



STEMCO "Commercial" THERMOSTATS

TYPE 444, 445, 446,
448 and 457

Adjustable and Non-Adjustable Styles

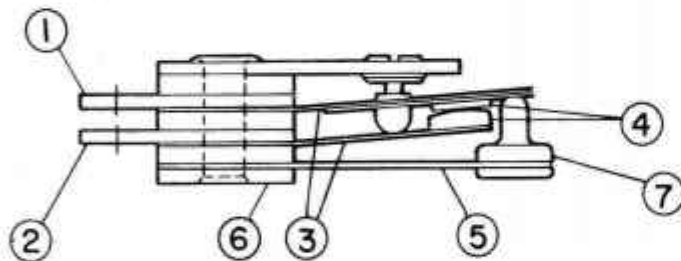


APPLICATION

The Type 444 thermostat is available with either adjustable or fixed calibration. It is used in flat irons, broilers, skillets, hot plates, waffle irons, fans, room heaters, coffee makers, sealing machines and many other appliances or industrial applications. The standard operating ranges are from 80° to 550°F., as measured on the bimetal.

Special ranges are from 32° to 550°F, subject to review of the application. Applications can be made to combine a heater with the thermostats to give a "percent of time on and off" control. It may also be furnished with a double pole off.

PRINCIPLE



Current flows from terminal (1) to terminal (2) through the contact springs (3) and contacts (4). The bimetal (5) carries no current. It is in direct contact with the mounting bushing (6) used in the surface mounting applications and responds rapidly to changes in surface temperature. As a result of this electrical independence, it responds mainly to temperatures of the device or to temperatures of the air surrounding the bimetal, eliminating false cycling or life-shortening "jitters". In the case of a thermostat opening on temperature rise, the bimetal strip moves upward. There is a friction movement of the insulated pin (7) against the blade and this, combined with the fact that it has to overcome contact blade pressure, gives the thermostat a positive action with a clean make and break. Contacts close again when the temperature drops to a point where the downward force of the contact spring overcomes the bimetal pressure and friction. When the thermostat closes on temperature rise, the bimetal moves downward, thus clearance must be provided below bimetal (5) and insulator (7).

With standard threads, the adjusting stem is rotated clockwise for higher temperature in open on rise construction.

MOUNTING

The easiest way to mount the thermostat is by means of a No. 8-32 screw through the hole in the thermostat into the surface on which the thermostat is mounted. It is recommended with this mounting that the torque applied to the #8 screw does not exceed 15 inch pounds. On special orders, this hole can be furnished with inside threads (Item C), at slight additional cost. For air heaters, and fan applications in particular, the nozzle mounting (Items T, W, X, Item T furnished at extra cost) is desirable, with threaded bushings in either No. 3/8-24 or 15/32-32 threads. One mounting nut for either thread will be supplied at no extra cost if specified.

Mounting brackets or heat collectors supplied by customer or developed by Stemco may be built into thermostat stack at additional cost.

CONSTRUCTION

PART	MATERIAL
Terminals	Plated steel
Contact spring	Stainless steel, phosphor bronze or beryllium copper
Contacts	Silver alloy or fine silver
Thermal element	Bimetal
Insulation	Ceramic
Pin	Ceramic (hardened ball optional extra)

STYLES

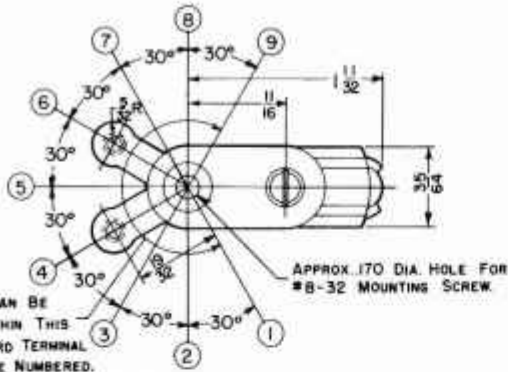
Stemco Type 444 thermostats are available in different dimensions and with various combinations of features, according to customer specifications. The outline drawings on the inside pages of this bulletin are representative of standard models. Adjustable units can be supplied with angular rotation of 90, 180, 250, 270 and 300 degrees. Terminals may be spaced to best suit the mounting conditions, specify position by number on page 2.

