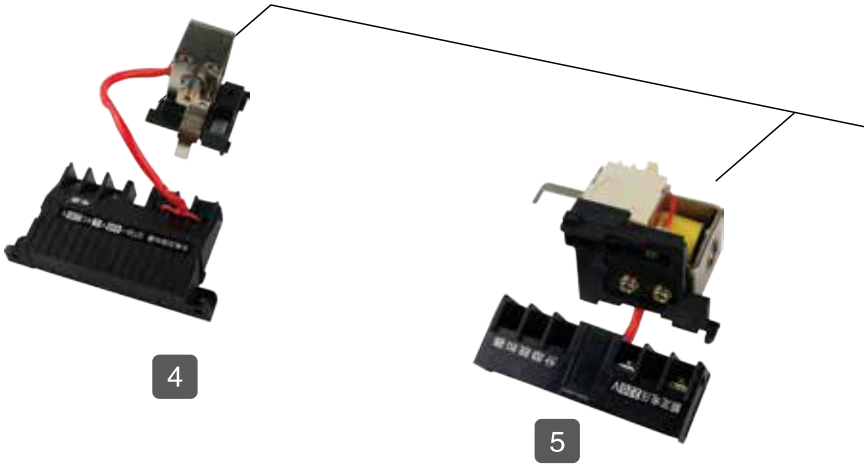
TGM1E Series Moulded Case Circuit Breaker

1. Switch body
2. Plug-in type (optional)
3. Arc isolating sheet (standard)
4. Undervoltage release (optional)
5. Shunt release (optional)
6. Alarm contact (optional)
7. Aux. contact (optional)
8. Front-panel wiring transition plate (optional)
9. Motor mechanism (optional)
10. Rotary handle operating mechanism (optional)
11. Communication shunt alarm accessory (optional)



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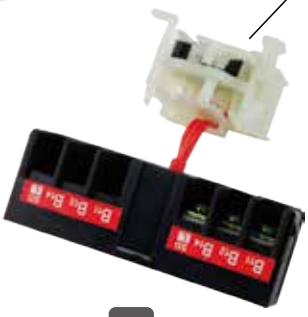

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TGM1E Series Moulded Case Circuit Breaker

1 Overview

TGM1E series moulded case circuit breaker (hereinafter referred to as circuit breaker) is one of the new circuit breakers researched and developed by our company with international advanced technology, featuring with four-stage selective protection, high breaking capacity, and small and compact structure.

Circuit breakers are divided into two categories: M type (medium breaking type) and H type (high breaking type) according to their rated limit short circuit breaking capacity (Icu), and they are ideal products for power distribution and motor protection. With its rated insulation voltage 1000V, it is used in the AC 50/60Hz circuits with the rated operating voltage 690V and below and the setting current up to 1250A for infrequent conversion of lines and infrequent start of the motor.

When the optional module with communication function is used, the original circuit breaker can be easily upgraded to a communication circuit breaker.

The circuit breaker has the functions of overload long delay, short circuit short delay, short circuit instantaneous and earthing protection, and the product can be equipped with optional accessories such as undervoltage, shunt, auxiliary, alarm and communication.

This series of circuit breakers can be installed perpendicularly (i.e. vertical installation) or horizontally (i.e. lateral installation).

It has an isolation function, and its corresponding symbol is  . Note: 3P+N has no isolation function.

It has a unique "overload alarm without trip" function to ensure the continuity of power supply.

The circuit breaker complies with the standards:

IEC/EN 60947-1 and GB/T 14048.1 Low-voltage switchgear and controlgear - Part 1: General rules.

IEC/EN 60947-2 and GB/T 14048.2 Low-voltage switchgear and controlgear - Part 2: Circuit-breakers.

2 Type Designation

TG M 1 E — □□□/□□□□ □□□□□□□□

- Special requirements
- Application code: Conventional type: No code;
- Installation method:
  - No code for fixed type front-panel;
  - B - Fixed type back-panel; C - Plug-in type;
- Accessory voltage
- Rated current
- Trip unit function code:
  - Default: Pre-alarm trip unit E1: Three-knob trip unit
  - E3: Earth trip unit E4: Neutral pole protection trip unit
- Overload alarm non-trip code:
  - Conventional: No code; III: Overload alarm non-trip;
- The code of N pole for 3N and 4P products sees (Table 1)
- Use code: No code for power distribution;
  - "2": Motor protection;
- Release type and accessory code (see Table 2)
- Code of number of poles:
  - 3 - Three-pole; 3N - Three-pole and four-wire; 4 - Four-pole;
- Operation mode code:
  - Direct operation via handle: No code;
  - "P": Motor operation;
  - "Z": Operation via rotary handle;
- Short-circuit breaking capability level:
  - M type - Medium breaking type; H type - High breaking type;
- Frame rated current
- Electronic type
- Design code
- Moudled case circuit breaker
- Enterprise code

TGM1E Series Moulded Case Circuit Breaker

Table 1

Code	Description	Example
A	N pole is not equipped with an overcurrent trip element, the N pole is always on, and is open and closed not together with other three poles	3N300A
B	N pole is not equipped with an overcurrent trip element, and the N pole is open and closed together with other three poles (N pole is closed and then open)	4300B
C	N pole is equipped with an overcurrent trip element, and the N pole is open and closed together with other three poles (N pole is closed and then open)	4300C
D	N pole is equipped with an overcurrent trip element, the N pole is always on, and is open and closed not together with other three poles	3N300D

Note: No code for 3-pole product; A and D type: 3N; B and C type: 4P.

3 Operating Conditions

3.1 The ambient air temperature is ranged -5°C ~ +40°C;

3.2 The relative humidity of the air at the installation site does not exceed 50% at a maximum temperature of +40°C, and a higher relative humidity is allowed at low temperatures, such as up to 90% at 20°C. Special measures should be taken for condensation occurred occasionally due to temperature changes;

3.3 The pollution degree is Level 3;

3.4 The circuit breaker can withstand the mechanical vibration of the tolerable frequency 2Hz~13.2Hz, the displacement of ±1mm, the frequency 13.2Hz~100Hz, and the acceleration of ±0.7g according to the GB/T2423.10 test requirements;

3.5 The installation category of main circuit of the circuit breaker is Class III, and of other aux. circuits and control circuit is Class II.

3.6 The circuit breaker is suitable for electromagnetic environment B;

3.7 The circuit breaker shall be installed in a place where there is no explosion hazard and no conductive dust without causing metal corrosion and insulation damage;

3.8 The circuit breaker should be installed in a place where there is no rain or snow attacks;

3.9 Operation conditions:
3.9.1 The circuit breaker passes the tests of GB/T 2423.1 and GB/T2423.2, and the ambient air temperature can be as low as -30°C and as high as +70°C (the derating is required if above +40°C; for detailed information, refer to the technical data in this Catalogue);
3.9.2 The characteristics are not affected at altitude up to 2000m (derating is required if more than 2000m; for detailed information, refer to the technical data in this Catalogue);
3.9.3 Storage conditions: The ambient air temperature is -40°C ~+75°C.

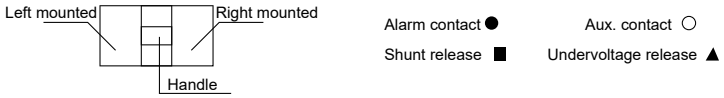
3.10 The protection grade of the product body is IP20.

