

# CONTENTS

<b>TYPE REFERENCE LIST</b> .....	1	
<b>1. GENERAL PURPOSE CONTACTORS &amp; STARTERS</b> .....	Series <b>MS-N</b>	
<b>1.1 Conformity to International Standards</b> .....	<b>2</b>	
1.1.1 List of <b>CE</b> Marked Type .....	3	
1.1.2 TÜV Certified Type .....	3	
1.1.3 UL Approval for U.S.A. and Canada .....	5	
1.1.4 CCC Certified Products .....	7	
1.1.5 Approved Marine Standards .....	11	
<b>1.2 Selection Guide</b> .....	<b>12</b>	
<b>1.3 The Overview (Type designation breakdown)</b> .....	<b>14</b>	
1.3.1 Non-Reversing Types .....	14	
1.3.2 Reversing Type .....	15	
<b>1.4 Technical Data of Series S-N Contactors</b> .....	<b>16</b>	
1.4.1 Ratings and Characteristics .....	16	
1.4.2 Performance of Series S-N Contactors .....	18	
1.4.3 Mounting Attitude of Starters and Contactors .....	18	
<b>1.5 When Ordering</b> .....	<b>19</b>	
<b>1.6 Selection Table of Contactors</b> .....	<b>20</b>	
1.6.1 Non-Reversing Contactors .....	Type <b>S-N</b> □, <b>SD-N</b> □ .....	20
1.6.2 Reversing Contactors .....	Type <b>S-2xN</b> □, <b>SD-2xN</b> □ .....	21
1.6.3 Non-Reversing Mechanically Latched Contactors .....	Type <b>SL-N</b> □, <b>SLD-N</b> □ .....	22
1.6.4 Reversing Mechanically Latched Contactors .....	Type <b>SL-2xN</b> □, <b>SLD-2xN</b> □, <b>SLxS-N</b> □ .....	23
<b>1.7 Selection Table of Direct-On-Line Motor Starters</b> .....	<b>24</b>	
1.7.1 Non-Reversing Motor Starters without Enclosure(IP 00) Type <b>MSO-N</b> □ .....	24	
1.7.2 Reversing Motor Starters without Enclosure(IP 00) .....	Type <b>MSO-2xN</b> □ .....	25
1.7.3 Enclosed Non-Reversing Motor Starters(IP 20) .....	Type <b>MS-N</b> □ .....	26
1.7.4 Enclosed Non-Reversing Motor Starters with Pushbutton Switch(IP 20) .....	Type <b>MS-N</b> □ <b>PM</b> .....	27
<b>1.8 Optional Parts and Accessories for Contactors</b> .....	<b>28</b>	
1.8.1 Replacement Coils .....	28	
1.8.2 Replacement Contact Kits .....	28	
1.8.3 Auxiliary Contact Blocks .....	29	
1.8.4 Mechanical Interlocks .....	29	
1.8.5 Connecting Bar Kits .....	29	
1.8.6 Surge Absorbers .....	30	
1.8.7 Terminal Covers .....	30	
1.8.8 Pneumatic Time Delay Modules .....	30	
1.8.9 DC Interface Modules .....	30	
<b>1.9 Connections and Contact Arrangement</b> .....	<b>31</b>	
1.9.1 S, SD-N□ .....	31	
1.9.2 S, SD-2xN□ .....	32	
1.9.3 SL, SLD-(2x)N□ .....	33	
1.9.4 MSO-(2x)N□ .....	34	
1.9.5 MS-N□ .....	35	
1.9.6 MS-N□PM .....	35	
<b>1.10 Outline Dimensions</b> .....	<b>36</b>	
1.10.1 Outline Dimensions of Non-Reversing Contactors .....	36	
1.10.2 Outline Dimensions of Reversing Contactors .....	37	
1.10.3 Outline Dimensions of Open Type Starters .....	38	
1.10.4 Outline Dimensions of Enclosed Motor Starters .....	39	

<b>2. MOTOR PROTECTION RELAYS</b>		
<b>2.1 Thermal Overload Relays</b>	Series <b>TH-N</b>	<b>40</b>
2.1.1 Selection Guide of Thermal Overload Relays		41
2.1.2 Selection Guide of the Current Transformers for TH-N600KP		42
2.1.3 Technical Data		42
2.1.4 Selection Guide of Quick Trip Thermal Overload Relay		42
2.1.5 Operating Characteristics of Thermal Overload Relays		43
(Connecting wire size : Refer to “standard wire size” of Table 2.1.3)		
2.1.6 Optional Parts and Accessories		44
2.1.7 Outline Dimensions		45
<b>2.2 Electronic Motor Protection Relays</b>	Series <b>ET-N</b>	<b>46</b>
<b>3. DEFINITE PURPOSE CONTACTORS &amp; STARTERS</b>		
<b>3.1 DC Contactors</b>	Series <b>DU-K/A</b>	<b>49</b>
<b>3.2 Medium Voltage Vacuum Contactors</b>	Series <b>SH-V</b>	<b>52</b>
<b>3.3 Compact 3-Pole Contactors</b>	Series <b>S-N □ 8</b>	<b>55</b>
<b>3.4 NC Main Contact Contactors</b>	Series <b>B-N</b>	<b>56</b>
<b>3.5 Delay Open Type Magnetic Starters &amp; Contactors</b>	Series <b>S/MSO-N □ DL</b>	<b>58</b>
<b>3.6 DC Interface Contactors</b>	Series <b>SD-Q</b>	<b>60</b>
<b>3.7 DC Interface Modules</b>	Series <b>UN-SY</b>	<b>63</b>
<b>4. RELAYS</b>		
<b>4.1 Contactor Relays</b>	Series <b>SR-N</b>	<b>65</b>
4.1.1 Specifications		66
4.1.2 Auxiliary Contact Blocks		67
4.1.3 Contact Arrangements of Contactor Relay		68
4.1.4 Spare Coils & Accessories		68
4.1.5 Outline Dimensions		68
<b>4.2 Voltage Detection Relays</b>	Series <b>SRE</b>	<b>69</b>
<b>4.3 Re-Starting Relays</b>	Series <b>UA-DL</b>	<b>71</b>
<b>4.4 Solid State Time Delay Relays</b>	Series <b>SRS-H</b>	<b>73</b>
<b>4.5 Pneumatic Time Delay Relays</b>	Series <b>SRT-N</b>	<b>74</b>
<b>5. STAR-DELTA STARTERS</b>	Series <b>EYD-N</b>	
<b>5.1 Selection Table</b>		<b>76</b>
<b>5.2 Specifications</b>		<b>77</b>
<b>5.3 Outline Dimensions</b>		<b>78</b>
5.3.1 Open Type (EYDO-N)		78
5.3.2 Enclosed Type (EYD-N)		78
<b>6. SOLID STATE CONTACTORS</b>	Series <b>US-N/K, H</b>	
<b>6.1 Features</b>		<b>79</b>
<b>6.2 Product Scope</b>		<b>80</b>

# TYPE REFERENCE LIST

Type	Description	Ref. Page
<b>B(D)-N</b> <input type="checkbox"/>	NC main contact contactors .....	56
<b>DU(D)-</b> <input type="checkbox"/>	DC contactors .....	49
<b>ET-N</b> <input type="checkbox"/>	Electronic motor protection relays .....	46
<b>EYD(O)-N</b> <input type="checkbox"/>	Star-delta starters .....	76
<b>MS-N</b> <input type="checkbox"/>	General purpose enclosed type motor starters .....	26
<b>MS-N</b> <input type="checkbox"/> <b>PM</b>	Enclosed non-reversing motor starters with pushbutton switch .....	27
<b>MSO(D)-N</b> <input type="checkbox"/>	General purpose open type motor starters .....	14,24,38
<b>MSO-N</b> <input type="checkbox"/> <b>DL</b>	Delay open type magnetic contactors .....	58
<b>MSO(D)-2XN</b> <input type="checkbox"/>	General purpose open and reversing type motor starters .....	15,25,38
<b>PF-</b> <input type="checkbox"/>	Plug-in sockets for,UA-DL2 .....	72
<b>S-N</b> <input type="checkbox"/> <b>8</b>	Compact 3-pole contactors .....	55
<b>S(D)-N</b> <input type="checkbox"/>	General purpose contactors .....	2~
<b>SD-Q</b> <input type="checkbox"/>	DC interface contactors .....	60
<b>S-N</b> <input type="checkbox"/> <b>DL</b>	Delay open type magnetic contactors .....	58
<b>S(D)-2XN</b> <input type="checkbox"/>	General purpose reversing contactors .....	32
<b>SH(L)(D)-V</b> <input type="checkbox"/>	Medium voltage vacuum contactors .....	52
<b>SH(L)(D)-2XV</b> <input type="checkbox"/>	Medium voltage reversing vacuum contactors .....	52
<b>SL(D)-N</b> <input type="checkbox"/>	Mechanically latched contactors .....	22
<b>SL(D)-2XN</b> <input type="checkbox"/>	Mechanically latched reversing contactors .....	23
<b>SLXS-N</b> <input type="checkbox"/>	Mechanically latched and normal reversing contactors .....	23
<b>SR(D)-N</b> <input type="checkbox"/>	Contactors relays .....	65
<b>SRE-</b> <input type="checkbox"/>	Voltage detection relays .....	69
<b>SRS-H</b> <input type="checkbox"/>	Solid state time delay relays .....	73
<b>SRT(D)-N</b> <input type="checkbox"/>	Pneumatic time delay relays .....	74
<b>TH-N</b> <input type="checkbox"/>	Thermal overload relays .....	40
<b>THR-</b> <input type="checkbox"/>	Saturable reactors for TH-N .....	44
<b>UA-AXVV</b> <input type="checkbox"/>	Auxiliary contact blocks for SH-V .....	54
<b>UA-DL2</b>	Re-starting relay .....	71
<b>UA-SU</b> <input type="checkbox"/>	Surge absorbers for SH-V .....	53
<b>UN-AX</b> <input type="checkbox"/>	Auxiliary contact blocks .....	29,50,67
<b>UN-ML</b> <input type="checkbox"/>	Mechanical interlocks for S-N .....	29
<b>UN-RR</b> <input type="checkbox"/>	Reset release for TH-N .....	44
<b>UN-SA</b> <input type="checkbox"/>	Surge absorbers for S-N and SR-N4 .....	30
<b>UN-SY</b> <input type="checkbox"/>	DC interface modules for S-N .....	30,63
<b>UN-TL</b> <input type="checkbox"/>	Trip indicator for TH-N .....	44
<b>UN-TR</b> <input type="checkbox"/>	Pneumatic time delay modules .....	30,78
<b>US-N</b> <input type="checkbox"/> <b>/K</b> <input type="checkbox"/>	Solid State Contactors .....	79
<b>US-H</b> <input type="checkbox"/>	Solid State Contactors .....	79

# 1. GENERAL PURPOSE CONTACTORS & STARTERS

Series MS-N

## 1.1 Conformity to International Standards

Mitsubishi magnetic motor starters and contactors are designed to conform to the relevant IEC recommendations and to the standards of as many countries as possible. Specifically, they conform to the following:

IEC60947-4-1 International  
EN60947-4-1 Europe

VDE0660 Germany  
NEMA-ICS U.S.A

Table 1.1

Type	Model Name	Europe		North America / UL				China	Marine			
		CE Mark	TÜV	Listing		Recognition		CCC certification	U.K.	France	Korea	Japan
		U.S.A	Canada	U.S.A	Canada			Lloyd's Register of Shipping	Bureau Veritas	Korean Register of Shipping	Nippon Kaiji Kyokai	
AC Operated Contactor	S-N10(CX)											
	S-N11(CX)/N12(CX)											
	S-N18(CX)											
	S-N20(CX)/N21(CX)		⊙ (*2)					⊙	○	○	○	⊙
	S-N25(CX)											
	S-N35(CX)											
	S-N28(CX)											
	S-N38(CX)											
	S-N48(CX)											
	S-N50											
	S-N65	⊙			⊙		( US Mark)					
	S-N80											
	S-N95											
	S-N125		⊙					⊙	○	○	○	⊙
	S-N150											
	S-N180											
S-N220												
S-N300												
S-N400												
S-N600												
S-N800		—		☆			★					
Overload Relay	TH-N12(CX)KP							⊙				
	TH-N18(CX)KP		○					—				
	TH-N20(TA)(CX)KP											
	TH-N60(TA)KP	⊙			⊙		( US Mark)	⊙	○	○	—	—
	TH-N120(TA)KP		○									
	TH-N220RHKP/HZKP											
	TH-N400RHKP/HZKP											
DC Operated Contactor	SD-N11(CX)/N12(CX)											
	SD-N21(CX)		⊙									
	SD-N35(CX)											
	SD-N50											
	SD-N65											
	SD-N80											
	SD-N95	⊙			⊙		( US Mark)	⊙	○	○	—	⊙
	SD-N125		⊙									
	SD-N150											
	SD-N220											
	SD-N300											
	SD-N400											
SD-N600												
SD-N800		—	—	—	—	—	★					
AC Operated Contactor Relay	SR-N4(CX)	⊙	⊙ (*2)	⊙	⊙	( Mark)	( Mark)	⊙	○	○	—	—
DC Operated Contactor Relay	SRD-N4(CX)	⊙	⊙ (*2)	⊙	⊙	( Mark)	( Mark)	⊙	○	○	—	—
Auxiliary Contact Block	UN-AX2(CX)											
	UN-AX4(CX)		○	⊙	⊙	( Mark)	( Mark)					
	UN-AX11(CX)	⊙				( Mark)	( Mark)	★	○	○	—	—
	UN-AX80		○	—	—	○	—					
	UN-AX150											

- Notes: 1. ⊙ : CE Mark (Manufacturer's Declaration) == Standard model applicable, marking on the product.  
 UL, TÜV, CCC == Standard model applicable, marking on the product.  
 NK == Standard model applicable, Certificate No. on the product.  
 ○ : Standard model applicable, no marking on the product.  
 ☆ : Special model applicable, marking on the product. Order model name followed by suffix "UL".  
 ★ : China export applicable, no marking on the product. Ensure to add "CN" after the model name when placing an order.  
 — : Not applicable to the Standard or not approved.
2. Applicable coil ratings : S-N10~N12, N18, N28, N38, N48 : up to AC440V S-N20~N35 : up to AC380V  
 3. For each certificate conditions, see next three pages.

