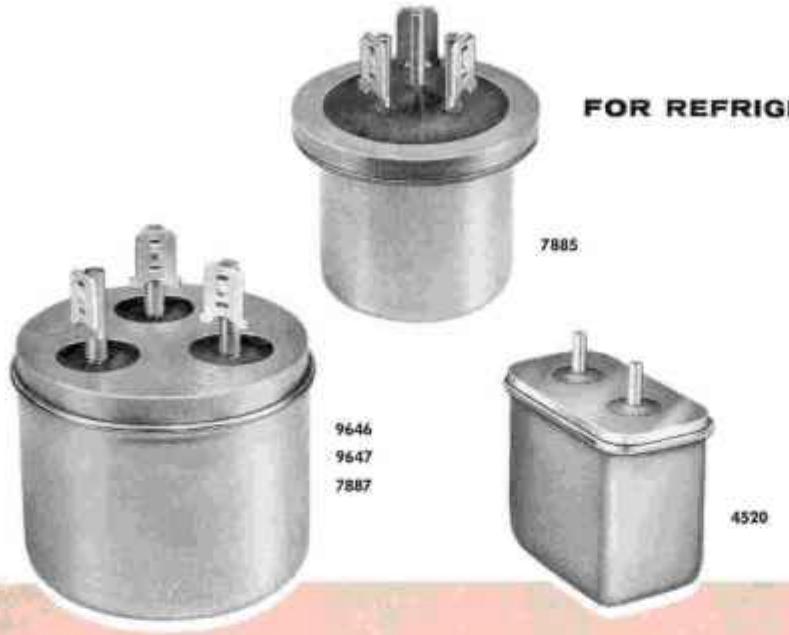
# HERMETIC PROTECTORS
# FOR REFRIGERATION COMPRESSORS






- **Hermetic seal prevents arcing in freon atmosphere**
- **Internal mounting for improved temperature sensing, better motor protection.**
- **Snap-acting disc is sensitive to both current and temperature.**
- **Maximum safe output—shuts off motor only when temperature exceeds maximum safe level. No nuisance tripouts.**
- **Precision calibration—temperature calibrated and inspected in controlled atmosphere for dependable consistent performance.**

KLIXON® hermetic motor protectors are designed to provide superior overload protection for hermetically sealed refrigeration compressor motors. Located inside the shell close to the compressor windings, KLIXON hermetic motor protectors incorporate the best features of both external and internal sensing devices in a single compact unit. This tamper proof location assures the compressor manufacturer that his unit will remain protected to the high level he desires.

The snap-acting thermally operated element, the well-known KLIXON disc, is mounted on a rugged, inorganic glass-mica or ceramic base. Fine silver, or silver alloy contacts insure trouble-free performance. Terminations are provided by passing specially formed conductors through compression type glass-to-metal seals.

Since KLIXON hermetic protectors are refrigerant-proof and airtight, there can be no chemical changes in the refrigeration gas, or oil contamination from contact arcing.

## DEVELOPMENT OF HERMETIC PROTECTION

In some compressor applications open-type, dome-mounted protectors could not give adequate protection because of the variations of temperature difference between the motor windings and the outer dome.

There is an even greater variation with internally sprung motors as they have no direct all-metal path to the protector location as do conventional compressors. The advent of heat pumps with reverse gas flow has further complicated the protection of compressor motors. In such compressors, a higher level of over-heat protection can be attained by using a hermetic protector.

## CALIBRATION AND INSPECTION

KLIXON hermetic protectors are extensively tested and inspected. Every piece is given a high potential test to check for insulation breakdown, a mass spectrometer test for leakage, and a temperature setting and short-time trip check. All parts are baked in a vacuum oven to remove moisture and impurities. They do not leave a controlled atmosphere in dry box units until after the cans are welded to the headers. With these and other closely inspected procedures, hermetic protectors offer long life and dependable performance to the high level which the customer desires.

## TEST SAMPLES

For application test samples contact either your local Texas Instruments field engineer or the factory in Attleboro.

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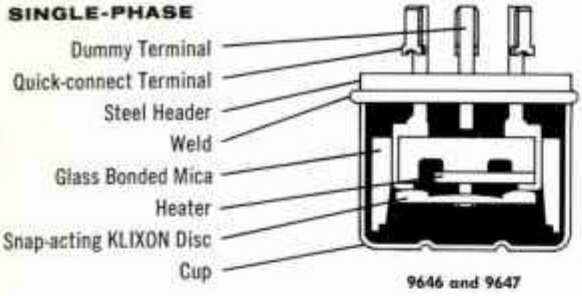
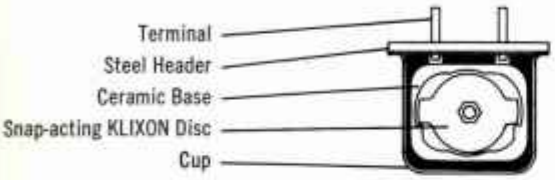
ATTLEBORO, MASSACHUSETTS, U. S. A.

