

TGM3E Series Moulded Case Circuit Breaker

- 1 Body
- 2 Flame arresting chamber (optional to customers)
- 3 Plug-in type (optional to customers)
- 4 Flash barrier (standard)
- 5 Zero flashover cover (optional to customers)
- 6 Undervoltage release (optional to customers)
- 7 Shunt release (optional to customers)
- 8 Alarm contact (optional to customers)
- 9 Auxiliary contact (optional to customers)
- 10 Front panel connection transition plate (optional to customers)
- 11 Electric motor operating mechanism (optional to customers)
- 12 Rotating handle operating mechanism (optional to customers)
- 13 Communication shunt alarm accessory (optional to customers)
- 14 Four-remote communication accessory (optional to customers)







TGM3E Series Moulded Case Circuit Breaker

1 Product overview

TGM3E series moulded case circuit breaker (hereinafter referred to as circuit breaker) is one of the new circuit breakers researched and developed by us with international advanced technology. It has the characteristics of four sections of selective protection, zero flashover, high breaking, box-type accessories, small and compact structure, green and environmental protection.

By rated limit short-circuit breaking capacity (Icu), the circuit breaker is divided into M type (relatively high breaking) and H (high breaking). It is an ideal product for power distribution and motor protection. It has the rated isolation voltage of 1,000V. It can be used for occasional circuit switch and startup of motor in circuits under AC 50/60Hz, with the rated working voltage $\leq 690V$ and setting current of 12.5A-1,250A.

The circuit breaker can be equipped with communication modules, so as to upgrade the original circuit breaker to a communication circuit breaker easily, achieving “four remote” functions, namely remote control, remote adjustment, remote measurement and remote signaling.

The circuit breaker has the functions of overload long-time delay, short circuit short-time delay, short circuit instantaneous action and ground protection. Undervoltage, shunt, auxiliary, alarm and communication accessories are optional to the product.

This series circuit breaker may be installed vertically (i.e., vertical installation) or horizontally (i.e., horizontal installation).

It is has isolating function, with the corresponding symbol of:

Note: 3P+N type without isolating function has a unique “overload alarm without tripping” function, to ensure the continuity of power supply.

The circuit breaker shall meet the standard: IEC 60947-1 and IEC 60947-2.

2 Type designation

TG M 3 E — □ □ □ □ □ □ □ □ □ □ □ □ □ □

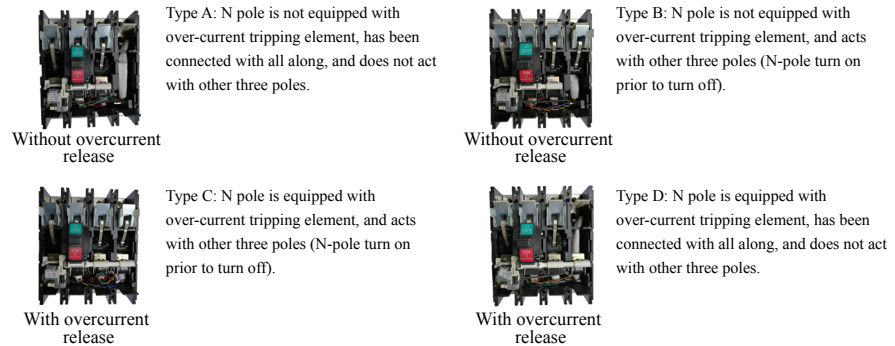
- Special requirements
Code of zero flashover:
 - No code: standard; W- zero flashover;
- Code of application scenarios: No code: standard;
 - Installation mode:
 - No code: Fixed, front panel connection;
 - B: fixed, rear-panel connection; C: plug-in type;
- Voltage of accessories
- Rated current
- Controller function code:
 - Default: Pre-alarm type controller E1: three-knob controller E2: Current unbalance type controller E3: Grounding type controller E4: Neutral pole protection controller
- Code of overload alarm without tripping:
 - No code: standard; III: Overload alarm without tripping;
- Code of prepayment:
 - No code: standard; F-prepaid;
- Code of N pole of 3N and 4P products (Table 1)
- Usage code: No code : For distribution;;
 - 2: Motor protection;
- Release type and accessory code (Table 2)
- Code of pole number:
 - 3: 3P; 3N : three-pole and four-line; 4 : 4P;
- Code of operation mode:
 - No code : Direct operation with handle;
 - P: Electric motor operation;
 - Z: Rotating handle;
- Short circuit breaking capability level:
 - M type - relatively high breaking; H type - high breaking;
- Frame rated current
- Electronic
- Design code
 - Moulded case circuit breaker
 - Enterprise code

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Table 1

Code	Statement	Example
Type A	N pole is not equipped with over-current tripping element, has been connected with all along, and does not act with other three poles	3N300A
Type B	N pole is not equipped with over-current tripping element, and acts with other three poles (N-pole turn on prior to turn off)	4300B
Type C	N pole is equipped with over-current tripping element, and acts with other three poles (N-pole turn on prior to turn off)	4300C
Type D	N pole is equipped with over-current tripping element, has been connected with all along, and does not act with other three poles	3N300D

View of codes of 4-pole product



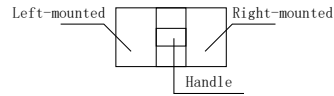
3 Normal working conditions and installation conditions

- 3.1 Ambient air temperature is -5°C to +40°C;
- 3.2 The relative air humidity at the installation site shall not exceed 50% at a maximum temperature of +40°C. A higher relative humidity is allowed at the lower temperature. For example, the relative humidity can reach 90% at 20°C. Special measures should be taken to deal with occasional condensation due to temperature changes;
- 3.3 Pollution class is 3;
- 3.4 The circuit breaker is required to withstand mechanical vibration with the frequency of 2Hz-13.2Hz, displacement of $\pm 1\text{mm}$ and mechanical vibration with the frequency of 13.2Hz-100Hz and accelerated velocity of $\pm 0.7\text{g}$;
- 3.5 The installation category is III for main circuits of the circuit breaker and II for other auxiliary circuits and control circuits;
- 3.6 The circuit breaker shall be applicable to electromagnetic environment B;
- 3.7 Hot and humid band type (TH type) circuit breaker can withstand the effect of damp air, salt mist, oil mist and mold;
- 3.8 The circuit breakers should be installed in a place without explosive hazard, conductive dust and corrosion against metal and damage to insulation;
- 3.9 The circuit breaker shall be installed in the place without invasion of rain and snow;
- 3.10 Operation conditions:
 - 3.10.1 The ambient air temperature shall be from -30°C to +70°C (derate when the temperature exceeds; see the technical materials in the sample for details);
 - 3.10.2 The characteristic shall not be affected when the altitude is 2,000m (derate when above 2,000 m; see the technical materials in the sample for details);
 - 3.10.3 The ambient air temperature for storage shall be -40°C- +75°C.
- 3.11 The protection grade of the product body is IP20
- 3.12 Cabinet door installation
 - With toggle handle: Protection grade is IP40.
 - With rotation handle: Protection grade is IP50.
 - With motor-operated mechanism: Protection grade is IP40.

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4 Tripper mode and accessory code

Release mode and accessory code



Alarm contact ● Auxiliary contact ○
Shunt release ■ Undervoltage release ▲

Table 2

Accessory Name	Accessory Code	Accessory installation and lead mode					
		TGM3E-125/160		TGM3E-250/320		TGM3E-400 TGM3E-630 TGM3E-800 TGM3E-1250 customized	
No accessories	300						
Alarm contact	308						
Shunt release	310						
Auxiliary contact	320						
Undervoltage release	330						
Shunt tripper Auxiliary contact	340						
Shunt release Undervoltage release	350						
Two groups of auxiliary contacts	360						
Auxiliary contact Undervoltage release	370						
Shunt release Alarm contact	318						
Auxiliary contact Alarm contact	328						
Undervoltage release Alarm contact	338						
Shunt release Auxiliary contact Alarm contact	348						
Two groups of auxiliary contacts Alarm contact	368						
Undervoltage release Auxiliary contact Alarm contact	378						

Note: Right alarm accessory is unavailable for TGM3E-800.

