POWER RELAY
1 POLE - 16A / Inrush 120A relay

FTR-K1-KS Series

RoHS Compliant

■ FEATURES

- 1 pole 16A, 1 Form A or 1 Form C, flux proof
- Peak inrush current 120A / TV-8
- Glow wire compliant type available which satisfied GWT required to relay in IEC/EN60335-1
- Coil power 400mW
- High insulation in small package (between coil and contacts
  - Insulation distance: 10mm min.
  - Dielectric strength: 5,000VAC
  - Surge strength: 10,000V
- UL1446 Class F coil insulation wire
- Cadmium-free contacts for eco-program
- Flux proof, RTII
- RoHS compliant

■ APPLICATIONS

Power supplies

■ PART NUMBERS

[Example] FTR-K1 C K 005 T - KS - GW
(a) (b) (c) (d) (e) (f) (g)

(a)	Relay type	FTR-K1 series
(b)	Contact congiguration	A : 1a (1 Form A) C : 1c (1 Form C)
(c)	Coil type	K : Standard type (400mW)
(d)	Coil reated voltage	005 : 5...110VDC*1 See coil rating table
(e)	Contact material / TV type	T : $AgSnO_2$ / TV-8 rating
(f)	Inrush type	KS : Inrush 120A type
(g)	Special type	GW : Comply with GWEPT (IEC60695-2-11)

Note: Actual marking does not carry the type name: “FTR”. E.g.: Ordering code: FTR-K1CK005T-KS Actual marking: K1CK005T-KS

*1: 110V coil is not for new design.

■ SPECIFICATIONS

Item			Specifications	
			FTR-K1CK( )T-KS	FTR-K1AK( )T-KS
Contact Data	Configuration		1c (1 Form C)	1a (1 Form A)
	Material		$AgSnO_2$	
	Resistance (initial)		Max. 100mΩ at 1A, 6VDC	
	Contact rating		16A, 250VAC	
	Max. carrying current		20A	
	Max. switching voltage		440VAC	
	Max. switching power		4,000VA	
	Min. switching load *1		100mA, 5VDC	
	Max. inrush current		120A, 250VAC (N.O. contact)	120A, 250VAC
Coil	Rated power		400 to 430mW	
	Operate power		200 to 210mW	
	Operating temperature range		-40℃ to +85℃ (no frost)	
Time	Operate (at nominal voltage)		Max. 15ms (without bounce)	
	Release (at nominal voltage)		Max. 5ms (no diode, without bounce)	
Life	Mechanical		Min. 20 x 10^6 operations	
	Electrical	Resistive load	Min. 30 x 10^3 operations	Min. 100 x 10^3 operations
		Lamp load (TV-8)	Min. 25 x 10^3 operations (N.O. contact)	Min. 25 x 10^3 operations
		Peak inrush (120A, 250VAC)	Min. 30 x 10^3 operations (N.O. contact)	Min. 30 x 10^3 operations
Insulation	Insulation resistance (initial)		Min. 1,000MΩ at 500VDC	
	Dielectric	Open contacs	1,000VAC, 1min.	
		Coil to contacts	5,000VAC, 1min.	
	Surge strength	Coil to contacts	10,000V / 1.2 x 50μs standard wave	
	Clearance / Creepage		10mm / 10mm	
Others	Vibration resistance	Misoperation >1ms	10 to 55 to 10Hz single amplitude 0.35mm	
		Endurance	10 to 55 to 10Hz single amplitude 0.75mm	
	Shock	Misoperation >1ms	Min. 100m/s^2 (11±1ms)	
		Endurance	Min. 1,000m/s^2 (6±1ms)	
	Weight		Approximately 13 g	
	Sealing		Flux proof RTII	

*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*1 (VDC)	Must Release Voltage*1 (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*2	110*2	28,800	77.0	11.0	

Note: All values in the table are valid for 20℃ and zero contact current.

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

*2: 110V coil is not for new design.

■ SAFETY STANDARDS

Type	Compliance	Contact rating	
		1 Form A type	1 Form C type
UL	UL 508 (No. E63614)	Flammability: UL 94-V0 (plastics)	
		16A, 277VAC (resistive), 105℃ TV-8, 120VAC, 105℃	16A, 277VAC (resistive), 105℃ TV-8, 120VAC, (N.O. contact), 105℃
CSA	C22.2 No. 14 (No. LR40304)	16A, 277VAC (resistive) TV-8, 120VAC	16A, 277VAC (resistive) TV-8, 120VAC (N.O. contact)
VDE	IEC/EN61810-1 EN60065 clause 14.6.1 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, 250VAC, cosφ=1, 105℃ 8/120A, 250VAC, 85℃	16A, 250VAC, cosφ=1, 105℃ 8/120A, 250VAC, 85℃ (N.O. contact)

