TGM1P Series External Circuit Breaker

1 Overview

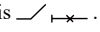
TGM1P series moulded case circuit breaker (hereafter referred to as ECB) is suitable for power distribution system. It is a mechanical switch used to make, carry, and break current under normal circuit conditions and to make and carry current for some time and break current under specified abnormal circuit for protection of lines and equipment in case of overload or short circuit of power distribution line.

This series circuit breaker has overload and short-circuit protections and motor electric operating mechanism, and there are manual and electric models available.

It is equipped with a locking system to ensure safety during maintenance and to prevent disconnection by customer.

It has a cage wiring terminal for convenient wiring by customer.

It has a threaded sealing plug and a protective cover, with a seal strip provided to prevent removal by customer without permission.

With isolation function, the corresponding symbol is  .

Standard: IEC 60947-1, IEC 60947-2, SEC Power Company Technical Specifications.

2 Type Designation

TG M 1 P – □ □

- AC: Type of control power of motor mechanism
- Frame current
- Electric motor operating Mechanism
- Design code
- Moulded case circuit breaker
- Enterprise code

3 Technical Parameters

3.1 Basic parameters of ECB

Table 1

Basic parameters					
Frame current		250	400	630	1000
Rated operating voltage Ue(V)		AC230, AC400/415V			
Rated insulation voltage Ui(V)		800	1000		
Rated impulse withstand voltage Uimp(kV)		8			
Rated frequency Hz		AC（50/60）Hz			
Rated current In(A)		125/160/200/225/250	300/400.	500/600	800/1000
Short-circuit protection setting value Ii		10In			
Rated limit short-circuit breaking capacity Icu(kA)	AC230V	25	25	65	65
	AC400V	20	20	40	40
Rated operate short-circuit breaking capacity Ics(kA)	AC230V	25	25	65	65
	AC400V	20	20	40	40
Working Environment		+55℃			

TGM1P Series External Circuit Breaker

Table 1, Continue

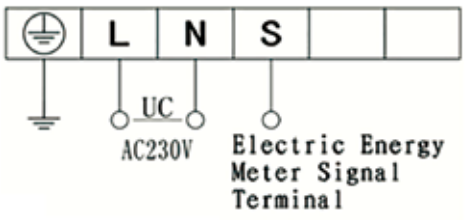
Basic parameters				
Applicable working environment temperature	-10℃ ～ +75℃			
Usage category	A			
Flashover distance (mm)	≤50	≤100	≤100	
Mechanical life (times)	7000	4000	4000	2500
Electrical life (times)	1000	1000	1000	500
Trip method	Thermal magnetic trip			
	Single magnetic trip			

3.2 Basic parameters of motor

Table 2

Model	TGM1P-250	TGM1P-400	TGM1P-630	TGM1P-1000
Rated control circuit voltage (V)	AC230V			
Starting power (W)	50	70	/	44
Normal operating power (W)	12	19	/	3

3.3 Wiring diagram of control part



① Input power voltage: AC230V.

② The meter outputs AC250V/1A signal to disconnect circuit breaker.

3.4 ECB control logic

Table 3

Operating mode	Function	Operation method	ECB state after operation	Meter relay signal status	Window indication color
For the first installation, the product is at the trip position			TRIP	NC	White
	Manual operation from trip to open	Turn the operating handle counterclockwise	OFF	NC	Green
	Manual operation from open to closed	Turn the operating handle clockwise	ON	NC	Red
	After installation, when the user's signal line is disconnected, ECB shall open if the meter signal is a closing signal.				
Manual mode	Manual operation from closed to open	Counterclockwise manual operation	OFF	NC	Green

