Shihlin Electric

MAGNETIC CONTACTOR & MOTOR STARTER

P Series

SHIHLIN ELECTRIC & ENGINEERING

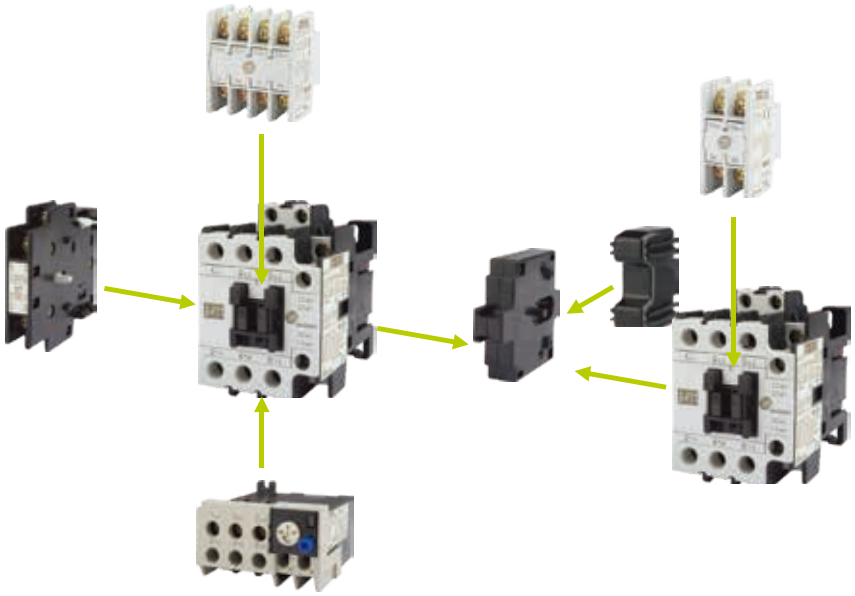
Functionalities and characteristics of Magnetic Contactor

• Configuration

Composite magnetic switch (abbreviated as MS) is comprised of a contactor for switching on and off current and a thermal overload relay for protecting the load.

• Functions

a. Switching the control system for electric power transmission and distribution.
b. Operation of the start and stop of motors.
c. Electric power control for all kinds of industrial machinery, machine tools, injection molding machines.



• Feature

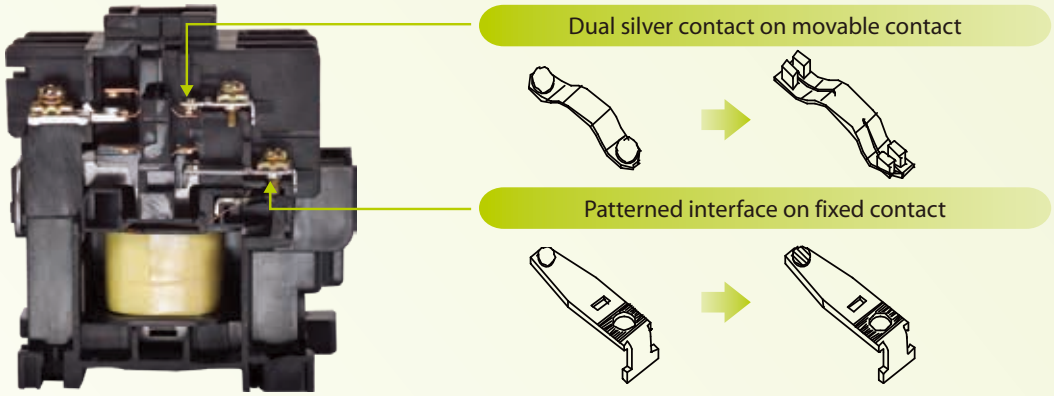
a. Products comply with multiple international standards.
   Compliant standards: JIS, JEM, IEC, EN, VDE
   Certificate: UL, UR, CSA, TUV, CE
b. Auxiliary Contact Block designed for installing on the front and on the side can satisfy the spatial requirements of different operating environments.

AP-2P
(1NO 1NC, 2NO, 2NC)

AP-4P
(2NO 2NC 4NO, 3NO 1NC)

APS-11
(1NO 1NC)

c. Increase the reliability of auxiliary contacts (S-P60T and lower).



Notes:
Apply the above auxiliary terminal design can increase the reliability of the contacts and minimize the contact resistance variation.

Descriptions of product characteristics S-P300、S-P400

Category	Product features
Usability	• Energy saving design with low power consumption for operating coils and operating VA capacity. • Operating coils apply common AC/DC power, AC or DC operation, DC holding, absolutely free of electromagnetic noise. • Wide range of operating voltage 100-240V, 265-450V, 440-575V, ease of customer use.
Internationalization	• Compliant with IEC, CE, UL, TUV worldwide standards.
Safety	• Spaced safety partition design: prevent short-circuit accidents caused by falling foreign objects. • Safety trip mechanism design: when main contact melts down, auxiliary NC contact will break apart and open. • Trip indication safety mechanism design: prevent external forces or human faulty activation which could lead to false function that bring about danger. • Highly voltage drop withstand coil design (prevent the motor from starting at insufficient voltage [<65%Us is not allowed to activate]).
Others	• Contact material does not contain cadmium, which complies with RoHs requirements

Description of thermal overload relay

- **Automatic temperature compensation design**

  Bi-metal design can adjust and compensate automatically for ambient temperature changes, which increase the reliability of the product.

- **Single unit installation base can be added for independent use**

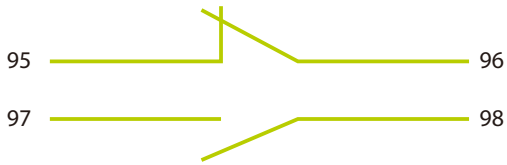
  TH-P12, TH-P18 can be installed to single unit installation base, which can be used independently on the track or be fixed on the installation plate.

- **Safety terminal cover design for high safety level**

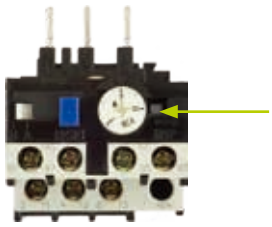
  Terminal cover, is easy to install and complies with IEC degree of protection of IP 20.

- **Auxiliary terminal of thermal overload relay is 1NO 1NC**

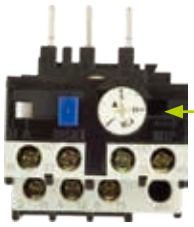
  The auxiliary contact are designed independently, which can be used for the control of two different power sources and are convenient for wiring.



- **Thermal overload relay reset/trip indicator can be seen easily and clear**

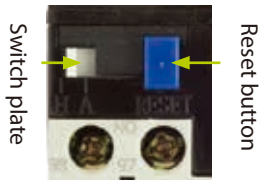


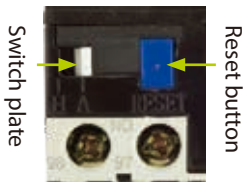
(Reset state) White rod will appear in the indicator window.



(Trip) White rod shifted and unable to be seen directly.

- **Switching of thermal overload relay between manual/automatic reset is easy (customers can switch by themselves according to their needs)**





TH-P12

Manual → Automatic reset switching method

Press reset button down and hold it; in the meantime, pull switch plate to the right to position "A" to lock reset rod and keep it in pressed down state, which then becomes the automatic reset state.

Automatic →Manual reset switching method

Pull switch plate to the left to position "H" to have reset rod recoiled back upward and finish.

TH-P20~TH-P600

Manual → Automatic reset switching method

Use cross screwdriver and align it with the cross hole on the top of reset button, engage and drive the button rotating it 90° counterclockwise to have the arrow points from "H" to "A" and keep reset button in pressed down state.

Automatic → Manual reset switching method

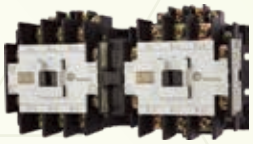
Use cross screwdriver and align it with the cross hole on the top of reset rod, engage and drive the rod rotating it 90° clockwise to have the arrow points from "A" to "H" and the reset rod recoiled back to its original position.

MS | S-P Series

Type designation

S	-	2×	P	35T	220V
①		②	③	④	⑤

S-P21



S-2×P30T

① Model

S：AC Magnetic contactor

② Non-reversing/reversing

Blank	Non-reversing
2×	Reversing

③ Series

P	P Series

④ Rated capacity

11、12、15、16、21、25、30T、35T、40T、50T、60T、80T、100T、125T、150T、200T、220T、300T、400T、600

⑤ Control circuit voltage

EX. 110V、220V、380V、440V (Refer to P34)

MS | MS-P Series

Type designation

MS	-	2×	P	35T	PB	380V/	220V	28A	E
①		②	③	④	⑤	⑥	⑦	⑧	⑨

MSO-P11

MSO-2×P11

MS-P11PB

MS-2×P11

① Model

MSO	AC Magnetic contactor without enclosure
MS	AC Magnetic contactor with enclosure

② Non-reversing/reversing

Blank	Non-reversing
2×	Reversing

③ Series

P	P Series

④ Rated capacity

11、12、15、16、21、25、30T、35T、40T、50T、60T、80T、100T、125T、150T、200T、220T、300T、400T、600

⑤ Push button

Blank	Non- Push button type
PB	With Push button type (MSO model is without PB)

⑥ Main circuit voltage

EX：110V、220V、380V、440V (When main circuit voltage and control circuit voltage are the same, it will be blank.)

