

Magnetic Contactor / Starter ◆ AC control



Model		80T	100T	125T	150T		
Type	Magnetic Contactor	Nonreversing	S-P80T	S-P100T	S-P125T	S-P150T	
		Reversing	S-2×P80T	S-2×P100T	S-2×P125T	S-2×P150T	
	Motor Starter	without enclosure	Nonreversing	MSO-P80T	MSO-P100T	MSO-P125T	MSO-P150T
			Reversing	MSO-2×P80T	MSO-2×P100T	MSO-2×P125T	MSO-2×P150T
		with enclosure	Nonreversing	MS-P80T	MS-P100T	MS-P125T	MS-P150T
			Reversing	MS-2×P80T	MS-2×P100T	MS-2×P125T	MS-2×P150T
		with enclosure (push button)	Nonreversing	—	—	—	—
		TOR	Standard	TH-P60 E(TA)	TH-P120 E(TA)	TH-P120 E(TA)	TH-P120 E(TA)
	Differential		TH-P60(TA)PP	TH-P120(TA)PP	TH-P120(TA)PP	TH-P120(TA)PP	
	Rated Capacity	IEC 60947-4-1 EN 60947-4-1 DIN VDE 0660	3 φ	240V	22/ 30/ 80	30/ 40/ 105	37/ 50/ 135
380/415V				45/ 60/ 80	60/ 80/ 105	75/ 100/ 130	90/ 125/ 160
440V				45/ 60/ 75	60/ 80/ 105	75/ 100/ 130	90/ 125/ 160
550V				45/ 60/ 60	60/ 80/ 85	75/ 100/ 105	90/ 125/ 130
660V				45/ 60/ 50	60/ 80/ 70	75/ 100/ 90	90/ 125/ 110
AC 3 (kW/HP/A)		Continuous Current (Ith) AC1 (A)	100	135	170	200	
		Rated insulation voltage (Ui) (V)	AC660	AC660	AC660	AC660	
UL 508 CSA-C22.2		1 φ	100~120V	7.5/ 80	—	—	—
			200~240V	15/ 68	—	—	—
		3 φ	200~240V	25/ 68	30/ 80	50/ 130	60/ 154
			380~480V	50/ 65	60/ 77	100/ 124	125/ 156
			550~600V	60/ 62	60/ 62	100/ 99	125/ 125
		AC3 (HP/A)	Continuous Current (Ith) AC1 (A)	90	100	170	200
Rated insulation voltage (Ui) (V)			AC600	AC600	AC600	AC600	
NEMA		3	3	3	3		
Auxiliary Contact	IEC 60947-5-1 EN 60947-5-1 GB14048.4	Contact	Standard	2NO 2NC	2NO 2NC	2NO 2NC	2NO 2NC
			Special	—	—	—	—
			220V	1.6	1.6	3.3	3.3
			380V	0.95	0.95	1.6	1.6
	AC 15	Continuous Current (Ith) AC1 (A)	16	16	16	16	
		Contact class (UL)	A600, Q300	A600, Q300	A600, Q300	A600, Q300	
Electrical Life		AC3	1.2 Mil.	1.2 Mil.	1.2 Mil.	1.2 Mil.	
Mechanical Life			6 Mil.	6 Mil.	6 Mil.	6 Mil.	
Operation (Time/Hour)			1200	1200	1200	1200	
Magnetic Contactor	Weight (kg)		1.5	2.35	2.7	2.7	
	Appearance Dimensions (W×H×D) (mm)		93×142×116	120×116×128	106×152.5×140	106×152.5×140	
	Installation dimension (mm)						
	Mechanical Interlock		MPU-50	Install by manufacturer	MPU-125	MPU-125	

## Auxiliary Contact Block

### ◆ AP Series



Installation		2P FRONT MOUNTED TYPE			4P FRONT MOUNTED TYPE			SIDE MOUNTED TYPE	
Type		AP-20	AP-11	AP-02	AP-40	AP-31	AP-22	APS-11	APL-11
Contact		2NO	1NO 1NC	2NC	4NO	3NO 1NC	2NO 2NC	1NO 1NC	1NO 1NC
Applicable contactor		SR-P40, SR-P50 S-P11~ S-P80T SD-P11~ SD-P21			SR-P40, SR-P50 S-P11~ S-P80T SD-P11~ SD-P21			SR-P40, SR-P50 S-P11~ S-P60T SD-P11~ SD-P21	
Rated Capacity AC 15 (A)	220V	1.6							
	380V	0.95							
Operation current	(Ith) (A)	16							

## Auxiliary Contact Block

### ◆ MAP Series

Installation		2P FRONT MOUNTED TYPE			4P FRONT MOUNTED TYPE		
Type		MAP-20	MAP-11	MAP-02	MAP-40	MAP-31	MAP-22
Contact		2NO	1NO 1NC	2NC	4NO	3NO 1NC	2NO 2NC
Applicable contactor		S-P06, S-P09.					
Rated Capacity AC 15 (A)	220V	3.3					
	380V	1.9					
Continuous Current	(Ith) (A)	10					

## Timer



Type		PTR-30	PTR-180
Contact		1NO 1NC	1NO 1NC
Adjustable time (Sec)		0~30	0~180
Applicable contactor		SR-P40, SR-P50, S-P11~ S-P60T, SD-P11~ SD-P21.	
Rated Capacity AC 15 (A)	220V	1.6	
	380V	0.95	
Continuous Current	(Ith) (A)	16	



## Varistors: Anti-surge interference

Type	BMSACW220V	BMSACW380V
Applicable contactor	SR-P40, SR-P50, S-P11~ S-P60T.	

## Coil Characteristics

Type		S-P06 S-P09	S-P11 S-P15	S-P12	S-P16 S-P21 S-P25 S-P30T	S-P35T S-P40T	S-P50T S-P60T S-P80T	S-P100T	S-P125T S-P150T	S-P200T S-P220T	S-P300T S-P400T	M-600C
Characteristics												
Coil Capacity (VA)	Impulse	25	55	55	55	72	250	319	370	440	700	4840
	Operation	5	11	11	11	12	28	36	42	50	50	242
Power Consumption (W)		1.6	2.5	2.5	2.5	3	7	11	10	12	7	80
Operation Vot. (Ue)	On	55~70%	55~68%	55~68%	59~70%	60~75%	63~75%	65~75%	75~80%	75~80%	65~80%	72~79%
	Off	35~50%	34~48%	34~48%	36~52%	40~57%	40~57%	40~55%	40~55%	40~60%	20~50%	59~66%
Close Time (ms)	Aux. OFF	5-12	5-12	4-11	6-14	6-13	6-13	18-28	9-20	10-19	22-37	42-71
	Aux. ON	6-15	10-18	10-18	10-18	12-20	12-20	22-32	15-24	17-25	25-40	49-78
	Contact ON	6-15	10-18	10-18	10-18	12-20	12-20	22-32	10-20	12-27	30-45	51-80
Open Time (ms)	Aux. OFF	6-15	12-20	9-18	9-19	10-17	10-17	50-100	9-18	10-20	40-60	61-97
	Aux. ON	5-12	8-15	4-13	6-14	5-12	5-12	48-98	7-15	7-18	31-51	58-94
	Contact ON	5-12	8-15	4-13	6-14	5-12	5-12	46-96	7-15	7-20	30-50	57-93

## Coil Specification Table

◆ S-P11~S-P25, S-P30T~P220T, SR-P40~P80, SC-P12~P60						
Description	AC12V	AC24V	AC48V	AC110V	AC120V	AC220V
Coil rated specifications marking	12V 50Hz 12V 60Hz	24V 50Hz 24V 60Hz	48~50V 50Hz 48~50V 60Hz	100V 50Hz 100~110V 60Hz	110~120V 50Hz 115~120V 60Hz	200~220V 50Hz 220V 60Hz
Description	AC230V	AC240V	AC380V	AC440V	AC480V	AC550V
Coil rated specifications marking	230V 50Hz 230V 60Hz	220~240V 50Hz 240~260V 60Hz	346~380V 50Hz 380V 60Hz	400V 50Hz 400~440V 60Hz	415~440V 50Hz 460~480V 60Hz	500V 50Hz 500~550V 60Hz

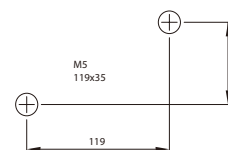
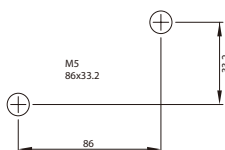
◆ S-P300T~P400T					
Description	AC48V	AC110V	AC220V	AC380V	AC550V
Coil rated specifications marking	AC 48~50V 50/60Hz DC 48V	AC 100-127V 50/60 Hz DC 100-127V	AC 200~250V 50/60Hz DC 200~250V	AC 265~450V 50/60Hz	AC 440~575V 50/60Hz

◆ M-600C					
Description	AC110V	AC120V	AC220V	AC230V	AC260V
Coil rated specifications marking	100V 50Hz 100~110V 60Hz	110~120V 50Hz 115~120V 60Hz	208~220V 50Hz 220V 60Hz	230~240V 50Hz 230~240V 60Hz	240~260V 50Hz 260~280V 60Hz
Description	AC380V	AC440V	AC480V	AC550V	
Coil rated specifications marking	346~380V 50Hz 380V 60Hz	380~415V 50Hz 400~440V 60Hz	415~440V 50Hz 460~480V 60Hz	500V 50Hz 500~550V 60Hz	

