

Low profile PCB relays

3 - 5 - 8 - 12 - 16 A



Medical and dentistry



Industrial robots



Building automation



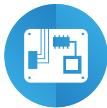
Control systems



Timers and lighting controls



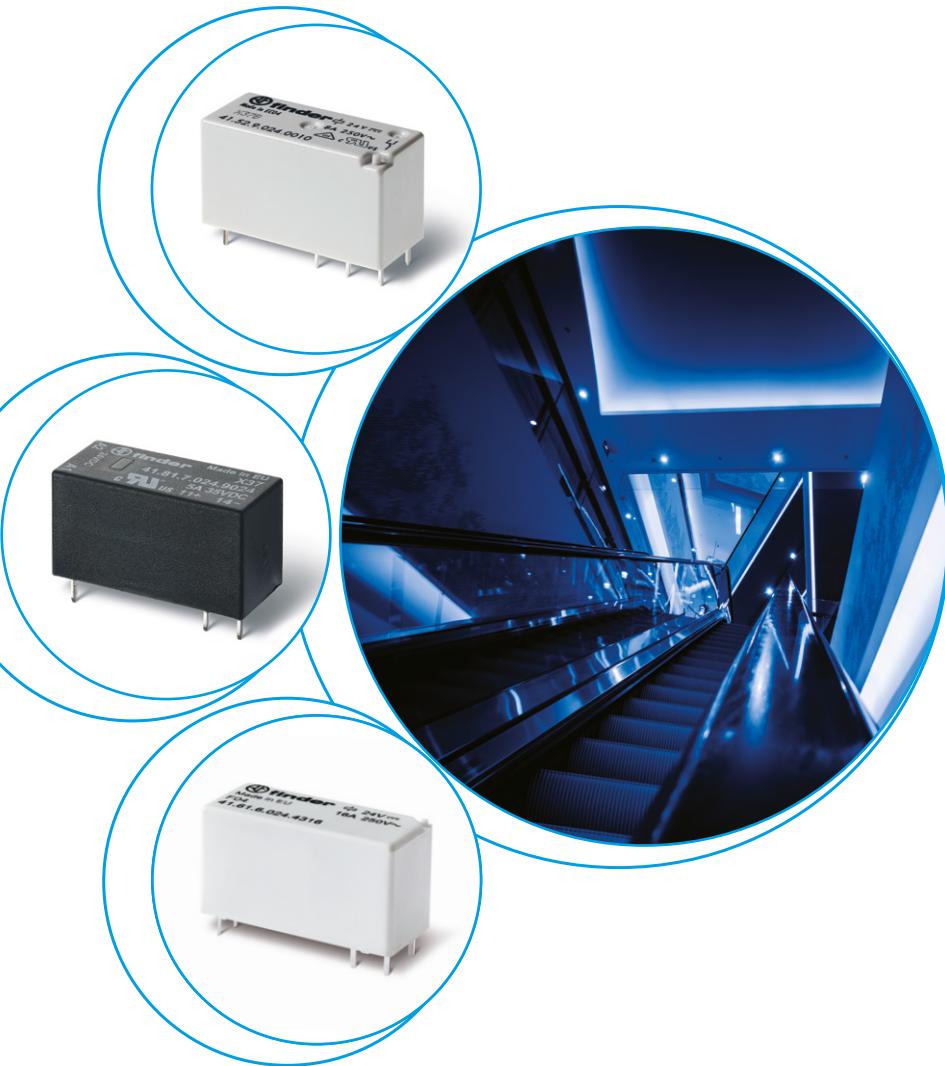
Door and gate openers



Electronic circuit boards



Vending machines



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In case of discrepancies between the printed and online versions, the latter prevails.

1 & 2 Pole - Low profile (15.7 mm height)

Type 41.31

- 1 Pole 12 A (3.5 mm pin pitch)

Type 41.52

- 2 Pole 8 A (5.0 mm pin pitch)

Type 41.61

- 1 Pole 16 A (5.0 mm pin pitch)

PCB mount

- direct or via PCB socket

35 mm rail mount

- via screw and screwless sockets

- AC and DC coils
- 8 mm, 6 kV (1.2/50 µs) isolation, coil-contacts
- Cadmium Free contact materials
- Versions compliant with IECEx, ATEX (Ex ec nC), HazLoc Class I Div. 2, Groups A, B, C, D - T4*

41.31



41.52



41.61



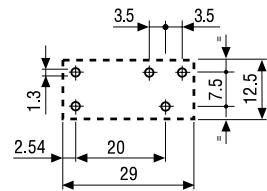
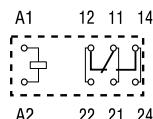
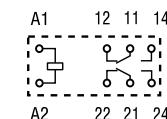
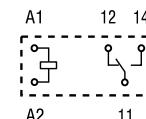
* Characteristics page 10

**With the AgSnO₂ material the maximum peak current is 80 A - 5 ms on NO contact.

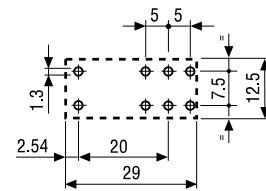
FOR UL RATINGS SEE:

"General technical information" page VIII

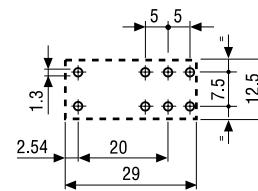
For outline drawing see page 9



Copper side view



Copper side view



Copper side view

Contact specification

Contact configuration	1 CO (SPDT)	2 CO (DPDT)	1 CO (SPDT)
Rated current/ Maximum peak current	A	12/25	8/15
Rated voltage/ Maximum switching voltage	V AC	250/400	250/400
Rated load AC1	VA	3000	2000
Rated load AC15 (230 V AC)	VA	600	400
Single phase motor rating (230 V AC)	kW	0.5	0.3
Breaking capacity DC1: 24/110/220 V	A	12/0.3/0.12	8/0.3/0.12
Minimum switching load	mW (V/mA)	300 (5/5)	300 (5/5)
Standard contact material		AgNi	AgNi

Coil specification

Nominal voltage (U _N)	V AC (50/60 Hz)	24 - 230	24 - 230	24 - 230
	V DC	5 - 6 - 12 - 24 - 48 - 60 - 110	5 - 6 - 12 - 24 - 48 - 60 - 110	5 - 6 - 12 - 24 - 48 - 60 - 110
Rated power AC/DC	VA (50 Hz)/W	0.75/0.4	0.75/0.4	0.75/0.4
Operating range	AC	(0.8...1.1)U _N	(0.8...1.1)U _N	(0.8...1.1)U _N
	DC	(0.7...1.5)U _N	(0.7...1.5)U _N	(0.7...1.5)U _N
Holding voltage	AC/DC	0.8/0.4 U _N	0.8/0.4 U _N	0.8/0.4 U _N
Must drop-out voltage	AC/DC	0.15/0.1 U _N	0.15/0.1 U _N	0.15/0.1 U _N

Technical data

Mechanical life AC/DC	cycles	10 · 10 ⁶ / 10 · 10 ⁶	10 · 10 ⁶ / 10 · 10 ⁶	10 · 10 ⁶ / 10 · 10 ⁶
Electrical life at rated load AC1	cycles	60 · 10 ³	60 · 10 ³	50 · 10 ³
Operate/release time	ms	8/6	8/6	8/6
Insulation between coil and contacts (1.2/50 µs)	kV	6 (8 mm)	6 (8 mm)	6 (8 mm)
Dielectric strength between open contacts	V AC	1000	1000	1000
Ambient temperature range AC/DC	°C	-40...+70/-40...+85	-40...+70/-40...+85	-40...+70/-40...+85
Environmental protection		RT II	RT II	RT II
Approvals (according to type)				

A

**1 & 2 Pole - Polarized bistable, Low profile
(15.7 mm height)**
Type 41.52

- 2 Pole 8 A (5.0 mm pin pitch)

Type 41.61

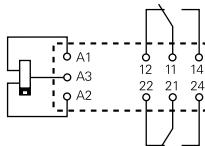
- 1 Pole 16 A (5.0 mm pin pitch)

Printed Circuit mount

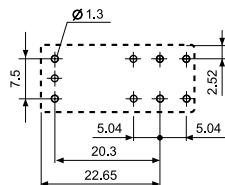
- Polarized bistable relay with 2 coils
- 10 mm, 6 kV (1.2/50 µs) isolation, coil-contacts
- Cadmium Free contact materials
- Flux proof: RT II standard

41.52.6.XXX

- 2 Pole, 8 A
- PCB direct mount



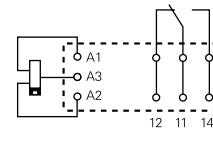
2 coil version:
A3(+) A2 (-) = Set
A3(+) A1 (-) = Reset



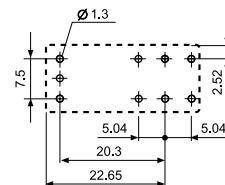
Copper side view

41.61.6.XXX

- 1 Pole, 16 A
- PCB direct mount



2 coil version:
A3(+) A2 (-) = Set
A3(+) A1 (-) = Reset



Copper side view

For outline drawing see page 9

Contact specification

Contact configuration	2 CO (DPDT)	1 CO (SPDT)
Rated current/ Maximum peak current (I_N/I_{max})	A	8/15
Rated voltage/ Maximum switching voltage (U_N/U_{max})	V AC	250/400
Rated load AC1	VA	2000
Rated load AC15 (230 V AC)	VA	350
Single phase motor rating (230 V AC)	kW	0.37
Breaking capacity DC1: 24/110/220 V	A	8/0.3/0.12
Minimum switching load	mW (V/mA)	500 (5/100)
Standard contact material		AgSnO ₂

Coil specification

Nominal voltage (U_N)	V DC	5 - 12 - 24	5 - 12 - 24
Rated power (P_N)	W	0.65	0.65
Operating range	DC	(0.7...1.1) U_N	(0.7...1.1) U_N
Min. impulse duration	ms	20	20
Max. impulse duration	s	30	30

Technical data

Mechanical life DC	cycles	$5 \cdot 10^6$	$5 \cdot 10^6$
Electrical life at rated load AC1	cycles	$30 \cdot 10^3$	$30 \cdot 10^3$
Operate/release time	ms	10/5	10/10
Insulation between coil and contacts (1.2/50 µs)	kV	6 (10 mm)	6 (10 mm)
Dielectric strength between open contacts	V AC	1000	1000
Ambient temperature range	°C	-40...+85	-40...+85
Environmental protection		RT II	RT II
Approvals (according to type)			

