# Specifications of AC Electromagnetic Contactor

Type: SC-N11

F Fuji Electric FA

## 1. Application scope

These specifications apply to AC electromagnetic contactor Type SC-N11.

The conformable standards are IEC 60947-4-1 (Electromechanical contactors and motor-starters) and JIS C 8201-4-1 (Electromechanical 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 $35^{\circ}$ 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	10 to 55Hz, 15m/s <sup>2</sup>				
Shock condition	50 m/s²	The contacts shall not have malfunction.				
Atmospheric conditions	There shall not be	e excessive dust, smoke, inflammable gases, vapor,				
	oil vapor, salinity a	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	80 to 110% of rated control supply voltage Us					

### 3. Main circuit ratings

## 3-1. IEC ratings (IEC 60947-4-1)

Three-phase squirrel-cage induction motor						n motor (A	(C-3)		Conven
Rated	Rated capacity [kW] Rated operational current Ie [A]				-tional				
insulation	200 to	380 to	500 to	600 to	200 to	380 to	500 to	600 to	free air
voltage	240V	440V	550V	690V	240V	440V	550V	690V	thermal
Ui [V]									current
									Ith [A]
1000	90	160	160	200	300	300	230	230	350

# 3-2. JIS ratings (JIS C 8201-4-1)

	Three-phase squirrel-cage induction motor (AC-3)							
Rated	Rated capacity [kW]			Rated op	-tional			
insulation	200 to	380 to	500 to	200 to	380 to	500 to	free air	
voltage	240V	440V	550V	240V	440V	550V	thermal	
Ui [V]							current	
							Ith [A]	
1000	75	150	160	300	300	230	350	

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## 4. Auxiliary circuit ratings

	Conven			Rated op	Rated operational		Rated op	erational	
Rated	-tional	Making and	Rated	current	t Ie [A]	Rated	current	t Ie [A]	Minimum
insulation	! !		operational	I ΔC-15 I	ΔC-12	operational	1 DC-13 I	DC-12	voltage/
voltage Ui [V]	thermal		voltage(AC) Ue [V]	(Inductive	(Resistive	lleIVI	(Inductive	(Resistive	*
	Ith [A]			load)	load)		load)	load)	
		60	100 to 120	6	10	24	3	5	
690	10	30	200 to 240	3	8	48	1.5	3	DC5V,
080	10	15	380 to 440	1.5	5	110	0.55	2.5	3mA
	<u> </u>	12	500 to 600	1.2	5	220	0.27	1	

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

# 5. Performance

#### 5-1. IEC ratings (IEC 60947-4-1)

Rated operational	Rated operational	Operating frequency	Durability [Mill.]		
voltage Ue [V]	current Ie [A]	[1/h]	Mechanical	Electrical AC-3	
220	300	1200	5*	4	
440	300	1200	J	<b>I</b>	

### 5-2. JIS ratings (JIS C 8201-4-1)

Rated operational	Rated operational	Operating frequency	1	ability lill.]	Performance	
voltage Ue [V]	current Ie [A]	[1/h]	Mechanical	Electrical AC-3	Performance	
220	300	1200	5*	1	JIS AC-3·1·1-0	
440	300	1200	3	1	019 MO-3,1,1-0	

# 5-3. Making and breaking current (IEC 60947-4-1, JIS C 8201-4-1)

Rated	Making and breaking			
operational	current			
voltage	[A]			
Ue [V]	Making	Breaking		
220	3600	3000		
440	3600	3000		

Note \*: The applied voltage to the coil is 1.1 times of min. rated coil voltage.

(example: The applied voltage is 220V when the range is 200V to 250V.)

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#### 6. Operating characteristics

6-1. Closing voltage : Closing operation shall be possible at 80% 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 10% and 65% 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]				oss [W]
Inrush		Sea	aled	200V 50Hz	220V 60Hz
200V 50Hz	200V 50Hz 220V 60Hz		220V 60Hz	200 / 30   12	220 00112
240	320	5.7	6.5	5.6	6

Note: The values in above table show the characteristics of the coil which rated coil voltage is AC200-250V 50/60 Hz, DC200-240V 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 5 second.

8-3. Rated impulse withstand voltage : Withstanding the voltage of the following table.

	Between all	Between main	Between main	Between main/	Between control
	circuits and earth	poles	circuits	auxiliary circuit	circuit and
Measuring position	(Contact:open/close)	(Contact:open/close)	and	and	auxiliary circuit
position			control/ auxiliary	control circuit	(Contact:open/close)
			circuit		
Insulation	100	100	100	100	100
resistance [MΩ]	100	100	100	100	100
Withstand	2200	2200	2200	2200	1890
voltage [V]	2200	2200	2200		
Rated impulse					
withstand	8	8	8	8	6
voltage		3			
Uimp [ kV]					

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#### 9. Resistance to vibration and shock

#### 9-1. Resistance to vibration

#### (1) Endurance

There shall be no malfunction such as loosing 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 $^2$  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	SC-N11	F068 03 01(5)	

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