

Specifications of DC Electromagnetic Contactor



Type : SB-N2BH(2B,1A2B)

1. Application scope

These specifications apply to DC electromagnetic contactor type SB-N2BH.

The conformable standards are JIS C8201-4-1

(Low-voltage switchgear and controlgear Part 4: Contactors and motor-starters)

2. Normal service conditions

The electromagnetic contactor shall operate normally without malfunction under the following standard conditions.

Ambient air temperature (near the product in use)	- 5 to +55°C	The average temperature in a day shall not exceed 35°C.
Relative humidity	45 to 85%	There shall be no condensation or freezing due to a sudden temperature change.
Altitude	2000m or less	
Vibration condition	10 to 55Hz, 15m/s <sup>2</sup>	
Shock condition	50 m/s <sup>2</sup>	The contacts shall not have malfunction.
Atmospheric conditions	There shall not be excessive dust, smoke, inflammable gases, vapor, oil vapor, salinity and corrosive materials in the atmosphere.	
Mounting	Vertical	If necessary, permissive angle is within 30 degrees in front/back or right/left directions.
Storage air temperature	- 40°C to +65°C	There shall be no condensation or freezing due to a sudden temperature change.
Control supply voltage tolerance	85 to 110% of rated control supply voltage Us	

3. Main circuit ratings

3-1. Main N.C. contacts (2-pole in series)

Rated insulation voltage Ui [V]	Class DC-2 and DC-4				Class DC-1				Conventional free air thermal current Ith [A]
	Rated capacity [kW]		Rated operational current Ie [A]		Rated operational current Ie [A]				
	110V	220V	110V	220V	110V	220V	440V	550V	
1000	2.2	3.7	30	20	30	25	10	5	50

3-2. Main N.O. contact

Rated insulation voltage Ui [V]	Class DC-2 and DC-4				Conventional free air thermal current Ith [A]
	Rated capacity [kW]		Rated operational current Ie [A]		
	110V	220V	110V	220V	
1000	1.5	2.2	20	15	60

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4. Auxiliary circuit ratings

Rated insulation voltage Ui [V]	Conventional free air thermal current Ith [A]	Making and breaking current (AC) [A]	Rated operational voltage(AC) Ue [V]	Rated operational current Ie [A]		Rated operational voltage(DC) Ue [V]	Rated operational current Ie [A]		Minimum voltage/current *
				AC-15 (Inductive load)	AC-12 (Resistive load)		DC-13 (Inductive load)	DC-12 (Resistive load)	
690	10	60	100 to 120	6	10	24	10	10	DC24V, 10mA
		60	200 to 240	6	10	48	3	5	
		40	380 to 440	4	10	110	1.5	2.5	
		25	500 to 600	2.5	10	220	0.5	1	

Note: \* The failure rate is  $10^{-7}$  level in the usual atmosphere where neither dirt nor corrosive gas exists.

5. Performance

5-1. Main N.C. contacts (2-pole in series)

Rated operational voltage Ue [V]	Rated operational current Ie [A]	Operating frequency [1/h]	Durability [Mill.]	
			Mechanical	Electrical Class DC-2 and DC-4
110	30	1200	2.5	0.25
220	20			

Rated operational voltage Ue [V]	Making and breaking current [A]	
	Making	Breaking
110	120	120
220	80	80

5-2. Main N.O. contact

Rated operational voltage Ue [V]	Rated operational current Ie [A]	Operating frequency [1/h]	Durability [Mill.]	
			Mechanical	Electrical Class DC-2 and DC-4
110	20	1200	2.5	0.25
220	15			

Rated operational voltage Ue [V]	Making and breaking current [A]	
	Making	Breaking
110	80	80
220	60	60

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6. Operating characteristics

- 6-1. Closing voltage : Closing operation shall be possible at 85% or less of rated control supply voltage under ambient temperature at 55°C and coil-hot condition.
- 6-2. Drop-out voltage : Opening operation shall be possible between 20% and 75% of rated control supply voltage under ambient temperature at -5°C and coil-cold condition.
- 6-3. Power consumption of operating electromagnetic coil (example)

Power consumption [VA]				Watt loss [W]	
Inrush		Sealed		200V 50Hz	220V 60Hz
200V 50Hz	220V 60Hz	200V 50Hz	220V 60Hz		
120	135	12.7	12.4	3.6	3.8

Note: The values in above table show the characteristics of the coil which rated coil voltage is 200V 50Hz/200-220V 60Hz under ambient temperature at 20°C and coil-cold condition

7. Temperature rise

The temperature rise of the parts shall not exceed the values in the following table when applied the conventional free air thermal current to the main circuit and the rated control supply voltage to the coil respectively.

(At the ambient air temperature of 55°C)

Measuring point	Contacts	Terminals	Coil (Resistance method)
Temperature rise [K]	85	50	85

8. Insulation resistance and withstand voltage

- 8-1. Insulation resistance :It measures with a 1000V megger and shall exceed the values in the following table.
- 8-2. Withstand voltage :Withstanding the voltage of the following table at 50 and 60Hz for 60 seconds.
- 8-3. Rated impulse withstand voltage :Withstanding the voltage of the following table.

Measuring position	Between all circuits and earth (Contact:open/close)	Between main poles (Contact:open/close)	Between main circuits and control/ auxiliary circuit	Between main/ auxiliary circuit and control circuit	Between control circuit and auxiliary circuit (Contact:open/close)
Insulation resistance [MΩ]	100	100	100	100	100
Withstand voltage [V]	2200	2200	2200	2200	1890
Rated impulse withstand voltage Uimp [kV]	8	8	8	8	6

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9. Resistance to vibration and shock

9-1. Resistance to vibration

(1) Endurance

There shall be no malfunction such as losing screws, changing characteristics and mechanical damage after the endurance test.

The test conditions are 16.7Hz for the frequency, 2mm for the double amplitude and 2hr for the time in 3-axis direction.

(2) Unintended opening and closing of the contacts

There shall be no unintended opening and closing of the contacts in applied 10 to 55Hz for the frequency and 15m/s<sup>2</sup> for the acceleration in 3-axis direction

9-2. Resistance to shock

(1) Endurance

There shall be no malfunction such as changing characteristics and mechanical damage after applied 100m/s<sup>2</sup> for the acceleration in 3-axis direction.

(2) Unintended opening and closing of the contacts

There shall be no unintended opening and closing of the contacts in applied 50m/s<sup>2</sup> for the acceleration in 3-axis direction.

10. Renewal recommendation time of the product

As for the product that passed for more than 10 years after production, the renewal is recommended, even in the case that it does not exceed the operating cycles of the electrical and mechanical durability.

11. Attached materials

Documents name	Type	Documents number
Outline drawing	SB-N2BH(2B,1A2B)	F083 04 12(5)

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