

## A28PA and A28PJ Type Two-Stage Temperature Controls with NEMA Type 4X Raintight Enclosures

### Application

**IMPORTANT:** The A28PA and A28PJ Type Temperature Controls are intended to control equipment under normal operating conditions. Where failure or malfunction of an A28PA or A28PJ temperature control could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory) intended to warn of or protect against failure or malfunction of the A28PA or A28PJ temperature control must be incorporated into and maintained as part of the control system.

The A28PA and A28PJ type two-stage electromechanical temperature controls are designed for use in many agricultural applications. The A28PA and A28PJ controls have rugged Noryl plastic enclosures and are UL Listed as NEMA Type 4X. A28PA and A28PJ controls are also UL Listed for use in National Electrical Code (NEC) Article 547 Agricultural Environments (ANSI/NFPA 70).

Two Single-Pole, Double-Throw (SPDT) switches allow independent stage control circuits. Each switch may be wired for open-high or close-high action, providing automatic changeover on heating/cooling applications. A jumper across the switches' common (red) terminals is supplied as a standard feature.

The adjustable A28PA and A28PJ type temperature controls have O-ring sealed external setpoint adjustment knobs and range scales with oversized markings for easy readability in low light.

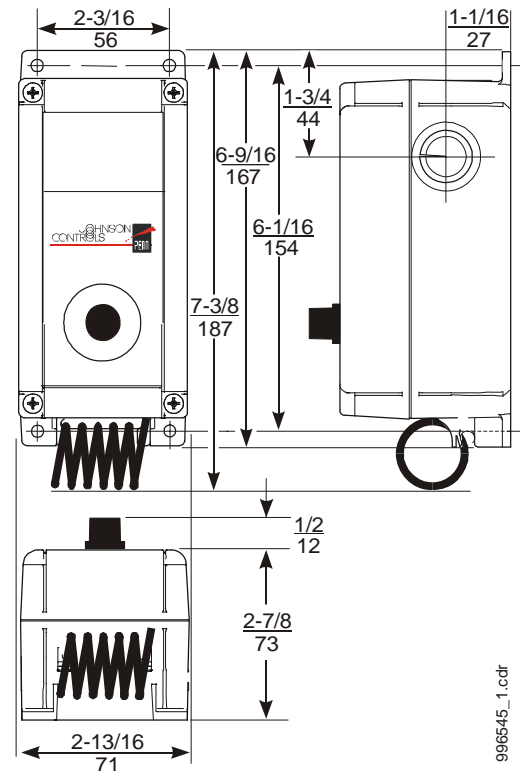
**IMPORTANT:** Do not dent, bend, uncoil, or otherwise alter the position of the sensing element (coil) mounted on the base of the A28PA and A28PJ type controls. Damaging the sensing element (coil) may change the control calibration and voids any warranties on the control.

### Operation

The circuit between R and Y of the low stage switch ( $RY_L$ ) closes, and R and B ( $RB_L$ ) opens on temperature increase to the setpoint (dial setting). On a further temperature increase, the high stage switch closes  $RY_H$  and opens  $RB_H$ . The reverse sequence occurs on a temperature decrease.

### Installation

#### Dimensions



**Figure 1: Dimensions for A28PA and A28PJ Type Temperature Controls with NEMA Type 4X Enclosures, in./mm**

### Mounting

Mount the temperature control where it is exposed to the average temperature of the controlled space. Do not mount it where it can be affected by unusual heat or cold, such as over an animal stall or in direct sunlight. Avoid locations near doors, windows, or other sources of non-ambient air drafts. Do not mount the control on an outside wall or where temperature at the sensing element exceeds 140°F (60°C).

Mount the temperature control to a flat surface with screws through the holes in the mounting ears on the back of the case. See **Error! Reference source not found.**

## Wiring



### **WARNING: Risk of Electric Shock.**

Disconnect each of multiple power supplies before making electrical connections. More than one disconnect may be required to completely de-energize equipment. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

**IMPORTANT:** All wiring must conform to all local, national, and regional regulations. Use copper conductors only for all wire connections.

