WE TEST EVERY PCS !

TURNMOONER

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TURNMOONER

Moulded Case Circuit Breaker

YUEQING ZHENGKUN ELECTRIC CO.,LTD.

About Us

Our factory stick to the principle of "quality first, service first, continuous improvement and innovation to meet the customers" for the management and "zero defect, zero complaints" as the quality objective. To perfect our service, we provide the products with good quality at the reasonable price.

Our factory is in accordance with ISO 9000 International Quality System. All Products Have Certificate of Conformity for Electrical Equipment From Government and Have Won The Safety Approvals of CE ,CCC, CB,SGS...etc international Standard Test.

Our factory Continued Adopts International Advanced Technology and Updating Our Products, Have Owned Advanced Equipment of Production, Inspection and Experiment, Powerful Technical Force and The Network System of Sales, Services The World. We Adhere to The Guide of Market and The Principle of Living on Quality, Developing on Credit.

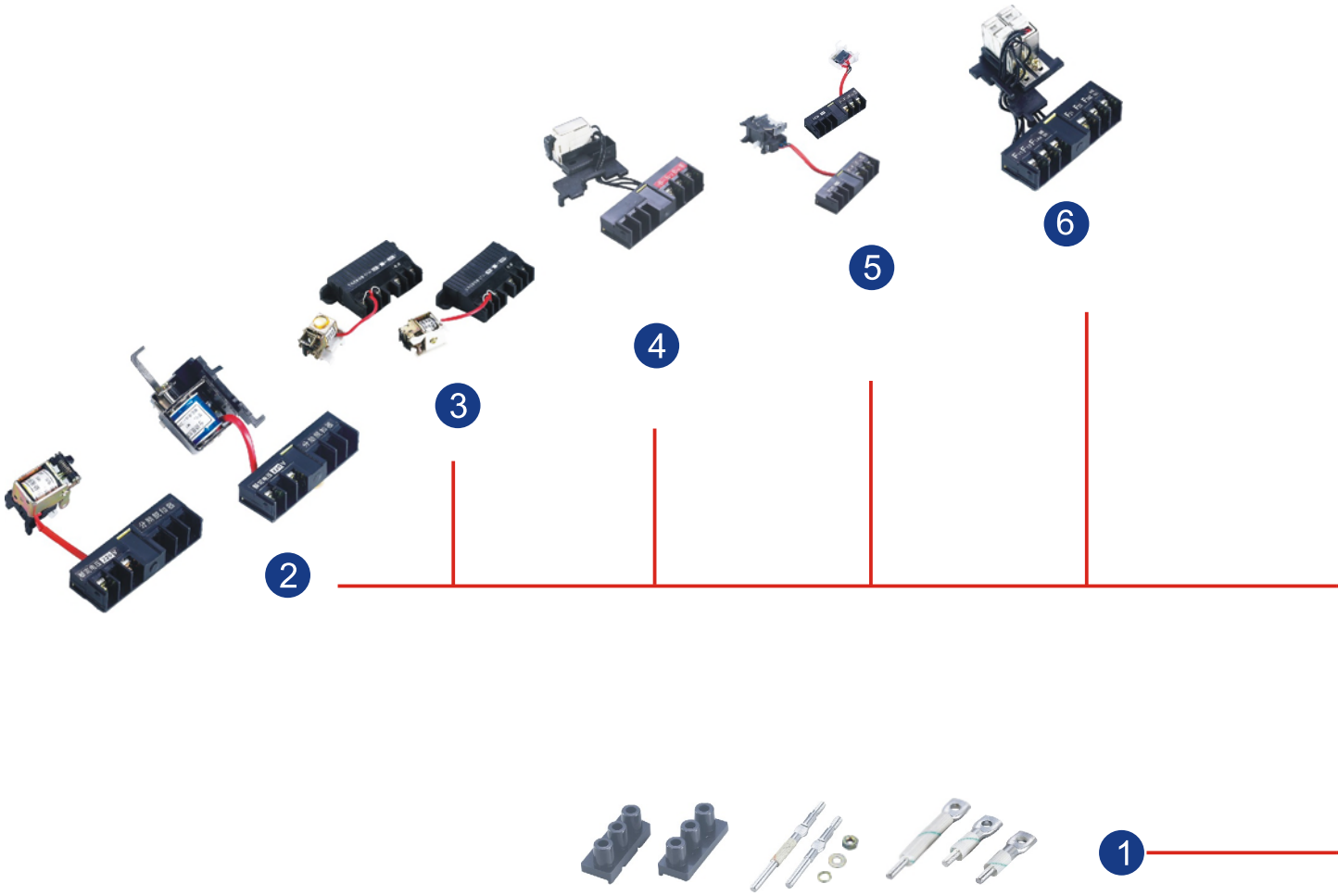
Our factory warmly welcome old&new client to discuss business on the basis of equal and mutual benefit .OEM&ODM is welcome.

TÜV CB CE ISO9001 RoHS

TURNMOONER

CONTENTS

ANNEX SYSTEM DRAWING



Product Overview

1. Rear contact
2. Shunt release
3. Under-voltage release
4. Alarm contact
5. Single auxiliary
6. Double auxiliary
7. Plug-in base
8. Motor driven operating mechanism
9. Rotary manual operating handle

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TURNMOONER
MOULDED CASE
CIRCUIT BREAKER
TM1-225L
225 A
ON
OFF
BREAKING CAPACITY
225AF at40℃
IEC947-2 EN60947-2
Ue Icu/Ics
AC500V 15/8kA
AC440V 25/13kA
AC400V 30/15kA
AC230V 50/25kA
Cat:A
Ue Max AC550V
Ui AC660V
225A

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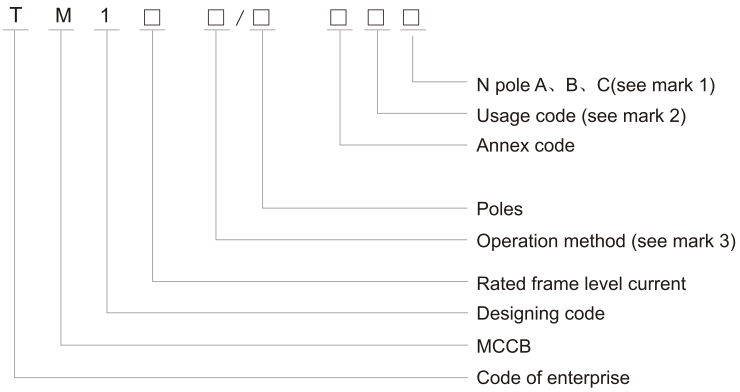
APPLICATION

- TM1 series moulded case circuit breaker (named as MCCB in the following) is a new type breaker which is applied with rated insulating voltage 800V(500V for TM1-63),rated working voltage 690V for TM1-63 and used for infrequent exchange and startup in AC(60)Hz condition. The MCCB is of protecting functioin in overloading, short-circuit, and under voltage situation to protect circuit system and power device from damage.
- The MCCB can be devided into L; M; H types according to their rated limit short-circuit breaking capacity.
- The MCCB is advantageous for its compact body,high breaking capacity (some even on flying arc),short arc-casting and superior aseismatic function.
- The MCCB has function of insulation with its mark " ⎯/⊢ "
- The product complies with IEC60947-2、GB14048.2.

TYPE CODE & SIGNIFICATION



1.N-P type from 4-P has 3 types:
A type: N-P without current tripper (normally open);
B type: N-P without current tripper working together with other 3P;
C type: N-P without current tripper working together with other 3P;
2.No code for distribution type breakers,2 for motor-protection type;
3.No-code for distribution type breakers,2 for motor-protection type;
4.It can be divided into L(common)type,M(standard)type and H(high) type.L type with connecting current equal to relevant frame level and M type with breaking capacity equaling to their frame level according to their rated limited short-circuit breaking capacity(Icu).

