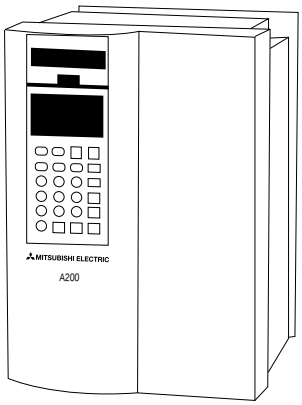
A201E Series

Variable Frequency Drives with Built-In Line Regeneration

Advanced technologies have been incorporated into a compact single unit to produce performance that is perfect for applications such as elevators and line controls.

- The inverter is integrated with a line regenerative converter for a more compact unit.
- Braking power is dramatically increased.
- Packed with specialized functions.
- Uses a multi-function, high performance inverter.
- Costs are lower than conventional system combinations.
- 5.5K to 55K ratings are provided for both 230 V and 460 V classes.
- Magnetic flux vector control provides high torque at low speeds with up to 200-300% starting torque.
- The integrated design of the line regenerative converter reduces panel space requirements by 60-80% over separate components.
- Continuous braking power enables 100% continuous regeneration and provides 150% overload for 60 seconds.
- Selectable stall prevention function protects against overcurrent tripping.
- Intelligent Power Module (IPM) incorporates IGBT transistor technology for quiet motor operation.
- Parameter units are used for operator control, reading and writing parameters, and drive monitoring.
- Software configuration with many adjustable parameters allows tailoring the drive to a wide variety of applications.

Constant Torque		Model Number
hp	Output Amps	
3-Phase 230 VAC Input / Output		
7.5	24	FR-A221E-5.5K-UL
10	33	FR-A221E-7.5K-UL
15	46	FR-A221E-11K-UL
20	61	FR-A221E-15K-UL
25	76	FR-A221E-18.5K-UL
30	90	FR-A221E-22K-UL
40	115	FR-A221E-30K-UL
50	145	FR-A221E-37K-UL
60	175	FR-A221E-45K-UL
75	215	FR-A221E-55K-UL
3-Phase 460 VAC Input / Output		
7.5	12	FR-A241E-5.5K-UL
10	17	FR-A241E-7.5K-UL
15	23	FR-A241E-11K-UL
20	31	FR-A241E-15K-UL
25	38	FR-A241E-18.5K-UL
30	43	FR-A241E-22K-UL
40	57	FR-A241E-30K-UL
50	71	FR-A241E-37K-UL
60	86	FR-A241E-45K-UL
75	110	FR-A241E-55K-UL

