

PCB power relays

Order code	Manufacturer code	Description
60-0900	4031-9006	6V DC 10A SPDT MIN. RELAY (RC)
60-0905	4031-7012	12V DC 10A SPDT MIN. RELAY (RC)
60-0910	4031-7024	24V DC 10A SPDT MIN. RELAY (RC)
60-0915	4031-7048	48V DC 10A SPDT MIN. RELAY (RC)
60-0920	4031-8024	24V AC 10A SPDT MIN. RELAY (RC)
60-0930	4031-8110	110V AC 10A SPDT MIN. RELAY
60-0935	4031-8240	240V AC 10A SPDT MIN. RELAY (RC)
60-1010	4061-9006	6V DC 16A SPDT MIN. RELAY (RC)
60-1015	4061-7012	12V DC 16A SPDT MIN. RELAY (RC)
60-1040	4061-7024	24V DC 16A SPDT MIN. RELAY (RC)
60-1045	4061-9048	48V DC 16A SPDT MIN. RELAY (RC)
60-1070	4061-8024	24V AC 16A SPDT MIN. RELAY
60-1080	4061-8240	240V AC 16A SPDT MIN. RELAY (RC)
60-1110	4052-9006	6V DC DPDT 8A MIN. RELAY (RC)
60-1115	4052-7012	12V DC DPDT 8A MIN. RELAY (RC)
60-1140	4052-7024	24V DC DPDT 8A MIN. RELAY (RC)
60-1145	4052-9048	48V DC DPDT 8A MIN. RELAY (RC)
60-1170	4052-8024	24V AC DPDT 8A MIN. RELAY (RC)
60-1175	4052-8110	110V AC DPDT 8A MIN. RELAY (RC)
60-1180	4052-8240	240V AC DPDT 8A MIN. RELAY (RC)

PCB power relays	Page 1 of 10
The enclosed information is believed to be correct, Information may change without notice due to product improvement. Users should ensure that the product is suitable for their use. E. & O. E.	Revision A 20/02/2007

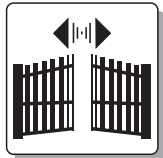
40 SERIES

MINIATURE P.C.B. RELAYS 5-10-16 A



- a range of miniature P.C.B. relays, with 1 or 2 CO (SPDT or DPDT) contacts
- NO contact circuits available
- P.C.B. or plug-in versions available
- AC, DC, DC sensitive or single bistable coil versions available
- sealed version available - sealed version has special removable pip to avoid ozone accumulation when relay is working
- 8 mm between coil and contacts in accordance with VDE 0700
- sockets and accessories: see 95, 99.01 and 99.80 series
- approvals (according to type): BBJ, BEAB, DEMKO, FIMKO, IMO, NEMKO, RINA, SEMKO, SEV, cUL, UTE, VDE

DOOR, GATE
OPENERS



WHITE-GOODS



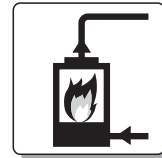
ALARM SYSTEMS



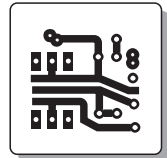
INDUSTRIAL
AUTOMATION



BURNERS



ELECTRONIC
APPLIANCES



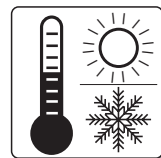
TIMERS



INDUSTRIAL
APPLIANCES



CONDITIONING



MEDICAL
EQUIPMENT





40.31



MINIATURE P.C.B. RELAY

- TYPE 40.31** 1 CO (SPDT) 10 A - 3.5 mm pinning
- TYPE 40.51** 1 CO (SPDT) 10 A - 5 mm pinning
- tin plated pins for P.C.B.
- standard contact material: Ag Ni
- Options:
- TYPE 40.31-0300** 1 NO (SPST) 10 A - 3.5 mm pinning
- TYPE 40.51-0300** 1 NO (SPST) 10 A - 5 mm pinning
- options: see coding table page 13
- ordering information: see page 13

