Finder 40.51

Miniature PCB/Plug-In Relay (Set of 6)

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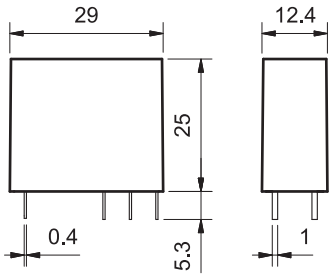
Features

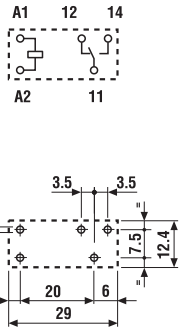
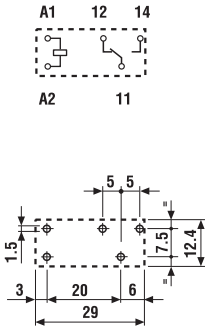
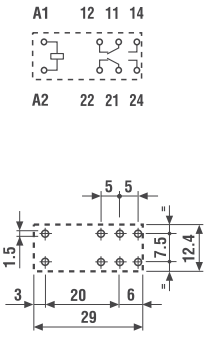
1 & 2 Pole relay range
40.31 - 1 Pole 10 A (3.5 mm pin pitch)
40.51 - 1 Pole 10 A (5 mm pin pitch)
40.52 - 2 Pole 8 A (5 mm pin pitch)

PCB mount
- direct or via PCB socket
35 mm rail mount
- via screw and screwless sockets

- DC coils (standard or sensitive) & AC coils
- Cadmium Free contact material
- 8 mm, 6 kV (1.2/50 µs) isolation, coil-contacts
- UL Listing (certain relay/socket combinations)
- Flux proof: RT II standard, (RT III option)
- 95 series sockets
- Coil EMC suppression
- Timer accessories 86 series



For UL Horsepower and Pilot Duty ratings See "General technical information" page V

	40.31	40.51	40.52
	• 3.5 mm contact pin pitch • 1 Pole 10 A • PCB or 95 series sockets	• 5 mm contact pin pitch • 1 Pole 10 A • PCB or 95 series sockets	• 5 mm contact pin pitch • 2 Pole 8 A • PCB or 95 series sockets
	 Copper side view	 Copper side view	 Copper side view

Contact specification				
Contact configuration		1 CO (SPDT)	1 CO (SPDT)	2 CO (DPDT)
Rated current/Maximum peak current	A	10/20	10/20	8/15
Rated voltage/Maximum switching voltage	V AC	250/400	250/400	250/400
Rated load AC1	VA	2,500	2,500	2,000
Rated load AC15 (230 V AC)	VA	500	500	400
Single phase motor rating (230 V AC)	kW	0.37	0.37	0.3
Breaking capacity DC1: 30/110/220 V	A	10/0.3/0.12	10/0.3/0.12	8/0.3/0.12
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)	6 - 12 - 24 - 48 - 60 - 110 - 120 - 230 - 240		
	V DC	5 - 6 - 7 - 9 - 12 - 14 - 18 - 21 - 24 - 28 - 36 - 48 - 60 - 90 - 110 - 125		
Rated power AC/DC/sens. DC	VA (50 Hz)/W/W	1.2/0.65/0.5	1.2/0.65/0.5	1.2/0.65/0.5
Operating range	AC	$(0.8...1.1)U_N$	$(0.8...1.1)U_N$	$(0.8...1.1)U_N$
	DC/sens. DC	$(0.73...1.5)U_N/(0.73...1.75)U_N$	$(0.73...1.5)U_N/(0.73...1.75)U_N$	$(0.73...1.5)U_N/(0.73...1.75)U_N$
Holding voltage	AC/DC	0.8 U_N /0.4 U_N	0.8 U_N /0.4 U_N	0.8 U_N /0.4 U_N
Must drop-out voltage	AC/DC	0.2 U_N /0.1 U_N	0.2 U_N /0.1 U_N	0.2 U_N /0.1 U_N
Technical data				
Mechanical life AC/DC	cycles	$10 \cdot 10^6/20 \cdot 10^6$	$10 \cdot 10^6/20 \cdot 10^6$	$10 \cdot 10^6/20 \cdot 10^6$
Electrical life at rated load AC1	cycles	$200 \cdot 10^3$	$200 \cdot 10^3$	$100 \cdot 10^3$
Operate/release time	ms	7/3 - (12/4 sensitive)	7/3 - (12/4 sensitive)	7/3 - (12/4 sensitive)
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	1,000	1,000	1,000
Ambient temperature range	°C	–40...+85	–40...+85	–40...+85
Environmental protection		RT II**	RT II**	RT II**
Approvals (according to type)				

