

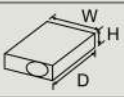


## Specification List

### Model list



Frame			T18	T25		
Appearance						
Model name	with 2-elements	For Magnetic Starters For independent mounting	TH-T18 -	TH-T25		
	with 3-elements	For Magnetic Starters For independent mounting	TH-T18KP -	TH-T25KP		
	Outside dimensions (mm)	For Magnetic Starters	45×55×76.5	63×51×79		
	W×H×D	For independent mounting	-			
	Product weight [kg]	For Magnetic Starters	0.11		0.16	
Applicable standard			IEC60947-4-1, EN60947-4-1, JIS C8201-4-1, GB14048.4			
Use condition		Ambient temperature [°C]	-10 to +40 (Standard: 20°C; maximum temperature on the board: 55°C)			
		Frequency [Hz]	0(DC) to 400			
Rated insulation voltage [V]			690			
Rated impulse withstand voltage [kV]			6			
Pollution degree			3			
Main circuit specifications	Heater designation (adjustable range of stabilized current) [A] (Rated operational voltage : 550V maximum)		0.12 (0.1 to 0.16) 0.17 (0.14 to 0.22) 0.24 (0.2 to 0.32) 0.35 (0.28 to 0.42) 0.5 (0.4 to 0.6) 0.7 (0.55 to 0.85) 0.9 (0.7 to 1.1) 1.3 (1 to 1.6) 1.7 (1.4 to 2)	2.1 (1.7 to 2.5) 2.5 (2 to 3) 3.6 (2.8 to 4.4) 5 (4 to 6) 6.6 (5.2 to 8) 9 (7 to 11) 11 (9 to 13) 15 (12 to 18)	0.24 (0.2 to 0.32) 0.35 (0.28 to 0.42) 0.5 (0.4 to 0.6) 0.7 (0.55 to 0.85) 0.9 (0.7 to 1.1) 1.3 (1 to 1.6) 1.7 (1.4 to 2) 2.1 (1.7 to 2.5)	
	Power consumption [VA/element] at minimum/maximum stabilization		0.8 / 1.8		1.5 / 3.0	
	Terminal screw size		M3.5		M4	
	Compatible with terminal	Electric wire size [mm <sup>2</sup> ]	φ 1.6, 0.75 to 2.5		φ 1.6 to 2.6, 1.25 to 6	
		Crimp lug size	1.25-3.5 to 2-3.5, 5.5-S3		1.25-4 to 5.5-4	
	Contact arrangement		1a1b		1a1b	
	Conventional free air thermal current Ith [A]		2		5	
	Rating Operational Current [A]	Category AC-15 (AC operated Magnetic Contactors) a contact/b contact The value in brackets indicates the rating for automatic reset.	24VAC	2(0.5) / 2(0.5)		2(0.5) / 3(0.5)
			120VAC	2(0.5) / 2(0.5)		2(0.5) / 3(0.5)
			240VAC	1(0.5) / 1(0.5)		1(0.5) / 2(0.5)
550VAC			0.3(0.3) / 0.3(0.3)		0.3(0.3) / 0.3(0.3)	
Category DC-13 (DC operated Magnetic Contactors) The value in brackets indicates the rating for automatic reset.	24VDC	0.5(0.3)		1(0.3)		
	110VDC	0.2(0.2)		0.2(0.2)		
	220VDC	0.1(0.1)		0.1(0.1)		
Minimum applicable load level		20V 5mA		20V 5mA		
Terminal screw size		M3.5		M3.5		
Compatible with terminal	Electric wire size [mm <sup>2</sup> ]	φ 1.6, 0.75 to 2.5		φ 1.6, 0.75 to 2.5		
	Crimp lug size	1.25-3.5 to 2-3.5		1.25-3.5 to 2-3.5		
Trip class		10A				
Operating characteristic curve description page		Page 27				
Vibration resistance (vibration resistance malfunction performance)		10 to 55 Hz, 19.6 m/s <sup>2</sup>				
Trip-free		☉				
Reset method		Manual/Automatic switchable		Manual/Automatic switchable		
Operation indication (lever indication)		☉				
Manual trip check		☉				
Applied products	With saturable reactor	TH-☐SR	☉	☉		
	With 3-element (2E) thermal saturable reactor	TH-☐KPSR	☉	☉		
	2-element quick-acting characteristics thermal	TH-☐FS	☉	☉		
	With 3-element (2E) thermal quick-acting characteristics	TH-☐FSKP	☉	☉		

Note 1: The ambient temperature compensator is mounted on all types.

Note 2: ☉ indicates standard equipment.

