FUJITSU THE POSSIBILITIES ARE INFINITE

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 design this quiet relay.
  (Average acoustic noise level: 53 dB, distance 10 cm)
- New types of materials are used for the conductive parts, allowing this compact relay to carry 20 AMP.
- Two types of contact material are available for various contact loads.
- Wider contact gap (0.6 mm) version is also available for enhanced cut-off ability to overload condition.

■ ORDERING INFORMATION

[Example] FTR-P1 (a) C (b) N (c) 012 (d) W1 (e) -** (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	W1 : 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.
(Example) Designation ordered: FTR-P1CN012W1
Stamp: P1CN012W1

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■ SPECIFICATIONS

Item			Specifications
Contact	Arrangement		1 form C (SPDT)
	Material		Silver-tin oxide-indium (W1 type)
	Voltage Drop (resistance)		Maximum 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)
	Maximum Carrying Current		20 A/ 1 hour (25°C, 100% rated coil voltage)
	Maximum Inrush Current (reference)		W1 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 to +85°C (no frost) (reter to the CHARACTERISTIC DATA)
	Storage Temperature Range		–40°C to +100°C (no frost)
Time Value	Operate (at nominal voltage)		Maximum 10 ms
	Release (at nominal voltage)		Maximum 5 ms
Life	Mechanical		1×10^7 operations minimum
	Electrical		2×10^5 operations minimum (locked motor load) 4×10^5 operations minimum (motor free load)
Other	Vibration Resistance		10 to 55 Hz (double amplitude of 1.5 mm)
	Shock Resistance	Misoperation	100 m/s^2
		Endurance	1,000 m/s^2
	Weight		Approximately 10.0 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.

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■ COIL DATA CHART

● 0.3 mm contact gap type

MODEL W1 TYPE	Nominal voltage	Coil resistance (±10%)	Must operate voltage	Must release voltage	Thermal resistance
FTR-P1CN009W1	9 VDC	135 Ω	5.4 V (at 20°C) 6.8 V (at 85°C)	0.7 V	73°C/W
FTR-P1CN010W1	10 VDC	180 Ω	6.3 V (at 20°C) 7.9 V (at 85°C)	0.8 V	
FTR-P1CN012W1	12 VDC	240 Ω	7.3 V (at 20°C) 9.2 V (at 85°C)	0.9 V	

● 0.6 mm Contact Gap Type

MODEL W1 TYPE	Nominal voltage	Coil resistance (±10%)	Must operate voltage	Must release voltage	Thermal resistance
FTR-P1CP009W1	9 VDC	100 Ω	5.4 V (at 20°C) 6.8 V (at 85°C)	0.7 V	65°C/W
FTR-P1CP010W1	10 VDC	135 Ω	6.3 V (at 20°C) 7.9 V (at 85°C)	0.8 V	
FTR-P1CP012W1	12 VDC	180 Ω	7.3 V (at 20°C) 9.2 V (at 85°C)	0.9 V	

Note: Values in the table of coil resistance and must release voltage are measured at 20°C.

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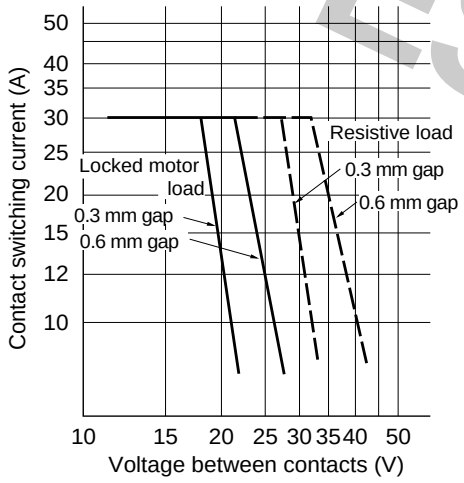
■ SUITABLE APPLICATION

