



MAGNETIC CONTACTOR & MOTOR STARTER



P Series



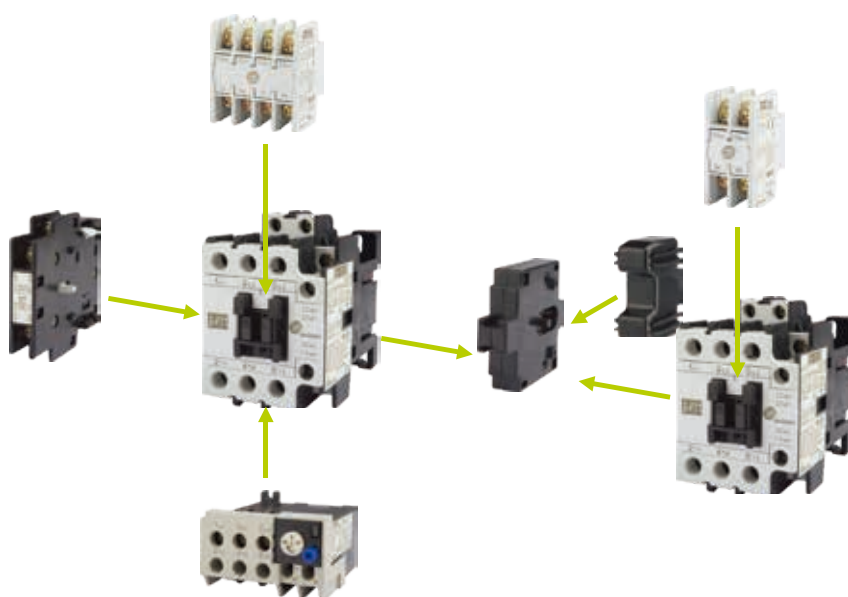
Functionalities and characteristics of Magnetic Contactor

• 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.



Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

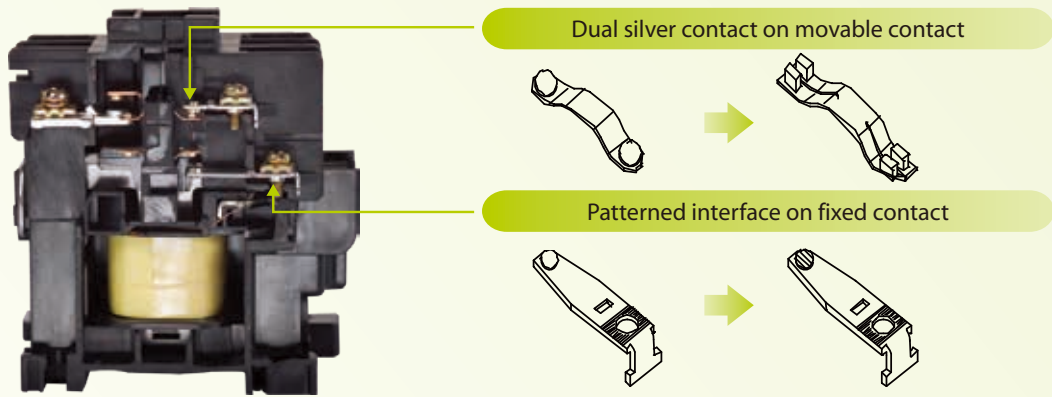
SD

Series

Selec-tion

Others

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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Compliant with IEC, CE, UL, TUV worldwide standards.
Safety	<ul style="list-style-type: none"> • 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 [$<65\%U_s$ is not allowed to activate]).
Others	<ul style="list-style-type: none"> • Contact material does not contain cadmium, which complies with RoHs requirements

Characteristics

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

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**

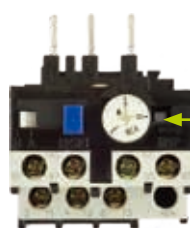
Terminal cover, is easy to install and complies with IEC degree of protection of IP 20.

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

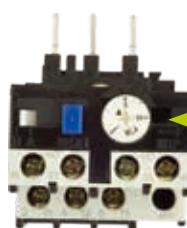
The auxiliary contact are designed independently, which can be used for the control of two different power sources and are convenient for wiring.



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



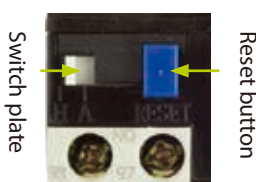
(Reset state)
White rod will appear in the indicator window.



(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)



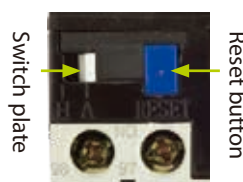
TH-P12

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.

