

Power relays 1 and 2 pole for direct PCB or socket mount

Type 40.31/51

- 1 CO 12 A (3.5 mm pin pitch)
- 1 CO 12 A (5.0 mm pin pitch)

Type 40.52

- 2 CO 8 A (5.0 mm pin pitch)

Type 40.61

- 1 CO 16 A (5.0 mm pin pitch)

- Pin length 3.5 mm for PCB mount
- Pin length 5.3 mm for Plug-in mount
- DC coils (650 mW or 500 mW)
- Cadmium-free contact material available
- 8 mm Creepage and Clearance, 6 kV (1.2/50µs) between coil and contact
- Meets EN 60335-1 glow wire requirements
- 95 series sockets for PCB or 35 mm rail mounting (EN 60715) with Screw, Screwless or Push-in terminals
- Coil Indication and EMC suppression modules 99 series and Timer module 86.30 options
- Environmental protection:
RT II - flux proof (Standard)
RT III - wash tight (Option)

* Mounted on sockets ≤ 10 A

** With the AgSnO₂ material the maximum peak current is 120 A - 5 ms on normally open contact.

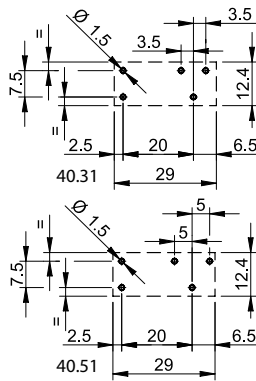
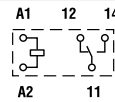
FOR UL RATINGS SEE:
"General technical information" page V

For outline drawing see page 12

40.31/51



- 1 CO 12 A on PCB, 10 A with socket
- 3.5 mm pin pitch (40.31), 5.0 mm pin pitch (40.51)
- PCB or 95 Series socket mount



Copper side view

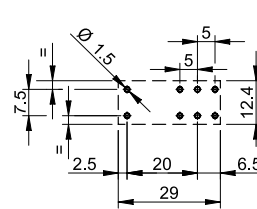
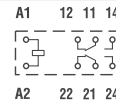
Pin length 3.5 mm for PCB only
Pin length 5.3 mm for PCB or sockets

See ordering information

40.52



- 2 CO 8 A
- 5.0 mm pin pitch
- PCB or 95 Series socket mount

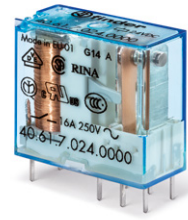


Copper side view

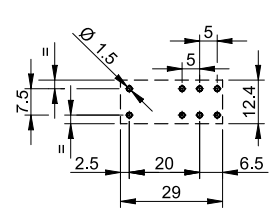
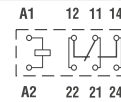
Pin length 5.3 mm for PCB or sockets

See ordering information

40.61



- 1 CO 16 A
- 5.0 mm pin pitch
- PCB or 95 Series socket mount



Copper side view

Pin length 3.5 mm for PCB only
Pin length 5.3 mm for PCB or sockets

See ordering information

Contact specification		40.31/51	40.52	40.61
Contact configuration		1 CO (SPDT)	2 CO (DPDT)	1 CO (SPDT)
Rated current/Maximum peak current	A	12*/20	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	1000	750	1000
Single phase motor rating (230 V AC)	kW	0.55	0.37	0.55
Breaking capacity DC1: 30/110/220 V	A	12/0.6/0.25	8/0.6/0.25	16/0.6/0.25
Minimum switching load	mW (V/mA)	300 (5/5)	300 (5/5)	500 (10/5)
Standard contact material		AgNi	AgNi	AgCdO
Coil specification				
Nominal voltage (U _N)	V AC (50/60 Hz)	—		
	V DC	5 - 6 - 7 - 9 - 12 - 14 - 18 - 21 - 24 - 28 - 36 - 48 - 60 - 90 - 110 - 125		
Rated power DC/sensitive DC	W	0.65/0.5		
Operating range	AC	—		
	DC/sensitive DC	(0.73...1.5)U _N /(0.73...1.5)U _N		
Holding voltage	DC	0.4 U _N		
Must drop-out voltage	DC	0.1 U _N		
Technical data				
Mechanical life	cycles	10 · 10 ⁶		
Electrical life at rated load AC1	cycles	200 · 10 ³		
Operate/release time	ms	7/3 (10/3 sensitive)		
Insulation between coil and contacts (1.2/50 µs)	kV	6 (8 mm)		
Dielectric strength between open contacts	V AC	1000		
Ambient temperature range	°C	-40...+85		
Environmental protection		RT II***		