# 1.1.1 List of CE Marked Type



Table 1.1.1

Standard Contactors Non-reversing	A.C. operated	S-N10, S-N11, S-N12, S-N18, S-N20, S-N21, S-N25, S-N28, S-N35, S-N38, S-N48, S-N50, S-N65, S-N80, S-N95, S-N125, S-N150, S-N180, S-N220, S-N300, S-N400, S-N600, S-N800
	D.C. operated	SD-N11, SD-N12, SD-N21, SD-N35, SD-N50, SD-N65, SD-N80, SD-N95, SD-N125, SD-N150, SD-N220, SD-N300, SD-N400, SD-N600, SD-N800
Standard Contactors Reversing	A.C. operated	S-2XN10, S-2XN11, S-2XN20, S-2XN21, S-2XN25, S-2XN35, S-2XN50, S-2XN65, S-2XN80, S-2XN95, S-2XN125, S-2XN150, S-2XN180, S-2XN220, S-2XN300, S-2XN400, S-2XN600, S-2XN800
	D.C. operated	SD-2XN11, SD-2XN21, SD-2XN35, SD-2XN50, SD-2XN65, SD-2XN80, SD-2XN95, SD-2XN125, SD-2XN150, SD-2XN220, SD-2XN300, SD-2XN400, SD-2XN600, SD-2XN800
Additional Auxiliary Contact Blocks		UN-AX2, UN-AX4, UN-AX11, UN-AX80, UN-AX150, UQ-AX2(KR)
Mechanical Interlocks <sup>3</sup>		UN-ML11, UN-ML21, UN-ML80, UN-ML150, UN-ML220
Thermal Overload Relays		TH-N12KP, TH-N18KP, TH-N20KP, TH-N20TAKP, TH-N60KP, TH-N60TAKP, TH-N120KP, TH-N120TAKP, TH-N220RHKP, TH-N220HZKP, TH-N400RHKP, TH-N400HZKP, TH-N600KP
Contactor Relays	A.C. operated	SR-N4
	D.C. operated	SRD-N4
D.C. Interface Contactors	Non-reversing	SD-Q11, SD-Q12, SD-Q19
	Reversing	SD-QR11, SD-QR12, SD-QR19
Solid state Contactors (for motor/heater load)		US-N5SS(TE), US-N8SS(TE), US-N20(TE), US-N30(TE), US-N40(TE), US-N50(TE), US-N70NS(TE), US-N80NS(TE), US-NH70NS(TE), US-NH80NS(TE), US-N20(TE)CX, US-N30(TE)CX, US-N40(TE)CX, US-N20(TE)RM
Solid state Contactors (for heater load)		US-H20(DD), US-H30(DD), US-H40(DD), US-H50(DD), US-H20(DD)RM, US-H30(DD)RM

Notes:1. Listed types are representatives and contains standard models.

2. Applicable product standards

Contactor : EN60947-1, EN60947-4-1, EN60947-5-1

Thermal overload relays : EN60947-1, EN60947-4-1, EN60947-5-1

Aux. contact blocks : EN60947-1, EN60947-5-1

Mechanical interlocks : EN60947-1, EN60947-4-1, EN60947-5-1

Solid state Contactors : EN60947-4-2, EN60947-4-3  
(for motor/heater load)

Solid state Contactors : EN60947-4-3  
(for heater load)

3. For mechanical interlocks, no marking on the product. Mechanical interlocks are applicable when used in reversing contactors.

4. Necessary to connect a varistor etc., in order to provide compliance for CE marking for the US-N5/N8SS(TE) and US-N(H) 70N(H) 80NS(TE) type.

# 1.1.2 TÜV Certified Type Contactor



Table 1.1.2 (1)

Model Name	Applicable standard	Certificate No.	Mirror contact <sup>6</sup>	
			Internal auxiliary NC contact	Auxiliary contact block Auxiliary NC contact
S-N10(CX)(SA) S-N11(CX)(SA) S-N12(CX)(SA)	EN60947-4-1	R9551340		
S-N20(CX)(SA) S-N21(CX)(SA)	EN60947-4-1	R9551336	○	○ (UN-AX2(CX), UN-AX4(CX))
S-N25(CX)(SA) S-N35(CX)(SA)	EN60947-4-1	R9651190		
S-N18(CX)(SA) S-N28(CX)(SA) S-N38(CX)(SA) S-N48(CX)(SA)	EN60947-4-1	R9651189	—	—
S-N50/S-N65	EN60947-4-1	R9851170	○	○ (UN-AX2(CX), UN-AX4(CX))
S-N80/S-N95	EN60947-4-1	R9851138		
S-N125	EN60947-4-1	R9851169	○	—
S-N150	EN60947-4-1	R9851167		○
S-N180/S-N220	EN60947-4-1	R9851164	○	(UN-AX150)
S-N300/S-N400	EN60947-4-1	R9851171		
SD-N11(CX)(SA) SD-N12(CX)(SA)	EN60947-4-1	R9551340		○
SD-N21(CX)(SA)	EN60947-4-1	R9551336	○	(UN-AX2(CX), UN-AX4(CX))
SD-N35(CX)(SA)	EN60947-4-1	R9651190		
SD-N50/SD-N65	EN60947-4-1	R9851170		
SD-N80/SD-N95	EN60947-4-1	R9851138		
SD-N125	EN60947-4-1	R9851169	○	—
SD-N150	EN60947-4-1	R9851167		○
SD-N220	EN60947-4-1	R9851164	○	(UN-AX150)
SD-N300/SD-N400	EN60947-4-1	R9851171		

Notes:1. Standard models are applicable under following conditions.

Main circuits : AC-3 rated current at 440V AC max.

(Main contacts) and rated continuous current.

Auxiliary contacts : AC-15 rated current at 550V AC max.

and rated continuous current.

Operation coil : AC coil designation

N10~N12, N18~N48 and SR-N4 ; AC12V~AC440V

N20~N35 ; AC12V~AC380V

N50~N150 ; AC24V~AC500V

N180~N400 ; AC48V~AC500V

DC coil designation DC12V~DC220V

2. For contactors, standard models are with TÜV mark on the product.

For other products, standard models are with no TÜV mark on the product.

3. Finger protection type is certified according to DIN VDE 0106 part 100. For finger protection type, order model name followed by suffix "CX".

4. Models with built-in surge absorber (model name followed by "SA") are also certified.

5. Mirror contact function compliance certification has been obtained from TÜV. This product is suitable for use in a machine tool's interlock circuit. The mirror contact function refers to a function in which the auxiliary NC contact can withstand a 2500V impulse voltage without contacting even if the main contact melts. 3

## DC Interface Contactor

Table 1.1.2 (2)

Model Name	Certificate No.	Miller contact <sup>5</sup>	
		Internal auxiliary NC contact	Auxiliary contact block Auxiliary NC contact
SD-Q11	R2-50004919	○ <sup>6</sup>	○ (UQ-AX2)
SD-Q12	R2-50004919	○	—
SD-Q19	R2-50004918	○	—
SD-QR11	R2-50004919	—	—
SD-QR12	R2-50004919	—	—
SD-QR19	R2-50004918	—	—

## Contacting Relay

Table 1.1.2 (4)

Model Name	Applicable standard	Certificate No.
SR-N4(CX)(SA)	EN60947-5-1	R9551339
SRD-N4(CX)(SA)	EN60947-5-1	R9551339

Notes: 1. Standard models are applicable under following conditions.

Main circuits

: AC-3 rated current at 440V AC max.

(Main contacts)

and rated continuous current.

Auxiliary contacts

: AC-15 rated current at 550V AC max. (SD-Q(R)11~Q(R)19 : 440V AC max.)

and rated continuous current.

Operation coil

: AC coil designation

SR-N4 : AC12V~AC440V

DC coil designation DC12V~DC220V (SD-Q(R)11~Q(R)19 : DC12V~DC24V)

2. For contactors, standard models are with TÜV mark on the product.

For other products, standard models are with no TÜV mark on the product.

For contactor relays, order model name followed by suffix "DZ" if TÜV mark on the product is required.

3. Finger protection type is certified according to DIN VDE 0106 part 100. For finger protection type, order model name followed by suffix "CX".

4. Models with built-in surge absorber (model name followed by "SA") are also certified.

5. Miller contact function compliance certification has been obtained from TÜV. This product is suitable for use in a machine tool's interlock circuit. The miller contact function refers to a function in which the auxiliary NC contact can withstand a 2500V impulse voltage without contacting even if the main contact melts.

6. If the SD-Q11 with INC is required, it must be so indicated when placing an order.

## Solid state contactor (for motor/heater load)

Table 1.1.2 (6)

Model Name	Approval rating (A)						Certificate No.			Applicable standard
	Heater (AC-51)				Motor (AC-53)		Standard	Finger protected	Mounting on 35mm rail	
	AC100-240V		AC200-440V		AC200-240V	AC400-440V				
40C°	60C°	40C°	60C°	40C°	40C°	US-□	US-□CX	US-□RM		
US-N5SS(TE)	5	3	—	—	3.2	—	R50037627	—	—	
US-N8SS(TE)	8	4.8	—	—	3.2	—				
US-N20(TE)	20	12	20	12	11.1	11.1	R50037628	R50037628	R50037628	
US-N30(TE)	30	18	30	18	17.4	17.4				
US-N40(TE)	40	24	40	24	26	26	R50037629	—	—	
US-N50(TE)	50(45)	30(27)	50(45)	30(27)	26	26				
US-N70NS(TE)	70	42	—	—	48	—	R50037629	—	—	
US-N80NS(TE)	80	48	—	—	48	—				
US-NH70NS(TE)	—	—	65	39	48	48	R50037630	—	—	
US-NH80NS(TE)	—	—	75	45	48	48				

Notes: 1. The number in the type field indicates the certificate number, and hyphen "-" indicates that there are no compatible models.

2. The value in the certified rating field in the bracket "( )" indicates the rating for US-N50TE.

3. The frame field "(TE)" indicates 3-pole, 3-element type main circuit.

4. Standard models are with TÜV mark on the product.

## Solid state contactor (for heater load)

Table 1.1.2 (7)

Model Name	Approval rating (A)		Certificate No.			Applicable standard
	Heater (AC-51)		Standard	No cooling fin	Mounting on 35mm rail	
	AC24-480V					
40C°	60C°	US-□	US-□HZ	US-□RM		
US-H20(DD)	20	12	R50018958	R50018958	R50018958	Heater : EN60947-4-3
US-H30(DD)	30	18			—	
US-H40(DD)	40	24			—	
US-H50(DD)	50	30			—	
					—	

Notes: 1. The number in the type field indicates the certificate number, and hyphen "-" indicates that there are no compatible models.

2. The frame field "(DD)" indicates 3-pole individual control.

3. Standard models are with TÜV mark on the product.

# 1.1.3 UL Approval for U.S.A. and Canada



## ■ Contactor and Motor Starter

Table 1.1.3 (1)

Contactor (open)	Mark	cUL <sup>us</sup>																	UL <sup>us</sup>	
	Model Name	S-N10(CX)	S(D)-N11(CX) S(D)-N12(CX)	S-N18(CX)	S-N20(CX) S(D)-N21(CX)	S-N25(CX)	S(D)-N35(CX)	S(D)-N50	S(D)-N65	S(D)-N80	S(D)-N95 <sup>2</sup>	S(D)-N125 <sup>2</sup>	S(D)-N150 <sup>2</sup>	S-N180 <sup>2</sup>	S(D)-N220 <sup>2</sup>	S(D)-N300 <sup>2</sup>	S(D)-N400 <sup>2</sup>	S-N600 <sup>2</sup>	S-N800 <sup>2</sup>	
Continuous current rating A open	13	20	30	30	35	40	80	95	100	100	125	150	220	220	300	400	680	910		
	Horsepower rating Single phase	1/2	1/2	1	1	2	2	3	3	5	7-1/2	10	15	15	—	—	—	—		
	120V HP	1-1/2	1-1/2	3	3	3	5	7-1/2	10	15	15	20	25	30	40	50	100	125	150	200
	240V HP	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Three phase	208V HP	3	3	5	5	7-1/2	10	15	15	20	25	40	40	60	60	100	125	150	250	
	240V HP	3	3	5	5	7-1/2	10	15	20	25	30	40	50	60	75	100	150	200	300	
	480V HP	5	7-1/2	10	10	15	20	30	40	50	60	75	100	125	150	200	300	400	600	
	600V HP	5	7-1/2	10	10	15	20	30	40	50	60	75	100	125	150	200	300	400	600	
Starter (open)	Mark	cUL <sup>us</sup>																	—	
	Model Name	MSO-N10KP(CX)	MSO-N11KP(CX) N12KP(CX)	MSO-N18KP(CX)	MSO-N20KP(CX) N21KP(CX)	MSO-N25KP(CX)	MSO-N35KP(CX)	MSO-N50KP	MSO-N65KP	MSO-N80KP	MSO-N95KP <sup>2</sup>	MSO-N125KP <sup>2</sup>	MSO-N150KP <sup>2</sup>	MSO-N180KP <sup>2</sup>	MSO-N220KP <sup>2</sup>	MSO-N300KP <sup>2</sup>	MSO-N400KP <sup>2</sup>	—	—	
Horsepower rating Three phase	208V HP	3	3	5	5	7-1/2	10	15	15	20	25	40	40	60	60	100	125	—	—	
	240V HP	3	3	5	5	7-1/2	10	15	20	25	30	40	50	60	75	100	150	—	—	
	480V HP	5	7-1/2	10	10	15	20	30	40	50	60	75	100	125	150	200	300	—	—	
	600V HP	5	7-1/2	10	10	15	20	30	40	50	60	75	100	125	150	200	300	—	—	
Max. rating of short circuit protection device	Fuse class K5	A	30	30	70	70	100	125	250	250	300	225	350	350	500	500	600 <sup>3</sup>	500 <sup>3</sup>	800 <sup>4</sup>	1200 <sup>4</sup>
	Circuit breaker	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

- Notes: 1. UL listed types for S-N600 and S-N800 require suffix letters "UL" (eg. S-N800UL).  
 2. Types S-N95 to S-N800 and MSO-N95KP to N400KP with IlSCO lugs are also listed as type name with suffix letters "UL" (eg. S-N95UL).  
 3. Time delay fuse  
 4. Class L fuse

## ■ Thermal Overload Relay



Table 1.1.3 (2)