3.11 Cabinet door installation
With a toggle handle: The protection grade is IP40
With a rotary handle: The protection grade is IP50
With a motor mechanism: The protection grade is IP40

TGM1E Series Moulded Case Circuit Breaker

4 Release Type and Accessory Code

Release type and accessory code



	Accessory code	Accessory installation and lead mode					
Accessory name	Electronic release	TGM1E-125/160		TGM1E-250/320		TGM1E-400 TGM1E-630 TGM1E-630 Large size TGM1E-800 TGM1E-1250	
No accessory	300						
Alarm contact	308						
Shunt release	310						
Aux. contact	320						
Undervoltage release	330						
Shunt release Aux. contact	340						
Shunt release Undervoltage release	350						
Two sets of aux. contacts	360						
Aux. contact Undervoltage release	370						
Shunt release Alarm contact	318						
Aux. contact Alarm contact	328						
Undervoltage release Alarm contact	338						
Shunt release Aux. contact Alarm contact	348						
Two sets of aux. contacts Alarm contact	368						
Undervoltage release Aux. contact Alarm contact	378						

TGM1E Series Moulded Case Circuit Breaker

5 Technical Parameters

5.1 The technical parameters refer to Table 3 and Table 4

Table 3

Basic informaiton									
Frame rated current		125		160		250		320	
Number of poles		3P, 3P+N, 4P		3P, 3P+N, 4P		3P, 3P+N, 4P		3P, 3P+N, 4P	
Frequency (Hz)		50/60		50/60		50/60		50/60	
Rated operating voltage Ue (V)		380/400/415 660/690		380/400/415 660/690		380/400/415 660/690		380/400/415 660/690	
Rated insulation voltage Ui (V)		1000		1000		1000		1000	
Rated impulse withstand voltage Uimp (kV)		8		8		8		8	
Rated operating current In (A)		32AF:12.5-32 63AF:25-63 125AF:50-125		63AF:25-63 125AF:50-125 160AF:63-160		250AF:100-250		320AF:125-320	
Breaking capacity level		M	H	M	H	M	H	M	H
Rated limit short circuit breaking capacity Icu (kA)	AC415V	50	85	50	85	50	85	50	85
	AC690V	10	20	10	20	10	20	10	20
Rated operation short circuit breaking capacity Ics (kA)	AC415V	50	50	50	50	50	50	50	50
	AC690V	10	10	10	10	10	10	10	10
Rated short time withstand current Icw (kA/1s)	AC415V	2	2	2.5	2.5	3	3	4	4
Isolation function		Yes (3P, 4P)		Yes (3P, 4P)		Yes (3P, 4P)		Yes (3P, 4P)	
Use category		Class A		Class A		Class A		Class A	
Flashover distance (mm)		≤50		≤50		≤50		≤50	
Mechanical life (times)	Maintenance-free	20000		20000		20000		20000	
	With maintenance	40000		40000		40000		40000	
Electrical life (times)		10000		10000		10000		10000	
Protection function information									
Overload long delay protection		■(Standard)		■(Standard)		■(Standard)		■(Standard)	
Short circuit short delay protection		■(Standard)		■(Standard)		■(Standard)		■(Standard)	
Short circuit instantaneous protection		■(Standard)		■(Standard)		■(Standard)		■(Standard)	
Earthing protection		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Neutral pole protection		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Other function informaiton									
Communicaiton function		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Overload alarm without trip		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Run LED indicator		■(Standard)		■(Standard)		■(Standard)		■(Standard)	
Pre-warm LED indicator		■(Standard)		■(Standard)		■(Standard)		■(Standard)	
Warm LED indicator		■(Standard)		■(Standard)		■(Standard)		■(Standard)	
Accessory information									
Direct operation via handle		■(Standard)		■(Standard)		■(Standard)		■(Standard)	
Extended rotary handle		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Motor mechanism		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Shunt release		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Undervoltage release		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Aux. contact		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Alarm contact		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Fixed type front-panel		■(Standard)		■(Standard)		■(Standard)		■(Standard)	
Fixed type back-panel		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Plug-in type front-panel (not available for 4P product)		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Plug-in type back-panel		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Front-panel wiring transition plate		□(Optional)		□(Optional)		□(Optional)		□(Optional)	
Arc isolating sheet		■(Standard)		■(Standard)		■(Standard)		■(Standard)	
Converter		□(Optional)		□(Optional)		□(Optional)		□(Optional)	

TGM1E Series Moulded Case Circuit Breaker

Table 4

Basic informaiton								
Frame rated current		400		630/630 Large size		800		1250
Number of poles		3P, 3P+N, 4P		3P, 3P+N, 4P		3P, 3P+N, 4P		3P, 4P
Frequency (Hz)		50/60		50/60		50/60		50/60
Rated operating voltage Ue (V)		380/400/415 660/690		380/400/415 660/690		380/400/415 660/690		400/690
Rated insulation voltage Ui (V)		1000		1000		1000		1000
Rated impulse withstand voltage Uimp (kV)		12		12		12		8
Rated operating current In (A)		400AF:160-400		630AF:250-630		630AF:250-630 800AF:315-800		1000AF:630-1000 1250AF:850-1250
Breaking capacity level		M	H	M	H	M	H	M
Rated limit short circuit breaking capacity Icu (kA)	AC415V	70	100	70	100	70	100	65(AC400V)
	AC690V	20	30	20	30	20	30	20
Rated operation short circuit breaking capacity Ics (kA)	AC415V	70	70	70	70	70	70	50(AC400V)
	AC690V	20	20	20	20	20	20	10
Rated short time withstand current Icw (kA/1s)	AC415V	10	10	10	10	10	10	20(AC400V)
Isolation function		Yes (3P, 4P)		Yes (3P, 4P)		Yes (3P, 4P)		Yes (3P, 4P)
Use category		Class B		Class B		Class B		Class B
Flashover distance (mm)		≤100		≤100		≤100		≤100
Mechanical life (times)	Maintenance-free	10000		10000		8000		8000
	With maintenance	20000		20000		10000		10000
Electrical life (times)		8000		8000		7500		5000
Protection function information								
Overload long delay protection		■(Standard)		■(Standard)		■(Standard)		■(Standard)
Short circuit short delay protection		■(Standard)		■(Standard)		■(Standard)		■(Standard)
Short circuit instantaneous protection		■(Standard)		■(Standard)		■(Standard)		■(Standard)
Earthing protection		□(Optional)		□(Optional)		□(Optional)		□(Optional)
Neutral pole protection		□(Optional)		□(Optional)		□(Optional)		□(Optional)
Other function informaiton								
Communicaiton function		□(Optional)		□(Optional)		□(Optional)		□(Optional)
Overload alarm without trip		□(Optional)		□(Optional)		□(Optional)		□(Optional)
Run LED indicator		■(Standard)		■(Standard)		□(Optional)		□(Optional)
Pre-warm LED indicator		■(Standard)		■(Standard)		■(Standard)		■(Standard)
Warm LED indicator		■(Standard)		■(Standard)		■(Standard)		■(Standard)
Accessory information								
Direct operation via handle		■(Standard)		■(Standard)		■(Standard)		■(Standard)
Extended rotary handle		□(Optional)		□(Optional)		□(Optional)		□(Optional)
Motor mechanism		□(Optional)		□(Optional)		□(Optional)		□(Optional)
Shunt release		□(Optional)		□(Optional)		□(Optional)		□(Optional)
Undervoltage release		□(Optional)		□(Optional)		□(Optional)		□(Optional)
Aux. contact		□(Optional)		□(Optional)		□(Optional)		□(Optional)
Alarm contact		□(Optional)		□(Optional)		□(Optional)		□(Optional)
Fixed type front-panel		■(Standard)		■(Standard)		■(Standard)		■(Standard)
Fixed type back-panel		□(Optional)		□(Optional)		□(Optional)		/
Plug-in type front-panel (not available for 4P product)		□(Optional)		□(Optional)		□(Optional)		/
Plug-in type back-panel		□(Optional)		□(Optional)		□(Optional)		/
Front-panel wiring transition plate		□(Optional)		□(Optional)		□(Optional)		/
Arc isolating sheet		■(Standard)		■(Standard)		■(Standard)		■(Standard)
Converter		□(Optional)		□(Optional)		/		/

5.2 The type of application is power distribution

There is no protection code for the power distribution type TGM1E circuit breaker by default, and it has the functions of overload long delay + short circuit short delay + short circuit instantaneous protection. For example, the selected model is TGM1E - 125M/3300.

