FUJITSU

SILENT RELAY
1 POLE - 25A (for automotive applications)
FTR-P5 Series

■ FEATURES

- Low operating sound
  An original silent mechanism decreases the propagation of operating sound when mounted on a PCB
  (Average sound pressure: 50dB at 5 cm, 45dB at 10cm)
- Compact, high density package 198 mm2 mounting area
- High sensitivity, low power consumption
  (nominal power consumption: 450 mW)
- High capacity
  Heat dissipation is high due to a single cover structure
- Typical applications:
  Wiper, power window, doorlock, power seat
  sunroof, interior lighting, fan
- RoHS compliant
  Please see page 7 for more information

■ PARTNUMBER INFORMATION

	FTR-P5	C	N	012	W1	**
[Example]	(a)	(b)	(c)	(d)	(e)	(f)

(a)	Relay type	FTR-P5 :FTR-P5-Series
(b)	Contact configuration	C : 1 form C
(c)	Sealing	N : Plastic sealed
(d)	Coil rated voltage	012 : 9.....12 VDC Coil rating table at page 3
(e)	Contact material	W1 : Silver-tin oxide-indium oxide
(f)	Special type	To be assigned custom specification

Actual marking does not carry the type name: "FTR"
E.g.: Ordering code: FTR-P5CN012W1 Actual marking: P5CN012W1

■ SPECIFICATION

Item			FTR-P5
Contact Data	Configuration		1 form C
	Material		Silver-tin oxide-indium oxide
	Contact path voltage drop		Max. 100mV at 1A, 12VDC
	Contact rating		14VDC, 25A (motor locked)
	Max. carrying current		25A/1 hour (25 °C, nominal voltage applied to coil)
	Max. inrush current		35A (reference)
	Max. switching voltage		16VDC (reference)
	Max. switching current		35A (reference)
	Min. switching load *		6VDC, 1A (reference)
Life	Mechanical		Min. 10 million operations
	Electrical		Min. 100k operations (at contact rating)
Coil Data	Operating temperature range		-40 °C to +85 °C (no frost)
	Storage temperature range		-40 °C to +100 °C (no frost)
Timing Data	Operate (at nominal voltage)		Max. 10 ms
	Release (at nominal voltage)		Max. 5 ms (without diode)
Other	Vibration resistance	Operational	10 to 55Hz double amplitude 1.5mm , 3 shock in 6 directions
	Shock	Operational	Min. 100m/s² (10g) (11 ± 1ms)
		No damage	Min. 1000m/s² (100g) (6 ± 1ms)
	Weight		Approximately 13 g
	Average sound pressure		Approximately 50dB at 5cm

* Minimum switching loads mentioned above are reference values. Please perform the confirmation test with actual load before production since reference values may vary according to switching frequencies, environmental conditions and expected reliability levels.

■ COIL RATING

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance +/- 10% (Ohm)	Must Operate Voltage (VDC) *	Must Release Voltage (VDC) *	Power Consumption at Nominal Coil Voltage (mW)
009	9	180	5.5 (at 20 °C)	0.7 (at 20 °C)	450
			6.9 (at 85 °C)	0.9 (at 85 °C)	
010	10	220	6.3 (at 20 °C)	0.8 (at 20 °C)	455
			7.9 (at 85 °C)	1.0 (at 85 °C)	
012	12	320	7.3 (at 20 °C)	1.0 (at 20 °C)	450
			9.2 (at 85 °C)	1.3(at 85 °C)	

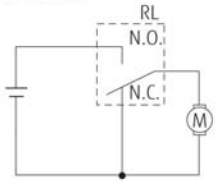
Note: All values in the table are valid for 20°C and zero contact current, unless otherwise stated.
* Specified operate values are valid for pulse wave voltage.

