 x 10 ⁷ /load dependent	5 x 10 ⁷ /load dependent
Max. switching frequency	10 Hz	
Test isolation voltage	4 kV AC	
Temperature range	-20...+50 °C	
Mounting method	DIN-rail mounting to EN 60715 (TH 35) or (G 32)	
Dimensions H x B x T	75 x 22.5 x 102 mm	
Dimension drawing		
Notes		
	Accessories can be found in chapter 3.13	

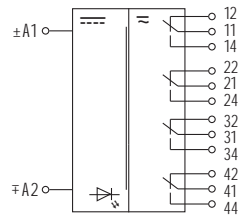
MCVO Relays

RME
Input relay

RME
Input relay



Circuit diagram



Ordering data

Art.-No.

Input voltage	1 relays; 4 C/O contacts	
24 V DC		516001
48 V DC		
110 V AC		
230 V AC		

Input

Input voltage/-current	24 V DC \pm 10 %/20 mA
Status indicator	yellow LED

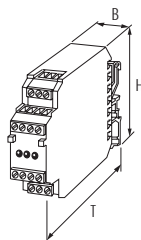
Output

Max. switched voltage	250 V AC/DC
Max. switched current	2 A
Min. load current	1 mA
Max. power rating (voltage dependent)	125 VA/60 W
Contact material	Ag hv
Energize/release/contact bounce time	10/10/1 ms

General data

Mech./elect. life	1 x 10 ⁸ /load dependent
Max. switching frequency	15 Hz
Test isolation voltage	1.5 kV AC
Temperature range	-20...+50 °C
Mounting method	DIN-rail mounting to EN 60715 (TH 35) or (G 32)
Dimensions H x B x T	75 x 22.5 x 102 mm

Dimension drawing



Notes

Accessories can be found in chapter 3.13

MCVO Relays

with positive displacement contact

RM

Output relay
with positive displacement contact

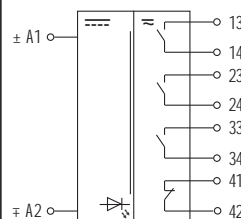
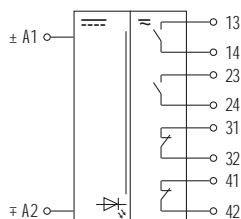


RM

Output relay
with positive displacement contact

Relays

Circuit diagram



Ordering data

Input voltage	Art.-No.	Art.-No.
24 V DC	1 relay; 2 N/O contacts/2 N/C contacts 51300	1 relay; 3 N/O contacts/1 N/C contact 51301
48 V DC		
110 V AC		
230 V AC		

Input

Input voltage/-current	24 V DC \pm 10 %/17 mA
Status indicator	red LED

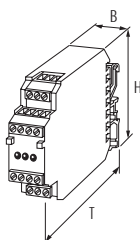
Output

Max. switched voltage	250 V AC/DC
Max. switched current	5 A
Min. load current	300 mA
Max. power rating (voltage dependent)	1000 VA/50 W
Contact material	Ag hv; Ag Sn O ₂
Energize/release/contact bounce time	15/15/2 ms

General data

Mech./elect. life	1 x 10 ⁶ /load dependent
Max. switching frequency	1 Hz
Test isolation voltage	2.5 kV AC
Temperature range	-20...+50 °C
Mounting method	DIN-rail mounting to EN 60715 (TH35) or (G32)
Dimensions H x B x T	75 x 22.5 x 102 mm

Dimension drawing



Notes

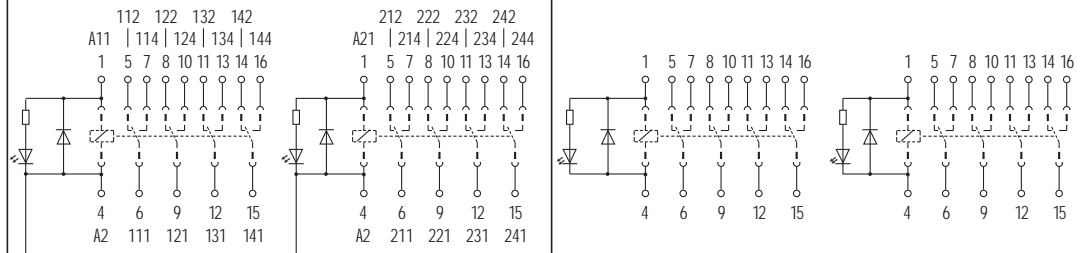
Accessories can be found in chapter 3.13

Sockets for cradle relays

MKS-K
4 C/O contacts



Circuit diagram



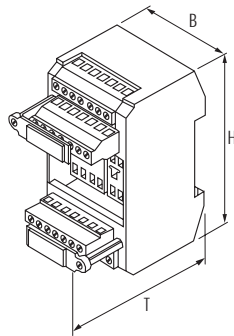
Ordering data

Coil voltage	Suppression	Art.-No.	Art.-No.
24 V DC	LED + Diode	67030	67000

Technical data

Relay socket	for cradle relays
Max. switched voltage	125 V AC/150 V DC
Max. switched current	2 A
Wiring method	screw terminals max. 4 mm ²
Test isolation voltage	2.5 kV AC
Mounting method	DIN-rail mounting to EN 60715
Dimensions H x B x T	85 x 45 x 64 mm

Dimension drawing



Accessories

Accessories	Art.-No.
Plug-in relays 24 V DC	61422
Holding clip 24 V	61428

Notes

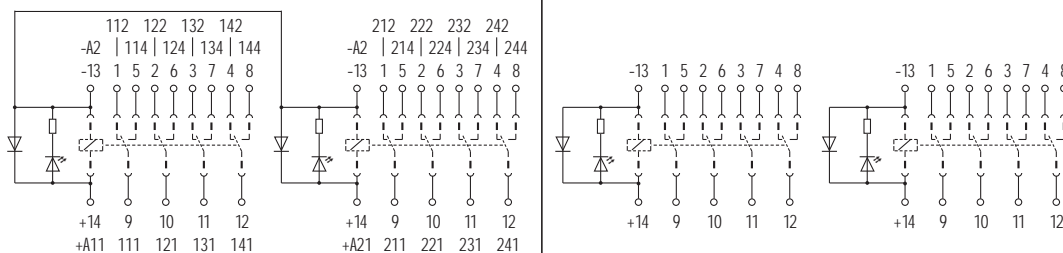
Accessories can be found in chapter 3.13

Sockets for industrial relays

MKS-J
4 C/O contacts



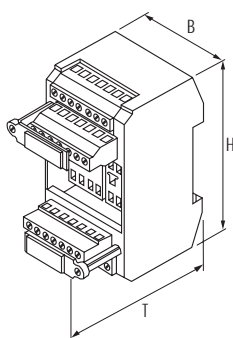
Circuit diagram



Ordering data		Art.-No.	Art.-No.
Coil voltage	Suppression		
24 V DC	LED + Diode	67035	67010
110 ... 230 V AC	LED + RC		67011

Technical data	
Relay socket	for industrial relays
Max. switched current	250 V AC/110 V DC
Max. current	3 A
Wiring method	screw terminals max. 4 mm ²
Test isolation voltage	2.5 kV AC
Mounting method	DIN-rail mounting to EN 60715
Dimensions H x B x T	85 x 45 x 64 mm

Dimension drawing



Accessories		Art.-No.
Plug-in relays	24 V DC	61402
Plug-in relays	230 V AC	61401
Holding clip	24 V	61406
Holding clip	230 V	61406

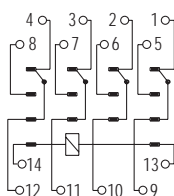
Notes	
Accessories can be found in chapter 3.13	

Sockets for industrial relays with 4 C/O contacts

IR 4



Circuit diagram



Ordering data

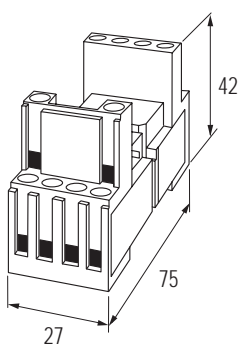
Art.-No.

