

TGD1-32 AC Motor Circuit Breaker

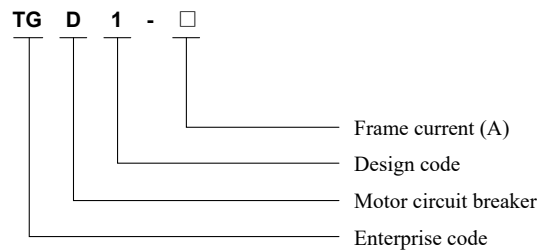


1 Overview

TGD1-32 AC motor circuit breaker is suitable for circuits with AC voltage up to 690V and current up to 32A for overload, open-phase, short-circuit protection, and infrequent start control of three-phase squirrel-cage asynchronous motor and for power distribution line protection, and infrequent load changeover. It can be used as disconnecter.

Standard: GB/T 14048.2 and GB/T 14048.4.

2 Type Designation



3 Technical Parameters

- 3.1 Rated insulation voltage U_i (V): 690.
- 3.2 Rated working voltage U_e (V): 230/240, 400/415, 440, 500, 690.
- 3.3 Rated frequency (Hz): 50/60.
- 3.4 Frame current I_{nm} (A): 32.
- 3.5 Rated current of release I_n (A): (See Table 1).
- 3.6 Setting current range: (See Table 1).
- 3.7 Rated ultimate short-circuit breaking capacity I_{cu} (kA): (See Table 1).
- 3.8 Rated operating short-circuit breaking capacity I_{cs} (kA): (See Table 1).
- 3.9 Rated impulse withstand voltage U_{imp} (V): 6000.

Table 1

Model	Rated current of release I_n (A)	Setting current regulating range (A)	Rated limit short-circuit breaking capacity I_{cu} Rated run short-circuit breaking capacity I_{cs}										Flashover distance (mm)	
			230/240V		400/415V		440V		500V		690V			
			I_{cu} kA	I_{cs} kA	I_{cu} kA	I_{cs} kA	I_{cu} kA	I_{cs} kA	I_{cu} kA	I_{cs} kA	I_{cu} kA	I_{cs} kA		
TGD1-32	0.16	0.1-0.16	100	100	100	100	100	100	100	100	100	100	100	40
TGD1-32	0.25	0.16-0.25	100	100	100	100	100	100	100	100	100	100	100	40
TGD1-32	0.4	0.25-0.4	100	100	100	100	100	100	100	100	100	100	100	40
TGD1-32	0.63	0.4-0.63	100	100	100	100	100	100	100	100	100	100	100	40
TGD1-32	1	0.63-1	100	100	100	100	100	100	100	100	100	100	100	40

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Table, continued

Model	Rated current of release In(A)	Setting current regulating range (A)	Rated limit short-circuit breaking capacity Icu Rated run short-circuit breaking capacity Ics										Flashover distance (mm)	
			230/240V		400/415V		440V		500V		690V			
			Icu kA	Ics kA	Icu kA	Ics kA	Icu kA	Ics kA	Icu kA	Ics kA	Icu kA	Ics kA		
TGD1-32	1.6	1-1.6	100	100	100	100	100	100	100	100	100	100	100	40
TGD1-32	2.5	1.6-2.5	100	100	100	100	100	100	100	100	100	3	2.25	40
TGD1-32	4	2.5-4	100	100	100	100	100	100	100	100	100	3	2.25	40
TGD1-32	6.3	4-6.3	100	100	100	100	50	50	50	50	50	3	2.25	40
TGD1-32	10	6-10	100	100	100	100	15	5	10	10	10	3	2.25	40
TGD1-32	14	9-14	100	100	15	7.5	8	4	6	4.5	3	2.25	40	
TGD1-32	18	13-18	100	100	15	7.5	8	4	6	4.5	3	2.25	40	
TGD1-32	23	17-23	50	50	15	6	6	3	3	3	3	2.25	40	
TGD1-32	25	20-25	50	50	15	6	6	3	3	3	3	2.25	40	
TGD1-32	32	24-32	50	50	10	5	6	3	3	3	3	2.25	40	

