POWER RELAY
1 POLE - 25A HIGH CAPACITY TYPE

FTR-K3-WS Series

RoHS Compliant

■ FEATURES

- 1 pole, 25A
- 1 form A contact
- Wide contact gap: 1.8mm
  (Compliant with European photovoltaic standard VDE0126)
- High insulation in small package (between coil and contacts)
  - Dielectric strength: 5,000VAC
  - Surge strength: 8,500V
- Low coil power consumption: 1,200mW
- Coil holding voltage can be reduced up to 35% of nominal coil voltage
  (ambient temperature; +20°C, contact current; 25A)
- Power consumption at the lowest coil holding voltage; 147mW
  * Coil holding voltage is the coil voltage after 100ms of applied nominal coil voltage
- Plastic materials: Flammability; UL94 V-0
- Cadmium-free contacts
- Flux free, cat. RTII protection
- RoHS compliant

■ APPLICATIONS

Photovoltaic power generation system (power conditioner), UniUninterruptible Power Supply (UPS)

■ PART NUMBERS

[Example] FTR-K3 A B 012 W - WS
(a) (b) (c) (d) (e) (f)

(a)	Relay type	FTR-K3 series
(b)	Contact configuration	A : 1a (1 Form A) / PCB type
(c)	Coil power	B : Standard (1,200mW)
(d)	Coil rated voltage	12 : 5....48VDC Please refer to coil rating table
(e)	Contact material	W : Silver alloy
(f)	Option code	WS : Contact gap 1.8mm

Actual marking does not carry the type name : “FTR”

E.g.: Ordering code: FTR-K3AB012W-WS Actual marking: K3AB012W-WS

■ SPECIFICATIONS

Item			Specifications	Remarks/Conditions
Contact Data	Configuration		1a (1 Form A)	
	Material		Silver alloy	
	Resistance (initial)		Max. 100 mΩ	At 1A, 6VDC
	Contact rating		25A, 250VAC	Resistive
	Max. carrying current		25A	
	Max. switching voltage		250VAC	
	Max. switching power		6,250VA	
	Max. switching current		25A	
	Min. switching load *1		100mA, 5VDC	Reference
Coil	Rated power (20°C)		1,200mW	
	Operate power (20°C)		588mW	
	Coil power at holding voltage		147mW (35% of nominal coil voltage)	
	Holding voltage *2		35 to 120% of nominal coil voltage (25A at +20°C) 45 to 80% of nominal coil voltage (25A at +85°C)	
	Operating temperature range		-40°C to +60°C (coil nominal voltage) -40°C to +85°C (holding voltage; 45~80% of nominal coil voltage)	No frost
Time	Operate (at nominal voltage)		Max. 20ms (without bounce)	
	Release (at nominal voltage)		Max. 10ms (no diode, without bounce)	
Life	Mechanical		Min. 100 x 10^3 operations	
	Electrical	Resistive	Min. 30 x 10^3 operations (at 25A, 250VAC)	
		Inductive (Endurance)	Min. 30 x 10^3 operations (at 25A, 250VAC, cosφ=0.8)	
		Inductive (Overload)	Min. 50 operations (at 37.5A, 250VAC, cosφ=0.8)	
Insulation	Contact gap		Min. 1.8mm	
	Resistance		Min. 1,000MΩ	At 500VDC
	Dielectric strength	Open contacs	2,500VAC (50/60Hz), 1 minute	
		Coil to contacts	5,000VAC (50/60Hz), 1 minute	
	Surge strength	Coil to contacts	8,500V / 1.2 x 50μs standard wave	
	Clearance		Min. 6.4mm	
	Creepage		Min. 9.5mm	
Others	Vibration resistance	Misoperation	10 to 55 to 10Hz single amplitude 0.75mm	Coil ON/OFF, 3 axis, total 6 cycles
		Endurance	10 to 55 to 10Hz single amplitude 0.75mm	Coil OFF, 3 axis, total 6 hours
	Shock resistance	Misoperation	Min. 200m/s² (11±1ms)	Coil ON/OFF, 3 axis, total 36 operations
		Endurance	Min. 1,000m/s² (6±1ms)	Coil OFF, 3 axis, total 18 operations
	Dimensions / Weight		15.7 x 30.1 x 23.3mm / Approximately 25g	

*1 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.

*2 Reduction of minimum coil holding voltage to maximum coil voltage range, after 100msec energizing with nominal coil voltage.

Care shall be taken on the heat generated on PC board when maximum carrying current exceeds 10A. Please perform the confirmation test with actual conditions.

■ COIL DATA

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ω)	Must Operate Voltage*1 (VDC)	Must Release Voltage*1 (VDC)	Min. Non Release Voltage*1 (VDC)	Rated Power (mW)
005	5	21	3.5	0.5	1.75	1,200 (147) *2
006	6	30	4.2	0.6	2.1	
009	9	68	6.3	0.9	3.15	
012	12	120	8.4	1.2	4.2	
018	18	270	12.6	1.8	6.3	
024	24	480	16.8	2.5	8.4	
048	48	1,920	33.6	4.8	16.8	

Note: All values in the table are valid for 20°C and zero contact current. or mis-operation may occur.