Input voltage	Suppression	
... 230 V AC/DC	No suppression	61300

Technical data

Relay socket	for industrial relays suppressor + LED + label plate
Max. switched current	250 V AC/110 V DC
Max. current	5 A
Wiring method	screw terminals
Mounting method	DIN-rail mounting to EN 60715
Proofing	IP40

Dimension drawing



Accessories

Art.-No.

Plug-in relays	24 V DC	61402
Plug-in relays	230 V AC	61401
Holding clip		61301
Label plate		61302
Suppressor module + LED (green)	6 ... 24 V AC/DC	61303
	110 ... 230 V AC/DC	61304

Notes

Accessories can be found in chapter 3.13

Sockets with plug-in relays

Compact size

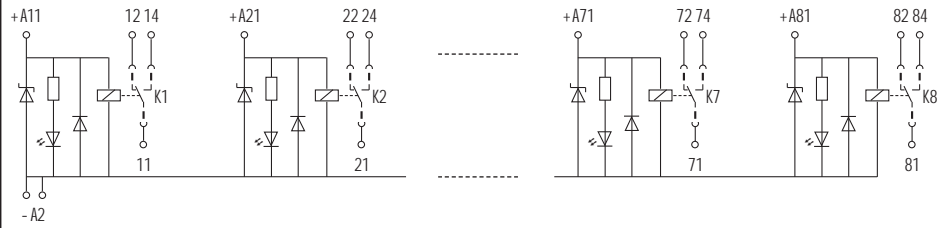
RM
sockets with 2 plugged relays

RM
sockets with 4 plugged relays

RM
sockets with 8 plugged relays



Circuit diagram

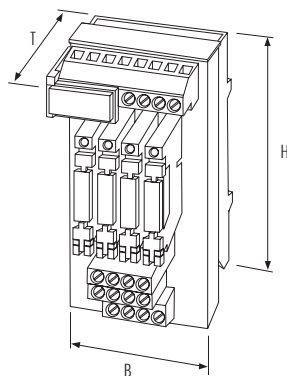


Art.-No. 53025 (schematic) ¹⁾

Ordering data		Art.-No.	Art.-No.	Art.-No.
Input voltage	Suppression	2 relays, each 1 C/O contact	4 relays, each 1 C/O contact	8 relays, each 1 C/O contact
24 V DC	LED + Diode	53019	53020	53025

Technical data	
Max. switched current / min. switched voltage	250 / 12 V AC/DC
Max. current / min. load current	6 A / 10 mA
Wiring method	screw terminals, max. 4 mm ²
Test isolation voltage	4.0 kV AC
Mounting method	DIN-rail mounting to EN 60715
Dimensions H x B x T	86 x 22.5 x 75 mm 86 x 45 x 75 mm 86 x 67.5 x 75 mm

Dimension drawing



Switching capabilities to EN 60947

	AC 1	AC 15	DC 13
24 V	6 A	3 A	1 A
110 V	6 A	3 A	0.2 A
230 V	6 A	3 A	0.1 A

Accessories		Art.-No.
Relays (SNR)	24 V DC	max. switched current 6 A (included in the above listed part numbers) 61513
Electronic load relay (ELR)	24 V DC	max. 2 A at 24 V DC for non mechanical switching 61506

Notes

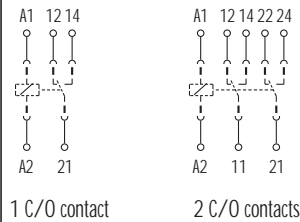
¹⁾ Art.-No. 53019 and 53020 with individually - A2 connections

Sockets with plug-in relays

MRB
1 or 2 C/O contacts



Circuit diagram



Ordering data

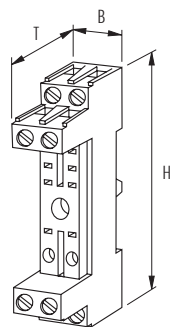
Art.-No.

Input voltage	Suppression	
...230 V AC		51353

Technical data

Relay socket	for plug-in relays MRS see page 3.3.27
Max. switched voltage	plug-in suppressor MRE
Max. switched current	250 V AC
Max. current	16 A
Wiring method	screw terminals, max. 4 mm ²
Guidelines	touch protected to VBG 4 and VDE 0106 part 100 and 101
Test isolation voltage	5 kV AC
Mounting method	DIN-rail mounting to EN 60715
Dimensions H x B x T	75 x 15.5 x 42.5 mm

Dimension drawing



Accessories

	Art.-No.	Art.-No.	Art.-No.
	plug-in relays with 1 C/O contact	plug-in relays with 2 C/O contacts	suppressor
Coil voltage 24 V DC	61352	61353	61340
24 V AC	61354	61355	61343
110 V AC	61356	61357	61341, 61342
230 V AC	61358	61359	61341, 61342
Holding clip for plug-in relays (switching module)	supplied		

Notes

Accessories suppressor see chapter 3.13

Plug-in relays for sockets

Cradle relay with 2 C/O contacts



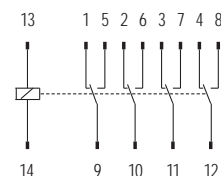
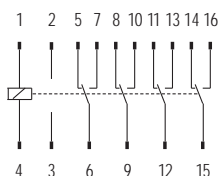
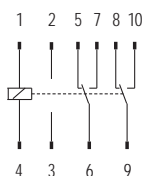
Cradle relay with 4 C/O contacts



Industrial relay with 4 C/O contacts



Circuit diagram



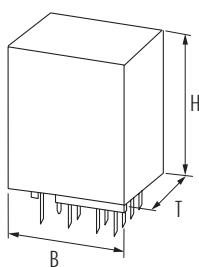
Ordering data

Input voltage	Art.-No.	Art.-No.	Art.-No.
24 V DC	61436	61422	61402
24 V DC			with suppression and LED 61413
24 V AC			61400
230 V AC			61401

Technical data

Contact	Ag Ni 0.15 hv; Ag hv	Ag Ni 0.15 hv; Ag hv	Ag Ni; Ag hv
Max. voltage range	125 V AC/150 V DC	125 V AC/150 V DC	250 V AC/110 V DC
Max. switched current	2 A	2 A	5 A
Max. power rating (voltage dependent)	50 VA/35 W	50 VA/35 W	1250 VA/100 W
Coil hold-on rating	2.2 VA/0.7 W	2.2 VA/0.9 W	1.4 VA/0.9 W
Switch-on time	6 ms	7.5 ms	18 ms
Dimensions H x B x T	30 x 24 x 19 mm	30 x 30 x 19 mm	36 x 28 x 21 mm

Dimension drawing



Accessories

	Art.-No.	Art.-No.	Art.-No.
Holding clip 24 V	61427	61428	61406
Holding clip 230 V			61406

Notes

Relays in other voltage on request.

