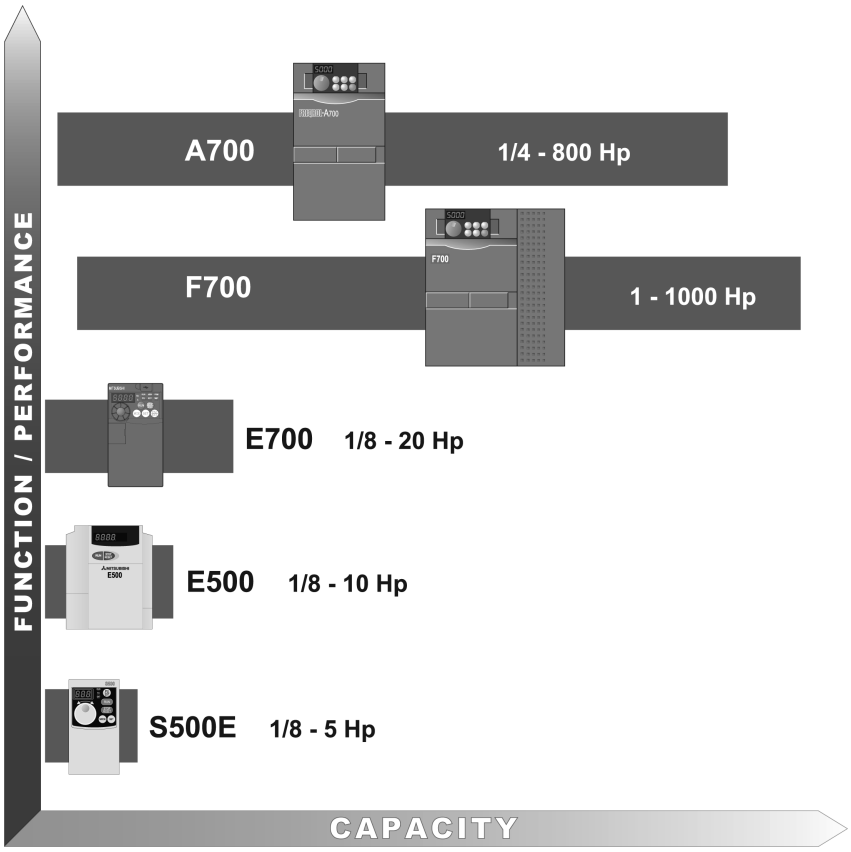
Variable Frequency Drives



Stock Product: Stock product is product MEAU makes every effort to have on hand for immediate shipment. There may be instances when we are out of stock due to unexpected large requirements. All stock product will be indicated in this book by an "S" in the Stocked Item columns/rows.

Non-Stock Product: Non-stock product is product supplied on an "as-needed" basis. Standard lead times of 12 – 16 weeks apply, product is non-returnable and non-cancelable. Product listed as non-stock may change to stock product subject to increases in sales and usage. All non-stock product will be indicated in this book by a dash "–" in the Stocked Item columns/rows.

Variable Frequency Drives Family

Model Series		S500E			E500		E700		F700		A700		
Page		5			9		13		19		29		
Voltage Range (VAC)		115	240	480	115	600	240	480	240	480	A700	480	600
HP Range	Constant Torque	1/8 – 1	1/8 – 5	1/2 – 5	1/8 – 1	1 – 10	1/8 – 20	1/2 – 20			3/4 – 700	1/4 – 700	1 – 400
	Variable Torque								3/4 – 125	3/4 – 700	1 – 200	1 – 800	2 – 550
Control Algorithm	Open-Loop Flux Vector				Standard		Standard				Standard		
	Real Sensorless Vector										Standard		
	Closed-Loop Vector										Standard		
	Closed-Loop Speed										Standard		
	Closed-Loop Torque										Standard		
	Open-Loop Torque										Standard		
	Closed-Loop Position										Standard		
Communication	Modbus RTU	Special					Standard		Standard		Standard		
	CC-Link					Option	Option		Option		Option		
	DeviceNet					Option	Option		Option		Option		
	Profibus-DP					Option	Option		Option		Option		
	Modbus Plus										Option		
	LonWorks					Option	Option		Option				
	SSCNETIII										Option		
	Metasys N2	Option			Option		Option		Option		Option		
	Siemens FLN	Option			Option		Option		Option		Option		
	Ethernet I/P	Option			Option		Option		Option		Option		
	Modbus TCP I/P	Option			Option		Option		Option		Option		
	BacNET TP	Option			Option		Option		Option		Option		
	ControlNET										Option		
Specifications	Max Output Freq.	120Hz			400Hz		400Hz		400Hz		400Hz		
	Analog Inputs	1: 0-5/10Vdc or 4-20mA			1: 0-5/10Vdc or 4-20mA		1: 0-5/10Vdc or 4-20mA		3: 0-5/10Vdc or 4-20mA				
	Analog Outputs	1: 0-5Vdc			1: 0-5/10Vdc(600V) 1: FM (pulse train) (100V)		1: 0-10Vdc		2: 0-10Vdc and 4-20mA		2: 0-10Vdc and FM		
	Digital Inputs	5 (4 assignable)			7 (4 assignable)		7 (assignable)		12 (assignable)				
	Digital Outputs	1 transistor type (assignable) & 1 form C (assignable)			2 transistor type (assignable) & 1 form C (assignable)		2 transistor type (assignable) & 1 form C (assignable)		5 transistor type (assignable) and 2 form C (assignable)				
	Pulse Train Input										Standard		
	Brake Transistor				All		1/2 HP – 20 HP				Up to 30 HP		
	Brake Resistor										Up to 10 HP		Up to 5 HP
	DC Link Reactor	Option			Option		Option		Option (Standard 100Hp and above)				
	EMC Filter	Option			Option		Option		Standard		Standard		
	Operator Interface	LED included			Option LED FR-PA02-02		LED included		FR-DU07 removeable (LED/Copy)				
	Remote Mount Keypad	FR-PU04 (LCD/Copy)			FR-PU07 (LCD/Copy) or FR-PU04 (LCD)		FR-PU07 (LCD/Copy) or FR-PU04 (LCD)						
	Alarm History	Last 4			Last 4		Last 8		Last 8		Last 8		

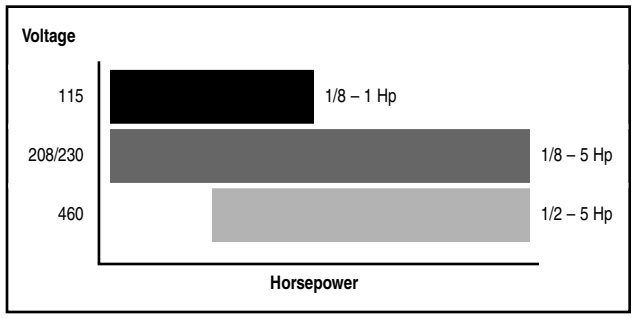
Standard Features:

1. RS-485 serial communications (Mitsubishi VFD protocol)
2. PID or PI control
3. Adjustable carrier frequency (Low Noise) upto 14.5KHz
4. Soft PWM
5. Packaged options available
6. Setup Software available
7. Line regenerative braking is available for using the FR-CV option
8. User selectable Sink (default) / Source I/O

S500E Series

Low Cost Sub-Micro VFD with Mitsubishi Electric Quality.

- **Simple to Use:** The S500E is perfect for a wide range of applications
- **Simple to Set Up:** The digital setting dial with integrated display makes S500E configuration fast and easy
- **Simple Operation:** Control the S500E remotely or with built-in digital control
- **Simple to Choose:** Low cost and Mitsubishi Electric quality ensure solid solutions
- Capable of generating 150% torque at 5Hz
- 150% overload for 1 minute
- 14.5 kHz carrier frequency
- DIN Rail Mounting (option)
- 50°C (122°F ambient rating)
- Programmable I/O
- Adjustable torque boost
- DC Injection braking
- Fault history
  - ❒ Stores last 4 alarms
  - ❒ Can display operation frequency at occurence of last alarm



FR-S520E – 0.1 K – NA

Symbol	Voltage Class
S510WE	Single-phase 100V class
S520E	Three-phase 200V class
S540E	Three-phase 400V class

Inverter capacity "kW"

S500E Series

Rating (CT & VT)		IP20 Open Chassis	Dimensions				Stocked Item
Hp	Output Current (Amps)	Model Number	Height mm (in)	Width mm (in)	Depth mm (in)	Weight kg (lb)	
1-Phase 100 – 115VAC Input / 3-Phase 230VAC Output							
1/8	0.8	FR-S510WE-0.1K-NA	128 (5.04)	68 (2.68)	80.5 (3.17)	0.5 (1.1)	S
1/4	1.4	FR-S510WE-0.2K-NA	128 (5.04)	68 (2.68)	110.5 (4.35)	0.5 (1.1)	S
1/2	2.5	FR-S510WE-0.4K-NA	128 (5.04)	68 (2.68)	142.5 (5.61)	0.9 (2)	S
1	4.1	FR-S510WE-0.75K-NA	128 (5.04)	108 (4.25)	149.5 (5.89)	1.5 (3.3)	S
200 – 240VAC Input / 3-Phase Output							
3-Phase		1-Phase					
Hp	Amp	Hp	Amp					
1/8	0.8	1/20	0.4	FR-S520E-0.1K-NA	128 (5.04)	68 (2.68)	80.5 (3.17)	0.5 (1.1)	S
1/4	1.4	1/8	0.8	FR-S520E-0.2K-NA	128 (5.04)	68 (2.68)	80.5 (3.17)	0.5 (1.1)	S
1/2	2.5	1/4	1.5	FR-S520E-0.4K-NA	128 (5.04)	68 (2.68)	112.5 (4.43)	0.8 (1.8)	S
1	4.1	1/2	2.5	FR-S520E-0.75K-NA	128 (5.04)	68 (2.68)	132.5 (5.22)	0.9 (2)	S
2	7	3/4	4	FR-S520E-1.5K-NA	128 (5.04)	108 (4.25)	135.5 (5.33)	1.5 (3.3)	S
3	10	1.0	5	FR-S520E-2.2K-NA	128 (5.04)	108 (4.25)	135.5 (5.33)	1.5 (3.3)	S
5	16.5	2.0	7	FR-S520E-3.7K-NA	128 (5.04)	170 (6.69)	142.5 (5.61)	2.1 (4.6)	S
380 – 480VAC Input / Output									
1/2		1.1		FR-S540E-0.4K-NA	128 (5.04)	108 (4.25)	129.5 (5.10)	1.5 (3.3)	S
1		2.1		FR-S540E-0.75K-NA	128 (5.04)	108 (4.25)	129.5 (5.10)	1.5 (3.3)	S
2		3.5		FR-S540E-1.5K-NA	128 (5.04)	108 (4.25)	135.5 (5.33)	1.5 (3.3)	S
3		4.8		FR-S540E-2.2K-NA	128 (5.04)	108 (4.25)	155.5 (6.12)	1.6 (3.5)	S
5		7.7		FR-S540E-3.7K-NA	128 (5.04)	108 (4.25)	165.5 (6.52)	1.7 (3.7)	S

S500E General Specifications

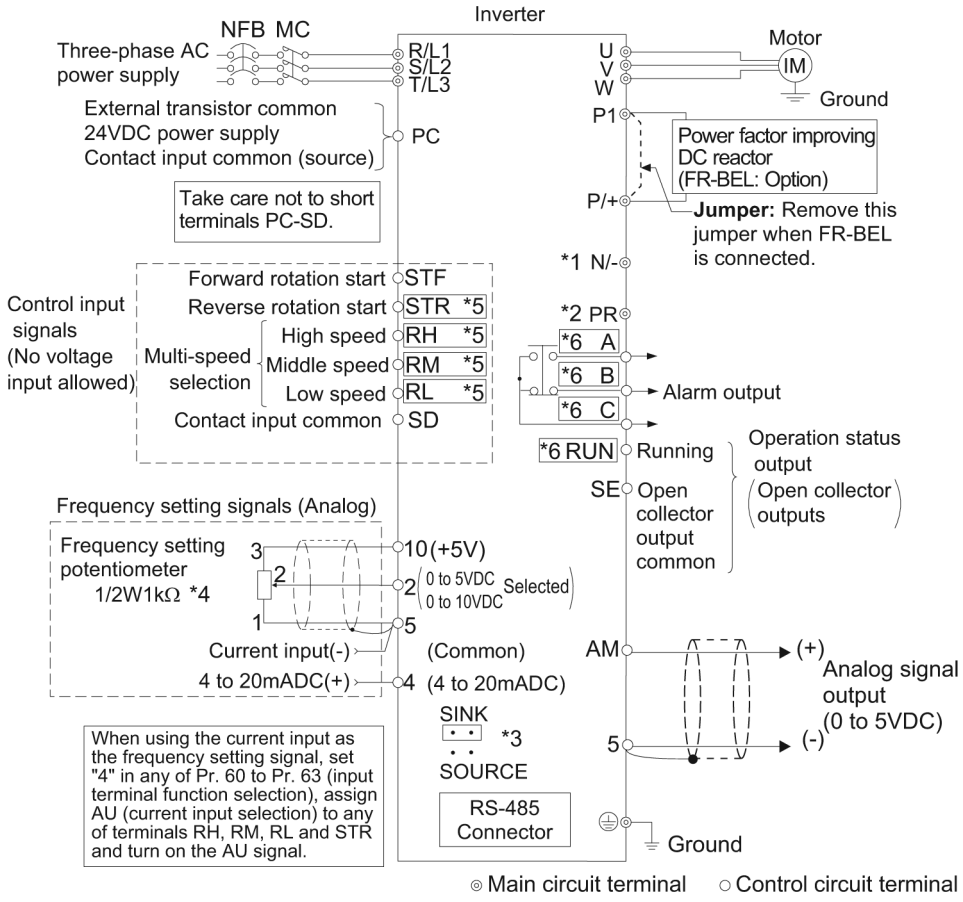
Control Specifications	Control System		Algorithm	V/F control	
			Options	Soft-PWM; Adjustable carrier frequency (2kHz -14.5kHz)	
	Output Frequency Range			0.2 to 120Hz (starting frequency variable between 0 and 60Hz)	
	Frequency Setting Resolution		Analog Input	5VDC input: 0.2% of selected maximum frequency 10VDC, 4-20mADC input: 0.1% of selected maximum frequency	
			Digital Input (Using Keypad)	<100Hz: 0.1Hz ≥100Hz: 1Hz	
	Output Frequency Accuracy		Analog Input	±1% of maximum output frequency (25°C ±10°C (77°F ±18°F))	
			Digital Input (Using Keypad)	±0.5% of commanded output frequency	
	Voltage/Frequency Characteristic			Base frequency setting range: 0 - 120Hz	
	Torque Boost			Automatic Torque Boost function selectable	
	Starting Torque			150% or more (at 6Hz) when automatic torque boost is selected	
	Acceleration/Deceleration Time Setting			0, 0.1 to 999 sec (acceleration and deceleration set independently) Linear or S-pattern curves may be selected	
	Braking Torque (*3)		Regenerative	0.1K, 0.2K–150%, 0.4K, 0.75K–100%, 1.5K–50%, 2.2K, 3.7K–20%	
			DC Braking	Operation frequency (0 to 120Hz), operation time (0 to 10s), operation voltage (0 to 15%)	
	Input Signals	Freq. Setting Signal	Analog Input	0 to 5VDC, 0 to 10VDC, 4 to 20mADC	
			Digital Input	Entered from built-in digital setting dial	
		Start Signal		Forward and reverse rotation, start signal	
		Alarm Reset		Used to reset alarm output after alarm condition	
		Multi-Speed Selection		Up to 15 speeds can be defined	Use Pr. 180 to Pr. 183 for selection.
		Second Function Selection		Used to select second functions (acceleration time, deceleration time, torque boost, base frequency, electronic overcurrent protection)	
		Output Stop		Instantaneous shut-off of inverter output (frequency, voltage)	
		Current Input Selection		Used to select input of frequency setting signal 4 to 20mADC (terminal 4)	
		Thermal Relay Input		Used to provide interface to external thermal relay	
		Digital Operation-External Operation Switching		Used to remotely switch the VFD between operation via the digital setting dial and external operation	
		3-Wire Control Input		Control input holding circuit for 3-wire control applications	
	Operation Functions			Maximum/minimum frequency setting, frequency jump operation, external thermal relay input selection, automatic restart operation after instantaneous power failure, forward/reverse rotation prevention, slip compensation, operation mode selection, PID control	
	Output Signals	One (1) Open-Collector and One (1) Form C Contact Outputs (User Definable)		Running, up to frequency, frequency detection, overload alarm, zero current detection, output current detection, PID upper limit, PID lower limit, PID forward/reverse rotation, operation ready, minor fault and alarm, and 1 contact output (230VAC 0.3A, 30VDC 0.3A) can be selected	
	One (1) Analog Outputs (0 to 5VDC, 1mA)			Output Frequency or Motor Current selection	
Display	Control Panel Display		Operating Status	Output voltage, output current, set frequency, running	
			Alarm Definition	Alarm definition is displayed when protective function is activated. 4 alarm definitions are stored	
	LED Display			Power application (POWER), Alarm (ALARM)	
Protective / Alarm Functions				Overcurrent shut-off (during acceleration, deceleration, constant speed), regenerative overvoltage shut-off, undervoltage (*1), instantaneous power failure (*1), overload shut-off (electronic overcurrent protection), stall prevention, fin overheat, fan failure (*4), parameter error, PU disconnection, starting ground fault overcurrent protection	
Environment	Ambient Temperature			-10°C to +50°C, 14°F to 122°F (non-freezing)	
	Ambient Humidity			90%RH or less (non-condensing)	
	Storage Temperature (*2)			-20°C to +65°C / -4°F to 149°F	
	Atmosphere			Indoors, no corrosive and flammable gases, oil mist, dust and dirt.	
	Altitude, Vibration			Maximum 1000m (3280.80 ft.) above sea level for standard operation. After that derate by 3% for every extra 500m (1640.40 feet) up to 2500m (8202.00 feet) (91%)	

Notes:

1. When undervoltage or instantaneous power failure has occurred, alarm display or alarm output is not provided but the inverter itself is protected. Overcurrent, regenerative overvoltage or other protection may be activated at power restoration according to the operating status (load size, etc.).
2. Temperature applicable for a short period in transit, etc.
3. 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.
4. Provided only for forced-air models FR-S520E-1.5K-NA, FR-S520E-2.2K-NA and FR-S520E-3.7K-NA.

S500E Series Terminal Connection Diagram

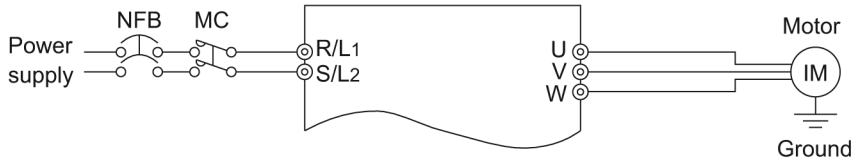
Three-Phase 200V Power Input/Output
Three-Phase 400V Power Input/Output



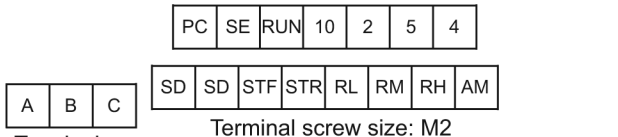
Notes:

1. The N/- terminal is not provided for the FR-S520E-0.1K to 0.75K-NA.
2. The PR terminal is provided for the FR-S520E-0.4K to 3.7K-NA. (not used)
3. You can switch the position of sink and source logic.
4. When the setting potentiometer is used frequently, use a 2W1kΩ potentiometer.
5. The terminal functions change with input terminal function selection (Pr. 60 to Pr. 63). (RES, RL, RM, RH, RT, AU, STOP, MRS, OH, REX, JOG, X14, X16, (STR) signal selection)
6. The terminal function changes according to the setting of output terminal function selection (Pr. 64, Pr. 65). (RUN, SU, OL, FU, RY, Y12, Y13, FDN, FUP, RL, Y93, Y95, LF, ABC signal selection)

Single-phase 100V power input / three-phase 200V power output



Terminal Block Layout



S500E Series Options

Options and Accessories			
Model Number	**Description**	**Notes**	**Stocked Item**
FR-E5T	Mounting Adapter	Allows mounting 2.2 & 3.75K S520E VFD in A024 hole pattern	–
FR-E5T-14	Mounting Adapter	Allows mounting 1.5K, 2.2K & 3.7K S540E VFD in A044 hole pattern	–
IB(NA)0600027	S500 Detailed Instruc. Manual	Download from www.meau.com	–
FR-PU04	Parameter Unit	Use with remote cable	S
FR-CB201	Remote Cable	1m cable	S
FR-CB203	Remote Cable	3m cable	S
FR-CB205	Remote Cable	5m cable	S
FR-CONFIGURATOR	Programming and Diagnostic Software		S
SC-FRPC	Serial Communications Cable		S

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)	–

DIN Rail Mounting Attachment

This attachment allows the S500E Series inverter to mount on a 35mm DIN rail.

Model Number	Drive Model		Stocked Item
	S510WE	S520E	
FR-UDA01	0.1K – 0.4K	0.1K – 0.75K	S
FR-UDA02	0.75K	1.5K – 2.2K	S
FR-UDA03	—	3.7K	–

Installation Interchange Attachment

This attachment allows the S500E Series inverter to be mounted using the installation holes from the previous series VFDs.

Model Number	Installation Model		Previous Model		Stocked Item
	S500E Series	A0x4 Series	Z024 Series	A200E Series	
FR-E5T-10	FR-S520E-0.1K-NA		FR-Z024-0.1K-UL	—	S
	FR-S520E-0.2K-NA	FR-A024-0.2K-UL	FR-Z024-0.2K-UL	—	
	FR-S520E-0.4K-NA	FR-A024-0.4K-UL	FR-Z024-0.4K-UL	—	
	FR-S520E-0.75K-NA	FR-A024-0.75K-UL	—	—	
FR-E5T-11	FR-S520E-0.75K-NA	—	FR-Z024-0.75K-UL	—	–
	FR-S520E-1.5K-NA	FR-A024-1.5K-UL	FR-Z024-1.5K-UL	—	
FR-E5T	FR-S520E-2.2K-NA	FR-A024-2.2K-UL	FR-Z024-2.2K-UL	—	–
	FR-S520E-3.7K-NA	FR-A024-3.7K-UL	FR-Z024-3.7K-UL	—	
FR-E5T-14	FR-S540E-1.5K-NA	FR-A044-1.5K-UL	—	—	–
	FR-S540E-2.2K-NA	FR-A044-2.2K-UL	—	—	
	FR-S540E-3.7K-NA	FR-A044-3.7K-UL	—	—	

S500E Series Watt Loss and Efficiency Data

	120VAC 1-Phase Input / 240VAC 3-Phase Output			
HP-CT	**Model Number**	**Rated Watts**	**Watts Loss**	**Efficiency**
1/8	FR-S510WE-0.1K-NA	100	16	84%
1/4	FR-S510WE-0.2K-NA	200	20	90%
1/2	FR-S510WE-0.4K-NA	400	45	89%
1	FR-S510WE-0.75K-NA	750	50	93%

Notes at right.

S500E Series Watt Loss and Efficiency Data

	480VAC 3-Phase Input / Output			
HP-CT	**Model Number**	**Rated Watts**	**Watts Loss**	**Efficiency**
1/2	FR-S540E-0.4K-NA	400	45	89%
1	FR-S540E-0.75K-NA	750	50	93%
2	FR-S540E-1.5K-NA	1500	85	94%
3	FR-S540E-4.4K-NA	2200	100	95%
5	FR-S540E-3.7K-NA	3700	160	96%

Notes at right.

S500E Series Watt Loss and Efficiency Data

	240VAC 3-Phase Input / Output			
HP-CT	**Model Number**	**Rated Watts**	**Watts Loss**	**Efficiency**
1/8	FR-S520E-0.1K-NA	100	16	84%
1/4	FR-S520E-0.2K-NA	200	20	90%
1/2	FR-S520E-0.4K-NA	400	45	89%
1	FR-S520E-0.75K-NA	750	50	93%
2	FR-S520E-1.5K-NA	1500	85	94%
3	FR-S520E-2.2K-NA	2200	100	95%
5	FR-S520E-3.7K-NA	3700	160	96%

General Notes:

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

S540E EMC Filters

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

Model Number	Installation Mode	Stocked Item
FFR-S540-8A-RF100	FR-S540E-0.4K – 1.5K	–
FFR-S540-13A-RF100	FR-S540E-2.2K – 3.7K	–

E500 Series

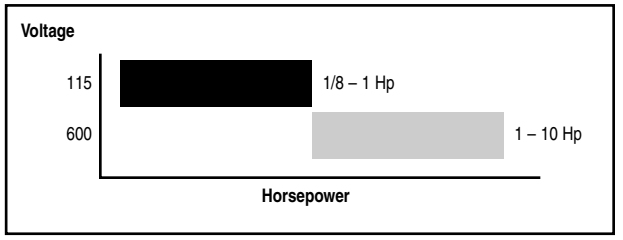
The cost-effective variable speed control solution for general purpose applications.

- Up to 1 Hp at 115VAC
- Up to 10 Hp at 600VAC
- Advanced Magnetic Flux Vector Control
- Auto-tuning
- 50°C maximum ambient temperature
- RS-485 serial communication (standard)
- Selectable cooling fan operation mode
- Built-in PID control
- Adjustable carrier frequency (0.7kHz to 14.5kHz)
- Optional keypad interface (FR-PA02-02)
- Compatible with FR-PU04 user interface
- UL & cUL listed / CE marked
- Available configuration software for Windows® 95 / 98
- Open-network communication options
  - ☐ DeviceNet
  - ☐ CC-Link
  - ☐ Profibus DP (600V only)
- Brake Transistor

FR-E510W – 0.1 K – NA

Symbol	Voltage Class
E510W	Single-phase 100V class
E560	Three-phase 600V class

Inverter capacity "kW"



E500 Selection

Rating (CT & VT)		IP20 Open Chassis	Dimensions				Stocked Item
Hp	Output Current Amps	Model Number	Height mm (in)	Width mm (in)	Depth mm (in)	Weight kg (lbs)	
1-Phase 100 – 115VAC Input / 3-Phase 230VAC Output							
1/8	0.8	FR-E510W-0.1K-NA	128 (5.0)	68 (2.7)	76 (3.0)	0.6 (1.4)	–
1/4	1.5	FR-E510W-0.2K-NA	128 (5.0)	68 (2.7)	106 (4.2)	0.6 (1.4)	S
1/2	3.0	FR-E510W-0.4K-NA	128 (5.0)	68 (2.7)	138 (5.5)	1.0 (2.2)	S
1.0	5.0	FR-E510W-0.75K-NA	128 (5.0)	108 (4.3)	155 (6.1)	1.7 (3.8)	S
3-Phase 575 – 600VAC Input / Output							
1.0	1.7	FR-E560-0.75K-NA	150 (5.9)	140 (5.5)	136 (5.4)	1.8 (4.0)	S
2.0	2.7	FR-E560-1.5K-NA	150 (5.9)	140 (5.5)	136 (5.4)	2.0 (4.7)	S
3.0	4.0	FR-E560-2.2K-NA	150 (5.9)	140 (5.5)	136 (5.4)	2.0 (4.7)	S
5.0	6.1	FR-E560-3.7K-NA	150 (5.9)	220 (8.7)	148 (5.8)	3.8 (8.4)	S
7.5	9.0	FR-E560-5.5K-NA	150 (5.9)	220 (8.7)	148 (5.8)	3.8 (8.4)	S
10.0	12	FR-E560-7.5K-NA	150 (5.9)	220 (8.7)	148 (5.8)	3.8 (8.4)	S