Table 5

Electronic release	Frame rated current Inm (A)	Rated current In (A)	Current setting value of the adjustable overload release I_R (A)	Trip characteristics/ time
Overload long delay	125	32	12.5-14-16-18-20-22-25-28-30-32	Operation according to I^2t $1.05I_R$: No operation within 2h $1.3I_R$: Operation within 1h Inm<400A $2I_R$: t_R=(12-60-80-100) Inm≥400A $2I_R$:t_R=(12-60-100-150)s Characteristic curve $T=(2*I_R/I)^2*t_R$ ($1.2I_R$≤I<Isd)
		63	25-28-32-36-40-45-50-56-60-63	
		125	50-56-63-70-75-80-90-100-110-125	
	160	63	25-28-32-36-40-45-50-56-60-63	
		125	50-56-63-70-75-80-90-100-110-125	
		160	63-70-80-90-100-110-125-140-150-160	
	250	250	100-110-125-140-150-160-180-200-225-250	
	320	320	125-140-160-180-200-225-250-280-300-320	
	400	400	160-180-200-225-250-280-315-350-375-400	
	630/630 Large size	630	250-280-315-350-375-400-450-500-560-630	
	800	630	250-280-315-350-375-400-450-500-560-630	
		800	315-350-400-450-500-560-630-700-760-800	
	1250	1000	630-680-700-750-800-850-900-950-1000	$2I_R$: t_R=(8-12-16-24-32-48-64-96-128-256)
		1250	850-900-950-1000-1050-1100-1150-1200-1250	$2I_R$: t_R=(8-12-16-24-32-48-64-96-128)
Operation error				±20%

5.3 The type of application is motor protection

The protection code of the motor protection type TGM1E circuit breaker is 2, and it has the functions of overload long delay + short circuit short delay + short circuit instantaneous protection. For example, the selected model is TGM1E-125M/33002.

Table 6

Electronic release	Frame rated current Inm (A)	Rated current In (A)	Current setting value of the adjustable overload release I_R (A)	Trip characteristics/ time
Overload long delay	125	32	12.5-14-16-18-20-22-25-28-30-32	Operation according to I^2t (see Table 7)
		63	25-28-32-36-40-45-50-56-60-63	
		125	50-56-63-70-75-80-90-100-110-125	
	160	63	25-28-32-36-40-45-50-56-60-63	
		125	50-56-63-70-75-80-90-100-110-125	
		160	63-70-80-90-100-110-125-140-150-160	
	250	250	100-110-125-140-150-160-180-200-225-250	
	320	320	125-140-160-180-200-225-250-280-300-320	
	400	400	160-180-200-225-250-280-315-350-375-400	Operation according to I^2t (see Table 8)
	630/630 Large size	630	250-280-315-350-375-400-450-500-560-630	
	800	630	250-280-315-350-375-400-450-500-560-630	
		800	315-350-400-450-500-560-630-700-760-800	
	1250	1000	630-680-700-750-800-850-900-950-1000	
		1250	850-900-950-1000-1050-1100-1150-1200-1250	
Operation error				±20%

Table 7

$1.05I_R$	No operation within 2h			
$1.2I_R$	Operation within 1h			
$1.5I_R$	21.3s	107s	142s	178s
$2I_R$	12s	60s	80s	100s
$7.2I_R$	0.93s	4.63s	6.17s	7.72s
Trip level	/	10A	10	20

Table 8

$1.05I_R$	No operation within 2h			
$1.2I_R$	Operation within 1h			
$1.5I_R$	21.3s	107s	178s	267s
$2I_R$	12s	60s	100s	150s
$7.2I_R$	0.93s	4.63s	7.72s	11.6s
Trip level	/	10	20	30

TGM1E Series Moulded Case Circuit Breaker

5.4 Short Circuit Short Delay Protection

Table 9

Electronic release	Frame rated current Inm (A)	Rated current In (A)	Current setting value of the adjustable short circuit short delay release I_{sd} (A)	Trip characteristics/time
Short circuit short delay	Full series	32-800	I_{sd}=(2-2.5-3-4-5-6-7-8-10-12)×I_R+OFF	When I_{sd}≤I<1.5I_{sd}, the inverse time limit operation error is ±20% Characteristic curve T=(1.5×I_{sd}/I)^2×t_{sd} When 1.5I_{sd}≤I<Ii, there is definite time limit operation t_{sd}=0.06s±0.02s; t_{sd}=0.1s±0.03s; t_{sd}=0.2s±0.04s; t_{sd}=0.3s±0.06s
		1000-1250	I_{sd}=(2-3-4-5-6-7-8-10-12)×I_R+OFF	When I_{sd}≤I<1.5I_{sd}, the inverse time limit operation error is ±20% Characteristic curve T=(1.5×I_{sd}/I)^2×t_{sd} When 1.5I_{sd}≤I<Ii, there is definite time limit operation t_{sd}=0.05s±0.02s; t_{sd}=0.1s±0.03s; t_{sd}=0.15s±0.03s; t_{sd}=0.2s±0.04s; t_{sd}=0.3s±0.06s

5.5 Short Circuit Instantaneous Protection

Table 10

Electronic release	Frame rated current Inm (A)	Rated current In (A)	Current setting value of the adjustable short circuit instantaneous release I_i (A)	Trip characteristics/time
Short circuit instantaneous	Full series	32-800	I_i=(4-6-7-8-10-11-12-13-14)×I_R+OFF	When I≤0.85I_i, there is no operation; When I≥1.15I_i, the operation time is < 0.08s.
		1000-1250	I_i=(4-6-7-8-9-10-11-12-14)×I_R+OFF	
Operation error				±15%

5.6 Neutral Pole Protection

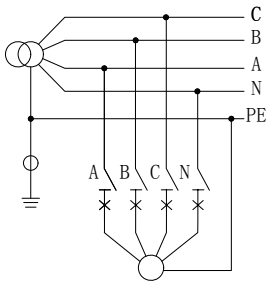
Table 11

Electronic release	Frame rated current Inm (A)	Rated current In (A)	Current setting value of the adjustable neutral pole protection release I_g (A)	Trip characteristics/time
Neutral pole protection	Full series	32-1250	I_{RN}=(0.5-1)×I_R+OFF	Inm<400A 2I_{RN}: t_{RN}=(12-60-80-100) Inm≥400A 2I_{RN}: t_{RN}=(12-60-100-150)s Characteristic curve T= (2*I_{RN}/I)^2*t_{RN} (1.2I_{RN}≤I<Isd)
Operation error				±15%

5.7 Earthing Protection

Table 12

Electronic release	Frame rated current Inm (A)	Rated current In (A)	Current setting value of the adjustable earthing protection release I_g (A)	Trip characteristics/time
Earthing protection	Full series	32-800	I_g=(0.7-0.75-0.8-0.85-0.9-0.95-1)×I_R+OFF	When I≤1I_g, there is no operation; when I≥1.1I_g, there is operation at t_g=(0.1-0.2-0.3-0.4)s
		1000-1250	I_g=(0.6-0.65-0.7-0.75-0.8-0.85-0.9-0.95-1)×I_R+OFF	
Operation error				±15%



1. For TN-S system only
2. The earthing protection is used to balance the load. For unbalanced loads, this function shall be disabled or the fixed value is set above the allowable unbalanced current

