

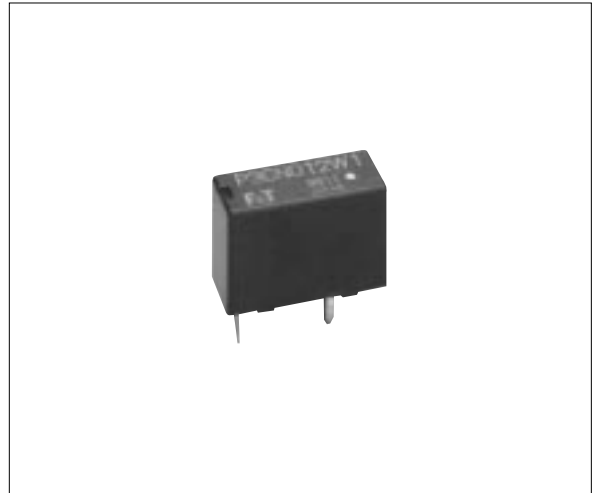
COMPACT POWER RELAY

1 POLE—25A FOR AUTOMOTIVE APPLICATIONS

FTR-P3 Series

■ FEATURES

- Compact for high density packaging.
(65% volume of previous generation FBR 51/52 Series).
- High contact capacity with proven contact material.
(100,000 operations, 14 V, 25 A achieved, even with reduced size).
- Coil power savings
(600mW nominal achieved with state-of-the-art magnetic analysis/design).
- Ease of PCB layout
(all terminals on perimeter, coil and contact terminals separated).
- Optional over-voltage circuit breaking capability
(0.6mm gap, contact our representative).
- Packaging for auto-insertion
(tube packing, 30 relays/tube).



■ ORDERING INFORMATION

[Example] $\frac{\text{FTR-P3}}{\text{(a)}} \frac{\text{C}}{\text{(b)}} \frac{\text{N}}{\text{(c)}} \frac{\text{012}}{\text{(d)}} \frac{\text{W1}}{\text{(e)}} \frac{\text{***}}{\text{(f)}}$

(a)	Series Name	FTR-P3 Series
(b)	Contact Arrangement	C : 1 Form C
(c)	Contact Gap	N : 0.3mm gap
(d)	Nominal Coil Voltage	009 : 09VDC 010 : 10VDC 012 : 12VDC
(e)	Contact Material	W1 : Silver-tin oxide-indium
(f)	Custom Designation	To be assigned custom specification

Note: The part number stamped on the relay cover does not include "FTR".
 Example: Ordering part number: FTR-P3CN012W1
 Stamped on part number: P3CN012W1

■ TYPICAL APPLICATIONS

Power window	Power seat	Tilt steering
Door lock	Wiper/IWW	Retractable antenna
Sun roof		

FTR-P3 SERIES

■ SPECIFICATIONS

Item		Specification	
Contact	Arrangement	1 form C (SPDT)	
	Material	Silver-tin oxide-indium	
	Contact path Voltage Drop (Initial)	Maximum 100 mV (at 2 A 12 VDC)	
	Rating	25 A at 14VDC (locked motor load)	
	Maximum Carry Current	25 A / 1hour (25° C, 100% rated coil voltage)	
	Maximum Inrush Current (Reference)	35 A	
	Maximum Switching Current (Reference)	35 A at 16 VDC	
	Minimum Switching Load*1 (Reference)	1 A, 6 VDC	
Coil	Operating Ambient Temperature Range	-40° C to +85° C (no frost)	
	Storage Temperature Range	-40° C to +100° C (no frost)	
Timing Values	Operate (at nominal voltage)	Maximum 10ms (not including bounce)	
	Release (at nominal voltage)	Maximum 5ms (not including bounce, no diode) Maximum 15ms (not including bounce, with diode)	
Life	Mechanical	10 x 10 ⁶ operations minimum	
	Electrical	100 x 10 ³ operations minimum, 14 VDC, 25 A (locked motor load) (1 operation = 1 forward and 1 reverse)	
Other	Vibration Resistance	Operational	10-55Hz, 1.5mm double amplitude (=9.13G @ 55Hz) 55-100Hz, 45m/sec ² (4.6G)
		Operational	100 m/s ² minimum (10G)
	Shock Resistance	Withstand, no damage	1,000 m/s ² minimum (100G)
		Insulation Resistance (initial)	100M ohms @500 VAC
	Dielectric Withstanding Voltage (initial)	500 VAC	
	Weight	Approximately 4.5g	

