Standard specifications

Rating

● Three-phase 200V power supply

Model FR-E720-□K (SC)*9(NF)*10(NC)*11(-NE)*12(-TM)*13		0.1	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
Applicable motor capacity (kW)*1		0.1	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
Output	Rated capacity (kVA)*2	0.3	0.6	1.2	2.0	3.2	4.4	7.0	9.5	13.1	18.7	23.9
	Rated current (A)*7	0.8 (0.8)	1.5 (1.4)	3 (2.5)	5 (4.1)	8 (7)	11 (10)	17.5 (16.5)	24 (23)	33 (31)	47 (44)	60 (57)
	Overload current rating*3	150% 60s, 200% 3s (inverse-time characteristics)										
	Rated voltage*4	Three-phase 200 to 240V										
	Regenerative braking torque*5	150%		100%		50%		20%				
Power supply	Rated input AC (DC) voltage/frequency	Three-phase 200 to 240V 50Hz/60Hz (283 to 339VDC*8)										
	Permissible AC (DC) voltage fluctuation	170 to 264V 50Hz/60Hz (240 to 373VDC*8)										
	Permissible frequency fluctuation	±5%										
	Power supply capacity (kVA)*6	0.4	0.8	1.5	2.5	4.5	5.5	9	12	17	20	28
Protective structure (JEM1030)		Enclosed type (IP20) Open type (IP00) for the FL remote communication model, CC-Link communication model, and the dedicated EtherCAT communication model.										
Cooling system		Natural			Forced air							
Approximate mass (kg)		0.5	0.5	0.7	1.0	1.4	1.4	1.7	4.3	4.3	6.5	6.5

● Three-phase 400V power supply

Model FR-E740-□K (SC)*9(NF)*10(NC)*11(-NE)*12(-TM)*13		0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
Applicable motor capacity (kW)*1		0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15
Output	Rated capacity (kVA)*2	1.2	2.0	3.0	4.6	7.2	9.1	13.0	17.5	23.0
	Rated current (A)*7	1.6 (1.4)	2.6 (2.2)	4.0 (3.8)	6.0 (5.4)	9.5 (8.7)	12	17	23	30
	Overload current rating*3	150% 60s, 200% 3s (inverse-time characteristics)								
	Rated voltage*4	Three-phase 380 to 480V								
	Regenerative braking torque*5	100%		50%		20%				
Power supply	Rated input voltage/frequency	Three-phase 380 to 480V 50Hz/60Hz (537 to 679VDC*8)								
	Permissible AC voltage fluctuation	325 to 528V 50Hz/60Hz (457 to 740VDC*8)								
	Permissible frequency fluctuation	±5%								
	Power supply capacity (kVA)*6	1.5	2.5	4.5	5.5	9.5	12	17	20	28
Protective structure (JEM1030)		Enclosed type (IP20) Open type (IP00) for the FL remote communication model, CC-Link communication model, and the dedicated EtherCAT communication model.								
Cooling system		Natural		Forced air						
Approximate mass (kg)		1.4	1.4	1.9	1.9	1.9	3.2	3.2	6.0	6.0

*1 The applicable motor capacity indicated is the maximum capacity applicable for use of the Mitsubishi Electric 4-pole standard motor.

*2 The rated output capacity indicated assumes that the output voltage is 230V for three-phase 200V class and 440V for three-phase 400V class.

*3 The % value of the overload current rating indicated is the ratio of the overload current to the inverter's rated output current. For repeated duty, allow time for the inverter and motor to return to or below the temperatures under 100% load.

*4 The maximum output voltage does not exceed the power supply voltage. The maximum output voltage can be changed within the setting range. However, the pulse voltage value of the inverter output side voltage remains unchanged at about $\sqrt{2}$ that of the power supply.

*5 The braking torque indicated is a short-duration average torque (which varies with motor loss) when the motor alone is decelerated from 60Hz in the shortest time and is not a continuous regenerative torque. When the motor is decelerated from the frequency higher than the base frequency, the average deceleration torque will reduce. Since the inverter does not contain a brake resistor, use the optional brake resistor when regenerative energy is large. A brake unit (FR-BU2) may also be used. (Option brake resistor cannot be used for 0.1K and 0.2K.)

*6 The power supply capacity varies with the value of the power supply side inverter impedance (including those of the input reactor and cables).

