

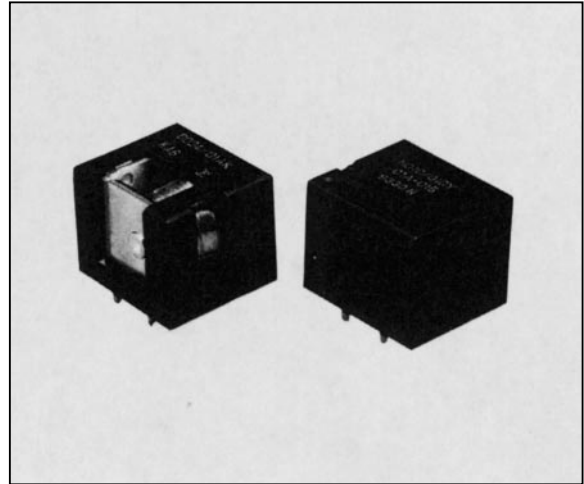
HIGH POWER RELAY

1 POLE-30 A (FOR AUTOMOTIVE APPLICATIONS)

FRL-270 SERIES

■ FEATURES

- Maximum switching current 30 A
- Three type of contact gap (0.4 mm, 1.0 mm, 1.4 mm)
- Various contact materials
- Immersion cleanable type available
- Tube carrier package



■ ORDERING INFORMATION

[Example] $\frac{\text{FRL-274}}{\text{(a)}} \frac{\text{N}}{\text{(b)}} \frac{\text{D}}{\text{(c)}} \frac{\text{012}}{\text{(d)}} \frac{\text{01}}{\text{(e)}} \frac{\text{C}}{\text{(f)}} \frac{\text{S}}{\text{(g)}} - \frac{\text{01A}}{\text{(h)}} - \frac{\text{001}}{\text{(i)}} - \frac{\text{(-S)}}{\text{(j)}}$

(a)	Series Name	FRL-274: FRL-270 series
(b)	Enclosure	Nil : Flux Free Type N : Plastic Sealed Type
(c)	Coil Type	D : Standard (nominal power 1.7 W) H : Low power (nominal power 0.6 W)
(d)	Nominal Voltage	(Example) D09 : 9 VDC D12 : 12 VDC D24 : 24 VDC
(e)	Contact Gap	01 : Standard gap (0.4 mm gap) 51 : 1.0 mm gap 61 : 1.4 mm gap
(f)	Contact Arrangement	A : 1 Form A (SPST-NO) C : 1 Form C (SPDT)
(g)	Contact Material	S : Silver copper Y : Silver-Tin oxide Y : Special silver alloy
(h)	Cover Terminal	A : w/cover, standard terminal width 01A : w/cover, wide terminal width
(i)	Custom Designation	To be assigned custom specification
(j)	Package	Nil : Standard tray -S : Carrier tube

FRL-270 SERIES

■ SPECIFICATIONS

Item		Specifications			
		S Contact Material	Y Contact Material	D Contact Material	
Contact	Arrangement	1 Form A (SPST-NO), 1 Form C (SPDT)			
	Material	Silver copper	Silver-Tin oxide	Special silver alloy	
	Volatage Drop (Resistance)	Max. 300 mV Initial Max. 500 mV After durability test			
	Rating	N.O	12 VDC 15 A, 24 VDC 10 A		12 VDC 30 A
		N.C	12 VDC 10 A, 24 VDC 7 A		
	Gap	01: 0.4 mm gap (Standard gap) 51: 1.0 mm gap 61: 1.4 mm gap			
	Max. Carrying Current	30 A 40 A/10 min. (at 20°C Nominal voltage)			
	Max. Switching Frequency	Mechanical : 18,000 ops./h Electrical : 1,800 ops./h			
	Min. Switching Load (*1) (Reference)	0.6 W min. (0.1 A min.)	0.6 W min. (50 mA min.)	0.6 W min. (0.3 A min.)	
Coil	Nominal Power (Rated Voltage at 20°C)	Standard (D) : Approx. 1.7 W Low power (H) : Approx. 0.6 W 1.4 mm gap Type : Approx. 2.1 W			
	Coil Temperature Rise	Standard (D) : Approx. 75 deg C Low power (H) : Approx. 35 deg C 1.4 mm gap Type : Approx. 85 deg C (Rated Voltage at 20°C)			
	Operating Temperature	-30°C~+85°C (No frost) (Refer to the CHARACTERISTIC DATA)			
	Storage Temperature	-40°C~+100°C (No frost)			
Insulation	Resistance	Min. 100 MΩ (at 500 VDC)			
	Dielectric Strength	AC 500 V 1 min.			
Time Value	Operate (at nominal voltage)	Max. 10 ms			
	Release (at nominal voltage)	Standard gap : Max. 5 ms 1.0 mm gap : Max. 8 ms 1.4 mm gap : Max. 10 ms			
Life	Mecanical	10 × 10 ⁶ ops. min.			
	Electrical	250 × 10 ³ ops. min.			
Other	Vibration Resistance	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 (11 ± ¹ ms)		
	Unit Mass	Approx. 20 g			

*1 Values when switching a resistive load at normal room temperature and humidity and in a clean atomosphere. The minimum applicable load varies with the switching frequency and operating environment.

