Standard specifications

Standard specifications (VT specifications: For square reduction torque)

●Three-phase 3 kV series; Overload capacity: 105% 1 min, 120% 1 min (At cold start, at cooling fin temperature of 40°C or lower)

Type	Input voltage [kV]	Rated capacity [kVA]	Rated current [A]	Maximum current (when overloaded) [A]*1	Applicable motor maximum output [KW]*2	Main circuit insulation class	Main circuit standard rated short-circuit current [kA 1s]	Control power source capacity [kVA]	Fan capacity [kVA]	
FRN46–1FA–3□□30–0350□	3.0	350	68	72	285	3B	8.0	0.5	1.5	
FRN46–1FA–3□□33–0390□	3.3	390			315					
FRN46–1FA–3□□30–0500□	3.0	500	98	103	400	3B	8.0	0.5	1.5	
FRN46–1FA–3□□33–0560□	3.3	560			450					
FRN46–1FA–3□□30–0700□	3.0	700	134	141	560	3B	8.0	0.5	3.0	
FRN46–1FA–3□□33–0770□	3.3	770			610					
FRN46–1FA–3□□30–1050□	3.0	1050	202	212	840	3B	8.0	0.5	4.0	
FRN46–1FA–3□□33–1150□	3.3	1150			920					
FRN46–1FA–3□□30–1350□	3.0	1350	262	275	1100	3B	8.0	0.5	4.0	
FRN46–1FA–3□□33–1500□	3.3	1500			1200					
FRN46–1FA–3□□30–1600□	3.0	1600	306	321	1280	3B	12.5	0.5	4.5	
FRN46–1FA–3□□33–1750□	3.3	1750			1400					
FRN46–1FA–3□□30–2350□	3.0	2350	459	482	1930	3B	25.0	0.5	5.5	
FRN46–1FA–3□□33–2600□	3.3	2600			2100					
FRN46–1FA–3□□30–3200□	3.0	3200	612	643	2570	3B	25.0	0.5	9.5	
FRN46–1FA–3□□33–3500□	3.3	3500			2800					
FRN46–1FA–3□□30–4750□	3.0	4750	918	964	3850	3B	25.0	0.5	15.5	
FRN46–1FA–3□□33–5200□	3.3	5200			4200					

*1: At an output frequency of 25 Hz or less, the output current is limited. (At a frequency of 0.2 Hz, the current is 70% of rated current.)
*2: The applicable motor maximum output is the reference value of Fuji Electric's standard 4-pole motors.

●Three-phase 6 kV series; Overload capacity: 105% 1 min, 120% 1 min (At cold start, at cooling fin temperature of 40°C or lower)

Type	Input voltage [kV]	Rated capacity [kVA]*3	Rated current [A]	Maximum current (when overloaded) [A]*1	Applicable motor maximum output [KW]*2	Main circuit insulation class	Main circuit standard rated short-circuit current [kA 1s]	Control power source capacity [kVA]	Fan capacity [kVA]	
FRN46–1FA–6□□60–2360□	6.0	2360	227	238	1900	6B	8.0	0.5	7.5	
FRN46–1FA–6□□66–2600□	6.6	2600			2000					
FRN46–1FA–6□□60–2700□	6.0	2700	265	275	2200	6B	8.0	0.5	7.5	
FRN46–1FA–6□□66–3000□	6.6	3000			2400					
FRN46–1FA–6□□60–3200□	6.0	3200	306	321	2560	6B	12.5	0.5	7.5	
FRN46–1FA–6□□66–3500□	6.6	3500			2800					
FRN46–1FA–6□□60–4000□	6.0	4000	385	462	3200	6B	12.5	0.5	13.5	
FRN46–1FA–6□□66–4400□	6.6	4400			3500					
FRN46–1FA–6□□60–4700□	6.0	4700	459	482	3860	6B	25.0	0.5	13.5	
FRN46–1FA–6□□66–5200□	6.6	5200			4160					
FRN46–1FA–6□□60–6400□	6.0	6400	612	643	5140	6B	25.0	0.5	18.5	
FRN46–1FA–6□□66–7000□	6.6	7000			5500					
FRN46–1FA–6□□60–9500□	6.0	9500	918	964	7700	6B	25.0	0.5	31.0	
FRN46–1FA–6□□66–X500□	6.6	10500			8300					

