



## LOW VOLTAGE SWITCHGEAR

## S-N Motor Control

Mitsubishi Electric's S-N Series contactors are perfect for the control of 3 phase power, either for the direct control of a motor, to supply power to a drive or servo, or even for the control of resistive loads, such as heating and lighting.

Compact and rugged, the S-N Series is built to meet global standards and provide safe, dependable solutions, that are used and trusted the world over.

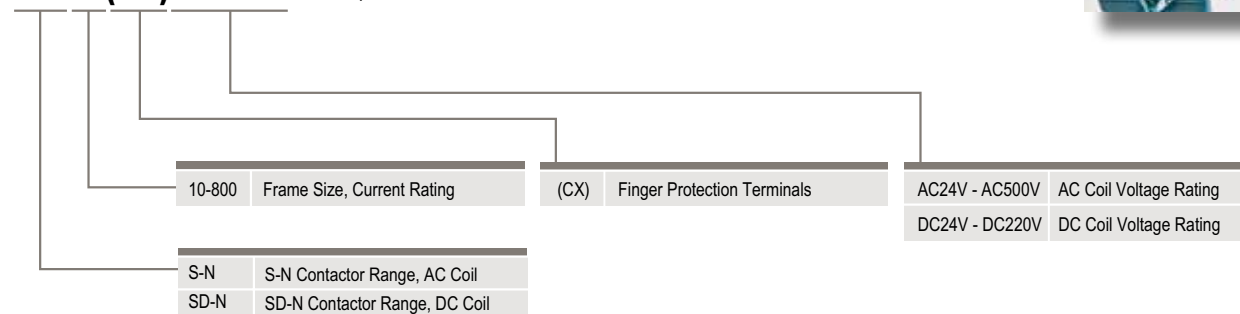
- UL Listed up to 600HP (480V)
- Patented CAN Terminals for easy wiring. The integrated terminal screw is held in place for fast and secure connection.
- Compatible with International Standards and Shipping Approvals: UL, CSA, JIS, IEC, EN, LR, BV, NK, KR
- Contactors up to 20 HP DIN Rail mounted
- Patented low power consumption coil and magnet system allows contactors to be driven even by small relays
- Bifurcated moving contacts ensure greater contact reliability
- Full range of DC and AC coils
- Full range of supporting accessories
- Control coils have a wide voltage range and withstand large voltage drops
- 'Mirror contacts' meet the safety requirements of IEC / EN60947-1
- Coordinated SCCR ratings with WSS type Mitsubishi circuit breakers



## S-N Series Specifications

Standard Non-Reversing Contactors

### S-N20(CX)AC100V Example Part Number



Contactor Open	Mark		cUL						cRU												
	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*	S(D)- N125*	S(D)- N150*	S-N 180*	S(D)- N220*	S(D)- N300*	S(D)- N400*	S-N 600*	S-N 800*	
	Frame Size		10	11, 12	18	20, 21	25	35	50	65	80	95	125	150	180	220	300	400	600	800	
	Continuous Current (A) Open		13	20	30	30	35	40	80	95	100	100	125	150	220	220	300	400	680	910	
	HP Rating	Single Phase	120V HP	1/2	1/2	1	1	2	2	3	3	5	7-1/2	10	15	15	15	—	—	—	—
			240V HP	1-1/2	1-1/2	3	3	3	5	7-1/2	10	15	15	20	25	30	40	—	—	—	—
		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		

\*Note: UL listed types for S-N95 to S-N800, SD-N95 to SD-N400 require suffix letters "UL" (eg. S-N95UL) and will have ILSCO lugs installed on line and load side terminals.

