TEM5E Series Moulded Case Circuit Breaker

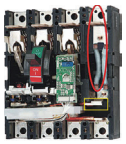
1 Overview

TEM5E series moulded case circuit breaker is one of the new circuit breakers developed by TENGEN with international advanced technology. It is characterized by comprehensive protection, excellent performance and compact size. The circuit breakers are classified into two types according to their rated ultimate short-circuit breaking capacity (Icu): M type (medium breaking type) and H type (high breaking type), which are ideal products for power distribution and motor protection. It is an ideal product for power distribution and motor protection. With rated insulation voltage of 1000V, they are suitable for infrequent switching of circuits and infrequent starting of motors in circuits with AC 50/60Hz, rated working voltage of 690V and below, and rated current from 12.5A to 800A. The circuit breaker can be equipped with optional communication function module, which makes it convenient to upgrade the original circuit breaker to communication type circuit breaker. The circuit breakers have the functions of overload long delay, short-circuit short delay, short-circuit instantaneous, grounding protection, neutral pole protection, etc. The products can be equipped with undervoltage, shunt, auxiliary, alarm and communication accessories. This series of circuit breakers can be installed vertically (i.e. vertical installation) and horizontally (i.e. horizontal installation).
The circuit breakers comply with the standards: IEC 60947-1, IEC 60947-2.

Four-pole product code

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

Four-pole product code view

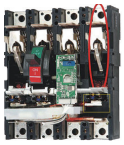


A type: N pole is not equpped with an overcurrent trip element, and N pole is always on, and is not open and closed together other three poles

No overcurrent release

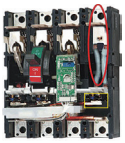
B type: N pole is not equpped with an overcurrent trip element, and N pole is always open and closed together other three poles (N pole is first closed and then open)

No overcurrent release



C type: N pole is equpped with an overcurrent trip element, and N pole is always open and closed together other three poles (N pole is first closed and then open)

With overcurrent release



D type: N pole is equpped with an overcurrent trip element, and N pole is always on, and is not open and closed together other three poles

With overcurrent release

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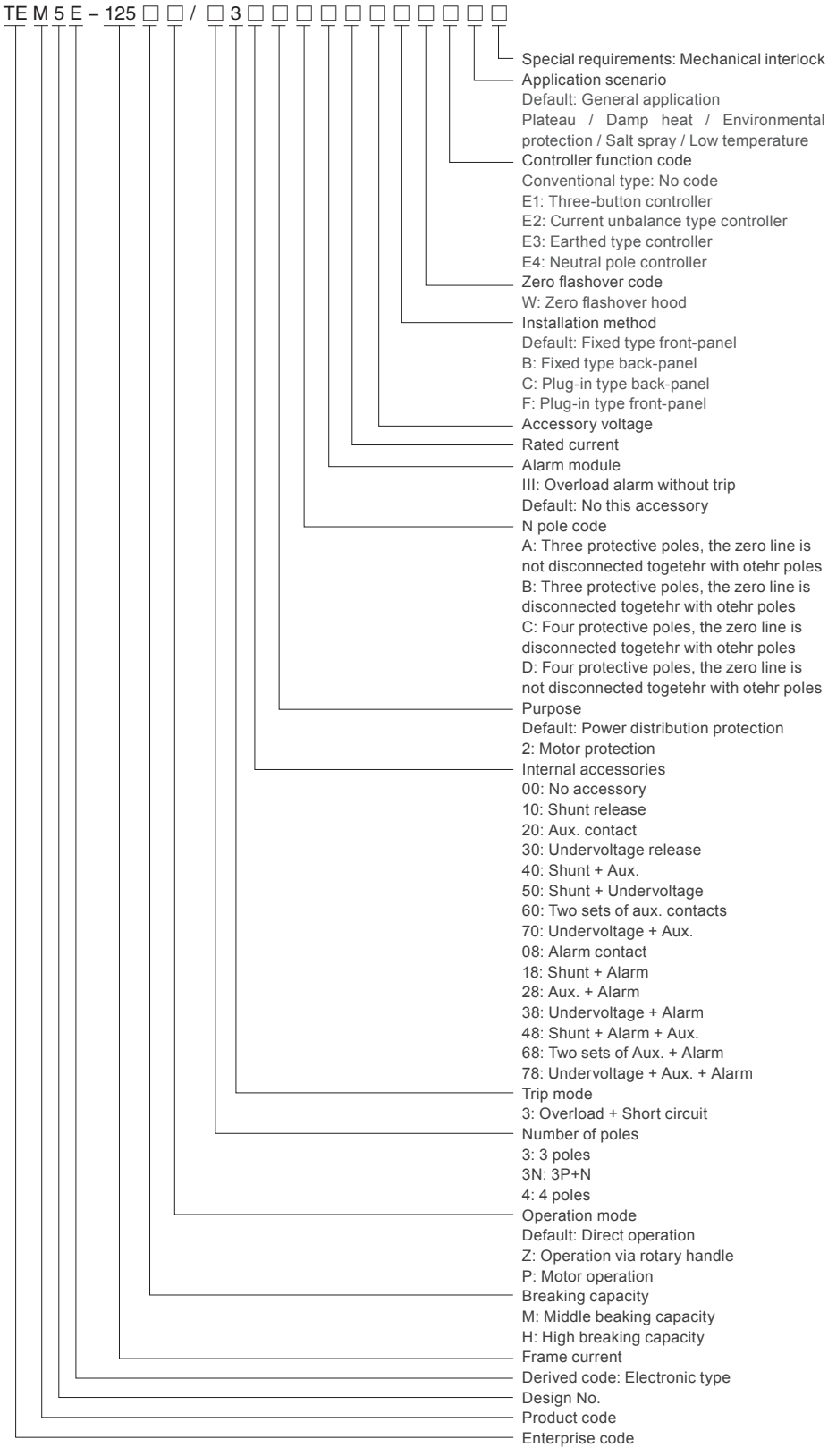
2 Type Designation