*1: At an output frequency of 25 Hz or less, the output current is limited. (At a frequency of 0.2 Hz, the current is 70% of rated current.)
*2: The applicable motor maximum output is the reference value of Fuji Electric's standard 4-pole motors.
*3: For 2300 kVA or less, refer to the catalog for FRENIC4600FM5d (RC 92-52).

	Outline drawing	Outline dimensions							Approx. mass [kg]
		A(Full width) [mm]	B(Transformer panel) [mm]	C(Converter panel) [mm]	D(Control output panel) [mm]	E(Fan section) [mm]	F(Depth) [mm]	G(Maintenance space) [mm]	
	Fig.1	2000	—	1500	500	458	1000	1300	2000
		2300	—	1800	500	458	1100	1300	3000
		2300	—	1800	500	520	1200	1300	4100
	Fig.2	3000	2100	900	—	59	1300	1300	4500
		3400	2300	1100	—	455	1400	1300	6200
		3500	2300	1200	—	455	1400	1300	7000
	Fig.4	3600	2200	1400	—	455	1400	1500	8100
	Fig.6	6800	2300	3600	900	455	1400	1500	12300
	Fig.8	10900	5200	4800	900	600	1900	1800	26000

	Outline drawing	Outline dimensions							Approx. mass [kg]
		A(Full width) [mm]	B(Transformer panel) [mm]	C(Converter panel) [mm]	D(Control output panel) [mm]	E(Fan section) [mm]	F(Depth) [mm]	G(Maintenance space) [mm]	
	Fig.3	4800	2400	2400	—	455	1400	1300	10200
		4800	2400	2400	—	455	1400	1300	10200
		4800	2400	2400	—	455	1400	1300	11200
	Fig.5	8400	2300	1400	1000	455	1400	1500	17900
		8400	2300	1400	1000	455	1400	1500	17900
	Fig.7	12900	2400	3600	900	455	1400	1500	24500
	Fig.9	21800	5600	4800	1000	600	1800	1800	51000

Standard specifications

Standard specifications (CT specifications : Constant torque application)

Three-phase 3kV series; Converter overload capacity: Rated current, 150% of CT applicable continuous current (motor protection) 1 min

Type	Input voltage [kV]	Rated capacity [kVA]	Rated current [A]	CT applicable capacity [kVA]	CT applicable continuous current [A]	Maximum current (when overloaded) [A]	CT applicable motor maximum output [KW]*1	Main circuit insulation class	Main circuit standard rated short-circuit current [kA 1s]
FRN46–1□A–3□□30–0250□	3.0	350	68	250	48	72	185	3B	8.0
FRN46–1□A–3□□33–0275□	3.3	390		275			200		
FRN46–1□A–3□□30–0350□	3.0	500	98	350	68	103	265	3B	8.0
FRN46–1□A–3□□33–0390□	3.3	560		390			300		
FRN46–1□A–3□□30–0490□	3.0	700	134	490	94	141	355	3B	8.0
FRN46–1□A–3□□33–0540□	3.3	770		540			400		
FRN46–1□A–3□□30–0730□	3.0	1050	202	730	141	212	560	3B	8.0
FRN46–1□A–3□□33–0800□	3.3	1150		800			630		
FRN46–1□A–3□□30–0950□	3.0	1350	262	950	183	275	710	3B	8.0
FRN46–1□A–3□□33–1045□	3.3	1500		1045			800		
FRN46–1□A–3□□30–1110□	3.0	1600	306	1110	214	321	900	3B	12.5
FRN46–1□A–3□□33–1220□	3.3	1750		1220			1000		
FRN46–1□A–3□□30–1670□	3.0	2350	459	1670	321	482	1320	3B	25.0
FRN46–1□A–3□□33–1830□	3.3	2600		1830			1500		
FRN46–1□A–3□□30–2220□	3.0	3200	612	2220	428	643	1700	3B	25.0
FRN46–1□A–3□□33–2450□	3.3	3500		2450			1900		
FRN46–1□A–3□□30–3340□	3.0	4750	918	3340	643	964	2650	3B	25.0
FRN46–1□A–3□□33–3670□	3.3	5200		3670			3150		

*1: The applicable motor maximum output is the reference value of Fuji Electric's standard 4-pole motors.

