

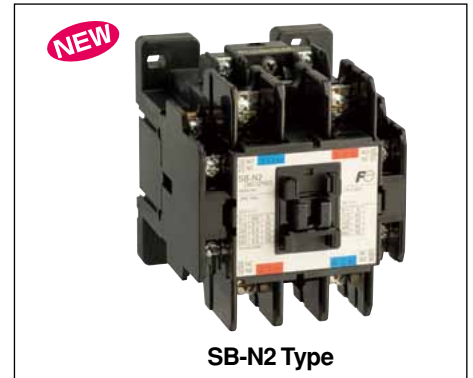
DC Magnetic Contactor SB Series

SB-N2 Type

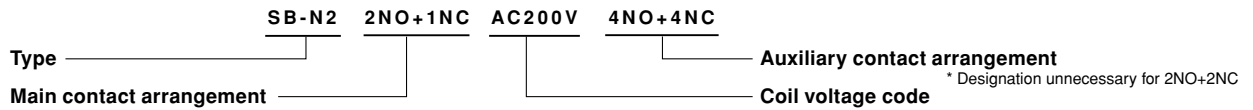
DC Magnetic Contactor Model Change
Max applicable voltage increased to 660 VDC.
Application scope widened for DC low voltage circuits.

■ Features

- Applicable up to resistive load 660 VDC, 40 A
- An auxiliary contact with a mirror contact function is adopted, which is applicable to circuits where safety categories 3 or 4 are required.
- Shares options available in the SC series.
- RoHS support is standard. Flame-proofing material with enhanced tracking performance is adopted as standard.



■ Ordering information



■ Types

Model	Type	Main contact arrangement	Auxiliary contact arrangement		Product code
			Standard	Designation	
Standard type	SB-N2 *2	2NO	2NO+2NC [22] *1	4NO+4NC	SB35CAA- □ ■ ■
		2NO+1NC		[44] *1	SB35CBA- □ ■ ■
	SB-N2B *2	2NC		—	SB35CCA- □ 22
		1NO+2NC		—	SB35CDA- □ 22
With SUPER-MAGNET (AC/DC)	SB-N2/SE *2	2NO	4NO+4NC [44] *1	4NO+4NC	SB35CAS- □ ■ ■
		2NO+1NC		[44] *1	SB35CBS- □ ■ ■
	SB-N2B/SE *2	2NC		—	SB35CCS- □ 22
		1NO+2NC		—	SB35CDS- □ 22

Note: For the product code field, fill the coil voltage designation code in the □ field and the auxiliary contact designation code in the ■ field.

*1: The data in the brackets represents an auxiliary contact designation code. For 4NO+4NC, the contactor will be combined with two auxiliary contact blocks (side mounting) SZ-AS1.

■ Operating coil voltages

• AC-operated models

Type	Coil voltage code	Designation code	Coil voltage/frequency AC	Coil voltage color indication
SB-N2 SB-N2B	24 VAC	E	24V, 50 Hz / 24-26V, 60 Hz	White
	48 VAC	F	48V, 50 Hz / 48-52V, 60 Hz	White
	100 VAC	1	100V, 50 Hz / 100-110V, 60 Hz	Green
	110 VAC	H	100-110 V, 50 Hz / 110-120 V, 60 Hz	White
	120 VAC	K	110-120V, 50 Hz / 120-130V, 60 Hz	White
	200 VAC	2	200V, 50 Hz / 200-220V, 60 Hz	Yellow
	220 VAC	M	200-220V, 50 Hz / 220-240V, 60 Hz	White
	240 VAC	P	220-240V, 50 Hz / 240-260V, 60 Hz	White
	380 VAC	S	346-380V, 50 Hz / 380-420V, 60 Hz	White
	400 VAC	4	380-400V, 50 Hz / 400-440V, 60 Hz	Lilac
	440 VAC	T	415-440V, 50 Hz / 440-480V, 60 Hz	White
500 VAC	5	480-500V, 50 Hz / 500-550V, 60 Hz	White	

Note 1: The coil voltage code indicates a voltage specified so as to simplify the designation of the control coil voltage at the time of order.
 For orders with a coil voltage code, a magnetic contactor with a coil having a voltage range corresponding to the coil voltage code will be delivered. At this time, the contactor will display a coil voltage and frequency listed in the table above, instead of the coil voltage code.

• SUPER MAGNET (AC/DC)

Type	Coil voltage code	Designation code	Coil voltage/frequency		Coil voltage color indication
			AC	DC	
SB-N2/SE SB-N2B/SE	24 V	E	24-25 V, 50/60 Hz	24 V	White
	48 V	F	48-50 V, 50/60 Hz	48 V	White
	100 V	1	100-127 V, 50/60 Hz	100-120 V *1	Green
	200 V	2	200-250 V, 50/60 Hz	200-240 V *2	Yellow
				200-240 V	Yellow

Note: The coil voltage is common for AC and DC.

