



Johnson Controls, Inc.  
 Control Products Division

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 Milwaukee, WI 53202

## Series A19, A28 Thermostats for Agricultural Buildings

### Application

These thermostats are designed for heating and ventilation applications in the agricultural market. The A19JN(), A28JA and A28JJ have

NEMA 4X enclosures. They may be installed in agricultural buildings in accordance with Article 547 of the National Electrical Code. A19BA() and A28AA models have NEMA 1 enclosures. Both types have an

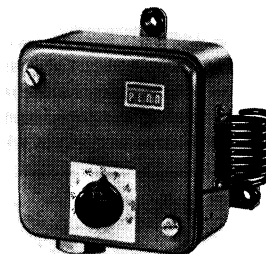


Fig. 1 — A19JN( ), A28JA and A28JJ Agricultural Thermostats.

### Specifications

Type Number	A19BAA	NEMA 1, One Open Low Switch
	A19BAB	NEMA 1, One Open High Switch
	A19BAC	NEMA 1, One SPDT Switch
	A19JNC	NEMA 4X, One SPDT Switch
	A19JNF	NEMA 4X, One SPDT Switch, Close Differential
	A28AA	NEMA 1, Two SPDT Switches
	A28JA, A28JJ	NEMA 4X, Two SPDT Switches, Close Differential
Ranges		30 to 110°F (0 to 43°C) 35 to 95°F (0 to 35°C) Heating Only With Off Position
Differential	Each Switch	Standard — 3.5F° (1.9C°) Close — 1.75F° (0.97C°); A28JJ — 2F° (1.1C°)
	Between Stage	Standard — 3F° (1.7C°) Close — 1.5F° (0.8C°)
Ambient Temperature	Maximum	140°F (60°C)
Contact Action		Red to Yellow Closes on Temperature Rise Red to Blue Opens on Temperature Rise
Switch		Sealed, Dust Protected Pennswitch
Wiring Connections		Screw Type Terminals
Conduit Opening	A19BA( ), A28AA	One 7/8" (22.2 mm) Diameter Hole for 1/2" Conduit in Bottom of Case
	A19JN( ), A28JA, A28JJ	One Welded Female Connector for 1/2" Conduit in Bottom of Case
Material	A19BA( ), A28AA	Case — .062" (1.6 mm) Cold Rolled Steel Cover — .025" (0.6 mm) Cold Rolled Steel
	A19JN( ), A28JA, A28JJ	Case — .070" (1.8 mm) Cold Drawn Steel, Galvanized Cover — .070" (1.8 mm) Cold Drawn Steel, Galvanized with Neoprene Gasket
Finish	A19BA( ), A28AA	Gray Baked Enamel
	A19JN( ), A28JA, A28JJ	Gray Baked Enamel, Corrosion Resistant
Sensing Element		Coiled Liquid Filled Element Secured to Enclosure, Black Vinyl Coated for Corrosion Resistance
Shipping Weight	A19BA( )	Individual Pack 1.0 lb (0.45 kg) Overpack of 50 Units 51 lb (23 kg)
	A19JN( )	Individual Pack 2.3 lb (1.0 kg)
	A28AA	Individual Pack 1.1 lb (0.5 kg) Overpack of 50 Units 56 lb (25 kg)
	A28JA, A28JJ	Individual Pack 2.4 lb (1.1 kg)

external adjusting knob. The single stage A19 and the two-stage A28 thermostats have single-pole, double-throw switches for controlling automatic ventilation or heating in livestock barns, poultry houses, milk houses, brooder houses, hog houses and other buildings. The temperature ranges permit use for many space applications. Single-stage thermostats are also available with open high contacts or open low contacts only.

The thermostats are designed for open low and open high operating control applications.