Three-phase 6kV series; Converter overload capacity: Rated current, 150% of CT applicable continuous current (motor protection) 1 min

Type	Input voltage [kV]	Rated capacity [kVA]*2	Rated current [A]	CT applicable capacity [kVA]	CT applicable continuous current [A]	Maximum current (when overloaded) [A]	CT applicable motor maximum output [KW]*1	Main circuit insulation class	Main circuit standard rated short-circuit current [kA 1s]
FRN46–1□A–6□□60–1900□	6.0	2360	238	1900	159	238	1320	6B	8.0
FRN46–1□A–6□□66–2000□	6.6	2600		2000			1500		
FRN46–1□A–6□□60–2200□	6.0	2700	275	2200	186	275	1600	6B	8.0
FRN46–1□A–6□□66–2400□	6.6	3000		2400			1700		
FRN46–1□A–6□□60–2560□	6.0	3200	321	2560	214	321	1800	6B	12.5
FRN46–1□A–6□□66–2800□	6.6	3500		2800			1900		
FRN46–1□A–6□□60–3200□	6.0	4000	462	3200	269	462	2250	6B	12.5
FRN46–1□A–6□□66–3500□	6.6	4400		3500			2360		
FRN46–1□A–6□□60–3860□	6.0	4700	482	3860	321	482	2800	6B	25.0
FRN46–1□A–6□□66–4160□	6.6	5200		4160			3000		
FRN46–1□A–6□□60–5140□	6.0	6400	643	5140	428	643	3750	6B	25.0
FRN46–1□A–6□□66–5500□	6.6	7000		5500			4250		
FRN46–1□A–6□□60–7700□	6.0	9500	964	7700	643	964	5300	6B	25.0
FRN46–1□A–6□□66–8300□	6.6	10500		8300			6200		

*1: The applicable motor maximum output is the reference value of Fuji Electric's standard 4-pole motors.
*2: For 2300 kVA or less, refer to the catalog for FRENIC4600FM5d (RC 92-52).

	Control power source capacity [kVA]	Fan capacity [kVA]	Outline drawing	Outline dimensions							Approx. mass [kg]
				A(Full width) [mm]	B(Transformer panel) [mm]	C(Converter panel) [mm]	D(Control output panel) [mm]	E(Fan section) [mm]	F(Depth) [mm]	G(Maintenance space) [mm]	
	0.5	1.5	Fig.1	2000	—	1500	500	458	1000	1300	2000
	0.5	1.5		2300	—	1800	500	458	1100	1300	3000
	0.5	3.0		2300	—	1800	500	520	1200	1300	4100
	0.5	4.0	Fig.2	3000	2100	900	—	59	1300	1300	4500
	0.5	4.0		3400	2300	1100	—	455	1400	1300	6200
	0.5	4.5		3500	2300	1200	—	455	1400	1300	7000
	0.5	5.5	Fig.4	3600	2200	1400	—	455	1400	1500	8100
	0.5	9.5	Fig.6	6800	2300	3600	900	455	1400	1500	12300
	0.5	15.5	Fig.8	10900	5200	4800	900	600	1900	1800	26000