Solid State Relays

Printed circuit mount:

- direct or via PCB socket

35 mm rail mount:

- via screw or screwless sockets

- Single circuit output switching options
 - 5 A 24 V DC
 - 3 A 240 V AC
- Silent, high speed switching with long electrical life
- LED indicator
- Low profile (15.7 mm)
- Wash tight: RT III
- 2500 V AC insulation, input-output

41.81 - 9024



- 5 A, 24 V DC output switching
- PCB or 93 Series sockets

41.81 - 8240

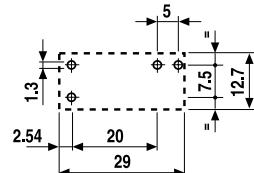


- 3 A, 240 V AC output switching
- Zero crossing switching
- PCB or 93 Series sockets

For outline drawing see page 9

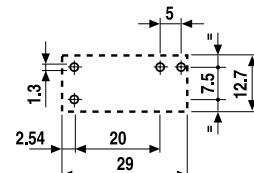
A1+ 11+ 14

A2 -



A1+ 11 14

A2 -



Copper side view

Copper side view

Output circuit

Contact configuration	1 NO (SPST-NO)	1 NO (SPST-NO)
Rated current/ Maximum peak current (10 ms)	A	5/40
Rated voltage/ Maximum blocking voltage	V	(24/35)DC (240/-)AC
Switching voltage range	V	(1.5...24)DC (12...275)AC
Repetitive peak off-state voltage	V _{pk}	— 600
Minimum switching current	mA	1 50
Max. "OFF-state" leakage current	mA	0.01 1
Max. "ON-state" voltage drop	V	0.3 1.1

Input circuit

Nominal voltage	V DC	12	24	12	24
Operating range	V DC	8...17	14...32	8...17	14...32
Control current	mA	5.5	9	8.8	9
Release voltage	V DC	4	9	4	9
Impedance	Ω	1550	2600	1030	2600

Technical data

Operate/release time	ms	0.05/0.25	10/10
Dielectric strength between input/output	V AC	2500	2500
Ambient temperature range	°C	-20...+60	-20...+60
Environmental protection		RT III	RT III

Approvals (according to type)

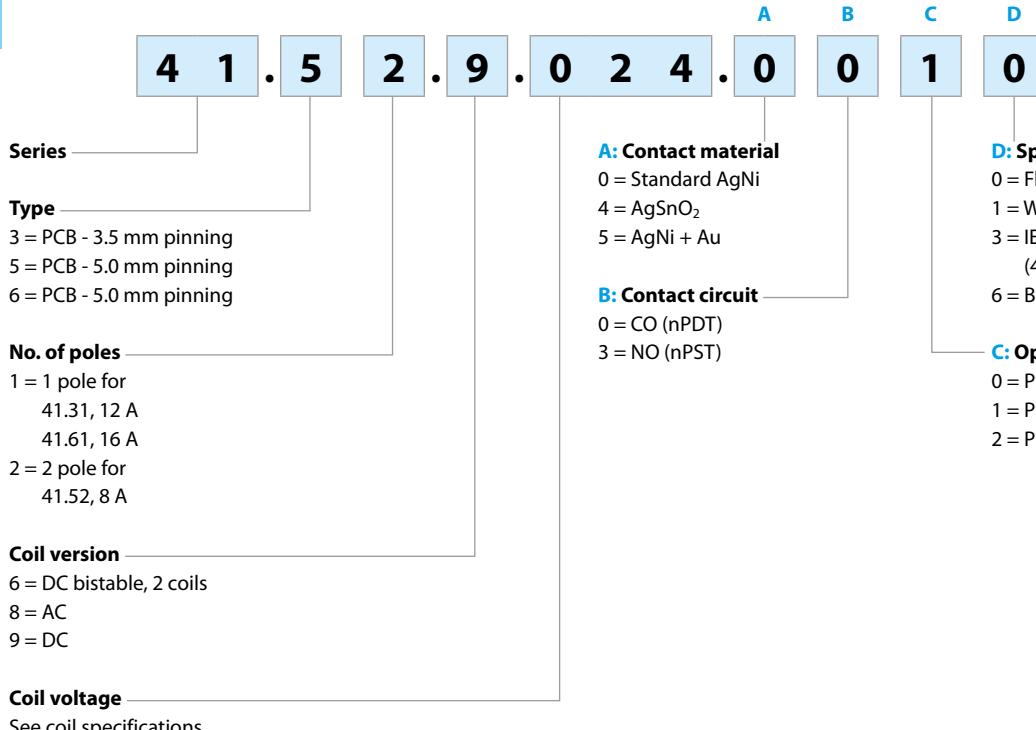


Ordering information

Electromechanical relay (EMR)

Example: 41 series low-profile PCB relay, 2 CO (DPDT), 24 V DC coil.

