

INDUSTRIAL RELAYS

Industrial Electromagnetic Relays

Industrial electromagnetic relays are used mainly in industrial and power automation applications, in signaling controls, safety and protection systems and control and electric drives systems.



Features:

- DPDT, 3PDT and 4PDT contact configuration
- DC Coil voltages from 5VDC to 220V DC
- AC coil voltages from 6VAC to 240V AC 50/60 Hz
- Din Rail Plug in Socket are standard
- Rated load current: 5A/250V AC to 16A/250V AC rating
5A/24V DC to 16A/24VDC DC1 rating
- Test button with (K) or without block function (W)
- Built in LED light indicator (L)
- Surge suppression element with diode (D) or varistor (V)
- Approved for railroad applications (DE)
- Silver Nickel (AgNi) cadmium free contact material
- UL and CSA recognized relays
- ROHS2 and REACH compliance

Miniature Electromagnetic Relays

Miniature electromagnetic relays are used in many interface applications, standard automation projects, lighting control systems, emergency lighting applications, building application projects, food processing equipment control and many other electrical system applications.



Features:

- Standard SPDT, DPDT contact configuration
- DC Coil voltages from 3VDC to 110V DC
- AC coil voltages from 12VAC to 240V AC 50/60 Hz
- PCB mounting with socket or direct PCB solder
- Din Rail Plug in Socket are standard
- Rated load current: 8A/250V AC (DPDT) or 16A/250V AC (SPDT) rating;
8A/24V DC (DPDT) or 16A/24VDC (SPDT) DC1 rating
- Silver Nickel (AgNi) cadmium free contact material
- UL and CSA recognized relays
- ROHS2 and REACH compliance

Slimline Interface Relays

Slimline interface relays are used for PLC system and industrial automation applications, panel builders, machinery builders, time relays, office equipment and other applications that require a high switching capability in a small space.



Features:

- Standard SPDT contact configuration
- Standard 5 mm width
- DC Coil voltages from 5VDC to 60V DC
- Vertical or Horizontal configuration
- Sealed for Soldering and cleaning
- Can be used with Din rail socket or PCB mountable
- Rated load current
- 6A / 250V AC or 0.05A / 30V AC gold plated) rating
- 6A / 24V DC or 0.05A / 36V DC gold plated) rating
- 4A max for Solid state relays
- Silver Tin Oxide (AgSnO₂) cadmium free contact material
- Gold plated contact (AgSnO₂/Au 3μm) available
- UL recognized
- ROHS2 and REACH compliance

Subminiature Electromagnetic and Solid State Modules

Subminiature electromagnetic relays are used for PLC systems and industrial automation applications, panel builders, equipment builders and other applications that require a high switching capability in a small space. The Altech slim line interface relays can be used as a universal interface between the controller and the actuator to switch loads between 1 mA and 6A. They are available with electromechanical contacts or solid state configuration. Installation time is greatly reduced when a pre-assembled relays and sockets combination is used. Replacement relays and sockets are available from stock. Additional accessories include colored coded jumpers, spacers and markers (unmarked or marked based on the customer specification) for identification purposes.



Features:

- Standard SPDT contact configuration
- Space-saving 6.2 mm width
- Only 85 mm in height from DIN rail
- DC Coil voltages from 5VDC to 110V DC
- AC coil voltages from 6VAC to 240V AC 50/60 Hz
- Pre-assembled relay and DIN mount socket
- Screw clamp or Spring clamp terminals
- Universal AC/DC socket with built-in surge suppression and green LED
- Rated load current
- 6A / 250V AC or 0.05A / 30V AC gold plated) rating
- 6A / 24V DC or 0.05A / 36V DC gold plated) rating
- 4A max for Solid state relays
- Silver Tin Oxide (AgSnO₂) cadmium free contact material
- Gold plated contact (AgSnO₂/Au 3μm) available
- UL recognized
- ROHS2 and REACH compliance

Relays for Photovoltaic Systems

The Altech photovoltaic relays are suitable to be integrated in the solar converter to switch the DC voltage and current generated by the solar panels supplying the generated electricity to the electrical network. This requires an interface between the solar converter and the power grid. The circuit isolation gap between the converter and the power grid must have a contact gap of $\geq 1.5\text{mm}$ (according to safety standard DIN VDE 0126-1-1). Altech offers two different relays to meet this requirement.



Features:

- Standard DPST (2 NO) contact configuration
- DC Coil voltages from 5VDC to 110V DC
- Rated load current
- 35A / 250V AC or 48A / 250V AC
- 35A / 24V DC or 48A / 24V DC
- Contact gap $>1.75\text{ mm}$; Holding power 1W
- Silver Tin Oxide (AgSnO₂) cadmium free contact material
- Compact size, PCB mounting
- UL recognized
- ROHS2 and REACH compliance

MOUNTING OPTIONS					COIL			TYPE OF RELAY	NUMBER AND TYPE OF CONTACTS							RATED CURRENT [A]							
Direct PCB mounting	With plug-in socket PCB mounting	Panel mounting	35 mm rail mount acc. To PN-EN 60715	Others	AC	DC	AC/DC		SPDT	SPST(1NO)	SPST(1NC)	DPDT	DPST(2NO)	DPST(2NC)	3PDT	3PST(3NO)	4PDT	5	10	15	20	25	30