⑦ Control circuit voltage

EX：110V、220V、380V、440V... (Refer to P34)

⑧ TH heater rated capacity

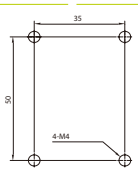
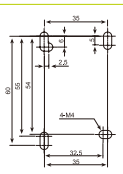
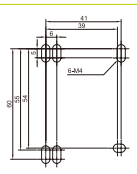
EX：3.3A、6.5A、9A、11A、15A...350A...

⑨ TH Type

Blank	Compressor Type (2 heaters)
E	3 heaters
PP	Differential Type

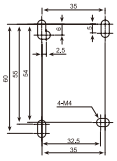
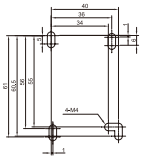
Magnetic Contactor / Starter ◆ AC control




Model				06	09	11	12
Type	Magnetic Contactor	Nonreversing		S-P06	S-P09	S-P11	S-P12
		Reversing		S-2×P06	S-2×P09	S-2×P11	S-2×P12
	Motor Starter	without enclosure	Nonreversing	MSO-P06	MSO-P09	MSO-P11	MSO-P12
			Reversing	—	—	MSO-2×P11	MSO-2×P12
		with enclosure	Nonreversing	—	—	MS-P11	MS-P12
			Reversing	—	—	MS-2×P11	MS-2×P12
		with enclosure (push button)	Nonreversing	—	—	MS-P11PB	MS-P12PB
		TOR	Standard	—	—	TH-P12 E	TH-P12 E
			Differential	TH-P09PP	TH-P09PP	TH-P12PP	TH-P12PP
Rated Capacity	IEC 60947-4-1 EN 60947-4-1 DIN VDE 0660 AC 3 (kW/HP/A)	3 ø	240V	1.5/ 2/ 7.5	2.2/ 3/ 10.1	3.5/ 4.5/ 13	3.5/ 4.5/ 13
			380/415V	3/ 4/ 6.6	4/ 5.5/ 9	5.5/ 7.5/ 12	5.5/ 7.5/ 12
			440V	3/ 4/ 6.5	4/ 5.5/ 8.5	5.5/ 7.5/ 12	5.5/ 7.5/ 12
			550V	3/ 4/ 5	4/ 5.5/ 6.5	5.5/ 7.5/ 9	5.5/ 7.5/ 9
			660V	3/ 4/ 4	4/ 5.5/ 5	5.5/ 7.5/ 7	5.5/ 7.5/ 7
		Continuous Current (Ith) AC1 (A)		20	20	20	20
		Rated insulation voltage (Ui) (V)		AC660	AC660	AC660	AC660
	UL 508 CSA-C22.2 AC3 (HP/A)	1 ø	100~120V	0.25/ 5.8	0.5/ 9.8	0.5/ 9.8	0.5/ 9.8
			200~240V	1/ 8	1.5/ 10	2/ 10	2/ 12
		3 ø	200~240V	2/ 6.8	3/ 9.6	3/ 9.6	3/ 9.6
			380~480V	3/ 4.8	5/ 7.6	7.5/ 11	7.5/ 11
			550~600V	3/ 3.9	5/ 6.1	10/ 11	10/ 11
		Continuous Current (Ith) AC1 (A)		20	20	24	24
		Rated insulation voltage (Ui) (V)		AC660	AC660	AC600	AC600
NEMA				00	00	0	0
Auxiliary Contact	IEC 60947-5-1 EN 60947-5-1 GB14048.4 AC 15	Contact	Standard	1NO	1NO	1NO	1NO 1NC
			Special	1NC	1NC	1NC	2NC or 2NO
			220V	3.3	3.3	1.6	1.6
			380V	1.9	1.9	0.95	0.95
		Continuous Current (Ith) AC1 (A)		10	10	16	16
		Contact class (UL)		A600	A600	A600, P600, Q300	A600, P600, Q300
Electrical Life AC3				1.6 Mil.	1.6 Mil.	1.6 Mil.	1.6 Mil.
Mechanical Life				10 Mil.	10 Mil.	10 Mil.	10 Mil.
Operation (Time/Hour)				1200	1200	1200	1200
Magnetic Contactor	Weight (kg)			0.15	0.15	0.33	0.35
	Appearance Dimensions (W×H×D) (mm)			46×58×51	46×58×51	43×81×83.5	53×81×83.5
	Installation dimension (mm)						
Mechanical Interlock				—	—	MPU-11	MPU-21

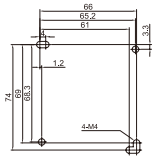
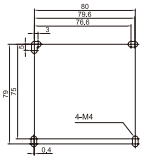
Magnetic Contactor / Starter ◆ AC control




Model				15	16	21 (A)	25
Type	Magnetic Contactor	Nonreversing		S-P15	S-P16	S-P21 (A)	S-P25
		Reversing		S-2×P15	S-2×P16	S-2×P21 (A)	S-2×P25
	Motor Starter	without enclosure	Nonreversing	MSO-P15	MSO-P16	MSO-P21 (A)	MSO-P25
			Reversing	MSO-2×P15	MSO-2×P16	MSO-2×P21 (A)	MSO-2×P25
		with enclosure	Nonreversing	MS-P15	MS-P16	MS-P21 (A)	MS-P25
			Reversing	MS-2×P15	MS-2×P16	MS-2×P21 (A)	MS-2×P25
		with enclosure (push button)	Nonreversing	MS-P15PB	MS-P16PB	MS-P21PB (A)	MS-P25PB
		TOR	Standard	TH-P12 E	TH-P20 E	TH-P20 E	TH-P20 E(TA)
			Differential	TH-P12PP	TH-P20PP	TH-P20PP	TH-P20(TA)PP
Rated Capacity	IEC 60947-4-1 EN 60947-4-1 DIN VDE 0660 AC 3 (kW/HP/A)	3 ø	240V	4.5/ 6/ 18	4.5/ 6/ 18	5.5/ 7.5/ 24	6.5/ 8.5/ 26
			380/415V	7.5/ 10/ 18	7.5/ 10/ 18	11/ 15/ 21	12/ 16/ 25
			440V	7.5/ 10/ 16	7.5/ 10/ 16	11/ 15/ 21	12/ 16/ 23
			550V	7.5/ 10/ 13	7.5/ 10/ 13	11/ 15/ 17	12/ 16/ 20
			660V	7.5/ 10/ 9	7.5/ 10/ 9	11/ 15/ 14	12/ 16/ 16
		Continuous Current (Ith) AC1 (A)		25	30	32	32
		Rated insulation voltage (Ui) (V)		AC660	AC660	AC660	AC660
	UL 508 CSA-C22.2 AC3 (HP/A)	1 ø	100~120V	—	1/ 16	2/ 24	2/ 24
			200~240V	—	3/ 17	3/ 17	3/ 17
		3 ø	200~240V	—	5/ 15.2	7.5/ 22	10/ 28
			380~480V	—	10/ 14	15/ 21	15/ 21
			550~600V	—	10/ 11	15/ 17	15/ 17
		Continuous Current (Ith) AC1 (A)		—	30	35	40
		Rated insulation voltage (Ui) (V)		—	AC600	AC600	AC600
NEMA				0	0	1	1
Auxiliary Contact	IEC 60947-5-1 EN 60947-5-1 GB14048.4 AC 15	Contact	Standard	1NO	1NO 1NC	1NO 1NC (2NO 2NC)	1NO 1NC
			Special	1NC	—	—	—
			220V	1.6	1.6	1.6	1.6
			380V	0.95	0.95	0.95	0.95
		Continuous Current (Ith) AC1 (A)		16	16	16	16
		Contact class (UL)		—	A600, Q300	A600, Q300	A600, Q300
Electrical Life AC3				1.3 Mil.	1.3 Mil.	1.3 Mil.	1.3 Mil.
Mechanical Life				10 Mil.	10 Mil.	10 Mil.	10 Mil.
Operation (Time/Hour)				1200	1200	1200	1200
Magnetic Contactor	Weight (kg)			0.33	0.37	0.38	0.38
	Appearance Dimensions (W×H×D) (mm)			43×81×83.5	53.5×81×83.5	53.5×81×83.5	53.5×81×83.5
	Installation dimension (mm)						
Mechanical Interlock				MPU-11	MPU-21	MPU-21	MPU-21

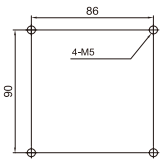
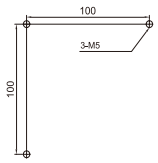
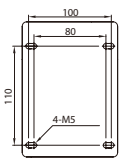