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3 Technical Parameters

Basic parameters															
Frame rated current Inn		125		160		250		320		400		630		800	
Number of poles		3P, 3P+N, 4P		3P, 3P+N, 4P		3P, 3P+N, 4P		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		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		380/400/415/660/690		380/400/415/660/690		380/400/415/660/690	
Rated insulation voltage Ui(V)		1000		1000		1000		1000		1000		1000		1000	
Rated impulse withstand voltage Uimp (kV)		8		8		8		8		12		12		12	
Rated working current In(A)		32AF: 12.5-32A 63AF: 25-63A 125AF: 50-125A		63AF: 25-63A 125AF: 50-125A 160AF: 63-160A		250AF: 100-250A		320AF: 125-320A		400AF: 160-400A		630AF: 250-630A		630AF: 250-630A 800AF: 315-800A	
Breaking capacity		M	H	M	H	M	H	M	H	M	H	M	H	M	H
Rated ultimate short circuit breaking capacity Icu(kA)	AC415V	50	85	50	85	50	85	50	85	70	100	70	100	70	100
	AC690V	10	20	10	20	10	20	10	20	20	30	20	30	20	30
Rated run short circuit breaking capacity Ics(kA)	AC415V	50	50	50	50	50	50	50	50	70	70	70	70	70	70
	AC690V	10	10	10	10	10	10	10	10	20	20	20	20	20	20
Rated short time withstand current Icw(kA/1s)	AC415V	-	-	-	-	-	-	-	-	5	5	8	8	10	10
Isolation function		Yes (3P, 4P)		Yes (3P, 4P)		Yes (3P, 4P)		Yes (3P, 4P)		Yes (3P, 4P)		Yes (3P, 4P)		Yes (3P, 4P)	
Usage category		Class A		Class A		Class A		Class A		Class B		Class B		Class B	
Service life	Mechanical	40000		40000		40000		40000		20000		20000		20000	
	Electrical	8000		8000		8000		8000		7500		7500		7500	
Outline dimensions L*W*H	M, H type 3P (L*W*H)	155*92.5*116		155*92.5*116		165*107*116		180*107*116		257*150*150		257*150*150		280*210*155	
	M, H type 4P (L*W*H)	155*122.5*116		155*122.5*116		165*142*116		180*142*116		257*198*150		257*198*150		280*280*155	
Installation dimensions A*B	M, H type 3P	30*134		30*134		35*126		35*126		44*194		44*194		70*243	
	M, H type 4P	60*134		60*134		70*126		70*126		94*194		94*194		140*243	

Accessory information							
Direct operation via handle	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Extended rotary handle	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Motor mechanism	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Shunt release	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Undervoltage release	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Aux. conact	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Alarm contact	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)

Fixed front-panel	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Fixed back-panel	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Plug-in front-panel (not available for 4P product)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Plug-in back-panel	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Transition bar	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Phase partition	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)	■ (Standard)
Handle lock	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Zero flashover accessory	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional)
Mechanical inerlock	□ (Optional)	□ (Optional)	□ (Optional)	□ (Optional))	□ (Optional)	□ (Optional)	□ (Optional)

4 Working and Installation Conditions

- Ambient temperature: The low temperature type is suitable for the -40°C - +70°C environment where the mean value does not exceed +35°C within 24 hours. If below -5°C or higher than 40°C, derating is required.
- Atmosphere conditions: The relative temperature does not exceed 50% at ambient temperature +40°C, and higher relative humidity can be allowed at lower temperatures; for example, when the mean monthly minimum temperature is +25°C, the relative humidity is 90%, considering the condensation that occurs on the surface of the product due to temperature changes.
- Altitude: Suitable for up to 2000 m; if more than 2000 m, the altitude derating is required.
- Installation category: Main circuit: Class III; the installation category of the auxiliary circuit and control circuit not connected to main circuit is Class II.
- Pollution degree: 3
- Use category: See technical parameters table
- Protection grade: IP40 (installed in the small chamber in the cabinet with door frame provided)
- Electromagnetic compatibility: Electromagnetic environment A
- Installation angle: The vertical slope does not exceed 5°

