

## A28PJ Type Two-Stage Space Thermostat With Raintight Enclosure

### Application

The A28PJ series are two-stage electromechanical thermostats with raintight enclosures. They are designed for use in agricultural applications that require compliance with Article 547 of the National Electrical Code. They have rugged Noryl plastic gasketed enclosures that meet NEMA 4X specifications.

The A28PJ series thermostats have O-ring sealed set point adjustment knobs and range scales with oversized white markings for easy readability in low light situations. The exposed portion of the liquid filled expansion sensing elements are plated and plastic coated to resist damage in corrosive atmospheres.

Two SPDT switches permit independent control circuits. Each switch may be wired for "open high" or "close high" action, as required, providing automatic changeover on heating/cooling or similar requirements. A jumper across the "common" terminals is supplied as a standard feature. Models are available for fixed or adjustable between stage differential.

**All Series A28 temperature controls are designed for use only as operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add devices (safety, limit controls) that protect against, or systems (alarm, supervisory systems) that warn of, control failure.**

### Operation

Figure 2 illustrates the operation of the A28PJ. On a temperature increase to the dial setting, the circuit between R and Y of the low stage switch (RY<sub>L</sub>) closes. Simultaneously the circuit between R and B (RB<sub>L</sub>) opens. On a further increase in temperature the high stage switch operates and closes RY<sub>H</sub> while simultaneously opening RB<sub>H</sub>. The reverse sequencing takes place on a temperature fall.

### Installation

#### Mounting

Mount the thermostat in a location where it will be exposed to the average temperature of the controlled space. Do not mount where it will be affected by unusual heat or cold, such as directly over an animal stall or in sunlight. Avoid locations near a door, window, or hay chute. Do not mount on an outside wall or where temperature at the bulb (coil) exceeds 140°F (60°C).

Mount the A28PJ to a flat surface with screws through the holes in the mounting ears on the back of the case.

**CAUTION:** Do not dent or deform the sensing bulb (element) of this thermostat. A dent or deformation will change the calibration and cause the thermostat to cycle at a temperature lower than the dial setting.



Fig. 1 -- A28PJ Thermostat.

### Wiring

**WARNING:** Disconnect the power supply before wiring connections are made to avoid possible electrical shock or damage to equipment.

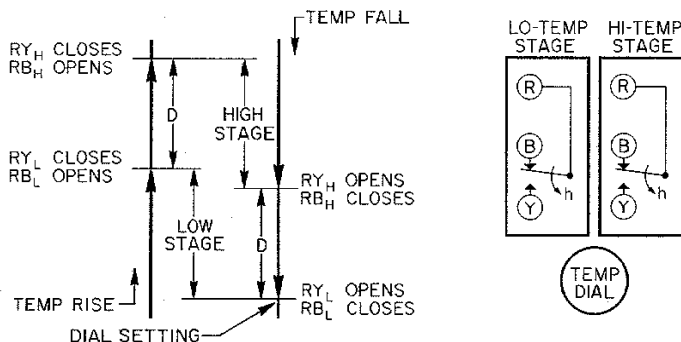
Make all wiring connections using copper conductors only, and in accordance with the National Electrical Code and local regulations.

Wiring terminals of each Pennswitch are color coded for convenience and to simplify wiring. Red is the common terminal; red to yellow circuit closes on temperature increase, red to blue circuit opens on temperature increase.

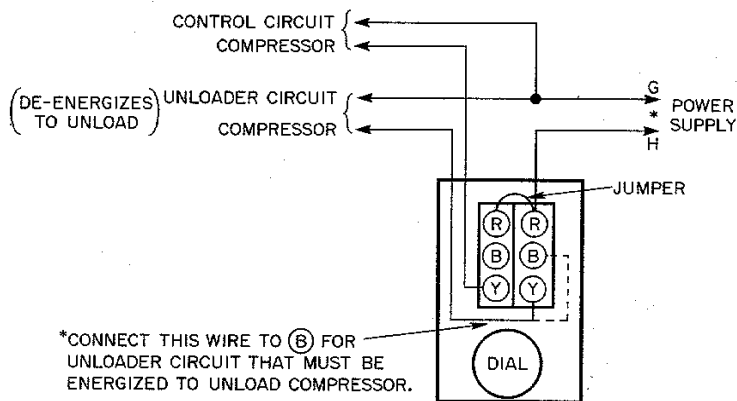
**CAUTION:** Use terminal screws furnished (8-32 x 1/4 in. binder head). Substitution of other screws may cause problems in making proper connections.

To make wiring connections, proceed as follows:

1. Select the knockout to be removed. With the cover in place, locate a screwdriver blade at the edge of the knockout opposite the web. Hold the case firmly. A sharp blow to the screwdriver handle will loosen the knockout.
2. 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 gasket.
3. For watertight connection to rigid conduit, connect an approved watertight conduit fitting to the conduit first, and then connect the fitting to the A28PJ enclosure.
4. Insert wire through conduit opening.
5. Make wiring connections to the screw terminals. (See Figs. 2 and 3).
6. Replace cover and knob assembly. Be sure to check the alignment of the range adjustment knob.



**Fig. 2 — Switching action of the two-stage control is illustrated in the sketch above, RB<sub>H</sub>, RY<sub>H</sub> indicates HI-TEMP stage; RB<sub>L</sub>, RY<sub>L</sub> indicates LO-TEMP stage. "D" represents the differential between stages.**



**Fig. 3 — Typical wiring diagram of a refrigeration compressor with single stage unloader. Two compressor packages may be sequenced with same circuit.**

Do not use the thermostat on applications where the electrical ratings exceed the ratings shown on the thermostat's label.

## Adjustments

All models have fixed differential on each Pennswitch. To adjust those models with interstage differential, rotate adjusting wheel counterclockwise to widen the differential (increase spread). Use a small screwdriver and insert into serrated wheel.

## Checkout Procedure

Before leaving the installation, observe at least three complete operating cycles to be sure 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 according to Fig. 2.

## Repairs and Replacement

Field repairs must not be made. For a replacement control, contact the nearest Johnson Controls distributor.

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