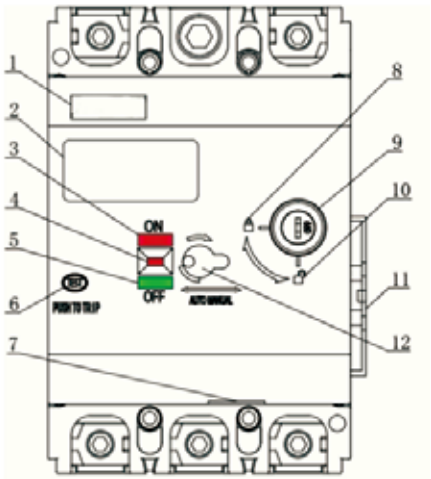
Table 3, Continue

Operating mode	Function	Operation method	ECB state after operation	Meter relay signal status	Window indication color
Manual mode	When the meter relay issues a remote closing command, ECB shall be still in the open state rather than closed state	Meter relay issues a remote closing command	OFF	NC	Green
	The intelligent meter relay command is a closing command to allow the ECB is manually operated to the closing state from the open state	Turn the operating handle clockwise	ON	NC	Red
	The intelligent meter relay issues a remote open command to open the ECB from the closed state	Meter relay issues a remote open command	OFF	NO	Green
	The intelligent meter has issued an opening command for manual closing operation at this time, and ECB shall open automatically after 5 seconds	Turn the operating handle clockwise	OFF after 5-sec (min.)	NO	Green
	The opening command issued remotely from the intelligent meter becomes a closing command, and the original opening state of ECB is unchanged	Meter relay issues a remote closing command	OFF	NC	Green
	When the meter relay signal is at the closed state, ECB will be closed automatically when the manual mode is switched to the auto mode.	Turn the manual/auto transfer switch from left to right	ON	NC	Red
	When the meter relay issues a closing signal, with a test button pressed, ECB will trip	Press the test button with a tool	TRIP	NC	White
	Remote two-step re-trip command is not allowed for closing after trip	Operate the relay to issue an open signal and then a closed signal	TRIP	NC	White
	Meter relay signal is at the open state; ECB is at the locked state from the unlock state, ECB trips	Operate #660 key	TRIP	NO	White
Auto mode	Meter relay controls auto opening state remotely	Meter relay signal becomes the open state from the closed state	OFF	NO	Green
	Manually operate for closing; at this time the intelligent meter relay is at the open state, and ECB will open automatically after 5 seconds	Turn the operating handle clockwise in the manual mode	OFF after 5-sec (min.)	NO	Green
	Meter relay will be closed remotely and automatically	Meter relay signal becomes the closed state from the open state	ON	NC	Red
	The intelligent meter remote command is a closed command, with test button pressed for tripping	Press the test button with a tool	TRIP	NC	White
	When the meter relay signal is a open/closed command, ECB is in the trip state, and a two-step remote re-trip command is issued for closing	Open remotely and then closed	ON	NC	Red
	Lock ECB for auto trip	Operate #660 key	TRIP	NO	White
Lock	Unable to manually close after locking	Unable to close successfully with a operating handle	TRIP	NO	White
	Unable to achieve remote closing after locking	Unable to close with a remote command	TRIP	NO	White
	Unable to operate the test button after locking	Unable to press the test button	TRIP	NO	White

Note: ECB opening and closing time is 15s.

TGM1P Series External Circuit Breaker

4 External Picture (for reference only, with actual product prevailed)



1. Logo 2. Sign parameter sticker palce 3. Closing indicator – Red

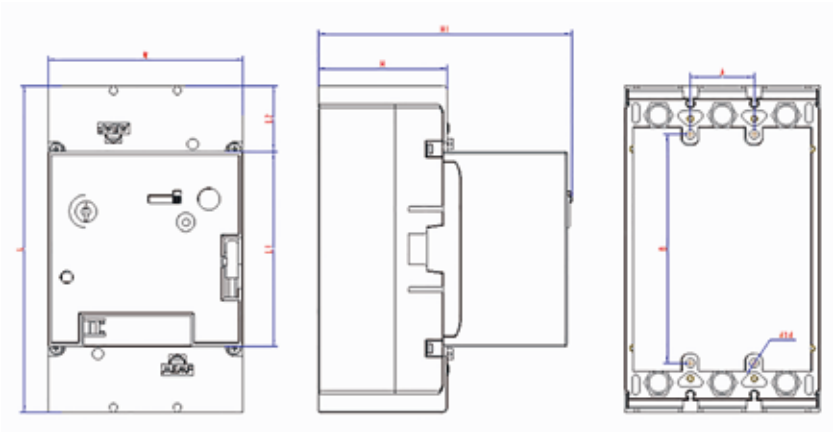
4. Opening and closing indication visual window 5. Opening indicator – Green