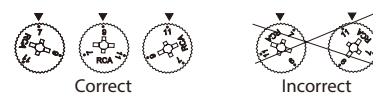


Type		60				120			
Standard	Contactored Assembled Type	TH-P60E		TH-P60ETA		TH-P120E		TH-P120ETA	
	Independently Installed Type	-		-		-		-	
With phase failure protection	Contactored Assembled Type	TH-P60PP		TH-P60TAPP		TH-P120PP		TH-P120TAPP	
	Independently Installed Type	-		-		-		-	
Reset Mode		Manual / Automatic				Manual / Automatic			
Magnetic Contactor		S-P50T, S-P60T, S-P80T.		S-P60T, S-P80T.		S-P100T, S-P125T, S-P150T.			
TOR Adjustment Range (A)	Rating (A)	Range (A)	Rating (A)	Range (A)	Rating (A)	Range (A)	Rating (A)	Range (A)	
	11	9~13	67	54~80	40	32~48	105	80~130	
	15	12~18	80	60~100	54	43~65	130	100~160	
	21	17~24			67	54~80	160	120~200	
	28	22~34			80	60~100			
	33	28~38							
	40	32~48							
	54	43~65							
Auxiliary Contact		1NO 1NC				1NO 1NC			
Weight		0.28 / 0.30		0.34 / 0.36		0.55		0.76	
Dimensions (mm) (W×H×D)		TH-P60(PP): 98×50.5×78		TH-P60TA(PP): 64.5×65.5×80		TH-P120(PP): 133×54×105		TH-P120TA(PP): 133×85.5×105	

Installation Dimensions (mm)



- Note. 1. The purpose of using TOR is protecting load tripping. For protecting circuit, please choose circuit breaker.  
 2. When adjusting the rated current; please refer to the TOR range table above. Do not exceed its range.  
 3. (E): 3 Elements



Characteristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

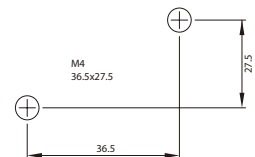
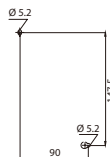
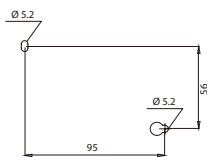
Series

Selection

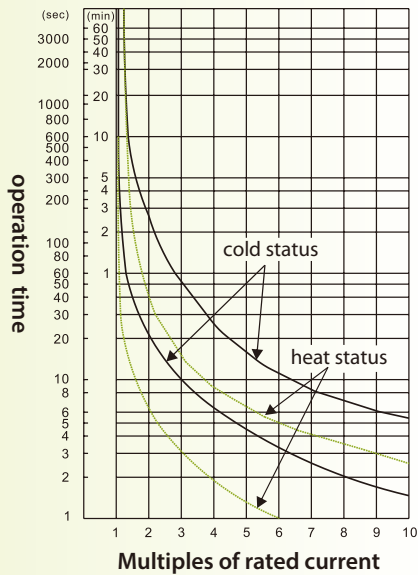
Others



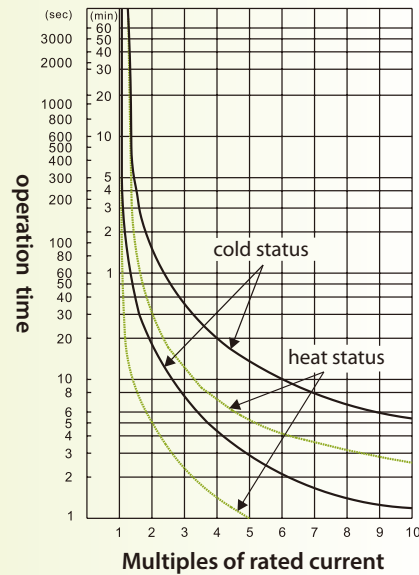
220T		400T		600CT	
TH-P220TE		TH-P400TE		TH-P600E	
—		—		—	
TH-P220TPP		TH-P400TPP		TH-P600PP	
—		—		—	
Manual / Automatic		Manual / Automatic		Manual / Automatic	
S-P200T, S-P220T.		S-P300T, S-P400T.		M-600C	
Rating (A)	Range (A)	Rating (A)	Range (A)	Rating (A)	Range (A)
80	60~100	105	80~130	260	200~320
105	80~130	130	100~160	350	260~440
130	100~160	160	120~200	500	400~600
160	120~200	200	150~250		
200	150~250	260	200~320		
		350	260~440		
1NO 1NC		1NO 1NC		1NO 1NC	
2.25		2.65		3.93/ 3.95	
140×151×158.7		164×165×163.7		TOR: 64.5×46.1×80	
				TOR W/CT: 106×46.8×104.5	



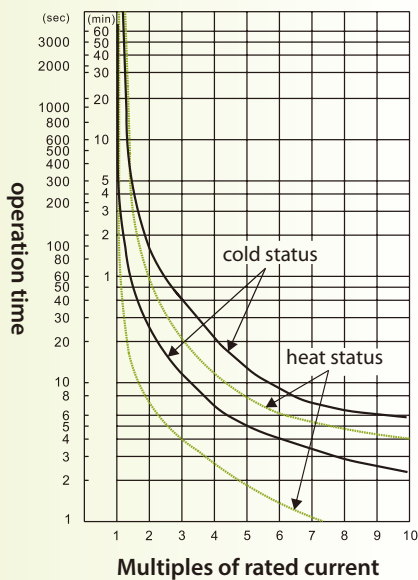
TH-P12E tripping characteristic curve



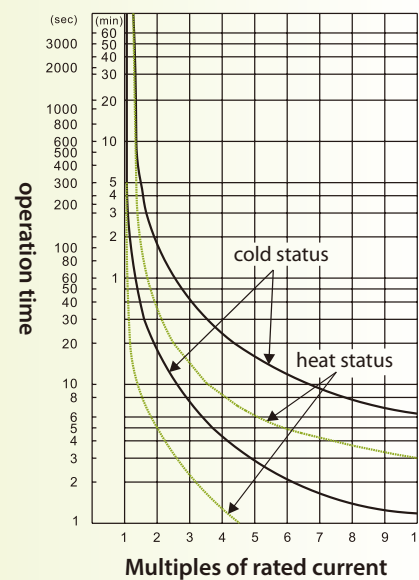
TH-P18E – below 6.5A tripping characteristic curve



TH-P18E – above 9A tripping characteristic curve



TH-P20E – below 6.5A tripping characteristic curve



Thermal overload (overcurrent) relay | TH Series

Tripping Characteristic

Characteristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

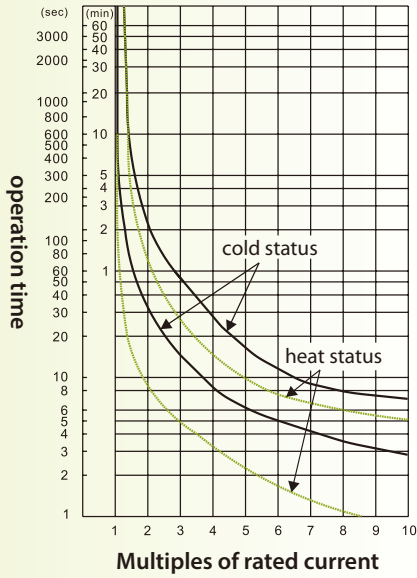
SD

Series

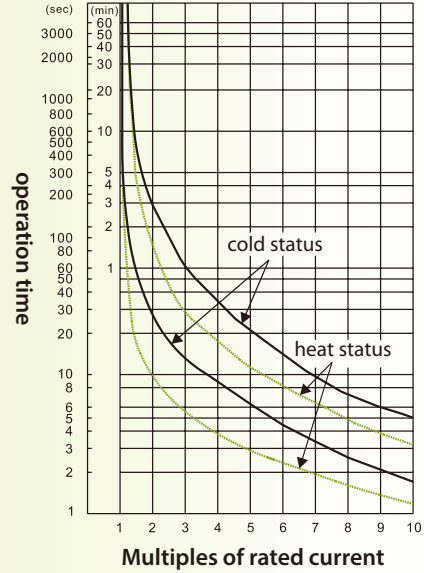
Selection

Others

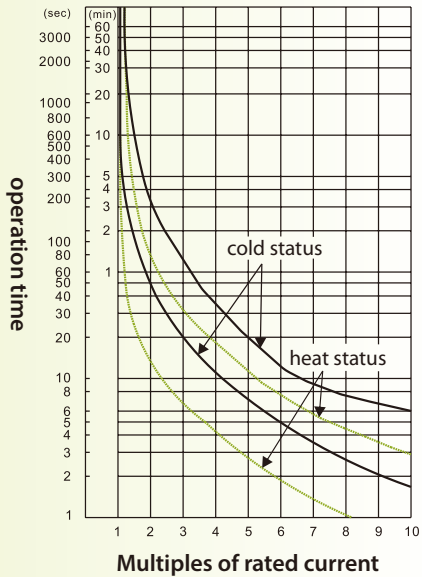
TH-P20ETA – above 9A tripping characteristic curve



