POWER RELAY

1 POLE – 16A Silver Nickel Contact

FTR-K1 Series

■ FEATURES

- Suitable for low current load (silver nickel)
- 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)
- Safety standards
  UL, CSA, VDE approved
- UL F class isolation
- Flux proof RTII
- RoHS compliant

■ PARTNUMBER INFORMATION

[Example] FTR-K1 (a) C (b) K (c) 012 (d) E (e)

(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 (400mW) / flux proof
(d)	Coil rating voltage	012	: 5....110VDC See coil rating table
(e)	Contact material	W	: AgNi

Actual marking does not carry the type name : "FTR“
E.g.: Ordering code: FTR-K1CK012E Actual marking: K1CK012E

■ SPECIFICATIONS

Item			FTR-K1AK( )E	FTR-K1CK( )E
Contact data	Configuration		1 form A	1 form C
	Construction		Single	
	Material		AgNi	
	Resistance (initial)		Max. 100mΩ at 1A, 6VDC	
	Contact rating (resistive)		16A, 250VAC / 24VDC	
	Max. carrying current		20A	
	Max. switching voltage		440VAC / 300VDC	
	Max. switching power		4,000VA / 384W	
	Min. switching load *		100mA, 5VDC	
Coil data	Rated power (20℃)		400mW (430mW at 48V coil, 420mW at 60V/110V coil)	
	Operate power (20℃)		200mW (210mW at 48V coil, 206mW at 60V/110V coil)	
	Operating temperature range		-40℃ to +85℃ (no frost)	
Timing data	Operate (at nominal voltage)		Max. 15ms (without bounce, no diode)	
	Release (at nominal voltage)		Max. 5ms (without bounce, no diode)	
Life	Mechanical		Min. 20 x 10^6 operations	
	Electrical	AC contact rating	Min. 100 x 10^3 operations	Min. 50 x 10^3 operations
		DC contact rating	Min. 100 x 10^3 operations	Min. 30 x 10^3 operations
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 / creepage		10mm / 10mm	
	EN61810-1, VDE0435	Voltage	250V	
		Pollution group	3	
		Material group	III a	
		Category	C / 250V (Reference voltage) (VDE0110b)	
Others	Vibration resistance	Misoperation ≧1μs	10 to 55 to 10Hz single amplitude 0.35mm	
		Endurance	10 to 55 to 10Hz single amplitude 0.75mm	
	Shock	Misoperation ≧1μs	100m/s² (11 ± 1ms)	
		Endurance	1,000m/s² (6 ± 1ms)	
	Weight		Approximately 13g	
	Sealing		Flux proof, RTII	

* : 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.

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

■ COIL DATA

Coil Code	Nominal Voltage (VDC)	Coil Resistance ±10% (Ω)	Must Operate Voltage* (VDC)	Must Release Voltage* (VDC)	Nominal 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℃ and zero contact current.
* Specified operate values are valid for pulse wave 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.