Plug-in relays for sockets

MRS
with 1 C/O contact

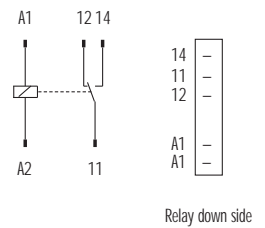
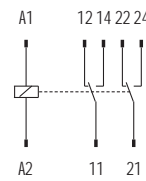
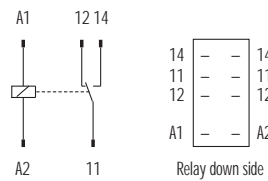


MRS
with 2 C/O contacts

SNR
with 1 C/O contact
for MIRO 6.2 pluggable



Circuit diagram



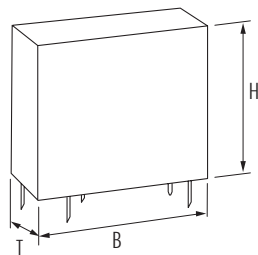
Ordering data

Input voltage	1 C/O contact	Art.-No.	2 C/O contacts	Art.-No.	Art.-No.
24 V DC		61352		61353	3000-16023-2100010
60 V DC					3000-16023-2100020
110 V AC		61356		61357	
230 V AC		61358		61359	

Technical data

Contact	Ag Sn O ₂	Ag Ni	Ag Sn O ₂
Max. voltage range	250 V AC/DC		
Min. load current	12 V DC/100 mA		12 V DC/10 mA
Max. switched current	16 A	5 A	6 A
Max. power rating (voltage dependent)	4000 VA/300 W	1250 VA/110 W	1500 VA/120 W
Suppression	see accessories		
Coil hold-on rating	1.6 VA/0.65 W		
Switch-on time	15/20 ms		10/15 ms
Dimensions H x B x T	25 x 29 x 12.4 mm		15 x 28 x 5 mm

Dimension drawing



Notes

Accessories can be found in chapter 3.13

General information

Opto-couplers are used as an interface between different signal levels or to isolate one signal from another. Similar to function to a relay, the following points should be noted:

Opto-couplers have the following qualities:

- long life
- no mechanical wear and tear (solid state operation)
- silent operation
- no contact bounce
- shorter switching time

The modules are often used to enable the low voltage outputs of PLC's to control higher voltage and current loads. For example, a load voltage of 250 V AC, will be completely isolated from the PLC.

Control of DC loads

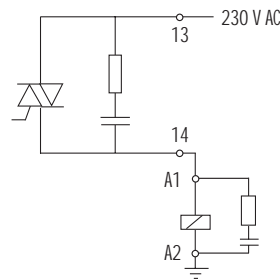
To control DC voltages, an opto-coupler with a transistor output is used. An opto-coupler can be used, for example, to convert an NPN output into a PNP output, or vice versa.

Modules are available to cover the input range 5 to 230 volts. Switched output current can be up to 40 A.

When switching inductive loads, it is advisable to prevent voltage transients by suppressing the load.

Control of AC loads

To control AC voltages, an opto-coupler with a triac output is used. Murrelektronik opto-couplers for AC switching incorporate a control circuit which ensures that the triac is switched on only when the AC voltage is at zero and is switched off only when the load current is zero. This eliminates the electro-magnetic interference which would otherwise be caused.

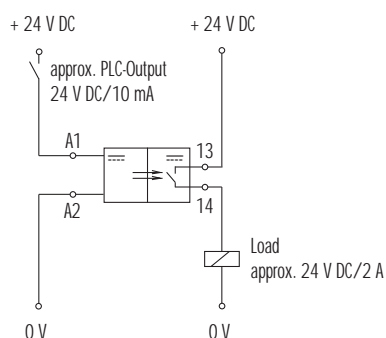


An RC snubber network is fitted internally across the triac switch. This is necessary to limit the rate of rise of the voltage. However, it does result to a small leakage current which will flow through the load when the switch is off.

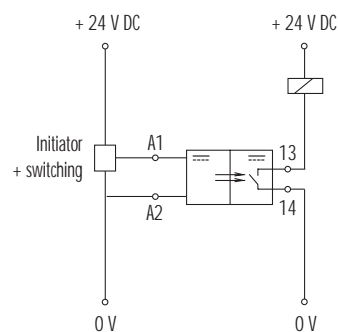
This must be taken into account when driving low power loads, where the leakage would be significant. By fitting a resistor or a resistor-capacitor network (e.g. Murrelektronik Art.-No. 20011) across the load, some of the leakage can be diverted away from the load.

Applications

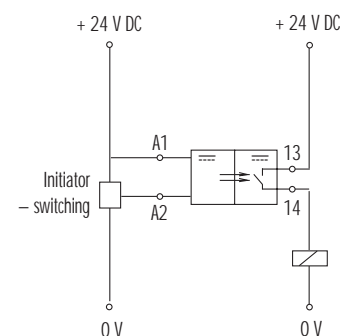
Application with electrical isolation



Conversion from PNP to NPN



Conversion from NPN to PNP



Opto-coupler modules



MIRO 6.2

Compact format which snaps on to 35 mm DIN-rail to EN 60715.

The potential plug bridge offers a rapid connection between modules to the transistor and triac versions without the need for additional terminals.

from page 3.4.3



MIRO 6.2 pluggable

Compact format. Snap on to DIN-rail mounting to EN 60715 (TH35) resp. (G32).

Fast connection via potential bridging link to blue and black.

Pluggable opto-coupler modules exchangeable.

Isolation plate for potential separation. With spring clamp terminals.

page 3.4.6



AMMS/EMMS

Built to a compact 12 mm format.

Galvanically separated inputs and outputs as well as maintenance free semi-conductor circuits guarantee smooth operation.

Input signals from 3.5 . . . 230 V can be processed. Transistor or triac circuits are used on the output side.

LED-status indicator, a label plate and mounting on to DIN-rail to EN 60715 (TH35) resp. (G32) are standard features.

from page 3.4.7



AMMDS

The ideal way to bring clarity to a control system.

The Murrelektronik advantages are:

- 12 mm compact format, galvanic separation between input and output, transistor or triac outputs.
- LED status indicator at the input, switching currents up to 2 A, label plate, plug-link on the input.
- Can be snapped on to DIN-rail to EN 60715 (TH35) resp. (G32).
- Potential rail with 12 mm spacing on the output.

from page 3.4.11

Power opto-coupler modules



AMS

22.5 mm wide MCVO housing with up to three galvanically separated opto-couplers or a single circuit with a nominal output current of up to 4 A.

DIN-rail mounting to EN 60715 (TH35) resp. (G32).

from page 3.4.14

Opto-coupler modules with pole changing switch



DC-MOTOR CONTROL

The DC MOTOR CONTROL can control DC motors with a nominal voltage of 24 V DC.

