

FR-A800-E Series

The FR-A800-E adds an integrated web server and 100Mbit Ethernet TCP/IP connectivity as standard to the existing network options of the FR-A800 flagship multi-use inverter. The FR-A800-E provides machine builders and systems integrators an increased ability for remote system monitoring and parameter adjustment, as well as easy integration into existing network environments.

- **High Speed Response:** With a speed response of 50Hz, FR-A800 to respond to a change in motor load. FR-A800 reacts to a speed signal much faster too – between 2 to 3 ms as opposed to 5 to 20 ms with FR-A700.
- **Wide Speed Range:** 200:1 speed range open loop, 1500:1 closed loop speed range.
- **Extended Maximum Speed:** A standard FR-A800 VFD can drive high speed motors at up to 590Hz, compared to the FR-A700's 400Hz.
- **IPM Motor Control:** Standard FR-A800 VFDs can drive the new generation IPM (Internal Permanent Magnet) motors, such as the Marathon 'SyMAX' Series.
- **Safety Stop:** FR-A800 is a SAFETY drive. "STO" capability enables SIL2 / PLD category emergency stops.
- **Compatible with USB Stick:** VFD settings can be easily uploaded or downloaded and 'black box' operating data at the time of a drive trip can be copied for diagnosis using the FR-Configurator software.
- **GOT Interface:** Automatic connectivity to GOT 2000 series GOTs without the need to change any parameters.
- **Improved PLC:** FR-A800 has a new internal PLC based around the Mitsubishi Electric 'L Series' processor. Instructions in the form of 'Function Blocks' can now be used.
- **Conformal Coating:** All FR-A800 VFDs have Conformal Coated boards as standard.
- **Separate Rectifier Stage:** For drives over 500 HP – greater system flexibility.
- **Ethernet Communications as Standard –** Communicate with MODBUS TCP/IP or CC-Link IE Field Basic communications networks at a speed of 100Mbps without the need for an extra option card.
- **Automatic IP Address Detection –** Automatically detect the IP address of all connected drives, quickly enabling connection and programming using FR-Configurator2 software.
- **Multiple Protocol Capability –** Network option cards offer connection to other drive based networks and a higher level information system.
- **Drive to Drive Communications –** Utilize the internal PLC to communicate without a master PLC controller allowing the drives to work together as a team.



FR-A8 1 0- 2 3 4

1 Max Load Capacity

Symbol	Voltage Class
2	200V class
4	400V class

2 Voltage

Symbol	Voltage Class
100023 to 068301	Inverter SLD rated current (A)
0.4 to 280K	Inverter ND rated capacity (kW)

3 Communication

Symbol	Type (*1)	Communication Type
E1	FM	Ethernet (*2)
E2	CA	

4 Circuit Board

Symbol	Circuit Board Coating (conforming to IEC60721-3-3 3C2/3S2)	Plated Conductor
None	Without	Without
60	With	Without
06 (*3)	With	With

1. Specification differs by the type. Major differences are shown in the table below.
 2. Inverter equipped with a built-in Ethernet board (FR-A8ETH).
 3. Applicable for the FR-A820-00340(5.5K) or higher, and the FR-A840-00170(5.5K) or higher

Type	Monitor Output	Initial Setting			
		Built-in EMC Filter	Control Logic	Rated Frequency	Pr.19 Base Frequency Voltage
FM (Terminal FM Equipped Model)	Terminal FM: pulse train output Terminal AM: analog voltage output (0 to ±10 VDC)	OFF	Sink logic	60 Hz	9999 (same as the power supply voltage)
CA (Terminal CA Equipped Model)	Terminal CA: analog current output (0 to 20 mADC) Terminal AM: analog voltage output (0 to ±10 VDC)	ON	Source logic	50 Hz	8888 (95% of the power supply voltage)

FR-A800-E Ratings 240V Class

Model Number	AMPS for Duty				Horsepower For Duty (NEC)				Frame Size	Weight	Cooling Method	Protective Rating	Regen. Braking Torque / Duty Using Standard Brake Resistors Where Supplied	Stocked Item
	SLD	LD	ND	HD	SLD	LD	ND	HD						
FR-A820-00046-E1N6	4.6	4.2	3	1.5	1		0.75	0.25	A	5.5	Self-Cooling	NEMA 1, UL-1, Plenum Rated (IP20)	150% torque / 3% ED	S
FR-A820-00077-E1N6	7.7	7	5	3	2		1	0.5	B	5.9			100% torque / 3% ED	S
FR-A820-00105-E1N6	10.5	9.6	8	5	3		2	1	C	8.8	100% torque / 2% ED		S	
FR-A820-00167-E1N6	16.7	15.2	11	8	5		3	2	C	8.8	20% torque / 100% ED (Brake transistor included)		S	
FR-A820-00250-E1N6	25	23	17.5	11	7.5		5	3	C	8.8			S	
FR-A820-00340-E1N6	34	31	24	17.5	10		7.5	5	D	16.7			S	
FR-A820-00490-E1N6	49	45	33	24	20	15	10	7.5	D	16.7			S	
FR-A820-00630-E1N6	63	58	46	33	20		15	10	E	20.5			S	
FR-A820-00770-E1N6	77	70.5	61	46	25		20	15	F	37.4			S	
FR-A820-00930-E1N6	93	85	76	61	30		25	20	F	37.4			S	
FR-A820-01250-E1N6	125	114	90	76	40		30	25	F	37.4	Forced Air Cooling	IP00	20% torque / 100% ED (Use FR-BU2 brake unit for higher ratings)	S
FR-A820-01540-E160	154	140	115	90	60	50	40	30	G	48.4				S
FR-A820-01870-E160	187	170	145	115	60		50/60	40	H	92.4				S
FR-A820-02330-E160	233	212	175	145	75		60	50	H	92.4				S
FR-A820-03160-E160 (*1)	316	288	215	175	125	100	75	60	K	118.8				S
FR-A820-03800-E1U6 (*1)	380	346	288	215	150	125	100	75	L	162.8				S
FR-A820-04750-E1U6 (*1)	475	432	346	288	150		125	100	L	162.8				S

Note 1: These drives must be used together with a DC Link Choke, sold separately.
 SLD- 110% 60s, 120% 3s (inverse-time characteristics) at ambient temperature 40°C
 LD- 120% 60s, 150% 3s (inverse-time characteristics) at ambient temperature 50°C
 ND- 150% 60s, 200% 3s (inverse-time characteristics) at ambient temperature 50°C
 HD- 200% 60s, 250% 3s (inverse-time characteristics) at ambient temperature 50°C

FR-HEL DC Link Chokes (sold separately)

Model Number	SLD	LD	ND	HD
FR-A820-03160-E160	FR-HEL-90K	FR-HEL-75K	-	-
FR-A820-03800-E1U6	FR-HEL-110K	FR-HEL-90K	FR-HEL-75K	-
FR-A820-04750-E1U6	FR-HEL-110K	FR-HEL-110K	FR-HEL-90K	FR-HEL-75K

FR-A800-E Ratings 480V Class

Model Number	AMPS For Duty				Horsepower For Duty (NEC)				Frame Size	Weight (lbs) (*4)	Cooling Method	Protective Rating	Regen. Braking Torque / Duty (Using Standard Brake Resistors Where Supplied)	Stocked Item
	SLD	LD	ND	HD	SLD	LD	ND	HD						
FR-A840-00023-E1N6	2.3	2.1	1.5	0.8	1	1	0.5	0.25		7.7	Self-Cooling	NEMA 1, UL-1, Plenum Rated (IP20)	100% torque / 2% ED	S
FR-A840-00038-E1N6	3.8	3	2.5	1.5	2	2	1	0.5		7.7				S
FR-A840-00052-E1N6	5.2	4.8	4	2.5	3	3	2	1	C	7.7				S
FR-A840-00083-E1N6	8.3	7.6	6	4	5	5	3	2		8.8				S
FR-A840-00126-E1N6	12.6	11.5	9	6	7.5	7.5	5	3		8.8				S
FR-A840-00170-E1N6	17	16	12	9	10	10	7.5	5	D	16.7				S
FR-A840-00250-E1N6	25	23	17	12	15	15	10	7.5		16.7				S
FR-A840-00310-E1N6	31	29	23	17	20	20	15	10	E	20.5				S
FR-A840-00380-E1N6	38	35	31	23	25	25	20	15		20.5				S
FR-A840-00470-E1N6	47	43	38	31	30	30	25	20	F	37.4				S
FR-A840-00620-E1N6	62	57	44	38	40	40	30	25		37.4	S			
FR-A840-00770-E160	77	70	57	44	60	50	40	30	G	50.6	20% torque / 100% ED (Brake transistor included)	S		
FR-A840-00930-E160	93	85	71	57	60	60	50	40		90.2		S		
FR-A840-01160-E160	116	106	86	71	75	75	60	50	H	90.2		S		
FR-A840-01800-E160 (*1)	180	144	110	86	150	100	75	60		94.6		S		
FR-A840-02160-E1U6 (*1)	216	180	144	110	150	150	100	75	J	114.4		S		
FR-A840-02600-E1U6 (*1)	260	216	180	144	200	150	150	100		121.0		S		
FR-A840-03250-E1U6 (*1)	325	260	216	180	250	200	150	150	L	156.2		S		
FR-A840-03610-E1U6 (*1)	361	325	260	216	300	250	200	150		171.6		S		
FR-A840-04320-E1U6 (*1)	432	361	325	260	350	300	250	200	M	257.4		S		
FR-A840-04810-E1U6 (*1)	481	432	361	325	400	350	300	250		257.4		S		
FR-A840-05470-E1U6 (*1)	547	481	432	361	450	400	350	300	N	365.2	S			
FR-A840-06100-E1U6 (*1)	610	547	481	432	500	450	400	350		365.2	S			
FR-A840-06830-E1U6 (*1)	683	610	547	481	550	500	450	400		365.2	S			
FR-A842-07700-E1U6 + FR-CC2-H315K-60 (*2)	-	-	610	547	-	-	500	450	P+R	820.6	Forced Air Cooling	IP00	10% torque / 100% ED (Use FR-BU2-H for higher ratings)	- (*3)
FR-A842-08660-E1U6 + FR-CC2-H315K-60 (*2)	-	-	-	610	-	-	-	500		820.6				- (*3)
FR-A842-07700-E1U6 + FR-CC2-H355K-60 (*2)	-	683	-	-	-	550	-	-		827.2				- (*3)
FR-A842-08660-E1U6 + FR-CC2-H355K-60 (*2)	-	-	683	-	-	-	550	-		827.2				- (*3)
FR-A842-09620-E1U6 + FR-CC2-H355K-60 (*2)	-	-	-	683	-	-	-	550	Q+R	1003.2				- (*3)
FR-A842-07700-E1U6 + FR-CC2-H400K-60 (*2)	770	-	-	-	650	-	-	-	P+S	979				- (*3)
FR-A842-08660-E1U6 + FR-CC2-H400K-60 (*2)	-	770	-	-	-	650	-	-		979				- (*3)
FR-A842-09620-E1U6 + FR-CC2-H400K-60 (*2)	-	-	770	-	-	-	650	-	Q+S	1155				- (*3)
FR-A842-10940-E1U6 + FR-CC2-H400K-60 (*2)	-	-	-	770	-	-	-	650		1155				- (*3)
FR-A842-08660-E1U6 + FR-CC2-H450K-60 (*2)	866	-	-	-	700	-	-	-	P+S	986				- (*3)
FR-A842-09620-E1U6 + FR-CC2-H450K-60 (*2)	-	866	-	-	-	700	-	-	Q+S	1162	- (*3)			
FR-A842-10940-E1U6 + FR-CC2-H450K-60 (*2)	-	-	866	-	-	-	700	-		1162	- (*3)			
FR-A842-12120-E1U6 + FR-CC2-H450K-60 (*2)	-	-	-	866	-	-	-	700		1162	- (*3)			
FR-A842-09620-E1U6 + FR-CC2-H500K-60 (*2)	962	-	-	-	800	-	-	-		1168	- (*3)			
FR-A842-10940-E1U6 + FR-CC2-H500K-60 (*2)	-	962	-	-	-	800	-	-		1168	- (*3)			
FR-A842-12120-E1U6 + FR-CC2-H500K-60 (*2)	-	-	962	-	-	-	800	-		1168	- (*3)			
FR-A842-10940-E1U6 + FR-CC2-H560K-60 (*2)	1094	-	-	-	900	-	-	-		1179	- (*3)			
FR-A842-12120-E1U6 + FR-CC2-H560K-60 (*2)	-	1094	-	-	-	900	-	-		1179	- (*3)			
FR-A842-12120-E1U6 + FR-CC2-H630K-60 (*2)	1212	-	-	-	1000	-	-	-		1181	- (*3)			

