POWER RELAY

1 POLE—3A to 5 A (CADMIUM FREE CONTACTS TYPE)

VG SERIES

■ FEATURES

- UL, CSA recognized, TV-5 rated
- 1 form A (SPST-NO) or 1 form C (SPDT) contact
- Reliable, low power consumption miniature power relay —Surge strength 7,000 V
- Slim type—meets high density mounting requirement
- Easy circuit design with completely separated terminal arrangement (coil and contact terminals)
- Plastic sealed type backfilled with nitrogen available
- Environmentally friendly cadmium free contact type is available

■ ORDERING INFORMATION

[Example] VG (a) – (∗) 12 (b) H (c) M (d) S (e) E (f) – K (g) – UL (h)

(a)	Series Name	VG: VG Series
(b)	Nominal Voltage	Refer to the COIL DATA CHART
(c)	Contact Rating	Nil : 3 A H : 5 A T : 5 A (only TV-5)
(d)	Contact Arrangement	Nil : 1 form C (SPDT) M : 1 form A (SPST-NO)
(e)	Coil Type	Nil : Standard type S : High sensitivity type (only 3 A type available)
(f)	Contact Material (Rating)	Nil : Gold overlay silver-nickel (3 A, 5 A) Nil : Silver alloy (only TV-5) E : Silver-nickel (3 A, 5 A)
(g)	Enclosure	Nil : Flux free type C : Plastic sealed type (with tape) K : Plastic sealed type
(h)	Standard	UL : UL, CSA approved type

Note: Actual marking omits the hyphen (-) of (∗)

■ SAFETY STANDARD AND FILE NUMBERS

UL508, 873 (File No. E56140)
C22.2 No. 1, No. 14 (File No. LR35579)
Please note that UL/CSA ratings may differ from the standard ratings.

	Type	Nominal voltage	Contact rating
TV-Rating	VG-TM	5 to 48 VDC	TV-5 120 VAC 1/8 HP 120 VAC/240 VAC 5 A 24 VDC/240 VAC resistive (*) Pilot duty C 150
General	VG-H	5 to 48 VDC	1/8 HP 120 VAC/240 VAC 5 A 24 VDC/120 VAC resistive Pilot duty C 150
	VG	5 to 48 VDC	1/10 HP 120 VAC/240 VAC 3 A 30 VDC/120 VAC resistive Pilot duty D 150

* Only UL approval

■ SPECIFICATIONS

Item			Standard Type			High Sensitive Type
			TV-5 Type	5 A Type	3 A Type	3 A Type
			VG-( ) TM	VG-( ) H VG-( ) HE	VG VG-E	VG-S VG-SE
Contact	Arrangement		1 form A (SPST-NO)	1 form A (SPST-NO) or 1 form C (SPDT)		
	Material		Silver alloy	Gold overlay silver alloy (VG-H, VG), silver alloy (VG-HE,E)		
	Style		Single			
	Resistance (initial) (at 1 A 6 VDC)		Maximum 200 mΩ	Maximum 70 mΩ (VG-H,VG), Max. 100 mΩ (VG-HE, E)		
	Rating (resistive)		5 A 120 VAC 5 A 24 VDC		3 A 120 VAC 3 A 30 VDC	
	Maximum Carrying Current		5 A			
	Maximum Switching Power		1,000 VA, 150 W		500 VA, 90 W	
	Maximum Switching Voltage		250 VAC, 150 VDC			
	Maximum Switching Current		5 A		3 A	
	Minimum Switching Load*1		10 mA 5 VDC (VG-H,VG), 100 mA 5 VDC (VG-TM,VG-HE, E)			
Coil	Nominal Power (at 20°C)		0.36 to 0.4 W			0.21 to 0.26 W
	Operate Power (at 20°C)		0.18 to 0.2 W			0.102 to 0.13 W
	Operating Temperature		–40°C to +70°C (no frost)			–40°C to +85°C (no frost)
Time Value	Operate (at nominal voltage)		Maximum 10 ms			
	Release (at nominal voltage)		Maximum 5 ms			
Insulation	Resistance (at 500 VDC)		Minimum 1,000 MΩ			
	Dielectric Strength	between open contacts	900 VAC 1 minute	750 VAC 1 minute		
		between coil and contacts	4,000 VAC 1 minute			
	Surge Strength		7,000 V (at 1.2 × 50 μs)			
Life	Mechanical		1×10^7 operations minimum			
	Electrical		1×10^5 operations minimum (at contact rating)			
Other	Vibration Resistance	Misoperation	10 to 55 Hz (double amplitude of 1.5 mm)			
		Endurance	10 to 55 Hz (double amplitude of 1.5 mm)			
	Shock Resistance	Misoperation	100 m/s^2 (11 ±1 ms)			
		Endurance	1,000 m/s^2 (6 ±1 ms)			
	Weight		Approximately 12 g			