Via 2 inputs the motor can be directly switched into left or right wheel operation.

page 3.4.16

Terminal opto-coupler

Transistor output

with enhanced features

MIRO 6.2
Transistor 0.5 A

MIRO 6.2
Transistor 2 A

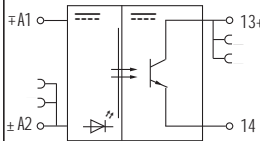
MIRO 6.2
Transistor 10 A

MIRO 6.2
Transistor 10 A
overload and short-circuit protection



Circuit diagram

Common connection up to max. 50 V AC/DC



Ordering data	Art.-No.	Art.-No.	Art.-No.	Art.-No.
Input voltage	Spring clamp/screw terminals	Spring clamp/screw terminals	Spring clamp/screw terminals	Spring clamp/screw terminals
5 V DC		UL + CSA 6652502		
24 V DC	UL + CSA 6652500	UL + CSA 6652501	6652520	²⁾ 6652521
48 V DC	UL + CSA 6652505			
110 V AC/DC	UL + CSA 6652506	UL + CSA 6652508		
230 V AC	UL + CSA 6652507	UL + CSA 6652508		

Input					
ON/OFF/Control current	5 V DC	4 ... 5.5 V DC	/ 0 ... 2 V DC	/ 6 mA	
	24 V DC	10 ... 44 V DC	/ 0 ... 3 V DC	/ 6 mA	10 ... 53 V DC / 0 ... 5 V DC / 10 mA
	48 V DC	18 ... 56 V DC	/ 0 ... 12 V DC	/ 6 mA	
	110 V AC/DC	70 ... 130 V AC/DC	/ 0 ... 30 V AC/DC	/ 6 mA	(at Art.-No. 6652508 90 ... 250 V AC)
	230 V AC	90 ... 250 V AC	/ 0 ... 30 V AC	/ 7 mA	(at Art.-No. 6652508 15 mA)

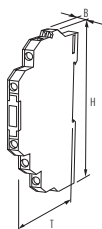
Status indicator: yellow LED

Output					
Switching element	Transistor	Transistor			
Switching current min./max.	0.1 mA/0.5 A (see de-rating curve)	1 mA/2 A (no de-rating)	1 mA/10 A (see de-rating curve)	¹⁾ 1 mA/10 A (see de-rating curve)	
Switched voltage	5 ... 48 V DC	5 ... 48 V DC	5 ... 48 V DC		
Saturation voltage (across output)	≤ 1.2 V DC	≤ 0.3 V DC	≤ 0.12 V DC		
Leakage current (when output is open)	< 0.3 mA		< 25 µA		
Switching time ON/OFF	100/700 µs	1/5 ms, (3/10 ms at Art.-No. 6652508)	2/5 ms (at 10 A load)		
Switching frequency ohmic/inductive	500/30 Hz	10/1 Hz	1 Hz		

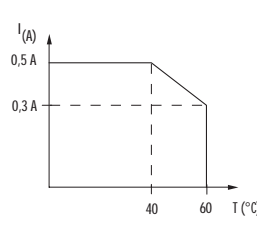
General data					
Test isolation voltage	3.75 kV AC	2.5 kV AC	2.75 kV AC		
Temperature range	-20 ... +60 °C				
Housing	flame retardant black plastic				
Mounting method	DIN-rail mounting to EN 60715				
Dimensions H x B x T	78 x 6.2 x 65 mm				

Accessories	Art.-No.
Bridging link max. 2 A	90961
Bridging comb 10-pole, red	90976
End caps, 2 pieces, red	90982
Bridging comb 10-pole, blue	90975
End caps, 2 pieces, blue	90980
Wire chain 16-pole	90977
Label plate	90901

Dimension drawing

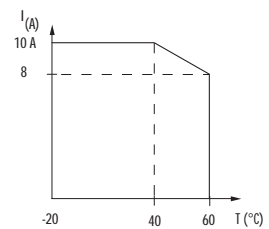


De-rating curve



Transistor 0.5 A

De-rating curve



Transistor 10 A

Notes

For screw-type terminal connection, the item number changes from 6652... to 52... (i.e. the prefix 66 is dropped).
¹⁾Pulse switched overload and short-circuit protection. ²⁾Art.-No. 6652522 resp. 52522 with 5 A switching current.

Terminal opto-coupler

fast transistor output
C/O contact

with enhanced features

MIRO 6.2

Transistor 2 A
with soldering terminal



MIRO 6.2

Transistor 0.5 A
with C/O output

MIRO 6.2

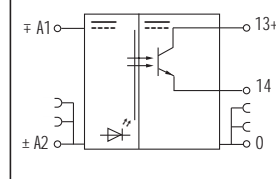
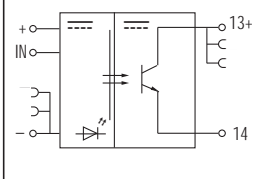
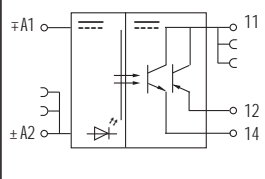
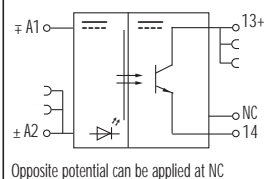
Transistor 0.5 A
control current 0.1 mA
¹⁾max. switching frequency 20 kHz

MIRO 6.2

Transistor 2 A
short-circuit protected
max. 1 kHz switching frequency

Circuit diagram

Common connection up to max. 50 V DC



Ordering data	Art.-No.	Art.-No.	Art.-No.	Art.-No.
Control voltage input	Spring clamp/screw terminals	Spring clamp/screw terminals	Spring clamp/screw terminals	Spring clamp/screw terminals
5 V DC				
24 V DC	UL	UL + CSA	UL + CSA	
48 V DC	6652512	6652510	¹⁾ 6652511	6652503
110 V AC/DC				
230 V AC				

Input	
ON/OFF/Control current	5 V DC
	24 V DC
	48 V DC
	110 V AC/DC
	230 V AC

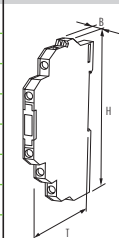
Status indicator	yellow LED
------------------	------------

Output	
Switching element	Transistor
Switching current min./max.	²⁾ 1 mA/2 A overload protection
Switched voltage	5... 48 V DC
Saturation voltage (across output)	≤ 0.35 V DC
Leakage current (when output is open)	< 0.1 mA
Switching time ON/OFF	5/10 ms
Switching frequency ohmic/inductive	10 Hz

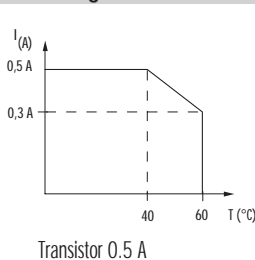
General data	
Test isolation voltage	2.5 kV AC
Temperature range	-20... +60 °C
Housing	flame retardant black plastic
Mounting method	DIN-rail mounting to EN 60715
Dimensions H x B x T	90 x 6.2 x 65 mm

Accessories	Art.-No.
Bridging link max. 2 A	90961
Bridging comb 10-pole, red	90976
End caps, 2 pieces, red	90982
Bridging comb 10-pole, blue	90975
End caps, 2 pieces, blue	90980
Wire chain 16-pole	90977
Label plate	90901

Dimension drawing



De-rating curve



Notes

For screw-type terminal connection, the item number changes from 6652... to 52... (i.e. the prefix 66 is dropped).
¹⁾ 30 kHz switching frequency with spring terminals available under Art.-No. 526071. ²⁾ Making current limitation.