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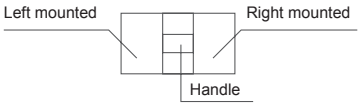
5 TEM5E Release and Accessory Code



Alarm contact ●　　Aux. contact ○

Shunt release ■　　Undervoltage release ▲

	Accessory code	Accessory installation and lead mode					
Accessory name	Electronic release	TEM5E-125/160		TEM5E-250/320		TEM5E-400 TEM5E-630 TEM5E-800	
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 conact	318						
Aux. contact Alarm contact	328						
Undervoltage release Alarm contaact	338						
Shunt release Aux. contact Alarm contact	348						
Two sets of aux. contacts Alarm contact	368						
Undervoltage release Aux. contact Alarm contact	378						

Note: 800 frame product has no right alarm accessory.

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6 Usage type

Power distribution type

The power distribution type TEM5E circuit breaker has no protection code by default, and has overload long delay + short circuit short delay + short circuit instantaneously protection functions, such as optional model is TEM5E – 125M/3300.

Electronic release	Frame rated current Inm (A)	Rated current In (A)	Adjustable overload release current setting value I_R (A)	Trip characteristic / time
Overload long delay	125	32	12.5-14-16-18-20-22-25-28-30-32	Operated according to I^2t $1.05I_R$: No operation within 2 hours $1.3I_R$: Operation within 1 hour Inm<400A $2I_R$: t_R = (12-60-80-100) Inm≥400A $2I_R$:t_R = (12-60-100-150)s Characteristic curve $T=(2*I_R/I)^{2}*t_R$ ($1.2I_R \le I < Isd$)
		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	
Operation tolerance				±20%

Motor protection type

Electronic release	Frame rated current Inm (A)	Rated current In (A)	Adjustable overload release current setting value I_R (A)	Trip characteristic / time
Overload long delay	125	32	12.5-14-16-18-20-22-25-28-30-32	Operated according to I^2t (see Table 1)
		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	Operated according to I^2t (see Table 2)
	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	
Operation tolerance				±20%

$1.05I_R$	No operation within 2 hours			
$1.2I_R$	Operation within 1 hour			
$1.5I_R$	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

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$1.05I_R$	No operation within 2 hours			
$1.2I_R$	Operation within 1 hour			
$1.5I_R$	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

7 Circuit Protection

Short circuit short delay protection

Electronic release	Frame rated current Inm (A)	Adjustable short circuit short delay current setting value I_{sd} (A)	Trip characteristic / time
Short circuit short delay	Full series	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-delay opeation tolerance is ± 20% Characteristic curve $T=(1.5\times I_{sd}/I)^2\times t_{sd}$ When 1.5I_{sd} ≤I < Ii, the definite time limit is triggerred t_{sd}=0.06s±0.02s; t_{sd}=0.1s±0.03s; t_{sd}=0.2s±0.04s; t_{sd}=0.3s±0.06s;

Short circuit instantaneous protection

Electronic release	Frame rated current Inm (A)	Adjustable short circuit instantaneous trip current setting value I_i (A)	Trip characteristic / time
Short circuit instantaneous	Full series	I_i=(4-6-7-8-10-11-12-13-14)×I_R+OFF	When I ≤ 0.85I_i, no action When I ≥ 1.15I_i, the operation time is < 0.08s
Operation tolerance			±15%

Current unbalance protection

Electronic release	Frame rated current Inm (A)	Adjustable current unbalance protection release current setting value I_{unbal} (A)	Trip characteristic / time
Current unbalance protection	Full series	I_{unbal}=(10-15-20-25-30-35-40-45-50)%×I_R+OFF	When I ≤ 0.9I_{unbal} , no operation When I ≥ 1.1I_{unbal} , operation
Operation tolerance			±15%

Earthing protection – Three-phase current balance type

Electronic release	Frame rated current Inm (A)	Adjustable earthing protection release current setting value I_g (A)	Trip characteristic / time
Earthing protection	Full series	I_g=(0.7-0.75-0.8-0.85-0.9-0.95-1)×I_R+OFF	When I ≤ 1I_g, no operation When I ≥ 1.1I_gg, operation
Operation tolerance			±15%

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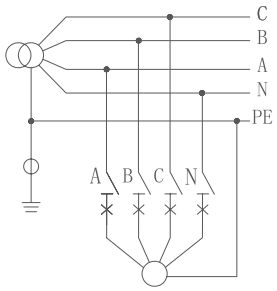


1. Only for TN-S system.
2. The earthing protection is used for load balancing; for unbalance load, this function shall be disenabled or set the constant value more than the allowable unbalance current

