

# POWER RELAY

## 1 POLE - 16A, 80A INRUSH TYPE

### FTR-K1 Series

RoHS Compliant

#### ■ FEATURES



- Peak 80A inrush current (1 form A type)
- Low profile (height: 15.7mm)
- High insulation
- Insulation distance (between coil and contacts): 10mm minimum, dielectric strength: 5kV, surge strength: 10kV
- Class F coil wire
- Low coil power (400mW)
- Glow wire compliant type available which satisfies GWT required for relay in IEC/EN 60335-1
- Cadmium free contacts
- Safety standards: UL, CSA, VDE, CQC approved  
UL, CSA TV-5 rating approved (make contact)
- Flux proof, RTII
- RoHS compliant

#### ■ APPLICATIONS

Heater control, home appliances, lighting equipment etc.

#### ■ PART NUMBERS

[Example] FTR-K1   A   K   012   I   -   BG   -   GW  
                   (a)    (b)   (c)   (d)   (e)   (f)   (g)

(a)	Relay type	FTR-K1 series
(b)	Contact configuration	A : 1a (1 Form A, SPST-NO) C : 1c (1 Form C, SPDT)
(c)	Coil type	K : Standard type (400mW)
(d)	Coil rated voltage	012 : 5...110VDC Please refer to coil rating table
(e)	Contact material / TV type	T : AgSnO <sub>2</sub> (1a, TV-5 contact) W : AgSnO <sub>2</sub> (1c, TV-5 contact) (make contact only)
(f)	Special type	Nil : Standard type (without gold plate) BG : Gold plated contact
(g)	Option	GW Comply with GWEPT (IEC/EN 60695-2-11)

Actual marking does not carry the type name: "FTR" and option: "BG"

E.g.: Ordering code: FTR-K1CK012W Actual marking: K1CK012W

## ■ SPECIFICATIONS

Item		Specifications		Remarks/Conditions	
		FTR-K1AK( )T	FTR-K1CK( )W		
Contact Data	Configuration	1a (1 Form A)	1c (1 Form C)		
	Construction	Single			
	Material	AgSnO <sub>2</sub>			
	Resistance	Max. 100mΩ		Initial at 1A, 6VDC	
	Contact rating	16A, 250VAC/24VDC		Resistive	
	Max. carrying current	20A			
	Max. inrush current	80A, 250VAC			
	Max. switching voltage	440VAC/300VDC			
	Max. switching power	4,000VA/384W			
	Min. switching load *1	100mA, 5VDC			
Coil	Rated power (20°C)	400 to 430mW			
	Operate power (20°C)	196 to 211mW			
	Operating temperature range	-40°C to +85°C		No frost	
Time	Operate	Max. 15ms		Without bounce	
	Release	Max. 5ms		Without bounce, no diode	
Life	Mechanical	Min. 20 x 10 <sup>6</sup> operations			
	Electrical	AC contact rating	Min. 100 x 10 <sup>3</sup> ops.	Min. 50 x 10 <sup>3</sup> ops.	
		DC contact rating	Min. 100 x 10 <sup>3</sup> ops.	Min. 30 x 10 <sup>3</sup> ops.	
		Peak inrush	Min. 10 x 10 <sup>3</sup> ops. (only make contact)		At 85°C, VDE#0435 (80A 250VAC)
Lamp (UL TV-5)		Min. 25 x 10 <sup>3</sup> ops.	Min. 25 x 10 <sup>3</sup> ops. (only make contact)		
Insulation	Insulation resistance	Min. 1000MΩ		At 500VDC	
	Dielectric withstanding strength	Open contacts	1000VAC (50/60Hz), 1 minute		
		Coil to contacts	5,000VAC (50/60Hz), 1 minute		
	Surge strength	Coil to contacts	10,000V / 1.2 x 50μs standard wave		
	Clearance / creepage		10mm / 10mm		
	EN61810-1, VDE0435	Voltage	250V		
		Pollution degree	3		
Material group		IIIa			
Category		C / 250 (reference voltage) (VDE0110b)			
Others	Vibration resistance	Misoperation≥1μs	10 to 55 to 10Hz single amplitude 0.35mm	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≥1μs	Min. 100m/s <sup>2</sup> (11±1ms)		Coil ON/OFF, 3 axis, total 36 operations
		Endurance	Min. 1,000m/s <sup>2</sup> (6±1ms)		Coil OFF, 3 axis, total 18 operations
	Dimensions / Weight		12.7 x 29.0 x 15.7 mm / approx. 13g		
	Sealing		Flux proof, RTII		

Need to consider the heat from PCB when max. current is more than 10A.

\*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.

## ■ COIL DATA

Coil Code	Rated Coil Voltage (VDC)	Coil Resistance ±10% (Ω)	Must Operate Voltage* <sup>1</sup> (VDC)	Must Release Voltage* <sup>1</sup> (VDC)	Rated Power (mW)
005	5	62	3.5	0.5	400
006	6	90	4.2	0.6	
009	9	202	6.3	0.9	
012	12	360	8.4	1.2	
018	18	810	12.6	1.8	
022	22	1,210	15.4	2.2	
024	24	1,440	16.8	2.4	
028	28	1,960	19.6	2.8	
048	48	5,360	33.6	4.8	430
060	60	8,570	42.0	6.0	420
110	110	28,800	77.0	11.0	

Note: All values in the table are valid for 20°C and zero contact current unless otherwise specified.