**SINGLE-PHASE**

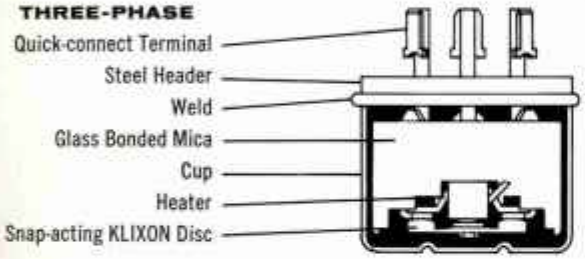



9646 and 9647

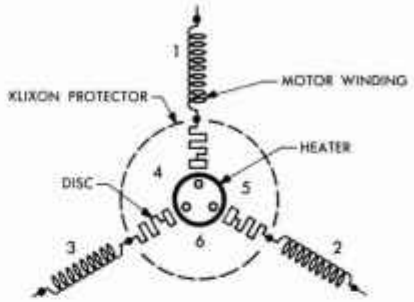



4520

**THREE-PHASE**



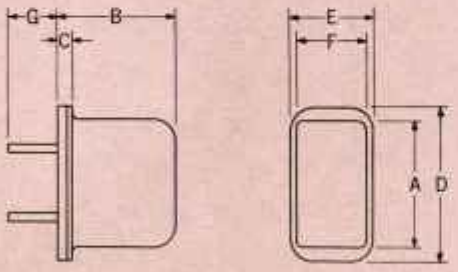

7885 and 7887



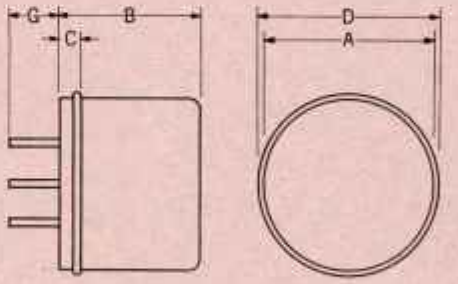

**SCHEMATIC FOR THREE-PHASE WIRING CONNECTION (HIGH VOLTAGE)**

**DESIGN SPECIFICATION**
**Single-phase and Three-phase**

| | |
|---|---|
| Dielectric Tests | 1 Phase: 300V rating — 2200 V-ac<br>3 Phase: 300V rating — 2200 V-ac<br>600V rating — 2700 V-ac |
| Leakage Rate | Not greater than 1 x $10^{-9}$ std cc air per second at 1 atmosphere differential |
| Maximum Operating Pressure | 500 psi |
| Terminals | Wire leads or quick-connects |




TYPE 4520




TYPES 4946/9647/7885/7887

**DIMENSION IN INCHES**

**SINGLE-PHASE**

| TYPE | SIZE | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|---|
| **4520** | ¾" | 1.125 Max | 1.125 Max | 1/16 ± 1/32 | 1.344 Max | .784 Max | .585 Max | .520 Max |
| **9646** | 1¼" | 1 49/64 ± 1/32 | 1 15/32 ± 1/32 | 3/16 ± 1/32 | 1 7/8 ± 1/32 | | | .554 Max |
| **9647** | 1½" | 2 1/8 ± 1/32 | 1.477 ± .020 | 3/16 ± 1/32 | 2 1/4 ± 1/32 | | | .554 Max |
| **THREE-PHASE** | | | | | | | | |
| **7885** | ¾" | 1 5/32 ± 1/32 | 1 13/64 ± 1/32 | 1/16 ± 1/32 | 1 15/32 ± 1/32 | | | .490 Max. |
| **7887** | 1¼" | 1 49/64 ± 1/32 | 1 15/32 ± 1/32 | 3/16 ± 1/32 | 1 7/8 ± 1/32 | | | .554 Max |

**RATINGS**

| APPROXIMATE H.P. RATING | MAXIMUM CURRENT RATINGS | |
|---|---|---|
| 1/12—1 | 115V/ 50 amps* | 230V/ 37 amps* |
| 1—3 | 115V —— | 230V/100 amps* |
| 1—5 | 115V —— | 230V/135 amps* |
| 1/3—2 | 220V/ 43 amps* | 440V/ 28 amps* |
| 2—7½ | 220V/125 amps* | 440V/ 95 amps* |

*tentative values

QUALITY *ELECTRO* / *THERMAL* CONTROLS

Printed in U.S.A. 3-62 MOPR-168

# M2 PRECISION THERMOSTAT
## NARROW DIFFERENTIAL
## WELDED SEAMS



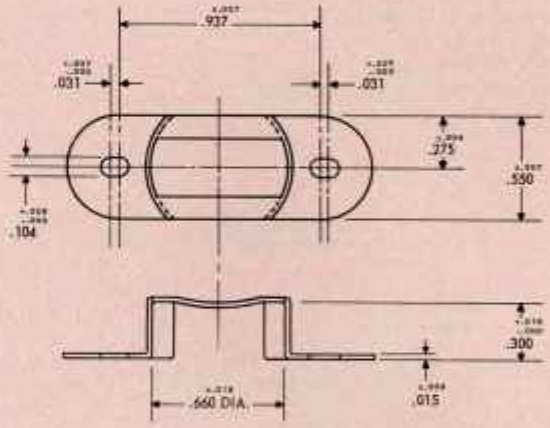
Actual Size

- **Narrow differential — provides close temperature control**
- **High reliability**
- **Welded seams assure better hermetic seal — eliminate corrosive solder fluxes**
- **Designed to easily fit small, narrow spaces**
- **Can be supplied to open or close on temperature rise**
- **Pre-set temperature settings — tamperproof**

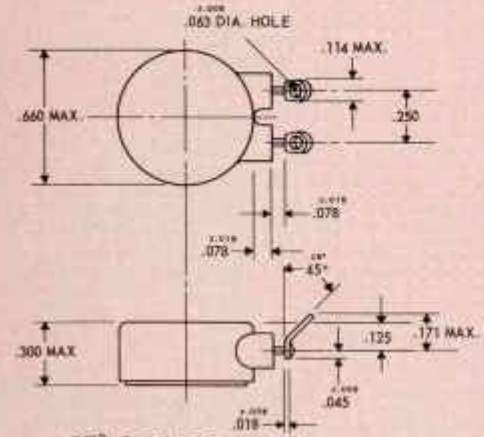
The KLIXON® M2 thermostat is a simple, snap-acting mechanism designed to provide precise temperature control within exceptionally narrow limits. The thermal control element consists of a basic snap-acting, KLIXON disc and fine silver contacts – mounted in a silicone-ceramic base. This assembly is hermetically welded in a flat, nickel plated steel shell. The terminals pass through glass-to-metal seals.

The exclusive all-welded construction – a process perfected through years of KLIXON thermostat production – eliminates the use of organic substances commonly found in units having a soldered seal (solder fluxes often leave deposits of contaminants inside the device which tend to corrode and shorten the expected service life of the thermostat).