Approvals (according to type)

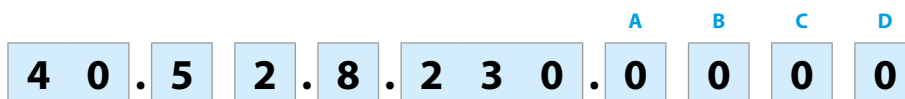


*** See general technical information "Guidelines for automatic flow solder processes" page II.

Ordering information

Example: 40 series PCB relay, 2 CO, 230 V AC coil.

A



- Series**
Type
 1 = PCB - 3.5 mm pinning, flat
 3 = PCB/Plug-in - 3.5 mm pinning
 5 = PCB/Plug-in - 5 mm pinning
 6 = PCB/Plug-in - 5 mm pinning

- No. of poles**
 1 = 1 pole
 2 = 2 pole

- Coil version**
 6 = AC/DC bistable
 7 = Sensitive DC, 0.5 W
 8 = AC (50/60 Hz)
 9 = Standard DC, 0.65 W

Coil voltage
 See coil specifications

- A: Contact material**
 See table below
B: Contact circuit
 0 = CO (nPDT)
 3 = NO (nPST)

- D: Special versions**
 0 = Standard
 1 = Wash tight (RT III)
 3 = High temperature (+125 °C) wash tight
C: Options
 0 = Pin length 5.3 mm (Plug-in relays)
 2 = Pin length 3.5 mm (PCB relays)

Selecting features and options: only combinations in the same row are possible.

Preferred selections for best availability are shown in **bold**.

Terminal pin	Type	Coil version	A	B	C	D
PCB relay, pin length 3.5 mm	40.11	Sensitive DC	2 (AgCdO) - 4 (AgSnO ₂)	0	0	0
	40.31/51	Standard DC/sensitive DC	1 (AgNi)	0 - 3	2	0 - 1
	40.61	Standard DC/sensitive DC	1 (AgNi) - 2 (AgCdO)	0 - 3	2	0 - 1
PCB/Plug-in relay pin length 5.3 mm	40.31/51	AC/sensitive DC	0 (AgNi) - 2 (AgCdO) - 5 (AgNi+Au)	0 - 3	0	0 - 1
	40.31/51	Standard DC	0 (AgNi) - 2 (AgCdO) - 5 (AgNi+Au)	0 - 3	0	0 - 1 - 3
	40.52	AC/sensitive DC	0 (AgNi) - 2 (AgCdO) - 5 (AgNi+Au)	0 - 3	0	0 - 1
	40.52	Standard DC	0 (AgNi) - 2 (AgCdO) - 5 (AgNi+Au)	0 - 3	0	0 - 1 - 3
	40.61	AC/sensitive DC	0 (AgCdO) - 4 (AgSnO ₂)	0 - 3	0	0 - 1
	40.61	Standard DC	0 (AgCdO) - 4 (AgSnO ₂)	0 - 3	0	0 - 1 - 3
	40.62	Standard DC/sensitive DC	0 (AgNi) - 4 (AgSnO ₂)	0	0	0 - 1
	40.31/51/52	Bistable	0 (AgNi)	0	0	0
40.61	Bistable	0 (AgCdO)	0	0	0	