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

FTR-P3 SERIES

■ COIL DATA CHART

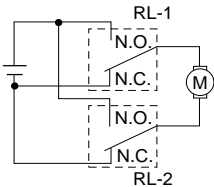
FTR-P3 Series

Model	Nominal Coil Voltage	Coil Resistance ($\pm 10\%$ at 20° C)	Must Operate Voltage	Must Release Voltage (at 20° C)	Coil Power at Nominal Voltage	Thermal Resistance (approx.)
FTR-P3CN009W1	9VDC	135 Ω	5.5VDC (at 20° C) 6.9VDC (at 85° C)	0.75VDC	0.6W	73° C/W
FTR-P3CN010W1	10VDC	167 Ω	6.3VDC (at 20° C) 7.9VDC (at 85° C)	0.9VDC	0.6W	73° C/W
FTR-P3CN012W1	12VDC	240 Ω	7.3VDC (at 20° C) 9.2VDC (at 85° C)	1.0VDC	0.6W	73° C/W

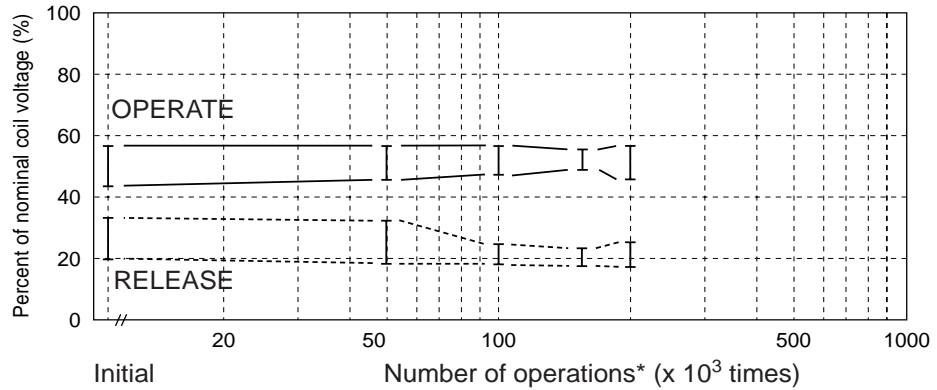
CHARACTERISTIC DATA

1. LIFE TEST (EXAMPLES)

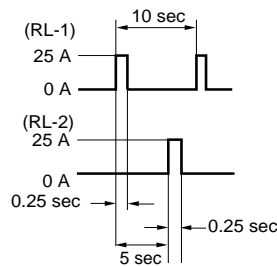
- Test item
14 V DC-25 A
locked motor
100K operations* minimum
0.25 seconds ON,
9.75 seconds OFF