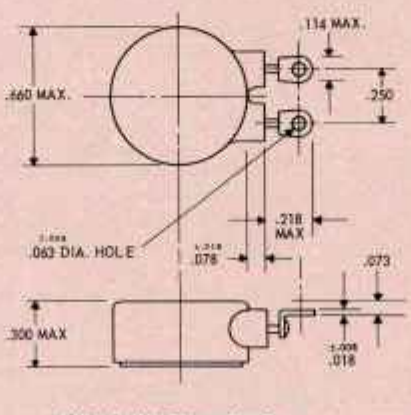
M2 thermostats are recommended for use as controls and warning devices in guided missiles, aircraft controls, heating blankets, electronic circuit components, servo mechanisms, gyroscopes, aerial cameras, crystal ovens, surface heaters, computers, and similar electronic devices where reliable performance is vital.



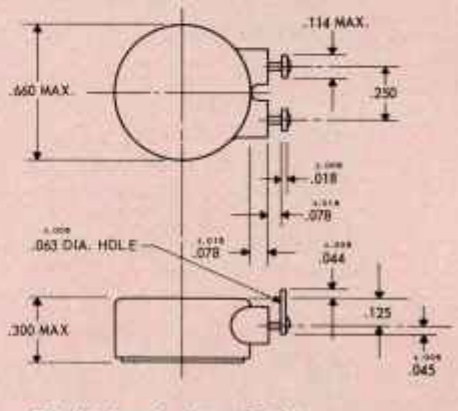

**Loose Mounting Bracket**




**45° Angle Terminals**




**Straight Terminals**




**Right Angle Terminals**

Tolerances ±.010 unless otherwise specified. Dimensions shown in inches and are subject to change without notice. Send for up-to-date drawings.

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## PERFORMANCE CHARACTERISTICS

| | |
|---|---|
| Electrical rating | 2 amps 30 v-dc/120 v-ac 250,000 cycles<br>3 amps 30 v-dc 50,000 cycles |
| Dielectric strength | 1250 VRMS, 60 cycles for 30 sec |
| Switch action | SPST, closes on temperature rise or temperature drop |
| Contact resistance | .015 ohms per MIL-STD-202B, Method 307 |
| Calibration | See table |
| Differential | See table |
| Temperature exposure | −65°F to 450°F (depending on calibrated temperatures) |
| Temperature settings | See table |
| Vibration resistance (operating) | 5-2000 cps at 10 G or 5-500 cps at 15 G |
| Shock resistance (Non-operating) | 60 G, 11 millisecond duration<br>100 G, 6 millisecond duration |
| Acceleration | 100 G |
| Leakage | Surpasses immersion test MIL-E-5272C |
| Weight | 5.4 Grams (average) |

## CALIBRATION

| Temperature Setting Range | Differentials Available | Closing Temperature Tolerance* | |
|---|---|---|---|
| | | Standard | Special |
| 0° to 250°F | 2° — 5°F | ±4°F | ±3°F |
| 251° to 350°F | 3° — 7°F | ±5°F | ±4°F |

*These tolerances are based on precision factory calibration and test equipment. Customers checking tolerances should allow for differences in test equipment. A "funnel" of ±1° F is recommended.

## SPECIAL CONTACTS

Gold plated contacts can be furnished for the following electrical loads to insure reliable circuit continuity under low wattage conditions.

| | |
|---|---|
| 30 v-ac/v-dc | 500 milliamps & below |
| 115 v-ac | 200 milliamps & below |
| 230 v-ac | 100 milliamps & below |

**Gold Plated Contacts are not suitable for heavier loads.**

## MOUNTING AND TERMINALS

The M2 is available with a variety of terminals and can be mounted in any position: through openings in metal closures, in casting wells and in space for control of air temperature. A surface mounting bracket can be provided at slight extra cost.

## TEST SAMPLES

### Operating Samples

Operating samples generally can be supplied for your application tests. To order your test sample, please fill out the application data sheets at the end of your thermostat catalog (or attached herewith). Send one copy to us and retain the other for your files. Complete information is needed to produce an operating sample for testing on your actual application.

### Thermocouple Samples

Frequently in checking an application, non-operating thermocouple-equipped samples may prove more valuable than a number of operating samples. Thermocouple samples can be shipped usually within a few days of receipt of request. Be sure to specify either iron-constantan or copper-constantan thermocouples.

## ORDER BY CODED PART NUMBER

To facilitate the ordering of M2 thermostats to your specifications use the part number code below. The code permits you to call out a complete production part number at the time of component selection.

M2 1 1 L 163 03 05 1 1

**TYPE**

Basic Number

**BRACKET**

1 = No Bracket
2 = Loose Bracket

**TERMINALS**

1 = Straight
2 = 45 Degree
3 = Right Angle

**OPERATION**

L = Open on Temp. Rise + °F
F = Close on Temp. Rise + °F
B = Open on Temp. Rise — °F
M = Close on Temp. Rise — °F

**TEMPERATURE**

Closing Temperature °F

**TOLERANCE**

Closing Temperature Tolerance (± °F)

**DIFFERENTIAL**

05 = 2° — 5° Diff.
07 = 3° — 7° Diff.

**PLATING**

0 = None
1 = Cadmium
2 = Copper — Nickel
3 = Black Chromate
4 = Tin Plate
5 = Chromate Dip

**CONTACTS**

1 = Silver Contacts
2 = Gold Plated Contacts
(based on electrical load)

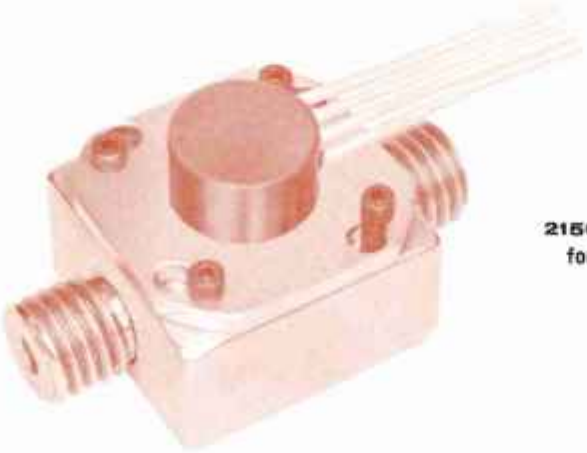
**21504** Immersion probe for high-low temperature limiting of hydraulic, cooling and other liquid systems.