5.8 Overload pre-warm

Table 13

Electronic release	Frame rated current Inm (A)	Rated current In (A)	Current setting value of the adjustable overload pre-warm protection release I_P (A)	Trip characteristics/ time
Overload pre-alarm	Full series	32-800	I_p=(0.7-0.75-0.8-0.85-0.9-0.95-1)×I_R+OFF	/
		1000-1250	I_p=(0.6-0.65-0.7-0.75-0.8-0.85-0.9-0.95-1)×I_R+OFF	

6 Electronic Release

6.1 Indicator State Interpretation

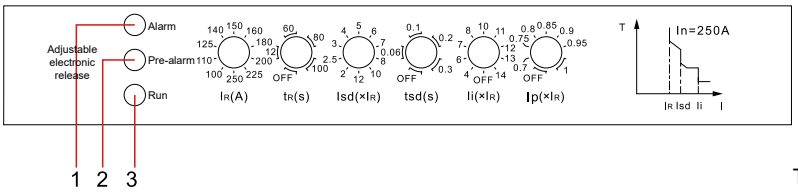


Table 14

	Indicator description	Indicator operation state description
1	Alarm LED indicator (red)	When I > 1.05I_R, the overload alarm indicator is on; when I ≤ 1.0 I_R, the overload alarm indicator is not on;
2	Pre-alarm LED indicator (yellow)	When I > 1.1I_p, the pre-alarm indicator is on; when I ≤ 0.9 I_p, the pre-alarm indicator is not on;
3	Operation LED indicator (green)	When I > 0.4I_n, the operation indicator will flacker (flacker once per second)

6.2 Three-Knob Intelligent Trip Unit (E1 Type)

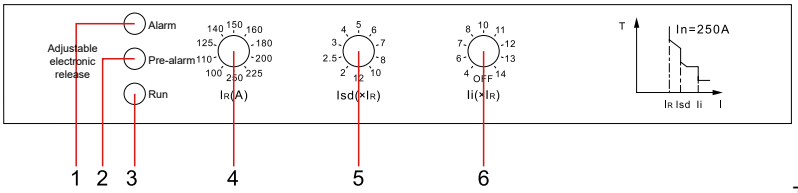


Table 15

Three-knob intelligent trip unit information		
1	Alarm LED indicator	Default parameters 1. The default setting value of the overload long delay time is t_R=60s 2. The default setting value of the short circuit short delay time is t_{sd}=0.3s 3. The default setting value of the overload pre-alarm current is I_p=0.9×I_R
2	Pre-alarm LED indicator	
3	Operation LED indicator	
4	Overload long delay current setting value I_R(A)	
5	Short circuit short delay current setting value I_{sd}(A)	
6	Short circuit instantaneous current setting value I_i(A)	

TGM1E Series Moulded Case Circuit Breaker

6.3 Pre-Alarm Type Intelligent Trip Unit (General)

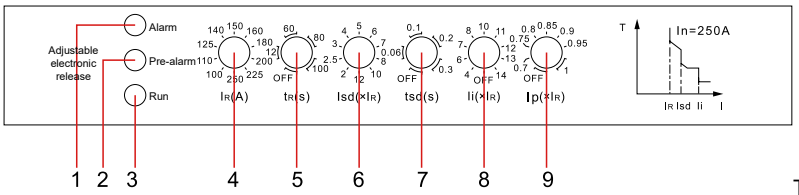


Table 16

Six-knob intelligent trip unit information		
1	Alarm LED indicator	Default parameters See Table 33
2	Pre-alarm LED indicator	
3	Operation LED indicator	
4	Overload long delay current setting value I_R(A)	
5	Overload long delay time setting value t_R(s)	
6	Short circuit short delay current setting value I_{sd}(A)	
7	Short circuit short delay time setting value t_{sd}(s)	
8	Short circuit instantaneous current setting value I_i(A)	
9	Overload pre-alarm current setting value I_p(A)	

6.4 Earthed Type Intelligent Trip Unit (E3 Type)

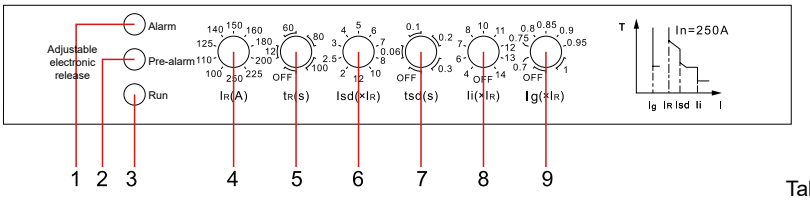


Table 17

Six-knob intelligent trip unit information		
1	Alarm LED indicator	Default parameters 1. The earthing protection time setting value is t_g=0.4s 2. The default setting value of the overload pre-alarm current is I_p=0.9×I_R
2	Pre-alarm LED indicator	
3	Operation LED indicator	
4	Overload long delay current setting value I_R(A)	
5	Overload long delay time setting value t_R(s)	
6	Short circuit short delay current setting value I_{sd}(A)	
7	Short circuit short delay time setting value t_{sd}(s)	
8	Short circuit instantaneous current setting value I_i(A)	
9	Earthing protection current setting value I_g(A)	

6.6 Neutral Pole Protection Trip Unit (E4 Type)

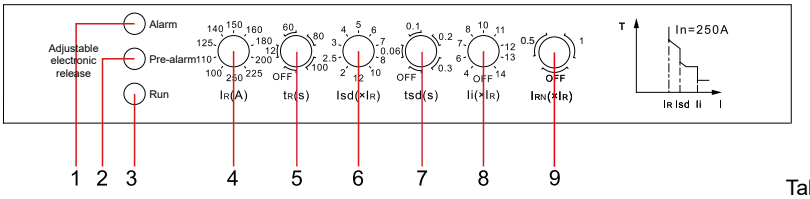


Table 18

Six-knob intelligent trip unit information		
1	Alarm LED indicator	Default parameters 1. The default setting value of the overload pre-alarm current is I_p=0.9×I_R
2	Pre-alarm LED indicator	
3	Operation LED indicator	
4	Overload long delay current setting value I_R(A)	
5	long delay time setting value t_R(s)	
6	Short circuit short delay current setting value I_{sd}(A)	
7	Short circuit short delay time setting value t_{sd}(s)	
8	Short circuit instantaneous current setting value I_i(A)	
9	Neutral pole protection current setting value I_{RN}(A)	

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7 Technical Information

7.1 Reference cross-sectional area of connecting wire with different rated current

Table 19

Rated current In (A)	32	63	125	160	250	320	400
Sectional area (mm^2)	6	16	50	70	120	185	240

Table 20

Rated current In (A)	Cable		Copper busbar	
	Sectional area (mm^2)	Qty.	Dimension (mm * mm)	Qty.
630/630 Large size	185	2	40×5	2
800	240	2	50×5	2
1250	/	/	80×5	2

7.2 Power Loss

Table 21

Product info.	Power-on current (A)	Total power loss of three-pole / four-pole (W)		
		Front-panel / Back-panel wiring	Plug-in type front-panel wiring	Plug-in type back-panel wiring
TGM1E-125	125	12	12	12.2
TGM1E-160	160	40	50	62
TGM1E-250	250	50	75	86
TGM1E-320	320	55	80	89
TGM1E-400	400	58	87	90
TGM1E-630/630 Large size	630	110	120	130
TGM1E-800	800	115.2	125	140

7.3 Derating factor at different temperatures

Table 22

Product model	Power-on current (A)	Ambient temp.						
		0°C	45°C	50°C	55°C	60°C	65°C	70°C
TGM1E-125	125	1In	1In	1In	0.93In	0.92In	0.91In	0.89In
TGM1E-160	160	1In	1In	1In	0.93In	0.92In	0.91In	0.89In
TGM1E-250	250	1In	1In	1In	0.89In	0.85In	0.81In	0.78In
TGM1E-320	320	1In	1In	1In	0.89In	0.85In	0.81In	0.78In
TGM1E-400	400	1In	1In	1In	0.89In	0.85In	0.81In	0.78In
TGM1E-630/630 Large size	630	1In	1In	1In	0.92In	0.9In	0.87In	0.86In
TGM1E-800	800	1In	1In	1In	0.85In	0.82In	0.8In	0.78In
TGM1E-1250	1250	1In	1In	1In	0.88In	0.87In	0.87In	0.85In

The derating factor of the TGM1E circuit breaker is measured under the max. rated current of each frame.