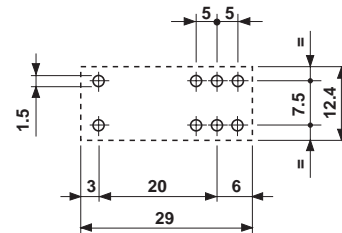
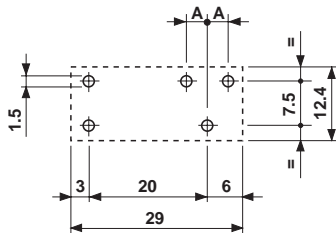
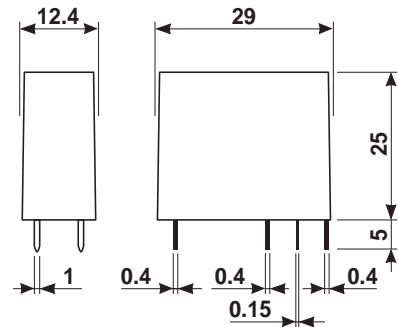
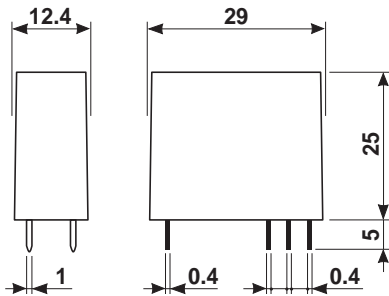


40.52

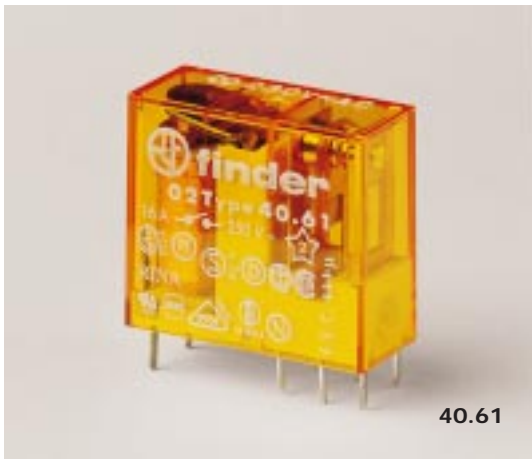


MINIATURE P.C.B. RELAY

- TYPE 40.52** (DPDT) 2 CO 5 A - 5 mm pinning
- tin plated pins for P.C.B.
- standard contact material: Ag Ni
- Options:
- TYPE 40.52-0300** 2 NO (DPST) 5 A - 5 mm pinning
- options: see coding table page 13
- ordering information: see page 13



A: 40.31 = 3.5 mm
 A: 40.51 = 5 mm



40.61



MINIATURE P.C.B. RELAY

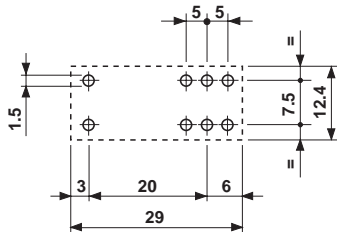
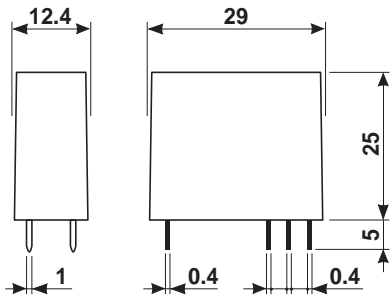
TYPE 40.61 1 CO (SPDT) 16 A - 5 mm pinning

- tin plated pins for P.C.B.
- standard contact material: Ag CdO

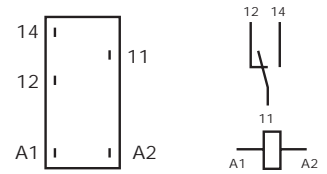
Options:

TYPE 40.61-0300 1 NO (SPST) 16 A - 5 mm pinning

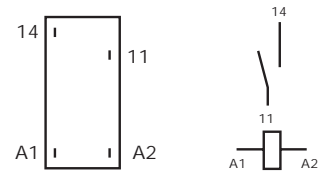
- options: see coding table page 13
- ordering information: see page 13



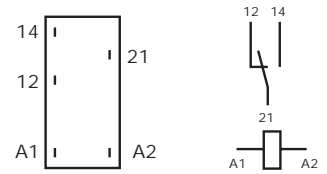
TYPE 40.31 (1 CO - SPDT)



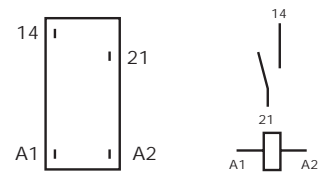
TYPE 40.31 (1 NO - SPST)



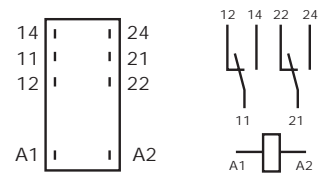
TYPE 40.51 (1 CO - SPDT)



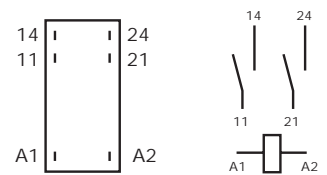
TYPE 40.51 (1 NO - SPST)



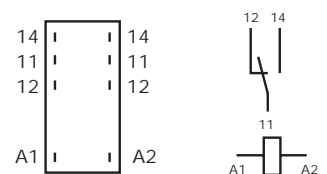
TYPE 40.52 (2 CO - DPDT)



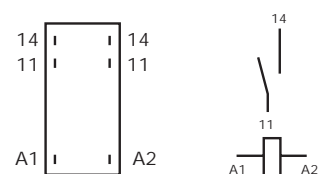
TYPE 40.52 (2 NO - DPST)





TYPE 40.61 (1 CO - SPST)



TYPE 40.61 (1 NO - SPST)



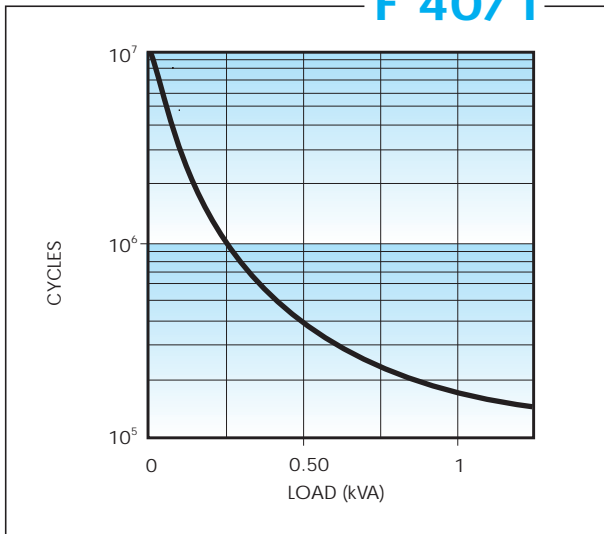
TECHNICAL DATA

DIELECTRIC STRENGTH tested at: leakage current ≤ 10 mA for 1 min at 50 Hz	between coil and contacts	4000 V
	between open contacts	1000V
	between adjacent contacts	2000 V
	between frame and live parts	relay without external ground
SURGE TEST (1.2/50 μs) between coil and contacts	6000 V	
INSULATION RESISTANCE	≥ 20 · 10 ³ MΩ	
INSULATION GROUP	C 250 (1 CO) B 250 (2 CO)	
INSULATION DISTANCES	≥ 8 mm between coil and contacts according to VDE 0700	
MAXIMUM SWITCHING FREQUENCY - without load - at rated load - at rated load	36000 cycles/h 1800 cycles/h (5 - 10 A) 600 cycles/h (16 A)	
AMBIENT TEMPERATURE	- 40 to + 70°C	
MECHANICAL LIFE	10 · 10 ⁶ cycles (AC) 20 · 10 ⁶ cycles (DC)	
PROTECTION CATEGORY OF ENCLOSURES	IP 40/IP 67 (sealed version)	
OPERATE AND RELEASE TIME - pick-up time (from 0 to U _N) - drop-out time (from U _N to 0)	≤ 15 ms (including contact bounce) ≤ 20 ms (including contact bounce)	
TYPE OF DUTY:	continuous	
PICK-UP CLASS	C (according to IEC 255)	
DIELECTRIC TEST	 1 CO  2 CO	
TYPE OF RELAY	all - or - nothing	

