

## A19BAC, A28AA Single and Two-Stage Space Thermostats For Farm and General Purpose Applications

### Application

The single-stage A19BAC and the two-stage A28AA thermostats incorporate single-pole double-throw switches for controlling automatic ventilation or heating in livestock barns, poultry houses, milk houses, brooder houses and other buildings. The 30 to 110°F (0 to 43°C) and 0 to 140°F (-15 to 60°C) temperature ranges permit use for many space applications.

**All Series A19 and A28 space thermostats 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) or systems (alarm, supervisory systems) that protect against, or warn of, control failure.**

### Operation

On a temperature increase to the dial setting, the circuit between R and Y closes. Simultaneously the R and B circuit opens.

Figure 3 illustrates the operation of the A28AA. 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

Mounting may be by wiring conduit or to a flat surface with screws through holes provided in back of frame.

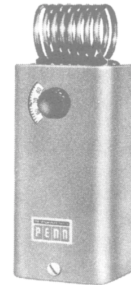
**CAUTION:** On rough mounting surfaces use the top two mounting holes only. When these controls are mounted on an uneven surface using screws in all four holes, the case can be twisted enough to affect the thermostat's calibration and operation.

Mount the thermostat 5 to 6 feet above the floor 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 maximum ambient temperature exceeds 140°F (60°C).

**CAUTION:** Do not dent or deform the sensitive bulb 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.

### Adjustment

Knob adjustment or screwdriver slot is supplied on the range screw. Dial pointer is located on cutout stop bracket on knob and screwdriver adjustment models. Solid cover models are adjusted by removing cover and moving dial so set point is in line with dial pointer on the stop bracket. (See Fig. 4.)



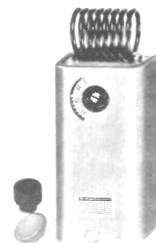
**Fig. 1 -- Exterior view of Space Thermostat.**

Convertible adjustment models can be field converted from concealed screwdriver slot adjustment to knob adjustment or external screwdriver slot adjustment. They are supplied with a snap-in plug in the cover to provide concealed screwdriver slot adjustment. For knob adjustment remove the snap-in plug and press the knob onto the slotted shaft. For external screwdriver slot adjustment remove the snap-in plug.

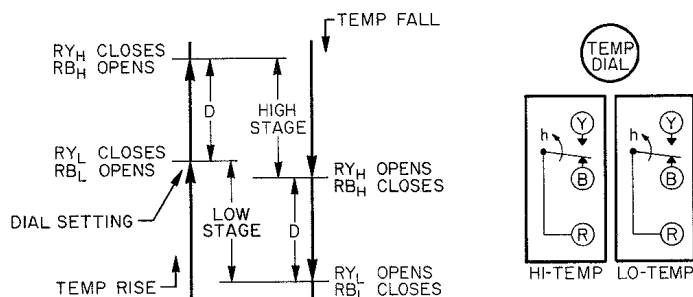
The A28AA switch is stamped to indicate the HI-TEMP switch and the LO-TEMP switch.

A high temperature cutout stop is supplied on the thermostats. (See Fig. 4.) If cutout stop is required proceed as follows:

1. Set dial to temperature at which stop is desired.



**Fig. 2 -- The Space Thermostats with convertible adjustment have a snap-in plug in the cover, built-in screwdriver slot and a knob for field installation.**



**Fig. 3 — Switching action of the two-stage control is illustrated in the sketch above, RB<sub>H</sub>, RY<sub>H</sub> indicates HI-TEMP; RB<sub>L</sub>, RY<sub>L</sub> indicates LO-TEMP. "D" represents the differential between stages.**

2. Remove cover from thermostat.
3. Loosen the cutout stop screw, slide the screw to the front of the thermostat against the plastic stop behind the dial and tighten the screw. (See Fig. 4.)

Sometimes an exact stop setting is not possible and stop must be set to the closest step corresponding to dial setting required.

4. Turn dial to set point desired.
5. Replace cover.

## Wiring

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

All wiring should conform to local codes and the National Electrical Code. Use copper conductors only. Do not use on applications where electrical ratings exceed ratings shown on the thermostat's cover label.

See Figs. 5 through 11 for typical wiring applications.

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

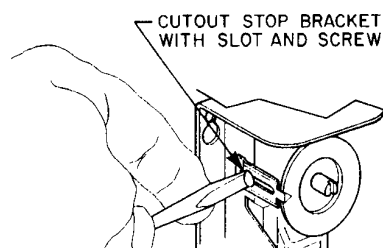
## Checkout Procedure

Before leaving the installation, observe at least three complete operating cycles to be sure that all components are functioning correctly.

Check for correct operation in the following manner.

1. *A19BAC -- Ventilating or Cooling System:* Turn dial clockwise to a setting above space temperature. Fan or cooling system should be off. When dial is turned counterclockwise, the fan or cooling system should turn on approximately at the dial setting.

*A19BAC -- Heating System:* Turn dial clockwise above the space temperature; the heating unit should be on. When dial is turned counterclockwise, the heating unit should turn off approximately at the dial setting.