Notes:

1. These drives must be used with DC Link Chokes (sold separately).
2. Drives are "sectional" design, used together with FR-CC2 rectifier stage.
3. Consult VFD Marketing for availability.
4. For FR-A842 and FR-CC2 combinations, the weights are COMBINED. Drives in shaded area MUST be used together with FR-HEL DC Link Choke (sold separately).

FR-A800-E Ratings 600V Class

Model Number (*4)	AMPS for Duty				Horsepower for Duty (NEC)				Frame Size	Weight (lbs)	Cooling Method	Protective Rating	Regen. Braking Torque / Duty (Using Standard Brake Resistors Where Supplied)
	SLD	LD	ND	HD	SLD	LD	ND	HD					
FR-A860-00027-E1N6	2.7	2.5	1.7	1	2	1.5	1	0.5	C	11.7	Self Cooling	Enclosed Type (UL-1 plenum rated) (*3)	20% Braking Torque 100% ED
FR-A860-00061-E1N6	6.1	5.6	4	2.7	5	3	3	2	C	12.8			
FR-A860-00090-E1N6	9	8.2	6.1	4	7.5	5	5	3	C	12.8			
FR-A860-00170-E1N6	17	16	12	9	15	10	10	7.5	D	15.4			
FR-A860-00320-E1N6	32	27	22	16	30	25	20	10	E	19.8			
FR-A860-00450-E1N6	45	41	33	24	40	40	30	20	F	37.4			
FR-A860-00680-E160	68	62	55	41	60	60	50	40	H	79.2			
FR-A860-01080-E160 (*1)	108	99	84	63	100	100	75	60	H	90.2			
FR-A860-01440-E160 (*1)	144	131	104	84	150	125	100	75	J	114			
FR-A860-01670-E160 (*1)	167	152	131	104	150	150	125	100	J	114			
FR-A860-02430-E160 (*1)	243	221	152	131	250	200	150	125	J	121	Forced Air Cooling	Open Type (IP00)	10% Braking Torque 100% ED (Use FR-BU2-C for higher rating)
FR-A860-02890-E160 (*1)	289	255	221	152	300	250	200	150	M	246			
FR-A860-03360-E160 (*1)	336	304	255	202	350	300	250	200	M	253			
FR-A860-04420-E160 (*1)	442	402	304	255	450	400	300	250	N	337			
FR-A862-05450-E160 + FR-CC2-C355K-60 (*2)	545	496	402	304	550	500	400	300	P+R	810			
FR-A862-06470-E160 + FR-CC2-C400K-60 (*2)	647	589	496	402	650	600	500	400	Q+S	920			
FR-A862-08500-E160 + FR-CC2-C560K-60 (*2)	850	773	663	589	850	750	650	600	Q+S	1126			

Notes:

- These drives MUST be used with a DC Link Choke (sold separately).
- FR-A862 Drives are inverter stage only; use together with FR-CC2-C rectifier stage. Maximum Input and Output Current of FR-CC2 modules is the value shown. COMBINED weight shown.
- Remove the standard brake resistor (if fitted) for UL type 1. Rating is otherwise NEMA 1.
- The FR-A860 does not include a built in parameter unit. The FR-DU08 or FR-LU08 is sold separately.

690 VAC Power Input

Model Number	A870-02300-E1-60		A870-02860-E1-60	
Stocked Item	-		-	
Applicable Motor Capacity (kW) (*1)	SLD	200	SLD	250
	ND (Initial Setting)	160	ND (Initial Setting)	200
Output	Rated Capacity (kVA) (*2)	SLD	275	342
		ND (Initial Setting)	221	275
	Rated Current (A) (*3)	SLD	230	286
		ND (Initial Setting)	185	230
Overload Current Rating	SLD	110% 60 s, 120% 3 s (inverse-time characteristics) at surrounding air temperature 40°C		
	ND (Initial Setting)	150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature 40°C		
Rated Voltage	Three-phase 600 to 690 V			
Rated input AC Voltage/Frequency	Three-phase 600 to 690 V 50 Hz/60 Hz			
Permissible AC Voltage Fluctuation	540 to 759 V 50 Hz/60 Hz			
Permissible Frequency Fluctuation	±5%			
Power Supply	Rated Input Current (A)	SLD	230	286
		ND (Initial Setting)	185	230
	Power Supply Capacity (kVA)	SLD	275	342
	ND (Initial Setting)	221	275	
Protective Structure (IEC 60529)	Enclosed type (IP20)			
Cooling System	Forced air cooling			
Noise Level (dB)	79			79
Approx. Weight (kg)	120			122

600 VAC Power Input

Model Number	A870-02300-E1-60		A870-02300-E1-60	
Stocked Item	-		-	
Applicable Motor Capacity (kW) (*1)	SLD	132	SLD	160
	ND (Initial Setting)	110	ND (Initial Setting)	132
Output	Rated Capacity (kVA) (2)	SLD	229	285
		ND (Initial Setting)	184	229
	Rated Current (A) (*3)	SLD	230	286
		ND (Initial Setting)	185	230
Overload Current Rating	SLD	110% 60 s, 120% 3 s (inverse-time characteristics) at surrounding air temperature 40°C		
	ND (Initial Setting)	150% 60 s, 200% 3 s (inverse-time characteristics) at surrounding air temperature 40°C		
Rated Voltage (*5)	Three-phase 525 to 600 V			
Rated input AC Voltage/Frequency	Three-phase 525 to 600 V 50 Hz/60 Hz			
Permissible AC Voltage Fluctuation	472 to 660 V 50 Hz/60 Hz			
Permissible Frequency Fluctuation	±5%			
Power Supply	Rated Input Current (A)	SLD	230	286
		ND (Initial Setting)	185	230
	Power Supply Capacity (kVA)	SLD	229	285
	ND (Initial Setting)	184	229	
Protective Structure (IEC 60529)	Enclosed type (IP20)			
Cooling System	Forced air cooling			
Noise Level (dB)	79			79
Approx. Weight (kg)	120			122

Notes: See User Manual for detailed information.

- Indicates the maximum capacity applicable to voltage of 690 V.
- The rated output capacity indicated assumes that the output voltage is 690 V.
- Possible output currents during continuous operation under Real sensorless vector control or Vector control are shown in the table below. The PWM carrier frequency is automatically decreased to 2 kHz for heavy duty applications when operating the motor under Real sensorless vector control or Vector control with a PWM carrier frequency of 6 kHz or more (Pr.72 ≥ 6). The carrier frequency stays at 4 kHz in fast response operation.

