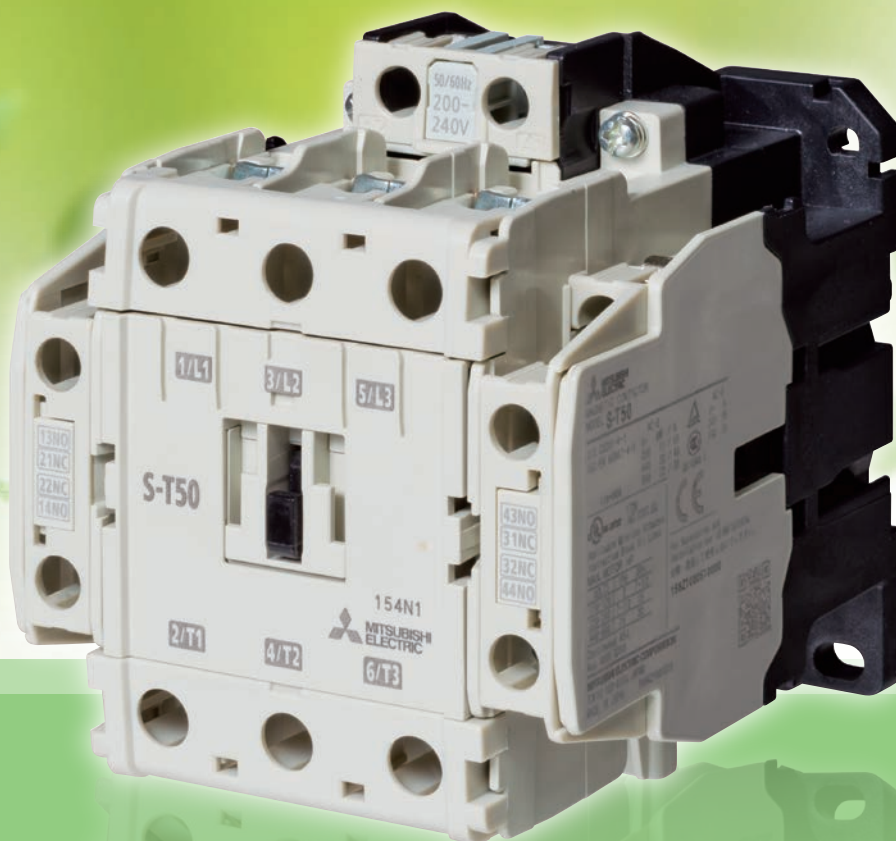


Mitsubishi Electric Magnetic Contactors and Magnetic Starters

Exceed your expectations

Mitsubishi Electric's Magnetic Contactors and Magnetic Starters, continuously pushing the boundaries.



MS-T Series

Mitsubishi Electric Magnetic Contactors and Magnetic Starters

Down-sizing

Small

10A frame model is over 16% smaller with a width of just 36mm!!

There is a saying that "every bit helps" and now with the industries smallest* general purpose Magnetic Contactor in its class, customers are able to more easily down-size their boards than ever before.

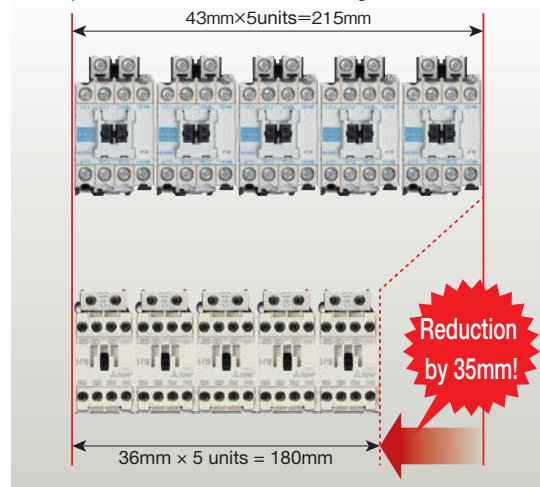
For AC operated 10A frame class general-purpose Magnetic Contactor (based on survey conducted by Mitsubishi Electric dated September 2016)

Example: Status where 5 units are arranged

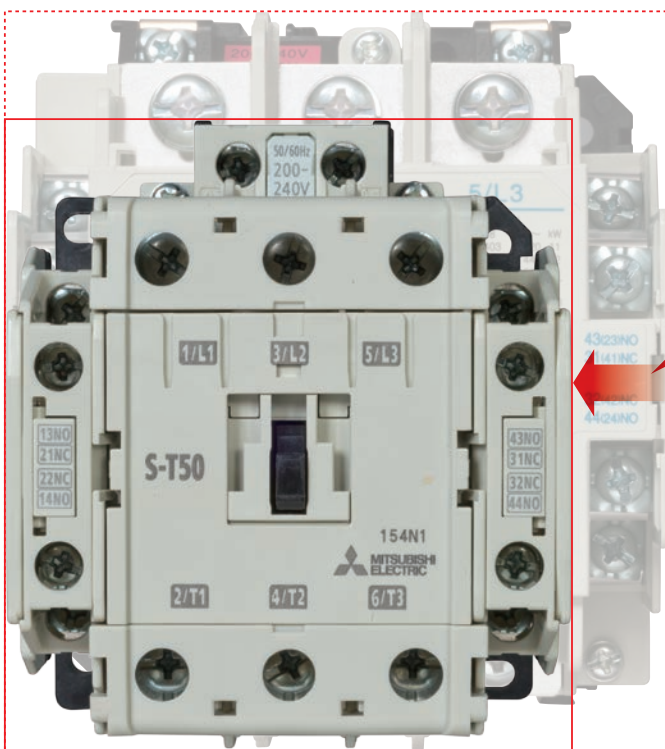


S-T10 (actual size)

Reduction by 7mm!



(For mounting details, please refer to "mounting on Page 14.")

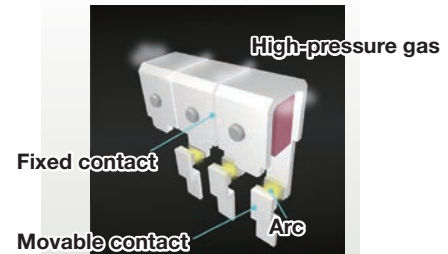


S-T50 (actual size)

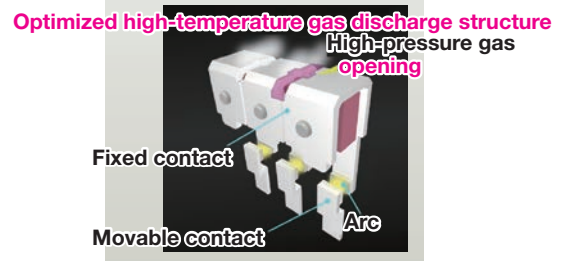
Reduction by 13mm!