Industrial Electromagnetic Relays

					AC	DC	AC/DC	R2										12					
					AC	DC	AC/DC	R3										10					
					AC	DC	AC/DC	R4										6					
					AC	DC	AC/DC	RY2										12					
					AC	DC	AC/DC	R2M										5					
					AC	DC	AC/DC	RUC										16					
					AC	DC	AC/DC	R15 - DPDT										10					
					AC	DC	AC/DC	R15 - 3PDT										10					
					AC	DC	AC/DC	R15 - 4PDT										10					

Miniature Electromagnetic Relays

					AC	DC	AC/DC	RM40										5/8*					
					AC	DC	AC/DC	RM50										12					
					AC	DC	AC/DC	RM84										9					
					AC	DC	AC/DC	RM85										16					
					AC	DC	AC/DC	RM87										12					

Slimline Interface Relays

					AC	DC	AC/DC	RM699B										6					
					AC	DC	AC/DC	RSR30-...-D1-24-010-1										1					
					AC	DC	AC/DC	RSR30-...-A1-24-020-1										2					
					AC	DC	AC/DC	RSR30-...-D1-04-025-1										2.5					
					AC	DC	AC/DC	RSR30-...-D1-02-040-1										4					

Subminiature Electromagnetic and Solid State Modules

					AC	DC	AC/DC	PI6-1P										6					
					AC	DC	AC/DC	PI6-1T										1					
					AC	DC	AC/DC	PI6-1OC										1					
					AC	DC	AC/DC	PIR6W-1PS-...										max 6					
					AC	DC	AC/DC	PIR6WB-1PS-... **										max 6					

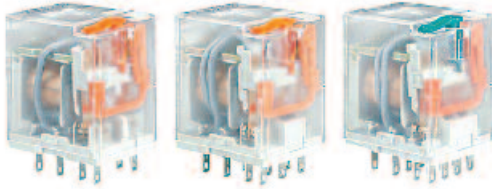
Relay Socket Combinations

					AC	DC	AC/DC	PI84 with socket GZT80										8					
					AC	DC	AC/DC	PI85 with socket GZT80										16					
					AC	DC	AC/DC	PI84 with socket GZM80										8					
					AC	DC	AC/DC	PI85 with socket GZM80										16					
					AC	DC	AC/DC	PIR2 with socket GZM2										12					
					AC	DC	AC/DC	PIR3 with socket GZM3										10					
					AC	DC	AC/DC	PIR4 with socket GZM4										6					
					AC	DC	AC/DC	PIR2M with socket GZ2										5					

* SPDT 5 A; SPST (1NO) 8A. **spring clamp socket. *** for more information see data sheet.

R2, R3, R4

Industrial Electromagnetic Relays



- Compact size
- Relays of general application
- Cadmium - free contacts
- AC and DC coils
- For plug-in sockets, 35 mm rail mount or on panel mounting *
- WT (mechanical indicator + lockable front test button) - standard features of relays for plug-in sockets. Relays may be provided with the test buttons (no latching) and plugs (see page 115)
- AUCOTEAM GmbH Berlin - railway standards.

Contact Data

	R2	R3	R4
Number and type of contacts	DPDT	3PDT	4PDT
Contact material	AgNi**	AgNi**	AgNi**
Rated / max. switching voltage AC	250 V / 440 V	250 V / 440 V	250 V / 250 V
Min. switching voltage	10 V	10 V	10 V
Rated load (capacity)			
AC1	12 A / 250 V AC	10 A / 250 V AC	6 A / 250 V AC
AC15	3 A / 120 V; 1.5 A / 240 V (B300)	3 A / 120 V; 1.5 A / 240 V (B300)	1.5 A / 120 V; 0.75 A / 240 V (C300)
AC3	370 W (single-phase motor)	370 W (single-phase motor)	125 W (single-phase motor)
DC1	12 A / 24 V DC (see Fig. 3.1)	10 A / 24 V DC (see Fig. 3.2)	6 A / 24 V DC (see Fig. 3.3)
DC13	0.22 A / 120 V; 0.1 A / 250 V (R300)	0.22 A / 120 V; 0.1 A / 250 V (R300)	0.22 A / 120 V; 0.1 A / 250 V (R300)
Min. switching current	5 mA	5 mA	5 mA
Max. inrush current	24 A	20 A	12 A
Rated current	12 A	10 A	6 A
Max. breaking capacity AC1	3000 VA	2500 VA	1500 VA
Min. breaking capacity	0.3 W	0.3 W	0.3 W
Contact resistance	≤ 100 mΩ	≤ 100 mΩ	≤ 100 mΩ
Max. operating frequency			
• at rated load	1200 cycles/hour	1200 cycles/hour	1200 cycles/hour
• no load	18000 cycles/hour	18000 cycles/hour	18000 cycles/hour

Coil Data

Rated voltage	50/60 Hz AC	6 ... 240 V	6 ... 240 V	6 ... 240 V
	DC	5 ... 220 V	5 ... 220 V	5 ... 220 V
Must release voltage		AC: ≥ 0.2 U _n ; DC: ≥ 0.1 U _n	AC: ≥ 0.2 U _n ; DC: ≥ 0.1 U _n	AC: ≥ 0.2 U _n ; DC: ≥ 0.1 U _n
Operating range of supply voltage		see page 54	see page 54	see page 54
Rated power consumption	AC	1.6 VA	1.6 VA	1.6 VA
	DC	0.9 W	0.9 W	0.9 W