Neutral pole protection

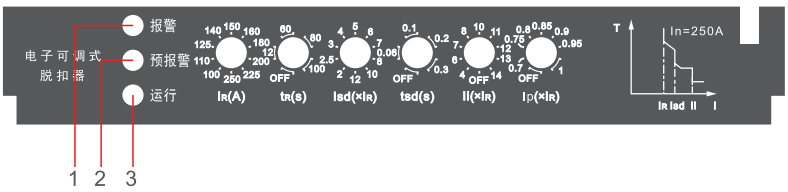
Electronic release	Frame rated current Inm (A)	Adjustable neutral pole protection release current setting value I_{RN} (A)	Trip characteristic / time
Neutral pole protection	Full series	I_{RN}=(0.5-1)×I_R+OFF	Inm<400A $2I_{RN}$: t_{RN} = (12-60-80-100) Inm≥400A $2I_{RN}$:t_{RN} = (12-60-100-150)s Characteristic curve T=（$2*I_{RN}/I$）$^{2}*t_{RN}$ （$1.2I_{RN}$≤I<Isd）
Operation tolerance			±15%

Overload pre-warning

Electronic release	Frame rated current Inm (A)	Adjustable overload pre-warning protection release current setting value I_g (A)	Trip characteristic / time
Overload pre-warning	Full series	I_p=(0.7-0.75-0.8-0.85-0.9-0.95-1)×I_R+OFF	/

8 Electronic release

Indicator status explanation



	Indicator description	Indicator run status 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	Prewarning LED indicator (yellow)	When I > 1.1I_p, the prewarning indicator is on; when I ≤ 0.9I_p, the prewarning indicator is not on
3	Run LED indicator (green)	When I > 0.4I_n, the run indicator is flickering (lit once every second); when I≤0.35I_n, the run indicator is flickering slowly (lit once every 2 seconds)

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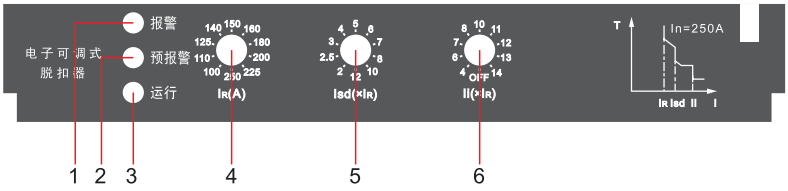
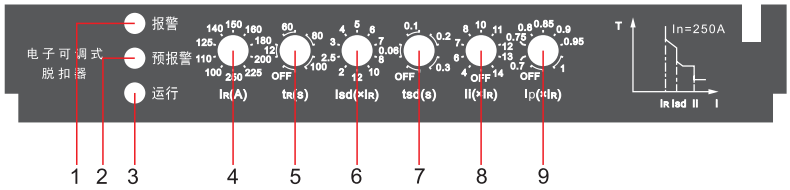
Three-button intelligent controller (E1 type)



Three-button intelligent controller information		
1	Alarm LED indicator	Default parameters 1 Default setting value of the overload long delay time is t_R = 60s 2 Default setting value of the short circuit short delay time is t_{sd} = 0.3s 3 Default setting value of the overload prewarning current is I_p = 0.9 x I_R
2	Prewarning LED indicator	
3	Run 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)	

Prewarning type intelligent controller (conventional type)



Six-button intelligent controller information		
1	Alarm LED indicator	Default parameters No
2	Prewarning LED indicator	
3	Run 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 tsd(s)	
8	Short circuit instantaneous current setting value I_i(A)	
9	Overload prewarning current setting value I_p(A)	

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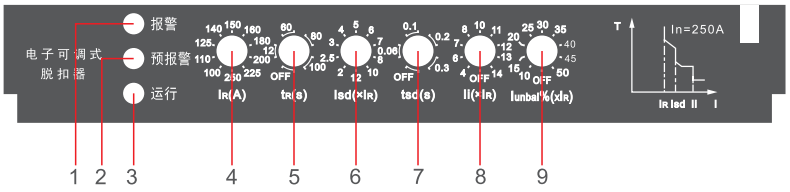
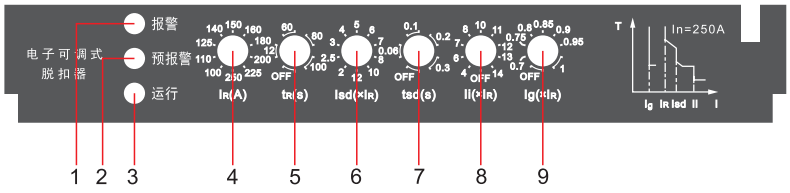
Current unbalance type intelligent controller (E2 type)



Six-button intelligent controller information		
1	Alarm LED indicator	Default parameters 1. The current unbalance time setting value t_{unbal} = 10s 2. The default setting value of the overload prewarning current is $I_p = 0.9 \times I_R$
2	Prewarning LED indicator	
3	Run 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	Current unbalance setting value I_{unbal}(A)	

