Electromechanical power relays RERM3

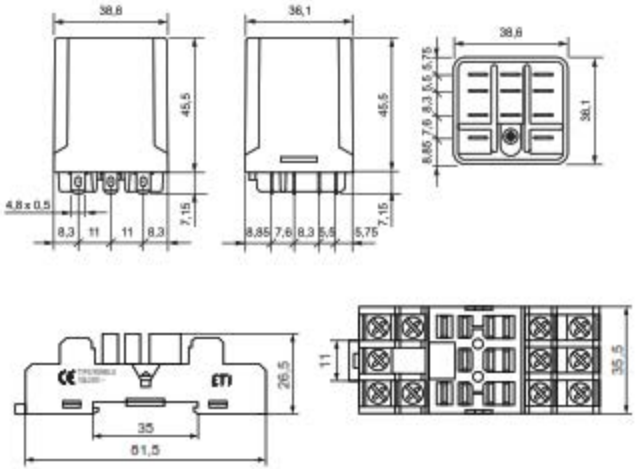
Table 1: Technical data

	RERM3	
Contact Data		
Number and type of contacts	3 CO	
Contact material	AgNi	
Rated / max. switching voltage AC	440 V	
Min. switching voltage	5V	
Rated load (capacity)	16 A / 250 V AC 10 A / 400 V AC	
Min. switching current	5 mA	
Max. inrush current	40A	
Rated current	16A	
Max. breaking capacity AC1	4000 VA	
Min. breaking capacity	0.3W	
Contact resistance	≤ 100 mΩ	
Max. operating frequency (cycles/hour)		
• at rated load AC1	1 200	
• no load	12 000	
Coil data		
Rated voltage	AC: 24V, 240V	
Must release voltage	AC: ≥ 0,15 Un	
Operating range of supply voltage	see next page	
Rated power consumption	2,8 VA (50Hz) / 2,5 VA (60Hz)	
Insulation according to EN 60664-1		
Insulation rated voltage	400 V AC	
Rated surge voltage	4 000 V 1,2 / 50 µs	
Overvoltage category	III	
Insulation pollution degree	2	
Dielectric strength between coil and contacts (basic insulation)	2500 V AC	
Dielectric strength - contact clearance - micro-disconnection - full disconnection with contact gap ≥1mm	 1500 V AC 2500 V AC	
Dielectric strength pole-pole (basic insulation)	2500 V AC	
Contact - coil distance		
- Clearance	≥ 5 mm 2CO, 2NO	≥ 4 mm 3CO, 3NO
- Creepage	≥ 8 mm 2CO, 2NO	≥ 5 mm 3CO, 3NO
General data		
Operating / release time (typical values)	20 ms / 15 ms	
Electrical life		
- Resistive AC1	$>10^5$ 16 A, 250 V AC / 10 A, 400 V AC	
- cos φ	See next page	
Mechanical life (cycles)	$>10^7$	
Dimensions	36,1 x 38,6 x 45,5 mm	
Ambient temperature		
- storage	- 40...+85°C	
- operating	- 40...+55°C	
Cover protection category	IP 00	
Environmental protection	RTI	
Shock resistance (NO/NC)	10 g	
Vibration resistance	5g 10...150 Hz	
Solder bath temperature	max. 270°C	
Soldering time	max. 5s	

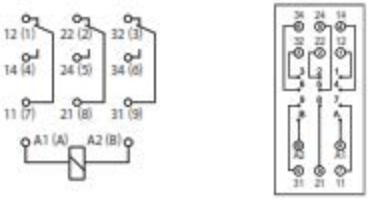
Table 2: Coil data

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
024AC	24	75	± 15%	19,2	26,4
230AC	230	7080	± 15%	184,0	253,0