FR-A800-E General Specifications

Operation Specifications	Control Method		Soft-PWM control, high carrier frequency PWM control (selectable among V/F control, Advanced magnetic flux vector control, Real sensorless vector control), Optimum excitation control, vector control (*1), and PM sensorless vector control
	Output Frequency Range		0.2 to 590 Hz (The upper-limit frequency is 400 Hz under Advanced magnetic flux vector control, Real sensorless vector control, vector control (*1) and PM sensorless vector control.)
	Frequency Setting Resolution	Analog Input	0.015 Hz/60 Hz (0 to 10 V/12 bits for terminals 2 and 4) 0.03 Hz/60 Hz (0 to 5 V/11 bits or 0 to 20 mA/approx. 11 bits for terminals 2 and 4, 0 to ±10 V/12 bits for terminal 1)
		Digital Input	0.01 Hz
	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 590 Hz. Constant-torque/variable-torque pattern or adjustable 5 points V/F can be selected.
	Starting Torque (*2)		SLD Rating: 120% 0.3 Hz, LD Rating:150% 0.3 Hz, ND Rating: 200% 0.3 Hz (*3), HD Rating: 250% 0.3 Hz (*3) (Real sensorless vector control, vector control (*1))
	Torque Boost		Manual torque boost
	Acceleration / Deceleration Time Setting		0 to 3600 s (acceleration and deceleration can be set individually), linear or S-pattern acceleration/deceleration mode, backlash countermeasures acceleration/deceleration can be selected.
	DC Injection Brake (Induction Motor)		Operation frequency (0 to 120 Hz), operation time (0 to 10 s), operation voltage (0 to 30%) variable
	Stall Prevention Operation Level		Activation range of stall prevention operation (SLD rating: 0 to 120%, LD rating: 0 to 150%, ND rating: 0 to 220%, HD rating: 0 to 280%). Whether to use the stall prevention or not can be selected. (V/F control, Advanced magnetic flux vector control)
	Torque Limit Level		Torque limit value can be set (0 to 400% variable). (Real sensorless vector control, vector control (*1) PM sensorless vector control)
	Frequency Setting Signal	Analog Input	Terminals 2 and 4: 0 to 10 V, 0 to 5 V, 4 to 20 mA (0 to 20 mA) are available. Terminal 1: -10 to +10 V, -5 to +5 V are available.
		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-A8AX)
Start Signal		Forward and reverse rotation or start signal automatic self-holding input (3-wire input) can be selected.	
Input Signals (Twelve Terminals)		Low-speed operation command, Middle-speed operation command, High-speed operation command, Second function selection, Terminal 4 input selection, Jog operation selection, Selection of automatic restart after instantaneous power failure, flying start, Output stop, Start self-holding selection, Forward rotation command, Reverse rotation command, Inverter reset. The input signal can be changed using Pr.178 to Pr.189 (Input terminal function selection).	
Pulse Train Input		100 kpps	
Operational Functions		Maximum and minimum frequency settings, multi-speed operation, acceleration/deceleration pattern, thermal protection, DC injection brake, starting frequency, JOG operation, output stop (MRS), stall prevention, regeneration avoidance, increased magnetic excitation deceleration, DC feeding (*4), frequency jump, rotation display, automatic restart after instantaneous power failure, electronic bypass sequence, remote setting, automatic acceleration/deceleration, retry function, carrier frequency selection, fast-response current limit, forward/reverse rotation prevention, operation mode selection, slip compensation, droop control, load torque high-speed frequency control, speed smoothing control, traverse, auto tuning, applied motor selection, gain tuning, RS-485 communication, Ethernet communication, PID control, PID precharge function, easy dancer control, cooling fan operation selection, stop selection (deceleration stop/coasting), powerfailure deceleration stop function, stop-on-contact control, PLC function, life diagnosis, maintenance timer, current average monitor, multiple rating, orientation control (*1), speed control, torque control, position control, pre-excitation, torque limit, test run, 24 V power supply input for control circuit, safety stop function, anti-sway control.	
Output Signals Open Collector Output (Five Terminals) Relay Output (Two Terminals)		Inverter running, Up to frequency, Instantaneous power failure/undervoltage (*4), Overload warning, Output frequency detection, Fault The output signal can be changed using Pr.190 to Pr.196 (Output terminal function selection). Fault codes of the inverter can be output (4 bits) from the open collector.	
Pulse Train Output		50 kpps	
Indication	Pulse Train Output (FM Type)		Max. 2.4 kHz: one terminal (output frequency) The monitored item can be changed using Pr.54 FM/CA terminal function selection.
	Current Output (CA Type)		Max. 20 mADC: one terminal (output frequency). The monitored item can be changed using Pr.54 FM/CA terminal function selection.
	Voltage Output		Max. 10 VDC: one terminal (output frequency). The monitored item can be changed using Pr.158 AM terminal function selection.
	Operation Panel (FR-DU08)	Operating Status	Output frequency, Output current, Output voltage, Frequency setting value. The monitored item can be changed using Pr.52 Operation panel main monitor selection.
Fault Record		A fault record is displayed when a fault occurs. Past 8 fault records and the conditions immediately before the fault (output voltage/current/frequency/cumulative energization time/year/month/date/time) are saved.	
Protective Functions			Overcurrent trip during acceleration, Overcurrent trip during constant speed, Overcurrent trip during deceleration or stop, Regenerative overvoltage trip during acceleration, Regenerative overvoltage trip during constant speed, Regenerative overvoltage trip during deceleration or stop, Inverter overload trip, Motor overload trip, Heatsink overheat, Instantaneous power failure (*4), Undervoltage (*4), Input phase loss (*4, *5), Stall prevention stop, Loss of synchronism detection (*5), Brake transistor alarm detection (*6), Output side earth (ground) fault overcurrent, Output short circuit, Output phase loss, External thermal relay operation (*5), PTC thermistor operation (*5), Option fault, Communication option fault, Parameter storage device fault, PU disconnection, Retry count excess (*5), CPU fault, Operation panel power supply short circuit, 24 VDC power fault, Abnormal output current detection (*5), Inrush current limit circuit fault (*4), Ethernet communication fault (*5), Analog input fault, USB communication fault, Safety circuit fault, Overspeed occurrence (*5), Speed deviation excess detection (*1, *5), Signal loss detection (*1, *5), Excessive position fault (*1, *5), Brake sequence fault (*5), Encoder phase fault (*1, *5), 4 mA input fault (*5), Pre-charge fault (*5), PID signal fault (*5), Option fault, Opposite rotation deceleration fault (*5), Internal circuit fault, Abnormal internal temperature (*7), Magnetic pole position unknown (*1)
Warning Functions			Fan alarm, Stall prevention (overcurrent), Stall prevention (overvoltage), Regenerative brake pre-alarm (*5, *6), Electronic thermal relay function pre-alarm, PU stop, Speed limit indication (*5), Parameter copy, Safety stop, Maintenance timer 1 to 3 (*5), USB host error, Home position return setting error (*5), Home position return uncompleted (*5), Home position return parameter setting error (*5), Operation panel lock (*5), Password locked (*5), Parameter write error, Copy operation error, 24 V external power supply operation, Internal fan alarm (*7), Continuous operation during communication fault, Ethernet communication fault
Environment	Ambient Temperature		-10°C to +50°C (non-freezing) (LD, ND, HD ratings) -10°C to +40°C (non-freezing) (SLD rating, IP55 compatible model)
	Ambient Humidity		95% RH or less (non-condensing) (With circuit board coating (conforming to IEC60721-3-3 3C2/3S2), IP55 compatible model) 90% RH or less (non-condensing) (Without circuit board coating)
	Storage Temperature (*8)		-20°C to +65°C (*2)
	Atmosphere		Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt, etc.)
	Altitude / Vibration		1000 m or lower (*9), 5.9 m/s ² (*10) or less at 10 to 55 Hz (directions of X, Y, Z axes)

Notes:

- Available only when a vector control compatible option is installed.
- For PM sensorless vector control, refer to the Instruction Manual (Detailed) of the FR-A800 inverter.
- In the initial setting of the FR-A820-00340(5.5K) or higher and the FR-A840-00170(5.5K) or higher, it is limited to 150% by the torque limit level.
- Enabled only for standard models and IP55 compatible models.
- This protective function is not available in the initial status.
- Enabled only for standard models.
- Available for the IP55 compatible model only.
- Temperature applicable for a short time, e.g. in transit.
- For the installation at an altitude above 1000 m (up to 2500 m), consider a 3% reduction in the rated current per altitude increase of 500 m.
- 2.9 m/s² or less for the FR-A840-04320(160K) or higher.

FR-HEL DC Link Chokes (sold separately)

Model Number	SLD	LD	ND	HD
FR-A840-01800-E1U6	FR-HEL-H110K	FR-HEL-H75K	FR-HEL-H75K	FR-HEL-H55K
FR-A840-02160-E1U6	FR-HEL-H110K	FR-HEL-H90K	FR-HEL-H75K	FR-HEL-H75K
FR-A840-02600-E1U6	FR-HEL-H132K	FR-HEL-H110K	FR-HEL-H90K	FR-HEL-H90K
FR-A840-03250-E1U6	FR-HEL-H160K	FR-HEL-H132K	FR-HEL-H110K	FR-HEL-H110K
FR-A840-03610-E1U6	FR-HEL-H185K	FR-HEL-H160K	FR-HEL-H132K	FR-HEL-H132K
FR-A840-04320-E1U6	FR-HEL-H220K	FR-HEL-H185K	FR-HEL-H160K	FR-HEL-H160K
FR-A840-04810-E1U6	FR-HEL-H250K	FR-HEL-H220K	FR-HEL-H185K	FR-HEL-H185K
FR-A840-05470-E1U6	FR-HEL-H280K	FR-HEL-H250K	FR-HEL-H220K	FR-HEL-H220K
FR-A840-06100-E1U6	FR-HEL-H315K	FR-HEL-H280K	FR-HEL-H250K	FR-HEL-H250K
FR-A840-06830-E1U6	FR-HEL-H355K	FR-HEL-H315K	FR-HEL-H280K	FR-HEL-H280K

FR-HEL DC Link Chokes (sold separately)

Model Number	SLD	LD	ND	HD
FR-A860-01080-E160	FR-HEL-C75K	FR-HEL-C75K	-	-
FR-A860-01440-E160	FR-HEL-C90K	FR-HEL-C90K	FR-HEL-C75K	-
FR-A860-01670-E160	FR-HEL-C110K	FR-HEL-C110K	FR-HEL-C90K	FR-HEL-C75K
FR-A860-02430-E160	FR-HEL-C132K	FR-HEL-C132K	FR-HEL-C110K	FR-HEL-C90K
FR-A860-02890-E160	FR-HEL-C185K	FR-HEL-C185K	FR-HEL-C132K	FR-HEL-C110K
FR-A860-03360-E160	FR-HEL-C220K	FR-HEL-C220K	FR-HEL-C185K	FR-HEL-C185K
FR-A860-04420-E160	FR-HEL-C280K	FR-HEL-C280K	FR-HEL-C220K	FR-HEL-C185K

Key to Duty Code (FR-A820, FR-A840)

	Overload Rating			Ambient Temp (°C)
	60s	3s		
SLD	110%	120%		40
LD	120%	150%		50
ND	150%	200%		50
HD	200%	250%		50

Key to Duty Code (FR-A860)

	Overload Rating		Ambient Temperature by Frame Size (°C)		
	60s	3s	C	D-H	J-Q
SLD	110%	120%	30	40	40
LD	120%	150%	40	40	50
ND	150%	200%	40	40	50
HD	200%	250%	40	40	40