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

MS | S-P Series

Type designation



S-P21



S-2×P30T

MS | MS-P Series

Type designation



MSO-P11



MSO-2×P11



MS-P11PB



MS-2×P11

S	-	2×	P	35T	220V
①		②	③	④	⑤

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

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			11	12		
Type	Magnetic Contactor	Nonreversing	S-P11	S-P12		
		Reversing	S-2×P11	S-2×P12		
	Motor Starter	without enclosure	Nonreversing	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-P12PP	TH-P12PP		
	Rated Capacity	IEC 60947-4-1 EN 60947-4-1 DIN VDE 0660	3 Ø	240V	3.5/ 4.5/ 13	3.5/ 4.5/ 13
380/415V				5.5/ 7.5/ 12	5.5/ 7.5/ 12	
440V				5.5/ 7.5/ 12	5.5/ 7.5/ 12	
550V				5.5/ 7.5/ 9	5.5/ 7.5/ 9	
660V				5.5/ 7.5/ 7	5.5/ 7.5/ 7	
AC 3 (kW/HP/A)		Continuous Current (Ith) AC1 (A)	20	20		
		Rated insulation voltage (Ui) (V)	AC660	AC660		
UL 508 CSA-C22.2		1 Ø	100~120V	0.5/ 9.8	0.5/ 9.8	
			200~240V	2/ 10	2/ 12	
		3 Ø	200~240V	3/ 9.6	3/ 9.6	
			380~480V	7.5/ 11	7.5/ 11	
			550~600V	10/ 11	10/ 11	
		AC3 (HP/A)	Continuous Current (Ith) AC1 (A)	24	24	
		Rated insulation voltage (Ui) (V)	AC600	AC600		
NEMA			0	0		
Auxiliary Contact		IEC 60947-5-1 EN 60947-5-1 GB14048.4	Contact	Standard	1NO	1NO 1NC
				Special	1NC	2NC or 2NO
				220V	1.6	1.6
	380V			0.95	0.95	
	AC 15	Continuous Current (Ith) AC1 (A)	16	16		
		Contact class (UL)	A600, P600, Q300	A600, P600, Q300		
Electrical Life AC3			1.6 Mil.	1.6 Mil.		
Mechanical Life			10 Mil.	10 Mil.		
Operation (Time/Hour)			1200	1200		
Magnetic Contactor	Weight (kg)		0.33	0.35		
	Appearance Dimensions (W×H×D) (mm)		43×81×83.5	53×81×83.5		
	Installation dimension (mm)					
Mechanical Interlock			MPU-11	MPU-21		

Characteristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

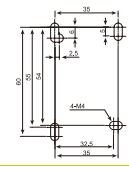
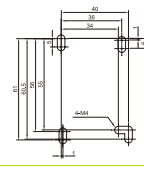
Series

Selection

Others

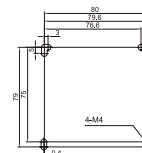
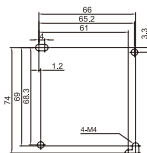
Magnetic Contactor / Starter ◆ AC control



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	3 φ	240V	4.5/ 6/ 18	4.5/ 6/ 18	5.5/ 7.5/ 24
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
AC 3 (kW/HP/A)		Continuous Current (Ith) AC1 (A)	25	30	32	32	
		Rated insulation voltage (Ui) (V)	AC660	AC660	AC660	AC660	
UL 508 CSA-C22.2		1 φ	100~120V	—	1/ 16	2/ 24	2/ 24
			200~240V	—	3/ 17	3/ 17	3/ 17
		3 φ	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
		AC3 (HP/A)	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	Contact	Standard	1NO	1NO 1NC	1NO 1NC (2NO 2NC)	1NO 1NC
			Special	1NC	—	—	—
		AC 15	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

Characteristics

SP Series

MS Series

Other Series

Coil

TH Series

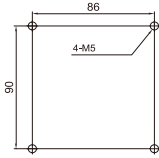
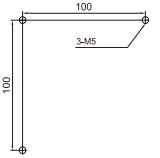
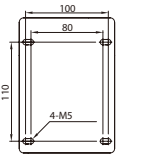
SD Series

Selection

Others

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	



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

Charact-eristics

SP Series

MS Series

Other Series

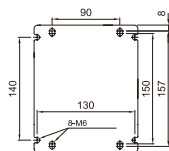
Coil

TH Series

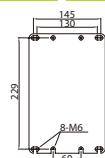
SD Series

Selec-tion

Others



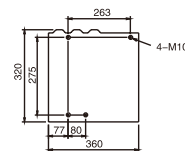
MPU-125



MPU-125

MPU-125

MPU-125



—

Magnetic Contactor / Starter ◆ AC control

Mini Contactor



Model		06	09		
Type	Magnetic Contactor	Nonreversing	S-P06	S-P09	
		Reversing	S-2×P06	S-2×P09	
	Motor Starter	without enclosure	Nonreversing	MSO-P06	MSO-P09
			Reversing	—	—
		with enclosure	Nonreversing	—	—
			Reversing	—	—
		with enclosure (push button)	Nonreversing	—	—
			TOR	Standard	—
			Differential	TH-P09PP	TH-P09PP
	Rated Capacity	IEC 60947-4-1 EN 60947-4-1 DIN VDE 0660	3 ∅	240V	1.5/ 2/ 7.5
380/415V				3/ 4/ 6.6	4/ 5.5/ 9
440V				3/ 4/ 6.5	4/ 5.5/ 8.5
550V				3/ 4/ 5	4/ 5.5/ 6.5
660V				3/ 4/ 4	4/ 5.5/ 5
AC 3 (kW/HP/A)		Continuous Current (Ith) AC1 (A)	20	20	
		Rated insulation voltage (Ui) (V)	AC660	AC660	
UL 508 CSA-C22.2		1 ∅	100~120V	0.25/ 5.8	0.5/ 9.8
			200~240V	1/ 8	1.5/ 10
		3 ∅	200~240V	2/ 6.8	3/ 9.6
			380~480V	3/ 4.8	5/ 7.6
			550~600V	3/ 3.9	5/ 6.1
		AC3 (HP/A)	Continuous Current (Ith) AC1 (A)	20	20
			Rated insulation voltage (Ui) (V)	AC660	AC660
NEMA		00	00		
Auxiliary Contact	IEC 60947-5-1 EN 60947-5-1 GB14048.4	Contact	Standard	1NO	1NO
			Special	1NC	1NC
			220V	3.3	3.3
	380V	1.9	1.9		
	AC 15	Continuous Current (Ith) AC1 (A)	10	10	
	Contact class (UL)	A600	A600		
Electrical Life		AC3	1.6 Mil.	1.6 Mil.	
Mechanical Life			10 Mil.	10 Mil.	
Operation (Time/Hour)			1200	1200	
Magnetic Contactor	Weight (kg)	0.15	0.15		
	Appearance Dimensions (W×H×D) (mm)	46×58×51	46×58×51		
	Installation dimension (mm)				
Mechanical Interlock		—	—		

