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> KACON HR705-4PLD-24VDC Electro Mechanical Relay Instruction Manual

## KACON HR705-4PLD-24VDC

# KACON HR705-4PLD-24VDC Electro Mechanical Relay Instruction Manual

Model: HR705-4PLD-24VDC

## 1. INTRODUCTION

This manual provides essential information for the safe and effective installation, operation, and maintenance of the KACON HR705-4PLD-24VDC Electro Mechanical Relay. This cube-type relay features a 5A 4PDT contact configuration, a 24VDC coil input, an integrated LED indicator, and surge protection. It is designed for general-purpose industrial control applications and requires a compatible socket for installation.



Image 1: KACON HR705-4PLD-24VDC Electro Mechanical Relay. This image shows the compact, transparent cube-shaped relay with its pins visible at the bottom, an internal coil, and contact mechanisms. An LED indicator is also visible.

## 2. PRODUCT OVERVIEW AND FEATURES

The HR705-4PLD-24VDC is a robust electro-mechanical relay designed for reliable switching in various control circuits. Its key features include:

- **Cube Type Design:** Compact and space-saving form factor.
- **4PDT Contact Configuration:** Four Pole Double Throw contacts allow for versatile switching of up to

four independent circuits.

- **5A Current Rating:** Capable of switching currents up to 5 Amperes.
- **24VDC Coil Input:** Operates with a standard 24 Volts DC control signal.
- **LED Indicator:** Provides visual confirmation of coil energization.
- **Surge Protection:** Integrated protection against transient voltage spikes.
- **High Reliability:** Designed for long operational life.
- **Socket Required:** Designed for plug-in installation into a compatible relay socket (e.g., KMY2, KMY4, KMY4S series).

### 3. SPECIFICATIONS

The following table details the technical specifications for the HR705-4PLD-24VDC relay. Refer to Image 2 for a comprehensive overview including other HR705 series models and detailed diagrams.

Parameter	Specification (HR705-4PLD-24VDC)
Contact Type	4PDT (4 Form C)
Rated Current	5 Amps
Coil Voltage	24 VDC
Operation Mode	Automatic
Max. Switching Current	5A at 24VDC/240VAC
Min. Switching Voltage	100mVDC
Max. Switching Voltage	125VDC / 250VAC
Coil Resistance	1.2WDC (1.0WDC-1.2WDC for 24VDC)
Power Consumption	0.9W Approx. (DC: 0.9W Approx.)
Minimum Operating Voltage	80% of the rated coil voltage
Max. Dropout Voltage	DC Coil: 10% of rated voltage
Operating Time	20ms
Dropout Time	20ms
Insulation Resistance	100MΩ at 500VDC
Dielectric Strength	Between Contact: 1,000 Vrms 1Min. Between Contact & Coil: 1,500Vrms 1Min.
Mechanical Life	100,000,000 operations
Electrical Life	100,000 operations
Vibration Resistant	10~55Hz at double amplitude of 1.5mm
Ambient Temperature	-25°C ~ +55°C (-13°F ~ 131°F) at non-freezing

Parameter	Specification (HR705-4PLD-24VDC)
Ambient Humidity	35% ~ 85% RH
Weight	35g (1.2oz)
Socket Part Number	KMY2(Rail), KMY02(PCB), KMY4(Rail), KMY4S(PCB)
Terminal Mounting Torque	0.5N·m (5.10kgf·cm)