	Control power source capacity [kVA]	Fan capacity [kVA]	Outline drawing	Outline dimensions							Approx. mass [kg]
				A(Full width) [mm]	B(Transformer panel) [mm]	C(Converter panel) [mm]	D(Control output panel) [mm]	E(Fan section) [mm]	F(Depth) [mm]	G(Maintenance space) [mm]	
	0.5	7.5	Fig.3	4800	2400	2400	—	455	1400	1300	10200
	0.5	7.5		4800	2400	2400	—	455	1400	1300	10200
	0.5	7.5		4800	2400	2400	—	455	1400	1300	11200
	0.5	13.5	Fig.5	8400	2300	1400	1000	455	1400	1500	17900
	0.5	13.5		8400	2300	1400	1000	455	1400	1500	17900
	0.5	18.5	Fig.7	12900	2400	3600	900	455	1400	1500	24500
	0.5	31.0	Fig.9	21800	5600	4800	1000	600	1800	1800	51000

Standard specifications

Dimensions

●Description of code symbol (VT)

FRN46 – 1 F A – 665 60 – 1000 A

Basic code symbol

Code	Product category
FRN46-1	FRENIC4600FM5e

Control system

Code	Control system
F	VT specifications (V/F simple sensorless vector)

Input voltage and frequency

Code	Input voltage and frequency	Code	Input voltage and frequency
305	3.0kV 50Hz	605	6.0kV 50Hz
306	3.0kV 60Hz	606	6.0kV 60Hz
335	3.3kV 50Hz	665	6.6kV 50Hz
336	3.3kV 60Hz	666	6.6kV 60Hz

Auxiliary power source

Code	Auxiliary power source
A	Control power source: Single-phase 200 V or 220 V Fan power source: Three-phase 200 V or 220 V
Z	Other

Output capacity

Code	Output capacity
0250 to 0970	250 to 970kVA
1000 to 9500	1000 to 9500kVA
X500	10500kVA

For details, see individual specifications.

Output voltage

Code	Output voltage	Code	Output voltage
30	3.0kV	60	6.0kV
33	3.3kV	66	6.6kV

●Description of code symbol (CT)

FRN46 – 1 C A – 665 60 – 1000 A

Basic code symbol

Code	Product category
FRN46-1	FRENIC4600FM5e

Control system

Code	Control system
C	CT specifications (V/F simple sensorless vector)
S	CT specifications (sensorless vector)
V	CT specifications (vector with sensor)

Input voltage and frequency

Code	Input voltage and frequency	Code	Input voltage and frequency
305	3.0kV 50Hz	605	6.0kV 50Hz
306	3.0kV 60Hz	606	6.0kV 60Hz
335	3.3kV 50Hz	665	6.6kV 50Hz
336	3.3kV 60Hz	666	6.6kV 60Hz

Auxiliary power source

Code	Auxiliary power source
A	Control power source: Single-phase 200 V or 220 V Fan power source: Three-phase 200 V or 220 V
Z	Other

Output capacity

Code	Output capacity
0250 to 0970	250 to 970kVA
1000 to 9500	1000 to 9500kVA
X500	10500kVA

For details, see individual specifications.

Output voltage

Code	Output voltage	Code	Output voltage
30	3.0kV	60	6.0kV
33	3.3kV	66	6.6kV

Common specifications

Common specifications

Input	Main circuit	3-phase 3000, 3300, 6000, 6600 V; 50 or 60Hz
	Auxiliary power source	Control power source: Single-phase 200 or 220 V, 50 or 60 Hz; Fan power source: 3-phase 200 or 220 V, 50 or 60 Hz
	Cell control power source	Supplied from AC main circuit (supplied from secondary side of input transformer)
	Allowable power source variation	Voltage: ±10%; Frequency: ±5%
Control system	Control system	V/f constant control with simple sensorless vector control, vector control, and sensorless vector control are available. (Must be selected when ordering.)
	Output frequency	Control range: 0.2 Hz to 50 or 60 Hz (option: up to 120 Hz); Accuracy: ±0.5% relative to maximum frequency (for analog frequency standard input); Resolution: 0.005%
	Acceleration, deceleration time	0.1～5500s
	Main control functions	Current limit, stall prevention, jump frequency setting, deceleration to prevent overvoltage, restart after momentary power interruption (optional)
	Protection functions	Overcurrent, main circuit fuse blown, overvoltage, undervoltage, CPU fault, cooling fan stop
	Transmission functions (optional)	T-link, PROFIBUS-DP, Modbus
Structure	Panel	Steel panel, self-standing, enclosed; Protection rating: IP20 (Other rating optional); Cooling method: Forced ventilation with ceiling fan
	Paint finish color	Munsell 5Y7/1 (interior and exterior)
Ambient *1 conditions	Temperature	Ambient temp.: 0 to +40°C; Storage temp.: –10 to +60°C; Transport temp.: –10 to +70°C (+60 to +70°C: Within 24 h)
	Humidity	85% RH max. (non-condensing)
	Installation location	Indoor; Site altitude: Up to 1000 m above sea level; Acceleration vibration: up to 4.9 m/s^2 (10 to 50 Hz) Atmosphere: General environment free from corrosive gas, dust, flammable or explosive gas
Applicable standard		JIS, JEM, JEC