30T	35T	40T	50T	60T
S-P30T	S-P35T	S-P40T	S-P50T	S-P60T
S-2×P30T	S-2×P35T	S-2×P40T	S-2×P50T	S-2×P60T
MSO-P30T	MSO-P35T	MSO-P40T	MSO-P50T	MSO-P60T
MSO-2×P30T	MSO-2×P35T	MSO-2×P40T	MSO-2×P50T	MSO-2×P60T
MS-P30T	MS-P35T	MS-P40T	MS-P50T	MS-P60T
MS-2×P30T	MS-2×P35T	MS-2×P40T	MS-2×P50T	MS-2×P60T
MS-P30TPB	MS-P35TPB	MS-P40TPB	MS-P50TPB	MS-P60TPB
TH-P20 E(TA)	TH-P20 E(TA)	TH-P20 E(TA)	TH-P60 E	TH-P60 E(TA)
TH-P20(TA)PP	TH-P20(TA)PP	TH-P20(TA)PP	TH-P60PP	TH-P60(TA)PP
7.5/ 10/ 30	9/ 12.5/ 35	11/ 15/ 44	15/ 20/ 58	19/ 25/ 65
15/ 20/ 30	18.5/ 25/ 35	22/ 30/ 40	30/ 40/ 52	37/ 50/ 65
15/ 20/ 27	18.5/ 25/ 27	22/ 30/ 40	30/ 40/ 52	37/ 50/ 65
15/ 20/ 22	18.5/ 25/ 22	22/ 30/ 32	30/ 40/ 41	37/ 50/ 52
15/ 20/ 18	18.5/ 25/ 18	22/ 30/ 26	30/ 40/ 34	37/ 50/ 43
50	50	50	80	90
AC660	AC660	AC660	AC660	AC660
2/ 24	2/ 24	3/ 34	5/ 56	5/ 56
5/ 28	5/ 28	7.5/ 40	10/ 50	10/ 50
10/ 28	10/ 28	15/ 42	20/ 54	20/ 54
20/ 27	20/ 27	20/ 27	30/ 40	40/ 52
30/ 32	30/ 32	30/ 32	40/ 41	50/ 52
50	50	50	80	90
AC600	AC600	AC600	AC600	AC600
2	2	2	2	2
2NO 2NC	2NO 2NC	2NO 2NC	2NO 2NC	2NO 2NC
—	—	—	—	—
1.6	1.6	1.6	1.6	1.6
0.95	0.95	0.95	0.95	0.95
16	16	16	16	16
A600, Q300	A600, Q300	A600, Q300	A600, Q300	A600, Q300
1.3 Mil.	1.3 Mil.	1.3 Mil.	1.3 Mil.	1.3 Mil.
10 Mil.	10 Mil.	10 Mil.	6 Mil.	6 Mil.
1200	1200	1200	1200	1200
0.55	0.55	0.55	1.05	1.05
73×95×93	73×95×93	73×95×93	87.9×115×107	87.9×115×107
				
MPU-11	MPU-11	MPU-11	MPU-11	MPU-11

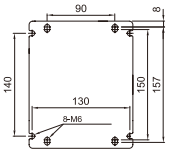
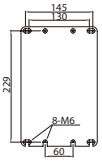
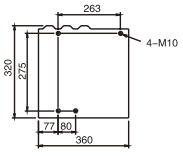
Magnetic Contactor / Starter ◆ AC control




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 AC 3 (kW/HP/A)	3 ø	240V	22/ 30/ 80	30/ 40/ 105	37/ 50/ 135	45/ 60/ 165
			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
		Continuous Current (Ith) AC1 (A)		100	135	170	200
		Rated insulation voltage (Ui) (V)		AC660	AC660	AC660	AC660
	UL 508 CSA-C22.2 AC3 (HP/A)	1 ø	100~120V	7.5/ 80	—	—	—
			200~240V	15/ 68	—	—	—
		3 ø	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
		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 AC 15	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
		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





200T	220T	300T	400T	600C
S-P200T	S-P220T	S-P300T	S-P400T	M-600C
S-2×P200T	S-2×P220T	S-2×P300T	S-2×P400T	RC-600C
MSO-P200T	MSO-P220T	MSO-P300T	MSO-P400T	—
MSO-2×P200T	MSO-2×P220T	MSO-2×P300T	MSO-2×P400T	—
MS-P200T	MS-P220T	—	—	—
MS-2×P200T	MS-2×P220T	—	—	—
—	—	—	—	—
TH-P220T E	TH-P220T E	TH-P400T E	TH-P400T E	TH-P600 E
TH-P220TPP	TH-P220TPP	TH-P400TPP	TH-P400TPP	TH-P600PP
55/ 75/ 200	65/ 85/ 225	90/ 125/ 300	110/ 150/ 400	160/ 220/ 620
110/ 150/ 200	120/ 160/ 220	160/ 220/ 300	220/ 300/ 400	315/ 420/ 600
110/ 150/ 190	120/ 160/ 220	185/ 250/ 300	250/ 340/ 400	315/ 420/ 600
110/ 150/ 150	132/ 180/ 180	185/ 250/ 263	250/ 340/ 360	315/ 420/ 500
110/ 150/ 125	132/ 180/ 150	200/ 300/ 220	280/ 380/ 305	—
240	260	350	450	660
AC660	AC660	AC1000	AC1000	AC660
—	—	—	—	—
—	—	—	—	—
75/ 192	75/ 192	100/ 248	125/ 312	—
150/ 180	150/ 180	200/ 240	250/ 302	—
150/ 144	150/ 144	200/ 192	300/ 289	—
240	260	350	450	—
AC600	AC600	AC1000	AC1000	—
4	4	5	5	6
2NO 2NC	2NO 2NC	2NO 2NC	2NO 2NC	2NO 2NC
—	—	—	—	—
3.3	3.3	3.3	3.3	1.6
1.6	1.6	1.6	1.6	0.95
16	16	10	10	16
A600, Q300	A600, Q300	A600, Q300	A600, Q300	A600, Q300
1.2 Mil.	1.2 Mil.	1.2 Mil.	1.2 Mil.	0.6 Mil.
6 Mil.	6 Mil.	6 Mil.	6 Mil.	6 Mil.
1200	1200	1200	1200	1200
4.35	4.35	9.75	9.75	28
138×185×159.5	138×185×159.5	164×246×196.5	164×246×196.5	360×320×234
				
MPU-125	MPU-125	MPU-125	MPU-125	—

Other | SD Series | DC control type

Type designation

SD	-	2×	P	21	220V
①		②	③	④	⑤

SD-P11

SD-2×P11

①	Model	SD	DC Contactor
②	Non-reversing/ reversing	Blank	Non-reversing
		2×	Reversing
③	Series	P	P Series
④	Rated capacity	11、16、21	
⑤	Control circuit voltage	EX：12V、24V、48V...110V、220V... (Refer to P33)	

Other | MDO Series | DC control type

Type designation

MDO	-	2×	P	21	380V /	220V	28A	E
①		②	③	④	⑤	⑥	⑦	⑧

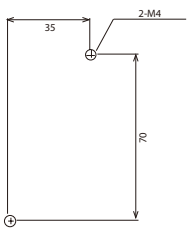
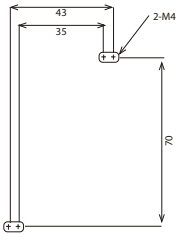
MDO-P11

MDO-2×P11

①	Model	MDO	DC Magnetic Switch without enclosure
②	Non-reversing/ reversing	Blank	Non-reversing
		2×	Reversing
③	Series	P	P Series
④	Rated capacity	11、16、21	
⑤	Main circuit voltage	EX：110V、220V、380V、440V... (When main circuit voltage and control circuit voltage are the same, it will be blank.)	
⑥	Control circuit voltage	EX：12V、24V、48V...110V、220V...	
⑦	TH heater rated capacity	EX：3.3A、6.5A、9A、11A...21A...	
⑧	TH Type	Blank	Compressor Type (2 heaters)
		E	3 heaters
		PP	Differential

