7.1 Rating

7.1.1 Inverter rating

● Three-phase 200V power supply

Type FR-E720-□□□-NA		008	015	030	050	080	110	175	240	330	470	600
Applicable motor capacity (kW (HP)) *1		0.1 (1/8)	0.2 (1/4)	0.4 (1/2)	0.75 (1)	1.5 (2)	2.2 (3)	3.7 (5)	5.5 (7.5)	7.5 (10)	11 (15)	15 (20)
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) *6	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)										
	Voltage *4	Three-phase 200 to 240V										
Power supply	Rated input AC (DC) voltage/frequency	Three-phase 200 to 240V 50Hz/60Hz (283 to 339VDC *7)										
	Permissible AC (DC) voltage fluctuation	170 to 264V 50Hz/60Hz (240 to 373VDC *7)										
	Permissible frequency fluctuation	±5%										
	Power supply capacity (kVA) *5	0.4	0.8	1.5	2.5	4.5	5.5	9	12	17	20	28
Protective structure (JEM1030)		Enclosed type (IP20)										
Cooling system		Self-cooling				Forced air cooling						
Approximate mass (kg (lbs))		0.5 (1.10)	0.5 (1.10)	0.7 (1.54)	1.0 (2.2)	1.4 (3.09)	1.4 (3.09)	1.7 (3.75)	4.3 (9.48)	4.3 (9.48)	9.0 (19.84)	9.0 (19.84)

*1 The applicable motor capacity indicated is the maximum capacity applicable for use of the Mitsubishi 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.

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

*6 Setting 2kHz or more in *Pr. 72 PWM frequency selection* to perform low acoustic noise operation in the ambient temperature exceeding 40°C(104°F), the rated output current is the value in parenthesis.

*7
- 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/-.
- Since the voltage between P/+ and N/- may increase due to the regeneration energy from the motor and exceeds 415V temporarily, select the DC power supply which can withstand the voltage/energy during regeneration. If using the power supply which can not 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 powering on as the inrush current four times of the rated inverter flows at powering 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.

● Three-phase 400V power supply

Model FR-E740-□□□-NA		016	026	040	060	095	120	170
Applicable motor capacity (kW (HP))*1		0.4 (1/2)	0.75 (1)	1.5 (2)	2.2 (3)	3.7 (5)	5.5 (7.5)	7.5 (10)
Output	Rated capacity (kVA)*2	1.2	2.0	3.0	4.6	7.2	9.1	13.0
	Rated current (A)*6	1.6 (1.4)	2.6 (2.2)	4.0 (3.8)	6.0 (5.4)	9.5 (8.7)	12	17
	Overload current rating*3	150% 60s, 200% 3s (inverse-time characteristics)						
	Voltage*4	Three phase 380 to 480V						
Power supply	Rated input voltage/frequency	Three-phase 380 to 480V 50Hz/60Hz						
	Permissible AC voltage fluctuation	325 to 528V 50Hz/60Hz						
	Permissible frequency fluctuation	±5%						
	Power supply capacity (kVA)*5	1.5	2.5	4.5	5.5	9.5	12	17
Protective structure (JEM1030)		Enclosed type (IP20)						
Cooling system		Self-cooling		Forced air cooling				
Approximate mass (kg (lbs))		1.4 (3.09)	1.4 (3.09)	1.9 (4.19)	1.9 (4.19)	1.9 (4.19)	3.2 (7.06)	3.2 (7.06)

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

*2 The rated output capacity indicated assumes that the output voltage is 440V.

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

*6 Setting 2kHz or more in *Pr. 72 PWM frequency selection* to perform low acoustic noise operation with the ambient temperature exceeding 40°C(104°F), the rated output current is the value in parenthesis.