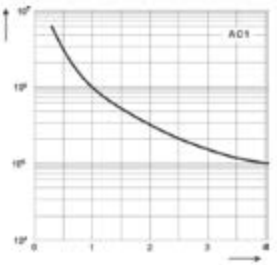
Dimensions



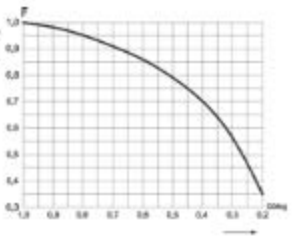
Connection diagram (pin side view)



Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour



Electrical life reduction factor at AC inductive load



Industrial plugin electromagnetic relays

Relays for general application

For plug-in sockets: 35 mm rail mount acc. to EN 60715; panel mounting
Miniature dimensions
Cadmium - free contacts
AC and DC coils
Recognitions, certifications, directives: RoHS, CE
Standards: EN61810-1:2008 (electromechanical relays); EN61984:2002, EN60998-2-1:2001, EN60664-1:2003 (sockets)

Table 1: Technical data

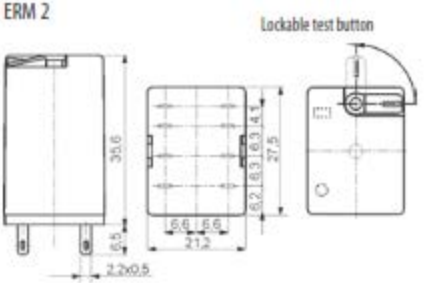
	ERM2	ERM4
Number and type of contacts	2 CO	4 CO
Contact material	AgNi	
Rated / max. switching voltage AC	250 V / 440 V	250 V / 250 V
Min. switching voltage	10 V	10 V AgNi, 10 V AgNi/Au 0,2 µm, 5 V AgNi/Au 5 µm
Rated load (capacity)		
AC1	12 A / 250 V AC	6 A / 250 V AC
AC15	3 A / 120 V 1,5 A / 240 V	1,5 A / 120 V 0,75 A / 240 V (C300)
AC3	370 W (single-phase motor)	125 W (single-phase motor)
DC1	12 A / 24 V DC (see Fig. 3)	6 A / 24 V DC (see Fig. 3)
DC13	0,22 A / 120 V 0,1 A / 250 V	0,22 A / 120 V 0,1 A / 250 V (R300)
Min. switching current	5 mA	
Max. inrush current	24 A	12 A
Rated current	12 A	6 A
Max. breaking capacity AC1	3 000 VA	1 500 VA
Min. breaking capacity	0,3 W	0,3 W AgNi, 0,3 W AgNi/Au 0,2 µm, 0,1 W AgNi/Au 5 µm
Contact resistance	≤ 100 mΩ	
Max. operating frequency (cycles/hour)		
• at rated load AC1	1 200	
• no load	18 000	
Coil data		
Rated voltage 50/60 Hz AC DC	See table 2	
Must release voltage	AC: ≥ 0,2 Un DC: ≥ 0,1 Un	
Operating range of supply voltage	see Table 2	
Rated power consumption AC	1,6 VA	
DC	0,9 W	
Insulation according to EN 60664-1		
Insulation rated voltage	250 V AC	
Rated surge voltage	4 000 V 1,2 / 50 µs	2 500 V 1,2 / 50 µs
Overvoltage category	III	II
Insulation pollution degree	3	2
Dielectric strength		
• between coil and contacts	2 500 V AC type of insulation: basic	
• contact clearance	1 500 V AC type of clearance: micro-disconnection	
• pole - pole	2 500 V AC type of insulation: basic	
Contact - coil distance		
• clearance	≥ 2,5 mm	≥ 1,6 mm
• creepage	≥ 4 mm	≥ 3,2 mm
General data		
Operating / release time (typical values)	AC: 10 ms / 8 ms DC: 13 ms / 3 ms	
Electrical life		
• resistive AC1	> 10^5 12 A, 250 V AC	> 10^5 6 A, 250 V AC
• cosΦ	see Fig. 2	see Fig. 2
Mechanical life (cycles)	> 2 x 10^7	
Dimensions (L x W x H)	27,5 x 21,2 x 35,6 mm	
Weight	35 g	
Ambient temperature		
• storage	-40...+85 °C	
• operating	AC: -40...+55 °C DC: -40...+70 °C	
Cover protection category	IP 40 EN 60529	
Environmental protection	Rtii EN 116000-3	
Shock resistance (NO/NC)	10 g / 5 g	
Vibration resistance	5 g 10...150 Hz	