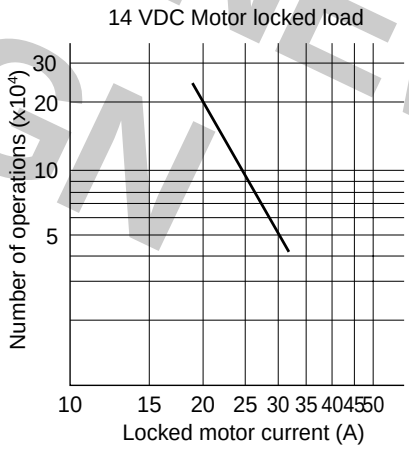
CONTACT MATERIAL	SUITABLE LOAD
W1: Silver-tin oxide-indium	Door lock Power window Solenoids, etc. (locked rotor)

■ CHARACTERISTIC DATA

1. MAXIMUM BREAK CAPACITY



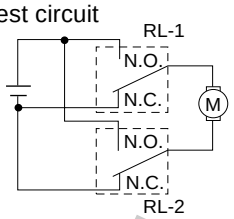
2. LIFE



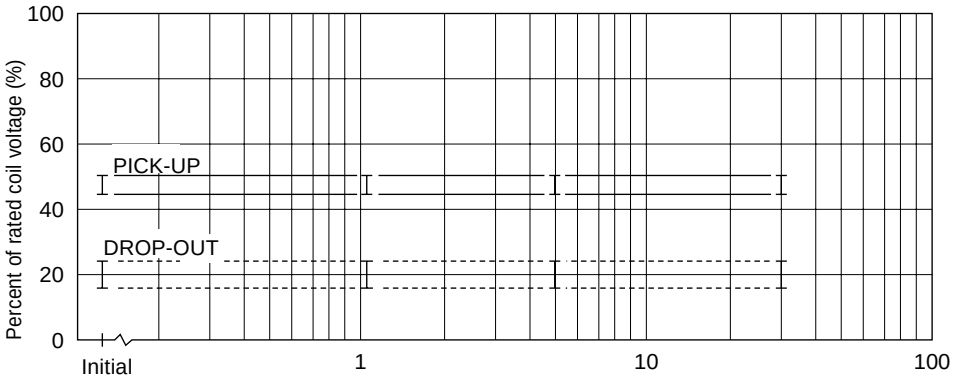
3. LIFE TEST (EXAMPLE)

• Test item
14 V DC-20 A
Motor Lock
200,000 operations
minimum

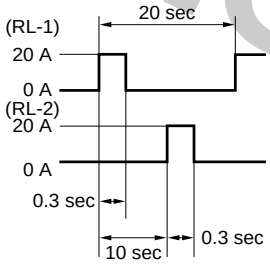
• Test circuit



• Shift of pick-up drop-out voltage

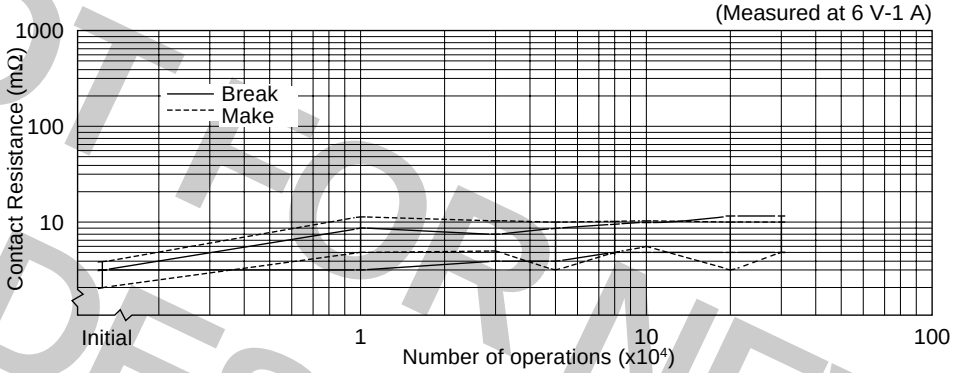


• Current wave form



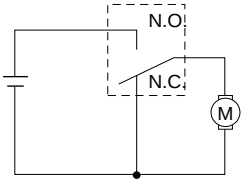
• Shift of contact resistance

(Measured at 6 V-1 A)