Model Name	Heater designation (Rated current [A])	Contactor to be coupled	Auxiliary Contact
TH-N12(CX)KP <sup>☆</sup> TH-N12(CX) <sup>☆</sup> *1 TH-N12(CX)HZKP <sup>★</sup> *2 TH-N12(CX)HZ <sup>★</sup> *1	0.12A(0.1~0.16),0.17(0.14~0.22),0.24A(0.2~0.32), 0.35A(0.28~0.42),0.5A(0.4~0.6),0.7A(0.55~0.85),0.9A(0.7~1.1), 1.3A(1~1.6),1.7A(1.4~2),2.1A(1.7~2.5),2.5A(2~3),3.6A(2.8~4.4), 5A(4~6),6.6A(5.2~8),9A(7~11),11A(9~13)	S-N10 S-N11 S-N12	Rated Code / C600 AC600Vmax Make 1800VA(15A max) Break 180VA(1.5A max)
TH-N18(CX)KP <sup>☆</sup> TH-N18(CX) <sup>☆</sup> *1	1.3A(1~1.6),1.7(1.4~2),2.1A(1.7~2.5),2.5A(2~3),3.6A(2.8~4.4), 5A(4~6),6.6A(5.2~8),9A(7~11),11A(9~13),15A(12~18)	S-N18	Rated Code / B600 AC600Vmax Make 3600VA(30A max) Break 360VA(3A max)
TH-N20(CX)KP TH-N20(CX)*1 TH-N20CXHZKP <sup>★</sup> TH-N20CXHZ <sup>★</sup> *1	0.24A(0.2~0.32),0.35A(0.28~0.42),0.5A(0.4~0.6), 0.7A(0.55~0.85),0.9A(0.7~1.1),1.3A(1~1.6),1.7A(1.4~2), 2.1A(1.7~2.5),2.5A(2~3),3.6A(2.8~4.4),5A(4~6),6.6A(5.2~8), 9A(7~11),11A(9~13),15A(12~18)	S-N20 S-N21 S-N25 S-N35	Rated Code / B600 AC600Vmax Make 3600VA(30A max) Break 360VA(3A max)
TH-N20TAKP <sup>☆</sup> TH-N20TA <sup>☆</sup> *1	22A(18~26) 29A(24~34)	S-N25,N35 S-N35	Rated Code / B600 AC600Vmax Make 3600VA(30A max) Break 360VA(3A max)
TH-N60KP TH-N60TAKP <sup>☆</sup>	15A(12~18),22A(18~26),29A(24~34),35A(30~40),42A(34~50) 54A(43~65) 67A(54~80) 82A(65~100)	S-N50,N65,N80,N95 S-N65,N80,N95 S-N80,N95 S-N95	Rated Code / B600 AC600Vmax Make 3600VA(30A max) Break 360VA(3A max)
TH-N120KP TH-N120TAKP <sup>☆</sup>	42A(34~50),54A(43~65),67A(54~80),82A(65~100) 105A(85~125) 125A(100~150)	S-N125,N150 S-N125,N150 S-N150	Rated Code / B600 AC600Vmax Make 3600VA(30A max) Break 360VA(3A max)
TH-N220RHKP <sup>☆</sup> TH-N220HZKP <sup>★</sup>	82A(65~100),105A(85~125),125A(100~150),150A(120~180) 180A(140~220)	S-N180,N220 S-N220	Rated Code / B600 AC600Vmax Make 3600VA(30A max) Break 360VA(3A max)
TH-N400RHKP <sup>☆</sup> TH-N400HZKP <sup>★</sup>	105A(85~125),125A(100~150),150A(120~180),180A(140~220),250A(200~300) 330A(260~400)	S-N300,N400 S-N400	Rated Code / B600 AC600Vmax Make 3600VA(30A max) Break 360VA(3A max)

- Notes: 1. ☆ is to be coupled with contactor and can not be mounted separately from contactor. ★ is only for separate mounting.  
 2. Suffix "KP" ; Overload and phase failure protection type with three heater elements.  
 3. \*1 ; TH-N12(CX), N12(CX)HZ, N18(CX), N20(CX), N20CXHZ and N20TA are recognized (UL) for single phase motors.  
 4. \*2 is to be coupled with TH-N12(CX)KP (cUL<sup>us</sup>) and UN-HZ12 (UL).

## ■ Contactor Relay and Auxiliary Contact Block

Table 1.1.3 (3)

Type	Model Name	Ratings		Mark
Contactor Relay	SR-N4 SRD-N4	Rated Code; A600	Rated Code; R300	UL <sup>us</sup> cUL <sup>us</sup>
Auxiliary Contact Block	UN-AX2(CX) UN-AX4(CX) UN-AX11(CX)	AC600V max Make 7200VA Break 720VA	DC250V max Make 28VA Break 28VA	UL <sup>us</sup> cUL <sup>us</sup>
	UN-AX80 UN-AX150			UL <sup>us</sup>



## DC Interface Contactor

Table 1.1.3 (4)

Model Name		Horsepower rating [HP]					Continuous current rating [A]
		Single-phase (only non-reversing type)		three-phase			
Non-reversing type	Reversing type	110 ~ 120V	220 ~ 240V	200 ~ 208V	220 ~ 240V	440 ~ 480V	
SD-Q11	SD-QR11	$\frac{1}{3}$	1	3	3	5	20
SD-Q12	SD-QR12						13
MSOD-Q11(KP)	MSOD-QR11KP	$\frac{1}{2}$	$1\frac{1}{2}$	5	5	$7\frac{1}{2}$	30
MSOD-Q12(KP)	MSOD-QR12KP						18
SD-Q19	SD-QR19						
MSOD-Q19(KP)	MSOD-QR19KP						

Note: 1. MSOD-Q11, Q12 and Q19 are approved for single-phase circuits.

## Solid state contactor (for motor/heater load)

Table 1.1.3 (5)

Model Name		Horsepower rating [HP]				Continuous current rating [A]
3-pole,2-element type	3-pole,3-element type	Single-phase		three-phase		
		100~120V	220~240V	220~240V	440~480V	
US-N5SS	US-N5SSTE	$\frac{1}{10}$	$\frac{1}{4}$	$\frac{3}{4}$	–	5
US-N8SS	US-N8SSTE	$\frac{1}{10}$	$\frac{1}{4}$	$\frac{3}{4}$	–	8
US-N20(CX)(RM)	US-N20TE(CX)(RM)	$\frac{1}{2}$	$1\frac{1}{2}$	3	5	20
US-N30(CX)	US-N30TE(CX)	1	3	5	10	30
US-N40(CX)	US-N40TE(CX)	2	3	$7\frac{1}{2}$	20	40
US-N50(CX)	US-N50TE(CX)	2	3	$7\frac{1}{2}$	20	50
US-N70NS	US-N70NSTE	3	$7\frac{1}{2}$	15	–	70
US-N80NS	US-N80NSTE	3	$7\frac{1}{2}$	15	–	80
US-NH70NS	US-NH70NSTE	3	$7\frac{1}{2}$	15	30	70
US-NH80NS	US-NH80NSTE	3	$7\frac{1}{2}$	15	30	80

## Solid state contactor (for heater load)

Table 1.1.3 (6)

Model Name		Continuous current rating [A]
Batch control	Individual control	
US-H20(RM)(HZ)	US-H20DD(RM)(HZ)	20
US-H30(RM)	US-H30DD(RM)	30
US-H40	US-H40DD	40
US-H50	US-H50DD	50

Notes: 1. "(HZ)" has no cooling fin. "(RM)" is available rail mounting.

2. The US-H□ (DD) HZ type is certified at the continuous current rating when combined with the fin used on the US-H□ (DD) type.

3. The US-H□ (DD) HZ type is UR certified.



# 1.1.4 CCC Certified Products

Magnetic motor starters, etc., are designated as products targeted for China Compulsory Certification. CCC certification must be acquired before the product is exported to main land China from Domestic or marketed in China.

The certified models are shown in Tables 1.1.4 (1-1) to 1.1.4 (8-2). The option units (UN-CV, ML, RR, SA, etc.) which are mounted on the magnetic motor starter and which do not have a load switching function are excluded from the CCC certification target.



## Magnetic motor starter

### With Enclosure

Table 1.1.4 (1-1)

Model Name MS : AC operated	Approval rating AC-3 Class (200~240V/380~440V)		Heater designation	Coil designation AC operated	Type ** application range (combination possible)	Number of aux. contacts Non-reversing Standard (special)	Certificate No.
	Rated capacity (kW)	Rated operational current (A)					
MS-N10CN**	2.5/4	11/9	0.12~9A	AC12V~AC500V	KP, SA, PM	1NO	20030103 04093078
MS-N11CN**	3.5/5.5	13/12	0.12~11A			1NO	
MS-N12CN**	3.5/5.5	13/12	0.12~11A			1NO1NC(2NO)	
MS-N20CN**	5.5/11	22/22	0.24~19A		KP, SA, PM	1NO1NC(2NO)	20030103 04093077
MS-N21CN**	5.5/11	22/22	0.24~19A			2NO2NC	20030103 04093076
MS-N25CN**	7.5/15	30/30	0.24~22A			2NO2NC	
MS-N35CN**	11/18.5	40/40	0.24~35A	AC24V~AC500V		2NO2NC	20030103 04093073
MS-N50CNKP**	15/22	55/50	15~54A		2NO2NC		
MS-N65CNKP**	18.5/30	65/65	15~54A		2NO2NC	20030103 04093064	
MS-N80CNKP**	22/45	85/85	15~67A		2NO2NC		
MS-N95CNKP**	30/55	105/105	15~95A		PM	2NO2NC	20030103 04093067
MS-N125CNKP	37/60	125/120	42~105A			2NO2NC	20030103 04093079
MS-N150CNKP	45/75	150/150	42~125A	AC48V~AC500V	2NO2NC	20030103 04093070	
MS-N180CNKP	55/90	180/180	82~150A		2NO2NC		
MS-N220CNKP	75/132	250/250	82~210A		2NO2NC	20030103 04093066	
MS-N300CNKP	90/160	300/300	105~250A		2NO2NC		
MS-N400CNKP	125/220	400/400	105~330A		2NO2NC		

### Without Enclosure

Table 1.1.4 (1-2)

Model Name MSO : AC operated MSOD : DC operated 2X : Reversing type	Approval rating AC-3 Class (200~240V/380~440V)		Heater designation	Coil designation AC operated (MSO type) DC operated (MSOD type)	Type ** application range (combination possible)	Number of aux. contacts Non-reversing Standard (special)	Certificate No.	
	Rated capacity (kW)	Rated operational current (A)						
MSO-(2X)N10**	2.5/4	11/9	0.12-9A	AC12V~AC500V DC12V~DC220V	CX, KP, SA, SR	1NO(1NC)	20020103 04093078	
MSO(D)-(2X)N11**	3.5/5.5	13/12	0.12-11A			1NO(1NC)		
MSO(D)-N12**	3.5/5.5	13/12	0.12-11A			1NO1NC(2NO)		
MSO-(2X)N18**	4.5/7.5	18/16	0.12-15A		CX, SA	—	20020103 04093077	
MSO-(2X)N20**	5.5/11	22/22	0.24-19A			1NO1NC(2NO)		
MSO(D)-(2X)N21**	5.5/11	22/22	0.24-19A			CX, KP, SA, SR		2NO2NC
MSO-(2X)N25**	7.5/15	30/30	0.24-22A	2NO2NC				
MSO(D)-(2X)N35**	11/18.5	40/40	0.24-35A	AC24V~AC500V DC12V~DC220V	CX, SR	2NO2NC	20020103 04093073	
MSO(D)-(2X)N50KP**	15/22	55/50	15-42A			2NO2NC		
MSO(D)-(2X)N65KP**	18.5/30	65/65	15-54A			2NO2NC		20020103 04093064
MSO(D)-(2X)N80KP**	22/45	85/85	15-67A		2NO2NC			
MSO(D)-(2X)N95KP**	30/55	105/105	15-95A		DC12V~DC220V	2NO2NC	20020103 04093067	
MSO(D)-(2X)N125KP**	37/60	125/120	42-105A			2NO2NC	20020103 04093079	
MSO(D)-(2X)N150KP**	45/75	150/150	42-125A	AC48V~AC500V DC12V~DC220V	SR	2NO2NC	20020103 04093070	
MSO-(2X)N180KP**	55/90	180/180	82-150A			2NO2NC		
MSO(D)-(2X)N220KP**	75/132	250/250	82-210A			2NO2NC		20020103 04093066
MSO(D)-(2X)N300KP**	90/160	300/300	105-250A		2NO2NC			
MSO(D)-(2X)N400KP**	125/220	400/400	105-330A		2NO2NC			

Notes: 1. The MSO-(2X)N10KP, MSO(D)-(2X)N11KP or MSO(D)-N12KP type with heater designation 0.12A and 0.17A are not certified.  
2. MSO-(2X)N18KP type is not certified.