Technical data

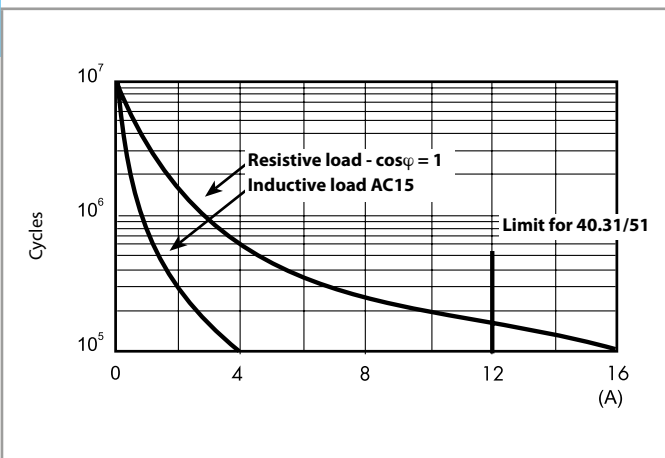
Insulation according to EN 61810-1					
		1 pole		2 pole	
Nominal voltage of supply system	V AC	230/400		230/400	
Rated insulation voltage	V AC	250	400	250	400
Pollution degree		3	2	3	2
Insulation between coil and contact set					
Type of insulation		Reinforced (8 mm)		Reinforced (8 mm)	
Overvoltage category		III		III	
Rated impulse voltage	kV (1.2/50 µs)	6		6	
Dielectric strength	V AC	4000		4000	
Insulation between adjacent contacts (40.52, page 4)					
Type of insulation		—		Basic	
Overvoltage category		—		II	
Rated impulse voltage	kV (1.2/50 µs)	—		2.5	
Dielectric strength	V AC	—		2000	
Insulation between adjacent contacts (40.52, page 3 + 40.62)					
Type of insulation		—		Basic	
Overvoltage category		—		III	
Rated impulse voltage	kV (1.2/50 µs)	—		4	
Dielectric strength	V AC	—		2500	
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	2/5			
Vibration resistance (10...150)Hz: NO/NC	g	20/5 (1 changeover)		15/4 (2 changeover)	
Shock resistance NO/NC	g	20/13 (1 changeover)		20/12 (2 changeover)	
Power lost to the environment	without contact current	W	0.65		
	with rated current	W	1.2 (40.11/31/51)		2 (40.61/52/62)
Recommended distance between relays mounted on PCB	mm	≥ 5			

A

Contact specification

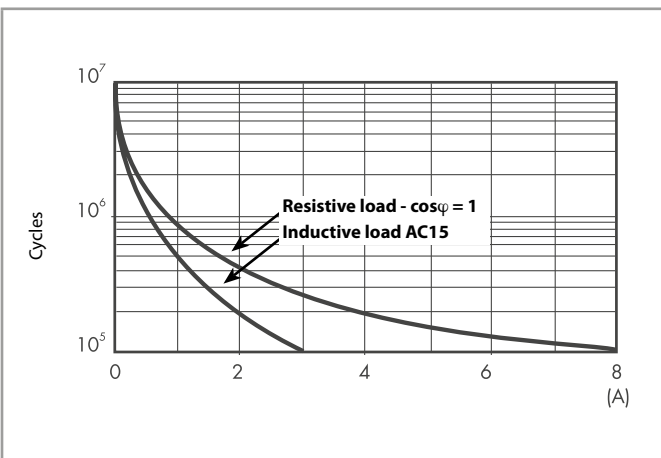
F 40.1 - Electrical life (AC) v contact current

Types 40.31/51/61 (page 3)



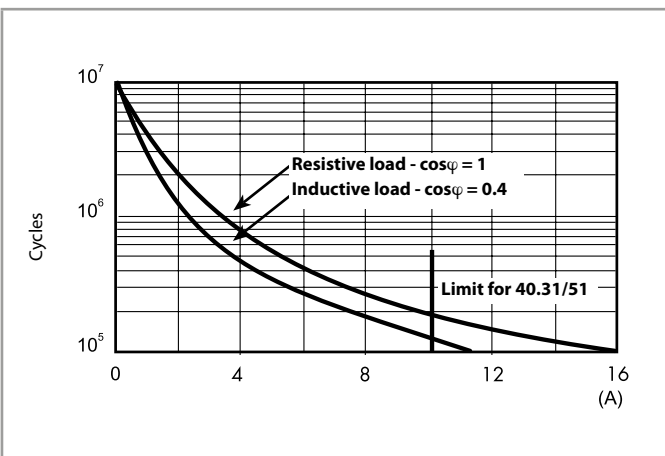
F 40.2 - Electrical life (AC) v contact current