Insulation

Insulation rated voltage		250 V AC	250 V AC	250 V AC
Rated surge voltage		4000 V 1.2 / 50 μs	with AC coils: 2500 V 1.2 / 50 μs with DC coils: 4000 V 1.2 / 50 μs	2500 V 1.2 / 50 μs
Overvoltage category		III	III	II
Insulation pollution degree		3	3	2
Dielectric strength				
• between coil and contacts		2500 V AC type of insulation: basic	2500 V AC type of insulation: basic	2500 V AC type of insulation: basic
• contact clearance		1500 V AC type of clearance: micro-disco.	1500 V AC type of clearance: micro-disco.	1500 V AC type of clearance: micro-disco.
• pole - pole		2500 V AC type of insulation: basic	2500 V AC type of insulation: basic	2500 V AC type of insulation: basic
Contact - coil distance				
• clearance		≥ 2.5 mm	≥ 2.5 mm	≥ 1.6 mm
• creepage		≥ 4 mm	≥ 4 mm	≥ 3.2 mm

General data

Operating / release time (typical)		AC: 10 ms / 8 ms; DC: 13 ms / 3 ms	AC: 10 ms / 8 ms; DC: 13 ms / 3 ms	AC: 10 ms / 8 ms; DC: 13 ms / 3 ms
Electrical life				
• resistive	AC1	> 10 ⁵ ; 12 A. 250 V AC see Fig. 2.1	> 10 ⁵ ; 10 A. 250 V AC see Fig. 2.2	> 10 ⁵ ; 6 A. 250 V AC see Fig. 2.3
• cosφ				
Mechanical life (cycles)		> 2 x 10 ⁷	> 2 x 10 ⁷	> 2 x 10 ⁷
Dimensions (L x W x H)		27.5 x 21.2 x 35.6 mm	27.5 x 21.2 x 35.6 mm	27.5 x 21.2 x 35.6 mm
Weight		35 g	35 g	35 g
Ambient temperature				
• storage		-40...+85 °C	-40...+85 °C	-40...+85 °C
• operating		AC: -40...+55 °C; DC: -40...+70 °C	AC: -40...+55 °C; DC: -40...+70 °C	AC: -40...+55 °C; DC: -40...+70 °C
Cover protection category		IP 40 PN-EN 60529	IP 40 PN-EN 60529	IP 40 PN-EN 60529
Environmental protection		RTI PN-EN 116000-3	RTI PN-EN 116000-3	RTI PN-EN 116000-3
Shock resistance (NO/NC)		10 g / 5 g	10 g / 5 g	10 g / 5 g
Vibration resistance		5 g 10...150 Hz	5 g 10...150 Hz	5 g 10...150 Hz
Solder bath temperature		max. 270 °C	-	max. 270 °C
Soldering time		max. 5 s	-	max. 5 s

* PCB or threaded bolt versions contact Altech Corp.

** Other contact materials (eg. gold plated) available, contact Altech Corp.

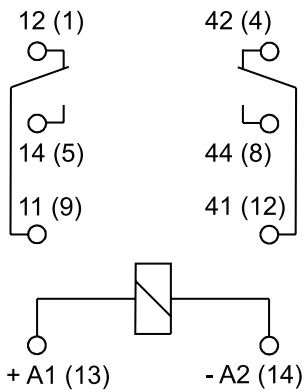
R2, R3, R4 Industrial Electromagnetic Relays



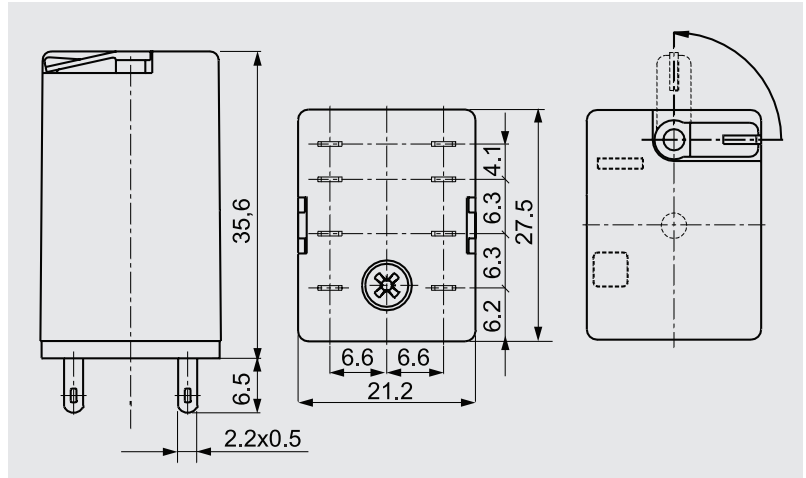
R2 (DPDT)