NORMAL WORKING SITUATION

- Altitude 2000m and below;
- Ambient temperature no higher than+40℃ (45℃ for watercraft) no less than-5℃;
- Stand moist air;
- Stand salty&oil mildew;
- Most gradient 22.5°;
- Atmosphere without corrupt&electric air and; no danger of explosion;
- Without rain effect.

TRIPPING CHARACTER

Table 1:tripping characteristic

Rated tripping current (A)	Thermal tripper(Temperature 40℃)		E-magnetic tripping current(A)	Remarks
	1.05In(cold)un-working duration (h)	1.30In(hot)un-working duration (h)		
10≤In≤63	1	1	10In×(1±20%)	Distribution type
63<In≤100	2	2	10In×(1±20%)	
100<In≤800	2	2	5In×(1±20%) 10In×(1±20%)	
10<In≤630	1.01In(cold)un-working duration (h)	1.30In(hot)un-working duration (h)	12In×(1±20%)	Motor-protection type
	2	2		

POWER LOSS

Table 2:MCCB power loss reference

Type	Current(A)	3 Pole power loss(W)		
		Back、front wiring	Plug-in front wiring	Plug-in back wiring
TM1-63(L、M)	63	20	--	24
TM1-100(L、M)	100	35	37	40
TM1-225(L、M)	225	62	66	70
TM1-250(L、M)	250	67	73	73
TM1-400(M、H)	400	115	120	125
TM1-630(M、H)	630	187	--	200
TM1-800(H)	800	262	--	--

DERATING FACTOR

Table 3: shipcraft type MCCB derating factor

Type	Derating factor（In）				
	+40℃ Shipcraft+45℃	+45℃ Shipcraft+50℃	+50℃ Shipcraft+55℃	+55℃ Shipcraft+60℃	+60℃ Shipcraft+65℃
TM1-63	1	0.94	0.88	0.81	0.74
TM1-100	1	0.96	0.91	0.85	0.78
TM1-225	1	0.94	0.94	0.9	0.86
TM1-250	1	0.94	0.94	0.9	0.86
TM1-400	1	0.95	0.89	0.82	0.75
TM1-630	1	0.94	0.88	0.82	0.76
TM1-800	1	0.94	0.87	0.8	0.72

Note：The above derating factors are got by rated frame level current

MAIN TECHNIQUE DATA OF MCCB

Mark4:MCCB main technique data reference

63A

100A

225A

Type		TM1-63L TM1-63M				TM1-100L TM1-100M				TM1-225L TM1-225M		TM1-250L TM1-250M	
Rated frame level current Inm(A)		63				100				225			
Rated current In(A)		10、12、16、20、25、32、40、50、63				16、20、25、32、40、50、63、80、100				125、160、180、200、225、(250)			
Rated insulated voltage Ui（AC V）		500				800				800			
Rated impulse-stand voltage Uimp（V）		8000				8000				8000			
Rated working voltage Ue(AC V）		400/415				400/415				400/415			
Poles		3		4		3		4		3		4	
Rated limited short-circuit breaking capacity level		L	M	L	M	L	M	L	M	L	M	L	M
Rated limited short-circuit breaking capacity Icu(KA)	400V/415V	20	30	20	30	30	50	30	50	35	50	35	50
Rated working short circuit breaking capacity Ics(KA)	400V/415V	15	22.5	15	22.5	22.5	37.5	22.5	37.5	26.25	37.5	26.25	37.5
Operation characteristic (Times)	Connected	2000				2000				1500			
	Break	10000				10000				8500			
Outlook dimension	L	135				150				165			
	W	78		103		92		122		107		142	
	H	73.5		81.5		72		88		86		103	
Weight（g）		735	849	1464	1952	1257	1493	1493	1900	1714	2014	1900	2014
Arcing distance（mm）		0、≤50				0、≤50				0、≤50			

400A

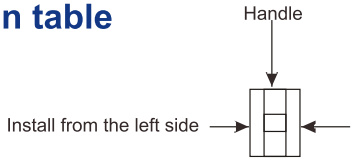
630A

800A

Type		TM1-400M TM1-400H				TM1-630M TM1-630H				TM1-800H	
Rated frame level current Inm(A)		400				630				800	
Rated current In(A)		225、250、315、350、400				400、500、630				630、700、800	
Rated insulated voltage Ui（AC V）		800				800				800	
Rated impulse-stand voltage Uimp(V)		8000				8000				8000	
Rated working voltage Ue(AC V)		400/415				400/415				400/415	
Poles		3			4	3			4	3	4
Rated limited short-circuit breaking capacity level		L	M	L	M	L	M	L	M	H	H
Rated limited short-circuit breaking capacity Icu(KA)	400V/415V	50	70	50	70	50	70	50	70	80	80
Rated working short circuit breaking capacity Ics(KA)	400V/415V	37.5	52.5	37.5	52.5	37.5	52.5	37.5	52.5	60	60
Operation characteristic (Times)	Connected	1000				1000				500	
	Break	5000				4000				3000	
Outlook dimension	L	257				270				280	
	W	150		198		182		240		210	280
	H	106.5				110				115.5	
Weight(g)		5420		7443		6116	7116	7116	9929	8526	11731
Arcing distance(mm)		0、 ≤50				0、 ≤100				0、 ≤100	

ANNEX SERIES

1.Annex code comparison table



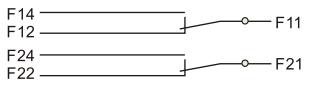
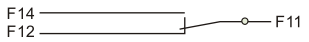
Legend:
- Single auxiliary contact
- Double auxiliary contact
- Alarming contact
- Shunt tripping device
- Under voltage tripping device

Table 4: Annex code comparison table

Annex code	Annex type	Installing position / Type / Poles	TM1-63 TM1-100		TM1-225 TM1-250		TM1-400		TM1-630		TM1-800	
			3	4	3	4	3	4	3	4	3	4
00	NO		———		———		———		———		———	
10	Shunt tripping device		●		●		●		●			●
20	Double auxiliary contact		◨		◨		◨		◨		◨	
21	Single auxiliary contact		◧		◧		◧		◧		◧	
30	Under voltage tripping device			○		○		○		○	○	
40	Shunt tripping device Double auxiliary contact		◨	●	◨	●	●	◨	●	◨	●	◨
41	Shunt tripping device Single auxiliary contact		●	◧	●	◧	●	◧	●	◧	●	◧
50	Shunt tripping device Under voltage tripping device		●	○	●	○	●	○	●	○	○	●
60	Two-component double auxiliary contact		◨	◨	◨	◨	◨	◨	◨	◨	◨	◨
61	Two-component single auxiliary contact		◧	◧	◧	◧	◧	◧	◧	◧	◧	◧
62	Double auxiliary contact Single auxiliary contact		◨	◧	◨	◧	◨	◧	◨	◧	◨	◧
70	Under voltage tripping device Double auxiliary contact		◨	○	◨	○	◨	○	◨	○	○	◨
71	Under voltage tripping device Single auxiliary contact		◧	○	◧	○	◧	○	◧	○	○	◧
08	Alarming contact		□		□		□		□		□	
18	Shunt tripping device Alarming contact		□	●	□	●	□	●	□	●	□	●
28	Double auxiliary contact Alarming contact		□	◨	□	◨	□	◨	□	◨	□	◨
38	Under-voltage tripping device Alarming contact		□	○	□	○	□	○	□	○	○	□
48	Shunt tripping device single auxiliary Alarming contact		□	●	□	●	□	●	□	●	□	●
58	Single auxiliary Alarming contact		□	◧	□	◧	□	◧	□	◧	□	◧
68	Double auxiliary contact single auxiliary Alarming contact		□	◨	□	◨	□	◨	□	◨	□	◨
78	Under voltage tripping device sigle auxiliary Alarming contact		□	○	□	○	□	○	□	○	○	□