Magnetic Contactor / Starter ◆ DC control



Type	Magnetic Contactor	Nonreversing			SD-P11	SD-P16	SD-P21
		Reversing			SD-2×P11	SD-2×P16	SD-2×P21
	Motor Starter	without enclosure	Nonreversing		MDO-P11	MDO-P16	MDO-P21
			Reversing		MDO-2×P11	MDO-2×P16	MDO-2×P21
		with enclosure	Nonreversing		—	—	—
			Reversing		—	—	—
		with enclosure (push button)	Nonreversing		—	—	—
		TOR	Standard		TH-P12	TH-P20	TH-P20
			Differential		TH-P12PP	TH-P20PP	TH-P20PP
Rated Capacity	IEC 60947-4-1 EN 60947-4-1 DIN VDE 0660 AC 3 (kW/HP/A)	3 ø	240V		3.5/ 4.5/ 13	4.5/ 6/ 18	5.5/ 7.5/ 24
			380/440V		5.5/ 7.5/ 12	7.5/ 10/ 18	11/ 15/ 21
			550V		5.5/ 7.5/ 9	7.5/ 10/ 13	11/ 15/ 17
			660V		5.5/ 7.5/ 7	7.5/ 10/ 9	11/ 15/ 14
		Continuous Current (Ith) AC1 (A)			20	30	32
	UL 508 CSA-C22.2 AC3 (HP/A)	1 ø	110~120V		0.5/ 9.8	1/ 16	2/ 24
			220~240V		2/ 12	3/ 17	3/ 17
		3 ø	220~240V		3/ 9.6	5/ 15.2	7.5/ 22
			440~480V		7.5/ 11	10/ 14	15/ 21
			550~600V		10/ 11	10/ 11	15/ 17
		Continuous Current (Ith) AC1 (A)			24	30	35
NEMA					0	0	1
Auxiliary contact					1NO or 1NC	1NO 1NC	1NO 1NC
Control coil voltage			DC (V)			12/ 24/ 48/ 72/ 110/ 125/ 220	
Electrical Life			AC3 (10 thousand)		120	120	120
Mechanical Life			(10 thousand)		600	600	600
Magnetic Contactor	Weight		(kg)		0.33	0.37	0.38
	Appearance Dimensions (W×H×D)		(mm)		43×81×83.5	53.5×81×83.5	53.5×81×83.5
	Installation dimension		(mm)				
Mechanical Interlock					MPU-11	MPU-11	MPU-11

Other | S-PSC Series | Capacitor use

Type designation

S	-	P	35	SC	220V
1		2	3	4	5

1 Model

S	Electromagnetic contactor

2 Series

P	P Series (Non-reversing)

3 Rated capacity

11、16、21、35、60、80

4 Purposes

SC	Applied to switching capacitor type.

5 Control circuit voltage

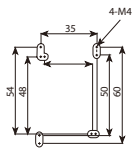
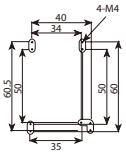
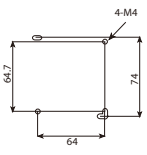
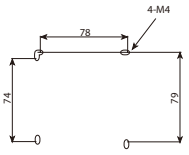
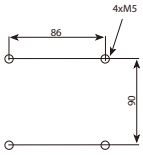
EX：110V、220V、380V、440V

- **Feature:**

a : applicable to rated voltage AC600V and below, with frequency at 50Hz/60Hz, and applied as a contactor for connecting and disconnecting low-voltage capacitors in parallel.

b : contactor is equipped with current limiting resistor, which can suppress surge current output from capacitors when they are initially connected, which could effectively reduce the impact of surge current to the capacitors and increase the life and reliability of capacitors.

Capacitor Contactor

Type				SC-P12	SC-P16	SC-P20	SC-P25	SC-P33	SC-P45	SC-P60
Rated insulation voltage (Ui)			(V)	690	690	690	690	690	690	690
Rated Capacity	IEC 60947-4-1 EN 60947-4-1 DIN VDE 0660 AC 3 (kW/HP/A)	AC-6b 3 ø (kVar/A)	200~240V	6.7/ 18	8.5/ 22	10/ 26	15/ 39	20/ 48	25/ 66	35/ 92
			400~440V	12.5/ 16	16.7/ 22	20/ 26	25/ 33	33.3/ 44	45/ 59	60/ 86
			525V	14/15	18/20	23/25	28/31	38/42	48/53	72/79
			660~690V	18/ 15	24/ 20	30/ 25	36/ 30	48/ 40	58/ 49	75/ 63
		Continuous Current (Ith) AC1 (A)		20	30	40	50	80	90	100
		Auxiliary Contact		2NO or 1NO 1NC	2NO 1NC	2NO 1NC	3NO 2NC	3NO 2NC	3NO 2NC	3NO 2NC
Auxiliary Contact	IEC 60947-5-1 EN 60947-5-1	AC12 (A)	100~120V	6	6	6	6	6	6	6
			200~220V	5	5	5	5	5	5	5
			380~440V	3	3	3	3	3	3	3
			550~600V	3	3	3	3	3	3	3
		Continuous Current (Ith)	(A)	16	16	16	16	16	16	16
Mechanical Life / Electrical Life (AC-6b) ≦440V (10 thousand)				100 / 30	100 / 30	100 / 30	100 / 30	100 / 30	100 / 30	100 / 30
Operation Frequency			(time/ hour)	240	240	240	240	240	240	100
Magnetic Contactor	Weight		(kg)	0.42	0.47	0.47	0.63	1.14	1.14	1.59
	Installation Dimensions (W×H×D)		(mm)	44×108×134	54×112×134	54×112×134	74×185×144	89×185×158	89×185×158	101×195×168
	Dimensions		(mm)							

Capacitor Unit

Capacitor Unit	Magnetic Contactor	Maximum operating power(kvar)			Max. peak current(A)
		220~240V	400~440V	660~690V	
AP-40 A	S-P11	6.7	12.5	18	560
	S-P16	8.5	16.7	24	560
	S-P21	10	20	30	1250
AP-40 B	S-P40T	15	25	36	1900
	S-P50T	20	33.3	48	2160
	S-P60T	25	45	58	3040
	S-P80T	35	60	75	3040

Other | SF Series | Definite purposes

Type designation

SF	-	20	C	2	M
1		2	3	4	5

SF25C2

1 Model

SF	Definite purposes

2 Rated capacity

20, 25, 30, 35, 40

3 Type

C	close type

4 Contact structure

1	1 Pole
2	2 Pole
3	1 Pole + conductor contact

5 Code of Coil voltage

Frequency	H	A	L	M	B	F
50Hz	24V	110~120V	200V	220V	208~240V	277V
60Hz	24V	110~120V	200V	220V	208~240V	277V

- **Features:**
  - All contacts are AMP250 quick contacts , which saves wiring
  - Compact size saving panel space.
  - Standard dimensions of the installation holes, compliant with the installation dimensions of the product of the same grade made by other brands.
  - Comply with Air-conditioning and Refrigeration Institute, USA ARI 780/790 standards.
  - Certified by cUL and compliant with the US UL508 standards.
  - Certified by CSA, compliant with Canadian C.S.A. C22.2 No.14 standards.
  - Comply with IEC 60947-4-1 standards, CE marking.
  - Operating voltage of coil: 85%~105% rated voltage

Definite Purpose Magnetic Contactor | SF Series

Type		20	25	30	35	40
		 C1		 C2		 C3
Type	1 Pole	SF20C1	SF25C1	SF30C1	SF35C1	SF40C1
	2 Pole	SF20C2	SF25C2	SF30C2	SF35C2	SF40C2
	1Pole w/shunt	SF20C3	SF25C3	SF30C3	SF35C3	SF40C3
Start Current(A) (Per Pole)	AC 240V / AC 277V	120	150	180	180	180
	AC 480V	100	125	150	150	150
	AC 600V	80	100	120	120	120
Start Current(A) (Single Phase) (2 Pole)	AC 240V / AC 277V	120	150	180	210	240
	AC 480V	100	125	150	175	200
	AC 600V	80	100	120	140	160
Rated Current w/resistance load (A)		30	35	40	50	50
Full Rated Current (A)		20	25	30	35	40
Mechanical / Electrical life (10 thousand)		50/25	50/25	50/25	50/25	50/25
Operation frequency (time / hour)		360	360	360	360	360
Coil Control Voltage 50/60 Hz		24 / 110-120 / 200 / 220 / 208-240 / 277				

Note: locked rotor current is the rotor current when the motor/compressor rotor is locked/immobilized, i.e. "starting current" as it is typically named.

Applicable scope

Applicable to the motor protective system in air-conditioning equipment, refrigerator or the control of the heater, motor, pump, fan, compressor in other industrial equipment.

Operating environment

- Altitude below 2000m
- Ambient temperature: -40℃~65℃ (dew is not allowed)
- Relative humidity: 45~85%RH

Installation direction

The normal installation direction of SF series contactor is vertical, but is allowed to tilt 30° along the front and the rear directions; and is allowed to rotate 360° along the front direction for installation.