CONNECTION DIAGRAM

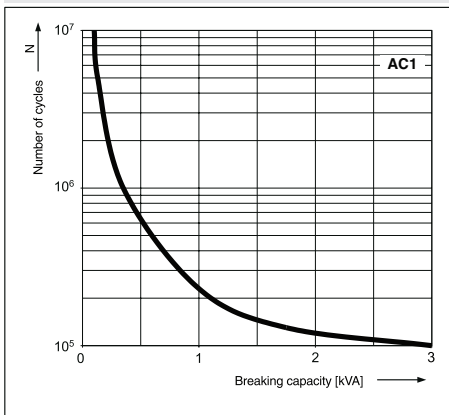


DIMENSIONS

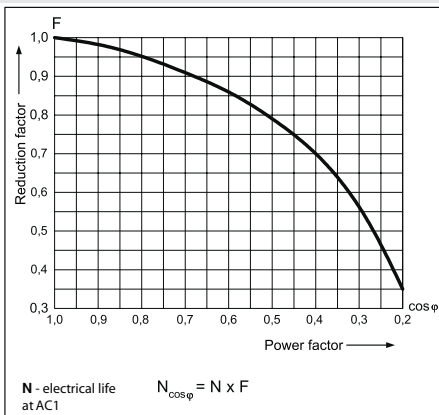


LOAD CHARTS

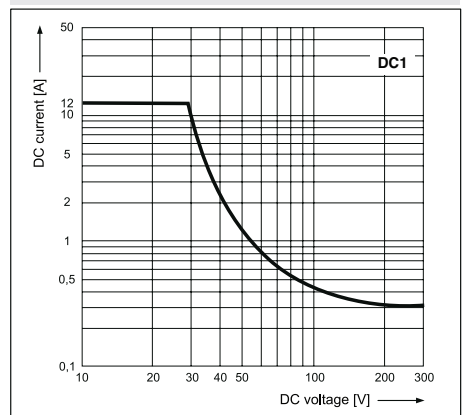
Electrical life at AC resistive load. Switching frequency: 1200 cycles/hour **Fig. 1.1**



Electrical life reduction factor at AC inductive load **Fig. 2.1**



Max. DC resistive load breaking capacity **Fig. 3.1**



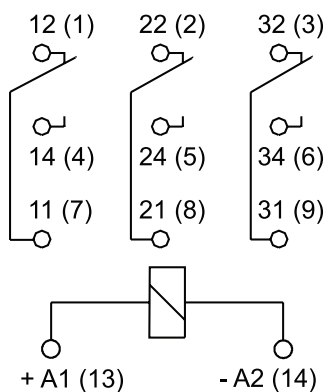
R2, R3, R4 Industrial Electromagnetic Relays



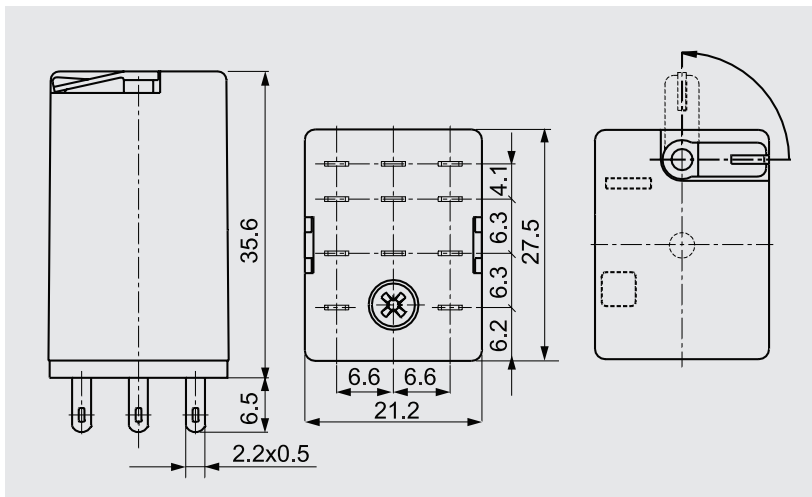
R3 (3PDT)



CONNECTION DIAGRAM

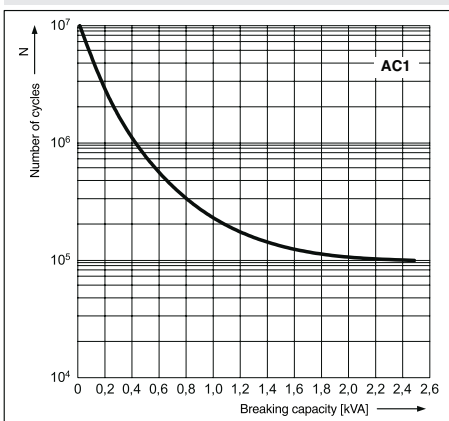


DIMENSIONS

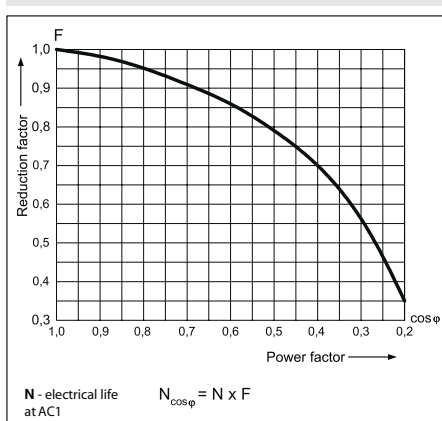


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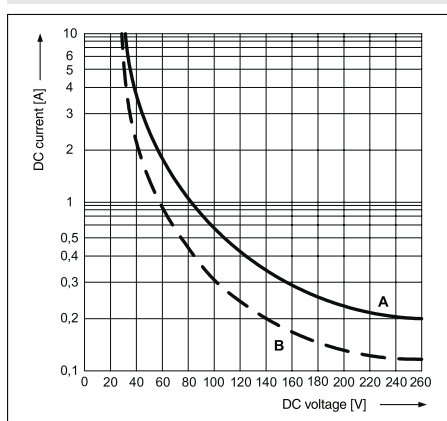
Electrical life at AC resistive load.
Switching frequency: 1200 cycles/hour **Fig. 1.2**