7.4 When the altitude exceeds 2000m in the available working environment, the electrical properties of the circuit breaker are corrected according to the table below.

Table 23

Altitude (m)	2000	2500	3000	4000	5000
Power frequency withstand voltage (V)	3000	3000	2500	2000	1800
Insulation voltage (V)	1000	800	700	600	500
Max. operating voltage (V)	690	690	600	500	440
Operating current correction factor	1In	1In	0.94In	0.88In	0.85In

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7.5 Recommended tightening torques of the connecting cable / copper busbar with different frame currents

Table 24

Rated current (A)	Front-panel / back-panel wiring torque (N.m)
125/160	8.8~10
250/320	8.8~12
400/630	17.7~22.6
630 large size /800	28~33
1250	17.7~22.6

7.6 Screw tightening torque

Table 25

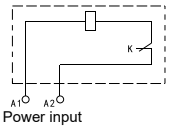
Product model	TGM1E-125/160	TGM1E-250/320	TGM1E-400/630	TGM1E-630 Large size	TGM1E-800	TGM1E-1250
Nominal dia. of thread (mm)	M8	M8	M10	M12	M12	M10
Tightening torque (N.m)	10	12	22	28	28	22
Breaking torque (N.m)	15	18	26	33	33	26

8 Accessories

Internal accessories of the product

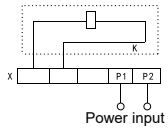
According to the user's needs, the circuit breaker accessories can be directly led out with wires (the wire length is 50cm, and any special requirements shall be indicated when ordering if any), or the terminal block is provided for wiring (if the terminal block is required, please indicate this when ordering).

● Shunt release (divided into left and right mounted)

Rated control power voltage (Us)	AC: AC220/230V, AC380/400V DC: DC24V, DC110V, DC220V
Operating voltage	(0.7~1.1)Us
Wiring diagram: 	Note: K - The micro switch connected to the coil in series in the shunt release is a normally closed contact; when the circuit breaker is powered off, this contact will open automatically, and will be closed when power-on.

When the rated control power supply voltage is DC24V, the shunt release can be used directly, but the maximum length 150m of 1.5mm² copper wire (the length of each of the two wires) shall be satified, and the maximum length of the 2.5mm² copper wire is 250m. The power supply power at the terminal of the release shall meet the minimum 50W requirements, or the DC24V intermediate relay is used to control the AC230V or AC400V shunt release, and the contact capacity of the intermediate relay is not less than 1A.

● Undervoltage release (left and right mounted)

Rated operating voltage (Ue)	AC: AC220/230V, AC380/400V
Operation characteristics	Reliable trip at the voltage of 35% ~ 70% of rated operating voltage; power-on at 35% ~ 70%; and prevent power-on when below 35%.
Wiring diagram: 	Note: X - Terminal block Note: The wiring diagram of the internal accessory of the circuit breaker is shown in the dashed box.

Warning: The undervoltage release must be powered on, and then the circuit breaker can be re-tripped and closed, otherwise this may cause damage to the circuit breaker.

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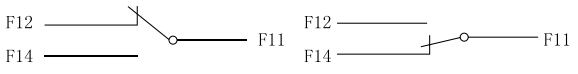
● Aux. contact (left and right mounted)

Table 26

Frame rated current	Inm≤320A		Inm≥400A	
Conventional thermal current Ith	3A		6A	
Use category	AC-15	DC-13	AC-15	DC-13
Operating voltage	AC380V/415V	DC 110V/250V	AC380V/415V	DC 110V/250V
Rated operating current	0.3A	0.15A	1A	0.15A

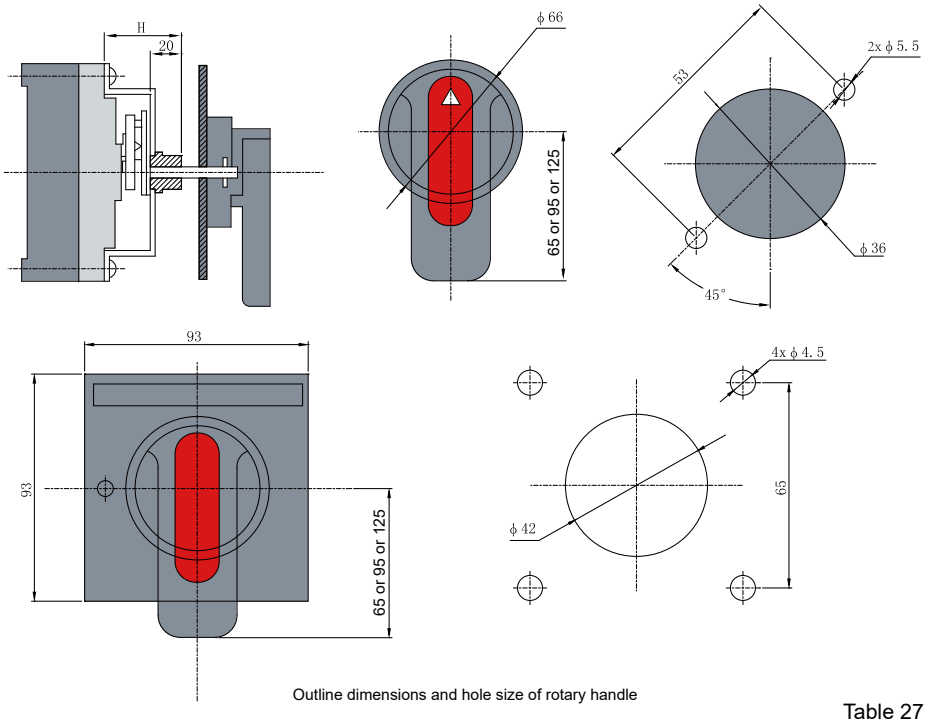
Wiring diagram



Circuit breaker in the "OFF" position　　Circuit breaker in the "ON" position

● Manual operating mechanism:

The outline and installation dimensions of the rotary handle are shown below:



Outline dimensions and hole size of rotary handle

Table 27

Model & Spec.	TGM1E-125/160	TGM1E-250/320	TGM1E-400/630	TGM1E-630 Large size	TGM1E-800
Installation dimensions (H)	62	60	89	88	92

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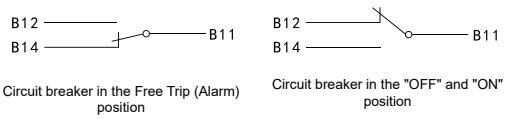
● Alarm contact (left and right mounted)

Conventional thermal current Ith	3A
Rated operating current	Same as aux. contact
Wiring diagram	



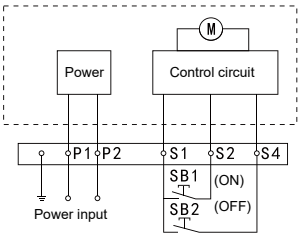
Circuit breaker in the Free Trip (Alarm) position

Circuit breaker in the "OFF" and "ON" position

External accessories of the product

● Motor mechanism:

This accessory is installed on the panel of the circuit breaker to realize the remote electric operation that circuit breaker can be closed, open and re-tripped, suitable for automatic control application. The outline dimensions of the motor mechanism see Table 28.

