

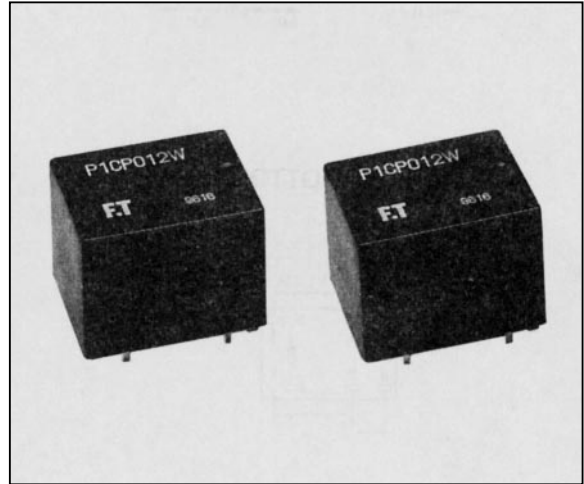
QUIET POWER RELAY

1 POLE-20 A (FOR AUTOMOTIVE APPLICATIONS)

FTR-P1 SERIES

■ FEATURES

- Original construction, where reduction of operational noise is considered when mounted on PCB, made it possible to realize this quiet relay.
(Average Acoustic Noise Level: 53 dB, Distance 10 cm)
- New types of materials are used for the conductive parts which allows this compact relay to carry 20 AMP.
- Two types of contact material are available for various contact load.
- Wider contact gap (0.6 mm) version is also available for enhanced cut-off ability to overload condition.



■ ORDERING INFORMATION

[Example] $\frac{\text{FTR-P1}}{\text{(a)}} \frac{\text{C}}{\text{(b)}} \frac{\text{N}}{\text{(c)}} \frac{\text{012}}{\text{(d)}} \frac{\text{N}}{\text{(e)}} \frac{\text{-**}}{\text{(f)}}$

(a)	Series Name	FTR-P1: FTR-P1 Relay
(b)	Contact Arrangement	C : 1 form C (SPDT)
(c)	Contact Gap	N : 0.3 mm Gap P : 0.6 mm Gap
(d)	Nominal Voltage	009 : 9 VDC 010 : 10 VDC 012 : 12 VDC
(e)	Contact Material	N : Silver-Copper-Nickel W : Silver-Tin oxide-Indium
(f)	Custom Designation	To be assigned for custom specification

Note: Part No. is printed on the top of relay as follows.
e.g.) Order No.: FTR-P1CN012N
Printing: P1CN012N

FTR-P1 SERIES (QUIET TYPE)

■ SPECIFICATIONS

Item		Specifications	
Contact	Arrangement	1 Form C (SPDT)	
	Material	Silver-Copper-Nicel alloy (N Type) Silver-Tin oxide-Indium (W Type)	
	Voltage Drop (Resistance)	Max. 100 mV (at 2 A 12 VDC)	
	Ratings	14 VDC/20 A (Locked Motor Load) 14 VDC/Inrush 20 A, Break 4 A (Motor Free Load)	
	Max. Carrying Current	20 A/ 1 hour (at 25°C, Nominal Voltage)	
	Max. Inrush Current (Reference)	N Type: 40 A W Type: 60 A	
	Max. Switching Current (Reference)	30 A at 16 VDC	
	Min. Switching Load*1 (Reference)	6 VDC 1 A	
Coil	Operating Temperature Range	-40°C~+85°C (No frost) (Refer to the CHARACTERISTIC DATA)	
	Storage Temperature Range	-40°C~+100°C (No frost)	
Time Value	Operate (at nominal voltage)	Max. 10 ms	
	Release (at nominal voltage)	Max. 5 ms	
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. 10.0 g

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

■ COIL DATA CHART

• 0.3 mm Contact Gap Type

MODEL		Nominal Voltage	Coil Resistance (±10%)	Must Operate Voltage	Must Release Voltage	Thermal Resistance
N TYPE	W TYPE					
FTR-P1CN009N	FTR-P1CN009W	9 VDC	135 Ω	5.4 V (at 20°C) 6.8 V (at 85°C)	0.7 V	73°C/W
FTR-P1CN010N	FTR-P1CN010W	10 VDC	180 Ω	6.3 V (at 20°C) 7.9 V (at 85°C)	0.8 V	
FTR-P1CN012N	FTR-P1CN012W	12 VDC	240 Ω	7.3 V (at 20°C) 9.0 V (at 85°C)	0.9 V	