Electrical life reduction factor
at AC inductive load **Fig. 2.2**



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms **Fig. 3.2**



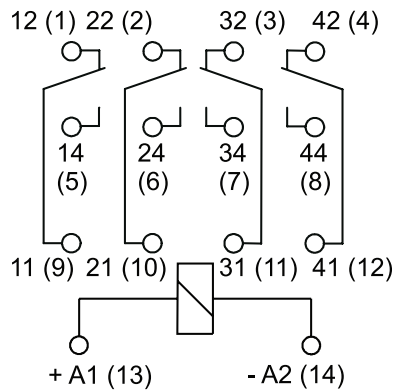
R2, R3, R4 Industrial Electromagnetic Relays



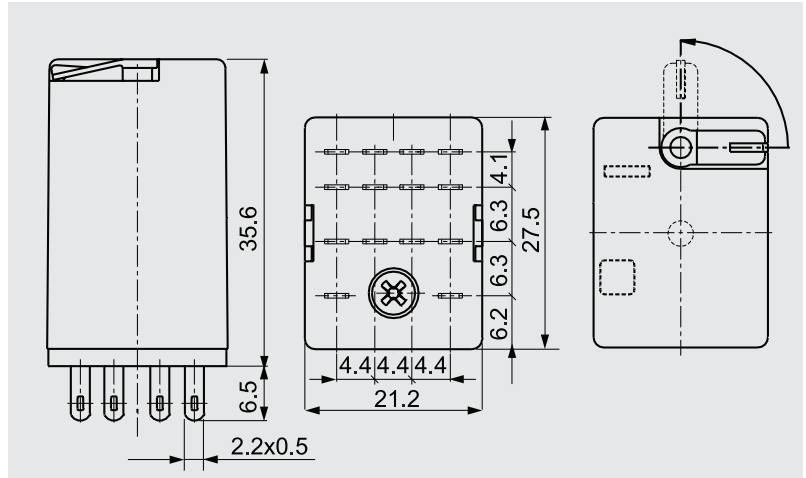
R4 (4PDT)



CONNECTION DIAGRAM

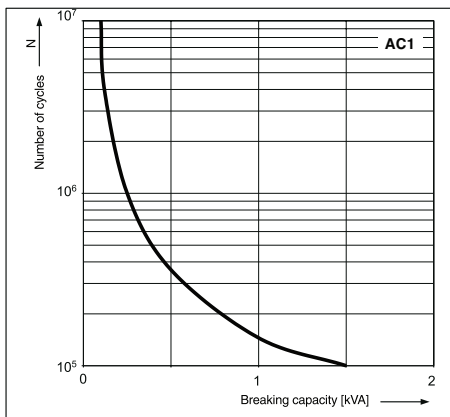


DIMENSIONS

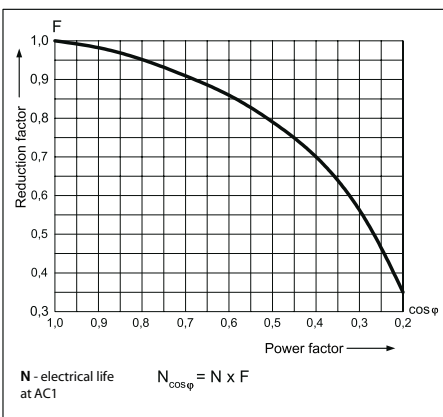


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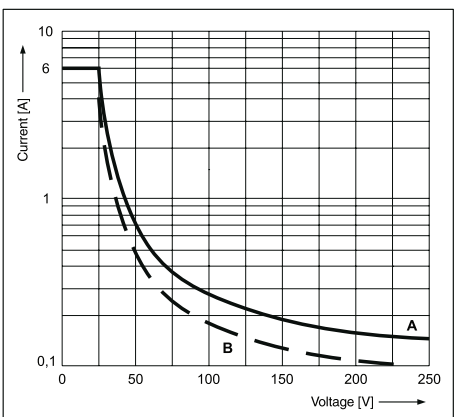
Electrical life at AC resistive load.
Switching frequency: 1200 cycles/hour **Fig. 3.1**



Electrical life reduction factor at AC inductive load **Fig. 2.3**



Max. DC breaking capacity
A - resistive load DC1
B - inductive load L/R = 40 ms **Fig. 3.3**