*1: To use this inverter unit at an ambient temperature of +40°C or more, at an altitude of 1,000 m or more, derating is required. Contact us.
Note 1) Regenerative braking is not provided.
Note 2) For this inverter unit, a separate dedicated input circuit breaker is required.

Protection functions

Item	Description	Touch panel display	Related function code
Overcurrent	This status is detected if the peak value of output current exceeds the overcurrent operation level. Although this function varies depending on the ripple rate (differs depending on motor constant) because of momentary operation, it means that current larger than approximately 200% of inverter rated current (in terms of effective value) is flowing.	OC	
Inverter overload	This status is detected if output current overload is detected (current that exceeds the inverter rated current is flowing continuously).	OLINV	
Motor overload	This status is detected if output current that exceeds the overload setting is flowing continuously for more than the set time.	OLM	No.169[No.358], No.170[No.359], No.171[No.360], No.173
Overfrequency, overspeed	This status is detected if the inverter output frequency or the revolving speed exceeds 120% of the rating.	OS	No.173
ACR CPU error	This error is output if any CPU interrupt for ACR does not occur for certain period.	A CPU	
Pulse distribution error	This error is output if the CPU for pulse distribution that controls the output pulse or its peripheral circuit is abnormal and the watchdog timer (WDT) is activated.	PDU	
Analog frequency setting error	This error is output if the analog frequency setting drops drastically. During momentary power interruption and within 100 ms after momentary power interruption, this fault is not detected.	AI	No.89, No.90
Motor starting jam	The starting jam is detected if the inverter output frequency is less than the setting and the output current detected value (calculated for the motor) is continuously over the set value for more than the set time.	MLK	No.176[No.367], No.177[No.368] No.178[No.369]
Momentary power interruption	This status is output if momentary power interruption of the DDC control power source (the voltage is less than 85% of power source voltage for more than 20 ms) occurs during motor operation.	PWRL	No.284
System momentary power interruption	This status is output if momentary power interruption of the system power source (the value is less than the set value of setting No. 295 for more than 4 ms) occurs during motor operation.	MPWRL	No.284
System power interruption fault	This fault is detected if the system power source drops less than the set value of momentary power interruption during motor operation and the momentary power interruption continues for more than the set time.	MLPWR	No.290, No.295, No.284, No.293