Thermal Overload Relay



Type		09	
Standard	Contactors Assembled Type	—	
	Independently Installed Type	—	
With phase failure protection	Contactors Assembled Type	TH-P09PP	
	Independently Installed Type	—	
Reset Mode		Manual / Automatic	
Magnetic Contactor		S-P06, S-P09.	
TOR Adjustment Range (A)		Rating (A)	Range (A)
		0.13	0.1~0.16
		0.20	0.16~0.24
		0.32	0.24~0.4
		0.5	0.4~0.6
		0.8	0.6~1
		1.3	1~1.6
Auxiliary Contact		1NO 1NC	
Weight		0.075	
Dimensions (mm) (W×H×D)		45.5×64.8×50	

Coil Specification Table

◆ S-P06, S-P09						
Description	AC12V	AC24V	AC48V	AC110V	AC120V	AC220V
Coil rated specifications marking	12V 50Hz	24V 50Hz	48~50V 50Hz	100V 50Hz	110~120V 50Hz	200~220V 50Hz
	12V 60Hz	24V 60Hz	48~50V 60Hz	100~110V 60Hz	115~120V 60Hz	220V 60Hz
Description	AC230V	AC240V	AC380V	AC440V	AC480V	AC550V
Coil rated specifications marking	230V 50Hz	220~240V 50Hz	346~380V 50Hz	400V 50Hz	415~440V 50Hz	500V 50Hz
	230V 60Hz	240~260V 60Hz	380V 60Hz	400~440V 60Hz	460~480V 60Hz	500~550V 60Hz

Other | SD Series | DC control type

Type designation

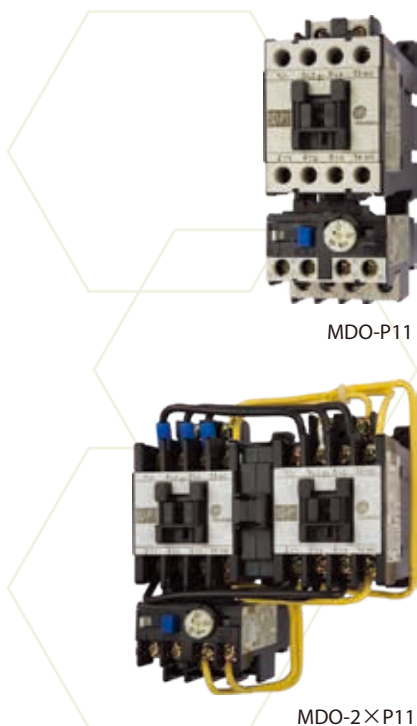


SD	-	2X	P	21	220V
1		2	3	4	5

1	Model	SD	DC Contactor
2	Non-reversing/ reversing	Blank	Non-reversing
		2X	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	-	2X	P	21	380V /	220V	28A	E
1		2	3	4	5	6	7	8

1	Model	MDO	DC Magnetic Switch without enclosure
2	Non-reversing/ reversing	Blank	Non-reversing
		2X	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

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series




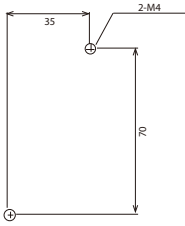
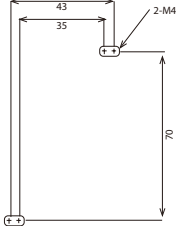
SD

Series

Selec-tion

Others

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 ∅	240V	3.5/ 4.5/ 13	4.5/ 6/ 18
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 (lth) AC1 (A)			20	30	32	
UL 508 CSA-C22.2 AC3 (HP/A)		1 ∅	110~120V	0.5/ 9.8	1/ 16	2/ 24
			220~240V	2/ 12	3/ 17	3/ 17
		3 ∅	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 (lth) 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	

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.

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

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 φ (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	
			200~220V	5	5	5	5	5	5	
			380~440V	3	3	3	3	3	3	
			550~600V	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

Type designation

SF	-	20	C	2	M
①		②	③	④	⑤



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

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

Definite Purpose Magnetic Contactor | SF Series

		20	25	30	35	40
Type		 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°C~65°C (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.

Characteristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selection

Others

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	

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

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	

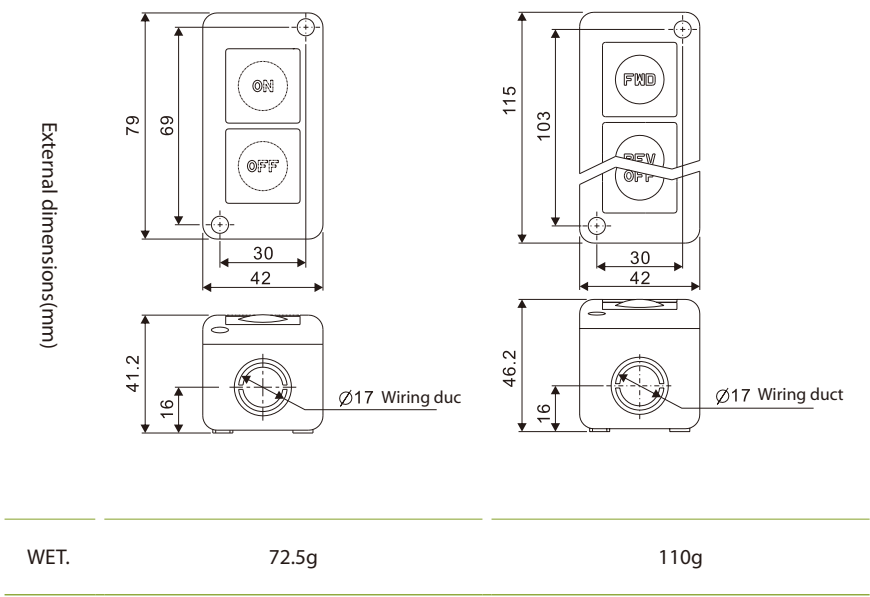
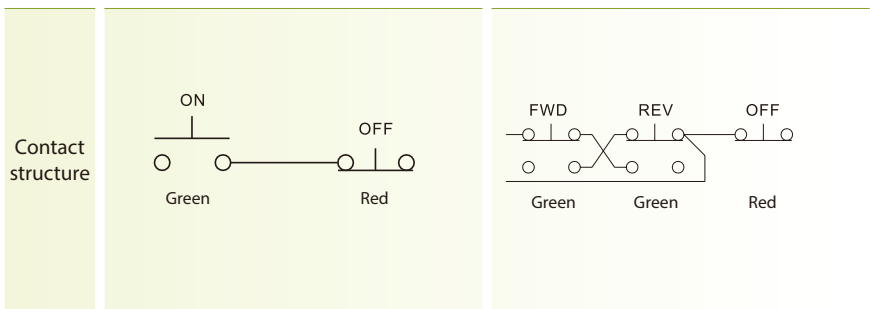