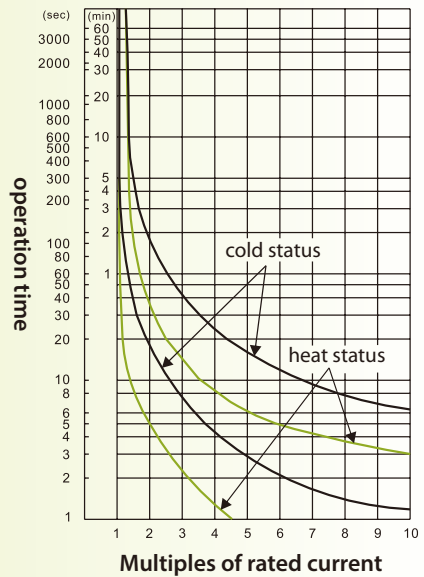
TH-P60ETA tripping characteristic curve



TH-P120ETA tripping characteristic curve



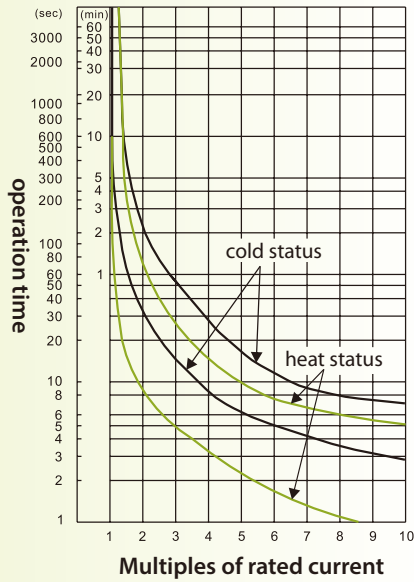
TH-P220ECT, P400ECT, TH-P220TE, P400TE 130A tripping characteristic curve



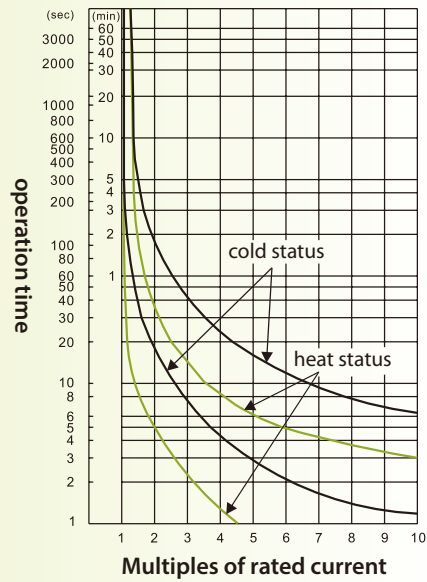
# Thermal overload (overcurrent) relay | TH Series

## Tripping Characteristic

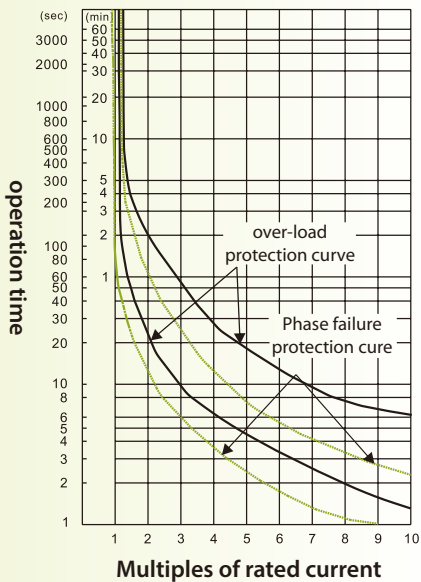
TH-P220ECT、TH-P400ECT、TH-P220TE、TH-P400TE 160A tripping characteristic curve



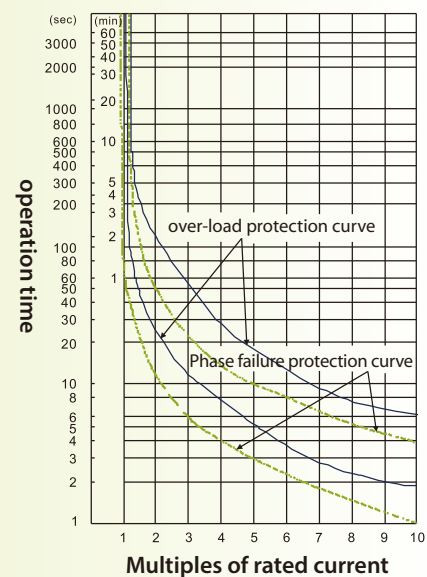
TH-P600ECT tripping characteristic curve



TH-P12PP tripping characteristic curve



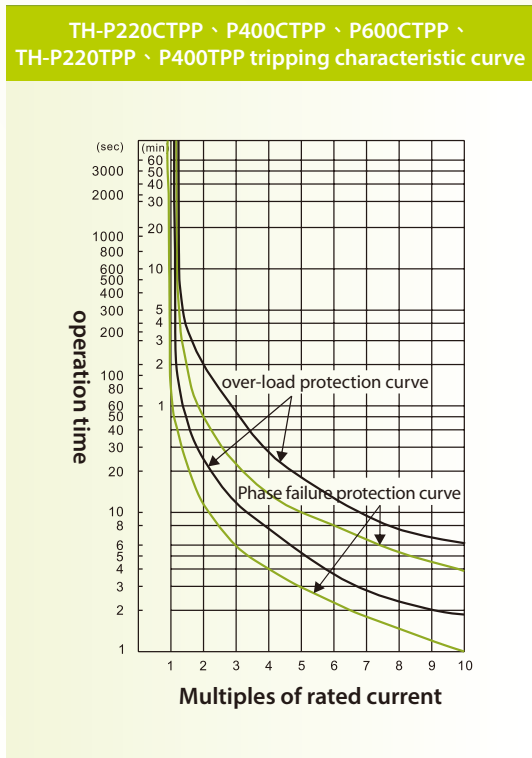
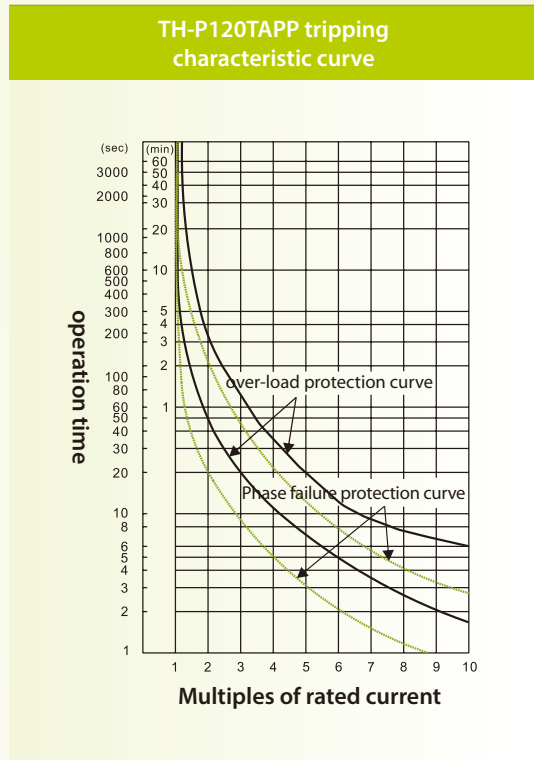
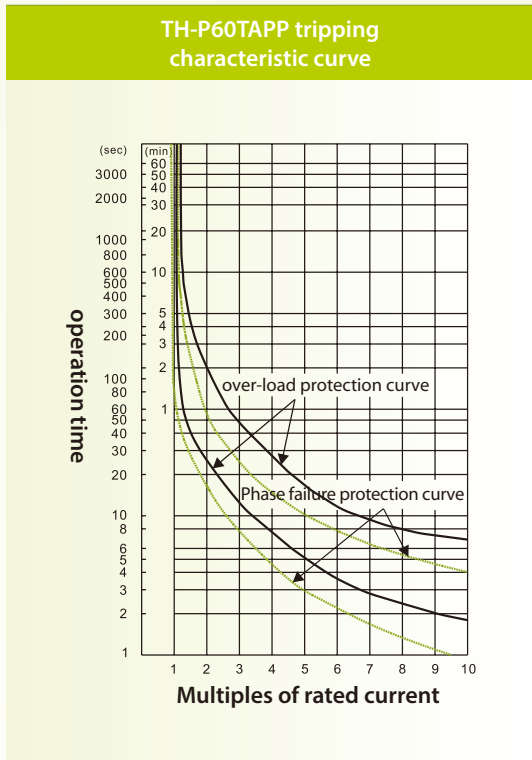
TH-P20TAPP tripping characteristic curve





Thermal overload (overcurrent) relay | TH Series

Tripping Characteristic



Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

Reduced voltage Starter | SD Series (Y-D Starter)

Type designation

SD	-	O	P35	T	380V/	220V	28A	E
①		②	③	④	⑤	⑥	⑦	⑧



<b>① Model</b>	SD	Star-delta Starter
<b>② Type</b>	O	without enclosure
	E	with enclosure , Push button 、 Indicator lamp
	A	with enclosure , Push button 、 Indicator lamp 、 Ammeter
<b>③ Rated capacity</b>	21 、 35 、 50 、 60 、 80 、 100 、 125 、 150 、 200 、 220	
<b>④ Contact / CT</b>	Blank	CT not included
	T	CT included
<b>⑤ Main circuit voltage</b>	EX : 110V 、 220V 、 380V 、 440V... When main circuit voltage and control circuit voltage are the same, it will be blank.)	
<b>⑥ Control circuit voltage</b>	EX : 110V 、 220V 、 380V 、 440V...	
<b>⑦ TH heater rated capacity</b>	EX : 40A 、 54A...350A...	
<b>⑧ TH Type</b>	Blank	Standard (2 heaters)
	E	3 heaters
	PP	Differential

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

## • Structure, principle

When starting by  $\lambda - \Delta$  starting method, starting current and torque of motor will be reduced to 1/3 of those of direct starting; the purpose is to suppress starting current, but somehow it also suppresses torque at the same.