7.2 Common specifications

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 can be selected)
	Output frequency range			0.2 to 400Hz
	Frequency setting resolution		Analog input	0.06Hz/60Hz (terminal2, 4: 0 to 10V/10bit) 0.12Hz/60Hz (terminal2, 4: 0 to 5V/9bit) 0.06Hz/60Hz (terminal4: 4 to 20mA/10bit)
			Digital input	0.01Hz
	Frequency accuracy		Analog input	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 less)
	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 mode can be selected.
	DC injection brake			Operation frequency (0 to 120Hz), operation time (0 to 10s), operation voltage (0 to 30%) variable
	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	Two points 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	Entered from operation panel and parameter unit
	Start signal			Forward and reverse rotation or start signal automatic self-holding input (3-wire input) can be selected.
	Input signal			Seven points You can select from among multi-speed selection, remote setting, stop-on contact selection, second function selection, terminal 4 input selection, JOG operation selection, PID control valid terminal, brake opening completion signal, external thermal input, PU-external operation switchover, V/F switchover, output stop, start self-holding selection, forward rotation, reverse rotation command, inverter reset, PU-NET operation switchover, external-NET operation switchover, command source switchover, inverter operation enable signal, and PU operation external interlock
	Operational functions			Maximum/minimum frequency setting, frequency jump operation, external thermal relay input selection, automatic restart after instantaneous power failure operation, forward/reverse rotation prevention, remote setting, brake sequence, second function, multi-speed operation, stop-on contact control, droop control, regeneration avoidance, slip compensation, operation mode selection, offline auto tuning function, PID control, computer link operation (RS-485)
	Output signal	Output signal points	Open collector output	Two points
			Relay output	One point
		Operating status		You can select from among 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*2, heatsink overheat pre-alarm, deceleration at an instantaneous power failure, PID control activated, during retry, life alarm, current average value monitor, remote output, alarm output, fault output, fault output 3, and maintenance timer alarm
		For meter Output points	Analog output	0 to 10VDC: one point
		For meter		You can select from among 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 0 to 10VDC
Indication	Operation panel Parameter unit (FR-PU07)		Operating status	You can select from among 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, PID measured value, PID deviation, inverter I/O terminal monitor, I/O terminal option monitor, output power, cumulative power, motor thermal load factor, and inverter thermal load factor.
			Fault definition	Fault definition is displayed when the fault occurs and the past 8 fault definitions (output voltage/current/frequency/cumulative energization time right before the fault occurs) are stored
	Additional display by the parameter unit (FR-PU04/FR-PU07) only		Operating status	Not used
			Fault definition	Output voltage/current/frequency/cumulative energization time immediately before the fault occurs
			Interactive guidance	Function (help) for operation guide
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, output side earth (ground) fault overcurrent at start*4, output phase failure, external thermal relay operation *4, option fault, parameter error, internal board fault, PU disconnection, retry count excess *4, CPU fault, brake transistor alarm, inrush resistance overheat, communication error, analog input error, USB communication error, brake sequence error 4 to 7 *4 <Warning functions> Fan alarm*2, overcurrent stall prevention, overvoltage stall prevention, PU stop, parameter write error, regenerative brake prealarm *4, electronic thermal relay function prealarm, maintenance output *4, undervoltage
Environment	Ambient temperature			-10°C to +50°C (14°F to 122°F) (non-freezing) *3
	Ambient humidity			90%RH maximum (non-condensing)
	Storage temperature*1			-20°C to +65°C (-4°F to 149°F)
	Atmosphere			Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt etc.)
	Altitude/vibration			Maximum 1000m (3280.80 feet) above sea level, 5.9m/s ^{2} or less

*1 Temperatures applicable for a short time, e.g. in transit.

*2 As the FR-E720-050 or less, FR-E740-026 or less is not provided with the cooling fan, this alarm does not function.

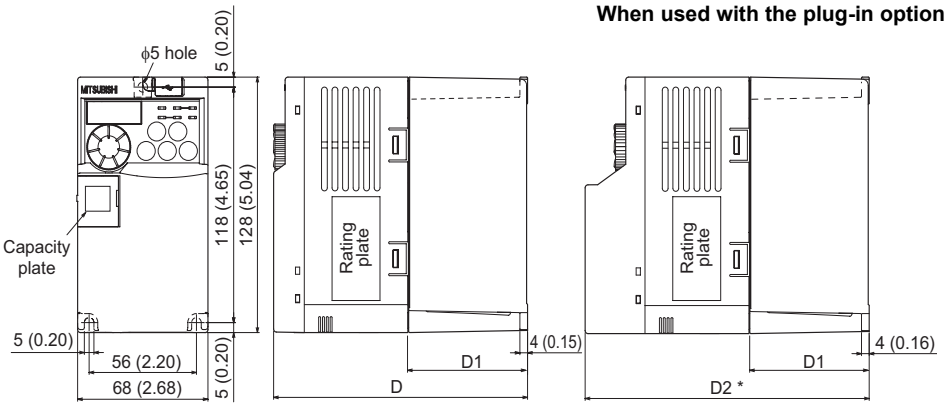
*3 When using the inverters at the ambient temperature of 40°C (104°F) or less, the inverters can be installed closely attached (0cm clearance).