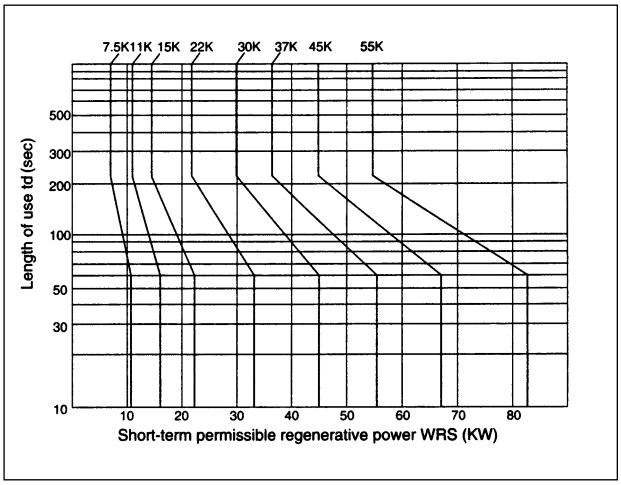


Ratings 200V & 400V Class

Model Type			200 V Class FR-A221E-☐☐-UL										400 V Class FR-A241E-☐☐-UL									
			5.5K	7.5K	11K	15K	18.5K	22K	30K	37K	45K	55K	5.5K	7.5K	11K	15K	18.5K	22K	30K	37K	45K	55K
Horsepower Rating			7.5	10	15	20	25	30	40	50	60	75	7.5	10	15	20	25	30	40	50	60	75
Output	Rated Capacity (kVA) *1		9.2	12.6	17.6	23.3	29	34	44	55	67	82	9.1	13	17.5	23.6	29	32.8	43.4	54	65	84
	Rated Current (A)		24	33	46	61	76	90	115	145	175	215	12	17	23	31	38	43	57	71	86	110
	Overload Current Rating *2		150% 60 sec., 200% 0.5 sec. (inverse time characteristics)										150% 60 sec., 200% 0.5 sec. (inverse time characteristics)									
	Voltage *3		3-Phase 200-220 V 50 Hz, 200-230 V 60 Hz										3-phase 380 to 460 V 50/60 sec.									
	Regenerative Braking Torque		100% continuous, 150% 60 sec.										100% continuous, 150% 60 sec.									
Power Supply	Rated Input, AC Volt. and Frequency		3-Phase 200-220 V 50 Hz, 200-230 V 60 Hz										3-Phase 380-460 V 50/60 Hz									
	Tolerable AC Voltage Fluctuation		170-242 V 50 Hz, 170-253 V 60 Hz										323-506 V 50/60 Hz *8									
	Tolerable Frequency Fluctuation		±5%										±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 msec of continuous operation										When operated at or above 320 V continuously and voltage falls from rated voltage to under 320 V, 15 msec of continuous operation									
	Power Supply Capacity (kVA) *4		12	17	20	28	34	41	52	66	80	100	12	17	20	28	34	41	52	66	80	100
Protective Structure (JEM 1030)			Open type (IP00)										Open type (IP00)									
Cooling Method			Forced-air cooling										Forced-air cooling									
Approximate Weight		kg	23	23	34	32	52	52	63	85	87	120	24	24	37	37	48	48	63	85	85	120
		lbs	50.6	50.6	74.9	81.4	114.4	114.4	138.6	187	191.4	264	52.8	52.8	81.5	81.5	105.6	105.6	138.6	187	187	264
Width		mm	250	250	300	300	390	390	450	470	470	600	250	250	300	300	390	390	450	470	470	600
		inches	9.8	9.8	11.8	11.8	15.35	15.35	17.7	18.5	18.5	23.6	9.8	9.8	11.8	11.8	15.3	15.3	17.7	18.5	18.5	23.6
Depth		mm	270	270	294	294	320	320	340	368	368	405	270	270	294	294	320	320	340	368	368	405
		inches	10.6	10.6	11.6	11.6	12.6	12.6	13.4	14.5	14.5	15.9	10.6	10.6	11.6	11.6	12.6	12.6	13.4	14.5	14.5	15.9
Height		mm	470	470	600	600	600	600	700	700	700	900	470	470	600	600	600	600	700	700	700	900
		inches	18.5	18.5	11.8	11.8	11.8	11.8	27.6	27.6	27.6	35.4	18.5	18.5	11.8	11.8	11.8	11.8	27.6	27.6	27.6	35.4

Notes: See page 27.