Table 2: Coil data

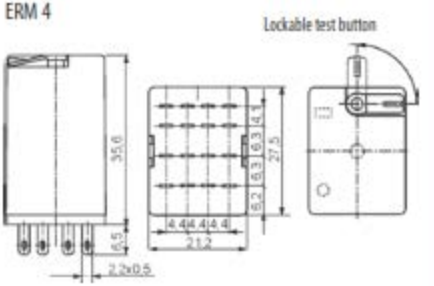
Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 55 °C)
DC voltage version					
012DC	12	160	± 10%	9,6	13,2
024DC	24	640	± 10%	19,2	26,4
AC voltage version					
024AC	24	158	± 10%	19,2	26,4
230AC	230	16100	± 10%	184,0	253,0

Dimensions

ERM 2

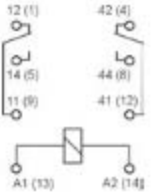


ERM 4

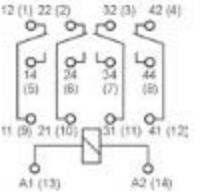


Connection diagram (pin side view)

ERM 2



ERM 4



Ordering designation
ERMX-YYYYYZ

X – Number of contacts:
4: 4 CO (4 changeover)
2: 2 CO (2 changeover)

YYYYY – Coil code:
024AC: 24 V AC 50/60 Hz
230AC: 230 V AC 50/60 Hz
024DC: 24 V DC
012DC: 12 V DC

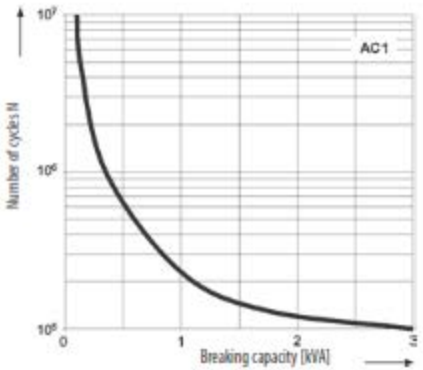
Z – Additional features:
L – Light indicator (smd LED - red)

Example:
ERM4-024DCL Electromagnetic relay for plugin sockets with mechanical indication and lockable test button, four changeover contacts, coil voltage 24 V DC with light indicator.

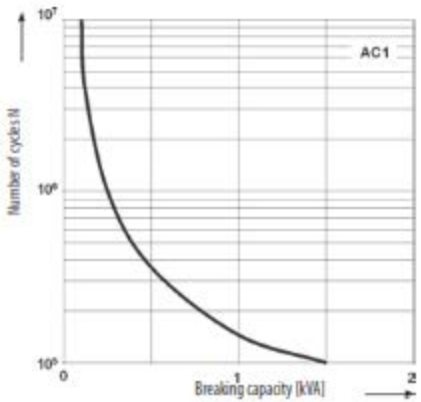
Meaning of color codes:

Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1

ERM 2

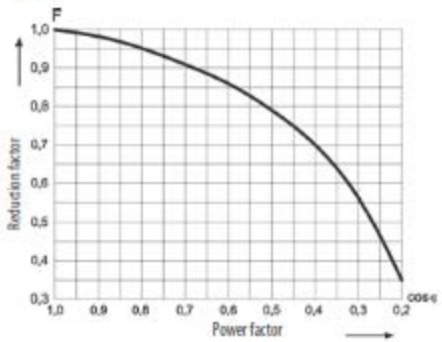


ERM 4



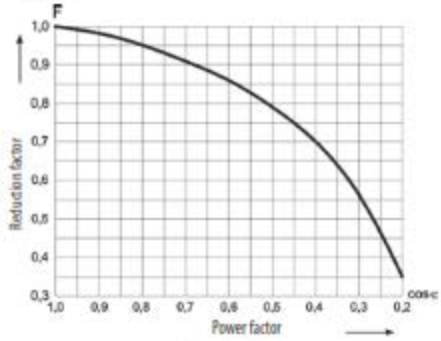
Electrical life reduction factor at AC inductive load Fig. 2