**IMPORTANT:** Do not use A28 temperature controls on applications where the electrical load across the control's switch may exceed the electrical ratings shown on the temperature control's label.

**IMPORTANT:** Use only the terminal screws furnished with the switch. Using other screws in the switch voids the warranty, may damage the switch, and may cause problems in making secure connections.

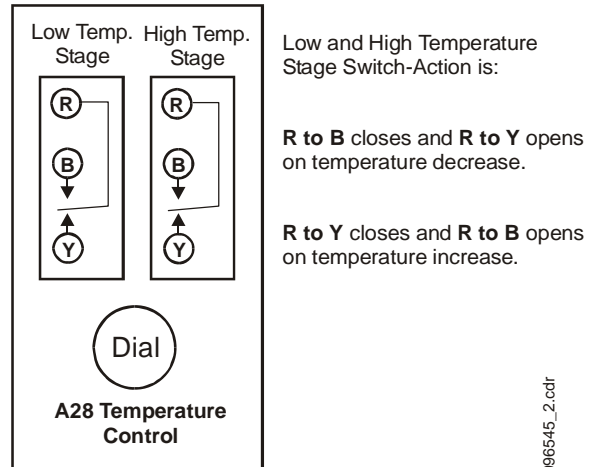
Wiring terminals of each switch are color coded to simplify wiring. Red (R) is the common terminal. The red to yellow (Y) circuit closes on temperature increase and is typically used to control cooling or ventilating equipment. The red to blue (B) circuit opens on temperature increase and is typically used to control heating equipment.

To make wiring connections, proceed as follows:

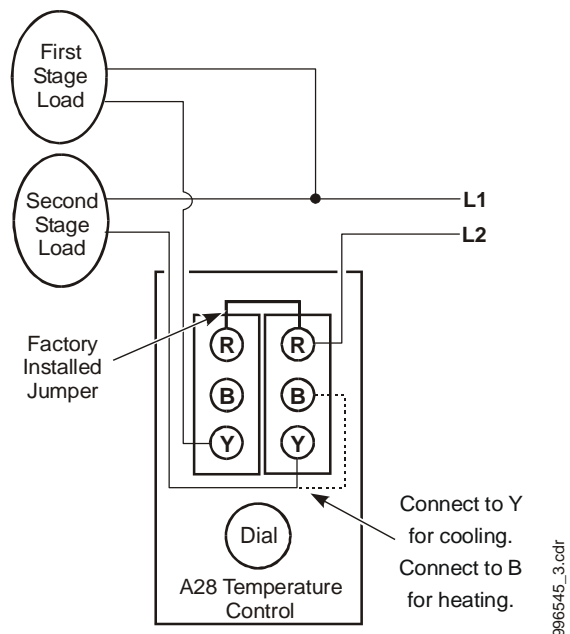
1. Loosen the four cover screws and remove the cover and knob assembly. The knob is secured in the cover and must not be removed. Do not damage the O-ring.
2. Select the knockout to be removed. Place a screwdriver blade on the knockout near the edge. Apply a sharp blow to the screwdriver handle to loosen the knockout.

**Note:** For watertight connection to rigid conduit, connect an approved watertight conduit fitting to the conduit first, and then connect the fitting to the A28PA or A28PJ control enclosure.

3. Insert wire through conduit opening.
4. Make wiring connections to the screw terminals. See Figure 2, Figure 3, and Figure 4.
5. Ensure that the O-ring is seated properly. Replace the cover and knob assembly. Be sure to check the alignment of the range adjustment knob.

