

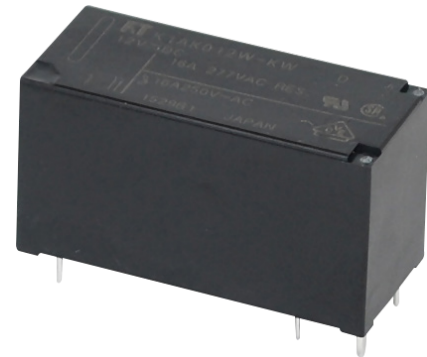
# POWER RELAY

## 1 POLE - 16A 105 °C, FLUX FREE TYPE

### FTR-K1 Series

#### ■ FEATURES

- Low profile (height: 15.7mm)
  - High insulation  
Insulation distance (between coil and contacts): 10mm min.  
Dielectric strength: 5KV  
Surge strength: 10KV
  - Low coil power (400mW)
  - Cadmium free contacts
  - Safety standards  
UL, VDE approved  
UL, TV-5 rating approved (1 form A type)
  - UL F class insulation wire
  - Flux proof, RTII
  - RoHS compliant
- Please see page 6 for more information



#### ■ PARTNUMBER INFORMATION

[Example]       $\frac{\text{FTR-K1}}{\text{(a)}}$      $\frac{\text{C}}{\text{(b)}}$      $\frac{\text{K}}{\text{(c)}}$      $\frac{\text{012}}{\text{(d)}}$      $\frac{\text{W}}{\text{(e)}}$  -  $\frac{\text{HT}}{\text{(f)}}$

(a)	Relay type	FTR-K1	: FTR-K1-Series
(b)	Contact configuration	A C	: 1 form A (SPST-NO) : 1 form C (SPDT)
(c)	Coil type / enclosure	K	: Standard type (400mW)
(d)	Coil rated voltage	012	: 5.....110 VDC Coil rating table at page 3
(e)	Contact material / TV type	W T	: AgSnO <sub>2</sub> (1 form C) : AgSnO <sub>2</sub> /TV-5 rated (1 form A, TV-5)
(f)	Special type	HT	: 105 °C, flux free type

Actual marking does not carry the type name : "FTR"

E.g.: Ordering code: FTR-K1CK012W-HT

Actual marking: K1CK012W

HT marking not part of type number printing,  
but next to coil rating print.

# FTR-K1 SERIES

## ■ SPECIFICATION

Item			FTR-K1 AK ( ) T - HT	FTR-K1 CK ( ) W - HT
Contact Data	Configuration		1 form A	1 form C
	Construction		Single	
	Material		AgSnO <sub>2</sub>	
	Resistance (initial)		Max. 100mΩ at 1A, 6VDC	
	Contact rating (resistive)		16A, 250VAC / 24VDC	
	Max. carrying current * <sup>1</sup>		20A	
	Max. inrush current		78A 250VAC (only make contact)	
	Max. switching voltage		440VAC / 300VDC	
	Max. switching power		4,000VA / 384W	
	Min. switching load * <sup>2</sup>		100mA, 5VDC	
Life	Mechanical		Min. 20 x 10 <sup>6</sup> operations	
	Electrical	AC contact rating	Min. 100 x 10 <sup>3</sup> operations	Min. 50 x 10 <sup>3</sup> operations
		DC contact rating	Min. 100 x 10 <sup>3</sup> operations	Min. 30 x 10 <sup>3</sup> operations
		Lamp Load (UL TV-5)	Min. 25 x 10 <sup>3</sup> operations	-
Coil Data	Rated power (20 °C)		400 to 430mW	
	Operate power (20 °C)		200 to 210mW	
	Operating temperature range		-40 °C to +105 °C (no frost)	
Timing Data	Operate (at nominal voltage)		Max. 15ms (without bounce, no diode)	
	Release (at nominal voltage)		Max. 5ms (without bounce, no diode)	
Insulation	Resistance (initial)		Min. 1,000MΩ at 500VDC	
	Dielectric strength	Open contacts	1,000VAC (50/60Hz) 1min	
		Contacts to coil	5,000VAC (50/60Hz) 1min	
	Surge strength	Coil to contacts	10,000V / 1.2 x 50μs standard wave	
	Clearance		10mm	
	Creepage		10mm	
	EN61810-1, VDE0435	Voltage	250V	
		Pollution degree	3	
		Material group	III a	
	Category	C / 250V (Reference voltage) (VDE0110b)		
Other	Vibration resistance	Misoperation≥1us	10 to 55 to 10Hz single amplitude 0.35mm	
		Endurance	10 to 55 to 10Hz single amplitude 0.75mm	
	Shock	Misoperation≥1us	100m/s <sup>2</sup> (11 ± 1ms)	
		Endurance	1,000m/s <sup>2</sup> (6 ± 1ms)	
	Weight		Approximately 13g	
	Sealing		Flux proof, RTII	

\* 1: Need to consider the heat from PCB when max. current is more than 10A.

\* 2: 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) *	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.

\* Specified operate values are valid for pulse wave voltage.