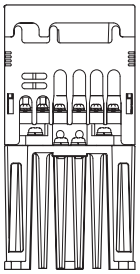
*4 This protective function does not function in the initial status.

7.3 Outline dimension drawings

(1) 200V class

●FR-E720-008 to 050

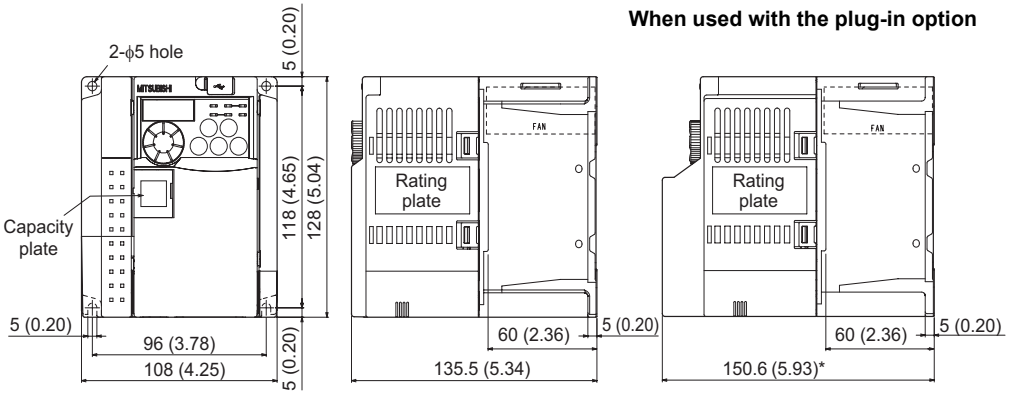


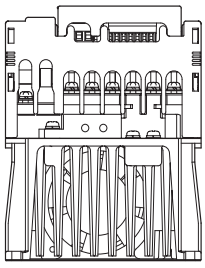


Inverter Type	D	D1	D2
FR-E720-008, 015	80.5 (3.17)	10 (0.39)	95.6 (3.76)
FR-E720-030	112.5 (4.43)	42 (1.65)	127.6 (5.02)
FR-E720-050	132.5 (5.22)	62 (2.44)	147.6 (5.81)

(Unit: mm(inches))