■ CHARACTERISTIC DATA

Life test (examples)

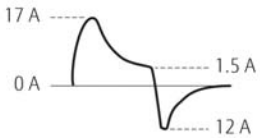
- Test item
  14 VDC, 17A
  Inrush current: 30A
  Motor free
  300K operations minimum
  0.25 seconds ON
  9.75 seconds OFF

- Test circuit

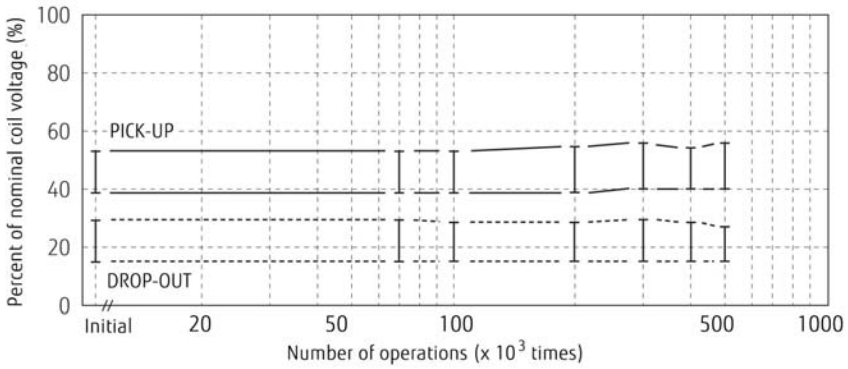


Note: NC contacts provide dynamic brake circuit

- Current wave form

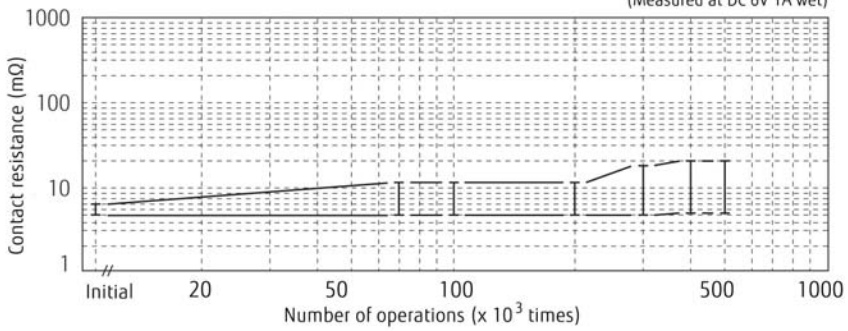


- Change in pick-up drop-out voltage



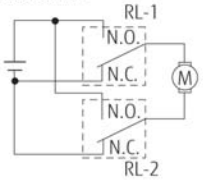
- Change in contact resistance

(Measured at DC 6V 1A wet)

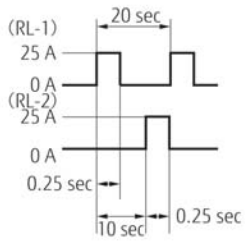


- Test item
  14 VDC, 25A
  Motor lock
  100K operations minimum
  (1 operation = 1 forward and 1 reverse)