Characteristics



Instruction Manuals	
Model Number	Part Number
FR-A201E	IB(NA)66637

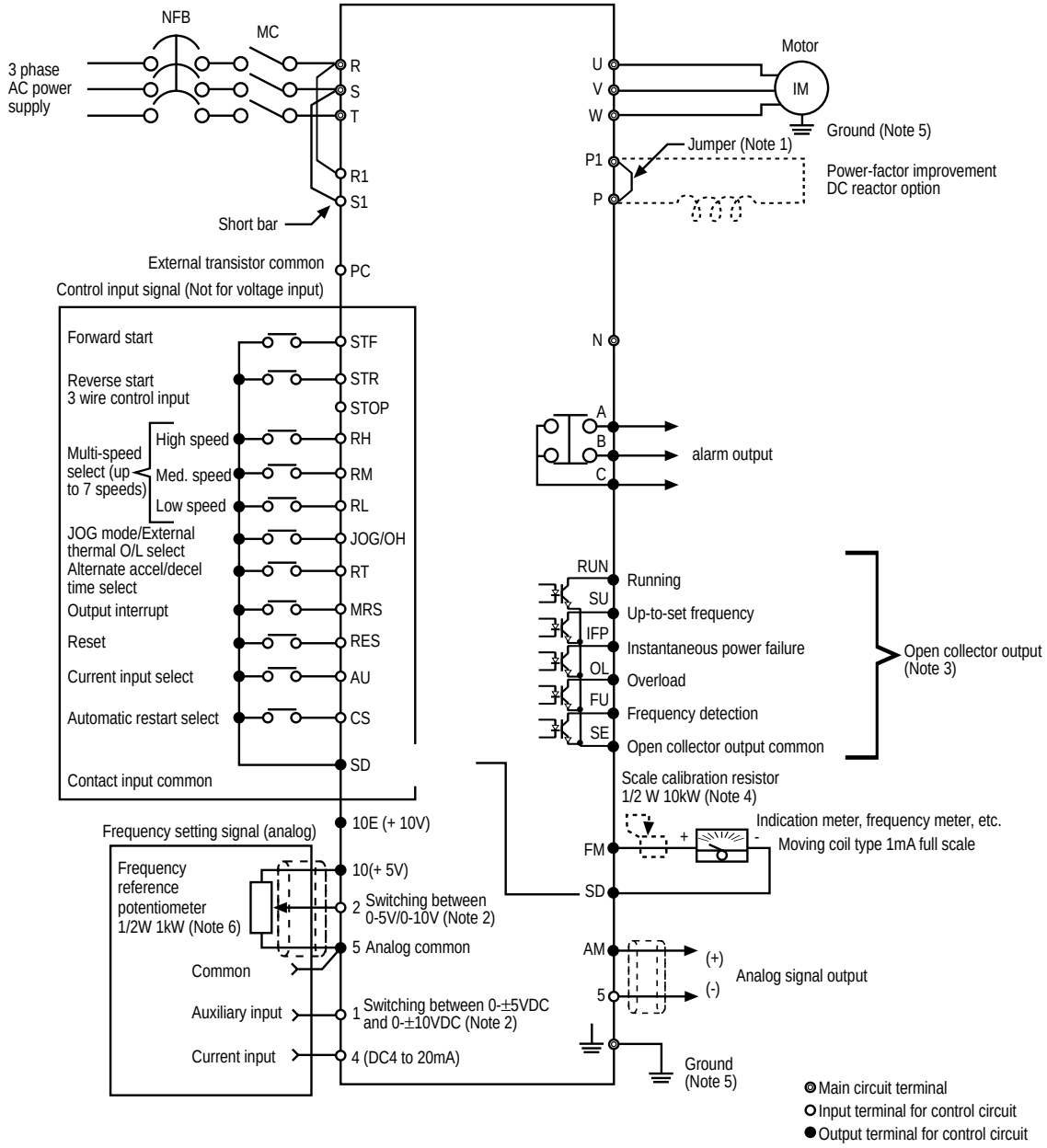
A201E General Specifications

Control Specifications	Control Method			High-carrier frequency sine wave PWM control (select V/F control or magnetic flux vector control)
	Output Frequency Range			0.2 to 400 Hz
	Frequency Control Resolution		Analog Input	0.015 Hz / 60 Hz (Terminal 2 input: 12 bits/0-10 V, 11 bits/0-5 V; terminal 1 input: 12 bit/-10 - + 10 V, 11 bit/-5+5 V) 0.030 Hz/60 Hz
			Digital Input	0.002 Hz/60 Hz (when using PU: 0.01 Hz)
	Frequency Precision			For analog input: within ±0.2% of the maximum output frequency 25°C ±10°C (59°F to 95°F) For digital input: within ±0.01% of the sent output frequency.
	Voltage / Frequency Characteristics			Can be set anywhere with a base frequency of 0 to 400 Hz. Select constant torque or declining torque pattern.
	Starting Torque			150% 1 Hz (for magnetic flux vector control)
	Torque Boost			Manual and automatic torque boost
	Accel. / Decel. Time Setting			0 to 3600 sec (Accel/decal can be set individually). Select between linear and S curve acceleration deceleration modes.
	DC Injection Braking			Variable operating frequency (0 to 120 Hz), operating time (0 to 10 sec.) and operating voltage (0 to 30%)
	Stall Prevention Operation Level			Stall prevention can be set (0-150%) variable stall prevention can be disabled
Operation Specifications	Input Signals	Frequency Setting Signal	Analog Input	DC 0 to 5V, 0 to 10V, 0 to ±5V, 0 to ±10V, 4 to 20 mA
			Digital Input	BCD 3-digit or 12 bit binary using the parameter unit (when using the optional FR-EPA or FR-EPE)
		Starting Signal		Select between independent forward and reverse or start signal self-holding input (3-wire input)
		Multi-Speed Selection		Up to 7 speeds can be selected. (Each speed can be set between 0 and 400 Hz; Operating speed can be changed during operation using parameter unit.)
		Second Accel. / Decel. Time Selection		0 to 3600 sec, (acceleration and deceleration can be set individually)
	JOG Operation Selection			Terminal for selecting jogging (JOG) operating mode. *5
	Current Input Selection			Select the input of a frequency setting signal DC 4 to 20 mA (terminal 4).
	Output Stop			Instantaneous shut-off of inverter output (frequency and voltage)
	Error Reset			Clears holds after the protection function engages.
	Output Signal	Operation Functions		Upper and lower limit frequency settings, frequency jump operation, external thermal input selection, reversible polarity operation, instant stop restart operation commercial switching operation, forward/reverse prevention, slip compensation, operating mode selection, auto-tuning function, break sequence for elevators *9 and load torque high-speed frequency control *9.
		Operation Status		Select 4 from among inverter operating, frequency reached, instant power stop (insufficient voltage), frequency detection, second frequency detection, PU operating, overload alarm and electronic thermal pre-alarm. Open collector output.
Display	Error (Inverter Trip)			PU operating, overload alarm, and electronic thermal pre-alarm. Open collector output. Contact output: 1c contact (AC 230 V 0.3 A, DC 30V 0.3 A). Open collector: Alarm code (4 bit) output.
