

## A36 Series Multistage Thermostats

### Application

A36 multistage thermostats operate electrically controlled equipment such as multiple refrigeration compressors, or unloading type compressors in air conditioning or chiller installations. They are available with three or four stages, and each stage has single-pole, double-throw contact action, and operates from a single, liquid-filled sensing element that is unaffected by barometric pressure changes. The control is ambient compensated for ambient temperatures from 0 to 140°F (-18 to 60°C).

**IMPORTANT:** The A36 multistage thermostats are intended to control equipment under normal operating conditions. Where failure or malfunction of an A36 thermostat 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 A36 thermostat must be incorporated into and maintained as part of the control system.

### General Description

Series A36 thermostats supplied in "open" construction (without an enclosure) are for panel mounting. Pennswitch terminals are supplied with Number 8 binding head screws. Optional 1/4 in. x .032 in. male quick-connect tabs are available on models with knob shaft adjustment.

The differential on each stage and the sequencing between stages are established by the equipment engineer for optimum performance of his units and are *nonadjustable* in the field. This permits package unit manufacturers to completely engineer the cycling of their equipment without the potential for field misadjustment and resultant erratic sequencing.

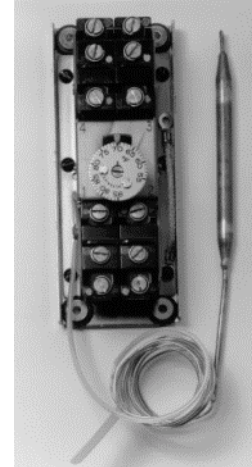
A single adjustment moves the entire staging band up or down within the range of the control to give the most desirable balance point between the unit and load, or to produce the desired temperature condition at the bulb location.

The A36 is regularly supplied with a calibrated dial and screwdriver slot adjustment with low dial stop, factory adjustable over the lower 40 degrees of the selected range. Extended 1/4 in. diameter shaft with a flat surface (.156 in. or .187 in.) available on quantity orders.

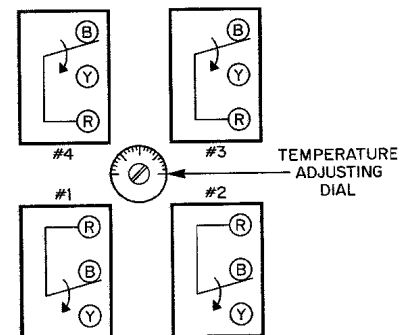
Shaft length to 3-1/2 in. from mounting surface of panel. Mounted models available at no extra cost. Shaft models are supplied with "stops" at both adjusting limits, eliminating need for "stops" in equipment manufacturers' knob or escutcheon plate. Standard shaft rotation is clockwise for warmer temperature adjustments.

The main operating arm is counterbalanced and spring loaded. Stresses at the pivot point are kept low to avoid wear.

Rigid main frame resists distortion and is protected by shock absorber mounting pads.



**Fig. 1 -- Panel mounted A36 Multistage Thermostat**



**Fig. 2 – Switch Action, R to Y Closes on Temp Increase**

### Optional Constructions

#### Capillary

Six foot standard. Optional lengths of 8, 10, and 15 feet available at extra cost. Single braid copper armor or nylon tubing on capillary available at extra cost.

#### Special Ranges

Available on OEM quantity orders only.

#### Dial Stop

High setting stop available in place of low setting stop.

## Specifications

<b>Type Number</b>	<b>A36AGA</b>	3 Stages, Standard Differential Less Enclosure
	<b>A36AHA</b>	4 Stages, Standard Differential Less Enclosure
	<b>A36AHB</b>	4 Stages, Close Differential Less Enclosure
<b>Ambient Temperature</b>	0 to 140°F (-18 to 60°C)	
<b>Switches</b>	Snap-Acting SPDT Contacts in a Phenolic Enclosure	
<b>Finish</b>	Galvanized	
<b>Maximum Allowable Shipping Temperature</b>	140°F (60°C)	
<b>Material</b>	<b>Baseplate</b>	.070" (1.8 mm) Steel
	<b>Frame</b>	.062" (1.6 mm) Steel
<b>Shipping Weights</b>	<b>Individual Pack</b>	1.7 lb (.8 kg)
	<b>Overpack of 10 Units</b>	19.0 lb (8.6 kg)
<b>Wiring Connections</b>	Screw Type Terminals with 8-32 x 1/4" wire binding screws are standard.	