FRL-270 SERIES

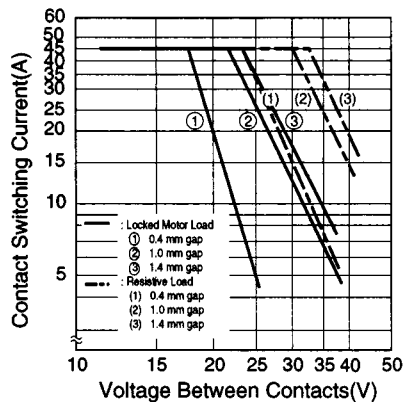
Features of contact material	Contact material	Symbol	Feature
	Silver fin oxide	Y	High durability, long life wiper or lamps
	Silver copper	S	Excellent welding and locking proof against DC load
	Special silver alloy	D	Durable against high in-rush, for head light or heavy load (30 A)

COIL DATA CHART

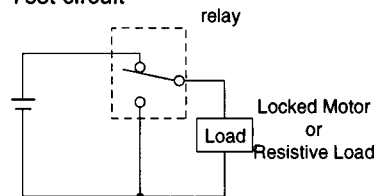
Type	Nominal Voltage	Contact gap	Part number	Coil resistance ($\pm 10\%$) (at 20°C)	Nominal power	Must operate voltage		Must release voltage	Thermal Resistance
						20°C	80°C		
Standard	6 VDC	0.4 mm (Standard)	FRL-274□D006/01 □□-□□A	21Ω	1.7 W	3.3 VDC	4.1 VDC	0.3 VDC	44°C/W
		1 mm	FRL-274□D006/51 □□-□□A	21Ω	1.7 W	4.2 VDC	5.2 VDC	0.3 VDC	
	12 VDC	0.4 mm (Standard)	FRL-274□D012/01 □□-□□A	85Ω	1.7 W	6.5 VDC	8.0 VDC	0.3 VDC	
		1 mm	FRL-274□D012/51 □□-□□A	85Ω	1.7 W	8.4 VDC	10.4 VDC	0.3 VDC	
	24 VDC	1 mm	FRL-274□D024/51 □□-□□A	340Ω	1.7 W	16.8 VDC	21.0 VDC	1.6 VDC	
		1.4 mm	FRL-274□D024/61 □□-□□A	275Ω	2.1 W	16.8 VDC	21.0 VDC	1.6 VDC	
Low Power	4 VDC	0.4 mm (Standard)	FRL-274□H004/01 □□-□□A	27Ω	0.6 W	3.0 VDC	3.7 VDC	0.2 VDC	58°C/W
	6 VDC		FRL-274□H006/01 □□-□□A	60Ω	0.6 W	4.2 VDC	5.2 VDC	0.3 VDC	
	9 VDC		FRL-274□H009/01 □□-□□A	135Ω	0.6 W	6.3 VDC	7.8 VDC	0.5 VDC	
	10 VDC		FRL-274□H010/01 □□-□□A	165Ω	0.6 W	7.0 VDC	8.7 VDC	0.6 VDC	
	12 VDC		FRL-274□H012/01 □□-□□A	240Ω	0.6 W	8.4 VDC	10.4 VDC	0.8 VDC	

CHARACTERISTIC DATA

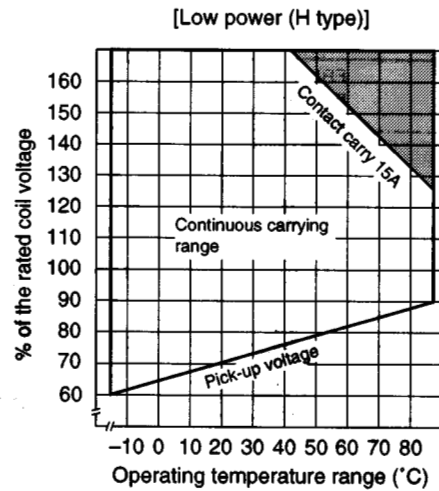
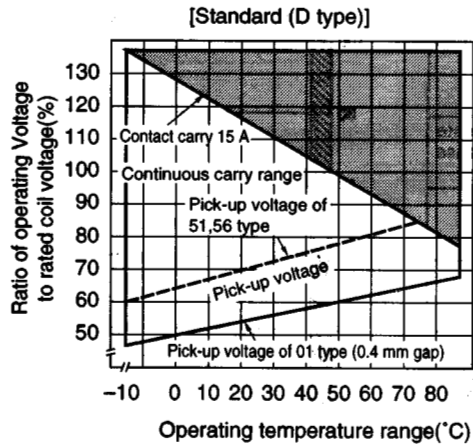
1. MAXIMUM BREAK CAPACITY



