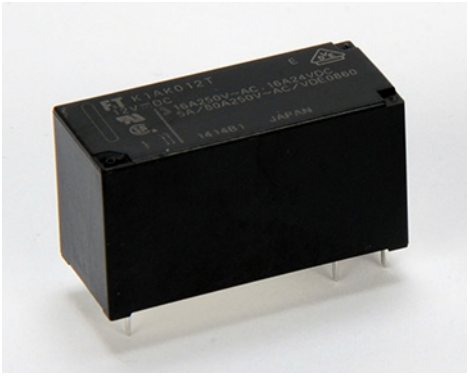
FUJITSU

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)
- Cadmium free contacts
- Safety standards
  UL, CSA, VDE, CQC approved
  UL, CSA TV-5 rating approved (1 form A type)
- Flux proof, RTII
- RoHS compliant
  Please see page 6 for more information

■ PARTNUMBER INFORMATION

[Example]

FTR-K1	C	K	012	W	-	BG
(a)	(b)	(c)	(d)	(e)		(f)

(a)	Relay type	FTR-K1	: FTR-K1-Series
(b)	Contact configuration	A C	: 1 form A (SPST-NO) : 1 form C (SPDT) (standard type "K" only)
(c)	Coil type / enclosure	K	: Standard type (400mW) / flux proof
(d)	Coil rated voltage	012	: 5.....110 VDC Coil rating table at page 3
(e)	Contact material	W T	: $AgSnO_2$ (1 form C contact type only) : $AgSnO_2$ / TV-5 rated (1form A / TV-5 contact type only)
(f)	Special type	Nil BG	: Standard type (without gold plate) : Gold plated 3 µm

Actual marking does not carry the type name : "FTR"
E.g.: Ordering code: FTR-K1CK012W Actual marking: K1CK012W

■ SPECIFICATION

Item			FTR-K1 AK ( ) T Standard	FTR-K1 CK ( ) W Standard
Contact Data	Configuration		1 form A	1 form C
	Construction		Single	
	Material		$AgSnO_2$	
	Resistance (initial)		Max. 100mΩ at 1A, 6VDC	
	Contact rating (resistive)		16A, 250VAC / 24VDC	
	Max. carrying current *1		20A	
	Max. inrush current		80A (20ms) 250VAC (only make contact)	
	Max. switching voltage		440VAC / 300VDC	
	Max. switching power		4,000VA / 384W	
	Min. switching load *2		100mA, 5VDC	
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
		Peak Inrush (80A)	Min. 10 x 10^3 operations (only make contact)	
		Lamp load (UL TV-5)	Min. 25 x 10^3 operations	Min. 25 x 10^3 operations (only make contact)
Coil Data	Rated power (20 °C)		400mW (430mW at 48V coil)	
	Operate power (20 °C)		196mW (210mW at 48V coil)	
	Operating temperature range		-40 °C to +85 °C (no frost)	
Timing Data	Operate (at nominal voltage)		Max. 15ms (without bounce)	
	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 55Hz double amplitude 0.7mm	
		Endurance	10 to 55Hz double amplitude 1.5mm	
	Shock	Misoperation≥1us	100m/s² (11 ± 1ms)	
		Endurance	1,000m/s² (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.

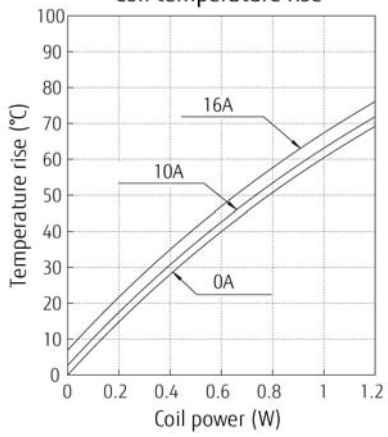
■ SAFETY STANDARDS

<table>
<tr><th rowspan="2">Type</th><th rowspan="2">Compliance</th><th colspan="2">Contact rating</th></tr>
<tr><th>1a</th><th>1c</th></tr>
<tr><td>UL</td><td>UL 508