All Series A19 and A28 thermostats are designed for use only as operating controls. Where an

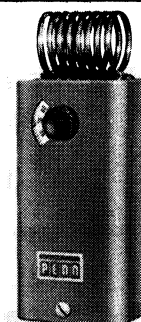
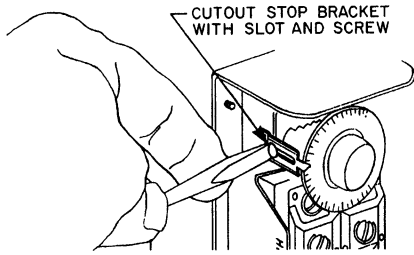


Fig. 2 — Exterior view of the A19BA( ) and A28AA thermostats.

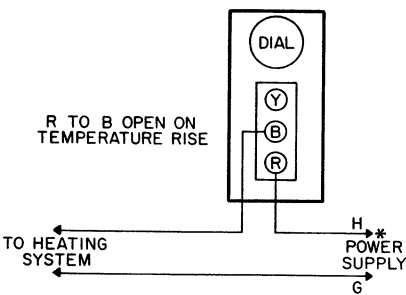


**Fig. 3 — The A19BA() and A28AA have a screw type cutout stop. The stop screw must be loosened and moved to the stop setting desired. Tighten screw after setting is made.**

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.

**Features**

- NEMA 4X, dust protected, splashproof, corrosion resistant



\*Disconnecting means and overload protection as required.

**Fig. 4 — A19 in a typical heating control circuit.**

gasketed enclosure with gray UL listed outdoor finish.

- Liquid filled sensing element provides uniform control at all ambient temperatures.
- Dependable snap-acting contacts.
- Close differential models available for critical requirements.

**General Description**

A19JN(), A28JA and A28JJ have NEMA 4X corrosion resistant enclosures with neoprene cover gasket. The coiled sensing element, secured to the side of the enclosure, has a black vinyl weather resistant coating. A19BA() and A28AA have NEMA 1 enclosures with the sensing element secured to the top of the enclosure.

**Operation**

**A19 SPDT Models**

When the temperature rises to the dial setting on SPDT models, the circuit between "R" and "Y" closes. Simultaneously the circuit between "R" and "B" opens.

**A19 SPST Models**

When the temperature rises to the dial setting on SPST types, the circuit closes on the close high models. The circuit opens on open high models.

**A28 Models**

Fig. 5 illustrates the operation of the A28 models. On a temperature increase to the dial setting, the circuit between "R" and "Y" of the low stage switch (RYL) closes. Simultaneously the circuit between "R" and "B" (RBL) opens. On a further increase in temperature the high stage switch closes (RYH) while simultaneously opening (RBH). The reverse sequencing takes place on a temperature fall.

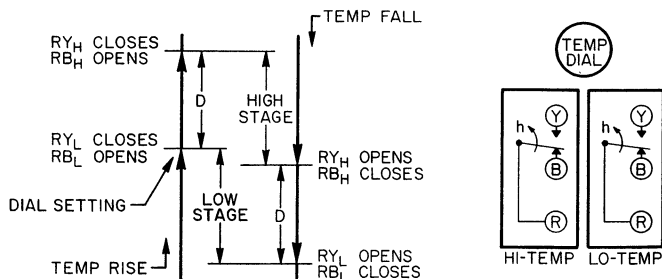
**Installation**

**Mounting**

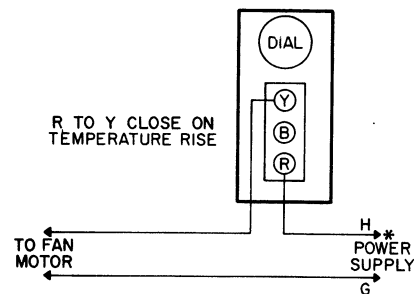
**CAUTION:** Do not dent or deform the sensitive bulb (element) of this thermostat. A dent or deformation will change the calibration and cause the thermostat to cycle at a temperature lower than the dial setting.

Mount the thermostat 5' to 6' 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.

The A19J and A28J thermostats must be mounted with the conduit connector pointing down. Mount to



**Fig. 5 — Switching action of the two-stage thermostat is illustrated above. RBH, RYH indicates HI-TEMP stage; RBL, RYL indicates LO-TEMP stage. "D" represents the differential between stages.**



\*Disconnecting means and overload protection as required.