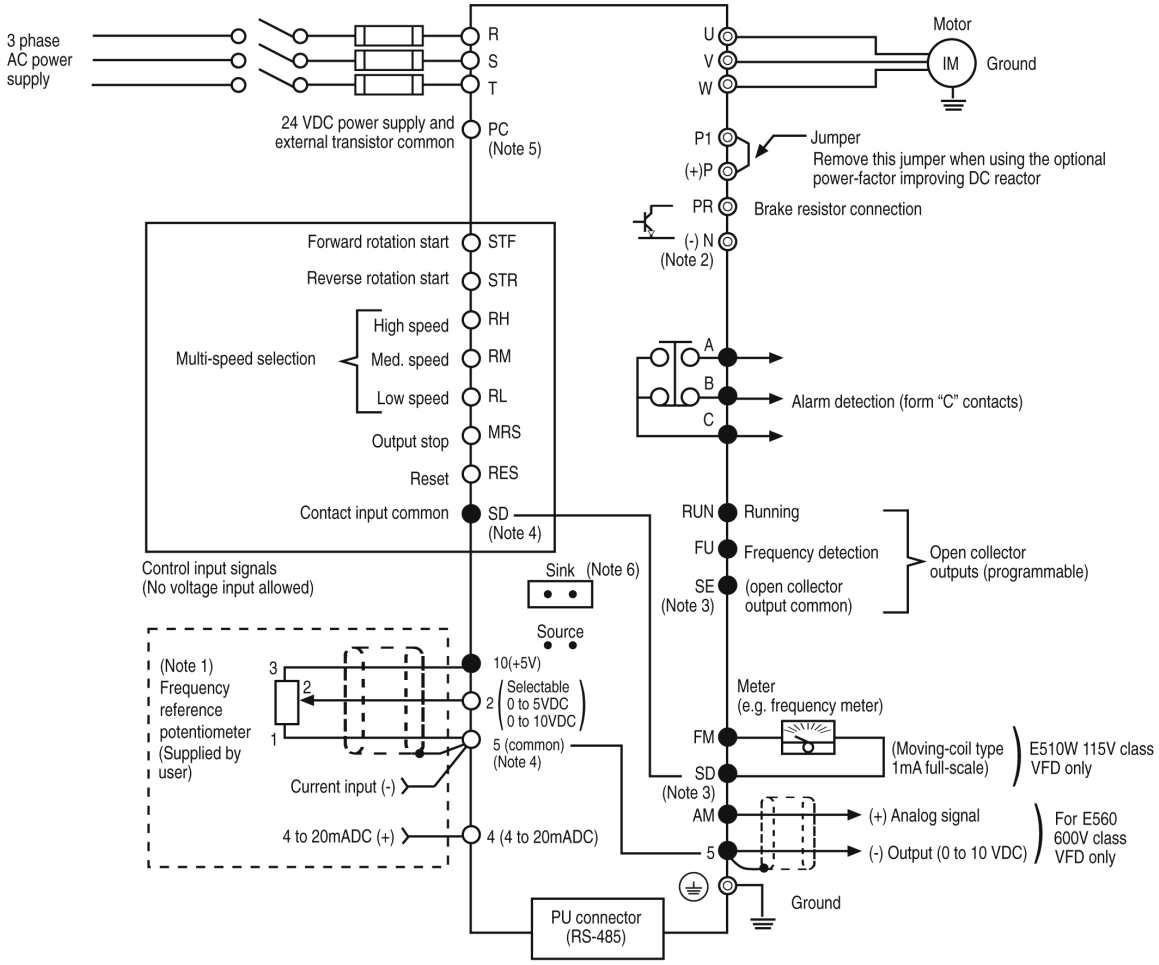
E500 General Specifications

Control Specifications	Control Method		Soft-PWM control / high carrier frequency PWM control can be selected. V / F control or general-purpose magnetic flux vector control can be selected.	
	Output Frequency Range		0.2 to 400Hz (starting frequency variable between 0 and 60Hz)	
	Frequency Control	Analog Input	Across terminals 2-5: 1/500 of maximum set frequency (5VDC input), 1/1000 (10VDC, 4-20mADC input).	
		Digital Input	0.01Hz (less than 100Hz), 0.1Hz (100Hz or more) when digital setting is made using the control panel.	
	Frequency Precision	Analog Input	Within ±0.5% of maximum output frequency (25°C ±10°C) / 59°F to 95°F.	
		Digital Input	Within 0.01% of set output frequency when setting is made from control panel.	
	Voltage / Frequency Characteristics		Base frequency set as required between 0 and 400Hz. Constant torque or variable torque pattern can be selected.	
	Starting Torque		150% or more (at 1Hz), 200% or more (at 3Hz) when general-purpose magnetic flux vector control or slip compensation is selected.	
	Torque Boost		Manual torque boost, 0 to 30% may be set.	
	Acceleration / Deceleration Time Setting		0.01, 0.1 to 3600 sec. (accel. and decel. can be set individually), linear or S-pattern accel./decel. mode can be selected	
	Braking Torque	Regenerative	0.1K, 0.2K...150% or more, 0.4K, 0.75K... 00% or more, 1.5K...50% or more, 2.2K, 3.7K, 5.5K, 7.5K ... 20% or more (*1)	
		DC Dynamic Brake	Operation frequency (0 to 120Hz), operation time (0 to 10 s), operation voltage (0 to 30%) variable.	
	Stall Prevention Operation Level		Operation current level can be set (0 to 200% variable), presence or absence can be selected.	
	Voltage Stall Prevention Operation Level		Operation level is fixed, presence or absence can be selected.	
	Fast-Response Current Limit Level		Operation level is fixed, presence or absence can be selected.	
Input Signals	Frequency Setting Signal	Analog Input	0 to 5VDC, 0 to 10VDC, 4 to 20mADC.	
		Digital Input	Entered from control panel (FR-PA02-02).	
	Starting Signal		Forward and reverse rotation, start signal automatic self-holding input (3-wire input) can be selected.	
	Alarm Reset		Used to reset alarm output provided when protective function is activated.	
	Multi-Speed Selection		Up to 15 speeds can be selected. (Each speed can be set between 0 and 400Hz, running speed can be changed during operation from the control panel.)	
	Second Function Selection		Used to select second functions (accel. time, decel. time, torque boost, freq., electronic overcurrent protection).	Use Pr. 180 to Pr. 183 for selection.
	Output Stop		Instantaneous shut-off of inverter output (frequency, voltage).	
	Current Input Selection		Used to select input of frequency setting signal 4 to 20mADC (terminal 4).	
	Start Signal Automatic Self-Holding Selection		Used to select start signal automatic self-holding input. (3-wire input)	
	External Thermal Relay Input		Thermal relay contact input for use when the inverter is stopped by the external thermal relay.	
	PU Operation-External Operation Switching		Used to switch between PU operation and external operation from outside the inverter.	
	V/F-General-Purpose Magnetic Flux Switching		Used to switch between V/F control and general-purpose magnetic flux vector from outside the inverter.	
	Operation Functions		Maximum/minimum frequency setting, frequency jump operation, external thermal relay input selection, automatic restart operation after instantaneous power failure, forward/reverse rotation prevention, slip comp., operation mode selection, off-line auto tuning function, PID control, computer link operation (RS-485).	
	Output Signals	Operation Status	2 open collector output signals can be selected from inverter running, up to frequency, frequency detection, overload alarm, zero current detection, output current detection, PID upper limit, PID lower limit, PID forward/reverse rotation, operation ready, minor fault and alarm, and 1 contact output (230VAC 0.3A, 30VDC 0.3A) can be selected.	
		For Meter	1 signal can be selected from output frequency, motor current and output voltage. Pulse train output (1440 pulses/second/full scale).	
Display	Control Panel Display	Operating Status	Output voltage, output current, set frequency, running.	
		Alarm Definition	Alarm definition is displayed when protective function is activated. 4 alarm definitions are stored.	
	LED Display		Power application (POWER)	
Protective And Warning Functions			Overcurrent shut-off (during acceleration, deceleration, constant speed), regenerative overvoltage shut-off, undervoltage (*2) , instantaneous power failure (*2), overload shut-off (electronic overcurrent protection), brake transistor alarm, output short circuit, stall prevention, brake resistor overheat protection, fan overheat, fan failure (*4), parameter error, PU disconnection, ground fault protection.	
Environment	Ambient Temperature		Constant torque: -10°C to +50°C (non-freezing) 14°F to 122°F	
	Ambient Humidity		90%RH or less (non-condensing)	
	Storage Temperature (*3)		-20°C to +65°C / -4°F to 149°F	
	Atmosphere		Indoors, no corrosive and flammable gases, oil mist, dust and dirt.	
	Altitude		Maximum 1000m (3300 ft.) above sea level for standard operation. After that derate by 3% for every extra 500m up to 2500m (91%).	
	Vibration		5.9 m/s^2 (0.6G max.) based on JIS C 0911.	

Notes:

1. 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. (The optional brake resistor cannot be used with 0.1K and 0.2K.) A brake unit (BU) may also be used.
2. When undervoltage or instantaneous power failure has occurred, alarm display or alarm output is not provided but the inverter itself is protected. Overcurrent, regenerative overvoltage or other protection may be activated at power restoration according to the operating status (load size, etc.).
3. Temperature applicable for a short period in transit, etc.
4. Not provided for the FR-E510W-0.1K to 0.75K which are not equipped with a cooling fan.

E500 Series Terminal Connection Diagram

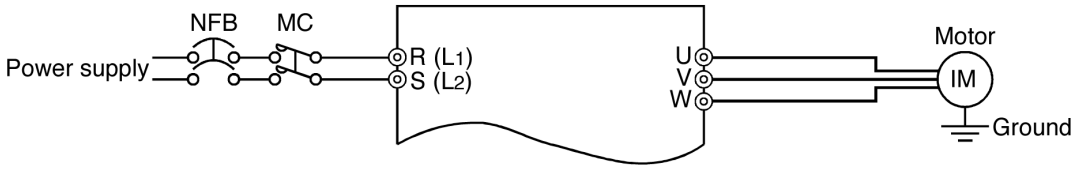


Notes:

1. Use 0.5W, 1kΩ potentiometer. For heavier duty applications, use a 2W, 1kΩ potentiometer.
2. 0.1kW and 0.2kW rated models do not contain braking transistor.
3. Terminals SD and SE are electrically isolated.
4. Terminals SD and 5 are not electrically isolated. Do not connect them to each other or to ground.
5. To avoid damage to the VFD, do not allow a short circuit between terminals PC and SD.
6. Sink/Source selectable I/O. Sink type is factory default.

◎ Main circuit terminal
○ Input terminal for control circuit
● Output terminal for control circuit

Single-phase 100V power input / three-phase 200V power output



Terminal Block Layout

100V class

*AM for the 600V class inverter.

RH
RM
RL
MRS
RES
SD
FM*
PC
SE
RUN
FU

600V class

A
B
C
10
2
5
4
SD
STF
STR
SD

E500 Series Options

Model Number	Description	Notes	Stocked Item
FR-PA02-02	Keypad for E500 VFD	For mounting on E500 VFD	S
FR-E5P	Keypad Panel Mounting Adapter	For use only on FR-PA02-02 and FR-CB20□	S
FR-DU04	LED Parameter Unit	Also used with A500(L).	S
FR-PU04	LCD Parameter Unit	Also used with A500(L).	S
FR-E5ND	E540, E560 DeviceNet Interface	Plug-in Option. Not for use with E520 or E510W.	–
FR-E5NP	E540, E560 Profibus DP Interface	Plug-in Option. Not for use with E520 or E510W.	S
FR-E5NC	E540, E560 CC-Link Interface	Plug-in Option. Not for use with E520 or E510W.	–
FR-E5NL	E540, E560 LonWorks Interface	Plug-in Option. Not for use with E520 or E510W.	–
FR-CB201	Remote cable	1m cable	S
FR-CB203	Remote Cable	3m cable	S
FR-CB205	Remote Cable	5m cable	S
IB(NA)66866	FR-E520/E540/E510W Instruction Manual		–
SH(NA)3193	FR-A500 / E500 Technical Manual		–
IB(NA)0600003	FR-E5NC, CC-Link Instruction Manual		–
IB(NA)0600006	FR-E5ND, DeviceNet Instruction Manual		–
IB(NA)0600007	FR-E5NP, Profibus Instruction Manual		–
IB(NA)0600204	FR-E560 Instruction Manual	Only available for download.	–
FR-CONFIGURATOR	Programming and Diagnostic Software		S
SC-FRPC	Serial Communication Cable		S

Dynamic Braking

All Mitsubishi Electric VFD's have some inherent braking capability. During controlled deceleration, motor regenerative losses are dissipated in the motor, wire, and VFD circuitry. The built-in DC injection braking allows for low speed braking and stopping.

When the above capabilities are inadequate for an application, it is necessary to add a power transistor brake unit and resistor unit in series across the DC bus. Motor regeneration causes the DC bus voltage to increase, and when the voltage exceeds a specified threshold, the transistor turns on to pass current through the resistor. Motor kinetic energy is converted to heat energy. VFD overcurrent and overvoltage protective circuits are active at all times, and will fault-trip the VFD if the brake size is inadequate.

Two main factors must be considered when sizing the brake, the effective duty cycle (%ED) and the short time duty rating. The effective duty cycle is increased when an external resistor is added. It is preferable to profile the effective duty cycle of the units of time. With this information, the short time duty is known and the %ED can be calculated, as shown in the below example.

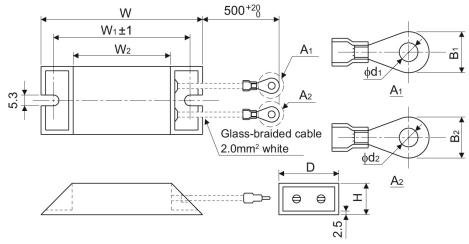
%ED = Braking time / total time for complete operating cycle x 100

Example: Complete cycle is:
- 5 sec: Acceleration time to reach set speed
- 60 sec: Run time at set speed
- 3 sec: Deceleration time to come to a complete stop
- 12 sec: Time period motor remains stopped

%ED = 3 / (5 + 60 + 3 + 12) * 100 = 3.6%

The tables shown assume 100% brake torque, when brake torque is represented by its percentage to the rated torque of the applied motor.

FR-ABR-0.4K to 0.75K



Torque (kg.m) = 974 * Power (kW) / Speed (rpm).

Dynamic Braking Unit for 230VAC • Braking Torque = 100%									
Braking Unit Model No. (*3)	Weight kg / lbs	Resistor Kit Model No.	Stocked Item	Weight kg / lbs	Resistance (Ohms)	Rated (W)	Motor (Hp)	Drive Model	
								E510W	%ED
Not Necessary	N/A	FR-ABR-0.4K	S	0.2 / 0.5	200	80	0.5	0.4K	10%
		FR-ABR-0.75K	S	0.4 / 0.9	100	150	1	0.75K	10%

Products are UL listed.

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 E500 Series inverter to mount on a 35mm DIN rail.

Model Number	Drive Model	Stocked Item
	E510W	
FR-UDA01	0.1K – 0.4K	S
FR-UDA02	0.75K	S

E700 Series

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

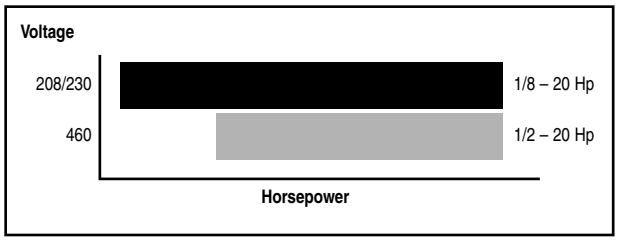
5 Year Warranty

- Available in 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
- USB communications allow fast commissioning and troubleshooting
- Standard RS485 serial communications supporting 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®
- Standard 5 year warranty

FR-E720 – 175 – NA

Symbol	Voltage Class
E720	Three-phase 200V class
E740	Three-phase 400V class

Inverter capacity Amperage/10 (175 = 17.5A output)



E700 Selection

Output Amps	HP	Model Number	Dimensions in inches (mm)			Weight Lbs (kg)	Stocked Item
			Height	Width	Depth		
3-Phase 200~240VAC Input & Output							
0.8	1/8	FR-E720-008-NA	5.0 (128)	2.7 (68)	3.2 (81)	1.1 (0.5)	S
1.5	1/4	FR-E720-015-NA					S
3	1/2	FR-E720-030-NA	5.0 (128)	2.7 (68)	4.5 (113)	1.6 (0.7)	S
5	1	FR-E720-050-NA	5.0 (128)	2.7 (68)	5.3 (133)	2.2 (1.0)	S
8	2	FR-E720-080-NA	5.0 (128)	4.3 (108)	5.4 (136)	3.1 (1.4)	S
11	3	FR-E720-110-NA					S
17.5	5	FR-E720-175-NA	5.0 (128)	6.7 (170)	5.7 (143)	3.8 (1.7)	S
24	7 1/2	FR-E720-240-NA	10.3 (260)	7.1 (180)	6.5 (165)	9.5 (4.3)	S
33	10	FR-E720-330-NA					S
47	15	FR-E720-470-NA	10.3 (260)	8.7 (220)	7.5 (190)	19.9 (9)	S
60	20	FR-E720-600-NA					S
3-Phase 380~480VAC Input & Output							
1.6	1/2	FR-E740-016-NA	5.9 (150)	5.5 (140)	4.5 (114)	3.1 (1.4)	S
2.6	1	FR-E740-026-NA					S
4	2	FR-E740-040-NA	5.9 (150)	5.5 (140)	5.4 (135)	4.2 (1.9)	S
6	3	FR-E740-060-NA					S
9.5	5	FR-E740-095-NA					S
12	7 1/2	FR-E740-120-NA	5.9 (150)	8.7 (220)	5.8 (147)	7.1 (3.2)	S
17	10	FR-E740-170-NA					S
23	15	FR-E740-230-NA	10.3 (260)	8.7 (220)	7.5 (190)	19.9 (9)	S
30	20	FR-E740-300-NA					S

E700 General Specifications

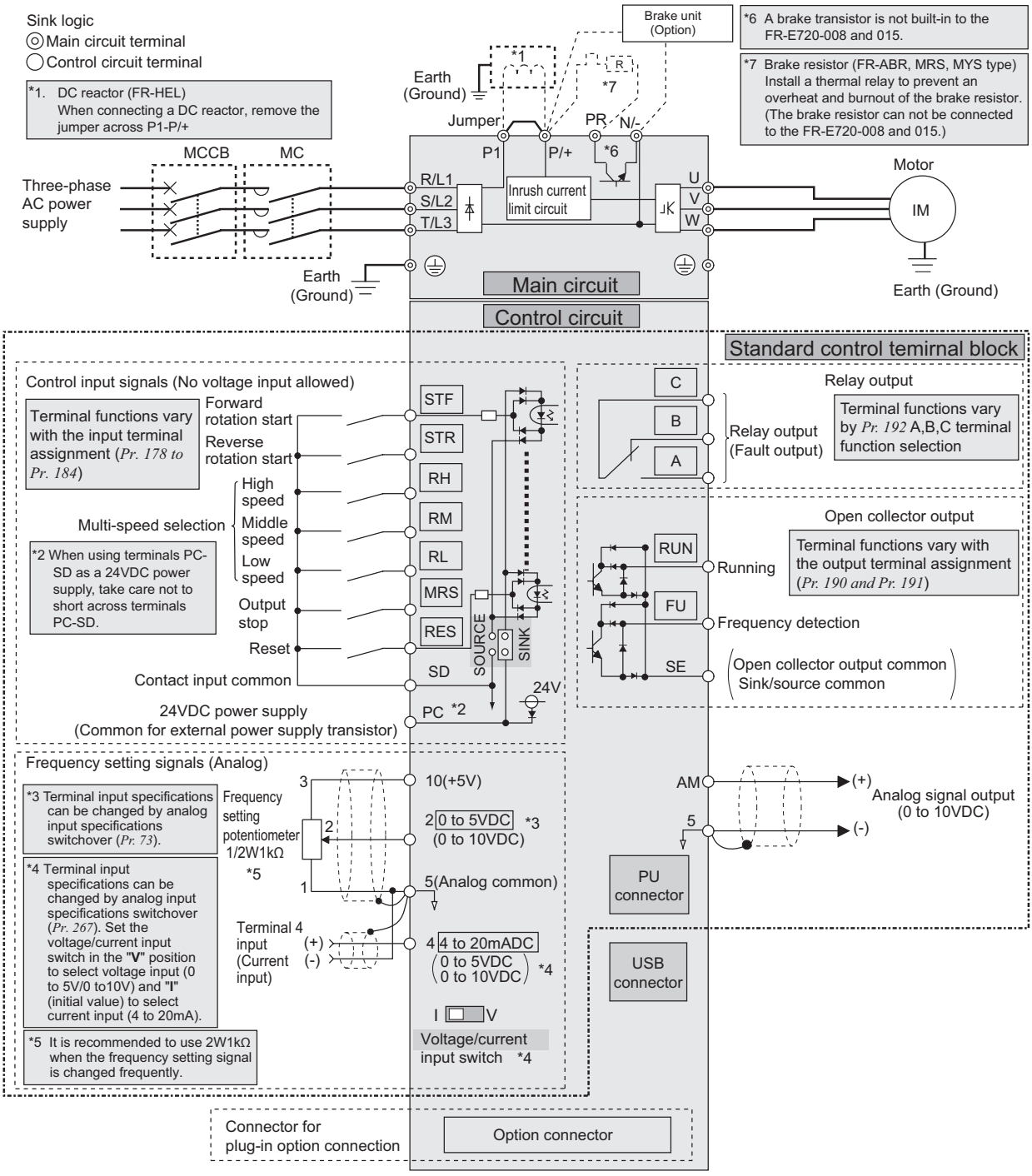
Control Specifications	Control Method			Soft-PWM control/high carrier frequency PWM control (V/F control, advanced magnetic flux vector control, general-purpose magnetic flux vector control, optimum excitation control can be selected)
	Output Frequency Range			0.2 to 400Hz
	Frequency Setting Resolution		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
	StartingTorque			200% or more (at 0.5Hz) when advanced magnetic flux vector control is set (3.7K or less)
	Torque Boost			Manual torque boost
	Acceleration/DecelerationTime 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, ibrake 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/s² or less

Notes:

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.

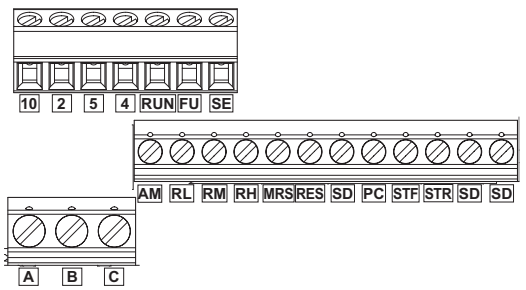
E700 Series Terminal Connection Diagram

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



Terminal Block Layout

Terminal screw size
M3: (Terminal A, B, C)
M2: (Other than the above)



E700 Series Plug-In Options

Model Number	Description	Stocked Item
FR-A7NC E KIT	CC-Link Network Option	S
FR-A7ND E KIT	DeviceNet Network Option	S
FR-A7NP E KIT	Profibus-DP Network Option	S
FR-A7NL E KIT	LonWorks Network Option	S
FR-A7AX E KIT	Additional 16-bit Digital Input	S
FR-A7AY E KIT	Additional Analog & Digital Output	S
FR-A7AR E KIT	Additional Relay Output	S

E700 Series External Options

Model Number	Description	Stocked Item
FR-PU07	Alpha-Numeric multi-language keypad	S
FR-PU07-BB	Battery powered Alpha-Numeric multi-language keypad	S
FR-CB20□	Keypad extension cable	S
SC-FRPC	Serial communications cable	S
FR-ABR-□□K	External brake resistor	S

Note: □ □ represents drive kW rating

E700 Dynamic Braking

All Mitsubishi Electric VFD's have some inherent braking capability. During controlled deceleration, motor regenerative losses are dissipated in the motor, wire, and VFD circuitry. The built-in DC injection braking allows for low speed braking and stopping.

When the above capabilities are inadequate for an application, it is necessary to add a power transistor brake unit and resistor unit in series across the DC bus. Motor regeneration causes the DC bus voltage to increase, and when the voltage exceeds a specified threshold, the transistor turns on to pass current through the resistor. Motor kinetic energy is converted to heat energy. VFD overcurrent and overvoltage protective circuits are active at all times, and will fault-trip the VFD if the brake size is inadequate.

Two main factors must be considered when sizing the brake, the effective duty cycle (%ED) and the short time duty rating. The effective duty cycle is increased when an external resistor is added. It is preferable to profile the effective duty cycle of the units of time. With this information, the short time duty is known and the %ED can be calculated, as shown in the below example.

%ED = Braking time / total time for complete operating cycle *100

Example: Complete cycle is:

5 sec: Acceleration time to reach set speed
60 sec: Run time at set speed
3 sec: Deceleration time to come to a complete stop
12 sec: Time period motor remains stopped

%ED = 3 / (5 + 60 + 3 + 12) * 100 = 3.6%
The tables shown assume 100% brake torque, when brake torque is represented by its percentage to the rated torque of the applied motor.
Torque (kg.m) = 974 * Power (kW) / Speed (rpm).

Dynamic Braking Unit For 230VAC • Braking Torque = 100%

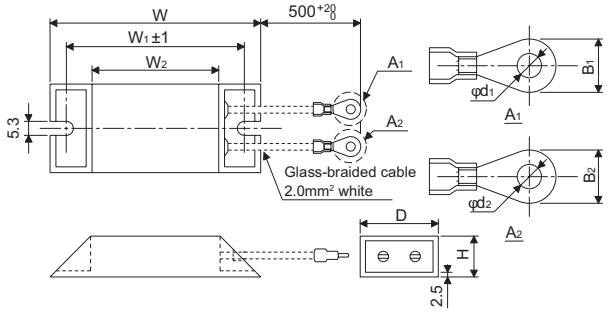
Resistor Kit Model Number	Weight kg / lbs	Resistance (Ohms)	Rated (W)	Motor (Hp)	Drive Model		Stocked Item
					E720	% ED	
FR-ABR-0.4K	0.2 / 0.5	200	80	1/2	030	10%	S
FR-ABR-0.75K	0.4 / 0.9	100	150	1	050	10%	S
FR-ABR-2.2K	0.5 / 1.1	60	250	3	080/110	10%	S
FR-ABR-3.7K	0.8 / 1.8	40	300	5	175	10%	S
FR-ABR-5.5K	1.3 / 2.9	25	500	7.5	240	10%	S
FR-ABR-7.5K	2.2 / 4.9	20	800	10	330	10%	S
FR-ABR-11K	3.4 (7.5)	13	—	15	470	6%	S
FR-ABR-15K (2 resistors in parallel)	2.4 (5.3) x 2	18/2	—	20	600	6%	S

Dynamic Braking Unit For 460-480VAC Braking Torque = 100%

Resistor Kit Model Number	Weight kg / lbs	Resistance (Ohms)	Rated (W)	Motor (Hp)	Drive Model		Stocked Item
					E740	% ED	
FR-ABR-H0.4K	0.2 / 0.5	1200	60	0.5	016	10%	S
FR-ABR-H0.75K	0.2 / 0.5	700	80	1	026	10%	S
FR-ABR-H1.5K	0.4 / 0.9	350	150	2	040	10%	S
FR-ABR-H2.2K	0.5 / 1.1	250	250	3	060	10%	S
FR-ABR-H3.7K	0.8 / 1.8	150	300	5	095	10%	S
FR-ABR-H5.5K	1.3 / 2.9	110	500	7.5	120	10%	S
FR-ABR-H7.5K	2.2 / 4.9	75	800	10	170	10%	S
FR-ABR-H11K	3.2 (7.1)	52	1000	15	230	6%	S
FR-ABR-H15K (2 resistors in series)	2.4 (5.3) x 2	18 x 2	1600	20	030	6%	S

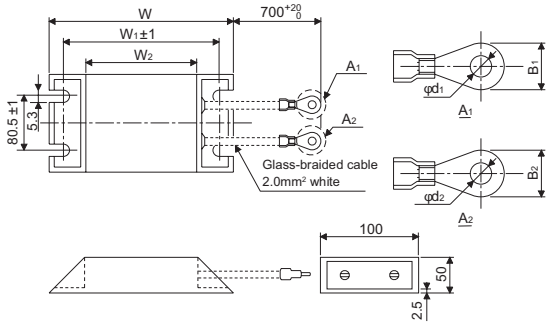
Brake Resistors

FR-ABR-0.4K to 7.5K, H0.4K to H7.5K



Brake Resistor Model		Dimensions (mm)				
		W	W1	W2	D	H
200 V 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
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-11K, 15K, 22K, H11K, H15K, H22K



Brake Resistor Model		Dimensions (mm)				
		W	W1	W2	D	H
200 V Class	FR-ABR-11K	140	125	100	40	21
	FR-ABR-15K	215	200	175	40	21
	FR-ABR-22K	240	225	200	50	26
400V Class	FR-ABR-H11K	115	100	75	40	21
	FR-ABR-H15K	140	125	100	40	21
	FR-ABR-H22K	400	385	360	80	40

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

E740 EMC Filters

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

Model Number	Drive Model	Stocked Item
FFR-E540-4.5A-SF1	FR-008-050	S
FFR-E540-15A-SF1	FR-080-175	–
FFR-E540-27A-SF1	FR-240-330	–

DIN Rail Mounting Attachment

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

Model Number	Drive Model	Stocked Item
	E720	
FR-UDA01	0080-050	S
FR-UDA02	080-110	S
FR-UDA03	175	–

Installation Interchange Attachment

This attachment allows the 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	—	—	

E700 Installation Interchange Attachment

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

Model Number	Installation Model	Previous Model			Stocked item
	E700 Series	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	—	—

E700 Series Watt Loss and Efficiency Data

HP-CT	240VAC 3-Phase Input				480VAC 3-Phase Input			
	Model Number	Rated Watts	Watts Loss	Efficiency	Model Number	Rated Watts	Watts Loss	Efficiency
1/8	FR-E720-008-NA	100	14	86%	—	—	—	—
1/4	FR-E720-015-NA	200	20	90%	—	—	—	—
1/2	FR-E720-030-NA	400	32	92%	FR-E740-016-NA	400	45	89%
1	FR-E720-050-NA	750	50	93%	FR-E740-026-NA	750	50	93%
2	FR-E720-080-NA	1500	80	95%	FR-E740-040-NA	1500	85	94%
3	FR-F720-110-NA	2200	100	95%	FR-E740-060-NA	2200	100	95%
5	FR-E720-175-NA	3700	160	96%	FR-E740-095-NA	3700	160	96%
7.5	FR-E720-240-NA	5500	290	95%	FR-E740-120-NA	5500	310	94%
10	FR-F720-330-NA	7500	380	95%	FR-E740-170-NA	7500	420	94%
15	FR-E720-470-NA	11000	520	95%	FR-E740-230-NA	11000	560	95%
20	FR-E720-600-NA	15000	600	96%	FR-E740-300-NA	15000	640	96%

Notes:

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

Conduit Kits

Model Number	Description	Stocked Item
FR-E7FN-01	Conduit kit for E720-008/015	S
FR-E7FN-02	Conduit kit for E720-030	S
FR-E7FN-03	Conduit kit for E720-050	S
FR-E7FN-04	Conduit kit for E720-080/110	S
FR-E7FN-05	Conduit kit for E740-016/026	S
FR-E7FN-06	Conduit kit for E740-040/060/090	S
FR-E7FN-07	Conduit kit for E720-175	S
FR-E7FN-08	Conduit kit for E740-120/170	S
FR-E7FN-09	Conduit kit for E720-240/330	S
FR-E7FN-10	Conduit kit for E720-470/600 E740-230/300	S

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 E740-040/060/090	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

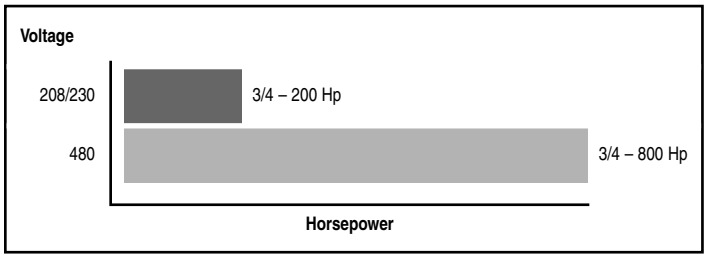
E700 Demonstration Unit

Model Number	Description	Stocked Item
VFD-MICRO-DEMO	Includes E720 1HP, pre-wired digital input switches, led outputs and speed potentiometer	S
VFD-MOTOR-DEMO	Includes 1/2HP motor with quick connection to VFD-MICRO-DEMO	S

F700 Series

The truly fantastic specifications of the F700, make this VFD from Mitsubishi Electric an absolute must for your drive systems.