A set of auxiliary contacts include 1NO+1NC contact for below 400 type; a set of auxiliary contacts include 2NO+2NC contacts for 400 and above 400 types.

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5 Product parameter

5.1 Product parameters (Table 3 and Table 4).

Table 3

Basic Information									
Frame rated current		125		160		250		320	
Pole number		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 working 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 working 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 capability level		M	H	M	H	M	H	M	H
Breaking capacity of rated limiting short circuit Icu(kA)	AC415V	50	85	50	85	50	85	50	85
	AC690V	10	20	10	20	10	20	10	20
Breaking capacity of rated operating short circuit 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
Isolating function		3P, 4P		3P, 4P		3P, 4P		3P, 4P	
Use category		Category A		Category A		Category A		Category A	
Flashover distance (mm)		0 ¹⁾ ≤50		0 ¹⁾ ≤50		0 ¹⁾ ≤50		0 ¹⁾ ≤50	
Mechanical life (times)	Maintenance-free	20000		20000		20000		20000	
	Maintenance needed	40000		40000		40000		40000	
Electrical life (times)		10000		10000		10000		10000	
Protection function information									
Overload long-time delay protection		■ (Standard)		■ (Standard)		■ (Standard)		■ (Standard)	
Short circuit short-time delay protection		■ (Standard)		■ (Standard)		■ (Standard)		■ (Standard)	
Instantaneous short circuit protection		■ (Standard)		■ (Standard)		■ (Standard)		■ (Standard)	
Ground protection		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Neutral pole protection		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Current unbalance protection		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Other functional information									
Communication function		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Overload alarm without tripping		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Operation LED indicator		■ (Standard)		■ (Standard)		■ (Standard)		■ (Standard)	
Pre-alarm LED indicator		■ (Standard)		■ (Standard)		■ (Standard)		■ (Standard)	
Alarm LED indicator		■ (Standard)		■ (Standard)		■ (Standard)		■ (Standard)	
Accessories information									
Direct operation with handle		■ (Standard)		■ (Standard)		■ (Standard)		■ (Standard)	
Extended rotating handle		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Electric motor operating mechanism		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Shunt release		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Undervoltage release		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Auxiliary contact		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Alarm contact		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Fixed, front panel connection		■ (Standard)		■ (Standard)		■ (Standard)		■ (Standard)	
Fixed, rear-panel connection		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Plug-in, front-panel connection (not optional to 4P products)		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Plug-in rear-panel connection		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Front-panel connection transition plate		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Flash barrier		■ (Standard)		■ (Standard)		■ (Standard)		■ (Standard)	
Handle lock		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Zero flashover accessories		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Converter		□ (Optional)		□ (Optional)		□ (Optional)		□ (Optional)	
Note 1): Select zero flashover accessories to achieve zero flashover									

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Table 4

Basic Information										
Frame rated current		400		630		800		1250		1250 (customized)
Pole number		3P、3P+N、4P		3P、3P+N、4P		3P、3P+N、4P		3P		3P/4P
Frequency (Hz)		50/60		50/60		50/60		50/60		50/60
Rated working voltage Ue(V)		380/400/415 660/690		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		1000
Rated impulse withstand voltage Uimp (kV)		12		12		12		12		8
Rated working current In(A)		400AF:160~400		630AF:250~630		630AF:250~630 800AF:315~800		1250AF:500~1250		1000AF:630-1000 1250AF:850-1250
Breaking capability level		M	H	M	H	M	H	M	H	M
Breaking capacity of rated limiting short circuit Icu(kA)	AC415V	70	100	70	100	70	100	50	80	65
	AC690V	20	30	20	30	20	30	20	30	20
Breaking capacity of rated operating short circuit Ics(kA)	AC415V	70	70	70	70	70	70	50	50	50
	AC690V	20	20	20	20	20	20	20	20	10
Rated short-time withstand current Icw(kA/1s)	AC415V	5	5	8	8	10	10	15	15	20
Isolating function		3P, 4P		3P, 4P		3P, 4P		3P, 4P		3P, 4P
Use category		Category B		Category B		Category B		Category B		Category B
Flashover distance (mm)		0 ¹⁾ ≤100		0 ¹⁾ ≤100		0 ¹⁾ ≤100		≤100		≤100
Mechanical life (times)	Maintenance-free	10000		10000		8000		8000		8000
	Maintenance needed	20000		20000		10000		10000		10000
Electrical life (times)		8000		8000		7500		5000		5000

Protection function information					
Overload long-time delay protection	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Short circuit short-time delay protection	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Instantaneous short circuit protection	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Ground protection	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Neutral pole protection	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Current unbalance protection	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Other functional information					
Communication function	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Overload alarm without tripping	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Operation LED indicator	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Pre-alarm LED indicator	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Alarm LED indicator	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Accessories information					
Direct operation with handle	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Extended rotating handle	□ (Optional)	□ (Optional)	□ (Optional)	/	/
Electric motor operating mechanism	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Shunt release	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Undervoltage release	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Auxiliary contact	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Alarm contact	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Fixed, front panel connection	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Fixed, rear panel connection	□ (Optional)	□ (Optional)	□ (Optional)	/	/
Plug-in, front panel connection (not optional to 4P products)	□ (Optional)	□ (Optional)	□ (Optional)	/	/
Plug-in rear panel connection	□ (Optional)	□ (Optional)	□ (Optional)	/	/
Front panel connection transition plate	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Flash barrier	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Handle lock	□ (Optional)	□ (Optional)	□ (Optional)	/	/
Zero flashover accessories	□ (Optional)	□ (Optional)	□ (Optional)	/	/
Convertor	□ (Optional)	□ (Optional)	/	/	/
Note 1): Select zero flashover accessories to achieve zero flashover					

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5.2 The application type: Power distribution type

The protection code of power distribution type TGM3E circuit breaker is no by default, with such functions as overload long-time delay + short circuit short-time delay + instantaneous short circuit protection. For example, the selection type is TGM3E - 125M/3300.

Table 5

Electronic tripper	Frame rated current Inm(A)	Rated current In(A)	Setting current of adjustable overload release IR(A)	Tripping characteristic/ time
Overload long-time delay	125	32	12.5-14-16-18-20-22-25-28-30-32	Act according to I2t 1.05IR: do not act within 2h 1.3IR: do not act within 1h Inm<400A 2IR:tR = (12-60-80-100) Inm ≥ 400A 2 IR:tR = (12-60-100-150) s Characteristic curve T= (2*IR/I) 2*tR (1.2IR≤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	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	1250	500-630-700-800-850-900-950-1050-1150-1250	
	1250 Custom-made	1000	630-680-700-750-800-850-900-950-1000	
		1250	850-900-950-1000-1050-1100-1150-1200-1250	
Action tolerance				±20%

5.3 The application type: Motor protection type

Table 6

Electronic tripper	Frame rated current $I_{nm}(A)$	Rated current $I_n(A)$	Setting current of adjustable overload release $I_R(A)$	Tripping characteristic/time
Overload long-time delay	125	32	12.5-14-16-18-20-22-25-28-30-32	Act according to I2t (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	Act according to I2t (see Table 8)
	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	250-280-315-350-375-400-450-500-560-630	
		630	250-280-315-350-375-400-450-500-560-630	
	800	800	315-350-400-450-500-560-630-700-760-800	
		800	315-350-400-450-500-560-630-700-760-800	
	1250	1250	500-630-700-800-850-900-950-1050-1150-1250	
	1250 Custom-made	1000	630-680-700-750-800-850-900-950-1000	
		1250	850-900-950-1000-1050-1100-1150-1200-1250	
Action tolerance				±20%

