

FR-E700 Series

The cost-effective variable speed control solution for general purpose applications.

- Available in 115V, 240V and 480V up to 20HP
- **Advanced Magnetic Flux Vector Control:** For improved starting torque and smooth low speed motor operation
- **Auto-tuning:** Allows improved performance using virtually any manufacturer's motor
- All capacities include built-in brake chopper
- **Safety Stop Function:** Meets EN954-1 Category 3 and IEC60204-1 Stop Category 0
- **USB Communications:** Allows fast commissioning and troubleshooting
- **Standard RS-485 Serial Communications:** Supports Modbus® RTU
- Sink / Source selectable I/O
- Supports remote I/O function via network
- Built-in PID Control
- Delivers rated current at 50°C and 14.5kHz carrier frequency with minimal de-rating
- 200% overload for 3 seconds
- 0 to 10V analog output
- CC-Link®, DeviceNet™, Profibus® DP, LONWORKS®, EtherNet/IP™
- Standard 5 year warranty



FR- ① - ② SC -NA

① Max Load Capacity

Symbol	Voltage Class
E710W*	Single-phase 115V class
E720S)*	Single-phase 240V class
E720	3-phase 200V class
E740	3-phase 400V class

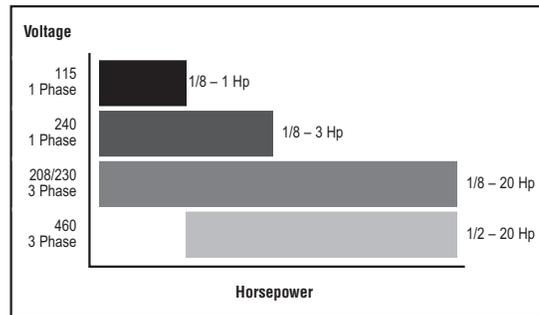
* Contact MEAU for SC version availability

② Capacity

Symbol	
	Inverter capacity amperage / 10 (175 = 17.5A output)

② Safety

Symbol	
SC	Safety Version (3-phase only)



FR-E700 Series

HP	Output Amps	Model Number	Dimensions in inches (mm)			Weight Lbs (kg)	Stocked Item
			Height	Width	Depth		
1-Phase 100-120VAC Input / 3-Phase 200-240VAC Output							
1/8	0.8	FR-E710W-008-NA	5.0 (128)	2.7 (68)	3.2 (80.5)	1.1 (0.5)	S
1/4	1.5	FR-E710W-015-NA	5.0 (128)	2.7 (68)	4.4 (110.5)	1.3 (0.6)	S
1/2	3	FR-E710W-030-NA	5.0 (128)	2.7 (68)	4.5 (112.5)	2.0 (0.9)	S
1	5	FR-E710W-050-NA	5.0 (128)	6.7 (170)	6.1 (155)	7.5 (3.4)	S
1-Phase 200-240VAC Input / 3-Phase 200-240VAC Output							
1/8	0.8	FR-E720S-008-NA	5.0 (128)	2.7 (68)	3.2 (80.5)	1.1 (0.5)	S
1/4	1.5	FR-E720S-015-NA	5.0 (128)	2.7 (68)	3.2 (80.5)	1.1 (0.5)	S
1/2	3	FR-E720S-030-NA	5.0 (128)	2.7 (68)	6.2 (157.6)	1.3 (0.6)	S
1	5	FR-E720S-050-NA	5.0 (128)	4.3 (108)	5.4 (135.5)	3.1 (1.4)	S
2	8	FR-E720S-080-NA	5.0 (128)	4.3 (108)	6.4 (161)	3.1 (1.4)	S
3	11	FR-E720S-110-NA	5.9 (150)	5.5 (140)	6.2 (155.5)	4.2 (1.9)	S
3-Phase 200-240VAC Input & Output							
1/8	0.8	FR-E720-008SC-NA	5.0 (128)	2.7 (68)	3.4 (87)	1.1 (0.5)	S
1/4	1.5	FR-E720-015SC-NA					S
1/2	3	FR-E720-030SC-NA	5.0 (128)	2.7 (68)	4.7 (120)	1.6 (0.7)	S
1	5	FR-E720-050SC-NA	5.0 (128)	2.7 (68)	5.5 (139)	2.2 (1.0)	S
2	8	FR-E720-080SC-NA	5.0 (128)	4.3 (108)	5.6 (142)	3.1 (1.4)	S
3	11	FR-E720-110SC-NA					S
5	17.5	FR-E720-175SC-NA	5.0 (128)	6.7 (170)	5.9 (149)	3.8 (1.7)	S
7 1/2	24	FR-E720-240SC-NA	10.3 (260)	7.1 (180)	6.9 (171)	9.5 (4.3)	S
10	33	FR-E720-330SC-NA					S
15	47	FR-E720-470SC-NA	10.3 (260)	8.7 (220)	7.7 (196)	19.9 (9)	S
20	60	FR-E720-600SC-NA					S
3-Phase 380-480VAC Input & Output							
1/2	1.6	FR-E740-016SC-NA	5.9 (150)	5.5 (140)	4.7 (120)	3.1 (1.4)	S
1	2.6	FR-E740-026SC-NA					S
2	4	FR-E740-040SC-NA	5.9 (150)	5.5 (140)	5.6 (142)	4.2 (1.9)	S
3	6	FR-E740-060SC-NA					S
5	9.5	FR-E740-095SC-NA	5.9 (150)	8.7 (220)	6.0 (153)	7.1 (3.2)	S
7 1/2	12	FR-E740-120SC-NA					S
10	17	FR-E740-170SC-NA	10.3 (260)	8.7 (220)	7.7 (196)	19.9 (9)	S
15	23	FR-E740-230SC-NA					S
20	30	FR-E740-300SC-NA	S				