A modification of the standard thermostat has a positive Off plate underneath the top contact blade (Item BB). This permits setting the turn on point in the low position and at the same time a calibration of the temperature in the high position. It also prevents closing of the contacts due to extremely low ambients, such as in some air heater applications. It is patented construction available at extra cost. Note a thermostat with such a range that it does not close in the low position when cooled to -31°F. is accepted by UL in place of a positive off on space heaters, hot plates and similar applications.

For applications requiring the breaking of both sides of a circuit in the off position, a separate circuit has been added to the Type 444 making the Type 448 shown on page 3. With a positive off blade both sides of a circuit are opened in the Off position at any ambient. The Type 448 can also be used to provide an indicating light circuit, showing whether thermostat is on or off.

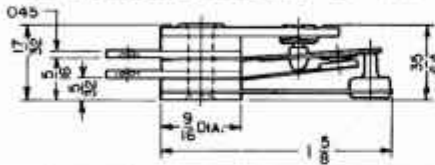


STANDARD CONSTRUCTION

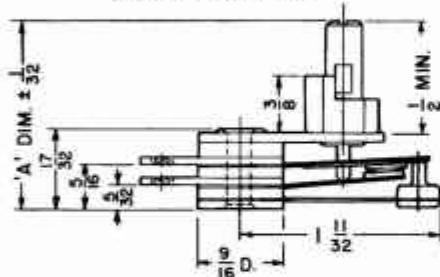


TERMINALS CAN BE MOUNTED WITHIN THIS ARC. STANDARD TERMINAL POSITIONS ARE NUMBERED.

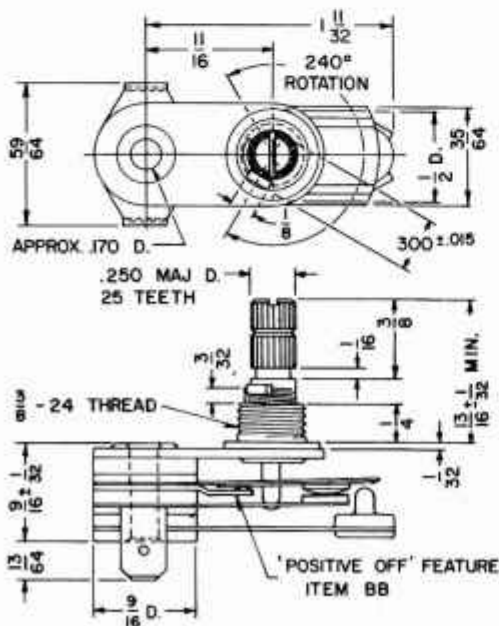
NON-ADJUSTABLE 444 OR 445



ADJUSTABLE

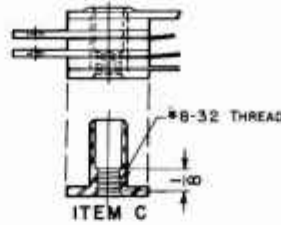


NOZZLE MOUNTING AND POSITIVE OFF

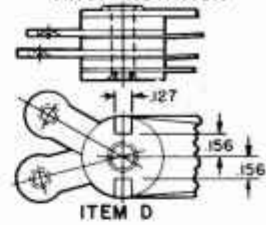


MOUNTING BUSHINGS

THREADED FOR MTG. SCREW

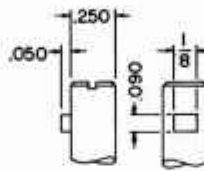


NOTCHED FOR ANTI-ROTATION



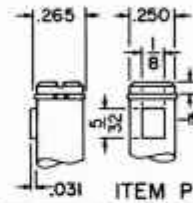
STOP LUGS, SPRING LUGS, AND SNAP RING

STANDARD LUG FOR USE WITH NOZZLE MOUNTED STOP BUSHINGS.