## Magnetic Contactors

### • General Type Contactors

Table 1.1.4 (2-1)

Model Name S : AC operated SD : DC operated 2X : Reversing type	Approval rating AC-3 Class (200~240V/380~440V)		Conventional free air thermal current Ith (A)	Coil designation AC operated (S type) DC operated (SD type)	Type ** application range (combination possible)	Number of aux. contacts Non-reversing Standard (special)	Certificate No.		
	Rated capacity (kW)	Rated operational current (A)							
S-(2X)N10**	2.5/4	11/9	20	AC12V~AC500V DC12V~DC220V	CX, SA	1NO (1NC)	20020103 04023375		
S(D)-(2X)N11**	3.5/5.5	13/12	20			1NO (1NC)			
S(D)-N12**	3.5/5.5	13/12	20			1NO1NC(2NO)			
S-(2X)N18**	4.5/7.5	18/16	25			–	20020103 04023377		
S-(2X)N20**	5.5/11	22/22	32			1NO1NC (2NO)			
S(D)-(2X)N21**	5.5/11	22/22	32			2NO2NC			
S-(2X)N25**	7.5/15	30/30	50	AC24V~AC500V DC12V~DC220V	CX	2NO2NC	20020103 04024684		
S(D)-(2X)N35**	11/18.5	40/40	60			2NO2NC			
S(D)-(2X)N50**	15/22	55/50	80			2NO2NC	20020103 04024704		
S(D)-(2X)N65**	18.5/30	65/65	100			2NO2NC			
S(D)-(2X)N80	22/45	85/85	135			2NO2NC	20020103 04024705		
S(D)-(2X)N95	30/55	105/105	150			2NO2NC			
S(D)-(2X)N125	37/60	125/120	150			2NO2NC	20020103 04024706		
S(D)-(2X)N150	45/75	150/150	200			2NO2NC	20020103 04024707		
S-(2X)N180	55/90	180/180	260			AC48V~AC500V DC12V~DC220V	–	2NO2NC	20020103 04024708
S(D)-(2X)N220	75/132	250/250	260					2NO2NC	
S(D)-(2X)N300	90/160	300/300	350					2NO2NC	20020103 04024709
S(D)-(2X)N400	125/220	400/400	450					2NO2NC	
S(D)-(2X)N600CN	190/330	630/630	660	AC100V~AC500V DC24V~DC220V	–			2NO2NC	20030103 04095569
S(D)-(2X)N800CN	220/440	800/800	800					2NO2NC	

### • Mechanically Latched Contactors

Table 1.1.4 (2-2)

Model Name SL : AC operated SLD : DC operated 2X : Reversing type	Approval rating AC-3 Class (200~240V/380~440V)		Conventional free air thermal current Ith (A)	Coil designation AC operated (SL type) DC operated (SLD type)	Type ** application range (combination possible)	Number of aux. contacts Non-reversing Standard	Certificate No.	
	Rated capacity (kW)	Rated operational current (A)						
SL(D)-(2X)N21**	5.5/11	22/22	32	AC100V~AC500V DC12V~DC200V	CX, SA	2NO2NC	20020103 04023377	
SL(D)-(2X)N35**	11/18.5	40/40	60			2NO2NC		
SL(D)-(2X)N50**	15/22	55/50	80			2NO2NC	20020103 04024704	
SL(D)-(2X)N65**	18.5/30	65/65	100		2NO2NC			
SL(D)-(2X)N80	22/45	85/85	135		–	CX	2NO2NC	20020103 04024705
SL(D)-(2X)N95	30/55	105/105	150				2NO2NC	
SL(D)-(2X)N125	37/60	125/120	150				2NO2NC	20020103 04024706
SL(D)-(2X)N150	45/75	150/150	200				2NO2NC	20020103 04024707
SL(D)-(2X)N220	75/132	250/250	260				2NO2NC	20020103 04024708
SL(D)-(2X)N300	90/160	300/300	350				2NO2NC	20020103 04024709
SL(D)-(2X)N400	125/220	400/400	450		2NO2NC			
SL(D)-(2X)N600CN	190/330	630/630	660		AC100V~AC500V DC24V~DC200V	–	1NO2NC	20030103 04095569
SL(D)-(2X)N800CN	220/440	800/800	800	2NO2NC				

### • 3-Pole Contactors

Table 1.1.4 (2-3)

Model Name S : AC operated 2X : Reversing type	Approval rating AC-3 Class (200~240V/380~440V)		Conventional free air thermal current Ith (A)	Coil designation AC operated (S type)	Type ** application range (combination possible)	Number of aux. contacts Non-reversing Standard	Certificate No.
	Rated capacity (kW)	Rated operational current (A)					
S-(2X)N18**	4.5/7.5	18/16	25	AC12V~AC500V	CX, SA	–	20020103 04023377
S-(2X)N28**	7.5/7.5	26/17	30			–	
S-(2X)N38**	11/15	39/32	60			–	
S-(2X)N48**	15/18.5	50/40	80			–	20020103 04024684

### • NC Main Contact Type Contactors

Table 1.1.4 (2-4)

Model Name B : AC operated BD : DC operated	Main contact Arrangement	Certification ratings (A)			Conventional free air thermal current Ith (A)	Coil designation AC operated (B type) DC operated (BD type)	Type ** application range (combination possible)	Number of aux. contacts Non-reversing	Certificate No.
		Number of series	DC-3,5 NC	DC-1 NC					
B(D)-N20CN**	B: 1NO2NC, 3NC	DC110V 2P	8	15	25	AC24V~AC500V DC12V~DC220V	SA	2NO	20020103 04023377
		3P	15	20					
		DC220V 2P	1	5					
B(D)-N65CN	BD: 1NO2NC	3P	5	10	80	–	–	2NO2NC	20020103 04024705
		DC110V 2P	20	30					
		3P	50	65					
B(D)-N100CN	B:1NO2NC BD:1NO2NC	DC220V 2P	3	10	120	–	–	2NO2NC	20020103 04024706
		3P	20	30					
		DC110V 2P	30	40					
		DC220V 2P	3	20					

## ■ Thermal overload relay

### ● Three heater type with phase failure protection

Table 1.1.4 (3-1)

Model Name	Heater designation	Type ** application range (combination possible)	Combination magnetic contactor	Certificate No.
TH-N12KP**	0.24A, 0.35A, 0.5A, 0.7A, 0.9A, 1.3A, 1.7A, 2.1A, 2.5A, 3.6A, 5A, 6.6A, 9A, 11A	CX, HZ	S-N10-N12	20020103 09024710
TH-N20KP**	0.24A, 0.35A, 0.5A, 0.7A, 0.9A, 1.3A, 1.7A, 2.1A, 2.5A, 3.6A, 5A, 6.6A, 9A, 11A, 15A	CX, HZ, SR	S-N20-N35	20020103 09024712
TH-N20TAKP**	22A, 29A	CX, SR	S-N25, N35	
TH-N60KP**	15A, 22A, 29A, 35A, 42A, 54A	CX, SR	S-N50-N95	20020103 09024714
TH-N60TAKP**	67A, 82A	SR	S-N80, N95	
TH-N120KP**	42A, 54A, 67A, 82A	HZ, SR	S-N125, N150	20020103 09024724
TH-N120TAKP**	105A, 125A	SR		
TH-N220RHKP**	82A, 105A, 125A, 150A, 180A, 210A <sup>2</sup>	SR	S-N180, N220	20020103 09024719
TH-N220HZKP**			Dedicated for independent mounting	
TH-N400RHKP**	105A, 125A, 150A, 180A, 250A, 330A		S-N300, N400	
TH-N400HZKP**			Dedicated for independent mounting	
TH-N600KP**	250A, 330A, 500A, 660A		Dedicated for independent mounting	20030103 04095454

Note: 1. The TH-N12KP\*\* type with heater designation 0.12A and 0.17A, and the TH-N18KP\*\* type are not certified.

2. Heater designation 210A are certified for S-N220 type.

### ● Two heater type

Table 1.1.4 (3-2)

Model Name	Heater designation	Type ** application range (combination possible)	Combination magnetic contactor	Certificate No.
TH-N12**	0.12A, 0.17A, 0.24A, 0.35A, 0.5A, 0.7A, 0.9A, 1.3A, 1.7A, 2.1A, 2.5A, 3.6A, 5A, 6.6A, 9A, 11A	CX, HZ, SR	S-N10-N12	20020103 09024701
TH-N18**	1.3A, 1.7A, 2.1A, 2.5A, 3.6A, 5A, 6.6A, 9A, 11A, 15A	CX, DM	S-N18	20020103 09024702
TH-N20**	0.24A, 0.35A, 0.5A, 0.7A, 0.9A, 1.3A, 1.7A, 2.1A, 2.5A, 3.6A, 5A, 6.6A, 9A, 11A, 15A	CX, HZ, SR	S-N20-N35	20020103 09024703
TH-N20TA**	22A, 29A, 35A <sup>1</sup>	CX, SR	S-N25, N35	

Note: 1. Heater designation 35A are certified for S-N35 type.

## ■ Auxiliary contact block

Table 1.1.4 (4)

Model Name	Available contact arrangements	Type ** application range (combination possible)	Applicable magnetic contactor	Certificate No.
UN-AX2CN**	2NO, 1NO1NC	CX	S-N10-N65	20020103 03024700
UN-AX4CN**	4NO, 3NO1NC, 2NO2NC		S-N10, N11, N20-N65	
UN-AX11CN**	1NO1NC			
UN-AX80CN	1NO1NC	-	S-N80-N125	20020103 03024720
UN-AX150CN	1NO1NC		S-N150-N400	20020103 03024722
UN-AX600CN	2NO2NC		S-N600, N800	
UN-LL22CN**	1NO1NC(low level), 1NO1NC(standard)	CX	S-N10-N65, SR-N4	20020103 03024720

## ■ DC interface contactor

### ● Magnetic motor starter

Table 1.1.4 (5-1)

Model Name Q : Non-reversing type QR : Reversing type	Approval rating AC-3 Class (200~240V/380~440V)		Heater designation	Coil designation DC operation	Type ** application range (combination possible)	Number of aux. contacts Standard (special)	Certificate No.
	Rated capacity (kW)	Rated operational current (A)					
MSOD-Q11**	3/4	12/9	0.12~11A	DC24V	CX, KP	1NO(1NC)	20030103 04093069
MSOD-Q12**						1NO1NC(2NO)	
MSOD-Q19**	4.5/5.5	18/13	1.3~15A		CX	1NO1NC(2NO)	20030103 04093080
MSOD-QR11**	3/4	12/9	0.12~11A	DC24V	CX, KP	2NC	20030103 04093069
MSOD-QR12**						2NO2NC	
MSOD-QR19**	4.5/5.5	18/13	1.3~15A		CX	2NO2NC	20030103 04093080

Note: 1. Heater designation 0.12A and 0.17A are not certified for MSOD-Q11KP and Q12KP types.

### ● Magnetic contactor

Table 1.1.4 (5-2)

Model Name Q : Non-reversing type QR : Reversing type	Approval rating AC-3 Class (200~240V/380~440V)		Conventional free air thermal current Ith (A)	Coil designation DC operation	Number of aux. contacts Standard (special)	Certificate No.
	Rated capacity (kW)	Rated operational current (A)				
SD-Q11	3/4	12/9	20	DC24V	1NO(1NC)	20030103 04095567
SD-Q12					1NO1NC(2NO)	
SD-Q19	4.5/5.5	18/13	30		1NO1NC(2NO)	20030103 04086213
SD-QR11	3/4	12/9	20	DC24V	2NC	20030103 04095567
SD-QR12					2NO2NC	
SD-QR19	4.5/5.5	18/13	30		2NO2NC	20030103 04086213

## ■ Contactor Relays

Table 1.1.4 (6)

Model Name SR : AC operated SRD : DC operated SRL : AC operated SRLD : DC operated	Coil designation		Type ** application range (combination possible)	Available contact arrangement	Certificate No.
	AC operated (SR, SRL type) DC operated (SRD, SRLD type)				
SR-N4**	AC12V~AC440V		CX, SA	4NO, 3NO1NC, 2NO2NC	20020103 03024696
SRD-N4**	DC12V~DC220V				
SRL-N4**	AC100V~AC440V			4NO, 3NO1NC, 2NO2NC	
SRLD-N4**	DC12V~DC200V				

## ■ Pneumatic Time Delay Relays

Table 1.1.4 (7)

Model Name SRT : AC operated SRTD : DC operated	Coil designation		Type ** application range (combination possible)	Available contact arrangement	Certificate No.
	AC operated (SRT type) DC operated (SRTD type)				
SRT(D)-NNCN**	AC12V~AC440V		CX, SA	Instantaneous : 2NO2NC Delayed : 1NO1NC	20050103 03152666
SRT(D)-NFCN**	DC12V~DC220V				

## ■ Solid State Contactors

### • 2-elements type

Table 1.1.4 (8-1)

Model Name	Approval rating AC-51 class (A)	3-ph Heater capacity 220/380V AC-51 (kW)	3-ph Motor capacity 220-240/380-440V AC-53a (kW(A))	Rated operating voltage	Type ** application range (combination possible)	Certificate No.
US-N5SS**	5	1.9/-	0.4 (3.2) /-	DC12~24V	-	20060103 04174448
US-N8SS**	8	3.0/-	0.4 (3.2) /-			
US-N20**	20	7.6/13.1	2.2 (11.1) /3.7 (8.7)		CX, RM	20050103 04162980
US-N30**	30	11.4/19.7	3.7 (17.4) /7.5 (17.4)			
US-N40**	40	15.2/26.3	5.5 (26) /11 (26)		CX	
US-N50**	50	19.0/32.9	5.5 (26) /11 (26)			
US-N70NS**	70	26.6/-	11 (48) /-		-	20060103 04174451
US-N80NS**	80	30.4/-	11 (48) /-			
US-NH70NS**	65	24.7/42.7	11 (48) /22 (48)			
US-NH80NS**	75	28.5/49.3	11 (48) /22 (48)			

### • 3-elements type

Table 1.1.4 (8-2)

Model Name	Approval rating AC-51 class (A)	3-ph Heater capacity 220/380V AC-51 (kW)	3-ph Motor capacity 220-240/380-440V AC-53a (kW(A))	Rated operating voltage	Type ** application range (combination possible)	Certificate No.
US-N5SSTE	5	1.9/-	0.4 (3.2) /-	DC12~24V	-	20060103 04174448
US-N8SSTE	8	3.0/-	0.4 (3.2) /-			
US-N20TE**	20	7.6/13.1	2.2 (11.1) /3.7 (8.7)		CX, RM	20050103 04162980
US-N30TE**	30	11.4/19.7	3.7 (17.4) /7.5 (17.4)			
US-N40TE**	40	15.2/26.3	5.5 (26) /11 (26)		CX	
US-N50TE**	50	17.1/29.6	5.5 (26) /11 (26)			
US-N70NSTE	70	26.6/-	11 (48) /-		-	20060103 04174451
US-N80NSTE	80	30.4/-	11 (48) /-			
US-NH70NSTE	65	24.7/42.7	11 (48) /22 (48)			
US-NH80NSTE	75	28.5/49.3	11 (48) /22 (48)			

## ■ Medium Voltage Vacuum Contactors

Table 1.1.4 (9)

Model Name SH : AC operated SHD : DC operated SL : Mechanical Latched(AC operated) SLD : Mechanical Latched(DC operated)	Approval rating AC-3 Class (200~240V/380~440V/1000V)		Conventional free air thermal current Ith (A)	Coil designation	Number of aux. contacts Standard	Certificate No.
	Rated capacity (kW)	Rated operational current (A)				
SH(D)-V160CN	45/90/220	180/180/160	200	AC100V~AC500V DC100V, DC200V	2a2b	20060103 04201618
SH(D)-V320CN	75/150/400	320/320/320	350			
SH(D)-V400CN	95/200/500	400/400/400	450			
SHL(D)-V160CN	45/90/220	180/180/160	200	AC100V~AC500V DC100V, DC200V	SHL : 2a2b SHLD : 2a4b	20060103 04201618
SHL(D)-V320CN	75/150/400	320/320/320	350			
SHL(D)-V400CN	95/200/500	400/400/400	450			