## Thermal Overload Relays

## Model list

Frame			T50	T65	T100
Appearance					
Model name	with 2-elements	For Magnetic Starters For independent mounting	TH-T50 —	TH-T65 —	TH-T100 —
	with 3-elements	For Magnetic Starters For independent mounting	TH-T50KP —	TH-T65KP —	TH-T100KP —
	Outside dimensions [mm] W×H×D	For Magnetic Starters For independent mounting	74.3×72×83.5 —	89×57×83.5 —	89×73.5×83.5 —
	Product weight [kg]	For Magnetic Starters For independent mounting	0.2 —	0.26 —	0.32 —
Applicable standard			IEC60947-4-1, EN60947-4-1, JIS C8201-4-1, GB14048.4		
Use condition		Ambient temperature [°C]	-10 to +40 (Standard: 20°C; maximum temperature on the board: 55°C)		
		Frequency [Hz]	0(DC) to 400		
Rated insulation voltage [V]			690		
Rated impulse withstand voltage [kV]			6		
Pollution degree			3		
Main circuit specifications	Heater designation (adjustable range of stabilized current) [A] (Rated operational voltage : 550V maximum)		29 (24 to 34) 35 (30 to 40) 42 (34 to 50)	15 (12 to 18) 22 (18 to 26) 29 (24 to 34) 35 (30 to 40) 42 (34 to 50) 54 (43 to 65)	67 (54 to 80) 82 (65 to 100)
	Power consumption [VA/element] at minimum/maximum stabilization		1.6/3.2	2.4/5.5	2.5/6.0
	Terminal screw size		M5	M6	M6
Compatible with terminal	Electric wire size [mm <sup>2</sup> ]	φ5.5 to 14	—	—	
	Crimp lug size	5.5-5 to 14-5	5.5-6 to 22-6	14-6 to 22-6, 38-S6	
Contact arrangement			1a1b	1a1b	1a1b
Conventional free air thermal current Ith [A]			5	5	5
Rating Operational Current [A]	Category AC-15 (AC operated Magnetic Contactors) (Coil opening and closing a contact/b contact The value in brackets indicates the rating for automatic reset.	24VAC	2(0.5) / 3(0.5)	2(0.5) / 3(0.5)	2(0.5) / 3(0.5)
		120VAC	2(0.5) / 3(0.5)	2(0.5) / 3(0.5)	2(0.5) / 3(0.5)
		240VAC	1(0.5) / 2(0.5)	1(0.5) / 2(0.5)	1(0.5) / 2(0.5)
		550VAC	0.3(0.3) / 0.3(0.3)	0.5(0.5) / 1(0.5)	0.5(0.5) / 1(0.5)
	Category DC-13 (DC operated Magnetic Contactors) (Coil opening and closing The value in brackets indicates the rating for automatic reset.	24VDC	1(0.3)	1(0.3)	1(0.3)
		110VDC	0.2(0.2)	0.2(0.2)	0.2(0.2)
Minimum applicable load level		20V 5mA	20V 5mA	20V 5mA	
Terminal screw size			M3.5	M4	M4
Compatible with terminal	Electric wire size [mm <sup>2</sup> ]	φ 1.6, 1.25 to 2	φ 1.6, 1.25 to 2	φ 1.6, 1.25 to 2	
	Crimp lug size	1.25-3.5 to 2-3.5	1.25-4 to 2-4, 5.5-S4	1.25-4 to 2-4, 5.5-S4	
Trip class			10A	15 to 42A:10 54A:10A	67A:10 82A:10A
Operating characteristic curve description page			Page 27		
Vibration resistance (vibration resistance malfunction performance)			10 to 55Hz 19.6m/s <sup>2</sup>		
Trip-free			○	○	○
Reset method			Manual/Automatic switchable	Manual/Automatic switchable	Manual/Automatic switchable
Operation indication (lever indication)			○	○	○
Manual trip check			○	○	○
With saturable reactor			○(TH-T50SR)	○(TH-T65SR)	○(TH-T100SR)
With 3-element (2E) thermal saturable reactor			○(TH-T50KPSR)	○(TH-T65KPSR)	○(TH-T100KPSR)
2-element quick-acting characteristics thermal			△(TH-T50FS)	△(TH-T65FS)	△(TH-T100FS)
With 3-element (2E) thermal quick-acting characteristics			△(TH-T50FSKP)	△(TH-T65FSKP)	△(TH-T100FSKP)

Note 1: The ambient temperature compensator is mounted on all types.

Note 2: ○ indicates standard equipment.