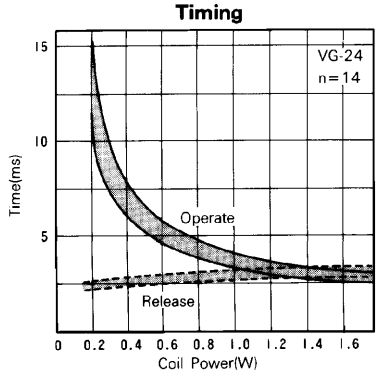
*1 Minimum switching loads mentioned above are reference values. Please perform the confirmation test with the actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

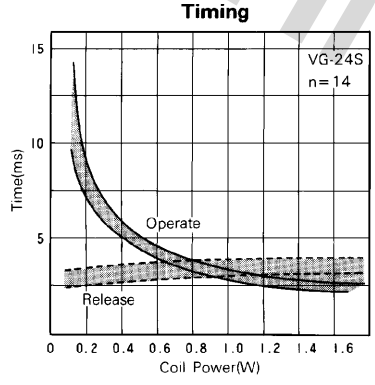
■ COIL DATA CHART

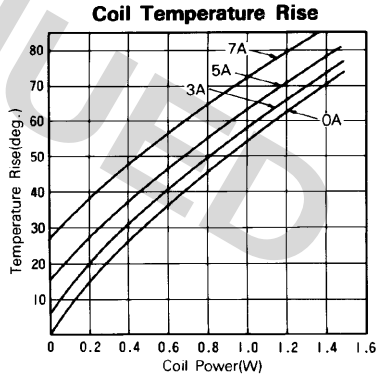
	MODEL			Nominal voltage	Coil resistance (±10%)	Must operate voltage	Must release voltage	Nominal power
	TV	Standard Type						
	5 A Type	5 A Type	3 A Type					
Standard Type	VG- 5TM	VG- 5H (M) (E)	VG- 5 (M) (E)	5 VDC	69 Ω	35 VDC	0.25 VDC	360 mW
	VG- 6TM	VG- 6H (M) (E)	VG- 6 (M) (E)	6 VDC	100 Ω	4.2 VDC	0.3 VDC	360 mW
	VG- 9TM	VG- 9H (M) (E)	VG- 9 (M) (E)	9 VDC	225 Ω	6.3 VDC	0.45 VDC	360 mW
	VG-12TM	VG-12H (M) (E)	VG-12 (M) (E)	12 VDC	400 Ω	8.4 VDC	0.6 VDC	360 mW
	VG-18TM	VG-18H (M) (E)	VG-18 (M) (E)	18 VDC	870 Ω	12.6 VDC	0.9 VDC	380 mW
	VG-24TM	VG-24H (M) (E)	VG-24 (M) (E)	24 VDC	1,450 Ω	16.8 VDC	1.2 VDC	400 mW
	VG-48TM	VG-48H (M) (E)	VG-48 (M) (E)	48 VDC	6,000 Ω	33.6 VDC	2.4 VDC	390 mW
High Sensitive Type			VG- 5 (M) S (E)	5 VDC	120 Ω	3.5 VDC	0.25 VDC	210 mW
			VG- 6 (M) S (E)	6 VDC	150 Ω	4.2 VDC	0.3 VDC	240 mW
			VG- 9 (M) S (E)	9 VDC	325 Ω	6.3 VDC	0.45 VDC	250 mW
			VG-12 (M) S (E)	12 VDC	575 Ω	8.4 VDC	0.6 VDC	250 mW
			VG-18 (M) S (E)	18 VDC	1,400 Ω	12.6 VDC	0.9 VDC	240 mW
			VG-24 (M) S (E)	24 VDC	2,230 Ω	16.8 VDC	1.2 VDC	260 mW

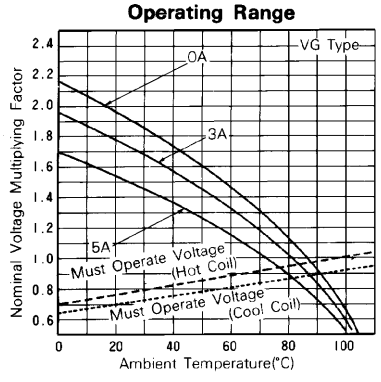
Note: All values in the table are measured at 20°C.

