



CANTHERM

Supplying high-quality bimetal and thermal sensor products.

CONTROL THERMOSTATS 5 AMP SERIES

M3, M3(Z), M2, M2F, MQT5S, MQT5S(Z)


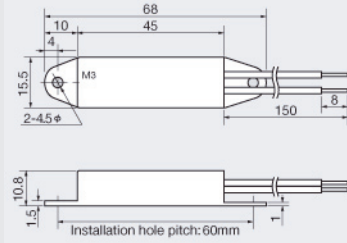
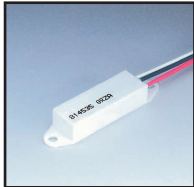
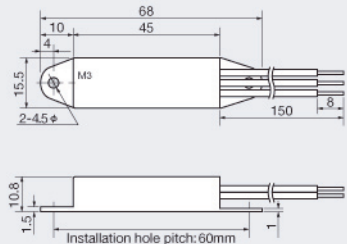

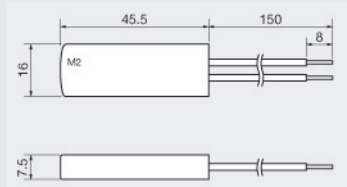
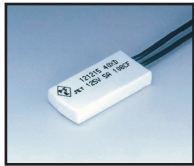
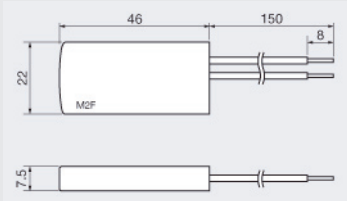
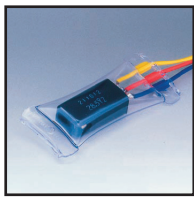
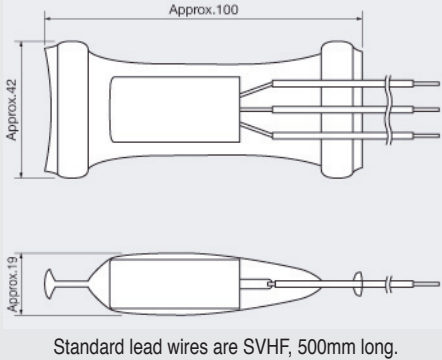


5 Amp. Series

For ordinary temperature.

(AC125V/5A, AC250V/3A, DC12V/5A, DC24V/3A) -10°C~110°C

Each model is available in a double sealed construction.

type	photo	drawing dimensions (mm)	features
M3 Two mounting holes Two lead wires X or Y contact			1.) 5 Amp. capacity in a compact body. 2.) Long life and small differential thermostat. 3.) SPST Contacts X=NC, Y=NO, Contacts set on rise in temperature.
M3 (Z) Two mounting holes Three lead wires XZ or YZ			1.) 5 Amp. capacity (main contact) as specified in part number. 2.) Back contact capacity: 60% of main contact capacity. 3.) Long life and small differential thermostat. 4.) Main contact lead is black, movable contact is white and back contact is red as standard. 5.) Standard "C" type contact (SPDT)
M2 No mounting hole Two lead wires D rank only			1.) It is a thin 5 Amp. version and has no back contact. 2.) Only D rank DIFF. available. 3.) Other specifications are the same as the M3 Model.
M2F Fuse installed No mounting hole. 2 lead wires D rank only			1.) A fuse connected in series with the M2 Model to insure safety. 2.) Other specifications are the same as the M2 Model. 3.) For fuse operating temperature, consult us. 4.) Choose a fuse temperature of 25 higher than the thermostat set temperature.
MQT5S / MQT5S (Z) Sealed type 3 leads for MQT5S(Z)			1.) While a near complete seal is achieved by double sealing (DS), moisture intrusion by capillary action at the tip of the lead cannot be avoided. Be careful not to have water splash on to the lead tip. 2.) Back contact capacity: 60% of main contact capacity.

* Regarding the lead;

AWM1015/AWG20 black 150mm length is the standard for 75°C or lower

AWM3271/AWG20 gray 150mm length is the standard for 76°C or higher



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■ 5 Amp. Series for ordinary temperature (AC125V/5A, AC250V/3A) ■ $[-10^{\circ}\sim 110^{\circ}\text{C}]$

Ratings and Characteristics:

Tolerance of Set Temperature and Differential vs. Set Temperature

Setting Temperature	$-10^{\circ}\text{C}\sim -1^{\circ}\text{C}$		$0^{\circ}\text{C}\sim 50^{\circ}\text{C}$		$51^{\circ}\text{C}\sim 65^{\circ}\text{C}$		$66^{\circ}\text{C}\sim 75^{\circ}\text{C}$		$76^{\circ}\text{C}\sim 110^{\circ}\text{C}$	
Diff. Contact configuration	X	Y	X	Y	X	Y	X	Y	X	Y
A ($2^{\circ}\text{C}\sim 5^{\circ}\text{C}$)			± 3	± 3						
B ($3^{\circ}\text{C}\sim 6^{\circ}\text{C}$)	± 4	± 4	± 3	± 3	± 4	± 4				
C ($5^{\circ}\text{C}\sim 8^{\circ}\text{C}$)	± 4	± 4	± 3	± 3	± 4	± 4	± 5	± 5		
D ($8^{\circ}\text{C}\sim 12^{\circ}\text{C}$)	± 4	± 4	± 4	± 4	± 4	± 4	± 5	± 5	± 5	± 5

Note: 1. Above list shows the standard tolerance.

2. Special tolerance such as ± 1.5 or ± 2 will be available.

Table of contact capacity by voltage used and by DIFF. ranking (100,000 cycle life is standard)

Current Voltage		M3/M3Z/5S/5SZ		M2/M2F	
		Differential rank	Current(unit power factor 1)	Differential rank	Current(unit power factor 1)
—	DC48V	A	0.1A ~ 0.3A		
		B	0.1A ~ 0.5A		
		C	0.1A ~ 0.8A		
		D	0.1A ~ 0.8A	D	0.1A ~ 0.8A
AC250V	DC24V	A	0.5A ~ 1.5A		
		B	0.5A ~ 2A		
		C	0.5A ~ 3A		
		D	0.5A ~ 3A	D	0.5A ~ 3A
AC125V	DC12V	A	0.5A ~ 3A		
		B	0.5A ~ 4A		
		C	0.5A ~ 5A		
		D	0.5A ~ 5A	D	0.5A ~ 5A

NOTE: 1. "5 Ampere Series" represents the standard maximum current of M3 Model at AC 125V.

2. Maximum current is limited slightly lower for M3 and 5S Models due to heat generated inside the switches.

3. Crossbar contact is not available for the 5 Ampere Series.

4. In the case of DC voltage, spark quenching will be required between contacts depending on the load level.

Maximum operating voltage : AC250V max., DC48V max.

Temperature setting range : $-10^{\circ}\text{C}\sim 110^{\circ}\text{C}$ (tolerance/differential will change at higher temps.)(see the above table)

Differential : rank A 3.5 ± 1.5 ($2\sim 5^{\circ}\text{C}$)
rank B 4.5 ± 1.5 ($3\sim 6^{\circ}\text{C}$)
rank C 6.5 ± 1.5 ($5\sim 8^{\circ}\text{C}$)
rank D 10 ± 2 ($8\sim 12^{\circ}\text{C}$)

Contact configuration : 1b(X) N Closed, or 1a(Y) N Open
1c(XZ or YZ) for M3(Z)/5S(Z) "C" Contact SPDT

Operating temperature range : $-30^{\circ}\text{C}\sim 85^{\circ}\text{C}$ (standard), $-30^{\circ}\text{C}\sim 125^{\circ}\text{C}$ (special) (no icing, non condensing)
(use within 60 degrees above the set temperature.)

Insulation resistance : 100M Ω or more

Contact resistance : 70m Ω or less (including lead wire resistance)

Withstanding voltage : AC2000V for 2sec.(600V for 1minute between contacts)

Vibration resistance : Selected from JIS·C·0911-1984

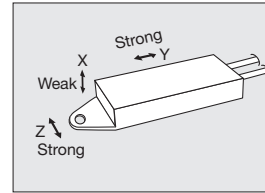
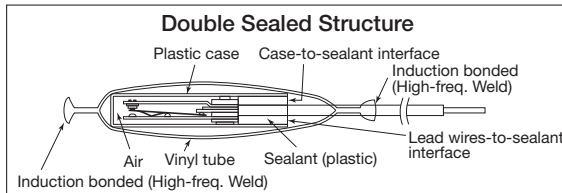
Constant vibration; 50Hz fixed/0.2mm fixed (1G)
Sweep vibration; 10~55Hz/0.35mm fixed (0.1~2.2G)
Withstands 2 hour each in directions X, Y and Z.

Impact resistance : No damage when dropped three times from the height of 40cm onto a concrete floor (about 70G).
No damage for double sealed model when dropped three times from the height of 1m onto a concrete floor (about 240G).
Withstands substantial impact after being put in a package or mounted in equipment.

Life : 2 million mechanical operations, 100,000 electrical operations at rated load.(see page 15 for details.)