FR-A800-E Dimensions - Frame Size Key

	Height-in (mm)	Width-in (mm)	Depth-in (mm)
A	12.2 (310)	4.33 (110)	4.39 (112)
B	12.2 (310)	4.33 (110)	4.98 (127)
C	12.52 (318)	5.91 (150)	5.57 (142)
D	12.76 (324)	8.66 (220)	6.69 (170)
E	14.29 (363)	8.66 (220)	7.48 (190)
F	20.37(517)	9.84 (250)	7.48 (190)
G	21.67 (550)	12.80 (325)	7.68 (195)
H	21.67 (550)	17.13 (435)	9.84 (250)
J	24.41 (620)	18.31 (465)	11.81 (300)
K	27.56 (700)	18.31 (465)	9.84 (250)
L	29.13 (740)	18.31 (465)	14.17 (360)
M	39.76 (1010)	19.61 (498)	14.96 (380)
N	39.76 (1010)	26.77 (680)	14.96 (380)
P	52.4 (1330)	21.3 (540)	17.3 (440)
Q	62.2 (1580)	26.8 (680)	17.3 (440)
R	52.4 (1330)	23.6 (600)	17.3 (440)
S	62.2 (1580)	23.6 (600)	17.3 (440)

Dimensions of REQUIRED DC Link Chokes (sold separately)

Model Number	Height - inches (mm)	Width - inches (mm)	Depth - inches (mm)	Weight (lbs)
FR-HEL-75K	13.39 (340)	5.91 (150)	7.87 (200)	37
FR-HEL-90K	13.39 (340)	5.91 (150)	7.87 (200)	42
FR-HEL-110K	15.75 (400)	6.89 (175)	7.87 (200)	44
FR-HEL-H75K	12.60 (320)	5.51 (140)	7.28 (185)	35
FR-HEL-H90K	13.39 (340)	5.91 (150)	7.48 (190)	44
FR-HEL-H110K	13.39 (340)	5.91 (150)	7.68 (195)	48
FR-HEL-H132K	15.94 (405)	6.89 (175)	7.87 (200)	57
FR-HEL-H160K	15.94 (405)	6.89 (175)	8.07 (205)	62
FR-HEL-H185K	15.94 (405)	6.89 (175)	9.45 (240)	64
FR-HEL-H220K	15.94 (405)	6.89 (175)	9.45 (240)	66
FR-HEL-H250K	17.32 (440)	7.48 (190)	9.84 (250)	77
FR-HEL-H280K	17.32 (440)	7.48 (190)	10.04 (255)	84
FR-HEL-H315K	19.5 (495)	8.3 (210)	9.8 (250)	92
FR-HEL-H355K	19.5 (495)	8.3 (210)	9.8 (250)	101
FR-HEL-C75K	12.6 (320)	5.5 (140)	7.3 (185)	35
FR-HEL-C90K	13.3 (340)	5.9 (150)	9.4 (240)	44
FR-HEL-C110K	13.3 (340)	5.9 (150)	9.4 (240)	51
FR-HEL-C132K	15.9 (405)	6.9 (175)	7.7 (195)	53
FR-HEL-C185K	15.9 (405)	6.9 (175)	9.4 (240)	70
FR-HEL-C220K	15.9 (405)	6.9 (175)	9.4 (240)	73
FR-HEL-C280K	17.3 (440)	7.5 (190)	9.8 (250)	88

FR-A800-E Dynamic Braking

All Mitsubishi Electric VFDs 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 following example. %ED = Braking time / total time for complete operating cycle x 100

Example: In a given application a load is accelerated for 5 seconds, runs for 60 seconds and decelerates in 3 seconds before resting for 12 seconds.

%ED = 3 / (5 + 60 + 3 + 12) x 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 x Power (kW) / Speed (rpm).

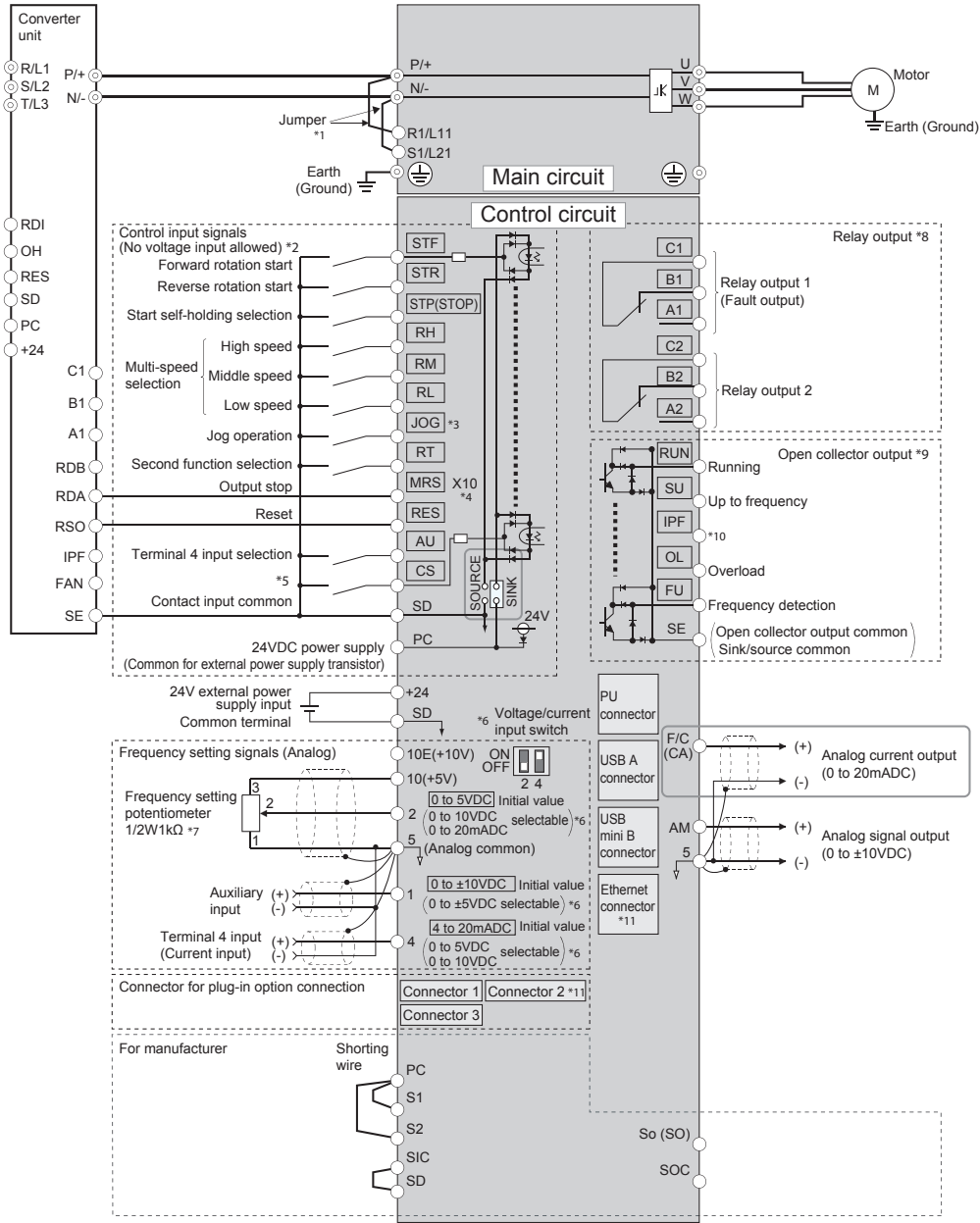
FR-A800-E Fitted with Internal Brake Resistor – Torque and Duty Cycle Figure

ND Mode HP	Drive Model Number	Internal Resistor			High Performance Brake Resistor Option			
		Brake Resistor Value (ohms)	Torque %	Duty % (ED%)	Part Ref.	Ohms	Torque %	Duty % (ED%)
3/4	FR-A820-00046-E1N6	200	150	3	FR-ABR-0.4K	200	150	10
1	FR-A820-00077-E1N6	100	150	3	FR-ABR-0.75K	100	150	10
2	FR-A820-00105-E1N6	60	150	3	FR-ABR-2.2K	60	100	10
3	FR-A820-00167-E1N6	60	100	3	FR-ABR-2.2K	60	100	10
5	FR-A820-00250-E1N6	40	100	3	FR-ABR-3.7K	40	100	10
7.5	FR-A820-00340-E1N6	25	100	2	FR-ABR-5.5K	25	100	10
10	FR-A820-00490-E1N6	20	100	2	FR-ABR-7.5K	20	100	10
15	FR-A820-00630-E1N6	-	-	-	FR-ABR-11K	13	100	6
20	FR-A820-00770-E1N6	-	-	-	(2x) FR-ABR-15K[2P]	9	100	6
25	FR-A820-00930-E1N6	-	-	-	(2x) FR-ABR-22K[2P]	6.5	100	6
30	FR-A820-01250-E1N6	-	-	-	(2x) FR-ABR-22K[2P]	6.5	100	6
1/2	FR-A840-00023-E1N6	1200	100	2	FR-ABR-H0.4K	1200	100	10
1	FR-A840-00038-E1N6	700	100	2	FR-ABR-H0.75K	700	100	10
2	FR-A840-00052-E1N6	350	100	2	FR-ABR-H1.5K	350	100	10
3	FR-A840-00083-E1N6	250	100	2	FR-ABR-H2.2K	250	100	10
5	FR-A840-00126-E1N6	150	100	2	FR-ABR-H3.7K	150	100	10
7.5	FR-A840-00170-E1N6	75	100	2	FR-ABR-H5.5K	110	100	10
10	FR-A840-00250-E1N6	75	100	2	FR-ABR-H7.5K	75	100	10
15	FR-A840-00310-E1N6	-	-	-	FR-ABR-H11K	52	100	6
20	FR-A840-00380-E1N6	-	-	-	(2x) FR-ABR-H15K[2S]	36 (72)	100	6
25	FR-A840-00470-E1N6	-	-	-	(2x) FR-ABR-H15K[2S]	36 (72)	100	6
30	FR-A840-00620-E1N6	-	-	-	(2x) FR-ABR-H22K[2S]	26 (52)	100	6
40	FR-A840-00770-E160	-	-	-	(2x) FR-ABR-H22K[2S]	26 (52)	100	6
50	FR-A840-00930-E160	-	-	-	3RD PARTY RESISTOR *	13.5	115	*
60	FR-A840-01160-E160	-	-	-	3RD PARTY RESISTOR *	13.5	95	*
75	FR-A840-01800-E160	-	-	-	3RD PARTY RESISTOR *	13.5	77	*
1	FR-A860-00027-E1N6	-	-	-	3RD PARTY RESISTOR *	1000	118	*
3	FR-A860-00061-E1N6	-	-	-	3RD PARTY RESISTOR *	370	108	*
5	FR-A860-00090-E1N6	-	-	-	3RD PARTY RESISTOR *	220	108	*
10	FR-A860-00170-E1N6	-	-	-	3RD PARTY RESISTOR *	110	107	*
20	FR-A860-00320-E1N6	-	-	-	3RD PARTY RESISTOR *	60	98	*
30	FR-A860-00450-E1N6	-	-	-	3RD PARTY RESISTOR *	40	100	*
50	FR-A860-00680-E160	-	-	-	3RD PARTY RESISTOR *	24	99	*
75	FR-A860-01080-E160	-	-	-	3RD PARTY RESISTOR *	16	100	*