*1: Specified operate values are valid for pulse wave voltage.

*2: This value is the coil power at 35% of nominal voltage at 20°C.

Please use at rated coil voltage. Please refer to characteristic data and set up adequate voltage in case of use at over voltage.

■ SAFETY STANDARDS

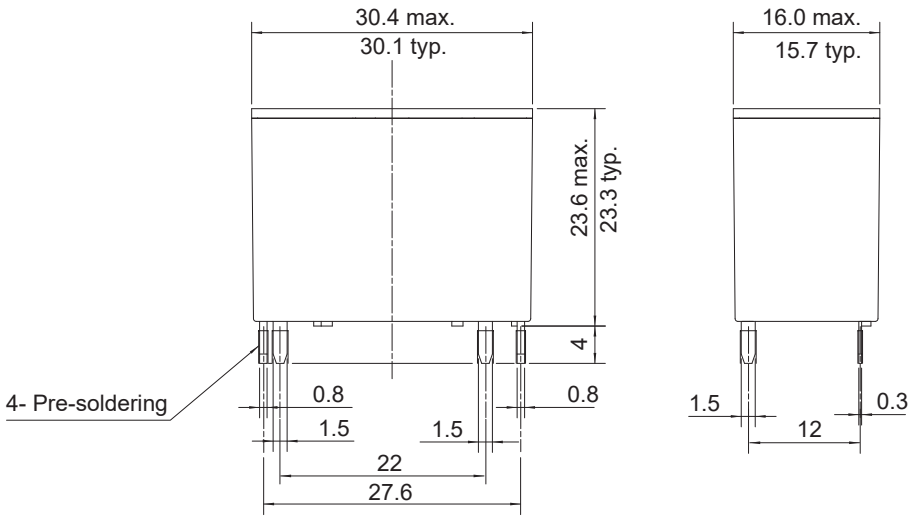
Type	Compliance	Contact Rating
UL	Flammability: UL 94-V-0 (plastics)	
	UL 508 CSA 22.2 No.14 (cULus) File No. E63614	25A, 277VAC (General Use, at 85°C) 1HP, 125VAC (at 60°C) 2HP, 277VAC, 100x103 (at 60°C)
VDE	IEC/EN61810-1	25A, 250VAC (cos φ = 1, at 85°C)

■ PART NUMBER LIST

Part Number	Contact Configuration	Contact Gap	Contact Material	Contact Rating	Rated Coil Power
FTR-K3AB( )W-WS	1a (1 Form A)	Min. 1.8mm	Silver alloy	25A, 250VAC	1,200mW

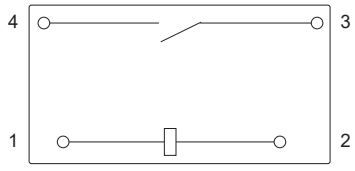
■ DIMENSIONS

● Dimentions



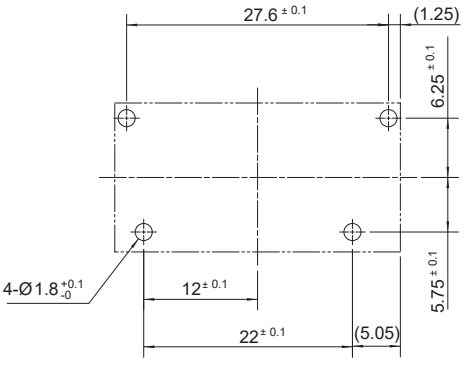
● Schemetics

(BOTTOM VIEW)



● PC board mounting hole layout

(BOTTOM VIEW)



- Dimensions of the terminals do not include thickness of pre-soldering.
- Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified.

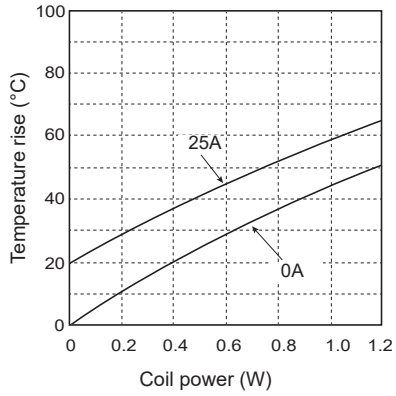
Unit: mm

( ): Reference

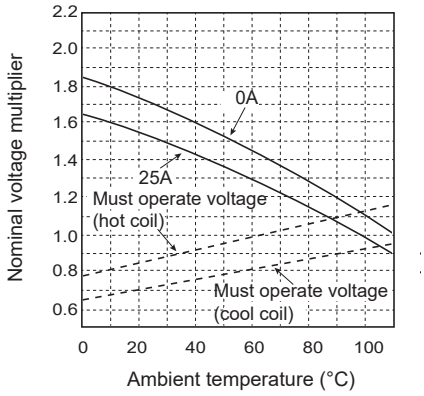
■ CHARACTERISTIC DATA

(Characteristic data is not guaranteed value but measured values of samples from production line.)