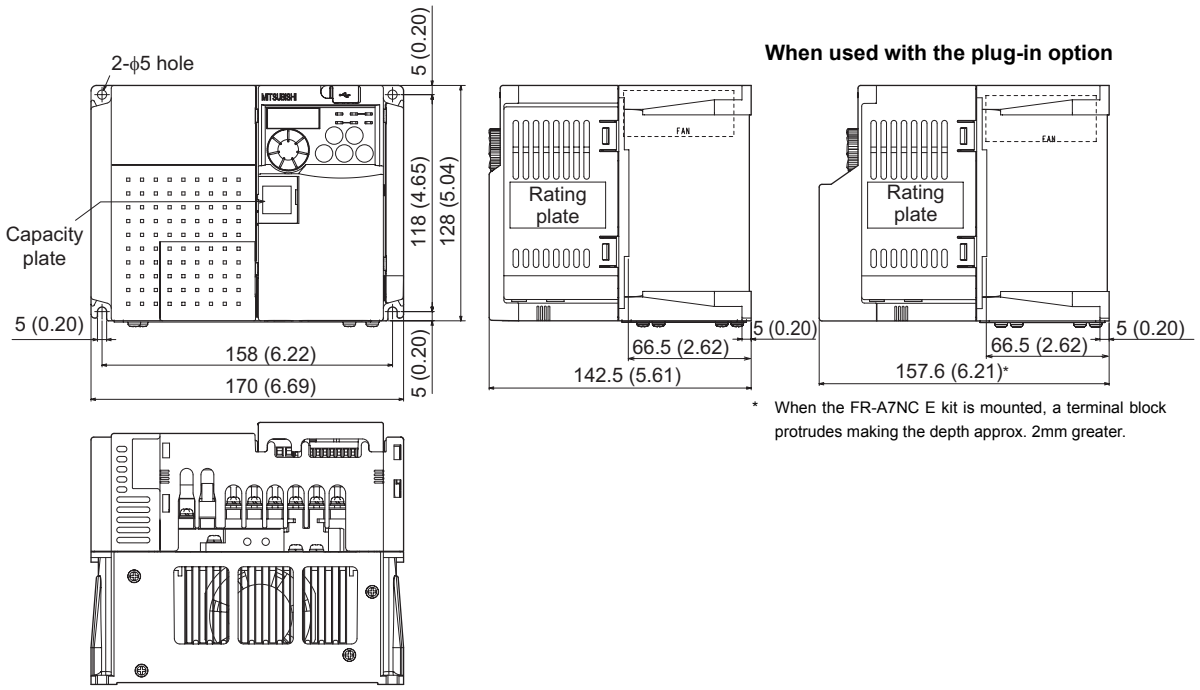
●FR-E720-080, 110





(Unit: mm(inches))