*Resistor wattage must be selected based on %ED (up to 100%)

FR-A800-E Terminal Connection Diagram

Sink logic
 ⊙ Main circuit terminal
 ○ Control circuit terminal



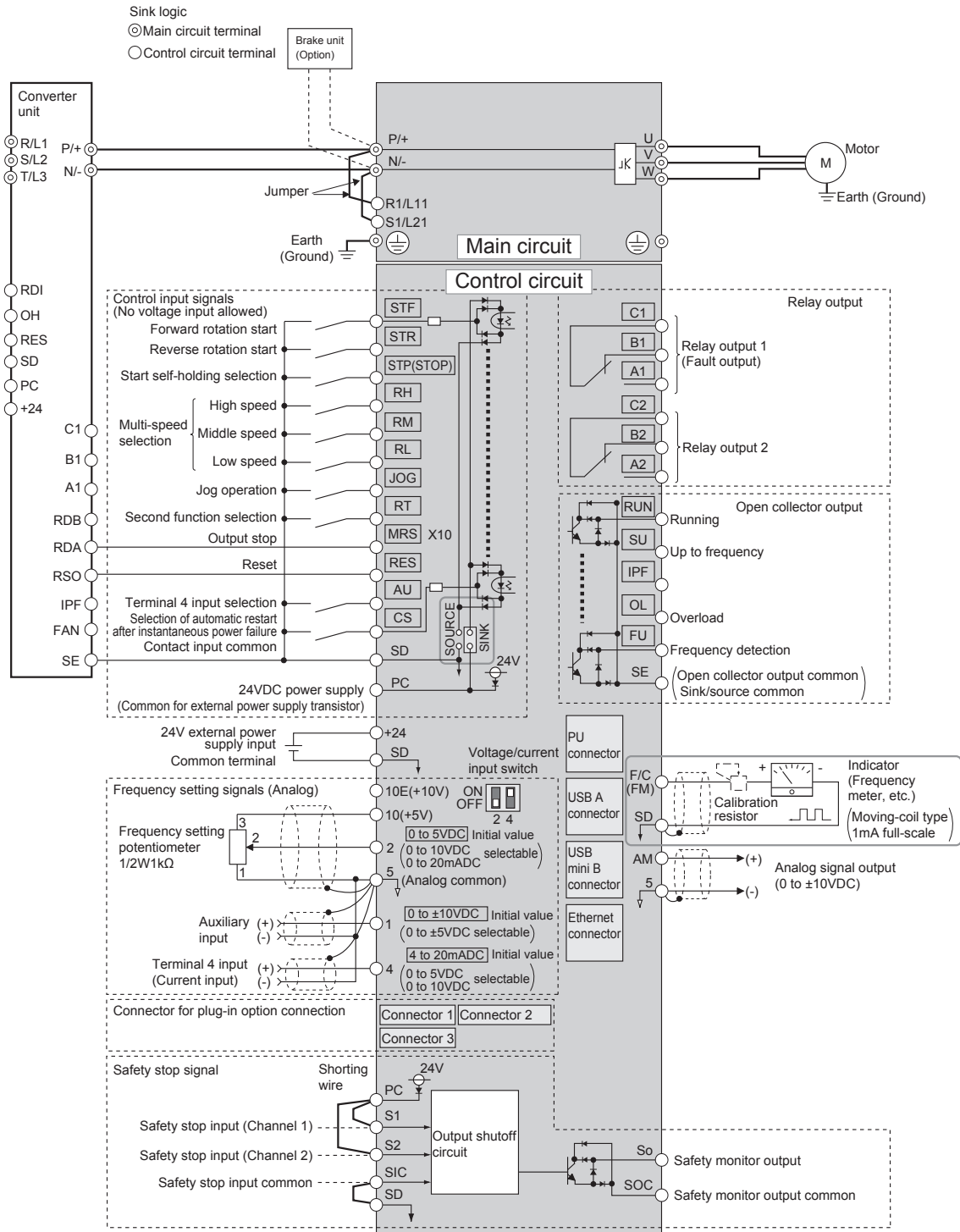
Notes:

1. For the FR-A820-03800(75K) or higher, the FR-A840-02160(75K) or higher, and when a 75 kW or higher motor is used, always connect a DC reactor (FR-HEL), which is available as an option. (To select a DC reactor, refer to page 26, and select one according to the applicable motor capacity.) When a DC reactor is connected to the FR-A820-03160(55K) or lower or the FR-A840-01800(55K) or lower, if a jumper is installed across terminals P1 and P/+, remove the jumper before installing the DC reactor.
2. When using separate power supply for the control circuit, remove the jumper between R1/L11 and S1/L21.
3. The function of these terminals can be changed with the input terminal assignment (Pr.178 to Pr.189).
4. Terminal JOG is also used as the pulse train input terminal. Use Pr.291 to choose JOG or pulse.
5. Terminal input specifications can be changed by analog input specification switchover (Pr.73, Pr.267). To input a voltage, set the voltage/current input switch OFF. To input a current, set the voltage/current input switch ON. Terminals 10 and 2 are also used as a PTC input terminal. (Pr.561) (Refer to the FR-A800 Instruction Manual (Detailed).)
6. It is recommended to use 2 W 1 kΩ when the frequency setting signal is changed frequently.
7. If connecting a brake resistor, remove the jumper between PR and PX (FR-A820-00046(0.4K) to 00490(7.5K), FR-A840-00023(0.4K) to 00250(7.5K)).
8. Connect a brake resistor across terminals P/+ (P3) and PR. (Terminal PR is equipped in FR-A820-00046(0.4K) to 01250(22K), FR-A840-00023(0.4K) to 01800(55K).) Install a thermal relay to prevent overheating and damage of discharging resistors. (Refer to the FR-A800 Instruction Manual (Detailed).)
9. Do not connect the DC power supply (under DC feeding mode) to terminal P3.
10. The function of these terminals can be changed with the output terminal assignment (Pr.195, Pr.196).
11. The function of these terminals can be changed with the output terminal assignment (Pr.190 to Pr.194).
12. Terminal F/C (FM) can be used to output pulse trains as open collector output by setting Pr.291.
13. Not required when calibrating the scale with the operation panel.
14. The option connector 2 cannot be used because the Ethernet board is installed in the initial status. The Ethernet board must be removed to install a plug-in option to the option connector 2. (However, Ethernet communication is disabled in that case.)

ADDITIONAL NOTES

- To prevent a malfunction due to noise, keep the signal cables 10 cm or more away from the power cables. Also, separate the main circuit cables at the input side from the main circuit cables at the output side.
- After wiring, wire offcuts must not be left in the inverter. Wire offcuts can cause an alarm, failure or malfunction. Always keep the inverter clean. When drilling mounting holes in an enclosure etc., take caution not to allow chips and other foreign matter to enter the inverter.
- Set the voltage/current input switch correctly. Incorrect setting may cause a fault, failure or malfunction.

FR-A802 Terminal Connection Diagram



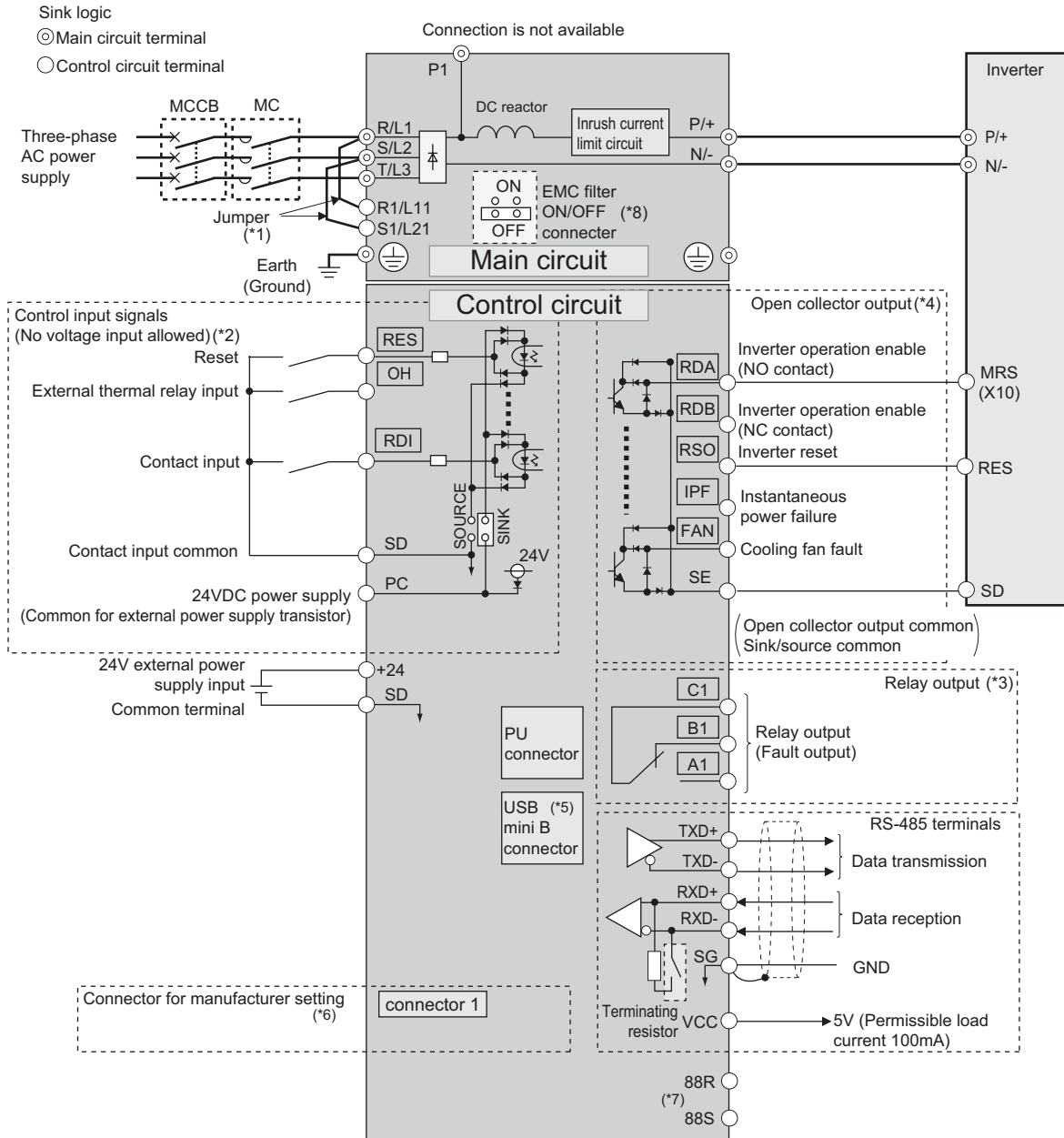
Notes:

- Terminals R1/L11 and S1/L21 are connected to terminals P/+ and N/- with a jumper respectively. When using separate power supply for the control circuit, remove the jumpers from R1/L11 and S1/L21.
- The function of these terminals can be changed with the input terminal assignment (Pr.178 to Pr.189).
- Terminal JOG is also used as the pulse train input terminal. Use Pr.291 to choose JOG or pulse.
- The X10 signal (NC contact input specification) is assigned to terminal MRS in the initial setting. Set Pr.599 = "0" to change the input specification of the X10 signal to NO contact.
- Terminal input specifications can be changed by analog input specification switchover (Pr.73, Pr.267). To input a voltage (0 to 5 V/0 to 10 V), set the voltage/current input switch OFF. To input a current (4 to 20 mA), set the voltage/current input switch ON. Terminals 10 and 2 are also used as a PTC input terminal. (Pr.561)
- It is recommended to use 2 W 1 kΩ when the frequency setting signal is changed frequently.
- The function of these terminals can be changed with the output terminal assignment (Pr.195, Pr.196).
- The function of these terminals can be changed with the output terminal assignment (Pr.190 to Pr.194).
- No function is assigned in the initial setting. Use Pr.192 for function assignment.
- Terminal FM can be used to output pulse trains as open collector output by setting Pr.291.
- Not required when calibrating the scale with the operation panel.
- The option connector 2 cannot be used because the Ethernet board is installed in the initial status. The Ethernet board must be removed to install a plug-in option to the option connector 2. (However, Ethernet communication is disabled in that case.)

ADDITIONAL NOTES

- To prevent a malfunction due to noise, keep the signal cables 10 cm or more away from the power cables. Also, separate the main circuit cables at the input side from the main circuit cables at the output side.
- After wiring, wire offcuts must not be left in the inverter. Wire offcuts can cause an alarm, failure or malfunction. Always keep the inverter clean. When drilling mounting holes in an enclosure etc., take caution not to allow chips and other foreign matter to enter the inverter.
- Set the voltage/current input switch correctly. Incorrect setting may cause a fault, failure or malfunction.

FR-CC2-H, FR-CC2-C Diode Converter Stage Terminal Connection Diagram

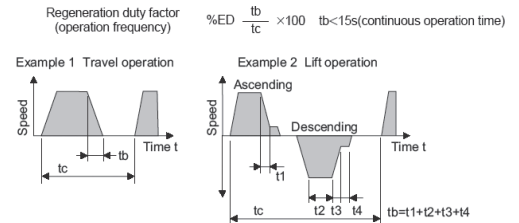


Notes:

1. When using separate power supply for the control circuit, remove the jumpers from R1/L11 and S1/L21.
2. The function of these terminals can be changed with the input terminal assignment (Pr.178, Pr.187, Pr.189).
3. The function of these terminals can be changed with the output terminal assignment (Pr.195).
4. The function of these terminals can be changed with the output terminal assignment (Pr.190 to Pr.194).
5. The connector is for manufacturer setting. Do not use.
6. Plug-in options cannot be used.
7. For manufacturer setting. Do not use.
8. For the FR-CC2-H400K or higher, two EMC filter ON/OFF connectors are provided.

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.



%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%	-	-	-	-
460V	FR-BU2-55K	-	FR-BR-55K-UL	-	-	-	-	-	-	-	-	90%	60%	30%	20%	15%	10%	-	-
	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%	-	-	-	-
600V	FR-BU2-H55K	S	FR-BR-H55K-UL	S	-	-	-	-	-	-	-	90%	60%	30%	20%	15%	10%	-	-
	FR-BU2-C22K	S	FR-BR-C3.7K	-	-	-	30%	10%	-	-	-	-	-	-	-	-	-	-	-
			FR-BR-C7.5K	-	-	-	40%	20%	10%	-	-	-	-	-	-	-	-	-	-
			FR-BR-C22K	-	-	-	-	-	-	85%	40%	20%	15%	10%	-	-	-	-	-
	2 x FR-BU2-C22K	S	2 x FR-BR-C22K	-	-	-	-	-	-	-	-	-	-	-	-	15%	-	-	-
3 x FR-BU2-C22K	S	3 x FR-BR-C22K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15%	

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%	5%	-	-
	8 x FR-BU2-H75K	S	8 x MT-BR5-H75K	-	-	-	-	-	-	70%	50%	45%	30%	25%	15%	13%	10%	5%	5%

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%	-	
460V	FR-BU2-55K	-	FR-BR-55K-UL	-	-	-	-	-	-	-	-	300%	250%	180%	150%	120%	100%	-	
	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%	-	-	
600V	FR-BU2-H55K	S	FR-BR-H55K-UL	S	-	-	-	-	-	-	-	300%	250%	180%	150%	120%	100%	-	
	FR-BU2-C22K	S	FR-BR-C3.7K	-	-	-	170%	100%	-	-	-	-	-	-	-	-	-	-	
			FR-BR-C7.5K	-	-	340%	200%	130%	100%	-	-	-	-	-	-	-	-	-	
			FR-BR-C22K	-	-	-	-	-	-	300%	200%	145%	120%	100%	-	-	-	-	
	2 x FR-BU2-C22K	S	2 x FR-BR-C22K	-	-	-	-	-	-	-	-	-	-	-	-	120%	-	-	
3 x FR-BU2-C22K	S	3 x FR-BR-C22K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120%		

Note: FR-BU2-C22K is not UL or cUL listed for use with the FR-BR-C resistor. If UL or cUL is required, use the ASC-RES-C22K in place of FR-BR-C22K.

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
	FR-BU2-3.7K	S	BU-3700-TEIKOUKI	-	n/a	30	900
	FR-BU2-7.5K	S	BU-7.5K-TEIKOUKI	-	n/a	20	1800
	FR-BU2-15K	S	FR-BR-15K-UL	S	15 (33)	8	4000
	FR-BU2-30K	S	FR-BR-30K-UL	S	30 (66)	4	8000
	FR-BU2-55K	-	FR-BR-55K-UL	-	70 (154)	2	16000
460V	FR-BU2-H7.5K	S	2 x BU-3700-TEIKOUKI	-	n/a	60	1800
	FR-BU2-H15K	S	FR-BR-H15K-UL	S	15 (33)	32	4000
	FR-BU2-H30K	S	FR-BR-H30K-UL	S	30 (66)	16	8000
	FR-BU2-H55K	S	FR-BR-H55K-UL	S	70 (154)	8	16000
	FR-BU2-H75K	S	MT-BR5-H75K	-	70 (154)	6.5	30000

FR-A800-E Dynamic Braking Units and Resistors - UFS Series

- A more economical solution to regenerative braking applications.
- 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)

Not UL listed. For non-UL applications only.

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				
	Brake Resistor	RUF15J					RUF22J				
Electrical Data	Continuous Permissible Power (W)	UFS22J - 1500W					UFS40J - 2000W				
	Resistance (Overall)	RUF15J - 24ohms					RUF22J - 12ohms				
	Continuous Current (Amps)	7A					10A				

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	RUF15/480					RUF22/480				
Electrical Data	Continuous Permissible Power (W)	UFS22 - 2000W					UFS40 - 4000W				
	Resistance (Overall)	RUF15/480 - 44ohms					RUF22/480 - 27ohms				
	Continuous Current (Amps)	6A					7.7A				

		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	RUF110/480					2 X RUF110/480				
Electrical Data	Continuous Permissible Power (W)	UFS110 - 8000W					2 x UFS110 - 16000W				
	Resistance (Overall)	RUF110/480 - 6.8ohms					2 x RUF110/480 (1 per unit)				
	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
	RUF15J	240	9.5			75	3	2.8	6.2	S
	RUF22J	310	12.2			3.5	7.7	S		
	RUF40J	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		
	RUF15/480	310	12.2	100	3.9	75	3	3.5	7.7	S
	RUF22/480	365	14.4	4.2	9.3	S				
	RUF40/480	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
	RUF110/480	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