Terminal opto-coupler with enhanced features

MIRO 6.2
Triac 0.5 A

MIRO 6.2
Triac 0.5 A
with enhanced features

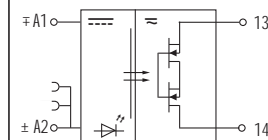
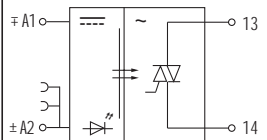
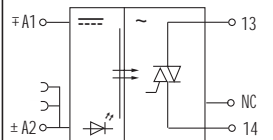
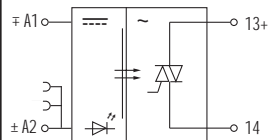
MIRO 6.2
Triac 1 A

MIRO 6.2
Transistor 1 A
with multiple voltage output AC/DC



Circuit diagram

Common connection up to max. 50 V AC/DC



Ordering data

	Art.-No.	Art.-No.	Art.-No.	Art.-No.
Input voltage	Spring clamp/screw terminals	Spring clamp/screw terminals	Spring clamp/screw terminals	Spring clamp/screw terminals
5 V DC	UL 6652551			
24 V DC	UL 6652550	UL 6652560	6652571	6652572
48 V DC	6652555			
110 V AC/DC	UL 6652556			
230 V AC	UL 6652557			

Input

ON/OFF/Control current	5 V DC	4.0 ... 5.5 V DC / 0 ... 2 V DC / 6 mA		
	24 V DC	10 ... 44 V DC / 0 ... 3 V DC / 6 mA	10 ... 53 V DC / 0 ... 3 V DC / 9 mA	10 ... 53 V DC / 0 ... 5 V DC / 10 mA
	48 V DC	18 ... 56 V DC / 0 ... 12 V DC / 6 mA		
	110 V AC/DC	70 ... 130 V AC/DC / 0 ... 35 V AC/DC / 4 mA		
	230 V AC	140 ... 250 V AC / 0 ... 80 V AC / 7 mA		

Status indicator

yellow LED

Output

Switching element	Triac	Triac	Transistor
Switching current min./max.	0.1 mA/0.5 A (see de-rating curve)	0.01 mA/1.0 A (see de-rating curve)	1 mA/1.0 A (see de-rating curve)
Switched voltage	24 ... 250 V AC	12 ... 280 V AC	5 ... 250 V AC/5 ... 350 V DC
Saturation voltage (across output)	≤ 1.5 V AC	≤ 1.5 V AC	≤ 0.7 V AC/DC
Leakage current (when output is open)	< 0.3 mA	< 1 mA	< 25 µA
Switching time ON/OFF	10/10 ms	10/10 ms	3/6 ms
Switching frequency ohmic/inductive	20 Hz	2 Hz	10 Hz

General data

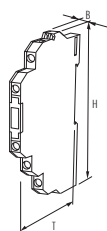
Test isolation voltage	2.5 kV AC		2.75 kV AC
Temperature range	-20 ... +60 °C		
Housing	flame retardant black plastic		
Mounting method	DIN-rail mounting to EN 60715		

Dimensions H x B x T	78 x 6.2 x 65 mm	90 x 6.2 x 65 mm	78 x 6.2 x 65 mm
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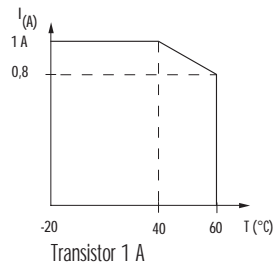
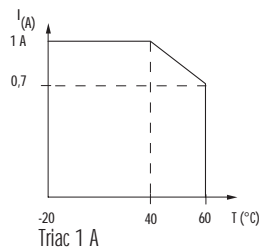
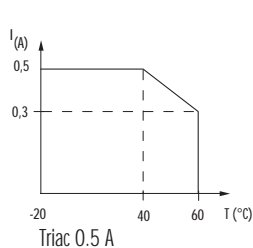
Accessories

	Art.-No.
Bridging link max. 2 A	90961
Bridging comb 10-pole, red	90976
End caps, 2 pieces, red	90982
Bridging comb 10-pole, blue	90975
End caps, 2 pieces, blue	90980
Wire chain 16-pole	90977
Label plate	90901

Dimension drawing



De-rating curves



Notes

For screw-type terminal connection, the item number changes from 6652... to 52... (i.e. the prefix 66 is dropped).

Terminal opto-coupler

MIRO 6.2

Transistor 2 A
with output isolation link



MIRO 6.2

Triac 0.5 A
with output isolation link

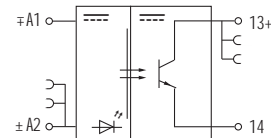
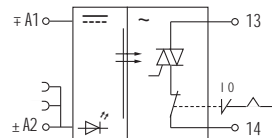
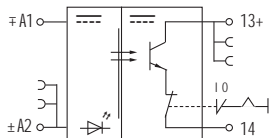
MIRO 6.2 Pluggable

Transistor



Circuit diagram

Common connection up to max. 50 V DC



Ordering data

Input voltage	Spring clamp/screw terminals	Art.-No.	Spring clamp/screw terminals	Art.-No.	Spring clamp terminals	Art.-No.
5 V DC						
24 V DC	UL + CSA	6652513		6652561	UL	3000-32512-2100010
48 V DC						
110 V AC/DC						
230 V AC						

Input

ON/OFF/Control current	5 V DC					
	24 V DC	10...53 V DC / 0...5 V DC / 7 mA				17...30 V DC / 0...5 V DC / 7 mA
	48 V DC					
	110 V AC/DC					
	230 V AC					

Status indicator	yellow LED					-
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Output

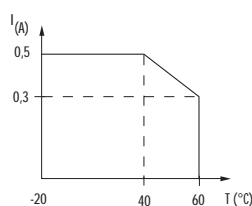
Switching element	Transistor	Triac	Transistor
Switching current min./max.	1 mA/2 A	0.1 mA/0.5 A (see de-rating curve)	1 mA/2 A
Switched voltage	5...48 V DC	24...250 V AC	1.5...24 V DC
Saturation voltage (across output)	≤ 0.3 V DC	≤ 15 V AC	≤ 0.15 V AC
Leakage current (when output is open)	< 0.3 mA	< 0.3 mA	< 10 µA
Switching time ON/OFF	1/5 ms	10/10 ms	0.1/0.3 ms
Switching frequency ohmic/inductive	10/1 Hz	20/1 Hz	1000/100 Hz

General data

Test isolation voltage	2.5 kV AC
Temperature range	-20...+60 °C
Housing	flame retardant black plastic
Mounting method	DIN-rail mounting to EN 60715
Dimensions H x B x T	78 x 6.2 x 65 mm