*7 Setting 2kHz or more in *Pr. 72 PWM frequency selection* to perform low acoustic noise operation in the surrounding air temperature exceeding 40°C, the rated output current is the value in parenthesis.

*8 • Connect DC power supply to terminal P/+ and N/-. Connect the plus side of the power supply to terminal P/+ and minus side to terminal N/-.
   • When energy is regenerated from the motor, the voltage between terminals P/+ and N/- may rise to 415V of more for the 200V class, or 810V or more for the 400V class. Use a DC power supply resistant to the regenerative voltage/energy.
     If using the power supply which cannot withstand voltage/energy during regeneration, insert diodes in series for reverse current prevention.
   • Although the FR-E700 series has the built-in inrush current limit circuit, select the DC power supply considering the inrush current at power-ON as the inrush current four times of the rated inverter flows at power-ON.
   • Since the power supply capacity depends on the output impedance of the power, select the power supply capacity which has enough allowance according to the AC power supply system capacity.

*9 The safety stop function model is indicated with SC.

*10 "NF" indicates the FL remote communication function model.

*11 "NC" indicates the CC-Link communication model.

*12 "-NE" indicates the Ethernet communication function model.

*13 "-TM" indicates the dedicated EtherCAT communication model. (Only for inverters that support the safety stop function.)

● Single-phase 200V power supply

Model FR-E720S-□K (SC)[10](-NE)[11]	0.1	0.2	0.4	0.75	1.5	2.2
Applicable motor capacity (kW)[1]	0.1	0.2	0.4	0.75	1.5	2.2
Output — Rated capacity (kVA)[2]	0.3	0.6	1.2	2.0	3.2	4.4
Output — Rated current (A)[7]	0.8 (0.8)	1.5 (1.4)	3.0 (2.5)	5.0 (4.1)	8.0 (7.0)	11.0 (10.0)
Output — Overload current rating[3]	150% 60s, 200% 3s (inverse-time characteristics)					
Output — Rated voltage[4]	Three-phase 200 to 240V					
Output — Regenerative braking torque[5]	150%		100%		50%	20%
Power supply — Rated input AC voltage/frequency	Single-phase 200 to 240V 50Hz/60Hz					
Power supply — Permissible AC voltage fluctuation	170 to 264V 50Hz/60Hz					
Power supply — Permissible frequency fluctuation	Within ±5%					
Power supply — Power supply capacity (kVA)[6]	0.5	0.9	1.5	2.5	4.0	5.2
Protective structure (JEM1030)	Enclosed type (IP20)					
Cooling system	Natural			Forced air		
Approximate mass (kg)	0.6	0.6	0.9	1.4	1.5	2.0

● Single-phase 100V power supply

Model FR-E710W-□K	0.1	0.2	0.4	0.75
Applicable motor capacity (kW)[1]	0.1	0.2	0.4	0.75
Output — Rated capacity (kVA)[2]	0.3	0.6	1.2	2.0
Output — Rated current (A)[7]	0.8 (0.8)	1.5 (1.4)	3.0 (2.5)	5.0 (4.1)
Output — Overload current rating[3]	150% 60s, 200% 3s (inverse-time characteristics)			
Output — Rated voltage	Three-phase 200 to 230V[8], [9]			
Output — Regenerative braking torque[5]	150%		100%	
Power supply — Rated input AC voltage/frequency	Single-phase 100 to 115V 50Hz/60Hz			
Power supply — Permissible AC voltage fluctuation	90 to 132V 50Hz/60Hz			
Power supply — Permissible frequency fluctuation	Within ±5%			
Power supply — Power supply capacity (kVA)[6]	0.5	0.9	1.5	2.5
Protective structure (JEM1030)	Enclosed type (IP20)			
Cooling system	Natural			
Approximate mass (kg)	0.6	0.7	0.9	1.5

[1] The applicable motor capacity indicated is the maximum capacity applicable for use of the Mitsubishi Electric 4-pole standard motor.

[2] The rated output capacity indicated assumes that the output voltage is 230V.

