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UAC SW4001C

UAC A/C Trinary Switch SW4001C Instruction Manual

Model: SW4001C | Brand: UAC

1. PRODUCT OVERVIEW

The UAC SW4001C A/C Trinary Switch is an essential component for automotive air conditioning systems, designed to integrate multiple pressure-sensing functions into a single unit. This switch monitors refrigerant pressure to control the compressor and condenser fan, ensuring efficient operation and protecting the system from extreme pressure conditions.

It combines the functions of a high-pressure cut-off (HPCO), low-pressure cut-off (LPCO), and an electric fan control switch. Manufactured to meet or exceed OEM specifications, the SW4001C ensures reliable performance and maximum cooling efficiency.



Image 1.1: Main view of the UAC A/C Trinary Switch SW4001C, showing the threaded connection and integrated wiring harness.

2. PACKAGE CONTENTS

- One (1) UAC A/C Trinary Switch (Model SW4001C)

3. SAFETY INFORMATION

Always observe the following safety precautions during installation and operation:

- Disconnect the vehicle's battery before performing any electrical work.
- Ensure the A/C system is properly discharged by a certified technician before disconnecting any refrigerant lines or components.
- Wear appropriate personal protective equipment (PPE), including safety glasses and gloves.
- Refer to your vehicle's service manual for specific A/C system diagrams and procedures.
- Improper installation can lead to system damage, refrigerant leaks, or personal injury. Professional installation is

recommended.

4. INSTALLATION AND SETUP

The UAC SW4001C Trinary Switch is designed for integration into existing automotive A/C systems. Installation typically involves mounting the switch and connecting its electrical wires. Due to the complexity of automotive A/C systems, professional installation is highly recommended.

4.1 General Installation Steps:

1. **System Discharge:** Ensure the A/C system is completely discharged of refrigerant by a qualified technician.
2. **Locate Mounting Point:** Identify the appropriate mounting location for the trinary switch, typically on the high-pressure side of the A/C system.
3. **Remove Old Switch (if applicable):** Carefully remove the existing pressure switch, if any, ensuring no debris enters the system.
4. **Install New Switch:** Thread the UAC SW4001C Trinary Switch into the designated port. Tighten to the manufacturer's specifications to prevent leaks.
5. **Electrical Connections:** Connect the four-wire harness of the trinary switch to the vehicle's A/C control system. Refer to your vehicle's wiring diagram for correct connections. A typical setup involves connections for:
 - Compressor Clutch Signal Input
 - Compressor Clutch Output
 - Condenser Fan Relay Trigger
 - Ground
6. **System Evacuation and Recharge:** After installation, the A/C system must be evacuated and recharged with the correct type and amount of refrigerant by a qualified technician.
7. **Test System:** Start the vehicle and test the A/C system for proper operation, including compressor engagement, fan activation, and cooling performance.



Image 4.1: Side view of the UAC A/C Trinary Switch SW4001C, highlighting the integrated wiring harness for electrical connections.



Image 4.2: Angled view of the UAC A/C Trinary Switch SW4001C, detailing the threaded connection point for system integration.

5. OPERATING PRINCIPLES

The UAC SW4001C Trinary Switch operates based on the refrigerant pressure within the A/C system, performing three critical functions:

- **High-Pressure Cut-Off (HPCO):** If the refrigerant pressure in the high-side of the A/C system exceeds a safe operating limit, the switch will open the circuit to the compressor clutch, disengaging the compressor. This prevents damage to the compressor and other system components due to excessive pressure.
- **Low-Pressure Cut-Off (LPCO):** If the refrigerant pressure drops below a minimum safe level (e.g., due to a leak), the switch will open the circuit to the compressor clutch, preventing the compressor from running without sufficient refrigerant. This protects the compressor from damage caused by lack of lubrication and overheating.
- **Electric Fan Control:** When the A/C system is activated and the refrigerant pressure reaches a predetermined threshold, the switch provides a signal to activate the electric condenser fan. This ensures adequate airflow across the condenser, facilitating heat exchange and maintaining optimal system performance.

6. MAINTENANCE

The UAC SW4001C Trinary Switch is a durable component designed for long-term reliability. Regular maintenance of the overall A/C system is crucial for its longevity and proper function.

- **Periodic Inspection:** Annually inspect the switch and its wiring harness for any signs of physical damage, corrosion, or loose connections.
- **Refrigerant Levels:** Ensure the A/C system maintains correct refrigerant levels. Both under-charging and over-charging can affect the switch's operation and overall system efficiency.
- **System Cleanliness:** Keep the condenser fins clean and free of debris to ensure proper heat dissipation, which directly impacts system pressures.
- **Leak Detection:** If frequent refrigerant top-ups are required, have the system inspected for leaks by a qualified technician.

7. TROUBLESHOOTING

If your A/C system is not performing as expected, consider the following troubleshooting steps. Always consult a professional technician for complex diagnostics and repairs.

- **A/C Compressor Not Engaging:**
 - **Check Refrigerant Charge:** Low refrigerant pressure will prevent the trinary switch from allowing the compressor to engage (LPCO function).
 - **Inspect Electrical Connections:** Ensure all wires to the trinary switch and compressor clutch are securely connected and free of corrosion.
 - **Verify Power Supply:** Check relevant fuses and relays for the A/C system.
 - **High Pressure Condition:** If the system is overcharged or has a blockage, the HPCO function may be preventing engagement.
- **Condenser Fan Not Activating with A/C:**
 - **Check Refrigerant Pressure:** The fan control function relies on adequate system pressure.
 - **Inspect Fan Motor and Relay:** Ensure the fan motor is operational and its relay is functioning correctly.
 - **Wiring to Fan Relay:** Verify the electrical connection from the trinary switch to the condenser fan relay.
- **A/C System Cycles On/Off Rapidly:**
 - **Low Refrigerant:** This is a common symptom of an undercharged system, causing the LPCO to cycle the compressor.
 - **Overcharging:** An overcharged system can cause the HPCO to cycle the compressor.
 - **Restricted Airflow:** A dirty condenser or malfunctioning fan can lead to high pressures, triggering the HPCO.

8. SPECIFICATIONS

Feature	Specification
Model Number	SW4001C
Brand	UAC
Operation Mode	OFF-NONE-ON
Current Rating	2 Amps

Operating Voltage	120 Volts
Contact Type	Normally Open
Connector Type	Clamp
Terminal	Screw
Item Dimensions (L x W x H)	3 x 3 x 3 inches
Circuit Type	3-way
Actuator Type	Rotary
Contact Material	Brass
Color	Black
Item Weight	2.08 ounces
Manufacturer Part Number	SW 4001C
UPC	711307273119

9. WARRANTY AND SUPPORT

For specific warranty details, terms, and conditions related to your UAC SW4001C A/C Trinary Switch, please refer to the documentation provided with your purchase or visit the official UAC website. Keep your proof of purchase for any warranty claims.

For technical assistance, installation guidance, or troubleshooting beyond the scope of this manual, it is recommended to contact UAC customer support or consult with a certified automotive A/C technician.