\*: Specified operated values are valid for pulse voltage.

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

## ■ PART NUMBER LIST

Part Number	Contact Configuration	Rated Power	Contact Material	UL TV Rating	Others
FTR-K1AK( )T	1a (1 Form A)	Standard (Approx. 400 to 430mW)	AgSnO <sub>2</sub>	TV-5	-
FTR-K1AK( )T-GW					Comply with GWEPT
FTR-K1AK( )T-BG			AgSnO <sub>2</sub> +Au plate		-
FTR-K1AK( )T-BG-GW					Comply with GWEPT
FTR-K1CK( )W	1c (1 Form C)	Standard (Approx. 400 to 430mW)	AgSnO <sub>2</sub>	TV-5 (N.O.)	-
FTR-K1CK( )W-GW					Comply with GWEPT
FTR-K1CK( )W-BG			AgSnO <sub>2</sub> +Au plate		-
FTR-K1CK( )W-BG-GW					Comply with GWEPT

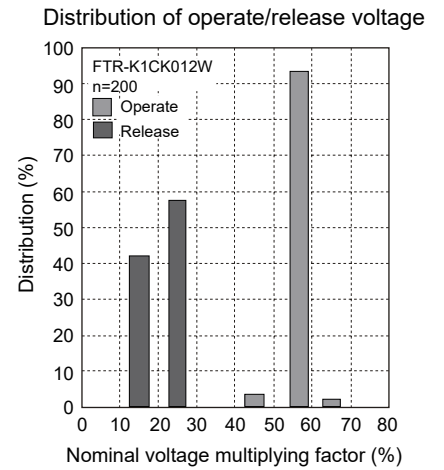
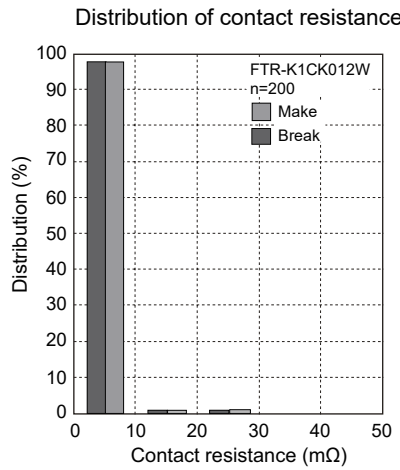
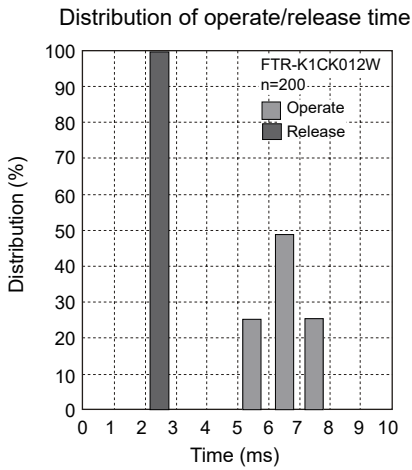
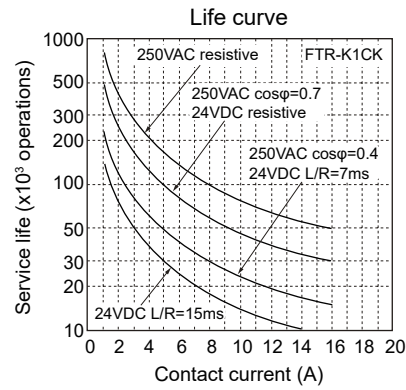
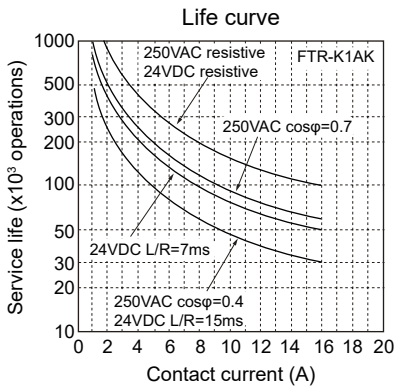
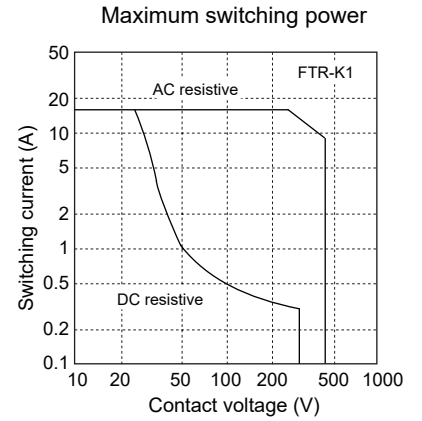
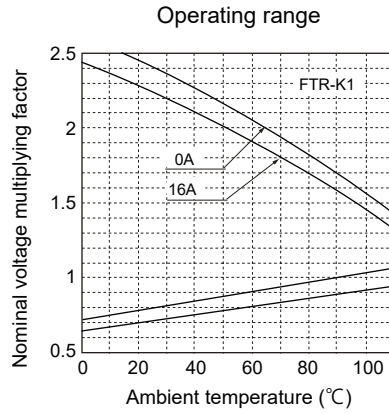
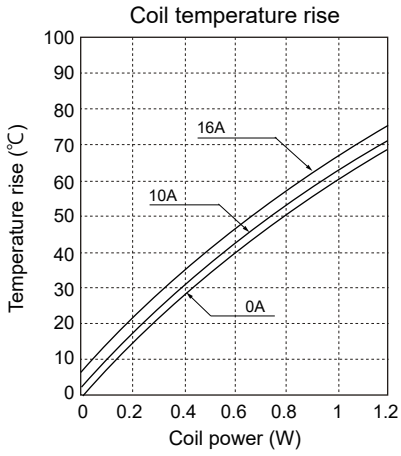
## ■ SAFETY STANDARDS