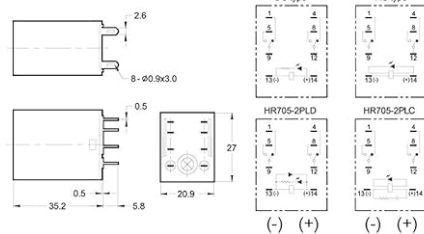


### Specifications

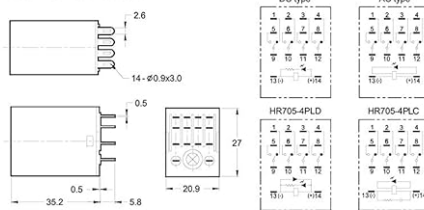
Part Numbers	Standard type	HR705-2PL-220VAC HR705-2PL-110VAC HR705-2PL-24VAC HR705-2PL-110VDC HR705-2PL-24VDC HR705-2PL-12VDC	HR705-4PL-220VAC HR705-4PL-110VAC HR705-4PL-24VAC HR705-4PL-110VDC HR705-4PL-24VDC HR705-4PL-12VDC
	Surge protection type	HR705-2PLD-12VDC HR705-2PLD-24VDC HR705-2PLC-110VAC HR705-2PLC-220VAC	HR705-4PLD-12VDC HR705-4PLD-24VDC HR705-4PLC-110VAC HR705-4PLC-220VAC
Contact	Configuration	DPDT (2NO + 2NC)	4PDT (4NO + 4NC)
	Material	Silver alloy (24K gold plate)	
	Max. Switching current	5A	3A
	Rated Max. Resistive Load	5A at 24VDC/240VAC	3A at 24VDC/240 VAC
Coil Spec.	Max. Switching Voltage	125VDC/ 250VAC	
	Min. Switching requirement	100mA 5VDC	
	Voltage range	12VDC to 110VDC, 12VAC to 240VAC	
	Power consumption	AC: 0.9VA Approx., DC: 0.9W Approx.	
	Minimum operating voltage	80% of the rated coil voltage	
	Max. Dropout voltage	DC Coil: 10% of rated voltage AC Coil: 30% of rated voltage	
	Operating Time	20ms	
General Info.	Dropout time	20ms	
	Insulation resistance	100MΩ at 500V DC	
	Dielectric Strength	Between Contact: 1,000 Vrms 1Min. Between Contact & Coil: 1,500Vrms 1Min.	
	Mechanical life	1,000,000 operations	
	Electrical life	100,000 operations	
	Vibration resistant	10~55Hz at double amplitude of 1.5mm	
	Ambient temperature	-35 ~ +55°C (-13°F~131°F) at non freezing	
	Ambient humidity	35% ~ 80% RH	
	Weight	33g (1.2oz)	
	Socket	Socket part number	KMY2(Rail), KY08-02(PCB)
Terminal Tightened Torque		0.5N·m (5.10kgf·cm)	

### Dimensions (unit: mm)

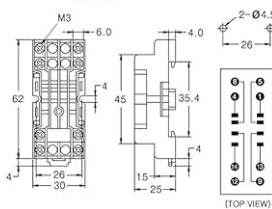
#### HR705-2PL Series



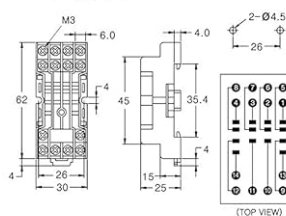
#### HR705-4PL Series



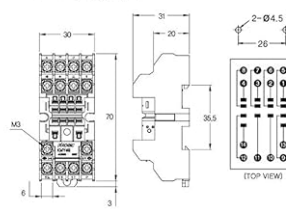
#### KMY2 Socket



#### KMY4 Socket



#### KMY4S Socket



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Image 2: KACON HR705 Series Specifications, Dimensions, and Wiring Diagrams. This detailed diagram includes a specifications table for HR705-2PL and HR705-4PL series, dimensional drawings for 2PL and 4PL relays, wiring diagrams for 2PLD, 2PLC, 4PLD, and 4PLC models, and socket diagrams for KMY2, KMY4, and KMY4S.

## 4. INSTALLATION AND SETUP

**Safety Precautions:** Always disconnect power to the circuit before installing or removing the relay to prevent electrical shock or damage to equipment.

1. **Select a Compatible Socket:** The HR705-4PLD-24VDC relay requires a compatible 14-pin relay socket. Refer to the 'Socket Part Number' in the specifications (e.g., KMY4 for rail mounting or KMY4S for PCB mounting).
2. **Mount the Socket:** Securely mount the chosen relay socket in the desired location (e.g., DIN rail for KMY4, or solder to PCB for KMY4S).
3. **Wire the Socket:** Connect the control circuit and load circuits to the appropriate terminals on the relay socket. Refer to the wiring diagrams in Section 6 for correct terminal assignments. Ensure all connections are secure and properly insulated.
4. **Insert the Relay:** Carefully align the pins of the HR705-4PLD-24VDC relay with the corresponding holes in the socket. Gently push the relay into the socket until it is fully seated. Do not force the relay, as this may bend or damage the pins.
5. **Verify Connections:** Double-check all wiring against the provided diagrams to ensure correct polarity for the DC coil and proper load connections.
6. **Apply Power:** Once installation is complete and verified, restore power to the circuit.