FR-E700 General 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 are available)	
	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: 0 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	
	Accel/Decel Time Setting		0.01 to 360s, 0.1 to 3600s (acceleration and deceleration can be set individually), linear or S-pattern accel/dec el 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	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	The signal is entered from the operation panel or parameter unit. Frequency setting increment can be set. 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 (3-wire input) can be selected.	
	Input Signal 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, 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)	
	Safety stop function (*1)		Safety shutoff signal can be input from terminals S1 and S2. (compliant with EN954-1 Cat.3)	
	Output Signal	Output Signal Points	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, upto-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, heatsink overheat prealarm, deceleration at an instantaneous power failure, PID control activated, safety monitor output (*1), safety monitor output2 (*1), 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 terminal
For Meter		The following signals can be assigned to Pr.158 AM 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 0 to 10VDC		
Indication	Operation Panel Parameter Unit (FR-PU07)	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, 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	
		Interactive Guidance	Function (help) for operation guide (*2)	
Protective Function		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 (*4), output side earth (ground) fault overcurrent at start (*4), output phase failure, external thermal relay operation (*3), option fault (*3), 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 (*3), safety circuit fault (*1)		
Warning Function		Fan alarm, overcurrent stall prevention, overvoltage stall prevention, PU stop, parameter write error, regenerative brake prealarm (*3), electronic thermal relay function prealarm, maintenance output (*3), undervoltage, operation panel lock, password locked, inverter reset, safety stop (*1)		
Environment	Ambient Temperature		-10°C to +50°C (14°F to 122°F) (non-freezing) (*5)	
	Ambient Humidity		90%RH maximum (non-condensing)	
	Storage Temperature (*6)		-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 at 10 to 55Hz (directions of X, Y, Z axes)	

Notes:

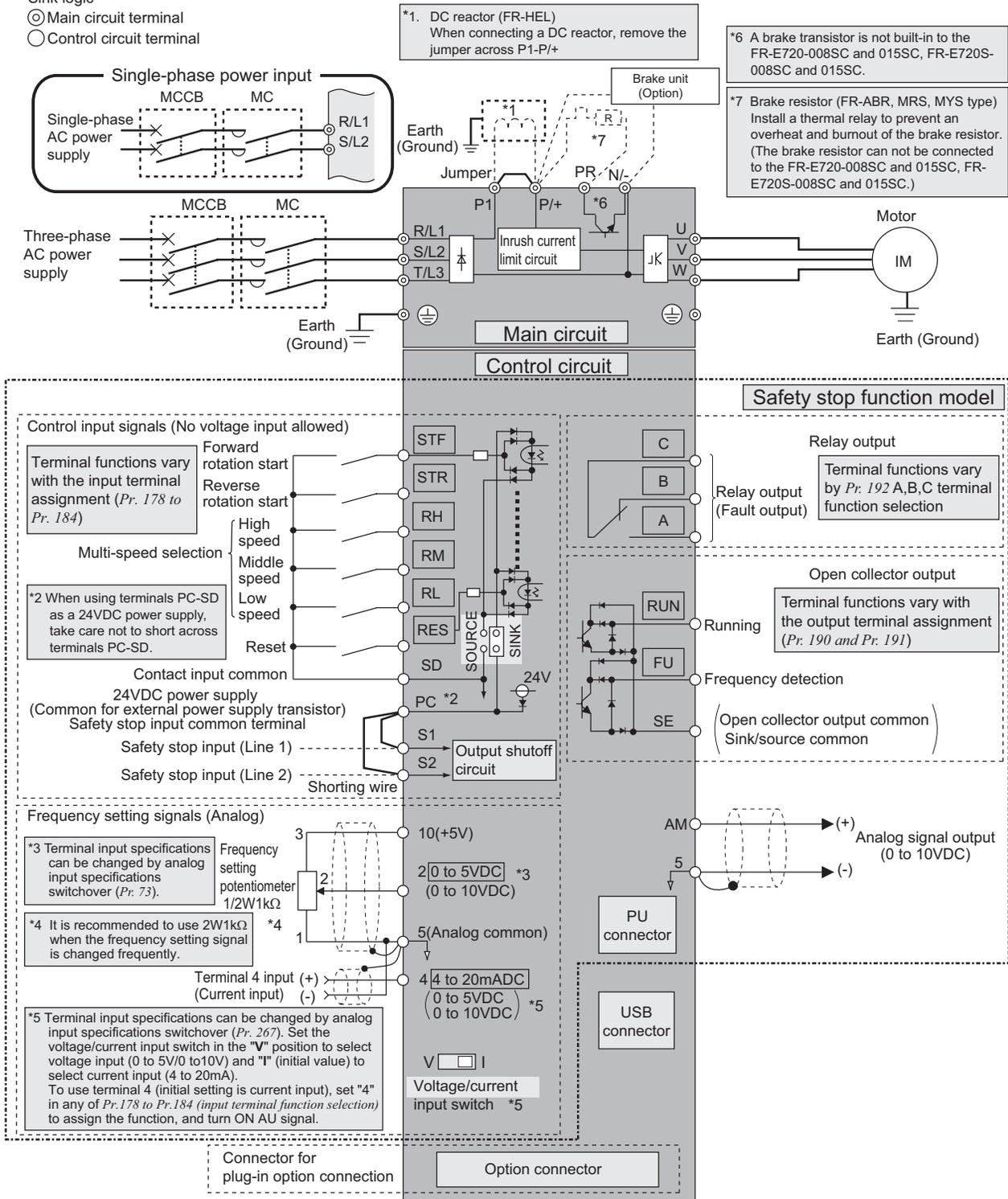
1. This function is only available for the safety stop function model.
2. This operation guide is only available with option parameter unit (FR-PU07).
3. This protective function does not function in the initial status.
4. This protective function is available with the three-phase power input model only.
5. When using the inverters at the surrounding air temperature of 40°C (104°F) or less, the inverters can be installed closely attached (0cm clearance).
6. Temperatures applicable for a short time, e.g. in transit.

FR-E700 Series Terminal Connection Diagram

One-phase 100V power input
 Three-phase 200V power input
 Three-phase 400V power input