The optimized high-temperature gas discharge structure and arc runner shape streamline the outline dimensions!!

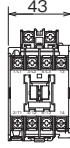
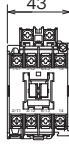
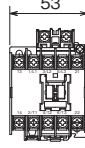
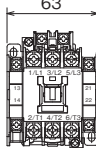
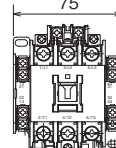
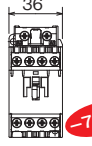
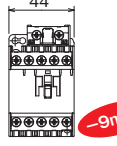
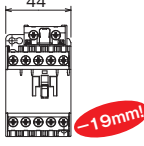
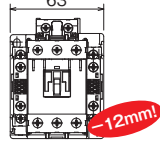
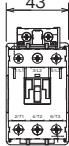
Traditional MS-N Series

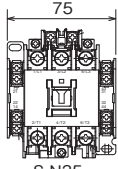
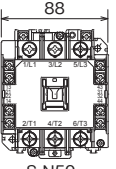
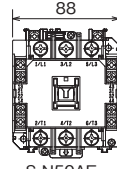
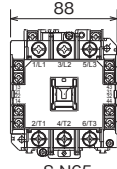
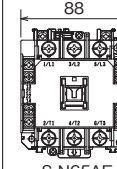
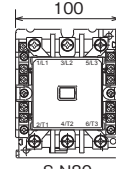
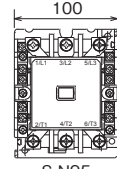
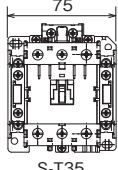
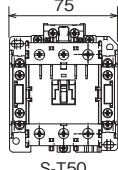
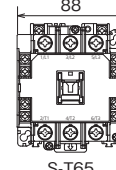
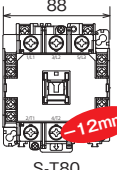
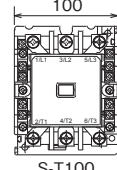


New MS-T Series

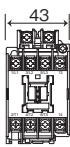
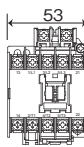
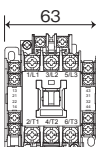
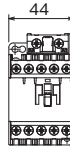
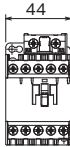
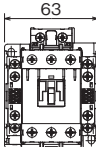
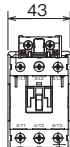


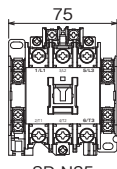
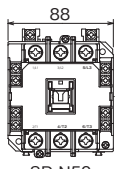
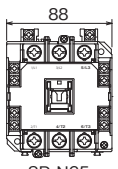
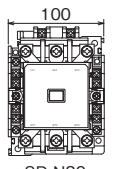
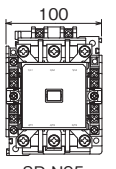
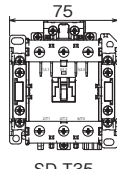
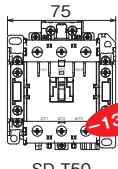
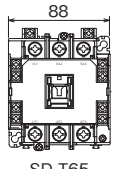
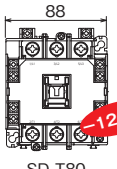
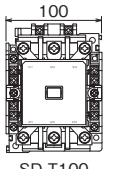
<AC operated type>

Frame size		11A	13A		20A	25A	32A
Traditional MS-N Series	Front view	 S-N10	 S-N11 (Auxiliary 1-pole)	 S-N12 (Auxiliary 2-pole)	 S-N20	 S-N25	-
New slimline MS-T Series	Front view	 S-T10 -7mm!	 S-T12 (Auxiliary 2-pole) -9mm!		 S-T20 -19mm!	 S-T25 -12mm!	 S-T32 NEW

Frame size		35A	50A		65A		80A	100A
Traditional MS-N Series	Front view	 S-N35	 S-N50	 S-N50AE	 S-N65	 S-N65AE	 S-N80	 S-N95
New slimline MS-T Series	Front view	 S-T35	 S-T50 -13mm!		 S-T65		 S-T80 -12mm!	 S-T100

<DC operated type>

Frame size		13A		18A	20A	32A
Traditional SD-N Series	Front view	 SD-N11	 SD-N12	-	 SD-N21	-
New slimline SD-T Series	Front view	 SD-T12 -9mm!		 SD-T20 NEW	 SD-T21	 SD-T32 NEW

Frame size		35A	50A	65A	80A	100A
Traditional SD-N Series	Front view	 SD-N35	 SD-N50	 SD-N65	 SD-N80	 SD-N95
New slimline SD-T Series	Front view	 SD-T35	 SD-T50 -13mm!	 SD-T65	 SD-T80 -12mm!	 SD-T100

About Handling

Note

Connection

● Applicable electric wire size and tightening torque and terminal dimension of terminal screw

⚠ This may cause overheating or fire. Be sure to properly keep the tightening torque and periodically re-tighten the screw.

However, please note that tightening the screw under the status where oil is adhered to the terminal portion may damage the terminal screw even within the existing tightening torque. Electric wires should be properly connected according to the electric wiring diagram. Tightening the terminal screw should be properly conducted within the tightening torque shown in the right table. Insufficient tightening of the terminal screw may cause overheating or cause the electric wire to drop off. Excessive tightening torque may damage the tightening screw. Adhesion of rock paint, thermo label, etc. to electric wire connection or contact may cause heat generation due to defective continuity, so this is very dangerous.

The main circuit terminals for the T10 to T50 and TH-T18 to T50 types can be wired connected by single wire, stranded wire or crimp lug. The main circuit terminals and operating circuit terminals of the T10 to T50 and TH-T18 to T50 types are self-lifting terminals that are easy to connect.