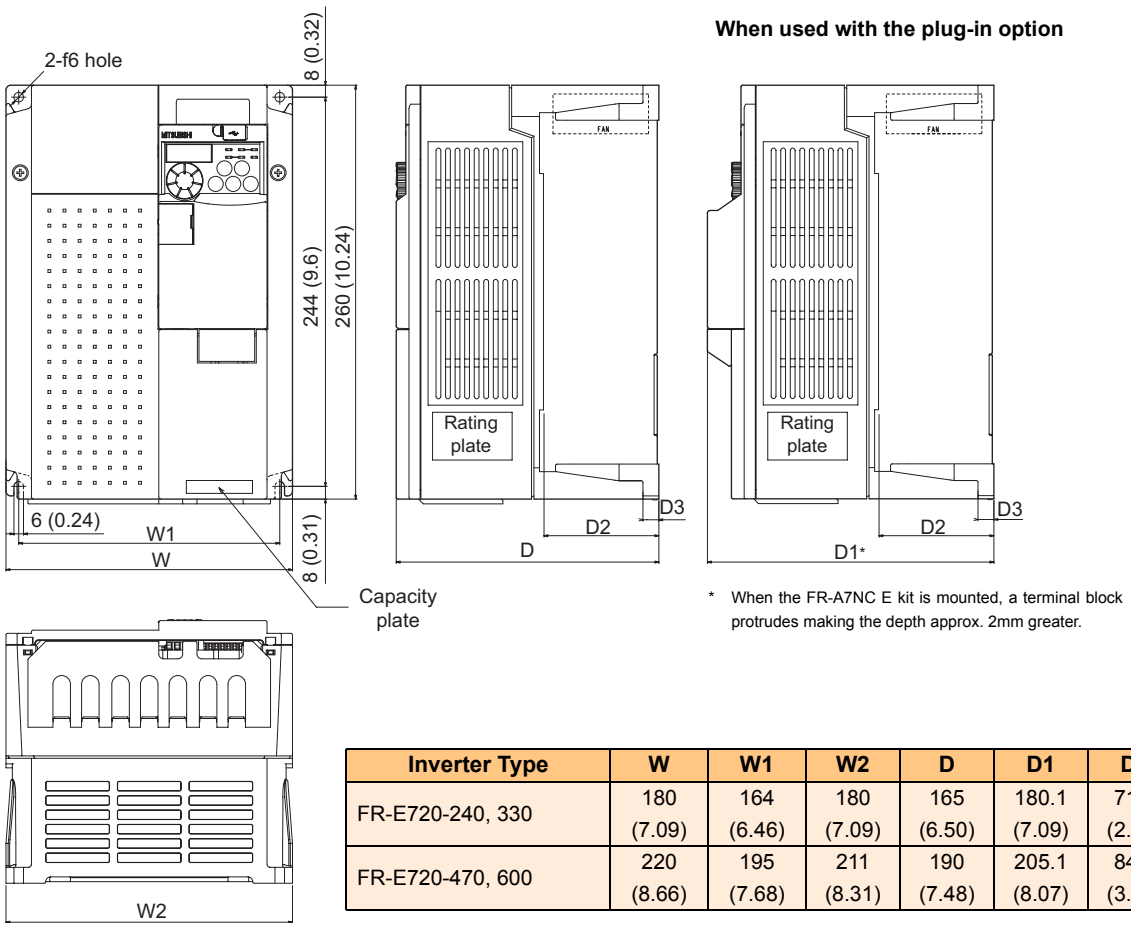
●FR-E720-175



* When the FR-A7NC E kit is mounted, a terminal block protrudes making the depth approx. 2mm greater.

(Unit: mm(inches))

●FR-E720-240 to 600



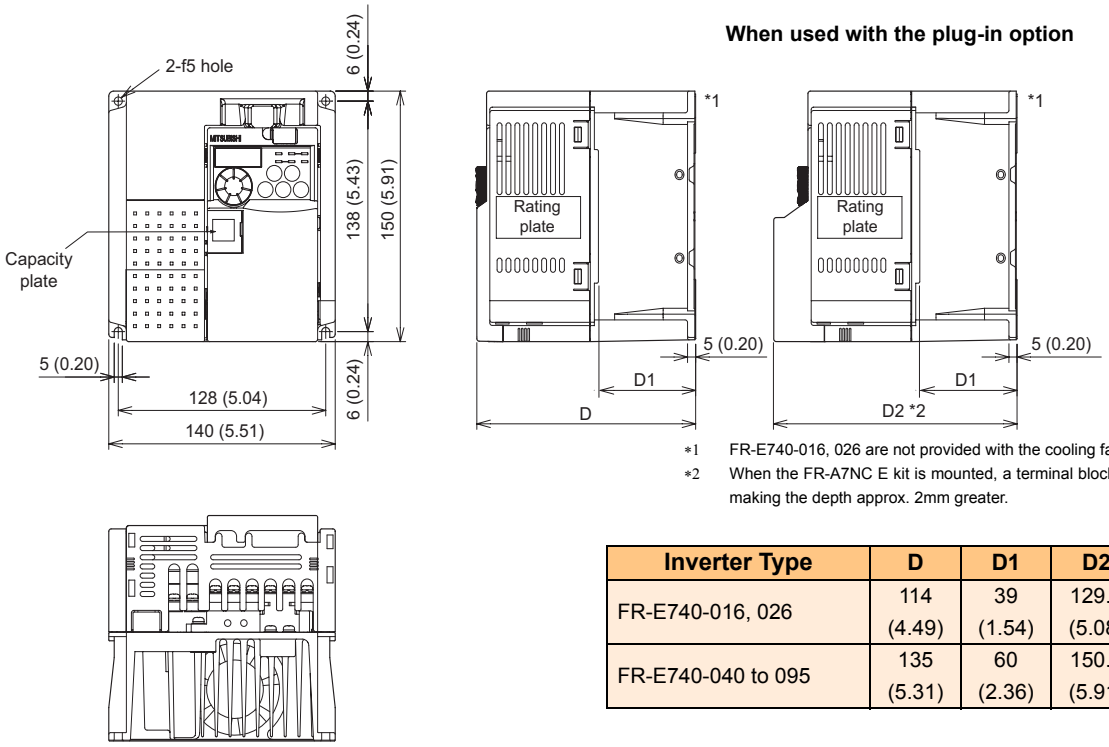
* When the FR-A7NC E kit is mounted, a terminal block protrudes making the depth approx. 2mm greater.