- **NEMA 1 UL Type 1 Enclosure Designs:** Drive can be mounted as a stand-alone unit where required. (Plenum rated)
- **Ease of Programming:** Taken to new levels with the new DU07 programming dial and FR-Configurator programming software
- **Built-in EMC filter:** Conforms to EN61800-3 2nd environmental
- **Energy Savings:** Optimum Excitation Control
- The popular setting dial makes operation easy
- Control terminals can be used over a network as remote I/O
- An operation panel can be installed on the front cover and is detachable (Cable connector option is required)
- PU/EXT (operation mode) switchover key is available
- RS-485 communications as standard – Mitsubishi or Modbus RTU protocol
- **Windmill start:** Catch a reverse spinning load
- Regeneration avoidance
- PID sleep mode
- Pre-soak mode
- 3 user programmable skip frequencies
- Remote I/O capability: All the drive I/O can be read or controlled over a network
- UL Listed for single phase input



F700 Ratings 200-240V Class

Input: 1 Phase/3 Phase - Output Voltage: 3 Phase 200-240V at 60Hz • Voltage Tolerance: 170-264V at 60Hz Available Braking Torque: 15% Torque Continuous								
SLD (40°C)		LD		Model Number (*4)	Frame Size	Cooling Method	Protective Rating	Stocked item
110% OL / 1min		120% OL / 1min						
120% OL / 3 sec		150% OL / 3 sec						
Hp (*1)	FLA	Hp (*1)	FLA					
1	4.6	1	4.2	FR-F720-00046-NA	A	Self Cooling	UL Type 1 – Plenum Rated	S
2	7.7	2	7	FR-F720-00077-NA	B			S
3	10.5	3	9.6	FR-F720-00105-NA	C	Forced Air Cooled		S
5	16.7	5	15.2	FR-F720-00167-NA	C			S
7.5	25	7.5	23	FR-F720-00250-NA	C			S
10	34	10	31	FR-F720-00340-NA	D			S
15	49	15	45	FR-F720-00490-NA	D			S
20	63	20	58	FR-F720-00630-NA	E			S
25	77	25	70	FR-F720-00770-NA	F			S
30	93	30	85	FR-F720-00930-NA	F			S
40	125	40	114	FR-F720-01250-NA	F		IP00 (*2)	S
50/60	154	50	140	FR-F720-01540-NA	G			S
60	187	60	170	FR-F720-01870-NA	H			S
75	233	75	212	FR-F720-02330-NA	H			S
40	125	40	114	FR-F720-01250-NAN1	F		NEMA 1	–
50/60	154	50	140	FR-F720-01540-NAN1	G			–
60	187	60	170	FR-F720-01870-NAN1	H			–
75	233	75	212	FR-F720-02330-NAN1	H			–
100/125	316	100	288	FR-F720-03160-NA	K		IP00 (*2)	S
150	380	125	346	FR-F720-03800-NA	K			S
200	475	150	432	FR-F720-04750-NA	K			–

Notes: See next page.

F700 Ratings 480V Class

Input: 1 Phase/ 3 Phase • Output Voltage: 3 Phase 380-480V at 50/60Hz Voltage Tolerance: 323-528V at 50/60Hz • Available Braking Torque: 15% Torque Continuous								
SLD (40°C)		LD		Model Number (*4)	Frame Size	Cooling Method	Protective Rating	Stocked Item
110% OL / 1min		120% OL / 1min						
120% OL / 3 sec		150% OL / 3 sec						
Hp (*1)	FLA	Hp (*1)	FLA					
1	2.3	1	2.1	FR-F740-00023-NA	C	Self Cooling	UL Type 1 – Plenum rated	S
2	3.8	2	3.5	FR-F740-00038-NA	C			S
3	5.2	3	4.8	FR-F740-00052-NA	C			S
5	8.3	5	7.6	FR-F740-00083-NA	C			S
7.5	12.6	7.5	11.5	FR-F740-00126-NA	C			S
10	17	10	16	FR-F740-00170-NA	D	Forced Air Cooled		S
15	25	15	23	FR-F740-00250-NA	D			S
20	31	20	29	FR-F740-00310-NA	E			S
25	38	25	35	FR-F740-00380-NA	E			S
30	47	30	43	FR-F740-00470-NA	F			S
40	62	40	57	FR-F740-00620-NA	F			S
50/60	77	50	70	FR-F740-00770-NA	G		IP00 (*3)	S
60	93	60	85	FR-F740-00930-NA	H			S
75	116	75	106	FR-F740-01160-NA	H			S
50/60	77	50	70	FR-F740-00770-NAN1	G		NEMA 1	–
60	93	60	85	FR-F740-00930-NAN1	H			–
75	116	75	106	FR-F740-01160-NAN1	H			–

Input: 1 Phase / 3 Phase • Output Voltage: 3 Phase 380-480V at 50/60Hz • Voltage Tolerance: 323-550V at 50/60Hz Available Braking Torque: 15% Torque Continuous • DC Link Choke is Included With The VFD								
SLD (40°C)		LD		Model Number (*4)	Frame Size	Fan	Protective Rating	Stocked Item
110% OL / 1min		120% OL / 1min						
120% OL / 3 sec		150% OL / 3 sec						
Hp (*1)	FLA	Hp (*1)	FLA					
100/150	180	100	144	FR-F740-01800-NA	H	Forced Air Cooled	IP00 (*3)	S
150	216	150	180	FR-F740-02160-NA	J			S
200	260	150	216	FR-F740-02600-NA	J			S
250	325	200	260	FR-F740-03250-NA	K			S
300	361	250	325	FR-F740-03610-NA	K			S
350	432	300	361	FR-F740-04320-NA	L			S
400	481	350	432	FR-F740-04810-NA	L			S
450	547	400	481	FR-F740-05470-NA	M			S
500	610	450	547	FR-F740-06100-NA	M			S
550	683	500	610	FR-F740-06830-NA	M			S
650	770	550	683	FR-F740-07700-NA	N		IP00	S
700	866	650	770	FR-F740-08660-NA	N			S
800	962	700	866	FR-F740-09620-NA	P			S
900	1094	800	962	FR-F740-10940-NA	P			–
1000	1212	900	1094	FR-F740-12120-NA	P			–

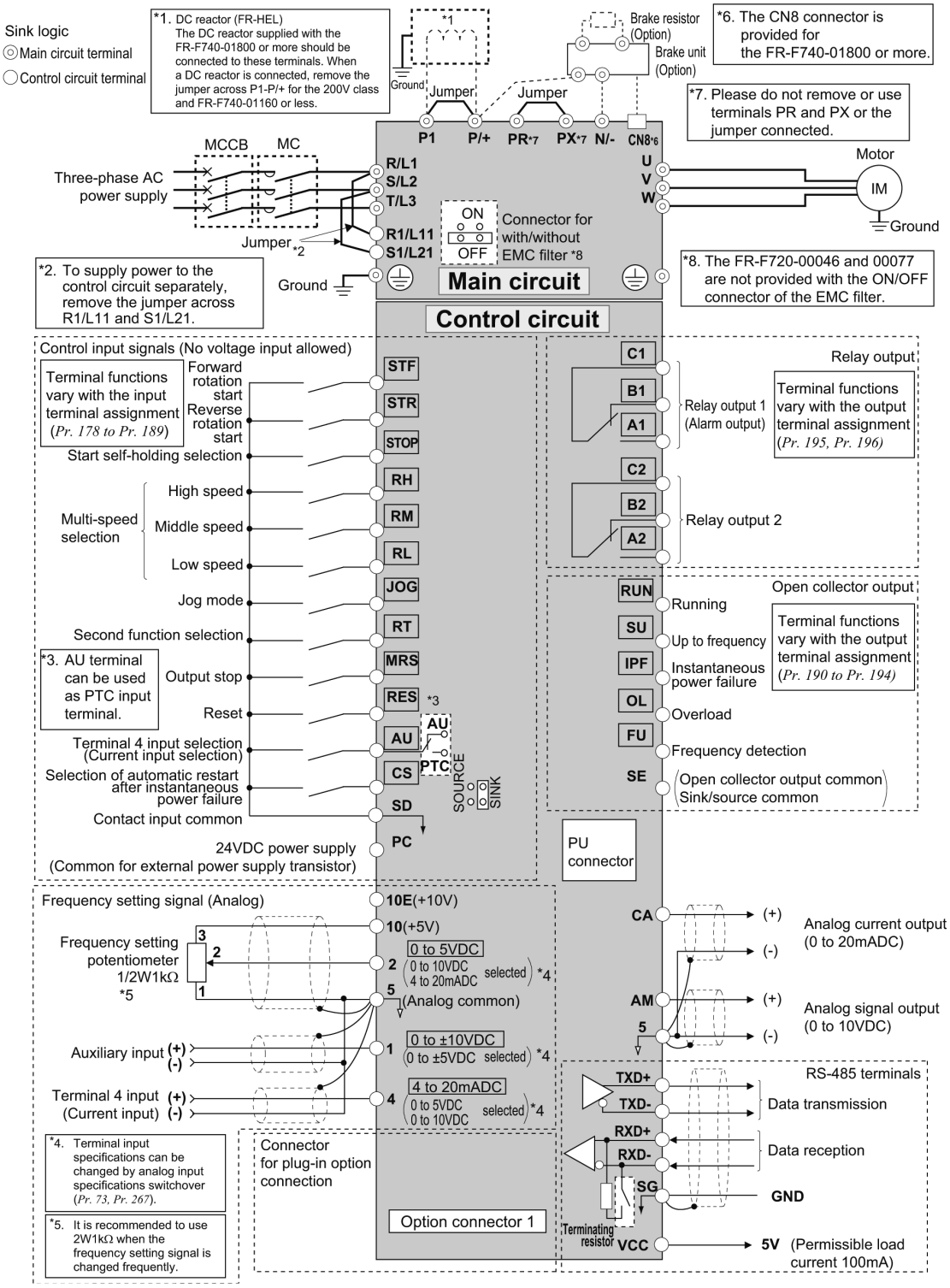
Notes:
1. Motor ratings shown are intended as guidelines only – based on 4 pole standard induction motors.
2. NEMA 1 conduit adapter option required for types 01250 – 04750. See page 24.
3. NEMA 1 conduit adapter option required for types 00770 – 06830. See page 24.
4. For single phase input, derate output current by 40% (Models up to F720-03800-NA, F740-04810-NA.)

F700 General Specifications

Control Specifications	Control System		High carrier frequency PWM control (V/F control)/optimum excitation control/simple magnetic flux vector control
	Output Frequency Range		0.5 to 400Hz
	Frequency Setting Resolution	Analog Input	0.015Hz/0 to 60Hz (terminal 2, 4: 0 to 10V/12bit); 0.03Hz/0 to 60Hz (terminal 2, 4: 0 to 5V/11bit, 0 to 20mA/approx. 11bit, terminal 1: -10V to +10V/11bit); 0.06Hz/0 to 60Hz (terminal 1: 0 to ±5V/10bit)
		Digital Input	0.01Hz
	Frequency Accuracy	Analog Input	Within ±0.2% 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 or adjustable 5 points V/F can be selected
	Starting Torque		120% (3Hz) when set to simple magnetic flux vector control and slip compensation
	Acceleration/Deceleration Time Setting		0 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 150% adjustable), whether to use the function or not can be selected
Operation Specifications	Frequency Setting Signal	Analog Input	Terminal 2, 4: 0 to 10V, 0 to 5V, 4 to 20mA can be selected. Terminal 1: -10 to +10V, -5 to 5V can be selected.
		Digital Input	Four-digit BCD or 16-bit binary using the setting dial of the operation panel (when used with the option FR-A7AX)
	Start Signal		Available individually for forward and reverse rotation. Start signal automatic self-holding input (3-wire input) can be selected.
	Input Signals		Select any twelve signals using Pr.178 to Pr.189 (input terminal function selection) from among multi-speed selection, second function selection, terminal 4 input selection, JOG operation selection, selection of automatic restart after instantaneous power failure, external thermal relay input, HC connection (inverter operation enable signal), HC connection (instantaneous power failure detection), PU operation/external interlock signal , PID control enable terminal, PU operation, external operation switchover, output stop, start self-holding selection, forward rotation command, reverse rotation command, inverter reset, PTC thermistor input, PID forward reverse operation switchover, PU-NET operation switchover, NET-external operation switchover, command source switchover.
	Operational Functions		Max. and min. frequency settings, frequency jump operation, external thermal relay input selection, polarity reversible operation, automatic restart after instantaneous power failure operation, continuous operation at an instantaneous power failure, commercial power supply-inverter switchover operation, forward/reverse rotation prevention, operation mode selection, PID control, computer link operation (RS-485).
	Output Signals	Operating Status	Select any seven signals using Pr.190 to Pr.196 (output terminal function selection) from among inverter running, up-to-speed, instantaneous power failure/undervoltage, overload warning, output frequency detection, second output frequency detection, electronic thermal relay function pre-alarm, PU operation mode, inverter operation ready, output current detection, zero current detection, PID lower limit, PID upper limit, PID forward rotation reverse rotation output, commercial power supply-inverter switchover MC1, commercial power supply-inverter switchover MC2, commercial power supply-inverter switchover MC3, fan fault output, heatsink overheat pre-alarm, inverter running start command on, deceleration at an instantaneous power failure, PID control activated, during retry, during PID output suspension, life alarm, input MC stop signal, power savings average value update timing, current average monitor, alarm output 2, maintenance timer alarm, remote output, minor failure output, alarm output. Open collector output (5 points), relay output (2 points) and alarm code of the inverter can be output (4 bit) from the open collector.
		When Used With The FR-A7AY (Option)	Select any seven signals using Pr. 313 to Pr. 319 (extension output terminal function selection) from among control circuit capacitor life, main circuit capacitor life, cooling fan life, inrush current limit circuit life.
	Analog Output		Select from output frequency, motor current (steady or peak value), output voltage, frequency setting value, running speed, converter output voltage (steady or peak value), electronic thermal relay function load factor, input power, output power, load meter, reference voltage output, motor load factor, energy saving effect, PID set value, PID process value using Pr. 54 “CA terminal function selection (analog current output)” and Pr. 158 “AM terminal function selection (analog output)”.
Display	Parameter Unit (FR-DU07/ FR-PU04)	Operating Status	Output frequency, motor current (steady or peak value), output voltage, alarm indication, frequency setting, running speed, converter output voltage (steady or peak value), electronic thermal load factor, input voltage, output voltage, road meter, cumulative energization time, actual operation time, motor load factor, cumulative energization power, power saving effect, cumulative saving power, PID set point, PID process value, PID deviation value, inverter I/O terminal monitor, input terminal option monitor (*1), output terminal option monitor (*1), option fitting status monitor (*2), terminal assignment status (*2)
		Alarm Definition	Alarm definition is displayed when the protective function is activated, the output voltage/current/frequency/cumulative energization time right before the protection function was activated and the past 8 alarm definitions are stored.
		Interactive Guidance	Operation guide/troubleshooting with a help function. (*2)
Protective/Warning 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, heatsink overheat, instantaneous power failure occurrence, undervoltage, input phase failure, motor overload, output side earth (ground) fault overcurrent, output phase failure, external thermal relay operation, PTC thermistor operation, option alarm, parameter error, PU disconnection, retry count excess, CPU alarm, power supply short for operation panel, 24VDC power output short, output current detection value over, inrush resistance overheat, communication alarm (inverter), analog input alarm, internal circuit alarm (15V power supply), fan fault, overcurrent stall prevention, overvoltage stall prevention, electronic thermal prealarm, PU stop, maintenance timer alarm (*1), parameter write error, copy operation error, operation panel lock.
Environment	Ambient Temperature		-10°C to +50°C (non-freezing)
	Ambient Humidity		90% RH or less (non-condensing)
	Storage Temperature (*3)		-20°C to +65°C
	Atmosphere		Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt, etc.)
	Altitude, Vibration		Maximum 1000m above sea level, 5.9m/s^2 or less (conforms to JIS C 0040)

Notes:
1. Can be displayed only on the operation panel (FR-DU07).
2. Can be displayed only on the parameter unit (FR-PU04/FR-PU07).
3. Temperature applicable for a short period in transit, etc.

F700 Series Terminal Connection Diagram



F700 Control Terminal Layout

A1	B1	C1	A2	B2	C2	10E	10	2	5	4	
RL	RM	RH	RT	AU	STOP	MRS	RES	SD	CA	AM	1
SE	RUN	SU	IPF	OL	FU	SD	SD	STF	STR	JOG	CS	PC

F700 Factory Supplied DC Link Chokes

Standard With VFD					Dimensions inches (mm)			Approx. Weight lb (kg)
FR-F700 Series	DC Link Model Number	mH	Amps	Watt Loss	Height	Width	Depth	
FR-F740-01800-NA	FR-HEL-H90K	0.3	191	130	13.4 (340)	5.9 (150)	7.5 (190)	20 (44)
FR-F740-02160-NA	FR-HEL-H110K	0.246	233	130	13.4 (340)	5.9 (150)	7.7 (195)	22 (48)
FR-F740-02600-NA	FR-HEL-H132K	0.204	281	140	15.9 (405)	6.9 (175)	7.9 (200)	26 (57)
FR-F740-03250-NA	FR-HEL-H160K	0.171	335	140	15.9 (405)	6.9 (175)	8 (205)	28 (62)
FR-F740-03610-NA	FR-HEL-H185K	0.148	389	170	15.9 (405)	6.9 (175)	9.4 (240)	29 (64)
FR-F740-04320-NA	FR-HEL-H220K	0.124	462	230	15.9 (405)	6.9 (175)	9.4 (240)	30 (66)
FR-F740-04810-NA	FR-HEL-H250K	0.109	524	240	17.3 (440)	7.5 (190)	9.8 (250)	35 (77)
FR-F740-05470-NA	FR-HEL-H280K	0.098	585	270	17.3 (440)	7.5 (190)	10 (255)	38 (84)
FR-F740-06100-NA	FR-HEL-H315K	0.087	658	300	19.5 (495)	8.3 (210)	9.8 (250)	42 (92)
FR-F740-06830-NA	FR-HEL-H355K	0.077	742	360	19.5 (495)	8.3 (210)	9.8 (250)	46 (101)
FR-F740-07700-NA	FR-HEL-H400K	0.069	836	360	19.7 (500)	8.7 (220)	9.8 (250)	50 (110)
FR-F740-08660-NA	FR-HEL-H450K	0.061	940	450	19.7 (500)	8.7 (220)	10.6 (270)	57 (125)
FR-F740-09620-NA	FR-HEL-H500K	0.055	1045	450	17.8 (455)	8.5 (215)	13.6 (345)	67 (1147)
FR-F740-10940-NA	FR-HEL-H560K	0.049	1170	470	18.1 (460)	8.5 (215)	14.2 (360)	85 (187)
FR-F740-12120-NA	FR-HEL-H630K	0.044	1317	500	18.1 (460)	8.5 (215)	14.2 (360)	95 (209)

F700 Frame Size

Frame Size	Dimensions inches (mm)			Weight Without Reactor lbs (kg)
	Height	Width	Depth	
A	10.2 (260)	4.3 (110)	4.3 (110)	4.2 (1.9)
B	10.2 (260)	4.3 (110)	4.9 (125)	5 (2.3)
C	10.2 (260)	5.9 (150)	5.5 (140)	9.3 (4.2)
D	10.2 (260)	8.7 (220)	6.7 (170)	17.7 (8)
E	11.8 (300)	8.7 (220)	7.5 (190)	19.4 (8.8)
F	15.8 (400)	9.8 (250)	7.5 (190)	32.6 (14.8)
G	21.7 (550)	12.8 (325)	7.7 (195)	77.1 (35)
H	21.7 (550)	17.1 (435)	9.8 (250)	134.4 (61)
J	27.6 (700)	18.3 (465)	9.8 (250)	134.4 (61)
K	29.1 (740)	18.3 (465)	14.2 (360)	244.5 (111)
L	39.8 (1010)	19.6 (498)	15 (380)	378.9 (172)
M	39.8 (1010)	26.8 (680)	15 (380)	385 (175)
N	52.4 (1330)	31.1 (790)	17.3 (440)	572 (260)
P	62.2 (1580)	39.2 (995)	17.3 (440)	814 (370)

F700 Series Options

Conduit Attachments

Model Number	Drive Model		Stocked Item
	F720 (*1)	F740 (*1)	
FR-A7FN05	01250	—	–
FR-A7FN06	01540	00770	S
FR-A7FN07	01870, 02330	00930, 01160	S
FR-A7FN-10 (*2)	—	01800	S
FR-A7FN-11 (*2)	—	02160, 02600	S
FR-A7FN-12 (*2)	03160, 03800, 04750	03250, 03610	S
FR-A7FN-13 (*2)	—	04320, 04810	S
FR-A7FN-14 (*2)	—	05470, 06100, 06830	S

Notes:
1. For FR-F700s smaller than listed above, they are UL Type 1, and conduit attachment is standard.
2. Mounting hardware included for standard DC chokes which ship with VFD.

External Heatsink Attachment

Model Number	Drive Model		Stocked Item
	F720	F740	
FR-A7CN01	00105 to 00250	00023 to 00126	S
FR-A7CN02	00340, 00490	00170, 00250	S
FR-A7CN03	00630	00310, 00380	S
FR-A7CN04	00770 to 01250	00470, 00620	S
FR-A7CN05	01540		S
FR-A7CN06		00770	S
FR-A7CN07	01870, 02330	00930, 01160, 01800	S
FR-A7CN08		02160	–
FR-A7CN09		02600	–
FR-A7CN10		03250, 03610	–

Option Cards

		Model No.	Stocked Item
Function	Relay Output	FR-A7AR	S
	12 Bit Digital Input	FR-A7AX	S
	Digital Output	FR-A7AY	S
	Ext. Analog Output		
	BiPolar Analog Input	FR-A7AZ	–
	High Res Analog Input		
	Motor Thermistor		
Communication	CC-Link	FR-A7NC	S
	DeviceNet	FR-A7ND	S
	LonWorks	FR-A7NL	S
	Profibus DP	FR-A7NP	S

F700 Demonstration Unit

Model Number	Description	Stocked Item
VFD-F700-DEMO	Includes F720 1HP, pre-wired digital input switches, LED outputs, speed potentiometer and analog meter	S
VFD-MOTOR-DEMO	Includes 1/2HP motor with quick connection to VFD-F700-DEMO	S

Instruction Manuals

Description	Model Number	Stocked Item
FR-F700 Installation Manual – Contains instructions for installer and parameter list. (Included with VFD, plus CD with all versions of VFD and option manuals.)	IB(NA)0600218	–
FR-F700 Basic Manual – Contains wiring details, VFD layout drawings, alarm definitions and parameter list.	IB(NA)0600216	–
FR-F700 Applied Manual – Contains wiring details, VFD layout drawings, alarm definitions and complete parameter list with definitions and setting examples.	IB(NA)0600217	–
FR-PU07 Manual – Contains complete instruction sets and screen definitions.	IB(NA)0600240	–

Manuals available for download at www.meau.com

Parameter Units / Parameter Copy Units

Parameter units are used for operator control, reading and writing parameters, and drive monitoring. Parameter Copy Units also read the drive parameter settings and copy them into non-volatile memory, and can write them into other drives.

Model Number	Description	Stocked Item
FR-CB201	Extension cable straight plugs on both ends – 1 meter.	S
FR-CB203	Extension cable straight plugs on both ends – 3 meters.	S
FR-CB205	Extension cable straight plugs on both ends – 5 meters.	S
FR-DU07	Control Panel for F700	S
FR-PU07	LCD Multi-lingual Parameter Copy Unit (English, French, Spanish, German, Italian, Swedish, Finnish, Japanese) for operator control, parameter read/write and monitoring. Stores settings in non-volatile memory. Built-in parameter copy capability. (F/A700 based)	S
FR-ADP	FR-DU07 panel mounting adapter	S
FR-PU04	LCD Multi-lingual Parameter Copy Unit (English, French, Spanish, German, Italian, Swedish, Finnish, Japanese) for operator control, parameter read/write and monitoring.	S
SC-FRPC	Serial Communication Cable	S
FR-PU07-BB	Battery Powered PU07	S

Building Management Options

Model Number /Network Type	FR-A7N-ETH (*1, *2)	FR-A7N-XLT (*1, *2)	ETH-200 (*1, *3, *4)	XLTR-200 (*1, *3)
Stock Item	S	S	–	–
Ethernet I/P	X		X	
Modbus TCP/IP	X		X	
BacNET IP	X			
Metasys N2		X		X
Siemens FLN		X		X
Modbus RTU		X		
BacNET MSTP		X		

Notes:
1. For additional information visit www.iccdesigns.com
2. Physically mounts within VFD and powered by VFD
3. Communication to multiple VFD's is possible
4. Mounted and powered external to VFD

Software

Model Number	Description	Stocked Item
FR-Configurator	Programming and diagnostic software	S

F700 Parameter Unit/Cable Reference List

VFD Model		E500	A700 / F700	S500E
Parameter Unit	FR-DU04	2 a	2a	2 a
	FR-PA02	1 / 2 b		2 b
	FR-PA02-02	1 / 2 b		2 b
	FR-PU04	2 a	2a	2 a
	FR-DU07		1c / 2 b	
	FR-PU07		1 / 2 b	
Software	FR-CONFIGURATOR	3	3	3

Extension cables
1 = Direct mount
2 = FR-CB201, FR-CB203, FR-CB205 – Where 1, 3, 5 indicate length in meters
3 = SC-FRPC
Notes:
a = Will not mount directly on drive's cover – cable required.
b = To remote mount on the enclosure panel, an extension cable and gender change adapter (FR-E5P for E500, SD-54258-8811 for F700) are required.
c = Included standard with VFD.

Dynamic Braking Options

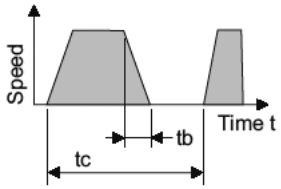
Select the brake unit according to the motor capacity.

To obtain braking torque greater than 200%, use a larger inverter capacity.

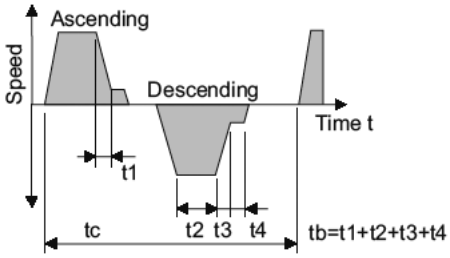
Up to 10 FR-BU2 brake units can be connected in parallel for increased braking capacity.