Table 7

$1.05I_R$	Do not act within 2h			
$1.2I_R$	Do not act 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
Tripping level	/	10A	10	20

Table 8

$1.05I_R$	Do not act within 2h			
$1.2I_R$	Do not act 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
Tripping level	/	10	20	30

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5.4 Short circuit short-time delay protection

Table 9

Electronic tripper	Frame rated current $I_{nm}(A)$	Rated current $I_n(A)$	Setting current of short circuit short-time delay time for current adjustable type release $I_{sd}(A)$	Tripping characteristic/time	
Short circuit short-time delay	Whole series	32-1250	$I_{sd}=(2-2.5-3-4-5-6-7-8-10-12) \times I_n + OFF$	When $I_{sd} \leq I$, inverse time-delay action tolerance $\pm 20\%$ characteristic curve $T=(1.5 \times I_{sd}/I)^2 \times t_{sd}$ When $1.5I_{sd} \leq I < I_i$, definite time-delay action $t_{sd}=0.06s \pm 0.02s$; $t_{sd}=0.1s \pm 0.03s$; $t_{sd}=0.2s \pm 0.04s$; $t_{sd}=0.3s \pm 0.06s$;	
		1000-1250 Customized	$I_{sd}=(2-3-4-5-6-7-8-10-12) \times I_n + OFF$	I_t^{*ON} range When $I_{sd} \leq I$, inverse time-delay action Tolerance of $\pm 20\%$, characteristic curve $T=(1.5 \times I_{sd}/I)^2 \times t_{sd}$ When $1.5I_{sd} \leq I < I_i$, definite time-delay action $t_{sd}=0.05s \pm 0.02s$ $t_{sd}=0.1s \pm 0.03s$ $t_{sd}=0.15s \pm 0.03s$ $t_{sd}=0.2s \pm 0.04s$ $t_{sd}=0.3s \pm 0.06s$	I_t^{*OFF} range When it is dialed to OFF interval, the inverse time-delay function is turned off, and only the definite time-delay action is enabled. When $I_{sd} \leq I < I_i$, definite time-delay action $t_{sd}=0.05s \pm 0.02s$ $t_{sd}=0.1s \pm 0.03s$ $t_{sd}=0.15s \pm 0.03s$ $t_{sd}=0.2s \pm 0.04s$ $t_{sd}=0.3s \pm 0.06s$

5.5 Instantaneous short circuit protection

Table 10

Electronic tripper	Frame rated current $I_{nm}(A)$	Rated current $I_n(A)$	Setting current of short circuit short-time delay time for current adjustable type release $I_i(A)$	Tripping characteristic/time
Instantaneous short-circuit	Whole series	32-1250	$I_i=(4-6-7-8-10-11-12-13-14) \times I_n + OFF$	When $I \leq 0.85I_i$, do not act; 1000-1250
		When $I \geq 1.15I_i$, the action time is $< 0.08s$	$I_i=(4-6-7-8-9-10-11-12-14) \times I_n + OFF$	
Customized	$I_i=(4-6-7-8-9-10-11-12-14) \times I_n + OFF$			
Action tolerance	$\pm 15\%$			

5.6 Current unbalance protection

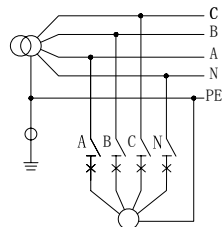
Table 11

Electronic tripper	Frame rated current $I_{nm}(A)$	Rated current $I_n(A)$	Setting current of unbalanced current protection for adjustable type $I_{unbal}(A)$	Tripping characteristic/time
Current unbalance Protection	Whole series	32-1250	$I_{unbal}=(10-15-20-25-30-35-40-45-50) \% \times I_n + OFF$	When $I \leq 0.9I_{unbal}$, do not act; When $I \geq 1.1I_{unbal}$, $t_{unbal}=(1-225)s$, act;
Action tolerance				$\pm 15\%$

5.7 Ground protection, single-phase and three-phase current balance type

Table 12

Electronic tripper	Frame rated current $I_{nm}(A)$	Rated current $I_n(A)$	Setting current of adjustable type for ground protection $I_g(A)$	Tripping characteristic/time
Ground protection	Whole series	32-1250	$I_g=(0.7-0.75-0.8-0.85-0.9-0.95-1) \times I_n + OFF$	When $I \leq 1I_g$, do not act; When $I \geq 1.1I_g$, $t_g=(0.1-0.2-0.3-0.4)s$, act
Action tolerance				$\pm 15\%$



1. Only applicable to TN-S system
2. The ground protection function is used to balance the load. In case of unbalanced load, this function shall be closed or set the setting value above the allowable unbalanced current value

5.8 Neutral pole protection

Table 13

Electronic tripper	Frame rated current $I_{nm}(A)$	Rated current $I_n(A)$	Setting current of adjustable tripper for ground protection $I_g(A)$	Tripping characteristic/time
Neutral pole protection	Whole series	32-1250	$I_{gn}=(0.5-1) \times I_n + OFF$	$I_{nm} < 400A$ $2I_{RN} + I_{RN} = (12-60-80-100)$ $I_{nm} \geq 400A$ $2I_{RN} + I_{RN} = (12-60-100-150)s$ Characteristic curve $T=(2 \times I_{RN}/I)^2 \times t_{RN}$ $(1.2I_{RN} \leq I < I_{sd})$
Action tolerance				$\pm 15\%$

TGM3E Series Moulded Case Circuit Breaker

5.9 Overload pre-alarm

Table 14

Electronic tripper	Frame rated current $I_{nm}(A)$	Rated current $I_n(A)$	Setting current of adjustable type for overload pre-alarm protection tripper $I_p(A)$	Tripping characteristic/time
Overload pre-alarm	Whole series	32-1250	$I_p=(0.7-0.75-0.8-0.85-0.9-0.95-1) \times I_n + \text{OFF}$	/
		1000-1250 Customized	$I_p=(0.6-0.65-0.7-0.75-0.8-0.85-0.9-0.95-1) \times I_n + \text{OFF}$	

6 Electronic tripper

6.1 Indicator status explanation

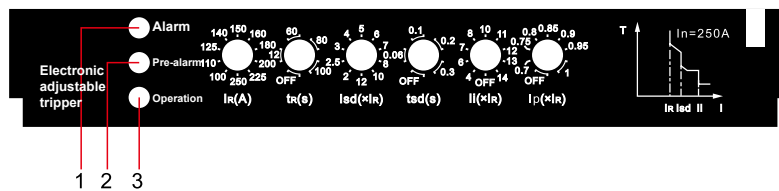


Table 15

	Instruction of indicator light	Instruction of indicator operating status
1	Alarm LED indicator (red)	When $I > 1.05I_R$, the overload alarm indicator light is on; when $I \leq 1.01I_R$, the overload alarm indicator light is off;
2	Pre-alarm LED indicator (yellow)	When $I > 1.1I_p$, the pre-alarm indicator light is on; when $I \leq 0.9I_p$, the pre-alarm indicator light is off.
3	Running LED indicator (green)	When $I > 0.4I_n$, the operation indicator light flickers (once per second)

6.2 Three-knob intelligent controller (E1 type)

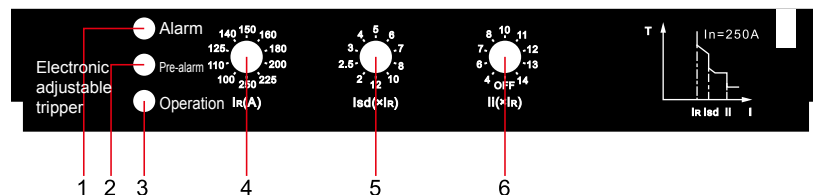


Table 16

Information of three-knob intelligent controller		
1	Alarm LED indicator	Default parameters 1 Default setting value of overload long-time delay time $t_R=60s$ 2 Default setting value of short circuit short-time delay time $t_{sd}=0.3s$ Default setting value of overload pre-alarm current $I_p=0.9 \times I_R$
2	Pre-alarm LED indicator	
3	Operation LED indicator	
4	Setting current of overload long-time delay current $I_R(A)$	
5	Setting current of short circuit short-time delay time $I_{sd}(A)$	
6	Current setting of short-circuit short delay time $I_i(A)$	