Model	Terminal dimension and size/type of screw				Applicable electric wire size [φmm, mm]		Connection conductor thickness (D) [mm]	Applicable crimp lug size (JST Cat No.)		Tightening torque of terminal screw [N·m]	
Standard type Contactor Relays Magnetic Contactors Thermal Overload Relays (Note 1)	Main circuit			Operating circuit							
	Dimension of terminal portion A x B x C [mm] (Note 2)	Screw size	Screw type	cross slot screw with pressure plate	Main circuit	Operating circuit	Main circuit (Note 2)	Main circuit	Operating circuit	Main circuit	Operating circuit
SR-T5, T9	—	—	—	M3.5×7.6	—	—	—	—	—	—	—
S-T10, T12, T20	7.5×3.7×4.5	M3.5×7.6	cross slot screw with pressure plate	M3.5×7.6	φ1.6 0.75 to 2.5	φ1.6 0.75 to 2.5	1.6	1.25-3.5 to 2-3.5 5.5-S3(Note 7, Note 8)	1.25-3.5 to 2-3.5	0.9 to 1.5	0.9 to 1.5
S-T21, T25, T32	10.5×5.2×5.5	M4×10.5		M3.5×7.6	φ1.6 to 2.6 1.25 to 6		3	1.25-4 to 5.5-4		1.2 to 1.9	
S-T35, T50	13.3×5.5×6.9	M5×14.8		M3.5×7.6	φ1.6 to 3.6 1.25 to 16		6	1.25-5 to 14-5 22-S5(Note 8)		2.0 to 3.3	
S-T65, T80 (Note 9)	15×7×8.5	M6×12	cross-head/slot-head screw	M4×10	(2 to 22)	φ1.6 0.75 to 2.5	3.7	1.25-6 to 22-6 38-S6(Note 8)	1.25-4 to 2-4 5.5-S4	3.5 to 5.7	1.2 to 1.9
S-T100	15×7.5×11.5				(2 to 38)		4	1.25-6 to 60-6			
TH-T18 (Load side)	7.5×4×4	M3.5×7.6	cross slot screw with pressure plate	M3.5×7.6	φ1.6 0.75 to 2.5		2	1.25-3.5 to 2-3.5 5.5-S3(Note 7, Note 8)	1.25-3.5 to 2-3.5	0.9 to 1.5	0.9 to 1.5
TH-T25 (Power side/Load side)	10.2×6.8×5/10.2×5.7×5	M4×10.5/ M4×10.5			φ1.6 to 2.6 1.25 to 6		2.5	1.25-4 to 5.5-4		1.2 to 1.9	
TH-T50 (Load side)	13.3×5.8×6.9	M5×14.8			φ2 to 3.6 4 to 14		8	5.5-5 to 14-5		2.0 to 3.3	
TH-T65	17×7.5×8.5	M6×12	cross-head/slot-head screw	M4×10	(2 to 22) (Note 3)	φ1.6 1.25 to 2	4	5.5-6 to 22-6	1.25-4 to 2-4 5.5-S4	3.5 to 5.7	1.2 to 1.9
TH-T100 (Load side)	15×7.5×10	M6×12			(8 to 38) (Note 3)		3.7	14-6 to 22-6 38-S6(Note 8)		3.5 to 5.7	

Note 1: The dimension of the main circuit terminal is a dimension for board conductor wiring. (See the right diagram) The board conductor thickness (D dimension) must be below the allowable connection conductor thickness stated above because of the length of the terminal screw. In case of wiring with two boards used, the total value of two boards must be below the value (D dimension) shown in the table.

Note 2: Two wires or two crimp lugs can be connected to each terminal. (One wire or one crimp lug can also be connected.)

Note 3: The cross slot screws with pressure plate of T Series and those of N or other Series are same in size but different in pressure plate dimension, so please avoid the mixed use of such screws. This may break the insulation barrier or make the wire likely to fall out.

Note 4: When using an IEC60529-based finger safe specification Magnetic Contactor/Starter (MSO/S-T10(BC) to T50(BC)), be sure to insulate the crimped part of the crimp lug. However, apply additional insulation to 5.5-S3 crimp lugs.

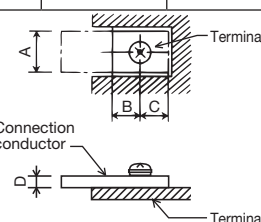
Note 5: Tightening the 3 terminal screw excessively without wiring may break the screw and consequently disable the tightening, so please avoid such excessive tightening.

Note 6: Operational circuits are coil terminals of Magnetic Contactors and control circuit terminals of Thermal Overload Relays.

Note 7: When two crimp lugs are used for wiring of the T10 to T20BC, and TH-T18BC, the F dimension must be at least 6mm.

Note 8: Typical applicable crimp lugs are listed and they are the model numbers of JST (Japan Solderless Terminals).

Note 9: Ring crimp lugs cannot be connected to the auxiliary contact terminals of T65CW and T80CW.

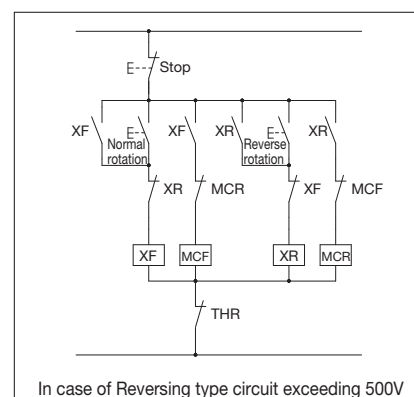


● Application to a circuit exceeding 380V

- Insulate the crimped part of the crimp lug and wire when applying the MSO/S-T10, T12, T20, MSOD/SD-T12, T20, SR(D)-T5, T9, or TH-T18 to a circuit exceeding 380V. However, apply additional insulation to 5.5-S3 crimp lugs.
- When applying such parts to a Reversing type circuit exceeding 500V, please use an SR-T type Contactor Relays (XF, XR) as shown in the right figure to set the switching time allowance.
- Be sure to use a 22-S5 crimp lug with an insulation sleeve attached when applying the MS/MSO/S-T35, or T50 to a circuit exceeding 380V. Be sure to use a 60-S6 crimp lug with an insulation sleeve attached when applying the MS/MSO/S-T65, or T80 to a circuit exceeding 380V.

● Wiring direction

Although the upper terminal side is usually set to the power supply side when wiring, the lower terminal side may be set to the power supply side when it is unavoidable due to some reason of the board wiring. However, the mounting direction must be in accordance with the description on Page 14.



Operating circuit

- ⚠ Applying a low voltage that does not operate the Magnetic Contactors to the operating circuit may cause overcurrent to the coil, which may cause the coil to be burned in a short time.
- ⚠ If the operating circuit wiring is too long, when the coil's instantaneous current flows, the wiring impedance may cause a reduction in the coil voltage, so that the operating circuit may fail to be activated. And, the stray capacitance of the wired line may cause the coil's excitation not to be released even when releasing the excitation.
- ⚠ Use in a circuit (inverter) with high harmonics and high frequency levels can burn the operation coil or surge absorber with CR in the S-T65 to T100 type Magnetic Contactors.

Power supply voltage fluctuation range for operating circuit

- (1) Operating voltage
When the rated voltage and frequency are applied to the coil at an ambient temperature of 40°C (Inside temperature of the board: 55°C), the device operates without any problem at 85 to 110% of the rated voltage of the coil after the temperature increases and becomes saturated.
- (2) Voltage/Frequency and coil rating of operating circuit
The voltage/frequency of the operating circuit and the same of the operation coil must be matched.
Applying a voltage exceeding 100% of the rated voltage to the operating circuit when using the coil may acceleratedly deteriorate the coil insulation and consequently reduce mechanical durability, so set the coil's average voltage to 95 to 100% of the rated voltage when using the coil.