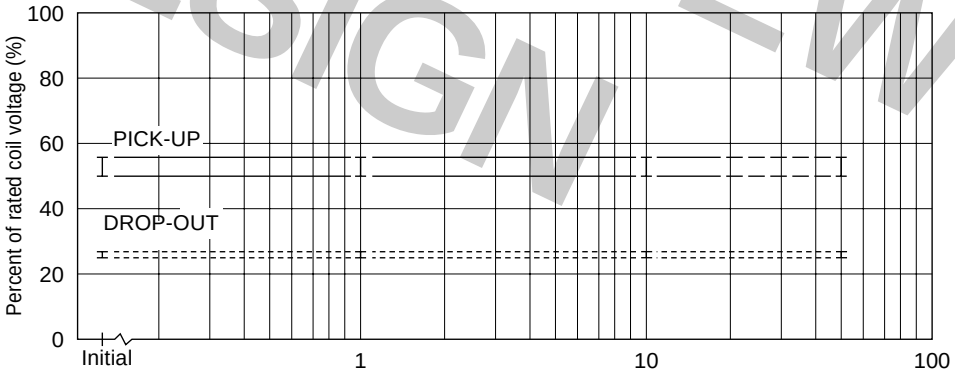


• Test item
14 V DC-20 A
motor free
400,000 operations
minimum

• Test circuit

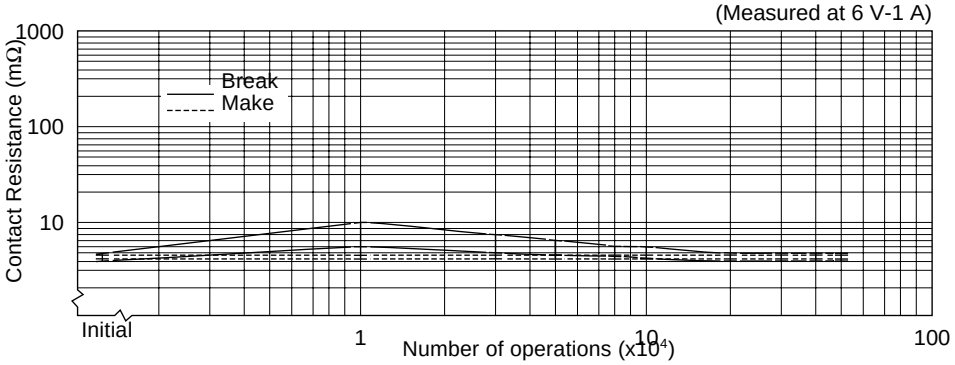


• Shift of pick-up drop-out voltage

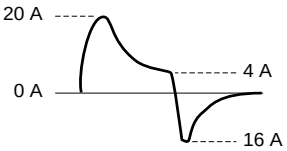


• Shift of contact resistance

(Measured at 6 V-1 A)