ERM 2



$N_{\cos\varphi} = N \times F$

ERM 4

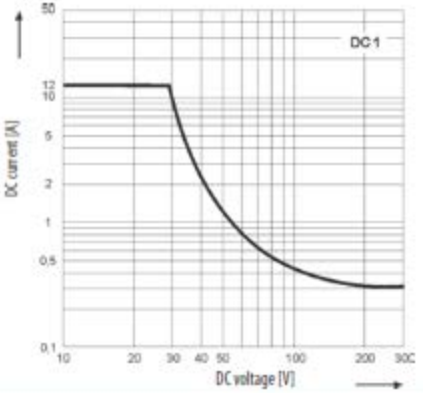


$N_{\cos\varphi} = N \times F$

N - electrical life at AC1

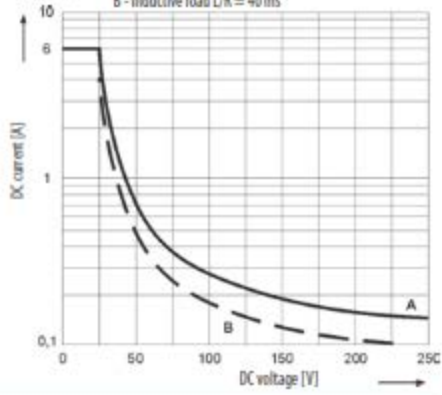
Max. DC resistive load breaking capacity Fig. 3

ERM 2



ERM 4

A - resistive load DC1
B - inductive load L/R = 40 ms



Contact material selection for different load types ERM2 and ERM4

AgNi - for resistive or inductive loads,

Mounting

ERM 2

Relays ERM2 are designed for mounting in plug-in sockets, standard version includes mechanical indicator with lockable front test button.
Relays ERM2 are designed for:

- screw terminals plug-in
- sockets ERB2-T*
- sockets ERB2-M* with clip ER-CLIP
- 35 mm rail mount acc. to EN 60715 or
- panel mounting

protecting modules type ERC are available as accessories /sockets (see below)

*Plug-in sockets ERB2-T and ERB2-M may be linked with interconnection strip type ER-TERMINAL

ERM 4

Relays ERM4 are designed for mounting in plug-in sockets, standard version includes mechanical indicator with lockable front test button.
Relays ERM4 are designed for:

- screw terminals plug-in
- sockets ERB4-T*
- sockets ERB4-M* with clip ER-CLIP
- 35 mm rail mount acc. to EN 60715 or
- panel mounting

protecting modules type ERC are available as accessories /sockets (see below)

*Plug-in sockets ERB4-T and ERB4-M may be linked with interconnection strip type ER-TERMINAL

Plugin Sockets And Accessories

ERB2-T and ERB4-T
Plugin sockets (base) type T

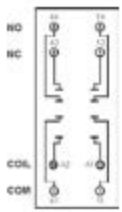
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 76,3 x 27 x 42,5(80) mm*

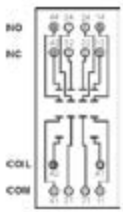
*In the bracket the height of socket with retainer / retractor clip is shown.

Two poles
12A, 300 V AC
For ERM2

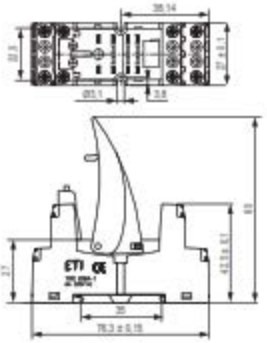
Four poles
6A, 300 V AC
For ERM4

Connection diagram





Dimensions



ERB2-M and ERB4-M
Plugin sockets (base) type M

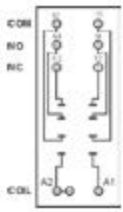
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 75 x 27 x 61(82) mm*

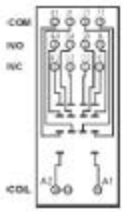
*In the bracket the height of socket with retainer / retractor clip is shown.