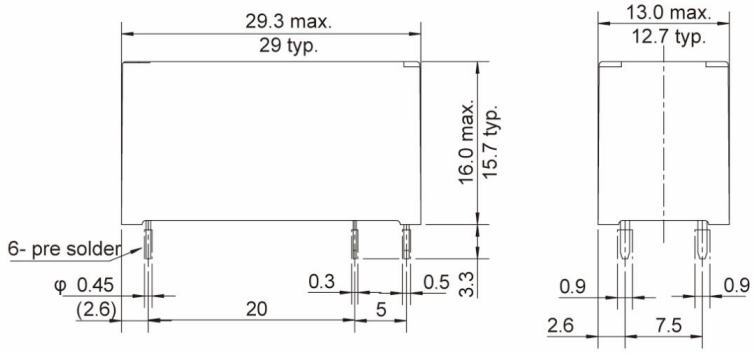
■ SAFETY STANDARDS

Type	Compliance	Contact rating	
		FTR-K1AK( )E	FTR-K1CK( )E
UL	UL 508 E63614	Flammability: UL 94-V0 (plastics)	
		16A, 277VAC (resistive) 20A, 277 VAC (resistive) 1 hp, 277VAC 1/2 hp, 125VAC Pilot duty: A300	16A, 277VAC / 24VDC (resistive) 20A, 277VAC (resistive) 1 hp, 277VAC 1/2 hp, 125VAC 1/8 hp, 125VAC Pilot duty: B300
CSA	C22.2 No. 14 LR 40304	16A, 277VAC / 24VDC (resistive) 1 hp, 277VAC 1/2 hp, 125VAC Pilot duty: A300	16A, 277VAC / 24VDC (resistive) 1 hp, 277VAC 1/2 hp, 125VAC 1/8 hp, 125VAC Pilot duty: B300
VDE	IEC/EN 61810-1 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	16A, 250 VAC (cosφ=1), 85˚C 3.5A, 250 VAC (cosφ=0.4), 85˚C 16A, 24VDC (0ms), 85˚C	

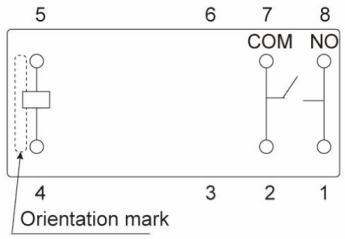
■ DIMENSIONS

FTR-K1AK( )E

Dimensions

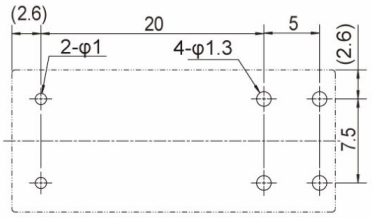


Schematics (BOTTOM VIEW)



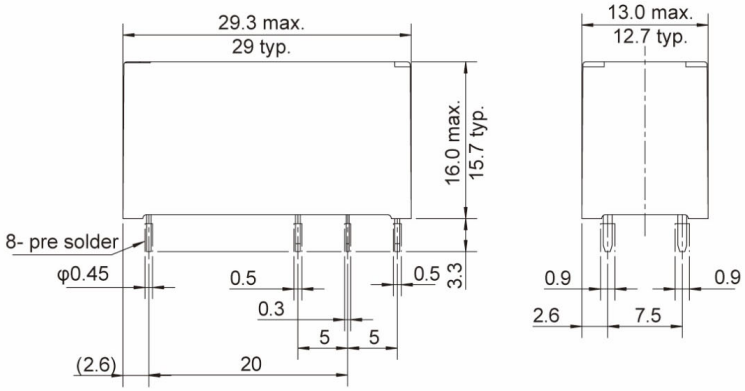
Connect terminal #1 and #8 on the PC board

PC board mounting hole layout (BOTTOM VIEW)

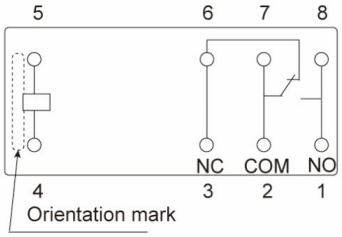


FTR-K1CK( )E

Dimensions

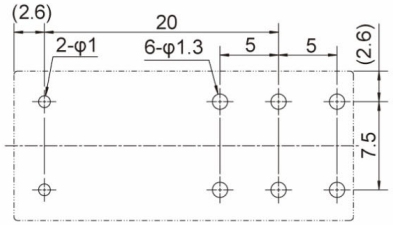


Schematics (BOTTOM VIEW)



Connect terminal #1 and #8 on the PC board

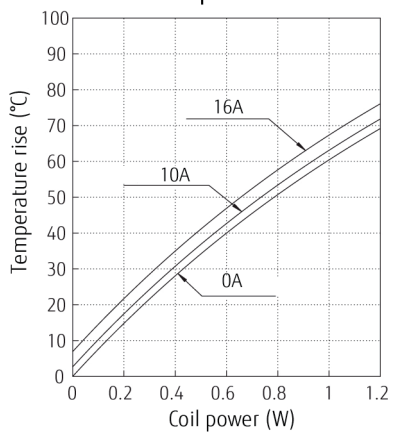
PC board mounting hole layout (BOTTOM VIEW)