Input voltage	AC220V/230V, AC380V/400V
Wiring diagram	

Note:
P1 and P2 are external power inputs
SB1 and SB2 are operating buttons (provided by users)

Note: The wiring diagram of the internal accessory of the motor mechanism is shown in the dashed box.

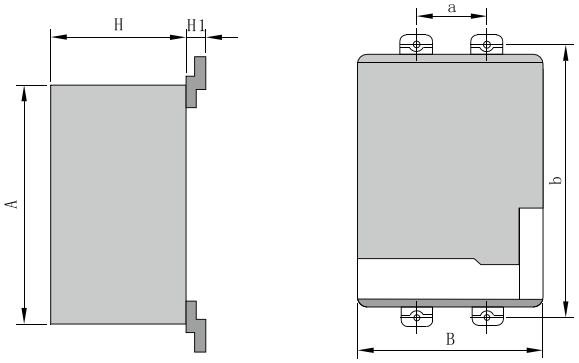


Table 28

Model	A	B	H	H1	a	b
TGM1E-125/160	116	90	77	20.5	30	134
TGM1E-250/320	116	90	77	18	35	143
TGM1E-400/630	176	130	115	34	44	194
TGM1E-630 Large size	176	130	115	28.5	58	200
TGM1E-800	176	130	115	35	70	243

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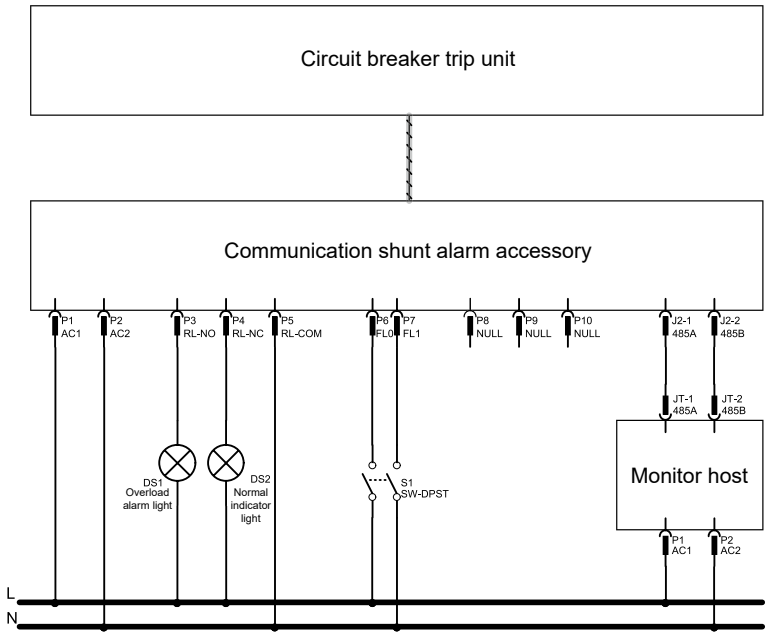
Electronic accessories of product

●Shunt alarm communication accessory

This accessory is installed on the side of the switch to realize the remote communication, remote shunt trip and alarm signal output of the circuit breaker, suitable for the intelligent automatic application. The outline dimensions of the accessory see Table 29.

Input voltage	AC400V/230V
Wiring diagram	

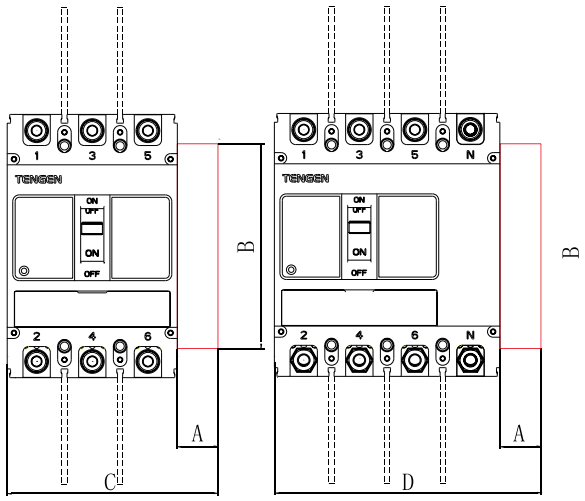


Table 29

Model & Spec.	Outline and installation dimensions (mm)			
	A	B	C	D
TGM1E－125/160	25	125	117.5	147.5
TGM1E－250/320	25	125	132	167
TGM1E－400/630	25	125	175	223
TGMIE-630 Large size	25	125	207	265
TGM1E－800	25	125	235	305
TGM1E－1250	25	125	235	305

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9 Outline and Installation Dimensions

9.1 The outline dimensions and installation dimensions of the product see Table 30 and Fig. 1

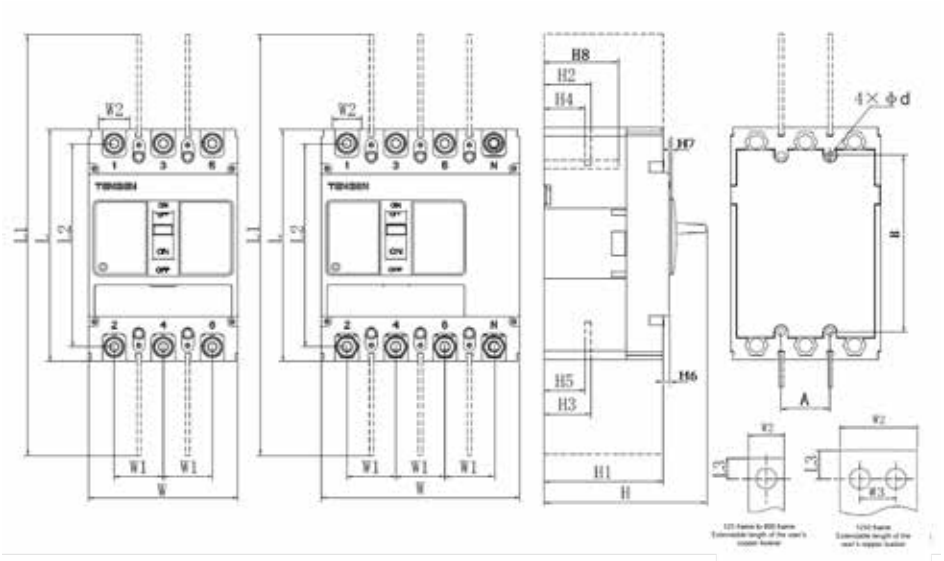

Fig. 1 Outline dimensions and installation dimensions of TGM1E

Table 30

Product model	Number of poles	Outline dimensions																Installation dimensions			
		L	L1	L2	L3	W	W1	W2	W3	H	H1	H2	H3	H4	H5	H6	H7	A	B	H8[1)]	Φd
TGM1E-125M/H	3	155	258	137	8	92.5	30	18	/	116	80	27.5	27.5	24.5	24.5	10	2	30	134	25	4.5
	4					122.5												60			
TGM1E-160M/H	3	155	258	137	8	92.5	30	18	/	116	80	27.5	27.5	24.5	24.5	10	2	30	134	25	4.5
	4					122.5												60			
TGM1E-250M/H	3	165	290	146	10	107	35	23.5	/	1175	85.5	22.5	22.5	18.5	18.5	4.3	2	35	126	60.5	4.8
	4					142												70			
TGM1E-320M/H	3	165	290	146	10	107	35	23.5	/	1175	85.5	22.5	22.5	18.5	18.5	4.3	2	35	126	60.5	4.8
	4					142												70			
TGM1E-400M/H	3	256	456	224	12.5	150	48	33.3	/	153	97.7	39	37.5	34.5	34.7	9	2	44	194	47	6.6
	4					198												94			
TGM1E-630M/H	3	256	456	224	12.5	150	48	33.3	/	153	97.7	40	41	34.5	34.7	9	2	44	194	47	6.6
	4					198												94			
TGM1E-630 Large size	3	270	478	236	17	181	58	44	/	157	103	45	44	39	39	7	3	58	200	52	7
	4					240												116			
TGM1E-800M/H	3	280	482	243	18.8	211	70	45	/	160	104	41	46	34.5	32.4	7	4.5	70	243	70	7
	4					282												140			
TGM1E-1250	3	276	476	243	13	210	70	45.7	21.8	152	98.4	28.7	35.6	19	19	6	6	70	243	65	7.8
	4					280												140			
Note 1): H8 is the fixed length of the user's mounting screws for the product.																					