Handling precautions : The thermostat withstands vibration and impact applied along Y and Z axis, but does not tolerate impact from X direction.
(see the illustration below.) It is recommended that the thermostats be installed to minimize stresses applied along the X axis.

Double Sealed Construction (Improvement in water and impact resistance performance)



1. Increased Resistance to Water

Covering a thermostat with a plastic case and sealing its lead wires with a plastic sealant is a widely accepted approach to achieve a dust-proof and water-resistant structure. Our thermostats, such as the MQT series in this catalogue, are of this design. Repeated material expansion and contraction, and internal air pressure changes caused by thermal cycle may lead to wear of plastic case and sealant, which consequently deteriorates sealing performance. Our double sealed design, using a vinyl tube, withstands severe environmental conditions for long periods of time.

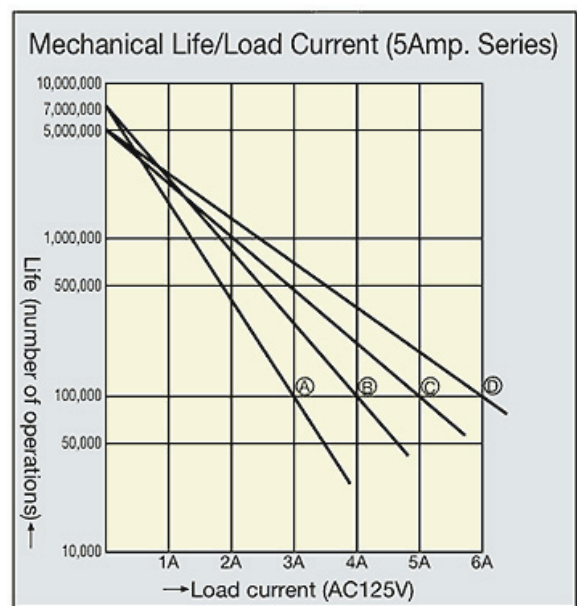
NOTES: 1.The soft vinyl tube must be taken care of to avoid damage.
2.Do not expose vinyl tube to the direct sunlight.

2. Increased impact resistance
Electrical components such as relays and motors are not very resistant against shocks. Dropping electrical components usually results in damage and subsequent malfunction. Products in the MQT Series are no exception. MQT Series products are fragile to impacts in X direction and more resistive to Y and Z direction impact. However, with the double sealing method using soft vinyl tubes, impact resistance is guaranteed for regular usage.

Impact resistance: 240G

Relationship between life & load

Temperature Power Sensor, TPS can perform more than 2 million mechanical operations. However, under heavy loads, the life will be reduced due to the wear of contacts. A life of 100,000 cycles of operation is guaranteed at the rated load current. Under reduced loads, the life lasts longer. See the graph to the right.

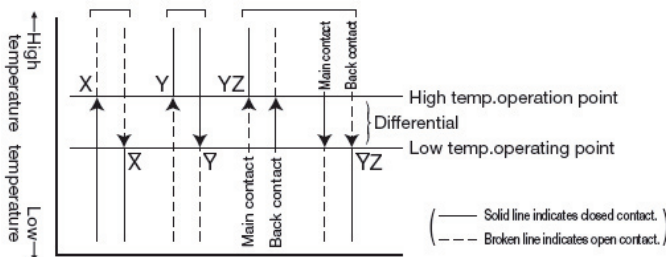


Contact type indication

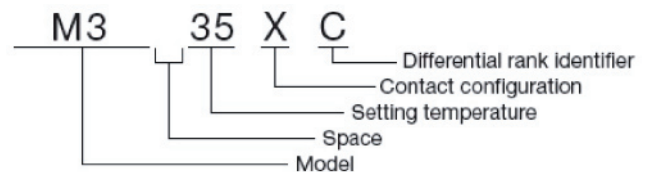
• Contacts which open when the temperature rises are designated as X, and those which close when the temperature rises are designated as Y. Shown in the diagram is the temperature at which the contacts operate when the temperature rises (the high temperature side).

• X [Xbar] and Y [Ybar] are used for contacts that operate when the temperature falls (the low temperature side). X [Xbar] indicates the contact that closes when the temperature falls. Y [Ybar] indicates the contact that opens when the temperature falls. Z indicates transfer contacts. XZ is the main contact that opens when the temperature rises. XZ [Xbar Z] is the main contact that closes when the temperature falls.

• C is the standard rank designation for X contacts and B is standard for Y contacts. Please consider X is C ranked and Y is B ranked, unless otherwise indicated.



Model designation method



For 5 Amp. Series with a back contact, a model name will be, for example, M3 70XZB, where Z means contact with the back contact.



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