*1: 100 to 110 V for single-phase full-wave DC.

*2: 200 to 220 V for single-phase full-wave DC.

Main contact ratings

• Main contacts 2NO, 2NO+1NC:

Main contact NO ratings (two serial contacts)

Type	Max. motor capacity (kW)				Rated operational current (A)						Conventional free air thermal current (rated thermal current) (A)			
	Class DC2, 4(JEM1038) (DC motor, L/R ≤ 15ms.)				Class DC2, 4(JEM1038) (DC motor, L/R ≤ 15ms.)			Class DC1(JEM1038) (Resistive, L/R ≤ 1ms.)						
	110 V	220 V	440 V	550 V	110 V	220 V	440 V	550 V	110 V	220 V		440 V	550 V	660 V
SB-N2 SB-N2/SE	3.7	5.5	7.5	5.5	40	35	20	15	60	60	60	50	40	60

Notes: Conforming to class DC2 and DC4, JEM 1038

DC2: For shunt-wound motors: Starting, switching off during running. The starting current is less than 2.5 times the rated current.

DC4: For series-wound motors: Starting, switching off during running. The starting current is less than 2.5 times the rated current.

Main contact NC ratings (single contact)

Type	Dynamic brake ^{*1}			Conventional free air thermal current (rated thermal current) (A)
	Making current (A)	Time rating (sec)	Operating cycles per hour	
SB-N2 SB-N2/SE	60	3	600	50

*1: The electrical switching durability test consists of 250,000 times or more under a double closed circuit and no-voltage open contact conditions

• Main contacts 2NC, 1NO+2NC:

Main contact NC ratings (two serial contacts)

Type	Max. motor capacity (kW)			Rated operational current (A)						Conventional free air thermal current (rated thermal current) (A)		
	Class DC2, 4(JEM1038) (DC motor, L/R ≤ 15ms.)			Class DC2, 4(JEM1038) (DC motor, L/R ≤ 15ms.)			Class DC1(JEM1038) (Resistive, L/R ≤ 1ms.)					
	110 V	220 V	440 V	110 V	220 V	440 V	110 V	220 V	440 V		550 V	660 V
SB-N2B SB-N2B/SE	2.2	3.7	—	30	20	—	30	25	10	5	—	50

Main contact NO ratings (single contact)

Type	Max. motor capacity (kW)			Rated operational current (A)			Conventional free air thermal current (rated thermal current) (A)
	Class DC2, 4(JEM1038) (DC motor, L/R ≤ 15ms.)			Class DC2, 4(JEM1038) (DC motor, L/R ≤ 15ms.)			
	110 V	220 V	440 V	110 V	220 V	440 V	
SB-N2B SB-N2B/SE	1.5	2.2	—	20	15	—	60

Auxiliary contact ratings

Conventional free air thermal current (rated thermal current) (A)	Making and breaking current at AC (A)	Rated operational current (A)						Minimum voltage and current ^{*1}
		AC			DC			
		Voltage (V)	AC-15 (Ind. load)	AC-12 (Res. load)	Voltage (V)	DC-13 ^{*3} (Ind. load)	DC-12 (Res. load)	
10	60	100 to 120	6	10	24	3	5	5 VDC, 3 mA
	30	200 to 240	3	8	48	1.5	3	
	15	380 to 440	1.5	5	110	0.55	2.5	
	12	500 to 600	1.2	5	220	0.27	1	

*1: The failure rate is level 10⁻⁷ in a usual atmosphere without dust and corrosive gas.

*2: The rating of the auxiliary contact block is the same as in the table above.

*3: Time constant L/R = 70 ms:

Performances

Type	Main contact	Rated operational voltage (V)	Rated operational current (A)	Operating cycles per hour	Durability	
					Mechanical	Electrical Class DC2, 4(JEM1038) (DC motor, L/R ≤ 15ms.)
SB-N2 SB-N2/SE	Contact NO (two serial contacts)	220	35	1200	2.5 million	500,000
		440	20			
SB-N2B SB-N2B/SE	Contact NC (two serial contacts)	110	30	1200	2.5 million	250,000
		220	20			
SB-N2B SB-N2B/SE	Contact NO (single contact)	110	20	1200	2.5 million	250,000
		220	15			

Coil Characteristics

• AC-operated models (SB-N2, N2B)

