



DELTA ELECTRONICS, INC.

www.delta.com.tw/industrialautomation

ASIA

Delta Electronics, Inc.

Taoyuan1

31-1, Xingbang Road, Guishan Industrial Zone,
Taoyuan County 33370, Taiwan, R.O.C.
TEL: 886-3-362-6301 / FAX: 886-3-362-7267

Delta Electronics (Jiang Su) Ltd.

Wujiang Plant3

1688 Jiangxing East Road,
Wujiang Economy Development Zone,
Wujiang City, Jiang Su Province,
People's Republic of China (Post code: 215200)
TEL: 86-512-6340-3008 / FAX: 86-769-6340-7290

Delta Electronics (Japan), Inc.

Tokyo Office

Delta Shibadaimon Building, 2-1-14 Shibadaimon,
Minato-Ku, Tokyo, 105-0012, Japan
TEL: 81-3-5733-1111 / FAX: 81-3-5733-1211

Delta Electronics (Korea), Inc.

Donghwa B/D 3F, 235-6, Nonhyun-dong,
Kangnam-gu, Seoul 135-010, Korea
TEL: 82-2-515-5303/5 / FAX: 82-2-515-5302

Delta Electronics (Singapore) Pte. Ltd.

8 Kaki Bukit Road 2, #04-18 Ruby Warehouse Complex,
Singapore 417841
TEL: 65-6747-5155 / FAX: 65-6744-9228

Delta Energy Systems (India) Pvt. Ltd.

Plot No. 27 & 31, Sector-34, EHTP,
Gurgaon-122001 Haryana, India
TEL: 91-124-4169040 / FAX: 91-124-4036045

AMERICA

Delta Products Corporation (USA)

Raleigh Office

P.O. Box 12173, 5101 Davis Drive,
Research Triangle Park, NC 27709, U.S.A.
TEL: 1-919-767-3813 / FAX: 1-919-767-3969

EUROPE

Deltronics (The Netherlands) B.V.

Eindhoven Office

De Witbogt 15, 5652 AG Eindhoven, The Netherlands
TEL: 31-40-2592850 / FAX: 31-40-2592851

*We reserve the right to change the information in this catalogue without prior notice



VFD-E

High Performance / Flexible Extension /
Micro Type AC Motor Drives



Variable Speed AC Motor Drive

VFD-E Series



Features

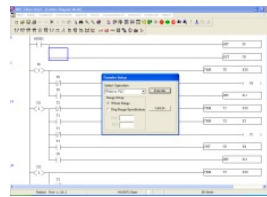
High Performance
Flexible Extension
Micro Type AC Motor Drives

• Power Range

- 1 phase 115V series: 0.2~0.75kW (0.25 ~1hp)
- 1 phase 230V series: 0.2~2.2kW (0.25 ~ 3hp)
- 3 phase 230V series: 0.2~7.5kW (0.25~10hp)
- 3 phase 460V series: 0.4~11kW (0.50~15hp)

• Built-in PLC Function

Easy to write PLC program without additional PLC



• Side-by-side Installation(40°C)

High-efficiency cooling and flexible space



• Easy Maintenance

Removable cooling fan for easy maintenance



Features

• Modular Design

Modular structure and extension with optional cards

• Standard MODBUS Protocol

Standard MODBUS Protocol via RS-485

• Built-in EMI Filter (230V 1 phase and 460V 3 phase)

To reduce electromagnetic interference efficiently

• Compact Design

Space saving and easy DIN rail mounting with optional DIN rail adapter

• Optional Fieldbus Modules

Provide connection to a variety of networks, including Profibus, DeviceNet, LonWorks and CANopen

• Flexible Extension

Via optional cards, such as I/O card, Relay card, PG (Encoder) card and USB card, to meet your application requirements



• RFI-Switch for IT Mains

Removable "Y" capacitor for use on IT mains supplies



• Easy DC BUS Sharing

Multiple VFD-E can be connected in parallel to share the regenerative braking energy. In this way, over-voltage is prevented and the DC-bus voltage stabilized.