#### Coil Ratings and Ordering Designations for S-N10(CX)~S-N48(CX) (as well as reversing versions) and SR-N

Rated Operating Voltage (VAC)		Ordering Designation
50Hz	60Hz	
24	24	AC24V
100	100~110	AC100V
110~120	115~120	AC120V
200	200~220	AC200V
-	208~230	AC208V
220~240	230~240	AC230V
380~415	400~440	AC400V
415~440	460~480	AC440V
500	500~550	AC500V

#### Coil Ratings and Ordering Designations for S-N50~S-N800 (as well as reversing versions)

Rated Operating Voltage at 50/60Hz (VAC)	Ordering Designation
100~127	AC100V
200~240	AC200V
380~440	AC400V
460~550	AC500V

#### Coil Ratings and Ordering Designations For All SD-N and SRD-N

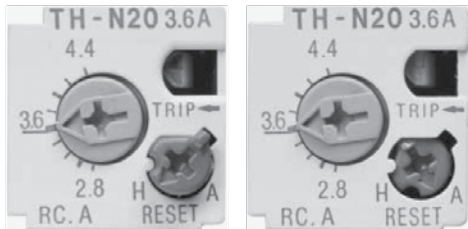
Rated Voltage (VDC)	Ordering Designation
24	DC24V
48	DC48V
100	DC100V
110	DC110V
120~125	DC125V
200	DC200V
220	DC220V

# TH-N Thermal Overload Relays

## Safe and Convenient

The TH-N Series overload relay will protect a motor from burnouts caused by overload, locked rotor, or single phasing. A relay is a three pole, bi-metal, non-interchangeable heater element type (phase failure protection). Although designed as a three phase device, TH-N overload relays can be used to protect single phase motors by connecting two heaters in series to one motor leg, and connecting the third heater to the remaining motor leg.

## TH-N20 Thermal Overload Relay

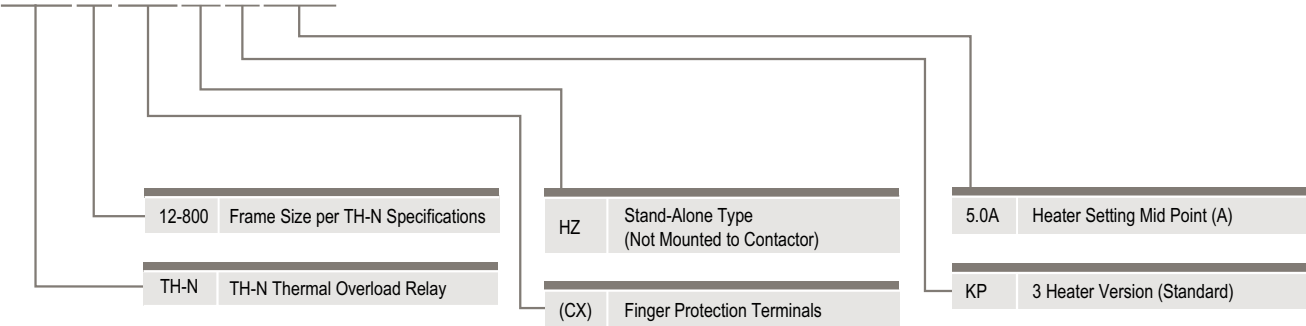


Thermal overloads can be switched between manual and automatic mode using the simple selection dial.


## TH-N Specifications

Thermal Overload Relays

### TH-N20(CX)HZKP5.0A Example Part Number



## Kits to Connect Thermal Overload Relays to Contactors

	Description	Overload Relay	Contactor	Part Number
	For Connecting O/L Relay to Contactor	TH-N20(CX)KPUL	S-N20(CX), S(D)-N21(CX)	UN-TH20
		TH-N20(CX)KPUL, TH-N20CXTAKPUL	S-N25(CX), S(D)-N35(CX)	UN-TH25
		TH-N60KP	S(D)-N50, -N65	CONNTBH559N350
	Connecting Bars and Mounting Plate are included with TH-N220 and TH-N400 for use with S-N180, N220, N300 & N400	TH-N60KP, N60TAKP	S-N80, -N95	CONNTBH569N350
		TH-N120KPUL, TH-N120TAKPUL	SD-N80, -N95	CONNTBH569N352
			S(D)-N125	CONNTBH579N355
			S(D)-N150	CONNTBH589N355

