FUJITSU

POWER RELAY

1 POLE - 16A 80A Inrush type

FTR-K1 Series

■ FEATURES

- Peak 80A inrush current (1 form A type)
- Low profile (height: 15.7mm)
- High insulation
  Insulation distance (between coil and contacts):
  10mm min. 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

Please see page 6 for more information

■ Part Numbers

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

(a)	Relay type	FTR-K1 : FTR-K1 series
(b)	Contact configuration	A : 1 form A (SPST-NO) C : 1 form C (SPDT)
(c)	Coil type	K : Standard type (400mW) / Flux proof
(d)	Coil rated voltage	012 : 5..... 110VDC Coil rating table at page 3
(e)	Contact material	T : $AgSnO_2$ (1 form A, TV-5 contact) W : $AgSnO_2$ (1form C, 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			FTR-K1 AK ( ) T	FTR-K1 CK ( ) W	Remarks / conditions
Contact data	Configuration		1 form A	1 form C	
	Construction		Single		
	Material		$AgSnO_2$		
	Resistance		Max. 100mOhm at 1A, 6VDC		Initial
	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)		400mW (430mW at 48V coil, 420mW at 60V/110V coil)		
	Operate power (20°C)		196mW (211mW at 48V coil, 206mW at 60V/110V coil)		
	Operating temperature range		-40°C ~ +85°C		No frost
Timing data	Operate		Max. 15ms		without bounce
	Release		Max. 5ms		without bounce, no diode
Life	Mechanical		Min. 20 x 10^6 operations		
	Electrical	AC contact rating	Min. 100 x 10^3 ops.	Min. 50 x 10^3 ops.	
		DC contact rating	Min. 100 x 10^3 ops.	Min. 30 x 10^3 ops.	
		Peak inrush	Min. 10 x 10^3 ops. (only make contact)		at 85°C, VDE#0435 (80A 250VAC)
		Lamp (UL TV-5)	Min. 25 x 10^3 ops.	Min. 25 x 10^3 ops. (only make contact)	
Insulation	Insulation resistance		Min. 1000MΩ at 500VDC		Initial
	Dielectric strength	Open contacts	1000VAC (50/60Hz), 1 minute		
		Coil contact	5000VAC (50/60Hz), 1 minute		
	Surge strength	Coil to contacts	10,000V / 1.2 x 50μs standard wave		
	Clearance		10mm		
	Creepage		10mm		
	EN61810-1, VDE0435	Voltage	250V		
		Pollution	3		
		Material group	III a		
		Category	C / 250 (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 resistance	Misoperation ≥1us	Min. 100m/s² (11 ± 1ms)		
		Endurance	Min. 1,000m/s² (6 ± 1ms)		
	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 contions

■ Coil Data

Coil code	Rated Coil Voltage (VDC)	Coil Resistance +/-10% (Ω)	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 at 20°C and zero contact current, unless otherwise specified.
* : 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

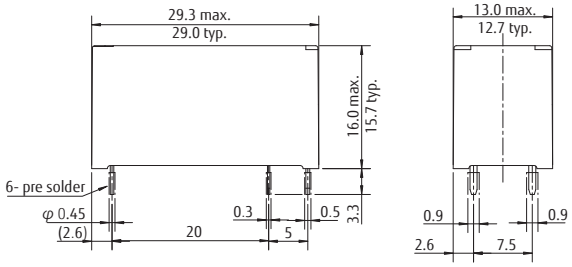
<table>
<tr><th>Type</th><th>Compliance</th><th colspan="2">Contact rating</th></tr>
<tr><td></td><td></td><td>1A</td><td>1C</td></tr>
<tr><td>UL</td><td>UL 508

E63614</td><td colspan="2">Flammability: UL 94-V0 (plastics)</td></tr>
<tr><td rowspan="2">CSA</td><td rowspan="2">C22.2 No. 14