3.10 Rated power of three-phase motor controlled by motor circuit breaker (see Table 2)

Table 2

Model	Rated current of release In(A)	Setting range regulating range (A)	Standard rated power of three-phase motor (kW)					
			AC-3, 50Hz/60Hz					
			230/240V	400V	415V	440V	v500V	690V
TGD1-32	0.16	0.1-0.16	-	-	-	-	-	-
TGD1-32	0.25	0.16-0.25	-	-	-	-	-	-
TGD1-32	0.4	0.25-0.4	-	-	-	-	-	-
TGD1-32	0.63	0.4-0.63	-	-	-	-	-	0.37
TGD1-32	1	0.63-1	-	-	-	0.37	0.37	0.55
TGD1-32	1.6	1-1.6	-	0.37	-	0.55	0.75	1.1
TGD1-32	2.5	1.6-2.5	0.37	0.75	0.75	1.1	1.1	1.5
TGD1-32	4	2.5-4	0.75	1.5	1.5	1.5	2.2	3
TGD1-32	6.3	4-6.3	1.1	2.2	2.2	3	3.7	4
TGD1-32	10	6-10	2.2	4	4	4	5.5	7.5
TGD1-32	14	9-14	3	5.5	5.5	7.5	7.5	9
TGD1-32	18	13-18	4	7.5	9	9	9	11
TGD1-32	23	17-23	5.5	11	11	11	11	15
TGD1-32	25	20-25	5.5	11	11	11	15	18.5
TGD1-32	32	24-32	7.5	15	15	15	18.5	25

3.11 Housing protection grade: IP20.

3.12 Motor circuit breaker operating performance: When the maximum operating frequency is 120 times/h, the mechanical life is 100,000 times, and the electrical life is also 100,000 times.

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4 Operating Conditions

- 4.1 The altitude generally does not exceed 2,000 meters at the installation site.
- 4.2 The lower limit of ambient air temperature generally is not below than -5°C , the upper limit generally is not higher than $+40^{\circ}\text{C}$, and the mean within 24H does not exceed $+35^{\circ}\text{C}$.
- 4.3 Atmospheric conditions: The relative air humidity does not exceed 50% at the ambient air temperature $+40^{\circ}\text{C}$, and a higher relative humidity is allowed at a lower temperature. The mean monthly minimum temperature of the wettest month does not exceed $+25^{\circ}\text{C}$, and the mean monthly maximum relative humidity of this month does not exceed 90%. Condensation occurred on the product surface due to temperature changes shall be considered.
- 4.4 Pollution degree: 3.
- 4.5 Installation category: Class III.
- 4.6 The inclination between the motor circuit breaker and the vertical installation plane does not exceed 5° .
- 4.7 Trip class: 10A.

5 Circuit Breaker Features

- 5.1 Action characteristics when all phase loads of motor circuit breaker are balanced (see Table 3).

Table 3

No.	Setting current multiple	Action time	Starting conditions	Ambient air temperature $^{\circ}\text{C}$
1	1.05	No action $\geq 2\text{h}$	Cold state starts	20 \pm 2
2	1.2	Action $< 2\text{h}$	Hot state (after No. 1 test) starts	
3	1.5	Action < 2 minutes	Hot state (starts after double the setting current is balanced thermally)	
4	7.2	$2\text{s} < T_p \leq 10\text{s}$	Cold state	

- 5.2 Action characteristics when all phase loads of motor circuit breaker are unbalanced (see Table 4).

Table 4

No.	Set current multiple		Action time	Starting condition	Ambient air temperature $^{\circ}\text{C}$
	Any two phases	Third phase			
1	1	0.9	No action $\geq 2\text{h}$	Cold state starts	20 \pm 2
2	1.15	0	Action $< 2\text{h}$	Hot state (after No. 1 test) starts	

- 5.3 Motor circuit breaker temperature compensation performance.

Table 5

No.	Set current multiple	Starting condition	Action time	Ambient air temperature $^{\circ}\text{C}$
1	1.0	Cold state starts	No action $\geq 2\text{h}$	40 \pm 2
2	1.2	Hot state (after No. 1 test) starts	Action $< 2\text{h}$	40 \pm 2
3	1.05	Cold state starts	No action $\geq 2\text{h}$	-5 ± 2
4	1.3	Hot state (after No. 3 test) starts	Action $< 2\text{h}$	-5 ± 2

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5.4 Setting current of instantaneous electromagnetic release of motor circuit breaker (see Table 6).

