



JRS1 Series Thermal Overload Relay User Manual



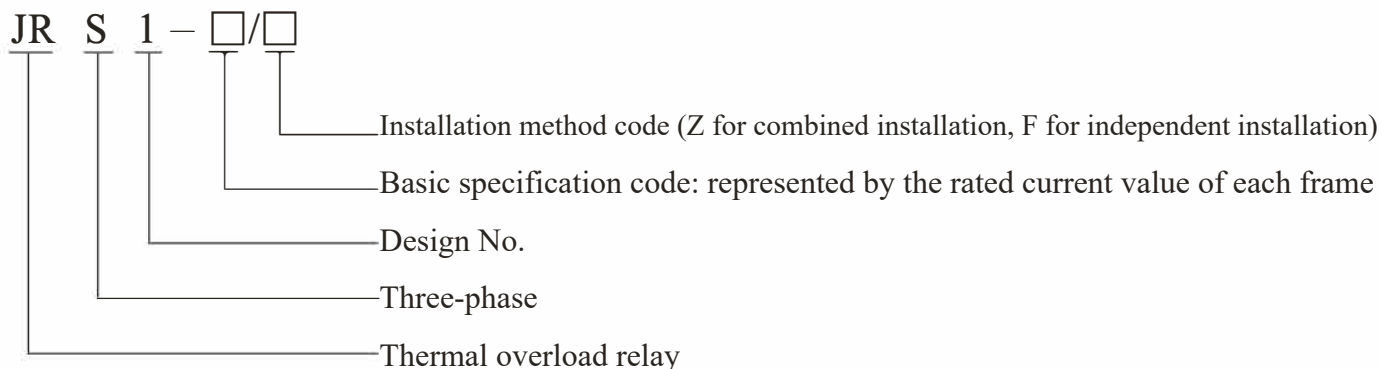
Please carefully read this User Manual before installing and operating the product, and keep this manual properly for future reference

1 Main Purpose and Scope of Application

JRS1 series thermal overload relay (hereinafter referred to as thermal relay) is mainly used in circuits with AC 50Hz/60Hz, rated working voltage up to 660V, rated working current 0.1A~80A, used to start and accelerate the motor to normal speed, and as circuit and Motor overload and phase failure protection, and can form a starter with the corresponding AC contactor.

2 Product Model Specifications and Meanings

2.1 Model composition and meaning



2.2 Product varieties

- a) Installation and wiring mode: combined type (basic type) and independent type;
- b) Tripping level: JRS1-25 is 10A level, JRS1-80 is 10 level;
- c) Rated current of the frame: 25, 80 two grades.

2.3 Product specifications

The setting current range of the whole series of products is 0.1A~80A, which is divided into two current levels, and there are 20 thermal element specifications in total. See Table 1 for details.

Table 1 Technical parameters and product weight of the main circuit

Model	Rated insulation voltage U_i V	Class of thermal element		Suitable contactor Model	Fuse rated current I_{max} A	Product weight kg
		Rated setting current A	Range of regulation A			
JRS1-25	660	0.16	0.1~0.12~0.14~0.16	CJX2-09~32	4	Around 0.126
		0.25	0.16~0.19~0.22~0.25		4	
		0.4	0.25~0.3~0.35~0.4		4	
		0.63	0.45~0.5~0.63		4	
		1	0.63~0.75~0.9~1		4	

Model	Rated insulation voltage Ui V	Class of thermal element		Suitable contactor Model	Fuse rated current Imax A	Product weight kg
		Rated setting current A	Range of regulation A			
JRS1-25	660	1.6	1~1.2~1.4~1.6	CJX2-09~32	4	约0.126
		2.5	1.6~1.9~2.2~2.5		6	
		4	2.5~3~3.5~4		10	
		6	4~5~6		16	
		8	5.5~6.6~8		20	
		10	7~8.5~10		20	
		13	10~11.5~13	CJX2-12~32	25	
		18	13~15.5~18	CJX2-18~32	35	
		25	18~21.5~25	CJX2-32	50	
JRS1-80	660	32	23~27.5~32	CJX2-40	63	约0.357
		40	30~35~40		80	
		50	38~44~50	CJX2-40~65	100	
		57	48~52~57		100	
		66	57~62~66	CJX2-65	125	
		80	63~72~80	CJX2-80和95(独立式)	125	
Note: The recommended fuse type for this thermal relay is RT16 or NT00.						