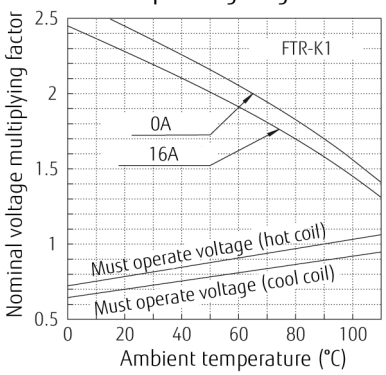
Dimensions of the terminals do not include thickness of pre-solder.
Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified. (Unit: mm)

■ CHARACTERISTIC DATA

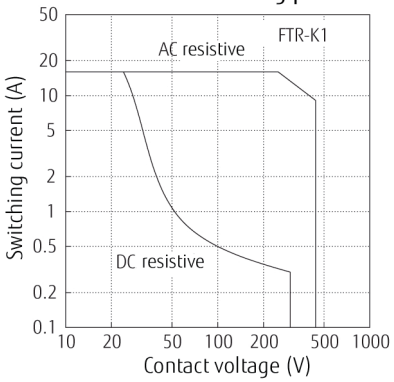
Coil temperature rise



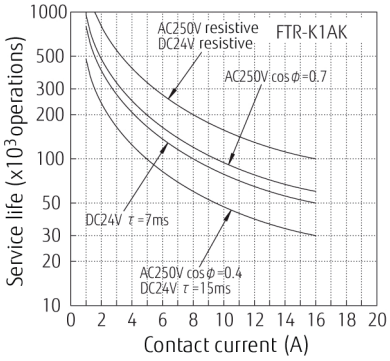
Operating range



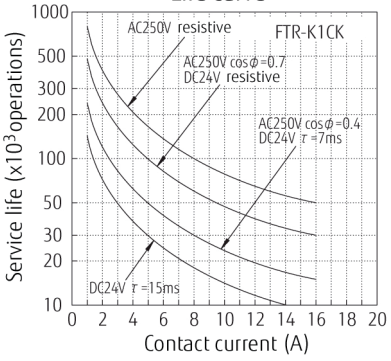
Maximum switching power



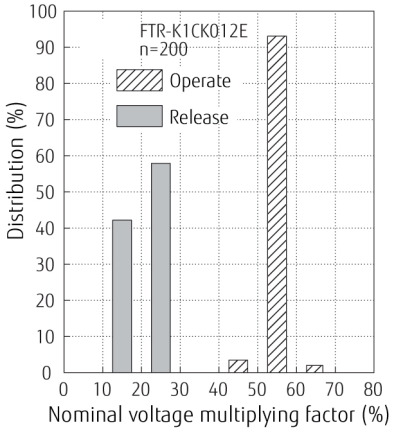
Life curve



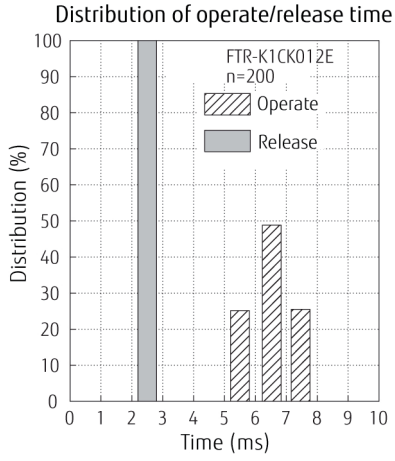
Life curve



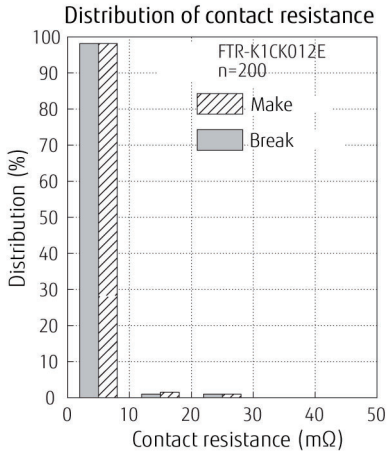
Distribution of operate/release voltage



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.

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: fcai.components@fcl-components.com

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

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

Web: www.fcl-components.com/en/

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