• Current wave form



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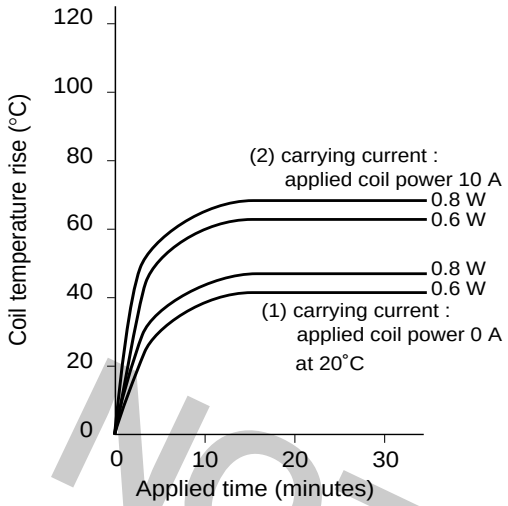
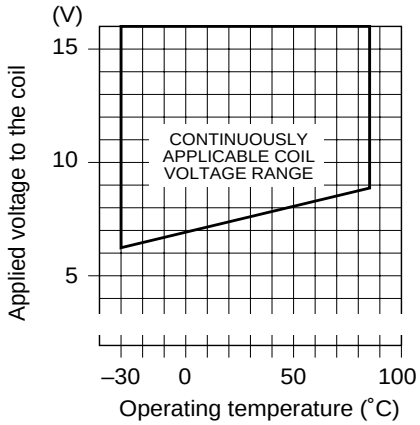
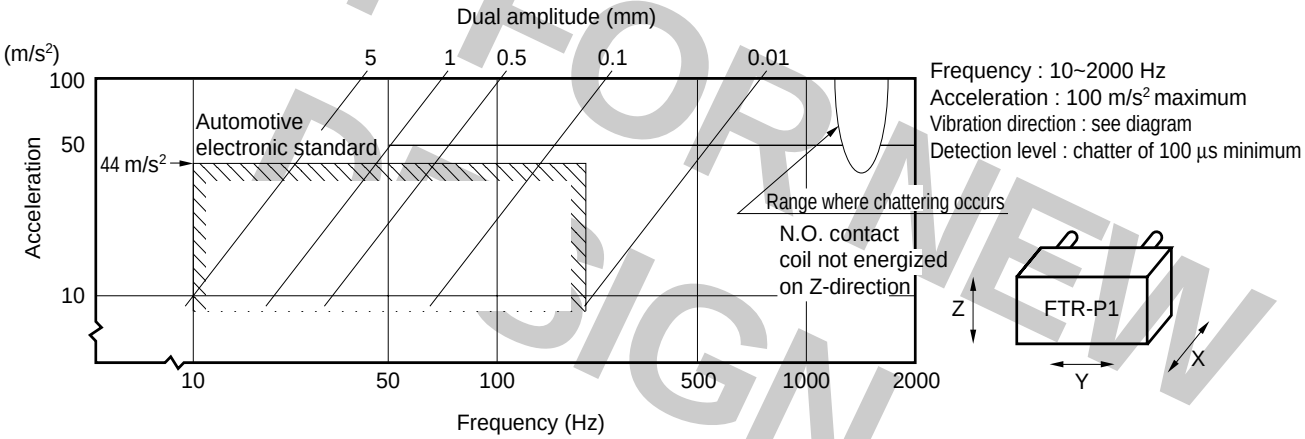
4. COIL TEMPERATURE RISE



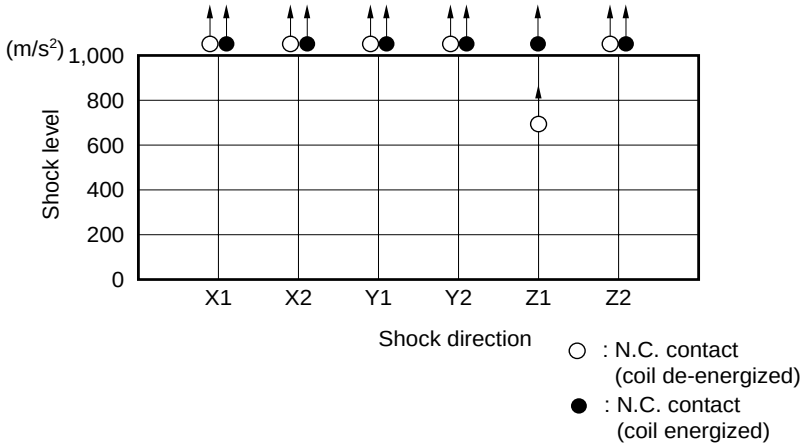
5. OPERATING COIL VOLTAGE RANGE (EXAMPLE)



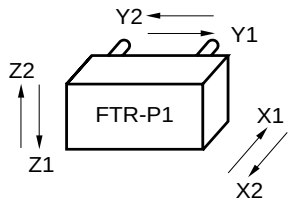
6. VIBRATION RESISTANCE CHARACTERISTICS



7. SHOCK RESISTANCE CHARACTERISTICS



Shock application time : 11 ms, half-sine wave
Test material : coil, energized and de-energized
Shock direction: see diagram
Detection level : chatter of 100 µs minimum