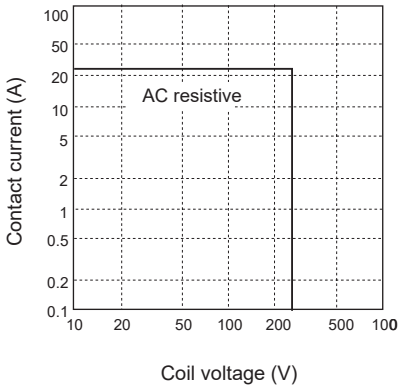
Coil temperature rise



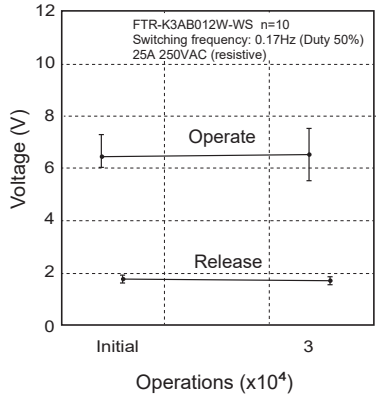
Operating range



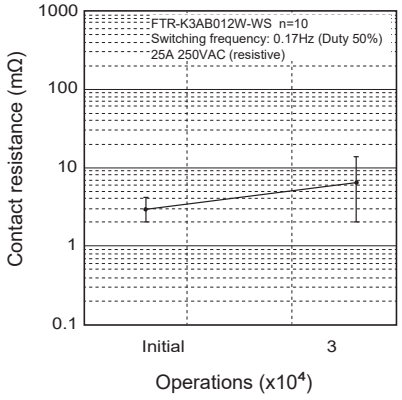
Maximum switching power



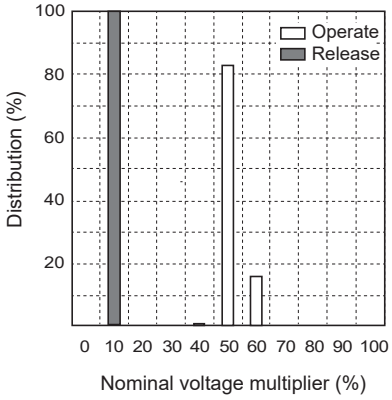
Electrical life test (resistive)
Operate/release voltage



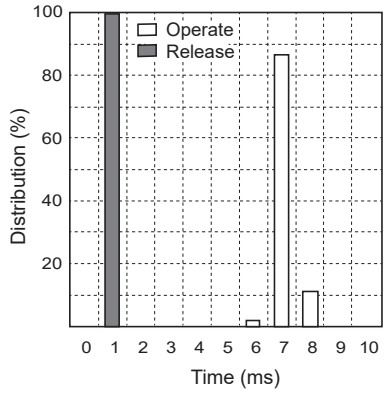
Electrical life test (resistive)
Contact resistance



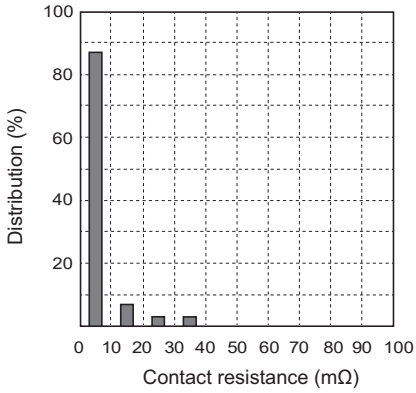
Distribution of operate/
release voltage



Distribution of operate/
release time



Distribution of contact resistance



CAUTIONS

- All values mentioned in this datasheet are provided under ideal conditions. Please perform the confirmation test before actual use.
- Reflow soldering is prohibited.
- Do not use relays in the atmosphere with sulfide gas, chloride gas or nitric oxide. Contact resistance may increase.
- Do not use silicon or silicon-containing product or materials near relays. It may cause contact failure.

GENERAL INFORMATION

1. **ROHS Compliance**
   - All relays produced by FCL Components are compliant with RoHS directive 2011/65/EU, including commission delegated directive 2015/863.

2. **Recommended lead free solder condition**
   - 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.
   - Recommended solder for assembly: Sn-3.0Ag-0.5Cu.

Flow Solder Condition:

Pre-Heating:	Maximum 120˚C within 90 sec.
Soldering:	Dip within 5 sec. at 255°C±5°C solder bath

Relay must be cooled by air immediately after soldering

Solder by Soldering Iron:

Soldering Iron:	30-60W
Temperature:	Maximum 340-360˚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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