2.Auxiliary contact

Table 5: Auxiliary contact and assemblies

In the position of "open" or "free trip" for breaker	Double auxiliary contact	
	Single auxiliary contact	
In the position of "close" for breaker	"close" turn to "disconnect" 、 "disconnect" turn to "close"	

3.Auxiliary contact technical parameter

Table 6: Auxiliary contact current parameter

Shell rated current	Conventional the mal current 1th	AC 400V rated working current
Inm≤225	3A	0.30A
Inm≥225	3A	0.40A

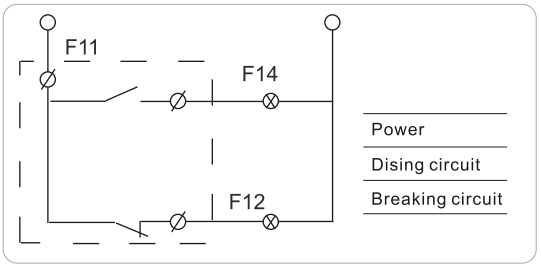
Table 7: Auxiliary contact electric life

Type of application	Connecting			Breaking			Times	Operation frequency (time/hour)	Conduction time
	I/Ie	U/Ue	cos ϕ	I/Ie	U/Ue	cos ϕ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95

Table 8: Auxiliary contact connecting and breaking capacity

Type of application	Connecting			Breaking			Times	Operation frequency (Time/hour)	Conduction time
	I/Ie	U/Ue	cos ϕ	I/Ie	U/Ue	cos ϕ			
AC-15	10	1.1	0.3	10	1.1	0.3	10	120	≥0.05s
DC-13	1.1	1.1	6Pe	1.1	1.1	6Pe			≥T0.95

4.Auxiliary contact wiring diagram



Auxiliary contact wiring diagram

5.Alarming contact

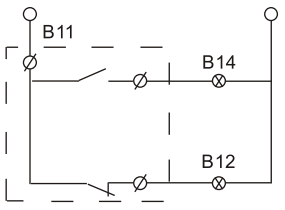
Table 9: Alarming contact and assemblies

Alarming contact Ue=220V,Ith=3A	
In the position of “on”、“off”	B14 B12 — B11
In the position of “free trip”	B14 B12 — B11

Alarming contact conventional thermal current is 3A,rated working current is 0.3A for rated working voltage AC400V

6.Alarming contact wiring diagram

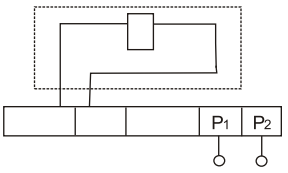
The contact will not act when breaker is in the working condition,contact will not change his original position untill breaker trip freely,it means normal open turn to close,normal closing turn to open,it will recover to original position after breaker trip again



Alarings contact wiring diagram

7.Undervoltage tripper

UVT should act reliable and push breakers to off when voltage reach 35%-70%rated supply voltage.When with less than 35% rated voltage, UVT should prevent breakers from closing,UVT ensure that breakers are closing when power supply voltage equals or surpass 85% rated voltage.



Undervoltage tripper wiring diagram

Controlling voltage: AC 50Hz 230V 400V
DC 110V 250V

P.S: Breaker can trip again and close on condition that UVT galvawize,otherwise will be broken

Table 10: Under-volt tripping instantaneous current and loss

Type	Instant current (mA)		Power consumption (w)	
	AC 400V	AC 230V	AC 400V	AC 230V
TM1-63	10	13.5	4	3.105
TM1-100	9.75	14.25	3.95	3.2275
TM1-225	10.88	14.75	4.352	3.392
TM1-400	9	11	3.6	2.53
TM1-630	8.5	11	3.4	2.53
TM1-800	5	7.25	2	1.6675

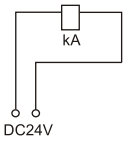
8.Shunt tripping device

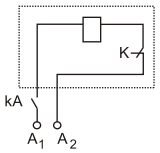
SHT is installed in A phase of breaker SHT should push breaker trip reliable at all requirements when voltage is within 70%-110% of rated controlling voltage

Controlling voltage: AC 50Hz 230V 400V
DC 24V 250V

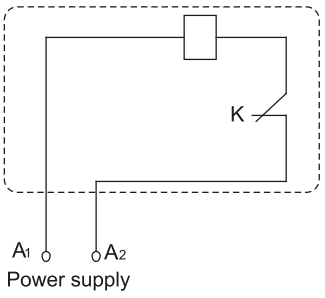
P.S:It is recommended for DC 24V controlling power to design circuit according to the right picture

KA:Means DC 24 middle relay contact current capacity 1A





Power supply

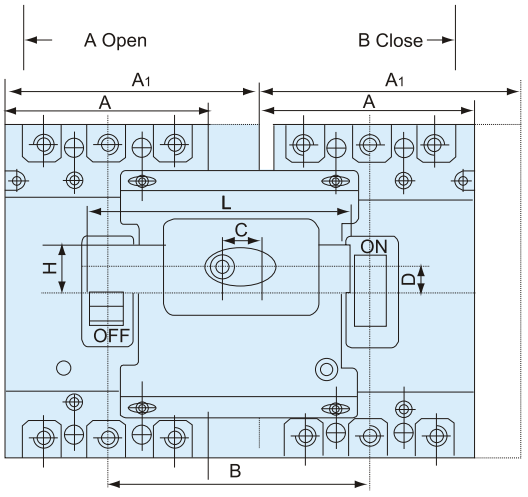


SHT diring diagram

Table 11: Shunt tripping device instantaneous current and loss

Type	Instant current (A)				Power consumption (w)			
	AC 400V	AC 230V	DC 250V	DC 24V	AC 400V	AC 230V	DC 250V	DC 24V
TM1-63	0.28	0.434	0.341	4	91.6	76.1	90.7	96.2
TM1-100	0.288	0.425	0.341	4	96.8	73	90.7	91.2
TM1-225	0.313	0.412	0.341	3.87	112	68.8	90.7	85.3
TM1-400	0.197	0.325	0.4	3.87	67	62.3	94.4	100
TM1-630	0.199	0.314	0.4	3.87	68	58.2	94.4	100
TM1-800	0.538	0.898	1.134	5.22	163	153		120

Interlock mechanism and relevent dimension picture1、marks13

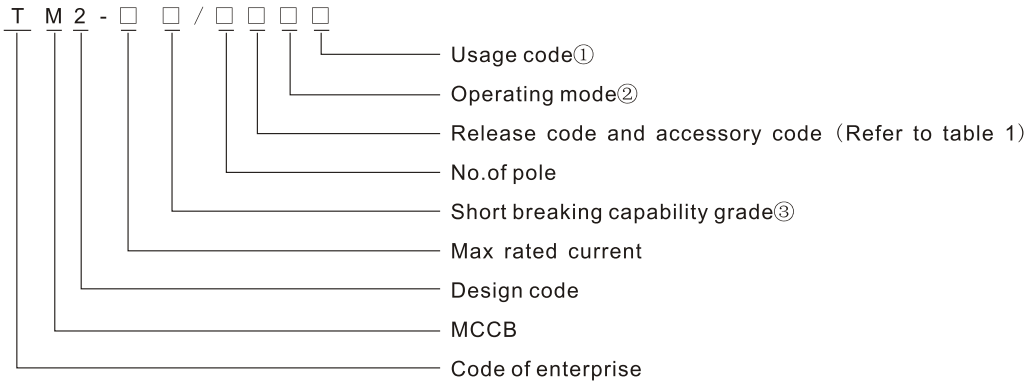


Picture1 Interlock mechanism

APPLICATION

- TM2 series moulded case circuit breader (hereinafter referred to as circuit breaker)is suitable for circuit of AC 50Hz or 60Hz, rated current 16A~630A, insulation voltage 750V, rated operating voltage 690V below , mainly used for low voltage distribution network to distribute energy and protect circuit and power device against overload, short circuit, under voltage , grounding fault and soon. By means of giving the special setting for release , it can be used as starting protection circuit breaker of motor.
- The MCCB can be devided into N;H;L types according to their rated limit short-circuit breaking capacity.
- The MCCB is advantageous for its compact body,high breaking capacity (some even on flying arc),short arc-casting and superior aseismatic function.
- The MCCB has function of insulation with its mark " ⎓ "
- The product complies with IEC60947-2、GB14048.2.