Comparison table between direct starting and  $\lambda - \Delta$  starting (the values in the table are all shown in %)

Starting method	When starting			In operation	
	Linear current (starting current)	Torque	Linear voltage (power voltage)	Linear current (loading current)	Phase current
Direct starting	600	150	100	100	$100 \times 1/\sqrt{3}=58$
$\lambda - \Delta$ starting	$600 \times 1/3=200$	$150 \times 1/3=50$	100	100	$100 \times 1/\sqrt{3}=58$

## • Operating circumstance

### (1) Unloaded starting circumstance.

- e.g.: (1-1) Starting the driving shaft of machine tool.  
 (1-2) Typical starting of woodworking machinery.  
 (1-3) Starting of grinding, drilling machines etc.  
 (1-4) Motor with clutch.

### (2) Light loading circumstance.

- e.g.: (2-1) Small-size belt conveyer.  
 (2-2) Light loading air compressor or water pump.  
 (2-3) Stamping press etc.

### (3) Equipment that needs to limit starting current.

### (4) Equipment that needs to reduce starting impact.

## • Notes

- (1) When speed of the motor exceeds 80% of rated value, it is the optimal time to perform  $\lambda - \Delta$  switching.
- (2) Starting time of  $\lambda$  can be defined according to motor capacity  $\sqrt{(kW)}$ . Use the equation  $t = 4 + 2$  to derive the time required (second)
- (3) When starting by  $\lambda - \Delta$ , ensure the power supply capacity is sufficient to prevent voltage drop in power supply during transition from  $\lambda$  starting to operation, which could cause the contactor to break or burn out.

Remarks:

1. Three-phase induction motor can be started by the following methods:

- (1) Full voltage direct starting.
- (2) Reduced voltage starting.
  - (2-1)  $\lambda - \Delta$  starting.
  - (2-2) Reactor starting.
  - (2-3) Self-coupled transformer starting.
  - (2-4) Primary resistor starting.

2. If the motor is not limited by its starting method, direct starting can be applied for all large or small-size models. If all motors are started by direct starting, the stability of system power supply will definitely be impacted. When starting, all the appliances connected to the same loop circuitry will be influenced by voltage drop. Lamps will flash and the motor will trip, due to overload of increased current resulting from low voltage. Therefore, national standards or power company internal regulations always define the circumstances that require reduced voltage starting.

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

## Reduced voltage starter | SD Series (Y-D Starter)

Model		21	35	50	60	80	100	125	150	220									
Type	Open	SDO-P21	SDO-P35	SDO-P50	SDO-P60	SDO-P80	SDO-P100	SDO-P125	SDO-P150	SDO-P220									
		SDO-P21T	SDO-P35T	SDO-P50T	SDO-P60T	SDO-P80T	SDO-P100T	SDO-P125T	SDO-P150T	SDO-P220T									
	Enclosure	SDE-P21	SDE-P35	SDE-P50	SDE-P60	SDE-P80	SDE-P100	SDE-P125	SDE-P150	SDE-P220									
		SDA-P21	SDA-P35	SDA-P50	SDA-P60	SDA-P80	SDA-P100	SDA-P125	SDA-P150	SDA-P220									
Rated capacity	Rated voltage	kW	HP	kW	HP	kW	HP	kW	HP	kW	HP	kW	HP	kW	HP	kW	HP	kW	HP
	200~220V	11	15	19	25	22	30	30	40	37	50	45	60	55	75	75	100	110	150
	380~440V	19	25	30	40	45	60	55	75	75	100	90	125	110	150	132	180	200	260
AC contactor	MCM	S-P21	S-P35T	S-P50T	S-P60T	S-P80T	S-P100T	S-P125T	S-P150T	S-P220T									
	MCD	S-P21	S-P35T	S-P50T	S-P60T	S-P80T	S-P100T	S-P125T	S-P150T	S-P220T									
	MCS	S-P11	S-P16	S-P21	S-P21	S-P35C	S-P35T	S-P50T	S-P50T	S-P60T									
TOR	TH-P20	TH-P60	TH-P60	TH-P120	TH-P120	TH-P120	TH-P220T	TH-P220T	TH-P400T										
	TH-P20TA	TH-P60TA	TH-P60TA	TH-P120TA	TH-P120TA	TH-P120TA	TH-P220T	TH-P400T	TH-P400T										
Wire (mm <sup>2</sup> )	Line	2.5~16	2.5~25	2.5~35	2.5~50	10~70	10~95	35~150	35~150	35~240									
	Load	2.5~10	2.5~16	2.5~25	2.5~35	4~50	4~70	10~95	10~90	16~150									
	Control circuit	1~2.5	1~2.5	1~2.5	1~2.5	1~2.5	1~2.5	1~2.5	1~2.5	1~2.5									

- Note: 1. SDE-P21~P220 is with enclosure, push button, indicator light and door lock.  
 2. SDA-P21~P220 is with enclosure, push button, indicator light, door lock, and current meter.  
 3. SDO-P21~P220 is attached with CT as current meter.



SDA-P50



SDA-P50

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

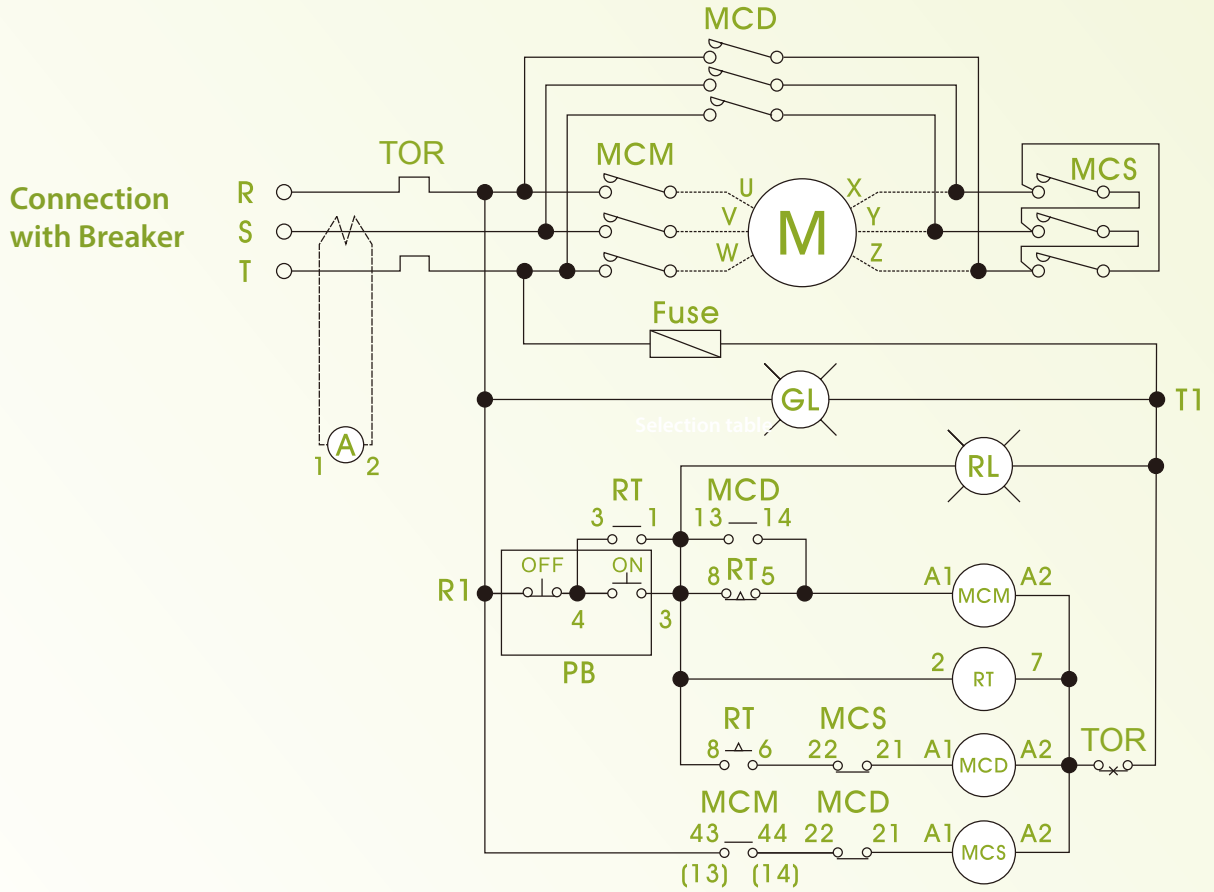
SD

Series

Selec-tion

Others

## Wiring



### Symbol descriptions

MC	Magnetic contactor	GL	Indicator light (green)	A	Ammeter
TOR	Thermal overload (overcurrent) relay	RL	Indicator light (red)	Fuse	Fuse
RT	Time limited relay	CT	Current transformer	PB	Push button