3 Normal Working Conditions and Installation Conditions

3.1 Normal operating and installation conditions

- The altitude does not exceed 2000m;
- The upper limit of the ambient air temperature is $+40^{\circ}\text{C}$, the lower limit is -5°C , and the average value within 24 hours does not exceed 35°C ;
- The relative humidity of the surrounding air does not exceed 50% at $+40^{\circ}\text{C}$, and does not exceed 90% when the temperature is low;
- The ambient air pollution level is level 3; installation category III;
- The installation inclination with the vertical plane does not exceed $\pm 5^{\circ}$;
- There is no significant shock and vibration at the installation site;
- The use category of the main circuit is AC-3, the auxiliary circuit is AC-15, and the operating frequency (average value) is 15 times/h.

3.2 Security protection

The product's main circuit outlet terminal and auxiliary circuit terminal are equipped with protection against finger electric shock.

4 Structural Features and Working Principle

4.1 Product Features

- Overload and phase failure protection;
- The setting current is continuously adjustable;
- With temperature compensation, the upper limit of ambient temperature is $+40^{\circ}\text{C}$, and the lower limit is -5°C ;
- Auxiliary circuit terminals and main circuit outlet terminals are equipped with protective covers;
- It has action indication, manual reset device and stop function.

4.2 Structure and working principle

The thermal relay adopts a front-to-back overall structure. The main structure of the product includes: heating element, auxiliary contact and action system, and reset mechanism. The heating element is connected to the main circuit, and it flows the current of the motor. When the motor is overloaded, the main bimetal is heated to the operating temperature, the thermal relay is activated, the normally closed contact is opened, and the contactor cuts off the main circuit. The action time of the thermal relay and the size of the overload current change according to the inverse time relationship. The typical working principle diagram of the thermal relay is shown in Figure 1. If it is used for over-load protection in AC single-phase or DC circuits, the three-phase thermal elements must be connected in series.

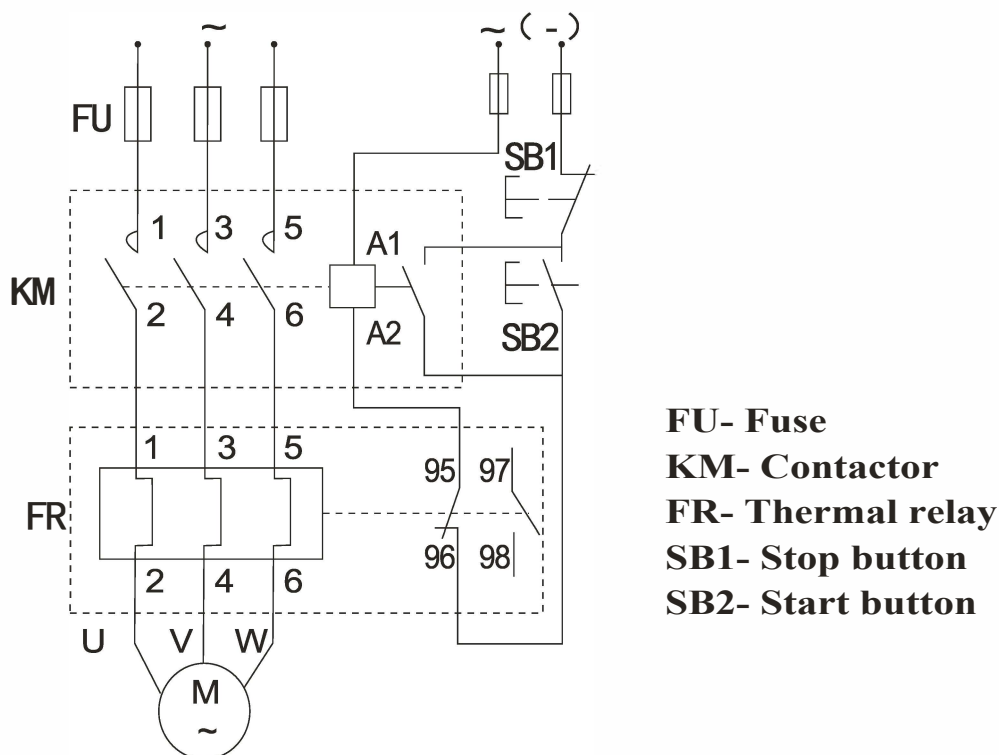


Figure 1 working principle diagram

5 Technical Characteristics

5.1 See Table 1 for the main circuit technical parameters and product weight;

5.2 The basic parameters of auxiliary contacts are shown in Table 2;

Table 2 The basic parameters of auxiliary contacts

Use category	Rated frequency Hz	Conventional free air heating current $I_{th}A$		Rated insulation voltage U_i V	Rated working voltage U_e V	Rated operating current I_eA
		NO	NC			
AC-15	50	6	6	500	220	1.64
					380	0.95