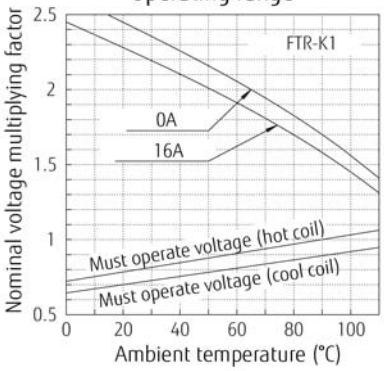
E63614</td><td colspan="2">Flammability: UL 94-V0 (plastics)</td></tr>
<tr><td rowspan="2">CSA</td><td rowspan="2">C22.2 No. 14
LR 40304</td><td rowspan="2">FTR-K1AK ( ) T (-BG)
16A, 24VDC (resistive)
16A, 277VAC (resistive)
20A, 277VAC (resistive)
1 hp, 277VAC
1/2 hp, 125VAC
TV-5, 120VAC 25,000 cycles
Pilot duty: A300</td><td>FTR-K1CK ( ) W (-BG)
16A, 277VAC/24VDC (resistive)
20A, 277VAC (resistive)
1 hp 277VAC
1/2 hp, 125VAC
1/8 hp, 125VAC
TV-5, 250VAC, 25,000 cycles
(only make contact)
Pilot duty: B300</td></tr>
<tr><td>FTR-K1CK ( ) W (-BG)
16A, 277VAC/24VDC (resistive)
20A, 277VAC (resistive)
1 hp 277VAC
1/2 hp, 125VAC
1/8 hp, 125VAC
TV-5, 120VAC (only make contact)
Pilot duty: B300</td></tr>
<tr><td>VDE</td><td>IEC/EN61810-1
EN60065
EN60335-1 clause 15.3; 16.3; 29.1; 29.2; 29.3
EN60730 clause 12.2; 13.2; 20.1; 20.2; 20.3,17.5; 17.7; 17.8</td><td>FTR-K1AK ( ) T (-BG)
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 (-BG)
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
12002083788</td><td>FTR-K1AK ( ) T
12A, 240VAC
72LRA/12FLA 240VAC</td><td>FTR-K1CK ( ) W
16A, 250VAC</td></tr>
</table>