Regeneration duty factor (operation frequency) $\%ED = \frac{tb}{tc} \times 100$ tb<15s(continuous operation time)

Example 1 Travel operation



Example 2 Lift operation



%ED or Time at Short-Time Rating When Braking Torque is 100%

Brake Unit Model No.		Stocked Item	Brake Resistor Model No.	Stocked Item	Motor Capacity (HP)													
					1	2	3	5	7.5	10	15	20	25	30	40	50	60	75
230V	FR-BU2-1.5K	S	BU-1500-TEIKOUKI	–	30 s.	–	–	–	–	–	–	–	–	–	–	–	–	–
	FR-BU2-3.7K	S	BU-3700-TEIKOUKI	–	–	30 s.	–	–	–	–	–	–	–	–	–	–	–	–
	FR-BU2-7.5K	S	BU-7.5K-TEIKOUKI	–	–	–	30 s.	30 s.	–	–	–	–	–	–	–	–	–	–
	FR-BU2-15K	S	FR-BR-15K-UL	S	–	–	–	–	80%	40%	15%	10%	–	–	–	–	–	–
	FR-BU2-30K	S	FR-BR-30K-UL	S	–	–	–	–	–	–	65%	30%	25%	15%	10%	–	–	–
	FR-BU2-55K	–	FR-BR-55K-UL	–	–	–	–	–	–	–	–	–	90%	60%	30%	20%	15%	10%
460V	FR-BU2-H7.5K	S	2 x BU-3700-TEIKOUKI	–	–	–	30 s.	30 s.	–	–	–	–	–	–	–	–	–	–
	FR-BU2-H15K	S	FR-BR-H15K-UL	S	–	–	–	–	80%	40%	15%	10%	–	–	–	–	–	–
	FR-BU2-H30K	S	FR-BR-H30K-UL	S	–	–	–	–	–	–	65%	30%	25%	15%	10%	–	–	–
	FR-BU2-H55K	S	FR-BR-H55K-UL	S	–	–	–	–	–	–	–	–	90%	60%	30%	20%	15%	10%

Brake Unit Model No.		Stocked Item	Brake Resistor Model No.	Stocked Item	Motor Capacity (HP)													
					100	125	150	200	250	300	350	400	450	500	600	700	800	
460V	FR-BU2-H75K	S	MT-BR5-H75K	–	10%	5%	–	–	–	–	–	–	–	–	–	–	–	
	2 x FR-BU2-H75K	S	2 x MT-BR5-H75K	–	40%	25%	15%	10%	5%	–	–	–	–	–	–	–	–	
	3 x FR-BU2-H75K	S	3 x MT-BR5-H75K	–	90%	60%	40%	20%	14%	10%	5%	5%	–	–	–	–	–	
	4 x FR-BU2-H75K	S	4 x MT-BR5-H75K	–	–	95%	70%	40%	25%	15%	13%	10%	5%	5%	–	–	–	
	5 x FR-BU2-H75K	S	5 x MT-BR5-H75K	–	–	–	–	60%	40%	25%	20%	15%	12%	10%	5%	5%	–	
	6 x FR-BU2-H75K	S	6 x MT-BR5-H75K	–	–	–	–	90%	55%	40%	25%	25%	15%	14%	10%	5%	5%	
	7 x FR-BU2-H75K	S	7 x MT-BR5-H75K	–	–	–	–	–	80%	55%	40%	35%	20%	15%	13%	10%	5%	
	8 x FR-BU2-H75K	S	8 x MT-BR5-H75K	–	–	–	–	–	–	70%	50%	45%	30%	25%	15%	13%	10%	

Braking Torque (%) at Short-Time Rating of 30 Sec. for 5HP and Less
Braking Torque (%) at Short-Time Rating of 15 Sec. for 7.5HP and Larger

Brake Unit Model No.		Stocked Item	Brake Resistor Model No.	Stocked Item	Motor Capacity (HP)													
					1	2	3	5	7.5	10	15	20	25	30	40	50	60	75
230V	FR-BU2-1.5K	S	BU-1500-TEIKOUKI	–	100%	50%	–	–	–	–	–	–	–	–	–	–	–	–
	FR-BU2-3.7K	S	BU-3700-TEIKOUKI	–	–	100%	50%	50%	–	–	–	–	–	–	–	–	–	–
	FR-BU2-7.5K	S	BU-7.5K-TEIKOUKI	–	–	–	100%	100%	–	–	–	–	–	–	–	–	–	–
	FR-BU2-15K	S	FR-BR-15K-UL	S	–	–	–	–	280%	200%	120%	100%	80%	70%	–	–	–	–
	FR-BU2-30K	S	FR-BR-30K-UL	S	–	–	–	–	–	–	260%	180%	160%	130%	100%	80%	70%	–
	FR-BU2-55K	–	FR-BR-55K-UL	–	–	–	–	–	–	–	–	–	300%	250%	180%	150%	120%	100%
460V	FR-BU2-H15K	S	FR-BR-H15K-UL	S	–	–	–	–	280%	200%	120%	100%	80%	70%	–	–	–	–
	FR-BU2-H30K	S	FR-BR-H30K-UL	S	–	–	–	–	–	–	260%	180%	160%	130%	100%	80%	70%	–
	FR-BU2-H55K	S	FR-BR-H55K-UL	S	–	–	–	–	–	–	–	–	300%	250%	180%	150%	120%	100%

Brake Unit Model No.		Stocked Item	Brake Resistor Model No.	Stocked Item	Motor Capacity (HP)												
					100	125	150	200	250	300	350	400	450	500	600	700	800
460V	FR-BU2-H75K	S	MT-BR5-H75K	–	100%	80%	65%	50%	40%	30%	28%	26%	22%	20%	–	–	–
	2 x FR-BU2-H75K	S	2 x MT-BR5-H75K	–	200%	165%	135%	100%	80%	65%	55%	53%	44%	40%	33%	28%	25%
	3 x FR-BU2-H75K	S	3 x MT-BR5-H75K	–	300%	250%	200%	150%	120%	100%	85%	80%	65%	60%	50%	43%	37%
	4 x FR-BU2-H75K	S	4 x MT-BR5-H75K	–	–	300%	270%	200%	160%	135%	115%	105%	85%	80%	65%	55%	50%
	5 x FR-BU2-H75K	S	5 x MT-BR5-H75K	–	–	–	300%	250%	200%	170%	140%	130%	110%	100%	83%	70%	62%
	6 x FR-BU2-H75K	S	6 x MT-BR5-H75K	–	–	–	–	300%	240%	200%	170%	160%	130%	120%	100%	85%	75%
	7 x FR-BU2-H75K	S	7 x MT-BR5-H75K	–	–	–	–	–	280%	235%	200%	185%	155%	140%	115%	100%	85%
	8 x FR-BU2-H75K	S	8 x MT-BR5-H75K	–	–	–	–	–	–	270%	230%	210%	175%	160%	130%	110%	100%

Dynamic Braking Unit & Resistor Specifications

Brake Unit Model No.		Stocked Item	Brake Resistor Model No.	Stocked Item	Weight kg / lbs	Resistance (Ohms)	Rated (Watts)	Continuous Permissible Power (Watts)
230V	FR-BU2-1.5K	S	BU-1500-TEIKOUKI	–	n/a	50	300	100
	FR-BU2-3.7K	S	BU-3700-TEIKOUKI	–	n/a	30	900	300
	FR-BU2-7.5K	S	BU-7.5K-TEIKOUKI	–	n/a	20	1800	600
	FR-BU2-15K	S	FR-BR-15K-UL	S	15 / 33	8	4000	990
	FR-BU2-30K	S	FR-BR-30K-UL	S	30 / 66	4	8000	1990
	FR-BU2-55K	–	FR-BR-55K-UL	–	70 / 154	2	16000	3910
460V	FR-BU2-H7.5K	S	2 x BU-3700-TEIKOUKI	–	n/a	60	1800	600
	FR-BU2-H15K	S	FR-BR-H15K-UL	S	15 / 33	32	4000	990
	FR-BU2-H30K	S	FR-BR-H30K-UL	S	30 / 66	16	8000	1990
	FR-BU2-H55K	S	FR-BR-H55K-UL	S	70 / 154	8	16000	3910
	FR-BU2-H75K	S	MT-BR5-H75K	–	70 / 154	6.5	30000	7500

F700 Dynamic Braking Units and Resistors – UFS Series

- A more economical solution to regenerative braking applications.
- UL and cUL listing for the brake units
- Internal Form-C relay
- Adjustable DC bus brake turn-on voltage
- Configurable master / slave brake configuration. Allows connection of up to 5 brake units (1 master / 4 slaves)

240V Series

		Motor Capacity									
Braking Torque	HP	7.5	10	15	20	25	30	40	50	60	75
	kW	5.5	7.5	11	15	18.5	22	30	37	45	55
100% For 15 Secs.	Brake Unit	UFS22J					UFS40J		2 x UFS40J		
	Brake Resistor	RUFC15J			RUFC22J		RUFC40J		2 x RUFC40J		
Electrical Data	Continuous Permissible Power (W)	UFS22J – 1500W					UFS40J – 2000W		2ea x UFS40J – 4000W		
	Resistance (Overall)	RUFC15J – 24ohms			RUFC22J – 12ohms		RUFC40J – 7.5ohms		2ea x RUFC40J – 3.75ohms		
	Continuous Current (Amps)	7A			10A		14.6A		29.2A		

460V Series

		Motor Capacity								
Braking Torque	HP	7.5	10	15	25	30	40	50	60	75
	kW	5.5	7.5	11	18.5	22	30	37	45	55
100% For 15 Secs.	Brake Unit	UFS22						UFS40		
	Brake Resistor	RUFC15/480		RUFC22/480				RUFC40/480		
Electrical Data	Continuous Permissible Power (W)	UFS22 – 2000W						UFS40 – 4000W		
	Resistance (Overall)	RUFC15/480 – 44ohms		RUFC22/480 – 27ohms				RUFC40/480 – 15ohms		
	Continuous Current (Amps)	6A		7.7A				14.6		

		Motor Capacity						
Braking Torque	HP	100	125	150	175	215	300	375
	kW	75	90	110	132	160	220	280
100% For 15 Secs.	Brake Unit	UFS110				2 X UFS110		
	Brake Resistor	RUFC110/480				2 X RUFC110/480		
Electrical Data	Continuous Permissible Power (W)	UFS110 – 8000W				2 x UFS110 – 16000W		
	Resistance (Overall)	RUFC110/480 – 6.8ohms				2 x RUFC110/480 – 3.4ohms		
	Continuous Current (Amps)	30.7A				61.4A		

Dimensions

Model Number		Height		Width		Depth		Approximate Weight		Stocked Item
		mm	inches	mm	inches	mm	inches	kg	lbs	
240V	UFS20J	250	9.8	100	3.9	175	6.9	2.5	5.5	S
	UFS40J									S
	RUFC15J	240	9.5			75	3	2.8	6.2	S
	RUFC22J	310	12.2					3.5	7.7	S
	RUFC40J	365	14.4					4.3	9.5	S
480V	UFS22	250	9.8	100	3.9	175	6.9	2.5	5.5	S
	UFS40									S
	UFS110			107	4.2	195	7.7	3.9	8.6	S
	RUFC15/480	310	12.2	100	3.9	75	3	3.5	7.7	S
	RUFC22/480	365	14.4					4.2	9.3	S
	RUFC40/480	2 x 365	2 x 14.4	2 x 100	2 x 3.9	2 x 75	2 x 3	8.7	19.2	S
	RUFC110/480	4 x 365	4 x 14.4	4 x 100	4 x 3.9	4 x 75	4 x 3	17.3	38.1	S

F700 VFD Efficiency Values

240VAC 3-Phase Input						480VAC 3-Phase Input					
Model Number	Rated Watts	Watts Loss SLD	Efficiency SLD	Watts Loss LD	Efficiency LD	Model Number	Rated Watts	Watts Loss SLD	Efficiency SLD	Watts Loss LD	Efficiency LD
FR-F720-00046-NA	750	70	91%	60	92%	FR-F740-00023-NA	750	60	92%	50	93%
FR-F720-00077-NA	1500	110	93%	100	93%	FR-F740-00038-NA	1500	80	95%	80	95%
FR-F720-00105-NA	2200	140	94%	130	94%	FR-F740-00052-NA	2200	100	95%	90	96%
FR-F720-00167-NA	3700	210	94%	190	95%	FR-F740-00083-NA	3700	160	96%	140	96%
FR-F720-00250-NA	5500	300	95%	260	95%	FR-F740-00126-NA	5500	190	97%	180	97%
FR-F720-00340-NA	7500	370	95%	340	95%	FR-F740-00170-NA	7500	240	97%	220	97%
FR-F720-00490-NA	11000	590	95%	530	95%	FR-F740-00250-NA	11000	340	97%	310	97%
FR-F720-00630-NA	15000	660	96%	580	96%	FR-F740-00310-NA	15000	390	97%	350	98%
FR-F720-00770-NA	18500	910	95%	810	96%	FR-F740-00380-NA	18500	490	97%	440	98%
FR-F720-00930-NA	22000	1050	95%	940	96%	FR-F740-00470-NA	22000	580	97%	520	98%
FR-F720-01250-NA	30000	1540	95%	1370	95%	FR-F740-00620-NA	30000	810	97%	710	98%
FR-F720-01540-NA	37000	1490	96%	1320	96%	FR-F740-00770-NA	37000	1000	97%	930	97%
FR-F720-01870-NA	45000	1680	96%	1490	97%	FR-F740-00930-NA	45000	1170	97%	1030	98%
FR-F720-02330-NA	55000	2210	96%	1950	96%	FR-F740-01160-NA	55000	1510	97%	1320	98%
—	—	—	—	—	—	FR-F740-01800-NA	75000	2700	96%	2250	97%
—	—	—	—	—	—	FR-F740-02160-NA	90000	3300	96%	2700	97%
—	—	—	—	—	—	FR-F740-02600-NA	110000	3960	96%	3300	97%
—	—	—	—	—	—	FR-F740-03250-NA	132000	4800	96%	3960	97%
—	—	—	—	—	—	FR-F740-03610-NA	160000	5550	97%	4800	97%
—	—	—	—	—	—	FR-F740-04320-NA	185000	6600	96%	5550	97%
—	—	—	—	—	—	FR-F740-04810-NA	220000	7500	97%	6600	97%
—	—	—	—	—	—	FR-F740-05470-NA	250000	8400	97%	7500	97%
—	—	—	—	—	—	FR-F740-06100-NA	280000	9450	97%	8400	97%
—	—	—	—	—	—	FR-F740-06830-NA	315000	10650	97%	9450	97%
—	—	—	—	—	—	FR-F740-07700-NA	355000	12000	97%	10650	97%
—	—	—	—	—	—	FR-F740-08660-NA	400000	13500	97%	12000	97%
—	—	—	—	—	—	FR-F740-09620-NA	450000	15000	97%	13500	97%
—	—	—	—	—	—	FR-F740-10940-NA	500000	16800	97%	15000	97%
—	—	—	—	—	—	FR-F740-12120-NA	560000	18900	97%	16800	97%

General Notes:

The amount of heat generated by the inverter is based on one inverter connected to one motor of the same capacity.

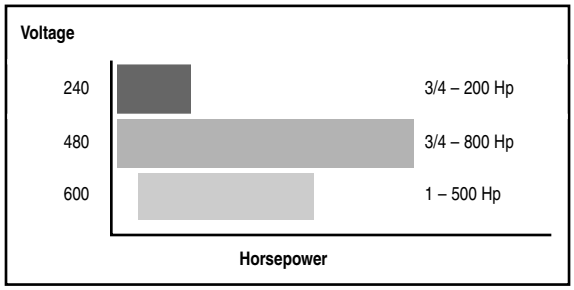
The amount of heat generated in the above table is the amount of heat generated when the inverter is operated at its rated current.

The amount of heat generated will decrease according to the motor load and usage (duty).

A700 Series

Mitsubishi Electric's RSV technology gives you class-leading power, control and flexibility.

- **Wide Speed Range:** 200:1 operating range is possible – even when the drive is used 'open loop'
- **PLC Feature:** A700 programmability provides true intelligence inside the drive – a simple solution for complex applications
- **Easy Gain Tuning:** Compensates automatically for changes in load inertia to ensure smooth and consistent operation
- **Fast Response:** Up to 300 radians / second speed response means lightning fast reaction to sudden load changes
- **USB Port:** Allows simple connection to the new FR-Configurator Software for quick and easy commissioning
- **Power Down Braking:** Keeps the motor under control even if the supply power is lost
- **Remote I / O Capability:** All of the drive I/O can be read or controlled over a network
- **Brake Transistor Circuit:** Included in all sizes up to 30 Hp
- **Integral Radio Filter:** Limits Radio Noise emissions to meet EU Directive – all sizes of drive
- **Speed Control:** with or without torque limit allows 200:1 Speed range, driving or overhauling
- **Open Loop Torque Control:** including torque at zero speed
- UL Listed for single-phase input



A700 Ratings 240V Class

Output voltage: 3 phase 200-240V at 60Hz – Voltage Tolerance 170-264V at 60Hz

ND (50°C) 150% OL / 1 min 200% OL / 3 sec		HD (50°C) 200% OL / 1 min 250% OL / 3 sec		LD (50°C) 120% OL / 1 min 150% OL / 3 sec		SLD (40°C) 110% OL / 1 min 120% OL / 3 sec		Model Number (*6)	Frame Size	Cooling Method	Protective Rating	Regenerative Braking Torque / Max Value (Permissible Duty)	Stocked Item
Hp (*1)	FLA	Hp (*1)	FLA	Hp (*1)	FLA	Hp (*1)	FLA						
1/2	3	1/4	1.5	1	4.2	1	4.6	FR-A720-00030-NA	A	Self Cooling	NEMA 1 (*2)	150% torque / 3% ED	S
1	5	1/2	3	2	6.5	2	7.1	FR-A720-00050-NA	B				S
2	8	1	5	3	9.6	3	10.5	FR-A720-00080-NA	C				S
3	11	2	8	5	15.2	5	16.7	FR-A720-00110-NA	C	Forced Air Cooling		100% torque / 3% ED	S
5	17.5	3	11	7.5	24	7.5	25	FR-A720-00175-NA	C				S
7.5	24	5	17.5	10	31	10	34	FR-A720-00240-NA	D			100% torque / 2% ED	S
10	33	7.5	24	15	45	15	49	FR-A720-00330-NA	D				S
1/2	3	1/4	1.5	1	4.2	1	4.6	FR-A720-00030-N4	A (*5)	Self Cooling	UL Type 1 – Plenum Rated	150% torque / 3% ED	–
1	5	1/2	3	2	6.5	2	7.1	FR-A720-00050-N4	B (*5)				–
2	8	1	5	3	9.6	3	10.5	FR-A720-00080-N4	C (*5)				–
3	11	2	8	5	15.2	5	16.7	FR-A720-00110-N4	C (*5)	Forced Air Cooling		100% torque / 3% ED	–
5	17.5	3	11	7.5	24	7.5	25	FR-A720-00175-N4	C (*5)				–
7.5	24	5	17.5	10	31	10	34	FR-A720-00240-N4	D (*5)			100% torque / 2% ED	–
10	33	7.5	24	15	45	15	49	FR-A720-00330-N4	D (*5)				–
15	46	10	33	20	58	20	63	FR-A720-00460-NA	E			20% torque / continuous (brake transistor included)	S
20	61	15	46	25	70	25	77	FR-A720-00610-NA	F				S
25	76	20	61	30	85	30	93	FR-A720-00760-NA	F				S
30	90	25	76	40	114	40	125	FR-A720-00900-NA	F				S
40	115	30	90	50	140	50/60	154	FR-A720-01150-NA	G		IP00 (*3)	20% torque / continuous	S
50	145	40	115	60	170	60	187	FR-A720-01450-NA	H				S
60	175	50	145	75	212	75	233	FR-A720-01750-NA	H				S
75	215	60	175	100	288	100/125	316	FR-A720-02150-NA	JA				S

A700 Ratings 240V Class

Output voltage: 3 phase 200-240V at 60Hz – Voltage Tolerance 170-264V at 60Hz – DC Link Choke is included with the VFD

ND (50°C) 150% OL / 1 min 200% OL / 3 sec		HD (50°C) 200% OL / 1 min 250% OL / 3 sec		LD (50°C) 120% OL / 1 min 150% OL / 3 sec		SLD (40°C) 110% OL / 1 min 120% OL / 3 sec		Model Number (*7)	Frame Size	Cooling Method	Protective Rating	Regenerative Braking Torque / Max Value (Permissible Duty)	Stocked Item
Hp	FLA	Hp	FLA	Hp	FLA	Hp	FLA						
100	288	75	215	125	346	150	380	FR-A720-02880-NA	K	Forced Air Cooling	IP00 (*3)	10% torque / continuous	–
125	346	100	288	150	432	200	475	FR-A720-03460-NA	K				–

Notes: See next page.

A700 Ratings 480V Class

Output voltage: 3 phase 380-480V at 60Hz – Voltage Tolerance 323-528V at 60Hz.

ND (50°C)		HD (50°C)		LD (50°C)		SLD (40°C)		Model Number (*6)	Frame Size	Cooling Method	Protective Rating	Regenerative Braking Torque / Max Value (Permissible Duty)	Stocked Item
150% OL / 1 min		200% OL / 1 min		120% OL / 1 min		110% OL / 1 min							
200% OL / 3 sec		250% OL / 3 sec		150% OL / 3 sec		120% OL / 3 sec							
Hp (*1)	FLA	Hp (*1)	FLA	Hp (*1)	FLA	Hp (*1)	FLA						
1/2	1.5	1/4	0.8	1	2.1	1	2.3	FR-A740-00015-NA	C	Self Cooling	NEMA 1 (*2)	100% torque / 2% ED	S
1	2.5	1/2	1.5	2	3.5	2	3.8	FR-A740-00025-NA	C				S
2	4	1	2.5	3	4.8	3	5.2	FR-A740-00040-NA	C				S
3	6	2	4	5	7.6	5	8.3	FR-A740-00060-NA	C	Forced Air Cooling			S
5	9	3	6	7.5	11.5	7.5	12.6	FR-A740-00090-NA	C				S
7.5	12	5	9	10	16	10	17	FR-A740-00120-NA	D				S
10	17	7.5	12	15	23	15	25	FR-A740-00170-NA	D				S
1/2	1.5	1/4	0.8	1	2.1	1	2.3	FR-A740-00015-N4	C (*5)	Self Cooling	UL Type 1 - Plenum Rated	100% torque / 2% ED	–
1	2.5	1/2	1.5	2	3.5	2	3.8	FR-A740-00025-N4	C (*5)				–
2	4	1	25	3	4.8	3	5.2	FR-A740-00040-N4	C (*5)				–
3	6	2	4	5	7.6	5	8.3	FR-A740-00060-N4	C (*5)	Forced Air Cooling			–
5	9	3	6	7.5	11.5	7.5	12.6	FR-A740-00090-N4	C (*5)				–
7.5	12	5	9	10	16	10	17	FR-A740-00120-N4	D (*5)				–
10	17	7.5	12	15	23	15	25	FR-A740-00170-N4	D (*5)				–
15	23	10	17	20	29	20	31	FR-A740-00230-NA	E			20% torque / continuous (brake transistor included)	S
20	31	15	23	25	35	25	38	FR-A740-00310-NA	E				S
25	38	20	31	30	43	30	47	FR-A740-00380-NA	F				S
30	44	25	38	40	57	40	62	FR-A740-00440-NA	F				S
40	57	30	44	50	70	50/60	77	FR-A740-00570-NA	JA		IP00 (*4)	20% torque / continuous	S
50	71	40	57	60	85	60	93	FR-A740-00710-NA	H				S
60	86	50	71	75	106	75	116	FR-A740-00860-NA	H				S
75	110	60	86	100	144	100/150	180	FR-A740-01100-NA	H				S

Notes: See below.

A700 Ratings 480V Class

Output voltage: 3 phase 380-480V at 60Hz – Voltage Tolerance 323-528V at 60Hz – DC Link Choke is included with the VFD.

ND (50°C)		HD (50°C)		LD (50°C)		SLD (40°C)		Model Number (*6)	Frame Size	Cooling Method	Protective Rating	Regenerative Braking Torque / Max Value (Permissible Duty)	Stocked Item
150% OL / 1 min		200% OL / 1 min		120% OL / 1 min		110% OL / 1 min							
200% OL / 3 sec		250% OL / 3 sec		150% OL / 3 sec		120% OL / 3 sec							
Hp (*1)	FLA	Hp (*1)	FLA	Hp (*1)	FLA	Hp (*1)	FLA						
100	144	75	110	150	180	150	216	FR-A740-01440-NA	J	Forced Air Cooling	IP00 (*4)	10% torque / continuous	S
150	180	100	144	150	216	200	260	FR-A740-01800-NA	J				S
150	216	150	180	200	260	250	325	FR-A740-02160-NA	K				S
200	260	150	216	250	325	300	361	FR-A740-02600-NA	K				S
250	325	200	260	300	361	350	432	FR-A740-03250-NA	L				S
300	361	250	325	350	432	400	481	FR-A740-03610-NA	L				S
350	432	300	361	400	481	450	547	FR-A740-04320-NA	M				S
400	481	350	432	450	547	500	610	FR-A740-04810-NA	M				S
450	547	400	481	500	610	550	683	FR-A740-05470-NA	M				S
500	610	450	547	550	683	650	770	FR-A740-06100-NA	N		IP00		–
550	683	500	610	650	770	700	866	FR-A740-06830-NA	N				–
650	770	550	683	700	866	800	962	FR-A740-07700-NA	P				–
700	866	650	770	800	962	900	1094	FR-A740-08660-NA	P				–
800	962	700	866	900	1094	1000	1212	FR-A740-09620-NA	P				–

Notes:

1. Motor ratings shown are intended as guidelines only - based on 4 pole standard inductions motors.
2. UL Type 1 version drives are available — replace "-NA" suffix with "-N4".
3. Conduit adapter option required for types 01150 – 03460. See page 34.
4. Conduit adapter option required for types 00570 – 05470. See page 34.
5. Depth is slightly extended to meet UL Type 1 requirements.
6. For single phase input, derate output current by 40% (Models up to FR-A720-02880-NA and FR-A740-03610-NA)

A700 Ratings 600V Class

Output voltage: 3 phase 525-600V at 60Hz - Voltage Tolerance 472-660V at 60Hz

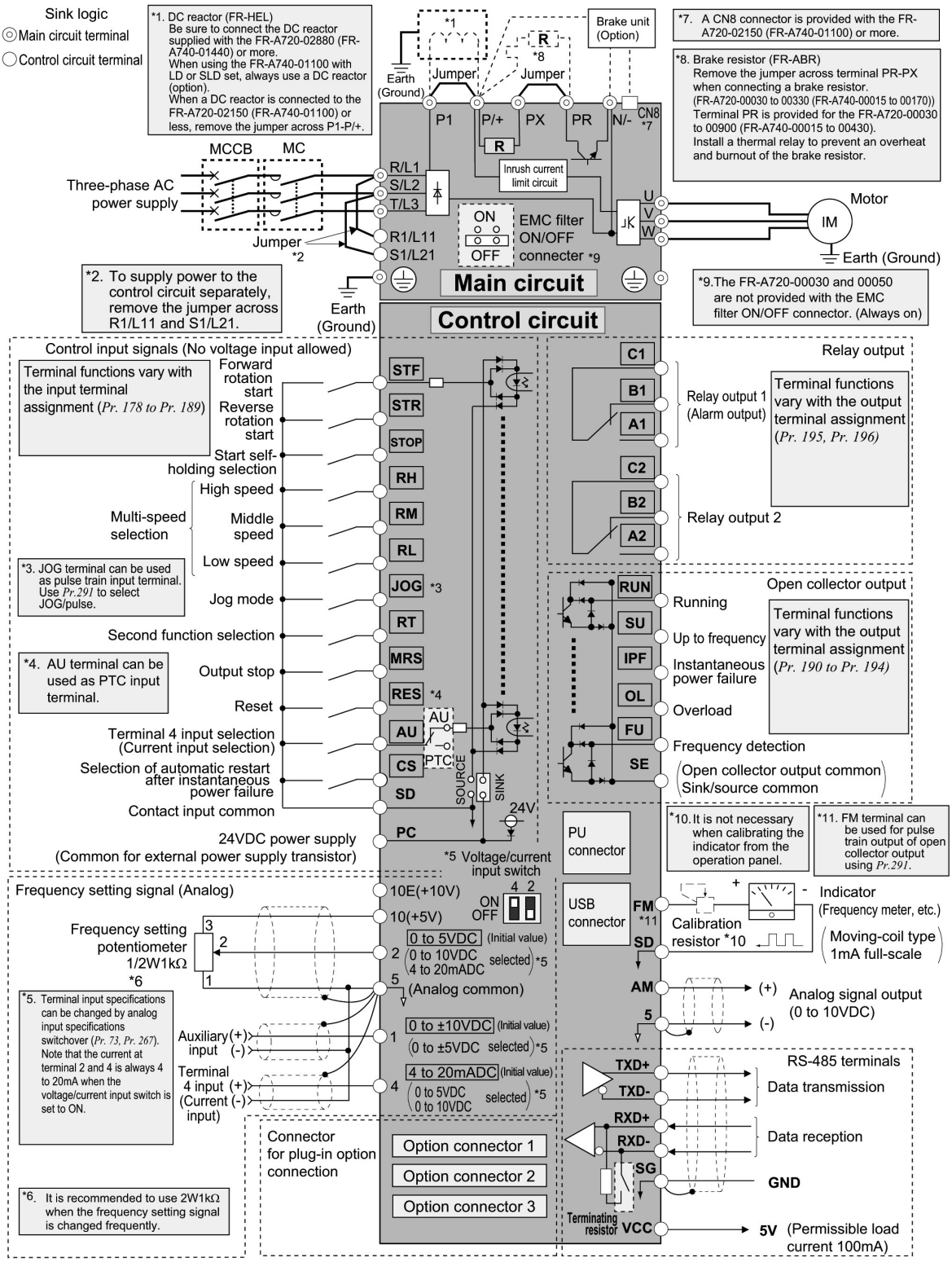
ND (40°C)		HD (40°C)		LD (40°C)		SLD (40°C) (30°C for 00040 or less)		Model Number	Frame Size	Cooling Method	Protective Rating	Regenerative Braking Torque / Max Value (Permissible Duty)	DC Link Reactor	Stocked Item
150% OL / 1 min		200% OL / 1 min 250% OL / 3 sec.		120% OL / 1 min		110% OL / 1 min								
200% OL / 3 sec.		280% OL / 0.5 sec.		150% OL / 3 sec.		120% OL / 3 sec.								
HP (*1)	FLA	HP (*1)	FLA	HP (*1)	FLA	HP (*1)	FLA							
1	1.7	1/2	1.0	1 1/2	2.5	2	2.7	FR-A760-00017-NA	C	Self cooling	UL Type 1 (*3)	100% torque / 2% ED	Option	–
3	4.0	2	2.7	3	5.6	5	6.1	FR-A760-00040-NA		Forced air cooling				S
5	6.1	3	4.0	5	8.2	7 1/2	9.0	FR-A760-00061-NA						S
10	12	7 1/2	9.0	10	16	15	17	FR-A760-00120-NA	D		UL Type 1	20% torque / continuous (brake transistor included)		S
20	22	10	16	25	27	30	32	FR-A760-00220-NA	E					S
30	33	20	24	40	41	40	45	FR-A760-00330-NA	F					S
50	55	40	41	60	62	60	68	FR-A760-00550-NA	H		IP00 (*4)	20% torque / continuous		S
75	84	60	63	100	99 (*2)	100	108 (*2)	FR-A760-00840-NA						S

ND (50°C)		HD (40°C)		LD (50°C)		SLD (40°C)		Model Number	Frame Size	Cooling Method	Protective Rating	Regenerative Braking Torque / Max Value (Permissible Duty)	DC Link Reactor	Stocked Item
150% OL / 1 min		200% OL / 1 min 250% OL / 3 sec.		120% OL / 1 min		110% OL / 1 min								
200% OL / 3 sec.		280% OL / 0.5 sec.		150% OL / 3 sec.		120% OL / 3 sec.								
HP (*1)	FLA	HP (*1)	FLA	HP (*1)	FLA	HP (*1)	FLA							
100	104	75	84	125	131	150	144	FR-A760-01040-NA	J	Forced air cooling	IP00 (*4)	20% torque / continuous	Standard	S
125	131	100	104	150	152	150	167	FR-A760-01310-NA						S
150	152	125	131	200	221	250	243	FR-A760-01520-NA						S
200	221	150	152	250	255	300	289	FR-A760-02210-NA	L					S
250	255	200	202	300	304	350	336	FR-A760-02550-NA						–
300	304	250	255	400	402	450	442	FR-A760-03040-NA	M					S
400	402	300	304	500	496	550	545	FR-A760-04020-NA	N		IP00			–

Notes:

1. Motor ratings shown are intended as guidelines only - based on 4 pole standard induction motors.
2. To utilize these ratings, DC Link reactor is required.
3. These models supplied with an externally connected brake resistor. When the external brake resistor is used, protective rating is open type (NEMA1).
4. Conduit adapter option required for types 00550-03040. See page 34.