Earthing type intelligent controller (E3 type)



Six-button intelligent controller information		
1	Alarm LED indicator	Default parameters 1. The earthing protection time setting value t_g = 0.4s 2. The default setting value of the overload prewarning current is $I_p = 0.9 \times I_R$
2	Prewarning LED indicator	
3	Run 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)	

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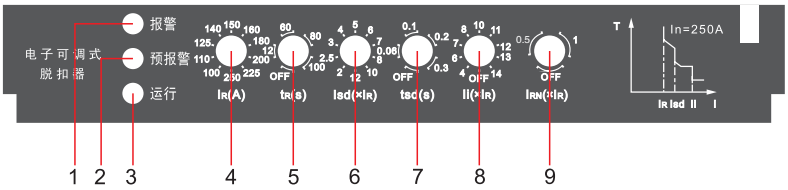
Neutral pole protection controller (E4 type)



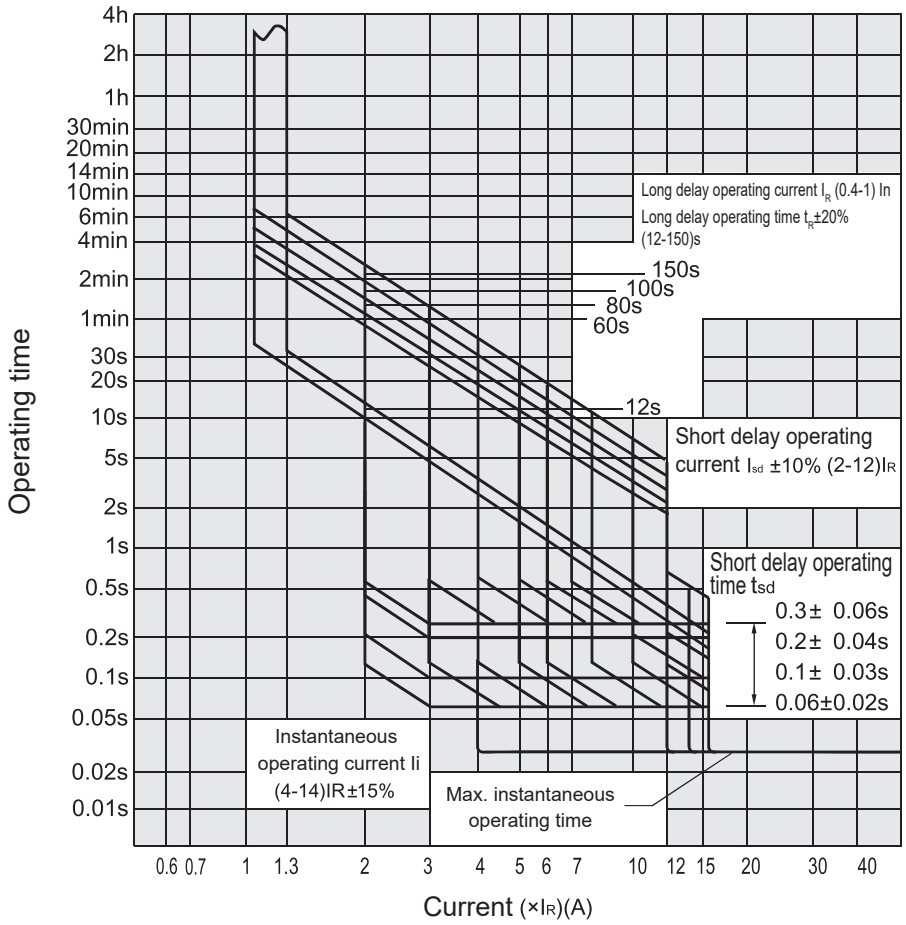
Six-button intelligent controller information		
1	Alarm LED indicator	Default parameters 1. The default setting value of the overload prewarning current is I_p = 0.9 x I_R
2	Prewarning LED indicator	
3	Run LED indicator	
4	Overload long delay current setting value I_R(A)	
5	Overload long delay time setting 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	Neutral pole protection current setting value I_{RN}(A)	

9 Factory parameters setting of circuit breaker intelligent controller

	Protection type		Power distribution protection		Motor protection
1	Overload long delay	Setting current I_R (A)	In		
2		Delay t_R (s)	60		100
3	Short circuit short delay	Setting current I_{sd} (A)	8 (XI_R)		10(XI_R)
4		Delay t_{sd} (s)	0.3		
5	Short circuit instantaneous	Setting current I_i (A)	Inm≤630A	12 (XI_R)	14(XI_R)
			Inm≥800A	10 (XI_R)	
6 (Prewaring is provided as standard configuration, and others are optional)	Prewarnging	Setting current I_P (A)	0.9 (XI_R)		
	Current unbalance protection	Setting current	50% (XI_R)		
	Earthing protection	Setting current I_g (A)	Off		
	Neutral pole protection	Setting current I_{RN} (A)	Off		
Thermal simulation function		Off			