**21532** Air sensing temperature control for duct or stand-off mounting.

**TYPICAL KLIXON M2 PRECISION THERMOSTAT PACKAGES**

To save vital engineering and procurement time, send us your specifications and special application requirements. Our custom packaging team will quickly design and produce a control package to meet your special needs.

**21563** Temperature control or indication for bearings, tube chimneys and pipe lines.



**21564** Two stage heater control for hydraulic or cooling systems.



Printed in U.S.A. 5M 3-64 PRET-9B

KLIXON®

THPR-11

# PRECISION THERMAL PROTECTORS FOR THREE-PHASE ELECTRIC MOTORS

5JE open type

MJE open type

9644 hermetically sealed

## FEATURES

- **Maximum Motor Output Consistent with System Requirements** — motor shuts down only when maximum allowable temperature is reached.
- **Complete Overtemperature Protection** — against such causes as:
  - Prolonged overloads
  - Stalling
  - Lack of ventilation
  - Failure to start
  - Excessive ambient temperature
  - Unbalanced voltage
- **Shock and Vibration Resistant** — high contact pressure continuously maintained by Spencer snap-acting disc.
- **Long Contact Life** — fine silver-clad contacts, terminals, and special components assure long life.
- **Fungus Resistant** — mycalex, silicone or phenolic housings, depending upon temperature requirements.
- **Dependable Operation** — single construction — only one moving part — insures reliability.

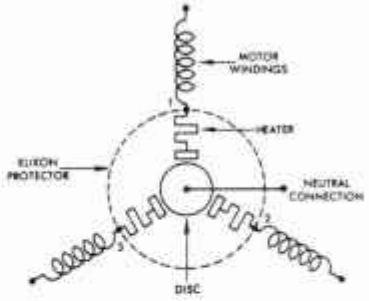
## GENERAL

High performance electric motors require overtemperature protection designed to match their special operating requirements. KLIXON Precision Inherent Overtemperature Protectors are designed to meet these requirements without limiting useful motor output. Motors equipped with KLIXON inherent protection develop maximum operating capacity under **all** overload conditions while eliminating danger of motor burnout. Present usage ranges from miniature camera motors to fuel pump motors and large actuator and blower motors.

## DESCRIPTION

The KLIXON Inherent Overheat Protector is a small, light weight, temperature and current sensitive device that is built into an electric motor to turn off the power when the windings get too hot. Mounted *inside* the motor, the protector is aware of motor temperature at all times.

The single operating element of the KLIXON Protector is the famous Spencer snap-acting disc. Fine silver clad contacts are mounted directly on the disc. Terminals are also silver clad. Solder connections are standard, but screw-type connections are available. Fungus resistant mycalex, silicone or phenolic housings are supplied, depending on temperature requirements.




To meet the requirements of a three-phase motor operating on one, two or three phases, KLIXON Three-Phase Protectors have a heater connected in each motor phase. The disc serves to close the neutral point of the motor and also carries phase current. Thus, the one protector performs the function of three separate devices but with the advantage of less weight, smaller size and greater reliability.

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## OPEN TYPES

### ESTIMATED CAPACITY

| PROTECTOR | | APPROXIMATE HORSEPOWER Continuous Duty | MAXIMUM RUPTURE CAPACITY (200 V., 400 cycles) |
|---|---|---|---|
| TYPE | SIZE | | |
| SJ | ½" | to 1½ | 30 amperes |
| MJ | ¾" | ¼ to 3 | 60 amperes |
| BJ | 1¼" | 2 to 10 | 120 amperes |

## HERMETICALLY SEALED TYPE

Originally designed for overtemperature protection of three-phase, four-wire aircraft fuel pump motors, the 9644 type is equally suitable for use in other explosive atmospheres. The basic protector is the well-proven KLIXON SJE Type, operating either as an automatic or non-reset device. Special mounting flanges can be made to meet customer requirements.

## OPERATING CHARACTERISTICS

KLIXON Inherent Overtemperature Protectors operate due to the combined effect of current and protector ambient temperatures. The graph below depicts the characteristics of several KLIXON SJE Type, 200° Protectors.

## CALIBRATION AND INSPECTION

Each protector is temperature calibrated and inspected in controlled ambients. A 100 per cent inspection for operation is performed, utilizing constant current held to ± 0.5%. Individual tests are applied to each phase of the protector.