■ CHARACTERISTIC DATA

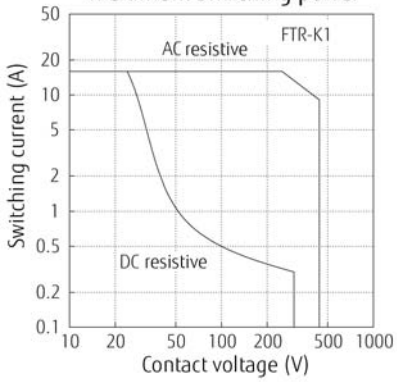
Coil temperature rise



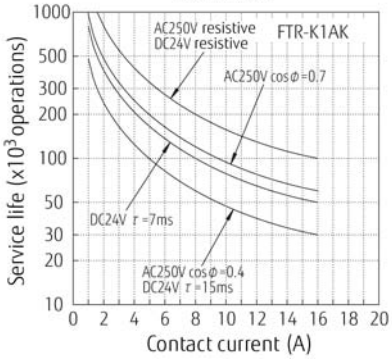
Operating range



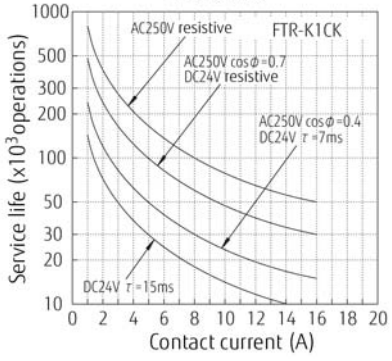
Maximum switching power



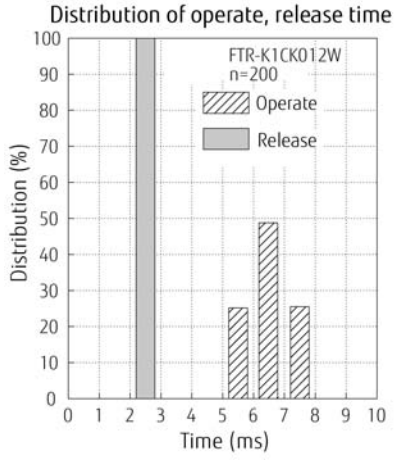
Life curve



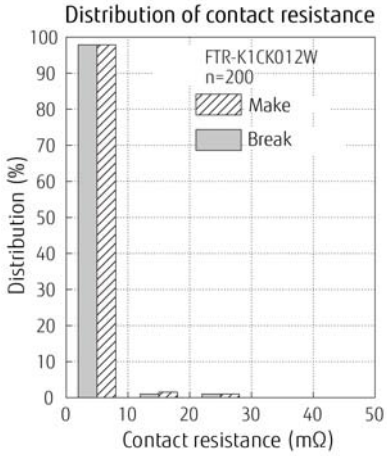
Life curve



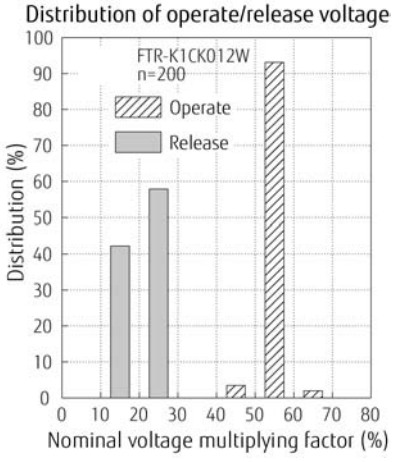
Distribution of operate, release time



Distribution of contact resistance



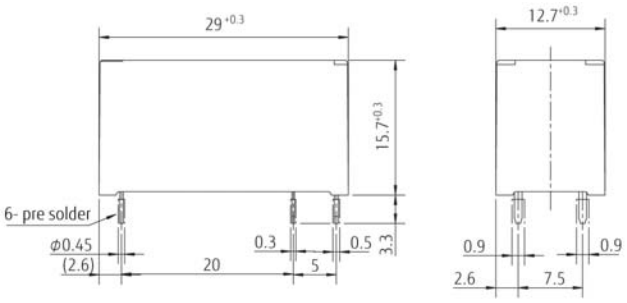
Distribution of operate/release voltage



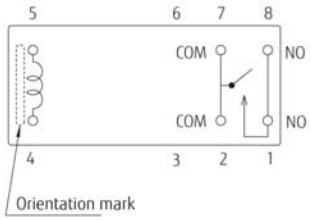
■ DIMENSIONS

FTR-K1AK( )T

- **Dimensions**

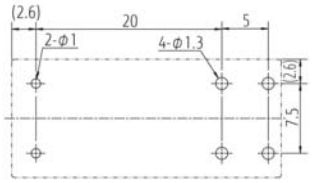


- **Schematics**



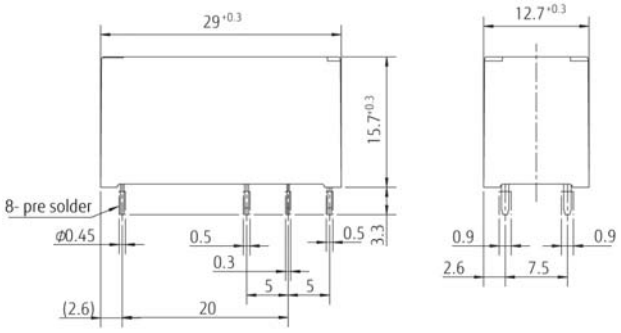
Connect terminal #1 and #8
on the PCB board

- **PC board mounting hole layout**
(BOTTOM VIEW)

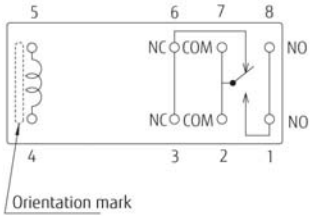


FTR-K1CK( )W

- **Dimensions**



- **Schematics**



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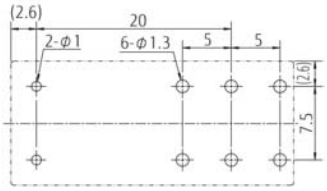

Unit: mm

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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