Varistors: Anti-surge interference

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

Push button | PB Series

Type	PB2	PB3
------	-----	-----



Separate Mounting Unit



Type	UATP12
TOR	TH-P12

Charact-eristics

SP Series

MS Series

Other Series

Coil

TH Series

SD Series

Selec-tion

Others

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

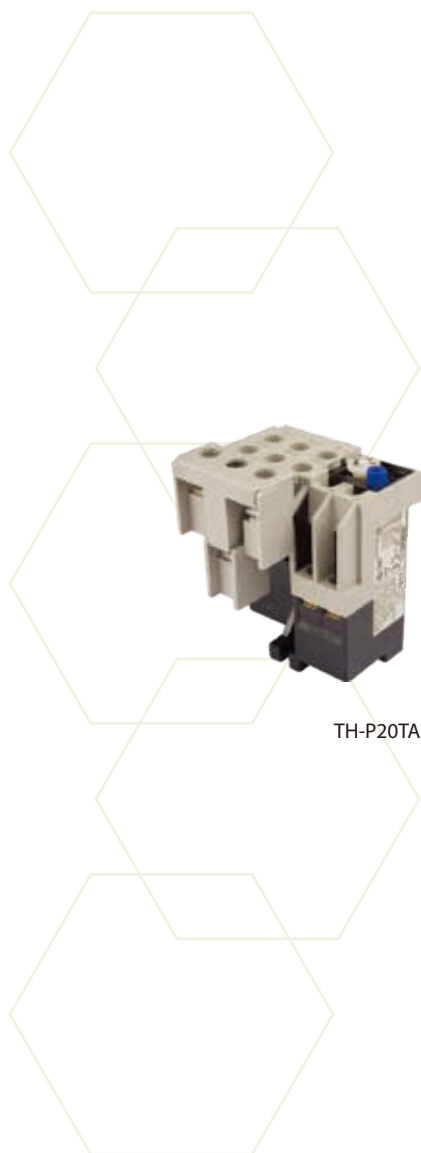
◆ S-P300T~P400T					
Description	AC48V	AC110V	AC220V	AC380V	AC550V
Coil rated specifications marking	AC 48~50V 50/60Hz DC 48V	AC 100-127V 50/60 Hz DC 100-127V	AC 200~250V 50/60Hz DC 200~250V	AC 265~450V 50/60Hz	AC 440~575V 50/60Hz

◆ 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	

Thermal overload relay | TH Series

Type designation

TH	-	P	20	E	TA	PP
①		②	③	④	⑤	⑥



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
		with TA contact
	TA	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

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selec-tion

Others

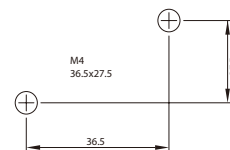
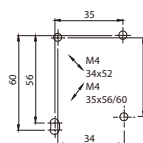
Thermal Overload Relay



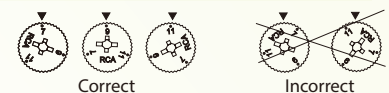
Type		12		20			
Standard	Contactor Assembled Type	TH-P12E		TH-P20E		TH-P20ETA	
	#3 Independently Installed Type	TH-P12ER		-		-	
With phase failure protection	Contactor Assembled Type	TH-P12PP		TH-P20PP		TH-P20TAPP	
	#3 Independently Installed Type	TH-P12PPR		-		-	
Reset Mode		Manual / Automatic		Manual / Automatic			
Magnetic Contactor		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)
		0.25	0.19~0.31	0.25	0.19~0.31	28	22~34
		0.4	0.3~0.5	0.4	0.3~0.5	33	28~38
		0.6	0.45~0.75	0.6	0.45~0.75	40	32~48
		0.9	0.7~1.1	0.9	0.7~1.1		
		1.2	0.9~1.5	1.2	0.9~1.5		
		1.7	1.3~2.1	1.7	1.3~2.1		
		2.1	1.6~2.6	2.1	1.6~2.6		
		3.3	2.5~4.1	3.3	2.5~4.1		
		4.4	3.4~5.4	4.4	3.4~5.4		
		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		
Auxiliary Contact		1NO 1NC		1NO 1NC			
Weight		0.11/ 0.12		0.18/ 0.19		0.20/ 0.21	
Dimensions (mm) (W×H×D)		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.



