

Low profile PCB relays 3 - 5 - 8 - 12 - 16 A



Medical and
dentistry



Industrial robots



Building
automation



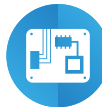
Control
systems



Timers and
lighting
controls



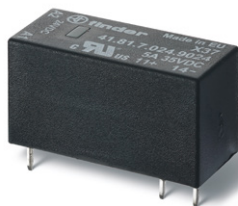
Door and
gate openers



Electronic circuit
boards



Vending
machines



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*

* 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

Contact specification

Contact configuration

1 CO (SPDT)

2 CO (DPDT)

1 CO (SPDT)

Rated current/

Maximum peak current

A

12/25

8/15

16/30**

Rated voltage/

Maximum switching voltage

V AC

250/400

250/400

250/400

Rated load AC1

VA

3000

2000

4000

Rated load AC15 (230 V AC)

VA

600

400

750

Single phase motor rating (230 V AC)

kW

0.5

0.3

0.5

Breaking capacity DC1: 24/110/220 V

A

12/0.3/0.12

8/0.3/0.12

16/0.3/0.12

Minimum switching load

mW (V/mA)

300 (5/5)

300 (5/5)

300 (5/5)

Standard contact material

AgNi

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 · 10⁶ / 10 · 10⁶

10 · 10⁶ / 10 · 10⁶

10 · 10⁶ / 10 · 10⁶

Electrical life at rated load AC1

cycles

60 · 10³

60 · 10³

50 · 10³

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)



**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

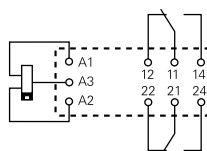
- 1 Pole 16 A (5.0 mm pin pitch)

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

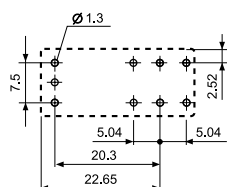
- 2 Pole, 8 A
- PCB direct mount



2 coil version:

A3(+) A2 (-) = Set

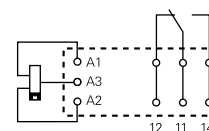
A3(+) A1 (-) = Reset



Copper side view

41.61.6.xxx

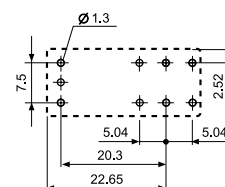
- 1 Pole, 16 A
- PCB direct mount



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	16/30
Rated voltage/ Maximum switching voltage (U_N/U_{max})	V AC	250/400	250/400
Rated load AC1	VA	2000	4000
Rated load AC15 (230 V AC)	VA	350	750
Single phase motor rating (230 V AC)	kW	0.37	0.55
Breaking capacity DC1: 24/110/220 V	A	8/0.3/0.12	16/0.3/0.12
Minimum switching load	mW (V/mA)	500 (5/100)	500 (5/100)
Standard contact material		AgSnO ₂	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 · 10 ⁶	5 · 10 ⁶
Electrical life at rated load AC1	cycles	30 · 10 ³	30 · 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:

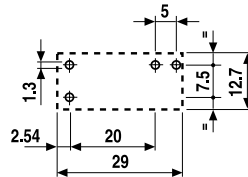
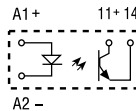
- via screw or screwless sockets

- 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

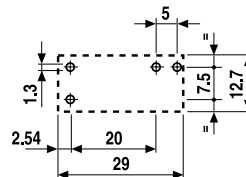
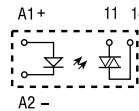


Copper side view

41.81 - 8240



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



Copper side view

For outline drawing see page 9

Output circuit

Contact configuration		1 NO (SPST-NO)	1 NO (SPST-NO)
Rated current/ Maximum peak current (10 ms)	A	5/40	3/40
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

4 1 . 5 2 . 9 . 0 2 4 . 0 0 1 0

Series ————

Type ————
 3 = PCB - 3.5 mm pinning
 5 = PCB - 5.0 mm pinning
 6 = PCB - 5.0 mm pinning

No. of poles ————
 1 = 1 pole for
 41.31, 12 A
 41.61, 16 A
 2 = 2 pole for
 41.52, 8 A

Coil version ————
 6 = DC bistable, 2 coils
 8 = AC
 9 = DC

Coil voltage ————
 See coil specifications

A: Contact material
 0 = Standard AgNi
 4 = AgSnO₂
 5 = AgNi + Au

B: Contact circuit ————
 0 = CO (nPDT)
 3 = NO (nPST)

D: Special versions
 0 = Flux proof (RT II)
 1 = Wash tight (RT III)
 3 = IECEx, ATEX (Ex ec nC), HazLoc
 (41.52 and 41.61 only)
 6 = Bistable version (RT II)

C: Options
 0 = Production line 0
 1 = Production line 1
 2 = Production line 2

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.