FTR-P1 SERIES (QUIET TYPE)

• 0.6 mm Contact Gap Type

MODEL		Nominal Voltage	Coil Resistance ($\pm 10\%$)	Must Operate Voltage	Must Release Voltage	Thermal Resistance
N TYPE	W TYPE					
FTR-P1CP009N	FTR-P1CP009W	9 VDC	100 Ω	5.4 V (at 20°C) 6.8 V (at 85°C)	0.7 V	65°C/W
FTR-P1CP010N	FTR-P1CP010W	10 VDC	135 Ω	6.3 V (at 20°C) 7.9 V (at 85°C)	0.8 V	
FTR-P1CP012N	FTR-P1CP012W	12 VDC	180 Ω	7.3 V (at 20°C) 9.0 V (at 85°C)	0.9 V	

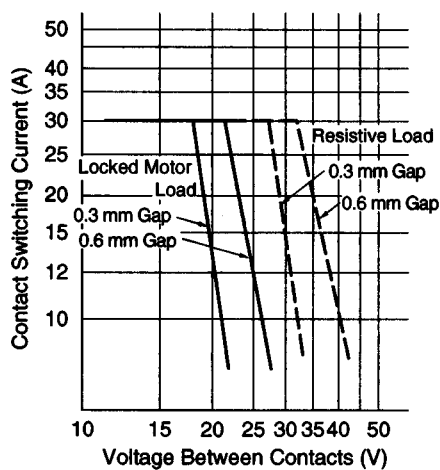
Note: Values in the table of Coil Resistance and Must Release Voltage are measured at 20°C.

■ SUITABLE APPLICATION

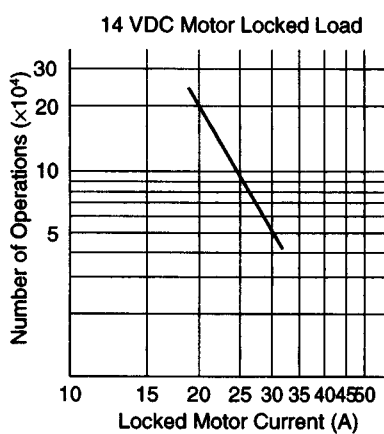
CONTACT MATERIAL	SUITABLE LOAD
N: Silver-Copper-Nicel	Intermittent Wiper
W: Silver-Tin oxide-Indium	Door lock Power Window Solenoids, etc. (Locked rotor)

■ CHARACTERISTIC DATA

1. MAXIMUM BREAK CAPACITY



2. LIFE

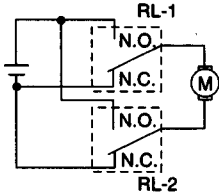


FTR-P1 SERIES (QUIET TYPE)

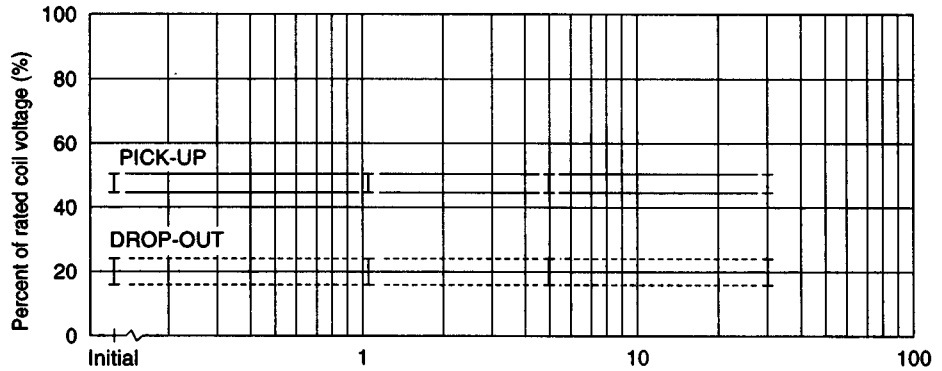
3. LIFE TEST (EXAMPLE)

- Test Item
14 V DC-20 A
Motor Lock
200,000 ops. MIN.

