

**Relay Input Terminal Unit**






**TUA711-DIR32**

**User manual**

**IM23H64-E**














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Symbol Definition	
	<b>WARNING:</b> Indicates information that a potentially hazardous situation which, if not avoided, could result in serious injury or death.
	<b>RISK OF ELECTRICAL SHOCK:</b> Indicates information that Potential shock hazard where HAZARDOUS LIVE voltages greater than 30V RMS, 42.4V peak, or 60V DC may be accessible.
	<b>ESD HAZARD:</b> Indicates information that Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices
	<b>ATTENTION:</b> Identifies information that requires special consideration.
	<b>TIP:</b> Identifies advice or hints for the user.

## Safety& Caution Symbols

The following table lists Safety& Caution symbols used on equipments.

No.	Symbol	Description
1		Direct current (DC)
2		Alternating current (AC)
3		Ground (Earth) terminal
4		Protective earth (ground) terminal
5		Reference ground (Earth) terminal
6		Frame or chassis
7		Equipotentiality
8		On (power)
9		Off (power)
10		Caution, risk of electric shock
11		Caution, hot surface
12		Caution, risk of danger
13		Electrostatic sensitive devices (ESD)

# Table of Contents

- Section 1 Overview..... 1**
- Section 2 Specifications ..... 2**
- Section 3 Usage..... 3**
  - 3.1 Appearance ..... 3
  - 3.2 Connectors ..... 3
  - 3.3 Wiring of Signal Connection ..... 3
  - 3.4 Interface Features ..... 4
  - 3.5 Terminal Definition and Wiring ..... 5
- Section 4 Engineering Application..... 7**
  - 4.1 Note..... 7
  - 4.2 Troubleshooting ..... 7
- Section 5 Revision..... 8**

# Relay Input Terminal Unit TUA711-DIR32

## Section 1 Overview

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TUA711-DIR32 is a relay input terminal unit of 32 channels, and mainly works with 1 non-redundant or a pair of redundant 32-channel digital input modules DI715-S11. The digital signal in field is sent to DI module after isolated by the relay of terminal unit. The terminal unit can work with the change-over bases MB745-S11 or MB746-S11 via the wire DB37.

Each channel of TUA711-DIR32 has 2 terminals, and supports inputting signals of passive contact and active contact. Every channel has changeable fuse and jumper, power supply has changeable fuse and indicator light, and the relay has socket. Therefore, user can change and maintain conveniently.

This terminal unit applies DIN rail installation and supports inlet wire of single side.

## Section 2 Specifications

**Table 2-1 Specifications**

Parameter		Instruction
Model		TUA711-DIR32
Type		Relay Input Terminal Unit
Channel		32
Temperature	Work	(-20~70)°C
	Storage	(-40~85)°C
Humidity	Work	10%RH~90%RH, No Condensation
	Storage	5%RH~95%RH, No Condensation
Coil Power Supply		24V DC $\pm$ 10%
Fuse	Coil (16 Channels for Each Group)	3.15A Pluggable Fuse
	Coil (Each Channel)	250mA Pluggable Fuse
Relay	Type	HF41F/24-HS (414)
	Rated Voltage	24VDC
	Operate Voltage	18V
	Release Voltage	1.2V
	Rated Current	7mA
	Rated Resistive Load	6A@250VAC, 6A@30VDC
ON/OFF	Contact Impedance Index	24V Index ON: <500 $\Omega$ OFF: >100k $\Omega$
	Voltage-level Voltage Index	ON: >18VDC OFF: <1VDC
Dimension (L x W)		402.2mm $\times$ 85.6mm $\times$ 65.7mm

## Section 3 Usage

### 3.1 Appearance

The appearance of TUA711-DIR32 is shown in Figure 3-1.