TEM5E Series Moulded Case Circuit Breaker

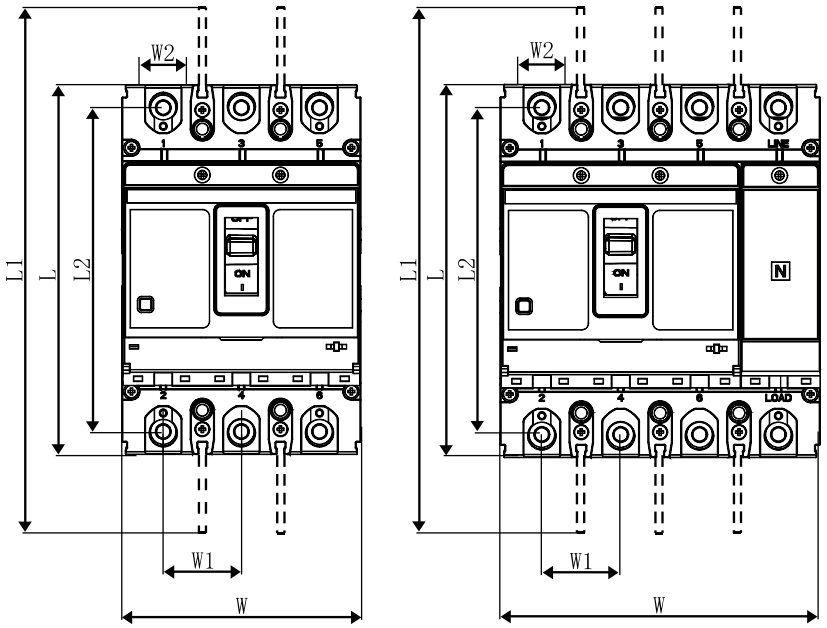
10 Protection characteristic

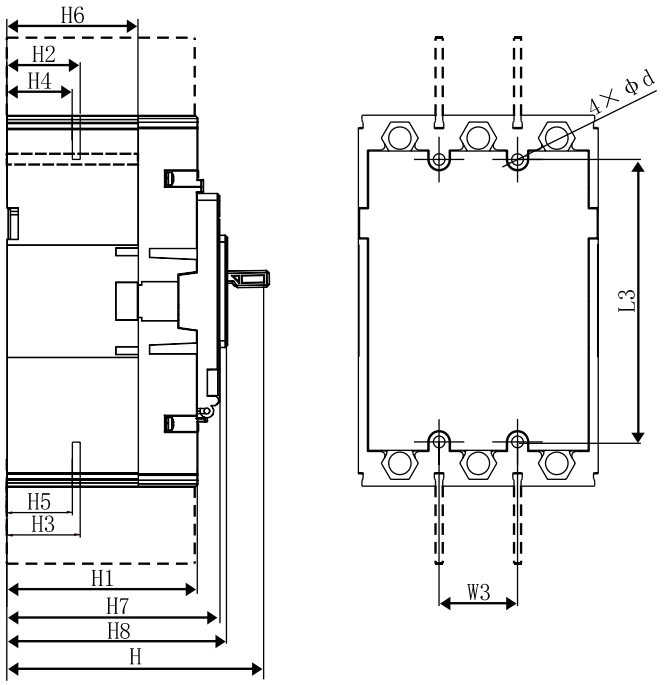


TEM5E Series Moulded Case Circuit Breaker

11 Outline and installation dimensions

Outline and installation dimensions of the product (non-zero flashover)