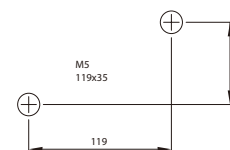
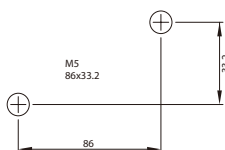
Correct

Incorrect

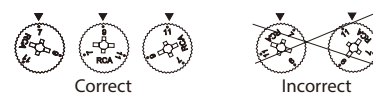


Type		60		120				
Standard	Contactor Assembled Type	TH-P60E	TH-P60ETA	TH-P120E	TH-P120ETA			
	Independently Installed Type	—	—	—	—			
With phase failure protection	Contactor Assembled Type	TH-P60PP	TH-P60TAPP	TH-P120PP	TH-P120TAPP			
	Independently Installed Type	—	—	—	—			
Reset Mode		Manual / Automatic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



Characteristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

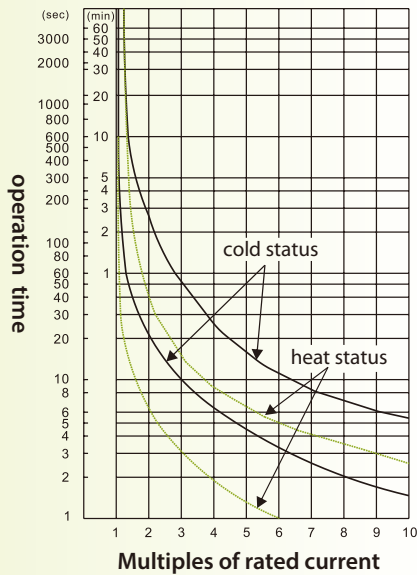
SD

Series

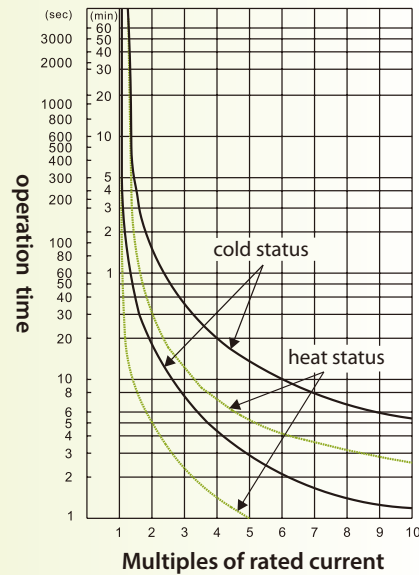
Selection

Others

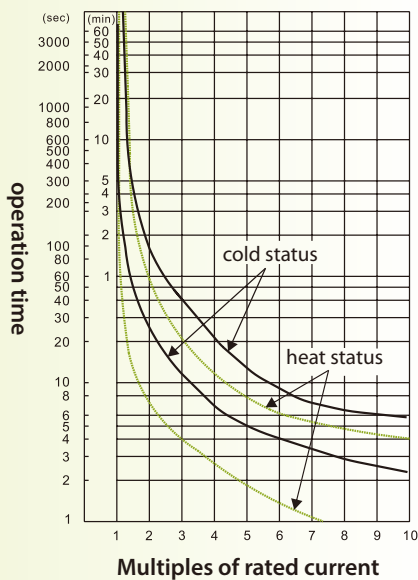
TH-P12E tripping characteristic curve



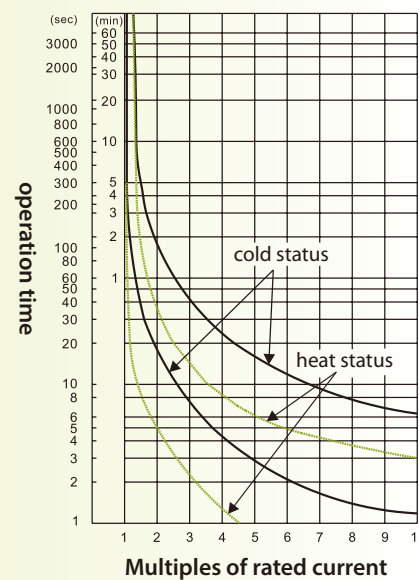
TH-P18E – below 6.5A tripping characteristic curve



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

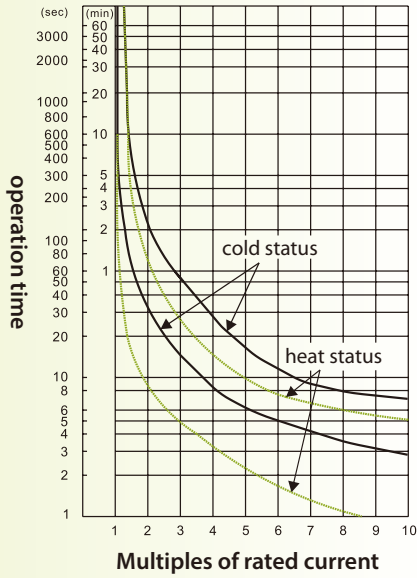
SD

Series

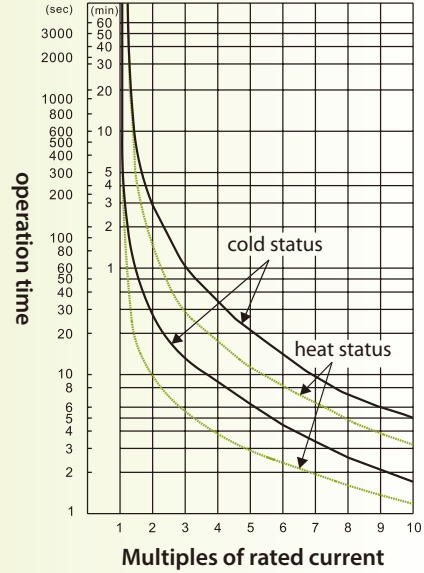
Selection

Others

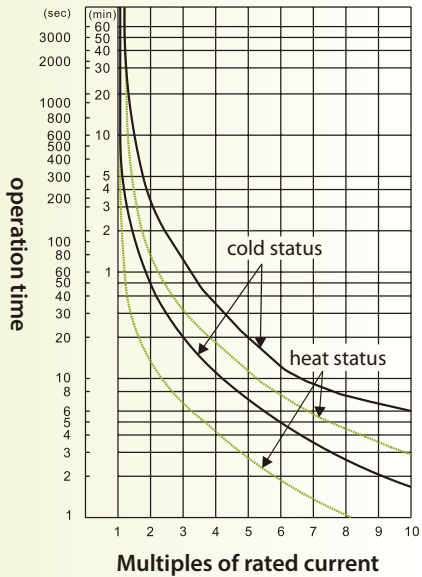
TH-P20ETA – above 9A tripping characteristic curve