## ■ Voltage Detection Relays

Table 1.1.4 (10)

Model Name	Detectable voltage range Min~Max	Output contact arrangement	Certificate No.
SRE-AACN	AC3V~AC250V	1c	20070103 03224330
SRE-AAUCN	DC0.1V~DC250V		
SRE-KCN	AC75V~AC250V, DC9V~DC105V		
SRE-KTCN	AC80V~AC260V, DC10V~DC115V		

## ■ Solid State Time Delay Relays

Table 1.1.4 (11)

Model Name	Control voltage designation	Output contact arrangement	Certificate No.
SRS-HNPSCN	AC100V, AC200V, AC400V	Instantaneous : 1c, Delayed : 1c	20070103 03224347

## 1.1.5 Approved Marine Standards

■ Lloyd's Register of Shipping (LR) 

■ Bureau Veritas (BV) 

Table 1.1.5 (1)

Type	Model Name	BV Certificate No.	LR Certificate No.	Note
Contactor	S-N10, N11, N12, N20, N21(CX)	06139	95/10008	AC-3 Maximum 550V Standard model can be applied.
	SD-N11, N12, N21(CX)(SA)	2634/6987	96/10035	
	S-N18, N25, N28, N35(CX)(SA)/SD-N35(CX)(SA)	2634/6988	96/10034	
	S/SD-N50, N65, N80, N95	2634/07905	98/10016	
	S/SD-N125, N150, N220, N300, N400, S-N180	2634/07905	98/10016	
	S/SD-N600, N800	2634/07905	98/10016	
Thermal Overload Relay	TH-N12 (CX)(KP), N20(CX)(KP)	06139	95/10009	Maximum 550V Standard model can be applied.
	TH-N18(CX)(KP), N20TA(CX)(KP)	2634/6988	96/10033	
	TH-N60(KP), N60TA(KP), N120(KP), N120TA(KP), N220(KP), N400(KP)	2634/07905	98/10017	
	TH-N600(KP)	2634/07905	98/10017	
Contactor Relay	SR-N4(CX)	06139	95/10010	AC-15 Maximum 550V Standard model can be applied.
	SRD-N4(CX)	2634/6987	96/10035	
Auxiliary Contact Block	UN-AX2, AX4, AX11(CX)	06139	95/10010	Standard model can be applied.
	UN-AX80, AX150, AX600	2634/07905	98/10016	

■ Korean Register of Shipping (KR) 

Table 1.1.5 (2)

Contactor Model Name	Certificate No.	Contactor Model Name	Certificate No.	Contactor Model Name	Certificate No.
S-N10(CX)	KOB02571-EL020	S-N21(CX)	KOB02571-EL020	S-N95	KOB02571-EL020
S-KR11	KOB02571-EL018	S-N25(CX)(SA)	KOB02571-EL020	S-N125	KOB02571-EL020
S-N11(CX)	KOB02571-EL020	S-N35(CX)(SA)	KOB02571-EL020	S-N150	KOB02571-EL020
S-N12(CX)	KOB02571-EL020	S-N50	KOB02571-EL020	S-N220	KOB02571-EL020
S-N18(CX)(SA)	KOB02571-EL020	S-N65	KOB02571-EL020	S-N300	KOB02571-EL020
S-N20(CX)	KOB02571-EL020	S-N80	KOB02571-EL020	S-N400	KOB02571-EL020

Note: 1. Standard models are applicable. (AC3 Max. 440V according to JEM standard.)

■ Nippon Kaiji Kyokai (NK) 

Table 1.1.5 (3)

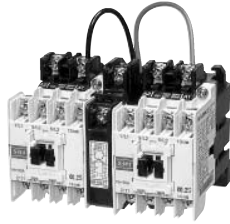
Contactor Model Name	Certificate No.	Contactor Model Name	Certificate No.	Contactor Model Name	Certificate No.		
S-N10(CX)	—	94T415	S-N125	SD-N125	98T407	SL(D)-N21NK	95T401
S-KR11	—	85T405	S-N150	SD-N150	98T408	SL(D)-N35NK	96T401
S-N11(CX)	SD-N11(CX)	94T416	S-N180	—	98T409	SL(D)-N50NK	98T413
S-N12(CX)	SD-N12(CX)	94T417	S-N220	SD-N220	98T410	SL(D)-N65NK	98T414
S-N18(CX)(SA)	—	95T404	S-N300	SD-N300	98T411	SL(D)-N80NK	98T415
S-N20(CX)	—	94T418	S-N400	SD-N400	98T412	SL(D)-N95NK	98T416
S-N21(CX)	SD-N21(CX)	94T419	S-N600	SD-N600	85T406	SL(D)-N125NK	98T417
S-N25(CX)(SA)	—	95T402	S-N800	SD-N800	85T407	SL(D)-N150NK	98T418
S-N35(CX)(SA)	SD-N35(CX)(SA)	95T403   96T401	S-N38(CX)(SA)	—	96T402	SL(D)-N220NK	98T419
S-N50	SD-N50	98T403	S-N48(CX)(SA)	—	96T403	SL(D)-N300NK	98T420
S-N65	SD-N65	98T404	B-N20	BD-N20	96T404	SL(D)-N400NK	98T421
S-N80	SD-N80	98T405	B-N65	BD-N65	01T401	SL(D)-N600NK	85T408
S-N95	SD-N95	98T406	B-N100	BD-N100	01T402	SL(D)-N800NK	85T409

Note: 1. Standard models are applicable. (AC3 Max. 440V according to JEM standard.)

## 1.2 Selection Guide



**S-N11CX**



**S-2xN11**



**MSO-N12**



**S-N21CX**



**MSO-N35**

Three-phase motor ratings IEC category AC-3 kW(hp)	220-240V	2.5(3-1/4)	3.5(4-1/2)	3.5(4-1/2)	4.5(6)	5.5(7-1/2)	5.5(7-1/2)	7.5(10)	11(15)
	380-440V	4(5-1/2)	5.5(7-1/2)	5.5(7-1/2)	7.5(10)	11(15)	11(15)	15(20)	18.5(25)
	500V	4(5-1/2)	5.5(7-1/2)	5.5(7-1/2)	7.5(10)	11(15)	11(15)	15(20)	18.5(25)
	690V	4(5-1/2)	5.5(7-1/2)	5.5(7-1/2)	7.5(10)	7.5(10)	7.5(10)	11(15)	15(20)
Conventional free air thermal current	Ith A	20	20	20	25	32	32	50	60
Auxiliary contacts <sup>1</sup>	(standard)	1NO	1NO	1NO+1NC	— <sup>2</sup>	1NO+1NC	2NO+2NC	2NO+2NC	2NO+2NC
	(special)	1NC	1NC	2NO	—	2NO	—	—	—
Number of additional auxiliary contact block for <sup>3</sup>	1NO + 1NC (front)	1	1	1	1	1	1	1	1
	1NO + 1NC (side)	2	2	—	—	2	2	2	2
	2NO + 2NC (front)	1	1	1	1	1	1	1	1
	Low level signal (front) [1NO+1NC (+Standard 1NO + 1NC)]	1	1	1	1	1	1	1	1

- Notes: 1. Number of auxiliary contact shows that for non-reversing type. Twice of the auxiliary contacts are provided on reversing type.  
 2. (2NO + 2NC) × 2 auxiliary contacts are provided on reversing type and no additional contact can be mounted.  
 3. Front clip-on and side clip-on block should not be mounted both.

## Contactors

AC operated models	Non-reversing	S-N10(CX)	S-N11(CX)	S-N12(CX)	S-N18(CX)	S-N20(CX)	S-N21(CX)	S-N25(CX)	S-N35(CX)
	Reversing	S-2xN10(CX)	S-2xN11(CX)	—	S-2xN18(CX)	S-2xN20(CX)	S-2xN21(CX)	S-2xN25(CX)	S-2xN35(CX)
DC operated models		—	SD-N11(CX)	SD-N12(CX)	—	—	SD-N21(CX)	—	SD-N35(CX)

- Note: 1. Products which model names are provided with suffix “CX” are provided with finger protection. (N10~N65)  
 Especially N10~N35 with suffix “CX” are provided with CAN terminals.

## Staters (AC operated)

Enclosed type (IP20)	MS-N10 (KP)	MS-N11 (KP)	MS-N12 (KP)	—	MS-N20 (KP)	MS-N21 (KP)	MS-N25 (KP)	MS-N35 (KP)
Open type (IP00)	MSO-N10 (KP)(CX)	MSO-N11 (KP)(CX)	MSO-N12 (KP)(CX)	MSO-N18 (KP)(CX)	MSO-N20 (KP)(CX)	MSO-N21 (KP)(CX)	MSO-N25 (KP)(CX)	MSO-N35 (KP)(CX)

## Thermal Overload Relays<sup>1</sup>

Three heater type with phase failure protection	TH-N12KP(CX)	TH-N18KP(CX)	TH-N20KP(CX)	TH-N20TAKP(CX)
Two heater type	TH-N12(CX)	TH-N18(CX)	TH-N20(CX)	TH-N20TA(CX)
Heater setting range A (Ordering designation)	0.1~0.16(0.12A) 0.14~0.22(0.17A) 0.2~0.32(0.24A) 0.28~0.42(0.35A) 0.4~0.6(0.5A) 0.55~0.85(0.7A) 0.7~1.1(0.9A) 1~1.6(1.3A) 1.4~2(1.7A)	1.7~2.5(2.1A) 2~3(2.5A) 2.8~4.4(3.6A) 4~6(5A) 5.2~8(6.6A) 7~11(9A) 9~13(11A) <sup>2</sup>	1~1.6(1.3A) 1.4~2(1.7A) 1.7~2.5(2.1A) 2~3(2.5A) 2.8~4.4(3.6A) 4~6(5A) 5.2~8(6.6A) 7~11(9A) 9~13(11A) 12~18(15A)	0.2~0.32(0.24A) 0.28~0.42(0.35A) 0.4~0.6(0.5A) 0.55~0.85(0.7A) 0.7~1.1(0.9A) 1~1.6(1.3A) 1.4~2(1.7A) 1.7~2.5(2.1A)
			2~3(2.5A) 2.8~4.4(3.6A) 4~6(5A) 5.2~8(6.6A) 7~11(9A) 9~13(11A) 12~18(15A)	18~26(22A) 24~34(29A) 30~40(35A) <sup>3</sup>

- Notes: 1. Saturable reactors for thermal overload relays are available as a kit or equipped with the relay. The suffix “SR” following the model name of the relay indicates “with saturable reactor”. (ex. TH-N20KPSR\*5A) (Except for type TH-N12KP, TH-N18 and TH-N18KP)  
 2. Except for size N10.  
 3. For size N35 only.





**S-N65**



**S-N125**



**S-N400**



**S-N800**

Table 1.2.1

15(20)	18.5(25)	22(30)	30(40)	37(50)	45(60)	55(75)	75(100)	90(125)	125(170)	190(250)	220(300)
22(30)	30(40)	45(60)	55(75)	60(80)	75(100)	90(125)	132(180)	160(210)	220(300)	330(450)	440(600)
25(34)	37(50)	45(60)	55(75)	60(80)	90(125)	110(150)	132(180)	160(210)	225(330)	330(450)	500(670)
22(30)	30(40)	45(60)	55(75)	60(80)	90(125)	110(150)	132(180)	200(270)	250(330)	330(450)	500(670)
80	100	135	150	150	200	260	260	350	450	800	1000
2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC	2NO+2NC
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	2	2	2	2	2	2	2	2	—	—
1	1	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	—	—

S-N50(CX)	S-N65(CX)	S-N80	S-N95	S-N125	S-N150	S-N180	S-N220	S-N300	S-N400	S-N600	S-N800
S-2xN50(CX)	S-2xN65(CX)	S-2xN80	S-2xN95	S-2xN125	S-2xN150	S-2xN180	S-2xN220	S-2xN300	S-2xN400	S-2xN600	S-2xN800
SD-N50	SD-N65	SD-N80	SD-N95	SD-N125	SD-N150	—	SD-N220	SD-N300	SD-N400	SD-N600	SD-N800

MS-N50 (KP)	MS-N65 (KP)	MS-N80 (KP)	MS-N95 (KP)	MS-N125 (KP)	MS-N150 (KP)	MS-N180 (KP)	MS-N220 (KP)	MS-N300 (KP)	MS-N400 (KP)	—	—
MSO-N50 (KP)(CX)	MSO-N65 (KP)(CX)	MSO-N80 (KP)	MSO-N95 (KP)	MSO-N125 (KP)	MSO-N150 (KP)	MSO-N180 (KP)	MSO-N220 (KP)	MSO-N300 (KP)	MSO-N400 (KP)	—	—



TH-N60KP(CX)	TH-N60TAKP	TH-N120KP	TH-N120TAKP	TH-N220RHKP	TH-N400RHKP	TH-N600KP <sup>8</sup>
TH-N60(CX)	TH-N60TA	TH-N120	TH-N120TA	TH-N220RH	TH-N400RH	TH-N600 <sup>9</sup>
12~18(15A) 18~26(22A) 24~34(29A) 30~40(35A) 34~50(42A) 43~65(54A)	54~80 (67A) 65~100(82A) 85~105(95A) <sup>4</sup>	34~50 (42A) 43~65 (54A) 54~80 (67A) 65~100(82A)	85~125 (105A) 100~150(125A) <sup>5</sup>	65~100 (82A) 85~125 (105A) 100~150(125A) 120~180(150A) 140~220(180A) <sup>6</sup> 170~250(210A) <sup>6</sup>	85~125 (105A) 100~150(125A) 120~180(150A) 140~220(180A) 200~300(250A) 260~400(330A) <sup>7</sup>	200~300(250A) 260~400(330A) 400~600(500A) 520~800(660A) <sup>9</sup>

4. For size N95 only. 5. For size N150 only. 6. For size N220 only. 7. For size N400 only.  
8. TH-N600(KP) must be used with the current transformers (to be supplied by the customer.) See Table 2.1.2.  
9. For size N800 only.