Type 40.52 (page 3)



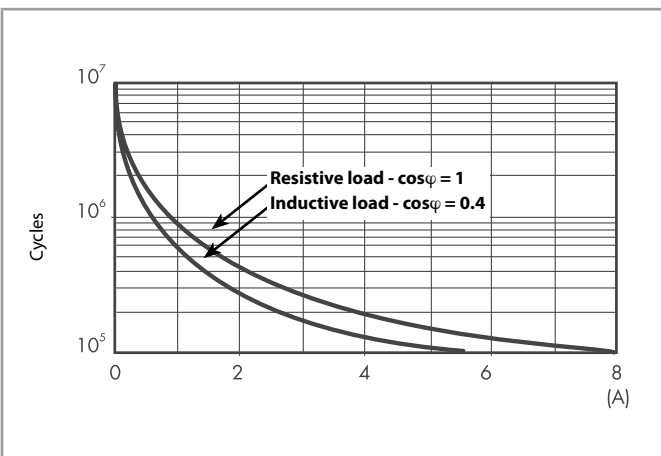
F 40.3 - Electrical life (AC) v contact current

Types 40.31/51/61 (page 4)



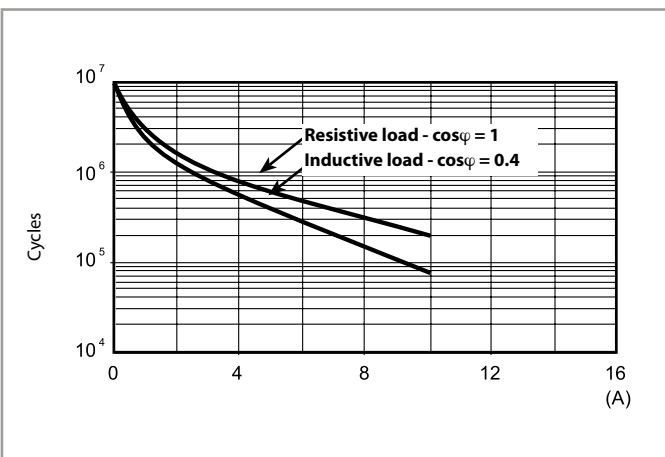
F 40.4 - Electrical life (AC) v contact current

Type 40.52 (page 4)



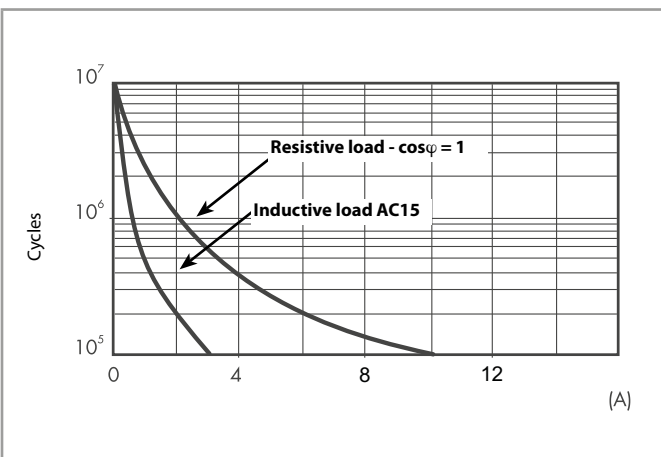
F 40.5 - Electrical life (AC) v contact current

Type 40.11 (page 5)



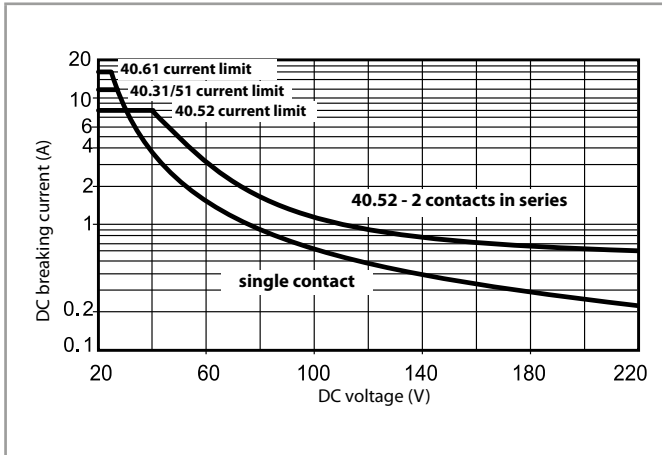
F 40.6 - Electrical life (AC) v contact current