Accessories	Art.-No.
Bridging link max. 2 A	90961
Bridging comb 10-pole, red	90976
End caps, 2 pieces, red	90982
Bridging comb 10-pole, blue	90975
End caps, 2 pieces, blue	90980
Wire chain 16-pole	90977
Label plate	90901

De-rating curve



Accessories	Art.-No.
Bridging link, blue	3000-90000-0300010
Bridging link, black	3000-90000-0300020
Removable opto-coupler	3000-32522-2100010
Isolation plate	3000-90000-0300030

Notes

For screw-type terminal connection, the item number changes from 6652... to 52... (i.e. the prefix 66 is dropped)

Mini-opto-coupler

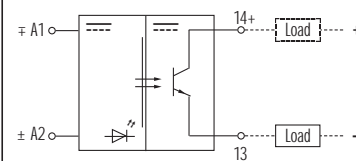
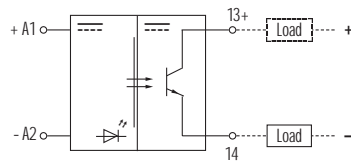
Transistor output

AMMS

AMMS



Circuit diagram



Ordering data

Control voltage input
3.5...5.5 V DC
24 V DC

Art.-No.

50041

Art.-No.

50040

Input

Voltage range "ON" 3.5...5.5 V DC
Voltage range "OFF" 0...0.8 V DC
Nominal current 6 mA
Status indicator red LED

10...53 V DC
0...3 V DC

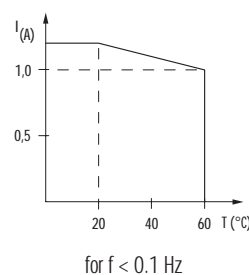
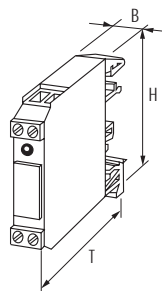
Output

Switching element Transistor
Switching voltage min./max. 4.5...53 V DC
Switching current min./max. 1 mA...1.2 A
Saturation voltage (across output) ≤ 1.2 V DC
Leakage current (when output is open) < 0.3 mA
Switching time ON/OFF 100/700 μ s
Switching frequency ohmic/inductive 500/30 Hz¹⁾

General data

Test isolation voltage 3.75 kV AC
Temperature range -20...+60 °C
Housing flame retardant black plastic
Mounting method DIN-rail mounting to EN 60715 (TH 35) or (G 32)
Dimensions H x B x T 56 x 12 x 64 mm

Dimension drawing/Load curve



Notes

¹⁾Max. switching frequency 500 Hz at resistive load and max. 0.2 A.
Accessories can be found in chapter 3.13

Opto-coupler modules

Mini-opto-coupler

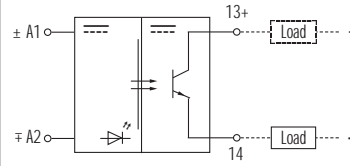
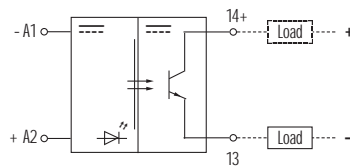
Transistor output

AMMS

AMMS



Circuit diagram



Ordering data

Art.-No.

Art.-No.

Control voltage input

4...30 V DC

50010

24 V DC

50070

Input

Voltage range "ON"

4...30 V DC

10...53 V DC

Voltage range "OFF"

0...2 V DC

0...3 V DC

Nominal current

10 mA

6 mA

Status indicator

red LED

LED red

Output

Switching element

Transistor

Transistor

Switching voltage min./max.

4.5...44 V DC

4.5...40 V DC

Switching current min./max.

1 mA...1.2 A

10 mA...2 A

Saturation voltage (across output)

≤ 1.2 V DC

< 0.1 V DC

Leakage current (when output is open)

< 0.3 mA

0.1 mA

Switching time ON/OFF

65/65 μs

2/8 ms

Switching frequency ohmic/inductive

7 kHz/10 Hz¹⁾

2.5 Hz

General data

Test isolation voltage

3.75 kV AC

2.5 kV AC

Temperature range

-20...+60 °C

Housing

flame retardant black plastic

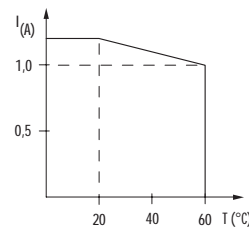
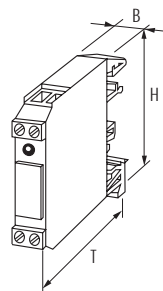
Mounting method

DIN-rail mounting to EN 60715 (TH 35) or (G 32)

Dimensions H x B x T

56 x 12 x 64 mm

Dimension drawing/Load curve



for $f < 0.1$ Hz

Art.-No. 50010

Notes

¹⁾max. switching frequency at Art.-No. 50010: 7 kHz at resistive load and max. 0.3 A.

Accessories can be found in chapter 3.13

Mini-opto-coupler

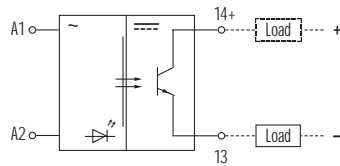
EMMS

AMMS

Transistor output



Circuit diagram



Ordering data

Art.-No.

Control voltage input
110/230 V AC

50105

Input

Voltage range "ON"	93.5 ... 253 V AC
Voltage range "OFF"	0 ... 40 V AC
Nominal current	10 mA
Status indicator	LED red

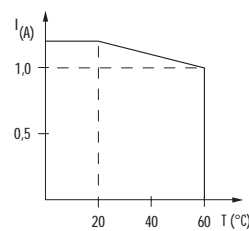
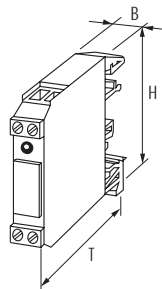
Output

Switching element	Transistor
Switching voltage min./max.	4.5 ... 53 V DC
Switching current min./max.	1 mA ... 1.2 A
Saturation voltage (across output)	≤ 1.2 V DC
Leakage current (when output is open)	< 0.3 mA
Switching time ON/OFF	20/50 ms
Switching frequency ohm.	5 Hz

General data

Test isolation voltage	3.75 kV AC
Temperature range	-20 ... +60 °C
Housing	flame retardant black plastic
Mounting method	DIN-rail mounting to EN 60715 (TH 35) or (G 32)
Dimensions H x B x T	56 x 12 x 64 mm

Dimension drawing/Load curve



Notes

Accessories can be found in chapter 3.13

Opto-coupler modules

Mini-opto-coupler

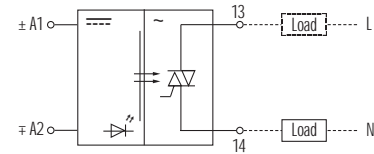
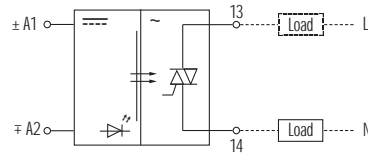
Triac output

AMMS

AMMS



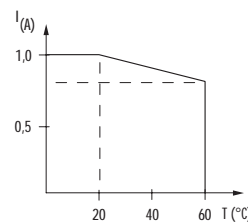
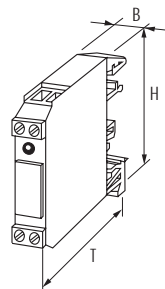
Circuit diagram



