

Product Bulletin

3MP

Motor Protector/Thermal Cut-out

As world leader in appliance motor protection, Texas Instruments has developed the 3MP for 120 and 230 Vac applications to operate in wider temperatures and current ranges than offered by existing protection solutions. In providing consistent performance characteristics and excellent reliability, its features anticipate future technical protection requirements on the AC motor market.

Design & operating principles

The 3MP consists of a metal housing with an integrated terminal. The housing holds the pre-set Klixon™ snap action bimetal disc. The split plate carries a resistive S-shaped wire which provides additional current sensitivity. The advanced contact system - one on the bimetal disc and one on the plate - in combination with the strong disc guarantees a long life and reliable cycling. The combination of a variety of standard terminal configurations and carefully selected materials provides easy handling and mounting. Customized terminal configurations are available on request. Wires including connectors can be automatically attached to the standard crimp terminal. Texas Instruments supplies a range of standard lead configurations; customized solutions are available on request. In construction where the 3MP device is contacting conductive parts of the motor assembly, Texas Instruments can deliver the devices with a Mylar™ insulation sleeve. Customized coding and colouring is an option on request.

The operating principle of the 3MP is both simple and effective. The protector is actuated by current passing through it and by the heat received from the surrounding parts.

The electrical circuit is interrupted when the disc reaches its pre-set temperature. As the device cools down to a safe temperature, the contacts will automatically reset. The bimetal disc provides excellent thermal and current sensitivity in an overload situation. Under locked rotor conditions the integrated heater in combination with the bimetal disc provide very accurate trip times for maximum protection.

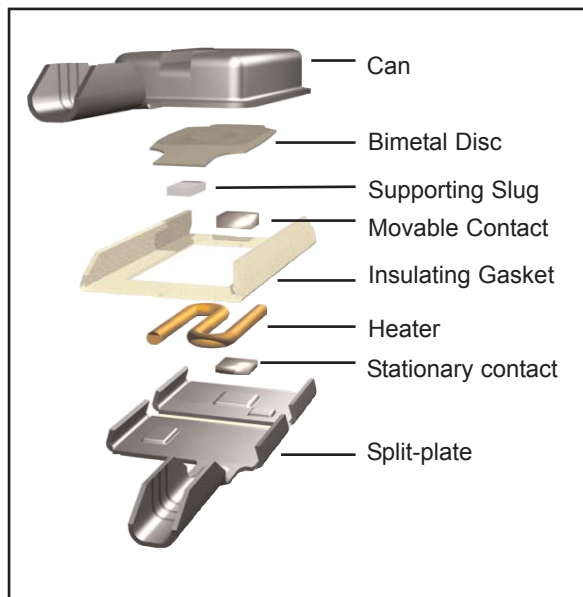
Applications

The 3MP is widely used throughout the world in electric motors for washing machines, dishwashers, dryers, vacuum cleaners and industrial applications in the 120 and 230 Vac applications. 3MP features permit to move the motor protector location outside the winding, providing the motor manufacturer extra flexibility during the manufacturing process. The recent certification as a thermal cut-out device combined with its unique current sensitivity, positions the 3MP as an advanced and effective solution to protect toroidal transformers.