Magnetic Control Relays



Type		SR-P40	SR-P50	SR-P80
Auxiliary Contact		4NO 3NO 1NC 2NO 2NC	5NO 4NO 1NC 3NO 2NC 2NO 3NC	8NO 7NO 1NC 6NO 2NC 5NO 3NC 4NO 4NC
Rated Capacity IEC 60947-4-1 AC15 (A)	220V	1.6	1.6	1.6
	380V	0.95	0.95	0.95
Rated insulation current	(Ui) (V)	660	660	660
Continuous Current	(Ith) (A)	16	16	16
Contact Class	(UL)	A600, Q300	A600, Q300	A600, Q300
Electrical Life	(10 thousand)	50 and up	50 and up	50 and up
Mechanical Life	(10 thousand)	500	500	500
Operation Frequency	(time / hour)	500	500	500

Other | SR Series | Anti-surge interference type

Type			SR-P40SA	SR-P50SA	SR-P80SA
Contact structure			4NO 3NO 1NC 2NO 2NC	5NO 4NO 1NC 3NO 2NC 2NO 3NC	8NO 7NO 1NC 6NO 2NC 5NO 3NC 4NO 4NC
Rated capacity (A)	AC 12 (IEC)	110V	6	6	6
		220V	5	5	5
		440V	3	3	3
		550V	3	3	3
	DC 12 (IEC)	24V	5	5	5
		48V	3	3	3
		110V	0.3	0.3	0.3
		220V	0.2	0.2	0.2
Continuous Current		(Ith)(A)	16	16	16
contact class		(UL)	A600,Q300	A600,Q300	A600,Q300
Electrical life		(10 thousand times)	50	50	50
Mechanical Life		(10 thousand times)	500	500	500

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	S-P125, S-P150T S-P200T, S-P220T S-P300T, S-P400T
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					

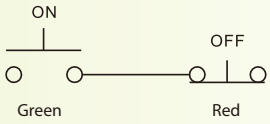
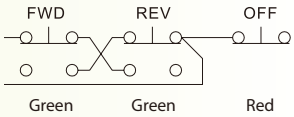
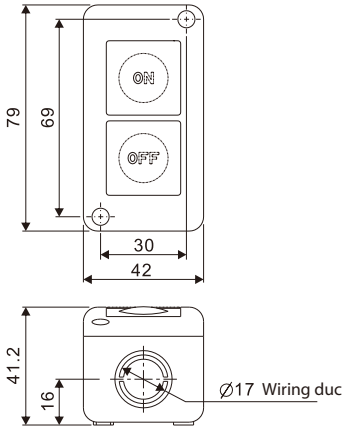
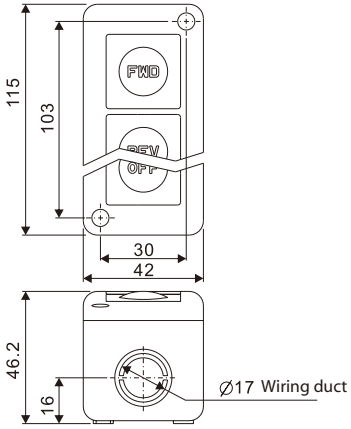
Timer

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.	

Push button | PB Series

Type	PB2	PB3
		
Contact structure		
External dimensions(mm)		
WET.	72.5g	110g

Separate Mounting Unit

Type	UATP12
TOR	TH-P12

Coil Characteristics

Type / Characteristics		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
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-P06~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	

Thermal overload relay | TH Series

Type designation

TH	-	P	20	E	TA	PP
1		2	3	4	5	6

TH-P20TA

1 Model

TH	Thermal overload (overcurrent) relay

2 Series

P	P series

3 Rated Capacity

12、18、20、60、120、200、400、600

4 Type

Blank	2 heaters or Differential Type
E	3 heaters

5 Contact/CT

Blank	Contact without TA
TA	with TA contact
	20 type＝28A~40A（Other Ampere is left blank）
	60 type＝67A~80A（Other Ampere is left blank）
	120 type＝105A~160A（Other Ampere is left blank）
CT	CT included (current transformer)；only for 220、400、600 type

6 TH Type

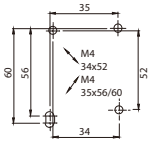
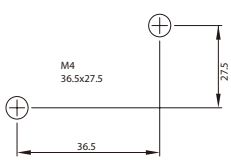
Blank	2 heaters (standard) or 3 heaters
PP	Differential Type

Thermal Overload Relay

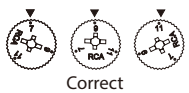


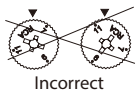

Type		09	12	20	
Standard	Contactor Assembled Type	—	TH-P12E	TH-P20E	TH-P20ETA
#3	Independently Installed Type	—	TH-P12ER	—	—
With phase failure protection	Contactor Assembled Type	TH-P09PP	TH-P12PP	TH-P20PP	TH-P20TAPP
#3	Independently Installed Type	—	TH-P12PPR	—	—
Reset Mode		Manual / Automatic	Manual / Automatic	Manual / Automatic	
Magnetic Contactor		S-P06, S-P09.	S-P11, S-P12, S-P15.	S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T.	S-P25, S-P30T, S-P35T, S-P40T.

TOR Adjustment Range (A)							
Rating (A)	Range (A)	Rating (A)	Range (A)	Rating (A)	Range (A)	Rating (A)	Range (A)
0.13	0.1~0.16	0.25	0.19~0.31	0.25	0.19~0.31	28	22~34
0.20	0.16~0.24	0.4	0.3~0.5	0.4	0.3~0.5	33	28~38
0.32	0.24~0.4	0.6	0.45~0.75	0.6	0.45~0.75	40	32~48
0.5	0.4~0.6	0.9	0.7~1.1	0.9	0.7~1.1		
0.8	0.6~1	1.2	0.9~1.5	1.2	0.9~1.5		
1.3	1~1.6	1.7	1.3~2.1	1.7	1.3~2.1		
2.0	1.6~2.4	2.1	1.6~2.6	2.1	1.6~2.6		
3.2	2.4~4	3.3	2.5~4.1	3.3	2.5~4.1		
5	4~6	4.4	3.4~5.4	4.4	3.4~5.4		
7.5	6~9	6.5	5~8	6.5	5~8		
		9	7~11	9	7~11		
		11	9~13	11	9~13		
		＊15	12~18	15	12~18		
				21	17~24		

Auxiliary Contact	1NO 1NC	1NO 1NC	1NO 1NC	
Weight	0.075	0.11/ 0.12	0.18/ 0.19	0.20/ 0.21
Dimensions (mm) (W×H×D)	45.5×64.8×50	TH-P12(PP): 45.5×55.5×78 TH-P12(PP)R: 47×71×86.2	TH-P20(PP): 64.5×46.1×80	TH-P20TA(PP): 64.5×56.2×80
Installation Dimensions (mm)	—	TH-P12(PP): TH-P12(PP)R: 		

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
4. ＊: The rating current of TH-P12 can only use up to "11A" when combined with S-P11.


Correct


Incorrect

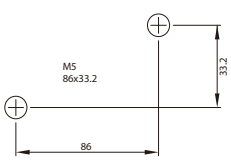


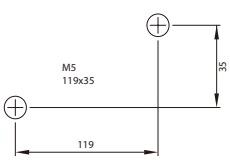

Type		60		120	
Standard	Contactor Assembled Type	TH-P60E	TH-P60ETA	TH-P120E	TH-P120ETA
	Independently Installed Type	—	—	—	—
With phase failure protection	Contactor Assembled Type	TH-P60PP	TH-P60TAPP	TH-P120PP	TH-P120TAPP
	Independently Installed Type	—	—	—	—
Reset Mode		Manual / Automatic		Manual / 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						

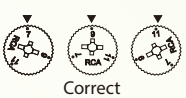
Auxiliary Contact	1NO 1NC		1NO 1NC	
Weight	0.28/ 0.30	0.34/ 0.36	0.55	0.76
Dimensions (mm) (W×H×D)	TH-P60(PP): 98×50.5×78	TH-P60TA(PP): 64.5×65.5×80	TH-P120(PP): 133×54×105	TH-P120TA(PP): 133×85.5×105

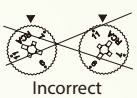
Installation Dimensions (mm)





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

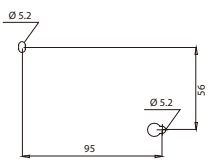

Correct

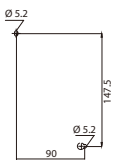

Incorrect

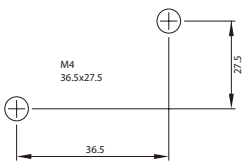
220T	400T	600CT
TH-P220TE	TH-P400TE	TH-P600E
—	—	—
TH-P220TPP	TH-P400TPP	TH-P600PP
—	—	—
Manual / Automatic	Manual / Automatic	Manual / Automatic
S-P200T, S-P220T.	S-P300T, S-P400T.	M-600C

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



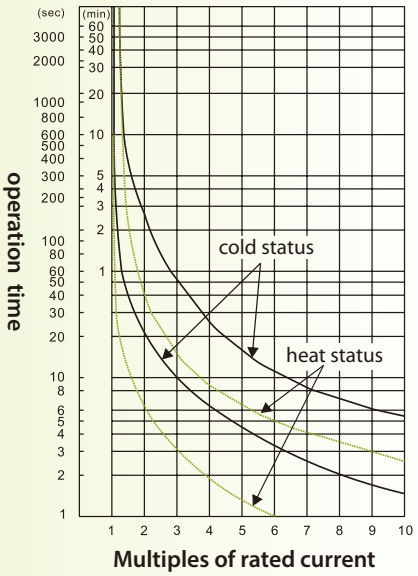




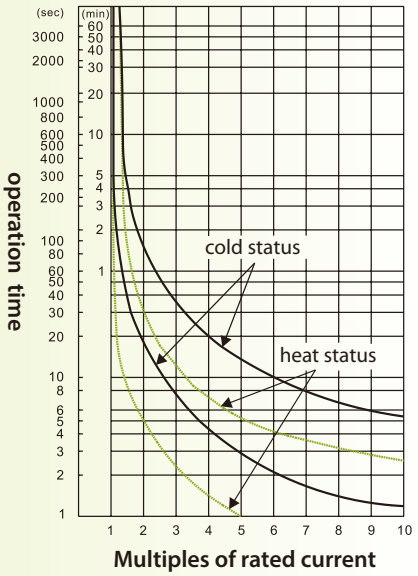
Thermal overload (overcurrent) relay | TH Series