## Ratings for Thermal Overloads (Nominal Current Rating is Mid-Point Setting)

Model Name	Heater Designation (Rated Current [A])	Contactor to be Coupled	Auxiliary Contact
TH-N12(CX)KP	0.12A (0.1~0.16), 0.17A (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), 5.0A (4~6), 6.6A (5.2~8), 9.0A (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	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), 5.0A (4~6), 6.6A (5.2~8), 9.0A (7~11), 11A (9~13), 15A (12~18)	S-N18	
TH-N20(CX)KP	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), 5.0A (4~6), 6.6A (5.2~8), 9.0A (7~11), 11A (9~13), 15A (12~18)	S-N20, S-N21 S-N25, S-N35	
TH-N20CXTAKP	22A (18~26) 29A (24~34)	S-N25, N35 S-N35	
TH-N60KP	15A (12~18), 22A (18~26), 29A (24~34), 35A (30~40), 42A (34~50) 54A (43~65)	S-N50, N65, N80, N95 S-N65, N80, N95	
TH-N60TAKP	67A (54~80) 82A (65~100)	S-N80, N95 S-N95	
TH-N120KPUL	42A (34~50), 54A (43~65), 67A (54~80), 82A (65~100)	S-N125, N150	
TH-N120TAKPUL	105A (85~125) 125A (100~150)	S-N125, N150 S-N150	
TH-N220RHKPUL TH-N220HZKPUL	82A (65~100), 105A (85~125), 125A (100~150), 150A (120~180) 180A (140~220)	S-N180, N220 S-N220	
TH-N400RHKPUL TH-N400HZKPUL	105A (85~125), 125A (100~150), 150A (120~180), 180A (140~220), 250A (200~300) 330A (260~400)	S-N300, N400 S-N400	







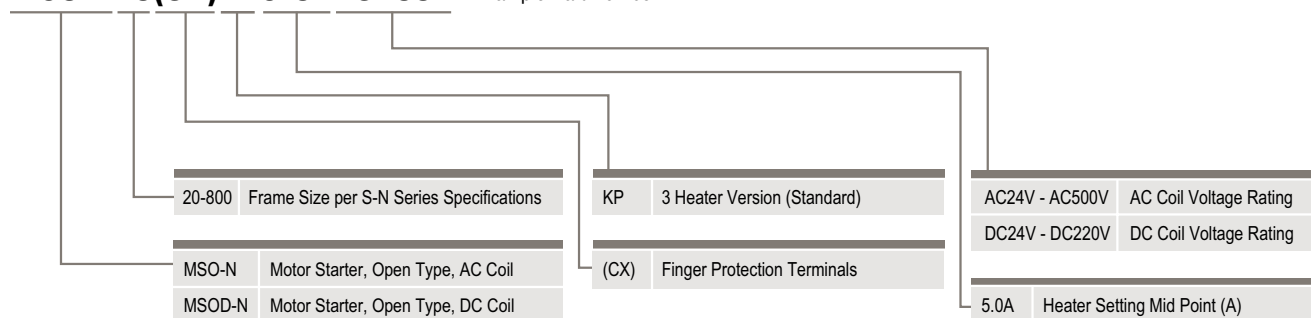
## Motor Starter Sets

An S-N contactor and a TH-N thermal overload relay can be supplied as an assembly, giving a motor starter set suitable for starting and protecting a three phase motor.