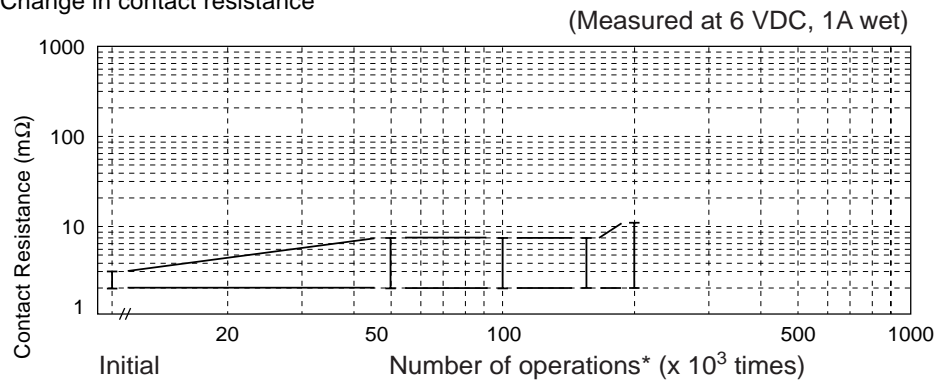
- Change of operate and release voltage



- Current wave form

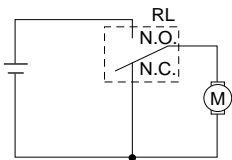


- Change in contact resistance

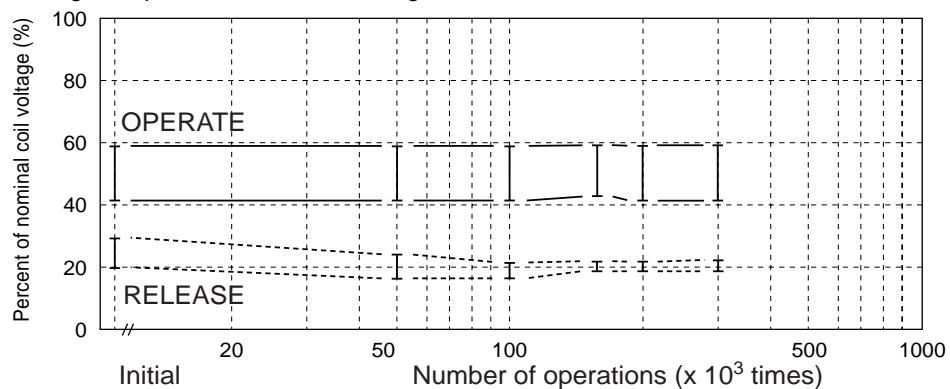


* 1 operation = 1 forward and 1 reverse

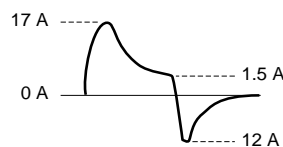
- Test item
14 V DC,
inrush current: 17A
motor free
300K operations minimum
0.25 seconds ON,
9.75 seconds OFF