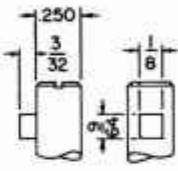
ITEM N

SNAP RING & COMPANION STOP LUG, 5/32 DIMENSION ON LUG IS STD.



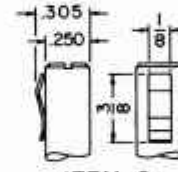
ITEM P

STANDARD LUG FOR USE WITH HEXAGON STOP BUSHINGS.



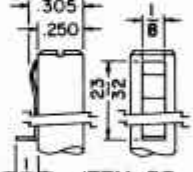
ITEM R

SPRING LUG FITS STANDARD KNOB-USE WITH NOZZLE MOUNTED STOP BUSHINGS.



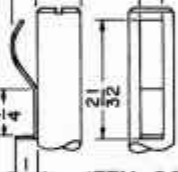
ITEM Q

SPRING LUG FITS STANDARD KNOB-USE WITH HEXAGON STOP BUSHINGS ONLY.



ITEM RR

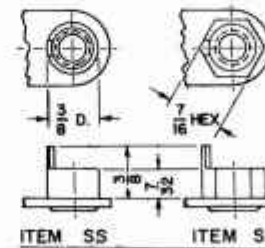
SPRING LUG



ITEM QQ

STOP BUSHINGS

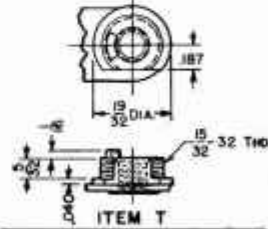
STANDARD



ITEM SS

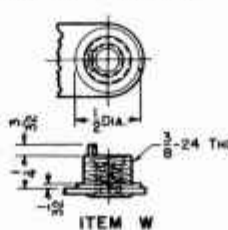
ITEM S

NOZZLE MOUNTING WITH FLAT FOR ANTI-ROTATION



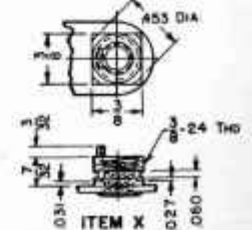
ITEM T

NOZZLE MOUNTING



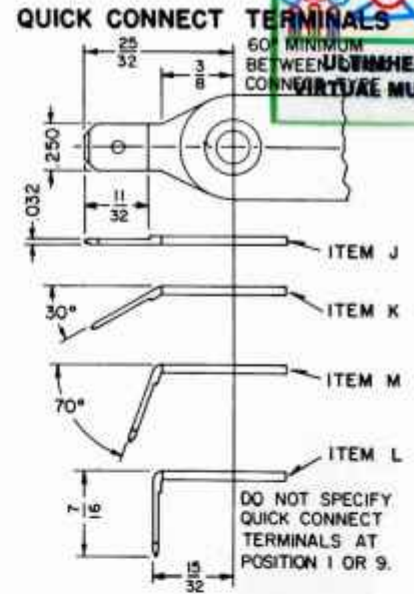
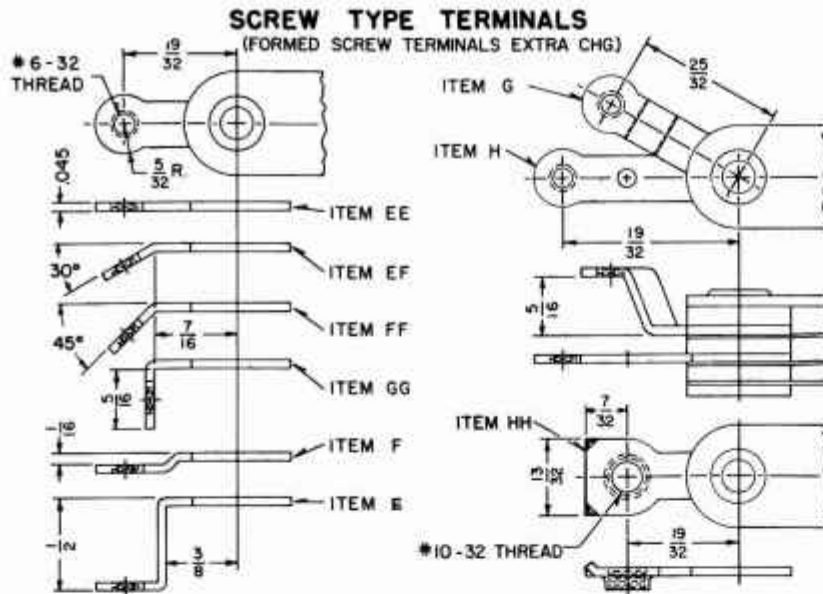
ITEM W