A

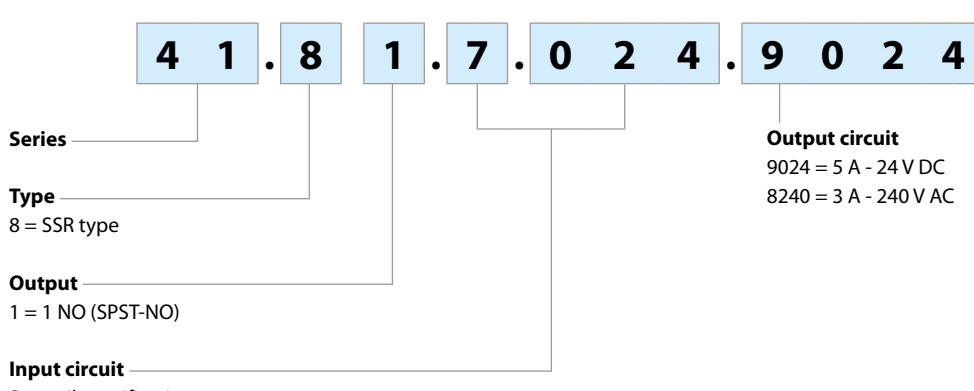


Selecting features and options: only combinations in the same row are possible.
 Preferred selections for best availability are shown in **bold**.

Type	Coil version	A	B	C	D
41.31	DC	0 - 4 - 5	0 - 3	1	0 - 1
41.52	DC	0 - 5	0 - 3	1	0 - 1 - 3
41.61	DC	0 - 4	0 - 3	1	0 - 1 - 3
41.31/61	DC (12-24V)	0	0	2	0
41.31/52/61	AC	0	0	0	0
41.52	DC bistable	4	0	1	6
41.61	DC bistable	4	0 - 3	1	6

Solid state relay (SSR)

Example: 41 series SSR relay, 5 A output, 24 V DC supply.



Electromechanical relay

A

Technical data

Insulation according to EN 61810-1

	V AC	1 pole		1 pole bistable	2 pole		2 pole bistable
Nominal voltage of supply system	V AC	230/400		230/400	230/400		230/400
Rated insulation voltage	V AC	250	400	250	250	400	250
Pollution degree		3	2	2	3	2	2

Insulation between coil and contact set

Type of insulation	Reinforced (8 mm)	Reinforced (10 mm)	Reinforced (8 mm)	Reinforced (10 mm)
Oversupply category	III	III	III	III
Rated impulse voltage	kV (1.2/50 µs)	6	6	6
Dielectric strength	V AC	4000	4000	4000

Insulation between adjacent contacts

Type of insulation	—	—	Basic	Basic
Oversupply category	—	—	III	III
Rated impulse voltage	kV (1.2/50 µs)	—	—	4
Dielectric strength	V AC	—	—	2000

Insulation between open contacts

Type of disconnection	Micro-disconnection	Micro-disconnection
Dielectric strength	V AC/kV (1.2/50 µs)	1000/1.5

Insulation between coil terminals

Rated impulse voltage (according to EN 61180)	kV (1.2/50 µs)	2
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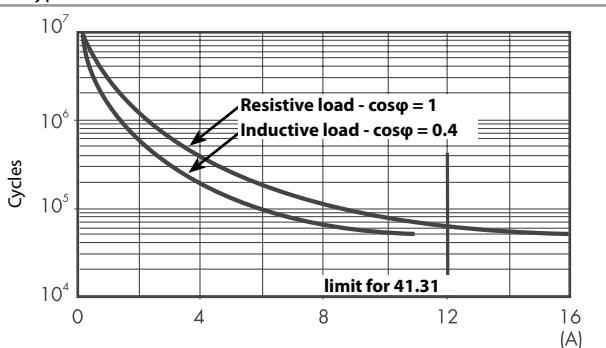
Other data

Bounce time: NO/NC	ms	4/6 (monostable) - 2/10 (bistable)			
Vibration resistance (5...55)Hz: NO/NC	g	15/2 (monostable) - 5/3 (bistable)			
Shock resistance	g	16 (monostable) - 10 (bistable)			
Power lost to the environment	without contact current	W			
	with rated current	W	0.4 (monostable)	1.2 (41.52)	1.8 (41.61)
Recommended distance between relays mounted on PCB	mm	≥ 5			

Contact specification

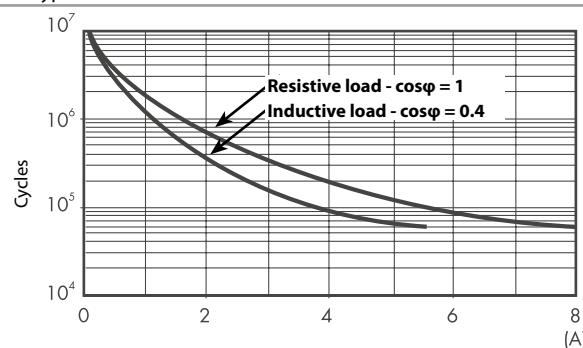
F 41 - Electrical life (AC) v contact current (monostable)