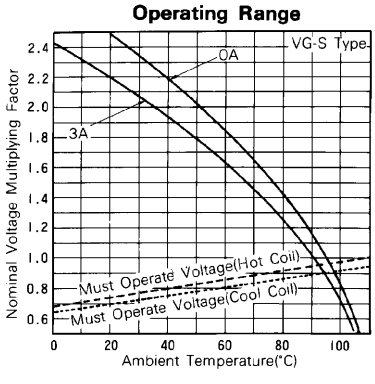
■ CHARACTERISTIC DATA

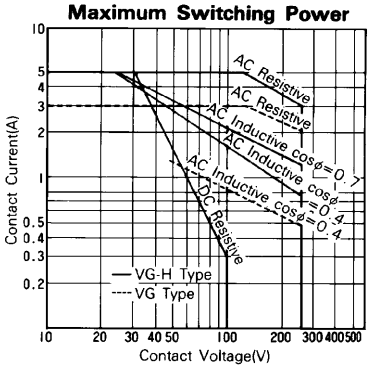




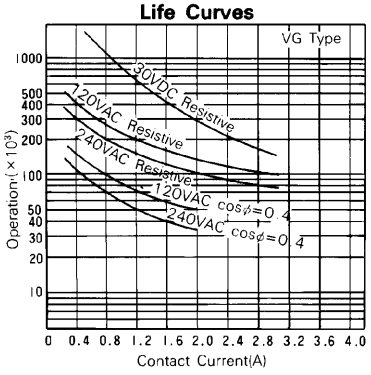








Life Curves



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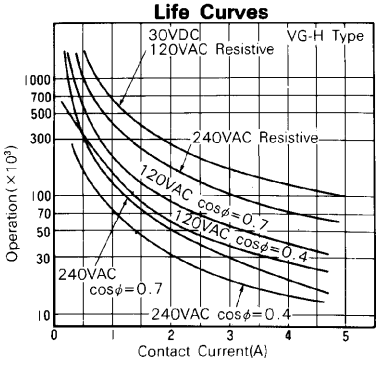
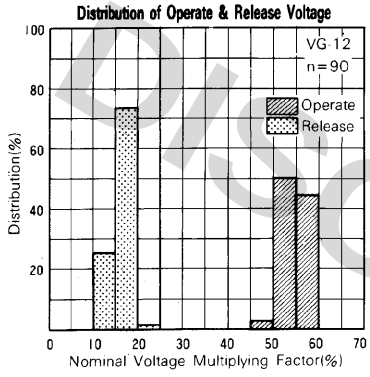
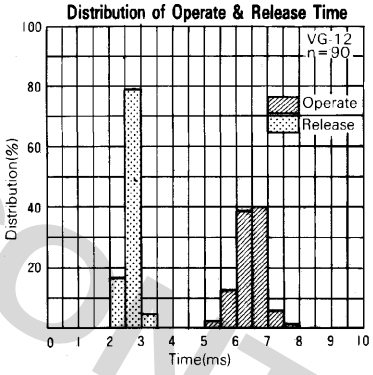


■ REFERENCE DATA

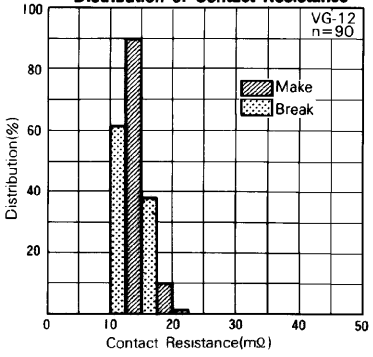
Distribution of Operate & Release Voltage