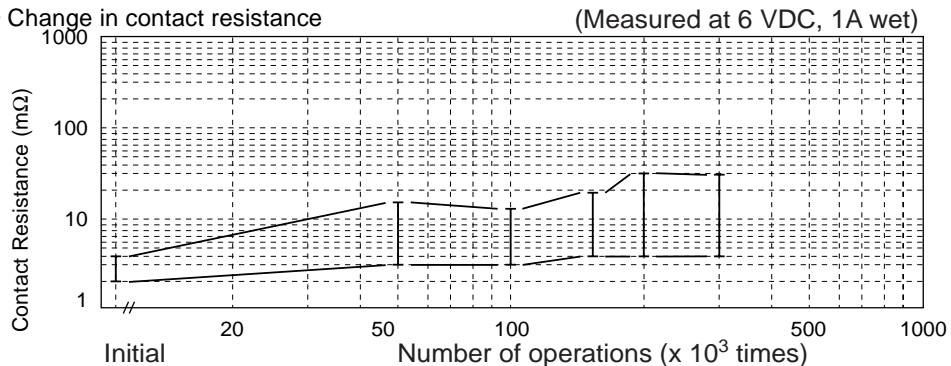
- Change of operate and release voltage



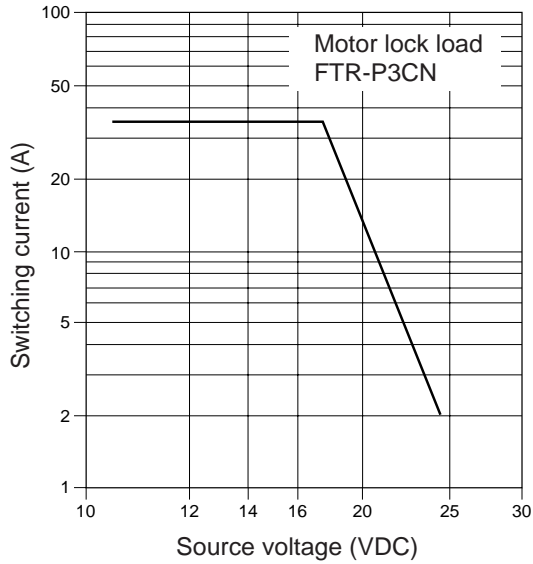
- Current wave form



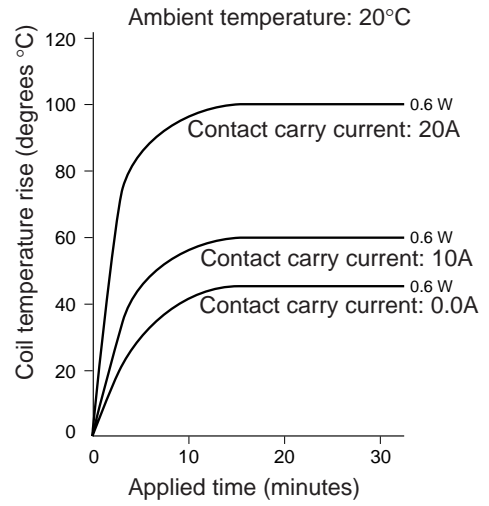
- Change in contact resistance



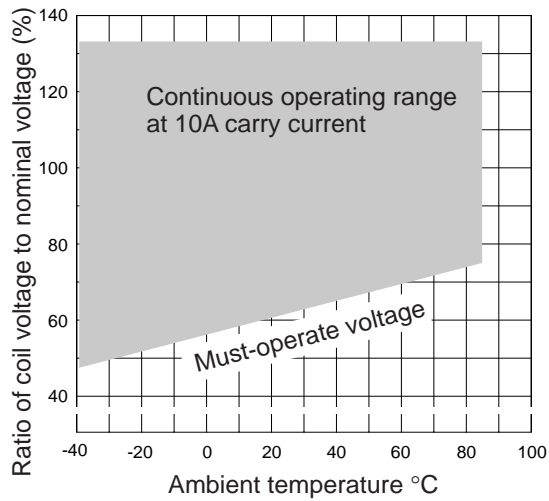
2. MAXIMUM BREAK CAPACITY



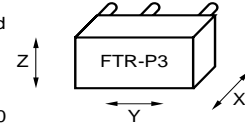
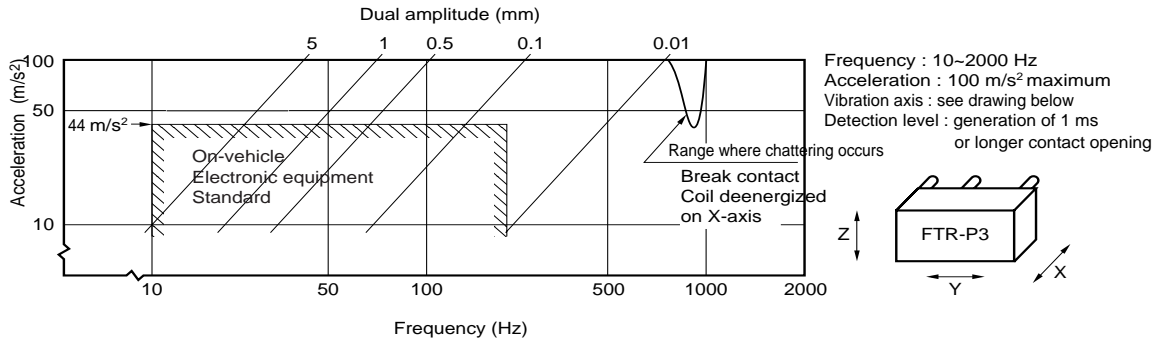
3. COIL TEMPERATURE RISE