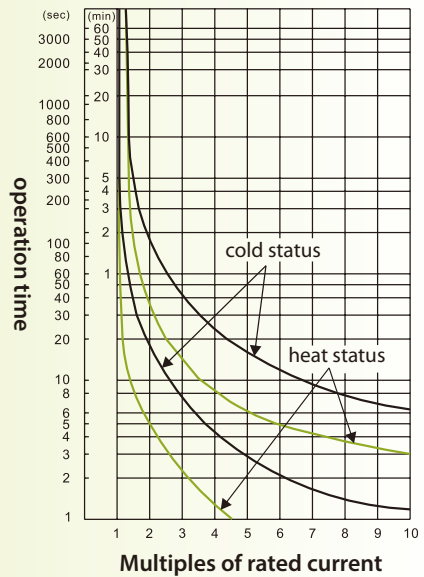
TH-P60ETA tripping characteristic curve



TH-P120ETA tripping characteristic curve



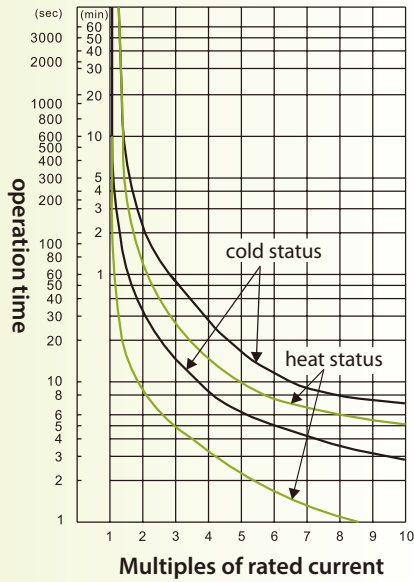
TH-P220ECT, P400ECT, TH-P220TE, P400TE 130A tripping characteristic curve



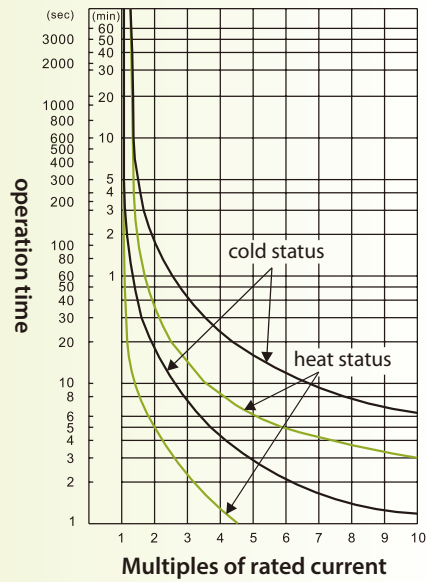
Thermal overload (overcurrent) relay | TH Series

Tripping Characteristic

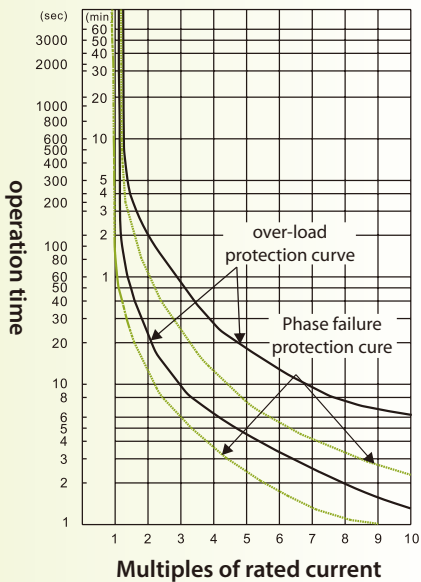
TH-P220ECT、TH-P400ECT、TH-P220TE、TH-P400TE 160A tripping characteristic curve



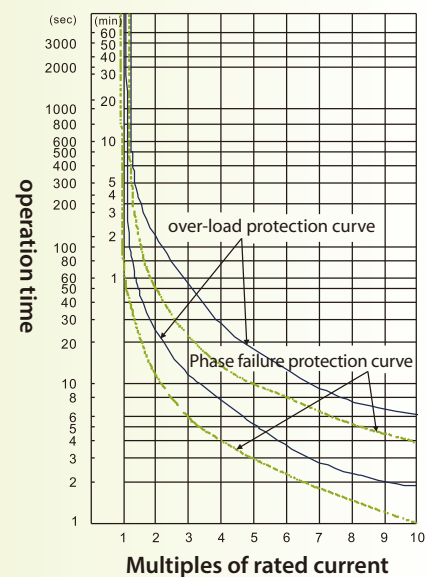
TH-P600ECT tripping characteristic curve



TH-P12PP tripping characteristic curve



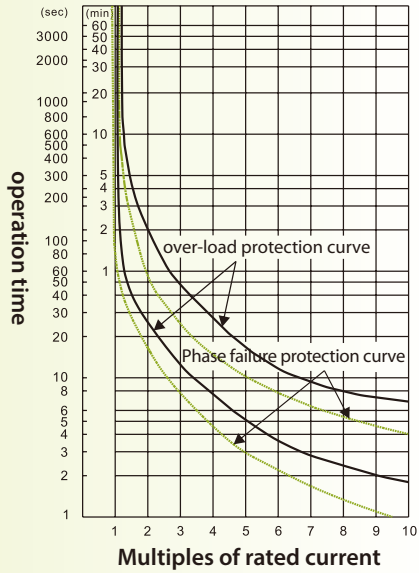
TH-P20TAPP tripping characteristic curve