Driving Magnetic Contactor with Triac control

The electromagnet in the S-T65 to T100 type Magnetic Contactor incorporates the capacitor-drop type AC operated DC excited method using the capacitor drop. Thus, a Triac with voltage resistance that is $2\sqrt{2}$ -fold the circuit voltage must be selected. If the Triac voltage resistance is low, use of a varistor in parallel with the Triac is recommended.

Using with square wave power supply

The electromagnet in the S-T65 to T100 type Magnetic Contactor incorporates the AC operated DC exciting method using the capacitor drop. It cannot be used with a square wave as the coil's exciting current will increase greatly.

Application to special environment

- ⚠ Please note that the operating characteristics of the Magnetic Contactor and Thermal Overload Relay may vary with the ambient temperature.

High temperature

When using Magnetic Starters or Magnetic Contactors at high ambient temperature, the temperature may mainly affect the insulation life (continuous electric conduction life) of the operation coil and the aging variation of the molding component.
MSO and S-T type without a box are standard products available even at the inside temperature of 55°C.

Low temperature

Standard S-T type Magnetic Contactors (AC operated type) can be used under the following conditions. There are cases of Magnetic Contactors being incorporated into switchboards and transported to or used in cold regions, or being used in extremely cold conditions such as those found in refrigerators. In addition, MSO-T type Magnetic Starters and TH-T type Thermal Overload Relays of low temperature specification are not manufactured.

Low-temperature-based products: S-T□, S-2xT□ types

Applicable temperature range of low-temperature product: Operating temperature -50 to 55°C, Storage temperature -60 to 65°C

Corrosive gas

S-T10 to T32 and SD-T12 to T32 type Magnetic Contactors have increased corrosion resistance as standard.

Corrosive gases that exist in an environment with an Magnetic Starters or Magnetic Contactors used are gases such as sulfurous acid (SO₂), hydrogen sulfide (H₂S), chlorine (Cl₂), and ammonia (NH₃), and conductive portions can be protected by plating a metal resistant to such gases on the portion. However, because there is no adequate corrosion prevention method for the contact, such gases may increase the contact resistance, resulted in increased temperature.

Additionally, if the environment contains some corrosive gas but is under dry condition, this may delay the progression of corrosion, so using the switchboard with the inside kept as dry as possible is also one of the corrosion prevention methods.

In the Magnetic Starters and Thermal Overload Relays, corrosion-prevented products (MSO-T□YS, TH-T□YS) of the specification with increased corrosion resistance to such corrosive gases are also manufactured.

Dust

Magnetic Starters and Magnetic Contactors used in an iron foundry, construction site, or powder conveying machine tend to be subject to a relatively large amount of dust. When using the control board in such locations, the board must be dust-prevention-structured. Also, using the board under hermetically-sealed condition for a long period may cause contact failure.

Export of the products to tropical regions

The environment of exported products which pass through tropical regions tends to be of high temperature and high humidity, and humidity is the environmental factor that affects the Magnetic Starters and Magnetic Contactors most severely. Humidity is the biggest rust-generating factor and the exported products must be in a structure resistant to humidity.

Therefore, it is recommended to put a moisture absorbent (Silica gel) in an amount of 3kg or more per m³; so as to lower the humidity.

Specification List Table

● Magnetic Starters/Magnetic Contactors (AC operated)

Frame				T10	T12	T20	T21		
Applicable standard				JIS C8201-4-1,IEC60947-4-1,EN60947-4-1,GB14048.4					
Model name	Magnetic Contactors (Without Thermal Overload Relays, Open type)		Non-Reversing	S-T10	S-T12	S-T20	S-T21		
			Reversing	S-2×T10	S-2×T12	S-2×T20	S-2×T21		
	Magnetic Starters (With standard 2-element, With Thermal Overload Relays)	Enclosed	Non-Reversing	MS-T10	MS-T12	—	MS-T21		
			Reversing	—		MS-2×T21			
		Open type	Non-Reversing	MSO-T10	MSO-T12	MSO-T20	MSO-T21		
			Reversing	MSO-2×T10	MSO-2×T12	MSO-2×T20	MSO-2×T21		
	Combined Thermal Overload Relays			TH-T18				TH-T25	
	Magnetic Starters (With 3-element type Thermal Overload Relays)	Open type	Non-Reversing	MSO-T10KP	MSO-T12KP	MSO-T20KP	MSO-T21KP		
Reversing			MSO-2×T10KP	MSO-2×T12KP	MSO-2×T20KP	MSO-2×T21KP			
Combined Thermal Overload Relays			TH-T18KP				TH-T25KP		
Main contact rating	Rated insulation voltage [V]			690					
	Rated impulse withstand voltage [kV]			6					
	Rated frequency [Hz]			50/60					
	Pollution degree			3					
	Rated operational current / power Category AC-3 (Note 1) (Three-phase squirrel-cage motor load standard responsibility) (Note 2) [kW/A]		220 to 240VAC	2.5/11 [2.2/11]	3.5/13 [2.7/13]	4.5/18 [3.7/18]	5.5/25 [4/20]		
			380 to 440VAC	4/9 [2.7/7]	5.5/12 [4/9]	7.5/18 [7.5/18]	11/23 [7.5/20]		
			500VAC	4/7 [2.7/6]	5.5/9 [5.5/9]	7.5/17 [7.5/17]	11/17 [7.5/17]		
			690VAC	4/5	5.5/7	7.5/9	7.5/9		
	Rated operational current / power Category AC-4 (Three-phase squirrel-cage motor load inching responsibility) [kW/A]		220 to 240VAC	1.5/8	2.2/11	3.7/18			
			380 to 440VAC	2.2/6	4/9	5.5/13			
			500VAC	2.7/6	5.5/9	5.5/10			
	Rated operational current / power Category AC-1 (Resistance, heater load)		100 to 240VAC	20				32	
			380 to 440VAC	11	13			32	
Conventional free air thermal current Ith [A]			20				32		
Minimum applicable load level			48V 200mA						
Auxiliary contact rating	Contact arrangement	Standard accessory		Non-Reversing	1a	1a1b	2a2b		
				Reversing (Note 4, Note 6)	1a×2+2b	1a1b×2+2b	2a2b×2		
		Special accessory		Non-Reversing	1b	2a	—		
				Reversing (Note 4, Note 6)	1b×2+2b	2a×2+2b	—		
		Max. number of additional options (Note 5)	Front clip-on	Non-Reversing	1				
				Reversing	2				
		Side clip-on	Non-Reversing	2					
			Reversing	2					
	Rated operational current (Category AC-15 : Alternating current coil load)			120VAC	6				
				240VAC	3				
	Rated operational current (Category DC-13 : Direct current coil load)			24VDC	3				
				110VDC	0.6				
	Conventional free air thermal current Ith [A]			10					
	Minimum applicable load level			20V 3mA					
Performance	Mechanical durability [ten thousand times]			1000					
	Electrical durability [ten thousand times]		Category AC-3	200(Note 9)					
			Category AC-4	3(Note 9)					
			Category AC-1	50					
	Switching frequency [time/hour]		Category AC-3	1800					
			Category AC-4	300					
Category AC-1			1200						
Characteristic	Coil consumption (Note 7)		Inrush [VA]	45			75		
			Sealed [VA]	7			7		
	Power consumption (Note 7) [W]			2.2			2.4		
Outside dimensions	Magnetic Contactors (without Thermal Overload Relays) (Width x Height x Depth) [mm]		Non-Reversing	36×75×78	44×75×78		63×81×81		
			Reversing	82×85×78	98×85×78		136×81×81		
	Open type Magnetic Starters (Width x Height x Depth) [mm]		Non-Reversing	46×115×79			63×128×82		
			Reversing	90.5×125×79	98.5×125×79		136×138×82		
	Enclosed Magnetic Starters (Width x Height x Depth) [mm]		Non-Reversing	76×165×97.5		—	104×176×110		
			Reversing	—		—	220×192×115		
				IEC 35mm rail mounting				Possible (excluding Enclosed Magnetic Starters)	