FR-A800 UL and Non-UL Listed DB Resistor Specifications

UL-Listed Resistors

Model Number	Input Voltage (VAC)	Normal Duty (HP) VT	Braking Torque	Rated Resistor Ohms	10% Braking	Encl.	Watts	25% Braking	Encl.	Watts
FR-A820-00046	230	1	100%	150.0	M150R250W-UL	CU-EN01	250	M150R250W-UL	CU-EN01	250
FR-A820-00077	230	2	100%	121.0	M121R250W-UL	CU-EN01	250	M121R250W-UL	CU-EN01	250
FR-A820-00105	230	3	100%	67.0	M67R250W-UL	CU-EN01	250	M67R500W-UL	CU-EN01	500
FR-A820-00167	230	5	100%	40.0	M40R250W-UL	CU-EN01	250	M40R506W-UL	CU-EN01	506
FR-A820-00250	230	7.5	100%	36.0	M36R500W-UL	CU-EN01	500	M36R851W-UL	CU-EN02	851
FR-A820-00340	230	10	100%	24.0	M24R506W-UL	CU-EN01	506	M24R1K27-UL	CU-EN02	1270
FR-A820-00490	230	15	100%	19.8	M19F8R690W-UL	CU-EN01	690	M19F8R2K00-UL	CU-EN04	2000
FR-A820-00630	230	20	100%	14.0	M14R1K50-UL	CU-EN04	1050	M14R2K53-UL	CU-EN06	2530
FR-A820-00770	230	25	100%	10.0	M10R1K38-UL	CU-EN04	1380	M10R3K45-UL	CU-EN04	3450
FR-A820-00930	230	30	100%	7.0	M7FR1K70-UL	CU-EN04	1700	M7FR4K26-UL	CU-EN06	4260
FR-A820-01250	230	40	100%	7.0	M7FR2K02-UL	CU-EN04	2020	M7FR5K06-UL	CU-EN06	5060
FR-A840-00023	460	1	100%	410.0	M410R750W-UL	CU-EN02	750	M410R750W-UL	CU-EN02	750
FR-A840-00038	460	2	100%	400.0	M400R750W-UL	CU-EN02	750	M400R750W-UL	CU-EN02	750
FR-A840-00052	460	3	100%	250.0	M250R500W-UL	CU-EN01	500	M250R500W-UL	CU-EN01	500
FR-A840-00083	460	5	100%	150.0	M150R250W-UL	CU-EN01	250	M150R506W-UL	CU-EN02	506
FR-A840-00126	460	7.5	100%	107.0	M107R500W-UL	CU-EN01	500	M107R1K00-UL	CU-EN02	1000
FR-A840-00170	460	10	100%	75.0	M75R506W-UL	CU-EN01	506	M75R1K27-UL	CU-EN02	1270
FR-A840-00250	460	15	100%	55.0	M55R1K00-UL	CU-EN02	1000	M55R2K00-UL	CU-EN04	2000
FR-A840-00310	460	20	100%	39.0	M39R1K01-UL	CU-EN02	1010	M39R2K53-UL	CU-EN04	2530
FR-A840-00380	460	25	100%	39.0	M39R1K38-UL	CU-EN02	1380	M39R3K45-UL	CU-EN06	3450
FR-A840-00470	460	30	100%	30.0	M30R1K70-UL	CU-EN03	1700	M30R4K26-UL	CU-EN06	4260
FR-A840-00620	460	40	100%	24.0	M24R2K02-UL	CU-EN04	2020	M24R5K06-UL	U-EN-DO09-1L	5060
FR-A840-00770	460	50	100%	17.0	M17R2K76-UL	CU-EN04	2760	M17R6K90-UL	U-EN-DO18-1L	6900
FR-A840-00930	460	60	100%	14.0	M14R3K40-UL	CU-EN06	3400	M14R8K51-UL	U-EN-DO18-1L	8510
FR-A840-01160	460	75	100%	13.7	M13F7R4K14-UL	CU-EN06	4140	M13F7R10K4-UL	U-EN-DO27-1H	10400
FR-A840-01800	460	100	80%	13.5	M13F5R5K06-UL	CU-EN06	5060	M13F5R12K7-UL	U-EN-DO27-1H	12700

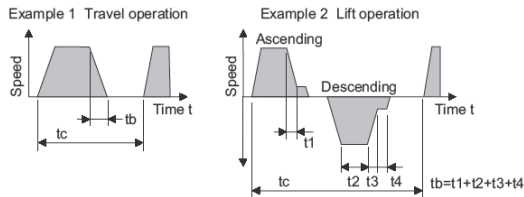
UL-Listed Resistors cont'd

Model Number	33% Braking	Encl.	Watts	50% Braking	Encl.	Watts
FR-A820-00046	M150R250W-UL	CU-EN01	250	M150R250W-UL	CU-EN01	250
FR-A820-00077	M121R250W-UL	CU-EN01	250	M121R500W-UL	CU-EN01	500
FR-A820-00105	M67R500W-UL	CU-EN01	500	M67R750W-UL	CU-EN02	750
FR-A820-00167	M40R750W-UL	CU-EN02	750	M40R1K01-UL	CU-EN02	1010
FR-A820-00250	M36R1K12-UL	CU-EN02	1120	M36R1K70-UL	CU-EN03	1700
FR-A820-00340	M24R1K67-UL	CU-EN03	1670	M24R2K53-UL	CU-EN04	2530
FR-A820-00490	M19F8R2K28-UL	CU-EN04	2280	M19F8R3K45-UL	CU-EN06	3450
FR-A820-00630	M14R3K34-UL	CU-EN06	3340	M14R5K06-UL	CU-EN06	5060
FR-A820-00770	M10R4K55-UL	U-EN-DO09-1L	4550	M10R6K90-UL	U-EN-DO18-1L	6900
FR-A820-00930	M7FR5K62-UL	U-EN-DO09-1L	5620	M7FR8K51-UL	U-EN-DO18-1L	8510
FR-A820-01250	M7FR6K68-UL	U-EN-DO18-1L	6680	M7FR10K1-UL	U-EN-DO27-1H	10100
FR-A840-00023	M410R750W-UL	CU-EN02	750	M410R750W-UL	CU-EN02	750
FR-A840-00038	M400R750W-UL	CU-EN02	750	M400R750W-UL	CU-EN02	750
FR-A840-00052	M250R500W-UL	CU-EN01	500	M250R750W-UL	CU-EN02	750
FR-A840-00083	M150R750W-UL	CU-EN02	750	M150R1K01-UL	CU-EN02	1010
FR-A840-00126	M107R1K12-UL	CU-EN02	1120	M107R1K70-UL	CU-EN03	1700
FR-A840-00170	M75R1K67-UL	CU-EN02	1670	M75R2K53-UL	CU-EN04	2530
FR-A840-00250	M55R2K28-UL	CU-EN03	2280	M55R3K45-UL	CU-EN06	3450
FR-A840-00310	M39R3K34-UL	CU-EN04	3340	M39R5K06-UL	U-EN-DO09-1L	5060
FR-A840-00380	M39R4K55-UL	CU-EN06	4550	M39R6K90-UL	U-EN-DO18-1L	6900
FR-A840-00470	M30R5K62-UL	U-EN-DO09-1L	5620	M30R8K51-UL	U-EN-DO18-1L	8510
FR-A840-00620	M24R6K68-UL	U-EN-DO18-1L	6680	M24R10K1-UL	U-EN-DO27-1H	10100
FR-A840-00770	M17R9K11-UL	U-EN-DO18-1L	9110	M17R13K8-UL	U-EN-DO36-1H	13800
FR-A840-00930	M14R11K2-UL	U-EN-DO27-1H	11200	M14R17K0-UL	U-EN-DO36-1H	17000
FR-A840-01160	M13F7R13K7-UL	U-EN-DO27-1H	13700	M13F7R20K7-UL	U-EN-DO27-1H	20700
FR-A840-01800	M13F5R16K7-UL	U-EN-DO36-1H	16700	M13F5R25K3-UL	2X U-EN-DO27-1H	25300

Non-UL Standard Resistors

Model Number	Input Voltage (VAC)	Normal Duty (HP) VT	Braking Torque	Rated Resistor Ohms	10% Braking	Encl.	Watts	25% Braking	Encl.	Watts	33% Braking	Encl.	Watts	50% Braking	Encl.	Watts
FR-A820-00046	230	1	100%	150.0	M150R250W	EN00	250	M150R250W	EN00	250	M150R250W	EN00	250	M150R250W	EN00	250
FR-A820-00077	230	2	100%	121.0	M121R250W	EN00	250	M121R250W	EN00	250	M121R250W	EN00	250	M121R500W	EN01	500
FR-A820-00105	230	3	100%	67.0	M67R250W	EN00	250	M67R500W	EN01	500	M67R500W	EN01	500	M67R750W	DB3C	750
FR-A820-00167	230	5	100%	40.0	M40R250W	EN00	250	M40R506W	EN01	506	M40R750W	DB3C	750	M40R1K01	EN02	1010
FR-A820-00250	230	7.5	100%	36.0	M36R500W	EN01	500	M36R851W	EN02	851	M36R1K12	EN03	1120	M36R1K70	EN03	1700
FR-A820-00340	230	10	100%	24.0	M24R506W	EN01	506	M24R1K27	EN01	1270	M24R1K67	EN03	1670	M24R2K53	EN09	2530
FR-A820-00490	230	15	100%	19.8	M19F8R690W	DB3C	690	M19F8R2K00	EN09	2000	M19F8R2K28	EN09	2280	M19F8R3K45	EN09	3450
FR-A820-00630	230	20	100%	14.0	M14R1K50	EN02	1500	M14R2K53	EN06	2530	M14R3K34	EN06	3340	M14R5K06	EN09	5060
FR-A820-00770	230	25	100%	10.0	M10R1K38	EN02	1380	M10R3K45	EN06	3450	M10R4K55	EN06	4550	M10R6K90	EN18	6900
FR-A820-00930	230	30	100%	7.0	M7FR1K70	EN02	1700	M7FR4K26	EN09	4260	M7FR5K62	EN09	5620	M7FR8K51	EN18	8510
FR-A820-01250	230	40	100%	7.0	M7FR2K02	EN03	2020	M7FR5K06	EN09	5060	M7FR6K68	EN09	6680	M7FR10K1	EN18	10100
FR-A840-00023	460	1	100%	410.0	M410R720W	EN01	720	M410R720W	EN01	720	M410R720W	EN01	720	M410R720W	EN01	720
FR-A840-00038	460	2	100%	400.0	M400R720W	EN01	720	M400R720W	EN01	720	M400R720W	EN01	720	M400R720W	EN01	720
FR-A840-00052	460	3	100%	250.0	M250R360W	EN00	360	M250R360W	EN00	360	M250R360W	EN00	360	M250R360W	EN00	360
FR-A840-00083	460	5	100%	150.0	M150R250W	EN00	250	M150R506W	EN01	506	M150R750W	DB3C	750	M150R1K01	DB3C	1010
FR-A840-00126	460	7.5	100%	107.0	M107R500W	EN01	500	M107R1K00	DB3C	1000	M107R1K12	EN03	1120	M107R1K70	EN03	1700
FR-A840-00170	460	10	100%	75.0	M75R506W	EN01	506	M75R1K27	EN03	1270	M75R1K67	EN03	1670	M75R2K53	EN06	2530
FR-A840-00250	460	15	100%	55.0	M55R1K00	DB3C	1000	M55R2K00	EN03	2000	M55R2K28	EN06	2280	M55R3K45	EN06	3450
FR-A840-00310	460	20	100%	39.0	M39R1K01	EN02	1010	M39R2K53	EN06	2530	M39R3K34	EN06	3340	M39R5K06	EN18	5060
FR-A840-00380	460	25	100%	39.0	M39R1K38	EN03	1380	M39R3K45	EN09	3450	M39R4K55	EN18	4550	M39R6K90	EN18	6900
FR-A840-00470	460	30	100%	30.0	M30R1K70	EN04	1700	M30R4K26	EN09	4260	M30R5K62	EN18	5620	M30R8K51	EN18	8510
FR-A840-00620	460	40	100%	24.0	M24R2K02	EN09	2020	M24R5K06	EN18	5060	M24R6K68	EN18	6680	M24R10K1	EN18	10100
FR-A840-00770	460	50	100%	17.0	M17R2K76	EN09	2760	M17R6K90	EN18	6900	M17R9K11	EN18	9110	M17R13K8	EN27	13800
FR-A840-00930	460	60	100%	14.0	M14R3K40	EN06	3400	M14R8K51	EN18	8510	M14R11K2	EN18	11200	M14R17K0	EN27	17000
FR-A840-01160	460	75	100%	13.7	M13F7R4K14	EN06	4140	M13F7R10K4	EN18	10400	M13F7R13K7	EN18	13700	M13F7R20K7	HNS	20700
FR-A840-01800	460	100	80%	13.5	M13F5R5K06	EN09	5060	M13F5R12K7	EN18	12700	M13F5R16K7	EN27	16700	M13F5R25K3	HWS	25300