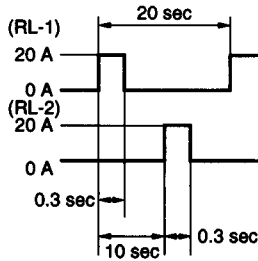
- Test Circuit



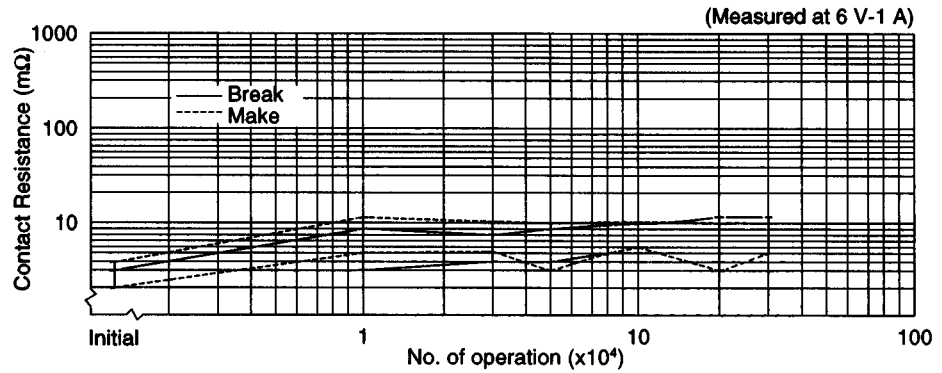
- Shift of Pick-up Drop-out Voltage



- Current Wave Form

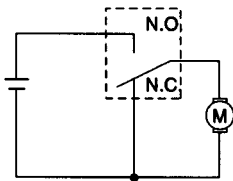


- Shift of Contact Resistance

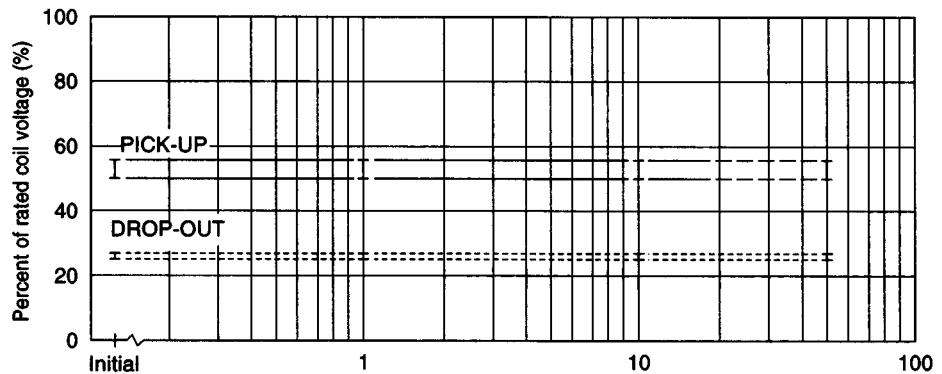


- Test Item
14 V DC-20 A
Motor Free
400,000 ops. MIN.