Note 1: The figure in the square brackets indicates the rated current shown on the rating plate of the product at which the category AC-3 opening/closing durability is 2,000,000 times for T10 to T65 (1,000,000 times for the T20 380V, T80 and T100). Refer to the electric durability curve for the life performance.

Note 2: The content within () of rated capacity and rated operational current is applied to the Magnetic Starter.

Note 3: The T10 to T50 types can be manufactured with a coil surge absorber-mounted type (□-□SA type). The UT-SA21 type can be mounted.

Note 4: +2b of T10 and T12 auxiliary contact arrangements in Reversing type represents b contact built in the UT-ML11 interlock unit.

Note 5: The main unit and auxiliary contact block must be prepared separately and additionally mounted by the user.

Note 6: For auxiliary contact arrangement in Reversing type, X2 is displayed as combined auxiliary contact arrangement of two Magnetic Contactors. Please specify the contact arrangement for which two main units are combined must be designated. <Designation example> In case of 1b x 2 + 2b: 2B

Note 7: Operational coil input and coil consumption are average values in case of applying 220V60Hz to AC200V coil.

Note 8: Refer to pages 36 for the mountable options.

Note 9: 1,000,000 times for T20 AC-3 Class 380V or higher, and 15,000 times for AC-4 Class. 15,000 times for T35 to T100 AC-4 Class 380V or higher.

	T25	T32	T35	T50	T65	T80	T100
	JIS C8201-4-1, IEC60947-4-1, EN60947-4-1, GB14048.4						
	S-T25	S-T32	S-T35	S-T50	S-T65	S-T80	S-T100
	S-2×T25	S-2×T32	S-2×T35	S-2×T50	S-2×T65	S-2×T80	S-2×T100
	—	—	MS-T35	MS-T50	MS-T65	MS-T80	MS-T100
	—	—	MS-2XT35	MS-2XT50	MS-2XT65	MS-2XT80	MS-2XT100
	MSO-T25	—	MSO-T35	MSO-T50	MSO-T65	MSO-T80	MSO-T100
	MSO-2×T25	—	MSO-2×T35	MSO-2×T50	MSO-2×T65	MSO-2×T80	MSO-2×T100
	TH-T25	—	TH-T25/T50	TH-T25/T50	TH-T65	TH-T65/T100	TH-T65/T100
	MSO-T25KP	—	MSO-T35KP	MSO-T50KP	MSO-T65KP	MSO-T80KP	MSO-T100KP
	MSO-2×T25KP	—	MSO-2×T35KP	MSO-2×T50KP	MSO-2×T65KP	MSO-2×T80KP	MSO-2×T100KP
	TH-T25KP	—	TH-T25/T50KP	TH-T25/T50KP	TH-T65KP	TH-T65/T100KP	TH-T65/T100KP
	690						
	6						
	50/60						
	3						
	7.5/30(26) [5.5/26]	7.5/32 [7.5/32]	11/40 [7.5/35]	15/55(50) [11/50]	18.5/65 [15/65]	22/85 [19/80]	30/105 [22/100]
	15/30(26) [11/25]	15/32 [15/32]	18.5/40 [15/32]	22/50 [22/48]	30/65 [30/65]	45/85 [37/80]	55/105 [45/93]
	15/24 [11/20]	15/24 [11/20]	18.5/32 [15/26]	25/38 [22/38]	37/60 [30/45]	45/75 [45/75]	55/85 [45/75]
	11/12	11/12	15/17	22/26	30/38	45/52	55/65
	4.5/20	5.5/26	5.5/26	7.5/35	11/50	15/65	19/80
	7.5/17	11/24	11/24	15/32	22/47	30/62	37/75
	7.5/12	7.5/13	11/17	15/24	22/38	30/45	37/55
	32		60	80	100	120	150
	32		60	80	100	120	150
	32		60	80	100	120	150
	48V 200mA						
	2a2b	—	2a2b	2a2b	2a2b	2a2b	2a2b
	2a2b×2	2a2b×2	2a2b×2	2a2b×2	2a2b×2	2a2b×2	2a2b×2
	—		—	—	—	—	—
	—		—	—	—	—	—
	1						—
	2	—	2				—
	2						
	2	—	2				
	6						
	3						
	3						
	0.6						
	10						
	20V 3mA						
	1000				500		
	200					100	
	3 (Note 9)						
	50						
	1800			1200			
	300						
	1200						600
	75	55	110	110	115	115	210
	7	4.5	10	10	20	20	23
	2.4	1.8	3.8	3.8	2.2	2.2	2.8
	63×81×81	43×81×81	75×89×91		88×106×106	88×106×106	100×124×127
	136×81×81	96×81×111	160×114×97		216×115×112	216×115×112	270×140×137
	63×128×82	—	75×157.5×91		90×158×106	90×169.5×106	100×191×127
	136×138×82	—	160×179×97		216×169×112	216×180.5×112	270×208×137
	—		135×231×126		160×282×145		190×317×163
	—		300×251×130		320×286×140		410×347×154
	Possible (excluding Enclosed Magnetic Starters)						—