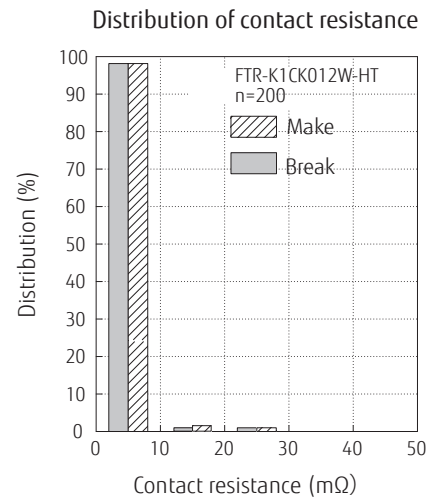
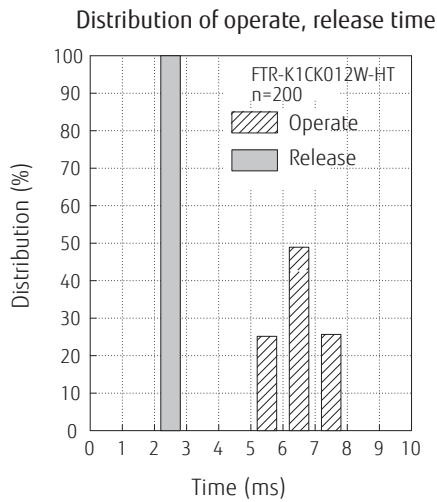
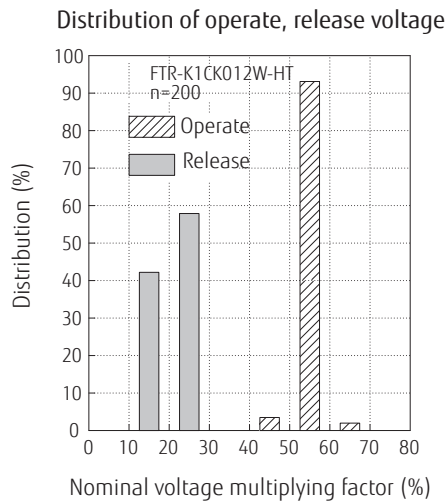
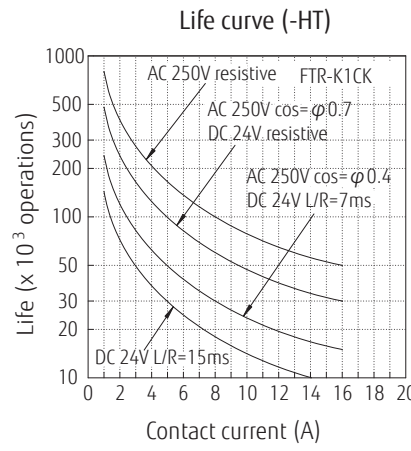
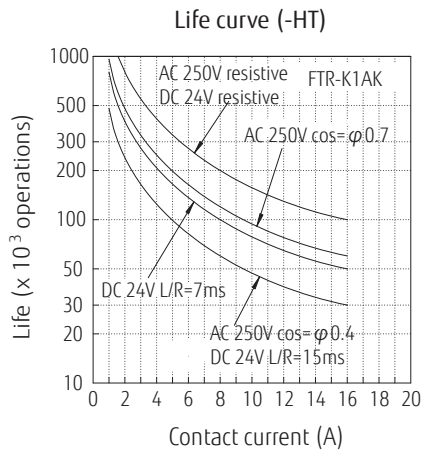
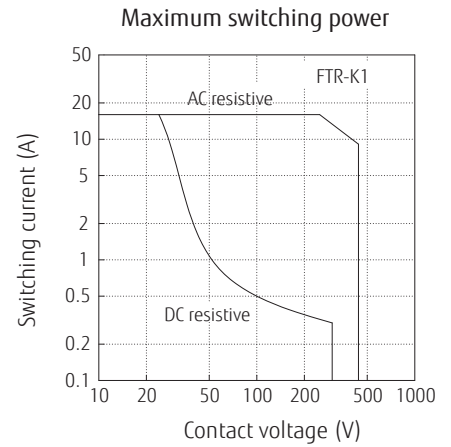
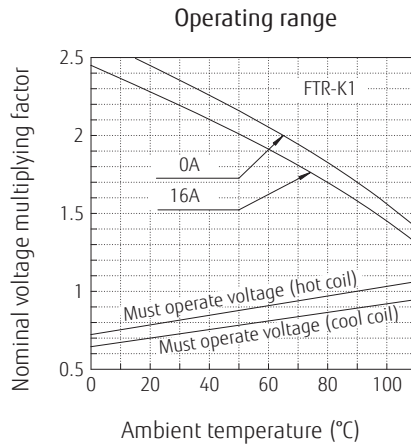
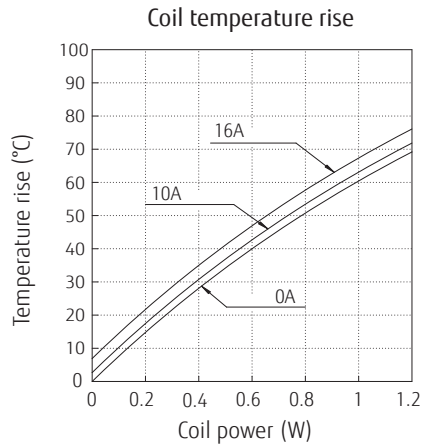
Please use at rated coil voltage. Please refer to characteristic data and set up adequate voltage in case of use at over voltage.