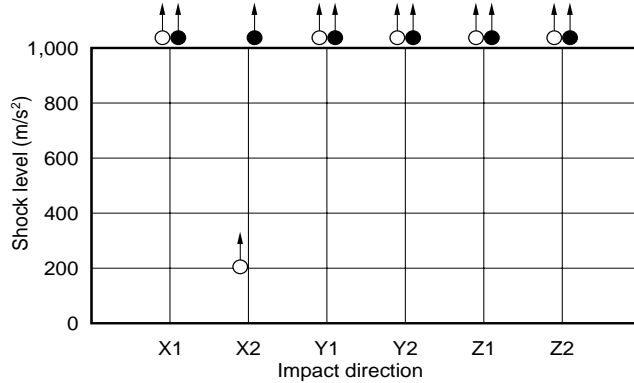
4. OPERATING COIL VOLTAGE RANGE



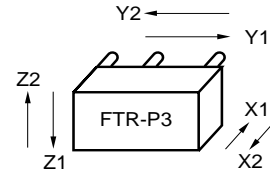
5. VIBRATION RESISTANCE CHARACTERISTIC



6. SHOCK RESISTANCE CHARACTERISTIC

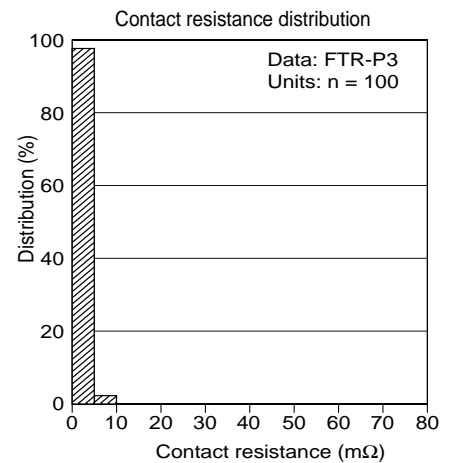
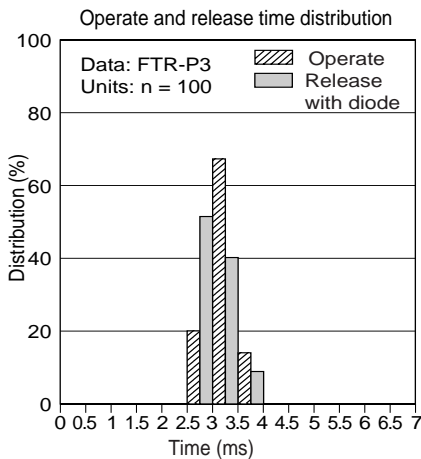
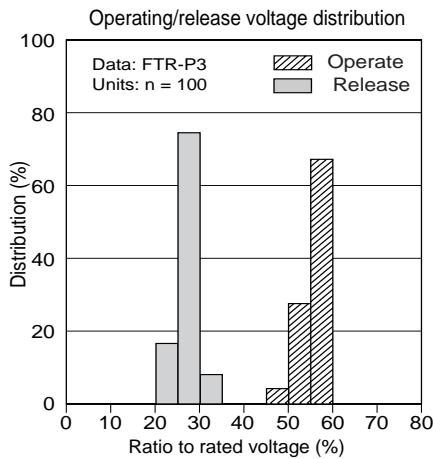


Shock duration : 11 ± 1 ms, half-sine wave
 Test condition : coil, energized and de-energized
 Impact direction : see drawing below
 Detection level : generation of 1 ms or longer contact opening