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

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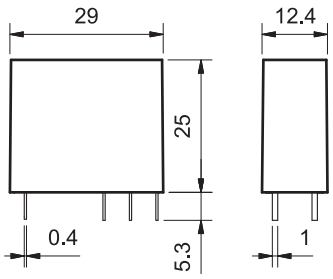
Features

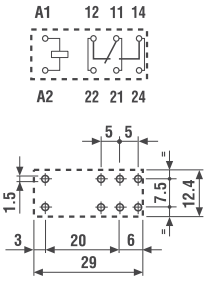
40.61 - 1 Pole 16 A (5 mm pin pitch)
40.xx.6 - Bistable versions of the 40.31, 40.51, 40.52 & 40.61 relays

PCB mount
- direct or via PCB socket
35 mm rail mount
- via screw and screwless sockets

- DC coils & AC coils
- Cadmium Free option available
- 8 mm, 6 kV (1.2/50 µs) isolation, coil-contacts
- UL Listing (certain 40.61 relay/socket combinations)
- Flux proof: RT II standard, (RT III option)
- 95 series sockets
- Coil EMC suppression
- Timer accessories 86 series

	40.61	40.xx.6
	• 5 mm contact pin pitch • 1 Pole 16 A • PCB or 95 series sockets	• Bistable (single coil) versions of 40.31/51/52/61 • PCB or 95 series sockets





Copper side view

Bistable version (1 coil) types:

40.31.6...
40.51.6...
40.52.6...
40.61.6...

For wiring diagrams see page 8

For UL Horsepower and Pilot Duty ratings See "General technical information" page V

		40.61	40.xx.6
Contact specification			
Contact configuration		1 CO (SPDT)	
Rated current/Maximum peak current	A	16/30*	
Rated voltage/Maximum switching voltage	V AC	250/400	See relays
Rated load AC1	VA	4,000	40.31
Rated load AC15 (230 V AC)	VA	750	40.51
Single phase motor rating (230 V AC)	kW	0.55	40.52
Breaking capacity DC1: 30/110/220 V	A	16/0.3/0.12	40.61
Minimum switching load	mW (V/mA)	500 (10/5)	
Standard contact material		AgCdO	
Coil specification			
Nominal voltage (U_N)	V AC (50/60 Hz)	6-12-24-48-60-110-120-230-240	5 - 6 - 12 - 24 - 48 - 110
	V DC	***See table	5 - 6 - 12 - 24 - 48 - 110
Rated power AC/DC/sens. DC	VA (50 Hz)/W/W	1.2/0.65/0.5	1.0/1.0/—
Operating range	AC	$(0.8...1.1)U_N$	$(0.8...1.1)U_N$
	DC/sens. DC	$(0.73...1.5)U_N/(0.8...1.5)U_N$	$(0.8...1.1)U_N$/—
Holding voltage	AC/DC	0.8 U_N /0.4 U_N	—
Must drop-out voltage	AC/DC	0.2 U_N /0.1 U_N	—
Technical data			
Mechanical life AC/DC	cycles	$10 \cdot 10^6/20 \cdot 10^6$	See relays
Electrical life at rated load AC1	cycles	$100 \cdot 10^3$	40.31
Operate/release time	ms	7/3 - (12/4 sensitive)	40.51
Insulation between coil and contacts (1.2/50 µs)	kV	6 (8 mm)	40.52
Dielectric strength between open contacts	V AC	1,000	40.61
Ambient temperature range	°C	–40...+85	Min. impulse duration
Environmental protection		RT II**	≥ 20 ms
Approvals (according to type)			

* With the $AgSnO_2$ material the maximum peak current is 120 A - 5 ms on normally open contact.