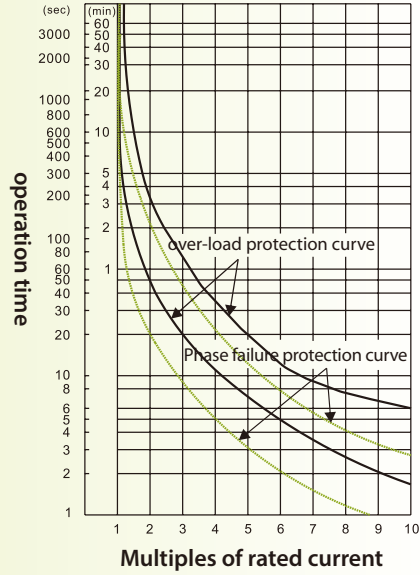
Thermal overload (overcurrent) relay | TH Series

Tripping Characteristic

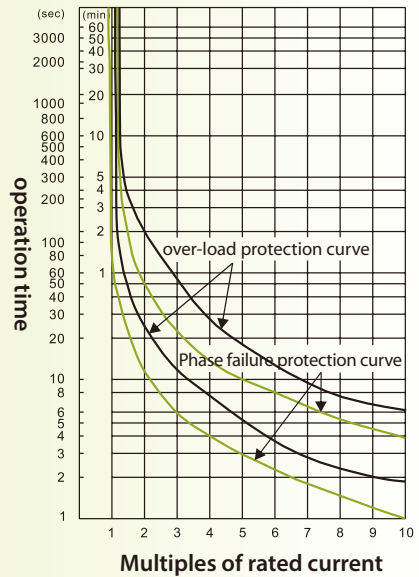
TH-P60TAPP tripping characteristic curve



TH-P120TAPP tripping characteristic curve



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



Characteristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

SD

Series

Selection

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



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

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 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 $\lambda - \Delta$, 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) $\lambda - \Delta$ 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 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

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

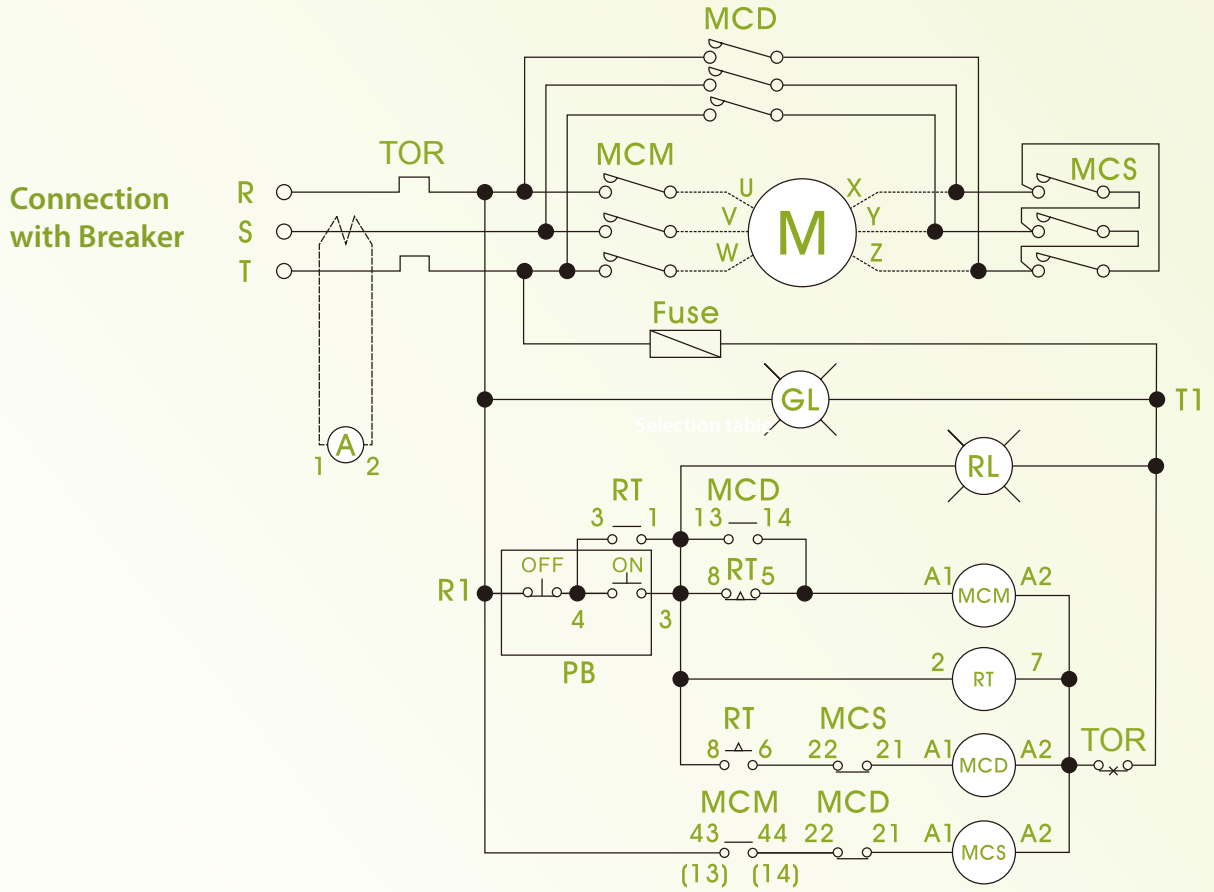
SD

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): $t = 4 + 2\sqrt{kW}$ (± 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					S-P50T	S-P60T	S-P80T							
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						S-P100T	S-P125T	S-P150T						
25	(35)	105A	80~130A														
30	(40)	130A	100~160A														
37	(50)	160A	120~200A						S-P200T	S-P220T							
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)										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													
0.25	(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													
4	(5 1/2)	9A	7~11A													
4.5	(6)	11A	9~13A	S-P50T	S-P60T	S-P80T										
5.5	(7 1/2)	15A	12~18A													
7.5	(10)	21A	17~24A													
11	(15)	28A	22~34A													
12	(16)	33A	28~38A													
15	(20)	40A	32~48A													
19	(25)	54A	43~65A													
22	(30)	67A	54~80A													
30	(40)	80A	60~100A													
37	(50)	105A	80~130A													
45	(60)	130A	100~160A													
50	(70)	160A	120~200A													
60	(80)	200A	150~250A													
75	(100)	260A	200~320A													
90	(125)	350A	260~440A													
110	(150)	500A	400~600A													
132	(180)															
150	(200)															
160	(220)															
220	(330)															
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 kVAR