MODEL DESCRIPTION



Note:

①No code for distribution , "2" denotes motor protection;

②NO code for direct operation by handle; D denotes electric operation; Z denoes rotary handle operation;

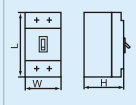
③N-Standard type; H-High breaking type; L-Current limiting type.

Table 1

Accessory name	Instantaneous release	Complex release	Electronic release
No accessory	200	300	400
Alarm contact	208	308	408
Shunt release	210	310	410
Auxiliary contact	220	320	420
Under voltage release	230	330	430
Shunt release, Auxiliary contact	240	340	440
Two groups of auxileary contacts	260	360	460
Under voltage release, Auxiliary contact	270	370	470
Shunt release, Alarm contact	218	318	418
Auxiliary contact, Alarm contact	228	328	428
Under voltage release, Alarm contact	238	338	438
Shunt release, Auxiliary contact, Alarm contact	248	348	448
Two groups of auxiliary contacts, Alarm contact	268	368	468
Under voltage release, Auxiliary contact, Alarm contact	278	378	478

MAIN TECHNIQUE DATA OF MCCB

Mark4:MCCB main technique data reference

Type		TM2-100N TM2-100H		TM2-160N TM2-160H TM2-160L			TM2-250N TM2-250H TM2-250L		
Rated frame level current Inm(A)		100		160			250		
Rated current In(A)		12.5、16、20、25、32、40、50、63、80、100		25、32、40、50、63、80、100、125、160			100、125、160、200、250		
Rated insulated voltage Ui(AC V)		690		690			690		
Rated impulse-stand voltage Uimp(V)		8000		8000			8000		
Rated working voltage Ue(AC V)		400/415		400/415			400/415		
Poles		3 / 4		3 / 4			3 / 4		
Rated limited short-circuit breaking capacity level		N	H	N	H	L	N	H	L
Rated limited short-circuit breaking capacity Icu(KA)	400V/415V	20	25	20	60	80	20	60	150
Rated working short circuit breaking capacity Ics(KA)	400V/415V	15	18.75	15	45	60	15	45	115
Operation characteristic (Times)	Connected	1500		1000			1000		
	Break	8500		7000			7000		
Outlook dimension 	L	157		157			157		
	W	105	140	105	140		105	140	
	H	88	88	88	88		88	88	
Weight（kg）		2.1	2.8	2.1	2.8		2.1	2.8	
Arcing distance（mm）		0、≤30		0、≤30			0、≤30		

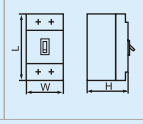
Type		TM2-400N TM2-400H TM2-400L			TM2-630N TM2-630H TM2-630L			TM2-1600N TM2-1600H	
Rated frame level current Inm(A)		400			630			1600	
Rated current In(A)		200、225、250、315、350、400			350、400、500、630			500 、630、800 、1000 、1250 、 1600	
Rated insulated voltage Ui（AC V）		690			690			690	
Rated impulse-stand voltage Uimp（V）		8000			8000			8000	
Rated working voltage Ue(AC V）		400/415			400/415			400/415	
Poles		3 / 4			3 / 4			3 / 4	
Rated limited short-circuit breaking capacity level		N	H	L	N	H	L	N	H
Rated limited short-circuit breaking capacity Icu(KA)	400V/415V	35	45	70	35	45	70	50	65
Rated working short circuit breaking capacity Ics(KA)	400V/415V	26.5	33.8	52.5	26.25	33.8	52.5	37.5	48.75
Operation characteristic (Times)	Connected	1000			1000			1000	
	Break	4000			4000			4000	
Outlook dimension 	L	255			255			370	
	W	140	185		140	185		210	280
	H	113			113			196	
Weight（kg）		8	11		8	11		17.5	23
Arcing distance（mm）		0、 ≤50			0、 ≤50			0、 ≤80	

Table 2(Continue)

Voltage class(V)		Limited breaking capability Icu(kA)Virtual value							
		TM2-800		TM2-1000		TM2-1250		TM2-1600	
		N	H	N	H	N	H	N	H
AC	380/415	50	65	50	60	50	65	50	65
	500	40	50	40	50	40	50	40	50
	660/690	25	30	25	30	25	30	25	30

Inverse time lag breaking characteristic of circuit breaker for distribution(at ambient air temperature+40℃) Table 3

Name of test current	Multiple of setting current	Conventional time(h)			Initial state
		In≤63	63A<In≤250A	In≥250A	
Convetional non-tripping current	1.05	≥1	≥2		Cold
Conventional tripping current	1.30	<1	<2		Hot
Return current characteristic	≤3.00	Returnable time			Cold
		5s	8s	12s	

Inverse time lag breaking characteristic of circuit breaker for motor protection(at ambient air temperature+40℃) Table 4

Name of test current	Multiple of rated current	Conventional time(h)	Initial state
		80A<In≤250A	
Conventional non-tripping current	1.00	≥2h	Cold
Conventional tripping current	1.20	<2h	Hot
	1.50	≤4min	Hot
	7.20	4s<Tp≤10s	Cold

Electric operating mechanism

Electric operating mechanism can be mounted on the front panel of TM2-100 and TM2-630A circuit breakers , it can realize remote opening , closing adn resetting with 2 or 3 pulses type or self -holding signal , if necessary , the circuit breaker also can realize on-site operation by means of using front panel . Each series of electric operating mechanism module is provided with only one specification that can be applicable for kinds of circuit breakers.

Insert type and with drawable type

insert type and withdrawable type:make sure the circuit breaker can be withdrawn or inserted rapidly not need contacting live element , can be used for standby outlet circuit for future extending circuit breaker or connecting wire , besides, can be applied to visual breaking.

Under voltage releasing coils and shunt releasing coils

The following circuit breakers have respective universal under voltage releasing coils(MN) and shunt releasing coils(MX)
TM2-100/TM2-630
TM2-800~1600
When the rated operating voltage steps down to 70%~35%,the under voltage release (coils) makes the circuit breaker break; when the control voltage is lower than 35% of rated operating voltage, the under voltage release(coils) can prevent circuit breaker closing ; and when the control voltage is more than 85% of rated operating voltage ,the under voltage release(coils) can make sure the circuit breaker closes reliably.

When the supply voltage is more than 70% of rated control voltage , the shunt release (coils) makes the circuit breaker trip and break reliably.

Time belay rotary handle

Time delay rotary handle The time delay rotary handle is mounted for circuit breaker on the switch cabiner , it can be operated with front rotary handle , it has three functions: O (breaking) , I (making) and tripping .

Auxiliary switch

TM2 auxiliary switch is provided with only one nodule , applicable for SNM1 full series circuit breakers , has four functions: On/Off(OF), tripping indication (SD), fault display (SDE) and grounding fault display (SDV).

Link accessory

Provided with many kinds of linking types, in cluding bare cable ,fore wire or rear wire for cable lug as well as insertion type or with drawable type wires, furthermore, there are a set of connecting accessories installed for circuit breaker rapidly.