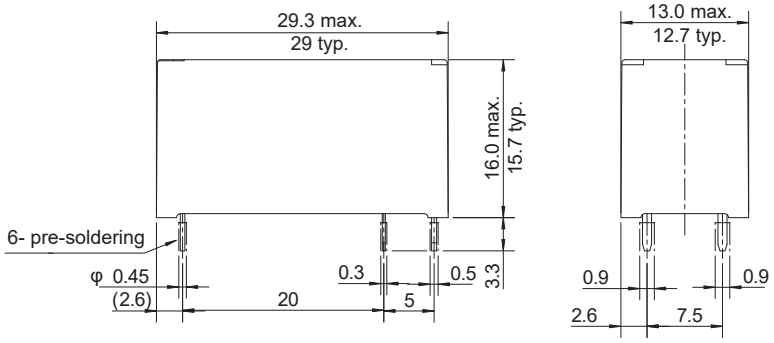
■ PART NUMBER LIST

Part number	Contact Construction	Nominal Power	Contact Material	Special Type 1	Special Type 2
FTR-K1AK( )T-KS	1a (1 Form A)	Standard (400 to 430mW)	$AgSnO_2$	TV-8 Inrush current 120A (N.O. contact only)	-
FTR-K1AK( )T-KS-GW					Comply with GWEPT
FTR-K1CK( )T-KS	1c (1 Form C)				-
FTR-K1CK( )T-KS-GW					Comply with GWEPT

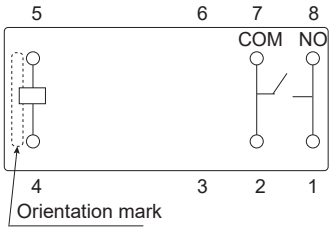
■ DIMENSIONS

FTR-K1AK( )T-KS

Dimensions

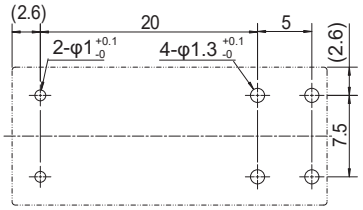


Schematics (BOTTOM VIEW)



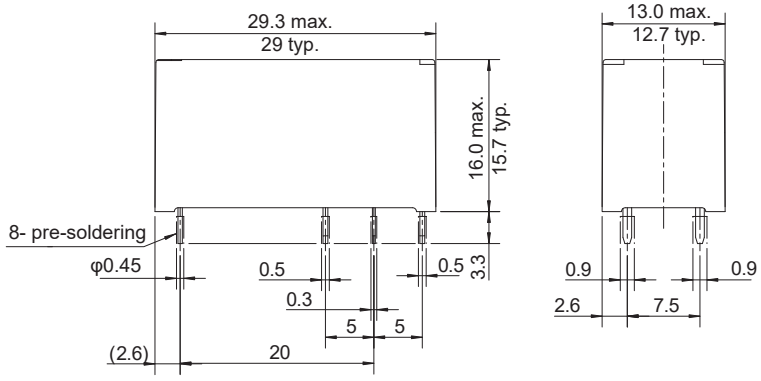
Connect terminal #1 and #8 on the PC board

PC board mounting hole layout (BOTTOM VIEW)

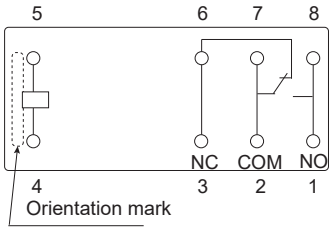


FTR-K1CK( )T-KS

Dimensions

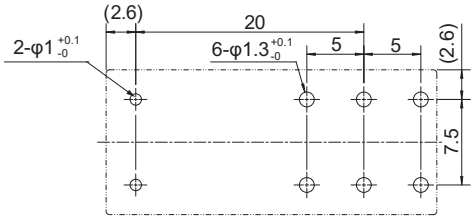


Schematics (BOTTOM VIEW)



Connect terminal #1 and #8 on the PC board

PC board mounting hole layout (BOTTOM VIEW)

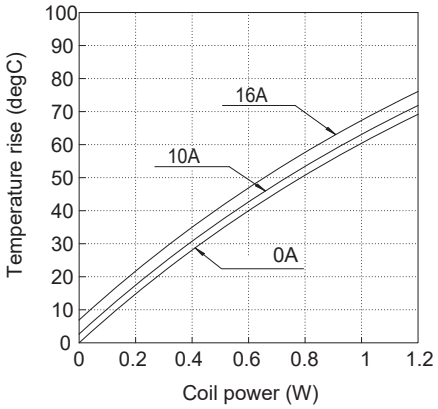


Dimensions of the terminals do not include thickness of pre-soldering.
Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified. (Unit: mm)