R2, R3, R4

Industrial Electromagnetic Relays

R2 DPDT AC 50/60Hz & DC coil

Part Number	Coil Voltage (V)	Coil Type	Coil resistance at 20 °C in Ω	Coil operating range		Options*	
				min. (at 20°C)	max. (at 55°C)	WT	WTL
R2N-2012-23-1012-WT	12	DC	160	9.6	13.2	x	
▶ R2N-2012-23-1012-WTL	12	DC	160	9.6	13.2		x
▶ R2N-2012-23-1024-WT	24	DC	640	19.2	26.4	x	
▶ R2N-2012-23-1024-WTL	24	DC	640	19.2	26.4		x
R2N-2012-23-1110-WT	110	DC	13600	88.0	121.0	x	
R2N-2012-23-1110-WTL	110	DC	13600	88.0	121.0		x
R2N-2012-23-5024-WT	24	AC 50/60Hz	158.0	19.2	26.4	x	
▶ R2N-2012-23-5024-WTL	24	AC 50/60Hz	158.0	19.2	26.4		x
▶ R2N-2012-23-5120-WT	120	AC 50/60Hz	3770	96.0	132.0	x	
▶ R2N-2012-23-5120-WTL	120	AC 50/60Hz	3770	96.0	132.0		x
R2N-2012-23-5230-WT	230	AC 50/60Hz	16100	184.0	253.0	x	
▶ R2N-2012-23-5230-WTL	230	AC 50/60Hz	16100	184.0	253.0		x

R3 DPDT AC 50/60Hz & DC coil

Part Number	Coil Voltage (V)	Coil Type	Coil resistance at 20 °C in Ω	Coil operating range		Options*	
				min. (at 20°C)	max. (at 55°C)	WT	WTL
R3N-2013-23-1012-WT	12	DC	160	9.6	13.2	x	
▶ R3N-2013-23-1012-WTL	12	DC	160	9.6	13.2		x
R3N-2013-23-1024-WT	24	DC	640	19.2	26.4	x	
▶ R3N-2013-23-1024-WTL	24	DC	640	19.2	26.4		x
R3N-2013-23-1110-WT	110	DC	13600	88.0	121.0	x	
R3N-2013-23-1110-WTL	110	DC	13600	88.0	121.0		x
R3N-2013-23-5024-WT	24	AC 50/60Hz	158.0	19.2	26.4	x	
R3N-2013-23-5024-WTL	24	AC 50/60Hz	158.0	19.2	26.4		x
▶ R3N-2013-23-5120-WT	120	AC 50/60Hz	3770	96.0	132.0	x	
▶ R3N-2013-23-5120-WTL	120	AC 50/60Hz	3770	96.0	132.0		x
R3N-2013-23-5230-WT	230	AC 50/60Hz	16100	184.0	253.0	x	
R3N-2013-23-5230-WTL	230	AC 50/60Hz	16100	184.0	253.0		x

R4 DPDT AC 50/60Hz & DC coil

Part Number	Coil Voltage (V)	Coil Type	Coil resistance at 20 °C in Ω	Coil operating range		Options*	
				min. (at 20°C)	max. (at 55°C)	WT	WTL
R4N-2014-23-1012-WT	12	DC	160	9.6	13.2	x	
▶ R4N-2014-23-1012-WTL	12	DC	160	9.6	13.2		x
▶ R4N-2014-23-1024-WT	24	DC	640	19.2	26.4	x	
▶ R4N-2014-23-1024-WTL	24	DC	640	19.2	26.4		x
R4N-2014-23-1110-WT	110	DC	13600	88.0	121.0	x	
▶ R4N-2014-23-1110-WTL	110	DC	13600	88.0	121.0		x
R4N-2014-23-5024-WT	24	AC 50/60Hz	158.0	19.2	26.4	x	
▶ R4N-2014-23-5024-WTL	24	AC 50/60Hz	158.0	19.2	26.4		x
▶ R4N-2014-23-5120-WT	120	AC 50/60Hz	3770	96.0	132.0	x	
▶ R4N-2014-23-5120-WTL	120	AC 50/60Hz	3770	96.0	132.0		x
R4N-2014-23-5230-WT	230	AC 50/60Hz	16100	184.0	253.0	x	
▶ R4N-2014-23-5230-WTL	230	AC 50/60Hz	16100	184.0	253.0		x

WT = with mechanical indicator + lockable front test button

WTL = with mechanical indicator + lockable front test button + light indicator (LED)

* other options available upon request

▶ BOLD - Regular stocked items.

R2, R3, R4

Industrial Electromagnetic Relays - Plug-in Sockets and Accessories



GZT2 (for R2)

Screw terminals
 Max. tightening moment for the terminal: 0.7 Nm
 35 mm rail mount acc. to PN-EN 60715
 or on panel mounting
 76,3 x 27 x 42.5(80) mm*
 Two poles
 12 A, 300 V AC

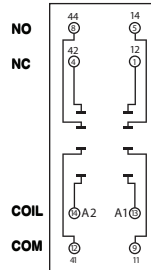


GZT2

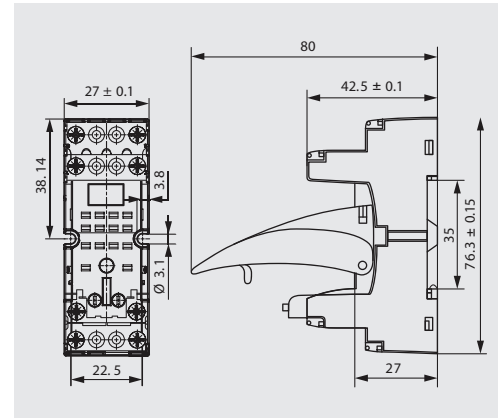
ZGGZ4 (see page 111)

Module type M... (see page 113)

CONNECTION DIAGRAM



DIMENSIONS



GZM2 (for R2)

