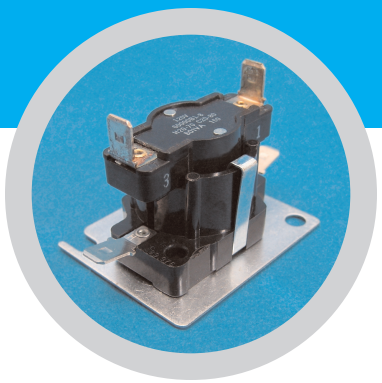
Sensata Technologies



# KLIXON® | TIME DELAY RELAYS

## 600 Series, Snap-Action Automatic or Manual Reset

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 switch and actuating elements incorporate the proven Klixon® snap-action bimetallic disc.

Sensata Technologies has been a leading global supplier of sensors & switches for over 50 years.

### Key Features

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

### Description

The positive temperature coefficient (PTC) heater element provides voltage compensation over a wide range without the danger of over-heating at high voltage. This 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.

This switch and actuating element has proven to be highly reliable since its introduction in 1960. A variety of terminals and mounting plates are available to meet the 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

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## *600 Series, Snap-Action Automatic or Manual Reset*

### 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

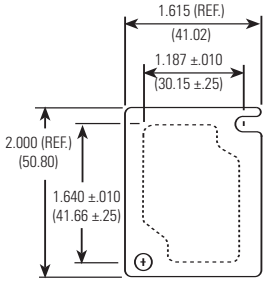
### Ambient Rating

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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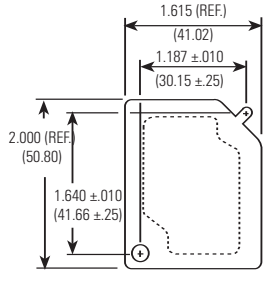


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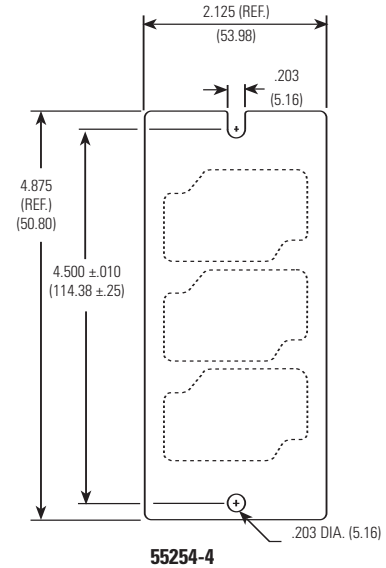


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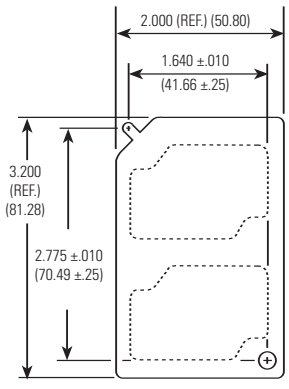


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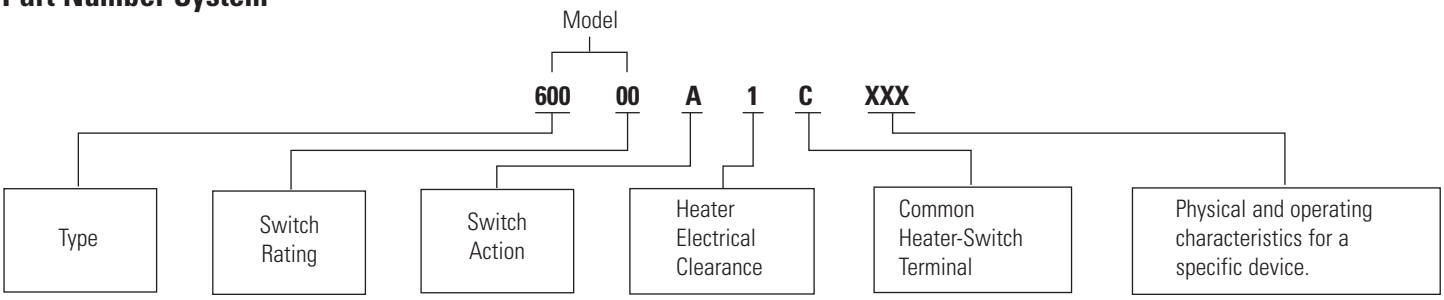
# KLIXON® | TIME DELAY RELAYS