5.3 Operating characteristics

5.3.1 See Table 3 for the action characteristics when the loads of each phase are balanced;

Table 3 Action characteristics when each phase load is balanced

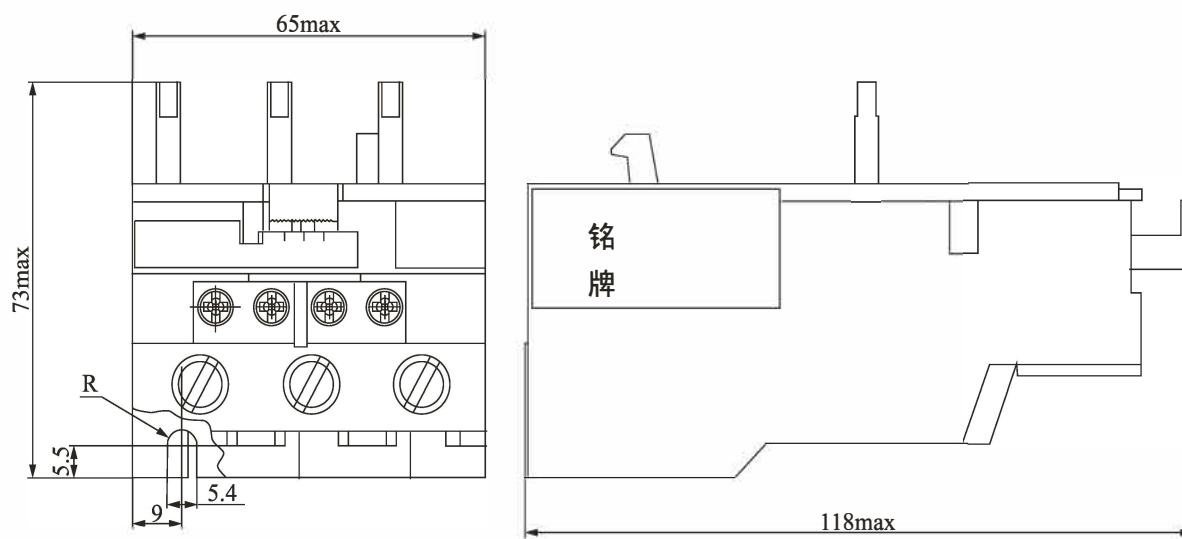


Figure 3 RSI-80/Z outline and installation dimensions

7 Installation and Adjustment

7.1 Product adjustments

When the thermal relay leaves the factory, it is set at the lower limit of the current scale value at 20°C. In order to match the thermal relay's set current value with the actual rated operating current of the circuit or motor, the constant current adjustment knob can be fine-tuned to achieve the best characteristic matching. , if the setting current value between the two scale values is required, it can be rotated proportionally and adjusted properly in actual use. It also needs to be adjusted when there is a large difference between the actual operating environment temperature and the ex-factory temperature.

7.2 Signs

7.2.1 The markings of the main circuit terminals, the incoming terminal markings are 1/L1, 3/L2, 5/L3, and the corresponding outgoing terminal markings are 2/T1, 4/T2, 6/T3.

7.2.2 Auxiliary circuit wiring terminal signs The normally closed contact (NC) terminal signs are 95, 96, and the normally open contact (NO) terminal signs are 97, 98.

7.3 The setting current adjustment range of the thermal relay should contain the rated operating current value of the protected object. The setting current adjustment knob cannot be rotated arbitrarily during work. If adjustment is required, please adjust and set according to the actual rated operating current value of the protected object, otherwise the protection Feature failure.

7.4 When choosing a combined installation, first loosen the wiring screws on the main terminal of the contactor properly, insert the hook part of the thermal relay into the corresponding hook groove of the contactor, and at the same time insert the conductive rod of the thermal relay into the main terminal of the contactor (2 , 4, 6), tighten the screws of the main terminal to complete the combined installation.

7.5 When independent installation is selected, firstly fix the thermal relay on the accessory according to the procedure in 7.4, then the independent installation can be carried out.