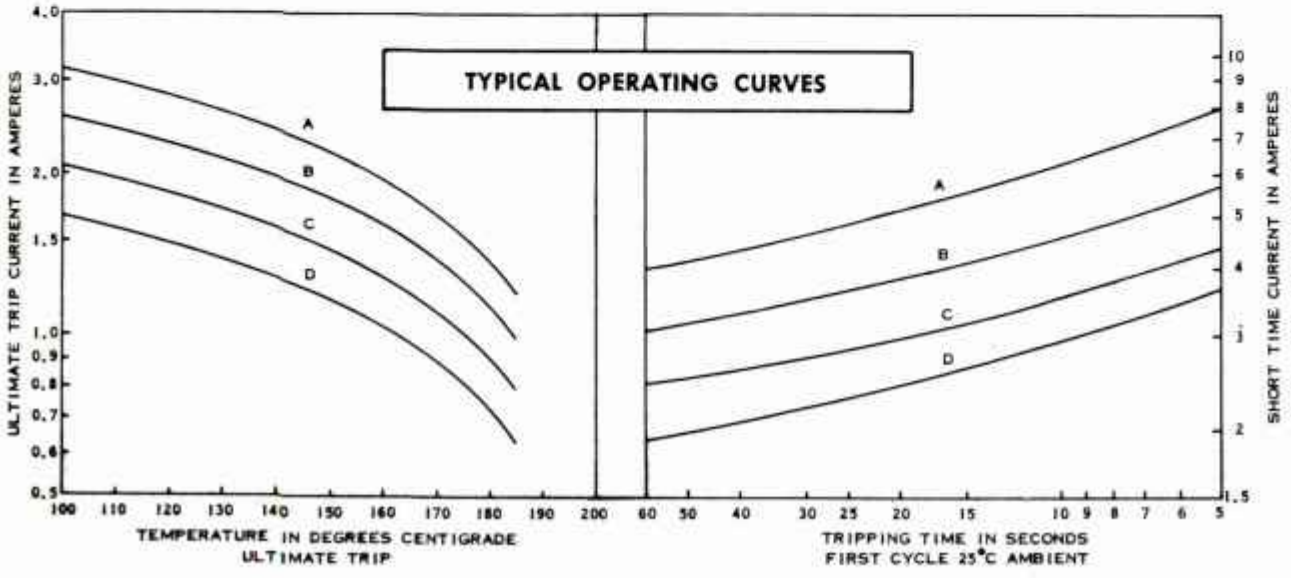
## OPERATION

Reliable overtemperature control requires that the sensing element function as though it were located at the limiting hot spot and affected by the same factors that cause motor overheating. The KLIXON Inherent Overheat Protector accomplishes this by combining the best features of the temperature sensitive thermostat and the current sensitive circuit breaker. Because the protector reacts to both temperature and current, the protector can be matched to the thermal and electrical characteristics of the motor.

The protector is mounted *inside the motor* where it can sense motor temperature and ventilation directly. In addition the phase currents flow thru separate heaters and the disc, producing a temperature in the thermal element closely corresponding to the winding temperature. When properly applied the protector will reach its operating temperature at the same time the winding reaches its maximum allowable temperature. This holds true for one, two and three phase motor operation. Nuisance tripouts are avoided and consistent temperature limitation is achieved.

When the motor is stalled, the higher current causes the protector to trip very rapidly. Ater a few cycles of operation the heat generated in the motor reaches the protector and again the device functions due to the combined effect of motor heat and motor current.

The *positive snap action* of the Spencer disc makes the protector highly resistant to vibration. This feature makes it especially suited to application where severe vibration is a factor.



## RATINGS

Standard ratings are available in approximately 5% current steps at ultimate trip for motors with maximum allowable temperatures of 150°, 175° and 200°C. Special operating temperatures or ratings can be produced as required. The stalled rotor first cycle trip time can be varied at each ultimate trip point to match this motor characteristic.

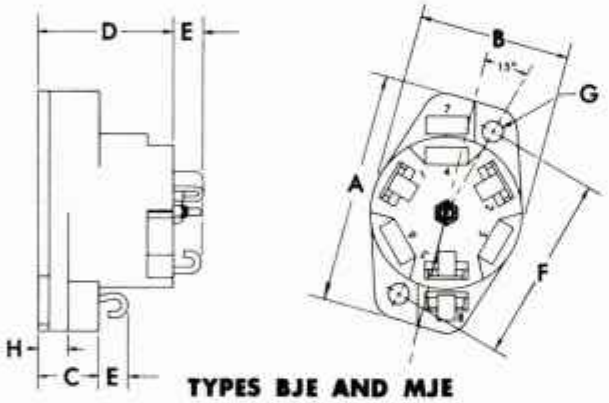
Physical size of the protector is determined by the stalled rotor current that must be ruptured. For capacity of each size, see the table of estimated capacity on the opposite page. Maximum current based on 200 volts, 400 cycles is 400 amperes.

## MOUNTING

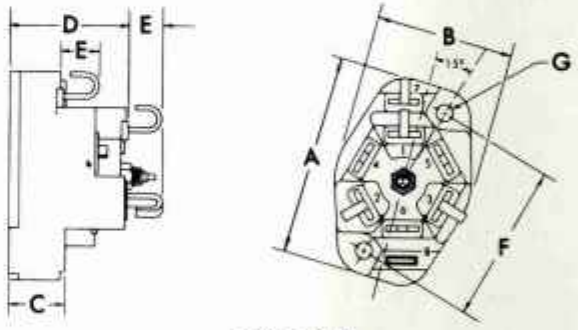
The protector should be located in the motor so that it will receive the maximum amount of heating from the windings, not only for running but also for stalled rotor conditions. The degree of protection obtained depends to a large extent upon the protector location and its manner of mounting. The best location depends upon the construction of the motor; but, in general, may be the air-shield, end-bell or possibly the stator iron and preferably in the discharge air.

## OPEN TYPES

## DIMENSIONS IN INCHES




TYPES BJE AND MJE




TYPE SJE

| PROTECTOR | | DIMENSIONS (in inches) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Type | Approx. Weight (Ounces) | A MAX. | B | C | D | E | F | G Diameter | H |
| SJE | ¾ | 1.072 | .718±.005 | .298±.015 | .630±.010 | .156 MAX. | .812±.002 | .090±.003 | —— |
| MJE | ⅞ | 1.635 | .970±.005 | .390±.010 | .863±.010 | .188 MAX. | 1.312±.006 | .152±.005 | .250±.010 |
| BJE | 2 ¾ | 2.457 | 1.562 +.000 −.015 | .609±.005 | 1.344±.010 | .312 MAX. | 1.937±.010 | .218 +.005 −.000 | .250±.010 |