**Fig. 6 — A19 in a typical ventilating or cooling control circuit.**

any flat surface with screws or bolts through the rubber bushings in the three mounting feet. (See Fig. 1.)

The A19B and A28A may be mounted to the wiring conduit or to a flat surface with screws through holes provided in back of the case.

**CAUTION:** On rough mounting surfaces, use the top two mounting holes only. When the thermostats with NEMA 1 enclosures are mounted on an uneven surface using screws in all four holes, the case can be twisted enough to affect the thermostats calibration and operation.

**Wiring**

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

All wiring must conform to local regulations and the National Electrical Code. Use copper conductors only.

To make wiring connections, proceed as follows:

**Electrical Ratings**

**A19, Standard Differential**

Voltage, AC	120	208	240	277
Full Load Amp	16.0	9.2	8.0	—
Locked Rotor Amp	96.0	55.2	48.0	—
Non-Inductive When Connected SPST	22.0	22.0	22.0	22.0*
Non-Inductive When Connected SPDT	16.0	9.2	8.0	7.2*

Pilot Duty — 125 VA, 24/600 VAC

\*Not applicable to A19JNC.

**A19, Close Differential**

Voltage, AC	120	208	240
Full Load Amp	6.0	3.4	3.0
Locked Rotor Amp	36.0	20.4	18.0
Non-Inductive or Resistance Load Amp (Not Lamp Loads)	10 Amp, 120 to 277 VAC		

Pilot Duty — 125 VA, 24/277 VAC

**A28, Standard Differential**

Voltage, AC	120	208	240	277
Full Load Amp	16.0	9.2	8.0	—
Locked Rotor Amp	96.0	55.2	48.0	—
Non-Inductive or Resistance Load Amp (Not Lamp Loads)	16.0	9.2	8.0	7.2

Pilot Duty — 125 VA, 24/277 VAC

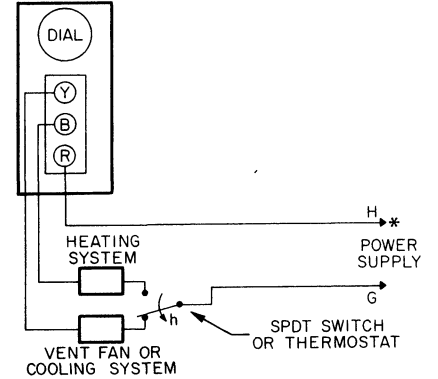
NOTE: When used as a two circuit switch, the total connected load must not exceed 2000 VA.

**A28JJ, Close Differential**

Voltage, AC	120	208	240	277
Full Load Amp	6.0	3.4	3.0	—
Locked Rotor Amp	36.0	20.4	18.0	—
Non-Inductive or Resistance Load Amp (Not Lamp Loads)	10.0	9.2	8.0	7.2

Pilot Duty — 125 VA, 24/277 VAC

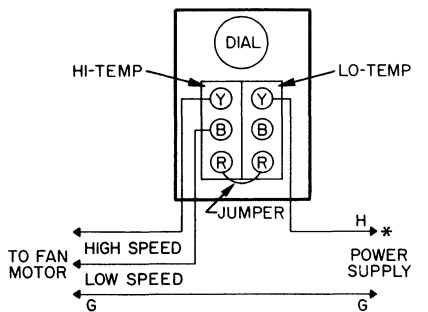
NOTE: When used as a two circuit switch, the total connected load must not exceed 2000 VA.



\*Disconnecting means and overload protection as required.

**Fig. 7 — A19 in control of heating and ventilating systems.**

1. On A19J and A28J models, loosen the set screw in the knob and remove the knob.
2. Loosen the cover screw(s) and remove the cover.
3. Make the wiring connections to the screw type terminals. (See Figs. 4 through 11 for wiring hookups.)
4. When wiring is completed replace the cover and the knob.



\*Disconnecting means and overload protection as required.