NOZZLE MOUNTING WITH ANTI-ROTATION



ITEM X

Note: 300 degree rotation not available in nozzle mounting or item SS bushing.

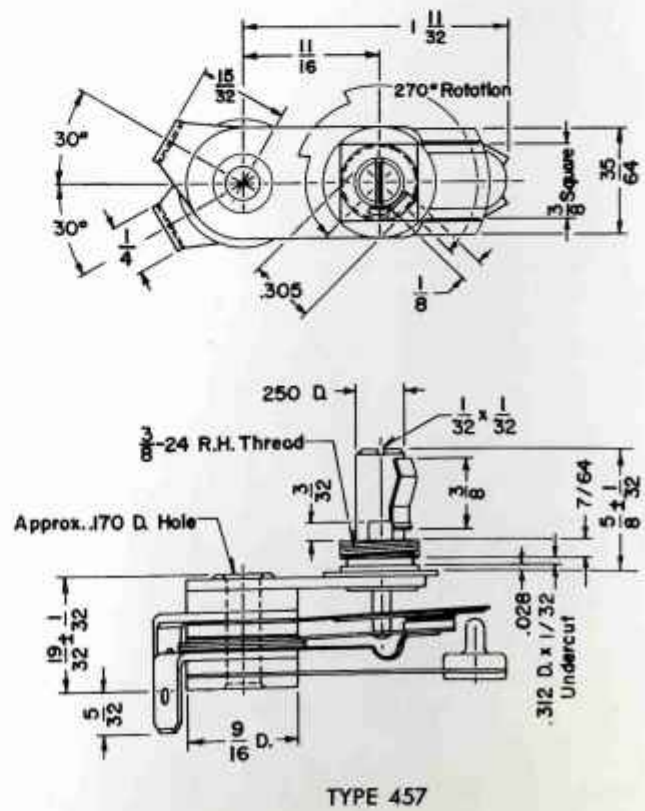
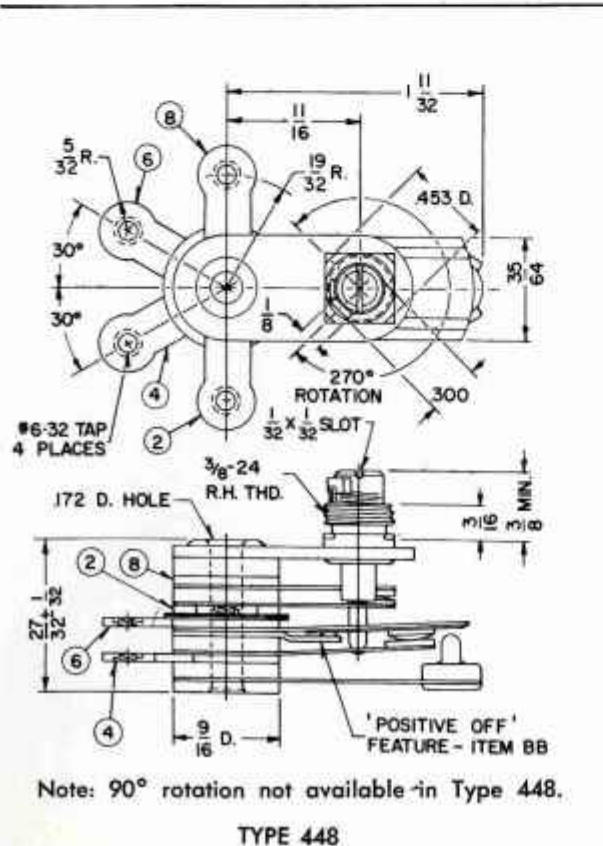