*** Nominal voltage (U_N): 5 - 6 - 7 - 9 - 12 - 14 - 18 - 21 - 24 - 28 - 36 - 48 - 60 - 90 - 110 - 125 V DC

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

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Features

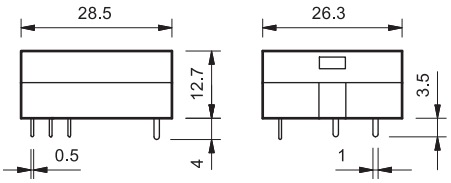
1 Pole relay range

40.11	**- 1 Pole 10 A (Flat pack)**
40.11-2016	**- 1 Pole 16 A (Flat pack)**
40.41	**- 1 Pole 10 A (Vertical)**

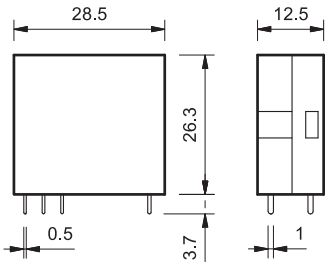
PCB mount

- direct or via PCB socket (40.41 version)

- DC coils
- Cadmium Free option available
- 8 mm, 6 kV (1.2/50 µs) isolation, coil-contacts
- 40.41 - NO version available

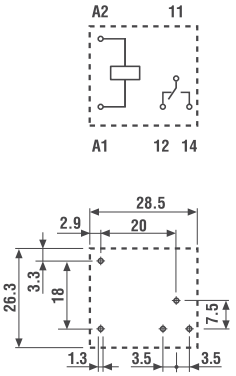
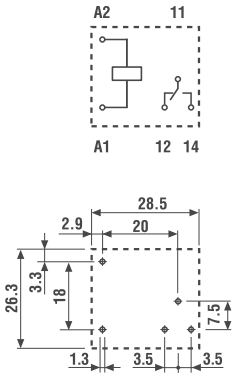
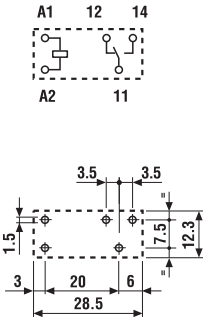


40.11



40.41

For UL Horsepower and Pilot Duty ratings See "General technical information" page V

	40.11	40.11-2016	40.41
	• 1 Pole 10 A • Flat pack • PCB mount	• 1 Pole 16 A • Flat pack • PCB mount	• 1 Pole 10 A • Vertical • PCB or 95 series socket
			