6. Emergency trip 7. Control power line interface Signal line ingerface 8. Disconnect lock mark

9. Lock 10. Unlock sign 11. Manual handle 12. Handle operation place

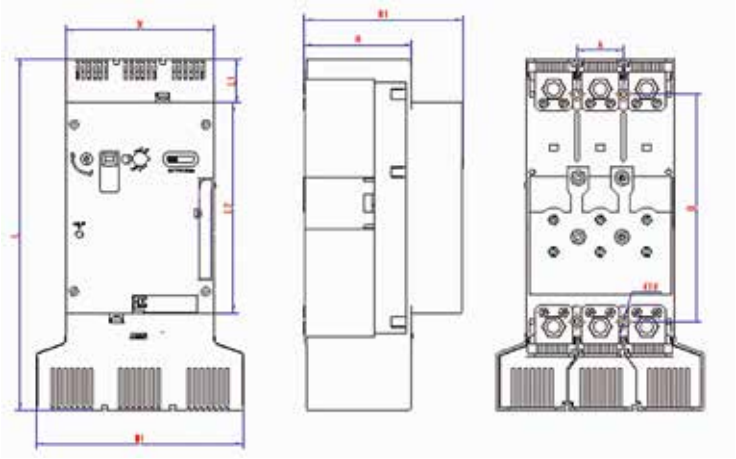
5 Outline and Installation Dimensions

5.1 Outline and installation dimensions

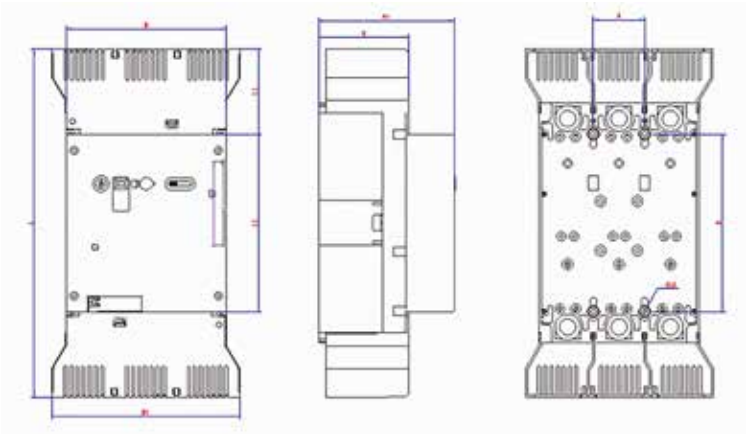


TGM1P-250

TGM1P Series External Circuit Breaker



TGM1P-400



TGM1P-630

Table 4

	Code	TGM1P-250	TGM1P-400	TGM1P-630	TGM1P-1000
Outline dimensions	W	107	140	181	210
	W1	/	196	212	238
	L	179	332.5	393	418
	L1	107	41.1	96.5	122
	L2	36	199.5	200	174
	H	71	101.6	101.5	172
	H1	139	150.3	153	103
Installation dimensions	A	35	44	58	70
	B	125.4	215	200	243
	D	5	6.5	6	8

TGM1P Series External Circuit Breaker

5.2 Section area of product connecting copper wire

Table 5

Rated current	Wire		Copper wire	
	Quantity	Section area of wire (mm^2)	Quantity	Section area of wire (mm^2)
500	2	150	2	30x5
800	2	240	2	50x5
1000	-	-	2	80x5
1600	-	-	2	100x5

6 Screw Tightening Torque

Table 6

Model	TGM1P-250	TGM1P-400	TGM1P-630	TGM1P-800	TGM1P-1000
Nominal thread diameter (mm)	M8	M10	M12	M12	
Tightening torque (N•m)	12	22	28	30	
Breaking torque (N•m)	18	26	33	33	