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9.2 The hole size on the handle and the hole size on the panel see Table 31 and Fig. 2

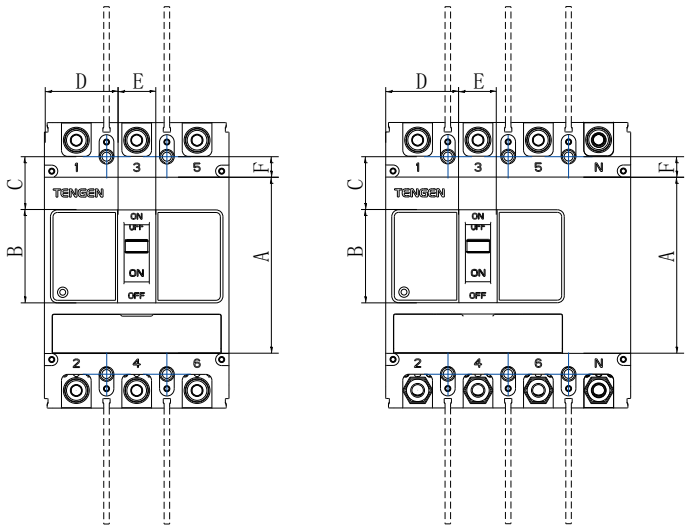
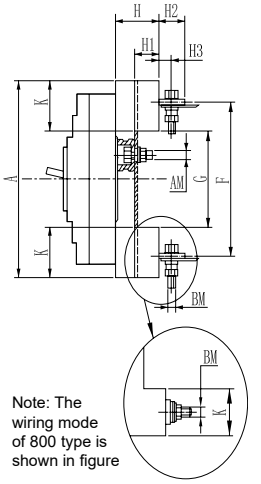


Fig. 2 Hole size on the handle and the hole size on the panel

Table 31

Model & Spec.	Outline and installation dimensions (mm)					
	A	B	C	D	E	F
TGM1E-125/160	93	50	40	34	25	22.5
TGM1E-250/320	102	54	31	42	22.5	11.5
TGM1E-400/630	175	101.5	45	45.5	59	9.6
TGM1E-630 Large size	180	102	49	58	65	10
TGM1E-800	193	106	62	74	65	25
TGM1E-1250	150	102	70	75	59	46

9.3 The outline and installation dimensions of the plug-in type see Table 32 and Fig. 3



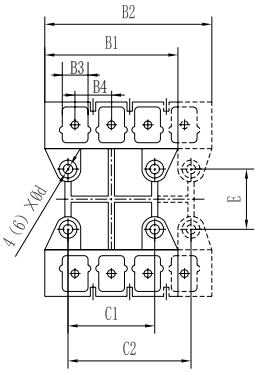
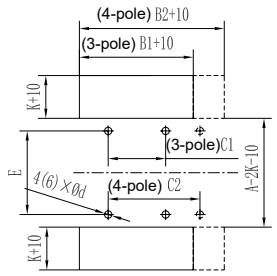


Fig. 4 Outline and installation dimensions of plug-in type



Hole size on the mounting plate (unit: mm)

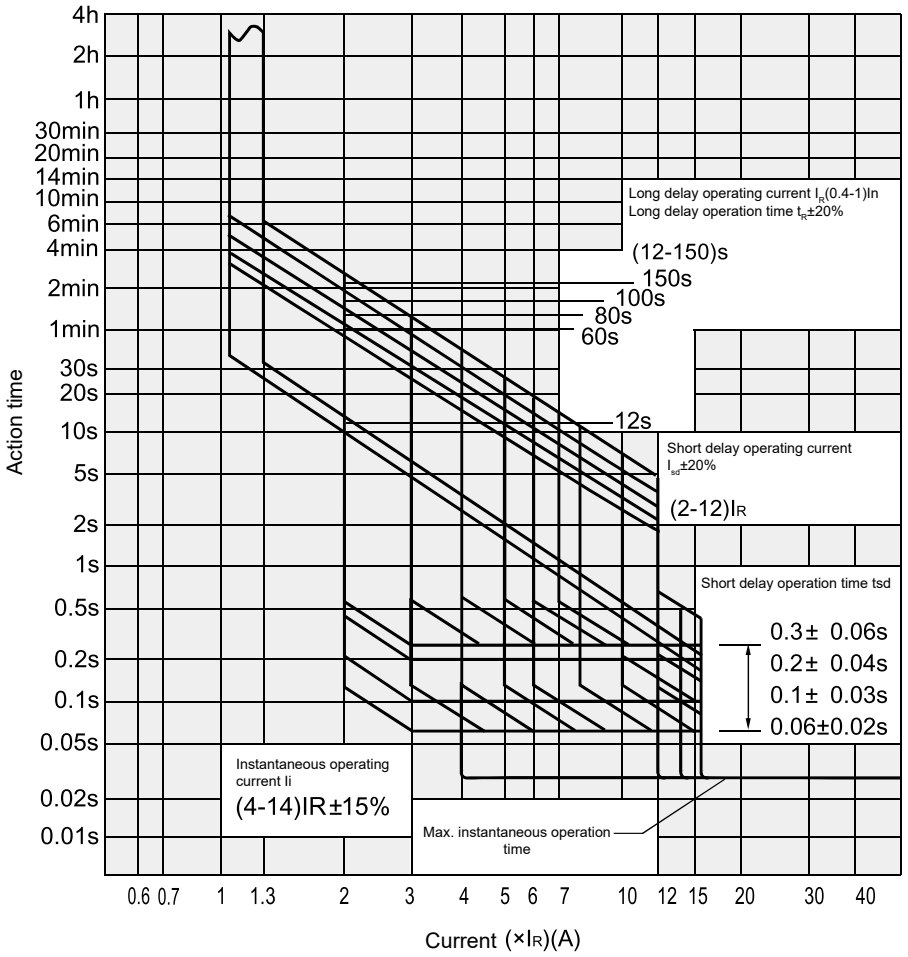
Table 32

Model & Spec.	Outline and installation dimensions (mm)															
	A	B1	B2	B4	C1	C2	E	F	G	K	H	H1	H2	AM	BM	φd
TGM1E-125/160	173	91.5	125	30	60	90	62	137	97	38	50	33	28	M6	M8	6.5
TGM1E-250/320	186	107	145	35	70	105	54	145	94	46	50	33	37	M6	M8	6.5
TGM1E-400/630	280	149	200	48	60	108	129	224	170	55	60	38	46	M8	M12	8.5
TGM1E-630 Large size	300	182	242	/	100	157	123	232	170	65	60	39	49	M8	M12	8.5
TGM1E-800	305	210	280	70	90	162	146	243	181	62	87	60	22	M10	M14	11

Note: The max. rated current of the plug-in type of 800 frame is 700A.