7.6 The connecting wires of the main circuit of the thermal relay should be selected according to Table 6. The current JRS1-25 is calculated according to 100%I_e, and the JRS1-80 is calculated according to the set current of 125% I_e; the maximum cross-sectional area of the auxiliary circuit connecting wires shall not exceed 2.5mm². The connecting wire screw should be tightened and not loosened, and its fastening condition should be checked regularly during use, otherwise the thermal relay may lose its protective effect.

Table 6 Cross-sectional area and length of main circuit connecting wire

Current range A	Conductor standard cross-sectional area mm ²	Wire length between two terminals m
$0 < I_e \leq 8$	1.0	1.0
$8 < I_e \leq 12$	1.5	1.0
$12 < I_e \leq 20$	2.5	1.0
$20 < I_e \leq 25$	4.0	1.0
$25 < I_e \leq 32$	6.0	1.0
$32 < I_e \leq 50$	10	1.0
$50 < I_e \leq 65$	16	1.0
$65 < I_e \leq 85$	25	1.0
$85 < I_e \leq 115$	35	1.0

8 Failure Analysis

The fault analysis of the thermal relay is shown in Table 7

Table 7 Fault Analysis

Fault Symptoms	Cause Analysis	Method of exclusion
Can't work normally	1. The actual working current is greater than the scale value current; 2. The working current fluctuates too much; 3. The operating frequency is high; heavy-duty starting, frequent reversible switching or tight connection; 4. The connecting wire is loose; 5. The connecting wire is seriously	1. Re-adjust the scale according to the actual working current; 2. Contact the manufacturer or re-adjust the scale if the conditions are not met; 3. Adjust the working system and improve the control and protection system; 4. Re-tighten the wire and connection; 5. Change the wire.
Overload does not work	1. The actual working current is less than	1. Re-adjust the scale according to the actual working current; 2. Contact the manufacturer if the conditions are not met, and re-adjust the scale.
Motor start does not protect	1. The tripping level of the selected thermal	Re-select the thermal relay with the same tripping level
It is difficult to install the combination of thermal relay and AC contactor	1. Improper selection of matching contactor	Choose the AC contactor that matches it

9 Transportation and storage

9.1 The thermal relay shall not be subjected to severe collision and vibration during transportation and installation, and the free fall height during transportation shall be 250mm.

9.2 Transport and storage conditions of the thermal relay

a) It must not be directly attacked by rain and snow and long-term direct radiation by the sun;

b) The relative humidity should not exceed 90%;

c) The ambient temperature, the upper limit is +55°C, the lower limit is -25°C, and it can reach +70°C within a short period of time (within 24 hours).

10 Precautions

10.1 It is necessary to choose a thermal relay suitable for the rated working current of the motor to be protected. If not, the protection function will be lost.

10.2 The thermal relay must be operated and used according to the provisions of this manual, and cannot be disassembled at will, otherwise its protection characteristics will be changed.

10.3 When performing normal dust removal, screw fastening, and wiring installation, the thermal relay must cut off the power supply.

10.4 The thermal relays are all basic types assembled and installed before leaving the factory. If the user has special requirements, he must declare to the manufacturer, and the manufacturer can provide corresponding products or accessories.

11 Unpacking Inspection

After unpacking, please check whether the product is intact, whether the exposed metal is rusty, and whether the product is defected due to poor transport or storage. If found the above phenomenon, please stop the product, and contact the supplier timely for solution.

12 Company Commitment

Under the condition that users follow the use and storage conditions and the product are well sealed, within 36 months from the production date, our company will provide repair and replacement service free of charge for any damage or abnormal operation due to poor manufacture quality. A paid repair will be provided if the warranty period expires. For any damage due to one of the following situations, a paid repair will be given even if within the warranty period:

- (1) Improper operation, maintenance, or storage;
 - (2) Modified and improper repair without permission;
 - (3) Damage due to falling off or found during installation after purchase;
 - (4) Force majeure such as earthquakes, fires, lightning strikes, abnormal voltages, and secondary disasters;
- If you have any question, please contact the dealer or our company's customer service department.

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Certificate

DELIXI ELECTRIC LTD

Name: Thermal Overload Relay

Model: JRS1 Series

This product passes the inspection and is allowed to be shipped.

Standard: GB/T 14048.4

Inspector: Check 05

Production date: See label on inner box

www.cn-delixi.com

The first edition of this manual was issued on Aug., 2017.