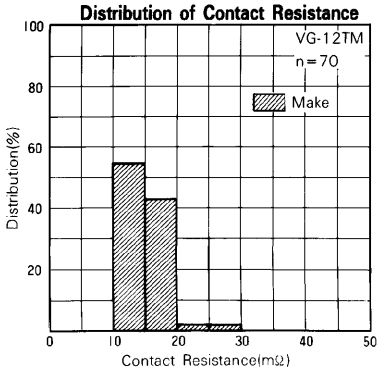
Distribution of Operate & Release Time



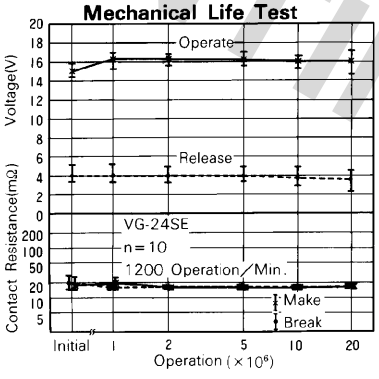
Distribution of Contact Resistance



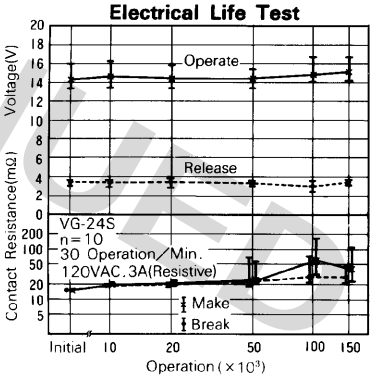
Distribution of Contact Resistance



Mechanical Life Test



Electrical Life Test



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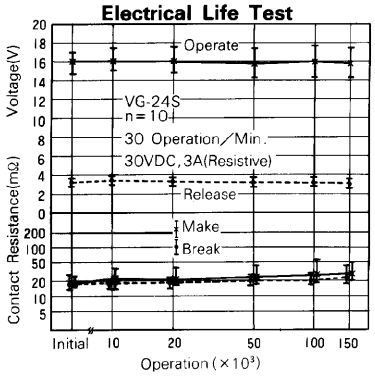

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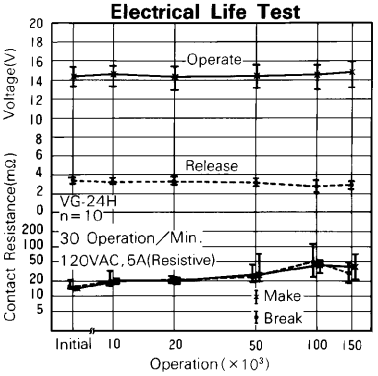
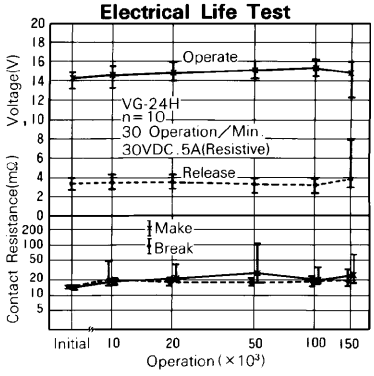


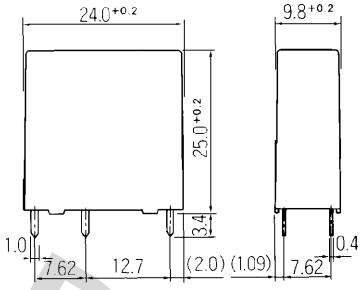
Electrical Life Test



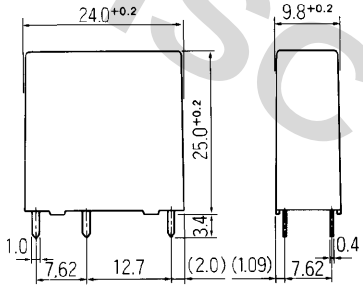
■ DIMENSIONS

● **Dimensions**

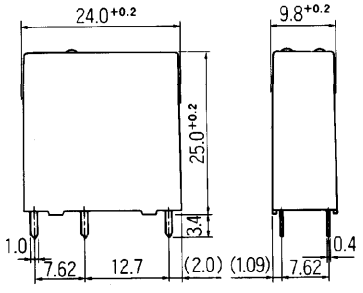
VG-M type



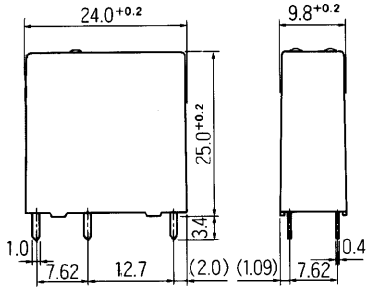
VG type



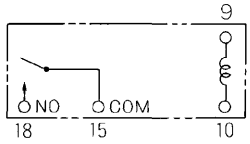
VG-M-K type (Plastic sealed type)