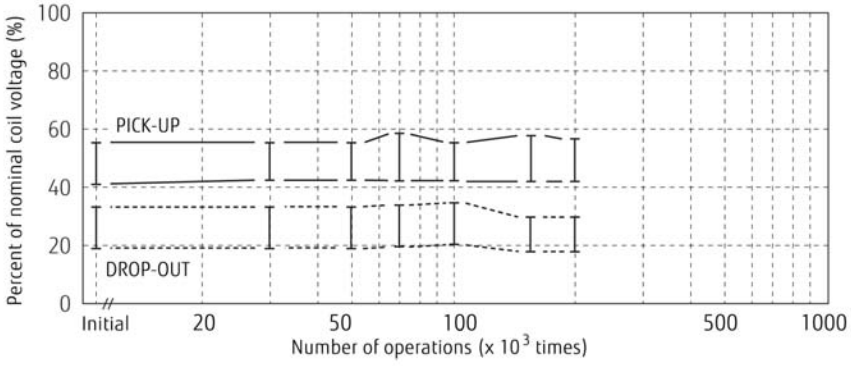
- Test circuit



- Current wave form

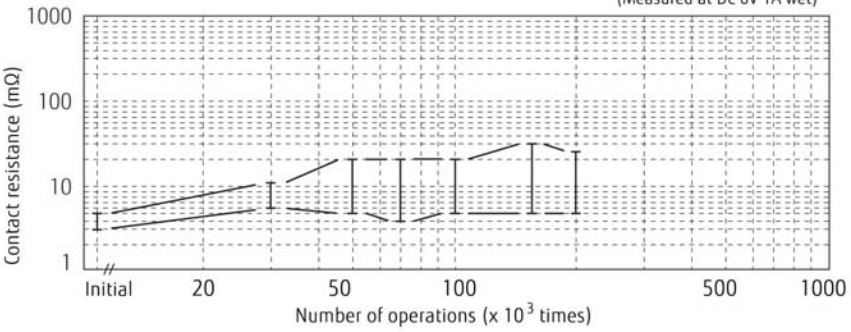


- Shift of pick-up drop-out voltage

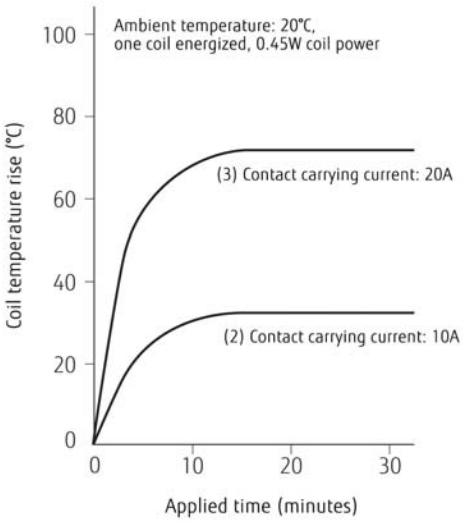


- Change in contact resistance

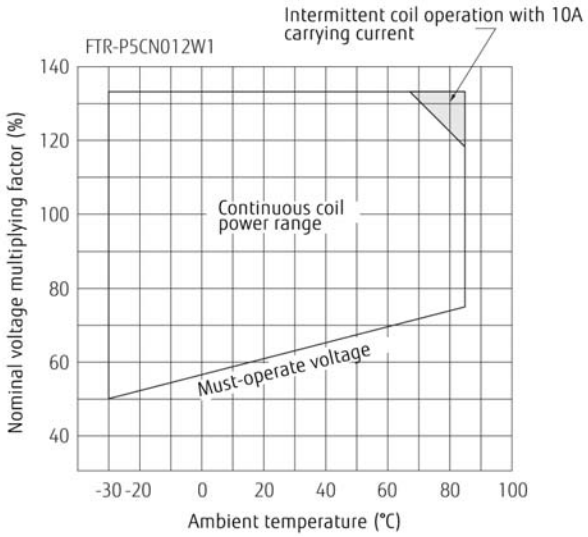
(Measured at DC 6V 1A wet)



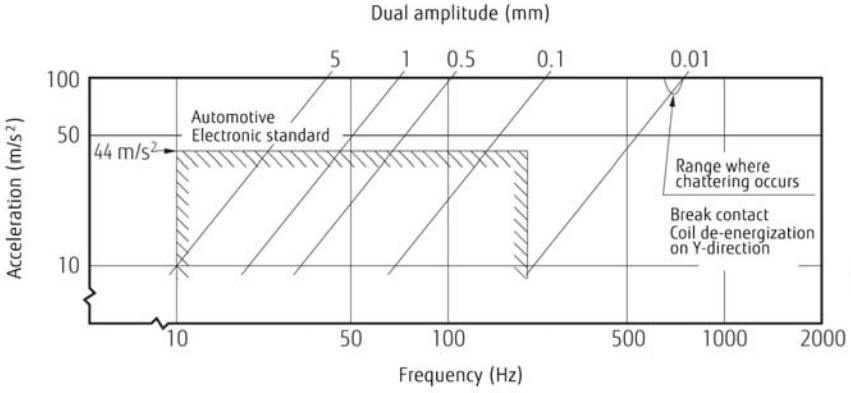
Coil temperature rise



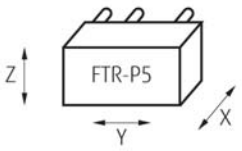
Operating coil voltage range



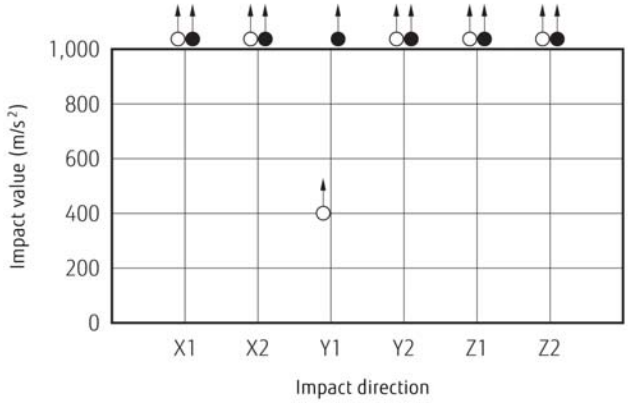
Vibration resistance characteristics



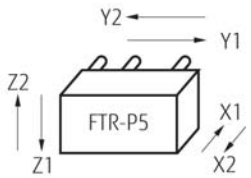
Frequency: 10~1000Hz
Acceleration: 100m/s² maximum
Vibration direction: see drawing below
Detection level: generation of 1ms or longer chattering