Charact-eristics

SP
Series

MS
Series

Other
Series

Coil

TH
Series

SD
Series

Selec-tion

Others

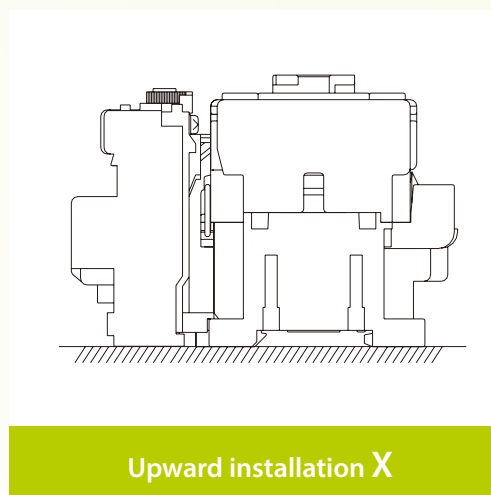
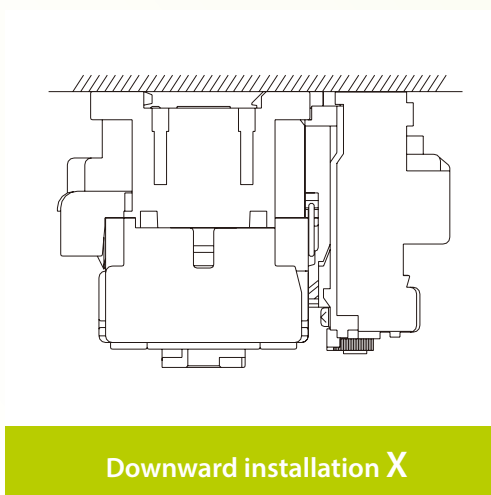
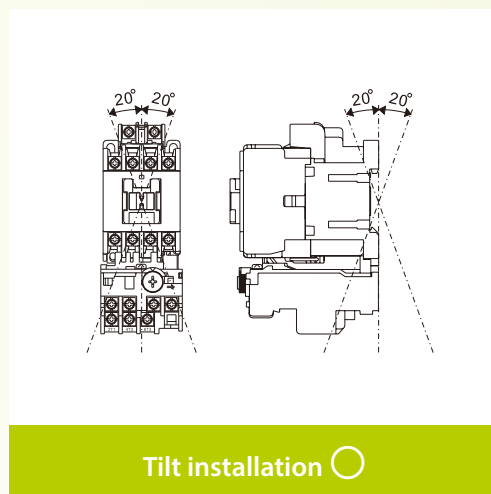
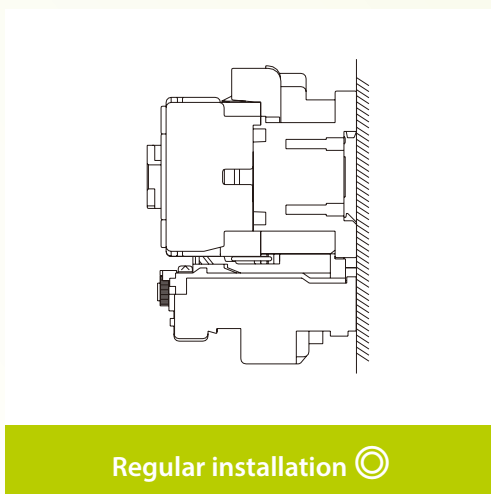
Installation notes

• 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

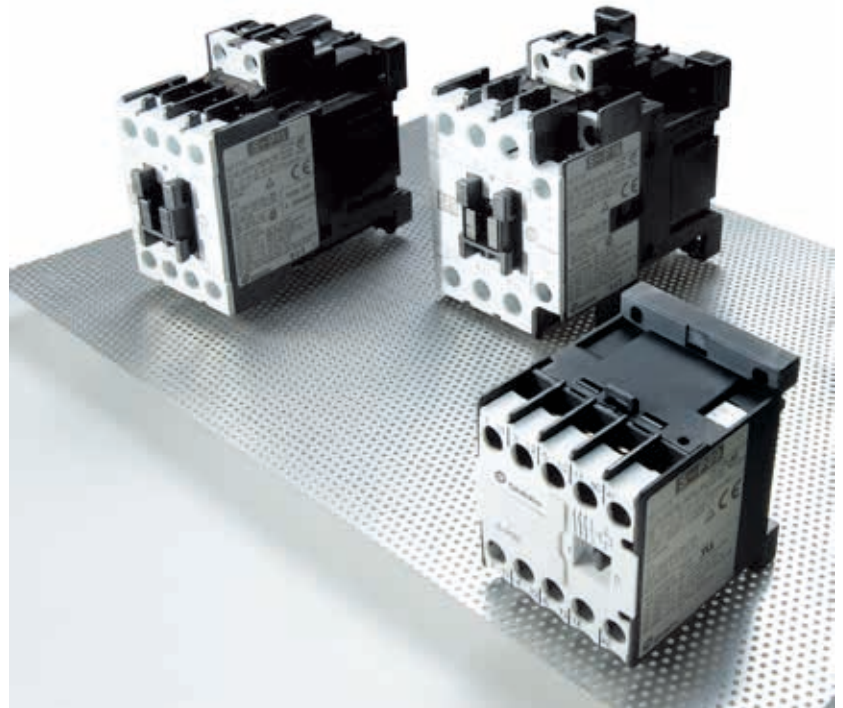


CIRCUIT BREAKER (MCCB / ELCB / EMCCB / MCB)

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



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