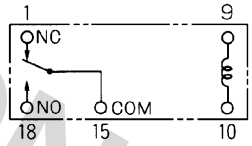


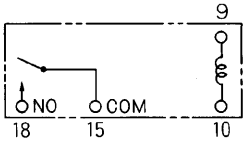
VG-K type (Plastic sealed type)

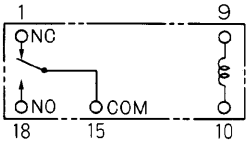


● **Schematics**
(BOTTOM VIEW)

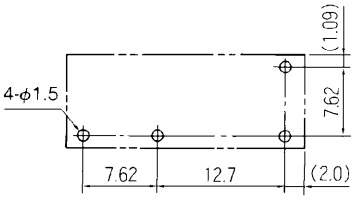


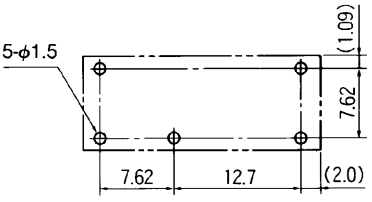


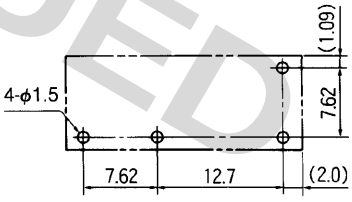


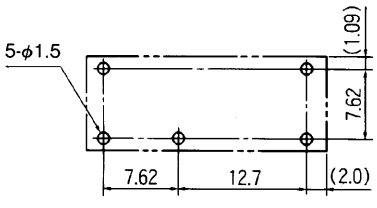


● **PC board mounting hole layout**
(BOTTOM VIEW)





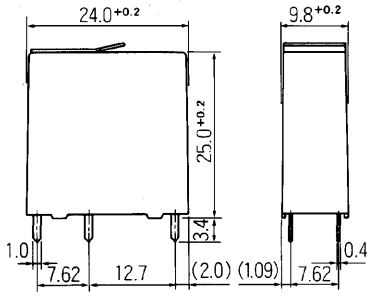




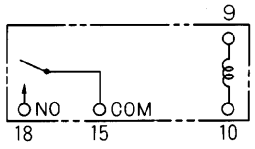
Unit: mm

● **Dimensions**

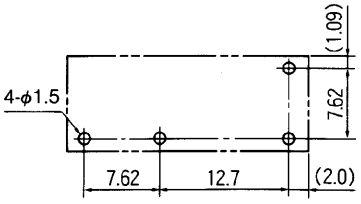
VG-M-C type (Plastic sealed type with tape)



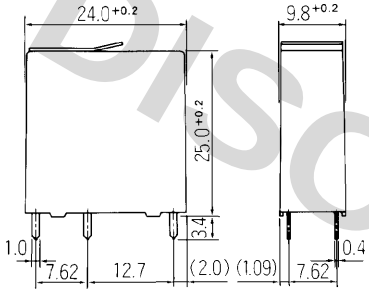
● **Schematics**
(BOTTOM VIEW)

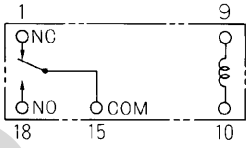


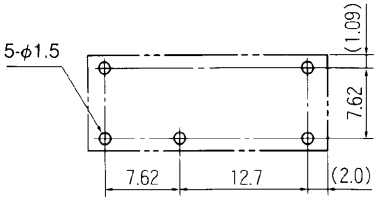
● **PC board mounting hole layout**
(BOTTOM VIEW)



VG-C type (Plastic sealed type with tape)







Unit: mm

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