Making and Breaking capacities

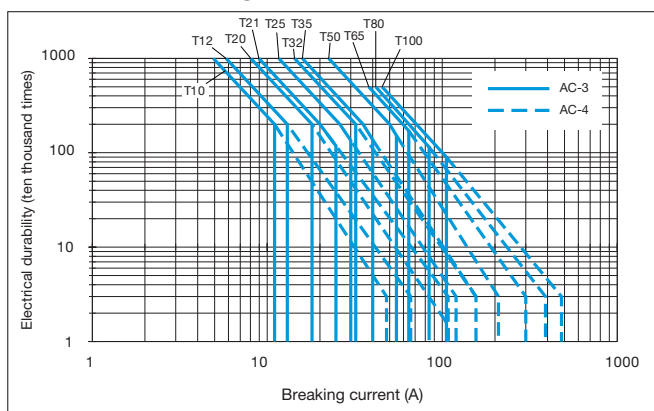
Frame		T10	T12	T20	T21	T25	T32	T35	T50	T65	T80	T100
Making capacity Category AC-3 [A]	220 to 240VAC	110	130	180	250	300	320	400	550	650	850	1050
	380 to 440VAC	90	120	180	230	300	320	400	500	650	850	1050
	500VAC	70	90	170	170	240	240	320	380	600	750	850
Breaking capacity Category AC-4 [A]	220 to 240VAC	88	104	144	200	240	256	320	440	520	680	840
	380 to 440VAC	72	96	144	184	240	256	320	400	520	680	840
	500VAC	56	72	136	136	192	192	256	304	480	600	680

Coordination with short-circuit protective devices

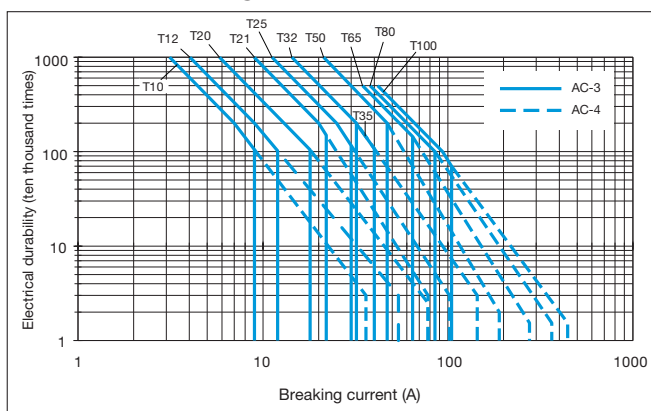
Magnetic Contactors model			T10	T12	T20	T21	T25	T32	T35	T50	T65	T80	T100	SR-T5/T9
Type1	Short-circuit protective device rating * Fuse gG (IEC60269-1/2)	Main circuit	40A			80A			100A			125A	160A	—
		Auxiliary circuit	10A											10A

Electrical Durability Curve

Main circuit voltage 220 to 240VAC



Main circuit voltage 380 to 440VAC



Coil Ratings

Coil types and ratings (Alternating voltage operation type)

For S-T10 to T100 types For SR-T5 and T9 types

Coil designation	Rated voltage [V] 50Hz/60Hz	Marking on the equipment
AC24V	24	Rated voltage and frequency
AC48V	48-50	
AC100V	100-127	
AC200V	200-240	
AC300V	260-300	
AC400V	380-440	
AC500V	460-550	

Note 1 : Even when the single rating (example: 200V60Hz) is specified for an order, the above rating voltage is indicated on the product.

Note 2 : Even when the single rating (example: 200V60Hz) is specified for an order, the above rating voltage is indicated on the product.

For S-T10SA to T50SA types For SR-T5SA and T9SA types

Coil designation	Rated voltage [V] 50Hz/60Hz	Coil indication	Varistor voltage [V]
AC24V	24	Rated voltage and frequency	120
AC48V	48-50		120
AC100V	100-127		470
AC200V	200-240		470
AC300V	260-300		910
AC400V	380-440		910

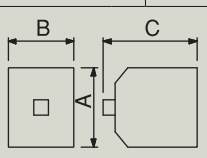
Note 1 : Add "SA" to the end of the type name to order the operation coil surge absorber mounting type (varistor).
Example: S-T10SA AC100V

Note 2 : Even when the single rating (example: 200V60Hz) is specified for an order, the above rating voltage is indicated on the product.

Magnetic Contactors

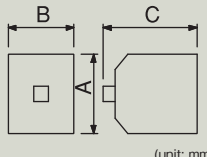
● S-T series (non-Reversing)

● S-2xT series (Reversing)

Model name		Non-Reversing	S-T10	S(D)-T12	S(D)-T20	S(D)-T21	S-T25	S(D)-T32	
		Reversing	S-2×T10	S(D)-2×T12	S(D)-2×T20	S(D)-2×T21	S-2×T25	S(D)-2×T32	
Rated operational current (A) Category AC-3 (Note 1, 2)	220 to 240VAC		11[11]	13[13]	18[18]	25[20]	30(26)[26]	32[32]	
	380 to 440VAC		9[7]	12[9]	18[18]	23[20]	30(26)[25]	32[32]	
	500VAC		7[6]	9[9]	17[17]	17[17]	24[20]	24[20]	
Conventional free air thermal current Ith (A)			20	20	20	32	32	32	
Operation coil rating			Refer to pages 22						
Auxiliary contact arrangement	Non- Reversing	Standard	1a	1a1b	1a1b	2a2b	2a2b	—	
		Special	1b	2a	2a	—	—	—	
	Reversing	Standard	1a×2+2b	1a1b×2+2b	1a1b×2+2b	2a2b×2	2a2b×2	—	
		Special	1b×2+2b	2b×2+2b	2b×2+2b	—	—	—	
 (unit: mm)		Non- Reversing	A	75	75	75	81	81	81
			B	36	44	44	63	63	43
			C	78	78(100)	78(100)	81(108)	81	81(108)
		Reversing	A	85	85	85	81	81	81
			B	82	98.5	98.5	136	136	96
			C	78	78(100)	78(100)	81(114)	81	111(138)
IEC 35mm rail mounting type			← →						
Option	Front clip-on auxiliary contact block mounting type		← →						
	Side clip-on auxiliary contact block mounting type		← →						
	Surge absorber mounting type		← →						