Test circuit



2. OPERATING COIL VOLTAGE (EXAMPLE)

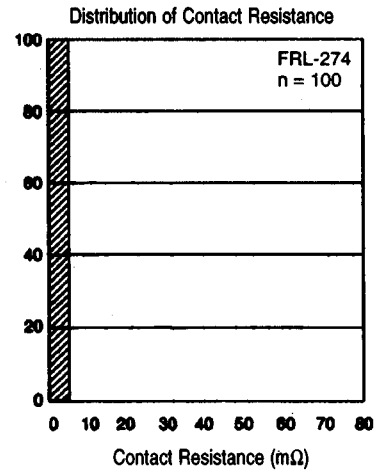
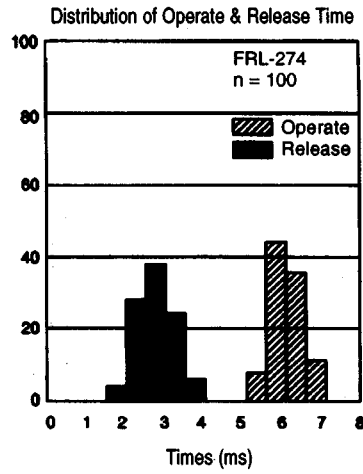
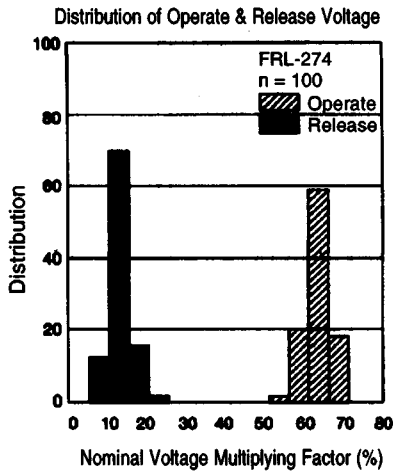


3. LIFE TEST (EXAMPLE)

Test Item	Test circuit
<p>N.O. DC 14 V-65 W × 2 N.C. DC 14 V-60 W × 2 Halogen lamp load 500,000 ops. min. (Contact material: Special silver alloy)</p>	
<p>DC 14 V-30 A Motor lock 100,000 ops. min. (Contact material: Silver copper)</p>	
<p>DC 30 V-1.6 A Motor free 200,000 ops. min. (Contact material: Silver copper)</p>	

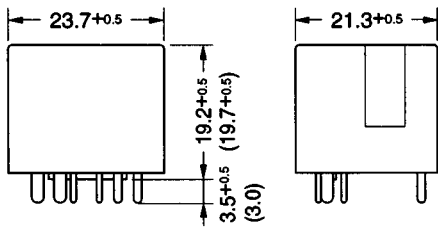
FRL-270 SERIES

REFERENCE DATA



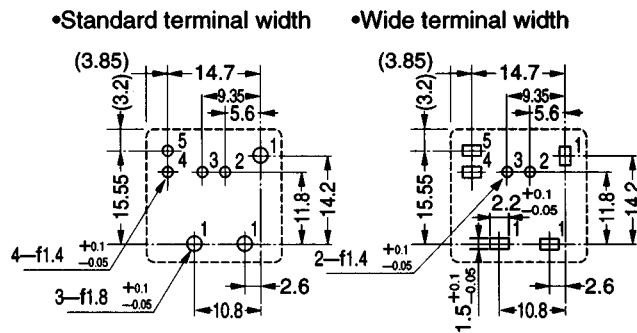
DIMENSIONS

Dimensions



(): N type

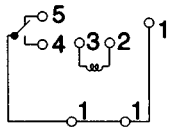
PC board mounting hole layout (BOTTOM VIEW)



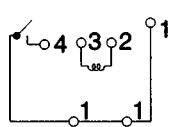
Note : Tolerance ± 0.1 mm

Schematics (BOTTOM VIEW)

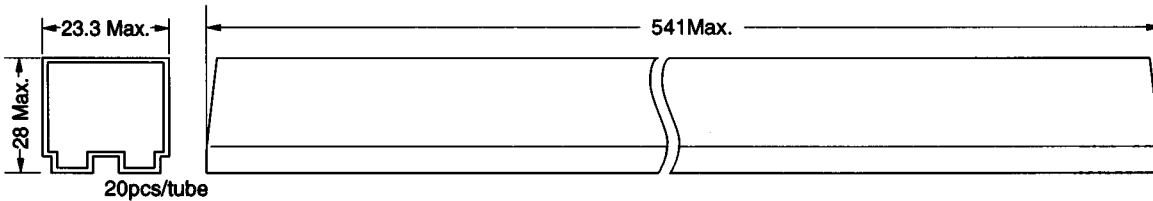
• 1 from C



• 1 from A



Tube carrier



Unit: mm