CONTACT SPECIFICATION

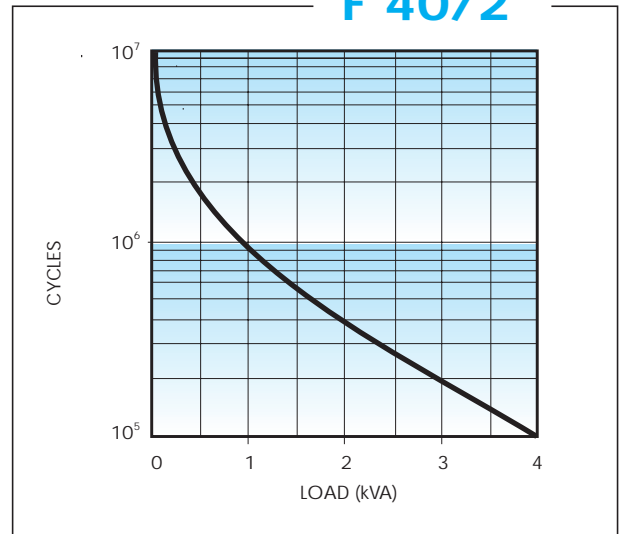
	40.31 - 40.51	40.52	40.61
NOMINAL RATE IN AC1	2500 VA	1250 VA	4000 VA
RATED CURRENT	10 A	5 A	16 A
MAXIMUM PEAK CURRENT	20 A	10 A	30 A
RATED VOLTAGE	250 V AC	250 V AC	250 V AC
MAXIMUM SWITCHING VOLTAGE	400 V AC	400 V AC	400 V AC
BREAKING CAPACITY IN DC1	see diagram H 40		
SINGLE PHASE HP MOTORS RATING 250 V	0.37 kW/0.3 HP	0.185 kW/0.2 HP	0.55 kW/0.5 HP
CONTACT RESISTANCE: - initial	≤ 50 mΩ	≤ 50 mΩ	≤ 50 mΩ
MINIMUM SWITCHING LOAD	300 mVA/5V/5 mA	300 mVA/5V/5 mA	300 mVA/10V/5 mA
STANDARD CONTACT MATERIAL	Ag Ni	Ag Ni	Ag CdO

F 40/1



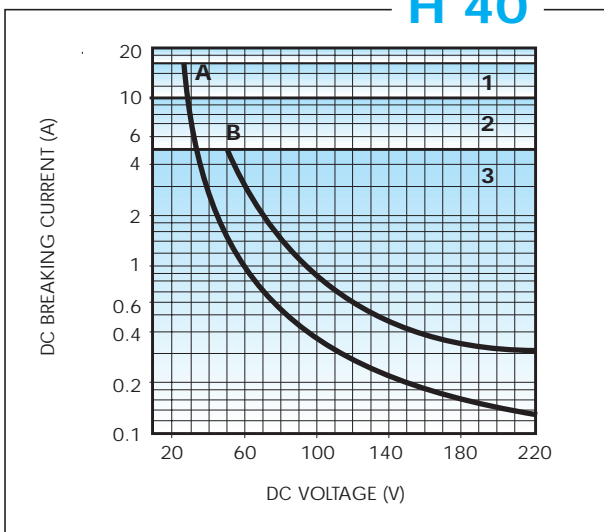
Contact life vs AC1 load.
Relay type 40.52 (5 A) at 1800 cycles/h.