Type	Compliance	Contact Rating	
		1a	1c
UL	Flammability: UL 94-V-0 (plastics)		
	UL508 File No. E63614	<b>FTR-K1AK ( ) T(-GW)</b> 16A, 24VDC (resistive) 16A, 277VAC (resistive) 20A, 277VAC (resistive) 1 hp 277VAC, 1/2hp 125VAC TV-5, 120VAC 25,000 cycles Pilot duty: A300	<b>FTR-K1CK ( ) W(-GW)</b> 16A, 277VAC/24VDC (resistive) 20A, 277VAC (resistive) 1 hp 277VAC, 1/2hp 125VAC 1/8 hp, 125VAC TV-5, 250VAC, 25,000 cycles (make contact) Pilot duty: B300
CSA	C22.2 No. 14 File No. LR40304		<b>FTR-K1CK ( ) W(-GW)</b> 16A, 277VAC/24VDC (resistive) 20A, 277VAC (resistive) 1hp 277VAC, 1/2hp 125VAC 1/8hp 125VAC TV-5, 120VAC (make contact) Pilot duty: B300
VDE	IEC/EN61810-1 EN60065 clause 14.6.1 (1a only) EN60335-1 clause 15.3; 16.3; 29.1; 29.2; 29.3 EN60730-1 clause 12.2; 13.2; 20.1; 20.2; 20.3	<b>FTR-K1AK ( ) T(-GW)</b> 16A, 250VAC ( $\cos\phi=1$ ), 85°C 3.5A, 250VAC ( $\cos\phi=0.4$ ), 85°C 16A, 24VDC (0ms), 85°C 5A/80A, 250VAC 10,000 times, 85°C	<b>FTR-K1CK ( ) W(-GW)</b> 16A, 250VAC ( $\cos\phi=1$ ), 85°C 3.5A, 250VAC ( $\cos\phi=0.4$ ), 85°C 16A, 24VDC (0ms), 85°C
CQC	GB/T21711.1 GB15092.1 File No. 12002083788	<b>FTR-K1AK ( ) T</b> 12A, 240VAC 72LRA/12FLA 240VAC	<b>FTR-K1CK ( ) W</b> 16A, 250VAC



## CHARACTERISTIC DATA

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



## 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.

## Contact

### Japan

FCL COMPONENTS LIMITED  
Shinagawa Seaside Park Tower  
12-4, Higashi-shinagawa 4-chome,  
Tokyo 140 0002, Japan  
Tel: +81-3-3450-1682  
Email: fcl-contact@cs.fcl-components.com

### North and South America

FCL COMPONENTS AMERICA, INC.  
2055 Gateway Place Suite 480,  
San Jose, CA 95110 USA  
Tel: +1-408-745-4900  
Email: fcmai.components@fcl-components.com

### Europe

FCL COMPONENTS EUROPE B.V.  
Diamantlaan 25  
2132 WV Hoofddorp, Netherlands  
Tel: +31-23-556-0910  
Email: info@fcl-components.eu

### Asia Pacific

FCL COMPONENTS ASIA PTE LTD.  
No. 20 Harbour Drive, #07-01B  
Singapore 117612  
Tel: +65-6375-8560  
Email: fcal@fcl-components.com

### China

FCL COMPONENTS (SHANGHAI) CO.,LTD.  
Unit 1105, Central Park - Jing An,  
No.329 Heng Feng Road, Shanghai  
200070, China  
Tel: +86-21-3253 0998  
Email: fcsh@fcl-components.com

### Hong Kong

FCL COMPONENTS HONG KONG CO.,  
LIMITED  
Unit 2313, Seapower Tower, Concordia  
Plaza, No.1 Science Museum Road,  
TST, Kowloon, Hong Kong  
Tel: +852-2881-8495  
Email: fcal@fcl-components.com

Web: [www.fcl-components.com/en/](http://www.fcl-components.com/en/)

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