Tripping Characteristic

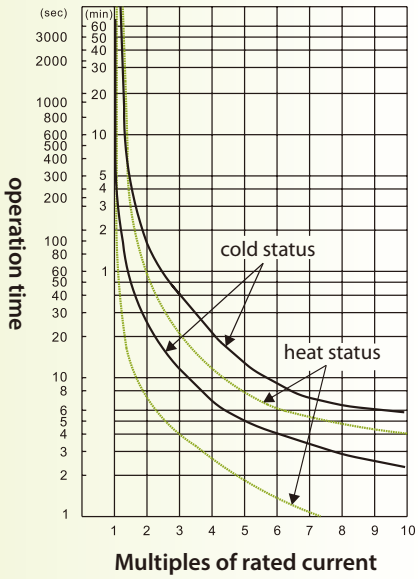
TH-P12E tripping characteristic curve



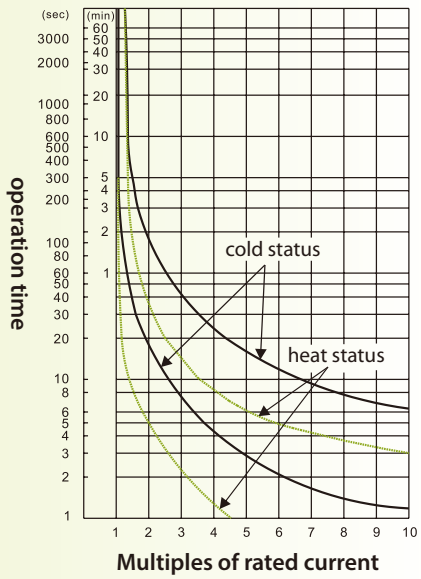
TH-P18E – below 6.5A tripping characteristic curve



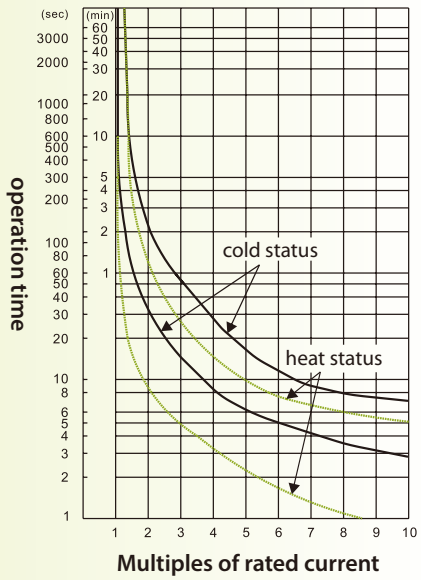
TH-P18E – above 9A tripping characteristic curve



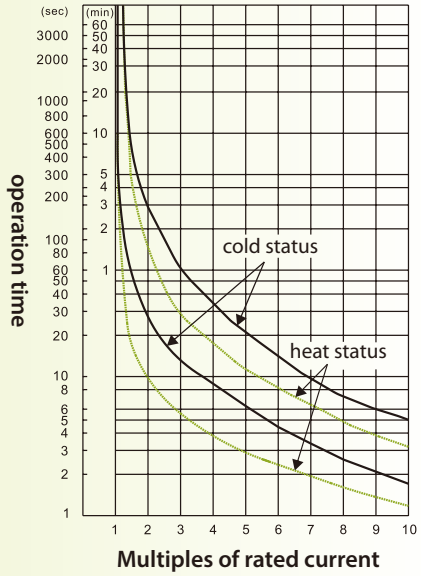
TH-P20E – below 6.5A tripping characteristic curve



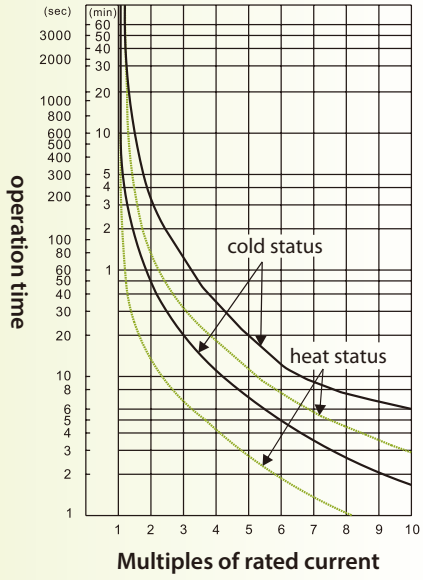
TH-P20ETA – above 9A tripping characteristic curve



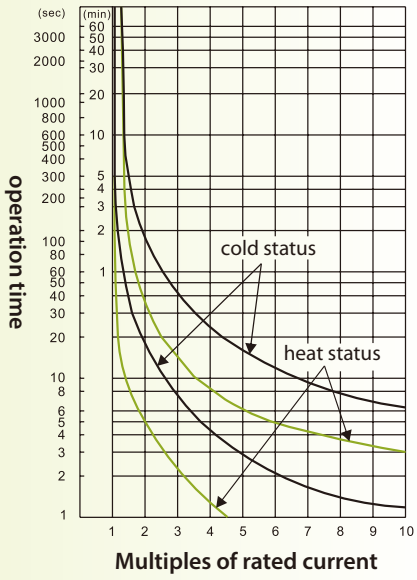
TH-P60ETA tripping characteristic curve



TH-P120ETA tripping characteristic curve



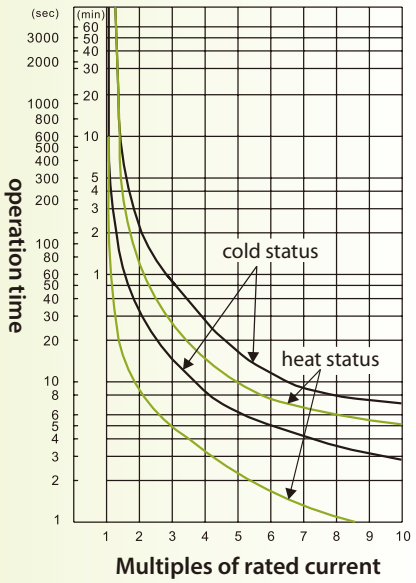
TH-P220ECT、P400ECT、TH-P220TE P400TE 130A tripping characteristic curve



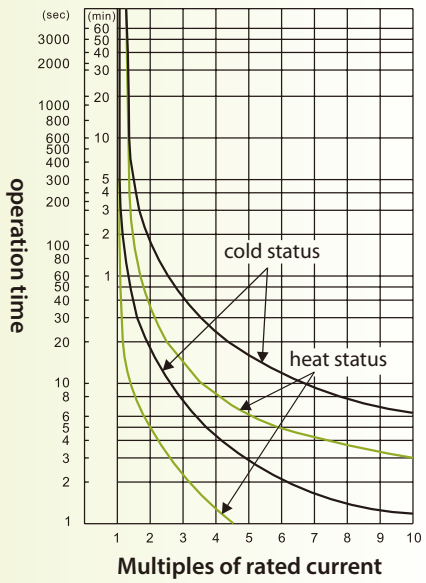
Thermal overload (overcurrent) relay | TH Series |

Tripping Characteristic

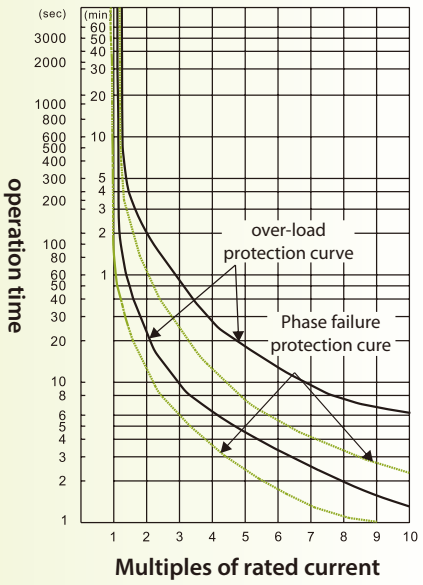
TH-P220ECT、TH-P400ECT、TH-P220TE TH-P400TE 160A tripping characteristic curve



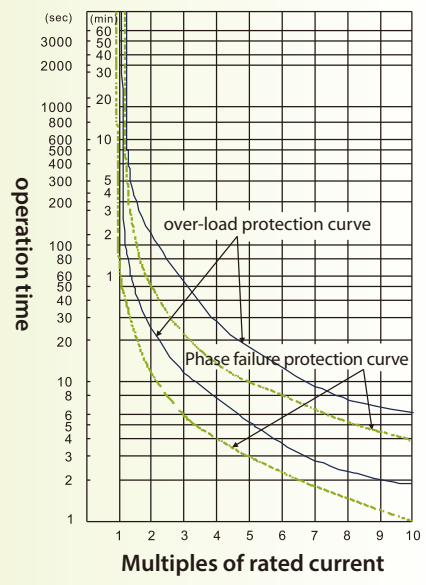
TH-P600ECT tripping characteristic curve