Type 40.62 (page 5)

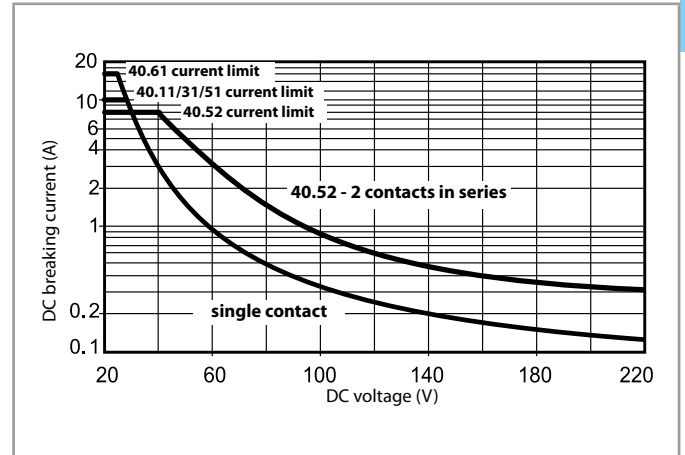


Contact specification

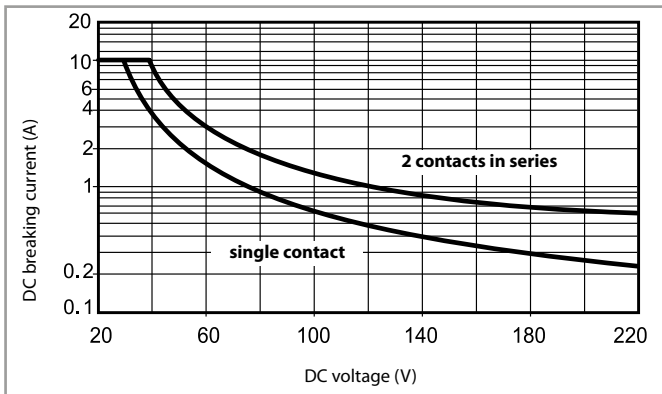
H 40.1 - Maximum DC1 breaking capacity
Types 40.31/51/52/61 (page 3)



H 40.2 - Maximum DC1 breaking capacity
Types 40.31/51/52/61 (page 4) and 40.11 (page 5)



H 40.6 - Maximum DC1 breaking capacity
Type 40.62 (page 5)



- 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

DC coil data - 0.65 W standard (types 40.31/51/52/61/62)

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N mA
		U_{min} V	U_{max} V		
5	9.005	3.65	7.5	38	130
6	9.006	4.4	9	55	109
7	9.007	5.1	10.5	75	94
9	9.009	6.6	13.5	125	72
12	9.012	8.8	18	220	55
14	9.014	10.2	21	300	47
18	9.018	13.1	27	500	36
21	9.021	15.3	31.5	700	30
24	9.024	17.5	36	900	27
28	9.028	20.5	42	1200	23
36	9.036	26.3	54	2000	18
48	9.048	35	72	3500	14
60	9.060	43.8	90	5500	11
90	9.090	65.7	135	12500	7.2
110	9.110	80.3	165	18000	6.2
125	9.125	91.2	188	23500	5.3

DC coil data - 0.5 W sensitive (types 40.31/51/52/61/62)

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N mA
		U_{min}^* V	U_{max} V		
5	7.005	3.7	7.5	50	100
6	7.006	4.4	9	75	80
7	7.007	5.1	10.5	100	70
9	7.009	6.6	13.5	160	56
12	7.012	8.8	18	288	42
14	7.014	10.2	21	400	35
18	7.018	13.2	27	650	27.7
21	7.021	15.4	31.5	900	23.4
24	7.024	17.5	36	1150	21
28	7.028	20.5	42	1600	17.5
36	7.036	26.3	54	2600	13.8
48	7.048	35	72	4800	10
60	7.060	43.8	90	7200	8.4
90	7.090	65.7	135	16200	5.6
110	7.110	80.3	165	23500	4.7
125	7.125	91.2	188	32000	3.9