F 40/2



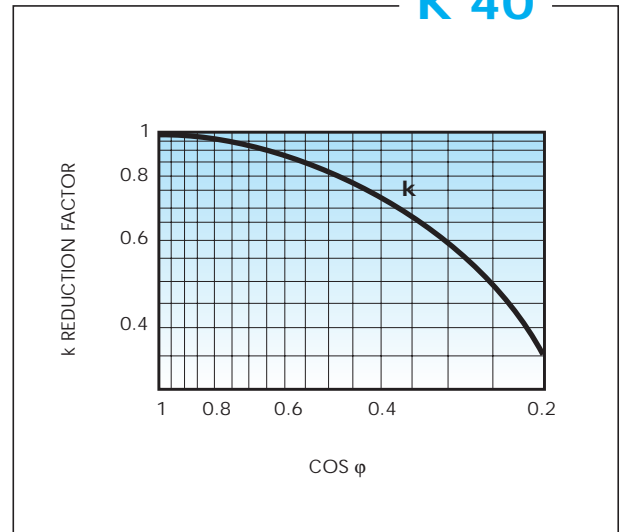
Contact life vs AC1 load.
Relay type 40.31 - 40.51 (10 A) at 1800 cycles/h.
Relay type 40.61 (16 A) at 600 cycles/h.

H 40



Breaking capacity for DC1 load.
1 - relay type 40.61 at 600 cycles/h
2 - relay type 40.31 - 40.51 at 1800 cycles/h
3 - relay type 40.52 at 1800 cycles/h
A - load applied to 1 contact
B - load applied to 2 contacts in series

K 40



Load reduction factor vs cos φ.

COIL SPECIFICATION

VERSIONS:

AC - alternating current 50 ÷ 60 Hz

DC - direct current

S sensitive - DC voltage with low absorption

	AC	DC	DC <i>sensitive</i>
RATED POWER	1.2 VA	0.65 W	0.5 W
MINIMUM POWER	0.6 VA	0.35 W	0.25 W
OPERATING RANGE	$(0.8 \div 1.1) U_N$	see diagram R 40/1	see diagram R 40/2
HOLDING VOLTAGE	$\leq 0.8 U_N$	$\leq 0.4 U_N$	$\leq 0.4 U_N$
MUST DROP-OUT VOLTAGE	$\geq 0.2 U_N$	$\geq 0.1 U_N$	$\geq 0.1 U_N$
NOMINAL MAGNETOMOTIVE FORCE	200 A	180 A	150 A
THERMAL INSULATION CLASS OF WIRE	F (+155°C)	F (+155°C)	F (+155°C)
THERMAL RESISTANCE	68 °C/W	68 °C/W	68 °C/W
CONDUCTED DISTURBANCE IMMUNITY	BURST (acc. to EN 61000 - 4 - 4) SURGE (acc. to EN 61000 - 4 - 5)	level 4 (4 kV) level 3 (2 kV)	

DC VERSION DATA (R values relate to +20°C.
Tolerance of R and I values: ±10%.)

nominal voltage U_N (V)	U min (V)	U max (V)	resistance R (Ω)	absorption I a U_N (mA)
4.5	3.3	6.75	30	150
6	4.4	9	55	109
7	5.1	10.5	75	93
9	6.6	13.5	125	72
12	8.8	18	220	55
14	10.2	21	300	47
18	13.1	27	500	36
21	15.3	31.5	700	30
24	17.5	36	900	27
28	20.5	42	1200	23
36	26.3	54	2000	18
48	35	72	3500	14
60	43.8	90	5500	11
90	65.7	135	12500	7.2
110	80.3	165	18000	6.1
125	91.2	188	23500	5.3

SENSITIVE DC VERSION DATA (R values relate to +20°C.
Tolerance of R and I values: ±10 %.)