4 1 . 8 1 . 7 . 0 2 4 . 9 0 2 4

Series ————

Type ————
 8 = SSR type

Output ————
 1 = 1 NO (SPST-NO)

Input circuit ————
 See coil specifications

Output circuit
 9024 = 5 A - 24 V DC
 8240 = 3 A - 240 V AC

Electromechanical relay

A

Technical data

Insulation according to EN 61810-1

		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)
Overvoltage category		III	III	III	III
Rated impulse voltage	kV (1.2/50 µs)	6	6	6	6
Dielectric strength	V AC	4000	4000	4000	4000

Insulation between adjacent contacts

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

Insulation between open contacts

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

Insulation between coil terminals

Rated impulse voltage (surge) differential mode (according to EN 61000-4-5)	kV (1.2/50 µs)	2
--	----------------	---

Other data

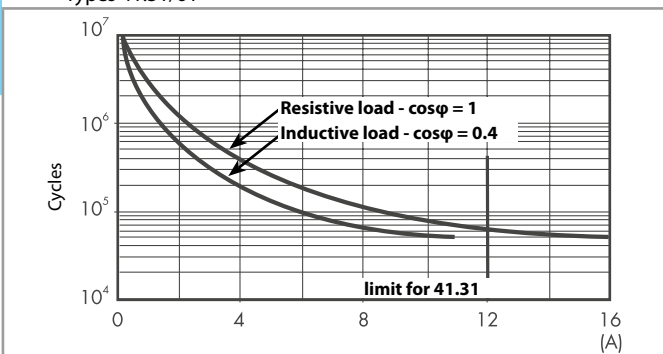
Bounce time: NO/NC	ms	4/6 (monostable) - 2/10 (bistable)			
Vibration resistance (5...55)Hz: NO/NC	g	15/2 (monostable) - 5/3 (bistable)			
Shock resistance	g	16 (monostable) - 10 (bistable)			
Power lost to the environment	without contact current	W	0.4 (monostable)		
	with rated current	W	1.7 (41.31)	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)

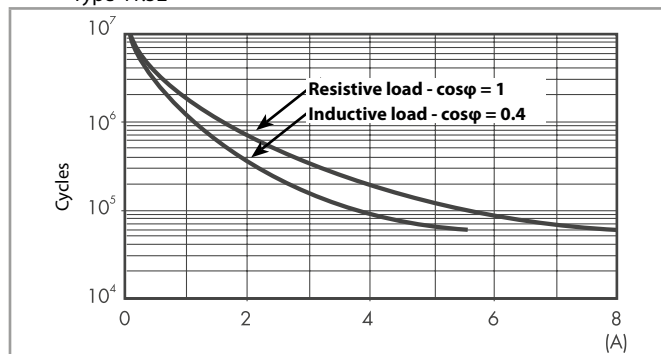
Types 41.31/61

A

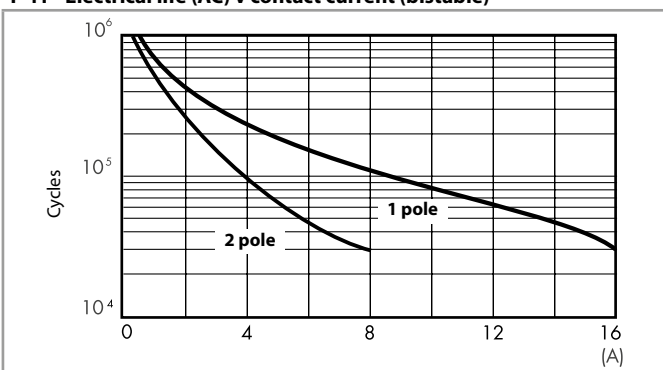


F 41 - Electrical life (AC) v contact current (monostable)