* $U_{min} = 0.8 U_N$ for 40.61

DC coil data - 0.5 W sensitive (types 40.11)

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N mA
		U_{min} V	U_{max} V		
6	7.006	4.4	10.5	75	80
12	7.012	8.8	21	300	40
24	7.024	17.5	42	1200	20
48	7.048	35	84	4600	10.4
60	7.060	43.8	105	7200	8.3

AC coil data (types 40.31/51/52/61)

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N (50 Hz) mA
		U_{min} V	U_{max} V		
6	8.006	4.8	6.6	21	168
12	8.012	9.6	13.2	80	90
24	8.024	19.2	26.4	320	45
48	8.048	38.4	52.8	1350	21
60	8.060	48	66	2100	16.8
110	8.110	88	121	6900	9.4
120	8.120	96	132	9000	8.4
230	8.230	184	253	28000	5
240	8.240	192	264	31500	4.1

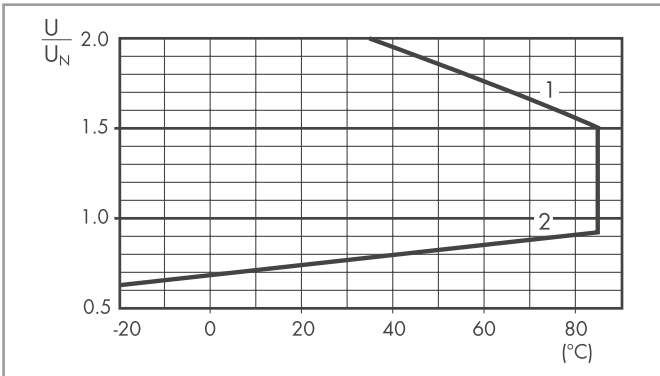
AC/DC coil data - bistable (types 40.31/51/52/61)

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N mA	DC: Release resistance** R_{DC} Ω
		U_{min} V	U_{max} V			
5	6.005	4	5.5	23	215	37
6	6.006	4.8	6.6	33	165	62
12	6.012	9.6	13.2	130	83	220
24	6.024	19.2	26.4	520	40	910
48	6.048	38.4	52.8	2100	21	3,600
110	6.110	88	121	11000	10	16,500

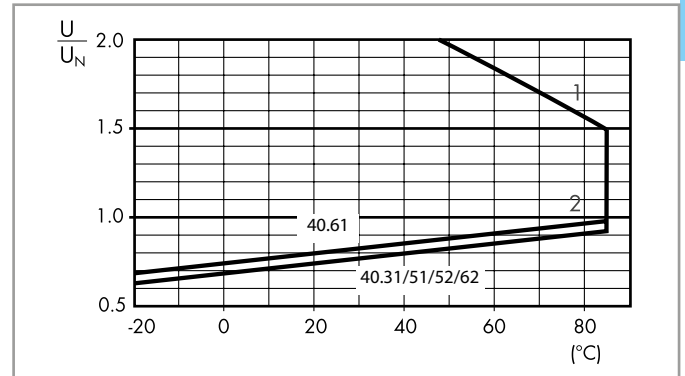
** R_{DC} = Resistance in DC, $R_{AC} = 1.3 \times R_{DC}$ 1 W

Contact specification

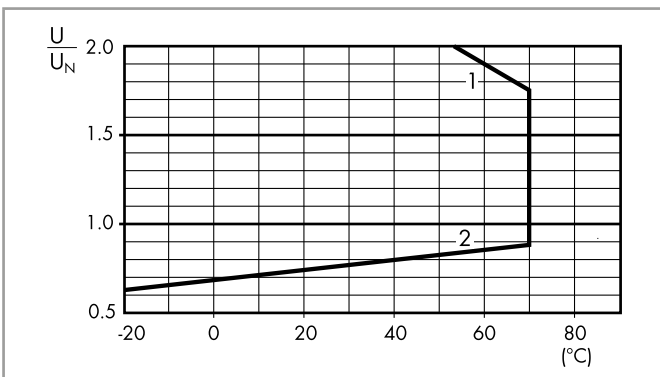
R 40 - DC coil operating range v ambient temperature
Standard coil