# 1.3 The Overview (Type designation breakdown)

## 1.3.1 Non-Reversing Types

Table 1.3.1

Frame Size		N10	N11	N12	N18	N20	N21	N25	N35	N50	N65	N80	N95	N125	N150	N180	N220	N300	N400	N600	N800				
Spec	Rated capacity	220-240V	2.5	3.5	3.5	4.5	5.5	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	125	190	220			
	Category AC-3(kW)	380-440V	4	5.5	5.5	7.5	11	11	15	18.5	22	30	45	55	60	75	90	132	160	220	330	440			
Spec	Number of aux. contacts	Standard	1NO	1NO	1NO1NC	—	1NO1NC	← 2NO2NC →																	
		Special	1NC	1NC	2NO	—	2NO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
ACCESSORIES	Additional aux. contact blocks	Front-on <sup>1</sup>	← 2P or 4P →										—	—	—	—	—	—	—	—	—	—			
		Side-on	← 1NO1NC×2(max.) →		—	← 1NO1NC×2(max.) →															2NO2NC×1(max.)				
	Surge absorber <sup>3</sup>	← Attachable →										← Provided as a standard →													
	Mechanical interlock unit	← Attachable →		—	← Attachable →																	—	—		
CONTACTORS	Open	AC operated	S-□	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
		DC operated	SD-□	—	○	○	—	—	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Finger protected	S-□CX	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
			SD-□CX	—	○	○	—	—	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Mechanically latched	SL(D)-□	—	—	—	—	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
STARTERS	Open	AC operated	MSO-□	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
		DC operated	MSOD-□	—	○	○	—	—	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		With phase failure protection	MSO-□KP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	Slow trip type		○	○	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	with saturable reactor	MSO-□SR	○	○	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	Quick-trip type		—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	with 2 heater elements	MSO-□FS	○	○	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
	with phase failure protection	MSO-□KF	○	○	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
Enclosed Class IP20	Standard type	MS-□	○	○	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
	With push button	MS-□PM	○	○	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
	With phase failure protection	MS-□KP	○	○	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
	Mounting on 35mm rail	← Available →										—	—	—	—	—	—	—	—	—	—	—			

Notes: 1. Additional head-on type aux. contact blocks cannot be attached to the enclosed type, mechanically latched type of size N50 & N65.  
 2. Surge absorber is provided as a standard on ac operated contactors and starters of sizes N50 to N800.

### 1.3.2 Reversing Type

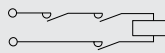
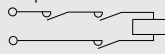
Table 1.3.2

Frame Size		2x N10	2x N11	2x N18	2x N20	2x N21	2x N25	2x N35	2x N50	2x N65	2x N80	2x N95	2x N125	2x N150	2x N180	2x N220	2x N300	2x N400	2x N600	2x N800	
Rated capacity	220-240V	2.5	3.5	4.5	5.5	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	125	190	220	
	380-440V	4	5.5	7.5	11	11	15	18.5	22	30	45	55	60	75	90	132	160	220	330	440	
Category AC-3(kW)	220-240V	4	5.5	7.5	11	11	15	18.5	22	30	45	55	60	75	90	132	160	220	330	440	
	380-440V	4	5.5	7.5	11	11	15	18.5	22	30	45	55	60	75	90	132	160	220	330	440	
Number of aux. contacts	Standard	←1NO1NC×2		2NO2NC	1NO1NC	←2NO2NC×2										←3NO3NC×2			←4NO4NC		
	Special	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Additional aux. contact blocks	Front-on <sup>1</sup>	←4P×2 2P×2		—	←4P×2 2P×2										—	—	—	—	—	—	—
	Side-on	1NO1NC×2		—	←1NO1NC×2										—	—	—	—	—	—	—
Surge absorber <sup>2</sup>		←Attachable										←Provided as a standard									
CONTACTORS Open	AC operated	S-□	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	DC operated	SD-□	—	○	—	—	○	—	○	—	○	—	○	—	○	—	○	—	○	—	○
	Finger protected	S-□CX	○	○	○	○	○	○	○	○	○	—	—	—	—	—	—	—	—	—	—
	Mechanically latched	SL(D)-□	—	—	—	—	○	—	○	—	○	—	○	—	○	—	○	—	○	—	○
STARTERS Open	AC operated	MSO-□	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	DC operated	MSOD-□	—	○	—	—	○	—	○	—	○	—	○	—	○	—	○	—	○	—	○
	With phase failure protection	MSO-□KP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Slow trip type		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	with saturable reactor	MSO-□SR	○	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Quick-trip type		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
STARTERS Enclosed (IP20)	with 2 heater elements	MSO-□FS	—	—	—	○	○	○	○	○	○	—	—	—	—	—	—	—	—	—	—
	with phase failure protection	MSO-□KF	○	○	—	○	○	○	○	○	○	—	—	—	—	—	—	—	—	—	—
	Standard type	MS-□	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	With phase failure protection	MS-□KP	○	○	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Mounting on 35mm rail		←Available <sup>3</sup>										—	—	—	—	—	—	—	—	—	

Notes: 1. Additional head-on type aux. contact blocks cannot be attached to the enclosed type, mechanically latched type of size N50 & N65.  
 2. Surge absorber is provided as a standard on ac operated contactors and starters of sizes 2xN50 to 2xN800.  
 3. Remove a mounting plate for mounting on 35mm rail of sizes 2xN25 to 2xN65.

# 1.4 Technical Data of Series S-N Contactors

## 1.4.1 Ratings and Characteristics

Contactor	Type	S/SD-			S/SD-			S/SD-		S/SD-	
		S-N10	N11, N12	S-N18	S-N20	N21	S-N25	N35	N50	N65	
Rated insulation voltage	V	690	690	690	690	690	690	690	690	690	
Conventional free air thermal current	I <sub>th</sub>	A	20	20	25	32	32	50	60	80	100
Rated capacity for resistive loads											
3-ph, Category AC-1	220-240V	kW(A)	7.5(20)	7.5(20)	9.5(25)	12(32)	12(32)	18(50)	20(60)	30(80)	35(100)
	380-440V	kW(A)	7(11)	8.5(13)	13(20)	20(32)	20(32)	30(50)	35(60)	50(80)	65(100)
	500V	kW(A)	7(8)	9.5(11)	13(16)	25(32)	25(32)	40(50)	50(60)	65(80)	85(100)
	690V	kW(A)	7(6)	8(8)	11(10)	30(32)	30(32)	50(50)	60(60)	80(80)	100(100)
Rated operational current											
3-ph, Category AC-3	220-240V	A	11	13	18	22	22	30	40	55	65
	380-440V	A	9	12	16	22	22	30	40	50	65
	500V	A	7	9	13	17	17	24	32	38	60
	690V	A	5	7	9	9	9	12	17	26	38
Rated capacity for jogging of AC motors											
3-ph, category AC-4 Electrical life is ca. 200,000 operations	220-240V	kW	0.75	1.1	1.5	2.2	2.2	3	3.7	5.5	7.5
	380-440V	kW	1.1	1.5	2.2	3.7	3.7	5.5	5.5	7.5	11
	500V	kW	1.1	1.5	2.2	3.7	3.7	5.5	5.5	7.5	11
	690V	kW	1.1	1.5	2.2	3.7	3.7	5.5	5.5	7.5	11
Max. current for AC-4 duty at 440V	A	6	9	9	13	13	17	24	32	47	
Rated current for DC non-inductive loads											
Category DC-1 100 operations/hour max. 500,000 operations	48V	A	10	12	12	20	20	25	35	50	65
	110V	A	8	12	12	20	20	25	35	50	65
	220V	A	8	12	12	20	20	22	30	40	50
											
Rated Current for DC motors											
Category DC-2 & DC-4 100 operations/hour max. 500,000operations	48V	A	6	10	10	20	20	25	30	35	40
	110V	A	4	8	8	15	15	20	20	30	35
	220V	A	2	4	4	8	8	10	10	12	15
											
Applicable standard: JEM-1038 (JAPAN)											
Rated capacity for 3-ph. capacitors <sup>1</sup>											
120 operations/hour max. Electrical durability at maximum load: 100,000 operations (ambient temperature 40°C)	220-240V	kvar	2.2	3	4	5.5	5.5	8.5	12	20	20
	380-440V	kvar	3.3	4	6	10	10	14	20	40	40
	550V	kvar	4	5	6	10	10	14	20	30	35
	690V	kvar	3.3	4.5	5.5	10	10	14	20	30	40
Making & breaking											
3-ph, cosθ=0.35 240V/440V	Making current	A	110/110	130/120	180/180	220/220	220/220	300/300	400/400	550/460	650/620
	Breaking current	A	100/72	120/100	180/130	220/220	220/220	300/240	400/320	550/460	650/620
Switching frequency											
Category AC-1 Category AC-3 Category AC-4	operations/hour		1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,200	1,200
	operations/hour		1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,200	1,200
	operations/hour		600	600	600	600	600	600	600	600	600
Operating time (at rated coil voltage)											
AC operated	Closing	ms	15	15	15	15	15	15	15	25	25
	Opening	ms	10	10	10	10	10	10	10	53	53
DC operated	Closing	ms	—	45	—	—	33	—	50	57	57
	Opening	ms	—	10	—	—	12	—	13	15	15
Coil consumption (at rated coil voltage)											
AC operated	Inrush	VA	45	45	60	90	90	110	110	115	115
	Sealed	VA	7	7	10	15	15	13	13	20	20
	Watts	W	2.4	2.4	3	4	4	4.3	4.3	2.2	2.2
DC operated	Inrush	VA	—	7	—	—	9	—	9	18	18
	Sealed	VA	—	7	—	—	9	—	9	18	18
Coil voltage tolerance			0.85 to 1.1 times rated coil voltage								
Mechanical endurance (make/break operations)		million	10	10	10	10	10	10	10	5	5
Permissible ambient temperature		°C	-25 to +55								
Vibration (10-55 Hertz)		m/s <sup>2</sup>	19.6								
Shock (10 ms half sine wave)		m/s <sup>2</sup>	49								
Conductor size	Main terminal (contactor)	mm <sup>2</sup>	1-2.5	1-2.5	1-6	1-6	1-6	1-6	2-16	2-16	2-25
	Main terminal (overload relay)	mm <sup>2</sup>	1-2.5	1-2.5	1-6	1-6	1-6	2-16	2-16	2-25	2-25
Control terminal		mm <sup>2</sup>	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
Busbar width		mm	—	—	—	—	—	—	—	—	—

Notes: 1. 660A at ambient temperature 40-55°C. 2. 800A at ambient temperature 40-55°C.

3. Conductor size in parentheses indicate compression terminal style not for bare clamping.

4. The peak value of inrush current should be less than 2000% of the effective value for rated current of capacitors.

The selection is invalid for the circuit of parallel capacitors which are controlled individually.

Table 1.4.1 (1)

S/SD-N80	S/SD-N95	S/SD-N125	S/SD-N150	S-N180	S/SD-N220	S/SD-N300	S/SD-N400	S/SD-N600	S/SD-N800
690	690	690	690	690	690	690	690	690	690
135	150	150	200	260	260	350	450	800 <sup>1</sup>	1000 <sup>2</sup>
50(135)	55(150)	55(150)	75(200)	95(260)	95(260)	130(350)	170(450)	250(660)	300(800)
85(135)	90(150)	90(150)	130(200)	170(260)	170(260)	230(350)	290(450)	430(660)	530(800)
110(135)	120(150)	120(150)	170(200)	220(260)	220(260)	300(350)	380(450)	570(660)	700(800)
135(135)	150(150)	150(150)	200(200)	260(260)	260(260)	350(350)	450(450)	660(660)	900(800)
85	105	125	150	180	250	300	400	630	800
85	105	120	150	180	250	300	400	630	800
75	85	90	140	180	200	250	350	500	720
52	65	70	100	120	150	220	300	420	630
7.5	11	15	18.5	22	22	37	45	65	75
15	18.5	22	30	37	45	60	75	110	130
15	18.5	22	37	45	55	60	90	130	150
15	18.5	22	30	50	55	75	90	130	150
62	75	90	110	150	180	220	300	400	630
80	93	120	150	180	220	300	400	630	800
80	93	100	150	180	220	300	400	630	800
60	70	80	150	180	220	300	300	630	800
60	90	90	130	180	220	280	280	630	630
50	80	80	120	150	150	200	200	630	630
20	50	50	80	100	100	150	150	630	630
35	35	38	50	60	60	95	115	190	190
60	60	65	80	120	120	150	200	350	350
48	60	65	80	150	150	200	250	350	350
50	60	65	80	150	150	200	200	400	400
850/850	1050/1050	1250/1250	1500/1500	1800/1800	2500/2500	3000/3000	4000/4000	6500/6500	8000/8000
800/750	930/930	1000/1000	1200/1200	1450/1450	2000/2000	2400/2400	3200/3200	5040/5040	6400/6400
1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
600	300	300	300	300	300	300	300	300	300
27	27	25	27	30	30	35	35	65	65
75	75	85	85	100	100	120	120	75	75
75	75	125	135	—	145	175	175	105	105
18	18	22	37	—	40	55	55	80	80
210	210	270	270	440	440	440	440	790	790
23	23	24	24	40	40	50	50	90	90
2.8	2.8	2.9	2.9	4.2	4.2	6.1	6.1	17	17
24	24	31	31	—	41	55	55	600	600
24	24	31	31	—	41	55	55	72	72
0.85 to 1.1 times rated coil voltage									
5	5	5	5	5	5	5	5	5	5
-25 to +55									
19.6									
49									
2-60	(2-60) <sup>3</sup>	(6-70) <sup>3</sup>	(6-95) <sup>3</sup>	(10-120) <sup>3</sup>	(10-150) <sup>3</sup>	(25-240) <sup>3</sup>	(25-240) <sup>3</sup>	(70-325) <sup>3</sup>	(70-325) <sup>3</sup>
2-50	2-50	(6-70) <sup>3</sup>	(6-95) <sup>3</sup>	(10-120) <sup>3</sup>	(10-150) <sup>3</sup>	(25-240) <sup>3</sup>	(25-240) <sup>3</sup>	—	—
1-2.5	1-2.5	1-2.5	1-2.5	1-2.5	1-2.5	1-2.5	1-2.5	1-4	1-4
15	15	15	20	25	25	30	30	35	35

### Rated operating current of auxiliary contacts

Table 1.4.1 (2)

Conventional free air thermal current	A	16
Rated operating current		
Category 120VAC	A	6
AC-15 240VAC	A	5
500VAC	A	3
660VAC	A	1.5
Category 24VDC	A	5
48VDC	A	3
DC-13 110VDC	A	0.6
	A	0.8 <sup>1</sup>
220VDC	A	0.2

Note: 1 UN-AX2(CX), UN-AX4(CX), UN-AX11(CX).