TECHNICAL DATA AND PERFORMANCE

Model number			TMB-125B TMB-125N			TMB-160B TMB-160N			TMB-250N TMB-250S TMB-250H		
Rated current of frame size		Inm (A)	125			160			250		
Rated current		In (A)	10 12.5 16 20 25 32 40 50 63 80 100 125			32 40 50 63 80 100 125 160			125 160 200 250		
Rated insulation voltage		Ui	500V			690V			690V		
Rated operational voltage		Ue	400V/415V			400V/415V			400V/415V		
Number of poles			3 / 4			3 / 4			3 / 4		
Rated current of the N pole			=In			=In			=In		
AC400V/50Hz O-CO (Icu) Rated ultimate short-circuit breaking capacity		(KA)	20	25		25	30		35	50	65
AC400V/50Hz O-CO-CO (Ics) Rated service short-circuit breaking capacity		(KA)	15	19		19	23		35	38	49
(peak)/cos ϕ AC400V/50Hz (Icm) Rated short-circuit making capacity		(KA)	32/0.3	52.5/0.25		73.5/0.25	105/0.25		73.5/0.25	143/0.2	187/0.2
AC400V/50Hz 1s (Icw) Rated short-time withstand current		(KA)	–			–			–		
(Uimp) Rated impulse withstand voltage		(V)	6000			8000			8000		
Dielectric property		(V)	2500			3000			3000		
Endurance (times)	Total cycles		10000			8000			8000		
	Electrical endurance		1500			1000			1000		
	Mechanical endurance		8500			7000			7000		
Flashover distance		(mm)	≤50			≤50			≤100		
Over current trip unit	Heat magnetic release		■			■			■		
	Intelligent trip unit	M type	–			–			■		
		H type	–			–			■		
Utilization category	Main circuit		A			A			A/B		
	Auxiliary circuit		AC-15			AC-15			AC-15		
Outline dimensions	W (mm)	3P 4P	78 103	78 103	78 103	90 120	90 120	90 120	105 140		
	L (mm)	3P 4P	120 120	120 120	120 120	120 120	120 120	120 120	170/254 ① 170/254 ①		
	H (mm)	3P 4P	70 70	70 70	79 79	70 70	70 70	79 79	103.5 103.5		
Weight (kg)	Fixed version 3P/4P		0.92/1.3			1.2/1.6			2.7/3.5	① 4.1/5.5	
	Plug-in version 3P/4P		1.2/1.5			1.4/1.8			3.2/4.2	① 4.6/6	
	Draw-out version 3P/4P		–			–			3.6/4.6	① 5/6.4	

Technical referrence: " ① " shows data of electronic release MCCB

Model number			TMB-400N TMB-400S TMB-400H			TMB-800N TMB-800S TMB-800H			TMB-1600S TMB-1600H	
Rated current of frame size		Inm (A)	400			800			1600	
Rated current		In (A)	250 315 (350) 400			400 500 630 800			800 1000 1250 1600	
Rated insulation voltage		Ui	690V			690V			690V	
Rated operational voltage		Ue	400V/415V			400V/415V			400V/415V	
Number of poles			3 / 4			3 / 4			3	
Rated current of the N pole			=In			=In			=In	
AC400V/50Hz O-CO (Icu) Rated ultimate short-circuit breaking capacity		(KA)	35	50	65	35	50	70	50	85
AC400V/50Hz O-CO-CO (Ics) Rated service short-circuit breaking capacity		(KA)	35	37.5	48.75	35	38	53	50	42.5
(peak)/cos ϕ AC400V/50Hz (Icm) Rated short-circuit making capacity		(KA)	73.5/0.25	143/0.2	187/0.2	73.5/0.25	143/0.2	187/0.2	105/0.25	220/0.2
AC400V/50Hz 1s (Icw) Rated short-time withstand current		(KA)	5			10			20	
(Uimp) Rated impulse withstand voltage		(V)	8000			8000			8000	
Dielectric property		(V)	3000			3000			3000	
Endurance (times)	Total cycles		5000			5000			3000	
	Electrical endurance		1000			1000			500	
	Mechanical endurance		4000			4000			2500	
Flashover distance		(mm)	≤100			≤100			≤100	
Over current trip unit	Heat magnetic release		■			■			–	
	Intelligent trip unit	M type	■			■			■	
		H type	■			■			■	
Utilization category	Main circuit		A/B			A/B			B	
	Auxiliary circuit		AC-15			AC-15			AC-15	
Outline dimensions	W (mm)	3P 4P	140 184			210 280			210 280	
	L (mm)	3P 4P	254 254			268 268			406 406	
	H (mm)	3P 4P	103.5 103.5			103.5 103.5			138.5 138.5	
Weight (kg)	Fixed version 3P/4P			① 5.1/7.1			① 9.6/12.2			① 17.2/22.2
	Plug-in version 3P/4P		–	① 6.2/8.5		–	–		–	–
	Draw-out version 3P/4P			① 6.5/8.7			① 12.2/15.3			① 22/30.1

APPLICATION

The MCCB, having rated insulation voltage 500V (Inm≤160A) to 690V (Inm≥250A) is designed to be used for distribution network of having rated current 10A to 1600A, rated operational voltage 380/400V to 660/690V, intended for power distribution, protection of electrical equipments and circuits against overload, short-circuit and under voltage, and also for unfrequent switching of electric circuits in most cases. MCCB with frame rating up to and including 400A can be used for unfrequent starting, and interruption of squirrel cage motors, and for protection of motors against overload, short-circuit and under voltage.

TMB series circuit breakers can be equipped with electric accessories and mechanical accessories, such as under voltage release, shunt release, auxiliary contacts, alarm contacts, electric operating mechanism and rotary mechanical operating handle etc.

TMB series intelligent moulded case circuit breakers are equipped with electronic release with the function of protection of electric circuits and equipments not only against overload, short-circuit and under voltage, but also against earthing failure. The intelligent functions of it are: current beam indication of operation; indication of power source and self-diagnostic indication of pre-alarm and alarm for over-current failure; output of over-current signal and monitoring of circuit breaker open/ close, particularly, the intelligent trip unit is designed with interface available for remote measuring, remote adjusting, remote controlling and remote communicating between circuit breakers and computers.

TECHNICAL FEATURES

1.Complete range of current ratings which enable users to solve all protection requirements of installation.