1. The numbers in the parentheses are applicable to Model P80~P220 type.
2. Setting time for RT (Timer):  $t = 4 + 2\sqrt{kW}$  ( $\pm 1$  second)

## Selection Table ◆ λ - Δ Starter

Heater selection table (A)	Motor output kW (HP)				TH selection of λ - Δ Starter																	
	A		B		21		35		50		60		80		100		125		150		220	
	200~220V		380~440V		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
6.5	1.5	(2)	3	(4)																		
9	1.9	(2 1/2)	3.7	(5)																		
9	2.2	(3)	4.5	(6)																		
11	3	(4)	5.5	(7 1/2)	TH-P20	TH-P20																
15	3.7	(5)	7.5	(10)																		
15	4.5	(6)	10	(13)																		
21	5.5	(7 1/2)	11	(15)																		
28	6.5	(8)	14	(19)																		
28	7.5	(10)	15	(20)	TH-P20TA	TH-P20TA																
33	9	(12 1/2)	19	(25)	TH-P20TA	TH-P20TA																
40	11	(15)	22	(30)																		
40	14	(19)	26	(35)																		
54	15	(20)	30	(40)																		
67	19	(25)	37	(50)																		
80	22	(30)	45	(60)																		
80	25	(34)	50	(67)																		
105	30	(40)	55	(75)																		
130	37	(50)	75	(100)																		
160	45	(60)	90	(125)																		
200	55	(75)	110	(150)																		
200	65	(85)	132	(200)																		
260	75	(100)	150	(200)																		
350	110	(150)	200	(260)																		

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

## Selection Table ◆ Direct On-Line Starter

Motor rated capacity kW (HP)		3 φ 200V~220V																									
		Heating element rating (A)		Selection of the contactor																							
0.016	(1/47)	0.13A	0.1~0.16A	S-P06	S-P09																						
0.025	(1/30)	0.2A	0.16~0.24A																								
0.04	(1/19)	0.32A	0.24~0.4A																								
0.09	(1/8)	0.5A	0.4~0.6A																								
0.12	(1/6)	0.8A	0.6~1.0A																								
0.25	(1/3)	1.3A	1.0~1.6A																								
0.37	(1/2)	2.0A	1.6~2.4A																								
0.75	(1)	3.2A	2.4~4.0A																								
1.1	(1 1/2)	5A	4.0~6.0A																								
1.5	(2)	7.5A	6.0~9.0A	S-P11, S-P12	S-P15, S-P16	S-P21	S-P25	S-P30T	S-P35T	S-P40T																	
0.03	(1/25)	0.25A	0.19~0.31A																								
0.05	(1/15)	0.4A	0.3~0.5A																								
0.1	(1/8)	0.6A	0.45~0.75A																								
0.15	(1/5)	0.9A	0.7~1.1A																								
0.2	(1/4)	1.2A	0.9~1.5A																								
0.3	(2/5)	1.7A	1.3~2.1A																								
0.4	(1/2)	2.1A	1.6~2.6A																								
0.75	(1)	3.3A	2.5~4.1A																								
1.1	(1 1/2)	4.4A	3.4~5.4A																								
1.5	(2)	6.5A	5~8A																								
2.2	(3)	9A	7~11A																								
3	(4)	11A	9~13A																								
3.7	(5)	15A	12~18A																								
5.5	(7 1/2)	21A	17~24A																								
6.5	(8 1/2)	28A	22~34A																								
7.5	(10)	33A	28~38A																								
9	(12 1/2)	40A	32~48A																								
15	(20)	54A	43~65A																								
19	(25)	67A	54~80A																								
22	(30)	80A	60~100A																								
25	(35)	105A	80~130A																								
30	(40)	130A	100~160A																								
37	(50)	160A	120~200A																								
45	(60)	200A	150~250A																								
55	(75)	260A	200~320A																								
65	(85)	350A	260~440A																								
75	(100)	500A	400~600A																								
90	(125)																										
110	(150)																										
132	(180)																										
160	(220)																										

- Characteristics
- SP Series
- MS Series
- Other Series
- Coil
- TH Series
- SD Series
- Selection
- Others

Selection Table ◆ Direct On-Line Starter

Motor rated capacity kW (HP)		3 φ 380V~440V		Selection of the contactor																			
		Heating element rating (A)																					
0.025	(1/30)	0.13A	0.1~0.16A																				
0.04	(1/19)	0.2A	0.16~0.24A																				
0.09	(1/8)	0.32A	0.24~0.4A																				
0.18	(1/4)	0.5A	0.4~0.6A																				
0.25	(1/3)	0.8A	0.6~1.0A																				
0.37	(1/2)	1.3A	1.0~1.6A																				
0.55	(3/4)	2.0A	1.6~2.4A																				
0.75	(1)	3.2A	2.4~4.0A																				
1.1	(1 1/2)	5A	4.0~6.0A																				
1.5	(2)	7.5A	6.0~9.0A																				
2.2	(3)	0.25A	0.19~0.31A																				
3	(4)	0.4A	0.3~0.5A																				
0.05	(1/15)	0.6A	0.45~0.75A																				
0.1	(1/8)	0.9A	0.7~1.1A																				
0.2	(1/4)	1.2A	0.9~1.5A																				
0.3	(2/5)	1.7A	1.3~2.1A																				
0.4	(1/2)	2.1A	1.6~2.6A																				
0.75	(1)	3.3A	2.5~4.1A																				
1.1	(1 1/2)	4.4A	3.4~5.4A																				
1.5	(2)	6.5A	5~8A																				
2.2	(3)	9A	7~11A																				
3	(4)	11A	9~13A																				
3.7	(5)	15A	12~18A																				
4	(5 1/2)	21A	17~24A																				
4.5	(6)	28A	22~34A																				
5.5	(7 1/2)	33A	28~38A																				
7.5	(10)	40A	32~48A																				
11	(15)	54A	43~65A																				
12	(16)	67A	54~80A																				
15	(20)	80A	60~100A																				
19	(25)	105A	80~130A																				
22	(30)	130A	100~160A																				
25	(35)	160A	120~200A																				
30	(40)	200A	150~250A																				
37	(50)	260A	200~320A																				
45	(60)	350A	260~440A																				
50	(70)	500A	400~600A																				
60	(80)																						
75	(100)																						
90	(125)																						
110	(150)																						
132	(180)																						
150	(200)																						
160	(220)																						
220	(330)																						
250	(350)																						
315	(420)																						

Charact-eristics

SP Series

MS Series

Other Series

Coil

TH Series

SD Series

Selec-tion

Others



## Selection Table ◆ Direct On-Line Starter

Motor rated capacity kW (HP)		3 φ 500V~550V																					
		Heating element rating (A)		Selection of the contactor																			
0.06	(1/12)	0.13A	0.1~0.16A	S-P06	S-P09																		
0.09	(1/8)	0.2A	0.16~0.24A																				
0.12	(1/6)	0.32A	0.24~0.4A																				
0.18	(1/4)	0.5A	0.4~0.6A																				
0.37	(1/2)	0.8A	0.6~1.0A																				
0.55	(3/4)	1.3A	1.0~1.6A																				
0.75	(1)	2.0A	1.6~2.4A																				
1.1	(1 1/2)	3.2A	2.4~4.0A																				
1.5	(2)	5A	4.0~6.0A																				
2.2	(3)	7.5A	6.0~9.0A																				
3	(4)			S-P11, S-P12	S-P15, S-P16	S-P21	S-P25	S-P30T	S-P35T	S-P40T													
4	(5 1/2)	0.25A	0.19~0.31A																				
0.12	(1/6)	0.4A	0.3~0.5A																				
0.18	(1/4)	0.6A	0.45~0.75A																				
0.25	(1/3)	0.9A	0.7~1.1A																				
0.37	(1/2)	1.2A	0.9~1.5A																				
0.55	(3/4)	1.7A	1.3~2.1A																				
0.75	(1)	2.1A	1.6~2.6A																				
1.1	(1 1/2)	3.3A	2.5~4.1A																				
1.5	(2)	4.4A	3.4~5.4A																				
2.2	(3)	6.5A	5~8A	S-P50T	S-P60T	S-P80T																	
4.5	(6)	9A	7~11A																				
5.5	(7 1/2)	11A	9~13A																				
7.5	(10)	15A	12~18A																				
11	(15)	21A	17~24A																				
12	(16)													S-P100T	S-P125T	S-P150T							
15	(20)	28A	22~34A																				
19	(25)	33A	28~38A																				
22	(30)	40A	32~48A																				
30	(40)	54A	43~65A																				
37	(50)	67A	54~80A																				
45	(60)			S-P200T	S-P220T	S-P300T	S-P400T																
50	(70)	80A	60~100A																				
60	(80)	105A	80~130A																				
75	(100)	130A	100~160A																				
90	(125)	160A	120~200A																				
110	(150)	200A	150~250A																				
132	(180)	260A	200~320A																				
150	(200)	350A	260~440A																				
160	(220)													M-600C									
220	(330)	500A	400~600A																				
315	(420)																						

Characteristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selection

Others

## Selection Table ◆ Magnetic contactor selection | Capacitor use

Model	3 Phase Rated Capacity kVAR(A)			
	200~220V	400~440V	500V	600V
S-P11,12	3(8.5)	4(6)	—	—
S-P21	4.5(14)	9(13)	—	—
S-P30T,S-P35T	6(18)	12(18)	—	—
S-P40T	8.5(25)	15(23)	—	—
S-P50T	12(35)	20(30)	—	—
S-P60T	13(40)	24(35)	25(30)	25(25)
S-P80T	15(50)	25(40)	30(35)	30(30)
S-P100T	22(65)	40(60)	45(50)	45(45)
S-P125T	24(72)	46(67)	50(55)	50(50)
S-P150T	25(80)	51(75)	60(70)	60(60)
S-P220T	50(150)	96(140)	110(130)	110(110)
S-P300	65(200)	120(180)	130(150)	130(130)
S-P400	85(250)	170(250)	200(230)	200(200)
S-C600	170(500)	350(500)	350(400)	400(400)

Model	Single Rated Capacity kVAR(A)			
	Single Phase		3 Phase in Series	
	200~220V	400~440V	500V	600V
S-P11,12	1.7(8.5)	2.4(6)	—	—
S-P21	2.8(14)	5(13)	—	—
S-P30T,S-P35T	3.6(18)	7(18)	—	—
S-P40T	5(25)	9(23)	—	—
S-P50T	7(35)	12(30)	—	—
S-P60T	8(40)	14(35)	20(40)	25(40)
S-P80T	10(50)	15(40)	25(50)	30(50)
S-P100T	13(65)	25(60)	30(60)	35(60)
S-P125T	14(72)	27(67)	33(70)	37(70)
S-P150T	15(80)	30(75)	35(80)	40(80)
S-P220T	30(150)	55(140)	75(150)	90(150)
S-P300	40(200)	72(180)	90(180)	100(180)
S-P400	50(250)	100(250)	120(250)	140(250)
S-C600	100(500)	200(500)	250(500)	300(500)

Note:

Single phase:  $kVAR = 6.3 \times 10^{-9} \times (Hz) \times (\mu F) \times (V)^2$ 3 phase:  $\sqrt{3} \times$  single phase kVARCharact  
-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec  
-tion

Others

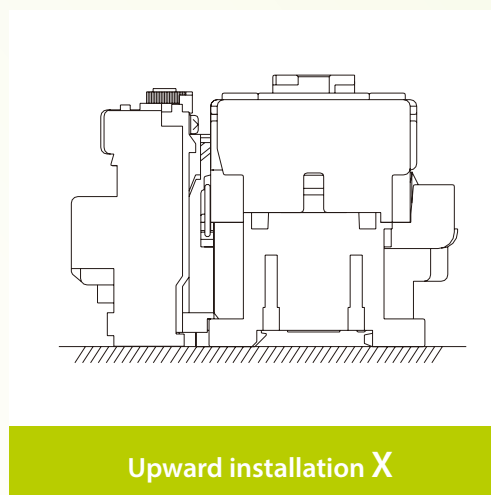
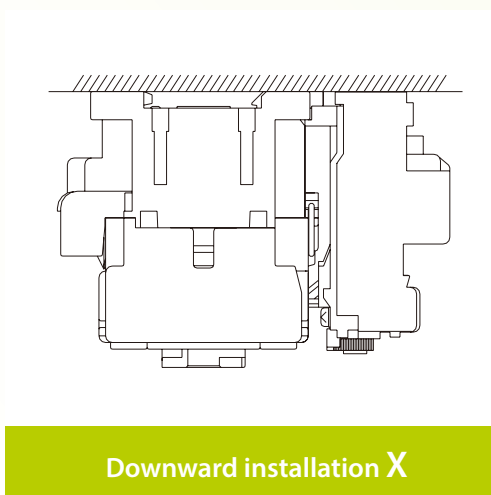
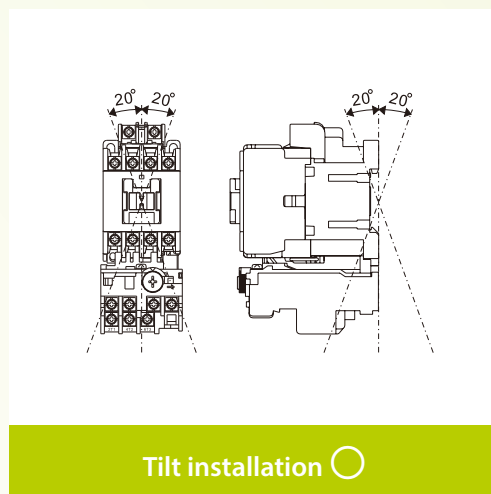
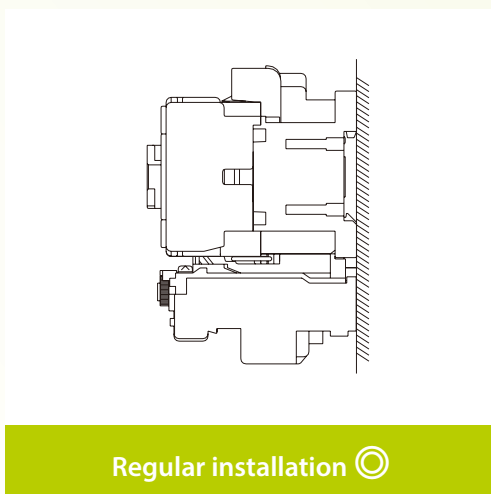
## Installation notes

### • Operating environment

- Altitude below 3000m
- Ambient temperature:  $-30^{\circ}\text{C}\sim+70^{\circ}\text{C}$  (dew is not allowed)
- Relative humidity: Relative humidity could not exceed 50% when the surrounding temperature is  $+40^{\circ}\text{C}$ . For lower temperature, the relative humidity can be higher. The average maximum relative humidity for the month with the highest humidity is 90%, and the average lowest temperature of that month is  $+25^{\circ}\text{C}$ . Please consider the possibility of frosting on the surface of the product due to temperature change.
- Withstand vibration 10Hz~55Hz 2G
- Withstand impact 5G
- Storage temperature:  $-50^{\circ}\text{C}\sim+85^{\circ}\text{C}$  (dew is not allowed)
- Please do not install in a place that contains dust, moisture, salt, oil stains, or corrosive or flammable gases.
- After switch installed, please add temporary protection to avoid harmful substances like dust or moisture etc coming into contact with it, if the switch is not to be used for a long period of time.
- Coil operating voltage should be applied within 85~110% of rated voltage. If higher than 110%, the coil life will be reduced, or the coil could burn out if lower than 85%.

### • Installation direction

The regular installation direction of the contactor is vertical, but is allowed  $20^{\circ}$  tilt along all directions. Refer to the figure below.



Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

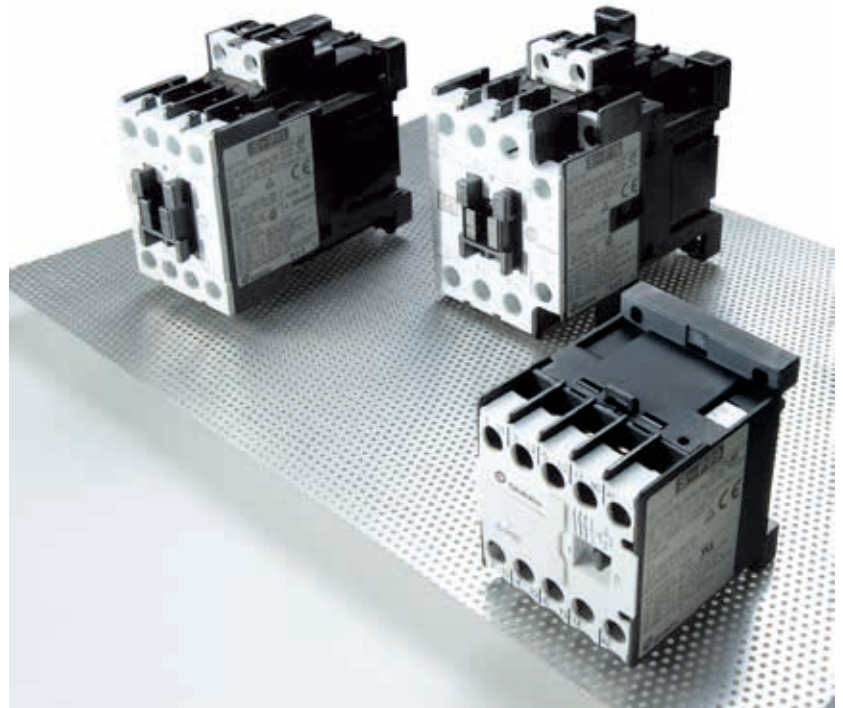


CIRCUIT BREAKER ( MCCB / ELCB / EMCCB / MCB )

**Breaker & Switchgear System**



AIR CIRCUIT BREAKER



MAGNETIC CONTACTOR / SWITCH ( CONTACTOR / MS / MMS )