Types 41.31/61

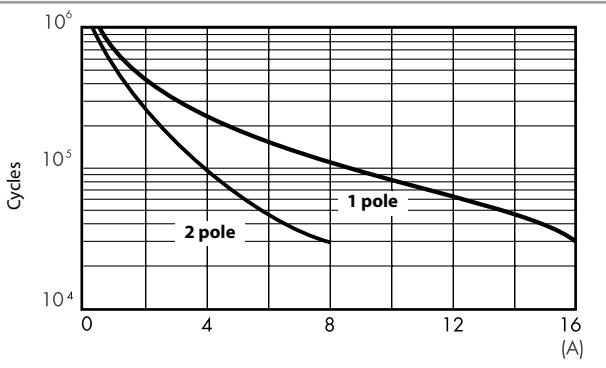


F 41 - Electrical life (AC) v contact current (monostable)

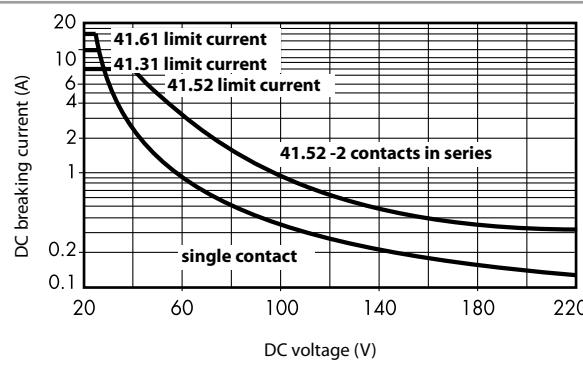
Type 41.52



F 41 - Electrical life (AC) v contact current (bistable)



H 41 - Maximum DC1 breaking capacity



- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of $\geq 100 \cdot 10^3$ can be expected.
 - In the case of DC13 loads, the connection of a diode in parallel with the load will permit a similar electrical life as for a DC1 load.
- Note: the release time for the load will be increased.

Coil specifications

AC coil data

Nominal voltage	Coil code	Operating range		Resistance	Rated coil consumption
U_N		U_{min}	U_{max}	R	I at U_N
V		V	V	Ω	mA
24	8.024	19.2	26.4	350	31.6
230	8.230	184	253	32500	3.2

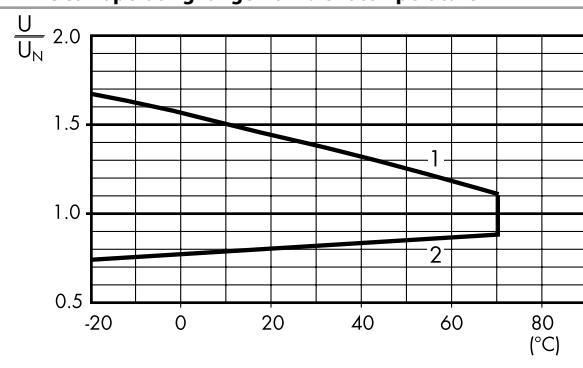
DC coil data

Nominal voltage	Coil code	Operating range		Resistance	Rated coil consumption
U_N		U_{min}	U_{max}	R	I at U_N
V		V	V	Ω	mA
5	9.005	3.5	7.5	62	80
6	9.006	4.2	9	90	66.7
12	9.012	8.4	18	360	33.3
24	9.024	16.8	36	1440	16.7
48	9.048	33.6	72	5760	8.3
60	9.060	42	90	9000	6.6
110	9.110	77	165	24200	4.5

DC coil data (bistable)

Nominal voltage	Coil code	Operating range			Resistance	Rated coil power
U_N		Set U_{min}	Reset U_{min}	Set/Reset U_{max}	R	I at U_N
V		V	V	V	Ω	mW
5	6.005	3.5	3.5	5.5	38	650
12	6.012	8.4	8.4	13.2	220	650
24	6.024	16.8	16.8	26.4	885	650

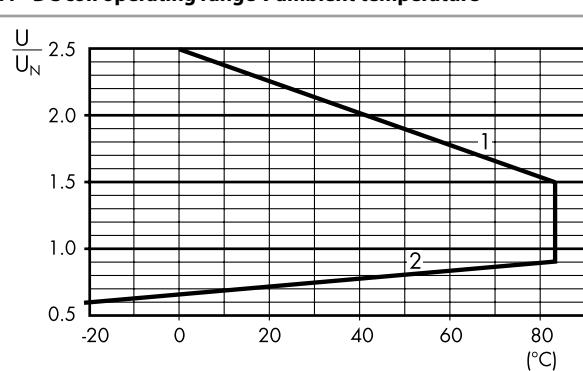
R 41 - AC coil operating range v ambient temperature



1 - Max. permitted coil voltage.

2 - Min. pick-up voltage with coil at ambient temperature.

R 41 - DC coil operating range v ambient temperature



1 - Max. permitted coil voltage.

2 - Min. pick-up voltage with coil at ambient temperature.