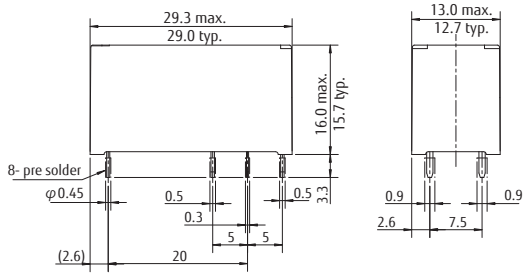
LR 40304</td><td rowspan="2">FTR-K1AK ( ) T(-GW)
16A, 24VDC (resistive)
16A, 277VAC (resistive)
20A, 277VAC (resistive)
1 hp 277VAC, 1/2hp 125VAC
TV-5, 120VAC 25,000 cycles
Pilot duty: A300</td><td>FTR-K1CK ( ) W(-GW)
16A, 277VAC/24VDC (resistive)
20A, 277VAC (resistive)
1 hp 277VAC, 1/2hp 125VAC
1/8 hp, 125VAC
TV-5, 250VAC, 25,000 cycles
(make contact)
Pilot duty: B300</td></tr>
<tr><td>FTR-K1CK ( ) W(-GW)
16A, 277VAC/24VDC (resistive)
20A, 277VAC (resistive)
1hp 277VAC, 1/2hp 125VAC
1/8hp 125VAC
TV-5, 120VAC (make contact)
Pilot duty: B300</td></tr>
<tr><td>VDE</td><td>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</td><td>FTR-K1AK ( ) T(-GW)
16A, 250VAC (cosφ=1), 85˚C
3.5A, 250VAC (cosφ=0.4), 85˚C
16A, 24VDC (0ms), 85˚C
5A/80A, 250VAC 10,000 times, 85˚C</td><td>FTR-K1CK ( ) W(-GW)
16A, 250VAC (cosφ=1), 85˚C
3.5A, 250VAC (cosφ=0.4), 85˚C
16A, 24VDC (0ms), 85˚C</td></tr>
<tr><td>CQC</td><td>GB/T21711.1
GB15092.1
12002083788</td><td>FTR-K1AK ( ) T
12A, 240VAC
72LRA/12FLA 240VAC</td><td>FTR-K1CK ( ) W
16A, 250VAC</td></tr>
</table>

■ Dimensions

- Dimensions (FTR-K1AK( )T)

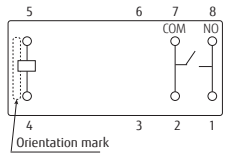


- Dimensions (FTR-K1CK( )W)



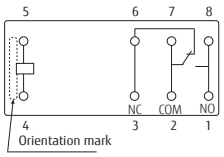
*Dimensions of the terminals do not include thickness of pre-solder.

- Schematics (BOTTOM VIEW) (FTR-K1AK( )T)



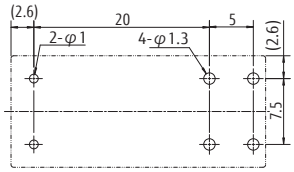
Connect terminal #1 and #8 on the PC board

- Schematics (BOTTOM VIEW) (FTR-K1CK( )W)

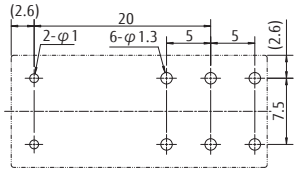


Connect terminal #1 and #8 on the PC board

- PC Board Mounting Hole Layout (BOTTOM VIEW) (FTR-K1AK( )T)



- PC Board Mounting Hole Layout (BOTTOM VIEW) (FTR-K1CK( )W)



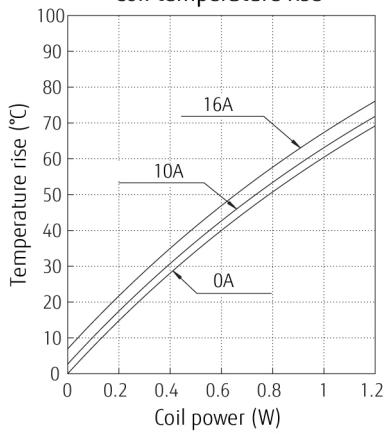
Tolerance of PC board mounting hole layout : ±0.1 unless otherwise specified.