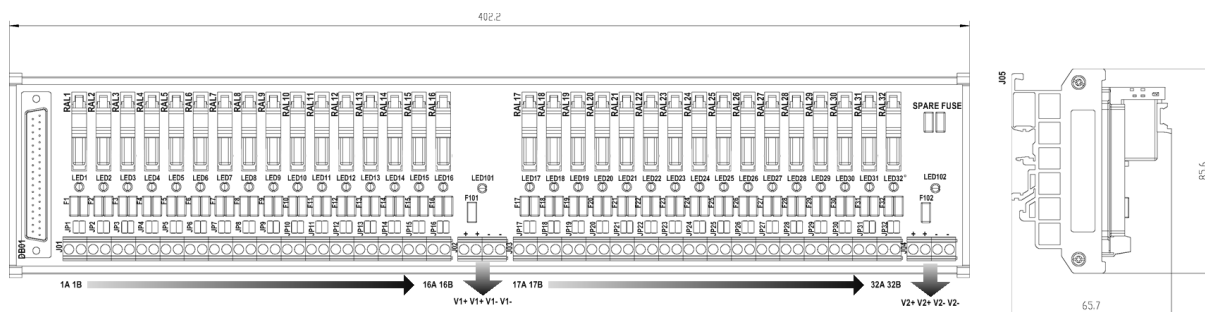


Figure 3-1 Appearance (Unit: mm)

### 3.2 Connectors

Table 3-1 Connectors

Sign	Instruction
DB01	Socket of 32-Channel DI Module
J02	Terminal of Coil Power Supply (For the Former 16 Channels)
J04	Terminal of Coil Power Supply (For the Later 16 Channels)
J01, J03	Signal Terminal
F1~F32	Channel Fuse (Model: T 250mA)
JP1~JP32	Channel Jumper
F101, F102	Fuse of Coil Power Supply (Model: T 3.15A)
LED101, LED102	Power Indicator Light of Coil Power Supply
RAL1~RAL32	Pluggable Relay of 32-Channel (Model: HF41F/24-HS(414))
LED1~LED32	Indicator Light of 32-Channel (ON: have signal; OFF: No Signal)

### 3.3 Wiring of Signal Connection

Table 3-2 Wiring of signal connection

Signal	Active Contact Signal Input	Passive Contact Signal Input
Settings of F1~F32		
Settings of JP1~JP32		

Signal	Active Contact Signal Input	Passive Contact Signal Input
Wiring of CH1~CH32		