Item	Description	Touch panel display	Related function code
Power interruption fault	This fault is displayed if momentary power interruption of the DDC control power source (the voltage is less than 85% of power source voltage) occurs during motor operation and the momentary power interruption continues for more than the set time.	LPWRL	No.293, No.290, No.297, No.284
Circuit breaker switching fault	This fault is detected if both the inverter and the commercial circuit breaker are on for more than 1 second during synchronizing and parallel off operation.	MCLAP	No.173
Synchronizing jam	This fault is detected if phase focusing with the commercial power source does not complete synchronizing within 20 s after output of the synchronizing command during synchronizing and parallel off operation.	SYNC	
Flying start fault	This fault is detected if the number of retries during a speed search fault at the start-up of the inverter exceeds the retry limit setting.	RTRY	No.195, No.196
External minor fault	This fault is output if some minor fault is input from an external sequence.	FTB	
External major fault	This fault is output if some major fault is input from an external sequence.	FTA	
External intermediate fault	This fault is output if some intermediate fault is input from an external sequence.	FTC	
Ground fault	This fault is detected if the ground fault detecting relay is activated.	OVG	No.173
Fan and temperature major fault	This fault is detected if an inverter panel fan fault and transformer overheating (major fault) occur.	FANH	
Fan and temperature minor fault	This fault is detected if an inverter panel fan fault and transformer overheating (minor fault) occur.	FANL	
Printed circuit board temperature error	This error is detected if the temperature of the control printed circuit board exceeds 60°C.	OTDDC	
Transformer overheating major fault	This fault is detected if transformer overheating (major fault) occurs.	TRTMP	
Optical link error	This error is detected if an optical link carrying multiplex transmission causes an error.	LINK	
Modbus error	This fault is activated if a Modbus logic error (address error, parity error, etc.) occurs or transmission stops for more than the set time. (Detected only during Modbus interlock operation and when the MC-RN on conditions are satisfied.)	MOD	No.377, No.174
PSB card error	This error is activated after an emergency stop if "PSB error" is set at the status flag of the PROFIBUS transmission board (PSB). (Detected only during PLC interlock operation and when the MC-RN on conditions are satisfied.)	PSB	No.174
PROFIBUS error	This error is activated if transmission stops for more than 100 ms in the PROFIBUS. (Detected only during PLC interlock operation and when the MC-RN on conditions are satisfied.)	PROFI	No.174
MICREX error	This error is activated if the "TER: Transmission error" bit in data received from PLC is 1. (Detected only during PLC interlock operation and when the MC-RN on conditions are satisfied.)	MICRX	No.174
Upper transmission system error	This error is activated if the P(E) link healthy bit delivered from the MPU of IFC (transmission repeater) to the DLA of IFC is "0". (Detected only during PLC interlock operation and when the MC-RN on conditions are satisfied.)	IFC	No.174
DLA error	This error is activated if "DLA error" is set at the status flag of the D-LINE transmission board (DLA). (Detected only during PLC interlock operation and when the MC-RN on conditions are satisfied.)	DLA	No.174
D-LINE (T-LINK) error	This error is activated if transmission stops for more than 100 ms on the D-LINE/T-LINK. (Detected only during PLC interlock operation and when the MC-RN on conditions are satisfied.)	DLINE	No.174
Cell DC fuse blown	This status is output if the inverter DC main circuit fuse in a cell is blown. For individual confirmation, check the operation display in the unit.	DCF	
Cell main circuit overvoltage	This status is output if the DC main circuit voltage in each inverter cell is too high.	OV	
Main circuit overvoltage in cell deceleration	This status is output if the DC main circuit voltage is too high during inverter deceleration operation.	OVDEC	
Cell main circuit undervoltage P-M	This status is output if the DC main circuit voltage is too low (receiving voltage ratio is approximately 80%) during inverter operation or if the DC main circuit voltage does not exceed the detection level even after the initial charge.	UV PM	
Cell main circuit undervoltage M-N	This status is output if the DC main circuit voltage is too low (receiving voltage ratio is approximately 80%) during inverter operation or if the DC main circuit voltage does not exceed the detection level even after the initial charge.	UV MN	
Cell main circuit voltage unbalance	This status is output if the difference between the positive (P) and negative (N) sides of DC voltage in a cell exceeds 14% of rated voltage for more than 5 seconds.	UNB	
Cell PWM optical signal error	This error is detected if the optical link for PWM signals becomes abnormal.	PWM	
Cell control power source drop	This status is detected if the control power source voltage in a cell drops or if the control power source in a cell becomes abnormal.	PWRL	
Cell coolant overheating	This status is detected if the cooling fin temperature in a cell becomes 95°C or higher.	OTF	
Cell local optical link error	This error is detected if an error occurs in the optical link that composes multiplex transmission.	LLINK	