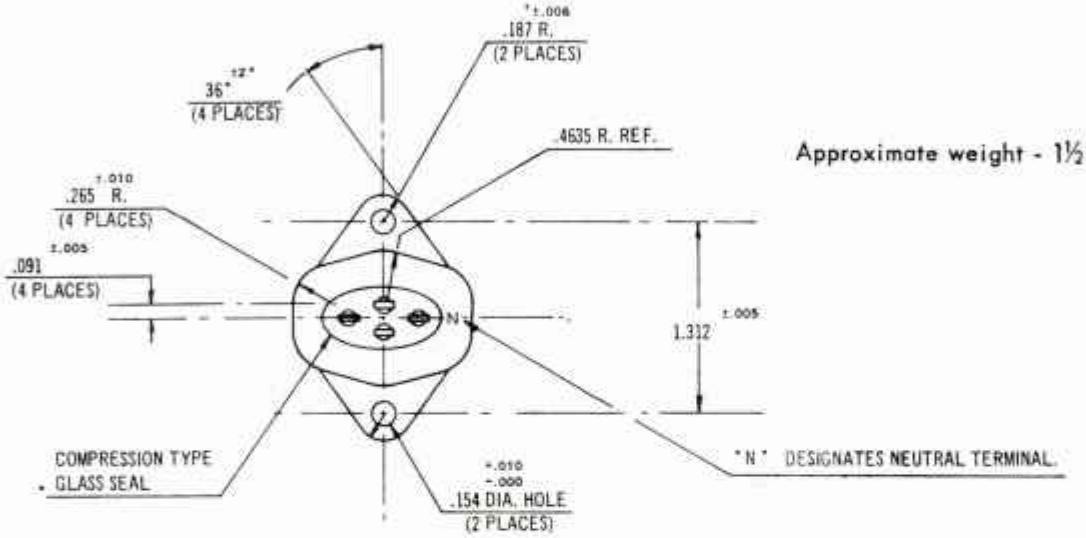
## APPLICATION DETAILS

For specific information concerning the selection of protector ratings, contact Spencer products group, Attleboro, Mass. or our local field engineer.

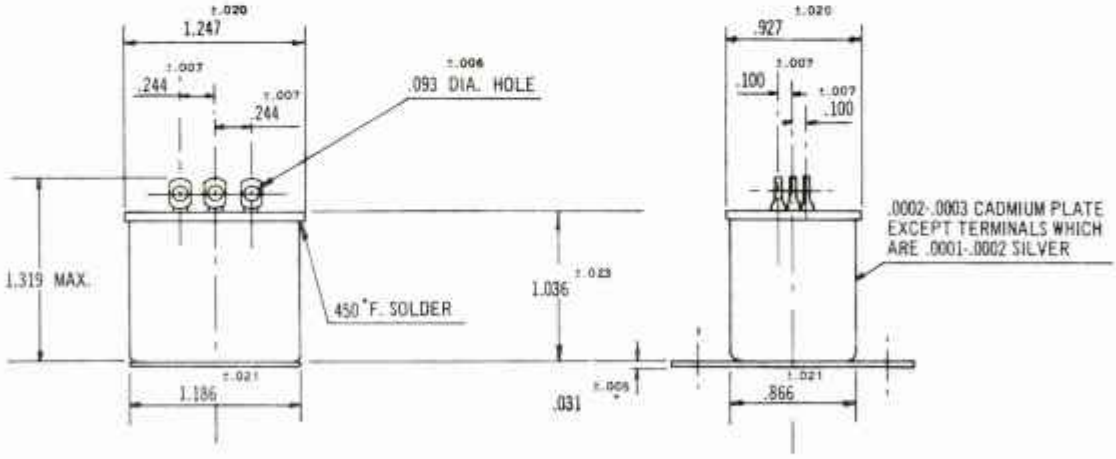
Suggested motor test procedure and forms for recording data are available upon request. These forms are identified as follows:

Suggested Test Procedure ..... IN-MOPR-11
Application Data Form ..... AD-MOPR-11
Verification Test Data ..... V-MOPR-11

## HERMETICALLY SEALED TYPE




Approximate weight - 1½ ozs.




9644

PRECISION CONTROLS

# C4344 THERMOSTATS
# WELDED HERMETIC SEAL

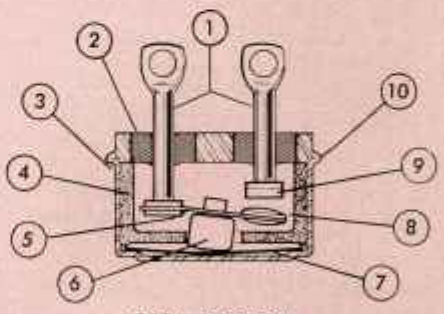
PRET-2A

## TYPICAL C4344 APPLICATIONS

- GROUND SUPPORT EQUIPMENT
- ELECTRONIC AND RADAR EQUIPMENT
- FUEL PUMP MOTORS • GYROS
- CABIN AIR CONDITIONING SYSTEMS • ACCELEROMETERS
- AERIAL CAMERAS • MISSILE HEATING BLANKETS
- POWER TUBES
- BEARINGS SUBJECT TO OVERHEAT CONDITIONS



- **Snap-action switching**
- **Welded hermetic seal eliminates corrosive solder flux**
- **Exceptional resistance to shock and vibration**
- **Available to open or close on temperature rise**
- **Tamperproof, pre-set temperature calibration**




OPEN POSITION
**CROSS SECTION OF BASIC UNIT**

The KLIXON® C4344 series thermostat is a hermetically-sealed, SPST device designed to provide temperature control, warning, or protection in applications that require reliable thermal switching under hostile environmental conditions.

The C4344 will maintain its exacting performance characteristics even under the most severe test conditions as detailed in MIL-STD-202 and MIL-E-5272.

### CONSTRUCTION

The KLIXON snap-acting disc, which actuates the C4344 thermostat, is located at the base of a drawn steel cup for rapid thermal response. The disc produces a crisp, positive switch action characteristic of KLIXON thermostats. It is coupled with a carefully engineered spring contact arm to provide exceptional resistance to shock and vibration through the entire operating temperature range of the thermostat.