With high short-circuit breaking capacity

(1) B — Basic type: general breaking capacity

(2) N — Ordinary type: ordinary breaking capacity

(3) S — Standard type: standard breaking capacity

(4) H — Higher breaking type: higher breaking capacity

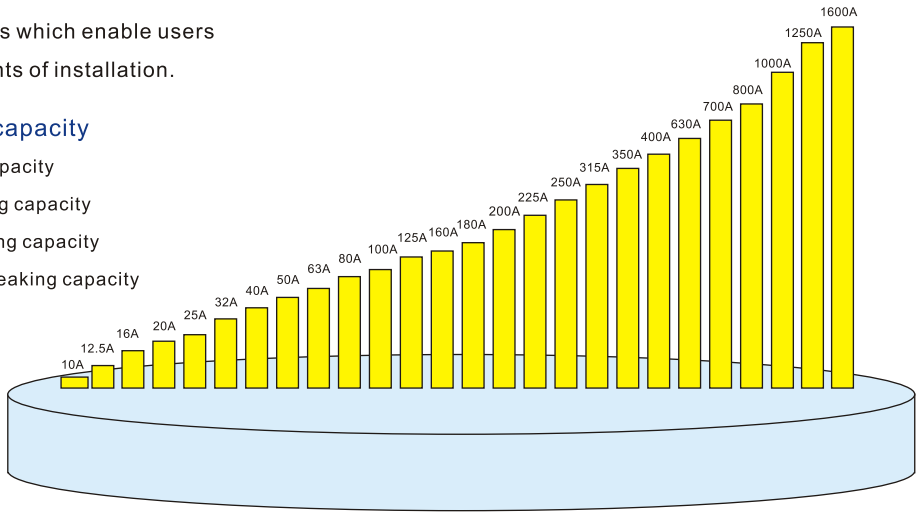


Table 1: Degree of rated ultimate short-circuit breaking capacities

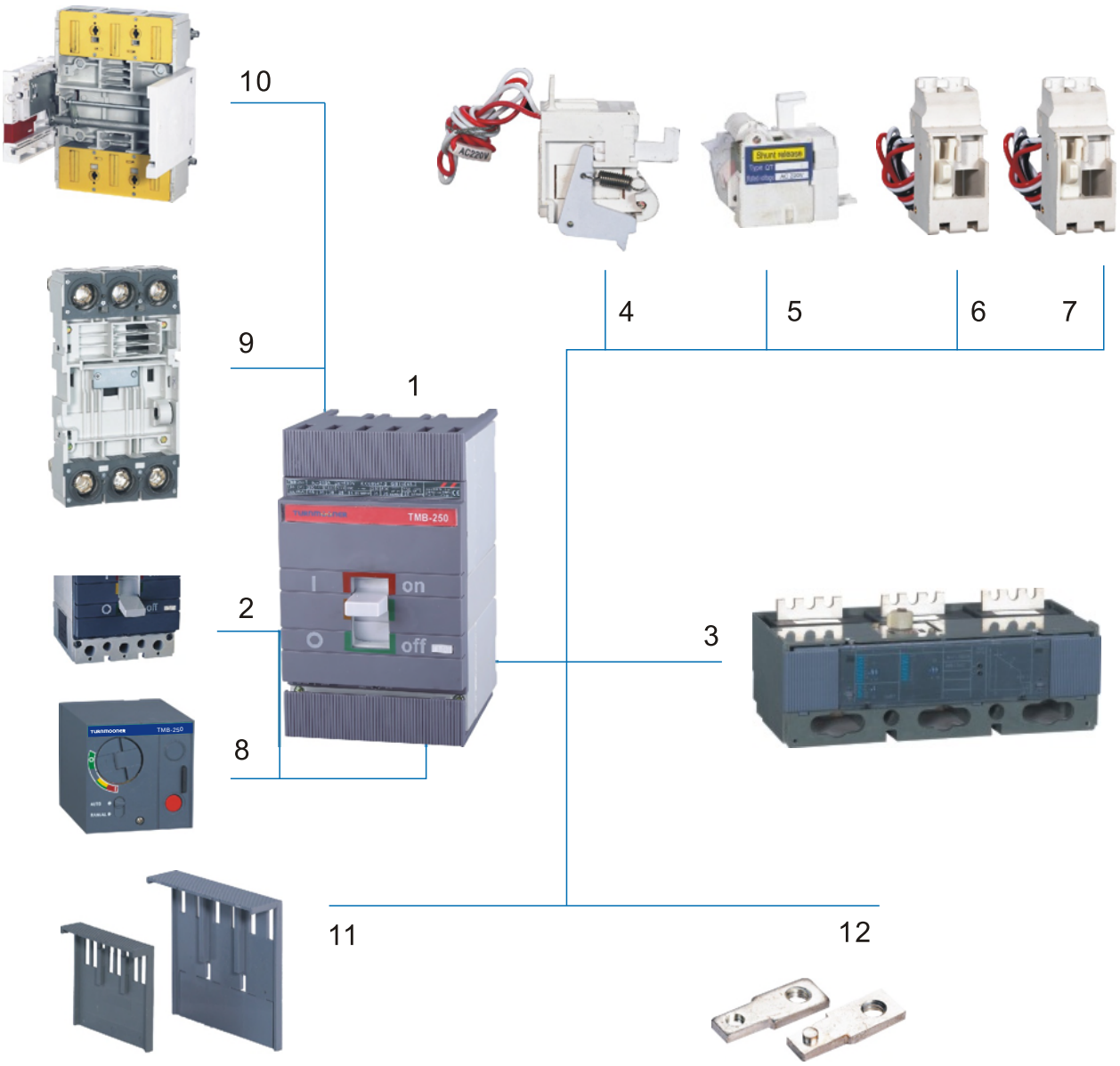
Frame rating Inm (A)	Rated ultimate short-circuit breaking capacity (Icu)							
	20KA	25KA	30KA	35KA	50KA	65KA	70KA	85KA
125A	B	N						
160A		B	N					
250A				N	S	H		
400A				N	S	H		
800A				N	S		H	
1600A					S			H

2.Modular design for entire series

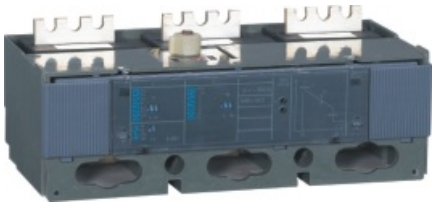
TMB series is developed with modular design in order to have a perfect structure of entire series. The circuit breaker can be assembled with various functions available for different applications, just by fitting with appropriate modular of electric accessories, mechanical accessories,electronic accessory, trip unit, socket and connection accessories.

Description

(1) Breaker
(2) Thermomagnetic release
(3) Electronic release
(4) Under voltage release
(5) Shunt release
(6) Auxiliary contacts
(7) Alarm contacts
(8) Electric operating mechanism
(9) Plug-in socket
(10) Draw-out base
(11) Arc partitions between phases
(12) Extended terminals



3.Smart



Smart electronic release

TMB series circuit breakers(Inm≥250A) are equipped with electronic release with advanced PC technology, having intelligent protection functions and communication interface, available for connection with the interface of the central computer, and suitable for measuring, remote adjusting, remote controlling and remote communicating.

4.Installation

Fixed version

Plug-in version

Draw-out version

TMB series circuit breakers are available for various installation:

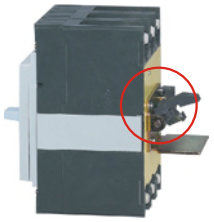
— Fixed version

— Plug-in version

— Draw-out version

5.The plug-in and draw-out versions are fitted with interlock mechanism for safer and more reliable operation.

Interlock mechanism



Interlock mechanism

For TMB series plug-in version and draw-out version circuit breakers,the interlock mechanism is designed between the breaker and plug-in base or draw-out base with following functions:

—The circuit breaker permits to close, only the breaker having been plugged in or cranked to the end.

—The breaker permits to be pulled out or cranked out from plug-in base or draw-out base, only after the circuit breaker opened.

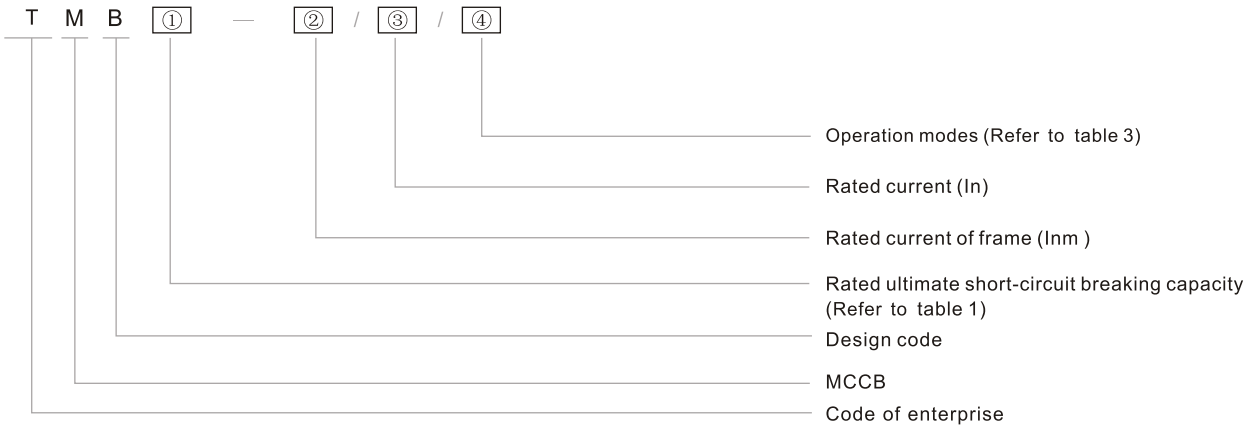
6.Various installations with fixed, plug-in and draw-out versions