Two poles
12A, 300 V AC
For ERM2

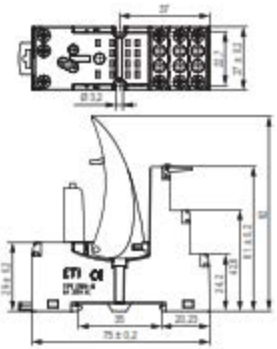
Four poles
6A, 300 V AC
For ERM4

Connection diagram





Dimensions



Removing the relay from the socket with a retrainer / retractor clip

Protection RC modules type ERC_AC

It protects against EMC disturbance and limits overvoltage.	A2 / A1	6/24 V AC 110/240 V AC	ERC-024AC ERC-230AC

Protection RC modules type ERC_ACDCL

It limits overvoltage on AC and DC coils. Coil energizing indication.	≂ A2 / ± A1	6…24 V ACDC 24…60 V AC DC 110…230 V ACDC	ERC-024ACDCL ERC-060ACDCL ERC-230ACDCL

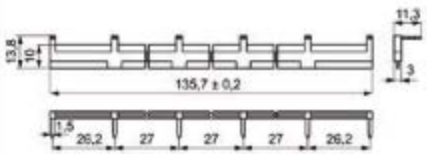
Modules are parallely connected with relay coil

Interconnection strip ER-CLIP

designed for the co-operation with plug-in sockets ERB of miniature industrial relays, which are equipped with screw terminals; sockets and relays are mounted on 35 mm rail mount acc. to EN 60715.

- bridges common input signals (coil terminals A1 or A2)
- maximum permissible current is 10 A / 250 V AC,
- possibility of connection of 6 sockets or relays

Dimensions



Miniature Electromagnetic Relays

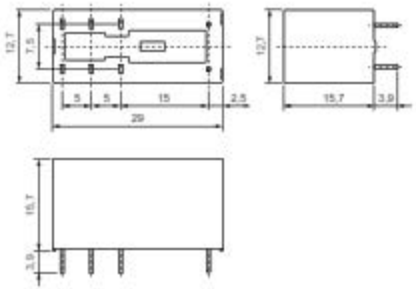
Table 1: Technical data

	MER2
Number and type of contacts	2 CO
Contact material	AgNi
Rated / max. switching voltage AC	250 V / 440 V
Min. switching voltage	5 V AgNi
Rated load (capacity) AC1 AC15 AC3 DC1 DC13	 8 A / 250 V AC 3 A / 120 V 1,5 A / 240 V (R300) 550 W (single-phase motor) 8 A / 24 V DC (see Fig. 3) 0,22 A / 120 V 0,1 A / 250 V (R300)
Min. switching current	5 mA AgNi
Rated current	8 A
Max. breaking capacity AC1	2000 VA
Min. breaking capacity	0,3 W AgNi
Contact resistance	≤ 100 mΩ
Max. operating frequency (cycles/hour) • at rated load AC1 • no load	 600 72 000
Coil data	
Rated voltage 50/60 Hz AC DC	12 ... 240 V 3 ... 110 V
Must release voltage	AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage	See Tables 1, 2 and Fig. 4, 5
Rated power consumption AC DC	0,75 VA 0,4 ... 0,48 W
Insulation according to EN 60664-1	
Insulation rated voltage	400 V AC
Rated surge voltage	4000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Dielectric strength • between coil and contacts • pole - pole	 5000 V AC type of insulation: reinforced 2500 V AC type of insulation: basic
Contact - coil distance • clearance • creepage	 ≥ 10 mm ≥ 10 mm
General data	
Operating / release time (typical values)	7 ms / 3 ms
Electrical life • resistive AC1 • cosΦ • DC L/R = 40 ms	 $> 10^5$ 8 A, 250 V AC see Fig. 2 $> 10^5$ 0,15 A, 220 V DC
Mechanical life (cycles)	$> 3x10^7$
Dimensions (L x W x H)	29 x 12,7 x 15,7 m
Weight	14 g
Ambient temperature • storage • operating	 -40 ... +85 °C AC: -40 ... +70 °C DC: -40 ... +85 °C
Cover protection category	IP40 / IP67
Environmental protection	RTII / RTIII
Shock resistance (NC)	20 g
Vibration resistance	5 g 10 ... 150 Hz
Solder bath temperature/ soldering time	max. 270 °C / max. 5 s