Shock resistance characteristics

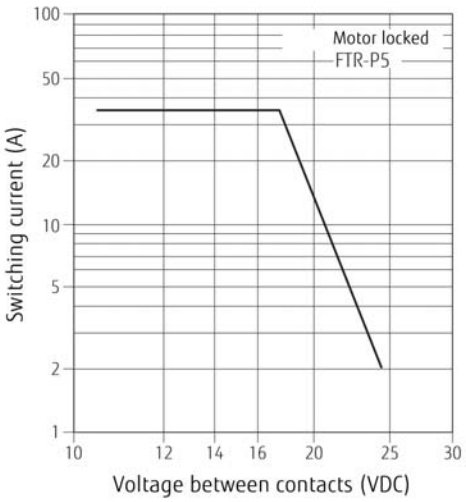


Impact apply time: 11 ±1ms, half-sine wave
Test condition: coil, energized and de-energized
Impact direction: see drawing below
Detection level: generation of 1ms or longer contact chattering

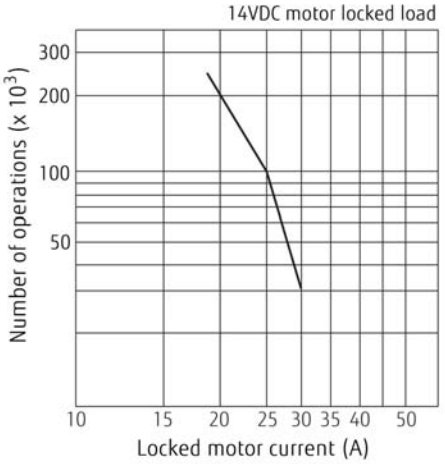


○ : Break contact (coil de-energized)
● : Make contact (coil energized)

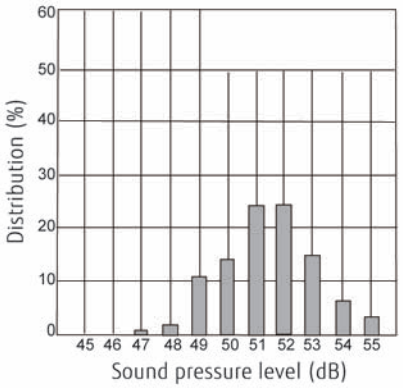
Maximum break capacity



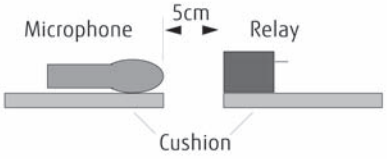
Life



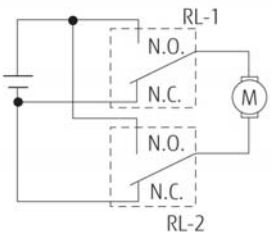
Distribution of sound pressure (with diode)



Method of acoustic noise measure
Measuring condition: Distance from 5 cm, relay operation at 10Hz
Tester: Noise tester Ryon NA-61, A range