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



FR-HEL DC Link Chokes (sold separately)

Model Number	HD	ND	LD	SLD
FR-A840-02160-E1U6	FR-HEL-H75K	FR-HEL-H75K	FR-HEL-H90K	FR-HEL-H110K
FR-A840-02600-E1U6	FR-HEL-H90K	FR-HEL-H90K	FR-HEL-H110K	FR-HEL-H132K
FR-A840-03250-E1U6	FR-HEL-H110K	FR-HEL-H110K	FR-HEL-H132K	FR-HEL-H160K
FR-A840-03610-E1U6	FR-HEL-H132K	FR-HEL-H132K	FR-HEL-H160K	FR-HEL-H185K
FR-A840-04320-E1U6	FR-HEL-H160K	FR-HEL-H160K	FR-HEL-H185K	FR-HEL-H220K
FR-A840-04810-E1U6	FR-HEL-H185K	FR-HEL-H185K	FR-HEL-H220K	FR-HEL-H250K
FR-A840-05470-E1U6	FR-HEL-H220K	FR-HEL-H220K	FR-HEL-H250K	FR-HEL-H280K
FR-A840-06100-E1U6	FR-HEL-H250K	FR-HEL-H250K	FR-HEL-H280K	FR-HEL-H315K
FR-A840-06830-E1U6	FR-HEL-H280K	FR-HEL-H280K	FR-HEL-H315K	FR-HEL-H355K

Dimensions FR-800-E Series Drives

Series	Frame Size	Height	Width	Depth
		Dimensions	Inches (mm)	
FR-800	A	12.2 (310)	4.3 (110)	4.4 (112)
	B	12.2 (310)	4.3 (110)	5.0 (127)
	C	12.5 (318)	5.9 (150)	5.6 (142)
	D	12.8 (324)	8.7 (220)	6.7 (170)
	E	14.3 (363)	8.7 (220)	7.5 (190)
	F	20.4 (517)	9.8 (250)	7.5 (190)
	G	21.7 (550)	12.8 (325)	7.7 (195)
	H	21.7 (550)	17.1 (435)	9.8 (250)
	J	24.4 (620)	18.3 (465)	11.8 (300)
	K	27.6 (700)	18.3 (465)	9.8 (250)
	L	29.1 (740)	18.3 (465)	14.2 (360)
	M	39.8 (1010)	19.6 (498)	15.0 (380)
	N	39.8 (1010)	26.8 (680)	15.0 (380)

Series	Frame Size	Height	Width	Depth
		Dimensions	Inches (mm)	
FR-A842	P	52.4 (1330)	21.3 (540)	17.3 (440)
	Q	62.2 (1580)	26.8 (680)	17.3 (440)
FR-CC2	R	52.4 (1330)	23.6 (660)	17.3 (440)
	S	62.2 (1580)	23.6 (660)	17.3 (440)

FR-A800-E Options and Accessories

Model Number	Description	Comments	Stocked Item
FR-A8AP	Encoder Feedback Card	Provides 1500:1 speed range and positioning control in Vector Mode	S
FR-A8AL	Encoder Feedback Card, Orient, Vector Position Control and Encoder Dividing Output	Multi function feedback option – includes 1500:1 speed range and positioning control in vector mode, Ideal for spindle orient and machine tool	S
FR-A8TP	Vector Control Terminal Block	Enables encoder feedback on I/O terminal block instead of option card slot, combine with FR-A8AP for orient control	S
FR-A8ERS-60	A/F800 Series RS485 Option Card		S
FR-A8AX	16 Bit Digital Input Card	BCD or Binary input	S
FR-A8AY	Digital Output / Extended Analog Output Card	2 extra 0-20 mA or 0-10V output signals	S
FR-A8AR	Relay Output Card	3 extra independent type 'C' relays	S
FR-A8AZ	High Res. Analog / Thermistor input Card		-
FR-A8AC	A/F800 120V Control Option		S
FR-A8AN	F/A800 4-20mA I/O Card		S
FR-A8APR	Resolver Interface / Orientation Card		-
FR-A8APS	Absolute Encoder Option	EnDat 2.x Interface	S
FR-A8NC	CC-Link Communications Card	A6CON-L5P / A6CON-TR11N connectors not included with Option card (Sold Separately)	S
FR-A8ND	DeviceNet Communications Card		S
FR-A8NP	PROFIBUS DPV0 Communications Card		S
A8NDPV1	PROFIBUS DPV1 Communications Card		S
FR-A8NF	FL-Net Communications Card		S
A8N-XLT	Multi-protocol RS485 Communications Card	(BACnet® MS/TP), Siemens FLN (P1), Metasys® N2	S
FR-A8NS	SSCNET III / F Communications Card		-
A8NEIP-2P	EtherNET IP™ Communications Card		S
A8NPRT-2P	PROFINET® Communications Card		S
FR-A8NCN	ControlNet™ Communications Card		S
FR-A8NCE	CC-Link® IE Communications Card		S
FR-A8NCA	CanOpen Communication Card		-
FR-A8NL	LonWorks Communication Card		S
A8NECT-2P	EtherCAT® Communications Card		S
A8NETH-2P	Multi-protocol EtherNET Communications Card	EtherNET IP, MODBUS TCP/IP, Profinet, BACnet IP	S
FR-LU08	Liquid Crystal Operation Panel	Mount on VFD or panel	S
FR-PU07, FR-PU07-01	Parameter Unit	Mount on panel only. FR-PU07-1 is for HVAC	S
FR-PU07BB-L	Parameter Unit with Battery Back-up	Hand held. Can program unpowered drives	S
FR-CB20 (_ = 1, 3 or 5)	Parameter Unit Connection Cable	1, 3 or 5 meter lengths	S
FR-ADP	Keypad Adaptor Unit	Connect FR-DU08 or FR-LU08 to FR-CB2	S
FR-A8TAT	Control Terminal Block Adaptor	Use A500 or A700 terminal block with A800	S
FR-A8TR	Screw Terminal Block Option	Screw Terminal Block Option	S
FR-ABR	High Duty Brake Resistor	Use with drives 30HP or below (ND rating)	S
FR-BR	Brake Resistor	Use with drives 75HP or below (ND rating)	S
MT-BR5	Brake Resistor	Use with drives 100HP or below (ND rating)	S
FR-CV, FR-CVL	Regenerative Controller	Use with drives 75HP or below (ND rating)	S
MT-RC	Regenerative Controller	Use with drives 100HP or ABOVE (ND rating)	-
FR-HC2	Zero Harmonic Controller	Available for all sizes	S
FR-HEL, FR-HEL-H, FR-HEL-C	DC Link Choke	Use in accordance with selection guide	S
FR-CONFIGURATOR2	Software Setup Utility for FR-800 Series		S

External Heatsink Attachment

Drive Model F/A820	Drive Model F/A840	Model Number	Stocked Item
00105, 00167, 00250	00023, 00038, 00052, 00083, 00126	FR-A8CN01	S
00340, 00490	00170, 00250	FR-A8CN02	S
00630	00310, 00380	FR-A8CN03	S
00770, 00930, 01250	00470, 00620	FR-A8CN04	S
01540	00770	FR-A8CN05	S
01870, 02330	00930, 01160, 01800	FR-A8CN06	S
03160	-	FR-A8CN07	S
03800, 04750	03250, 03610	FR-A8CN08	S
-	02160, 02600	FR-A8CN09	S

NEMA 1 Conduit Mounting Kits for A and FR-F800 Series Drives

Kits have provision for DC link choke installation (Drives in frame sizes A to F do not require a separate kit)

Model Number	A/F820	A/F840	Frame Size
AF8FN-G	01540	00770	G
AF8FN-H	01870	00930	H
	02330	01160	
AF8FN-J	-	01800	J
	-	02160	
AF8FN-K	-	02600	K
	03160	-	
AF8FN-L	03800	03250	L
	04750	03610	
AF8FN-M	-	04320	M
	-	04810	
AF8FN-N	-	05470	N
	-	06100	
	-	06830	