## Electrical Ratings

Volts, AC	Close Differential				Standard Differential			
	120	208	240	277	120	208	240	277
<b>Full Load Amp</b>	6.0	3.4	3.0	--	10.0	6.9	5.0	--
<b>Locked Rotor Amp</b>	36.0	20.4	18.0	--	60.0	41.4	30.0	--
<b>Non-Inductive Amp</b>	10.0	5.7	5.0	4.3	16.0	9.6	8.0	7.2

Pilot Duty – 125 VA, 120 to 277 VAC

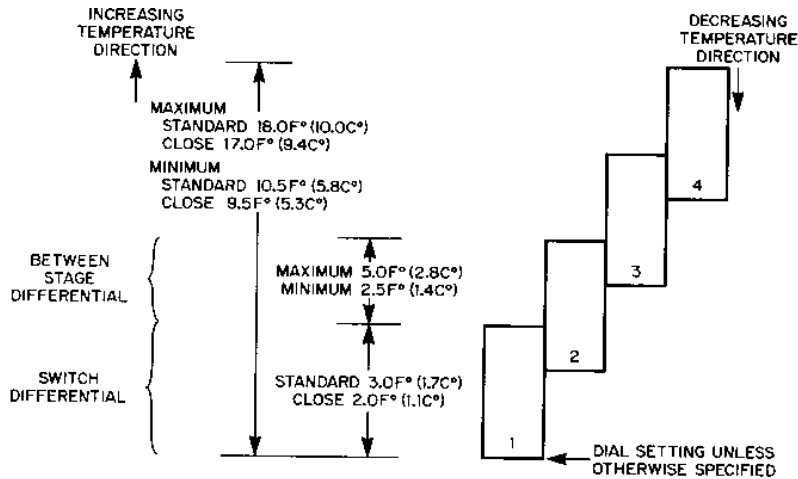
## Range and Differential Specifications

Range °F (°C)	Fixed Differential Each Stage F° (C°)		Sequence F° (C°)		Maximum Overrun Temperature	Bulb Size	Bulb Support	Compensated at Setting °F (°C)*
	Close	Standard	Minimum	Maximum				
0 to 70 (-18 to 21)	2 (1.1)	3 (1.7)	2.5 (1.4)	5 (2.8)	120 (49)	3/8" x 4-3/4"	3"	35 (1.7)
10 to 80 (-10 to 30)	2 (1.1)	3 (1.7)	2.5 (1.4)	5 (2.8)	120 (49)	3/8" x 4-3/4"	3"	35 (1.7)
55 to 95 (13 to 35)	--	2 (1.1)	1.5 (0.8)	3 (1.7)	120 (49)	3/8" x 5-1/4"	3"	55 (13)
70 to 140 (21 to 60)	2 (1.1)	3 (1.7)	2.5 (1.4)	5 (2.8)	180 (82)	3/8" x 4-3/4"	3"	95 (35)
100 to 250 (38 to 121)	2.5 (1.4)	3.8 (2.1)	2.0 (1.1)	6.5 (3.6)	290 (143)	.29" x 2.5"	3"	180 (82)