TH-P12PP tripping characteristic curve



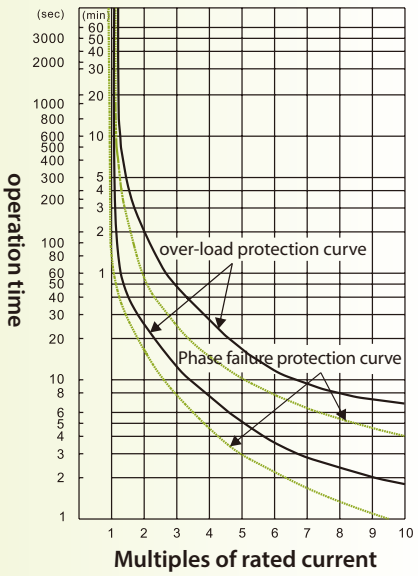
TH-P20TAPP tripping characteristic curve



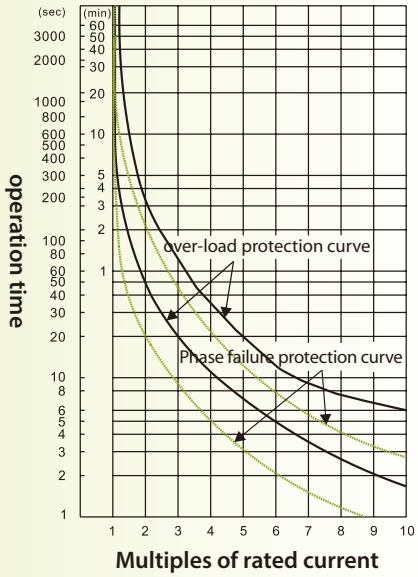
Thermal overload (overcurrent) relay | TH Series

Tripping Characteristic

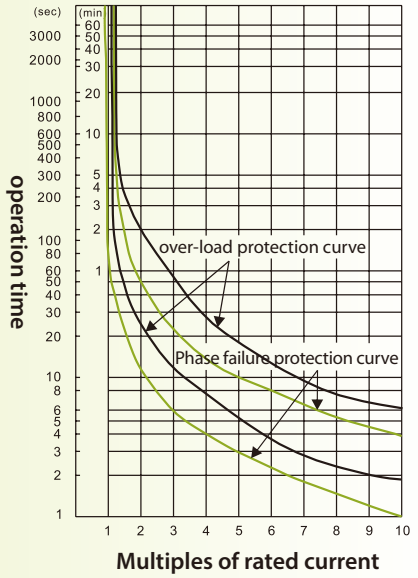
TH-P60TAPP tripping characteristic curve



TH-P120TAPP tripping characteristic curve



TH-P220CTPP、P400CTPP、P600CTPP、TH-P220TPP、P400TPP tripping characteristic curve



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

SDO-P60

SDE-P21

1 Model

SD	Star-delta Starter

2 Type

O	without enclosure
E	with enclosure，Push button、Indicator lamp
A	with enclosure，Push button、Indicator lamp、Ammeter

3 Rated capacity

21、35、50、60、80、100、125、150、200、220

4 Contact / CT

Blank	CT not included
T	CT included

5 Main circuit voltage

EX：110V、220V、380V、440V...
When main circuit voltage and control circuit voltage are the same, it will be blank.)

6 Control circuit voltage

EX：110V、220V、380V、440V...

7 TH heater rated capacity

EX：40A、54A...350A...

8 TH Type

Blank	Standard (2 heaters)
E	3 heaters
PP	Differential

Structure, principle

When starting by λ - △ 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 λ - △ 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	100×1/$\sqrt{3}$=58
λ -△ starting	600×1/3=200	150×1/3=50	100	100	100×1/$\sqrt{3}$=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 λ - △ switching.
(2) Starting time of λ 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 λ -△, ensure the power supply capacity is sufficient to prevent voltage drop in power supply during transition from λ 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) λ -△ 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.

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^2)	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	

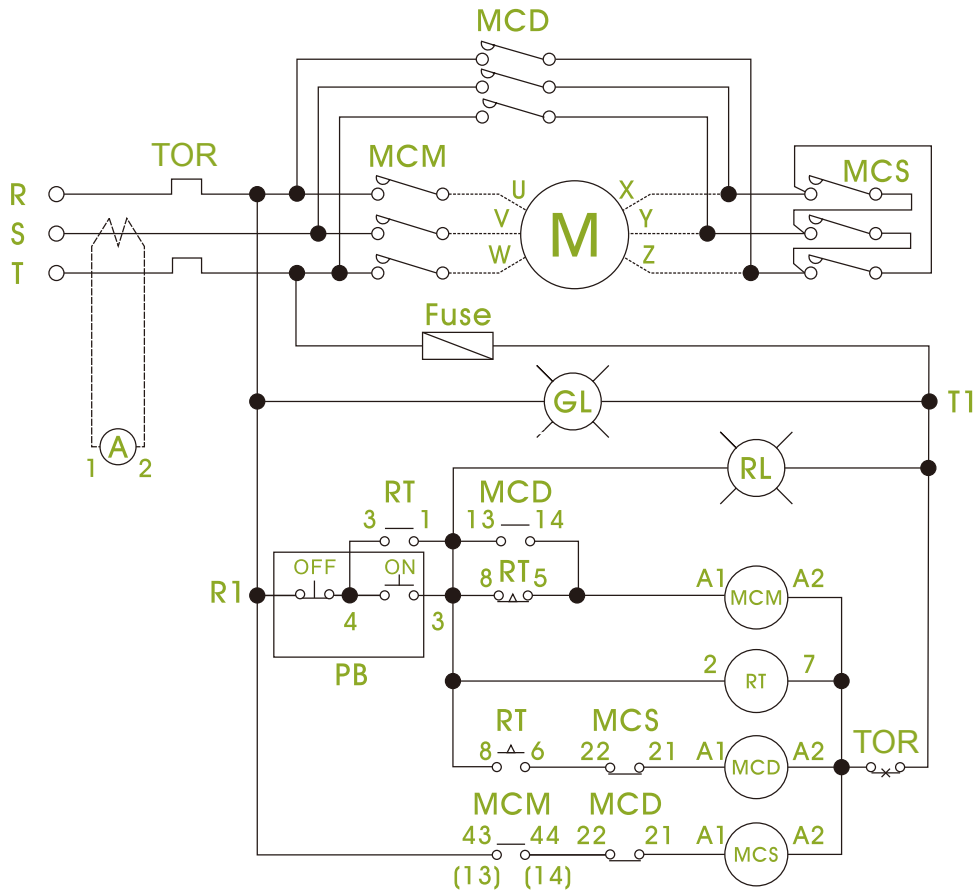
Note: 1. SDE-P21~P220 is with enclosure, push button, indicator light and door lock.
2. SDA-P21~P220 is with enclosure, push button, indicator light, door lock, and current meter.
3. SDO-P21~P220 is attached with CT as current meter.

SDA-P50

SDA-P50

Wiring

Connection with Breaker



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): $t = 4 + 2\sqrt{\ }kW$ (±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)	TH-P20	TH-P20																
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-P60	TH-P60	TH-P60	TH-P60												
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)	TH-P20TA	TH-P20TA																
28	7.5	(10)	15	(20)																		
33	9	(12 1/2)	19	(25)																		
40	11	(15)	22	(30)							TH-P120	TH-P120	TH-P120	TH-P120	TH-P120	TH-P120						
40	14	(19)	26	(35)																		
54	15	(20)	30	(40)																		
67	19	(25)	37	(50)			TH-P60TA		TH-P60TA	TH-P60TA												
80	22	(30)	45	(60)													TH-P220T	TH-P220T	TH-P220T	TH-P220T	TH-P400T	TH-P400T
80	25	(34)	50	(67)																		
105	30	(40)	55	(75)							TH-P120TA	TH-P120TA	TH-P120TA	TH-P120TA	TH-P120TA	TH-P120TA						
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)															TH-P400T			
350	110	(150)	200	(260)																		