	Copper side view	Copper side view	Copper side view
Contact specification			
Contact configuration	1 CO (SPDT)	1 CO (SPDT)	1 CO (SPDT)
Rated current/Maximum peak current A	10/20	16/30	10/20
Rated voltage/Maximum switching voltage V AC	250/400	250/400	250/400
Rated load AC1 VA	2,500	4,000	2,500
Rated load AC15 (230 V AC) VA	500	750	500
Single phase motor rating (230 V AC) kW	0.37	0.55	0.37
Breaking capacity DC1: 30/110/220 V A	10/0.3/0.12	16/0.3/0.12	10/0.3/0.12
Minimum switching load mW (V/mA)	300 (5/5)	500 (10/5)	300 (5/5)
Standard contact material	AgCdO	AgCdO	AgCdO
Coil specification			
Nominal voltage (U_N) V AC (50/60 Hz)	–	–	–
V DC	6 - 12 - 24 - 48 - 60	6 - 12 - 24 - 48	6 - 12 - 24 - 48 - 60
Rated power AC/DC/sens. DC VA (50 Hz)/W/W	–/–/0.5	–/–/0.5	–/–/0.5
Operating range AC	–	–	–
DC/sens. DC	–/(0.73...1.75)U_N	–/(0.73...1.5)U_N	–/(0.73...1.75)U_N
Holding voltage AC/DC	–/0.4 U_N	–/0.4 U_N	–/0.4 U_N
Must drop-out voltage AC/DC	–/0.1 U_N	–/0.1 U_N	–/0.1 U_N
Technical data			
Mechanical life AC/DC cycles	–/20 · 10^6	–/20 · 10^6	–/20 · 10^6
Electrical life at rated load AC1 cycles	200 · 10^3	50 · 10^3	200 · 10^3
Operate/release time ms	12/4	12/4	12/4
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	1,000	1,000	1,000
Ambient temperature range °C	–40...+70	–40...+70	–40...+70
Environmental protection	RT I	RT I	RT I
Approvals (according to type)			

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Ordering information

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

								A	B	C	D	
4	0	.	5	2	.	8	.	2	3	0	.	0	0	0	0

Series

Type
1 = PCB - 3.5 mm pinning, flat
3 = PCB - 3.5 mm pinning
4 = PCB - 3.5 mm pinning
5 = PCB - 5 mm pinning
6 = PCB - 5 mm pinning

No. of poles
1 = 1 pole
for: 40.11, 10 A/16 A
40.31, 10 A
40.41, 10 A
40.51, 10 A
40.61, 16 A
2 = 2 pole
for: 40.52, 8 A

Coil version
6 = AC/DC bistable
7 = Sensitive DC
8 = AC (50/60 Hz)
9 = DC

Coil voltage
See coil specifications

A: Contact material
0 = Standard AgNi
for 40.31/51/52, AgCdO for 40.61
2 = AgCdO (standard for 40.11/41)
4 = $AgSnO_2$
5 = AgNi + Au (5 µm)

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

C: Options
0 = None
16 = With rated current 16 A (for 40.11)

D: Special versions
0 = Standard
1 = Wash tight (RT III)
3 = High temperature (+ 125 °C) wash tight

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
40.11	sensitive DC	**2** - 4	**0**	**0**	**0**
40.11	sensitive DC	**2** - 4	0	16	/
40.41	sensitive DC	0 - **2**	**0** - 3	**0**	**0**
40.31/51	AC-sens. DC	**0** - 2 - 5	**0** - 3	**0**	**0** - 1
40.31/51	DC	**0** - 2 - 5	**0** - 3	**0**	**0** - 1 - 3
40.52	AC-sens. DC	**0** - 2 - 5	**0** - 3	**0**	**0** - 1
40.52	DC	**0** - 2 - 5	**0** - 3	**0**	**0** - 1 - 3
40.61	AC-sens. DC	**0** - 4	**0** - 3	**0**	**0** - 1
40.61	DC	**0** - 4	**0** - 3	**0**	**0** - 1 - 3
40.31/51/52/61	bistable	**0**	**0**	**0**	**0**

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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	4,000		4,000	
Insulation between adjacent contacts						
Type of insulation			—		Basic	
Overvoltage category			—		II	
Rated impulse voltage		kV (1.2/50 µs)	—		2.5	
Dielectric strength		V AC	—		2,000	
Insulation between open contacts						
Type of disconnection			Micro-disconnection		Micro-disconnection	
Dielectric strength		V AC/kV (1.2/50 µs)	1,000/1.5		1,000/1.5	
Conducted disturbance immunity						
Burst (5...50)ns, 5 kHz, on A1 - A2			EN 61000-4-4		level 4 (4 kV)	
Surge (1.2/50 µs) on A1 - A2 (differential mode)			EN 61000-4-5		level 3 (2 kV)	
Other data						
Bounce time: NO/NC		ms	2/5			
Vibration resistance (5...55)Hz: NO/NC		g	10/4 (1 changeover)		15/3 (2 changeover)	
Shock resistance		g	13			
Power lost to the environment	without contact current	W	0.6			
	with rated current	W	1.2 (40.11/31/41/51)		2 (40.61/52/40.11-2016)	
Recommended distance between relays	mounted on PCB	mm	≥ 5			