Table 6

Model	Related current of release $I_n(A)$	Setting current regulating range of thermal element (A)	Setting current of instantaneous electromagnetic release $I_r(A)$
TGD1-32	0.16	0.1-0.16	1.5
	0.25	0.16-0.25	2.4
	0.4	0.25-0.4	5
	0.63	0.4-0.63	8
	1	0.63-1	13
	1.6	1-1.6	22.5
	2.5	1.6-2.5	33.5
	4	2.5-4	51
	6.3	4-6.3	78
	10	6-10	138
	14	9-14	170
	18	13-18	223
	23	17-23	327
	25	20-25	327
32	24-32	416	

5.5 Action characteristics of instantaneous electromagnetic release of motor circuit breaker (see Table 7)

Table 7

Test current	Starting state	Action time	Ambient air temperature °C
0.8 I_r	Cold state	No action $\geq 0.2s$	20 \pm 2
1.2 I_r	Cold state	Action < 2s	20 \pm 2

5.6 Selection of backup fuse:

When the expected short-circuit current at the installation site is greater than the rated limit short-circuit breaking capacity of motor circuit breaker, the model and fuse current specification of the backup short circuit breaker fuse (see Table 8).

For example, fuse RT16(NT00) with usage category gG can be optional.

Table 8

Model	Rated current of release $I_n(A)$	Setting current regulating range (A)	Fuse current specifications of backup fuse only when the expected short-circuit current $I_{ce} > I_{cu}$ rated limit short-circuit breaking capacity									
			230/240V		400/415V		440V		500V		690V	
			I_{Am} A	$I_{gL/g}$ G A	I_{Am} A	$I_{gL/g}$ G A	I_{Am} A	$I_{gL/g}$ G A	I_{Am} A	$I_{gL/g}$ G A	I_{Am} A	$I_{gL/g}$ G A
TGD1-32	0.16	0.1-0.16	-	-	-	-	-	-	-	-	-	-
TGD1-32	0.25	0.16-0.25	-	-	-	-	-	-	-	-	-	-
TGD1-32	0.4	0.25-0.4	-	-	-	-	-	-	-	-	-	-
TGD1-32	0.63	0.4-0.63	-	-	-	-	-	-	-	-	-	-
TGD1-32	1	0.63-1	-	-	-	-	-	-	-	-	-	-
TGD1-32	1.6	1-1.6	-	-	-	-	-	-	-	-	-	-
TGD1-32	2.5	1.6-2.5	-	-	-	-	-	-	-	-	16	20
TGD1-32	4	2.5-4	-	-	-	-	-	-	-	-	25	32
TGD1-32	6.3	4-6.3	-	-	-	-	50	63	50	63	32	40
TGD1-32	10	6-10	-	-	-	-	50	63	50	63	32	40

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Table, continued

Model	Rated current of release I_n (A)	Setting current regulating range (A)	Fuse current specifications of backup fuse only when the expected short-circuit current $I_{cc} > I_{cu}$ rated limit short-circuit breaking capacity									
			230/240V		400/415V		440V		500V		690V	
			Am A	gL/g G A	Am A	gL/g G A	Am A	gL/g G A	Am A	gL/g G A	Am A	gL/g G A
TGD1-32	14	9-14	-	-	63	80	50	63	50	63	40	50
TGD1-32	18	13-18	-	-	63	80	50	63	50	63	40	50
TGD1-32	23	17-23	80	100	80	100	63	80	50	63	40	50
TGD1-32	25	20-25	80	100	80	100	63	80	50	63	40	50
TGD1-32	32	24-32	80	100	80	100	63	80	50	63	40	50

6 Motor Circuit Breaker Accessories

6.1 Types, models, and specification of accessories (see Table 9).

Table 9

Accessory name	Accessory model & Spec.		
Undervoltage release	TGD1-32 UV110	TGD1-32 UV220	TGD1-32 UV380
Shunt release	TGD1-32 SR110	TGD1-32 SR220	TGD1-32 SR380
Instantaneous auxiliary contact (front-mounted)	TGD1-32 AF-11	TGD1-32 AF-20	-
Instantaneous auxiliary contact (side-mounted)	TGD1-32 A-S11	TGD1-32 AS-20	-
Waterproof mounting box	TGD1-32MC		

6.2 Performances of undervoltage releases TGD1-32 UV110, TGD1-32 UV220, and TGD1-32 UV380:



- Rated insulation voltage U_i (V): 690
- Action characteristics: When the voltage drops to the 70%-35% range of rated voltage, the undervoltage release shall work; when the power voltage is below than 35% rated voltage of release, the undervoltage release shall work to prevent the motor circuit breaker from closing; when the power voltage equals to or is greater than 85% rated voltage of release, the undervoltage release shall work to ensure the motor circuit breaker closed.