nominal voltage U_N (V)	U min (V)	U max (V)	resistance R (Ω)	absorption I a U_N (mA)
5	3.7	8.8	50	100
6	4.4	10.5	75	80
7	5.1	12.2	100	70
9	6.6	15.8	160	56
12	8.8	21	300	40
14	10.2	24.5	400	35
18	13.2	31.5	650	27.7
21	15.4	36.9	900	23.3
24	17.5	42	1200	20
28	20.5	49	1600	17.5
36	26.3	63	2600	13.8
48	35	84	4800	10
60	43.8	105	7200	8.3
90	65.7	157	16200	5.5
110	80.3	192	23500	4.7
125	91.2	218	32000	3.9

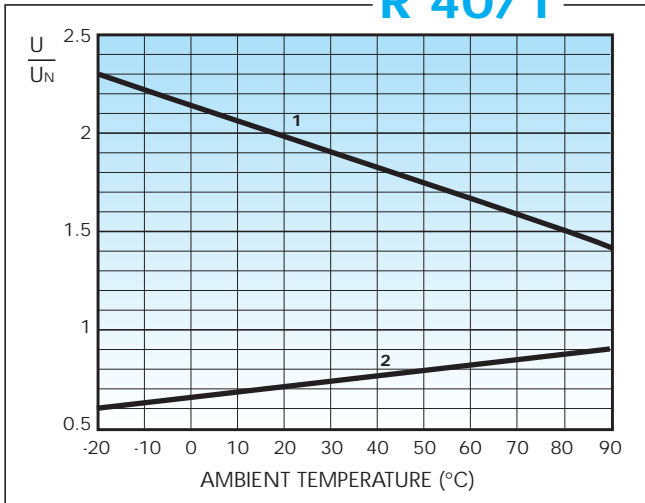
Sensitive DC coils for 40.61 type: $U_{min} = 0.8 U_N$.

AC VERSION DATA (R values relate to +20°C. Tolerance of R and I values: ±10%.)

nominal voltage U_N (V)	U min (V)	U max (V)	resistance R (Ω)	nominal coil absorption I at U_N (50 Hz) (mA)	inductance with closed armature (H)
6	4.8	6.6	21	168	0.092
12	9.6	13.2	80	90	0.34
24	19.2	26.4	320	45	1.3
48	38.4	52.8	1350	21	5.8
60	48	66	2100	16.8	9.2
110	88	121	6900	9.4	30
125	100	138	9000	8.4	37
230	184	253	28000	4.5	132
240	192	264	31500	4.1	157

COIL SPECIFICATION

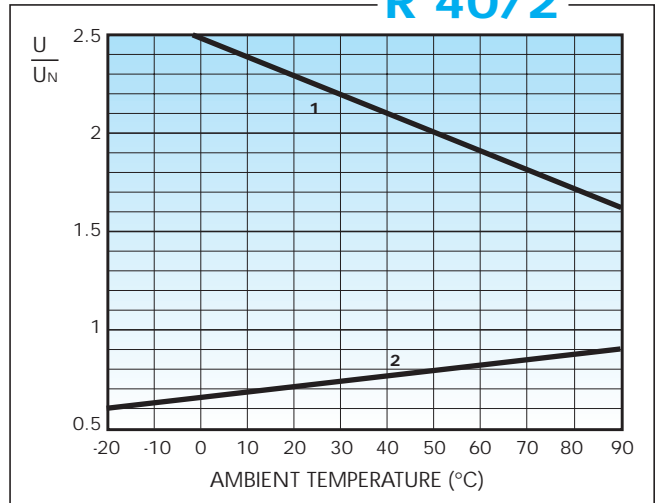
R 40/1



Operating range (DC type) vs ambient temperature.

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

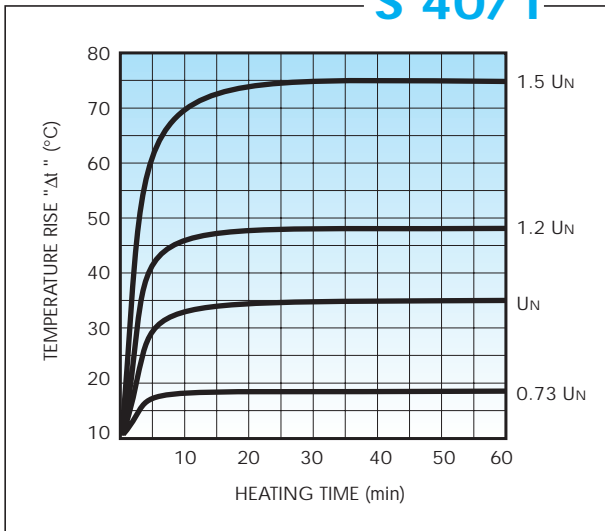
R 40/2



Operating range (DC sensitive type) vs ambient temperature.

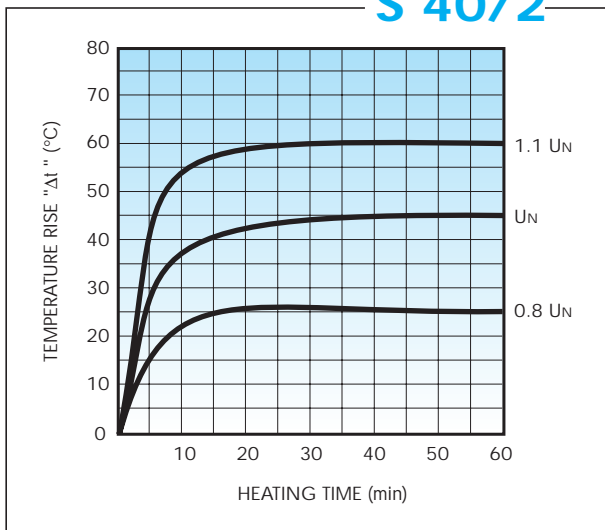
- 1 - Max coil voltage permitted
- 2 - Min pick-up voltage with coil at ambient temperature

S 40/1



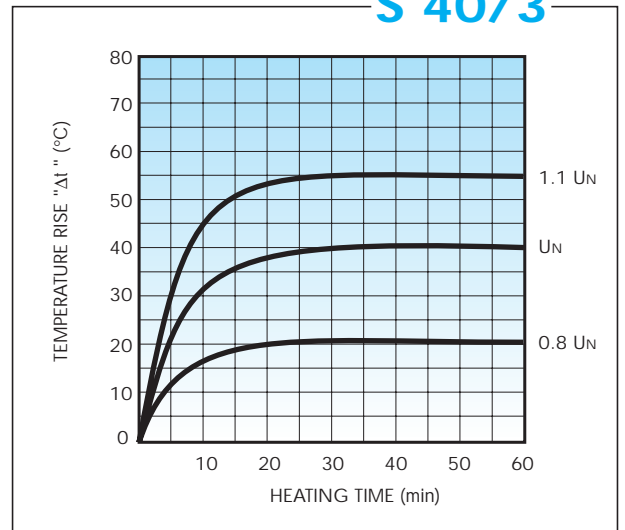
Temperature rise "Δt " vs applied voltage. DC coils.

S 40/2



Temperature rise "Δt " vs applied voltage. AC 50 Hz coils.

S 40/3

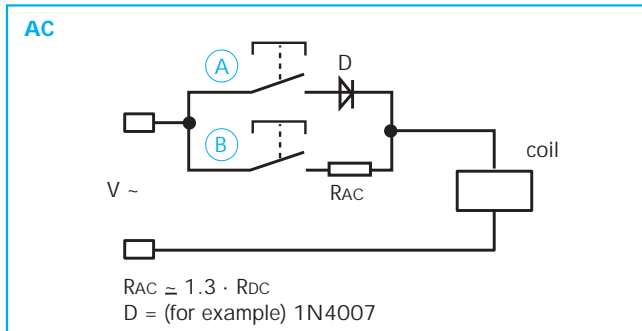


Temperature rise "Δt " vs applied voltage. AC 60 Hz coils.

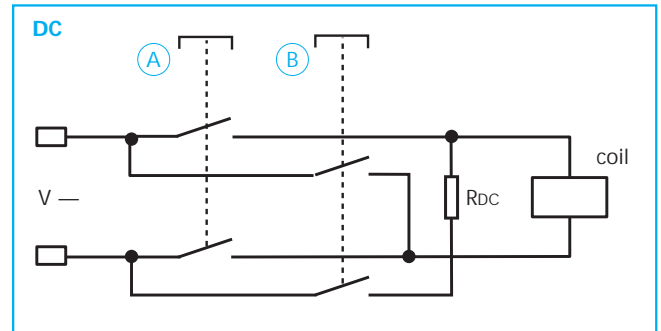
BISTABLE COIL SPECIFICATION

RATED POWER	1.1 W
MINIMUM POWER	0.7 W
OPERATING RANGE	$(0.8 \div 1.1) U_N$
NOMINAL MAGNETOMOTIVE FORCE	230 A
MINIMUM IMPULSE DURATION	20 ms
MAXIMUM IMPULSE DURATION	continuous
THERMAL INSULATION CLASS OF WIRE	F (+155°C)

DRIVING CIRCUIT (AC - DC)



- (A) push once to pick-up
- (B) push once to drop-out



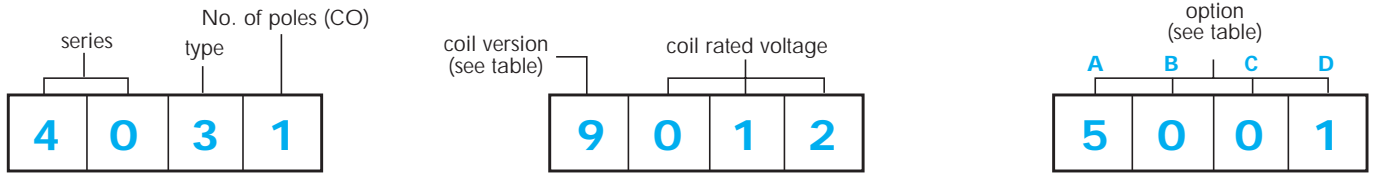
- (A) push once to pick-up
- (B) push once to drop-out

BISTABLE VERSION DATA (R values relate to +20°C. Tolerance of R and I values: $\pm 10\%$. Bistable coils: release resistance is not supplied.)

nominal voltage U_N (V)	U min (V)	U max (V)	resistance coil R (Ω)	nominal coil absorption $I_a U_N$ (DC) (mA)	release resistance R_{bc} (Ω) P=1W
5	4	5.5	23	215	37
6	4.8	6.6	33	165	62
12	9.6	13.2	130	83	220
24	19.2	26.4	520	40	910
48	38.4	52.8	2100	21	3600
110	88	121	11000	10	16500

ORDERING INFORMATION

Example: a 40 series sealed relay with 3.5 mm pinning and 1 CO (SPDT) contact, coil rated at 12 V DC with gold plated contacts.
For standard relays with no options, use the first 8 digits only.



COIL VERSIONS

Code	Coil types		Cover colour
9	DC	Direct current	blue transparent cover
8	AC	Alternating current at 50 + 60 Hz	orange transparent cover
7	S	Sensitive - DC voltage with low consumption	blue transparent cover
6	BS	Bistable (single winding)	green transparent cover

OPTIONS

A	contact material	B	contact circuit	C	light and mechanical indicators	D	special application
0	standard	0	standard	0	standard	0	standard
2	Ag CdO 90/10	3	NO			1	sealed version
3	Ag CdO 85/15						
4	Ag SnO ₂						
5	Ag Ni + Au (5μ)						

OPTIONS AVAILABLE

relay type	A	B	C	D
40.31 - 40.51	2 - 3 - 4 - 5	3	—	1
40.52	2 - 3 - 4 - 5	3	—	1
40.61	3 - 4	3	—	1



SEALED VERSION

Suitable for fully automated soldering and washing processes.



REMOVABLE VENTILATION PIP

Sealed version has special removable pip to avoid ozone accumulation when the relay is working.