TGM1E Series Moulded Case Circuit Breaker

10 Protection Characteristic Curve of the Circuit Breaker



TGM1E Series Moulded Case Circuit Breaker

11 Factory Parameters Settings of Intelligent Trip Unit of Circuit Breaker

Factory parameters setting values

Table 33

<table>
<tr><th></th><th colspan="2">Protection type</th><th colspan="2">Distribution protection</th><th>Motor protection</th></tr>
<tr><td>4</td><td rowspan="2">Overload long delay</td><td>Setting current I_R(A)</td><td colspan="3">In</td></tr>
<tr><td>5</td><td>Delay t_R(s)</td><td colspan="2">60/64(TGM1E-1250)</td><td>100/96(TGM1E-1250)</td></tr>
<tr><td>6</td><td rowspan="2">Short circuit short delay</td><td>Setting current I_{sd}(A)</td><td colspan="2">8(XI_R)</td><td>10(XI_R)</td></tr>
<tr><td>7</td><td>Delay t_{sd}(s)</td><td colspan="3">0.3</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">Short circuit instantaneous</td><td rowspan="2">Setting current I_i(A)</td><td>Inm≤630A</td><td>12(XI_R)</td><td rowspan="2">14(XI_R)</td></tr>
<tr><td>Inm≥800A</td><td>10(XI_R)</td></tr>
<tr><td rowspan="3">9 (Pre-alarm is a standard configuration; others are optional)</td><td>Pre-alarm (normal six-knob type)</td><td>Setting current I_P(A)</td><td colspan="3">0.9(XI_R)</td></tr>
<tr><td>Earthing protection E3 type</td><td>Setting current I_g(A)</td><td colspan="3">1.0(XI_R)</td></tr>
<tr><td>Neutral pole protection E43 type</td><td>Setting current I_{RN}(A)</td><td colspan="3">1.0(XI_R)</td></tr>
<tr><td colspan="2">Thermal simulation function</td><td></td><td colspan="3">OFF</td></tr>
</table>

Note: The trip setting time of the earthed type trip unit is 0.4s.

12 Ordering Notice

Please specify the following items when ordering:
- Model, name and number of poles of circuit breaker
- Rated current of the circuit breaker
- Accessory name, specification, and combination code of the circuit breaker (please indicate the operating voltages of the shunt release and undervoltage release).
- Application: For power distribution (power distribution will be provided by default), and motor protection (indicated by 2)
- Qty.

For example: TGM1E-250, three poles, 50kA breaking capacity, rated current 250A, with a shunt release, voltage AC400V, 20 sets. Please write as: TGM1E-250M/3310 250A AC400V 20 sets.

If you have any special requirements for the circuit breaker, please contact the manufacturer for negotiation.

13 Example of Quick selection

13.1 TGM1E-125M/3N300A 125A:

Order a TGM1E series circuit braker for electronic power distribution protection, with 125A frame, 50kA (medium type), rated current 125A, and three-pole four-wire (i.e. 3P+N) zero line without protection

13.2 TGM1E-125M/33002 125A:

Order a TGM1E series circuit braker for three-pole electronic motor protection, with 125A frame, 50kA (medium type), and rated current 125A

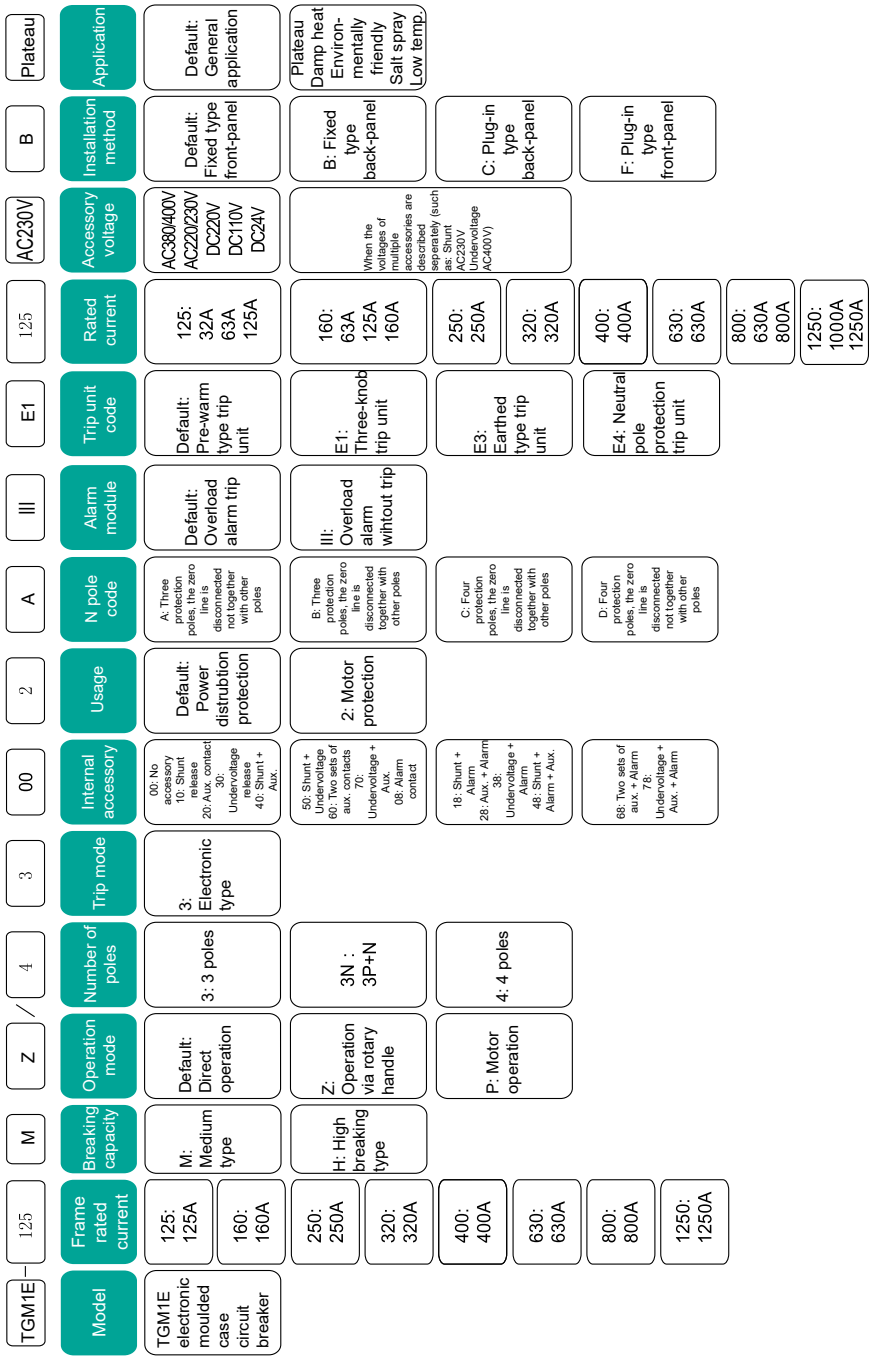
13.3 TGM1E-125H/3N300AE1 125A:

Order a TGM1E series circuit braker for electronic power distribution protection, with 125A frame, 85kA (high breaking type), rated current 125A, three-pole four-wire (i.e. 3P+N) zero line without protection, and 3-knob trip unit.

Note: If special customized products are required, please contact our company in advance.

TGM1E Series Moulded Case Circuit Breaker

14 Description of Selection Guide of TGM1E Series Moulded Case Circuit Breaker



Note: The undervoltage release accessory will not be provided. If required, please contact the local salesman when ordering.