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6.3 Pre-alarm intelligent controller (conventional)

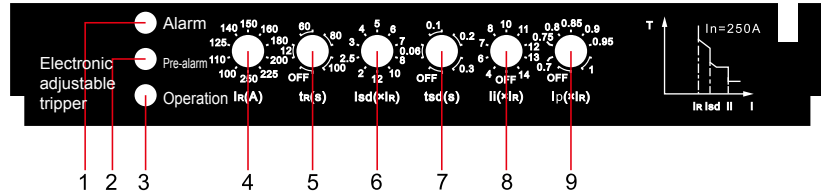


Table 17

Information of six-knob intelligent controller		
1	Alarm LED indicator light	Table 35 for default parameters
2	Pre-alarm LED indicator light	
3	Operation LED indicator light	
4	Setting current of overload long-time delay current IR(A)	
5	Setting value of overload long-time delay time tR(s)	
6	Setting current of short circuit short-time delay time Isd(A)	
7	Setting value of short circuit short-time delay time tsd(s)	
8	Current setting of short-circuit short delay time Ii(A)	
9	Setting current of overload pre-alarm Ip (A)	

6.4 Unbalanced current intelligent controller (E2 type)

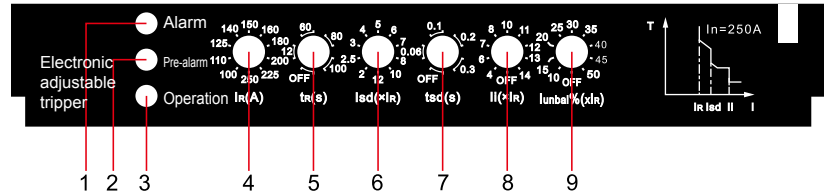


Table 18

Information of six-knob intelligent controller		
1	Alarm LED indicator	Default parameters 1 Setting value of unbalanced current time tunbal=10s 2 Default setting value of overload pre-alarm current Ip=0.9×IR
2	Pre-alarm LED indicator	
3	Operation LED indicator	
4	Setting current of overload long-time delay current IR(A)	
5	Setting value of overload long-time delay time tR(s)	
6	Setting current of short circuit short-time delay time Isd(A)	
7	Setting value of short circuit short-time delay time tsd(s)	
8	Current setting of short-circuit short delay time Ii(A)	
9	Setting unbalanced current Iunbal (A)	

6.5 Grounded intelligent controller (E3 type)

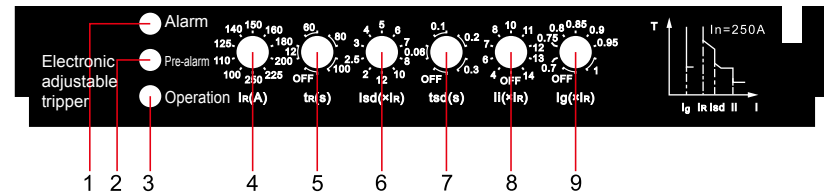


Table 19

Information of six-knob intelligent controller		
1	Alarm LED indicator	Default parameters 1 Setting value of ground protection time tg=0.4s 2 Default setting value of overload pre-alarm current Ip=0.9×IR
2	Pre-alarm LED indicator	
3	Operation LED indicator	
4	Setting current of overload long-time delay current IR(A)	
5	Setting value of overload long-time delay time tR(s)	
6	Setting current of short circuit short-time delay time Isd(A)	
7	Setting value of short circuit short-time delay time tsd(s)	
8	Current setting of short-circuit short delay time Ii(A)	
9	Setting current of ground protection Ig(A)	

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6.6 Neutral pole protection controller (E4 type)

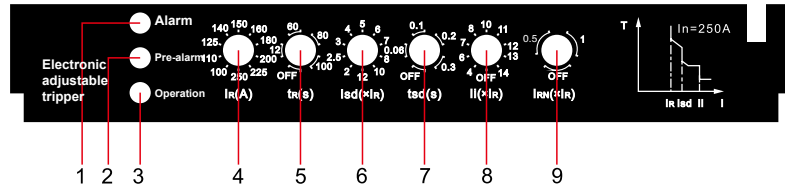


Table 20

Information of six-knob intelligent controller		
1	Alarm LED indicator	Default parameters 1 Default setting value of overload pre-alarm current $I_p=0.9 \times I_R$
2	Pre-alarm LED indicator	
3	Operation LED indicator	
4	Setting current of overload long-time delay current $I_R(A)$	
5	Setting value of overload long-time delay time $t_R(s)$	
6	Setting current of short circuit short-time delay time $I_{sd}(A)$	
7	Setting value of short circuit short-time delay time $t_{sd}(s)$	
8	Current setting of short-circuit short delay time $I_i(A)$	
9	Setting current of neutral pole protection $I_{RN}(A)$	

7 Technical materials

7.1 Reference cross-sectional area of connecting wire for different rated currents

Table 21

Rated current I_n (A)	32	63	125	160	250	320	400
Cross-sectional area of conductor (mm ²)	6	16	50	70	120	185	240

Table 22

Rated current I_n (A)	Cable		Copper bar	
	Cross-section area (mm ²)	Quantity	Dimension (mm*mm)	Quantity
630	185	2	40×5	2
800	240	2	50×5	2
1250	/	/	80×5	2

7.2 Power loss

Table 23

Model	Let-through current (A)	Total power consumption of 3 poles/4 poles (W)		
		Front and rear-panel connection	Plug-in front-panel connection	Plug-in rear-panel connection
TGM3E-125	125	12	12	12.2
TGM3E-160	160	40	50	62
TGM3E-250	250	50	75	86
TGM3E-320	320	55	80	89
TGM3E-400	400	58	87	90
TGM3E-630	630	110	120	130
TGM3E-800	800	115.2	125	140
TGM3E-1250	1250	200	/	/

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7.3 Derating factor under different temperatures

Table 24

Model	Let-through current (A)	Ambient temperature						
		-35℃	-30℃	-25℃	-20℃	-15℃	-10℃	-5℃
TGM3E-125	125	1.45In	1.4In	1.35In	1.3In	1.2In	1.18In	1.15In
TGM3E-160	160	1.45In	1.4In	1.35In	1.3In	1.25In	1.22In	1.2In
TGM3E-250	250	1.45In	1.4In	1.35In	1.3In	1.25In	1.2In	1.18In
TGM3E-320	320	1.45In	1.4In	1.35In	1.3In	1.25In	1.2In	1.18In
TGM3E-400	400	1.65In	1.6In	1.55In	1.44In	1.42In	1.4In	1.35In
TGM3E-630	630	1.4In	1.35In	1.31In	1.3In	1.25In	1.2In	1.18In
TGM3E-800	800	1.35In	1.34In	1.32In	1.31In	1.3In	1.25In	1.23In
TGM3E-1250	1250	1.36In	1.35In	1.34In	1.3In	1.28In	1.25In	1.21In

Table 25

Model	Let-through current (A)	Ambient temperature						
		0℃	45℃	50℃	55℃	60℃	65℃	70℃
TGM3E-125	125	1.15In	0.95In	0.94In	0.93In	0.92In	0.91In	0.89In
TGM3E-160	160	1.15In	0.95In	0.94In	0.93In	0.92In	0.91In	0.89In
TGM3E-250	250	1.15In	0.95In	0.9In	0.89In	0.85In	0.81In	0.78In
TGM3E-320	320	1.15In	0.95In	0.9In	0.89In	0.85In	0.81In	0.78In
TGM3E-400	400	1.3In	0.95In	0.9In	0.89In	0.85In	0.81In	0.78In
TGM3E-630	630	1.13In	0.95In	0.94In	0.92In	0.91In	0.87In	0.86In
TGM3E-800	800	1.18In	0.95In	0.93In	0.85In	0.82In	0.8In	0.78In
TGM3E-1250	1250	1.2In	0.92In	0.9In	0.88In	0.87In	0.87In	0.85In

- (1) Derating factor 1In of circuit breakers with all types of frames at 40℃ ;
(2) For TGM3E circuit breakers, the derating factor is determined at the maximum rated current of each frame.

