	Specifications of Thermal overload relay Types : TK-E02	Fuji Electric FA

1. Application scope

These specifications apply to the following types of Thermal overload relay.

Types: TK-E02

The conformable standards are IEC 60947-4-1(Electromechanical contactors and motor-starters) and JIS C 8201-4-1(Electromechanical contactors and motor-starters).

2. Normal service conditions

The thermal overload relay shall operate normally without malfunction under the following standard conditions.

Ambient air temperature (near the product in use)	- 5 to +55°C	The average temperature in a day must not exceed 35°C.
Relative humidity	45 to 85%	There shall be no condensation or freezing due to a sudden temperature change.
Altitude	2000m or less	
Vibration condition	10 to 55Hz, 15m/s^2 or less	
Shock condition	50 m/s^2 or less	The contacts shall not have malfunction.
Atmospheric conditions	There shall not be excessive dust, smoke, inflammable gases, vapor, oil vapor, salinity and corrosive materials in the atmosphere.	
Mounting	Vertical	If necessary, permissive angle is within 30 degrees in front/back or right/left directions.
Storage air temperature	- 40°C to +65°C	There shall be no condensation or freezing due to a sudden temperature change.

3. Main circuit ratings

Rated insulation voltage Ui [V]	Ampere setting range
690	0.1-0.15A, 0.13-0.2A, 0.15-0.24A, 0.2-0.3A, 0.24-0.36A, 0.3-0.45A, 0.36-0.54A, 0.48-0.72A, 0.64-0.96A, 0.8-1.2A, 0.95-1.45A, 1.4-2.2A, 1.7-2.6A, 2.2-3.4A, 2.8-4.2A, 4-6A, 5-8A, 6-9A, 7-11A, 9-13A, 12-18A, 16-22A, 20-25A

4. Auxiliary circuit ratings

Rated insulation voltage Ui [V]	Conventional free air thermal current Ith [A]	Making and breaking current (AC) [A]	Rated operational voltage Ue [V]	Rated operational current Ie [A]				Minimum voltage/ current
				AC-15 (Inductive load)		DC-13 (Inductive load)		
				NC contact	NO contact	NC contact	NO contact	
690	5	30	24	3	3 (0.5)*	1.1	1.1(0.3)*	DC5V, 3mA
		25	100 to 120	2.5	2.5(0.5)*	0.28	0.28	
		20	200 to 240	2	2 (0.5)*	0.14	0.14	
		10	380 to 440	1	1 (0.5)*	—	—	
		6	500 to 600	0.6	0.6(0.5)*	—	—	

Note: ( )* values show ratings in case of auto reset type (NO) contact.

5. Operating characteristics of thermal overload relay when energized on all poles (Trip Class 10A)

Current (Multiples of current setting)	Tripping time	Conditions	
		Ambient temperature [°C]	Status
105%	No tripping less than 2 hours	20	Cold start
120%	Tripping less than 2 hours	20	Hot start
150%	Tripping less than 2 minutes	20	Hot start
720%	Tripping within 2 to 10 seconds	20	Cold start

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6. Limit of operation of three-pole thermal overload relay energized on two poles

Current (Multiples of current setting)	Tripping time	Conditions	
		Ambient temperature [°C]	Status
2poles 100% 1pole 90%	No tripping less than 2 hours	20	Cold start
2poles 115% 1pole 0%	Tripping less than 2 hours	20	Hot start

7. Temperature rise

The temperature rise of the parts shall not exceed the values in the following table when applied the maximum current of the dial setting to the main circuit and the thermal current to the auxiliary circuit respectively.

(At the ambient air temperature of 55°C)

Measuring point	Contacts	Terminals
Temperature rise [K]	85	50

8. Insulation resistance and withstand voltage

8-1. Insulation resistance : It measures with a 500V megger and shall exceed the values in the following table.

8-2. Withstand voltage : Withstanding the voltage of the following table at 50 and 60Hz.

8-3. Rated impulse withstand voltage : Withstanding the voltage of the following table.

Measuring position	Between main circuits and earth	Between main poles	Between auxiliary circuits	Between main poles and auxiliary circuits
Insulation resistance [MΩ]	100	100	100	100
Withstand voltage [V]	2500	2500	2500	2500
Rated impulse withstand voltage Uimp [kV]	6	6	6	6

9. Resistance to vibration and shock

9-1. Resistance to vibration

(1) Endurance

There shall be no malfunction such as loosing screws, changing characteristics and mechanical damage after the endurance test.

The test conditions are 16.7Hz for the frequency, 2mm for the double amplitude and 2hr for the time in 3-axis direction.

(2) Unintended operation

There shall be no unintended opening and closing of the contact in applied 10 to 55Hz for the frequency and 15m/s^2 for the acceleration in 3-axis direction

9-2. Resistance to shock

(1) Endurance

There must be no malfunction such as changing characteristics and mechanical damage after applied 100m/s^2 for the acceleration in 3-axis direction.

(2) Unintended operation

There must be no unintended opening and closing of the contact in applied 50m/s^2 for the acceleration in 3-axis direction.

10. Renewal recommendation time of the product

As for the product that passed for more than 10 years after production, the renewal is recommended.

11. Attached materials

Documents name	Type	Documents number
Outline drawing	TK-E02	F212 04 01(5)
Operating characteristics	TK-E02	FIN208344

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DRAWN	2009-06-15	Y. Furukata	K. Suzuki
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