**Fig. 8 — A28 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.**

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

**CAUTION:** Use terminal screws furnished (No. 8-32 x 1/4" binder head). Substitution of other screws may cause problems in making proper connections.

**Adjustment**

**Set Point**

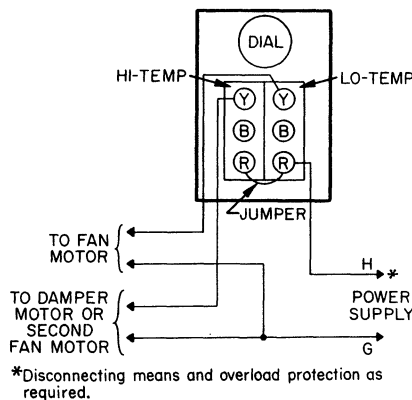
Turn the knob on the front of the thermostat to change the set point. Some A19B and A28A models have a screwdriver slot adjustment.

**High Temperature Cutout Stop**

The cutout stop on the A19J and A28J is factory set and is not field adjustable.

The cutout stop provided on the A19B and A28A is field adjustable. (See Fig. 3.) If the cutout stop is required, proceed as follows:

1. Remove the cover from the thermostat.
2. Set the dial to the temperature at which the stop is desired.



**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.**

3. Loosen the stop screw and slide the screw to the front of the thermostat against the plastic stop behind the dial. Tighten the screw. (See Fig. 3.) Sometimes an exact stop setting is not possible and the stop must be set to the closest step corresponding to the dial setting required.

4. Turn the dial to the set point desired.

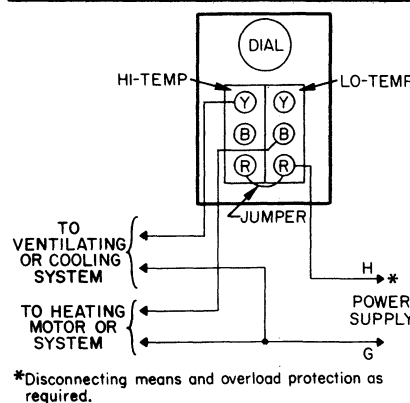
5. Replace the cover.

**Checkout Procedure**

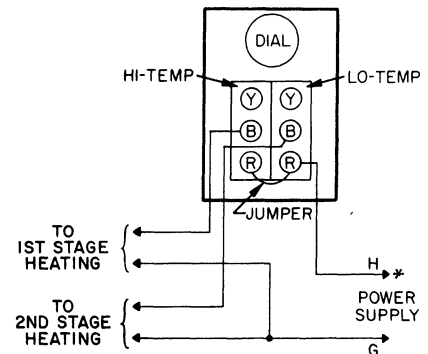
Before leaving the installation, observe at least three complete operating cycles to be sure that all components are functioning correctly.

Check for correct operation as follows:

1. A19 Ventilating or Cooling System: Turn the dial clockwise to a setting above the space temperature. The fan or cooling



**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°) for A28AA and A28JA or 1.5 F° (0.8C°) for A28JJ turns On the fan or cooling system through the "R-Y" contacts of the high temperature switch.**



\*Disconnecting means and overload protection as required.

**Fig. 11 — Typical wiring hookup for two-stage heating. On a temperature drop to the dial setting the first stage heating turns On. If the temperature continues to drop, approximately 3F° (1.7C°) for A28AA and A28JA or 1.5F° (0.8C°) for A28JJ, the second heating stage turns On.**

system should turn On approximately at the dial setting.

2. A19 Heating System: Turn the dial clockwise above the space temperature. The heating unit should be On. When the dial is turned counterclockwise, the heating unit should turn Off approximately at the dial setting.