Inverter Type	W	W1	W2	D	D1	D2	D3
FR-E720-240, 330	180 (7.09)	164 (6.46)	180 (7.09)	165 (6.50)	180.1 (7.09)	71.5 (2.81)	10 (0.39)
FR-E720-470, 600	220 (8.66)	195 (7.68)	211 (8.31)	190 (7.48)	205.1 (8.07)	84.5 (3.33)	10.5 (0.41)

(Unit: mm(inches))

(2) 400V class

●FR-E740-016 to 095

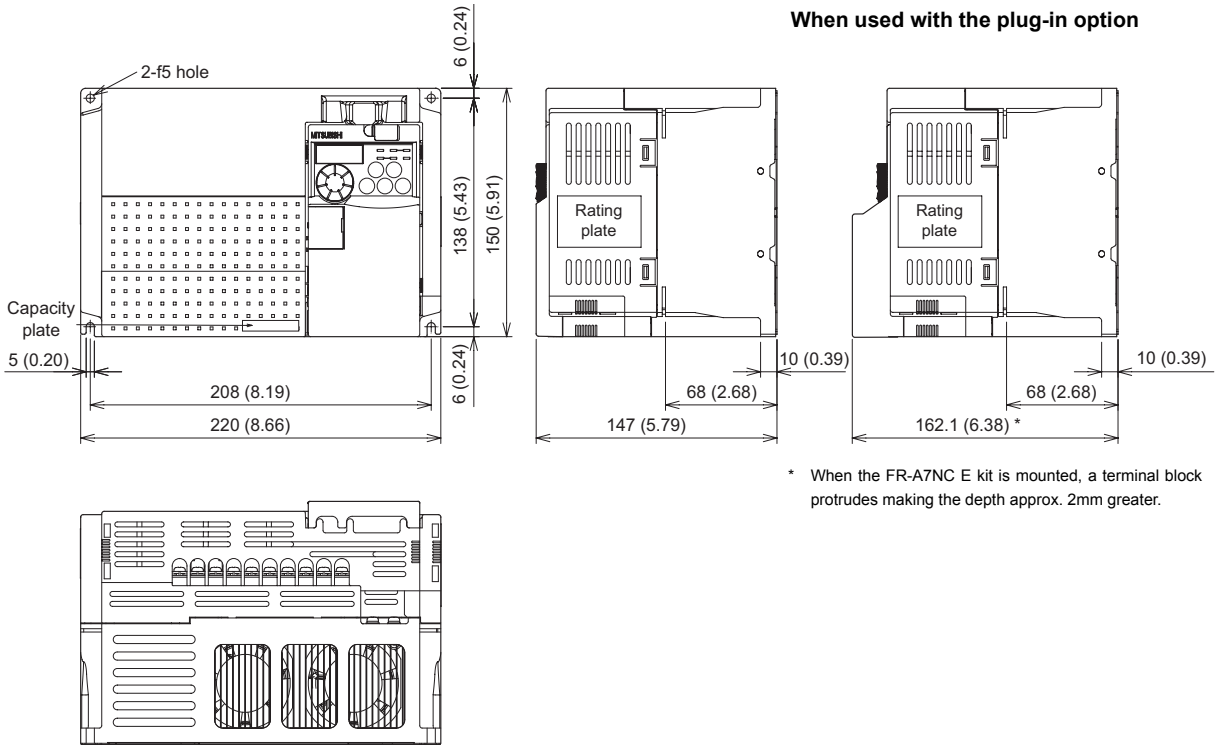


*1 FR-E740-016, 026 are not provided with the cooling fan.
*2 When the FR-A7NC E kit is mounted, a terminal block protrudes making the depth approx. 2mm greater.