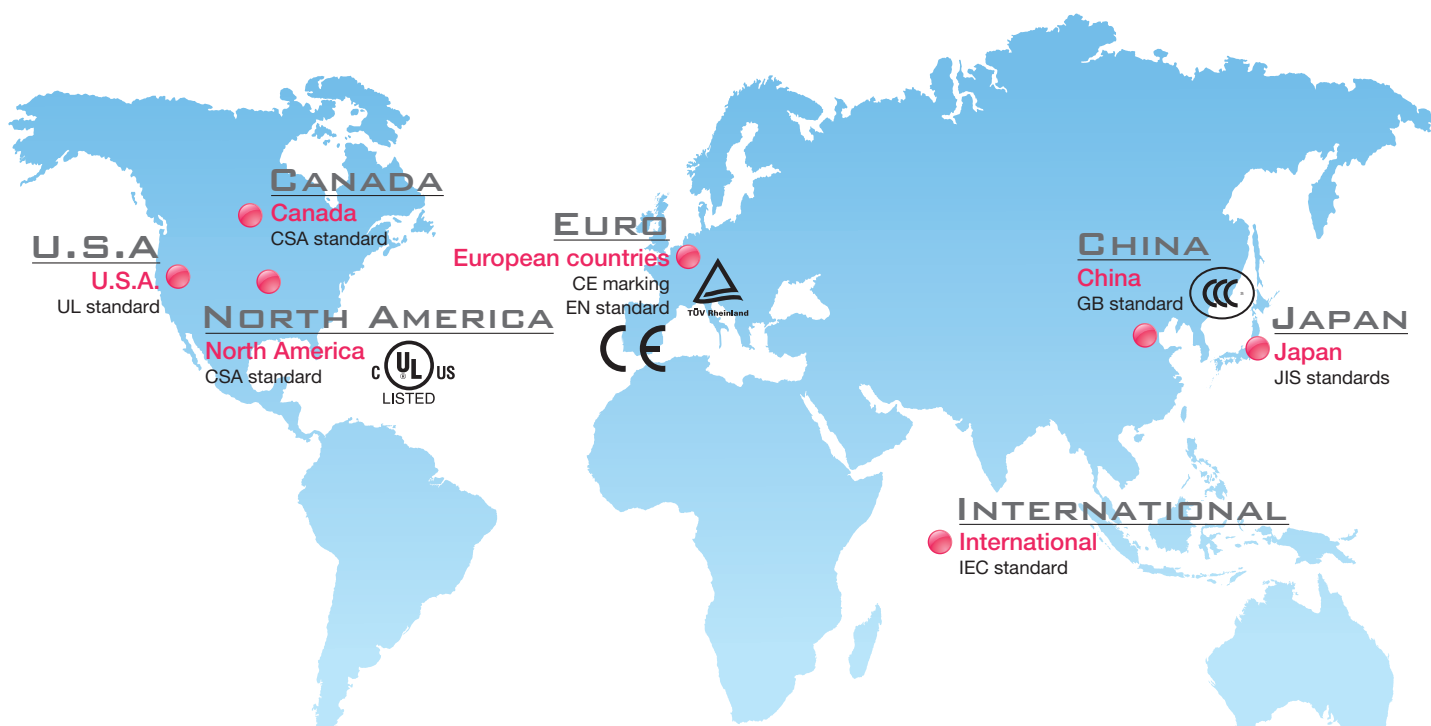
Note 1: The figure in the square brackets indicates the rated current shown on the rating plate of the product at which the category AC-3 opening/closing durability is 2,000,000 times (1,000,000 times for the T20 380V). Refer to the electric durability curve for the life performance.

Note 2: The content within () of rated capacity and rated operational current is applied to the Magnetic Contactor.

Model name		Non-Reversing	S (D)-T35	S (D)-T50	S (D)-T65	S (D)-T80	S (D)-T100
		Reversing	S (D) -2×T35	S (D) -2×T50	S (D) -2×T65	S (D) -2×T80	S (D) -2×T100
Rated operational current (A) Category AC-3 (Note 1)		220 to 240VAC	40[35]	55[50]	65[65]	85[80]	105[100]
		380 to 440VAC	40[32]	50[50]	65[65]	85[80]	105[93]
		500VAC	32[26]	38[38]	60[45]	75[75]	85[75]
Conventional free air thermal current Ith (A)			60	80	100	120	150
Operation coil rating			Refer to pages 22				
Auxiliary contact arrangement	Non- Reversing	Standard	2a2b	2a2b	2a2b	2a2b	2a2b
		Special	—	—	—	—	—
	Reversing	Standard	2a2b×2	2a2b×2	2a2b×2	2a2b×2	2a2b×2
		Special	—	—	—	—	—
 (unit: mm)		Non-Reversing	A	89	106	124(134)	
			B	75	88	100	
			C	91(123)	106(133)	127(157)	
		Reversing	A	114	115	140(147)	
			B	160	216	270	
			C	97(129)	112(139)	137(167)	
IEC 35mm rail mounting type			← →				—
Option	Front clip-on auxiliary contact block mounting type		← →				—
	Side clip-on auxiliary contact block mounting type		← →				—
	Surge absorber mounting type		← →				—

Note 1: The figure in the square brackets indicates the rated current shown on the rating plate of the product at which the category AC-3 opening/closing durability is 2,000,000 times (1,000,000 times for the T20 380V). Refer to the electric durability curve for the life performance.

We support your overseas business.



■ Our standard products comply with the domestic standards as well as various overseas standards and are certified to meet all the standards. (Note1)

Type	Model name	Applicable standard					Safety certification standard
		International	Japan	European countries		China	U.S. & Canada
		IEC	JIS	EN EC directive CE	Certificate authority TÜV Rheinland	GB CCC	cULUS LISTED
Magnetic Contactors	S(D)-T10 to T100	○	○	○	○	○	○
Thermal Overload Relays	TH-T18KP to T100KP	○	○	○	○	○	○
Open Type Magnetic Starters	MSO(D)-T10KP to T100KP (Note2)	○	○	○	○	○	○
Enclosed Magnetic Starters	T10KP to T100KP	○	○	—	—	—	—
Contactor Relays	SR(D)-T5/T9	○	○	○	○	○	○

Note1: ○:Compliant or supported with standard parts, ◎:Certified with standard parts

Note2: The Magnetic Starters will be certified under each type name of the Magnetic Contactors and the Thermal Overload Relays on the condition that the Magnetic Contactors and the Thermal Overload Relays are used in combination.