[3] The % value of the overload current rating indicated is the ratio of the overload current to the inverter's rated output current. For repeated duty, allow time for the inverter and motor to return to or below the temperatures under 100% load. If the automatic restart after instantaneous power failure function *(Pr. 57)* or power failure stop function *(Pr. 261)* is set and power supply voltage is low while load becomes bigger, the bus voltage decreases to power failure detection level and load of 100% or more may not be available.

[4] The maximum output voltage does not exceed the power supply voltage. The maximum output voltage can be changed within the setting range. However, the pulse voltage value of the inverter output side voltage remains unchanged at about that of the power supply.

[5] The braking torque indicated is a short-duration average torque (which varies with motor loss) when the motor alone is decelerated from 60Hz in the shortest time and is not a continuous regenerative torque. When the motor is decelerated from the frequency higher than the base frequency, the average deceleration torque will reduce. Since the inverter does not contain a brake resistor, use the optional brake resistor when regenerative energy is large. A brake unit (FR-BU2) may also be used. (Option brake resistor cannot be used for 0.1K and 0.2K.)

[6] The power supply capacity varies with the value of the power supply side inverter impedance (including those of the input reactor and cables).

[7] Setting 2kHz or more in *Pr. 72 PWM frequency selection* to perform low acoustic noise operation with the surrounding air temperature exceeding 40°C, the rated output current is the value in parenthesis.

[8] For single-phase 100V power input model, the maximum output voltage is twice the amount of the power supply voltage and cannot be exceeded.

[9] In a single-phase 100V power input model, the output voltage may fall down when the load is heavy, and larger output current may flow compared to a threephase input model. Use the motor with less load so that the output current is within the rated motor current range.

[10] The safety stop function model is indicated with SC.

[11] "-NE" indicates the Ethernet communication function model.