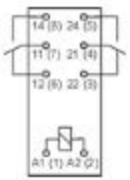
Table 2: Coil data

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
DC voltage version					
005DC	5	60	± 10%	3,5	12,7
012DC	12	360	± 10%	8,4	30,6
024DC	24	1440	± 10%	16,8	61,2
AC 50/60 Hz voltage version					
024AC	24	400	± 10%	19,2	28,8
230AC	230	38 500	± 10%	184,0	276,0

Dimensions



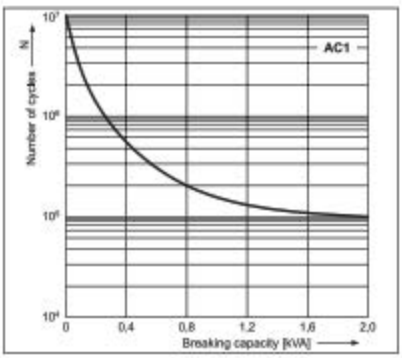
Connection diagram (pin side view)



Terminal (pin)	A1(1); A2(2)	22(3); 21(4); 24(5); 12(6); 11(7); 14(8)
[mm]	Ø 0,6	0,5 x 0,9
Drilling hole: • for relays • for sockets	 Ø 1,3 ÷ 0,1 mm Ø 1,6 ÷ 0,1 mm	

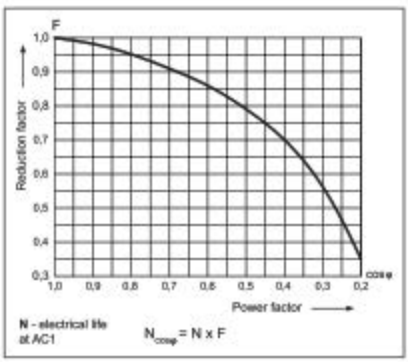
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour

Fig. 1

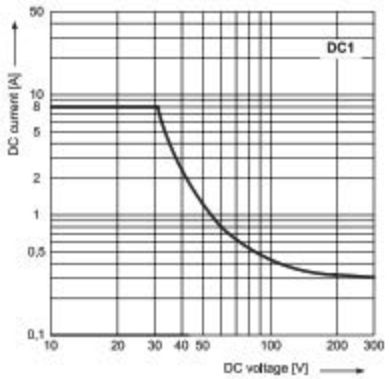


Electrical life reduction factor at AC inductive load

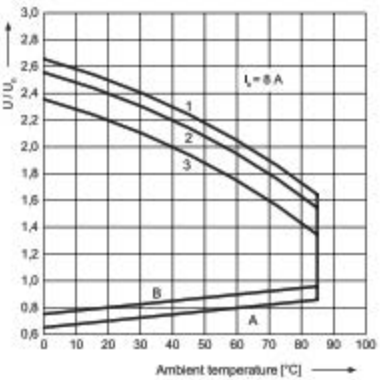
Fig. 2



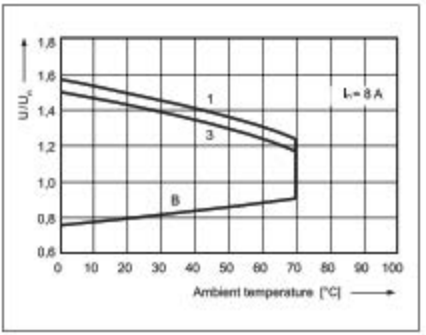
Max. DC resistive load breaking capacity
Fig. 3



