

# HIGH POWER RELAY

## 1 POLE—30 A

(FOR AUTOMOTIVE APPLICATIONS)

# FRL-274 SERIES

### ■ FEATURES

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



### ■ ORDERING INFORMATION

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

(a)	Series Name	FRL-274: FRL-274 Series
(b)	Enclosure	Nil : Flux free type N : Plastic sealed type
(c)	Coil Type	D : Standard (nominal power 1.7 to 2.1 W) H : Low power (nominal power 0.6 W)
(d)	Nominal Voltage	(Example) 009 : 9 VDC 012 : 12 VDC 024 : 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 D : 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-274 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	
	Voltage Drop (resistance)	Maximum 300 mV initial (at 5 Amps, 12 VDC) Maximum 500 mV after durability test (at 5 Amps, 12 VDC)			
	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 type) 51: 1.0 mm gap 61: 1.4 mm gap			
	Maximum Carrying Current	30 A continuous ,40 A/10 minutes (at 25°C 100% rated coil voltage)			
	Max. Switching Frequency	Mechanical: 18,000 operations/hour Electrical: 1,800 operations/hour			
Coil	Minimum Switching Load <sup>(*)</sup> (reference)	0.6 W minimum (0.1 A minimum)	0.6 W minimum (50 mA minimum)	0.6 W minimum (0.3 A minimum)	
	Nominal Power (rated Voltage at 20°C)	Standard type (D): approximately 1.7 W Low power type (H): approximately 0.6 W 1.4 mm gap type: approximately 2.1 W			
	Coil Temperature Rise	Standard type (D): approximately 75 °C Low power type (H): approximately 35 °C 1.4 mm gap type: approximately 85 °C (rated voltage at 20°C)			
	Operating Temperature	-40°C to +85°C (no frost) (refer to the CHARACTERISTIC DATA)			
	Storage Temperature	-40°C to +100°C (no frost)			
Insulation	Resistance	Minimum 100 MΩ (at 500 VDC)			
	Dielectric Strength	AC 500 V 1 minimum			
Time Value	Operate (at nominal voltage)	Maximum 10 ms			
	Release (at nominal voltage)	Standard gap type: maximum 5 ms 1.0 mm gap type: maximum 8 ms 1.4 mm gap type: maximum 10 ms			
Life	Mechanical	10 × 10 <sup>6</sup> operations minimum			
	Electrical	250 × 10 <sup>3</sup> operations minimum			
Other	Vibration Resistance	10 to 55 Hz (double amplitude of 1.5 mm)			
	Shock Resistance	Misoperation	100 m/s <sup>2</sup> (11 ± <sup>1</sup> ms)		
		Endurance	1,000 m/s <sup>2</sup> (11 ± <sup>1</sup> ms)		
	Weight	Approximately 20 g			

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

# FRL-274 SERIES

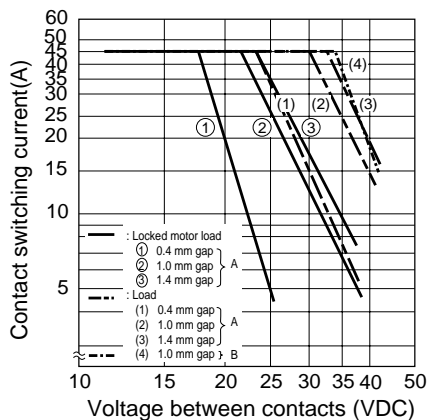
Features of contact material	Contact material	Symbol	Feature
	Silver copper	S	Excellent welding and locking proof against DC load
	Silver tin oxide	Y	High durability, long life wiper or lamps
	Special silver alloy	D	Durable against high in-rush, for head light or heavy load (30 A)

## COIL DATA CHART

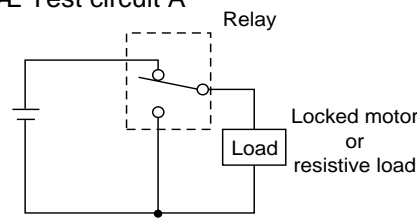
Type	Nominal voltage	Contact gap	Part number	Coil resistance ( $\pm 10\%$ ) (at 20°C)	Nominal power	Must operate voltage		Must release voltage	Thermal resistance
						20°C	80°C		
Standard	6 VDC	0.4 mm (Standard)	FRL-274□D006/01 □□-□□A	21Ω	1.7 W	3.3 VDC	4.1 VDC	0.3 VDC	44°C/W
		1 mm	FRL-274□D006/51 □□-□□A	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	0.6 VDC	
		1 mm	FRL-274□D012/51 □□-□□A	85Ω	1.7 W	8.4 VDC	10.4 VDC	0.6 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