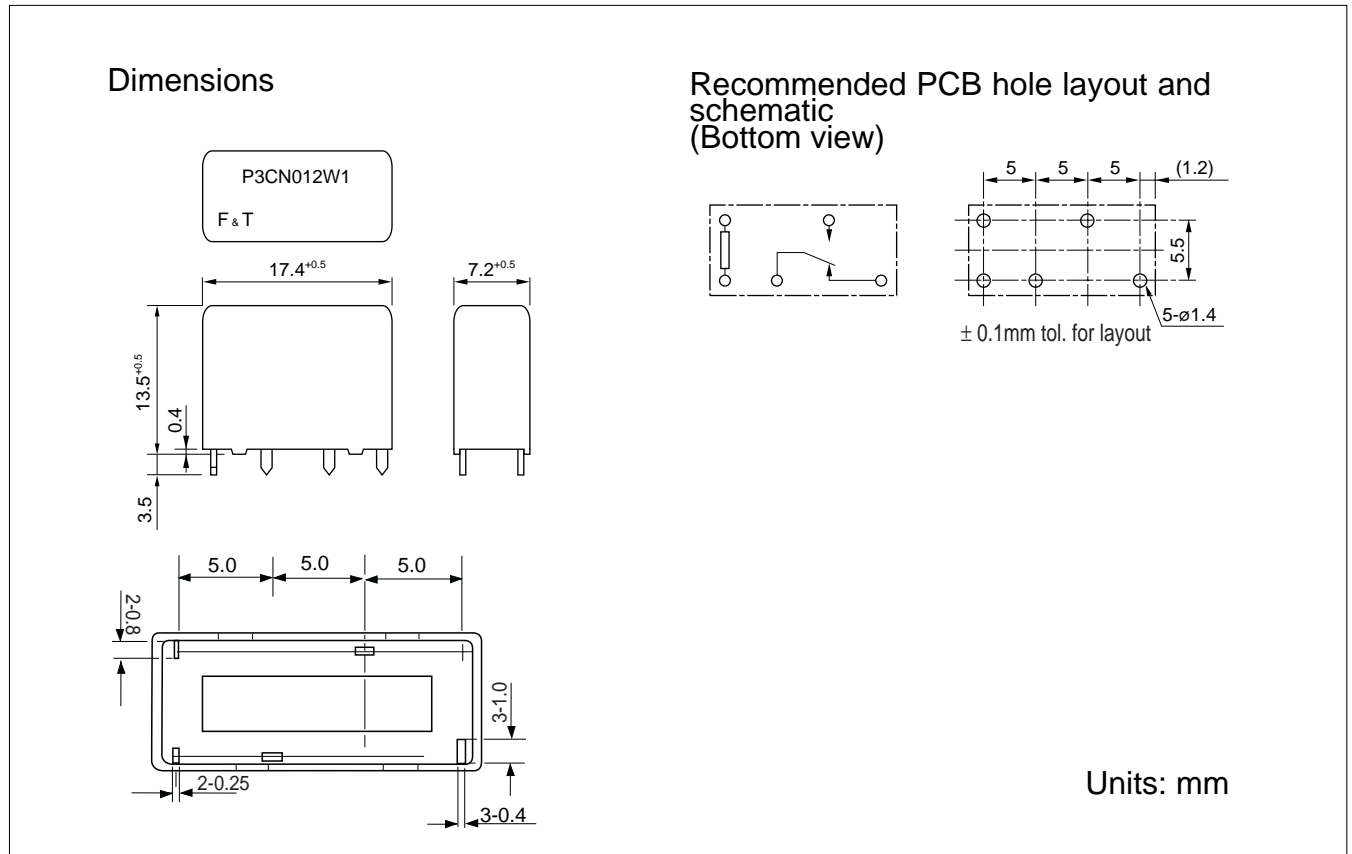


- : Break contact (coil de-energized)
- : Make contact (coil energized)

REFERENCE DATA



■ DIMENSIONS AND SCHEMATICS



■ PRECAUTIONS

Please refer to the Engineering Reference in our relay databook for general precautions.

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