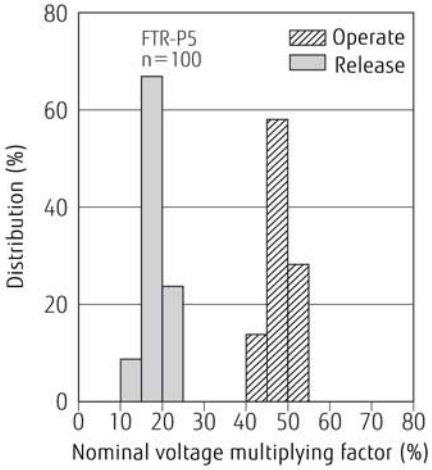


Test circuit

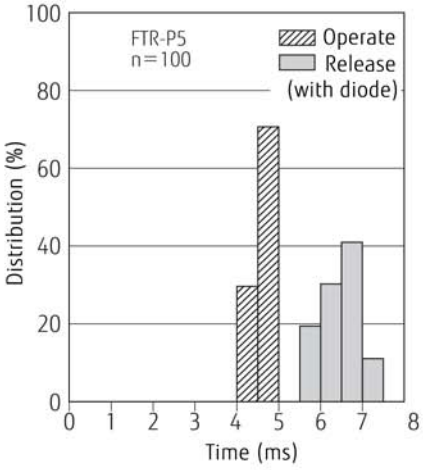


■ REFERENCE DATA

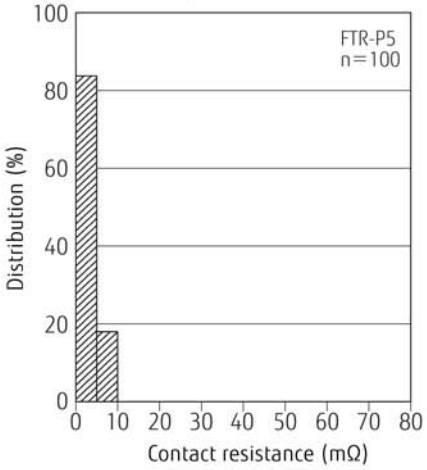
Distribution of operate/release voltage



Distribution of operate/release time

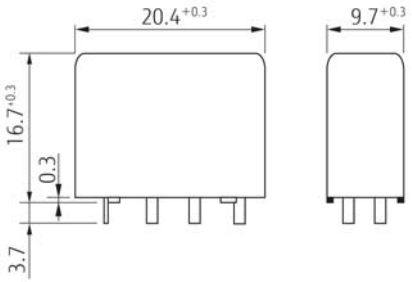


Distribution of contact resistance

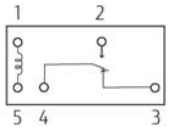


■ DIMENSIONS

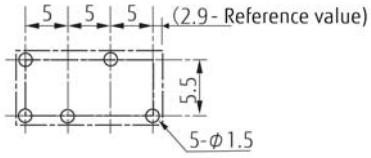
- **Dimensions**



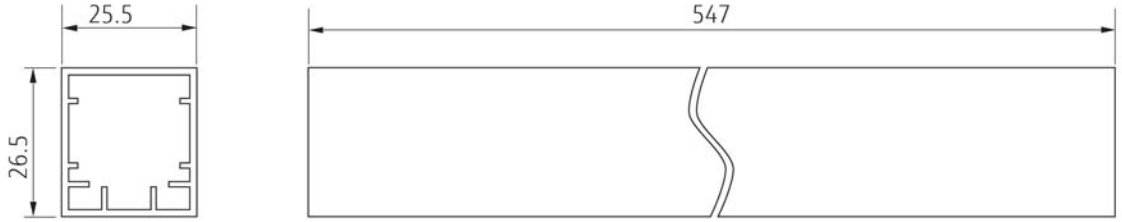
- **Schematics**
(BOTTOM VIEW)



- **PC board mounting hole layout**
(BOTTOM VIEW)



- **Tube carrier**



Unit: mm

RoHS Compliance and Lead Free Information

1. General Information

- All automotive relays produced by Fujitsu Components are compliant with RoHS directive 2002/95EC including amendments.
- Cadmium as used in electrical contacts is exempted from the RoHS directives on October 21st, 2005. (Amendment to Directive 2002/95/EC)
- All of our automotive relays are lead-free.
- Lead free solder plating on relay terminals is Sn-3.0Ag-0.5Cu, unless otherwise specified. This material has been verified to be compatible with PbSn assembly process.

2. Recommended Lead Free Solder Profile

- Recommended solder Sn-3.0Ag-0.5Cu.

Flow Solder condition:

Pre-heating:	maximum 120˚C
Soldering:	dip within 5 sec. at 260˚C solder bath

Solder by Soldering Iron:

Soldering Iron Temperature:	maximum 360˚C
Duration:	maximum 3 sec.

We highly recommend that you confirm your actual solder conditions

3. Moisture Sensitivity

- Moisture Sensitivity Level standard is not applicable to electromechanical relays, unless otherwise indicated.

4. Tin Whiskers

- Dipped SnAgCu solder is known as presenting a low risk to tin whisker development. No considerable length whisker was found by our in house test.

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