At Art.-No. 50031
+A1; -A2

Ordering data	Art.-No.	Art.-No.	Art.-No.
Control voltage input			
TTL (3.5...5.5 V DC)			50031
24 V DC	50032	50030	
Input			
Voltage range "ON"	10...53 V DC	10...53 V DC	3.5...5.5 V DC
Voltage range "OFF"	0...5 V DC	0...3 V DC	0...0.8 V DC
Nominal current	15 mA	10 mA	
Status indicator	red LED	LED red	
Output			
Switching element	Triac	Triac	
Switching voltage min./max.	24...253 V AC	24...253 V AC	
Switching current min./max.	1 mA...0.1 A	50 mA...1 A	
Saturation voltage (across output)	< 1.3 V AC	≤ 1.3 V AC	
Leakage current (when output is open)	< 0.1 mA	< 5 mA	
Switching time ON/OFF	10/10 ms		
Switching frequency ohm.	25 Hz		
General data			
Test isolation voltage	2.5 kV AC		
Temperature range	-20...+60 °C		
Housing	flame retardant black plastic		
Mounting method	DIN-rail mounting to EN 60715 (TH 35) or (G 32)		
Dimensions H x B x T	56 x 12 x 64 mm		

Dimension drawing/Load curve



Art.-No. 50030/50031

Notes

Accessories can be found in chapter 3.13

Mini-opto-coupler

Transistor output

Double terminals on the output side

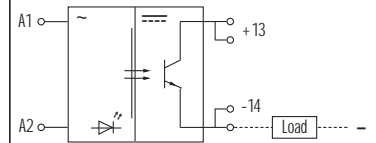
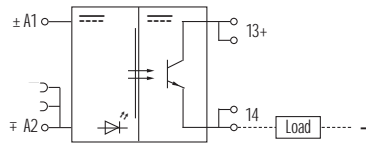
AMMDS
with negative plug-link

AMMDS
with negative plug-link

AMMDS



Circuit diagram



Ordering data

Control voltage input	Art.-No.	Art.-No.	Art.-No.
24 V DC	50081	50080	
230 V AC			50110

Input

Voltage range "ON"	10...53 V DC		195...253 V AC
Voltage range "OFF"	0...3 V DC		0...110 V AC
Nominal current	6 mA		10 mA
Status indicator	red LED		LED red
Plug link	Art.-No. 90960 included with module		no plug-link facility

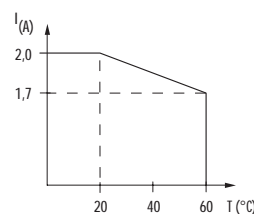
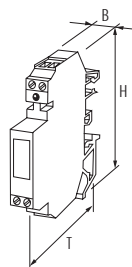
Output

Switching element	transistor switched positive	transistor switched positive	transistor switched positive
Switching voltage min./max.	4...40 V DC	4...35 V DC	4...40 V DC
Switching current min./max.	1 mA...0.1 A	10 mA...2 A (short-circuit protected)	1 mA...0.1 A
Saturation voltage (across output)	< 1.2 V DC	< 0.5 V DC	< 1.2 V DC
Leakage current (when output is open)	< 0.3 mA	< 0.3 mA	< 0.3 mA
Switching time ON/OFF	2/2 ms	2/15 ms	20/45 ms
Switching frequency ohmic/inductive	300/40 Hz	10/1 Hz	10/1 Hz

General data

Test isolation voltage	3.75 kV AC	2.5 kV AC	3.75 kV AC
Temperature range	-20...+60 °C		
Housing	flame retardant black plastic		
Mounting method	DIN-rail mounting to EN 60715 (TH 35) or (G 32)		
Dimensions H x B x T	82 x 12 x 68 mm		

Dimension drawing/Load curve



Art.-No. 50080

Notes

Accessories can be found in chapter 3.13

Opto-coupler modules

Mini-opto-coupler

Transistor output

Negative plug-link

AMMDS

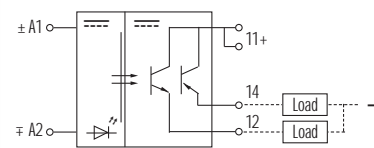
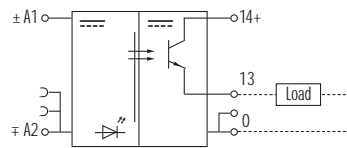
double terminals on the output side
for rapid switching



AMMDU

with electronic C/O contact

Circuit diagram



Ordering data

Art.-No.

Art.-No.

Control voltage input

24 V DC

50082

50085

Input

Voltage range "ON"

10...35 V DC

10...53 V DC

Voltage range "OFF"

0...5 V DC

0...6 V DC

Nominal current

15 mA

10 mA

Status indicator

red LED

red LED

Plug link

Art.-No. 90960 included with module

no plug-link facility

Output

Switching element

Transistor

Transistor

Switching voltage min./max.

5...35 V DC

4.5...53 V DC

Switching current min./max.

1 mA...2 A

1 mA...1 A

Saturation voltage (across output)

< 0.5 V DC

< 1.5 V DC

Leakage current (when output is open)

< 0.3 mA

< 0.3 mA

Switching time ON/OFF

7/6 μs

25/75 μs

Switching frequency ohmic/inductive

30 kHz/200 Hz

1 kHz/10 Hz

General data

Test isolation voltage

2.5 kV AC

Temperature range

-20...+60 °C

Housing

flame retardant black plastic

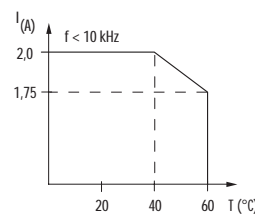
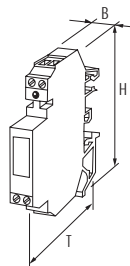
Mounting method

DIN-rail mounting to EN 60715 (TH 35) or (G 32)

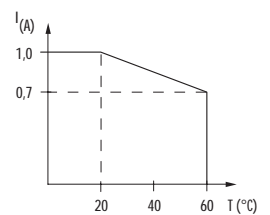
Dimensions H x B x T

82 x 12 x 68 mm

Dimension drawing/Load curve



Art.-No. 50082



Art.-No. 50085

Notes

Accessories can be found in chapter 3.13

Mini-opto-coupler

Triac output or all voltage version

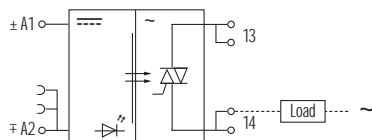
with double terminals on the output side

AMMDS

with negative plug-link



Circuit diagram



Ordering data

Art.-No.