Selection Table ◆ Direct On-Line Starter

Motor rated capacity kW	(HP)	3 ø 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	S-P06; S-P09
0.04	(1/19)	0.32A	0.24~0.4A	S-P06; S-P09
0.09	(1/8)	0.5A	0.4~0.6A	S-P06; S-P09
0.12	(1/6)	0.8A	0.6~1.0A	S-P06; S-P09
0.25	(1/3)	1.3A	1.0~1.6A	S-P06; S-P09
0.37	(1/2)	2.0A	1.6~2.4A	S-P06; S-P09
0.75	(1)	3.2A	2.4~4.0A	S-P06; S-P09
1.1	(1 1/2)	5A	4.0~6.0A	S-P09
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	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T
0.05	(1/15)	0.4A	0.3~0.5A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T
0.1	(1/8)	0.6A	0.45~0.75A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T
0.15	(1/5)	0.9A	0.7~1.1A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T
0.2	(1/4)	1.2A	0.9~1.5A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T
0.3	(2/5)	1.7A	1.3~2.1A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T
0.4	(1/2)	2.1A	1.6~2.6A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T
0.75	(1)	3.3A	2.5~4.1A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T
1.1	(1 1/2)	4.4A	3.4~5.4A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T
1.5	(2)	6.5A	5~8A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T
2.2	(3)	9A	7~11A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T; S-P50T; S-P60T; S-P80T
3	(4)	11A	9~13A	S-P11, S-P12; S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T; S-P50T; S-P60T; S-P80T
3.7	(5)	15A	12~18A	S-P15, S-P16; S-P21; S-P25; S-P30T; S-P35T; S-P40T; S-P50T; S-P60T; S-P80T
5.5	(7 1/2)	21A	17~24A	S-P21; S-P25; S-P30T; S-P35T; S-P40T; S-P50T; S-P60T; S-P80T
6.5	(8 1/2)	28A	22~34A	S-P25; S-P30T; S-P35T; S-P40T; S-P50T; S-P60T; S-P80T
7.5	(10)			S-P30T; S-P35T; S-P40T; S-P50T; S-P60T; S-P80T
9	(12 1/2)	33A	28~38A	S-P35T; S-P40T; S-P50T; S-P60T; S-P80T
11	(15)	40A	32~48A	S-P40T; S-P50T; S-P60T; S-P80T; S-P100T; S-P125T; S-P150T
15	(20)	54A	43~65A	S-P50T; S-P60T; S-P80T; S-P100T; S-P125T; S-P150T
19	(25)	67A	54~80A	S-P60T; S-P80T; S-P100T; S-P125T; S-P150T
22	(30)	80A	60~100A	S-P80T; S-P100T; S-P125T; S-P150T
25	(35)	105A	80~130A	S-P100T; S-P125T; S-P150T; S-P200T; S-P220T
30	(40)			S-P125T; S-P150T; S-P200T; S-P220T; S-P300T; S-P400T
37	(50)	130A	100~160A	S-P125T; S-P150T; S-P200T; S-P220T; S-P300T; S-P400T
45	(60)	160A	120~200A	S-P150T; S-P200T; S-P220T; S-P300T; S-P400T
55	(75)	200A	150~250A	S-P200T; S-P220T; S-P300T; S-P400T
65	(85)			S-P220T; S-P300T; S-P400T; M-600C
75	(100)	260A	200~320A	S-P300T; S-P400T; M-600C
90	(125)	350A	260~440A	S-P300T; S-P400T; M-600C
110	(150)			S-P400T; M-600C
132	(180)	500A	400~600A	M-600C
160	(220)			M-600C

Selection Table ◆ Direct On-Line Starter

Motor rated capacity kW (HP)		3 ø 380V~440V		
		Heating element rating (A)		Selection of the contactor
0.025	(1/30)	0.13A	0.1~0.16A	S-P06, S-P09
0.04	(1/19)	0.2A	0.16~0.24A	S-P06, S-P09
0.09	(1/8)	0.32A	0.24~0.4A	S-P06, S-P09
0.18	(1/4)	0.5A	0.4~0.6A	S-P06, S-P09
0.25	(1/3)	0.8A	0.6~1.0A	S-P06, S-P09
0.37	(1/2)	1.3A	1.0~1.6A	S-P06, S-P09
0.55	(3/4)	2.0A	1.6~2.4A	S-P06, S-P09
0.75	(1)			S-P06, S-P09
1.1	(1 1/2)	3.2A	2.4~4.0A	S-P06, S-P09
1.5	(2)	5A	4.0~6.0A	S-P06, S-P09
2.2	(3)			S-P06, S-P09
3	(4)	7.5A	6.0~9.0A	S-P09
0.05	(1/15)	0.25A	0.19~0.31A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
0.1	(1/8)	0.4A	0.3~0.5A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
0.2	(1/4)	0.6A	0.45~0.75A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
0.3	(2/5)	0.9A	0.7~1.1A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
0.4	(1/2)	1.2A	0.9~1.5A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
0.75	(1)	1.7A	1.3~2.1A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
1.1	(1 1/2)	2.1A	1.6~2.6A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
1.5	(2)	3.3A	2.5~4.1A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
2.2	(3)	4.4A	3.4~5.4A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
3	(4)	6.5A	5~8A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
3.7	(5)	9A	7~11A	S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
4	(5 1/2)			S-P11, S-P12, S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T
4.5	(6)	11A	9~13A	S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T, S-P50T, S-P60T, S-P80T
5.5	(7 1/2)			S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T, S-P50T, S-P60T, S-P80T
7.5	(10)	15A	12~18A	S-P15, S-P16, S-P21, S-P25, S-P30T, S-P35T, S-P40T, S-P50T, S-P60T, S-P80T
11	(15)	21A	17~24A	S-P21, S-P25, S-P30T, S-P35T, S-P40T, S-P50T, S-P60T, S-P80T
12	(16)			S-P21, S-P25, S-P30T, S-P35T, S-P40T, S-P50T, S-P60T, S-P80T
15	(20)	28A	22~34A	S-P25, S-P30T, S-P35T, S-P40T, S-P50T, S-P60T, S-P80T
19	(25)	33A	28~38A	S-P30T, S-P35T, S-P40T, S-P50T, S-P60T, S-P80T
22	(30)	40A	32~48A	S-P30T, S-P35T, S-P40T, S-P50T, S-P60T, S-P80T
25	(35)			S-P40T, S-P50T, S-P60T, S-P80T, S-P100T
30	(40)	54A	43~65A	S-P40T, S-P50T, S-P60T, S-P80T, S-P100T
37	(50)	67A	54~80A	S-P50T, S-P60T, S-P80T, S-P100T, S-P125T
45	(60)			S-P60T, S-P80T, S-P100T, S-P125T, S-P150T
50	(70)	80A	60~100A	S-P80T, S-P100T, S-P125T, S-P150T, S-P200T
60	(80)	105A	80~130A	S-P100T, S-P125T, S-P150T, S-P200T, S-P220T
75	(100)	130A	100~160A	S-P125T, S-P150T, S-P200T, S-P220T, S-P300T
90	(125)	160A	120~200A	S-P150T, S-P200T, S-P220T, S-P300T, S-P400T
110	(150)	200A	150~250A	S-P200T, S-P220T, S-P300T, S-P400T, M-600C
132	(180)			S-P200T, S-P220T, S-P300T, S-P400T, M-600C
150	(200)	260A	200~320A	S-P300T, S-P400T, M-600C
160	(220)	350A	260~440A	S-P300T, S-P400T, M-600C
220	(330)			S-P400T, M-600C
250	(350)	500A	400~600A	M-600C
315	(420)			M-600C

Selection Table ◆ Direct On-Line Starter

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

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 = 6.3×10-9×(Hz)×(μF)×(V)2
3 phase: √3 x single phase kVAR

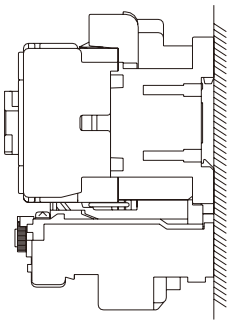
Installation notes

• Operating environment

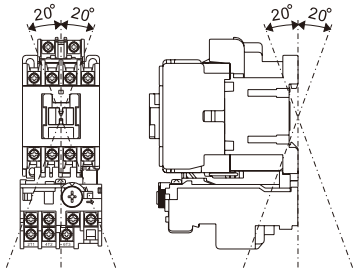
- Altitude below 3000m
- Ambient temperature: -30℃~+70℃ (dew is not allowed)
- Relative humidity: Relative humidity could not exceed 50% when the surrounding temperature is +40oC. For lower temperature, the relative humidity can be higher. The average maximum relative humidity for the month with the highest humidity is 90%, and the average lowest temperature of that month is +25oC. 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℃～+85℃(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

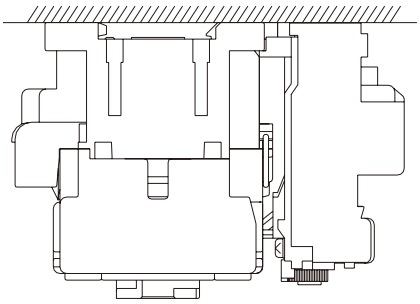
The regular installation direction of the contactor is vertical, but is allowed 20° tilt along all directions. Refer to the figure below.



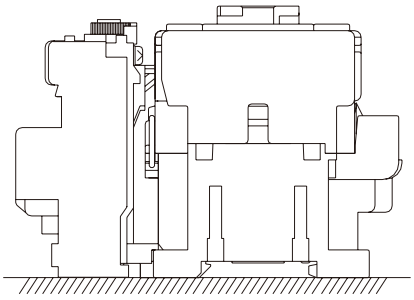
Regular installation ◎



Tilt installation ○



Downward installation X



Upward installation X

Note. If installation dimensional drawing is required, please contact regional distributor or e-mail：b.export@seec.com.tw