



MOTOGARD

Over-Temperature Protection System

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General Information

Motogard Over-Temperature Protection Systems provide immediate overheating protection for: motors, equipment enclosures, semiconductor heatsinks, sleeve bearings, and other related machinery.

All Motogard systems fully conform to the NEC requirements for integral motor thermal protection.

Using Positive Temperature Coefficient (PTC) thermistors embedded in or in contact with the surface, the Motogard system is able to continually sense when the equipment exceeds the pre-selected temperature limits.

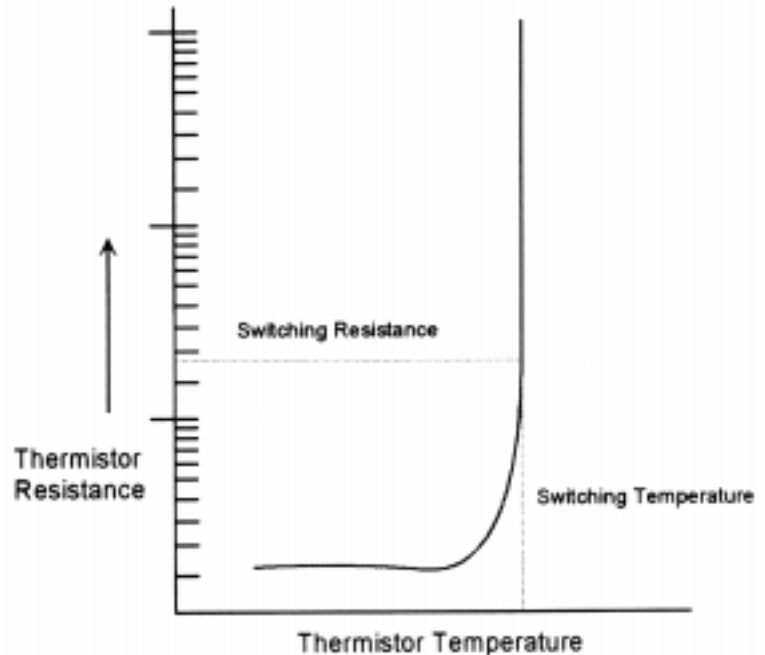
Motogard systems are recommended for applications requiring high reliability under conditions of heavy duty or severe ambient contamination. Minimum rif interference, absence of arcing, and maintenance-free long life are built into the Motogard systems.

Applications

1. **Safeguard's motor against:** overloads caused by single phasing, frequently repeated overloads, voltage unbalance, plugging or reversing duty, too frequent starting, locked rotor or bearing seizure, ventilation failures or abnormally high ambient temperatures.
2. **Bearing protection** systems for machine tool drives, compressors, pumps or motor-generator sets.
3. **Over-temperature** protection of process vats, furnaces and ovens.
4. **Simple fire** protection systems for equipment enclosures or material handling storage systems.
5. **Insulation over-temperature** protection for electromagnets or transformer windings.
6. Over-temperature protection of **semiconductor heatsinks**.

Key Features

- **Solid state logic circuitry** assuring rapid, spark free noiseless operation with no drift or chatter
- **"Fail Safe" operation** protecting against sensor lead breakage or loss of power
- **Protection against sensor lead short circuit** (series 135 and 150 only)
- **Solid state or electro-mechanical outputs** (Triac in series 115 and 120, Form C electro-mechanical relay in series 135 and 150)



Operation

The Motogard Over-Temperature Protection System uses PTC thermistors to indicate when the equipment has exceeded the set temperature. These thermistors act as a switch, which when reaching the pre-selected temperature will cause the resistance to increase to virtually infinity. This causes the controller to change the state of the contacts. As the equipment cools the "switching action" reverses and the controller will then change the state of the contacts back indicating an "OK" circumstance.

Note: This device does not monitor the actual temperature but protects against over-temperature conditions.