## ■ SAFETY STANDARDS

Type	Compliance	Contact rating	
		FTR-K1AK ( ) T-HT	FTR-K1CK ( ) W-HT
UL	UL 508 E63614	Flammability: UL 94-V0 (plastics)	
		16A, 24VDC (resistive) 105°C 16A, 277VAC (resistive) 105°C 20A, 277VAC (resistive) 105°C 1hp, 277VAC 105°C 1/2 hp, 125VAC 105°C TV-5, 120VAC, 25,000 cycles, 105°C Pilot duty: A300 105°C	16A, 24VDC (resistive) 105°C 16A, 277VAC (resistive) 105°C 20A, 277VAC (resistive) 105°C 1 hp, 277VAC 105°C 1/2 hp, 125VAC 105°C 1/8 hp, 125VAC 105°C Pilot duty: B300 105°C
VDE	IEC/EN61810-1, EN60730-1 clause 12.2; 13.2; 20.1; 20.2; 20.3, EN60335-1 clause 15.3; 16.3; 29.1; 29.2; 29.3	16A, 250VAC (cosφ=1), 105°C 10A, 250VAC (cosφ=1), 105°C	

## CHARACTERISTIC DATA (Reference)

\* Characteristic data is not a guaranteed value, but measured values of samples from production line.

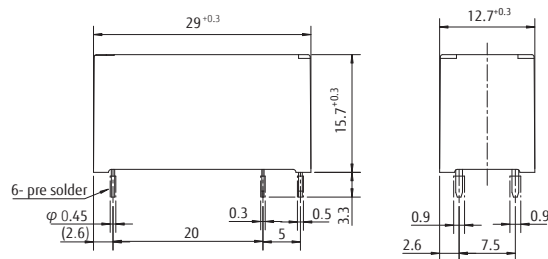


# FTR-K1 SERIES

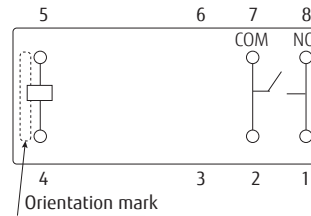
## ■ DIMENSIONS

FTR-K1AK( )T-HT

### ● Dimensions

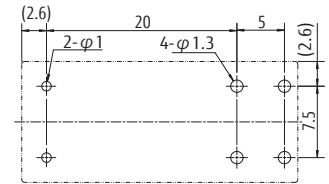


### ● Schematics



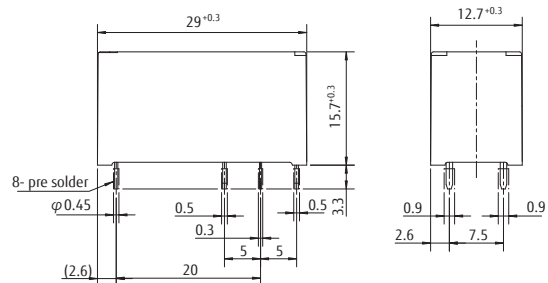
Connect terminal #1 and #8 on the PC board

### ● PC board mounting hole layout (BOTTOM VIEW)

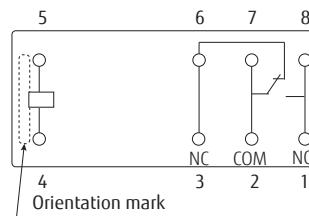


FTR-K1CK( )W-HT

### ● Dimensions

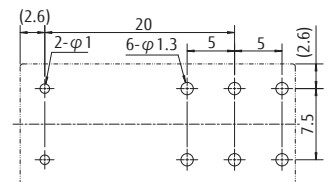


### ● Schematics



Connect terminal #1 and #8 on the PC board

### ● PC board mounting hole layout (BOTTOM VIEW)



\* Dimensions of the terminals do not include thickness of pre-solder.

\* Tolerance of PC board mounting hole layout :  $\pm 0.1$  unless otherwise specified.

Unit: mm

## 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.

## RoHS Compliance and Lead Free Information

### 1. General Information

- All relays produced by Fujitsu Components are compliant with RoHS directive 2011/65/EU including amendments.
- Cadmium as used in electrical contacts is exempted from the RoHS directives.  
As per Annex III of directive 2011/65/EU.
- All relays are lead-free. Please refer to Lead-Free Status Info for older date codes at:  
<http://www.fujitsu.com/downloads/MICRO/fcai/relays/lead-free-letter.pdf>
- 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 Condition

- Recommended solder 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 350-360°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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