Sink logic

- ⊙ Main circuit terminal
- Control circuit terminal

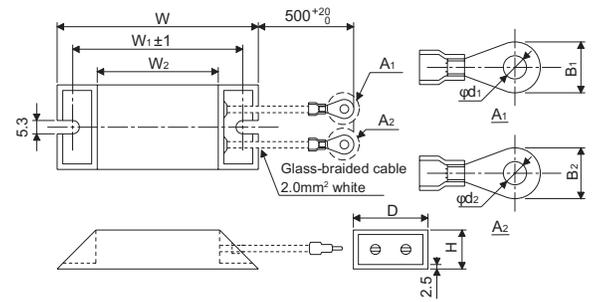


Brake Resistors

Brake Resistor Model	Dimensions (mm)				
	W	W1	W2	D	H
200V Class					
FR-ABR-0.4K	140	125	100	40	21
FR-ABR-0.75K	215	200	175	40	21
FR-ABR-2.2K	240	225	200	50	26
FR-ABR-3.7K	215	200	175	61	33
FR-ABR-5.5K	335	320	295	61	33
FR-ABR-7.5K	400	385	360	80	40
FR-ABR-11K	400	385	360	100	50
FR-ABR-15K (*1)	300	285	260	100	50
400V Class					
FR-ABR-H0.4K	115	100	75	40	21
FR-ABR-H0.75K	140	125	100	40	21
FR-ABR-H1.5K	215	200	175	40	21
FR-ABR-H2.2K	240	225	200	50	26
FR-ABR-H3.7K	215	200	175	61	33
FR-ABR-H5.5K	335	320	295	61	33
FR-ABR-H7.5K	400	385	360	80	40
FR-ABR-H11K	400	385	360	100	50
FR-ABR-H15K (*2)	300	285	260	100	50

Notes:

- For the 15K, connect the two supplied resistors (18 ohms) in parallel.
- For the H15K, connect the two supplied resistors (18 ohms) in series.



Input Radio Noise Filter

This filter is connected to the input of the drive and helps to reduce radiated noise in the radio frequencies.

Drive Voltage	Kit Model Number	Leakage Current (mA)	Dimensions mm (in)			Stocked Item
			L	W	D	
208 - 230	FR-BIF	4	58 (2.3)	44 (1.8)	42 (1.7)	S
460	FR-BIF-H	4	58 (2.3)	44 (1.8)	42 (1.7)	-

Line Noise Filter

Provides a toroid for line noise reduction.

Drive Hp	Kit Model Number	Dimensions mm (in)			Stocked Item
		L	W	D	
0.5 - 5	FR-BSF01	110 (4.33)	22.5 (0.89)	65 (2.56)	S
0.5 - 75	FR-BLF	180 (7.07)	31.5 (1.24)	83 (3.27)	S

DIN Rail Mounting Attachment

This attachment allows the E700 Series inverter to mount on a 35mm DIN rail.

Model Number	Drive Model FR-E720 (*1)	Stocked Item
FR-UDA01	008-050	S
FR-UDA02	080-110	S
FR-UDA03	175	-

Note 1: Not available for 400V models.

FR-E740 EMC Filters

This attachment allows the VFD to be mounted onto the filter.

Model Number	Drive Model	Stocked Item
FFR-CS-050-14A-SF1	E740-016 to 040	-
FFR-CS-080-20A-SF1	E740-060/095	-
FFR-CS-110-26A-SF1	E740-120/170	-
FFR-CSH-036-8A-SF1	E740-230/300	-

Building Management Options

	Network Type/Model	A7NETH-2P	FR-A7N-XLT
Direct Option	BACnet®/IP	X	-
	EtherNet/IP™	X	-
	Modbus® TCP	X	-
	PROFINET® IO	X	-
Gateway Option	BACnet® MS/TP	-	X
	Metasys® N2	-	X
	Siemens FLN (P1)	-	X
	Stocked Item	S	S

Note: Installation for E700 inverters requires optional cover (P/N: A7A-EKITCVR-SC)

Installation Interchange Attachment

This attachment allows the FR-E700 Series inverter to be mounted using the installation holes from the previous series VFDs.