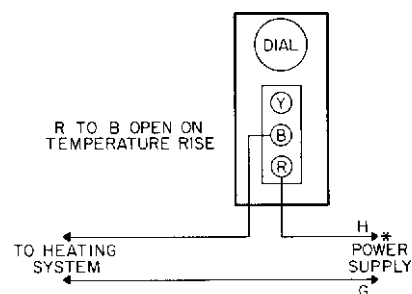


**Fig. 4 — All models have a screw type cutout stop. The stop screw must be loosened and moved to the stop setting desired. Tighten screw after setting is made.**

2. *A28AA --* If hookup is similar to Fig. 8, fan should start at approximately space temperature and should change to high speed as the dial is turned counterclockwise to a lower temperature setting. If wiring is similar to Fig. 9, the damper should open as the dial is turned counterclockwise. The devices should act in reverse sequence when the dial is turned clockwise to a higher setting.
3. If control devices do not operate in the manner described above, check all wiring for short circuits and tightness of wiring connections. If controlled devices operate in reverse (start in high or fully open position) check wiring as it is probably reversed.

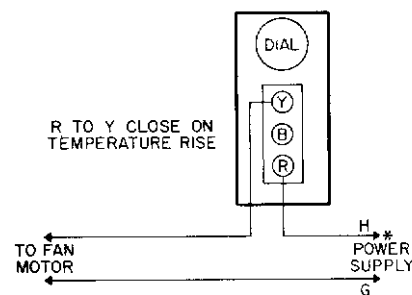
## Repairs and Replacement

Field repairs must not be made. For replacement thermostat contact the nearest Johnson Controls wholesaler.



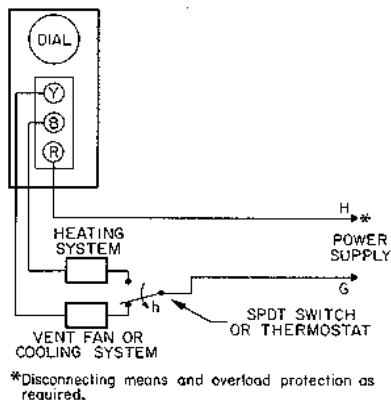
\*Disconnecting means and overload protection as required.

**Fig. 5 — An A19BAC in typical heating control circuit.**

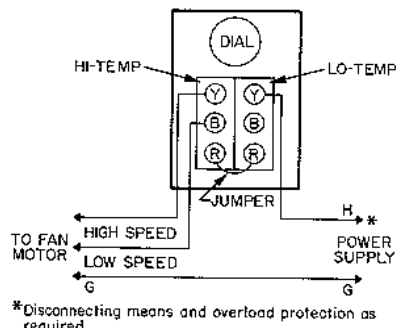


\*Disconnecting means and overload protection as required.

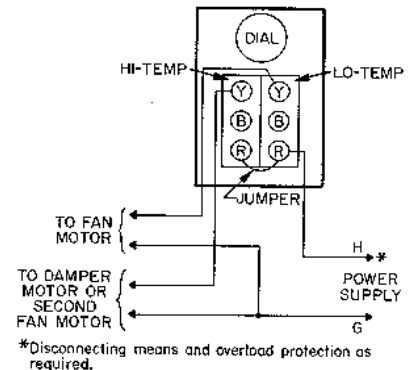
**Fig. 6 — An A19BAC in typical ventilating or cooling control circuit.**



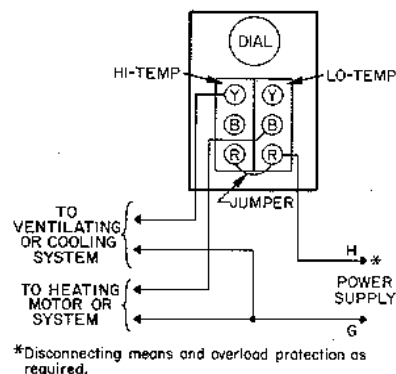
**Fig. 7 — An A19BAC in control of heating and ventilating systems.**



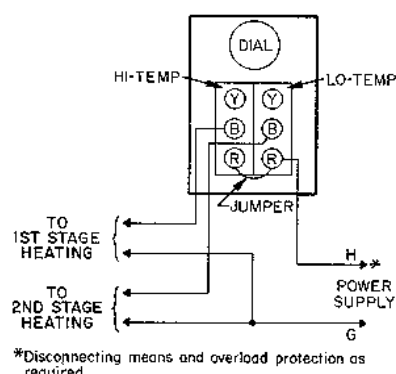
**Fig. 8 — An A28AA shows typical wiring for the control of a two speed ventilating fan. When control temperature reaches the dial setting, the low temperature switch starts the fan on low speed. If the space temperature continues to rise, the high temperature switch supplies power to the high speed motor winding while disconnecting the low speed winding.**



**Fig. 9 — Typical hookup for a two speed volume fan application. Fan starts when the temperature reaches the dial setting. If the temperature continues to rise, the damper motor is energized by the high temperature switch.**



**Fig. 10 — Typical wiring for a combination heating and cooling system automatic changeover. A temperature increase to dial setting turns off the heating system when the R-B low temperature switch contacts open. An increase of approximately 3F° (1.7C°) turns on the fan or cooling system through the R-Y contacts of the high temperature switch.**



**Fig. 11 — Typical hookup for two stage heating. On a temperature drop to dial setting the first stage heating turns on. If the temperature continues to drop about 3F° (1.7C°) the second heating stage turns on.**

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## Notes



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