CALIBRATION

Type 444 thermostats are precalibrated to open the contacts or to close the contacts (as specified), when the bimetal is at a predetermined temperature. With a range of from 80° to 200°F., limits of ±5°F. are used. With a range of from 201° to 550°F., limits are ±10°F. There is an extra charge for a calibration below 80°F. Customers checking calibrating tolerances should use limits of approximately ±2°F. greater than specified above, to allow for difference between methods in calibration as well as instrumentation.

TYPE 457 OPERATION

In operation the Type 457 modification of the Type 444 is designed to give a linear relationship between the percentage of the time on and the angular position of the adjusting stem. Clockwise rotation of the adjusting stem will vary the percent of time on from zero to 100%. Loads of 200 to 1100 watts 120 VAC can be handled. The unit is not UL listed, requires approval in the application.





UL and CSA ELECTRICAL RATINGS

UL File E 23581

TYPE	MAX. TEMP.	CYCLES	120 VAC		240 VAC	
			15.0 Amp. Res. 5.0 FLA* 30.0 LRA*	8.3 Amp. Res. 2.5 FLA* 15 LRA*	16.6 Amp. Res. 5.0 FLA* 30.0 LRA*	8.3 Amp. Res. 2.5 FLA* 15.0 LRA*
444 OR 446	550°F	100,000				
448	550°F	100,000				
445	450°F	100,000				
CSA File 12619 or 20339						
TYPE	MAX. TEMP.	CYCLES	120 VAC		240 VAC	
			6,000 100,000	16.7 Amp. Res. 5.0 FLA* 30.0 LRA*	6.9 Amp. Res. - - - - -	- - - - -
444 OR 446 OR 445	550°F					

* FLA: Full load amps. * LRA: Locked rotor amps. Inductive

Spacings on Types 444, 448 and 445 are to ground through air and over surface 1/16", Type 446 has 1/8" through air and 1/4" over surface.

No 277 VAC listing is shown in the rating table as we do not recommend application of the Type 444 construction on this voltage. See Bulletin 476 for 277 VAC

applications.

The Type 445 shown in the rating table is mechanically the same as the Type 444 nonadjustable, but is UL accepted as a limit on baseboard heaters. For portable heater applications a combined control and tip switch is also available, see Bulletin 462.

SAMPLES AND ORDERING INFORMATION

Stemco Controls welcomes the opportunity to work with you to develop thermostatic controls designed specifically for your product. The facilities of our laboratory are available to you for application or checking to U.L. standards, if you will send or bring your appliance to us.

In the initial application work it is frequently more satisfactory to order first a dummy assembly of the type required equipped with a thermocouple attached to the bimetal which can be used to explore the best location for the thermostat and arrive at the operating temperature required as the temperature is varied manually. Specify whether couple should be iron constantan or copper constantan.

A description of the appliance giving (1) load inductive or resistive, (2) operating temperature with maximum tolerance that can be allowed, (3) terminal types and location (4) angular and thermal range (5) adjusting stem height, (6) method of mounting (7) probable volume, (8) any detrimental environmental conditions should accompany requests for samples. Use of our application data sheet makes sure complete information is included.

Drawings and illustrations are for general information only. Part numbers, completely identifying the desired unit will be furnished on request for incorporation into specifications. Before tools or other equipment are ordered, certified and dimensioned prints should be obtained from the factory.

Manufacturer reserves right to alter specifications without notice.

ESSEX GROUP



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