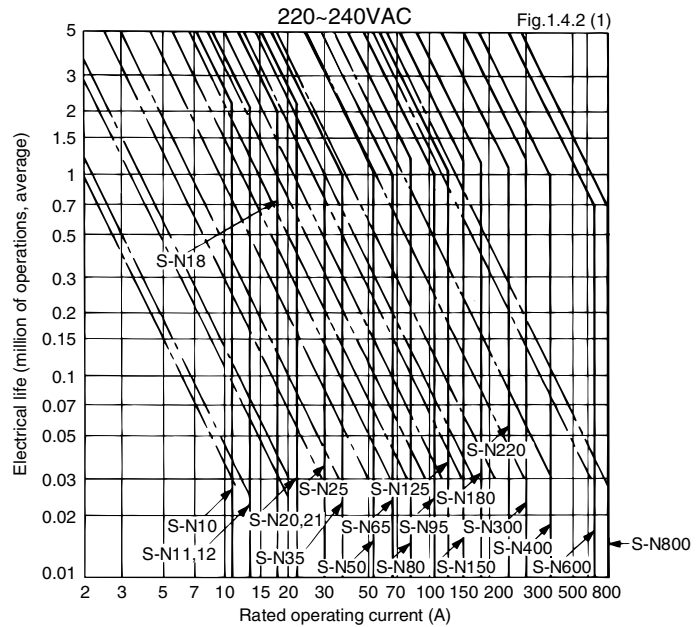
## 1.4.2 Performance of Series S-N Contactors

### Electrical Life

The electrical life of the main contacts of a contactor is determined mainly by the circuit-opening duty it will perform. The relationship between electrical life and rated current of Mitsubishi contactors under normal and jogging duties of squirrel-cage motors is shown in Fig. 1.4.2(1) and 1.4.2(2). In the case of a mixture of normal and jogging duties, the expected contactor life can be determined as follows:

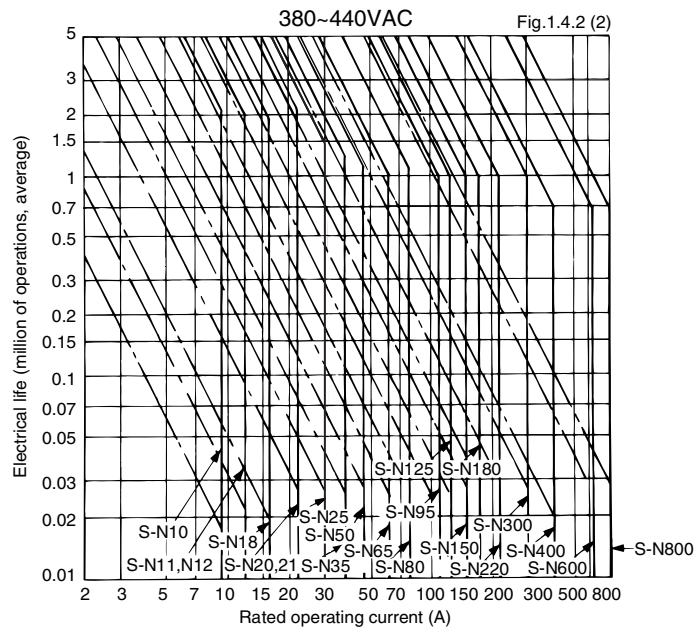
$$N = Nr/1 + \frac{\alpha}{100} (Nr/Ni - 1) \dots\dots\dots \text{Eq.1.1}$$

where N : Life in the case of  $\alpha\%$  jogging duty  
 Nr : Life in the case of normal duty  
 Ni : Life in the case of 100% jogging duty  
 $\alpha$  : Percentage of jogging duty



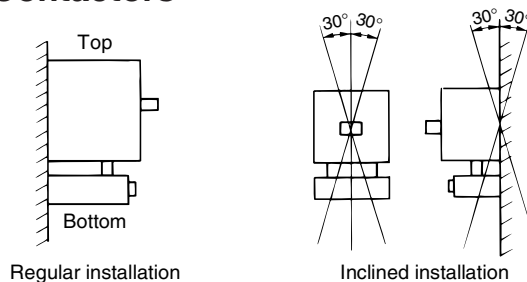
Electrical life versus rated operating current

- Normal duty, 6le on, le off, on-load factor 40%, 1200 operations/hour (AC3)
- - - Jogging duty, 6le on, 6le off, on-load factor 7%, 600 operations/hour (AC4)-S-N10~S-N300  
 300 operations/hour (AC4)-S-N400~S-N600  
 150 operations/hour (AC4)-S-N800



## 1.4.3 Mounting Attitude of Starters and Contactors

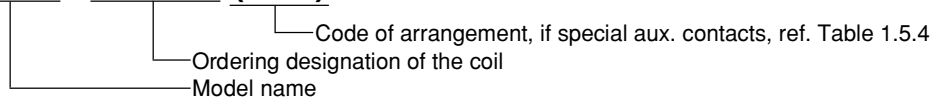
To assure proper performance, Mitsubishi magnetic motor starters and contactors should be mounted on a vertical supporting surface with the line terminals upwards and the load terminals downwards. The supporting surface may have a maximum inclination of 30° from the vertical in any direction.



# 1.5 When Ordering

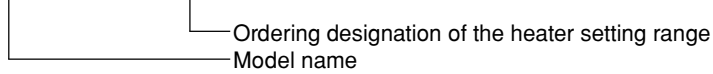
**Contactors**, indicate the model name and the ordering designation of the coil.

Example: **S-N20 \*AC230V (\* 2A)**



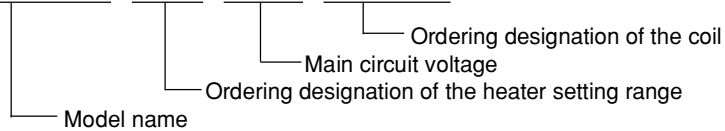
**Overload relays**, indicate the model name and the ordering designation of the heater setting range.

Example: **TH-N400RHKP\*250A**



**Motor starters**, indicate the model name, heater setting range, main circuit voltage, coil designation.

Example: **MSO-N11KP\*6.6A\*380V\*AC230V**



Note: Mark \* indicates a blank space.

## Coil Ratings and Ordering Designations

for **S-N10(CX), -N11(CX), -N12(CX), -N18(CX), -N20(CX), -N21(CX), -N25(CX), -N35(CX)** and **SR-N(CX)**

Table 1.5.1

Rated voltage (VAC)		Ordering designation
50Hz	60Hz	
24	24	AC24V
48~50	48~50	AC48V
100	100~110	AC100V
110~120	115~120	AC120V
125~127	127	AC127V
200	200~220	AC200V
208~220	220	AC220V
220~240	230~240	AC230V
240~260	260~280	AC260V
346~380	380	AC380V
380~415	400~440	AC400V
415~440	460~480	AC440V
500	500~550	AC500V

for **S-N50(CX)~N800**

Table 1.5.2

Rated voltage (50/60Hz)	Ordering designation
100~127V	AC100V
200~240V	AC200V
260~350V	AC300V
380~440V	AC400V
460~550V	AC500V

AC24V, AC48V are available for S-N50(CX)~N150

for **SD-N, SRD-N**

Table 1.5.3

Rated voltage (VDC)	Ordering designation
24	DC24V
48	DC48V
100	DC100V
110	DC110V
120~125	DC125V
200	DC200V
220	DC220V

## Code of arrangement for special aux. Contacts

Table 1.5.4

Arrangement	Code
1NC	1B
2NO	2A

A : Normally Open  
 B : Normally Closed

# 1.6 Selection Table of Contactors

## 1.6.1 Non-Reversing Contactors

Type S-N□, SD-N□

### Ordering Designation

Model name ..... S-N10  
 Coil designation (See page 13) ..... AC400V  
 If required special aux. contact (never specify for standard) ..... 1B  
 Complete type designation ..... S-N10\*AC400V\*1B

Note: Mark\*indicates a blank space.

Table 1.6.1

Rated operational current AC-3		Rated motor capacity 3-phase AC-2 & AC-3				Model name		Standard aux. contacts		Finger protection terminal cover	Additional auxiliary contact block											
220	380	220	380	500V	690V	AC operated	DC operated	NO	NC		UN-AX2(CX)	UN-AX4(CX)	UN-AX11(CX)	UN-AX80	UN-AX150	UN-AX600						
-240V (A)	-440V (A)	-240V (kW)	-440V (kW)	(kW)	(kW)																	
11	9	2.5	4	4	4	S-N10 S-N10CX <sup>1</sup> S-N10(1B) S-N10CX <sup>1</sup> (1B)	—	1	—	—	1											
13	12	3.5	5.5	5.5	5.5	S-N11 S-N11CX <sup>1</sup> S-N11(1B) S-N11CX <sup>1</sup> (1B)	SD-N11 SD-N11CX <sup>1</sup> SD-N11(1B) SD-N11CX <sup>1</sup> (1B)	1	—	—							2	—	—	—	—	
13	12	3.5	5.5	5.5	5.5	S-N12 S-N12CX <sup>1</sup> S-N12(2A) S-N12CX <sup>1</sup> (2A)	SD-N12 SD-N12CX <sup>1</sup> SD-N12(2A) SD-N12CX <sup>1</sup> (2A)	1	1	—							—	—	—	—	—	—
18	16	4.5	7.5	7.5	7.5	S-N18 S-N18CX <sup>1</sup>	—	—	—	—							—	—	—	—	—	—
22	22	5.5	11	11	7.5	S-N20 S-N20CX <sup>1</sup> S-N20(2A) S-N20CX <sup>1</sup> (2A)	—	1	1	—							—	—	—	—	—	—
22	22	5.5	11	11	7.5	S-N21 S-N21CX <sup>1</sup>	SD-N21 SD-N21CX <sup>1</sup>	2	2	—							—	—	—	—	—	—
30	30	7.5	15	15	11	S-N25 S-N25CX <sup>1</sup>	—	2	2	—							—	—	—	—	—	—
40	40	11	18.5	18.5	15	S-N35 S-N35CX <sup>1</sup>	SD-N35 SD-N35CX <sup>1</sup>	2	2	—							—	—	—	—	—	—
55	50	15	22	25	22	S-N50 S-N50CX <sup>1</sup>	SD-N50	2	2	—							—	—	—	—	—	—
65	65	18.5	30	37	30	S-N65 S-N65CX <sup>1</sup>	SD-N65	2	2	—							—	—	—	—	—	—
85	85	22	45	45	45	S-N80	SD-N80	2	2	—							—	—	—	—	—	—
105	105	30	55	55	55	S-N95	SD-N95	2	2	—							—	—	—	Max. 2	—	—
125	120	37	60	60	60	S-N125	SD-N125	2	2	—							—	—	—	—	—	—
150	150	45	75	90	90	S-N150	SD-N150	2	2	—							—	—	—	—	—	—
180	180	55	90	110	110	S-N180	—	2	2	—							—	—	—	—	—	—
250	250	75	132	132	132	S-N220	SD-N220	2	2	—							—	—	—	—	Max. 2	—
300	300	90	160	160	200	S-N300	SD-N300	2	2	—							—	—	—	—	—	—
400	400	125	220	225	250	S-N400	SD-N400	2	2	—							—	—	—	—	—	—
630	630	190	330	330	330	S-N600	SD-N600	2	2	—							—	—	—	—	—	1
800	800	220	440	500	500	S-N800	SD-N800	2	2	—							—	—	—	—	—	—

Note: 1 "CX" denotes with finger protection terminal covers.



S-N10CX



S-N21



SD-N65



S-N220



SD-N400



S-N800



## 1.6.2 Reversing Contactors

Type S-2xN□,SD-2xN□

### Ordering Designation

Model name ..... S-2xN95  
 Coil designation (See page 13) ..... AC400V  
 Complete type designation ..... S-2xN95\*AC400V

Note: Mark\*indicates a blank space.

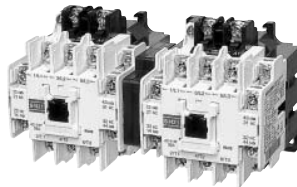
Table 1.6.2

Rated operational current AC-3		Rated motor capacity 3-phase AC-2 & AC-3				Model name		Standard aux. contacts		Additional auxiliary contact block(max).				
220 -240V (A)	380 -440V (A)	220 (kW)	380 -440V (kW)	500V (kW)	690V (kW)	AC operated	DC operated	NO	NC	UN- AX2(CX)	UN- AX4(CX)	UN- AX11(CX)	UN- AX80	UN- AX150
11	9	2.5	4	4	4	S-2xN10 S-2xN10CX <sup>1</sup>	—	2	2					
13	12	3.5	5.5	5.5	5.5	S-2xN11 S-2xN11CX <sup>1</sup>	SD-2xN11 SD-2xN11CX <sup>1</sup>	2	2	2	2	2	—	—
18	16	4.5	7.5	7.5	7.5	S-2xN18 S-2xN18CX <sup>1</sup>	—	4	4	—	—	—	—	—
22	22	5.5	11	11	7.5	S-2xN20 S-2xN20CX <sup>1</sup>	—	2	2					
22	22	5.5	11	11	7.5	S-2xN21 S-2xN21CX <sup>1</sup>	SD-2xN21 SD-2xN21CX <sup>1</sup>	4	4					
30	30	7.5	15	15	11	S-2xN25 S-2xN25CX <sup>1</sup>	—	4	4					
40	40	11	18.5	18.5	15	S-2xN35 S-2xN35CX <sup>1</sup>	SD-2xN35 SD-2xN35CX <sup>1</sup>	4	4	2	2	2	—	—
55	50	15	22	25	22	S-2xN50 S-2xN50CX <sup>1</sup>	SD-2xN50	4	4					
65	65	18.5	30	37	30	S-2xN65 S-2xN65CX <sup>1</sup>	SD-2xN65	4	4					
85	85	22	45	45	45	S-2xN80	SD-2xN80	4	4				2	—
105	105	30	55	55	55	S-2xN95	SD-2xN95	4	4	—	—	—	—	—
125	120	37	60	60	60	S-2xN125	SD-2xN125	4	4					
150	150	45	75	90	90	S-2xN150	SD-2xN150	6	6					
180	180	55	90	110	110	S-2xN180	—	6	6					
250	250	75	132	132	132	S-2xN220	SD-2xN220	6	6	—	—	—	—	2
300	300	90	160	160	200	S-2xN300	SD-2xN300	6	6					
400	400	125	220	225	250	S-2xN400	SD-2xN400	6	6					
630	630	190	330	330	330	S-2xN600	SD-2xN600	8	8	—	—	—	—	—
800	800	220	440	500	500	S-2xN800	SD-2xN800	8	8					

Note:1 "CX" denotes with finger protection terminal covers.