7.4 When the altitude exceeds 2,000m, the electrical performance of the circuit breaker shall be corrected according to the following table:

Table 26

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
Maximum working voltage (V)	690	690	600	500	440
Working current correction factor	1In	1In	0.94In	0.88In	0.85In

7.5 Recommended tightening torques for the connecting cable/copper bar under different frame currents:

Table 27

Rated current (A)	Front-panel/rear-panel connection torque (N·m)
125/160	8.8~10
250/320	8.8~12
400/630	17.7~22.6
800	28~33
1250	28.8~39.2

7.6 Screw tightening torque

Table 28

Model	TGM3E-125/160	TGM3E-250/320	TGM3E-400/630	TGM3E-800	TGM3E-1250	TGM3E-1250 定制款
Nominal diameter of thread (mm)	M8	M8	M10	M12	M12	M10
Tightening torque (N·m)	10	12	22	28	30	22
Failure moment (N·m)	15	18	26	33	35	26

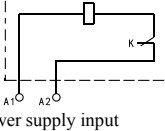
8 Accessories

Product internal accessories

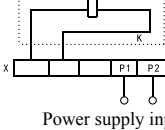
According to the needs of users, the circuit breaker accessories can be directly led out with wire (wire length of 50cm. For special requirements, please specify when ordering), or be equipped with terminal blocks (if needed, please specify when ordering).

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- Shunt release (left-mounted and right-mounted)

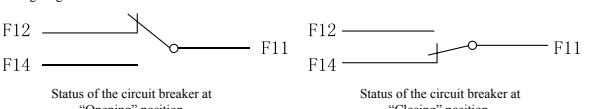
	Rated control power supply voltage (Us)	AC: AC220/230V, AC380/400V DC: DC24V, DC110V, DC220V
	Action voltage	(0.7~1.1)Us
	Wiring Diagram: 	Note: The microswitch in the K-shunt tripper which is in series with the coil inside is normally closed contact; after opening of circuit breaker, the contact is automatically opened; at the closing, it is closed.
When the rated control power supply voltage is DC24V, the shunt tripper can be used directly. The maximum length is 150m for 1.5mm ² copper lead (the length of each of the two leads) and 250m for 2.5mm ² copper lead. The power at the terminal of the tripper shall meet the minimum power of 50W, or a DC24V intermediate relay shall be used for controlling AC230V or AC400V shunt tripper, and the contact capacity of the intermediate relay shall be no less than 1A.		

- Undervoltage release (left-mounted and right-mounted)

	Rated working voltage (Ue)	AC: AC220/230V, AC380/400V
	Action feature	When the voltage is 35%-70% of the rated working voltage, it shall trip reliably. When the voltage is 85%-110% of the rated working voltage, it shall guarantee closing; When the voltage is lower than 35% of the rated working voltage, it shall prevent closing.
	Wiring Diagram: 	Note: X- terminal block. Note: (The circuit breaker internal accessory wiring diagram is in the dotted box.)

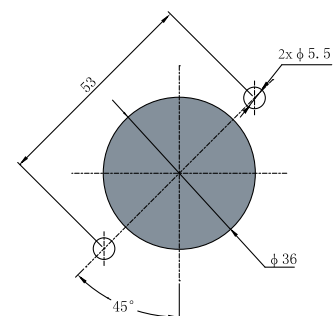
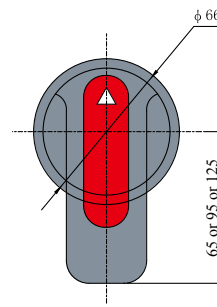
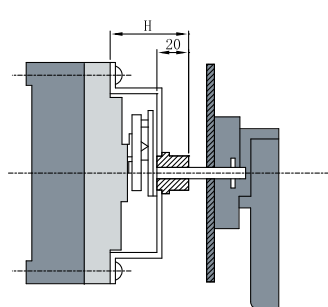
Attention: The undervoltage release must be energized first in order to re-buckle and close the circuit breaker, otherwise it will damage the circuit breaker.

- Auxiliary contact (left-mounted and right-mounted)

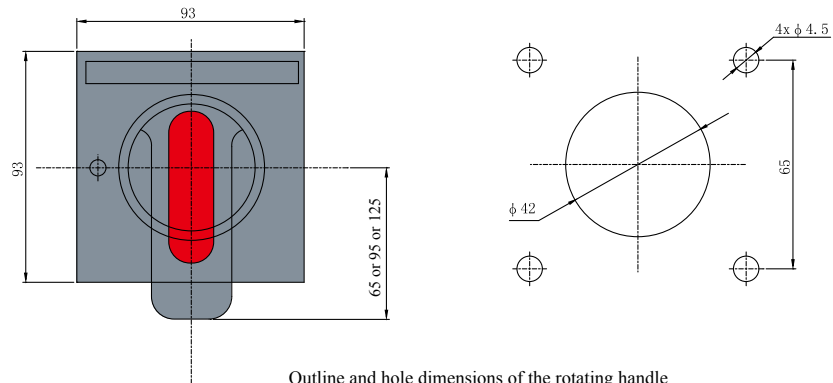
	Fram rated current	$I_{nm} \leq 320A$		$I_{nm} \geq 400A$	
	Conventional heating current Ith	3A		6A	
	Use category	AC-15	DC-13	AC-15	DC-13
	Working voltage	AC380V/415V	DC 110V/250V	AC380V/415V	DC 110V/250V
	Rated working current	0.3A	0.15A	1A	0.15A
	Wiring diagram				

- Manually operated mechanism:

The outline and installation dimension of the rotating handle are shown in following figures and table:



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Outline and hole dimensions of the rotating handle

Table 29

Model and specification	TGM3E—125/160	TGM3E—250/320	TGM3E—400/630	TGM3E—800
Installation dimension (H)	61	57	87	87

Alarm contact (left-mounted and right-mounted)

	Conventional heating current I _{th}	3A
	Rated working current I _e	Same as auxiliary contact
	Wiring Diagram: B 1 2 ———— B 1 4 ———— — B 1 1 — B 1 1 The circuit breaker is at free release (alarm) status. Status of the circuit breaker at "Opening" and "Closing" position.	

Product external accessories

Electric Motor operating mechanism:

It is mounted on the panel of the circuit breaker, and is used for the remote closing, disconnecting and re-closing of the circuit breaker electrically. It is suitable for automatic control. See Table 8 for the outline dimension of the motor-operated mechanism



Input voltage	AC220V/230V, AC380V/400V, DC220V/230V	
Wiring diagram	Note: P1 and P2 are inputs of external power supplies. SB1 and SB2 are operation buttons (prepared by users) Note: The wiring diagram of internal accessories of motor-operated mechanism is in the dashed box.	