UL Standards Certified product

■AC Operating Magnetic Contactor (Non-Reversing) T Series

 (File No. E58968)

Model		Rated capacity [HP]						Rated energizing current [A]	Remarks
Magnetic contactors		Single-phase(only nonreversible type)		3-phase					
		110 ~ 120V	220 ~ 240V	200V	220 ~ 240V	440 ~ 480V	550 ~ 600V		
S-T10(BC)(SA)	○	$\frac{1}{2}$	$1\frac{1}{2}$	3	3	5	5	13	The standard product is certified with  .
S-T12(BC)(SA)	○	$\frac{1}{2}$	$1\frac{1}{2}$	3	3	$7\frac{1}{2}$	$7\frac{1}{2}$	20	
S-T20(BC)(SA)	○	1	2	3	5	$7\frac{1}{2}$	$7\frac{1}{2}$	20	
S-T21(BC)(SA)	○	1	3	5	5	10	10	30	
S-T25(BC)(SA)	○	2	3	$7\frac{1}{2}$	$7\frac{1}{2}$	15	15	30	
S-T32(BC)(SA)	○	2	5	10	10	20	15	32.5	
S-T35(BC)(SA)	○	2	5	10	10	20	20	40	
S-T50(BC)(SA)	○	3	$7\frac{1}{2}$	15	15	30	30	65	
S-T65(CW)	○	3	10	15	20	40	40	95	
S-T80(CW)	○	5	15	20	25	50	50	100	
S-T100	○	$7\frac{1}{2}$	15	25	30	60	60	100	

■AC Operating Magnetic Contactor (Reversing) T Series

 (File No. E58968)

Model		Rated capacity [HP]				Rated energizing current [A]	Remarks
Magnetic contactors	Applicable	3-phase					
		200V	220 ~ 240V	440 ~ 480V	550 ~ 600V		
S-2×T10(BC)(SA)	○	3	3	5	5	13	The standard product is certified with 
S-2×T12(BC)(SA)	○	3	3	7½	7½	20	
S-2×T20(BC)(SA)	○	3	5	7½	7½	20	
S-2×T21(BC)(SA)	○	5	5	10	10	30	
S-2×T25(BC)(SA)	○	7½	7½	15	15	30	
S-2×T32(BC)(SA)	○	10	10	20	15	32.5	
S-2×T35(BC)(SA)	○	10	10	20	20	40	
S-2×T50(BC)(SA)	○	15	15	30	30	65	
S-2×T65(CW)	○	15	20	40	40	95	
S-2×T80(CW)	○	20	25	50	50	100	
S-2×T100	○	25	30	60	60	100	

■DC Operating Magnetic Contactor (Non-Reversing / Reversing) T Series

 (File No. E58968)

Model				Rated capacity [HP]						Rated energizing current [A]	Remarks
Non-Reversing		Reversing		Single-phase(only nonreversible type)		3-phase					
				110 ~ 120V	220 ~ 240V	200V	220 ~ 240V	440 ~ 480V	550 ~ 600V		
SD-T12(BC)(SA)	○	SD-2×T12(BC)(SA)	○	$\frac{1}{2}$	$1\frac{1}{2}$	3	3	$7\frac{1}{2}$	$7\frac{1}{2}$	20	The standard product is certified with 
SD-T20(BC)(SA)	○	SD-2×T20(BC)(SA)	○	1	2	3	5	$7\frac{1}{2}$	$7\frac{1}{2}$	20	
SD-T21(BC)(SA)	○	SD-2×T21(BC)(SA)	○	1	3	5	5	10	10	30	
SD-T32(BC)(SA)	○	SD-2×T32(BC)(SA)	○	2	5	10	10	20	15	32.5	
SD-T35(BC)(SA)	○	SD-2×T35(BC)(SA)	○	2	5	10	10	20	20	40	
SD-T50(BC)(SA)	○	SD-2×T50(BC)(SA)	○	3	$7\frac{1}{2}$	15	15	30	30	65	
SD-T65(CW)	○	SD-2×T65(CW)	○	3	10	15	20	40	40	95	
SD-T80(CW)	○	SD-2×T80(CW)	○	5	15	20	25	50	50	100	
SD-T100	○	SD-2×T100	○	$7\frac{1}{2}$	15	25	30	60	60	100	

Note 1: Application ... ○: Standard product

Note 2: 125A - 400A frames with "UL" at the end of the model name are  certified for solderless terminal structure.

■Mechanical Latch Type Magnetic Contactor T Series

 (File No. E58968)

Model				Rated capacity [HP]						Rated energizing current [A]	Remarks
Non-Reversing	Applicable	Reversing	Applicable	Single-phase(only nonreversible type)		3-phase					
				110 ~ 120V	220 ~ 240V	200V	220 ~ 240V	440 ~ 480V	550 ~ 600V		
SL(D)-T21UL(BC)(SA)	☆	SL(D)-(2×)T21UL(BC)(SA) SL(D)-(2×)T35/T50UL(BC)(SA) SL(D)-(2×)T65/T80UL(BC)(SA) SL(D)-(2×)T100UL(BC)(SA)	☆	1	3	5	5	10	10	30	The standard product is certified with  .

Note 1: Application ... ☆ Dedicated part

Order Procedure

Note

For orders, specify products as shown below. Insert a space where ▲ is present. If adding multiple two-character codes (such as SA, BC, and KP) after a frame size (T10 or others) of type name, specify them in alphabetical order of the first letters. (Example: MSO-T10BCKPSA)
(If they are not in alphabetical order, the type code is automatically changed.)

Enclosed Magnetic Starters

●MS-(2×)T type

Model name	motor capacity	Main circuit voltage	Operation coil designation or operation circuit voltage	Auxiliary contact
MS-T21	▲ 3.7kW	▲ 200V	▲ AC200V	▲
MS-T10		▲ 200V	▲ AC200V	▲ 1B
Refer to page 18,50.	Select from page 18,26.	Do not add AC to the main circuit voltage. (To distinguish it from the operation circuit voltage)	Select coil designation from pages 22 or specify the working operation circuit voltage.	Select the auxiliary contact arrangements from page 18.

Standard (AC operated) Magnetic Starters

●MSO-(2×)T type

Model name	Heater designation (setting current)	Main circuit voltage	Operation coil designation or operation circuit voltage	Auxiliary contact
MSO-T21	▲ 3.7kW	▲ 200V	▲ AC200V	▲
MSO-T10	▲ 9A	▲ 200V	▲ AC200V	▲ 1B
Refer to page 18,20,50.	Select from page 18,20,26.	Do not add AC to the main circuit voltage. (To distinguish it from the operation circuit voltage)	Select coil designation from pages 22 or specify the working operation circuit voltage.	Select the auxiliary contact arrangements from page 18,20.

Standard (AC operated) Magnetic Contactors

●S-(2×)T types

Model name	Operation coil designation or operation circuit voltage	Auxiliary contact
S-T20	▲ AC200V	▲ 2A
S-T20	▲ AC100V50Hz	
Refer to page 18,20,50.	Select coil designation from pages 22 or specify the working operation circuit voltage.	Select the auxiliary contact arrangements from page 18,20.

Contactors Relays

●SR-T types

Model name	Operation coil designation	Contact arrangement
SR-T5	▲ AC200V	▲ 3A2B
SR-T5	▲ AC100V50Hz	▲ 4A1B
Refer to page 34.	Select coil designation from pages 22 or specify the working operation circuit voltage.	Designate the contact arrangement listed on page 34.