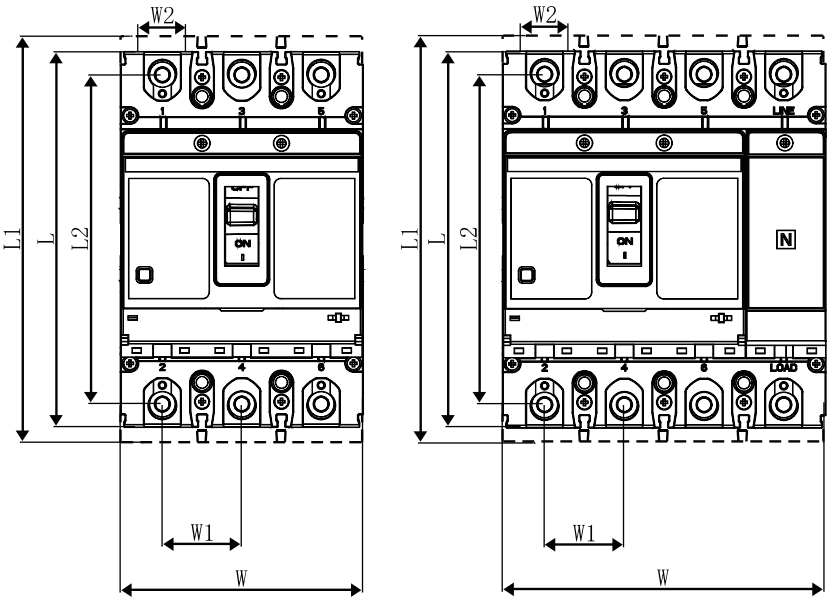


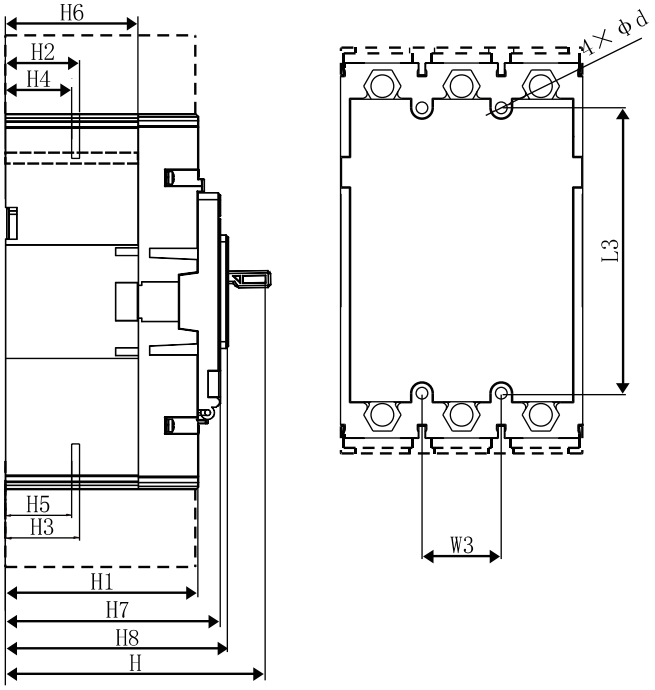


Note: The part marked in the dash line is zero flashover hood.

TEM5E Series Moulded Case Circuit Breaker

Outline and installation dimensions of the product (zero flashover)





Note: The part marked in the dash line is zero flashover hood.

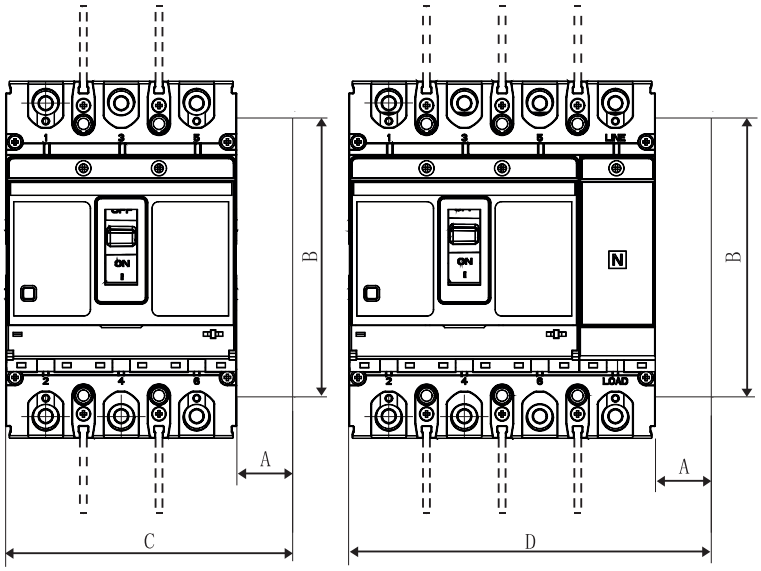
TEM5E Series Moulded Case Circuit Breaker

Model	Number of poles	Outline dimensions (mm)														Installation dimensions (mm)				
		L	L1		W	W1	W2	H	H1	H2	H3	H4	H5	H7	H8	L2	L3	W3	H6[1)]	Φd
			Non-zero flashover	Zero flashover																
TEM5E-125M	3	155	250	169	92.5	30	18	116	82	28.5	28.5	25.5	25.5	96	100	137	134	30	25	4.5
	4				122.5													60		
TEM5E-125H	3				92.5													30		
	4				122.5													60		
TEM5E-160M	3	155	250	169	92.5	30	18	116	82	28.5	28.5	25.5	25.5	96	100	137	134	30	25	4.5
	4				122.5													60		
TEM5E-160H	3				92.5													30		
	4				122.5													60		
TEM5E-250M	3	165	300	180	107	35	24	116	85	22.5	22.5	18.5	18.5	95	98.5	146	126	35	60.5	4.5
	4				142													70		
TEM5E-250H	3				107													35		
	4				142													70		
TEM5E-320M	3	165	300	180	107	35	24	116	85	22.5	22.5	18.5	18.5	95	98.5	146	126	35	60.5	4.5
	4				142													70		
TEM5E-320H	3				107													35		
	4				142													70		
TEM5E-400M	3	257	471	285	150	48	33	150	100	39.5	38.5	34.5	35.3	111	115	224	194	44	47	7
	4				198													94		
TEM5E-400H	3				150													44		
	4				198													94		
TEM5E-630M	3	257	471	285	150	48	33	150	100	40.5	41.5	34.5	35.3	111	115	224	194	44	47	7
	4				198													94		
TEM5E-630H	3				150													44		
	4				198													94		
TEM5E-800M	3	280	494	303	210	70	45	155	103	42	46	36	39	115	120	243	243	70	70	7
	4				280													140		
TEM5E-800H	3				210													70		
	4				280													140		