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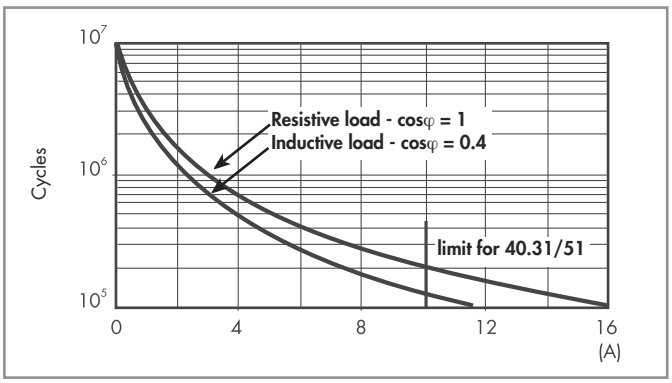
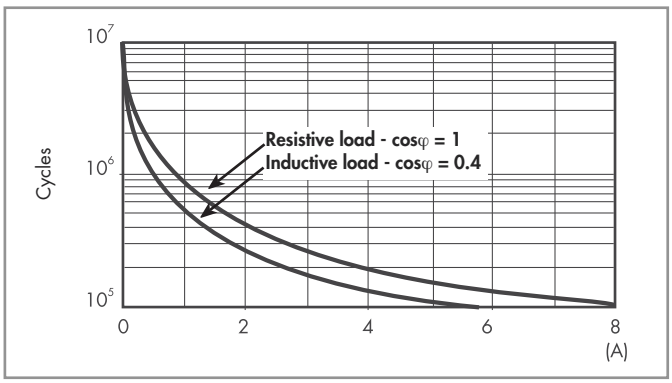
Contact specification

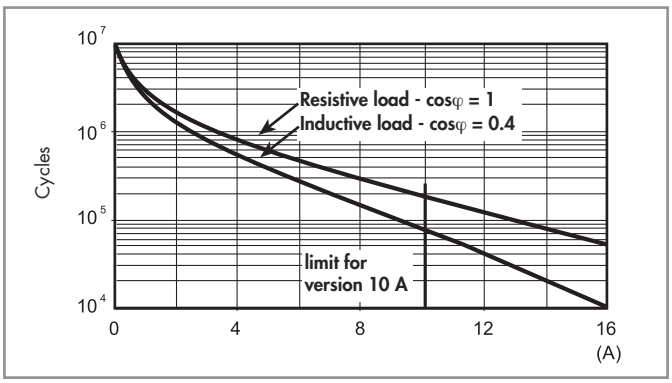
F 40 - Electrical life (AC) v contact current
Types 40.31/51/61



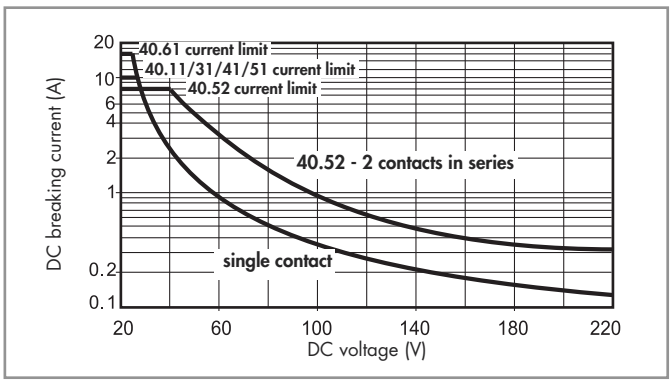
F 40 - Electrical life (AC) v contact current
Type 40.52



F 40 - Electrical life (AC) v contact current
Types 40.11/41



H 40 - Maximum DC1 breaking capacity



- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of ≥ $100 \cdot 10^3$ 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.

