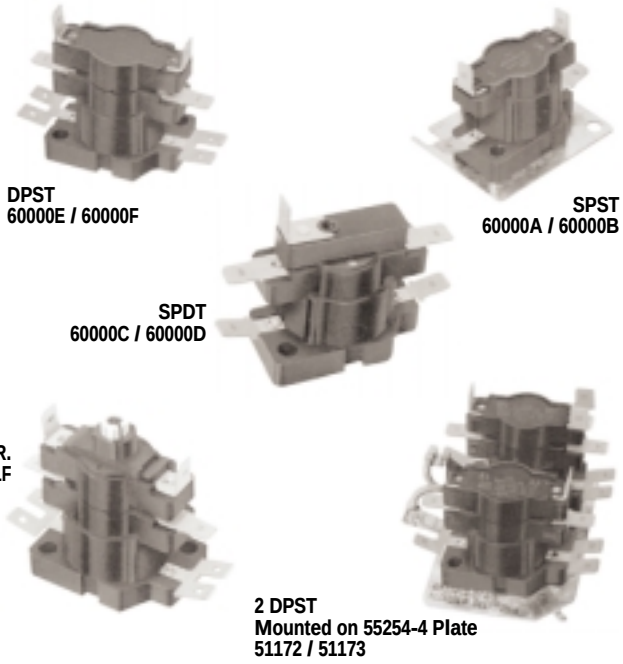
KLIXON

600 SERIES
Snap-Action
Automatic and Manual reset



Key Features

- Silent Operation
- Voltage Compensating
- Snap Action
- Small Size
- Low Cost
- Contact Ratings – to 30 Amps at 240 Volts and 23 at 277 Volts
- Automatic or Manual Reset
- Shock and Vibration Resistant
- Mounts in any Position
- DPST, SPST, or SPDT Switch Action

Description

The Klixon® 600 series thermal time delay is a snap-acting relay that performs in any position without contact chatter or noise. A wide variety of switch configurations are available including SPST, SPDT and DPST automatic reset and SPST manual reset.

The positive temperature coefficient (PTC) heater element provides voltage compensation over a wide voltage range without danger of over-heating at high voltage and assures device actuation under low voltage conditions due to its unique feature of always stabilizing at a specified temperature regardless of ambient temperature or voltage. This will allow the use of a common device over a wide voltage range (example 208V to 277V). Available heater voltages range from 6 volts to 277 volts.

The switch and actuating elements are our 206 series thermostat which incorporates the Klixon® snap-action bimetallic disc. This switch and actuating element has proved to be highly reliable since its introduction in 1960. A variety of terminals and mounting plates are available to meet installation requirements of most applications.

The 600 series is available in a variety of capacity ratings which are identified below: (A.R. = Automatic Reset, M.R. = Manual Reset).

Switch Rating

60000 - High Capacity - A.R.
60002 - Millivolt Capacity - A.R.
*60004 - Extra High Capacity - A.R.
60006 - Pilot Duty Capacity - A.R.
60011 - High Capacity - M.R. Manual Overide
60012 - MIllivolt Capacity - M.R. Manual Overide
60013 - Extra High Capacity - M.R. Trip Free
60015 - High Capacity - M.R. Manual Overide

The switch action is identified by the following letter designations. (N.O. = Normally Open; N.C. = Normally Closed)

Switch Action

A – SPST N.O.
B – SPST N.C.
C – SPDT contacts 1-3 N.O.
D – SPDT contacts 1-3 N.C.
E – DPST N.O.
F – DPST N.C.
J – DPST N.C., M.R.

* U.L. Recognition Pending

Electrical Clearances

The switch circuit of the 600 series is designed to provide electrical clearances of 3/8 inch through air to ground and 1/2 inch over surface to ground except on switch constructions E, F and J where clearances are 1/4 inch through air and 3/8 inch over surface to ground. The electrical clearances of the heater circuit vary depending upon the specific construction required in an application. The clearance to ground of the heater circuit is designed by one of the following numbers.

Designation Number	Through Air	Over Surface
0†	3/8 inch	1/2 inch
1	1/16 inch	1/16 inch
4	1/4 inch	3/8 inch

† Class II (30(volts or less)) heaters

Heater-Switch Connections

The 600 type can be supplied with one heater terminal common to either terminal #1 or #3 of the switch assembly. Standard construction is with separate heater terminals.