## Selection Table

Thermal Overload Relays

### Application to standard three-phase motor of Thermal Overload Relays

Thermal Overload Relays				Standard three-phase motor capacity [kW]		Magnetic Contactors that can be combined										
Heater designation (A)	Setting range (A)	Short-circuit protector rating (A) * See 95 (IEC 60259-1/2)		Frame	200-220V	380-440V	TH-T18	TH-T25	TH-T50	TH-T65	TH-T100					
		Main circuit	Auxiliary circuit													
0.12	0.1-0.16	2	6	T18			S(T)-T10	S(D)-T12	S(D)-T20	S(D)-T21	S(D)-T25					
0.17	0.14-0.22	2	6													
0.24	0.2-0.32	2	6			0.03						0.05				
0.35	0.28-0.42	2	6			0.05						0.1				
0.5	0.4-0.6	2	6			0.07										
0.7	0.55-0.85	4	6			0.1						0.18				
0.9	0.7-1.1	4	6									0.25				
1.3	1.0-1.6	4	6			0.2						0.37, 0.55				
1.7	1.4-2.0	6	6									0.75				
2.1	1.7-2.5	6	6			0.4										
2.5	2.0-3.0	10	6	T25		1.1										
3.6	2.8-4.4	10	6			0.75	1.5									
5	4.0-6.0	16	6			1	2.2									
6.6	5.2-8.0	20	6			1.5	3, 3.7									
9	7.0-11	20	6			2.2	3, 3.7									
11	9.0-13	25	6				5.5									
15	12-18	32	6			3.7	7.5, 9									
22	18-26	50	6			5.5	11									
29	24-34	63	6			7.5	15									
35	30-40	100	6		T50		18.5									
42	34-50	100	6			11	22									
54	43-65	100	6			15	30									
67	54-80	125	6			18.5	37									
82	65-100	160	6			22	45									
				T65												
				T100												

## Precautions for Use

Thermal Overload Relays

### Disassembly

The Thermal Overload Relays are adjusted at the time of assembly. Do not disassemble it.

### Ambient temperature compensation

The TH-T type Thermal Overload Relays are adjusted with the Magnetic Starters in the standard box (the MS type) relative to the ambient temperature of 20°C (The temperature on the control board of the MSO type Magnetic Starters is 35°C). The ambient temperature compensator is mounted on the TH-T type Thermal Overload Relays. Therefore, the ambient temperature less affects the operational characteristic change. The minimum operating current change according to the ambient temperature change relative to the ambient temperature of 20°C (the temperature on the control board of 35°C) generally depends on the characteristics in the diagrams 1 and 2.

The Thermal Overload Relays have a characteristic that the operating current becomes high when the ambient temperature is low and becomes low when the ambient temperature is high. If the ambient temperature of the installation site is significantly different from 20°C (the temperature on the control board of 35°C), the setting current of the Thermal Overload Relays needs to be corrected as shown in diagrams 1 and 2. In addition, note that the compensation factor has a characteristic to be the minimum scale > middle scale > maximum scale at the adjustment knob location. (Note that the Thermal Overload Relays may operate at a current of less than 100% stabilized current if in use at temperatures exceeding the allowable working temperature of 40°C (55°C).)

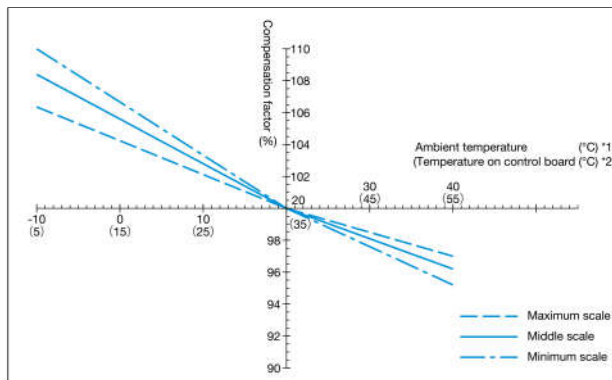


Diagram 1. Ambient temperature compensation curve (T18 frame)

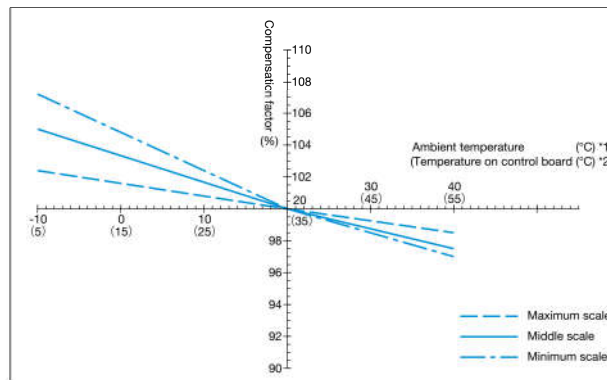


Diagram 2. Ambient temperature compensation curve (T25, T50, T65, T100 frame)

Compensation factor: Percentage of the minimum operating current at the ambient temperature of 20°C (the temperature on the control board of 35°C)

<Compensation procedure of setting current>

Determine the compensation factor of the working ambient temperature according to the curves in diagrams 1 and 2 and use the value of all load currents of the motor divided by the determined compensation factor as the stabilization value.

Example: The ambient temperature compensation factor for TH-T25 at the ambient temperature of 40°C (the temperature on the control board of 55°C) is 97% at the minimum scale according to diagram 2. If the motor rated current is 15A, the stabilization value is 15.5A (=15/0.97).

Note 1: [\*1] The ambient temperature applied to the MS type indicates the outside temperature of the box.

[\*2] The temperature including temperature increase on the control board applied to the MSO type is indicated.