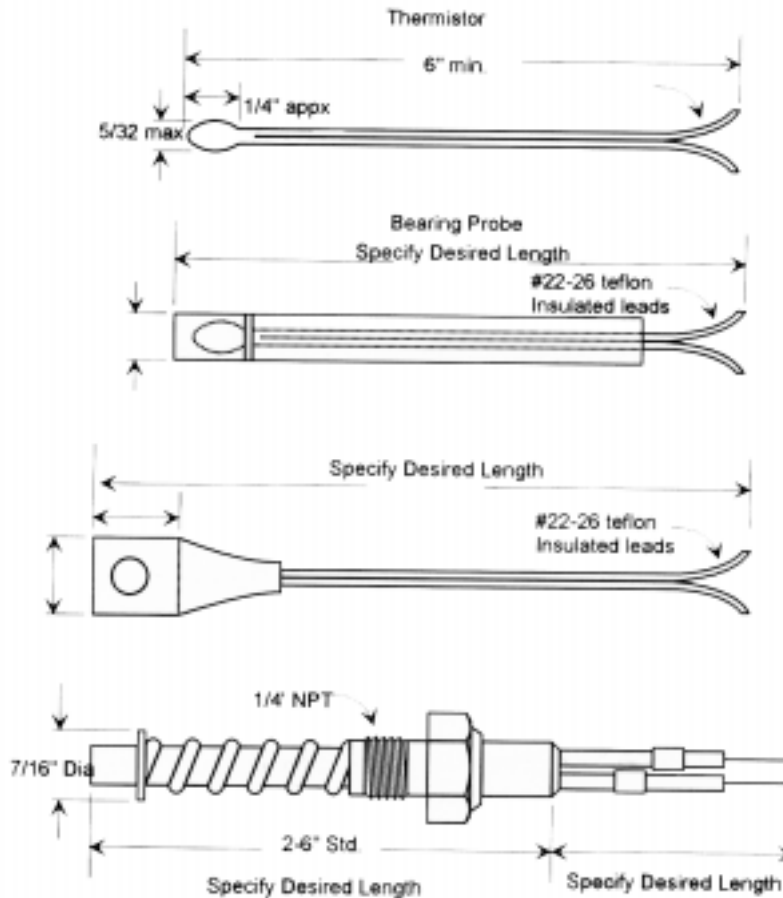
On Motogard series 115, 120, and 135 thermistors are placed in parallel allowing independent monitoring of 3-6 points in the equipment. On series 150, the three thermistors are wired in series reacting as a single switching point. Although there is a higher resistance switching point on the series 150, each separate thermistor will pass 3500 ohms on over-temperature.

PTC Thermistors

Motogard controllers are designed for use with positive temperature coefficient thermistors. PTC's are unlike other thermistors as they increase their resistance sharply when reaching their switch point temperature. This provides "snap" action response and allows remotely locating the controller without modifications.

All PTC thermistors feature high speed over-temperature sensing with no switch point drift or aging. Each thermistor is encapsulated in a special epoxy for rugged mechanical duty, severe environments, and good thermal conductivity.

Available in numerous designs from the simple thermistor to spring loaded bearing probes. Contact the factory for special applications.



Switching Temperatures (Normal)

Type	T8005	T8015	T8025	T8035	T8055	T8065	T8085	T8105	T8115	T8135	T8155	T8175	T8195
Centigrade °C ± 5°	5	15	25	35	55	65	85	105	115	135	155	175	195
Fahrenheit °F ± 9°	41	59	77	95	131	149	185	221	239	275	311	347	383

The switching temperatures listed above are standard. Thermistors with other switching temperatures within the range of 5° to 195°C can be supplied: Thermistors can also be supplied in a glass epoxy sheet suitable for mounting in one of the stator slots of an induction.

*	Series 115	Series 120	Series 135	Series 150
Model No.	115101-2	120101	135101	150101
Operating characteristics	6 Inputs 2 Triac Outputs 1-N.O.* 1 N.C.*	3 Inputs Single Triac Output N.C.*	3 Inputs Form C Relay Output	1 Input Form C Relay Output
Input Rating	120VAC ± 10% Single Phase 50/60 hz	120VAC ± 10% Single Phase 50/60 hz	120VAC ± 10% Single Phase 50/60 hz	120VAC ± 10% Single Phase 50/60 hz
Output Rating	120/240 Volts 5 amp continuous	120/240 Volts 3 amp continuous	120/240 Volts AC or 28 Volts DC 5 amp continuous	120 Volt AC for size 5 contactor coil
Input Resistance Control	Controller ON with 500 ohms or less - OFF with apppx. 1500 ohms or more	Controller ON with 500 ohms or less - OFF with apppx. 1500 ohms or more	Controller ON with 100 to 500 ohms or less - OFF with apppx. 1500 ohms or more	Controller ON with 100 to 500 ohms or less - OFF with apppx. 3500 ohms or more
Isolation	controller output, excitation, and sensor input electrically isolated from each other	Controller excitation only isolated from output and sensors	Controller output, excitation, and sensor input electrically isolated from each other	Controller output, excitation, and sensor input electrically isolated from each other
Reset Dimensions	Automatic 5.50"W x 4.25"L x 3.12"H	Automatic 3.24"W x 2.25"L x 2.50"H	Automatic 5.75"W x 2.0"L x 5.68"H	Automatic 3.25"W x 2.25"L x 2.50"H
Enclosure	Potted in NEMA 12 steel case	Potted in polyester case	Mounted in welded case	Potted in polyester case

* Series 115 and 120 controllers use output triacs that have been specifically selected to operate directly in series with mainline contactors. If a small interposing relay must be used, then sealed VA rating of the interposing relay should be greater than 10 VA.

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