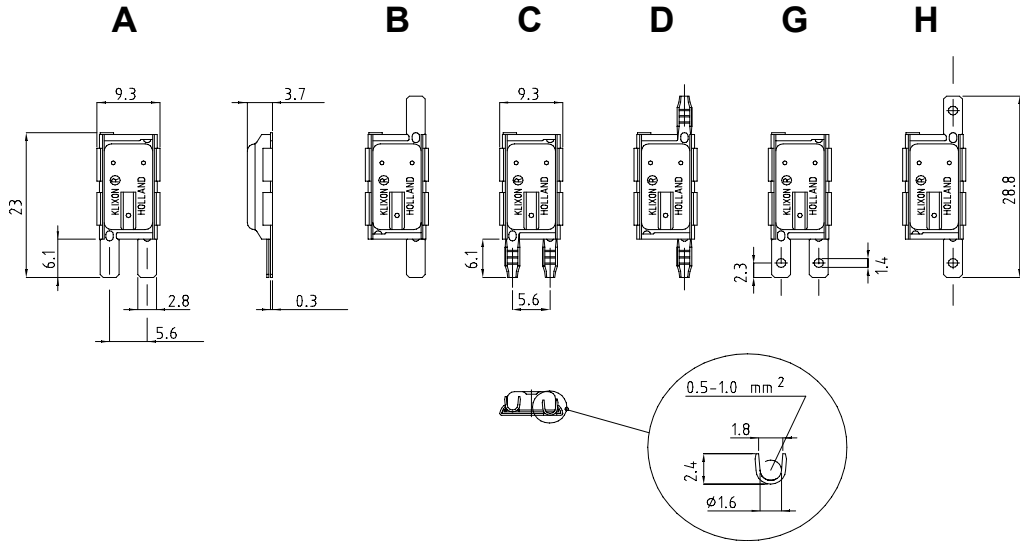
Key Benefits

- Minimizes the total cost of the motor protection function
- Maximum protection under locked rotor conditions
- Provides extra flexibility during the motor manufacturing process
- Reduces the total need of motor protector type; one code for several applications
- Provides mounting flexibility
- Ensures trouble-free soldering and welding
- Low cost solution for transformer protection



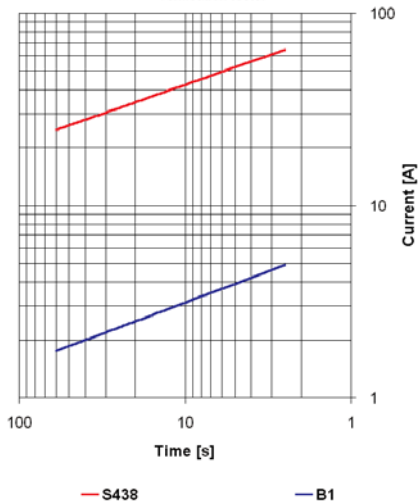
Dimensions (mm)

Terminal configurations



Average First Cycle Tripping Time vs. Current (ambient is 25°C)

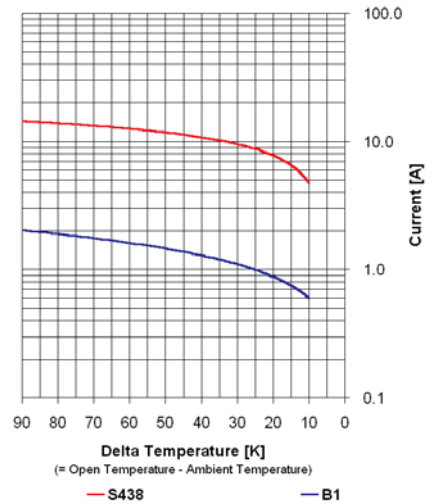
Approx. to be used for selecting samples for verification tests.



The curves of First Cycle Tripping time and Ultimate trip current are meant to be for selecting samples to perform verification tests only. In the figures two curves of a wide range of possibilities are shown. The level and slope can be varied by making an other selection for the pre-set temperature, bimetal disc and/or heater.

Ultimate Trip Current vs. Ambient Temperature (non-circulating air)

Approx. to be used for selecting samples for verification tests.



Specifications

Standard operating temperature range	from 80°C - 170°C (Increments 5K)
Tolerance on open temperature	± 5K
Peak temperature (5 min)	200°C
Max. Ambient temperature	T-open +20°C
Time check at T-ambient 25°C	4 to 10 seconds
Contact rating	27.5 Amp @cos 1 / 250Vac / 500 cycles 18 Amp @cos 0.6 / 250Vac / 1.000 cycles 18 Amp @cos 0.6 / 120Vac / 15.000 cycles

Certifications

Agency	File number	Standard
ENEC	2014531.07	EN60730-2-2 Thermal motor protector
BEAB	CRC.0001	EN60730-2-2 Thermal motor protector
ENEC	2014531.07	EN60730-2-9 Thermal cut-out
UL	E15962	UL2111
CSA	LR11372	CAN/CSA-C22.2 N° 0-M91

Declarations

Declarations to EN60730-2-9	Declarations to EN60730-2-2
Purpose of the control.....Thermal cut-out	Purpose of the control.....Thermal Motorprotector
Construction.....Incorporated, non-electronic	
Degree of protection.....IP00	
Terminals for ext. conductors:For internal conductors only	
Method of (dis) connection of terminals.....Soldering, spotwelding	
Temperature limits of the switchhead.....170°C	
PTI of insulation materials.....PTI 175	PTI of insulation materials.....PTI 175
Method of mounting.....Off-winding, fixed position, no mounting limitation	Method of mounting.....Off-winding, fixed position, no mounting limitation
Operating time.....For continuous operation	
Type of action.....Type 2B	Type of action.....Type 3C
Reset characteristic.....Automatic	Reset characteristic.....Automatic
Extent of sensing element.....Whole control	
Control pollution degree.....1 (per IEC 60730-1 3rd Edition)	Control pollution degree.....Normal

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