## Specifications

### Motor Starter Sets

#### MSO-N20(CX)KP5.0AAC100V Example Part Number



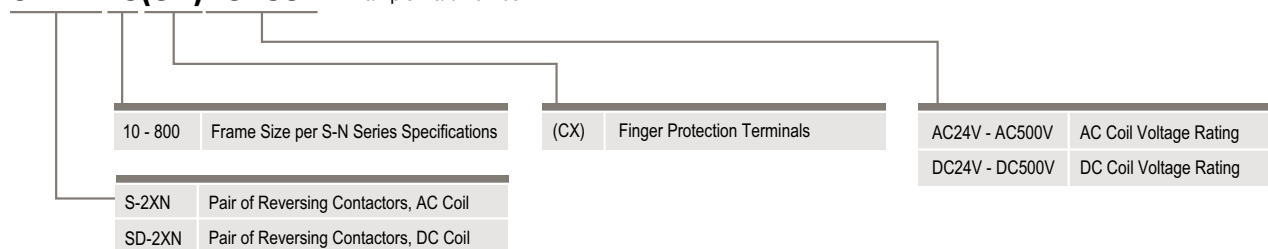
## Reversing Motor Starters

In the case of a reversing motor starter, 2 mechanically interlocked contactors are supplied together. Two motor phases are swapped over in operation, allowing forward or reverse rotation. The mechanical interlock ensures that only one contactor at a time can be operated.

## Specifications

### Reversing Contactor Sets

#### S-2XN20(CX)AC200V Example Part Number



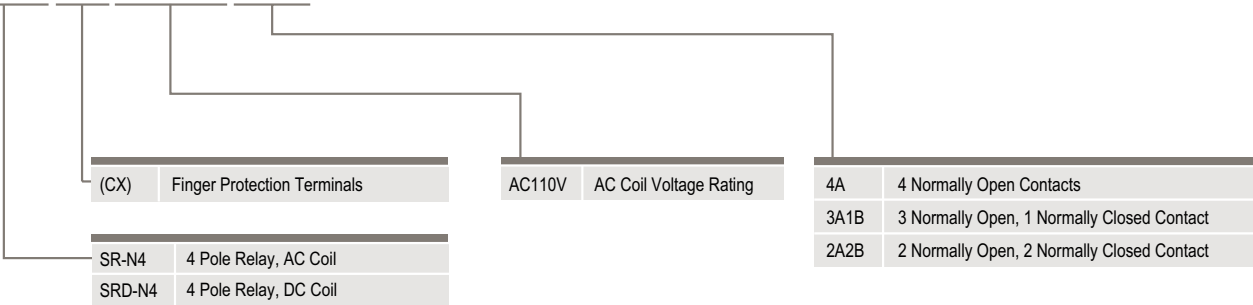
# SR-N Contactor Relays

SR-N Contactor Relays are available for use in low voltage control circuit applications. 4 poles can be specified with combinations of normally open and normally closed contacts and have a continuous current rating of 16A.

## Specifications

Contactor Relays

### SR-N4(CX)AC110V2A2B Example Part Number



### Coil Voltages for SR-N

Rated Operating Voltage (VAC)		Ordering Designation
50Hz	60Hz	
24	24	AC24V
100	100~110	AC100V
110~120	115~120	AC120V
200	200~220	AC200V
-	208~230	AC208V
220~240	230~240	AC230V
380~415	400~440	AC400V
415~440	460~480	AC440V
500	500~550	AC500V

### Coil Voltages for SRD-N

Rated Voltage (VAC)	Ordering Designation
24	DC24V
48	DC48V
100	DC100V
110	DC110V
120~125	DC125V
200	DC200V
220	DC220V



## WSS Molded Case Circuit Breakers

Mitsubishi's WSS 'World Series' Circuit Breakers are designed to give UL 489 compliant branch circuit protection for control panels or for OEM equipment. The range includes a full range of accessories and is available in sizes with continuous current ratings from 5A up to 600A – suitable for 230V, 480V or 600V operation.