Power consumption						Watt loss	
Inrush				Sealed			
200 V, 50 Hz	220 V, 60 Hz	200 VDC	200 V, 50 Hz	220 V, 60 Hz	200 VDC	200 V, 50 Hz	220 V, 60 Hz
120 VA	135 VA	125 W	3.5 VA	4.2 VA	2.4 W	3.6 W	3.8 W

Note 1: Coil rating: 200 V, 50 Hz / 220-220 V, 60 Hz

Note 2: Variation range of operating voltage: 85 to 110% of rated voltage

• SUPER MAGNET (SB-N2/SE, N2B/SE)

Power consumption						Watt loss		
Inrush				Sealed				
200 V, 50 Hz	220 V, 60 Hz	200 VDC	200 V, 50 Hz	220 V, 60 Hz	200 VDC	200 V, 50 Hz	220 V, 60 Hz	200 VDC
105 VA	130 VA	125 W	3.5 VA	4.2 VA	2.4 W	2.8 W	3.2 W	2.4 W

Note 1: Coil rating: 200-250 V, 50 Hz / 60 Hz, 200-240 VDC

Note 2: Variation range of operating voltage: 80 to 110% of rated voltage

Standard compliance

Type	Compliant standards		Certified standards	
	JEM	IEC	UL	CSA
	Japan	International	USA	Canada
	JEM	IEC	UL LISTED	
SB-N2, SB-N2/SE	○	○	○ *1	○ *1
SB-N2B, SB-N2B/SE	○	○	—	—

Note: Applicable ○: Standard product is compliant and certified
 *1: Under application

Options

Option	Combination of options				
	Type	Main contact arrangement			
		2NO	2NO+1NC	2NC	1NO+2NC
Auxiliary contact block (side mounting)	SZ-AS1	○	—	—	
Coil driving unit (relay type) for IC output *1	SZ-CD3	○	—	○	
Coil driving unit (SSR type) for IC output *1	SZ-CD4	○	—	○	
Coil-surge suppression unit *1	SZ-Z31 to Z35	○	—	○	
Live-section cover *1	SZ-N1J	○	—	○	
Terminal cover	SZ-T24	○	—	○	

*1: Unable to combine with the mechanical latch model and SB-N2/VS Type.
 *2: ○: combination OK, —: combination disabled

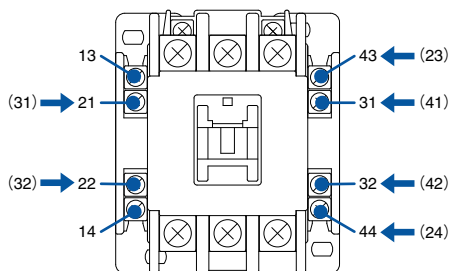
Comparison between new and old types

Model	Old type		New type	Compatible mounting method
	Type	Main contact arrangement		
Standard type	SB-2N	2NO	SB-N2	Yes
	SB-2NB	2NO+1NC	SB-N2B	Yes
		1NO+2NC	SB-N2B/SE	Yes
With super magnet	SB-2N/SE	2NO	SB-N2/SE	Yes
	SB-2NB/SE	2NO+1NC	SB-N2B/SE	Yes
		2NC	SB-N2B/SE	Yes
		1NO+2NC	SB-N2B/SE	Yes

Changing the auxiliary contact terminal number

Ensure that the terminal numbers for auxiliary contact differ from that for conventional contacts.

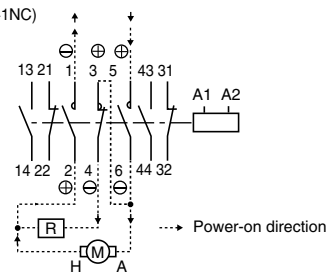
The number in the parentheses indicates a terminal number of old type SB-2N.



Note: Caution on use

- The main contact terminals have positive and negative polarities. Connect cables correctly in terms of their polarities. (Refer to the example on the right.)
- It is ideal to mount the contactor on a vertical plane. However, if mounting the contactor on a sloping surface, ensure that the slope is within ±30 degree longitudinally and vertically.
- When mounting the contactor, ensure that an arc space of more than the value shown in the outline drawing is provided in front of the arc-extinguishing chamber. (This is unnecessary if the contactor is not used for shutting off currents.)