6.3 Performances of shunt releases TGD1-32 SR110, TGD1-32 SR220, and TGD1-32 SR380:



- Rated insulation voltage U_i (V): 690;
- Action characteristics: The action voltage range of shunt release is 70% ~ 110% of rated working voltage.

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6.4 Performance of instantaneous auxiliary contacts TGD1-32 AF-20 and TGD1-32 AF-11 (front-mounted)



- a. Rated insulation voltage $U_i(V)$: 250;
- b. Resistive current $I_{th}(A)$: 2.5;
- c. Usage category, rated working voltage and rated working current of instantaneous auxiliary contact (see Table 10).

Table 10

Usage category	AC-15				DC-13		
	24	48	110/127	230/240	24	48	60
Rated working voltage $U_e(V)$	24	48	110/127	230/240	24	48	60
Rated working current $I_e(A)$	2	1.25	1	0.5	1	0.3	0.15
Normal working power $P(W)$	48	60	127	120	24	15	9

6.5 Performances of instantaneous auxiliary contacts TGD1-32 AS-20 and TGD1-32 AS-11 (side-mounted):



- a. Rated insulation voltage $U_i(V)$: 690;
- b. Resistive current $I_{th}(A)$: 6;
- c. Usage category, rated working voltage and rated working current of instantaneous auxiliary contact (see Table 11).

Table 11

Usage category	AC-15				DC-13							
	48	110/127	230/240	380/415	440	500	690	24	48	60	110	220
Rated working voltage $U_e(V)$	48	110/127	230/240	380/415	440	500	690	24	48	60	110	220
Rated working current $I_e(A)$	6	4.5	3.3	2.2	1.5	1	0.6	6	5	3	1.3	0.5
Normal working power $P(W)$	300	500	720	850	650	500	400	140	240	180	140	120