A700 Terminal Connection Diagram



A700 Control Terminal Layout

A1	B1	C1	A2	B2	C2	10E	10	2	5	4	
RL	RM	RH	RT	AU	STOP	MRS	RES	SD	FM	AM	1
SE	RUN	SU	IPF	OL	FU	SD	SD	STF	STR	JOG	CS	PC

A700 General Specifications

Operation Specifications	Control Method		Soft-PWM control/high carrier frequency PWM control (selectable from among V/F control, advanced magnetic flux vector control and real sensorless vector control) / vector control (when used with option FR-A7AP) (*1)
	Output Frequency Range		0.2 to 400Hz
	Frequency Setting Resolution	Analog Input	0.015Hz/0 to 60Hz (terminal 2, 4: 0 to 10V/12 bit); 0.03Hz/0 to 60Hz (terminal 2, 4: 0 to 5V/11 bit, 0 to 20mA/about 11 bit, terminal 1: 0 to ±10V/12 bit) 0.06Hz/0 to 60Hz (terminal 1: 0 to ±5V/11 bit)
		Digital Input	0.01Hz
	Frequency Accuracy	Analog Input	Within ±0.2% 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 or adjustable 5 points V/F can be selected
	Starting Torque		200% 0.3Hz (up to frame size C), 150% 0.3Hz (Frame Size D and above) (under real sensorless vector control or vector control)
	Torque Boost		Manual torque boost
	Acceleration / Deceleration Time Setting		0 to 3600s (acceleration and deceleration can be set individually), linear or S-pattern acceleration/deceleration mode, backlash measures acceleration/deceleration 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 220% adjustable), whether to use the function or not can be selected
	Torque Limit Level		Torque limit value can be set (0 to 400% variable)
	Frequency Setting Signal	Analog Input	Terminal 2: 4: 0 to 10V, 0 to 5V, 4 to 20mA can be selected • Terminal 1:-10 to +10V, -5 to +5V can be selected
		Digital Input	Input using the setting dial of the operation panel or parameter unit. Four-digit BCD or 16 bit binary (when used with option FR-A7AX)
	Start Signal		Forward and reverse rotation or start signal automatic self-holding input (3-wire input) can be selected.
	Input Signal		Select any twelve signals using Pr. 178 to Pr. 189 (input terminal function selection) from among multi speed selection, remote setting, stop-on-contact, second function selection, third function selection, terminal 4 input selection, JOG operation selection, selection of automatic restart after instantaneous power failure, flying start, external thermal relay input, inverter operation enable signal (FR-HC/FR-CV connection), FR-HC connection (instantaneous power failure detection), PU operation/external inter lock signal, external DC injection brake operation start, PID control enable terminal, brake opening completion signal, PU operation/external operation switchover, load pattern selection forward rotation reverse rotation boost, V/F switching, load torque high-speed frequency, S-pattern acceleration/deceleration C switchover, pre-excitation, output stop, start self-holding selection, control mode changing, torque limit selection, start-time tuning start external input, torque bias selection 1, 2 (*1), P/PI control switchover, forward rotation command, reverse rotation command, inverter reset, PTC thermistor input, PID forward reverse operation switchover, PU-NET operation switchover, NET-external operation switchover, and command source switchover, conditional position pulse train sign (*1), conditional position droop pulse clear (*1).
	Pulse Train Input		100kpps
	Operational Functions		Maximum/minimum frequency setting, frequency jump operation, external thermal relay input selection, polarity reversible operation, automatic restart after instantaneous power failure operation, commercial power supply-inverter switchover operation, forward/reverse rotation prevention, remote setting, brake sequence, second function, third function, multi-speed operation, original operation continuation at instantaneous power failure, stop-on-contact control, load torque high speed frequency control, droop control, regeneration avoidance, slip compensation, operation mode selection, offline auto tuning function, online auto tuning function, PID control, computer link operation (RS-485), motor end orientation (*1), machine end orientation (*1), pre-excitation, notch filter, machine analyzer (*1), easy gain tuning, speed feed forward, and torque bias (*1)
	Output Signals	Operating Status	Select any signals using Pr. 190 to Pr. 196 (output terminal function selection) from among inverter running, up-to-frequency, instantaneous power failure/undervoltage, overload warning, output frequency (speed) detection, second output frequency (speed) detection, third output frequency (speed) detection, regenerative brake prealarm, electronic thermal relay function pre-alarm, PU operation mode, inverter operation ready, output current detection, zero current detection, PID lower limit, PID upper limit, PID forward rotation reverse rotation output, commercial power supply-inverter switchover MC1, commercial power supply-inverter switchover MC2, commercial power supply-inverter switchover MC3, orientation completion (*1), brake opening request, fan fault output, heatsink overheat pre-alarm , inverter running/start command on, deceleration at an instantaneous power failure, PID control activated, during retry, PID output interruption, life alarm, alarm output 1, 2, 3 (power-off signal), power savings average value update timing, current average monitor, maintenance timer alarm, remote output, forward rotation output (*1), reverse rotation output (*1), low speed output, torque detection, regenerative status output (*1), start-time tuning completion, in-position completion (*1), minor failure output and alarm output. Open collector output (5 points), relay output (2 points) and alarm code of the inverter can be output (4 bit) from the open collector.
		When used with the FR-A7AY, FR-A7AR (optional)	In addition to the above, select any signals using Pr. 313 to Pr. 319 (extension output terminal function selection) from among control circuit capacitor life, main circuit capacitor life, cooling fan life, inrush current limit circuit life (only positive logic can be set for extension terminals of the FR-A7AR).
	Pulse Train Input		500kpps
	Pulse / Analog Output		Select any signals using Pr. 54 FM terminal function selection (pulse train output) and Pr. 158 AM terminal function selection (analog output) from among output frequency, motor current (steady or peak value), output voltage, frequency setting, operation speed, motor torque, converter output voltage (steady or peak value), electronic thermal relay function load factor, input power, output power, load meter, motor excitation current, reference voltage output, motor load factor, power saving effect, regenerative brake duty, PID set point, PID measured value, motor output, torque command, torque current command, and torque monitor.
Indication	PU (FR-DU07 / FR-PU07 / FR-PU04)	Operating Status	Output frequency, motor current (steady or peak value), output voltage, frequency setting, running speed,motor torque, overload, converter output voltage (steady or peak value), electronic thermal relay function load factor, input power, output power, load meter, motor excitation current, cumulative energization time, actual operation time, motor load factor, cumulative power, energy saving effect, cumulative saving power, regenerative brake duty, PID set point, PID measured value, PID deviation, inverter I/O terminal monitor, input terminal option monitor (*2), output terminal option monitor (*2), option fitting status (*3), terminal assignment status (*3), torque command, torque current command, feed back pulse (*1), motor output
		Alarm Definition	Alarm definition is displayed when the protective function is activated, the output voltage/current/frequency/cumulative energization time right before the protection function was activated and past 8 alarm definitions are stored.
		Interactive Guidance	Operation guide/trouble shooting with a help function (*3)
Protective / Warning 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, instantaneous power failure occurrence, undervoltage, input phase failure, motor overload, output side earth (ground) fault overcurrent, output short circuit, main circuit element overheat, output phase failure, external thermal relay operation, PTC thermistor operation, option alarm, parameter error, PU disconnection, retry count excess, CPU alarm, operation panel power supply short circuit, 24VDC power output short circuit, output current detection value excess, inrush current limit circuit alarm, communication alarm (inverter), USB error, opposite rotation deceleration error, analog input error, fan fault, overcurrent stall prevention, overvoltage stall prevention, regenerative brake prealarm, electronic thermal relay function prealarm, PU stop, maintenance timer alarm (*2), brake transistor alarm, parameter write error, copy operation error, operation panel lock, parameter copy alarm, speed limit indication, encoder no-signal (*1), speed deviation large (*1), overspeed (*1), position error large (*1), encoder phase error (*1)
Environment	Ambient Temperature		-10°C to +50°C (non-freezing)
	Ambient Humidity		90%RH maximum (non-condensing)
	Storage Temperature (*4)		-20°C to +65°C
	Atmosphere		Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt etc.)
	Altitude / Vibration		Maximum 1000m above sea level, 0.6 G or less (*5) (conforms to JIS C 60068-2-6)

Notes:
1. Available only when the option (FR-A7AP) is mounted
2. Can be displayed only on the operation panel (FR-DU07).
3. Can be displayed only on the parameter unit (FR-PU07/FR-PU04).
4. Temperature applicable for a short period in transit, etc.
5. 2.9m/s^2 or less for the FR-A740-03250 or more.

A700 Options

Function/Options

		Model No.	Stocked item
Function	120VAC Control Input	FR-A7AC	S
	Analog I/O	FR-A7AN	S
	Encoder Feedback	FR-A7AP	S
	Relay Output	FR-A7AR	S
	12 Bit Digital Input	FR-A7AX	S
	Digital Output	FR-A7AY	S
	Ext. Analog Output		
	BiPolar Analog Input	FR-A7AZ	–
	High Res Analog Input		
	Motor Thermistor		
Communiction	CC-Link	FR-A7NC	S
	ControlNET (*1)	FR-A7NCN	S
	DeviceNet	FR-A7ND	S
	EtherNET IP (*1)	FR-A7NE	S
	LonWorks	FR-A7NL	S
	Profibus DP	FR-A7NP	S
	SSCNET III	FR-A7NS	S

Note: Notify factory at time of order so that firmware support can be verified.

External Heatsink Attachment

Drive Model			Model Number	Stocked Item
A720	A740	A760		
00080 to 00175	00025 to 00090	00017, 00040, 00061	FR-A7CN01	S
00240, 00330	00120, 00170	00120	FR-A7CN02	S
00460	00230, 00310	00220	FR-A7CN03	S
00610 to 00900	00380, 00440	00330	FR-A7CN04	S
01150		—	FR-A7CN05	S
	00570	—	FR-A7CN06	S
01450, 01750	00710 to 01100	00550, 00840	FR-A7CN07	S
	01440	01040, 01310, 01520	FR-A7CN08	–
	01800	—	FR-A7CN09	–
	02160, 02600	—	FR-A7CN10	–
02150		—	FR-A7CN11	–

Software

Model Number	Description	Stocked Item
FR-Configurator	Programming and diagnostic software	S

F700 Demonstration Unit

Model Number	Description	Stocked Item
VFD-A700-DEMO	Includes A720 1/2HP, pre-wired digital input switches, LED outputs, two potentiometers, analog meter and encoder option	S
VFD-MOTOR-ENC-DEMO	Includes 1/2HP motor and encoder with quick connections to VFD-A700-DEMO	S

Instruction Manuals

Description	Model Number
FR-A700 Installation Manual – Contains instructions for installer and parameter list. (Included with VFD, plus CD with all versions of VFD and option manuals.)	IB(NA)0600254
FR-A700 Basic Manual – Contains wiring details, VFD layout drawings, alarm definitions and parameter list.	IB(NA)0600225
FR-A700 Applied Manual – Contains wiring details, VFD layout drawings, alarm definitions and complete parameter list with definitions and setting examples.	IB(NA)0600255
FR-A700 PLC Programming Manual – Contains complete instruction sets for PLC feature.	IB(NA)0600262
FR-PU07 Manual – Contains complete instruction sets and screen definitions.	IB(NA)0600240

Manuals available for download at www.meau.com

Building Management Options

	Network Type/ Model No.	FR-A7N-ETH (*1, *2)	FR-A7N-XLT (*1, *2)	ETH-200 (*1, *3, *4)	XLTR-200 (*1, *3, *4)
Gateway Communication	Ethernet I/P	x	–	x	–
	Modbus TCP/IP	x	–	x	–
	Metasys N2	–	x	–	x
	Siemens FLN	–	x	–	x
	BacNET MSTP	–	x	–	–
	BacNET IP	x	–	–	–
	Modbus RTU	–	x	–	–
Stocked Item		s	s	–	–

Notes:
1. For additional information visit www.iccdesigns.com
2. Physically mounts within VFD and powered by VFD
3. Communication to multiple VFDs is possible
4. Mounted and powered external to VFD

Conduit Attachments

Model Number	Drive Model			Stocked Item
	A720 (*1, *2)	A740 (*1, *2)	A760 (*2)	
FR-A7FN05	00900	—	—	—
FR-A7FN06	01150	00770	—	S
FR-A7FN07	01450, 01750	00930, 01160	00550, 00840	S
FR-A7FN-11 (*3)	—	01440, 01800	01040, 01310, 01520	S
FR-A7FN-12 (*3)	02880, 03460	02160, 2600	—	S
FR-A7FN-13 (*3)	—	03250, 03610	02210, 02550	S
FR-A7FN-14 (*3)	—	04320, 04810, 05470	03040	S

Notes:
1. FR-A720-00460 to 00760 & FR-A740-00230 to 00440 are UL Type 1: the conduit adapter is included as standard.
2. FR-A700 smaller than listed above, the UL Type 1 version (conduit adapter standard) is a special type: Change from suffix -NA to -N4.
3. Mounting hardware included for standard DC chokes which ship with VFD.

Factory Supplied DC Link Chokes

Standard With VFD				Dimensions inches (mm)			Approx Weight lb (kg)
Drive Model	DC Link Model No.	mH	Amps	Height	Width	Depth	
FR-A740-01440-NA	FR-HEL-H110K	0.246	233	13.4 (340)	5.9 (150)	7.7 (195)	22 (48)
FR-A740-01880-NA	FR-HEL-H132K	0.204	281	15.9 (405)	6.9 (175)	7.9 (200)	26 (57)
FR-A740-02160-NA	FR-HEL-H160K	0.171	335	15.9 (405)	6.9 (175)	8 (205)	28 (62)
FR-A740-02600-NA	FR-HEL-H185K	0.148	389	15.9 (405)	6.9 (175)	9.4 (240)	29 (64)
FR-A740-03250-NA	FR-HEL-H220K	0.124	462	15.9 (405)	6.9 (175)	9.4 (240)	30 (66)
FR-A740-03610-NA	FR-HEL-H250K	0.109	524	17.3 (440)	7.5 (190)	9.8 (250)	35 (77)
FR-A740-04320-NA	FR-HEL-H280K	0.098	585	17.3 (440)	7.5 (190)	10 (255)	38 (84)
FR-A740-04810-NA	FR-HEL-H315K	0.087	658	19.5 (495)	8.3 (210)	9.8 (250)	42 (92)
FR-A740-05470-NA	FR-HEL-H355K	0.077	742	19.5 (495)	8.3 (210)	9.8 (250)	46 (101)
FR-A740-06100-NA	FR-HEL-H400K	0.069	836	19.7 (500)	8.7 (220)	9.8 (250)	50 (110)
FR-A740-06830-NA	FR-HEL-H450K	0.061	940	19.7 (500)	8.7 (220)	10.6 (270)	57 (125)
FR-A740-07700-NA	FR-HEL-H500K	0.055	1045	17.8 (455)	8.5 (215)	13.6 (345)	67 (147)
FR-A740-08660-NA	FR-HEL-H560K	0.049	1170	18.1 (460)	8.5 (215)	14.2 (360)	85 (187)
FR-A740-09620-NA	FR-HEL-H630K	0.044	1317	18.1 (460)	8.5 (215)	14.2 (360)	95 (209)

A700 Frame Size

Frame Size	Drive Height x Width x Depth			Weight Without Reactor lbs (kg)
	Dimensions inches (mm)			
	Height	Width	Depth	
A	10.2 (260)	4.3 (110)	4.3 (110)	4.2 (1.9)
B	10.2 (260)	4.3 (110)	4.9 (125)	5 (2.3)
C	10.2 (260)	5.9 (150)	5.5 (140)	9.3 (4.2)
D	10.2 (260)	8.7 (220)	6.7 (170)	17.7 (8)
E	11.8 (300)	8.7 (220)	7.5 (190)	19.4 (8.8)
F	15.8 (400)	9.8 (250)	7.5 (190)	32.6 (14.8)
G	21.7 (550)	12.8 (325)	7.7 (195)	77.1 (35)
H	21.7 (550)	17.1 (435)	9.8 (250)	134.4 (61)
J	27.6 (700)	18.3 (465)	9.8 (250)	134.4 (61)
JA	24.4 (620)	18.3 (465)	11.8 (300)	176.2 (80)
K	29.1 (740)	18.3 (465)	14.2 (360)	244.5 (111)
L	39.8 (1010)	19.6 (498)	15 (380)	378.9 (172)
M	39.8 (1010)	26.8 (680)	15 (380)	385 (175)
N	52.4 (1330)	31.1 (790)	17.3 (440)	572 (260)
P	62.2 (1580)	39.2 (995)	17.3 (440)	814 (370)

Parameter Units / Parameter Copy Units

Parameter units are used for operator control, reading and writing parameters, and drive monitoring. Parameter Copy Units also read the drive parameter settings and copy them into non-volatile memory, and can write them into other drives.

Model Number	Description	Stocked Item
FR-CB201	Extension cable straight plugs on both ends – 1 meter.	S
FR-CB203	Extension cable straight plugs on both ends – 3 meters.	S
FR-CB205	Extension cable straight plugs on both ends – 5 meters.	S
FR-DU07	Control Panel for A700	S
FR-PU07	LCD Multi-lingual Parameter Copy Unit (English, French, Spanish, German, Italian, Swedish, Finnish, Japanese) for operator control, parameter read/write and monitoring. Stores settings in non-volatile memory. Built-in parameter copy capability. (F/A700 based)	S
FR-ADP	FR-DU07 panel mounting adapter	S
FR-PU04	LCD Multi-lingual Parameter Copy Unit (English, French, Spanish, German, Italian, Swedish, Finnish, Japanese) for operator control, parameter read/write and monitoring.	S
SC-FRPC	Serial Communication Cable	S
FR-PU07-BB	Battery Powered PU07	S

A700 Dynamic Braking

All Mitsubishi Electric VFD's have some inherent braking capability. During controlled deceleration, motor regenerative losses are dissipated in the motor, wire, and VFD circuitry. The built-in DC injection braking allows for low speed braking and stopping.

When the above capabilities are inadequate for an application, it is necessary to add a power transistor brake unit and resistor unit in series across the DC bus. Motor regeneration causes the DC bus voltage to increase, and when the voltage exceeds a specified threshold, the transistor turns on to pass current through the resistor. Motor kinetic energy is converted to heat energy. VFD overcurrent and overvoltage protective circuits are active at all times, and will fault-trip the VFD if the brake size is inadequate.

Two main factors must be considered when sizing the brake, the effective duty cycle (%ED) and the short time duty rating. The effective duty cycle is increased when an external resistor is added. It is preferable to profile the effective duty cycle of the units of time. With this information, the short time duty is known and the %ED can be calculated, as shown in the below example.

%ED = Braking time / total time for complete operating cycle x 100

Example: Complete cycle is:

5 sec: Acceleration time to reach set speed
60 sec: Run time at set speed
3 sec: Deceleration time to come to a complete stop
12 sec: Time period motor remains stopped

Instruction Manual		
Model	**Model Number**	**Stocked Item**
FR-BU/BR-C	IB(NA)66403	–

%ED = 3 / (5 + 60 + 3 + 12) * 100 = 3.6%
The tables shown assume 100% brake torque, when brake torque is represented by its percentage to the rated torque of the applied motor.
Torque (kg.m) = 974 * Power (kW) / Speed (rpm).

Dynamic Braking Unit For 230VAC • Braking Torque = 100%

Resistor Kit Model Number	Stocked Item	Weight kg / lbs	Resistance (Ohms)	Rated (W)	Motor (Hp)	Drive Model	
						A720	% ED
FR-ABR-0.4K	S	0.2 / 0.5	200	80	1/2	00030	10%
FR-ABR-0.75K	S	0.4 / 0.9	100	150	1	00050	10%
FR-ABR-2.2K	S	0.5 / 1.1	60	250	2/3	00080/00110	10%
FR-ABR-3.7K	S	0.8 / 1.8	40	300	5	00175	10%
FR-ABR-5.5K	S	1.3 / 2.9	25	500	7.5	00240	10%
FR-ABR-7.5K	S	2.2 / 4.9	20	800	10	00330	10%
FR-ABR-11K	S	3.4 (7.5)	13	—	15	00460	6%
FR-ABR-15K (2 resistors in parallel)	S	2.4 (5.3) x2	18/2	—	20	00610	6%
FR-ABR-22K (2 resistors in parallel)	S	3.3 (6.6) x2	13/2	—	25	00760	6%
					30	00900	6%

Dynamic Braking Unit For 460-480VAC Braking Torque = 100%

Resistor Kit Model Number	Stocked Item	Weight kg / lbs	Resistance (Ohms)	Rated (W)	Motor (Hp)	Drive Model	
						A740	% ED
FR-ABR-H0.4K	S	0.2 / 0.5	1200	60	0.5	00015	10%
FR-ABR-H0.75K	S	0.2 / 0.5	700	80	1	00025	10%
FR-ABR-H1.5K	S	0.4 / 0.9	350	150	2	00040	10%
FR-ABR-H2.2K	S	0.5 / 1.1	250	250	3	00060	10%
FR-ABR-H3.7K	S	0.8 / 1.8	150	300	5	00090	10%
FR-ABR-H5.5K	S	1.3 / 2.9	110	500	7.5	00120	10%
FR-ABR-H7.5K	S	2.2 / 4.9	75	800	10	00170	10%
FR-ABR-H11K	S	3.2 (7.1)	52	1000	15	00230	6%
FR-ABR-H15K (2 resistors in series)	S	2.4 (5.3) x 2	18 x 2	1600	20	00310	6%
FR-ABR-H22K (2 resistors in parallel)	S	3.3 (6.6) x 2	52 / 2	—	25	00380	6%
					30	00440	6%

Dynamic Braking Unit For 600VAC • Braking Torque = 100%

Braking Unit Model Number	Stocked Item	Weight kg / lbs	Resistor Kit Model Number	Stocked Item	Weight kg / lbs	Resistance (Ohms)	Rated (W)	Motor (Hp)	Drive Model	
									A760	% ED
FR-BU-C7.5K (*2)	S	5 / 11	FR-BR-C3.7K (*2)	—	10 / 22	200	1200	3	00040	30
								5	00061	10
			FR-BR-C7.5K (*2)	—	15 / 33	100	2400	5	00061	40
								7.5	00120	20
								10		10
FR-BU-C22K (*2)	S	5 / 11	FR-BR-C22K (*2)	—	30 / 66	31	4800	10	00120	85
								15	00220	40
								20		20
								25	00330	15
								30		10
FR-BU-C55K (*2)	S	9 / 20	FR-BR-C55K (*2)	—	70 / 300	13	9600	25	00330	90
								30		60
								40	00550	30
								50		20
								60	00840	15
								75		10

Note: 1. The FR-A720-00030 to 00460 and FR-A740-00015 to 00230 have a built-in braking transistor. **2.**FR-BU-C□□ and FR-BR-C□□ are CSA listed.

Dynamic Braking Options

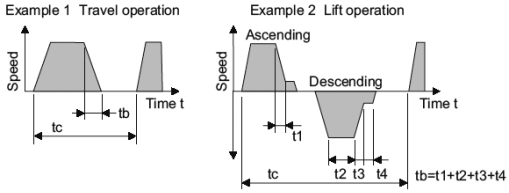
Select the brake unit according to the motor capacity.

To obtain braking torque greater than 200%, use a larger inverter capacity.

Up to 10 FR-BU2 brake units can be connected in parallel for increased braking capacity.

Regeneration duty factor (operation frequency)

$$\%ED = \frac{tb}{tc} \times 100 \quad tb<15s \text{(continuous operation time)}$$



%ED or Time at Short-Time Rating When Braking Torque is 100%

Brake Unit Model Number		Stocked Item	Brake Resistor Model Number	Stocked Item	Motor Capacity (HP)													
					1	2	3	5	7.5	10	15	20	25	30	40	50	60	75
230V	FR-BU2-1.5K	S	BU-1500-TEIKOUKI	–	30 s.	–	–	–	–	–	–	–	–	–	–	–	–	–
	FR-BU2-3.7K	S	BU-3700-TEIKOUKI	–	–	30 s.	–	–	–	–	–	–	–	–	–	–	–	–
	FR-BU2-7.5K	S	BU-7.5K-TEIKOUKI	–	–	–	30 s.	30 s.	–	–	–	–	–	–	–	–	–	–
	FR-BU2-15K	S	FR-BR-15K-UL	S	–	–	–	–	80%	40%	15%	10%	–	–	–	–	–	–
	FR-BU2-30K	S	FR-BR-30K-UL	S	–	–	–	–	–	–	65%	30%	25%	15%	10%	–	–	–
	FR-BU2-55K	–	FR-BR-55K-UL	–	–	–	–	–	–	–	–	–	90%	60%	30%	20%	15%	10%
460V	FR-BU2-H7.5K	S	2 x BU-3700-TEIKOUKI	–	–	–	30 s.	30 s.	–	–	–	–	–	–	–	–	–	–
	FR-BU2-H15K	S	FR-BR-H15K-UL	S	–	–	–	–	80%	40%	15%	10%	–	–	–	–	–	–
	FR-BU2-H30K	S	FR-BR-H30K-UL	S	–	–	–	–	–	–	65%	30%	25%	15%	10%	–	–	–
	FR-BU2-H55K	S	FR-BR-H55K-UL	S	–	–	–	–	–	–	–	–	90%	60%	30%	20%	15%	10%

Brake Unit Model Number		Stocked Item	Brake Resistor Model Number	Stocked Item	Motor Capacity (HP)													
					100	125	150	200	250	300	350	400	450	500	600	700	800	
460V	FR-BU2-H75K	S	MT-BR5-H75K	–	10%	5%	–	–	–	–	–	–	–	–	–	–	–	
	2 x FR-BU2-H75K	S	2 x MT-BR5-H75K	–	40%	25%	15%	10%	5%	–	–	–	–	–	–	–	–	
	3 x FR-BU2-H75K	S	3 x MT-BR5-H75K	–	90%	60%	40%	20%	14%	10%	5%	5%	–	–	–	–	–	
	4 x FR-BU2-H75K	S	4 x MT-BR5-H75K	–	–	95%	70%	40%	25%	15%	13%	10%	5%	5%	–	–	–	
	5 x FR-BU2-H75K	S	5 x MT-BR5-H75K	–	–	–	–	60%	40%	25%	20%	15%	12%	10%	5%	5%	–	
	6 x FR-BU2-H75K	S	6 x MT-BR5-H75K	–	–	–	–	90%	55%	40%	25%	25%	15%	14%	10%	5%	5%	
	7 x FR-BU2-H75K	S	7 x MT-BR5-H75K	–	–	–	–	–	80%	55%	40%	35%	20%	15%	13%	10%	5%	
	8 x FR-BU2-H75K	S	8 x MT-BR5-H75K	–	–	–	–	–	–	70%	50%	45%	30%	25%	15%	13%	10%	

Braking Torque (%) at Short-Time Rating of 30 Sec. for 5HP and Less
Braking Torque (%) at Short-Time Rating of 15 Sec. for 7.5HP and Larger

Brake Unit Model Number		Stocked Item	Brake Resistor Model Number	Stocked Item	Motor Capacity (HP)													
					1	2	3	5	7.5	10	15	20	25	30	40	50	60	75
230V	FR-BU2-1.5K	S	BU-1500-TEIKOUKI	–	100%	50%	–	–	–	–	–	–	–	–	–	–	–	–
	FR-BU2-3.7K	S	BU-3700-TEIKOUKI	–	–	100%	50%	50%	–	–	–	–	–	–	–	–	–	–
	FR-BU2-7.5K	S	BU-7.5K-TEIKOUKI	–	–	–	100%	100%	–	–	–	–	–	–	–	–	–	–
	FR-BU2-15K	S	FR-BR-15K-UL	S	–	–	–	–	280%	200%	120%	100%	80%	70%	–	–	–	–
	FR-BU2-30K	S	FR-BR-30K-UL	S	–	–	–	–	–	–	260%	180%	160%	130%	100%	80%	70%	–
	FR-BU2-55K	–	FR-BR-55K-UL	–	–	–	–	–	–	–	–	–	300%	250%	180%	150%	120%	100%
460V	FR-BU2-H15K	S	FR-BR-H15K-UL	S	–	–	–	–	280%	200%	120%	100%	80%	70%	–	–	–	–
	FR-BU2-H30K	S	FR-BR-H30K-UL	S	–	–	–	–	–	–	260%	180%	160%	130%	100%	80%	70%	–
	FR-BU2-H55K	S	FR-BR-H55K-UL	S	–	–	–	–	–	–	–	–	300%	250%	180%	150%	120%	100%

Brake Unit Model Number		Stocked Item	Brake Resistor Model Number	Stocked Item	Motor Capacity (HP)													
					100	125	150	200	250	300	350	400	450	500	600	700	800	
460V	FR-BU2-H75K	S	MT-BR5-H75K	–	100%	80%	65%	50%	40%	30%	28%	26%	22%	20%	–	–	–	
	2 x FR-BU2-H75K	–	2 x MT-BR5-H75K	–	200%	165%	135%	100%	80%	65%	55%	53%	44%	40%	33%	28%	25%	
	3 x FR-BU2-H75K	–	3 x MT-BR5-H75K	–	300%	250%	200%	150%	120%	100%	85%	80%	65%	60%	50%	43%	37%	
	4 x FR-BU2-H75K	–	4 x MT-BR5-H75K	–	–	300%	270%	200%	160%	135%	115%	105%	85%	80%	65%	55%	50%	
	5 x FR-BU2-H75K	–	5 x MT-BR5-H75K	–	–	–	300%	250%	200%	170%	140%	130%	110%	100%	83%	70%	62%	
	6 x FR-BU2-H75K	–	6 x MT-BR5-H75K	–	–	–	–	300%	240%	200%	170%	160%	130%	120%	100%	85%	75%	
	7 x FR-BU2-H75K	–	7 x MT-BR5-H75K	–	–	–	–	–	280%	235%	200%	185%	155%	140%	115%	100%	85%	
	8 x FR-BU2-H75K	–	8 x MT-BR5-H75K	–	–	–	–	–	–	270%	230%	210%	175%	160%	130%	110%	100%	