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Coil specifications

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

Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}	Resistance R	Rated coil consumption I at U_N
V		V	V	Ω	mA
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	1,200	23
36	**9**.036	26.3	54	2,000	18
48	**9**.048	35	72	3,500	14
60	**9**.060	43.8	90	5,500	11
90	**9**.090	65.7	135	12,500	7.2
110	**9**.110	80.3	165	18,000	6.2
125	**9**.125	91.2	188	23,500	5.3

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

Nominal voltage U_N	Coil code	Operating range U_{min}*	Operating range U_{max}**	Resistance R	Rated coil consumption I at U_N
V		V	V	Ω	mA
5	**7**.005	3.7	8.8	50	100
6	**7**.006	4.4	10.5	75	80
7	**7**.007	5.1	12.2	100	70
9	**7**.009	6.6	15.8	160	56
12	**7**.012	8.8	21	300	40
14	**7**.014	10.2	24.5	400	35
18	**7**.018	13.2	31.5	650	27.7
21	**7**.021	15.4	36.9	900	23.4
24	**7**.024	17.5	42	1,200	20
28	**7**.028	20.5	49	1,600	17.5
36	**7**.036	26.3	63	2,600	13.8
48	**7**.048	35	84	4,800	10
60	**7**.060	43.8	105	7,200	8.4
90	**7**.090	65.7	157	16,200	5.6
110	**7**.110	80.3	192	23,500	4.7
125	**7**.125	91.2	219	32,000	3.9

*U_{min} = 0.8 U_N for 40.61 **U_{max} = 1.5 U_N for 40.61

DC coil data - 0.5 W sensitive (types 40.11/41)

Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}*	Resistance R	Rated coil consumption I at U_N
V		V	V	Ω	mA
6	**7**.006	4.4	10.5	75	80
12	**7**.012	8.8	21	300	40
24	**7**.024	17.5	42	1,200	20
48	**7**.048	35	84	4,600	10.4
60	**7**.060	43.8	105	7,200	8.3

*U_{max} = 1.5 U_N for 40.11-2016

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

Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}	Resistance R	Rated coil consumption I at U_N (50Hz)
V		V	V	Ω	mA
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	1,350	21
60	**8**.060	48	66	2,100	16.8
110	**8**.110	88	121	6,900	9.4
120	**8**.120	96	132	9,000	8.4
230	**8**.230	184	253	28,000	5
240	**8**.240	192	264	31,500	4.1

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

Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}	Resistance R	Rated coil consumption I at U_N	DC: Release resistance** R_{DC}
V		V	V	Ω	mA	Ω
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	2,100	21	3,600
110	**6**.110	88	121	11,000	10	16,500

** R_{DC} = Resistance in DC, R_{AC} = 1.3 x R_{DC} 1W

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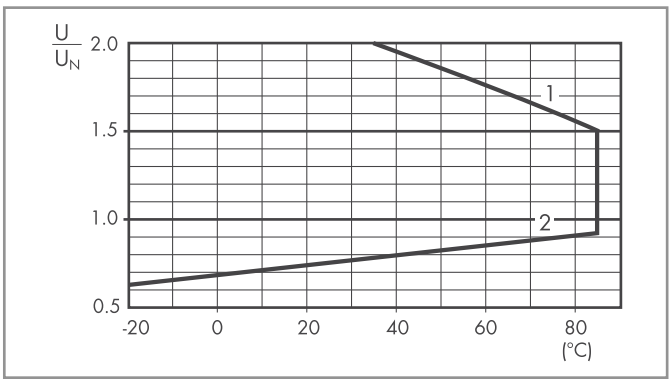
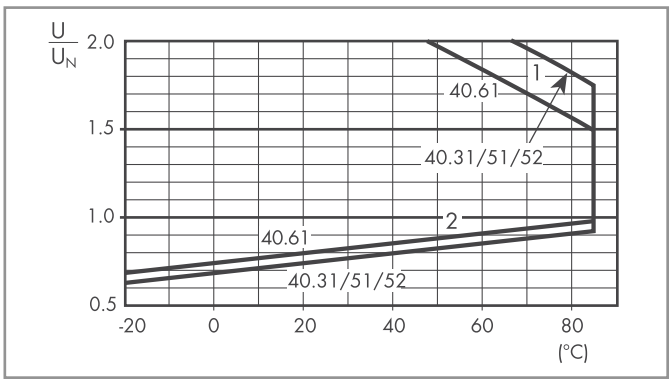
Coil specifications