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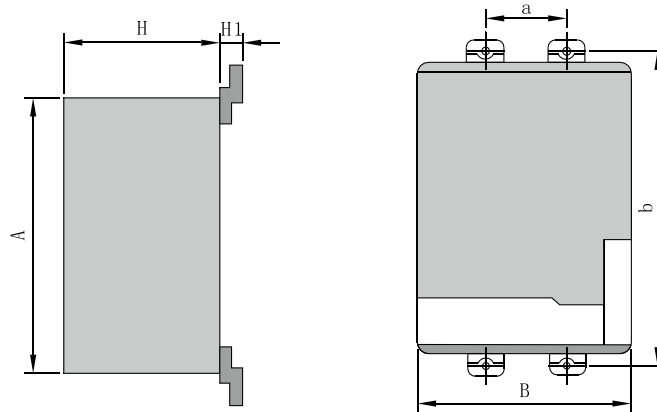
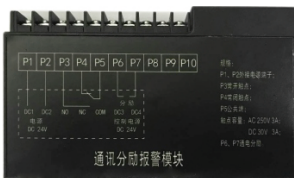


Table 30

Model	A	B	H	H1	a	b
TGM3E-125/160	111	73	77	20	30	134
TGM3E-250/320	116	90	77	17	35	146
TGM3E-400/630	176	130	115	30	44	194
TGM3E-800	176	130	115	27	70	243

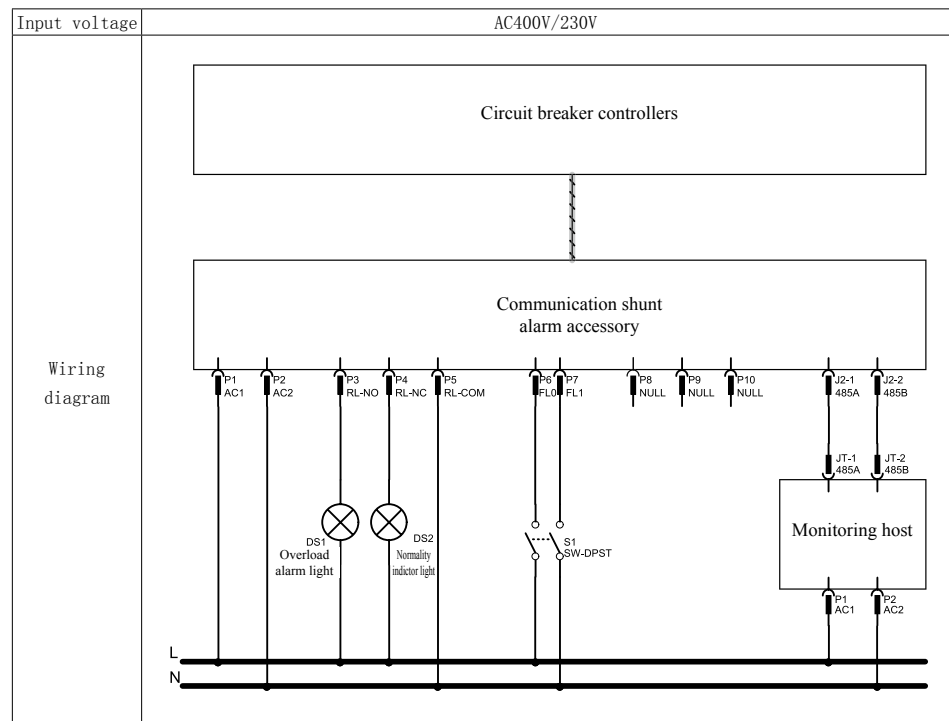


Electronic accessories of the product

According to user demands, electronic accessories of the circuit breaker can be divided into shunt alarm communication accessory, four-remote communication accessory and communication LCD components.

● Shunt alarm communication accessory

It is mounted on the side of the switch, and is used to realize the remote communication of the circuit breaker, remote shunt tripping and alarm signal output of the circuit breaker. It is suitable for intelligent automation circumstances. See Table 29 for outline dimension of accessories.



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·Four-remote communication accessory

It is mounted on the side of the switch, and is used to achieve the “four-remote” function of the circuit breaker together with the auxiliary alarm accessory and motor-operated mechanism, i.e., remote control, remote adjustment, remote measurement and remote signaling. It is suitable for intelligent automation circumstances. See Table 31 for outline dimension of accessories.

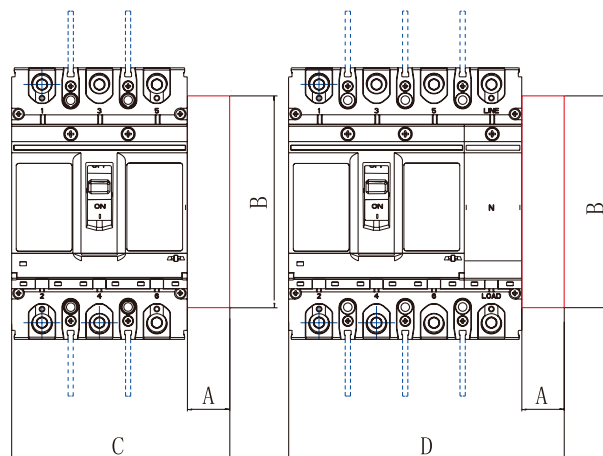
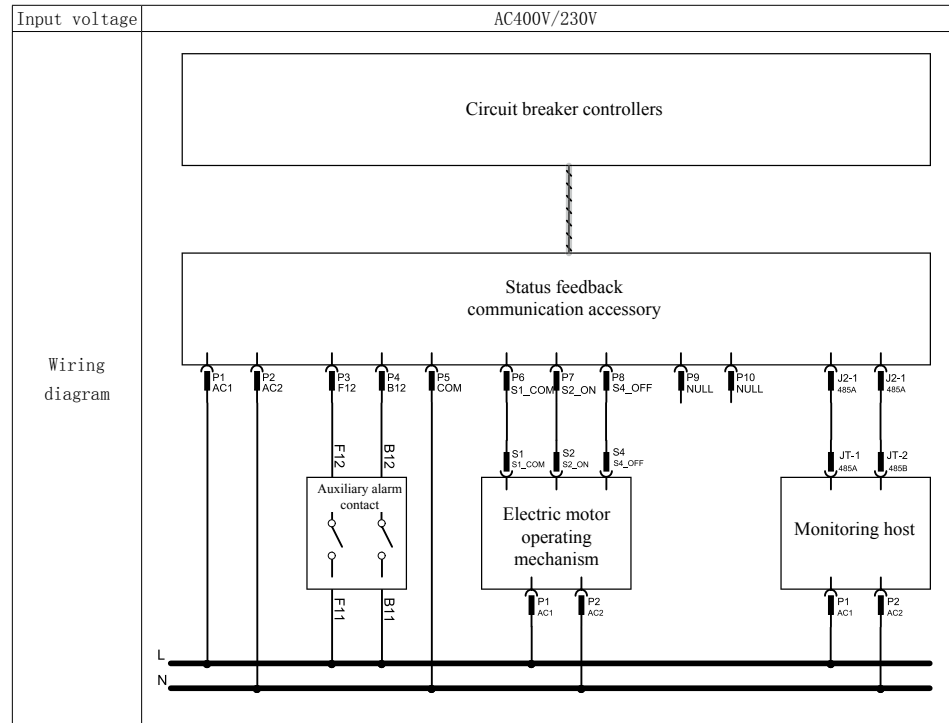


Table 31

Model and specification	Outline and installation dimension (mm)			
	A	B	C	D
TGM3E-125/160	25	125	117.5	147.5
TGM3E-250/320	25	125	132	167
TGM3E-400/630	25	125	175	223
TGM3E-800	25	125	235	305
TGM3E-1250	25	125	235	305

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9 Outline and installation dimension