Dynamic Braking Unit & Resistor Specifications

Brake Unit Model Number		Stocked Item	Brake Resistor Model Number	Stocked Item	Weight kg / lbs	Resistance (Ohms)	Rated (Watts)	Continuous Permissible Power (Watts)
230V	FR-BU2-1.5K	S	BU-1500-TEIKOUKI	–	n/a	50	300	100
	FR-BU2-3.7K	S	BU-3700-TEIKOUKI	–	n/a	30	900	300
	FR-BU2-7.5K	S	BU-7.5K-TEIKOUKI	–	n/a	20	1800	600
	FR-BU2-15K	S	FR-BR-15K-UL	S	15 / 33	8	4000	990
	FR-BU2-30K	S	FR-BR-30K-UL	S	30 / 66	4	8000	1990
	FR-BU2-55K	–	FR-BR-55K-UL	–	70 / 154	2	16000	3910
460V	FR-BU2-H7.5K	S	2 x BU-3700-TEIKOUKI	–	n/a	60	1800	600
	FR-BU2-H15K	S	FR-BR-H15K-UL	S	15 / 33	32	4000	990
	FR-BU2-H30K	S	FR-BR-H30K-UL	S	30 / 66	16	8000	1990
	FR-BU2-H55K	S	FR-BR-H55K-UL	S	70 / 154	8	16000	3910
	FR-BU2-H75K	S	MT-BR5-H75K	–	70 / 154	6.5	30000	7500

A700 Dynamic Braking Units and Resistors – UFS Series

- A more economical solution to regenerative braking applications.
- UL and cUL listing for the brake units
- Internal Form-C relay
- Adjustable DC bus brake turn-on voltage
- Configurable master / slave brake configuration. Allows connection of up to 5 brake units (1 master / 4 slaves)

240V Series

		Motor Capacity									
Braking Torque	Hp	7.5	10	15	20	25	30	40	50	60	75
	kW	5.5	7.5	11	15	18.5	22	30	37	45	55
100% for 15 secs.	Brake Unit	UFS22J					UFS40J		2 x UFS40J		
	Brake Resistor	RUFC15J			RUFC22J		RUFC40J		2 x RUFC40J		
Electrical Data	Continuous Permissible Power (W)	UFS22J – 1500W					UFS40J – 2000W		2ea x UFS40J – 4000W		
	Resistance (Overall)	RUFC15J – 24ohms			RUFC22J – 12ohms		RUFC40J – 7.5ohms		2ea x RUFC40J – 3.75ohms		
	Continuous Current (Amps)	7A			10A		14.6A		29.2A		

460V Series

		Motor Capacity								
Braking Torque	Hp	7.5	10	15	25	30	40	50	60	75
	kW	5.5	7.5	11	18.5	22	30	37	45	55
100% for 15 secs.	Brake Unit	UFS22						UFS40		
	Brake Resistor	RUFC15/480		RUFC22/480				RUFC40/480		
Electrical Data	Continuous Permissible Power (W)	UFS22 – 2000W						UFS40 – 4000W		
	Resistance (Overall)	RUFC15/480 – 44ohms		RUFC22/480 – 27ohms				RUFC40/480 – 15ohms		
	Continuous Current (Amps)	6A		7.7A				14.6A		

		Motor Capacity						
Braking Torque	Hp	100	125	150	175	215	300	375
	kW	75	90	110	132	160	220	280
100% for 15 secs.	Brake Unit	UFS110				2 X UFS110		
	Brake Resistor	RUFC110/480				2 X RUFC110/480		
Electrical Data	Continuous Permissible Power (W)	UFS110 – 8000W				2 x UFS110 – 16000W		
	Resistance (Overall)	RUFC110/480 – 6.8ohms				2 x RUFC110/480 – 3.4ohms		
	Continuous Current (Amps)	30.7A				61.4A		

Dimensions

Model Number		Height		Width		Depth		Approximate Weight		Stocked Item
		mm	inches	mm	inches	mm	inches	kg	lbs	
240V	UFS20J	250	9.8	100	3.9	175	6.9	2.5	5.5	S
	UFS40J									S
	RUFC15J	240	9.5			75	3	2.8	6.2	S
	RUFC22J	310	12.2					3.5	7.7	S
	RUFC40J	365	14.4					4.3	9.5	S
480V	UFS22	250	9.8	100	3.9	175	6.9	2.5	5.5	S
	UFS40									S
	UFS110			107	4.2	195	7.7	3.9	8.6	S
	RUFC15/480	310	12.2	100	3.9	75	3	3.5	7.7	S
	RUFC22/480	365	14.4					4.2	9.3	S
	RUFC40/480	2 x 365	2 x 14.4	2 x 100	2 x 3.9	2 x 75	2 x 3	8.7	19.2	S
	RUFC110/480	4 x 365	4 x 14.4	4 x 100	4 x 3.9	4 x 75	4 x 3	17.3	38.1	S

A700 VFD Efficiency Values • ND Rating Based

240VAC 3-Phase Input				480VAC 3-Phase Input					600VAC 3-Phase Input				
Model Number	Rated Watts	Watts Loss	Efficiency	Model Number	Rated Watts	Watts Loss	Efficiency	Factory Supplied DC Choke Watts Loss	Model Number	Rated Watts	Watts Loss	Efficiency	Factory Supplied DC Choke Watts Loss
FR-A720-00030-NA	400	50	88%	FR-A740-00015-NA	400	50	88%	—	FR-A760-00017-NA	750	40	95%	—
FR-A720-00050-NA	750	70	91%	FR-A740-00025-NA	750	65	91%	—	FR-A760-00040-NA	2200	70	97%	—
FR-A720-00080-NA	1500	110	93%	FR-A740-00040-NA	1500	75	95%	—	FR-A760-00061-NA	3700	110	97%	—
FR-A720-00110-NA	2200	140	94%	FR-A740-00060-NA	2200	100	95%	—	FR-A760-00120-NA	7500	160	98%	—
FR-A720-00175-NA	3700	190	95%	FR-A740-00090-NA	3700	150	96%	—	FR-A760-00220-NA	15000	260	98%	—
FR-A720-00240-NA	5500	260	95%	FR-A740-00120-NA	5500	200	96%	—	FR-A760-00330-NA	22000	410	98%	—
FR-A720-00330-NA	7500	360	95%	FR-A740-00170-NA	7500	250	97%	—	FR-A760-00550-NA	37000	650	98%	—
FR-A720-00460-NA	11000	520	95%	FR-A740-00230-NA	11000	300	97%	—	FR-A760-00840-NA	55000	940	98%	—
FR-A720-00610-NA	15000	670	96%	FR-A740-00310-NA	15000	400	97%	—	FR-A760-01040-NA	75000	1500	98%	100
FR-A720-00760-NA	18500	770	96%	FR-A740-00380-NA	18500	550	97%	—	FR-A760-01310-NA	90000	1800	98%	120
FR-A720-00900-NA	22000	940	96%	FR-A740-00440-NA	22000	650	97%	—	FR-A760-01520-NA	111000	2200	98%	140
FR-A720-01150-NA	30000	1050	97%	FR-A740-00570-NA	30000	800	97%	—	FR-A760-02210-NA	132000	2600	98%	180
FR-A720-01450-NA	37000	1270	97%	FR-A740-00710-NA	37000	1100	97%	—	FR-A760-02550-NA	185000	3200	98%	200
FR-A720-01750-NA	45000	1610	96%	FR-A740-00860-NA	45000	1300	97%	—	FR-A760-03040-NA	220000	3700	98%	230
FR-A720-02150-NA	55000	1880	97%	FR-A740-01100-NA	55000	1550	97%	—	FR-A760-04020-NA	280000	4800	98%	310
—	—	—	—	FR-A740-01440-NA	75000	1900	97%	130	FR-A760-04960-NA	355000	6000	98%	340
—	—	—	—	FR-A740-01800-NA	90000	2400	97%	130	FR-A760-05890-NA	400000	7500	98%	390
—	—	—	—	FR-A740-02160-NA	110000	2500	98%	140	—	—	—	—	—
—	—	—	—	FR-A740-02600-NA	132000	3000	98%	140	—	—	—	—	—
—	—	—	—	FR-A740-03250-NA	160000	4000	98%	170	—	—	—	—	—
—	—	—	—	FR-A740-03160-NA	185000	4200	98%	230	—	—	—	—	—
—	—	—	—	FR-A740-04320-NA	220000	5000	98%	240	—	—	—	—	—
—	—	—	—	FR-A740-04810-NA	250000	5500	98%	270	—	—	—	—	—
—	—	—	—	FR-A740-05470-NA	280000	6500	98%	300	—	—	—	—	—
—	—	—	—	FR-A740-06100-NA	315000	7000	98%	360	—	—	—	—	—
—	—	—	—	FR-A740-06830-NA	355000	8000	98%	360	—	—	—	—	—
—	—	—	—	FR-A740-07700-NA	400000	9000	98%	450	—	—	—	—	—
—	—	—	—	FR-A740-08660-NA	450000	10500	98%	450	—	—	—	—	—
—	—	—	—	FR-A740-09620-NA	500000	11500	98%	470	—	—	—	—	—

Notes:

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

V500 Series

Variable Frequency Drives True, Closed Loop Vector Control

This series achieves high precision and fast response that exceeds the performance of conventional general-purpose inverters. They can be used in specialized applications such as line control and elevators.

By incorporating our original all-digital vector control, high starting torque and high speed response have been made possible for both velocity and torque control modes.

- 2 to 75 Horsepower at 240V
- 2 to 75 Horsepower at 480V
- 100% continuous torque at Zero speed
- Auto Tuning to other manufacturer's constant torque motor with encoder
- Easy to use Parameter Unit
- 4-Quadrant torque control standard
- Multiple parameters for tailoring to a wide variety of applications
- Simple positioning included as standard
- DC Link Reactor standard (V500L)
- Peripheral devices such as power regenerative converter (FR-CV, FR-RC, MT-RC) available
- Communications options: DeviceNet, Profibus DP, CC-Link, Modbus Plus, SSCNet

Constant Torque		Model Number	Stocked Item
Hp	Output Amps		
3-Phase 240VAC Input / Output			
2	9.0	FR-V520-1.5K-NA	S
3	13.0	FR-V520-2.2K-NA	S
5	20.0	FR-V520-3.7K-NA	S
7.5	28.5	FR-V520-5.5K-NA	–
10	37.5	FR-V520-7.5K-NA	–
15	54	FR-V520-11K-NA	–
20	72.8	FR-V520-15K-NA	–
25	88	FR-V520-18.5K-NA	–
30	103.5	FR-V520-22K-NA	S
40	126.5	FR-V520-30K-NA	–
50	166.8	FR-V520-37K-NA	–
60	198.0	FR-V520-45K-NA	–
75	264.0	FR-V520-55K-NA	–

Constant Torque		Model Number	Stocked Item
Hp	Output Amps		
3-Phase 480VAC Input / Output			
2	4.5	FR-V540-1.5K-NA	S
3	6.5	FR-V540-2.2K-NA	S
5	10.0	FR-V540-3.7K-NA	S
7.5	14.5	FR-V540-5.5K-NA	–
10	18.5	FR-V540-7.5K-NA	–
15	27.5	FR-V540-11K-NA	S
20	35.5	FR-V540-15K-NA	S
25	44.0	FR-V540-18.5K-NA	–
30	51.8	FR-V540-22K-NA	–
40	67.0	FR-V540-30K-NA	–
50	86.0	FR-V540-37K-NA	S
60	99.0	FR-V540-45K-NA	S
75	132.0	FR-V540-55K-NA	–

V500 Ratings 240V Class 1.5K – 55K

Model FR-V520-☐☐K-NA			1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Output	Horsepower Rating (Hp)		2	3	5	7.5	10	15	20	25	30	40	50	60	75
	Rated Current (A)		9.0	13.0	20.0	28.5	37.5	54.0	72.8	88.0	103.5	126.5	166.0	198.0	264.0
	Overload Current Rating (*1)		150% 60 sec., 200% 0.5 sec. (inverse time characteristics)												
	Voltage (*2)		3-Phase 200-220V 50 Hz, 200-240V 60 Hz							3-Phase 200-220V 50 Hz, 200-230V 60 Hz					
	Regenerative Breaking Torque	Max. Time	100%/5 sec.				20% (*5)								
		Tolerable Work Rate	3% ED (*5)		2% ED (*5)		Continuous (*5)								
Power Supply	Rated Input, AC Volt. and Frequency		3-Phase 200-220 V 50 Hz, 200-240V 60 Hz							3-Phase 200-220 V 50 Hz, 200-230V 60 Hz					
	Tolerable AC Voltage Fluctuation		170-242V 50 Hz, 200-264V 60 Hz							170-242V 50 Hz, 170-253V 60 Hz					
	Tolerable Frequency Fluctuation		±5%												
	Amount of Instantaneous Voltage Drop that can be Withstood		When operated at or above 165 V continuously and voltage falls from rated voltage to under 165 V, 15 ms of continuous operation												
	Supply (kVA) (*3)		5.0	6.5	10	14	19	23	33	39	48	57	77	90	123
Protective Structure (JEM 1030)			Enclosed type (IP20) (*4)							Open type (IP00)					
Cooling Method			Forced air cooling												
Approximate Weight		kg	3.5	3.5	6	6	6	14	14	21	30	40	40	55	58
		lbs	7.7	7.7	13.2	13.2	13.2	30.8	30.8	46.2	66	88	88	121	128
Width		mm	150	150	220	220	250	250	250	250	340	450	450	480	480
		inches	5.9	5.9	8.7	8.7	9.9	9.9	9.9	9.9	13.4	17.7	17.7	18.9	18.9
Height		mm	260	260	260	260	400	400	400	400	550	550	550	700	700
		inches	10.2	10.2	10.2	10.2	15.8	15.8	15.8	15.8	21.7	21.7	21.7	27.6	27.6
Depth		mm	163	163	193	193	218	218	218	218	195	250	250	250	270
		inches	6.4	6.4	7.6	7.6	8.6	8.6	8.6	8.6	7.7	9.9	9.9	9.9	10.6

Notes: See next page.

V500 Ratings 480V Class 1.5K – 55K

Model FR-V540-☐☐K-NA			1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
	Horsepower Rating (Hp)		2	3	5	7.5	10	15	20	25	30	40	50	60	75
Output	Rated Current (A)		4.5	6.5	10.0	14.5	18.5	27.5	35.5	44.0	51.8	67.0	86.0	99.0	132.0
	Overload Current Rating (*1)		150% 60 sec., 200% 0.5 sec. (inverse time characteristics)												
	Voltage (*2)		3-Phase 380-480V 50 Hz/60 Hz												
	Regenerative Breaking Torque	Max. Time	100% / 5 sec.				20% (*5)								
		Tolerable Work Rate	2% ED (*5)				Continuous (*5)								
Power Supply	Rated Input, AC Volt. and Frequency		3-Phase 380-480 V 50 Hz/60 Hz												
	Tolerable AC Voltage Fluctuation		323-528V 50 Hz/60 Hz												
	Tolerable Frequency Fluctuation		±5%												
	Amount of Instantaneous Voltage Drop that can be Withstood		When operated at or above 320 V continuously and voltage falls from rated voltage to under 320 V, 15 ms of continuous operation												
	Supply (kVA) (*3)		5.0	6.5	10.2	14	19	23	33	39	48	57	77	90	123
Protective Structure (JEM 1030)			Enclosed type (IP20) (*4)							Open type (IP00)					
Cooling System			Forced air cooling												
Approximate Weight		kg	3.5	3.5	6	6	14	14	14	14	30	35	35	36	65
		lbs	7.7	7.7	13.2	13.2	30.8	30.8	30.8	30.8	66	77	77	79	143
Width		mm	150	150	220	220	250	250	250	250	340	450	450	480	480
		inches	5.9	5.9	8.7	8.7	9.9	9.9	9.9	9.9	13.4	17.7	17.7	18.9	18.9
Height		mm	260	260	260	260	400	400	400	400	550	550	550	700	700
		inches	10.2	10.2	10.2	10.2	15.8	15.8	15.8	15.8	21.7	21.7	21.7	27.6	27.6
Depth		mm	163	163	193	193	218	218	218	218	195	250	250	250	270
		inches	6.4	6.4	7.6	7.6	8.6	8.6	8.6	8.6	7.7	9.9	9.9	9.9	10.6

Notes:

1. The overload current % value indicates the percentage to the inverter's rated output current. For repeated duty, allow time for the inventer and motor to return to or below the temperature when at 100% load.
2. The maximum output voltage cannot exceed the power supply voltage. The maximum output voltage can be set below the power supply voltage.
3. The power capacity will vary according to the power supply side impedance (including input reactor and power lines) value.
4. When the wiring cover for the network option is removed and built-in options are installed, the protective structure will become open type (IP00).
5. For inverter capacities 1.5K to 15K, using the optional high-duty brake resistor (FR-ABR) will provide 100% torque/10% ED.

Dedicated Options V500 Series

Model Number	Description	Installation Manual	Stocked Item
FR-PU04V	Parameter unit used for operation control, reading and writing parameters, drive monitoring, parameter copy and multi-language	IB(NA)0600079	S
FR-V5AP	Pulse train input for advanced position control. Differential line receiver: 500kpps, open collector 200kpps	IB(NA)0600087	S
FR-V5AX	6 additional multi-function digital inputs and high resolution analog input (16-bit)	IB(NA)0600083	–
FR-V5AY	3 additional multi-function digital outputs and encoder pulse ratio output (differential or open collector output)	IB(NA)0600085	–
FR-V5AM	When used with additional encoder, machine side orientation can be performed	IB(NA)0600089	–
FR-V5NS	SSCNET motion control network operation	IB(NA)0600106E	S
FR-V5NE	Ethernet option for inverter setup and monitoring using LAN	IB(NA)0600108E	–
FR-V5AH	3-digit BCD or 12-bit binary code input for high accuracy speed control	IB(NA)0600110E	–
T-TRC50	Memory option used with setup software (FR-SW1-SETUP-WE) to analyze internal inverter trace data	Contact MEAU	–

SSCNET II Cables

Model Number	Length	Description	Stocked Item
FR-V5NSCBL005	0.5 meter	Connection of Q172CPU to FR-V5NS, FR-V5NS to FR-V5NS	S
FR-V5NSCBL01	1 meter		S
FR-V5NSCBL05	5 meters		S
FR-V5NSCBL10	10 meters		–
FR-V5NSCBL20	20 meters		–

Instruction Manuals

Model		Model Number
FR-V520	Basic	IB(NA)06000064
FR-V540	Detailed	IB(NA)06000065
FR-V560	Basic	IB(NA)0600134
	Detailed	IB(NA)0600135
FR-V500L	Basic	IB-T7311
	Detailed	IB-T7312

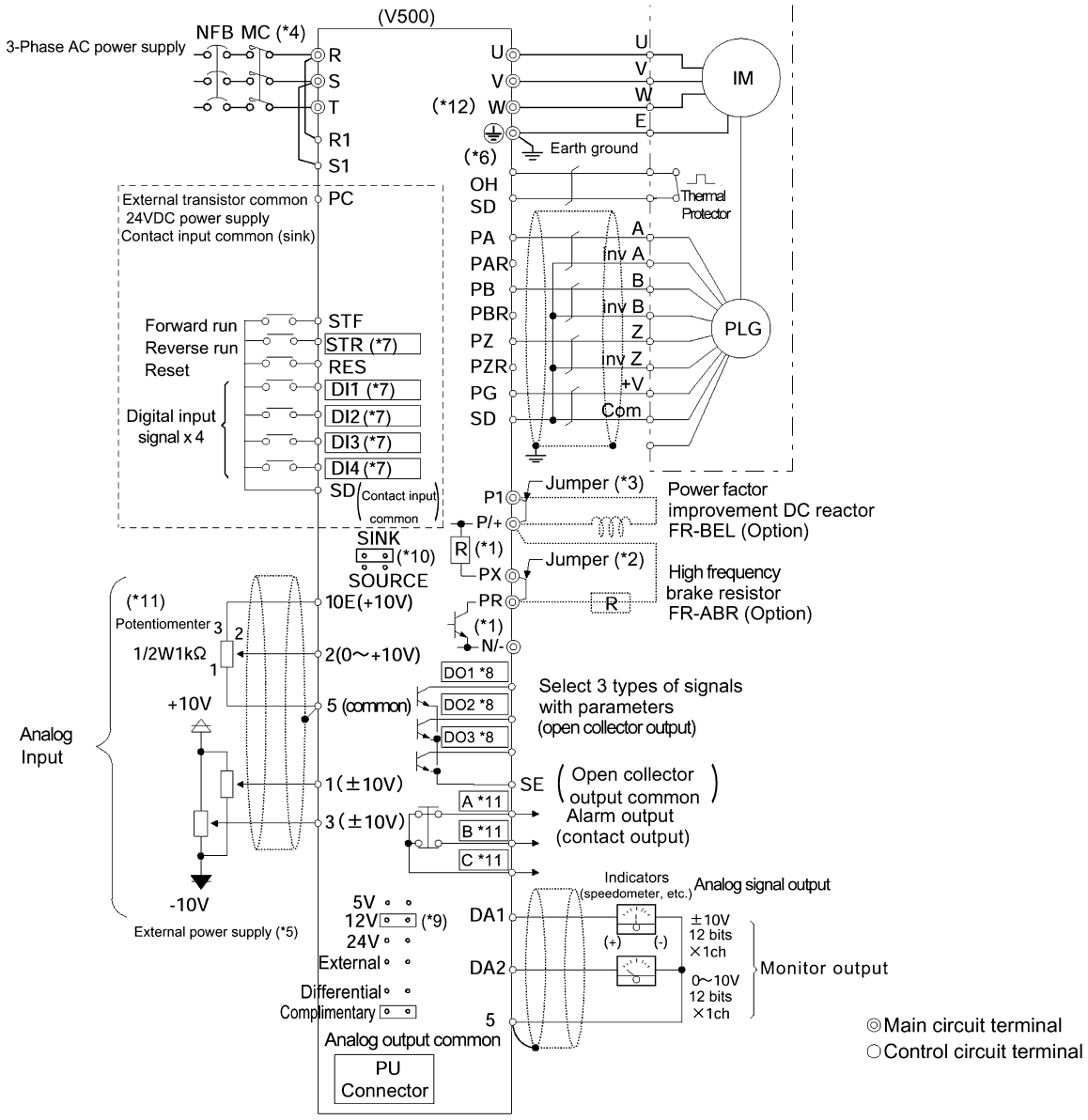
V500 General Specifications

Control Specs.	Control System		Soft- PWM control or high carrier frequency sine-wave PWM control can be selected. Vector control or V/F control can be selected.			
	Control Mode		Speed control, torque control, position control			
	Frequency Control Resolution	Analog Input	0.03% of maximum set speed			
		Digital Input	0.003% against maximum settings (0.1 rpm units for minimum setting)			
	Acceleration / Deceleration Time		0 to 3600 sec (0.1 second increments)			
	Acceleration / Deceleration Pattern		Linear, S pattern (3 types) or backlash compensation acceleration/deceleration can be selected			
	Torque Restriction Level		Torque restriction value can be set (0 to 400% variable)			
Input Signal	Analog Setting Signal		Terminal No.	Setting Range	Speed Control	Torque Control
			2	0 to 10V (resolution 0.03%)	Main speed setting	Speed restriction
			1	0 to ±10V (resolution 0.05%)	Auxiliary speed setting, magnetic flux command regenerative torque restriction	Speed restriction compensation, magnetic flux command, driving side speed restriction
			3	0 to ±10V (resolution 0.05%)	Torque restriction (Torque bias)	Torque command
	With Option FR-V5AX		6	0 to ±10V (resolution 0.003%)	Main speed setting (in this case, terminals 1 and 2 are invalid) Torque restriction	Speed restriction (at this time, terminal 2 is invalid) / Torque command (at this time, terminal 3 is valid)
	Contact Signal		3 fixed function terminals	Forward rotation command, alarm reset, external thermal relay		
			5 multi-function terminals	Selection can be made from reverse rotation command, multi-speed setting (max. 15 speeds), remote setting, jog operation, second function selection, third function selection, output stop, three-wire control, pre-excitation, control mode switchover, torque restriction selection, S pattern switchover, PID control terminal, orientation command, brake opening completion signal, PU operation/external operation switchover, torque bias selection 1, torque bias selection 2, P control selection, servo on, HC connection, PU/external interlock, external DC brake start, and commanded position selection.		
	With Option (FR-V5AX)		6 multi-function terminals			
Environment	Contact Signal		1 Form C Relay (230VAC 0.3A, 30VDC 0.3A)	Selection con be made from inverter running, up to speed, instantaneous power failure (undervoltage) speed detection, second speed detection, third speed detection, PU operation mode, overload alarm, regenerative brake pre-alarm, electronic thermal relay pre-alarm, output current detection, zero current detection, PID lower limit, PID upper limit, PID forward /reverse output, operation ready, operation ready 2. brake opening request, fan fault output, fin overheat pre-alarm, orientation in-position, forward rotation output, reverse rotation output, low speed output, torque detection, regenerative status output, minor fault output, alarm output, maintenance timer output, remote output, speed detection, in-position and trace status		
	Open Collector Signal		3 multi-function terminals			
	With Option (FR-V5AY)		3 multi-function terminals			
	With Option (FR-V5AM)		1 multi-function terminal			
	With Option (FR-A5AY)		7 multi-function terminals			
	Analog Output		0 to ±10V, 12 bits x 1CH 0 to 10V, 12 bits x 1CH	Selection can be made from speed, output current, output voltage, preset speed, output frequency, motor torque, converter output voltage, regenerative brake duty, electronic thermal relay load factor, output current peak value, converter output voltage peak value, load meter, motor exciting current, motor output, reference voltage		
	With Option (FR-A5AY)		0 to ±10V, 10 bits x 1CH 0 to 20mA, 10 bits x 1CH			
	Encoder Pulse Output Option (FR-V5AY)		A phase, B phase, Z phase, (A and B phases can be divided) Open collector/differential line driver			
	Operational Functions		Maximum/minimum speed setting, speed jump, external thermal relay input selection, polarity reversible operation, override function, automatic restart operation after instantaneous power failure, forward/reverse operation prevention, operation mode selection, offline auto tuning function, online auto tuning function, easy gain tuning, computer link operation, remote setting, brake sequence, second function, third function, multi-speed operation, coasting to stop, power failure stop, PID control, speed feed forward, model adaptive speed control, master/slave, torque bias, 12-bit digital command (FR-A5AX option), pulse train input (FR-A5AP option), motor thermistor interface (FR-V5AX option), and simple positioning			
Display	Parameter Unit (FR-DU04-1/FR-PU04V)		Selection can be made from speed, output current, output voltage, preset speed, output frequency, motor torque, converter output voltage, regenerative brake duty, electronic thermal relay load factor, output current peak value, converter output voltage, peak value, input terminal status (PU04V), load meter, motor exciting current, position pulse, cumulative energization time, actual operation time, motor load factor, torque command, torque current command, feedback pulse, motor output, trace status			
	Alarm Definition		Alarm definition is displayed when protective function is activated. 8 past alarm definitions are stored. (Only 4 alarm definitions are stored in the DU04-1)			
Protective Functions			Overcurrent shut-off (acceleration, deceleration, constant speed), regenerative overvoltage shut-off (acceleration, deceleration, constant speed), undervoltage, instantaneous power failure, overload shut-off (electronic thermal relay), brake transistor alarm, earth (ground) fault current, power output short circuit, stall prevention, external thermal relay, fin overheat, fan fault, option alarm, parameter error, PU disconnection, encoder no-signal, large speed deviation, overspeed large position error, CPU error, encoder phase error, output phase loss excessive retries, brake sequence error			
Environment	Ambient Temperature		-10°C to +50°C (Non-freezing) / 14°F to 122°F			
	Ambient Humidity		90% RH or less (Noncondensing)			
	Storage Temperature (*1)		-20°C to +65°C / -4°F to 149°F			
	Atmosphere		For indoor use; no corrosive gasses, flammable gasses, oil mist, dust or dirt present			
	Attitude		1000m above sea level. Contact factory for higher altitude deratings.			
	Vibration		5.9 m/s^2 (0.6G max.) based on JIS C 0911			

Notes:

1. Temperature that can be applied for short times, such as in transit.

V500 Series Terminal Connection Diagram



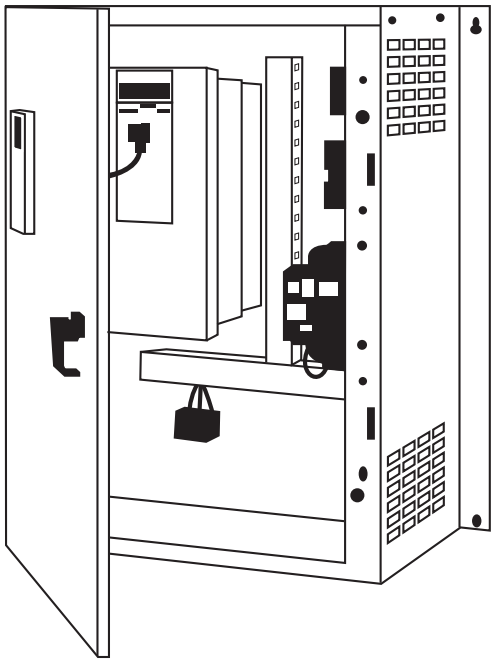
Notes:

1. Terminal PR is provided on the 15kW and smaller capacities, and terminal PX is provided on the 5.5kW and smaller capacities.
2. When using FR-ABR with the 5.5kW or smaller capacity, remove this jumper.
3. Remove this jumper when using FR-BEL for 55kW and smaller capacities. DC link reactor included with 75kW and larger.
4. The converter's life will be shortened by repeated in-rush currents when the power is turned ON, so do not turn the power ON and OFF frequently.
5. Prepare a ± 10V external power supply for terminals 1 and 3.
6. When using a motor without a thermal protector, set Pr.876 "Thermal protector input" to 0 and set Pr.9 (Pr.452) "Electronic thermal (2nd electronic thermal).
7. The terminal functions can be changed with the input terminal function selection (Pr.180 to Pr.183, Pr.187)
8. The terminal functions can be changed with the output terminal function selection (Pr.190 to Pr.192, Pr.195)
9. Change the connector according to the encoder power supply specifications.
10. The sink logic and source logic will change when the connector is changed.
11. Use of the 2W1kW is recommended when the settings are changed frequently.
12. Always ground the inverter and motor.