## 5. OPERATION

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The HR705-4PLD-24VDC relay operates by energizing its coil with a 24VDC control signal.

- **Coil Activation:** When 24VDC is applied across the coil terminals (typically A1 and A2 on the socket), an electromagnetic field is generated.
- **Contact Switching:** This electromagnetic field causes the relay's internal armature to move, simultaneously switching all four sets of Double Throw (DT) contacts. Each contact set will change its state from Normally Closed (NC) to Normally Open (NO), and vice-versa.
- **LED Indicator:** The integrated LED will illuminate when the coil is energized, providing a visual indication that the relay is active and its contacts have switched.
- **Deactivation:** When the 24VDC control signal is removed from the coil, the electromagnetic field collapses, and the armature returns to its original position, causing the contacts to revert to their default (de-energized) state.

## 6. WIRING DIAGRAMS

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The HR705-4PLD-24VDC is a 4PDT relay. The 'D' in the model number indicates a specific pin configuration. Refer to the 'HR705-4PLD' diagram within Image 2 for the precise pinout and contact arrangement. The coil terminals are typically labeled A1 and A2. The contact terminals are numbered to indicate common (C), normally open (NO), and normally closed (NC) connections for each pole.

For example, for a 4PDT relay, you will typically find:

- Coil: A1, A2
- Pole 1: Common (11), Normally Closed (12), Normally Open (14)
- Pole 2: Common (21), Normally Closed (22), Normally Open (24)
- Pole 3: Common (31), Normally Closed (32), Normally Open (34)
- Pole 4: Common (41), Normally Closed (42), Normally Open (44)

Always cross-reference these general pin assignments with the specific diagram for the HR705-4PLD model in Image 2 to ensure correct wiring.

## 7. DIMENSIONS

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The physical dimensions of the HR705-4PLD-24VDC relay are crucial for proper panel layout and socket selection. Refer to the 'HR705-4PL SERIES' dimensional drawing located in Image 2. Key dimensions include:

- Width: Approximately 20.9 mm
- Depth: Approximately 27 mm
- Height (excluding pins): Approximately 35 mm

These dimensions are approximate and should be verified against the detailed drawing in Image 2 for precise measurements.

## 8. MAINTENANCE

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The KACON HR705-4PLD-24VDC relay is designed for long-term, maintenance-free operation under normal conditions. However, periodic inspection can help ensure continued reliability:

- **Visual Inspection:** Periodically check the relay and its socket for any signs of physical damage, discoloration, or loose connections.
- **Cleanliness:** Ensure the relay and socket are free from dust, dirt, and moisture, which can affect performance. Use a dry, soft cloth for cleaning.
- **Connection Integrity:** Verify that the relay is securely seated in its socket and that all wiring connections to the socket terminals are tight.
- **Replacement:** If the relay shows signs of wear, damage, or inconsistent operation, it should be replaced with an identical model.

## 9. TROUBLESHOOTING

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If the HR705-4PLD-24VDC relay is not functioning as expected, consider the following troubleshooting steps:

- **Relay Not Activating (LED Off):**
  - Check if 24VDC is correctly applied to the coil terminals (A1, A2) of the socket.
  - Verify the polarity of the DC coil voltage.
  - Ensure the relay is fully seated in its socket.
  - Inspect for loose or damaged wiring to the coil.
- **Relay Activating (LED On) but Contacts Not Switching:**
  - Check the load circuit for continuity and proper connection to the relay contacts.
  - Ensure the load current and voltage do not exceed the relay's contact ratings (5A, 250VAC/125VDC).
  - The relay itself may be faulty; consider replacing it.
- **Intermittent Operation:**
  - Check for unstable coil voltage supply.
  - Inspect for loose connections in both control and load circuits.
  - Ensure ambient temperature and humidity are within specified operating ranges.

If issues persist after performing these checks, contact KACON technical support or a qualified electrician.

## 10. WARRANTY AND SUPPORT

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For information regarding product warranty, technical support, or service, please refer to the official KACON website or contact your authorized KACON distributor. Ensure you have the model number (HR705-4PLD-24VDC) available when seeking support.