Table 2: Installation versions

Frame rating Inm (A)	Installation					
	Fixed version		Plug-in version		Draw-out version	
125A	■	■	■	■	—	—
160A	■	■	■	■	—	—
250A	■	■	■	■	■	■
400A	■	■	■	■	■	■
800A	■	■	—	—	■	■
1600A	■	■	—	—	■	■

TYPE AND MEANINGS

1.Identification and its meanings of the circuit breakers



2.Operation

Table 3:Type of operation

Frame rating Inm (A)	Direct handle operation (code : non)	Electric operation (code: D)	Rotary handle operation (code: Z)
125A	■	■	■
160A	■	■	■
250A	■	■	■
400A	■	■	■
800A	■	■	■
1600A	■	■	■

3.Wiring and Mounting

Table 4:Wiring and mounting

Frame rating Inm （A）	Wiring and Mounting										
	Fixed version					Plug-in version		Draw-out version			
	Front terminals	Rear terminals			Extended front terminals	Front terminals	Screw	Front terminal	Rear terminals		
		Screw	Horizontal	Vertical					Screw	Horizontal	Vertical
125A	■	■	—	—	■	■	■	—	—	—	—
160A	■	■	—	—	■	■	■	—	—	—	—
250A	■	■	—	—	■	■	■	■	■	—	—
400A	■	■	—	—	■	■	■	■	■	■	■
800A	■	—	—	—	■	—	—	■	—	■	■
1600A	■	—	■	■	—	—	—	■	—	■	■

Note: The extended front terminal is an accessory part of busbar provided for user, which it can be supplied upon request in order.

1.Normal installation conditions

① The MCCB shall be installed in accordance with the instruction provided by the manufacturers.

② The MCCB shall be installed in the places where there shall be no explosion medium, and no corrosion, gas and dust, which will impair their insulation parts.

③ The MCCB shall be installed in the place, where there shall be no rain and snow.

④ The gradient should below 22.5° (including 22.5°).

⑤ The pollution degree is Ⅲ.

2.Degree of protection

Table 5: Degree of protection

Version of terminals		Degree of protection	Accessories
Fixed MCCB	(Extended) Front terminals	IP20	
	Screw rear terminals	IP40	With terminals cover
Plug-in and draw-out MCCB	Breaker	IP40	With terminals cover
	Fixed base	IP20	

3.Opening under overload conditions(inverse time delay)

① For power distribution

The MCCB used for power distribution is energized on all poles at the ambient air temperature +40℃.Its opening characteristics of inverse time delay without temperature compensation are shown in Table 6.

Table 6: Opening characteristics of inverse time delay for power distribution

Name of test current	Times of test current	Conventional time		Start state
		In<63A	In≥63A	
Conventional tripping current	1.05Ir1	≥1h	≥2h	Cold state
conventional non tripping current	1.30Ir1	<1h	<2h	Heat state

② For motor protection

The MCCB used for motor protection is energized on all poles at the ambient air temperature +40℃.Its opening characteristics of inverse time delay without temperature compensation are shown in Table 7.

Table 7: Opening characteristics of inverse time delay for motor protection

Name of test current	Times of test current	Conventional time	Start state
		In≤400	
Conventional tripping current	1.05Ir1	≥2h	Cold state
Conventional non tripping current	1.20Ir1	<2h	Heat state

4.Power loss of moulded case circuit breaker

Table 8: Power loss of moulded case circuit breaker

Rated current of frame size Imn	Electrified current	Three-pole total power loss					
		Fixed version		Plug-in version		Draw-out version	
		Thermo -magnetic version	Electronic version	Thermo-magnetic version	Electronic version	Thermo-magnetic version	Electronic version
125A	125A	25	—	30	—	30	—
160A	160A	30	—	40	—	40	—
250A	250A	50	40	65	55	65	55
400A	400A	135	60	165	90	165	90
800A	800A	225	135	280	190	280	190
1600A	1600A		260		360		360

ANNEX OF MCCB

1.Installation positions of accessories

Installation position of accessories

① Left side of MCCB

② Central part

③ Right side of MCCB

Table 9: Installation positions

Name of accessories	Code of accessories			Installation position		
				Left side	Central	Right side
Alarm contacts	208	308	408			Alarm
Shunt release	210	310	410	Shunt		
Alarm contacts and shunt release	218	318	418	Shunt		Alarm
Auxiliary contacts	220	320	420			Auxiliary
Auxiliary contacts and alarm contacts	228	328	428			Auxiliary+Alarm
Under voltage release	230	330	430	Under voltage		
Under voltage release and alarm contacts	238	338	438	Under voltage		Alarm
Shunt release and auxiliary contacts	240	340	440	Shunt		Auxiliary
Shunt release , auxiliary and alarm contacts	248	348	448	Shunt		Auxiliary+Alarm
Two sets of auxiliary contacts	260	360	460			Two sets of auxiliary
Two sets of auxiliary contacts and one alarm contacts （For 630A～1600A）	268	368	468			Auxiliary+Alarm
Under voltage release and auxiliary contacts	270	370	470	Under voltage		Auxiliary
Under voltage release , auxiliary and alarm contacts	278	378	478	Under voltage		Auxiliary+Alarm

2.Shunt release

Shunt release

① The shunt release is intended for remote controlling of open of MCCB

② It has three optional frame size:

• Inm 125A～160A • Inm 250A～400A • Inm 800A～1600A

Table 10: Characteristics of shunt release

Electrical accessories			Shunt release	
Range of supply voltage			(0.7-1.1) × Us	
Rated control supply voltage Us	Power supply	AC 50Hz	230V	400V
		Power loss	150VA	150VA
		DC	110V	250V
		Power loss	150W	150W

3.Under voltage release

125-160A embedded version under voltage release

50-400A under voltage release

① The under voltage release is intended for under voltage protection of circuit and electric equipment.

② The under voltage release is of the function of shunt release.

③ The under voltage release has following three frame sizes:

800-1600A under voltage release

- Imn 125A～160A
- Inm 250A～400A
- Inm 800A～1600A

Embedded version

Attached version

Table 11: Characteristics of under voltage release

Rated operational voltage Ue (V)	AC400	AC230	DC110	DC250
Operational voltage	(0.35-0.7) × Ue			
Conventional closing voltage	(0.85-1.1) × Ue			
Conventional non closing voltage	≤0.35Ue			
Power loss	10VA		4W	

4.Auxiliary contacts and alarm contacts

Auxiliary contacts and alarm contacts

- The auxiliary contacts are intended for automatical controlling of the auxiliary circuit of MCCB, such as indication of the open and close states of MCCB.
- The alarm contacts are used for alarm of open action of overload, short-circuit of over current, and under voltage of circuit and equipment.
- The following contacts can be provided for auxiliary contacts and alarm contacts:
  ① 1 N/O and 1 N/C ② 2 N/O and 2 N/C
  ③ 1 N/O and 1 N/C + 1 alarm contacts
  ④ 2 N/O and 2 N/C + 1 alarm contacts(only for 630～1600A)
- Filling three frame sizes are available for auxiliary contacts and alarm contacts:
  ① Imn 125~160A ② Imn 250~400A ③ Imn 800~1600A

Table 12: Technical data of auxiliary contacts

Rated current of frame size Imn	Conventional thermal current Ith	Rated insulation voltage Ue	Rated operational voltage Ue			
			AC400V	AC230V	DC250V	DC110V
125A	4A	AC250V	–	3A	0.14A	
160A						
250A	6A	AC400V	3.5A	6A	0.2A	
400A						
800A						
1600A						

5.Electric operation mechanism

The electric operating mechanism is used for remote close of MCCB

The types of electric operating mechanism are shown in table 13

Table 13: Types of electrical operating mechanism

Rated current of frame size Inn	Selection of types of electric operating mechanism		
	CD1	CD2	CD3
125A	–	CD2-125	–
160A	–	CD2-160	–
250A	CD1-250	–	–
400A	CD1-400	–	–
800A	–	–	CD3-800
1600A	–	–	CD3-1600

TD1 type electric operating mechanism

TD1 Electric operating mechanism

☐ Direct-acting, and manual close/open of MCCB.