- UL489 / CSA approved
  - Rated for Isolation Duty
  - Suitable for reverse connection
  - CCC approved (China)
  - CE marked (Europe)
  - All major shipping approvals
  - In stock and supported in the U.S.
  - Full range of handles and terminal covers
  - UL approved SCCR rating with Mitsubishi's S-N contactors
  - Interrupt ratings up to 50kA
- Options
    - » Shunt trips
    - » Auxiliary contacts
    - » Undervoltage trips
    - » Alarm relays
    - » Solderless terminals
    - » Handles
    - » Terminal covers



## Specifications

WSS Molded Case Circuit Breakers (Up to 100A Frame Size)

**NF100-SWU3P50ASAL** Example Part Number

-CWU or -SWU Interrupt Capacity per WSS Specifications		S Solderless Terminal Option		A, Y, L, 1, 2, 4, D Choose 1*	
Blank No Option		3A-100A Trip Current per WSS Specifications		A, Y, L, 1, 2, 4, D Choose 1*	
NF50	50 Amp Frame Size	2P 2 Pole		A = Auxiliary Contact	
NF100	100 Amp Frame Size	3P 3 Pole		Y = Auxiliary Contact with side lead terminal	
				L = Alarm Relay	
				1 = 100VAC Shunt Trips	
				2 = 200VAC Shunt Trips	
				4 = 400VAC Shunt Trips	
				D = 100VDC Shunt Trips	

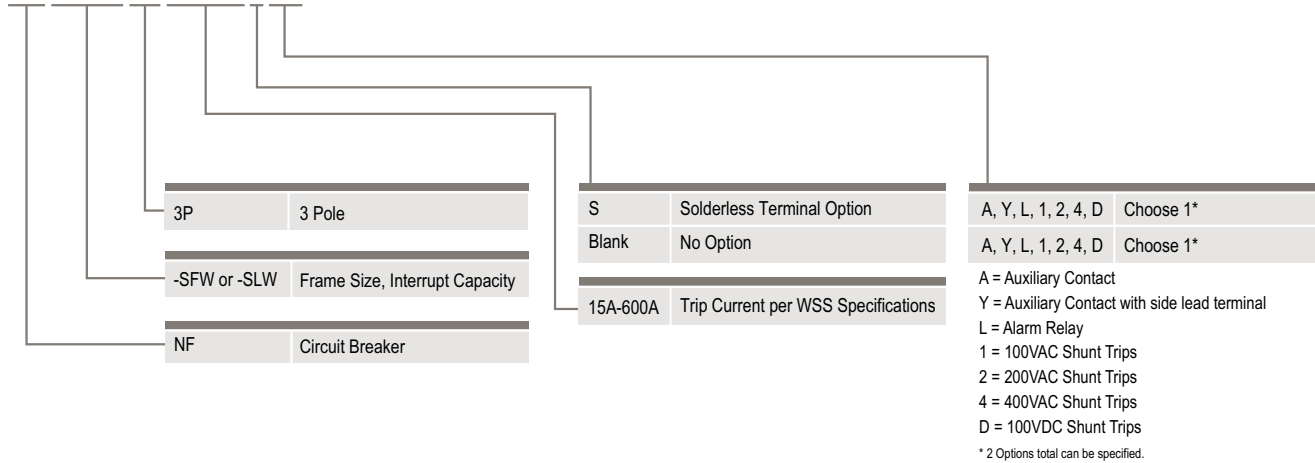
\* 2 Options total can be specified.












## Specifications

WSS Molded Case Circuit Breakers (Above 100A Frame Size)