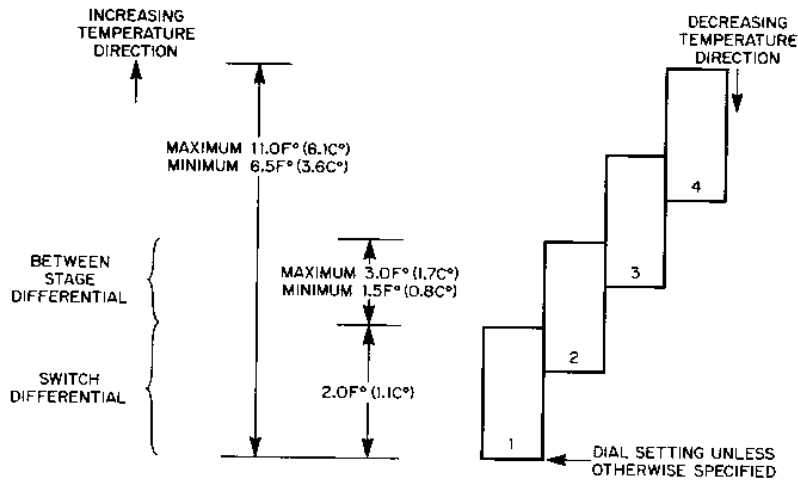
\* Assuming four feet of capillary and control frame are exposed to varying ambient temperature. If more capillary is exposed, the maximum compensation accuracy will be a lower setting.

Notes: Dial Calibration Point is shown in Figs. 3, 4, and 5, unless otherwise specified.

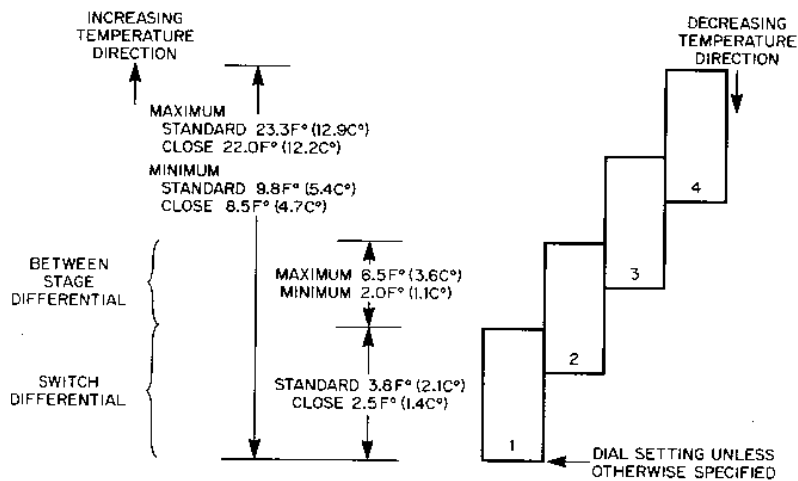
Contact application engineering for variations of existing models.



**Fig. 3 — Diagram showing differentials for 0 to 70F' (-15 to 20C'), 10 to 90F' (-10 to 30C') and 70 to 140F' (21 to 60C') ranges.**



**Fig. 4 — Diagram showing differentials for 55 to 95F' (13 to 35C') range.**



**Fig. 5 — Diagram showing differentials for 100 to 250F' (38 to 121C') range.**

## Installation

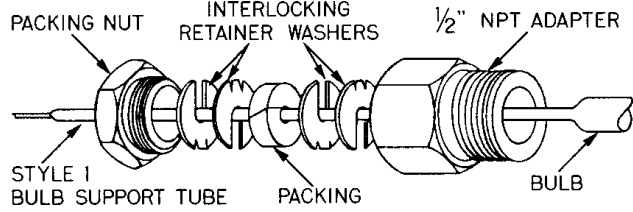
### Mounting

The thermostat may be mounted to any flat surface with four Number 8 screws or bolts through mounting pads provided.

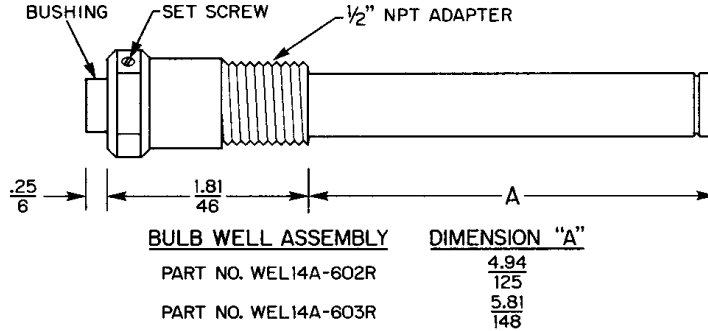
**Note:** See wiring instructions for installation of bonding conductor.