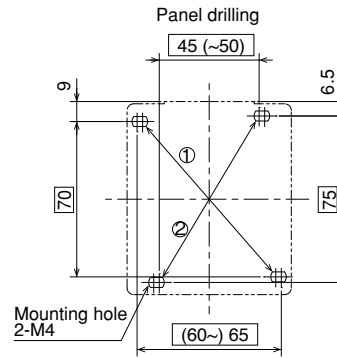
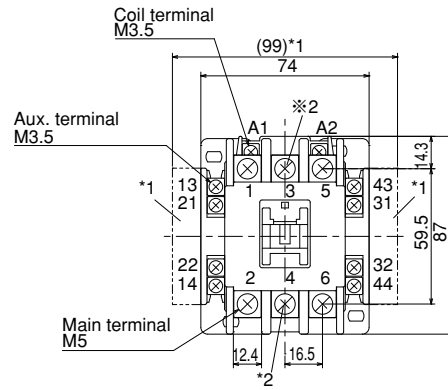
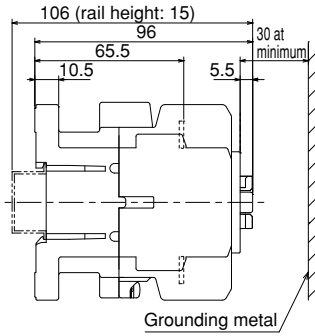
(example: product with connect 2NO+1NC)



Note: • R: resistance for dynamic brake
 • For products with main contact 2NO, contact 1NC No. 3, 4 are omitted.

■ Dimensions, mm

SB-N2 [SB35C □ A-...]
SB-N2B [SB35C □ A-...]

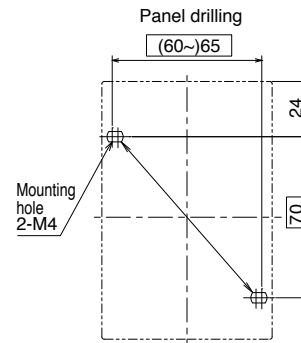
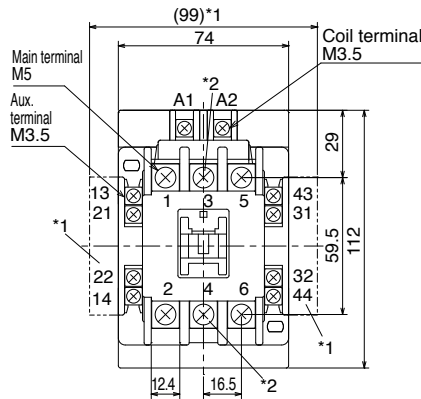
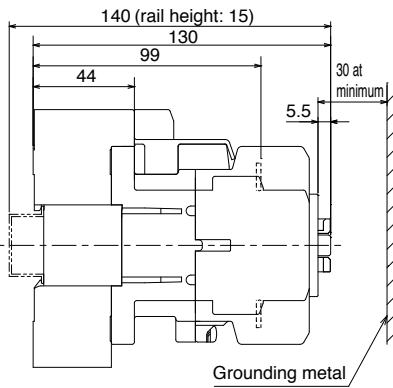


- *1: In cases where auxiliary contact block (side mounting) is installed (SB-N2B and N2B/SE are not allowed)
- *2: There are no terminals 3/4 in the case of main contact 2NO or 2NC.

Mass: 0.59 kg

SB-N2/SE [SB35C □ S-...]
SB-N2B/SE [SB35C □ S-...]

Caution
Use two diagonal holes for installation of the contactor.
(i) (60 to 65) x 70: compatible with SB-2N, 2NB
(ii) 45 (to 50) x 75: IEC mounting hole

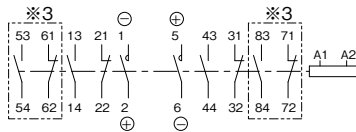


- *1: In cases where auxiliary contact block (side mounting) is installed (SB-N2B and N2B/SE are not allowed)
- *2: There are no terminals 3/4 in the case of main contact 2NO or 2NC.

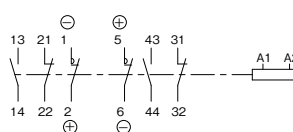
Mass: 0.87 kg

Contact arrangement

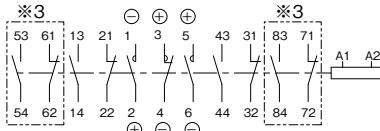
SB-N2 (2NO), SB-N2/SE (2NO)



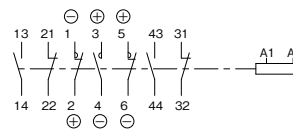
SB-N2B (2NC), SB-N2B/SE (2NC)



SB-N2 (2NO+1NC), SB-N2/SE (2NO+1NC)



SB-N2B (1NO+2NC), SB-N2B/SE (1NO+2NC)



- Note 1: *3: In the case of auxiliary contact 4NO+4NC
- Note 2: Combination with auxiliary contact block (front mounting) is not allowed.

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