AUTOMATIC TRANSFER SWITCHES



SURGE PROTECTIVE DEVICE



SMART METER



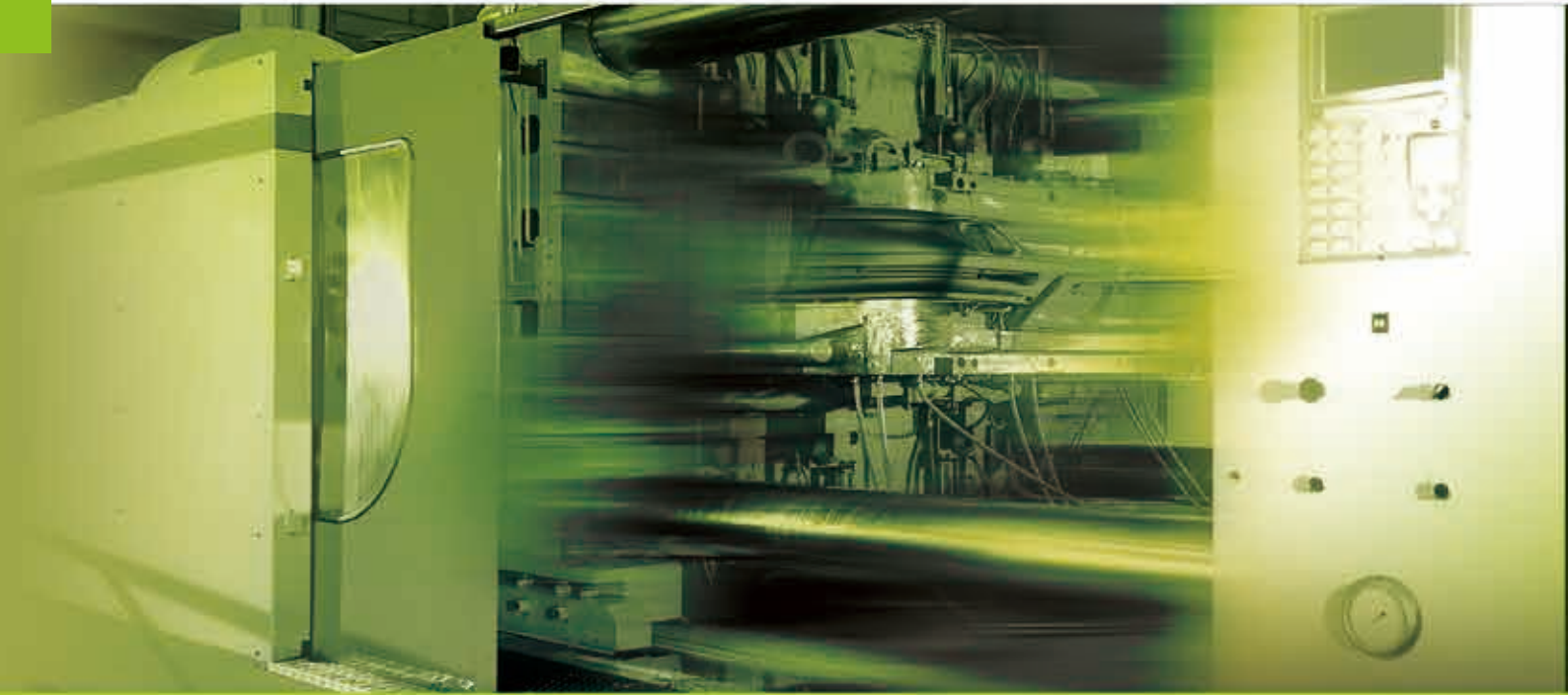
INVERTER



LOW VOLTAGE POWER CAPACITORS

# SHIHLIN ELECTRIC & ENGINEERING

MOTOR CONTROL (CONTACTOR/ MS/ MMS), CIRCUIT BREAKER (MCCB/ ELCB/ EMCCB/ MCB), AIR CIRCUIT BREAKER, AUTOMATIC TRANSFER SWITCHES (Panel Board Type/ Residential Unit Use), SURGE PROTECTIVE DEVICE, LOW VOLTAGE POWER CAPACITORS, SMART METER, INVERTER



## **Breaker & switchgears overseas sales dept.**

3F, No.9, Sec. 1, Chang-an E. Rd., Zhongshan Dist., Taipei City 10441, Taiwan

T. +886-2-2541-9822 F. +886-2-2581-2665

e-mail. b.export@seec.com.tw

<http://circuit-breaker.seec.com.tw>

## **Headquarters**

16F, No.88, Sec. 6, Zhongshan N. Rd., Shilin Dist., Taipei City 11155, Taiwan

T. +886-2-2834-2662 F. +886-2-2836-6187

<http://www.seec.com.tw>

Distributor

B180717E.MS-P-OB

## Selection Table ◆ Direct On-Line Starter

Motor rated capacity kW (HP)		3 φ 200V~220V														
		Heating element rating (A)		Selection of the contactor												
0.016	(1/47)	0.13A	0.1~0.16A	S-P06	S-P09											
0.025	(1/30)	0.2A	0.16~0.24A													
0.04	(1/19)	0.32A	0.24~0.4A													
0.09	(1/8)	0.5A	0.4~0.6A													
0.12	(1/6)	0.8A	0.6~1.0A													
0.25	(1/3)	1.3A	1.0~1.6A													
0.37	(1/2)	2.0A	1.6~2.4A													
0.75	(1)	3.2A	2.4~4.0A													
1.1	(1 1/2)	5A	4.0~6.0A													
1.5	(2)	7.5A	6.0~9.0A	S-P11, S-P12	S-P15, S-P16	S-P21	S-P25	S-P30T	S-P35T	S-P40T						
0.03	(1/25)	0.25A	0.19~0.31A													
0.05	(1/15)	0.4A	0.3~0.5A													
0.1	(1/8)	0.6A	0.45~0.75A													
0.15	(1/5)	0.9A	0.7~1.1A													
0.2	(1/4)	1.2A	0.9~1.5A													
0.3	(2/5)	1.7A	1.3~2.1A													
0.4	(1/2)	2.1A	1.6~2.6A													
0.75	(1)	3.3A	2.5~4.1A													
1.1	(1 1/2)	4.4A	3.4~5.4A													
1.5	(2)	6.5A	5~8A													
2.2	(3)	9A	7~11A													
3	(4)	11A	9~13A													
3.7	(5)	15A	12~18A													
5.5	(7 1/2)	21A	17~24A													
6.5	(8 1/2)	28A	22~34A					S-P50T								
7.5	(10)							S-P60T								
9	(12 1/2)	33A	28~38A					S-P80T								
11	(15)	40A	32~48A													
15	(20)	54A	43~65A													
19	(25)	67A	54~80A													
22	(30)	80A	60~100A													
25	(35)															
30	(40)	105A	80~130A					S-P100T								
37	(50)	130A	100~160A					S-P125T								
45	(60)	160A	120~200A					S-P150T								
55	(75)															
65	(85)															
75	(100)	260A	200~320A					S-P200T								
90	(125)															
110	(150)	350A	260~440A					S-P220T								
132	(180)															
160	(220)	500A	400~600A					S-P300T								
								S-P400T								
									M-600C							

Selection Table ◆ Direct On-Line Starter

Motor rated capacity kW (HP)		Heating element rating (A)		3 φ 380V~440V																		
				Selection of the contactor																		
0.025	(1/30)	0.13A	0.1~0.16A																			
0.04	(1/19)	0.2A	0.16~0.24A																			
0.09	(1/8)	0.32A	0.24~0.4A																			
0.18	(1/4)	0.5A	0.4~0.6A																			
0.25	(1/3)	0.8A	0.6~1.0A																			
0.37	(1/2)	1.3A	1.0~1.6A																			
0.55	(3/4)	2.0A	1.6~2.4A																			
0.75	(1)	3.2A	2.4~4.0A																			
1.1	(1 1/2)	5A	4.0~6.0A																			
1.5	(2)	7.5A	6.0~9.0A																			
2.2	(3)	0.25A	0.19~0.31A																			
3	(4)	0.4A	0.3~0.5A																			
0.05	(1/15)	0.6A	0.45~0.75A																			
0.1	(1/8)	0.9A	0.7~1.1A																			
0.2	(1/4)	1.2A	0.9~1.5A																			
0.3	(2/5)	1.7A	1.3~2.1A																			
0.4	(1/2)	2.1A	1.6~2.6A																			
0.75	(1)	3.3A	2.5~4.1A																			
1.1	(1 1/2)	4.4A	3.4~5.4A																			
1.5	(2)	6.5A	5~8A																			
2.2	(3)	9A	7~11A																			
3	(4)	11A	9~13A																			
3.7	(5)	15A	12~18A																			
4	(5 1/2)	21A	17~24A																			
4.5	(6)	28A	22~34A																			
5.5	(7 1/2)	33A	28~38A																			
7.5	(10)	40A	32~48A																			
11	(15)	54A	43~65A																			
12	(16)	67A	54~80A																			
15	(20)	80A	60~100A																			
19	(25)	105A	80~130A																			
22	(30)	130A	100~160A																			
25	(35)	160A	120~200A																			
30	(40)	200A	150~250A																			
37	(50)	260A	200~320A																			
45	(60)	350A	260~440A																			
50	(70)	500A	400~600A																			
60	(80)																					
75	(100)																					
90	(125)																					
110	(150)																					
132	(180)																					
150	(200)																					
160	(220)																					
220	(330)																					
250	(350)																					
315	(420)																					