Coil operating range = DC
Fig. 4



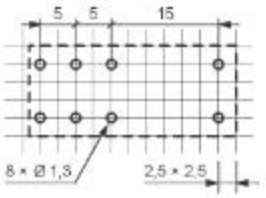
Coil operating range = AC 50 Hz
Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Pinout (soldier side view)



Mounting

Relays MER2 are designed for:

- direct PCB mounting
- screw terminals plug-in sockets MERB-T and MERB-M

Plugin Sockets And Accessories

MERB-T
Plugin sockets (base) type T

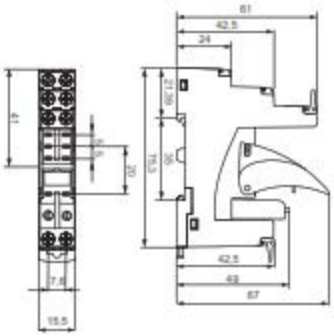
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 75,3 x 15,5 x 61(67) mm*

*In the bracket the height of socket with retainer / retractor clip is shown.

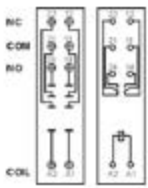
Two poles, 5mm pinout

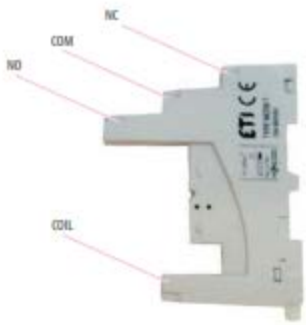
12A, 300 V AC

Dimensions



Connection diagram





MERB-M
Plugin sockets (base) type M

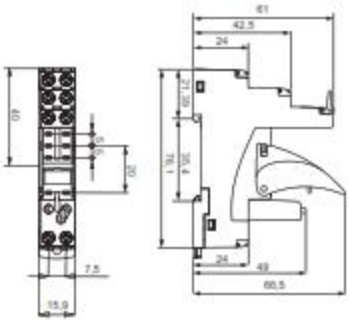
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 78,1 x 15,9 x 61(66,5) mm*

*In the bracket the height of socket with retainer / retractor clip is shown.

