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



2. Increased impact resistance Electrical components such as relays and motors are not very resistant against shocks. Drop-

ping 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

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.

- 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 M3 35 С



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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2010/August 5Amp



— 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	5 th at	*	 5 Amp. capacity in a compact body. Long life and small differential thermostat. SPST Contacts X=NC, Y=NO, Contacts set on rise in temperature.
M3 (Z) Two mounting holes Three lead wires XZ or YZ	Jun and Ta	*	 5 Amp. capacity (main contact) as specified in part number. Back contact capacity: 60% of main contact capacity. Long life and small differential thermostat. Main contact lead is black, movable contact is white and back contact is red as standard. Standard "C" type contact (SPDT)
M2 No mounting hole Two lead wires D rank only	Torre and	45.5 150 (M2 () () () () () () () () () ()	 It is a thin 5 Amp. version and has no back contact. Only D rank DIFF. available. Other specifications are the same as the M3 Model.
M2F Fuse installed No mounting hole. 2 lead wires D rank only	an in the state	*	 A fuse connected in series with the M2 Model to insure safety. Other specifications are the same as the M2 Model. For fuse operating temperature, consult us. Choose a fuse temperature of 25 higher than the thermostat set temperature.
MQT5S / MQT5S (Z) Sealed type 3 leads for MQT5S(Z)		Approx.100 CT YOUGH FT YOUGH FT YOUGH Standard lead wires are SVHF, 500mm long.	 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. Back contact capacity: 60% of main contact capacity.

5 Amp. Series for ordinary temperature (AC125V/5A, AC250V/3A) [-10°~110°C]

Ratings and Characteristics:

Tolerance of Set Temperature and Differential vs. Set Temperature											
Setti	ng Temperature	-10°C~-1°C		0°C~50°C		51°C~65°C		66°C~75°C		76°C~110°C	
Diff.	Contact configuration	Х	Y	Х	Y	Х	Y	Х	Y	Х	Y
Α	(2°C~5°C)			±3	±3						
В	(3°C~6°C)	±4	±4	±3	±3	±4	±4				
С	(5°C~8°C)	±4	±4	±3	±3	±4	±4	±5	±5		
D	(8°C~12°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		M3/M3Z/5S/5SZ				M2/M2F				
Voltage		Differential rank	Current(uni	t powe	er factor 1)	Differential rank	Current(uni	t pow	er factor 1)		
		A	0.1A	~	0.3A						
	DC48V	B	0.1A	~	0.5A						
		D	0.1A 0.1A	~ ~	0.8A 0.8A	D	0.1A	~	0.8A		
AC250V	DC24V	A	0.1A	~	1.5A		0.1A	~	0.0A		
		В	0.5A	~	2A						
		С	0.5A	~	ЗA						
AC125V		D	0.5A	~	3A	D	0.5A	~	3A		
		A	0.5A	~	3A						
	DC12V	В	0.5A	~	4A						
		C D	0.5A	~ ~	5A 5A	D	0.5A		5A		
· · · · ·	l ere Series" repres	_	0.5A		-			~	ЪА		
	se of DC voltage, sparl ge : AC250V ma			en cor	ntacts depe	nding on the load leve	l.				
				en cor	ntacts depe	nding on the load leve					
	•										
	ge ∶ -10°C~110°			will (change a	at higher temps	.)(see the	e ab	ove table		
Differential		3.5±1.5(2~5)°C									
		4.5±1.5(3~6)°C									
	rank C	6.5±1.5(5~8)°C	2								
			;								
	rank D	10 ± 2 (8~12)									
Contact configuratio		10 ± 2 (8~12)	°C								
Contact configuratio	on : 1b(X) N Clo	10 ± 2 (8~12) osed, or 1a(Y) N	°C V Open	Cont	act SPD	т					
-	n [:] 1b(X) N Clo 1c(XZ or Y	10 ± 2 (8~12) osed, or 1a(Y) N Z) for M3(Z)/55	°C N Open S(Z) "C" (densina)				
Operating temperatur	on [:] 1b(X) N Clo 1c(XZ or Y re : –30°C~85°C	10 ± 2 (8~12) osed, or 1a(Y) N Z) for M3(Z)/55 C(standard),–30	°C N Open S(Z) "C" (°C~125°C	(spe	ecial) (no	icing, non con	densing)				
Operating temperatur	on : 1b(X) N Clo 1c(XZ or Y re : -30°C~85°C (use within	10 ± 2 (8~12) osed, or 1a(Y) N Z) for M3(Z)/55 C(standard),-30 60 degrees abo	°C N Open S(Z) "C" (°C~125°C	(spe	ecial) (no	icing, non con	densing)				
Operating temperatur range Insulation resistanc	m [:] 1b(X) N Cla 1c(XZ or Y re [:] -30°C~85°C (use within ce [:] 100MΩ or r	10 ± 2 (8~12) psed, or 1a(Y) N Z) for M3(Z)/55 C(standard),-30 60 degrees abo more	°C N Open S(Z) "C" (°C~125°C ove the s	(spe et te	ecial) (no emperatu	icing, non con	densing)				
Operating temperatur range Insulation resistanc Contact resistanc	 m : 1b(X) N Cla 1c(XZ or Y re : -30°C~85°C (use within re : 100MΩ or r re : 70mΩ or le 	10 ± 2 (8~12) psed, or 1a(Y) NZ) for M3(Z)/55 C(standard),-30 60 degrees abornore ss (including le	°C N Open S(Z) "C" (°C~125°C ove the s ad wire r	(spe et te esist	ecial) (no emperatu tance)	icing, non con ıre.)	densing)				
Operating temperatur range Insulation resistanc Contact resistanc Withstanding voltag	 m : 1b(X) N Cla 1c(XZ or Y re : -30°C~85°C (use within re : 100MΩ or r re : 70mΩ or le re : AC2000V fr 	10 ± 2 (8~12) psed, or 1a(Y) NZ) for M3(Z)/55 C(standard),-30 60 degrees abornore ss (including le por 2sec.(600V for	°C N Open S(Z) "C" (°C~125°C ove the s ad wire r or 1minut	(spe et te esist	ecial) (no emperatu tance)	icing, non con ıre.)	densing)				
Operating temperatur range Insulation resistanc Contact resistanc Withstanding voltag	$\begin{array}{rcl} \text{n} & : & 1b(X) \text{ N Cla}\\ & 1c(XZ \text{ or } Y)\\ \text{re} & : & -30^\circ\text{C} \sim 85^\circ\text{C}\\ & (\text{use within})\\ \text{ce} & : & 100M\Omega \text{ or } 1\\ \text{ce} & : & 70m\Omega \text{ or } 1\\ \text{ge} & : & AC2000V \text{ fr}\\ \text{ce} & : & \text{Selected fr} \end{array}$	10 ± 2 (8~12) psed, or 1a(Y) N Z) for M3(Z)/55 C(standard),-30 60 degrees abo more ss (including le pr 2sec.(600V fo om JIS \cdot C \cdot 0911	°C N Open S(Z) "C" (°C~125°C ove the s ad wire r or 1 minut -1984	(spe et te esist te be	ecial) (no emperatu tance) etween c	icing, non con ure.) contacts)	densing)				
Operating temperatur range Insulation resistanc Contact resistanc Withstanding voltag	$\begin{array}{rcl} \text{n} & : & 1b(X) \text{ N Cla}\\ & 1c(XZ \text{ or } Y)\\ \text{re} & : & -30^\circ\text{C} \sim 85^\circ\text{C}\\ & (\text{use within})\\ \text{ce} & : & 100M\Omega \text{ or } 1\\ \text{ce} & : & 70m\Omega \text{ or } 1\\ \text{ge} & : & AC2000V \text{ fr}\\ \text{ce} & : & \text{Selected fr} \end{array}$	10 ± 2 (8~12) psed, or 1a(Y) NZ) for M3(Z)/55 C(standard),-30 60 degrees abornore ss (including le por 2sec.(600V for	°C N Open S(Z) "C" (°C~125°C ove the s ad wire r or 1 minut -1984	(spe et te esist te be	ecial) (no emperatu tance) etween c	icing, non con ure.) contacts)	densing)				
Operating temperatur range Insulation resistanc Contact resistanc Withstanding voltag	m : 1b(X) N Claure (XZ or Y) $re : -30^{\circ}C - 85^{\circ}C$ (use within $re : 100M\Omega$ or 1 $re : 70m\Omega$ or 1 re : AC2000V for re : Selected for Constant V	10 ± 2 (8~12) psed, or 1a(Y) N Z) for M3(Z)/55 C(standard),-30 60 degrees abo more ss (including le pr 2sec.(600V fo om JIS \cdot C \cdot 0911	°C N Open S(Z) "C" (°C~125°C ove the s ad wire r or 1minut -1984 ïxed/0.2r	(spe et te esist te be mm fi	ecial) (no emperatu cance) etween c fxed (1G	icing, non con ure.) contacts)	densing)				
Operating temperatur range Insulation resistanc Contact resistanc Withstanding voltag	m : 1b(X) N Claure (XZ or Y) $re : -30^{\circ}C - 85^{\circ}C$ (use within $re : 100M\Omega$ or 1 $re : 70m\Omega$ or 1 re : AC2000V for re : Selected for Constant v Sweep vibr	10 ± 2 (8~12) psed, or 1a(Y) N Z) for M3(Z)/55 C(standard),-30 60 degrees abo nore ss (including le or 2sec.(600V fo om JIS \cdot C \cdot 0911 ibration; 50Hz for ration; 10~55Hz	°C N Open S(Z) "C" (°C~125°C ove the s ad wire r or 1minut -1984 ïxed/0.2r z/0.35mm	c(spe et te esist te be mm fi fixe	ecial) (no emperatu ance) etween o xed (1G d (0.1~2.	icing, non con ure.) contacts)) 2G)	densing)				
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Operating temperatur range Insulation resistanc Contact resistanc Withstanding voltag Vibration resistanc Impact resistanc Life	m : 1b(X) N Cla 1c(XZ or Y re : -30°C~85°C (use within $2e$: 100M Ω or le $2e$: 70m Ω or le 3e : AC2000V f 2e : Selected fr Constant v Sweep vibr Withstands 2e : No damage No damage for Withstands : 2 million ments : The thermostat	10 ± 2 (8~12) psed, or 1a(Y) NZ) for M3(Z)/55 C(standard),-30 60 degrees about the second	°C N Open S(Z) "C" (C °C~125°C ove the s ad wire re or 1 minut -1984 fixed/0.2r z/0.35mm direction mree times I when dropp pact afte ns, 100,00 and impact	(spectrum) estimation terestrum) fixed from from poed the r being 00 electrum appli	ecial) (no emperatu ance) etween o xed (1G d (0.1~2. , Y and 2 n the heig ree times fi ing put i ectrical o ed along Y	icing, non con ire.) contacts) 2G) Z. ht of 40cm onto rom the height of 1m n a package or perations at rated and Z axis, but does	a concret onto a conc mountec d load.(see s not tolerate	rete fl I in e page e imp	oor (about 2 equipmer e 15 for de act from X c		

* 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

70G). 240G). nt. etails.) direction. X axis.