Charact-eristics

SP Series

MS Series

Other Series

Coil

TH Series

SD Series

Selec-tion

Others

Selection Table ◆ Direct On-Line Starter

Motor rated capacity kW (HP)		3 φ 500V~550V		Heating element rating (A)		Selection of the contactor											
0.06	(1/12)	0.13A	0.1~0.16A	S-P06	S-P09												
0.09	(1/8)	0.2A	0.16~0.24A														
0.12	(1/6)	0.32A	0.24~0.4A														
0.18	(1/4)	0.5A	0.4~0.6A														
0.37	(1/2)	0.8A	0.6~1.0A														
0.55	(3/4)	1.3A	1.0~1.6A														
0.75	(1)	2.0A	1.6~2.4A														
1.1	(1 1/2)	3.2A	2.4~4.0A														
1.5	(2)	5A	4.0~6.0A														
2.2	(3)	7.5A	6.0~9.0A														
3	(4)	0.25A	0.19~0.31A	S-P11, S-P12	S-P15, S-P16	S-P21	S-P25	S-P30T	S-P35T	S-P40T							
0.12	(1/6)	0.4A	0.3~0.5A														
0.18	(1/4)	0.6A	0.45~0.75A														
0.37	(1/2)	0.9A	0.7~1.1A														
0.55	(3/4)	1.2A	0.9~1.5A														
0.75	(1)	1.7A	1.3~2.1A														
1.1	(1 1/2)	2.1A	1.6~2.6A														
1.5	(2)	3.3A	2.5~4.1A														
2.2	(3)	4.4A	3.4~5.4A														
4	(5 1/2)	6.5A	5~8A														
4.5	(6)	9A	7~11A														
5.5	(7 1/2)	11A	9~13A	S-P50T	S-P60T	S-P80T											
7.5	(10)	15A	12~18A														
11	(15)	21A	17~24A														
12	(16)	28A	22~34A														
15	(20)	33A	28~38A														
19	(25)	40A	32~48A														
22	(30)	54A	43~65A														
30	(40)	67A	54~80A				S-P100T	S-P125T	S-P150T								
37	(50)	80A	60~100A														
45	(60)	105A	80~130A														
50	(70)	130A	100~160A														
60	(80)	160A	120~200A														
75	(100)	200A	150~250A														
90	(125)	260A	200~320A														
110	(150)	350A	260~440A														
132	(180)	500A	400~600A														
150	(200)																
160	(220)																
220	(330)																
315	(420)																
								S-P200T		S-P220T		S-P300T		S-P400T		M-600C	

- Charact-eristics
- SP Series
- MS Series
- Other Series
- Coil
- TH Series
- SD Series
- Selec-tion
- Others



## Selection Table ◆ Magnetic contactor selection | Capacitor use

Model	3 Phase Rated Capacity kVAR(A)			
	200~220V	400~440V	500V	600V
S-P11,12	3(8.5)	4(6)	—	—
S-P21	4.5(14)	9(13)	—	—
S-P30T,S-P35T	6(18)	12(18)	—	—
S-P40T	8.5(25)	15(23)	—	—
S-P50T	12(35)	20(30)	—	—
S-P60T	13(40)	24(35)	25(30)	25(25)
S-P80T	15(50)	25(40)	30(35)	30(30)
S-P100T	22(65)	40(60)	45(50)	45(45)
S-P125T	24(72)	46(67)	50(55)	50(50)
S-P150T	25(80)	51(75)	60(70)	60(60)
S-P220T	50(150)	96(140)	110(130)	110(110)
S-P300	65(200)	120(180)	130(150)	130(130)
S-P400	85(250)	170(250)	200(230)	200(200)
S-C600	170(500)	350(500)	350(400)	400(400)

Model	Single Rated Capacity kVAR(A)			
	Single Phase		3 Phase in Series	
	200~220V	400~440V	500V	600V
S-P11,12	1.7(8.5)	2.4(6)	—	—
S-P21	2.8(14)	5(13)	—	—
S-P30T,S-P35T	3.6(18)	7(18)	—	—
S-P40T	5(25)	9(23)	—	—
S-P50T	7(35)	12(30)	—	—
S-P60T	8(40)	14(35)	20(40)	25(40)
S-P80T	10(50)	15(40)	25(50)	30(50)
S-P100T	13(65)	25(60)	30(60)	35(60)
S-P125T	14(72)	27(67)	33(70)	37(70)
S-P150T	15(80)	30(75)	35(80)	40(80)
S-P220T	30(150)	55(140)	75(150)	90(150)
S-P300	40(200)	72(180)	90(180)	100(180)
S-P400	50(250)	100(250)	120(250)	140(250)
S-C600	100(500)	200(500)	250(500)	300(500)

Note:

Single phase:  $kVAR = 6.3 \times 10^{-9} \times (Hz) \times (\mu F) \times (V)^2$ 3 phase:  $\sqrt{3} \times$  single phase kVAR

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

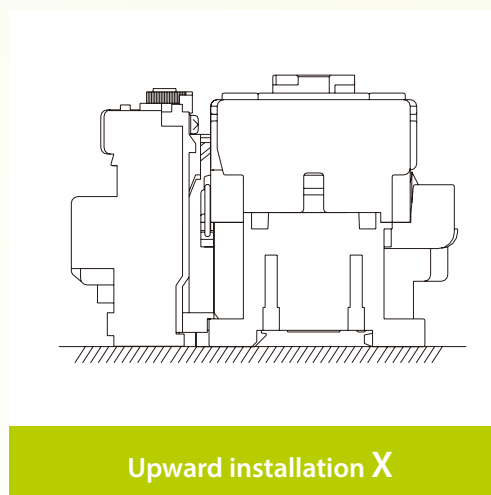
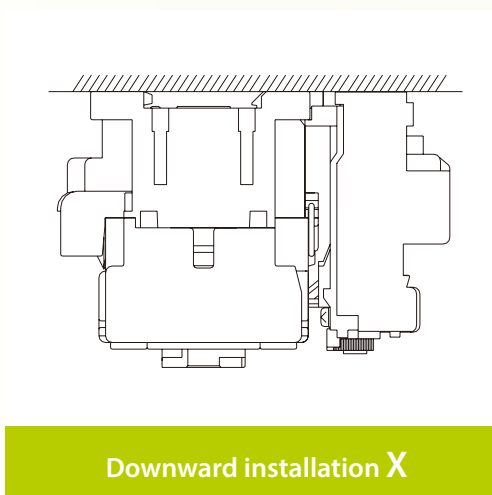
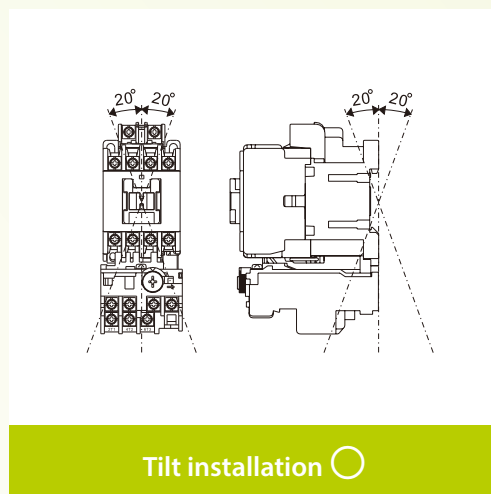
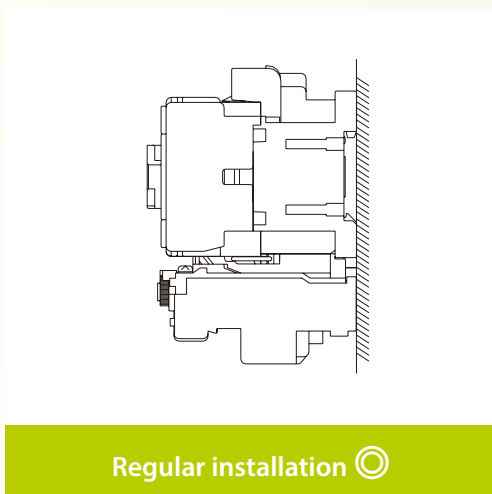
## Installation notes

### • Operating environment

- Altitude below 3000m
- Ambient temperature:  $-30^{\circ}\text{C}\sim+70^{\circ}\text{C}$  (dew is not allowed)
- Relative humidity: Relative humidity could not exceed 50% when the surrounding temperature is  $+40^{\circ}\text{C}$ . For lower temperature, the relative humidity can be higher. The average maximum relative humidity for the month with the highest humidity is 90%, and the average lowest temperature of that month is  $+25^{\circ}\text{C}$ . Please consider the possibility of frosting on the surface of the product due to temperature change.
- Withstand vibration 10Hz~55Hz 2G
- Withstand impact 5G
- Storage temperature:  $-50^{\circ}\text{C}\sim+85^{\circ}\text{C}$  (dew is not allowed)
- Please do not install in a place that contains dust, moisture, salt, oil stains, or corrosive or flammable gases.
- After switch installed, please add temporary protection to avoid harmful substances like dust or moisture etc coming into contact with it, if the switch is not to be used for a long period of time.
- Coil operating voltage should be applied within 85~110% of rated voltage. If higher than 110%, the coil life will be reduced, or the coil could burn out if lower than 85%.

### • Installation direction

The regular installation direction of the contactor is vertical, but is allowed 20° tilt along all directions. Refer to the figure below.



Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others