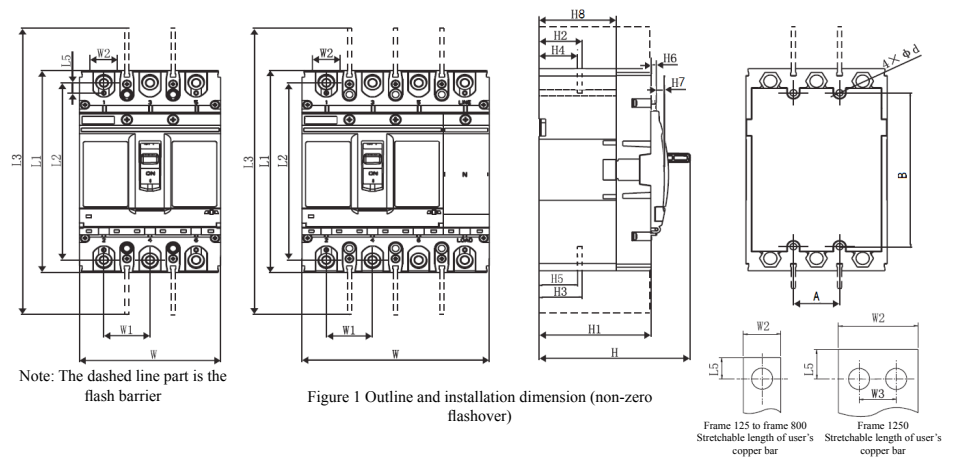
9.1 Outline and installation dimension (Table 32, Figure 1 and Figure 2)

Table 32

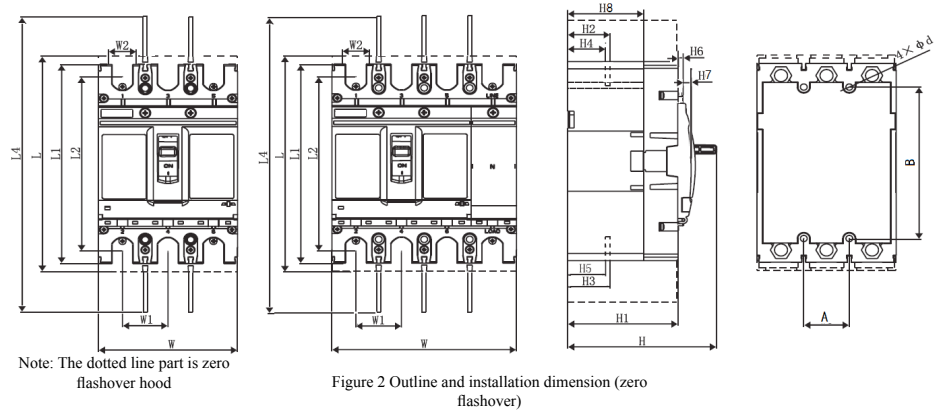
Model	Pole number	Outline dimension																	Installation dimension				
		L	L1	L2	L3	L4	L5	W	W1	W2	W4	H	H1	H2	H3	H4	H5	H6	H7	A	B	H8 ¹⁾	Φd
TGM3E-125 M/H	3	169	155	137	254	268	8	92.5	30	17.5	/	116	82	28.5	28.5	25.5	25.5	/	14.5	30	134	25	4.5
	4						8	122.5												60			
TGM3E-160 M/H	3	169	155	137	254	268	8	92.5	30	17.5	/	116	82	28.5	28.5	25.5	25.5	/	14.5	30	134	25	4.5
	4						8	122.5												60			
TGM3E-250 M/H	3	180	165	146	300	315	12	107	35	23	/	116	85	22.5	22.5	18.5	18.5	2.3	8	35	126	60.5	4.5
	4						12	142												70			
TGM3E-320 M/H	3	180	165	146	300	315	12	107	35	23	/	116	85	22.5	22.5	18.5	18.5	2.3	8	35	126	60.5	4.5
	4						12	142												70			
TGM3E-400 M/H	3	285	257	224	471	500	12	150	48	31	/	151	99	39.5	38.5	34.5	35.5	5	10	44	194	47	7
	4						12	198												94			
TGM3E-63 M/H	3	285	257	224	471	500	12	150	48	31	/	151	99	40.5	41.5	34.5	35.5	5	10	44	194	47	7
	4						12	198												94			
TGM3E-800 M/H	3	303	281	243	494	515	15	211	70	45	/	155	104	42	45	35	33	7	11.5	70	243	70	7
	4							280												140			
TGM3E-1250 M/H	3	/	340	303	494	/	18	210	70	47	25	196	132	23	23	/	/	/	/	70	303	70	7
TGM3E-1250 定制款	3	/	276	243	476	/	13	210	70	44	21.8	155	97	28	35	19	19	6	5	70	243	65	7
	4							280												140			

Note 1): H8 is the proper length of the mounting screws on the product

Note 1): H8 is the proper length of the mounting screws on the product



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9.2 The hole sizes of the handle and panel of the product (Table 33 and Figure 3)

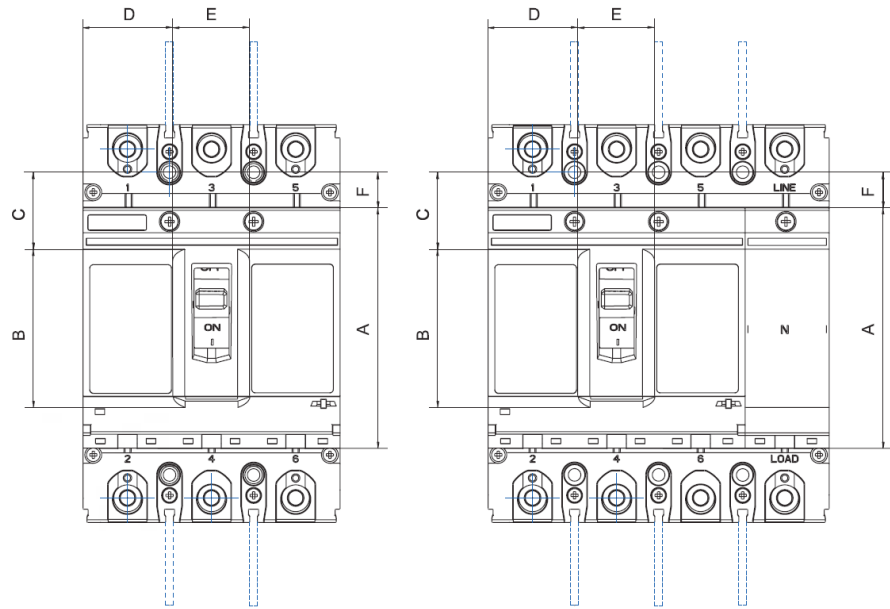


Figure 3 Hole sizes of the handle and panel

Table 33

Model and specification	Outline and installation dimension (mm)					
	A	B	C	D	E	F
TGM3E-125/160	101	68	33	32	29	16
TGM3E-250/320	100	67	32	37	33	15
TGM3E-400/630	162	107	46	46	58	20
TGM3E-800	177	116	66	73	67	33
TGM3E-1250	272	100	116	63	86	16
TGM3E-1250 customized	150	90	76	75	59	46

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9.3 Outline and installation dimension of plug-in type (Table 34 and Figure 4)