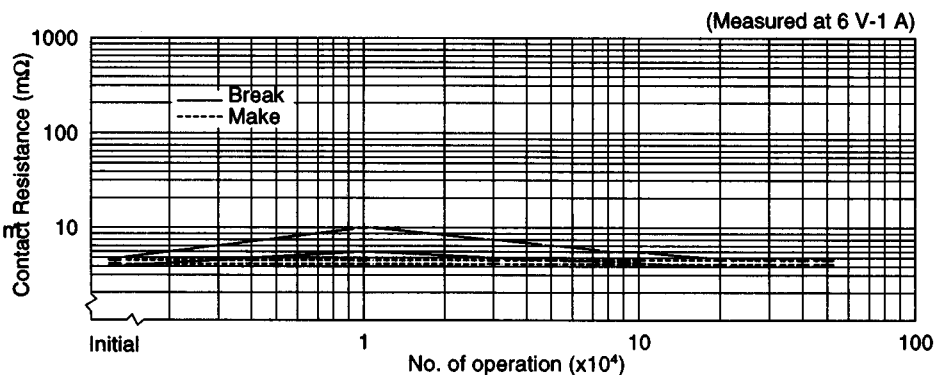
- Test Circuit



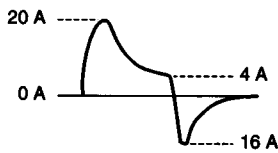
- Shift of Pick-up Drop-out Voltage



- Shift of Contact Resistance

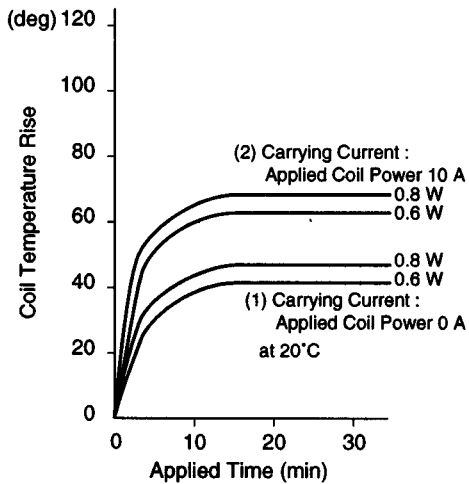


- Current Wave Form

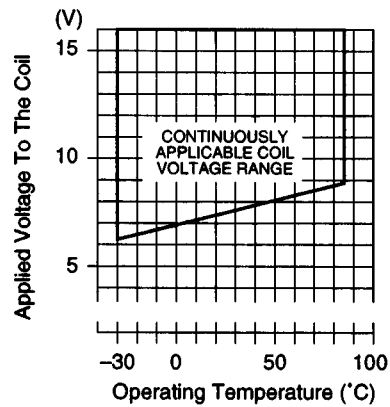


FTR-P1 SERIES (QUIET TYPE)

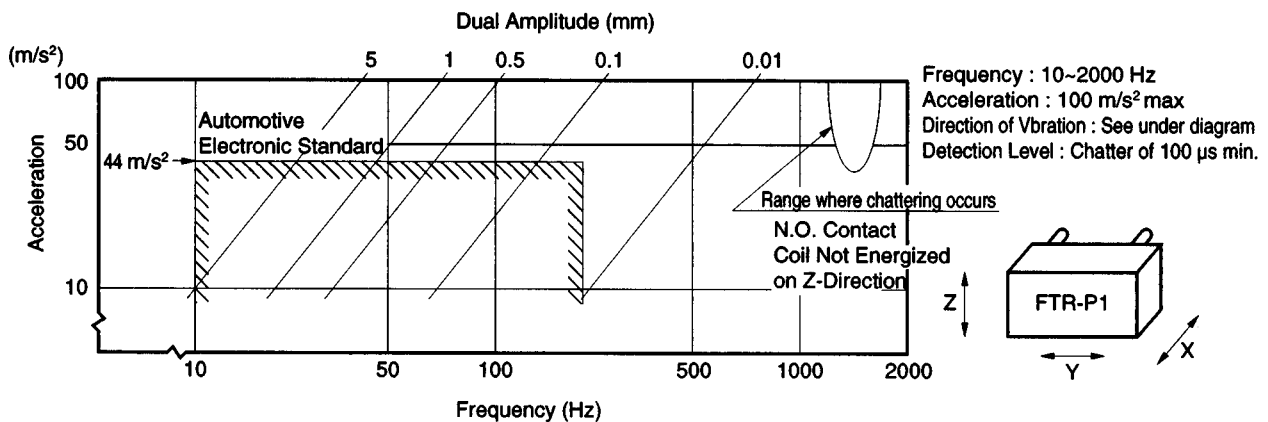
4. COIL TEMPERATURE RISE



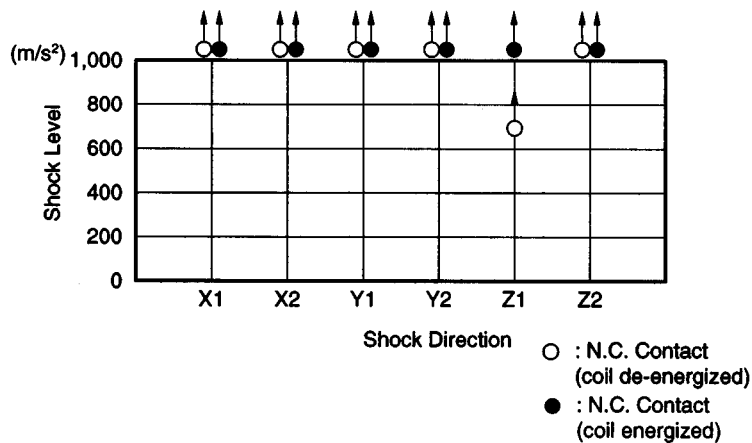
5. OPERATING COIL VOLTAGE RANGE (EXAMPLE)