Mountings

Standard mounting plates shown below are available to meet most application requirements.

Terminals

Standard terminal types are listed below. Special switch terminals such as double quick connects, female quick connects, and .187" x .032" quick connects may be available for a specific switch terminal. Consult marketing for details.

Switch terminals:

solder type
screw type
.250" x .032" Q.C.

Heater Terminals

solder type
.187" x .020" Q.C.
.250" x .032" Q.C. (available at additional cost)

Use 12 gauge or larger wire for loads greater than 15 amperes.

Timings

The 600 series relay can be supplied in a wide variety of timings to meet specific application requirements. Timings are varied by the selection of the proper operating temperature of the bimetallic disc and the proper heater configuration for the specific application.

Examples of standard timing characterisitcs at 75°F are shown below.*

Voltage	Heat Time*	Cool Time**
24	1-60 sec.	1-45 sec.
	1-30	45-75
	30-75	1-40
	30-110	1-45
120/240	20-70 sec.	20-80 sec.
	30-110	15-65

*Cool time after 6 min. soak time
**Optional timings available at extra cost – please consult marketing

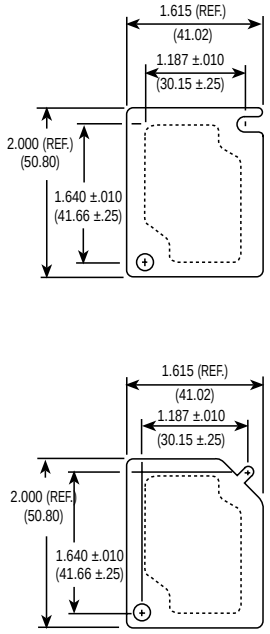
Ambient Rating

Ambient Exposure Range:
–40°F to 250°F

Ambient Operating Range:
–40°F to 152°F
(200°F Rating Available)

Mounting Plates

(*Metric Dimensions in parenthesis)



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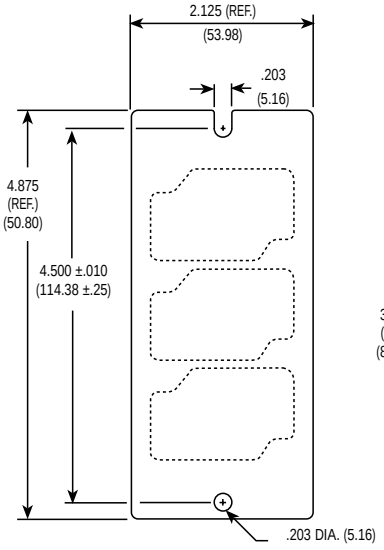

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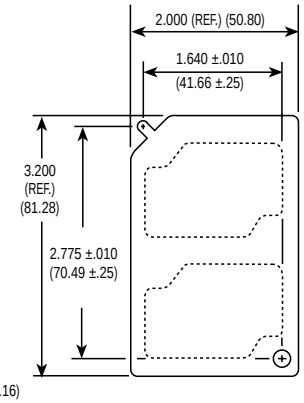

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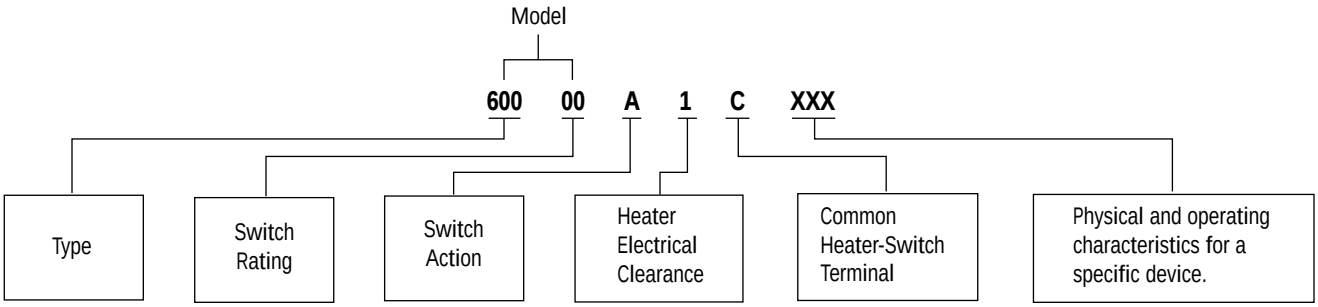
Part Number System