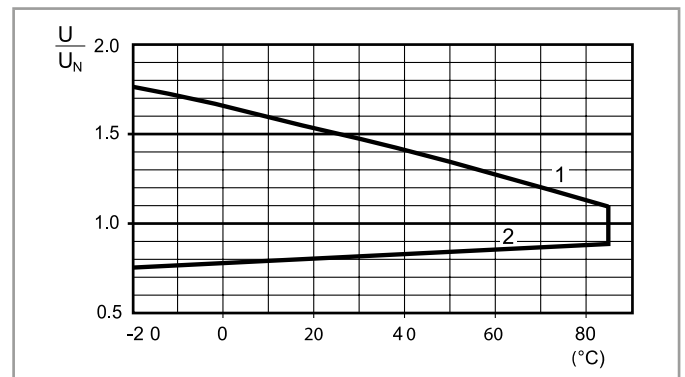
R 40 - DC coil operating range v ambient temperature
Sensitive coil, types 40.31/51/52/61/62



R 40 - DC coil operating range v ambient temperature
Sensitive coil, type 40.11



R 40 - AC coil operating range v ambient temperature

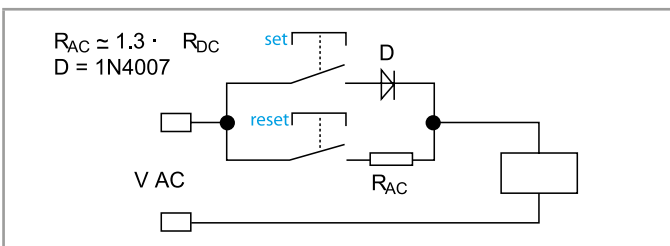


1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.

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

Wiring diagram for 40 series bistable coil version

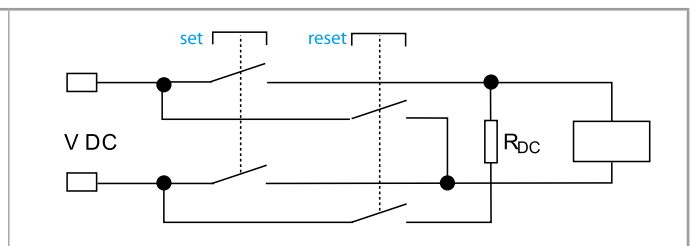
AC Operation



On momentary closure of the SET switch the relay is magnetised through the diode and the relay contacts transfer to the set position and remain in this position.

On momentary closure of the RESET switch the relay is demagnetised through limiting resistor (R_{AC}) and the contacts return to the reset position.

DC Operation



On momentary closure of the SET switch the relay is magnetised and the relay contacts transfer to the set position and remain in this position.

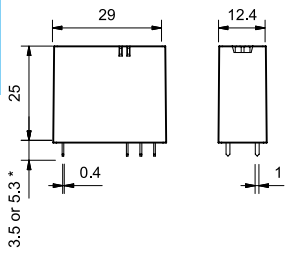
On momentary closure of the RESET switch the relay is demagnetised through limiting resistor (R_{DC}) and the contacts return to the reset position.

Notes: The minimum SET or RESET impulse time is 20 ms. The maximum time can be continuous. In practice, always ensure that the SET and RESET contacts cannot be operated simultaneously.

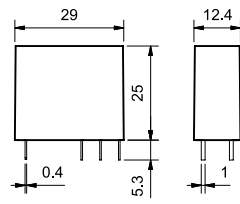
Outline drawings

A

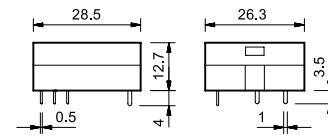
Types 40.31/51/52/61/62 (page 3 and 5)



Types 40.31/51/52/61 (page 4)



Type 40.11 (page 5)



* (3.5 or 5.3 mm) see ordering code