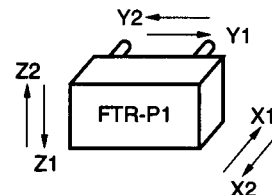
6. VIBRATION RESISTANCE CHARACTERISTICS



7. SHOCK RESISTANCE CHARACTERISTICS

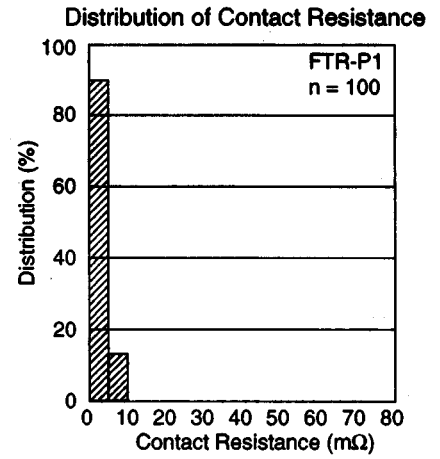
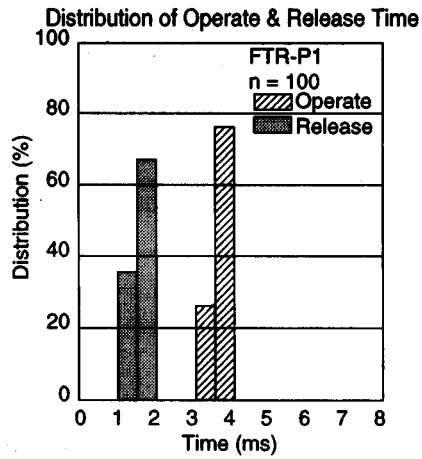
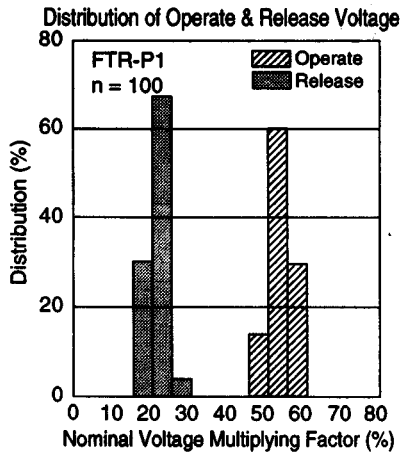


Shock Application Time : 11 ms, Half-Sine Wave
 Test Material : Coil, Energized and De-Energized
 Shock Direction : Set under diagram
 Detection Level : Chatter of 100 μs min.



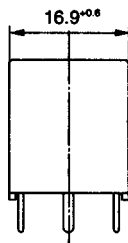
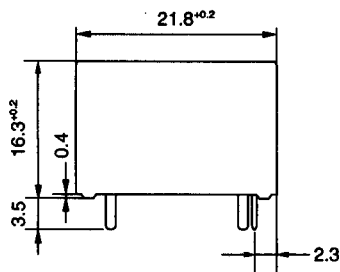
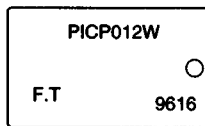
FTR-P1 SERIES (QUIET TYPE)

REFERENCE DATA

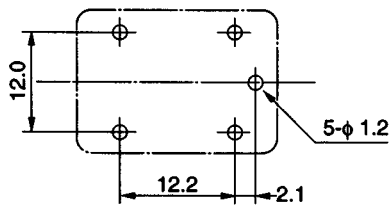


DIMENSIONS

Dimensions

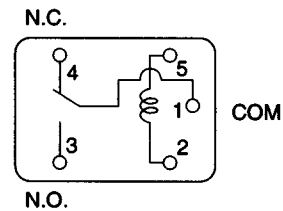


Mounting hole layout (BOTTOM VIEW)



Tolerance ±0.1

Schematics (BOTTOM VIEW)



Unit : mm