## *600 Series, Snap-Action Automatic or Manual Reset*

### 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 | Millivolt 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. of samples _____
3. Heat time: _____ sec. to _____ sec. @ _____ volts @ _____ °F
4. Cool time: _____ sec. to _____ sec. after min. soak time @ _____ °F
5. Heater voltage:
   - ☐ 12
   - ☐ 24
   - ☐ 120
   - ☐ 208/240
   - ☐ 277
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 |

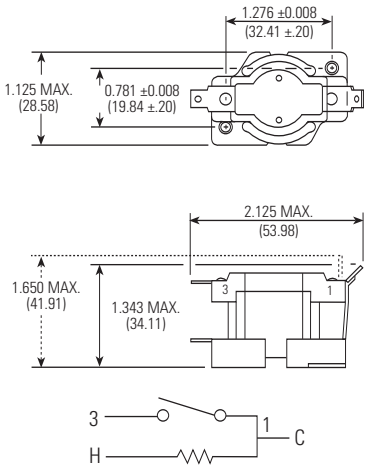
11. Mounting Plate _____
12. Circuit Diagram
13. Electrical load:
14. Equipment used on:
15. Function of relay
16. Annual volume _____

# KLIXON® | TIME DELAY RELAYS

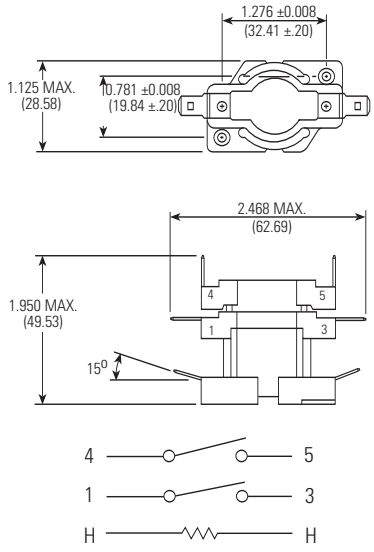
## *600 Series, Snap-Action Automatic or Manual Reset*

Metric dimensions in parenthesis

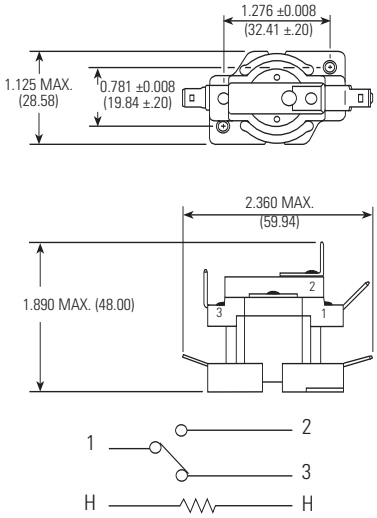
**Single Pole Single Throw**



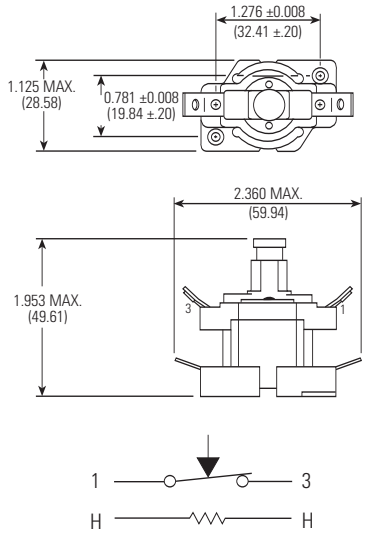

**Double Pole Single Throw**



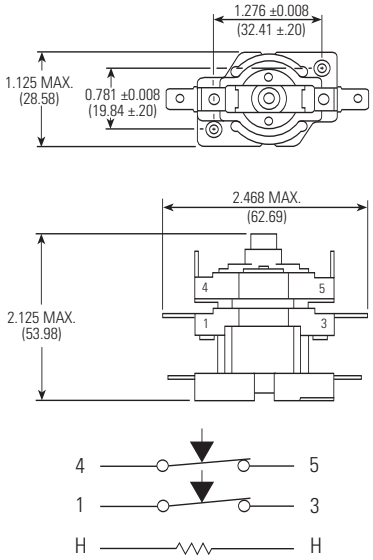

**Single Pole Double Throw**




**Single Pole Single Throw**
**Manual Reset – Trip free**




**Double Pole Single Throw**
**Manual reset – Manual Overide**




## 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 heater function.
- Control circuits requiring definite sequence of operation on both start up and shut down.


Sensata Technologies

The World Depends on Sensors and Controls

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