Screw terminals
 Max. tightening moment for the terminal: 0.7 Nm
 35 mm rail mount acc. to PN-EN 60715
 or on panel mounting
 75 x 27 x 61(82) mm*
 Two poles
 12 A, 300 V AC

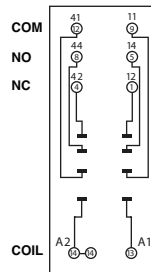


GZM2

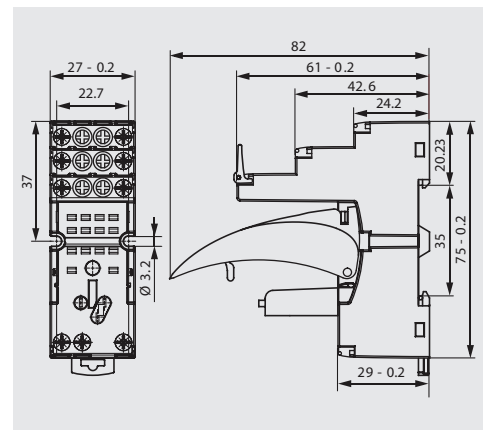
ZGGZ4 (see page 111)

Module type M... (see page 113)

CONNECTION DIAGRAM

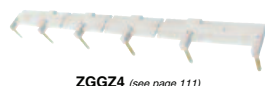


DIMENSIONS



GZT3 (for R3)

Screw terminals
 Max. tightening moment for the terminal: 0.7 Nm
 35 mm rail mount acc. to PN-EN 60715
 or on panel mounting
 76,3 x 27 x 42.5(80) mm*
 Three poles
 10 A, 300 V AC

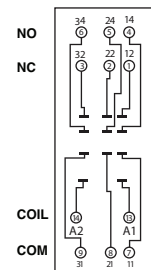


GZT3

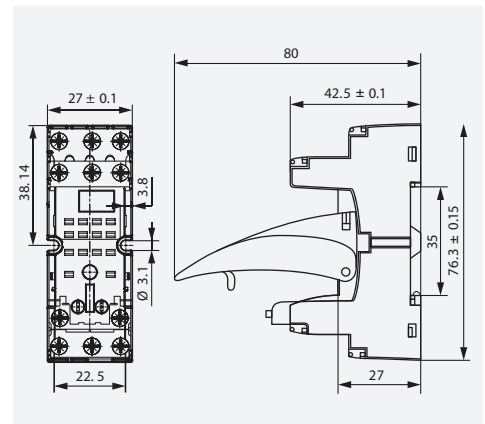
ZGGZ4 (see page 111)

Module type M... (see page 113)

CONNECTION DIAGRAM



DIMENSIONS



* In parenthesis is the height of the socket with plastic retainer clip. ** For lower profile application.

All accessories are sold separately.

R2, R3, R4

Industrial Electromagnetic Relays - Plug-in Sockets and Accessories

GZM3 (for R3)

Screw terminals
 Max. tightening moment
 for the terminal: 0.7 Nm
 35 mm rail mount
 acc. to PN-EN 60715
 or on panel mounting
 75 x 27 x 61(82) mm*
 Three poles
 10 A, 300 V AC



E22891



GZT2



GZT4-0040



G4 1052**



ZGGZ4 (see page 111)

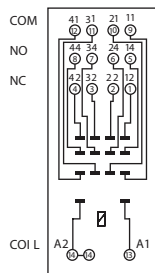


GZT4-0035

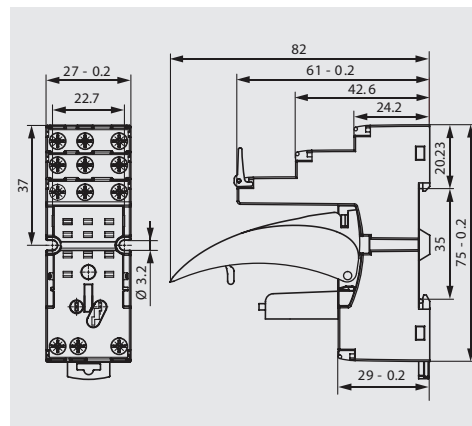


Module type M... (see page 113)

CONNECTION DIAGRAM



DIMENSIONS



GZT4 (for R4)

Screw terminals
 Max. tightening moment
 for the terminal: 0.7 Nm
 35 mm rail mount
 acc. to PN-EN 60715
 or on panel mounting
 76,3 x 27 x 42.5(80) mm *
 Four poles
 6 A, 300 V AC



E22891



GZM2



GZT4-0040



G4 1052**



ZGGZ4 (see page 111)

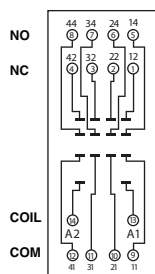


GZT4-0035

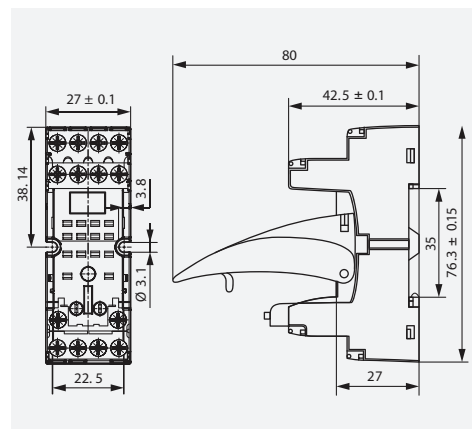


Module type M... (see page 113)