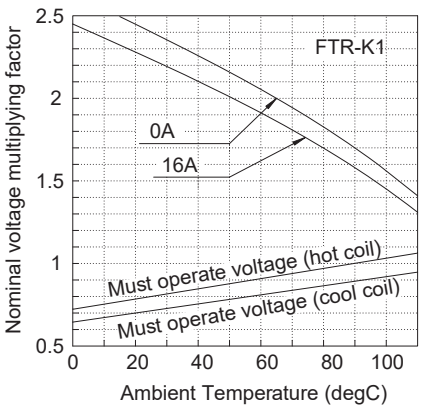
■ CHARACTERISTIC DATA

(Characteristic data is not guaranteed value bat measured value of samples from production linle.)

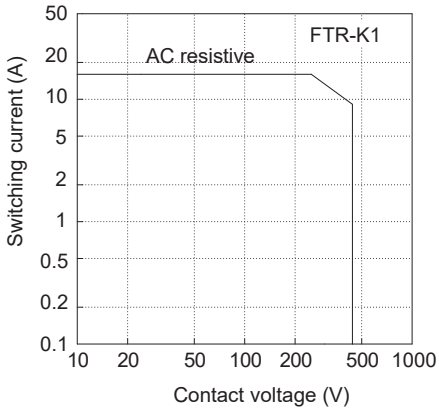
Coil Temperature Rise



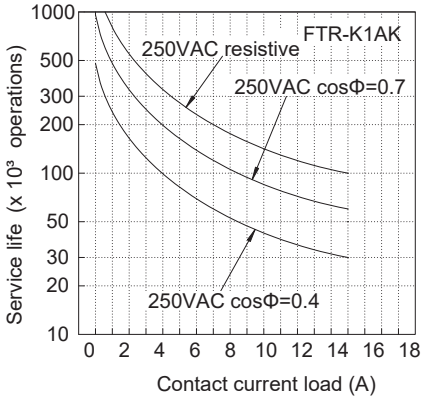
Operating Range



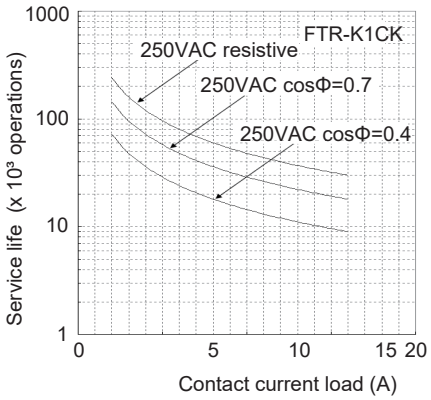
Maximum Switching Power



Life Curve



Life Curve



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: contact@fcl-components.us

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

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/

FCL Products are intended for general use, including without limitation, in personal, household and office environments, in buildings and for ordinary use in the industry. FCL Products are not intended to be used in applications where extremely high safety is required (”High Safety Required Applications”), such as, but not limited to, applications in nuclear facilities, in aircraft automatic flight control, in air traffic control, in mass transit system control, in missile launch system, in weapon systems, in medical equipment for life support or any application involving a direct serious risk of physical injury or death.
Please do not use FCL Products without securing the sufficient safety and reliability required for the High Safety Required Applications.
In addition, FCL shall not be liable against the customer and/or any third party for any claims or damages arising in connection with the use of FCL Products in the High Safety Required Applications.
FCL warrants that its Products, if properly used and services, will conform to their specification and will be free from defects in material and workmanship for twelve months from delivery.
The implied warranties of merchantability and fitness for a particular purpose and all other warranties, representations and conditions, express or implied by statute, trade usage or otherwise, expect as set forth in this warranty, are excluded and shall not apply to the Products delivered.

The contents, data and information in this datasheet are provided by FCL Components Limited as a service only to its user and only for general information purposes. The use of the contents, data and information provided in this datasheet is at the users’ own risk.
FCL has assembled this datasheet with care and will endeavor to keep the contents, data and information correct, accurate, comprehensive, complete and up to date.
FCL Components Limited and affiliated companies do however not accept any responsibility or liability on their behalf, nor on behalf of its employees, for any loss or damage, direct, indirect or consequential, with respect to this datasheet, its contents, data, and information and related graphics and the correctness, reliability, accuracy, comprehensiveness, usefulness, availability and completeness thereof. Nor do FCL Components Limited and affiliated companies accept on their behalf, nor on behalf of its employees, any responsibility or liability with respect to these datasheets, its contents, data, information and related graphics and the correctness, reliability, accuracy, comprehensiveness, usefulness, availability and completeness thereof. Rev. February 25, 2025.