In addition, heliarc welded construction and compression glass-to-metal terminal insulators combine for a consistently reliable hermetic seal. This avoids all contact contamination by entrapped solder flux which is common in soldered construction.

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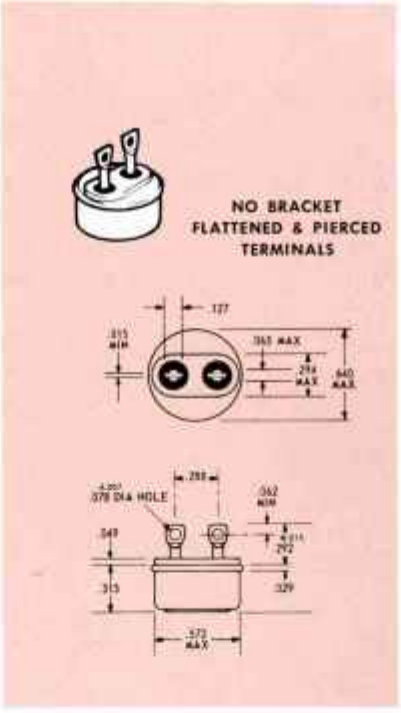
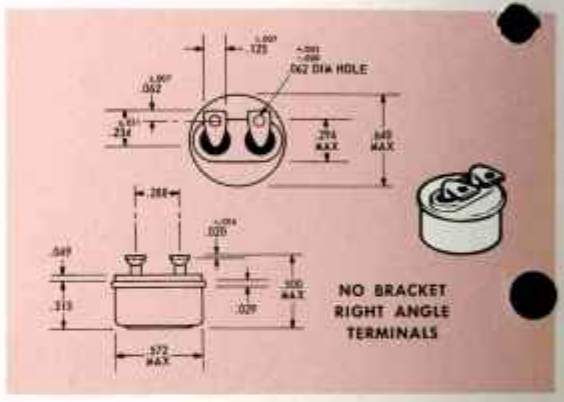
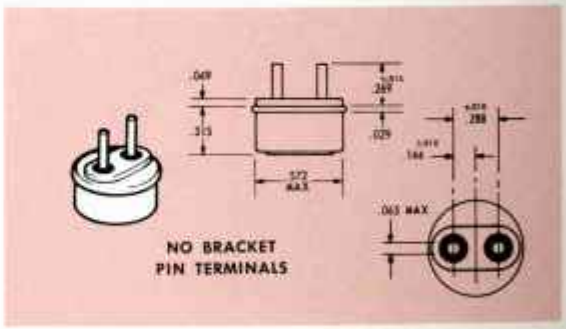



## PERFORMANCE CHARACTERISTICS

| | |
|---|---|
| Dielectric strength (without breakdown or current leakage in excess of one milliampere) | 1250 v-ac, rms, 60 cycles for 1 min, terminal to case; 1000 V-ac, rms, 60 cycles for 1 min, terminal to terminal with contacts open; Per MIL-STD-202B, Method 301 |
| Calibration | See temperature settings table |
| Differential | See temperature settings table |
| Switch action | SPST, (snap-action) |
| Ambient temperature range | —80°F to +500°F continuous (non-overmolded units available for exposure to —320°F when required) |
| Life cycle | See contact ratings table |
| Contact resistance | 0.015 ohms per MIL-STD-202B, Method 307 |
| Acceleration | 60 G |
| Shock resistance | 60 G, 11 milliseconds |
| Vibration resistance* | 5-2000 cps, 20 G per MIL-STD-202B, Method 204A, Condition D |
| Sand and dust | MIL-STD-202B, Method 110, Test Condition A |
| Humidity | MIL-STD-202B, Method 103A, Test Condition A |
| Salt spray | MIL-STD-202B, Method 101A, 168 hrs |
| Leakage | Immersion test per MIL-E-5272C or MIL-STD-202B, Method 104A, Condition A |
| Weight (avg) | Basic unit ..... 4.8 gr<br>Basic unit with bracket .... 5.9 gr<br>Basic unit with overmold, 12" leads ..... 23 gr |

* Devices with Group B or C differentials will withstand these vibration levels without contact bounce or chatter while thermally operated through their switching cycles.
(see temperature settings table — next page)



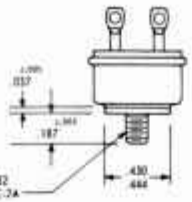




## CONTACT RATINGS (Resistive)

| 30 v-ac/dc | 125 v-ac | 250 v-ac | Life Cycles |
|---|---|---|---|
| Amperes | | | |
| 5.0 | 2.0 | 1.0 | 100,000 |
| 5.5 | 3.0 | 1.5 | 50,000 |
| 6.0 | 4.0 | 2.0 | 25,000 |
| 6.5 | 5.0 | 2.5 | 10,000 |
| 7.0 | 6.0 | 3.0 | 5,000 |

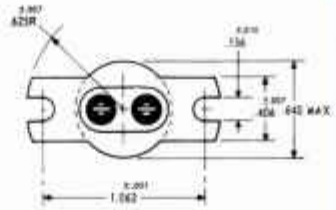
Electrical loads above 5 amps produce some internal heating. The effect on temperature settings varies with the usage and should be checked on critical applications.

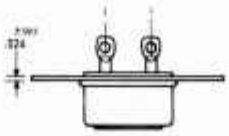
5123-1 MOUNTING STUD
FLATTENED & PIERCED TERMINALS



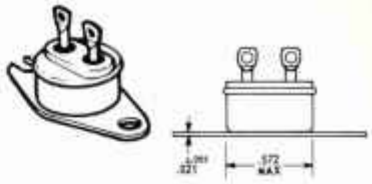
## DIMENSIONAL DRAWINGS

NOTE: Tolerances ±0.010 on all dimensions unless otherwise specified.