S-2xN11

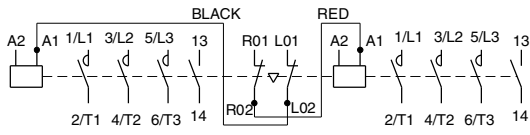


S-2xN21

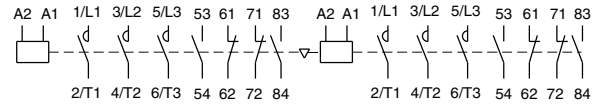


S-2xN150

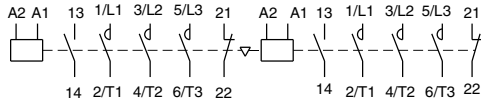
## 1.9.2 S, SD-2xN □



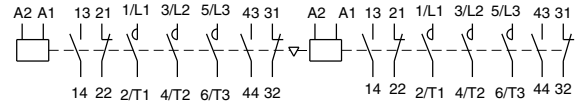
**S-2xN10, N11**  
**SD-2xN11**



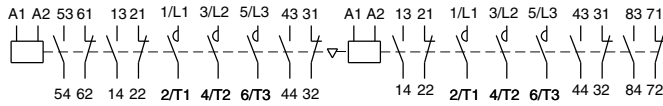
**S-2xN18**



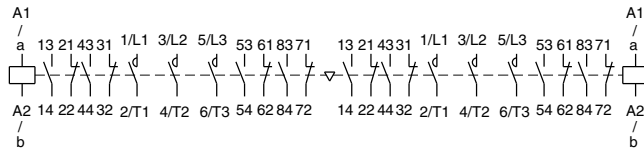
**S-2xN20**



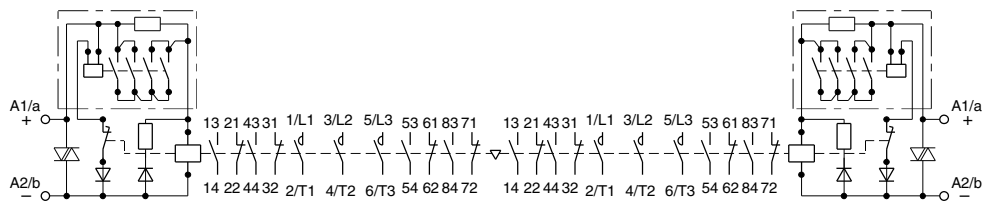
**S-2xN21~N35**  
**SD-2xN21, N35**



**S-2xN50~N400**  
**SD-2xN50~N150, N220~N400**

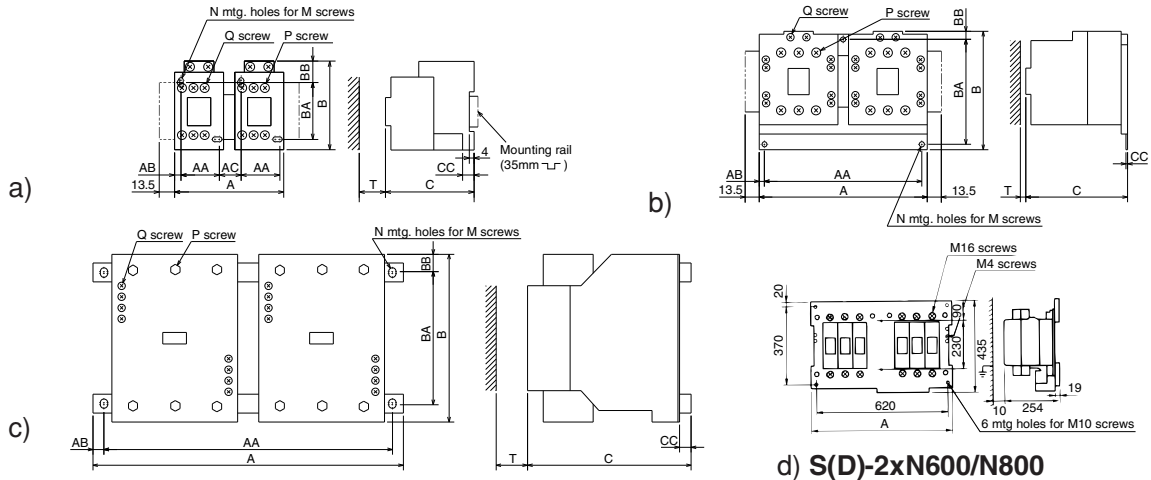


**S-2xN600, N800**



**SD-2xN600, N800**

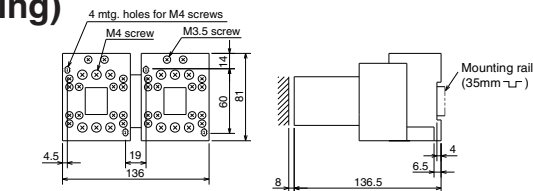
## 1.10.2 Outline Dimensions of Reversing Contactors



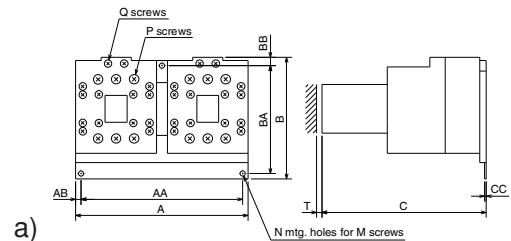
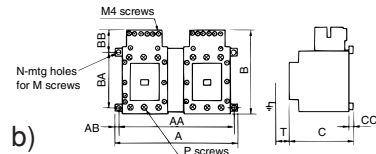
### • Dimensions

Type	Fig.	A	B	C	AA	AB	AC	BA	BB	CC	N	M	P	Q	Mass(kg)	T
S-2xN10/N11	a	99	78	78	35	4.5	21	50	19	10	4	M4	M3.5	M3.5	0.64	5
S-2xN18	a	96	79	109	30	3.5	23	60	13	10	4	M4	M4	M3.5	0.75	5
S-2xN20/N21	a	136	81	81	54	4.5	19	60	14	6.5	4	M4	M4	M3.5	0.8	5
S-2xN25/N35	b	160	110	97	150	15	—	100	8	1.6	3	M4	M5	M3.5	1.3	5
S-2xN50/N65	b	216	115	112	204	6	—	100	8	2	3	M5	M6	M4	2.6	10
S-2xN80/N95	b	270	140	137	247	11.5	—	100	32	10	3	M6	M6	M4	4.3	10
S-2xN125	c	276	150	148	255	10.5	—	125	12.5	1.6	4	M6	M8	M4	5.7	30
S-2xN150	c	296	160	156	275	10.5	—	125	17.5	1.6	4	M6	M8	M4	7.2	30
S-2xN180/220	c	370	215	189	340	15	—	190	12.5	1.6	4	M8	M10	M4	12	30
S-2xN300/N400	c	395	250	209	365	15	—	225	12.5	2.3	4	M8	M12	M4	20.5	50
S-2xN600/N800	d	660	—	—	—	—	—	—	—	—	—	—	—	—	54	—
SD-2xN11	a	99	78	110	35	4.5	21	50	19	10	4	M4	M3.5	M3.5	1.3	5
SD-2xN21	b	160	100	119	150	5	—	90	5	2	3	M4	M4	M3.5	1.7	5
SD-2xN35	b	160	113	129	150	5	—	100	8	1.6	3	M4	M5	M3.5	2.0	5
SD-2xN50/N65	b	216	116.5	133	204	6	—	100	8	2	3	M5	M6	M4	4.5	10
SD-2xN80/N95	b	270	140	167	247	11.5	—	100	32	10	3	M6	M6	M4	6.4	10
SD-2xN125	c	276	150	173	255	10.5	—	125	12.5	1.6	4	M6	M8	M4	9.2	30
SD-2xN150	c	296	160	180.5	275	10.5	—	125	17.5	1.6	4	M6	M8	M4	10	30
SD-2xN220	c	370	215	214.5	340	15	—	190	12.5	1.6	4	M8	M10	M4	17	30
SD-2xN300/N400	c	395	250	235	365	15	—	225	12.5	2.3	4	M8	M12	M4	29	50
SD-2xN600/N800	d	800	—	—	—	—	—	—	—	—	—	—	—	—	64	—

### Latched Contactors (Reversing)



SL(D)-2xN21



SL(D)-2xN600/N800 (Mass: 60kg)

### • Dimensions

Type	Fig.	A	B	C	AA	AB	BA(BC)	BB	CC	N	M	P	Q	Mass(kg)	T
SL(D)-2xN35	a	160	113	153	150	5	100	8	1.6	3	M4	M5	M3.5	2.2	5
SL(D)-2xN50/N65	a	216	115	141.5	204	6	100	8	2	3	M5	M6	M4	3.2	10
SL(D)-2xN80/N95	b	270	184	137	247	11.5	100	74	10	3	M6	M6	M4	5.3	10
SL(D)-2xN125	b	276	191	148	255	10.5	125	53.5	11	4	M6	M8	M4	6.7	30
SL(D)-2xN150	b	296	201	156	275	10.5	125	58.5	11	4	M8	M8	M4	8.8	30
SL(D)-2xN220	b	370	230	189	340	15	190	27	14	4	M8	M10	M4	13	30
SL(D)-2xN300/N400	b	395	263	209	365	15	225	25	14	4	M8	M12	M4	21.5	50

# 3.3 Compact 3-Pole Contactors

Series S-N□8

The MITSUBISHI series S-N□8 compact 3-pole contactors are designed for limited panel space applications such as machine control panels.

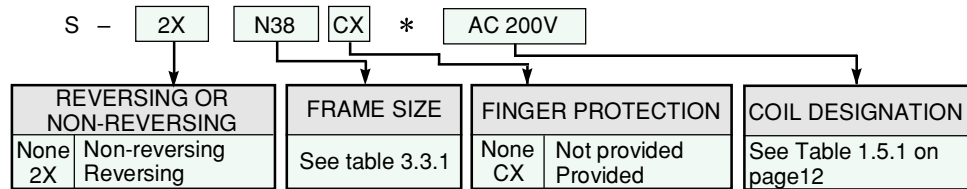


S-N48

## Features

- Compact design—Very limited required mounting space.
- Front clip-on type auxiliary contact block can be added.
- Coil surge absorbers are available. • Can be mounted on 35mm rail.

### Type Designation



Note: Mark\* indicates a blank space

## Specifications

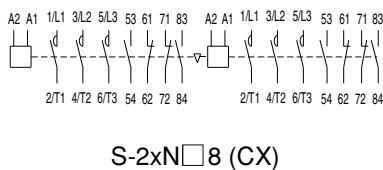
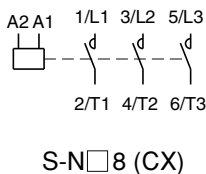
### Rating and characteristics

Table 3.3.1

Type		S-N18 (CX)	S-N28 (CX)	S-N38 (CX)	S-N48 (CX)	
Rated insulation voltage	V	AC690				
Rated operational current	220-240V	A(kW)	18(4.5)	26(7.5)	39(11)	50(15)
	380-440V	A(kW)	16(7.5)	17(7.5)	32(15)	40(18.5)
3-ph, category AC-3	500V	A(kW)	13(7.5)	13(7.5)	24(15)	32(18.5)
	690V	A(kW)	9(7.5)	9(7.5)	12(11)	17(15)
Conventional free air thermal current	A	25	30	60	80	
Electrical life	operations (million)	1				
Mechanical life		10	5			
Rated making current for 100,000 cycle operations Peak let through time 0.5ms	A	200	300	500	670	
Switching frequency(AC3)	operations/hour	1800	1800	1800	1200	
Coil consumption (at rated coil voltage)	Inrush	VA	60		110	
	Sealed	VA	10		13	
	Watts	W	3		4·5	
Terminal screw size	Main terminal	M4	M4	M5	M5	
	Control terminal	M3.5	M3.5	M3.5	M3.5	
Conductor size (Compression terminal size)	Main terminal	1~6		2~16		
	Control terminal	1~2.5		1~2.5		
Additional auxiliary contact block		UN-AX2 or UN-AX4				

Note: 1. For finger protection type, order model name followed by suffix "CX".

## Contact Arrangement



## Outline Dimensions

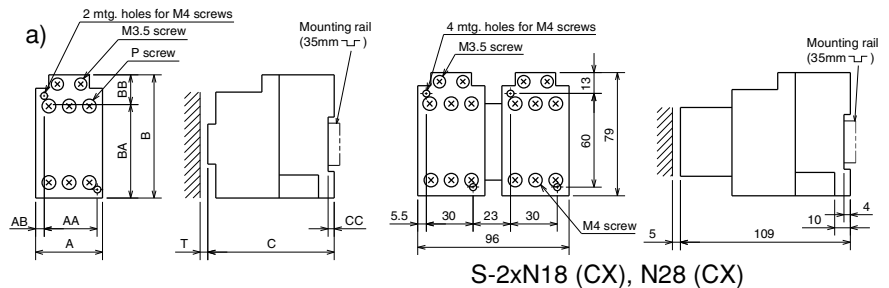


	Fig.	A	B	C	AA	AB	BB	BA	CC	CA	D	P	Q	Mass(kg)	T
S-N18 (CX), N28 (CX)	a	43	79	81	30	7	60	6	10	109	4	M4	M3.5	0.33	5
S-N38 (CX), N48 (CX)	a	54	90	93	40	7	80	6	7	121	4	M5	M3.5	0.4	5