Solid state relay

Technical data

Other data		41.81 - 9024	41.81 - 8240
Power lost to the environment	without current	W 0.25	0.25
	with maximum current	W 1.75	3.5

Input specification

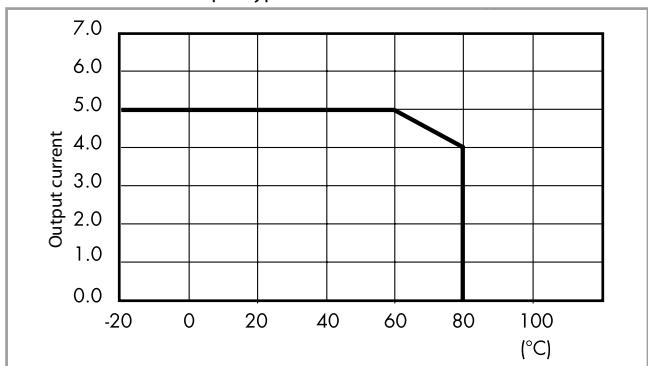
Input data - DC types

Nominal voltage U_N	Input code	Operating range		Release voltage	Impedance	Control current I at U_N
		U_{min}	U_{max}			
12	7.012	8	17	4	1550	5.5
24	7.024	14	32	9	2600	9

Output specification

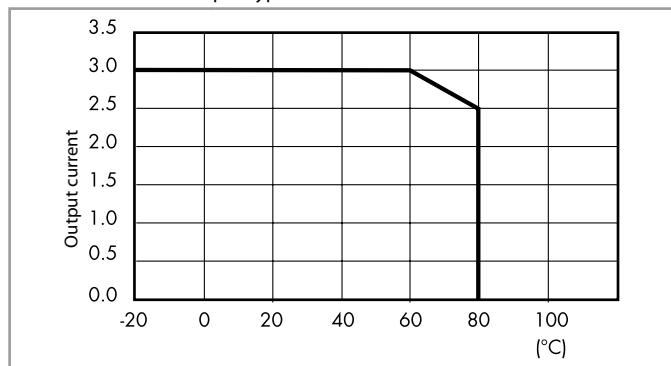
L 41 - Output current v ambient temperature

SSR - 5 A DC output types



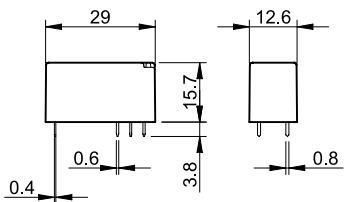
L 41 - Output current v ambient temperature

SSR - 3 A AC output types

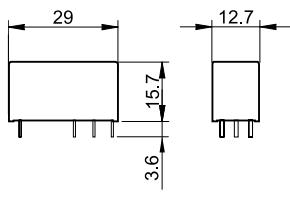


Outline drawings

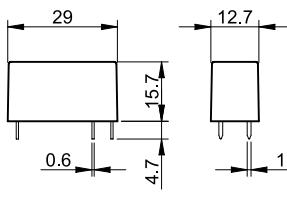
Types 41.31/52/61



Types 41.52.6.xxx/41.61.6.xxx



Types 41.81-9024/41.81-8240



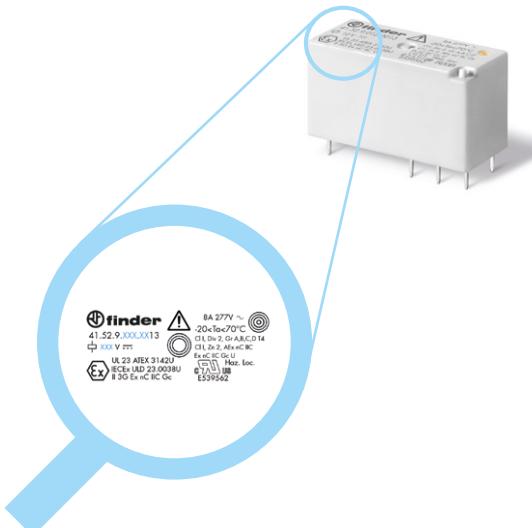
IECEx - ATEX - HazLoc: Nominal current and ambient temperature

A

Type		Contact configuration	41.52...13	41.61...13
IECEx - EX	-20...+85 °C (105 °C service temperature)	Approval	2 CO/NO	1 CO/NO
		Rated voltage	277 V AC	277 V AC
		Rated current	8 A	16 A
HazLoc	-20...+70 °C (105 °C service temperature)	Breaking capacity DC1: 32 V DC	5 A	5 A
		Rated voltage	277 V AC	277 V AC
		Rated current	8 A	16 A
	-20...+85 °C (105 °C service temperature)	Breaking capacity DC1: 32 V DC	5 A	5 A
		Rated voltage	—	277 V AC
		Rated current	—	10 A

Markings - ATEX, IECEx and HazLoc versions

ATEX (UL 23 ATEX 3142 U):	II 3 G	
IECEx (IECEx ULD 23.0038 U):	Ex nC IIC Gc	
HazLoc. (E539562):	C II, Div2, Gr A, B, C, D, T4 C II, Zn 2, AEx nC IIC Ex nC IIC Gc U	
Specific marking of explosion protection		
II Component for surface plant (different from mines)		
3 Category 3: normal level of protection		
G - CII Explosive atmosphere due to presence of combustible gas vapour or mist		
Div 2 - Zn 2 Hazardous explosive concentration presence just in case of fault		
Ex nC - AEx nC Sealed device		
IIC - Gr A, B, C, D Gas group		
T4 Temperature class		
Gc Device protection level		
UL 23 ATEX 3142 U - IECEx ULD 23.0038 U - E539562		
UL - ULD: ID of the notified body which issues the type certificate		
23: year of issue of the certificate		
3142 - 0013: number of the type certificate		
E539562: UL file number		
U: components		
Zyy: production batch identification		
Z: year, yy: week		