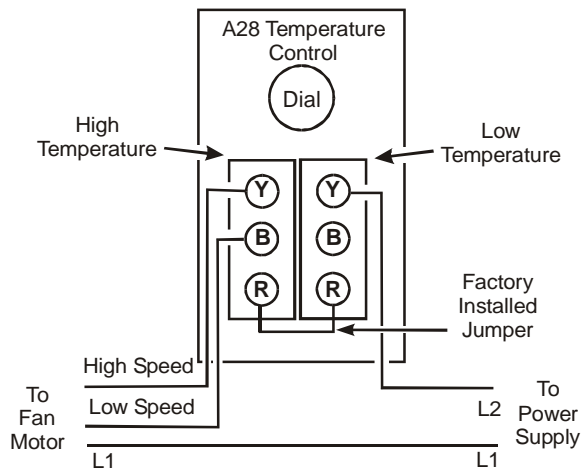


**Figure 2: A28 Temperature Control Switch Action**



**Figure 3: Typical A28 Control Wiring for Two-Stage Control Circuit**

Installer must provide means of disconnection and overload protection as required.



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**Figure 4: Typical A28 Control Wiring for Two-Speed Ventilating Fan**

## Checkout

Before leaving the installation, observe at least three complete operating cycles of the controlled equipment to ensure that all components are functioning correctly.

Adjust the dial to a lower or higher set point and check contact action of the switches to see that they are operating as illustrated in Figure 2, Figure 3, and Figure 4.

## Repairs and Replacement

All A28 temperature controls are not field repairable. Do not attempt to repair any control that is not functioning properly. Contact your Johnson Controls/PENN® sales representative or authorized distributor for a replacement control.

## Setup and Adjustments

Turn the knob on the front of the A28 temperature control to adjust both of the control's temperature setpoints simultaneously.



### **WARNING: Risk of Electric Shock.**

Disconnect all electric power sources from the A28 thermostat before removing the A28 thermostat cover. Contact with internal components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

All A28 thermostat models have a fixed differential on each switch. Some models have an adjustable inter-stage differential. To adjust those models with inter-stage differential:

1. Remove the control cover and rotate the adjusting wheel counterclockwise to increase the differential. (Increase spread as per label on control).
2. Use a small screwdriver and insert into serrated wheel at the lower left corner of the low temperature stage switch.
3. Replace and secure cover with screws when adjustments are complete.

## Technical Specifications

<b>Product</b>	A28PA and A28PJ Type Two-Stage Temperature Controls with NEMA Type 4X Raintight Enclosures					
<b>A28PA Type Switch Electrical Ratings (per switch)</b>	<b>Applied VAC</b>	<b>24</b>	<b>120</b>	<b>208</b>	<b>240</b>	<b>277</b>
	Motor, full load Amperes	-	16	9.2	8	-
	Motor, locked rotor Amperes	-	96	55.2	48	-
	Non-inductive Amperes	-	16	9.2	8	7.2
	Pilot duty Volt-Amperes	125	125	125	125	125
Total connected load not to exceed 2,000 VA						
<b>A28PJ Type PENN® Switch Electrical Ratings (per switch)</b>	<b>Applied VAC</b>	<b>24</b>	<b>120</b>	<b>208</b>	<b>240</b>	<b>277</b>
	Motor, full load Amperes	-	6	3.4	3	-
	Motor, locked rotor Amperes	-	36	20.4	18	-
	Non-inductive Amperes	-	10	9.2	8	7.2
	Pilot duty Volt-Amperes	125	125	125	125	125
Total connected load not to exceed 2,000 VA						
<b>Ambient Operating Temperature</b>	-26 to 140°F (-32 to 60°C)					
<b>Ambient Storage Conditions</b>	-40 to 140°F (-40 to 60°C)					
<b>Shipping Weight</b>	1.2 lb (0.54 kg)					
<b>Agency Listings</b>	UL Listed; File E6688, CCN XAPX (US) and XAPX7 (Canada) UL Listed as Type 4X and for NEC Article 547 Agricultural Environments					

*The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, contact Johnson Controls Application Engineering at 1-800-275-5676. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*



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