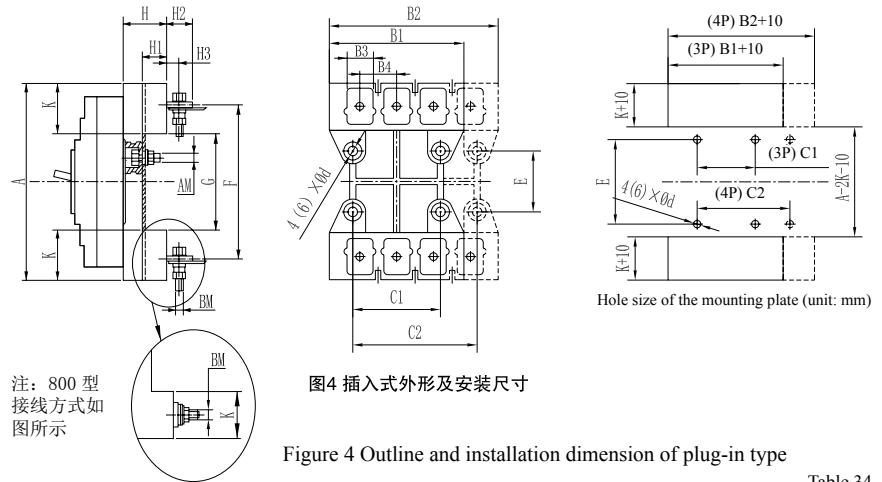
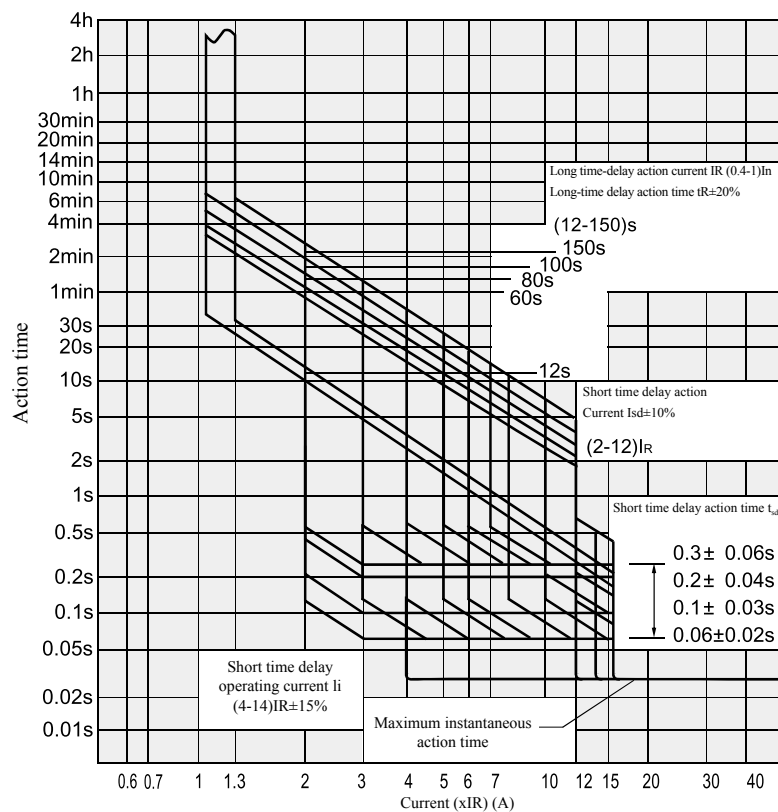


Table 34

Model and specification	Outline and installation dimension (mm)																
	A	B1	B2	B3	B4	C1	C2	E	F	G	K	H	H1	H2	H3	AM	BM
TGM3E-125/160	174	91	125	20	30	60	90	63	137	98	38	50	33	35	15	M6	M8
TGM3E-250/320	185	107	145	22	35	70	105	56	143	94	45	50	33	37	20	M6	M8
TGM3E-400/630	280	150	200	31	48	60	108	129	224	170	55	60	38	46	22	M8	M12
TGM3E-800	303	210	280	/	71	90	162	143	242	180	62	87	60	/	/	M10	M14

10 The protection characteristic curve of the circuit breaker



TGM3E Series Moulded Case Circuit Breaker

11 Setting of factory parameters of intelligent controller of the circuit breaker

Setting value of factory parameters

Table 35

	Protection type		Power distribution protection		Motor protection
4	Overload long-time delay	Setting current IR(A)	In		
5		Time delay tR(s)	60/64 (1250 custom-made)		100/96 (1250 custom-made)
6	Short circuit short-time delay	Setting current Isd(A)	8 (X _{I_R})		10(X _{I_R}), Note:1250:8(X _{I_R})
7		Time delay tsd(s)	0.3		
8	Instantaneous short-circuit	Setting current Ii(A)	Inm≤630A	12 (X _{I_R})	14(X _{I_R}), Note:1250:10(X _{I_R})
			Inm≥800A	10 (X _{I_R})	
9 (standard for pre-alarm type; and optional to other types)	Pre-alarm	Setting current IP(A)	0.9 (X _{I_R})		
	Current unbalance protection	Setting current Iunbal(A)	50 (X _{I_R})		
	Ground protection	Setting current Ig(A)	Close		
	Neutral pole protection	Setting current IRN(A)	Close		
Thermal simulation function		Close			

12 Ordering instructions

Please specify following matters when ordering:

- Model, name and pole number of the circuit breaker.
- Rated current of circuit breakers.
- Accessory name, specifications and combination code of the circuit breaker (the working voltage shall be specified for shunt tripper and undervoltage tripper).
- Usage: For power distribution (be delivered as for power distribution by default if not specified) and for motor protection (represented by 2).
- Quantity.
For example: 20 sets of TGM3E-250, 3-pole, 50kA, 250A, with shunt release, AC 400V. Fill in: TGM3E-250M/3310250AAC400V 20 sets.

For special requirements to the circuit breaker, please negotiate with the manufacturer.

13 Examples of rapid selection

- TGM3E-125M/3N300A125A:
i.e., order a TGM3E series electronic circuit breaker for power distribution protection, with 125A frame, 50kA (relatively high), rated current of 125A, 3-pole and 4-wire (i.e., 3P+N), without null line protection.
- TGM3E-125M/33002125A:
i.e., order a TGM3E series electronic circuit breaker for motor protection, with 125A frame, 50kA (relatively high), rated current of 125A, 3 poles.
- TGM3E-125H/3N300AE1W125A:
i.e., order a TGM3E series electronic circuit breaker for distribution protection, with 125A frame, 85kA (high breaking), rated current of 125A, 3-pole and 4-wire (i.e., 3P+N), with three-knob controller equipped with zero arc accessories, without null line protection. Remarks: For special customized products, please consult us firstly.

TGM3E Series Moulded Case Circuit Breaker

14 Description of the selection table of TGM3E series moulded case circuit

TGM3E	125	M	Z	4	3	00	2	A	F	III	E1	125	AC230V	B	Plateau	W
Model	Shell frame level current	Breaking capacity	Operation mode	Pole number	Tripping mode	Internal accessories	Usage	N pole code	Additional information	Alarm module	Controller code	Rated current	Voltage of accessories	Installation mode	Applicable situation	Special requirements
TGM3E electronic moulded case circuit breaker	125: 125A 160: 160A	M: relatively high	Default: Direct operation	3: 3 poles	3: Electronic	00: no accessory 10: shunt release 20: auxiliary contact 30: undervoltage release 40: shunt release + auxiliary contact	Default: Power distribution protection	A: three protective poles. Null line is not broken with other poles.	Default: Without prepayment	Default: Overload alarm release	Default: Pre-alarm controller	125: 32A 63A 125A	AC380/400V AC220/230V DC220V DC110V DC24V	Default: Fixed, front-board wiring	Default: Conventional application	Default: Flash barrier
	250: 250A 320: 320A	H: high breaking	Z: rotating handle operation	3N : 3P+N		50: shunt release 60: two sets of auxiliary contact 70: undervoltage release + alarm auxiliary contact 08: Alarm contact	2: Motor protection	B: three protective poles. Null line is broken with other poles.	F: Prepayment	III: Overload alarm without tripping	E1: Three-knob controller	160: 63A 125A 160A	Multiple accessory voltages shall be described separately (for example: Shunt AC230 OV, undervoltage AC400V)	B: Fixed, rear-board wiring	Plateau Damp heat Environmental protection Salt mist Low temperature	w: Zero flashover
	400: 400A 630: 630A		P: motor operation	4: 4 poles		18: shunt release + alarm contact 28: auxiliary contact + alarm contact 38: undervoltage release + alarm auxiliary contact 48: shunt release + alarm contact		C: four protective poles. Null line is broken with other poles.			E2: Current unbalance type controller	250: 250A 320: 320A		C: Plug-in rear-board wiring		Handle lock
	800: 800A 1250: 1250A					68: two sets of auxiliary contacts + alarm contact 78: undervoltage release + alarm auxiliary contact		D: four protective poles. Null line is not broken with other poles.			E3: Grounding type controller	400: 400A 630: 630A 800: 800A 1250: 1250A		F: Plug-in front-board wiring		