	For Meter			Select 1 from among output frequency, motor current (constant or peak value), output voltage, frequency setting, operating speed, motor torque, overload, converter output voltage (constant or peak value) electronic thermal load factor, input power, output power, *6 load meter, and cumulative running time. Pulse train output (1440 Hz/full scale) or analog output (0 to 10 VDC)
	Display on Parameter Unit or Main Unit LED	Operation Status		Select from among output frequency, motor current (constant or peak value), output voltage, frequency setting, operating speed, motor torque, overload, converter output voltage (constant or peak value), electronic thermal load factor, input power, output power *6, load meter, and cumulative running time. Display of error contents when protection function is engaged and storage of information of 8 errors.
	Additional Display Possible Only on Parameter Unit	Operation Status		Presence of input terminal signal and status of output terminal signal.
		Error Details		Output voltage, current, frequency, and I/O terminals status prior to engagement of protection function.
		Interactive Guidance		Operations guide, troubleshooting and graphic display for help function.
Protective and Warning Functions				Overcurrent breaking (acceleration, deceleration, constant speed), regenerative overvoltage breaking, insufficient voltage, instant stop, overload breaking (electronic thermal), ground overcurrent, output short, main circuit element overheating, stall prevention, overload warning, and power supply regeneration circuit 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 *7			-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. The rated output capacity shown is for an output voltage of 220 V for 200 V class and 440 V for 400 V class.
2. The % value for overload current rating indicates the ratio to the inverter's rater output current. When using repeatedly, wait until the inverter and motor temperature fall below the temperature when at 100% load.
3. The maximum output voltage cannot go above the power supply voltage. The maximum output voltage can be set anywhere below the power supply voltage.
4. The power supply capacity varies with the value of the power supply impedance (including input reactor and power lines).
5. Jogging operation is also possible with the parameter unit.
6. Shown as a positive value when running under power and a negative value during regeneration.
7. The temperature can be applied for short times, such as in transit.
8. When the power supply voltage fluctuation with a 400 V class inverter is at or below 342 V or at or above 484 V, a built-in transformer tap switch is required. See the manual for details.
9. See the manual for details.

A201E Series Terminal Connection Diagram



Notes:

1. Remove jumper when DC reactor is connected.
2. Input signal can be switched through parameter unit.
3. All terminal outputs other than RUN can be used to transmit alarm codes and error messages. Up to 10 functions can be individually assigned to the terminals. (Pr 40).
4. This resistor is not needed when parameter unit is used for scale calibration.
5. The drive and motor must be securely grounded before use.
6. Use 2W 1k ohm resistor if frequency setting is often changed.