Model Number	Installation Model E700 Series	Previous Model				Stocked Item
		E500 Series	A0x4 Series	Z024 Series	A200E Series	
FR-E5T-10	E720-008	Direct Replacement	FR-A024-0.1K-UL	FR-Z024-0.1K-UL	-	S
	E720-015		FR-A024-0.2K-UL	FR-Z024-0.2K-UL	-	
	E720-030		FR-A024-0.4K-UL	FR-Z024-0.4K-UL	-	
	E720-050		FR-A024-0.75K-UL	-	-	
FR-E5T-11	E720-050		-	FR-Z024-0.75K-UL	-	-
	E720-080		FR-A024-1.5K-UL	FR-Z024-1.5K-UL	-	-
FR-E5T	E720-110		FR-A024-2.2K-UL	FR-Z024-2.2K-UL	-	-
	E720-175		FR-A024-3.7K-UL	FR-Z024-3.7K-UL	-	-
FR-E5T-02	E720-240		-	-	FR-A220E-5.5K-UL	-
	E720-330		-	-	FR-A220E-7.5K-UL	-
Direct Attachment	E740-016	FR-A044-0.4K-UL	-	-	-	
	E740-026	FR-A044-0.75K-UL	-	-	-	
FR-E5T-14	E740-040	FR-A044-1.5K-UL	-	-	-	
	E740-060	FR-A044-2.2K-UL	-	-	-	
	E740-095	FR-A044-3.7K-UL	-	-	-	

FR-E700 Installation Interchange Attachment

This attachment allows the FR-E700 Series inverter to be mounted at a 90° angle so that the depth is reduced to 80 mm.

Model Number	Installation Model FR-E700 Series	Previous Model			Stocked item
		FR-E500 Series	A0x4 Series	Z024 Series	
FR-E5T-L	E720-030	Direct Replacement	FR-A024-0.4K-UL	FR-Z024-0.4K-UL	-
	E720-050		FR-A024-0.75K-UL	-	-

FR-E700 Series Watt Loss and Efficiency Data

HP-CT	115VAC 1-Phase Input				240VAC 1-Phase Input				240VAC 3-Phase Input				480VAC 3-Phase Input			
	Model Number	Rated Watts	Watts Loss	Efficiency	Model Number	Rated Watts	Watts Loss	Efficiency	Model Number	Rated Watts	Watts Loss	Efficiency	Model Number	Rated Watts	Watts Loss	Efficiency
	FR-E710W-				FR-E720S-				FR-E720-				FR-E740-			
1/8	008	100	14	86%	008	100	14	86%	008	100	14	86%	-	-	-	-
1/4	015	200	20	90%	015	200	20	90%	015	200	20	90%	-	-	-	-
1/2	030	400	38	91%	030	400	32	92%	030	400	32	92%	016	400	45	89%
1	050	750	50	93%	050	750	50	93%	050	750	50	93%	026	750	50	93%
2	-	-	-	-	080	1500	80	95%	080	1500	80	95%	040	1500	85	94%
3	-	-	-	-	110	2200	110	95%	110	2200	100	95%	060	2200	100	95%
5	-	-	-	-	-	-	-	-	175	3700	160	96%	095	3700	160	96%
7.5	-	-	-	-	-	-	-	-	240	5500	290	95%	120	5500	310	94%
10	-	-	-	-	-	-	-	-	330	7500	380	95%	170	7500	420	94%
15	-	-	-	-	-	-	-	-	470	11000	520	95%	230	11000	560	95%
20	-	-	-	-	-	-	-	-	600	15000	600	96%	300	15000	640	96%

General Notes:

- The amount of heat generated by the inverter is based on one inverter connected to one motor of the same capacity.
- The amount of heat generated in the above table is the amount of heat generated when the inverter is operated at its rated current.
- The amount of heat generated will decrease according to the motor load and usage (duty).

Conduit Kits

Model Number	Description	Stocked Item
CK-5567	Conduit Kit for E740-026/095SC	S
CK-27	Conduit Kit for E720-030/050SC	S
CK-87	Conduit Kit for E740-120/170SC	S

FR-E700 Heatsink Extension Kits

Model Number	Description	Stocked Item
FR-E7CN-02	Heatsink Extension kit for E720-030	S
FR-E7CN-03	Heatsink Extension kit for E720-050	S
FR-E7CN-04	Heatsink Extension kit for E720-080/110	S
FR-E7CN-05	Heatsink Extension kit for E740-016/026	S
FR-E7CN-06	Heatsink Extension kit for E740-040/060/095	S
FR-E7CN-07	Heatsink Extension kit for E720-175	S
FR-E7CN-08	Heatsink Extension kit for E740-120/170	S
FR-E7CN-09	Heatsink Extension kit for E720-240/330	S
FR-A7CN02	Heatsink Extension kit for E720-470/600 E740-230/300	S