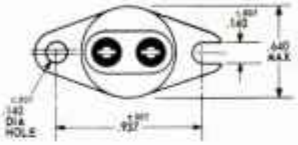


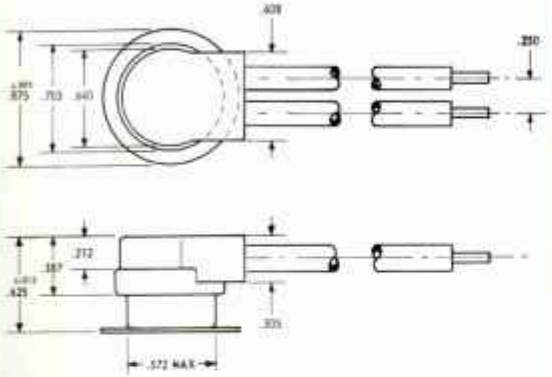


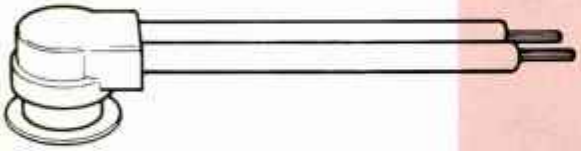
9770-39 TOP MOUNTING BRACKET
FLATTENED & PIERCED TERMINALS



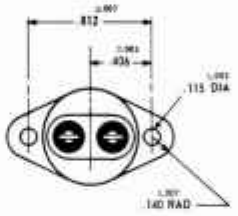
9770-30 BOTTOM MOUNTING BRACKET
FLATTENED & PIERCED TERMINALS

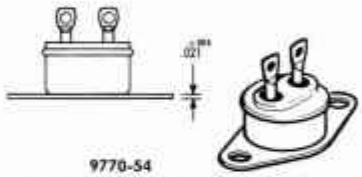




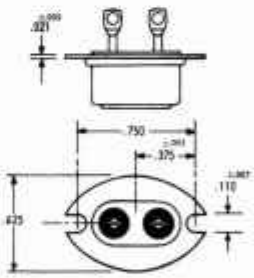


9770-68 BOTTOM MOUNTING BRACKET
WITH OVERMOLD





9770-54
BOTTOM MOUNTING
BRACKET
FLATTENED & PIERCED
TERMINALS



9770-48
TOP MOUNTING BRACKET
FLATTENED & PIERCED
TERMINALS

### TEMPERATURE SETTINGS

| Operating Temperatures | NOMINAL DIFFERENTIALS A Special | B Special | C Nominal | Opening* Temperature Tolerance °F | Closing* Temperature Tolerance °F | Ambient Temperature Exposure Range |
|---|---|---|---|---|---|---|
| —65° to 10°F | — | — | 30° — 40° | ±10 | ± 8 | **Standard** —80°F to 500°F with or without overmold |
| 11° to 200°F | 9° — 14° | 15° — 19° | 20° — 125° | ± 8 | ± 5 | |
| 201° to 300°F | 20° — 24° | 25° — 29° | 30° — 125° | ±10 | ± 8 | |
| 301° to 350°F | 30° — 34° | 35° — 39° | 40° — 125° | ±12 | ±12 | **Special** without overmold —320°F to +220°F |
| 351° to 450°F | 40° — 44° | 45° — 49° | 50° — 150° | ±15 | ±15 | |
| 451° to 500°F | 60° — 64° | 65° — 69° | 70° — 200° | ±25 | ±25 | |

* Tolerances are based on precision factory calibration and test equipment. Customers checking tolerances should allow for differences in test equipment of ±1°F.

Temperature settings outside the ranges indicated or to closer tolerances will be considered on special request.

### SPECIAL CONTACTS

Gold plated contacts can be furnished for the electrical loads listed in the following table to assure reliable circuit making under low wattage conditions. *Gold plated contacts are not suitable for heavier loads.*

| | |
|---|---|
| 30 v-ac/dc | 500 ma and below |
| 115 v-ac | 200 ma and below |
| 230 v-ac | 100 ma and below |

### TERMINALS

Terminal options include right angle, flattened and pierced or straight pin type. In addition, the C4344 thermostat can be supplied with integral leads and silicone rubber overmolding for use under extreme conditions of humidity, moisture and corrosion.

### LEADS

#### Without Overmold

The C4344 thermostat can be supplied with wire leads welded to straight pin type or right angle terminals. Leads are #18 AWG with insulation and lead length as specified.

#### With Silicone Rubber Overmold (Dow Corning 152 or equivalent)

Leads are #18 AWG wire insulated with silicone rubber and are cut to customers' specified length. Lead length is measured from the center of the thermostat to the end of the wire.

### TEST SAMPLES

#### Operating Samples

Operating samples generally can be supplied for your application tests. Please fill in the data sheets at the end of your precision thermostat catalog (or attached) for your test sample. Send one copy to us and retain the other for your files. Complete circuit and environmental information is needed to produce an operating sample for testing on your actual application.

#### Thermocouple Samples

Frequently, in making an application, non-operating thermocouple-equipped samples may prove more helpful than a number of operating samples. Thermocouple samples can be shipped usually within a few days of receipt of request. Be sure to specify either iron-constantan or copper-constantan thermocouples.

**No. 21540**
**Strap Mounted Thermostats**
Over temperature protection for bearings and power tube chimneys.

**No. 21400**
**Flange-Mounted Thermostats**
Temperature protection or warning for critical equipment enclosures

**No. 21556**
**High Pressure Thermostats**
Temperature protection or indication for hydraulic systems

**No. 21447**
**Immersion Thermostats**
Fast response sensing of coolant and other fluid temperatures

### TYPICAL KLIXON C4344 PRECISION THERMOSTAT PACKAGES

To save vital engineering and procurement time, send us your specifications and special application requirements. Our custom packaging team will quickly design and produce a control package to meet your special needs.



Printed in U.S.A. 5M 3-64 PRET-2A