93.02

Approvals
(according to type):

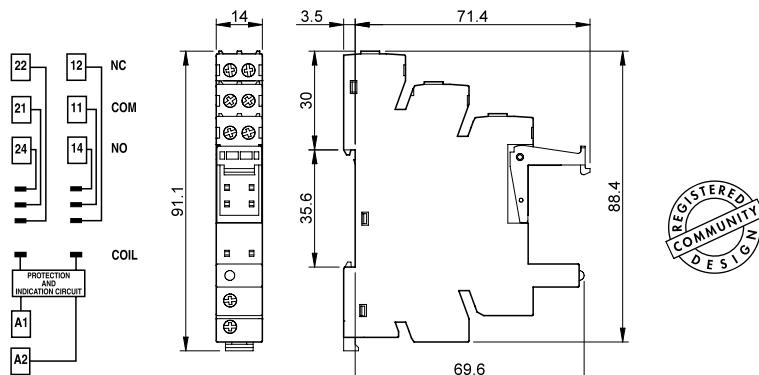


CSA[®] US

Box clamp socket 35 mm (EN 60715) mounting

Supply voltage	Relay type	Socket type								
6 V AC/DC	41.52.9.005.0010 or 41.61.9.005.0010	93.02.0.024								
12 V AC/DC	41.52.9.012.0010 or 41.61.9.012.0010	93.02.0.024								
24 V AC/DC	41.52.61.9.024.0010 or 41.81.7.024.xxxx	93.02.0.024								
60 V AC/DC	41.52.9.060.0010 or 41.61.9.060.0010	93.02.0.060								
(110...125)V AC/DC	41.52.9.110.0010 or 41.61.9.110.0010	93.02.0.125								
(220...240)V AC/DC	41.52.9.110.0010 or 41.61.9.110.0010	93.02.0.240								
(230...240)V AC	41.52.9.110.0010 or 41.61.9.110.0010	93.02.8.230								
6 V DC	41.52.9.005.0010 or 41.61.9.005.0010	93.02.7.024								
12 V DC	41.52.61.9.012.0010 or 41.81.7.012.xxxx	93.02.7.024								
24 V DC	41.52.61.9.024.0010 or 41.81.7.024.xxxx	93.02.7.024								
48 V DC	41.52.9.048.0010 or 41.61.9.048.0010	93.02.7.060								
60 V DC	41.52.9.060.0010 or 41.61.9.060.0010	93.02.7.060								
Accessories										
8-way jumper link	093.08 (see specification next page)									
Plastic separator	093.01 (see specification next page)									
Sheet of marker tags, 48 tags	060.48 (see specification next page)									
Technical data										
Rated values	10 A - 250 V*									
Dielectric strength	6 kV (1.2/50 µs) between coil and contacts									
Protection category	IP 20									
Ambient temperature ($U_N \leq 60 \text{ V} / > 60 \text{ V}$)	°C	-40...+70/-40...+55								
 Screw torque	Nm	0.5								
Wire strip length	mm	8								
Max. wire size for 93.02 socket	<table border="1"> <tr> <td>solid wire</td> <td>stranded wire</td> </tr> <tr> <td>mm²</td> <td></td> </tr> <tr> <td>1 x 6 / 2 x 2.5</td> <td>1 x 4 / 2 x 2.5</td> </tr> <tr> <td>AWG</td> <td>1 x 12 / 2 x 14</td> </tr> </table>		solid wire	stranded wire	mm ²		1 x 6 / 2 x 2.5	1 x 4 / 2 x 2.5	AWG	1 x 12 / 2 x 14
solid wire	stranded wire									
mm ²										
1 x 6 / 2 x 2.5	1 x 4 / 2 x 2.5									
AWG	1 x 12 / 2 x 14									

* For currents > 10 A, contact terminals must be connected in parallel (21 with 11, 24 with 14, 22 with 12).



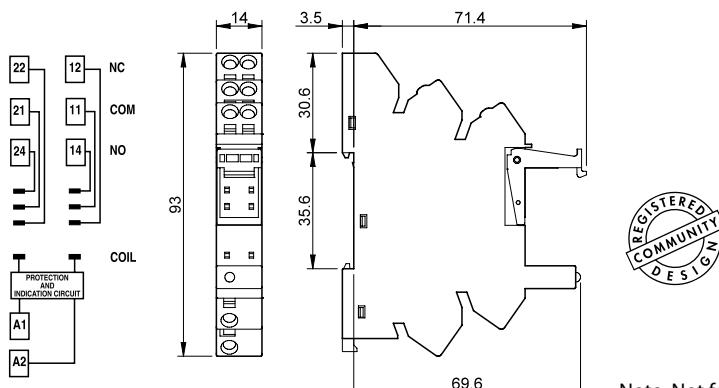
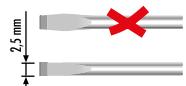
Note: Not for bistable relays