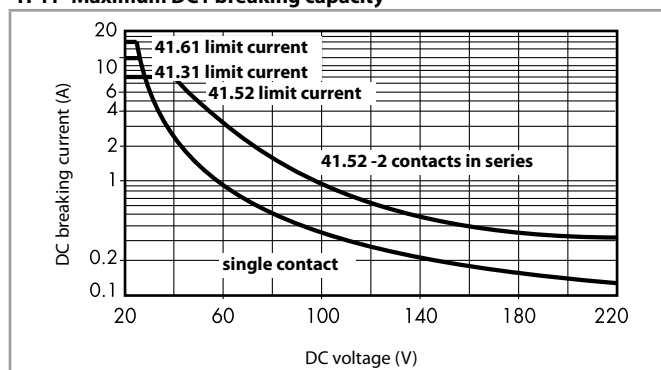
Type 41.52



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

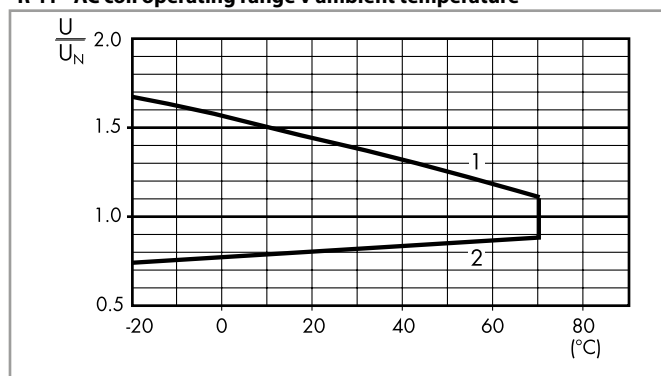
DC coil data

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

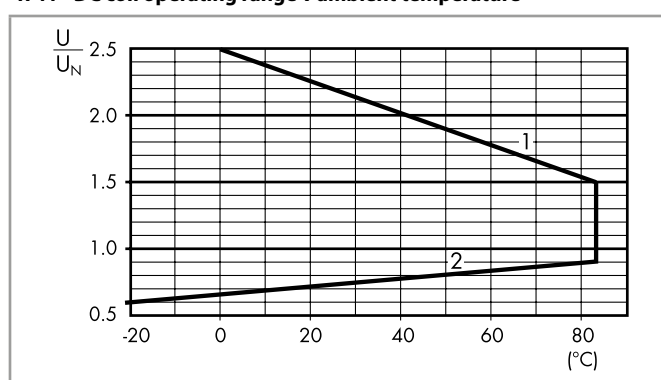
R 41 - AC coil operating range v ambient temperature



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

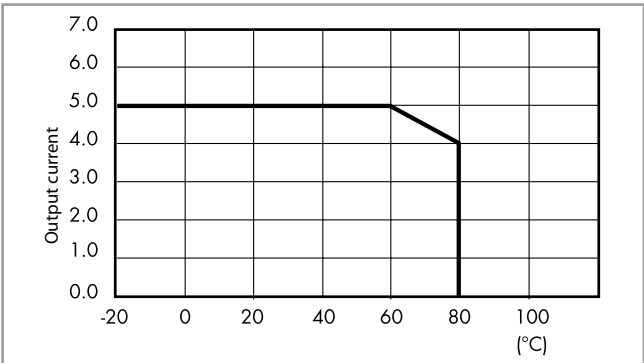
Input data - DC types

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

Output specification

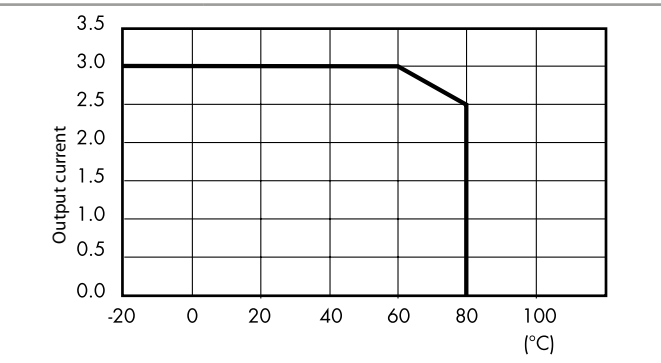
L 41 - Output current v ambient temperature