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Control specifications	**Control method**		Soft-PWM control/high carrier frequency PWM control (V/F control, Advanced magnetic flux vector control, General-purpose magnetic flux vector control, Optimum excitation control are available)
	Output frequency range		0.2 to 400Hz
	Frequency setting resolution	**Analog input** *10*13	0.06Hz/60Hz (terminal2, 4: 0 to 10V/10bit) 0.12Hz/60Hz (terminal2, 4: 0 to 5V/9bit) 0.06Hz/60Hz (terminal4: 0 to 20mA/10bit)
		Digital input	0.01Hz
	Frequency accuracy	**Analog input** *10*13	Within ±0.5% of the max. output frequency (25°C ±10°C)
		Digital input	Within 0.01% of the set output frequency
	Voltage/frequency characteristics		Base frequency can be set from 0 to 400Hz, Constant-torque/variable torque pattern can be selected
	Starting torque		200% or more (at 0.5Hz)...when Advanced magnetic flux vector control is set (3.7K or lower)
	Torque boost		Manual torque boost
	Acceleration/deceleration time setting		0.01 to 360s, 0.1 to 3600s (acceleration and deceleration can be set individually), linear or S-pattern acceleration/deceleration modes are available.
	DC injection brake		Operation frequency (0 to 120Hz), operation time (0 to 10s), operation voltage (0 to 30%) can be changed.
	Stall prevention operation level		Operation current level can be set (0 to 200% adjustable), whether to use the function or not can be selected
Operation specifications	**Frequency setting signal**	**Analog input** *10*13	Two terminals Terminal 2: 0 to 10V, 0 to 5V can be selected Terminal 4: 0 to 10V, 0 to 5V, 4 to 20mA can be selected
		Digital input	Input from the operation panel or parameter unit. (Instead of the input from the parameter unit, input via the FL remote network is available for the FL remote communication model, and input via the CC-Link network is available for the CC-Link communication model.) Frequency setting increment is selectable. 4 digit BCD or 16bit binary data (when the option FR-A7AX E kit is used)
	Start signal		Forward and reverse rotation or start signal automatic self-holding input*10*13 (3-wire input) can be selected.
	Input signal∗10∗14 **(Standard control circuit terminal model: Seven terminals Safety stop function model: Six terminals)**		The following signals can be assigned to *Pr.178 to Pr.184 (input terminal function selection)*: multi-speed selection, remote setting, stop-on contact selection, second function selection, terminal 4 input selection*13, JOG operation selection*13, PID control valid terminal, brake opening completion signal, external thermal input*13, PU-External operation switchover*13, V/F switchover, output stop, start self-holding selection*13, forward rotation, reverse rotation command*13, inverter reset*13, PU-NET operation switchover*13, External-NET operation switchover*13, command source switchover*13, inverter operation enable signal*13, and PU operation external interlock*13
	Operational functions		Maximum/minimum frequency setting, frequency jump operation, external thermal relay input selection*10*13, automatic restart after instantaneous power failure operation, forward/reverse rotation prevention, remote setting, brake sequence*10, second function, multi-speed operation, stop-on contact control, droop control, regeneration avoidance, slip compensation, operation mode selection, offline auto tuning function, PID control*10, computer link operation (RS-485)*10*13
	Safety stop function∗3		Safety shutoff signal can be input from terminals S1 and S2. (compliant with EN ISO 13849-1 Category 3 / PLd EN62061 / IEC61508 SIL2)
	Output signal∗11 **Open collector output (Two terminals) Relay output (One terminal)**	**Operating status**	The following signals can be assigned to *Pr.190 to Pr.192 (output terminal function selection)*: inverter operation, up-to-frequency, overload alarm, output frequency detection, regenerative brake prealarm, electronic thermal relay function prealarm, inverter operation ready, output current detection, zero current detection, PID lower limit, PID upper limit, PID forward/reverse rotation output, brake opening request, fan alarm*1, heatsink overheat pre-alarm, deceleration at an instantaneous power failure, PID control activated, safety monitor output*2, safety monitor output2*3, 24V external power supply operation*3, during retry, life alarm, current average value monitor, remote output, alarm output, fault output, fault output 3, and maintenance timer alarm
		For meter Pulse train output (Max. 2.4kHz: one terminal)∗10	The following signals can be assigned to *Pr.54 FM terminal function selection*: output frequency, motor current (steady), output voltage, frequency setting, motor torque, converter output voltage, regenerative brake duty, electronic thermal relay function load factor, output current peak value, converter output voltage peak value, reference voltage output, motor load factor, PID set point, PID measured value, output power Pulse train output (1440 pulses/s/full scale)
Indication	**Operation panel Parameter unit (FR-PU07)** ∗10∗13	**Operating status**	The following operating status can be displayed: output frequency, motor current (steady), output voltage, frequency setting, cumulative energization time, actual operation time, motor torque, converter output voltage, regenerative brake duty, electronic thermal relay function load factor, output current peak value, converter output voltage peak value, motor load factor, PID set point*10, PID measured value*10, PID deviation*10, inverter I/O terminal monitor, I/O terminal option monitor*10*13, output power, cumulative power, motor thermal load factor, and inverter thermal load factor.
		Fault record	Fault record is displayed when a fault occurs. Past 8 fault records (output voltage/current/frequency/cumulative energization time right before the fault occurs) are stored
		Interactive guidance∗10∗13	Function (help) for operation guide*4
Protective/warning function	**Protective/warning function**	**Protective functions**	Overcurrent during acceleration, overcurrent during constant speed, overcurrent during deceleration, overvoltage during acceleration, overvoltage during constant speed, overvoltage during deceleration, inverter protection thermal operation, motor protection thermal operation, heatsink overheat, input phase failure*6, stall prevention stop, output side earth (ground) fault overcurrent at start*5, output short circuit, output phase failure, external thermal relay operation*5*10*13, option fault*5, parameter error, internal board fault, PU disconnection*10*13, retry count excess*5, CPU fault, brake transistor alarm, inrush resistance overheat, communication error, analog input error*10*13, USB communication error*9*13, brake sequence error 4 to 7*5*10, and safety circuit fault*3
		Warning functions	Fan alarm*1, overcurrent stall prevention, overvoltage stall prevention, PU stop, parameter write error, regenerative brake prealarm*5, electronic thermal relay function prealarm, maintenance output*5, undervoltage, operation panel lock, password locked*5, inverter reset, safety stop*3, 24V external power supply in operation*12
Environment	**Surrounding air temperature**		-10°C to +50°C (non-freezing)*7
	Ambient humidity		90%RH or less (non-condensing)
	Storage temperature∗8		-20°C to +65°C
	Atmosphere		Indoors (free from corrosive gas, flammable gas, oil mist, dust and dirt etc.)
	Altitude/vibration		Maximum 1000m, $5.9m/s^2$ or less at 10 to 55Hz (directions of X, Y, Z axes)