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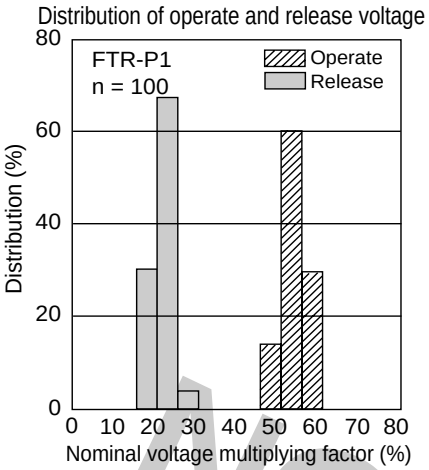
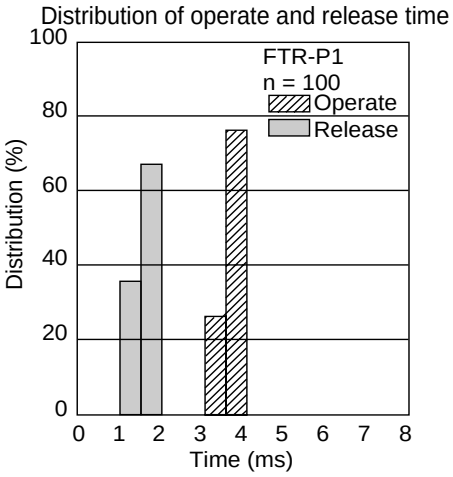
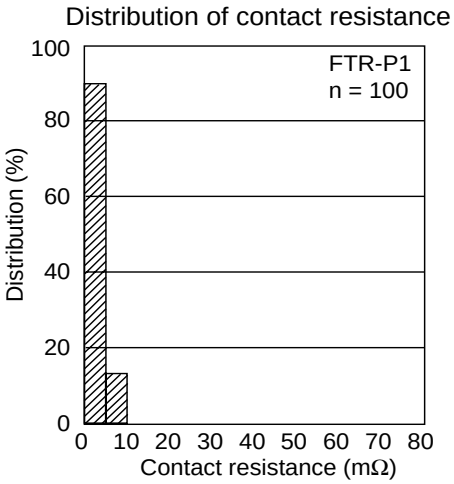
■ REFERENCE DATA

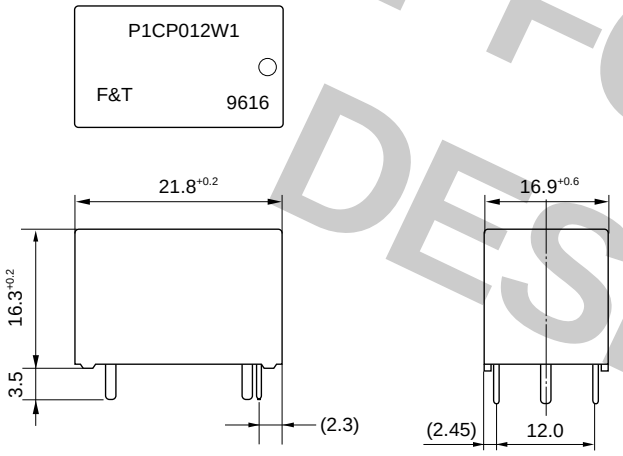




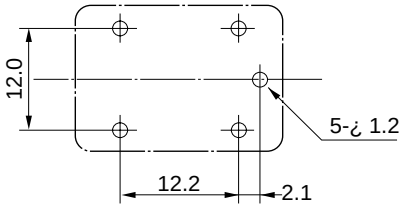


■ DIMENSIONS

● Dimensions

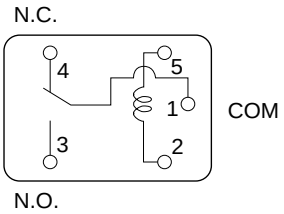


● Mounting hole layout (BOTTOM VIEW)



Tolerance –0.1

● Schematic
(BOTTOM VIEW)



Unit : mm

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