1. Avoid sharp bends or kinks in capillary tubing.
2. Style 1 (for clamp contact or liquid immersion) -- be sure the bulb is securely clamped to the evaporator coil or completely immersed in liquid.
3. Make sure the thermostat is not installed on equipment to handle a load in excess of electrical rating.
4. Coil and secure excess capillary to avoid vibration breakage, but allow some slack in the capillary to avoid "violin string" vibration which can cause tubing to break. Do not permit the tubing to rub against metal surfaces where friction can damage the capillary.
5. Be sure the sensing bulb is located where it properly senses the temperature of the medium being controlled.

**IMPORTANT:** 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. When a bulb mounting clip is used to mount the bulb near the refrigerant tubing, be sure the sheet metal screw does not pierce the tubing.



**Fig. 6 — Part Number FTG13A-600R Packing Nut Assembly for direct immersion application.**



**Fig. 7 — Bulb well dimensions.**

**IMPORTANT:** When closed tank mounting is required, turn off liquid supply and relieve pressure before installing or removing the bulb or bulb well.

Follow original equipment manufacturer's diagrams. Make all wiring connections using copper conductors only, and in accordance with the local, national, and regional regulations.

### Wiring

**WARNING: Risk of electrical shock.** Disconnect the power supply before mounting and wiring to prevent possible electrical shock. On multiple circuit units, more than one circuit may have to be disconnected.

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

**CAUTION: Risk of equipment damage.** Disconnect the power supply before mounting and wiring to prevent possible equipment damage. On multiple circuit units, more than one circuit may have to be disconnected.

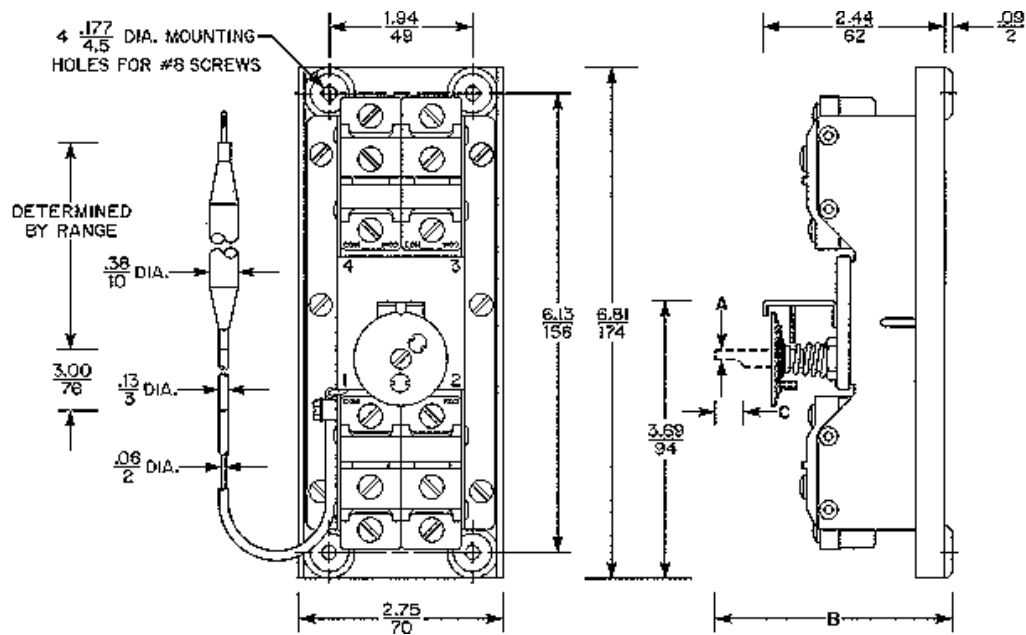
Secure grounding cable under head of mounting screw if screw is threaded into a grounded surface. If not, grounding cable (bonding conductor) must be attached to either the grounding conductor or other grounded surface.

## Checkout Procedure

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

## Repairs and Replacement

Field repairs must not be made except for replacement of the bulb well and closed tank connector. For a replacement thermostat, bulb well or closed tank connector, contact the nearest Johnson Controls distributor.



**Dimension Drawing – Dimensions A, B, and C vary by individual model.**

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

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