( ): Reference value
Unit: mm

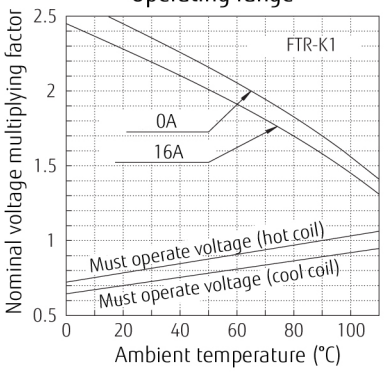
■ Characteristic Data (Reference)

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

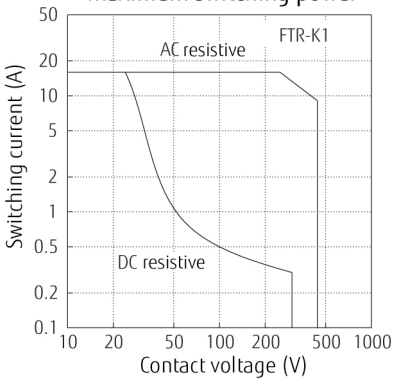
Coil temperature rise



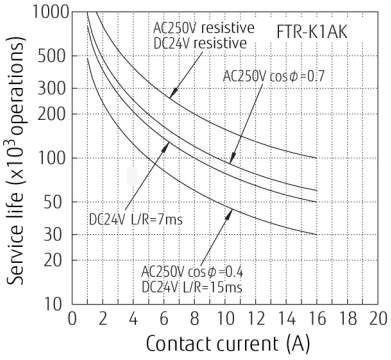
Operating range



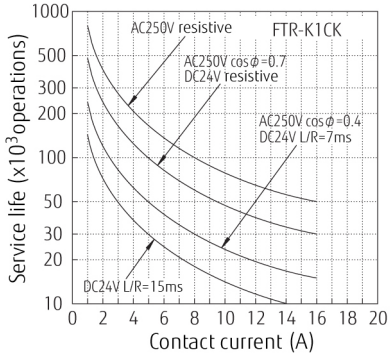
Maximum switching power



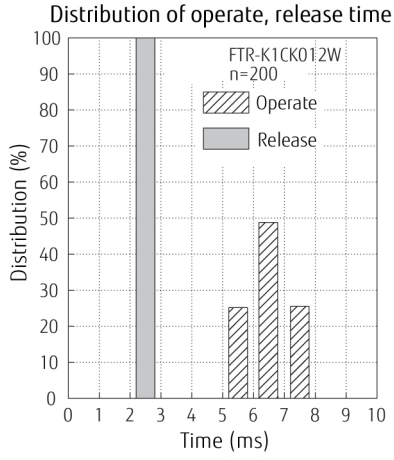
Life curve



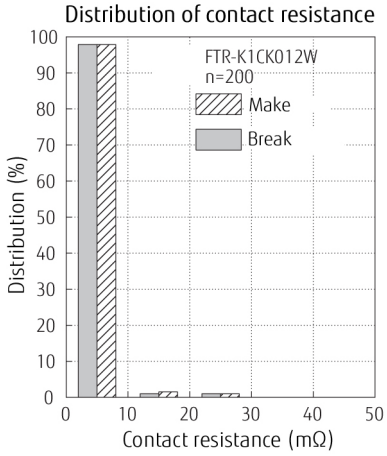
Life curve



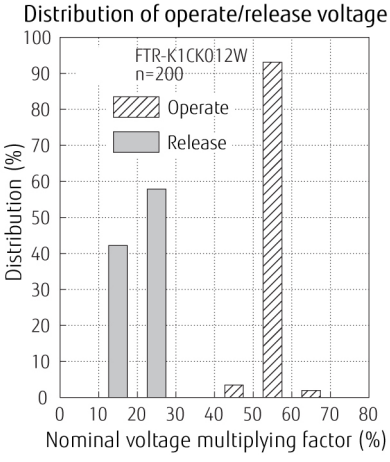
Distribution of operate, release time



Distribution of contact resistance



Distribution of operate/release voltage



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 Fujitsu 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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