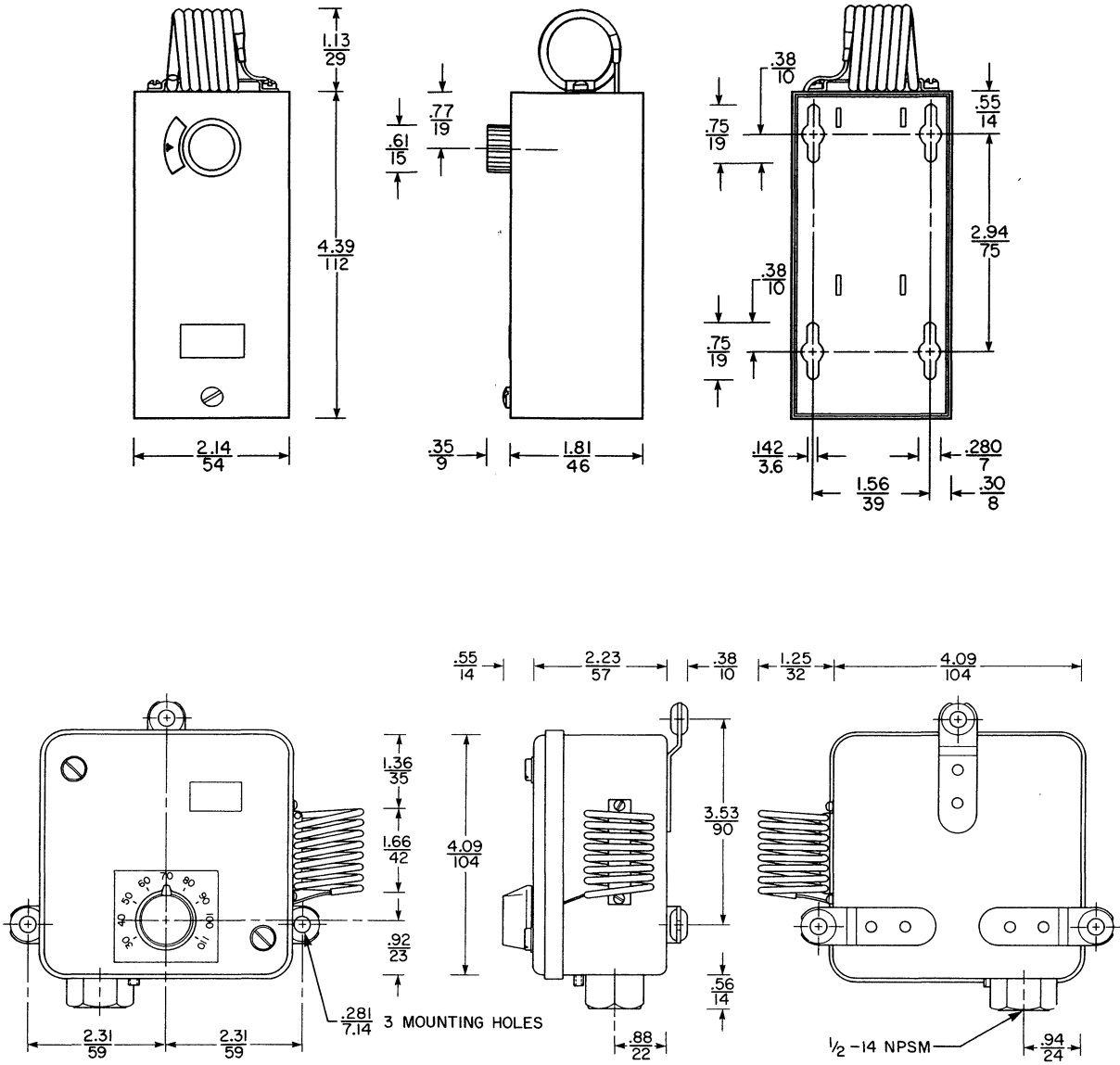
3. A28: When wired as shown in Fig. 7, the damper should open as the dial is turned counterclockwise. The devices should operate in reverse sequence when the dial is turned clockwise to a higher setting.

If the thermostats 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 in a fully open position), check wiring as it is probably reversed.

**Repairs and Replacement**

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



A19J, A28J Dimensions  $\frac{\text{in}}{\text{mm}}$

Performance specifications appearing herein are nominal and are subject to accepted manufacturing tolerances and application variables.

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File E6688

**A19, A28**

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