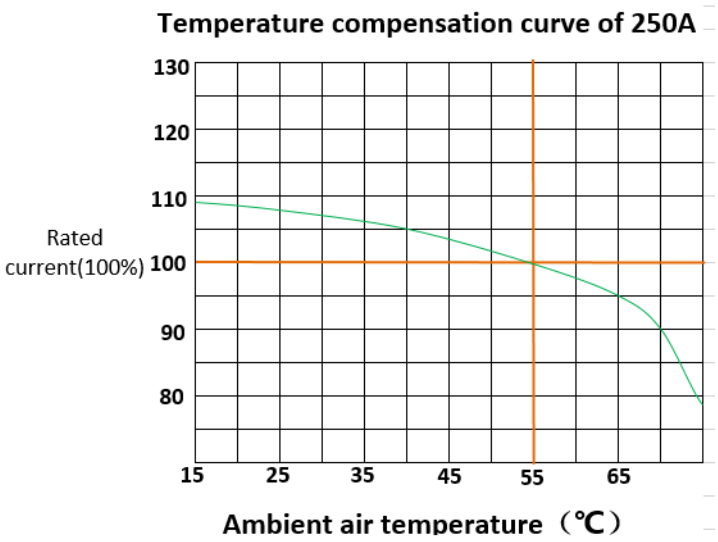
7 Screw Tightening Torque

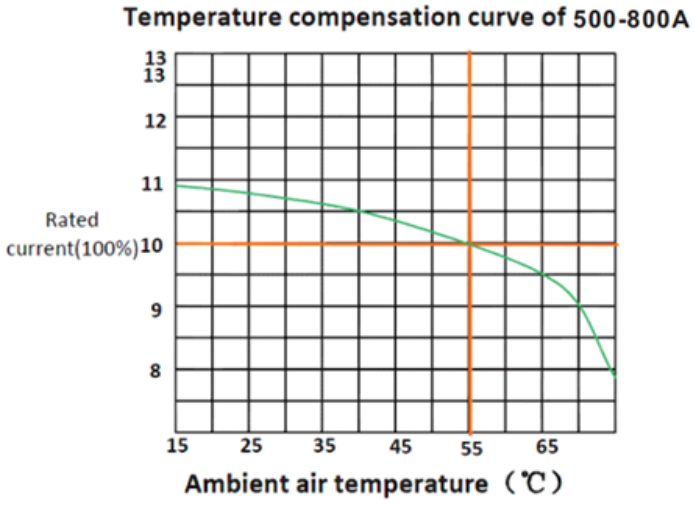
Table 7

Test current name	Setting current multiple	Convention time		Initial state
		In≤63A	In ＞ 63	
Conventional non-trip current	1.05 In	≥1h	≥2h	Cold state
Conventional trip current	1.30 In	＜ 1h	＜ 2h	Hot state

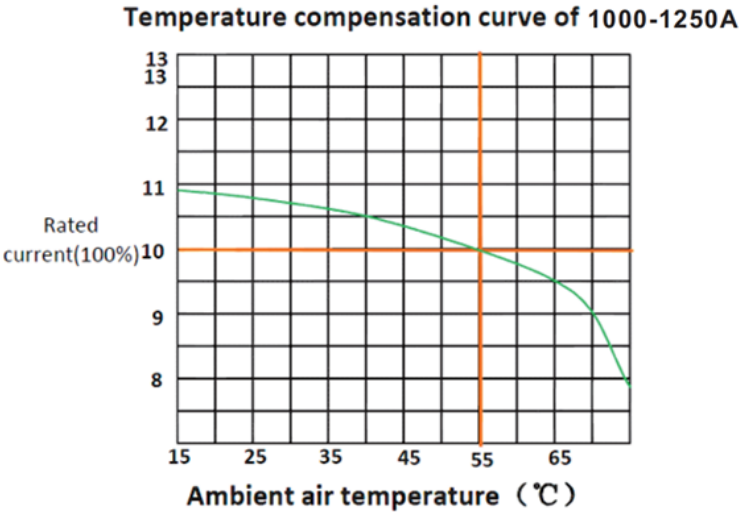
The instantaneous operation characteristic of the circuit breaker used for power distribution is set to 10In±20% (the reference ambient temperature is +55°C).

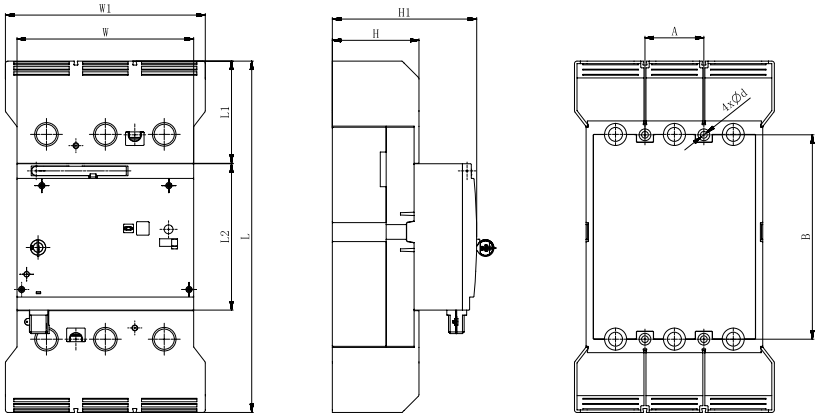
8 TGM1P Series Product Time/Current Characteristic Curve





TGM1P Series External Circuit Breaker





9 Operating Conditions

9.1 Ambient temperature: Normal operating temperature: -10℃ ~ +70℃;

9.2 Installation category: Main circuit: III; other auxiliary circuit: II.

9.3 Pollution degree: 3.

9.4 Altitude: Not exceed 2,000 meters; derating is required when greater than 2,000 meters.

9.5 Atmospheric conditions

(1) The relative humidity shall not exceed 50% at ambient temperature +40℃;

(2) A higher relative humidity is allowed at a lower temperature.

For example, up to 90% at 20℃. Special measures shall be taken for condensations caused by temperature changes.

9.6 Impact vibration

Circuit breaker passes the test specified in GB/T2423.10, and can withstand mechanical vibration with a frequency 2Hz ~ 13.2Hz and a displacement of ±1mm and with a frequency of 13.2Hz ~ 100Hz and a acceleration of ±0.7g.