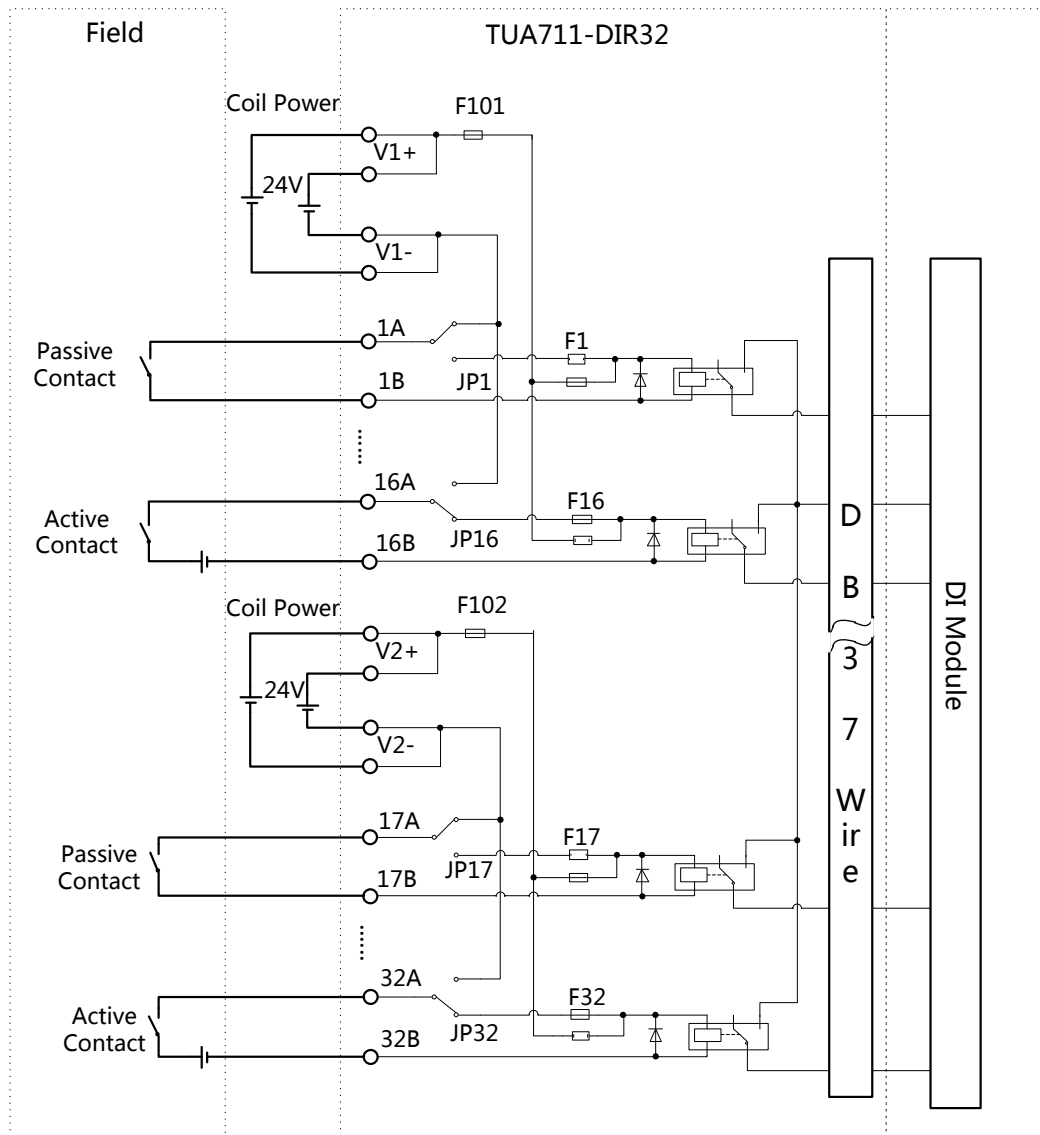
**Attention:**

Please make sure that the fuse and jumper settings in signal channel are correct before power on. Otherwise, damage for terminal board or module may be caused.

### 3.4 Interface Features

When the wiring is 24V passive contact input, plug F1~F32 in the left socket, and JP1~JP32 jump in left (as shown in Figure 3-2), and the terminal connects the 2 terminals of each channel. When the wiring is 24V active contact input, plug F1~F32 in the right socket, and JP1~JP32 jump in right (as shown in Figure 3-2), and the terminal connects the 2 terminals of each channel.





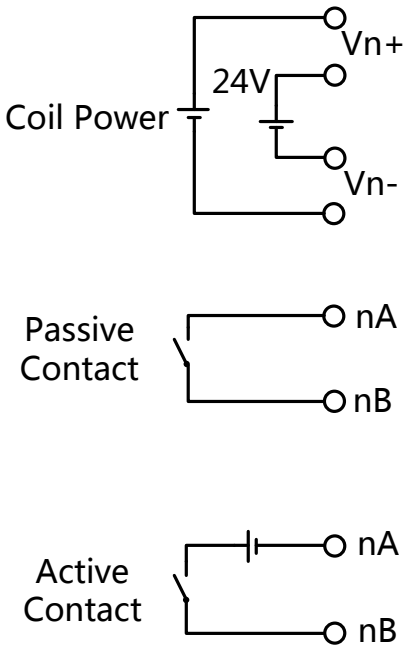
**Figure 3-2 Circuit**

The maximum section of wire allowed to connect the terminal in TUA711-DIR32 is  $2.5\text{mm}^2$ . The wires with sections of  $1\text{mm}^2$  or  $1.5\text{mm}^2$ , the wire stripping length of 8mm and the tightening torque of (0.5~0.6)Nm are recommended.