Control voltage input
24 V DC

50092

Input

Voltage range "ON"	10...35 V DC
Voltage range "OFF"	0...3 V DC
Nominal current	6 mA
Status indicator	red LED
Plug link	Art.-No. 90960 included with module

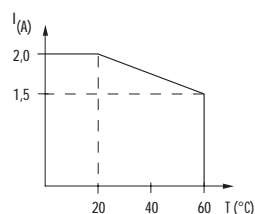
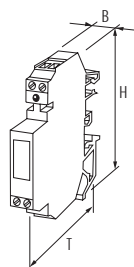
Output

Switching element	Triac
Switching voltage min./max.	24...280 V AC
Switching current min./max.	50 mA...2 A
Saturation voltage (across output)	≤ 1 V
Leakage current (when output is open)	≤ 2 mA
Switching time ON/OFF	10/10 ms
Switching frequency ohmic/inductive	20/5 Hz

General data

Test isolation voltage	2.5 kV AC
Temperature range	-20...+60 °C
Housing	flame retardant black plastic
Mounting method	DIN-rail mounting to EN 60715 (TH 35) or (G 32)
Dimensions H x B x T	82 x 12 x 68 mm

Dimension drawing/Load curve



Art.-No. 50092

Notes

Accessories can be found in chapter 3.13

MCVO Opto-coupler modules

Transistor output

AMS

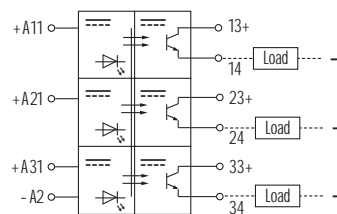
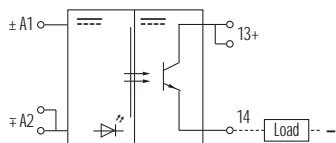


AMS

3-way Transistor



Circuit diagram



common negative for all 3 inputs = -A2

Ordering data

Art.-No.

Art.-No.

Control voltage input
24 V DC

50044

50043

Input

Voltage range "ON"	10...53 V DC ¹⁾
Voltage range "OFF"	0...3 V DC
Nominal current	10 mA
Status indicator	red LED

red LED per input

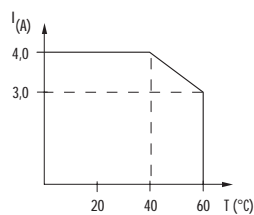
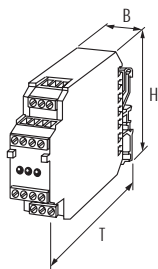
Output

Switching element	transistor switched positive	transistor switched positive
Switching voltage min./max.	4.5...53 V DC	4.5...35 V DC
Switching current min./max.	0.1...4 A	10 mA...2 A (short-circuit protected)
Saturation voltage (across output)	< 1.5 V DC	< 0.5 V DC
Leakage current (when output is open)	< 10 mA	< 0.3 mA
Switching time ON/OFF	8/14 μs	2/15 ms
Switching frequency ohmic/inductive	2 kHz/4 Hz	10/1 Hz

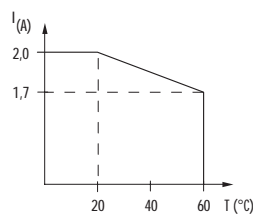
General data

Test isolation voltage	3.75 kV AC	2.5 kV AC
Temperature range	-20...+60 °C	
Housing	flame retardant black plastic	
Mounting method	DIN-rail mounting to EN 60715 (TH 35) or (G 32)	
Dimensions H x B x T	75 x 22.5 x 102 mm	

Dimension drawing/Load curve



Art.-No. 50044



Art.-No. 50043

Notes

Accessories can be found in chapter 3.13
¹⁾ 230 V AC control voltage on request

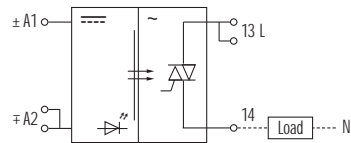
MCVO Opto-coupler modules

Triac output

AMS



Circuit diagram



Ordering data

Art.-No.

Control voltage input

24V DC

50034

Input

Voltage range "ON" 10...53 V DC ¹⁾

Voltage range "OFF" 0...3 V DC

Nominal current 6 mA

Status indicator red LED

Output

Switching element Triac

Switching voltage min./max. 24...253 V AC

Switching current min./max. 50 mA...4 A

Saturation voltage (across output) < 1.4 V

Leakage current (when output is open) < 10 mA

Switching time ON/OFF 10/20 ms

Switching frequency ohmic/inductive 30/5 Hz

General data

Test isolation voltage 3.75 kV AC

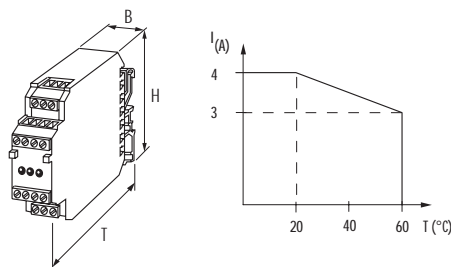
Temperature range -20...+60 °C

Housing flame retardant black plastic

Mounting method DIN-rail mounting to EN 60715 (TH 35) or (G 32)

Dimensions H x B x T 75 x 22.5 x 102 mm

Dimension drawing/Load curve



Notes

Accessories can be found in chapter 3.13

¹⁾ 230 V AC control voltage on request

Opto-coupler modules

Pole changing switch for DC motors

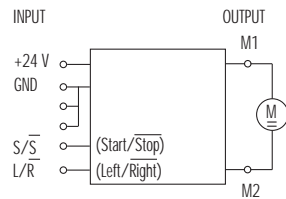
Start-stop/left-right Active stop modus

Over current or temperature indication

MIRO 12.4
DC MOTOR CONTROL



Circuit diagram



Ordering data

Art.-No.

Control voltage input
24V DC

6650140

Input

Voltage range "ON"
Voltage range "OFF"
Nominal current
Status indicator

15...30 V DC
0...5 V DC
max. 10 mA
yellow LED - right running, green LED - left running

Output

Switching element
Switching voltage min./max.
Switching current max.
Highest current
Saturation voltage (across output)
Leakage current (when output is open)
Switching time ON/OFF
Switching frequency ind.
Changing time
Status indicator

Transistor
19.2...30 V DC
3 A (see de-rating curve)
approx. 6 A for 100 ms
< 1.4 V
< 10 mA
1.2/10 ms
max. 1 Hz (motor dependant)
50 ms
LED red failure (overvoltage/overtemperature)

General data

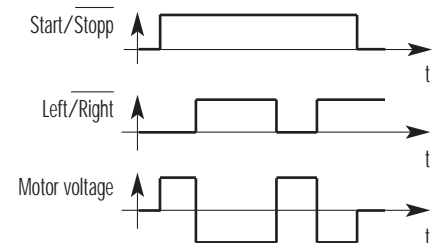
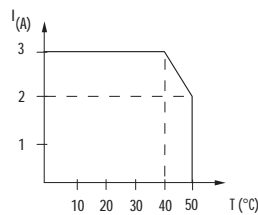
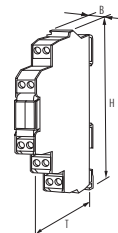
Test isolation voltage
Temperature range
Housing
Mounting method
Dimensions H x B x T

no separation
0...+50 °C
flame retardant black plastic
DIN-rail mounting to EN 60715 (TH 35) or (G 32)
90 x 12.4 x 65 mm

Dimension drawing

De-rating curve

Time diagram



Notes

For screw-type terminal connection, the item number changes from 6650... to 50... (i.e. the prefix 66 is dropped)
Accessories can be found in chapter 3.13