SSR - 5 A DC output types



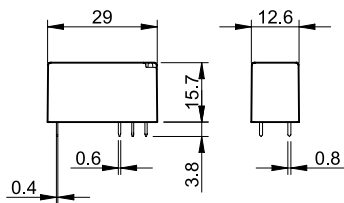
L 41 - Output current v ambient temperature

SSR - 3 A AC output types

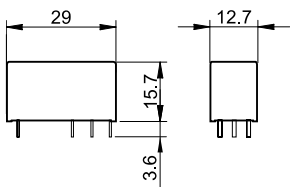


Outline drawings

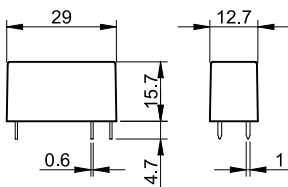
Types 41.31/52/61



Types 41.52.6.xxx/41.61.6.xxx



Types 41.81-9024/41.81-8240

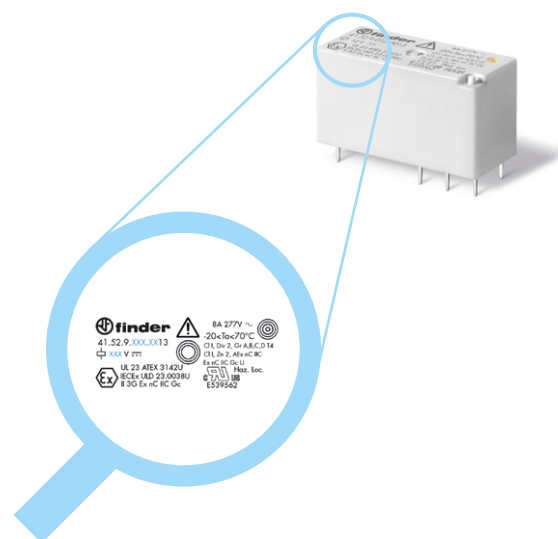


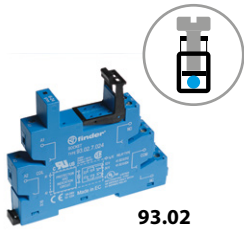
IECEx - ATEX - HazLoc: Nominal current and ambient temperature

Type				41.52...13	41.61...13
	Approval	Ambient temperature	Contact configuration	2 CO/NO	1 CO/NO
IECEx - EX	IECEx - EX	-20...+85 °C (105 °C service temperature)	Rated voltage	277 V AC	277 V AC
			Rated current	8 A	16 A
			Breaking capacity DC1: 32 V DC	5 A	5 A
HazLoc	HazLoc	-20...+70 °C (105 °C service temperature)	Rated voltage	277 V AC	277 V AC
			Rated current	8 A	16 A
			Breaking capacity DC1: 32 V DC	5 A	5 A
	HazLoc	-20...+85 °C (105 °C service temperature)	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	
Haz.Loc. (E539562):	CI I, Div2, Gr A, B, C, D, T4 CI I, Zn 2, AEx nC IIC Ex nC IIC Gc U	 LISTED IND. CONTR. EQ. FOR HAZLOC.
Specific marking of explosion protection		
II Component for surface plant (different from mines)		
3 Category 3: normal level of protection		
G - CI I 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):



Box clamp socket 35 mm (EN 60715) mounting

Supply voltage

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

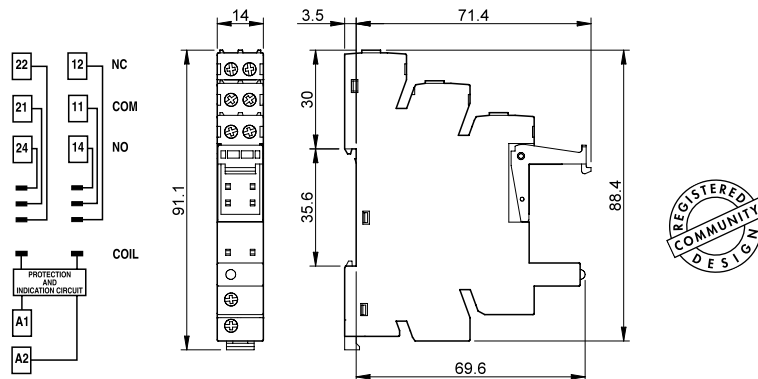
Accessories

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	solid wire	stranded wire
	mm ²	1 x 6 / 2 x 2.5
	AWG	1 x 10 / 2 x 14