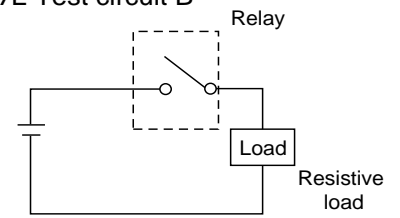
### 1. MAXIMUM BREAK CAPACITY



Æ Test circuit A

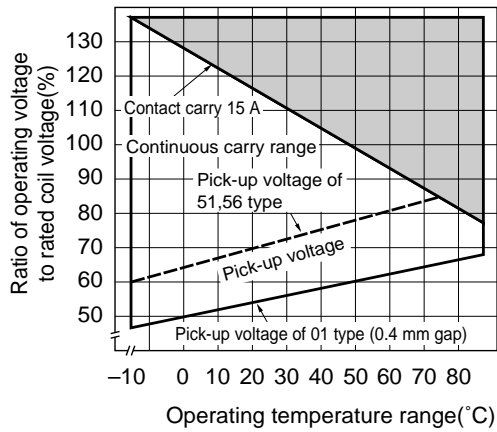


Æ Test circuit B

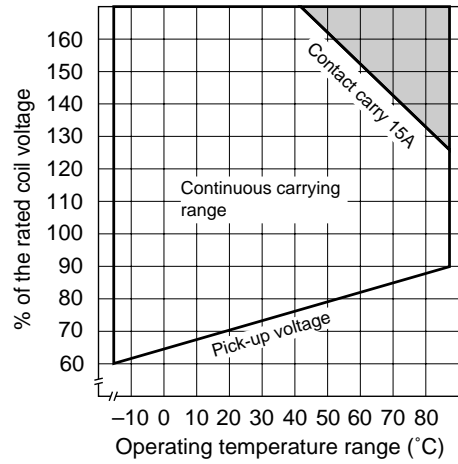


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## 2. OPERATING COIL VOLTAGE (EXAMPLE) [Standard (D type)]



## [Low power (H type)]

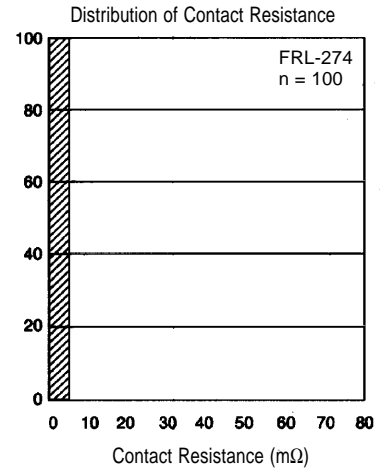
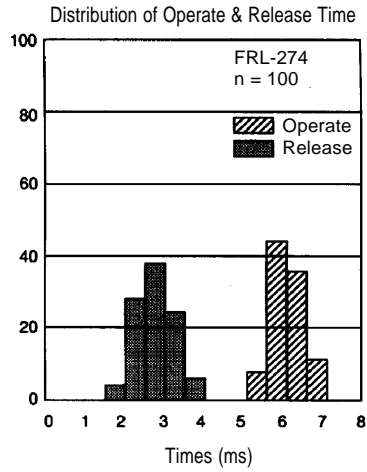
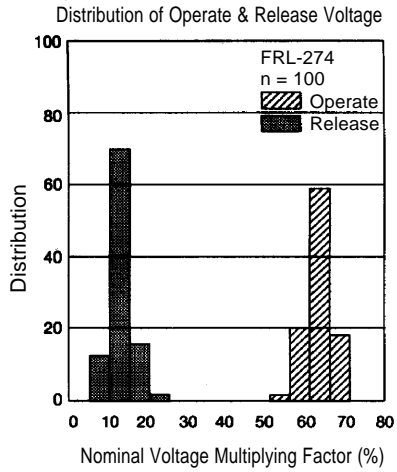


## 3. LIFE TEST (EXAMPLE)

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 operations minimum (contact material: special silver alloy)</p>	
<p>DC 14 V-30 A Motor lock 100,000 operations minimum (contact material: silver copper)</p>	
<p>DC 30 V-1.6 A Motor free 200,000 operations minimum (contact material: silver copper)</p>	

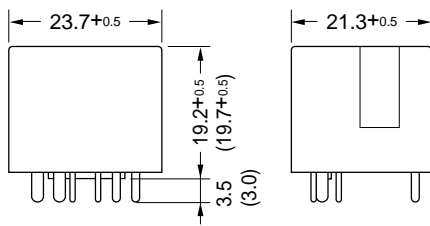
# FRL-274 SERIES

## REFERENCE DATA



## DIMENSIONS

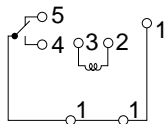
### Dimensions



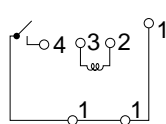
( ): N type

### Schematics (BOTTOM VIEW)

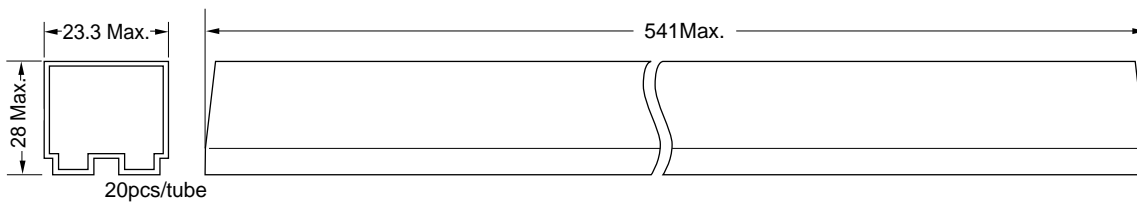
• 1 from C



• 1 from A



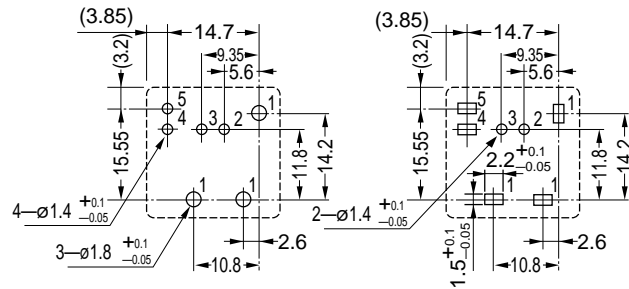
### Tube carrier



### PC board mounting hole layout (BOTTOM VIEW)

• Standard terminal width

• Wide terminal width



Note : Tolerance  $\pm 0.1$  mm

Unit: mm

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