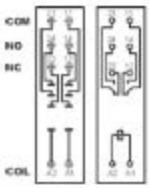
Two poles, 5mm pinout

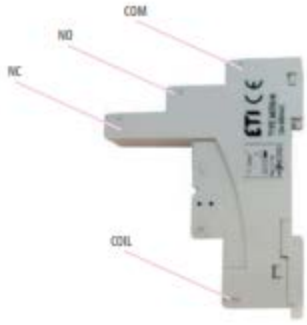
12A, 300 V AC

Dimensions



Connection diagram





SLIM RELAYS SSR & SER, Electromagnetic and solid

Table 1: Technical data

	SER1; Contact data	SSR1; Output circuit - Triac
Number and type of contacts	1 CO	1 NO
Contact material	AgSnO2	-
Rated / max. switching voltage AC	400 V AC / 250 V DC	400 V AC / 440 V AC
Min. switching voltage	10 V AC / DC	20 V AC
Rated load (capacity) AC1 DC1	 6 A / 250 V AC 6 A / 24 V DC; 0,15 A / 250 V DC	 1,2 A / 400 V AC -
Min. switching current	100 mA	10 mA
Max. inrush current / Max. non-repet surge current	10 A (t=20 ms)	30 A (t=20 ms)
Rated current	6 A	1,2 A
Max. breaking capacity AC1	1 500 VA	-
Min. breaking capacity	1 W	-
Contact resistance	≤100 mΩ 100 mA, 24 V	-
Max. operating frequency (cycles/hour) • at rated load AC1 • no load	 360 72 000	-
I^2t for fusing	-	5,1 A²s (t=1-10 ms)
di/dt	-	50 A/µs
dV/dt	-	40 V/µs
Input circuit		
Rated voltage AC: 50/60 Hz AC/DC	24 V; 230 V	
Must release voltage / Turn-off voltage	AC: ≥ 0,2 Un DC: ≥ 0,1 Un	
Must operate voltage	AC & DC: ≤ 0,8 Un	-
Rated power consumption AC/DC AC/DC	0,3 ... 1,6 VA / 0,3 ... 1,6 W -	0,3 VA / 0,3 W 24 V AC/DC 1,6 VA / 1,6 W 230 V AC/DC
Insulation according to PN-EN 60664-1		
Insulation rated voltage	400 V AC	600 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs	-
Overvoltage category	III	-
Insulation pollution degree	3	2
Dielectric strength • input - output • input - output • mass - input, output • contact clearance	 4 000 V AC 50/60 Hz, 1 min. (type of insulation: reinforced) 6 000 V 1,2 / 50 µs 2 500 V AC 50/60 Hz, 1 min. 1 000 V AC 50/60 Hz, 1 min. (type of clearance: micro-disconnection)	 4 000 V AC 50/60 Hz, 1 min. (type of insulation: reinforced) - - -
Input - output distance • clearance • creepage	 ≥ 6 mm ≥ 8 mm	-
General data		
Operating / release time (typical values)	AC: 7 ms DC: 6 ms / AC: 15 ms DC: 10 ms	10 ms max. (zero turn-on) / 10 ms max.
Electrical life • resistive AC1 (cos φ = 0,4) • resistive DC1	 > 0,6 x 10⁵ 6 A, 250 V AC; > 2 x 10⁵ 2 A, 250 V AC 10⁵ 6 A, 30 V DC	-
Mechanical life (cycles)	> 2 x 10⁷	-
Dimensions (L x W x H)	93,8 x 6,2 x 80 mm	
Weight	40 g	
Ambient temperature • storage • operating	 -40...+70 °C -40...+55 °C (-40...+60 °C 24 V DC)	 -40...+70 °C -40...+55 °C
Protection category	IP 20 PN-EN 60529	
Environmental protection	RTI PN-EN 116000-3	
Shock resistance	10 g	
Vibration resistance	5 g 10...500 Hz	

Input data SER1

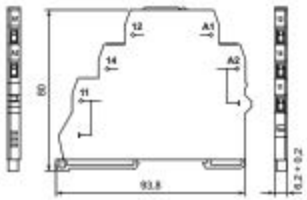
Interface relay code	Rated input voltage, Un	Power of input circuit	Input - voltage range, V	
			min. (20 °C)	max. (55 °C)
SER1-024ACDC	24 V AC/DC	0,5 VA / 0,5 W	19,2	26,4
SER1-230ACDC	230 V AC/DC	0,8 VA / 0,8 W	184,0	253,0

Input data SSR1

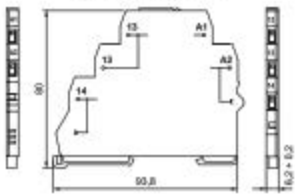
Interface relay code	Rated input voltage Un	Power of input circuit
SSR1-024ACDC	24 V AC/DC	0,3 VA / 0,3 W
SSR1-230ACDC	230 V AC/DC	1,6 VA / 1,6 W

Dimensions

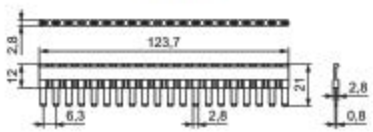
SER1-024ACDC / SER1-230ACDC



SSR1-024ACDC / SSR1-230ACDC

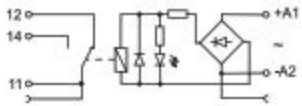


SR-TERMINAL

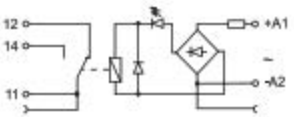


Connection diagram

SER1-024ACDC



SER1-230ACDC



SSR1-024ACDC
SSR1-230ACDC