Note: To install the external-hung accessories, a 22mm installation space shall be reserved on each side of the product.

TEM5E Series Moulded Case Circuit Breaker

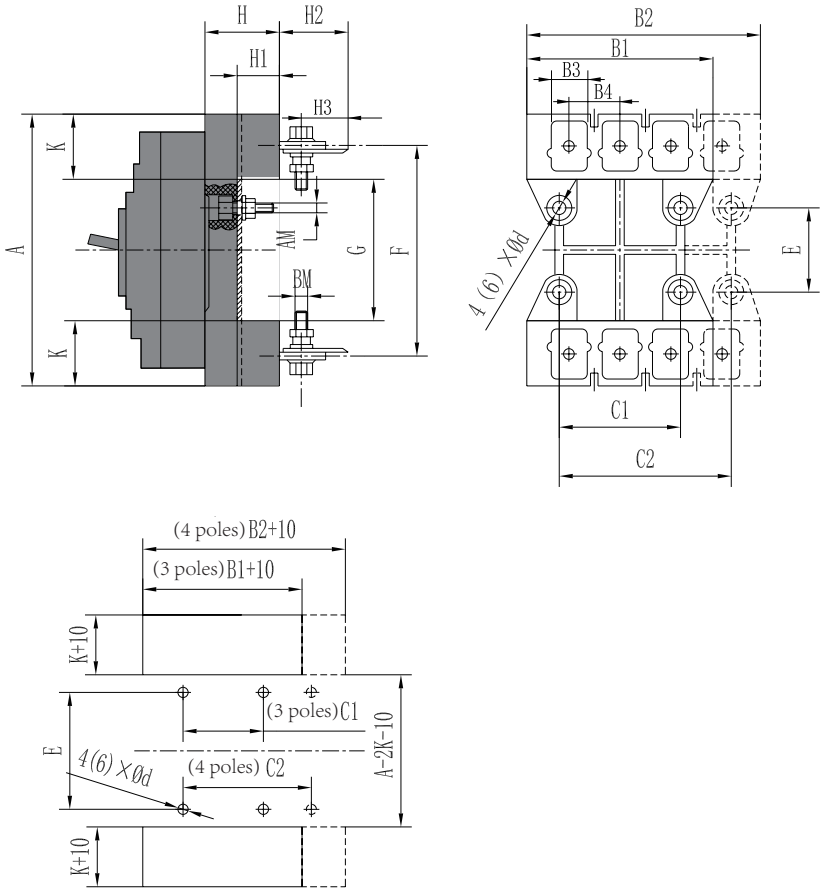
Outline dimensions of TEM5E electronic accessories



Model	Outline dimensions of accessory			
	A	B	C	D
TEM5E-125/160	25	125	117.5	147.5
TEM5E-250/320	25	125	132	167
TEM5E-400/630	25	125	175	223
TEM5E-800	25	125	235	305

TEM5E Series Moulded Case Circuit Breaker

Outline and installation dimensions of TEM5E plug-in type



Size of hole on the mounting plate (unit: mm)

Model	Outline and installation dimensions (mm)																	
	A	B1	B2	B3	B4	C1	C2	E	F	G	K	H	H1	H2	H3	AM	BM	φd
TEM5E-125/160	173	91	125	20	30	60	90	62	137	97	38	53	33	28	15	M6	M8	6.5
TEM5E-250/320	186	107	145	22	34	70	105	54	145	94	46	50	33	37	18	M6	M8	6.5
TEM5E-400/630	280	149	200	31	48	60	108	129	224	170	55	60	38	46	22	M8	M12	8.5
TEM5E-800	305	210	280	/	71	90	162	146	242	181	62	87	60	22	/	M10	M14	11

12 Ordering notice

When ordering, please specify: product model, specification, number of poles, accessory name, protection characteristics, rated current, and order quantity.

For example: Order TEM5E-125 circuit breaker with three poles and M type breaking capacity used in the power distribution protection, rated current 125A, 200 units.

Please specify: TEM5E-125M/3300 125A (63-125)A adjustable 200 units.

If you have special requirements for circuit breakers, please contact the manufacturer for this through negotiation.