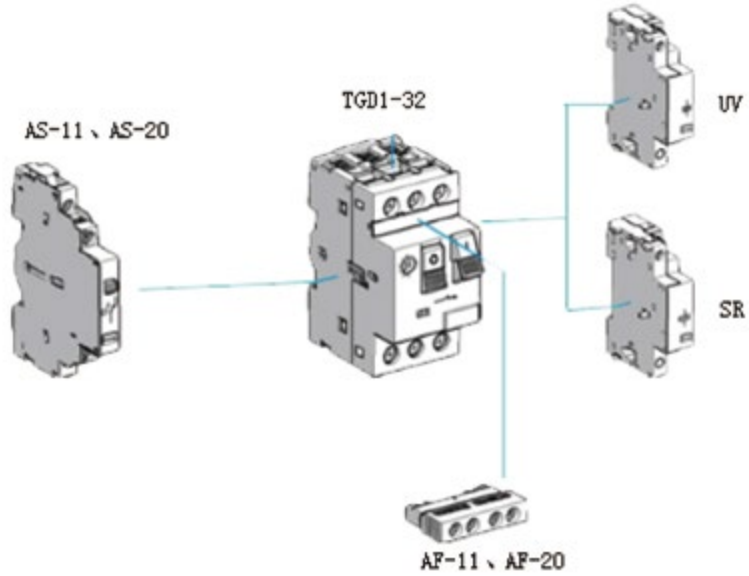
6.6 TGD1-32 waterproof box



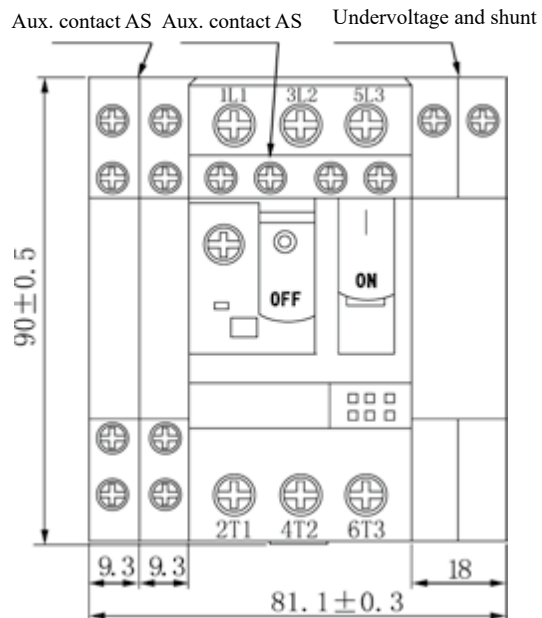
TGD1-32MC waterproof mounting box, protection grade: IP55.

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6.7 Installation position and dimensions of accessories (as shown in Figure below)



Installation position

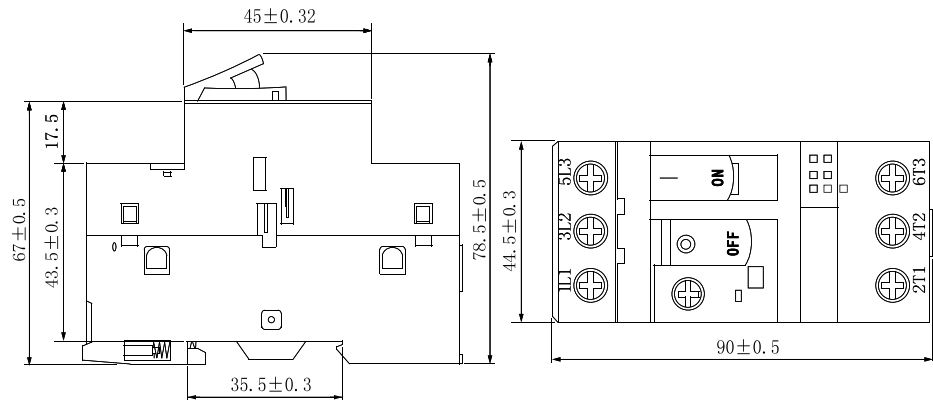


Installation dimensions

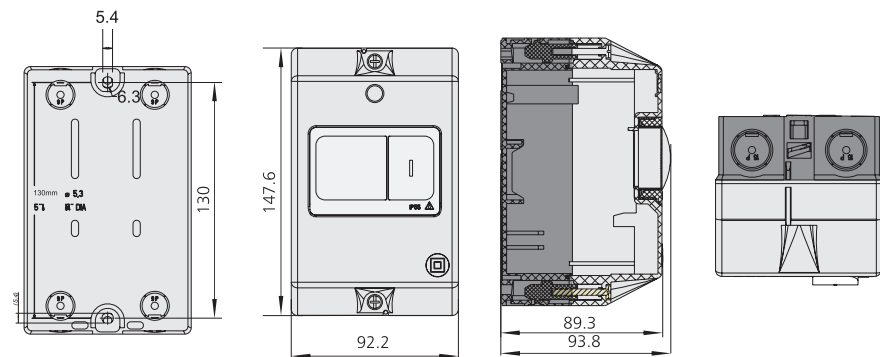
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7 Outline and Installation Dimensions

The motor circuit breaker is mounted on the standard rail that shall comply with the A.1 TH35-7.5 steel mounting rail requirements of GB/T 19334. The outline and installation dimensions of TGD1-32 motor circuit breaker are shown in figure below:



The outline dimensions of TGD1-32MC waterproof box are shown in figure below:



8 Ordering Notice

8.1 Please specify the product model, specification, and quantity when ordering.

For example: To order 20 TGD1-32 motor circuit breakers with setting current 24A-32A.

Please specify: TGD1-32 24A-32A, 20 pcs.

8.2 To order accessories, please specify the accessory model and quantity; accessory model sees Table 9.

For example: To order 20 pieces of 380V 50Hz undervoltage releases.

Please specify: TGD1-32 UV380V, 20 pcs.

For example: To order 10 instantaneous auxiliary contact sets with resistive current 6A containing one normally-open contact and one normally-closed contact.

Please specify: TGD1-32 AS-11, 10 pcs.