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



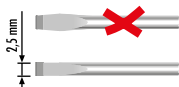
Note: Not for bistable relays

A



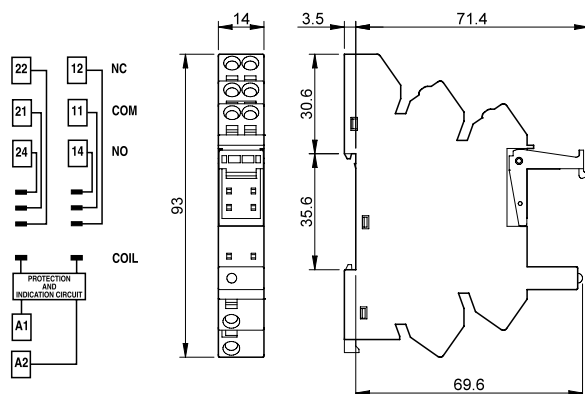
93.52

Approvals
(according to type):

**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 ≤ 60 V / > 60 V)	°C	−40...+70/−40...+55	
Wire strip length	mm	8	
Max. wire size for 93.52 socket		solid wire	stranded wire
	mm²	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

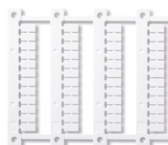
Accessories

093.08

Approvals
(according to type):

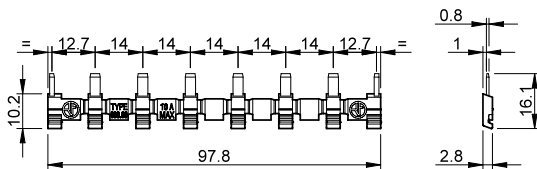


093.01



060.48

8-way jumper link for 93.02 and 93.52 sockets	093.08 (blue)	093.08.0 (black)	093.08.1 (red)
Rated values	10 A - 250 V		



Plastic separator for 93.02 and 93.52 sockets	093.01
--	--------

Thickness 2 mm, required at the start and the end of a group of interfaces.

Can be used for visual separation group, must be used for:

- 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	060.48
---	--------



95.13.2



95.15.2

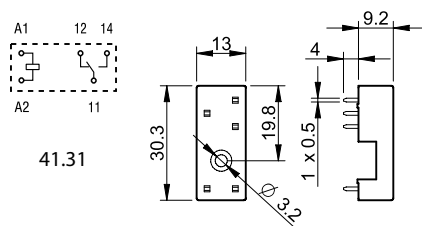
Approvals
(according to type):



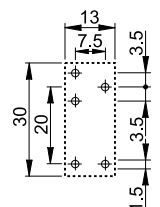
PCB socket	95.13.2 (blue)	95.13.20 (black)	95.15.2 (blue)	95.15.20 (black)
For relay type	41.31		41.52, 41.61, 41.81 ⁽¹⁾	
Accessories				
Plastic retaining clip (supplied with socket - packaging code SLA)	095.42.30			
Metal retaining clip	095.41.3			
Technical data				
Rated values	10 A - 250 V*			
Dielectric 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).

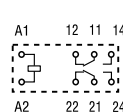
⁽¹⁾ With the relay 41.81 the NO change-over contact will be 11-14.



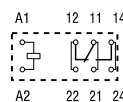
41.31



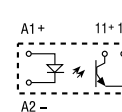
95.13.2
Copper side view



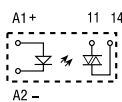
41.52



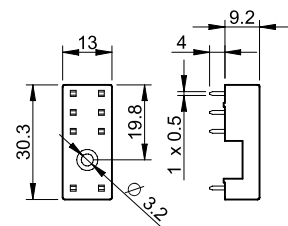
41.61



41.81 - 9024



41.81 - 8240



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:

