

Miniature High Power Relay

TH

Features

- DC & AC voltage coil type
- Low height: 15.7mm
- 16A switching capability
- 5kV dielectric strength
(between coil and contacts)
- Creepage distance: 10mm
- Meeting VDE 0700, 0631 reinforce insulation
- Product in accordance to IEC 60335-1 available
- Class F & Class B insulation system
- Plastic sealed Type
- Socket available



(File No.:E134581)



(File No.: 40038122)

1. COIL DATA (at 23°C)

1) DC coil

Nominal Voltage (VDC)	Pick-up Voltage(VDC) ¹⁾	Drop-out Voltage(VDC) ¹⁾	Max. Allowable Voltage(VDC) ²⁾	Coil Current (mA)(±10%)	Coil Resistance (Ω)	Coil Power (mW)
5	3.50	0.5	7.5	80.0	62 x (1±10%)	Approx. 400
6	4.20	0.6	9.0	66.7	90 x (1±10%)	
9	6.30	0.9	13.5	44.4	202 x (1±10%)	
12	8.40	1.2	18	33.3	360 x (1±10%)	
18	12.6	1.8	27	22.2	810 x (1±10%)	
24	16.8	2.4	36	16.7	1440 x (1±10%)	
48 ³⁾	33.6	4.8	72	8.33	5760 x (1±15%)	
60 ³⁾	42	6.0	90	6.67	7500 x (1±15%)	
110 ³⁾	77	11	165	3.64	25200 x (1±15%)	

2) AC coil (at 50Hz)

Nominal Voltage (VAC)	Pick-up Voltage (VAC) Max. ¹⁾	Drop-out Voltage (VAC) Min. ¹⁾	Coil Current (mA)	Coil DC Resistance (Ω)	Coil power (VA)
24	18.00	3.60	31.6	350 x (1±10%)	Approx. 0.75
115	86.30	17.3	6.60	8100 x (1±15%)	
230	172.5	34.5	3.20	32500 x (1±15%)	

Notes: 1) The data shown above are initial values.

2) The maximum allowable voltage refers to the maximum voltage which relay coil could endure in a very short time.

3) For products with nominal voltage ≥48VDC, measures should be taken to prevent coil overvoltage in order to protect coil in test and application (eg. Connect diodes in parallel).

2. CONTACT DATA

Contact Arrangement			1A, 1B, 1C	2A, 2B, 2C
Contact Resistance ¹⁾			100mΩ max. (at 1A 6VDC)	
Contact Material			AgNi	
Contact Ratings (Resistive load)			12A 250VAC	16A 250VAC 8A 250VAC*
Max. Switching Voltage			440VAC / 300VDC	
Max. Switching Current			12A	16A 8A
Max. Switching Power			3000VA	4000VA 2000VA
Life Expectancy	Electrical	DC coil	100,000 operations	
		AC coil	50,000 operations	
	Mechanical	DC coil	10,000,000 operations	
		AC coil	1,000,000 operations	

Notes: 1) The data shown above are initial values.

3. CHARACTERISTICS

Insulation Resistance			1000MΩ (at 500VDC)
Dielectric Strength	Open Contacts		1000VAC 1min
	Coil and Contacts		5000VAC 1min
	Contact Sets		2500VAC 1min
Surge voltage (between coil and contacts)		DC coil	10kV (1.2 / 50μs)
Operate Time (at nominal voltage)		DC coil	15ms max.
Release Time (at nominal voltage)		DC coil	8ms max.
Temperature rise (at nominal voltage)		DC coil	55K max.
		AC coil	85K max.
Temperature Range		DC coil	-40℃ ~ 85℃
		AC coil	-40℃ ~ 70℃
Shock Resistance*	Functional		98m/s ²
	Destructive		980m/s ²
Vibration Resistance*			10 ~ 150Hz 10g/5g
Humidity			5 ~ 85% RH
Termination			PCB
Weight			Approx. 13.5g
Outline Dimension (L x W x H)			29.0 x 12.7 x 15.7mm

Notes: 1) The data shown above are initial values.

2) *Index is not in relay length direction.

4. ORDERING INFORMATION

TH	1	-	H	12	S	F	(XX)
①	②		③	④	⑤	⑥	⑦
① Relay Model	TH						
② Contact Arrangement	11: 1 Form A (SPST-NO) 1B: 1 Form B (SPST-NC) 1: 1 Form C (SPDT) 22: 2 Form A (DPST-NO) 2B: 2 Form B (DPST-NC) 2: 2 Form C (DPDT)						
③ Contact Current	Nil: 8A (5.0mm pinning, 2poles) E: 16A (5.0mm pinning, 1pole) H: 12A (3.5mm pinning, 1pole) Q: 12A (5.0mm pinning, 1pole)						
④ Coil Voltage	DC: 5=5VDC, 6=6VDC, 9=9VDC, 12=12VDC, 18=18VDC, 24=24VDC, 48=48VDC, 60=60VDC, 110=110VDC AC: A24=24VAC, A115=115VAC, A230=230VAC						
⑤ Construction	S: Sealed Type						
⑥ Insulation Standard	Nil: Class B F: Class F						
⑦ Customer Special Code	(XX): May be followed by additional letters and/or numbers (Does not affect the construction)						

5. SAFETY APPROVAL

UL/cUL	TH1(11)-H***S(F), TH1(11)-Q***S(F)	12A 277VAC, 12A 250VAC
	TH1(11)-E***S(F)	16A 277VAC, 16A 250VAC 5FLA, 30LRA 250VAC
	TH2(22)-***S(F)	8A 277VAC, 8A 250VAC 10A 250VAC
VDE	TH1(11)-H***S(F), TH1(11)-Q***S(F)	12A 250VAC at 85°C/70°C
	TH1-E***S(F)	16A 250VAC (NO only) at 85°C/70°C 12A 250VAC at 85°C 9A 250VAC COSΦ=0.4 (NO only) at 70°C 10(4)A 250VAC (NO only) at 65°C 12(2)A 250VAC (NO only) at 65°C
	TH11-E***S(F)	16A 250VAC at 85°C/70°C 9A 250VAC COSΦ=0.4 at 70°C
	TH2(22)-***S(F)	8A 250VAC at 85°C/70°C 5A 400VAC at 85°C

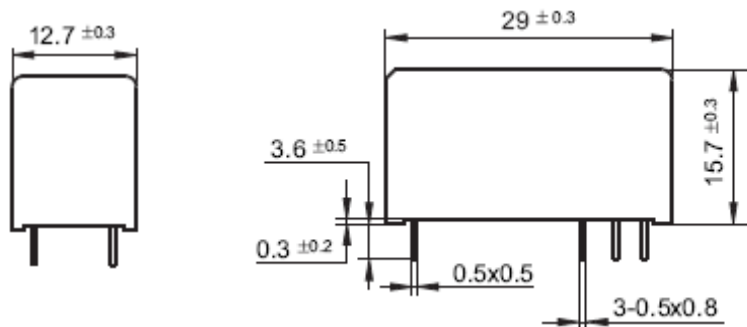
Notes: 1) All values unspecified are at room temperature.

2) Only typical loads are listed above. Other load specifications can be available upon request.

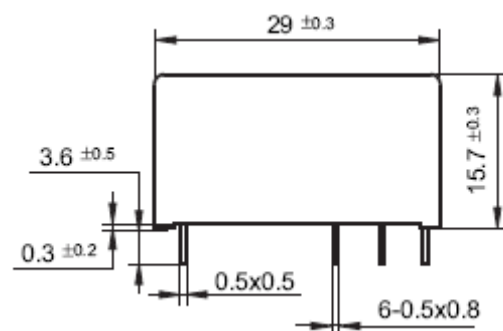
6. DIMENSIONS (Unit: mm)

Outline Dimensions

3.5mm pinning (1pole, 12A)

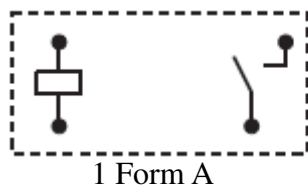


5mm pinning (1pole 12A, 1pole 16A, 2pole 8A)

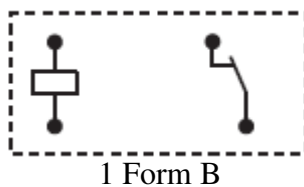


Wiring Diagram (Bottom View)

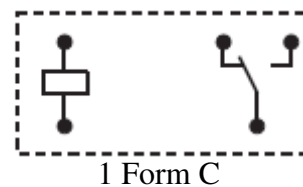
3.5/5mm pinning (1pole, 12A)



1 Form A

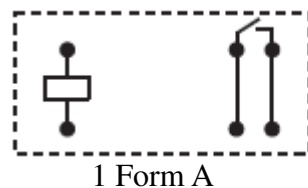


1 Form B

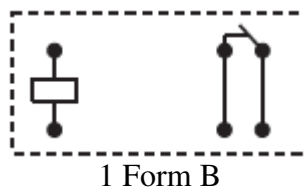


1 Form C

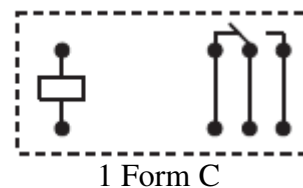
5mm pinning (1pole, 16A)



1 Form A

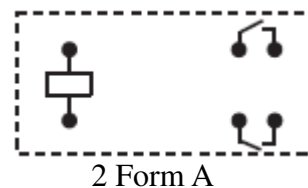


1 Form B

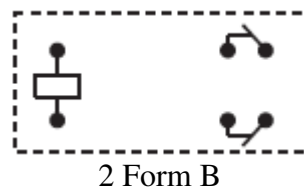


1 Form C

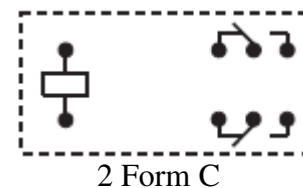
5mm pinning (2pole, 8A)



2 Form A



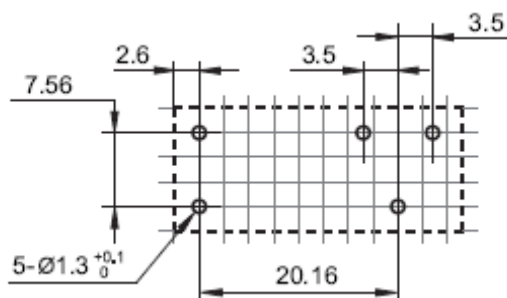
2 Form B



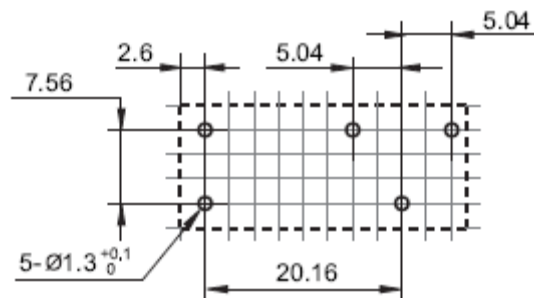
2 Form C

PCB Layout (Bottom view)

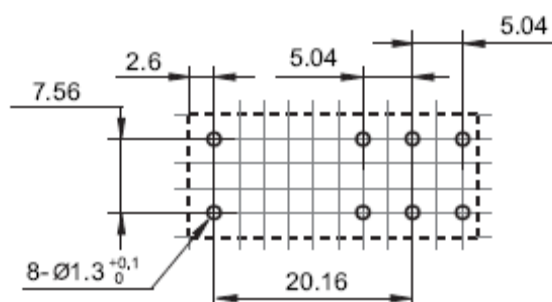
3.5mm 1Pole 12A



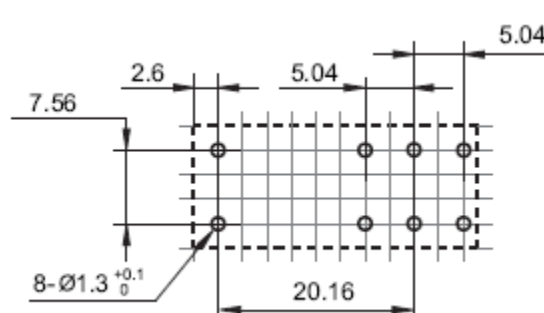
5mm 1Pole 12A



5mm 1Pole 16A



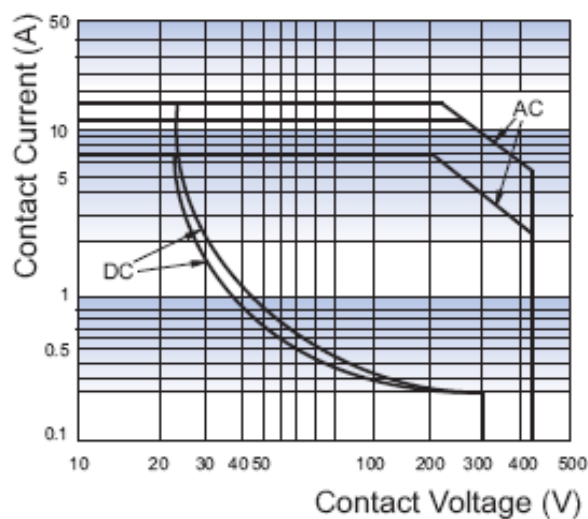
5mm 2Pole 8A



- Remark:** 1) In case of no tolerance shown in outline dimension: outline dimension $\leq 1\text{mm}$, tolerance should be $\pm 0.2\text{mm}$; outline dimension $> 1\text{mm}$ and $\leq 5\text{mm}$, tolerance should be $\pm 0.3\text{mm}$; outline dimension $> 5\text{mm}$, tolerance should be $\pm 0.4\text{mm}$.
- 2) The tolerance without indicating for PCB layout is always $\pm 0.1\text{mm}$
- 3) The width of the gridding is 2.52mm.

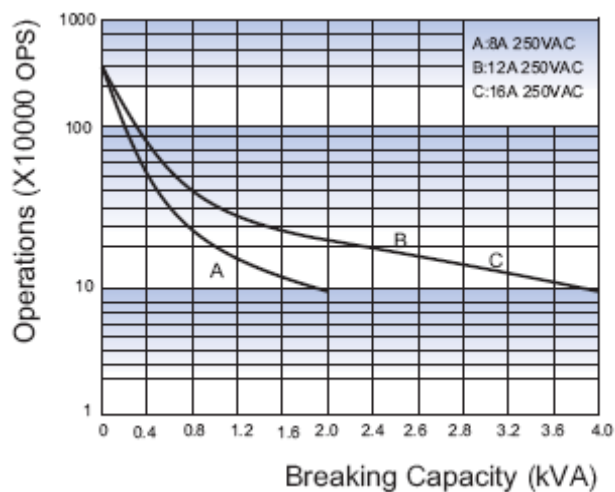
7. CHARACTERISTIC CURVES

Maximum Switching Power

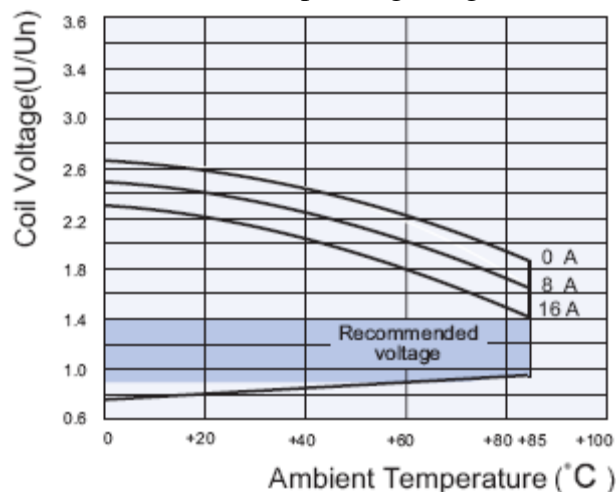


1) DC coil

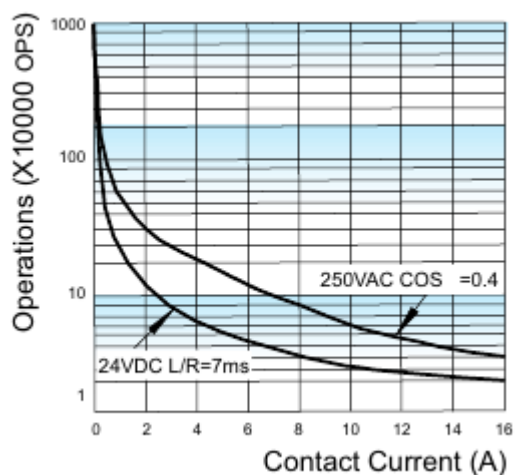
Endurance Curve (Resistive)



Coil Operating Range*



Endurance Curve (Inductive)



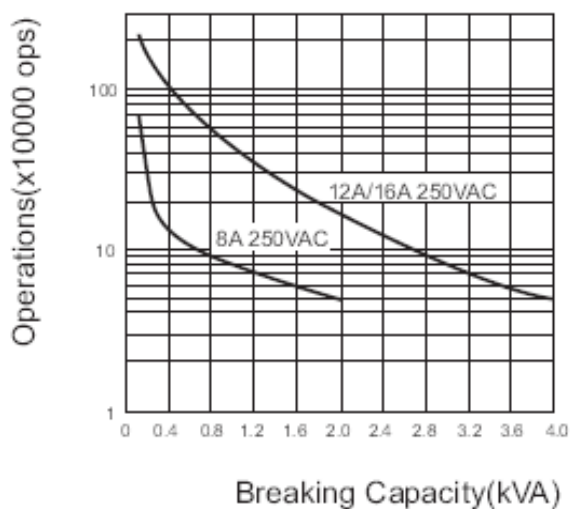
Note: *Coil Operating Range

The use of a relay with an energizing voltage other than the rated coil voltage may lead to reduced electrical life.

An energizing voltage over the below range may damage the insulation of relay coil.

2) AC coil

Endurance Curve



Coil Operating Range*