### 3.5 Terminal Definition and Wiring

In Table 3-3, if the channels are the former (later) 16 channels, the terminal Vn of coil power selects V1 (V2). In the figures below, “n” refers to channel number. For example, the terminal numbers of the CH16 are 16A and 16B.

Table 3-3 Wiring

Wiring	CH1~16	Terminal	CH17~32	Terminal
 <p>Coil Power</p> <p>Passive Contact</p> <p>Active Contact</p>	CH1	1A	CH17	17A
		1B		17B
	CH2	2A	CH18	18A
		2B		18B
	CH3	3A	CH19	19A
		3B		19B
	CH4	4A	CH20	20A
		4B		20B
	CH5	5A	CH21	21A
		5B		21B
	CH6	6A	CH22	22A
		6B		22B
	CH7	7A	CH23	23A
		7B		23B
	CH8	8A	CH24	24A
		8B		24B
	CH9	9A	CH25	25A
		9B		25B
	CH10	10A	CH26	26A
		10B		26B
	CH11	11A	CH27	27A
		11B		27B
	CH12	12A	CH28	28A
		12B		28B
	CH13	13A	CH29	29A
		13B		29B
	CH14	14A	CH30	30A
		14B		30B
	CH15	15A	CH31	31A
		15B		31B
	CH16	16A	CH32	32A
		16B		32B
	Coil Power of the Former 16 Channels	J02 (24VDC)	Coil Power of the Later 16 Channels	J04 (24VDC)
		V1+, V1+, V1-, V1-		V2+, V2+, V2-, V2-

## Section 4 Engineering Application

### 4.1 Note

- When the input signal in TUA711-DIR32 is active contact, the terminals J02 and J04 will not be powered, and the indicator lights LED101 and LED102 will be off.
- Functions terminal boards achieve and wiring methods of this version (V11.00.00) are compatible with previous version. They are mutually alternative. But, relays of this version are not compatible with the previous. Don't mix up.
- Don't make relays fall down from on high or suffer shock to avoid performance degradation.
- Don't use relays near high-intensify magnetic field to avoid relay's mistaken acts.
- Relays are better to be used in a dust-free, SO<sub>2</sub>-free and H<sub>2</sub>S-free environment.

### 4.2 Troubleshooting

- When the input power of J02 and J04 are normal but the LED101 and LED102 are off, the power loop has fault. Please check the fuses F101 and F102.
- Relay fault analysis is shown in the table below.

**Table 4-1 Relay trouble-shooting list**

Failure phenomena	Failure mode	Causes	Solution
Relay	Coil side has no voltage or insufficient voltage	Power supply fault; Power supply circuit opening	Check power supply firstly; Check power supply circuit; Use a new relay to have a test.
	Relay fault	Fall down or suffer shock	
Relay act unstable	Unstable power	Large power ripple	Check power supply firstly; Use a new relay to have a test; check the control program.
	Unstable parameters	Fall down or suffer shock	
	Relay mistaken act	Control program error	
Contact adhesion	Over-current	Large surge current	Replace the old one with a relay marked with larger external load capacitance.
Contact unclosed	No current on contact side	Movable contact damage or load circuit opening	Check load circuit; Use a new relay to have a test.
	Contact resistance is too large.	Contact oxidization or	

## Section 5 Revision

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*Table 5-1 Retrofit list of the version*

Document Version	Applicable Product Version	Remarks
V1.0(20131012)	TUA711-DIR32 V10.00.00 and later versions	The first version.
V1.1(20140428)	TUA711-DIR32 V10.00.00 and later versions	Add attention, modify relay model and appearance
V1.2(20161116)	TUA711-DIR32 V10.00.00 and later versions	Add wire specifications Add code
V1.3(20201210)	TUA711-DIR32 V11.00.00 and later versions	Modify size and relay