U.L. Electrical Ratings**

U.L. File E9977 CSA File 21794

U.L. Guide XAPX2 CSA Guide 400-E-O; CSA Class 4813, 4823

Device			120 V				240 V				277 V				480 V				
Model	Switch Action	Contacts	Res	FLA	LRA	Pilot Duty VA	Res	FLA	LRA	Pilot Duty VA	Res	FLA	LRA	Pilot Duty VA	Res	FLA	LRA	Pilot Duty VA	Milli-Volt DC
*60000	A,B,C,D,	1-3	30	23	88	480	30	23	88	480	23	23	88	1630	12.5	5	10	400	
	C,D	1-2	10	5.8	34.8	125	5	4.2	17.4	270	5	–	–	125	3	3	5	125	
	E,F	1-3	30	23	88	480	30	23	88	480	23	23	88	1630	12.5	–	–	–	
	E,F	4-5	30	23	88	480	30	23	88	480	23	23	88	163	12.5	5	10	400	
	J	1-3 / 4-5	30	23	88	480	30	23	88	480									
60002	A,B	1-3				125													
60006	A,B,C,D	1-3				125													
	C,D	1-2				125													
60011	B	1-3	30	10	60	480	30	7	42	480				690	48			690	
60012	B	1-3																	800
60013	B	1-3	48	16	96	480	48	8	48	690	48								
60015	B	1-3	30	10	60	480	30	7	42	480	25			690					
60016	B	1-3				125													

*In addition to the ratings in the table, the 60000 A, B, E and F are U.L. rated for a combination load of 23 amps resistive at 240 VAC in series with a blower motor load up to 7 FLA / 42 LRA at 240 VAC. Consult marketing for additional ratings. The 60000 A, B, E, F are also U.L. rated for a combination load of 13 amps resistive and 5 amps inductive / 30 LRA at 480 VAC.

**Use 12 gauge or larger wire size for loads greater than 15 amperes.

How to Order Samples

When ordering samples, faster service can be rendered if the application is described in detail. Please specify the following:

1. Type relay _____
2. No. fo samples _____
3. Heat time: ___ sec. to ___ sec.
   @ _____ volts@_____ °F
4. Cool time:
   ___ sec. to ___ sec. after
   min. soak time @ °F
5. Heater voltage:
   - ☐ 12
   - ☐ 208/240
   - ☐ 24
   - ☐ 277
   - ☐ 120

6. Ambient:
   Operating:
   Min. _____ °F Max. _____ °F
   Exposure:
   Min. _____ °F Max. _____ °F
7. Switch Action:
   - ☐ A - SPST N.O.
   - ☐ B - SPST N.C.
   - ☐ C - SPDT contacts 1-3 N.O.
   - ☐ D - SPDT contacts 1-3 N.C.
   - ☐ E - DPST N.O.
   - ☐ F - DPST N.C.
   - ☐ J - DPST N.C-M.R.
8. Heater Construction:
   - ☐ Separate terminals

   Heater common to:
   - ☐ #1 or ☐ #3

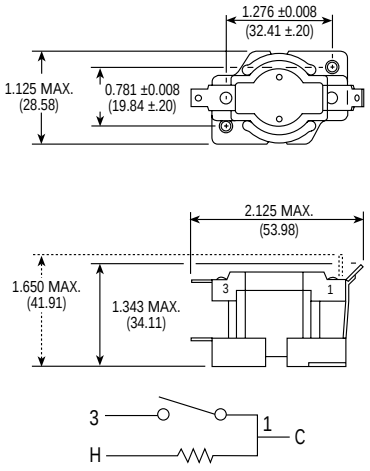
9. Heater terminals:
   - ☐ Solder
   - ☐ .187 x .020 Q.C.
   - ☐ .250 x .032 Q.C.
10. Switch Terminal:

#1	type	Angle
#2	type	Angle
#3	type	Angle
#4	type	Angle

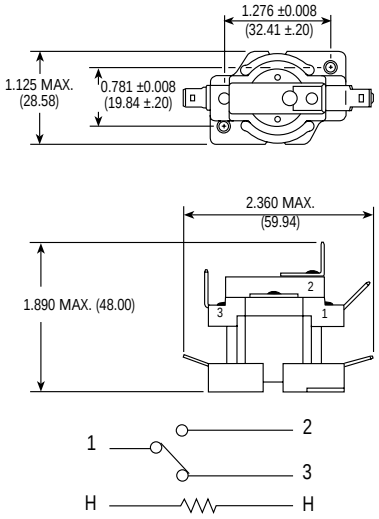
11. Mounting Plate _____
12. Circuit Diagram
13. Electrical load:
14. Equipment used on:
15. Function of relay
16. Annual volume _____

Metric dimensions in parenthesis

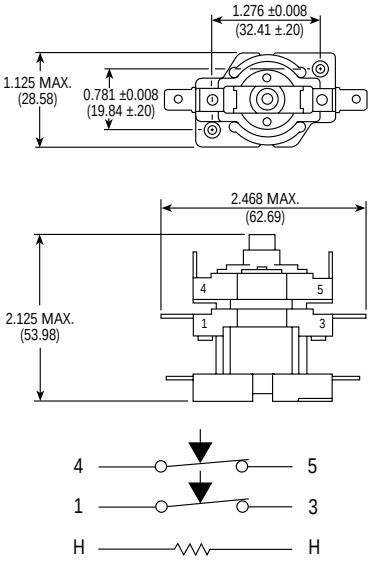
Single Pole Single Throw



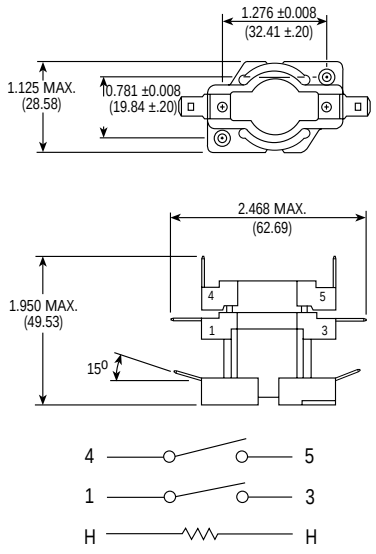
Single Pole Double Throw



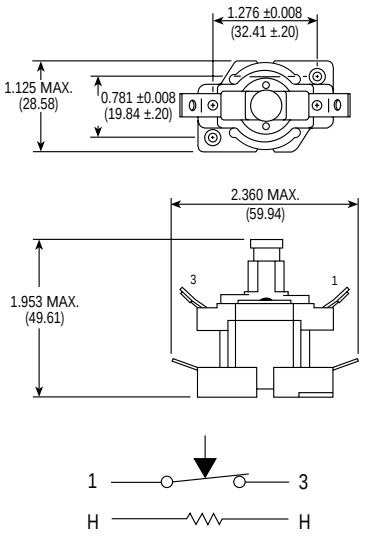
Double Pole Single Throw
Manual reset – Manual Overide



Double Pole Single Throw



Single Pole Single Throw
Manual Reset – Trip free



Applications

Sequencing of heater banks in:

- Electric furnaces
- Baseboard heaters
- Duct heaters
- Suspension heaters
- Recreational vehicle blower and element control.
- Heat pump blower and heating element control.
- Motor speed switching in air conditioning (high speed)/ heating systems (low speed) where a single set of contacts handle combination motor and heater element loading in the heating function.
- Control circuits requiring definite sequence of operation on both start up and shut down.

Texas Instruments provides customer assistance in varied technical areas. However, TI does not possess full access to customer's application data and designs, and therefore, cannot assume responsibility for applying TI devices to any other product.

Although manufacturers and other industrial customers have exclusive control over the manner in which time delay relays are used in applications, TI recommends the following:

A. Incorporate appropriate safety devices in furnaces in compliance with electrical codes and industry standards to protect against the time when operational sequencers reach their stated end-of-life.

B. Follow the furnace manufacturer's instructions and diagrams when replacing the worn sequencers.

C. Provide trouble-shooting instructions so that operational components are replaced by qualified service companies, after reaching their stated end-of-life.

D. Do not install time delay relays in non-certified enclosures or control panels and do include specific instructions that only licensed electricians are allowed to service the equipment.

For further information write or call:

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