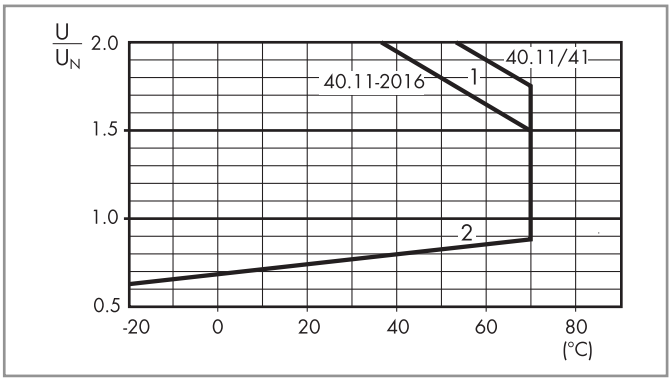
R 40 - DC coil operating range v ambient temperature
Standard coil



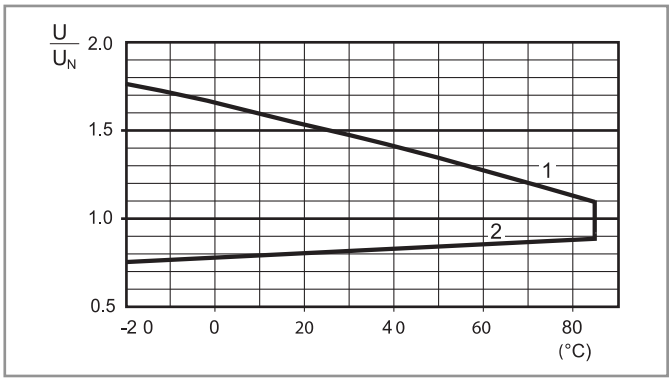
R 40 - DC coil operating range v ambient temperature
Sensitive coil, types 40.31/51/52/61



R 40 - DC coil operating range v ambient temperature
Sensitive coil, types 40.11/41



R 40 - AC coil operating range v ambient temperature

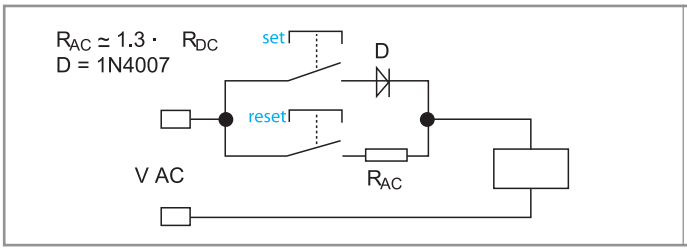


1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.

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

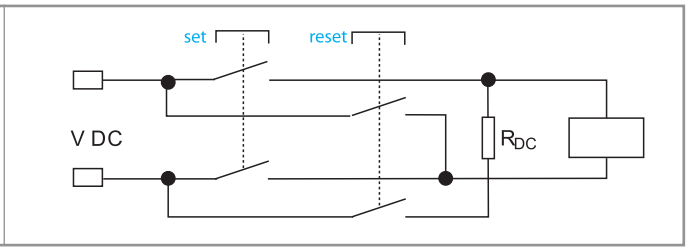
Wiring diagram for 40 series bistable coil version

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.

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