Packaged Variable Frequency Drives

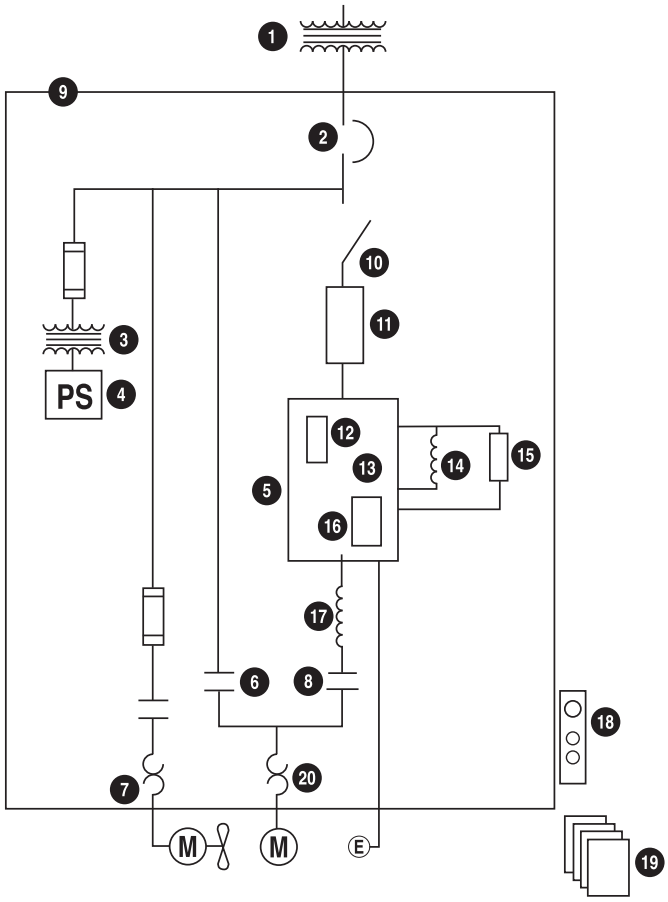
Now you can get the complete "package" from Mitsubishi Electric — we develop, engineer, manufacture and service AC variable frequency drive packages. Our packaged drives come to your facility with "As Built" documentation, pre-tested and ready for installation and wiring.

- Fast lead times and convenient: Sourcing a complete system from a single responsible manufacturer eliminates the delays and other problems associated with dealing with multiple vendors.
- Space saving design: A custom enclosure with double layer construction is designed and built for optimum compactness.
- Wide range of options: An extensive array of options and components are available to meet your exact application requirements.
- Easy-to-use documentation: Thorough "As-built" documentation makes servicing and troubleshooting simple. Only the products and optional items ordered per your specifications are shown in the drawings.
- Fast, economical and ready for installation: All internal wiring is complete and the drives package comes to you ready for field wiring and operation.
- Package options include: circuit breaker, fused disconnect, parameter units, door mounted pilot devices, factory plug-in options, reactors – AC input, DC link, and AC output, automatic/manual bypass, brake units, brake resistors, isolation transformers, RF filters for European directive compliance, output sine wave filter, output contactor, motor overload relay, blower starter, line regenerative braking, auxiliary power, remote pilot devices.
- Available in three different NEMA type enclosures.



For model numbers, pricing and availability, please contact your local Mitsubishi Electric representative.

Packaged drives are built-to-order and pre-wired with a variety of optional accessories from which to choose



1. **Input Impedance:** Input Reactors or Isolation Transformers provide impedance. Both can be provided in separate NEMA 1 enclosures; reactors can also be mounted inside the drive enclosure.
2. **Input Protection:** Fuses, Fused Disconnects, and Circuit Breakers are used to protect the drive from overcurrent.
3. **Control Transformer:** 115VAC control power for contactors, pilot devices, general control.
4. **Power Supplies:** 24VDC for control and pilot devices, 5VDC for encoder feedback.
5. **Drives Available:** All Mitsubishi Electric drives are available to be packaged.
6. **Automatic Bypass:** Allows the motor to be started and run across the line. This mode is initiated when the selector switch in manual, or when the drive is in auto and the drive has a fault. See items 8 and 10.
7. **Blower Motor Starter:** Provides a fused motor starter and overload for the blower motor which cools a constant torque, variable speed motor.
8. **Motor Output Contactor:** This is a standard with bypass.
9. **Enclosure:** NEMA 1, NEMA 12 and NEMA 12 ventilated enclosures are available.
10. **Isolating Disconnect:** Standard with bypass is a drive isolating disconnect. This allows the drive to be isolated from power while the motor is running across the line.
11. **Input Line Filter:** These devices help to reduce line noise (conducted and radiated) that is created by the drive.
12. **Parameter Units:** These keypads are used for operator control, reading and writing parameters, and drive monitoring. They can be installed on the drive, or mounted on the door of the enclosure.
13. **Loading Parameter Settings:** A customer's parameter settings can be factory loaded and documented.
14. **DC Link Reactor:** The DC Link Reactor improves power factor and helps reduce the input current.
15. **Dynamic Braking:** Separated braking resistors and braking control units can be mounted and wired.
16. **Plug-in Options:** Mitsubishi VFDs feature a wide choice of plug-in regulator and interface options.
17. **Output Line Conditioning:** Output reactors and output filters are available to reduce the voltage spikes that can stress motor insulation.
18. **Operator Control Stations:** NEMA 12 operator stations featuring various combinations of start, stop, and other pilot devices with speed potentiometers.
19. **Documentation:** Wiring, interconnection, weight and dimensions are included. Data books and electronic formats are optional.
20. **Output Overload:** These are standard with bypass. Overloads are required when operating multiple motors from a common VFD.

FR-F700 based VFD Complete Bypass System
NEMA 1 - Circuit Breaker, 3 Contactor Bypass, Input Reactor

Base System Includes:

- NEMA 1 construction
- Pow-R-Gate bypass controller with LCD display
- 3 contactor bypass with TEST mode
- Auto/manual bypass field selectable
- Damper end switch input & damper actuator output
- E-Stop string w/ provisions for 3 sets of N.C. contacts
- Catch a spinning load / windmill start activated
- Adjustable overload relay, class 20 equivalent
- Parameter unit cover mounted
- Input circuit breaker, UL 489 Type
- Control transformer, fused primary & secondary
- Terminal blocks for control connections
- RS-485, Modbus RTU Communication
- EMI/RFI Filter standard within VFD
- Complete standard Mitsubishi testing
- AutoCAD documentation packet
- Instruction manuals for VFD and controller
- UL / cUL 508
- Available options: Output line reactor, RFI filter, harmonic filter, DC link reactor, input options, well bulb sensors, transducers, pressure sensors
- 2 year warranty

F1C208V05HM30

Symbol	Voltage Class
208V	3 phase 60Hz input voltage
460V	3 phase 60Hz input voltage

Output HP
3-phase 60Hz

Symbol	Input Line Reactor Impedance
3	3%
5	5%

Standard Product with Circuit Breaker & 3 Contactor Bypass VFD System		208V Based VFD System			Panel Size	460V Based VFD System			Panel Size
HP	KW	Model Number	Stk. Item	Amps		Model Number	Stk. Item	Amps	
1	0.75	F1C208V01HM30	–	4.2	A	F1C460V01HM30	–	2.1	A
2	1.5	F1C208V02HM30	S	7	A	F1C460V02HM30	S	3.5	A
3	2.2	F1C208V03HM30	S	9.6	A	F1C460V03HM30	S	4.8	A
5	3.7	F1C208V05HM30	S	15.2	A	F1C460V05HM30	S	7.6	A
7.5	5.5	F1C208V07HM30	S	23	B	F1C460V07HM30	S	11.5	B
10	7.5	F1C208V10HM30	S	31	B	F1C460V10HM30	S	16	B
15	11	F1C208V15HM30	S	45	C	F1C460V15HM30	S	23	C
20	15	F1C208V20HM30	S	58	D	F1C460V20HM30	S	29	C
25	18.5	F1C208V25HM30	S	70	D	F1C460V25HM30	S	35	C
30	22	F1C208V30HM30	S	85	D	F1C460V30HM30	S	43	C
40	30	F1C208V40HM30	S	114	E	F1C460V40HM30	S	57	D
50	37	F1C208V50HM30	–	140	E	F1C460V50HM30	S	70	D
60	45	F1C208V60HM30	–	170	E	F1C460V60HM30	S	85	D
75	55	—	–	—	—	F1C460V75HM30	S	106	D
100	75	—	–	—	—	F1C460V100HM30	–	144	E
125	90	—	–	—	—	F1C460V125HM30	–	180	E
150	90	—	–	—	—	F1C460V150HM30	–	180	E
200	132	—	–	—	—	F1C460V200HM30	–	260	Floor mount NEMA 12

Panel	lbs	H (in)	W (in)	D (in)
A	85	32	12	8.2
B	105	40	16	10.2
C	120	44	17	10.2
D	150	52	25	12.6
E	210	68	27	18
Floor Mount	850	78	47.25	20

FR-F700 Based VFD Complete Outdoor Enclosure
NEMA 3R – Circuit Breaker, 3 Contactor Bypass, Input Reactor

Base System Includes:

- NEMA 3R construction with rain hood and sun shield, designed for -10°C to +40°C air in direct sunlight
- Thermostatically controlled enclosure heating/cooling
- Clear gasketed weatherproof entry door for Pow-R-Gate bypass controller with LCD display
- Screened entrance and exits for cooling air
- 3 contactor bypass with TEST mode
- Auto/manual bypass field selectable
- Adjustable overload relay
- Parameter unit VFD mounted
- Input circuit breaker with door interlocked handle
- Control transformer, fused primary & secondary
- Terminal blocks for control connections
- RS-485, Modbus RTU communication
- EMI/RFI filter standard within VFD
- Complete standard Mitsubishi testing
- AutoCAD documentation packet
- Instruction manuals for VFD and controller
- UL / cUL 508
- Available options: Output line reactor, RFI filter, harmonic filter, DC link reactor, input options, well bulb sensors, transducers, pressure sensors
- 2 year warranty

F 3 C 2 0 8 V 0 0 5 H M 3

Symbol	Voltage Class
208V	3 phase 60Hz input voltage
460V	3 phase 60Hz input voltage

Output HP
3-phase 60Hz

Symbol	Input Line Reactor Impedance
3	3%
5	5%

Standard Product with Circuit Breaker & 3 Contactor Bypass VFD System		208V Based VFD system			Panel Size	460V Based VFD system			Panel Size
HP	KW	Model Number	Stk. Item	Amps		Model Number	Stk. Item	Amps	
1	0.75	F3C208V001HM3	–	4.2	3A	F3C460V001HM3	–	2.1	3A
2	1.5	F3C208V002HM3	–	7	3A	F3C460V002HM3	–	3.5	3A
3	2.2	F3C208V003HM3	–	9.6	3A	F3C460V003HM3	–	4.8	3A
5	3.7	F3C208V005HM3	S	15.2	3A	F3C460V005HM3	S	7.6	3A
7.5	5.5	F3C208V007HM3	S	23	3B	F3C460V007HM3	S	11.5	3A
10	7.5	F3C208V010HM3	S	31	3B	F3C460V010HM3	S	16	3A
15	11	F3C208V015HM3	S	45	3B	F3C460V015HM3	S	23	3B
20	15	F3C208V020HM3	S	58	3D	F3C460V020HM3	S	29	3B
25	18.5	F3C208V025HM3	S	70	3D	F3C460V025HM3	S	35	3B
30	22	F3C208V030HM3	S	85	3D	F3C460V030HM3	S	43	3D
40	30	F3C208V040HM3	S	114	3D	F3C460V040HM3	S	57	3D
50	37	F3C208V050HM3	–	140	3E	F3C460V050HM3	S	70	3E
60	45	F3C208V060HM3	–	170	3E	F3C460V060HM3	S	85	3E
75	55	—	–	—	—	F3C460V075HM3	S	106	3E
100	75	—	–	—	—	F3C460V100HM3	–	144	3F
125	90	—	–	—	—	F3C460V125HM3	–	180	3F
150	90	—	–	—	—	F3C460V150HM3	–	180	3F
200	132	—	–	—	—	F3C460V200HM3	–	260	3F

Panel	lbs	H (in)	W (in)	D (in)
3A	170	28	24.38	15.4
3B	225	34	24.38	15.4
3C	250	34	30.38	15.4
3D	300	42.03	30.38	20.97
3E	420	54.11	36.28	20.97
3F	850	7.58	37.88	22

General Options

RFI Filters

Model No.	Filter Amps RMS	208V – Hp With >3% Reactor	208V – Hp* Without Reactor	240V – Hp* With >3% Reactor	240V – Hp* Without Reactor	480V – Hp* With >3% Reactor	480V – Hp* Without Reactor	600V – Hp* With >3% Reactor	600V – Hp* Without Reactor	Stocked Item
RF3-0006-4	6	1-1.5 Hp	1 Hp	1–1.5 Hp	1 Hp	1–3 Hp	1–2 Hp	—	—	–
RF3-0010-4	10	2 Hp	1.5 Hp	2–3 Hp	1.5–2 Hp	5 Hp	3–5 Hp	—	—	–
RF3-0018-4	18	3–5 Hp	2-3 Hp	5 Hp	3 Hp	7.5–10 Hp	7.5 Hp	—	—	–
RF3-0025-4	25	7.5 Hp	5 Hp	7.5 Hp	5 Hp	15 Hp	10 Hp	—	—	–
RF3-0033-4	33	10 Hp	7.5 Hp	10 Hp	7.5 Hp	20 Hp	15 Hp	—	—	–
RF3-0050-4	50	15 Hp	10 Hp	15 Hp	10 Hp	25-30 Hp	20–25 Hp	—	—	–
RF3-0070-4	70	20 Hp	15 Hp	20 Hp	15 Hp	40–50 Hp	30 Hp	—	—	–
RF3-0090-4	90	25 Hp	20 Hp	25–30 Hp	20 Hp	60 Hp	40–50 Hp	—	—	–
RF3-0130-4	130	30–40 Hp	25–30 Hp	40 Hp	25–30 Hp	75–100 Hp	60 Hp	—	—	–
RF3-0150-4	150	50 Hp	—	50 Hp	40 Hp	—	75 Hp	—	—	–
RF3-0330-4	330	60–100 Hp	40–75 Hp	60–125 Hp	50–100 Hp	125–250 Hp	100–200 Hp	—	—	–
RF3-0006-6	6	—	—	—	—	—	—	1–3 Hp	1–3 Hp	–
RF3-0010-6	10	—	—	—	—	—	—	5–7.5 Hp	5 Hp	–
RF3-0018-6	18	—	—	—	—	—	—	10–15 Hp	7.5–10 Hp	–
RF3-0025-6	25	—	—	—	—	—	—	20 Hp	15 Hp	–
RF3-0033-6	33	—	—	—	—	—	—	25–30 Hp	20 Hp	–
RF3-0050-6	50	—	—	—	—	—	—	40 Hp	25–30 Hp	–
RF3-0070-6	70	—	—	—	—	—	—	50–60 Hp	40–50 Hp	–
RF3-0090-6	90	—	—	—	—	—	—	75 Hp	60 Hp	–
RF3-0130-6	130	—	—	—	—	—	—	100–125 Hp	75–100 Hp	–
RF3-0150-6	150	—	—	—	—	—	—	150 Hp	—	–
RF3-0330-6	330	—	—	—	—	—	—	200–300 Hp	125–200 Hp	–

* Hp Based on NEC motor current ratings

RFI Filter Electrical Data

Model No.	Dissipation Watts	Leakage Current mA	Fig.	A	A	B	B	C	C	D	D	E	E	Weight (lb.)	Mass (kg)
				in	mm	in	mm	in	mm	in	mm	in	mm		
RF3-0006-4	3.5	1.5	A	7	179	1.8	45	3.1	79	6.57	167	1.26	32	1.4	0.65
RF3-0010-4	4.2	1.4	A	7	179	1.8	45	3.1	79	6.57	167	1.26	32	1.5	0.7
RF3-0018-4	11	1.5	A	9	229	2.2	55	4.5	114	8.54	217	1.65	42	2.4	1.1
RF3-0025-4	11	2.8	A	9	229	2.2	55	4.5	114	8.54	217	1.65	42	2.9	1.3
RF3-0033-4	16	3.7	B	10.7	272	2.9	74	6.3	161	10.16	258	2.36	60	6	2.7
RF3-0050-4	16	4.8	B	12.3	312	3.7	93	7.5	190	11.73	298	3.11	79	8.2	3.7
RF3-0070-4	19	4.4	B	12.3	312	3.7	93	7.5	190	11.73	298	3.11	79	9.3	4.2
RF3-0090-4	18	6.4	B	12.6	319	5	126	8.8	224	11.73	298	4.41	112	13.5	6.1
RF3-0130-4	25	8.6	B	12.6	319	5	126	8.8	224	11.73	298	4.41	112	13.5	6.1
RF3-0150-4	28	9.8	B	13.1	334	5	126	8.8	224	11.73	298	4.41	112	19.6	8.9
RF3-0330-4	40	6	C	15.2	386	10.2	260	4.6	116	4.72	120	9.25	235	24.3	11
RF3-0006-6	3.5	1.5	C	7.2	183	1.8	45	3.1	79	6.57	167	1.26	32	1.4	0.65
RF3-0010-6	4.2	1.5	C	7.2	183	1.8	45	3.1	79	6.57	167	1.26	32	1.5	0.7
RF3-0018-6	11	4.9	C	9.2	233	2.2	55	4.5	114	8.54	217	1.65	42	2.4	1.1
RF3-0025-6	11	4.9	C	9.2	233	2.2	55	4.5	114	8.54	217	1.65	42	2.9	1.3
RF3-0033-6	16	6.5	B	10.7	272	2.9	74	6.3	161	10.16	258	2.36	60	6	2.7
RF3-0050-6	16	9.9	B	12.3	312	3.7	93	7.5	190	11.73	298	3.11	79	8.2	3.7
RF3-0070-6	19	9.9	B	12.3	312	3.7	93	7.5	190	11.73	298	3.11	79	9.3	4.2
RF3-0090-6	19	9.9	B	12.3	312	3.7	93	7.5	190	11.73	298	3.11	79	9.3	4.2
RF3-0130-6	28	14.1	B	13.1	334	5	126	8.8	224	11.73	298	4.41	112	19.6	8.9
RF3-0150-6	28	14.1	B	13.1	334	5	126	8.8	224	11.73	298	4.41	112	19.6	8.9
RF3-0330-6	40	9.9	C	15.2	386	10.2	260	4.6	116	4.72	120	9.25	235	24.3	11

For additional information visit http://www.mtecorp.com/rfiemi.html

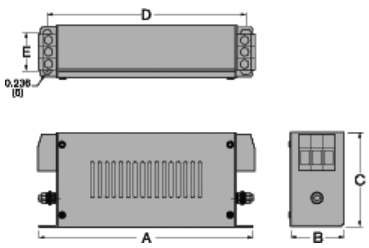


Figure A

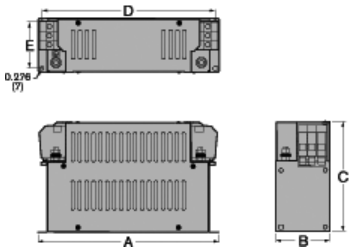


Figure B

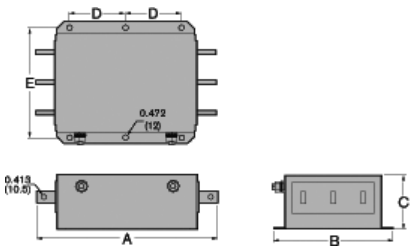


Figure C

Line / Load Reactors

Input or Output Reactors						
Open Type Model No.	Stocked Item	NEMA 1 Type Model No.	Stocked Item	3 Phase Voltage Class		
				208-240V	480V	600V
MRL-00101	–	MRL-00111	–	—	—	1/4-1/3Hp @ 5%
MRL-00102	–	MRL-00112	–	—	1/4-1/3Hp @ 5%	1/4-1/3Hp @ 3%, 1/2Hp @ 5%
MRL-00103	–	MRL-00113	–	—	1/4-1/3Hp @ 3%, 1/2Hp @ 5%	1/4-1/3Hp @ 1.5%. 1/2Hp @ 3%
MRL-00104	–	MRL-00114	–	—	1/4-1/2Hp @ 1.5%. 1/2Hp @ 3%	1/2Hp @ 1.5%
MRL-00201	–	MRL-00211	–	1//4Hp @ 3%, 1/3-3/4Hp @ 5%	3/4-1.5Hp @ 3%	3/4-1.5Hp @ 1.5%
MRL-00202	–	MRL-00212	–	1/4Hp @ 5%	3/4-1.5Hp @ 5%	3/4-1.5Hp @ 3%
MRL-00203	–	MRL-00213	–	—	—	3/4-1.5Hp @ 5%
MRL-00204	–	MRL-00214	–	1/3-3/4Hp @ 3%	3/4-1.5Hp @ 5%	—
MRL-00401	–	MRL-00411	–	1Hp @ 3%	2-3Hp @ 1.5%	—
MRL-00402	S	MRL-00412	–	1Hp @ 5%	2-3Hp @ 3%	2-3Hp @ 1.5%
MRL-00403	S	MRL-00413	–	—	2-3Hp @ 5%	2-3Hp @ 3%
MRL-00404	–	MRL-00414	–	—	—	2-3Hp @ 5%
MRL-00801	–	MRL-00811	–	1.5-2Hp @ 3%	5Hp @ 1.5%	7.5Hp @ 1.5%
MRL-00802	S	MRL-00812	–	1.5-2Hp @ 5%	5Hp @ 3%	5Hp @ 1.5%, 7.5Hp @ 3%
MRL-00803	–	MRL-00813	–	—	5Hp @ 5%	5Hp @ 3%, 7.5Hp @ 5%
MRL-00804	–	MRL-00814	–	—	—	5Hp @ 5%
MRL-01201	–	MRL-01211	–	3Hp @ 3%	7.5Hp @ 1.5%	10Hp @ 1.5%
MRL-01202	S	MRL-01212	–	3Hp @ 5%	7.5Hp @ 3%	10Hp @ 3%
MRL-01203	–	MRL-01213	–	—	7.5Hp @ 5%	10Hp @ 5%
MRL-01801	S	MRL-01811	–	5Hp @ 3%	10Hp @ 1.5%	15Hp @ 1.5%
MRL-01802	S	MRL-01812	–	5Hp @ 5%	10Hp @ 3%	15Hp @ 3%
MRL-01803	–	MRL-01813	–	—	10Hp @ 5%	15Hp @ 5%
MRL-02501	–	MRL-02511	–	7.5Hp @ 3%	15Hp @ 1.5%	20-25Hp @ 1.5%
MRL-02502	S	MRL-02512	–	7.5Hp @ 5%	15Hp @ 3%	20-25Hp @ 3%
MRL-02503	–	MRL-02513	–	—	15Hp @ 5%	20-25Hp @ 5%
MRL-03501	S	MRL-03511	–	10Hp @ 3%	20-25Hp @ 1.5%	30Hp @ 1.5%
MRL-03502	S	MRL-03512	–	10Hp @ 5%	20-25Hp @ 3%	30Hp @ 3%
MRL-03503	S	MRL-03513	–	—	20-25Hp @ 5%	30Hp @ 5%
MRL-04501	S	MRL-04511	–	15Hp @ 3%	30Hp @ 1.5%	40Hp @ 1.5%
MRL-04502	S	MRL-04512	–	15Hp @ 5%	30Hp @ 3%	40Hp @ 3%
MRL-04503	–	MRL-04513	–	—	30Hp @ 5%	40Hp @ 5%
MRL-05501	S	MRL-05511	–	20Hp @ 3%	40Hp @ 1.5%	50Hp @ 1.5%
MRL-05502	S	MRL-05512	–	20Hp @ 5%	40Hp @ 3%	50Hp @ 3%
MRL-05503	–	MRL-05513	–	—	40Hp @ 5%	50Hp @ 5%
MRL-08001	–	MRL-08011	–	25-30Hp @ 3%	50-60Hp @ 1.5%	60-75Hp @ 1.5%
MRL-08002	S	MRL-08012	–	25-30Hp @ 5%	50-60Hp @ 3%	60-75 Hp @ 3%
MRL-08003	–	MRL-08013	–	—	50-60Hp @ 5%	60-75 Hp @ 5%
MRL-10001	–	MRL-10011	–	40Hp @ 3%	75Hp @ 1.5%	100Hp @ 1.5%
MRL-10002	S	MRL-10012	–	40Hp @ 5%	75Hp @ 3%	100Hp @ 3%
MRL-10003	–	MRL-10013	–	—	75Hp @ 5%	100Hp @ 5%
MRL-13001	–	MRL-13011	–	50Hp @ 3%	100Hp @ 1.5%	125Hp @ 1.5%
MRL-13002	–	MRL-13012	–	50Hp @ 5%	100Hp @ 3%	125Hp @ 3%
MRL-13003	–	MRL-13013	–	—	100Hp @ 5%	125Hp @ 5%
MRL-16001	–	MRL-16011	–	60Hp @ 3%	125Hp @ 1.5%	150Hp @ 1.5%
MRL-16002	–	MRL-16012	–	60Hp @ 5%	125Hp @ 3%	150Hp @ 3%
MRL-16003	–	MRL-16013	–	—	125Hp @ 5%	150Hp @ 5%
MRL-20001B14	–	MRL-20011B14	–	75Hp @ 3%	150Hp @ 1.5%	200Hp @ 1.5%
MRL-20002B14	S	MRL-20012B14	–	75Hp @ 5%	150Hp @ 3%	200Hp @ 3%
MRL-20003B14	–	MRL-20013B14	–	—	150Hp @ 5%	200Hp @ 5%
MRL-25001B14	–	MRL-25011B14	–	100Hp @ 3%	200Hp @ 1.5%	250Hp @ 1.5%
MRL-25002B14	–	MRL-25012B14	–	100Hp @ 5%	200Hp @ 3%	250Hp @ 3%
MRL-25003B14	–	MRL-25013B14	–	—	200Hp @ 5%	250Hp @ 5%
MRL-32001B14	–	MRL-32011B14	–	125Hp @ 3%	250Hp @ 1.5%	300Hp @ 1.5%
MRL-32002B14	–	MRL-32012B14	–	125Hp @ 5%	250Hp @ 3%	300Hp @ 3%
MRL-32003B14	–	MRL-32013B14	–	—	250Hp @ 5%	300Hp @ 5%
MRL-40001B14	–	MRL-40011B14	–	150Hp @ 3%	300Hp @ 1.5%	350-400Hp @ 1.5%
MRL-40002B14	–	MRL-40012B14	–	150Hp @ 5%	300Hp @ 3%	350-400Hp @ 3%
MRL-40003B14	–	MRL-40013B14	–	—	300Hp @ 5%	350-400Hp @ 5%
MRL-50001	–	MRL-50011	–	200Hp @ 3%	350-400Hp @ 1.5%	500Hp @ 1.5%
MRL-50002	–	MRL-50012	–	200Hp @ 5%	350-400Hp @ 3%	500Hp @ 3%
MRL-50003	–	MRL-50013	–	—	350-400Hp @ 5%	500Hp @ 5%
MRL-60001	–	MRL-60011	–	—	500Hp @ 1.5%	600Hp @ 1.5%
MRL-60002	–	MRL-60012	–	—	500Hp @ 3%	600Hp @ 3%
MRL-60003	–	MRL-60013	–	—	500Hp @ 5%	600Hp @ 5%
MRL-75001	–	MRL-75011	–	—	600Hp @ 1.5%	700Hp @ 1.5%
MRL-75002	–	MRL-75012	–	—	600Hp @ 3%	700Hp @ 3%
MRL-75003	–	MRL-75013	–	—	600Hp @ 5%	700Hp @ 5%
MRL-85001	–	MRL-85011	–	—	700Hp @ 1.5%	800Hp @ 1.5%
MRL-85002	–	MRL-85012	–	—	700Hp @ 3%	800Hp @ 3%
MRL-85003	–	MRL-85013	–	—	700Hp @ 5%	800Hp @ 5%
MRL-100001	–	MRL-100011	–	—	800Hp @ 1.5%	—
MRL-100002	–	MRL-100012	–	—	800Hp @ 3%	—
MRL-100003	–	MRL-100013	–	—	800Hp @ 5%	—