Inverter Type	D	D1	D2
FR-E740-016, 026	114 (4.49)	39 (1.54)	129.1 (5.08)
FR-E740-040 to 095	135 (5.31)	60 (2.36)	150.1 (5.91)

(Unit: mm(inches))

●FR-E740-120, 170

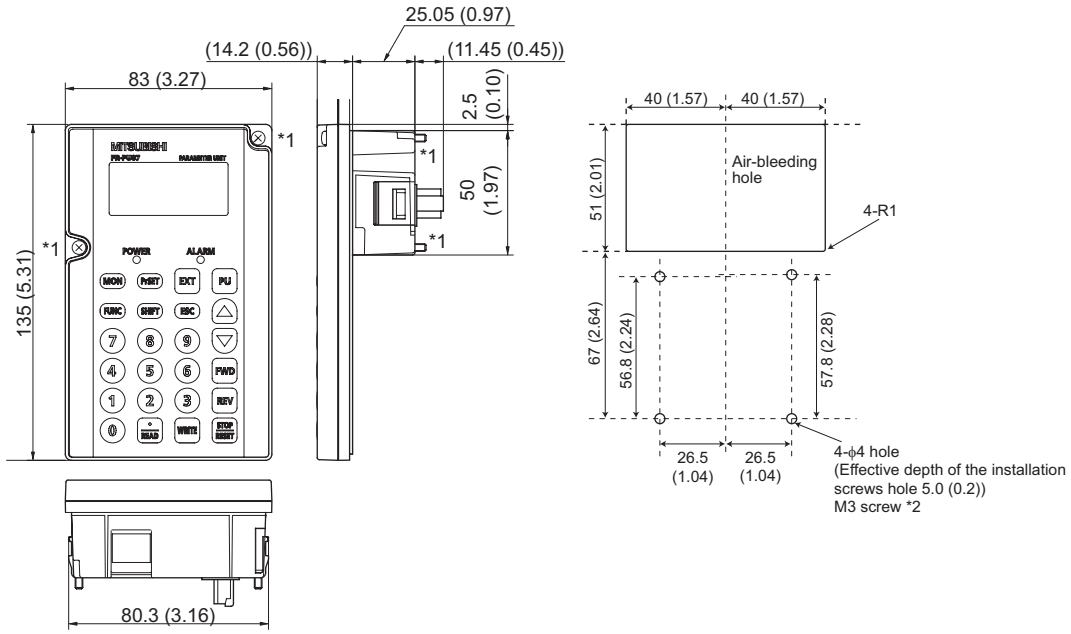


* When the FR-A7NC E kit is mounted, a terminal block protrudes making the depth approx. 2mm greater.

(Unit: mm(inches))

●Parameter unit (option) (FR-PU07)

<Outline drawing> <Panel cut dimension drawing>



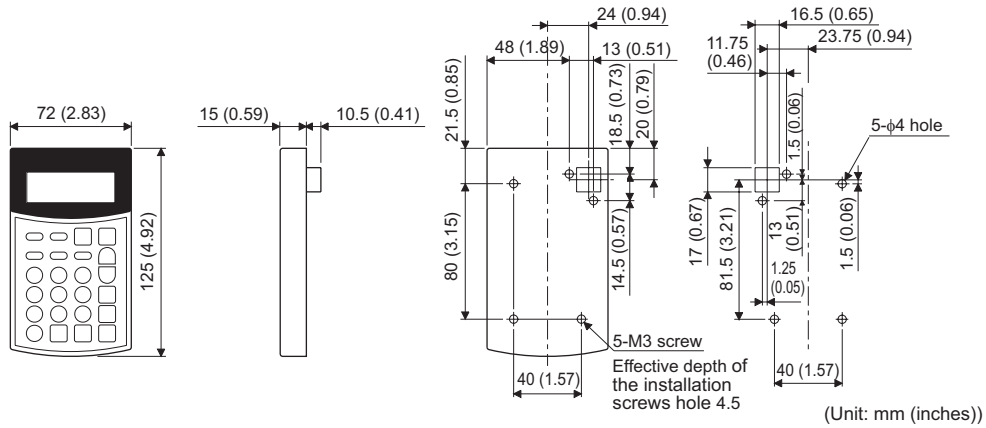
∗1 When installing the FR-PU07 on the enclosure, etc., remove screws or fix the screws to the FR-PU07 with M3 nuts.

∗2 Select the installation screw whose length will not exceed the effective depth of the installation screw hole.

(Unit: mm(inches))

●Parameter unit (option) (FR-PU04)

<Outline drawing> <Panel cut dimension drawing>



(Unit: mm (inches))

Select the installation screws whose length will not exceed the effective depth of the installation screws hole.

(Unit: mm(inches))