CONNECTION DIAGRAM



DIMENSIONS



GZM4 (for R4)

Screw terminals
 Max. tightening moment
 for the terminal: 0.7 Nm
 35 mm rail mount
 acc. to PN-EN 60715
 or on panel mounting
 75 x 27 x 61(82) mm*
 Four poles
 6 A, 300 V AC



E22891



GZT3



GZT4-0040



G4 1052**



ZGGZ4 (see page 111)

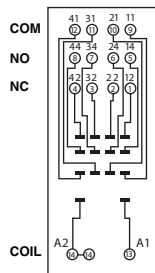


GZT4-0035

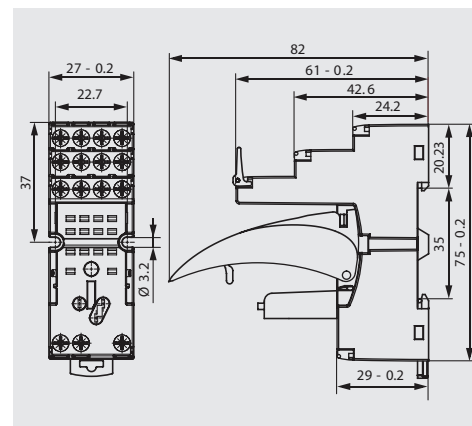


Module type M... (see page 113)

CONNECTION DIAGRAM



DIMENSIONS



* In parenthesis is the height of the socket with plastic retainer clip. ** For lower profile application.

All accessories are sold separately.

R2, R3, R4

Industrial Electromagnetic Relays - Plug-in Sockets and Accessories **Altech**[®]

GZMB2 (for R2)

Spring terminals

Max. cross section of the cables:

1 x 0,2...1,5 mm²

(1 x 24...16 AWG)

Stripping length deinsulation: 9...11 mm

35 mm rail mount

acc. to PN-EN 60715

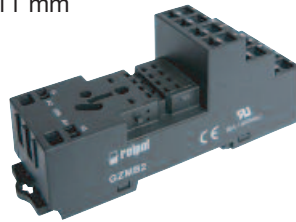
95 x 31 x 42.5(80) mm*

Two poles

10 A, 300 V AC

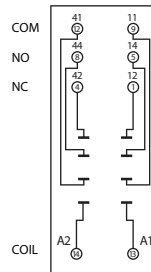


E22891

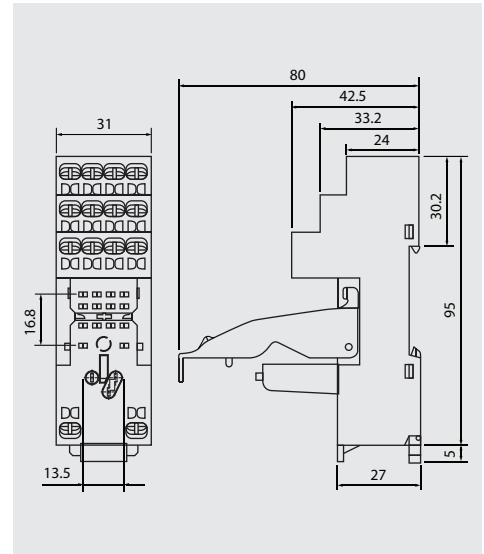


GZMB2

CONNECTION DIAGRAM



DIMENSIONS



GZMB4-0040



G4 1052**



TR



Module type M... (see page 113)

GZMB4 (for R4)

Spring terminals

Max. cross section of the cables:

1 x 0,2...1,5 mm²

(1 x 24...16 AWG)

Stripping length deinsulation:

9...11 mm

35 mm rail mount

acc. to PN-EN 60715

95 x 31 x 42.5(80) mm*

Four poles

10 A, 300 V AC

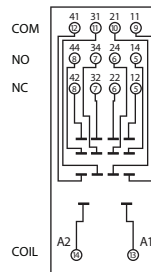


E22891

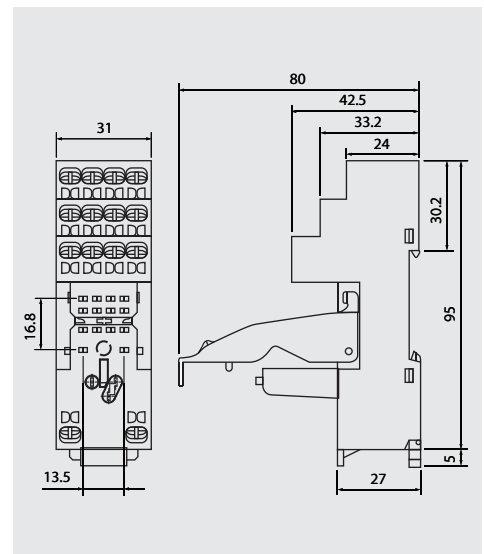


GZMB4

CONNECTION DIAGRAM



DIMENSIONS



GZMB4-0040



G4 1052**



TR



Module type M... (see page 113)

* In parenthesis is the height of the socket with plastic retainer clip. ** For lower profile application.

All accessories are sold separately.