Line / Load Reactor Electrical Data

Model Number	Watts Loss	Wire Range (AWG)	Terminal Torque (in / lbs)	Ind. mH	Fund Amps	Max Amps
MRL-00201	8	22 14	4.5	12	2	3
MRL-00202	12	22 14	4.5	20	2	3
MRL-00203	16	22 14	4.5	32	2	3
MRL-00204	11	22 14	4.5	6	2	3
MRL-00401	15	22 14	4.5	3	4	6
MRL-00402	20	22 14	4.5	6.5	4	6
MRL-00403	20	22 14	4.5	9	4	6
MRL-00404	21	22 14	4.5	12	4	6
MRL-00801	20	22 14	4.5	1.5	8	12
MRL-00802	29	22 14	4.5	3	8	12
MRL-00803	26	22 14	4.5	5	8	12
MRL-00804	28	22 14	4.5	7.5	8	12
MRL-01201	26	22 5	16	1.25	12	18
MRL-01202	31	22 5	16	2.5	12	18
MRL-01203	41	22 5	16	4.2	12	18
MRL-01801	36	22 5	16	0.8	18	27
MRL-01802	43	22 5	16	1.5	18	27
MRL-01803	43	22 5	16	2.5	18	27
MRL-02501	48	22 5	16	0.5	25	37.5
MRL-02502	52	22 5	16	1.2	25	37.5
MRL-02503	61	22 5	16	1.8	25	37.5
MRL-03501	49	22 5	16	0.4	35	52.5
MRL-03502	54	22 5	16	0.8	35	52.5
MRL-03503	54	18 4	20	1.2	35	52.5
MRL-04501	54	18 4	20	0.3	45	67.5
MRL-04502	62	18 4	20	0.7	45	67.5
MRL-04503	65	18 4	20	1.2	45	67.5
MRL-05501	64	6 0	6-4(45) & 2-0(50)	0.25	55	82.5
MRL-05502	67	6 0	6-4(45) & 2-0(50)	0.5	55	82.5
MRL-05503	71	6 0	6-4(45) & 2-0(50)	0.85	55	82.5
MRL-08001	82	6 0	6-4(45) & 2-0(50)	0.2	80	120
MRL-08002	86	6 0	6-4(45) & 2-0(50)	0.4	80	120
MRL-08003	96	6 0	6-4(45) & 2-0(50)	0.7	80	120
MRL-10001	94	6 0	6-4(45) & 2-0(50)	0.15	100	150
MRL-10002	84	6 0	6-4(45) & 2-0(50)	0.3	100	150
MRL-10003	108	6 0	6-4(45) & 2-0(50)	0.45	100	150
MRL-13001	108	2 0000	150	0.1	130	195
MRL-13002	180	2 0000	150	0.2	130	195
MRL-13003	128	2 0000	150	0.3	130	195
MRL-16001	116	2 0000	150	0.075	160	240
MRL-16002	149	2 0000	150	0.15	160	240
MRL-16003	138	2 0000	150	0.23	160	240
MRL-20001B14	124	Copper Tab	Not Applicable	0.055	200	300
MRL-20002B14	168	Copper Tab	Not Applicable	0.11	200	300
MRL-20003B14	146	Copper Tab	Not Applicable	0.185	200	300
MRL-25001B14	154	Copper Tab	Not Applicable	0.045	250	375
MRL-25002B14	231	Copper Tab	Not Applicable	0.09	250	375
MRL-25003B14	219	Copper Tab	Not Applicable	0.15	250	375
MRL-32001B14	224	Copper Tab	Not Applicable	0.04	320	480
MRL-32002B14	264	Copper Tab	Not Applicable	0.075	320	480
MRL-32003B14	351	Copper Tab	Not Applicable	0.125	320	480
MRL-40001B14	231	Copper Tab	Not Applicable	0.03	400	600
MRL-40002B14	333	Copper Tab	Not Applicable	0.06	400	600
MRL-40003B14	293	Copper Tab	Not Applicable	0.105	400	600
MRL-50001	266	Copper Tab	Not Applicable	0.025	500	750
MRL-50002	340	Copper Tab	Not Applicable	0.05	500	750
MRL-50003	422	Copper Tab	Not Applicable	0.085	500	750
MRL-60001	307	Copper Tab	Not Applicable	0.02	600	900
MRL-60002	414	Copper Tab	Not Applicable	0.04	600	900
MRL-60003	406	Copper Tab	Not Applicable	0.065	600	900
MRL-75001	427	Copper Tab	Not Applicable	0.015	750	1125
MRL-75002	630	Copper Tab	Not Applicable	0.029	750	1125
MRL-75003	552	Copper Tab	Not Applicable	0.048	750	1125
MRL-85001	798	Copper tab	Not Applicable	0.015	850	1063
MRL-85002	930	Copper tab	Not Applicable	0.027	850	1063
MRL-85003	1133	Copper tab	Not Applicable	0.042	850	1063
MRL-90001	860	Copper tab	Not Applicable	0.013	900	1125
MRL-90002	1020	Copper tab	Not Applicable	0.025	900	1125
MRL-90003	1365	Copper tab	Not Applicable	0.04	900	1125
MRL-100001	940	Copper tab	Not Applicable	0.011	1000	1250
MRL-100002	1090	Copper tab	Not Applicable	0.022	1000	1250
MRL-100003	1500	Copper tab	Not Applicable	0.038	1000	1250

For additional information visit http://www.mtecorp.com/lineload.html

Sine Wave dV/dT Filters (2-8kHz Carrier Frequency)

460VAC					
Motor HP	Filter Rating Amps	Open	Stocked Item	NEMA 1*	Stocked Item
		Model No.		Model No.	
1.5	9	SWAP0009D	–	SWAGA0009D	–
2					
3					
5					
7.5	12	SWAP0012D	–	SWAGA0012D	–
10	17	SWAP0017D	–	SWAGA0017D	–
15	22	SWAP0022D	–	SWAGB0022D	–
20	27	SWAP0027D	–	SWAGB0027D	–
25	35	SWAP0035D	–	SWAGB0035D	–
30	45	SWAP0045D	–	SWAGB0045D	–
40	55	SWAP0055D	–	SWAGB0055D	–
50	65	SWAP0065D	–	SWAGB0065D	–
60	80	SWAP0080D	–	SWAGC0080D	–
75	110	SWAP0110D	–	SWAGC0110D	–
100	130	SWAP0130D	–	SWAGC0130D	–
125	160	SWAP0160D	–	SWAGC0160D	–
150	200	SWAP0200D	–	SWAGD0200D	–
200	250	SWAP0250D	–	SWAGD0250D	–
250	305	SWAP0305D	–	SWAGD0305D	–
300	365	SWAP0365D	–	SWAGD0365D	–
350	415	SWAP0415D	–	SWAGD0415D	–
400	515	SWAP0515D	–	SWAGD0515D	–
450					
500	600	SWAP0600D	–	SWAGE0600D	–
600	720	SWAP0720D	–	SWAGE0720D	–

*** Note:** Some enclosures meet NEMA 2. For more information, visit www.mtecorp.com

DC Chokes

Model No.	208V	240V	480V	600V	Stocked Item
DCA000204	1/4hp @ 5%	1/4hp @ 5%	1/2hp @ 3% &1/2-1hp@ 5%	3/4-1hp @ 3&5%	–
DCA000402	1/2hp @ 3% & 3/4-1hp@ 5%	1/2hp @ 3% & 3/4-1hp@ 5%	2hp @ 3%		–
DCA000403	1/2hp @ 5%	1/2hp @ 5%	1.5hp @ 3%		–
DCA000404			1.5hp @ 5% & 2hp @5%	1.5hp & 2hp @ 3%& 5%	–
DCA000902	1.5hp @ 3%	1.5 & 2hp @ 3%			–
DCA000903	1.5 & 2hp @ 5%	1.5 & 2hp @ 5%	3 & 5hp @ 3%		–
DCA000904			3 & 5hp @ 5%	3 & 5hp @ 3 & 5%	–
DCA001202	2hp @ 3%	3hp @ 3%			–
DCA001203	3hp @ 5%	3hp @ 5%			–
DCA001204				7.5hp @ 3 & 5%	–
DCA001802	3hp@3% & 5hp@5%	5hp @ 3%			–
DCA001803		5hp @ 5%	10hp @ 3%	10hp @ 3%	–
DCA001804			7.5hp @ 3%	10hp @ 5%	–
DCA001805			7.5hp @ 3 & 5%		–
DCA002503			15hp @ 3%		–
DCA002505			15hp @ 5%	15hp @ 3 & 5%	–
DCA003201	7.5hp @ 3%	7.5hp @ 3%			–
DCA003202		7.5hp @ 5%	20hp @ 3%		–
DCA003203	7.5hp @ 5%		20hp @ 5%	20 & 25hp @ 3 & 5%	–
DCA004002	10hp @ 3%	10hp @ 3%			–
DCA004003	10hp @ 5%	10hp @ 5%	25hp @ 3%	30hp @ 3%	–
DCA004004			25hp @ 5%	30hp @ 5%	–
DCA005001		15hp @ 3%			–
DCA005003	15hp @ 5%			40hp @ 3%	–
DCA005004			30hp @ 5%	40hp @ 5%	–
DCA006201	15hp @ 3%				–
DCA008002		20hp @ 3%			–
DCA008005			50hp @ 5%	60hp @ 5%	–
DCA009202			60hp @ 3%		–
DCA009203			60hp @ 5%	75hp @ 3 & 5%	–
DCA011002	30hp @ 5%				–
DCA011003		30hp @ 5%			–
DCA012502	40hp @ 5%	40hp @ 3%			–
DCA015002	50hp @ 5%		100hp @ 5%		–
DCA015004					–
DCA020002	60hp @ 5%	60hp @ 5%			–

DC Choke Electrical Data

Model No.	DC Amps	mH	Watts	Lug Size	Torque	Unit Weight (lbs)
DCA000204	2	50	5	22-14	4.5	2
DCA000402	4	12	5	22-14	4.5	2
DCA000403	4	15	6	22-14	4.5	2
DCA000404	4	25	9	18-4	20	4
DCA000902	9	3.22	7	22-14	4.5	2
DCA000903	9	7.5	11	18-4	20	4
DCA000904	9	11.5	16	18-4	20	7
DCA001201	12	1	5	22-14	4.5	1
DCA001202	12	1	7	18-4	20	2
DCA001203	12	4	11	18-4	20	4
DCA001204	12	6	14	18-4	20	7
DCA001801	18	0.65	5	18-4	20	2
DCA001802	18	1.375	9	18-4	20	4
DCA001803	18	2.75	16	18-4	20	7
DCA001804	18	3.75	17	18-4	20	8
DCA001805	18	6	20	18-4	20	13
DCA002503	25	1.275	13	18-4	20	7
DCA002504	25	1.75	13	18-4	20	5
DCA002505	25	4	16	18-4	20	13
DCA003201	32	0.85	11	18-4	20	5
DCA003202	32	1.62	14	18-4	20	10
DCA003203	32	2.68	21	18-4	20	14
DCA004001	40	0.5	14	18-4	20	5
DCA004002	40	0.75	15	18-4	20	7
DCA004003	40	1	17	18-4	20	8
DCA004004	40	2	29	18-4	20	21
DCA005001	50	0.625	18	18-4	20	8
DCA005003	50	1.35	21	18-4	20	15
DCA005004	50	2	30	6-0	6-4(45) &2-0	25
DCA006201	62	0.32	17	6-0	6-4(45) &2-0	8
DCA006202	62	0.61	20	6-0	6-4(45) &2-0	14
DCA008002	80	0.4	25	6-0	6-4(45) & 2-0(50)	14
DCA008005	80	1.25		6-0	6-4(45) & 2-0(50)	35
DCA009201	92	0.2	19	6-0	6-4(45) & 2-0(50)	10
DCA009202	92	0.6	34	6-0	6-4(45) & 2-0(50)	23
DCA009203	92	1	48	6-0	6-4(45) & 2-0(50)	32
DCA011002	110	0.3	38	6-0	6-4(45) & 2-0(50)	22
DCA011003	110	0.45	45	6-0	6-4(45) & 2-0(50)	22
DCA012502	125	0.22	27	6-0	6-4(45) & 2-0(50)	23
DCA015002	150	0.22	36	2-0000	150	23
DCA015004	150	0.65		2-0000	150	52
DCA020002	200	0.21	50	2-0000	150	39

For additional information, visit http://www.mtecorp.com/dclink.html

Matrix Harmonic Filters, 5% THID
480V, 60Hz, Variable Torque Loads

Filter Max Load Amps	Motor HP	NEC Motor Amps	Filter Style		
			Open Panel	Gen. Purpose NEMA 2	Gen. Purpose NEMA 3R
			Model No. (*)	Model No. (*)	Model No. (*)
6	3	4.8	MDP0006D	MDG0006D	MDW0006C
8	5	7.6	MDP0008D	MDG0008D	MDW0008C
11	7.5	11	MDP0011D	MDG0011D	MDW0011C
14	10	14	MDP0014D	MDG0014D	MDW0014C
21	15	21	MDP0021D	MDG0021D	MDW0021C
27	20	27	MDP0027D	MDG0027D	MDW0027C
34	25	34	MDP0034D	MDG0034D	MDW0034C
44	30	40	MDP0044D	MDG0044D	MDW0044C
52	40	52	MDP0052D	MDG0052D	MDW0052C
66	50	65	MDP0066D	MDG0066D	MDW0066C
83	60	77	MDP0083D	MDG0083D	MDW0083C
103	75	96	MDP0103D	MDG0103D	MDW0103C
128	100	124	MDP0128D	MDG0128D	MDW0128C
165	125	156	MDP0165D	MDG0165D	MDW0165C
208	150	180	MDP0208D	MDG0208D	MDW0208C
240	200	240	MDP0240D	MDG0240D	MDW0240C
320	250	302	MDP0320D	MDG0320D	MDW0320C
403	300	361	MDP0403D	MDG0403D	MDW0403C
482	400	477	MDP0482D	MDG0482D	MDW0482C
636	500	590	MDP0636D	MDG0636D	MDW0636C
786	600	708	MDP0786D	MDG0786D	MDW0786C

* Non-stock. For use with bypass systems contactor option 010 or 011 is additionally required. For additional information, visit http://www.mtecorp.com/matrix.html

3 Phase Circuit Breaker

Amps	NEMA 1 Enclosed	NEMA 3R Enclosed
	Model No. (*)	Model No. (*)
15A	T1N015TL1	T1N015TL3
20A	T1N020TL1	T1N020TL3
25A	T1N025TL1	T1N025TL3
30A	T1N030TL1	T1N030TL3
40A	T1N040TL1	T1N040TL3
50A	T1N050TL1	—
60A	T1N060TL1	T1N060TL3
70A	T1N070TL1	T1N070TL3
80A	T1N080TL1	T1N080TL3
90A	T1N090TL1	T1N090TL3
100A	T1N100TL1	T1N100TL3
125A	T3N125TL1	T3N125TL3
150A	T3N150TL1	T3N150TL3
175A	T3N175TL1	T3N175TL3
200A	T3N200TL1	T3N200TL3
225A	T3N225TL1	T3N225TL3
250A	T4N250BL1	T4N250BL3
400A	T5N400BL1	T5N400BL3
600A	S6N600BL1	S6N600BL3
800A	S6N800BL1	S6N800BL3

* Non-stock. For additional information, visit http://www.abb-control.com/products/lv023-molded_casebreakers.htm

Micro MAX™ AC Inverter Duty Motor

1000:1 Constant Torque (TENV) • 20:1 Constant Torque (TEFC)

Designed for direct replacement of PMDC or any other variable speed application where up to a 1000:1 constant torque speed range is required. Typical uses include: machine tools, conveyors, packaging machines, batching machines and printing equipment.

- Replaces 90 and 180 volt PMDC motors when used with AC variable frequency drives
- Constant torque operation from 0 to base speed (TENV ratings)
- Constant torque operation from 1/20 speed to base speed (TEFC ratings)
- Constant horsepower to twice base speed (RPM)
- Class H insulation with CR200 magnetic wire
- Continuous duty at 40°C ambient
- "Quick Connect" terminal board as noted
- Top mounted conduit box with pigtail leads (TEFC and 1.5Hp TENV)
- UL recognized and CSA certified
- Three year warranty

C-Face with Rigid Base

Hp	RPM	Volts	Encl.	Frame	Catalog No.	F.L.A.	Weight	Notes
1/8	1800	230	TENV	56C	Y605 *	1.0	18	N, Q
1/4	1800	230	TENV	56C	Y500 *	1.0	18	N, Q
1/3	1800	230	TENV	56C	Y502 *	1.2	18	N, Q
1/2	1800	230	TENV	56C	Y504 *	1.8	20	N, Q
	1800	230/460	TENV	56C	Y360 *	1.8/0.9	20	N
	1800	575	TENV	56C	Y361 *	0.7	20	N, Q
3/4	1800	230	TEFC	56C	Y506 *	2.8	23	
	1800	230/460	TEFC	56C	Y362 *	2.8/1.4	23	
	1800	575	TEFC	56C	Y363	1.1	23	
1	1800	230	TEFC	56C	Y508 *	3.2	28	
	1800	230/460	TEFC	56C	Y364 *	3.2/1.6	28	
	1800	575	TEFC	56C	Y365 *	1.3	28	
1 1/2	1800	230	TENV	145TC	Y522 *	4.8	49	N, 6
	1800	230/460	TENV	145TC	Y366 *	4.8/2.4	49	N, 6
	1800	575	TENV	145TC	Y367 *	1.9	49	N, 6
2	1800	230	TEFC	145TC	Y523 *	5.8	50	6
	1800	230/460	TEFC	145TC	Y368 *	5.8/2.9	50	6
	1800	575	TEFC	145TC	Y369 *	2.3	50	6
3	1800	230	TEFC	182TC	Y998	8.4	70	
	1800	230/460	TEFC	182TC	Y999 *	8.4/4.2	70	
	1800	575	TEFC	182TC	Y270	3.5	70	
5	1800	230/460	TEFC	184TC	Y372 *	13.4/6.7	88	6
	1800	575	TEFC	184TC	Y373	5.4	88	6
7 1/2	1800	230/460	TEFC	213TC	Y994 *	21.4/10.7	125	
	1800	575	TEFC	213TC	Y995	8.5	125	
10	1800	230/460	TEFC	215TC	Y996 *	28.0/14.0	135	
	1800	575	TEFC	215TC	Y997	11.2	135	

* Marathon Motors stock item.

For additional information visit www.marathonelectric.com/motors/search.asp

C-Face Footless

Hp	RPM	Volts	Encl.	Frame	Catalog No.	F.L.A.	Weight	Notes
1/8	1800	230	TENV	56C	Y606 *	1.0	17	N, Q
1/4	1800	230	TENV	56C	Y501 *	1.0	17	N, Q
1/3	1800	230	TENV	56C	Y503 *	1.2	17	N, Q
1/2	1800	230	TENV	56C	Y505 *	1.8	19	N, Q
	1800	230/460	TENV	56C	Y374 *	1.8/0.9	19	N
	1800	575	TENV	56C	Y375 *	0.7	19	N, Q
3/4	1800	230	TEFC	56C	Y507 *	2.8	23	
	1800	230/460	TEFC	56C	Y376 *	2.8/1.4	23	
	1800	575	TEFC	56C	Y377	1.1	23	
1	1800	230	TEFC	56C	Y521 *	3.2	27	
	1800	230/460	TEFC	56C	Y378 *	3.2/1.6	27	
	1800	575	TEFC	56C	Y379 *	1.3	27	

* Marathon Motors stock item.

Notes:

N: Totally Enclosed Non Ventilated; Q: "Quick Connect" terminal board; 6: Bolt-on, removable base for footless mounting option.

For additional information visit www.marathonelectric.com/motors/search.asp

Black MAX™ Vector Duty

1000:1 Constant Torque

Designed for inverter or vector duty applications where up to a 1000:1 constant torque speed range is required. Typical uses include: material handling, machine tools, conveyors, crane & hoist, metal processing and other industrial machinery installed in dusty or dirty environments.

- Class F MAX GUARD insulation system
- Constant torque operation from 0 to base speed on vector drive
- Constant horsepower to twice base speed (RPM)
- Continuous duty at 40°C ambient
- Optimized for operation with IGBT inverter (NEMA Design A)
- Class F N/C thermostats
- Ball bearing
- Removable Base on some models as noted
- F1 standard, field reversible to F2 (except where noted)
- Encoder and brake provisions included on opposite drive end (maximum 10 lb-ft brake)
- UL recognized and CSA certified
- Three year warranty

Totally Enclosed Non-Ventilated, C-Face with Rigid Base

Hp	RPM	Volts	Frame	Catalog No.	F.L.A.	Weight	Notes
1/4	1800	230/460	56C	Y592 *	1.2/0.6	19	N, S, 13
1/2	1800	230/460	56C	Y534 *	1.6/0.8	28	N, S, 6, 13
	1800	575	56C	Y555 *	0.6	28	N, S, 6, 13
1	1800	230/460	56C	Y535 *	3.0/1.5	39	N, S, 6, 13
	1800	575	56C	Y556 *	1.2	40	N, S, 6, 13
	1800	230/460	143TC	Y536 *	3.0/1.5	43	N, S, 6, 13
	1200	230/460	145TC	Y537 *	3.8/1.9	49	N, S, 6, 13
1 1/2	1800	230/460	145TC	Y538 *	4.8/2.4	50	N, S, 6, 13
2	1800	230/460	145TC	Y551 *	6.0/3.0	70	N
	1800	575	145TC	Y557 *	2.4	70	N
	1200	230/460	184TC	Y540 *	6.6/3.3	88	N, AL
3	1800	230/460	182TC	Y541 *	8.4/4.2	93	N, AL
	1800	575	182TC	Y558 *	3.4	98	N, AL
	1200	230/460	213TC	Y542 *	9.4/4.7	118	N, AL
5	1800	230/460	184TC	Y543 *	14.0/7.0	103	N, AL
	1800	575	184TC	Y559 *	5.4	103	N, AL
	1200	230/460	215TC	Y544 *	15.4/7.7	128	N, AL
7 1/2	1800	230/460	213TC	Y545 *	21.0/10.5	146	N, AL
	1800	575	213TC	Y560 *	8.4	150	N, AL
	1200	230/460	254TC	Y546 *	22.0/11.0	209	N, AL
10	1800	230/460	215TC	Y547 *	27.0/13.5	159	N, AL
	1800	575	215TC	Y561 *	10.8	159	N, AL
	1200	230/460	256TC	Y548 *	28.0/14.0	275	N, AL
15	1800	230/460	254TC	Y549 *	40.0/20.0	250	N, AL, I
	1800	575	254TC	Y562 *	16.0	250	N, AL, I
20	1800	230/460	256TC	Y552 *	50.0/25.0	320	N, I
	1800	575	256TC	Y563 *	20.0	320	N, I
25	1800	230/460	284TC	Y553 *	62.0/31.0	525	N, I
	1800	575	284TC	Y567 *	24.8	525	N, I
30	1800	230/460	286TC	Y393 *	80.0/40.0	575	N, I

* Marathon Motors stock item. Shaded areas are cast iron frames.

Notes:

AL: Aluminum Frame Construction; N: Totally Enclosed Non-Ventilated; I: Intermittent duty from 90-120Hz operation; S: Steel Frame Construction; 6: Bolt-on, removable base for footless mounting option; 13: F1 Mounting only, cannot modify to F2.

For additional information visit www.marathonelectric.com/motors/search.asp

Black MAX™ Vector Duty: Encoders through Mod Center

Brand	Model	PPR	Catalog No.	Notes
Avtron	HS25A	1024	A746*	Optical Hollow Shaft, MS connector
		2048	A747*	
	HS35A	1024	A736*	Optical Hollow Shaft, MS connector
		2048	A739*	
	HS35M	1024	A742*	Magnetic Hollow Shaft, EPIC connector
		2048	A744	
	M3	1024	A753*	Optical Hollow Shaft, EPIC connector
	M56	1024	A793*	Magnetic Modular Style, EPIC connector
Dynapar	HS35	1024	A772*	Shaft mount, 5-26VDC, with 10 pin connector
		2048	A776*	
BEI	HS35	1024	A779*	Shaft mount, 5-26VDC, with 10 pin connector
		2048	A780*	

* Marathon Motors stock item.

For additional information visit www.marathonelectric.com/motors/search.asp

Blue MAX™ 2000 Vector Duty

2000:1 Constant Torque

Designed for inverter or vector duty applications where up to a 2000:1 constant torque speed range is required. Typical uses include: material handling, machine tools, conveyors, crane & hoist, metal processing, test stands, pumps, compressors, textile processing and other industrial machinery installed in dusty or dirty environments where cast iron construction is required.

- Class H MAX GUARD insulation system
- Constant torque operation from 0 to base speed on vector drive, including TEFC (on V/Hz drives, TEFC motors are limited to 20:1 Constant Torque)
- Constant horsepower to twice base speed (143-254 frame); 1.5 times base (all others)
- Continuous duty at 40°C ambient
- Optimized for operation with IGBT inverter (NEMA Design A)
- C-Face foot mount through 100 Hp as noted
- Class F N/C thermostats
- Ball bearing (roller bearing available 360 frame and larger)
- Cast iron frame and brackets
- Patented "fracket" design (TEBC enclosure)
- "B" temperature rise on Blower-Cooled motors
- F1 standard, field reversible to F2
- Encoder and brake provisions included on opposite drive end
- UL recognized and CSA certified
- Three year warranty

Totally Enclosed Rigid Base, and C-Face with Rigid Base

Hp	RPM	Volts	Encl.	Frame	Catalog No.	F.L.A.	Weight	Notes
1	1800	230/460	TENV	143TC	Y525 *	3.0/1.5	61	NEMA Design B
1 1/2	1800	230/460	TENV	145TC	Y590 *	4.6/2.3	68	
2	1800	230/460	TENV	145TC	Y526 *	6.0/3.0	70	
3	1800	230/460	TENV	182TC	Y527 *	8.0/4.0	110	
5	1800	230/460	TENV	184TC	Y564 *	13.4/6.7	117	NEMA Design B
7 1/2	1800	230/460	TEFC	213TC	Y595 *	19.4/9.7	191	
	1800	230/460	TENV	213TC	Y565 *	21.0/10.5	180	
10	1800	230/460	TEFC	215TC	Y596 *	25.4/12.7	211	
	1800	230/460	TENV	215TC	Y566 *	26.0/13.0	290	
15	1800	230/460	TEFC	254TC	Y597 *	37.0/18.5	339	
	1800	230/460	TENV	254TC	Y509 *	40.4/20.2	350	
	1200	230/460	TEBC	284TC	Y395 *	40.0/20.0	480	
20	1800	230/460	TEFC	256TC	Y598 *	52.0/26.0	375	
	1800	230/460	TENV	256TC	Y510 *	50.0/25.0	380	
	1200	230/460	TEBC	286TC	Y582	52.4/26.2	500	NEMA Design B
25	1800	230/460	TEFC	284T	Y569 *	63.0/31.5	492	
	1800	230/460	TEBC	284TC	Y511 *	63.0/31.5	500	
	1200	230/460	TEBC	324TC	Y583 *	67.0/33.5	620	NEMA Design B
30	1800	230/460	TEFC	286T	Y570 *	77.0/38.5	594	
	1800	230/460	TEBC	286TC	Y512 *	74.0/37.0	520	
	1200	230/460	TEBC	326TC	Y584 *	82.0/41.0	686	NEMA Design B
40	1800	230/460	TEFC	324T	Y571 *	100/50.0	540	
	1800	230/460	TEBC	324TC	Y513 *	100/50.0	620	
	1200	230/460	TEBC	364TC	Y585 *	104/52.0	1050	
50	1800	230/460	TEFC	326T	Y572 *	121/60.5	540	
	1800	230/460	TEBC	326TC	Y514 *	120/60.0	640	
	1200	230/460	TEBC	365TC	Y586	130/65.0	1100	

* Marathon Motors stock item.
Note:
B: NEMA Design B.
For additional information visit www.marathonelectric.com/motors/search.asp

Totally Enclosed Rigid Base, and C-Face with Rigid Base (continued)

Hp	RPM	Volts	Encl.	Frame	Catalog No.	F.L.A.	Weight	Notes
60	1800	230/460	TEFC	364T	Y573 *	147/73.5	965	
	1800	230/460	TEBC	364TC	Y515 *	147/73.5	1062	
	1200	230/460	TEBC	404TC	Y587 *	142/71.0	1380	
75	1800	230/460	TEFC	365T	Y574 *	184/92.0	1006	
	1800	230/460	TEBC	365TC	Y516 *	180/90.0	1106	
	1200	230/460	TEBC	405TC	Y588 *	180/90.0	1450	NEMA Design B
100	1800	230/460	TEFC	405T	Y575 *	230/115	1308	
	1800	230/460	TEBV	405TC	Y517 *	230/115	1429	
	1200	230/460	TEBC	444TC	Y589 *	250/125	2150	
125	1800	460	TEFC	444T	Y576 *	143	2062	
	1800	460	TEBC	444T	Y518 *	138	2110	NEMA Design B
150	1800	460	TEFC	445T	Y577 *	170	2246	
	1800	460	TEBC	445T	Y519 *	170	2321	
200	1800	460	TEFC	445T	Y578 *	230	2404	
	1800	460	TEBC	445T	Y520 *	230	2457	
250	1800	460	TEFC	449T	Y579	295	2800	
	1800	460	TEBC	449T	Y531 *	295	2880	
300	1800	460	TEFC	449T	Y580	330	2890	20:1
	1800	460	TEBC	449T	Y532 *	327	2950	
350	1800	460	TEBC	449T	Y533 *	385	3075	

* Marathon Motors stock item.
Note:
B: NEMA Design B.
For additional information visit www.marathonelectric.com/motors/search.asp

Blue MAX™ 2000 Vector Duty / Encoders Through Mod Center

Encl.	Brand	Model	PPR	Catalog No.	Notes
TENV	Avtron	HS25A	1024	A746*	Optical Hollow Shaft, MS connector
			2048	A747*	
		HS35A	1024	A736*	Optical Hollow Shaft, MS connector
			2048	A739*	
		HS35M	1024	A742*	Magnetic Hollow Shaft, EPIC connector
			2048	A744	
		M3	1024	A753*	Optical Hollow Shaft, EPIC connector
		M56	1024	A793*	Magnetic Modular Style, EPIC connector
	Dynapar	HS35	1024	A772*	Shaft mount, 5-26VDC, with 10 pin connector
			2048	A776*	
	BEI	HS35	1024	A779*	Shaft mount, 5-26VDC, with 10 pin connector
			2048	A780*	
TEFC	Avtron	HS35A	1024	A737*	Optical Hollow Shaft, MS connector
			2048	A740	
		HS35M	1024	A742*	Magnetic Hollow Shaft, EPIC connector
			2048	A744	
		M3	1024	A754*	Optical Hollow Shaft, EPIC connector
	Dynapar	HS35	1024	A774*	Shaft mount, 5-26VDC, with 10 pin connector
			2048	A777*	
	BEI	HS35	1024	A783*	Shaft mount, 5-26VDC, with 10 pin connector
			2048	A784*	
TEBC	Avtron	HS35A	1024	A738*	Optical Hollow Shaft, MS connector
			2048	A741*	
		HS35M	1024	A743*	Magnetic Hollow Shaft, EPIC connector
			2048	A745	
		M56	1024	A794*	Magnetic Modular Style, EPIC connector
	Dynapar	HS35	1024	A775*	Shaft mount, 5-26VDC, with 10 pin connector
			2048	A778*	
	BEI	HS35	1024	A781*	Shaft mount, 5-26VDC, with 10 pin connector
			2048	A782*	
				A801*	Encoder Conduit box

* Marathon Motors stock item.
For additional information visit www.marathonelectric.com/motors/search.asp