Screwless terminal socket 35 mm (EN 60715) mounting

Supply voltage	Relay type	Socket type
6 V AC/DC	41.52.9.005.0010 or 41.61.9.005.0010	93.52.0.024
12 V AC/DC	41.52.9.012.0010 or 41.61.9.012.0010	93.52.0.024
24 V AC/DC	41.52.61.9.024.0010 or 41.81.7.024.xxxx	93.52.0.024
60 V AC/DC	41.52.9.060.0010 or 41.61.9.060.0010	93.52.0.060
(110...125)V AC/DC	41.52.9.110.0010 or 41.61.9.110.0010	93.52.0.125
(220...240)V AC/DC	41.52.9.110.0010 or 41.61.9.110.0010	93.52.0.240
(230...240)V AC	41.52.9.110.0010 or 41.61.9.110.0010	93.52.8.230
6 V DC	41.52.9.005.0010 or 41.61.9.005.0010	93.52.7.024
12 V DC	41.52.61.9.012.0010 or 41.81.7.012.xxxx	93.52.7.024
24 V DC	41.52.61.9.024.0010 or 41.81.7.024.xxxx	93.52.7.024
48 V DC	41.52.9.048.0010 or 41.61.9.048.0010	93.52.7.060
60 V DC	41.52.9.060.0010 or 41.61.9.060.0010	93.52.7.060
Accessories		
8-way jumper link	093.08 (see table below)	
Plastic separator	093.01 (see table below)	
Sheet of marker tags, 48 tags	060.48 (see table below)	
Technical data		
Rated values	10 A - 250 V*	
Dielectric strength	6 kV (1.2/50 µs) between coil and contacts	
Protection category	IP 20	
Ambient temperature ($U_N \leq 60\text{ V} / > 60\text{ V}$)	°C	-40...+70/-40...+55
Wire strip length	mm	8
Max. wire size for 93.52 socket	solid wire	stranded wire
mm ²	1 x 2.5	1 x 2.5
AWG	1 x 14	1 x 14

* For currents > 10 A, contact terminals must be connected in parallel (21 with 11, 24 with 14, 22 with 12).



Note: Not for bistable relays

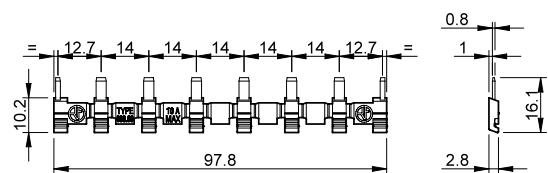
Accessories



8-way jumper link for 93.02 and 93.52 sockets

Rated values 10 A - 250 V

Rated values 10 A - 250 V



Plastic separator for 93.02 and 93.52 sockets

Plastic separator for 93.02 and 93.32 sockets 093.01
Thickness 2 mm, required at the start and the end of a group of interfaces.

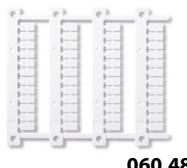
Thickness 2 mm, required at the start and the end of a group of interfaces. Can be used for visual separation groups, must be used for:

Can be used for visual separation group, must be used for:
- sections containing different results from multiple experiments

- protective separation of different voltages of neighbouring PLC interfaces according to VDE 0106-101
 - protection of cut jumper links

**Sheet of marker tags (CEMBRE Thermal transfer printers), plastic, 48 tags,
6 x 12 mm**

6 x 12 mm | 060.48



060.48



95.13.2



95.15.2

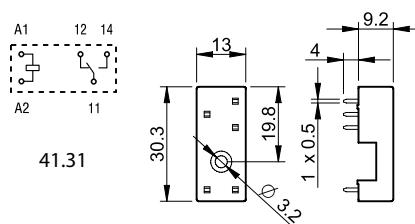
Approvals
(according to type):



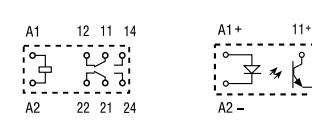
PCB socket	95.13.2 (blue)	95.13.20 (black)	95.15.2 (blue)	95.15.20 (black)
For relay type	41.31		41.52, 41.61, 41.81 ⁽¹⁾	
Accessories				
Plastic retaining clip (supplied with socket - packaging code SLA)		095.42.30		
Metal retaining clip		095.41.3		
Technical data				
Rated values	10 A - 250 V*			
Dielectric strength	6 kV (1.2/50 µs) between coil and contacts			
Protection category	IP 20			
Ambient temperature	°C -40...+70			

* For currents > 10 A, contact terminals must be connected in parallel (21 with 11, 24 with 14, 22 with 12).

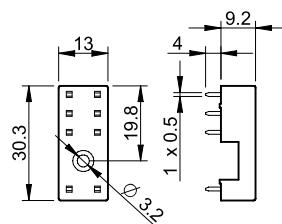
⁽¹⁾ With the relay 41.81 the NO change-over contact will be 11-14.



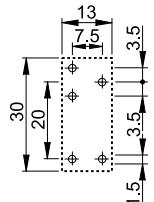
41.31



41.52

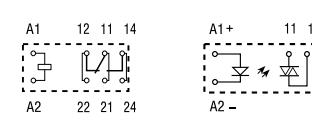


41.81 - 9024

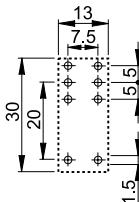


95.13.2

Copper side view



41.61



95.15.2

Copper side view

Note: Not for bistable relays

Packaging codes

How to code and identify retaining clip and packaging options for sockets.

Example:

9 5 . 1 3 . 2 S L A

A Standard packaging

SL Plastic retaining clip

Without retaining clip