### NF-SLW3P500ASYL Example Part Number

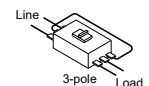


## Range Overview

Frame A			100	225	50	100	150	250		400	600	
			NF100-CWU	NF225-CWU	NF50-SWU	NF100-SWU	NF-SPW	NF-SJW	NF-HJW	NF-SKW	NF-SLW	
Model												
Rated Current in Amp. at Ambient Temperature 40°C (IEC 30°C)			50, 60, 75, 100	125, 150, 175, 200, 225	3, 5, 10, 15, 20, 30, 40, 50	15, 20, 30, 40, 50, 60, 75, 100	15, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 125, 150	125, 150, 175, 200, 225, 250	125, 150, 175, 200, 225, 250	250, 300, 350, 400	500, 600	
Number of Poles			2	3	3	2	3	3	3	3	3	
Rated Short-Circuit Breaking Capacities (kA)	UL 489	Rated Voltage (VAC)	240	240	240	480Y/227	600Y/347	600Y/347	600Y/347	600Y/347	600Y/347	
		AC	600Y/347V	-	-	-	-	14	14	18	20	20
			480V	-	-	-	-	35	35	50	35	35
			480Y/277V	-	-	-	22	35	35	50	-	-
			240V	10	35	14	35	65	65	100	65	85
	JIS C 8201-2 IEC 60947-2 (Icu/Ics)	Rated Insulation Voltage Ui (V)	600	600	600	690	690	690	690	690	690	
		AC	690V	-	-	-	8/4	8/8	8/8	15/15	10/10 (5/5) (*2)	10/10
			500V	7.5/4	10/5	7.5/4	18/9	30/30	30/30	36/36	30/30 (25/25) (*2)	30/30
			440V	10/5	15/8	7.5/4	25/13	36/36	36/36	50/50	42/42 (36/36) (*2)	42/42
			415V	10/5	18/9	7.5/4	30/15	36/36	36/36	50/50	45/45 (36/36) (*2)	45/45
			400V	10/5	18/9	7.5/4	30/15	36/36	36/36	50/50	45/45 (36/36) (*2)	45/45
			380V	10/5	18/9	7.5/4	30/15	36/36	36/36	50/50	50/50 (42/42) (*2)	50/50
			230V	30/15	35/18	15/8	50/25	85/85	85/85	100/100	85/85 (65/65) (*2)	85/85
			DC	250V (*1)	7.5/4	10/5	-	15/8	20/20	20/20	20/20	-

#### Notes:

- Use two poles among the three poles in the case of three-pole products. In addition, wiring as shown below allows the models of NF100-CWU, NF100-SWU and NF225-CWU to be used for up to 400VDC and the models of NF-SFW, NF-SJW, and NF-HJW to be used for up to 500VDC.
- Products with rated current in parentheses will be produced upon order. Operating characteristics of breakers are different between AC and DC (JIS and IEC only).



## Operating Handles for Circuit Breakers

Operating Handles are available for the complete range of WSS circuit breakers.

The type 'F' handle is retained on the breaker itself and interlocks with a hole in the panel door.

The type 'V' handle uses an extended shaft which interlocks with a handle mounted on the door.

Type 'V' comes complete with shaft and locking pin. If a longer shaft is needed, a shaft extension is available.

## Terminal Covers

Optional Large terminal covers are available for all breakers.



Interlocking handles and accessories



## Circuit Protectors

Circuit Protectors are UL Recognized products (UL 1077, CSA22.2) which can be used to protect components inside panels. Working together with a UL489 branch circuit protector, the circuit protector provides greater sensitivity to protect an individual piece of equipment, as well as a convenient way to isolate individual circuits. Note – they are rated for applications up to 250V.

### CP30-BA Circuit Protectors

- Available as 1 or 2 pole
- For protection of relays and other single phase equipment
- Sizes range from 0.1 to 30A
- Standard types available from stock
- 2.5kA interrupt capacity
- DIN Rail or screw mounted
- Integral terminal covers
- Shielded handle – prevents accidental operation
- Suitable for AC or DC
- 50G shock / 15G vibration withstand rating

### NF30-FAU Circuit Protectors

- Stocked as 3 pole (2 pole available)
- For protection of small VFDs, servo drives and similar (up to 250V) up to 10HP
- Sizes range from 5A to 30A
- 1.5kA interrupt capacity
- DIN Rail or screw mounted
- Suitable for AC or DC



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