☐ Equipped with emergency opening button.

☐ Customer can fit padlock on it for MCCB in open position (up to a Max of 3 padlocks with max 6 mm dia). It can be supplied with:

◇ One key and one lock for one MCCB

◇ One key and two locks for two MCCB

◇ Two keys and three locks for three MCCB

☐ Suitable for MCCB: ① Inm=125A ② Inm=160A

Table 14: Characteristics of TD1 electric operating mechanism

Electric accessories					Electric operating mechanism	
Range of supply voltage					(0.85-1.1)xUs	
Rated control supply voltage	Us	Power supply	AC 50Hz		230V	400V
			Power loss	Inrush power consumption	200VA	200VA
				Normal load	110VA	110VA
			DC		110V	250V
			Power loss	Inrush power consumption	200W	200W
				Normal load	110W	110W
Closing time					0.1s	
Opening time					0.1s	

TD2 type electric operating mechanism

TD2 Electric operating mechanism

☐ Direct-acting, and manual close/open of MCCB.

☐ Equipped with emergency opening button.

☐ Customer can fit padlock on it for MCCB in open position (up to a max of 3 padlocks with max 6 mm dia.). It can be supplied with:

◇ One key and one lock for one MCCB

◇ One key and two locks for two MCCB

◇ Two keys and three locks for three MCCB

☐ Suitable for MCCB: ① Inm=250A ② Inm=400A

Table 15: Characteristics of TD2 electrical operating mechanism

Electrical accessories					Electrical operating mechanism	
Range of supply voltage					(0.85-1.1)x Us	
Rated control supply voltage	Us	Power supply	AC 50Hz		230V	400V
			Power loss	Inrush power consumption	510VA	510VA
				Normal load	360VA	360VA
			DC		110V	250V
			Power loss	Inrush power consumption	510W	510W
				Normal load	360W	360W
Closing time					0.1s	
Opening time					0.1s	

TD1 type energy stored electrical operating mechanism

TD3 Electrical operating mechanism

☐ Spring charged by motor and/or manual

☐ Close outed by motor (close magnet) and/or manual

☐ For closing of MCCB, the procedures are:

-energy stored with spring charged by motor, then,closing MCCB

☐ Having electrical opening function

☐ Direct-acting, and manual close/open of MCCB.

☐ Equipped with emergency opening button.

☐ Customer can fit padlock on it for MCCB in open position (up to a max of 3 padlocks with max 6 mm dia). It can be supplied with:

◇ One key and one lock for one MCCB

◇ One key and two locks for two MCCB

◇ Two keys and three locks for three MCCB

☐ Suitable for MCCB: ① Inm=800A ② Inm=1600A

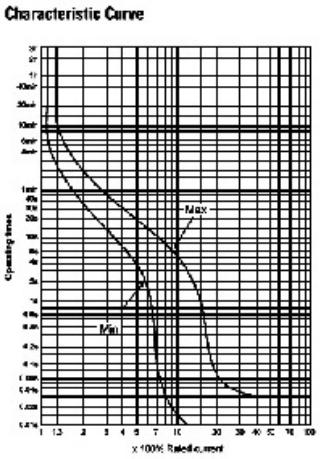
Table 16: Characteristics of TD3 electric operating mechanism

Electrical accessories					Electric operating mechanism	
Range of supply voltage					(0.85-1.1)xUs	
Rated control supply voltage	Us	Power supply	AC 50Hz		220V	380V
			Power loss	Inrush power consumption	660VA	660VA
				Normal load	180VA	180VA
			DC		110V	220V
			Power loss	Inrush power consumption	600W	600W
				Normal load	180W	180W
Closing time					0.1s	
Opening time					1.3s	

APPLICATION

TM-CS Series circuit breaker features reliable and steady performance, reasonable structure. Beautiful appearance and small volume ect. It can be used in the circuit of 50Hz or 60Hz, rated voltage up to 600V. It is used to distribute electric energy in distrbution network and overload or short circuit protection power equipment, and also can be used in transformation of circuit in frequency under the normal conditions.

Characteristic Curve



Main Technical Specifications

Type	Rated Current Of Trip(A)	Rated Insulation Voltage(v)	Mode Of Connection	On&off Capacity
TM-30CS	3,5,10,15,20,30	500	Mode After Board	AC380V/1.5KA
TM-50CS	10,15,20,30,40,50	600	Insertion Mode	AC380V/1.5KA 415V/2.5KA
TM-60CS	10,15,20,30,40,50,60	600		AC380V/1.5KA 415V/2.5KA
TM-100CS	60,75,100	600		AC380V/18KA 415V/10KA
TM-250CS	125,150,175,200,225,250	600		AC380V/18KA 415V/10KA
TM-400CS	250,300,350,400	600		AC380V/25KA 415V/25KA
TM-630CS	500,600,630	600		AC380V/35KA 415V/35KA
TM-800CS	600,700,800	600		AC380V/35KA 415V/35KA
TM-1250CS	630,700,800,1000,1250	600		AC380V/50KA 415V/35KA

APPLICATION

TM-CP moulded case circuit breaker is available in three ranges, standard, hi-break. The performance of the TM-CP range is the result of extensive design &Development-utilizing accredited test station. The current limiting action of TM-CP provides low values of let-through energy. Full information for this and time/current characteristic curves are both available on request to provide more information.

Main Technical Specifications

Type	Rated Current Of Triptrip (In A)	Pole number	(P1/P2) Ica/Ics breaking capacity(kA)			
			230	400	440	500
TM-50CP	5,10,15,20,30,40,50	3P	5/2	5/2	2.5/1	2.5/1
TM-60CP	60	3P	5/2	5/2	2.5/1	2.5/1
TM-100CP	60,75,100	3P	25/10	10/5	10/5	7/4
TM-250CP	125,150,175,200,225,250	3P	30/10	18/90	15/8	10/5
TM-400CP	250,300,350,400	3P	50/25	35/18	25/13	15/8

APPLICATION

TM-CW moulded case circuit breaker is available in three ranges, standard, hi-break. The performance of the TM-CW MCCB range is the result of extensive design & development-utilizing accredited test station. The current limiting action of TM-CW MCCBs provides low values of let-through energy. Full information for this and time/current characteristic curves are both available on request to provide more information.

Main Technical Specifications

Type	Rated Current Of Triptrip (In A)	Pole	(P1/P2) Ica/Ics breaking capacity(kA)					
			240	380	415	500	600	600
TM-30CW	3,5,10,15,20,30	2,3P	5/5	5/2.5	2.5/1.5	2.5/1.5	-	-
TM-50CW	10,20,30,40,50	3P	5/10	10/7.5	7.5/5	7.5/5	2.5/1.5	-
TM-60CW	10,20,30,40,50,60	3P	5/10	10/7.5	7.5/5	7.5/5	2.5/1.5	-
TM-100CW	60,75,100	3,4P	50/42	30/20	7.5/5	15/10	10/5	5/2.5
TM-250CW	,125,150,175,200,225,250	3,4P	50/42	30/22	25/15	18/15	15/10	5/2.5
TM-400CW	250,300,350,400	3,4P	50/42	50/35	25/20	35/25	25/18	15/10
TM-630CW	500,600,630	3,4P	85/60	50/35	50/30	35/25	25/18	15/10
TM-800CW	600,700,800	3,4P	85/60	50/35	50/30	35/25	25/18	15/10