• Complete Protection Function

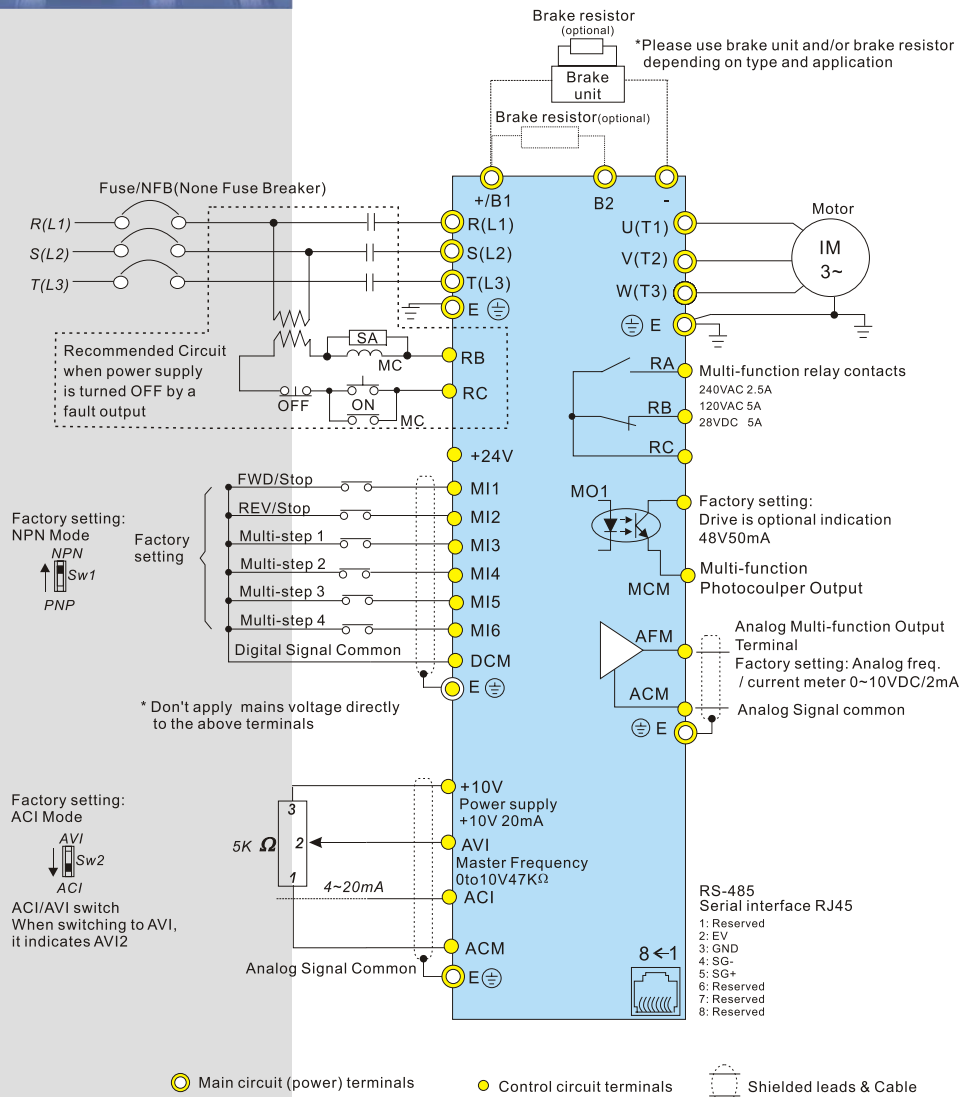
High precision current detection, full overload protection (oL, oL1 and oL2), over-voltage/over-current stall prevention, short-circuit protection, reset after fault, speed search function and motor overheat protection by PTC.

• Removable Keypad

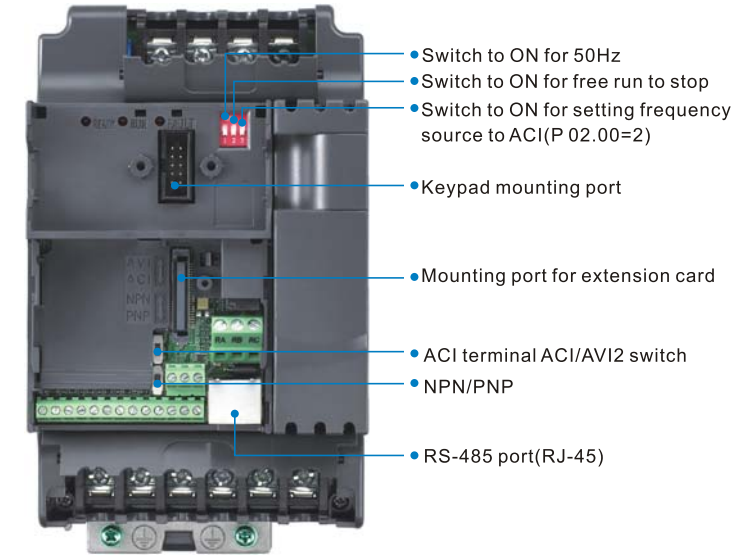
The standard keypad acts as status monitor. More functions, including parameter modification, RUN/STOP, speed change, and status display, via optional keypad



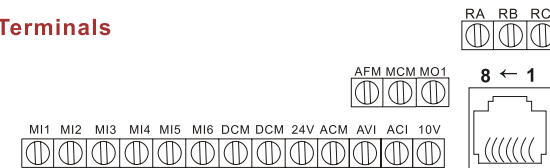
Basic Wiring Diagram



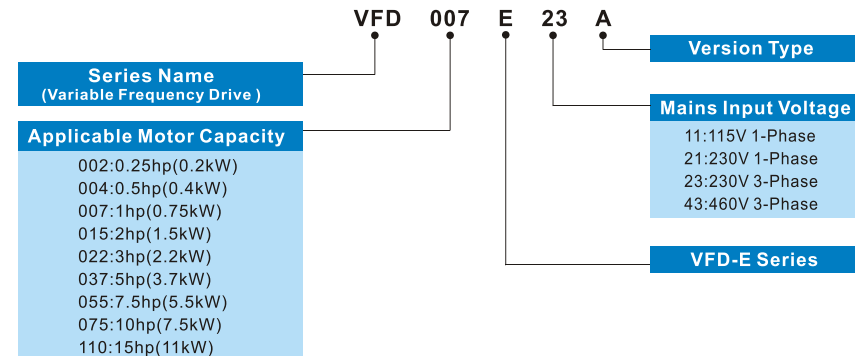
External Parts



Control Terminals



Model Explanation



VFD-E Applications

Conveyor and Transportation Machinery

- Conveyor belt
- Automatic doors
- Roller door
- Small elevator
- Escalator
- Parking device
- X-Y axis of traveling crane

Food Processing

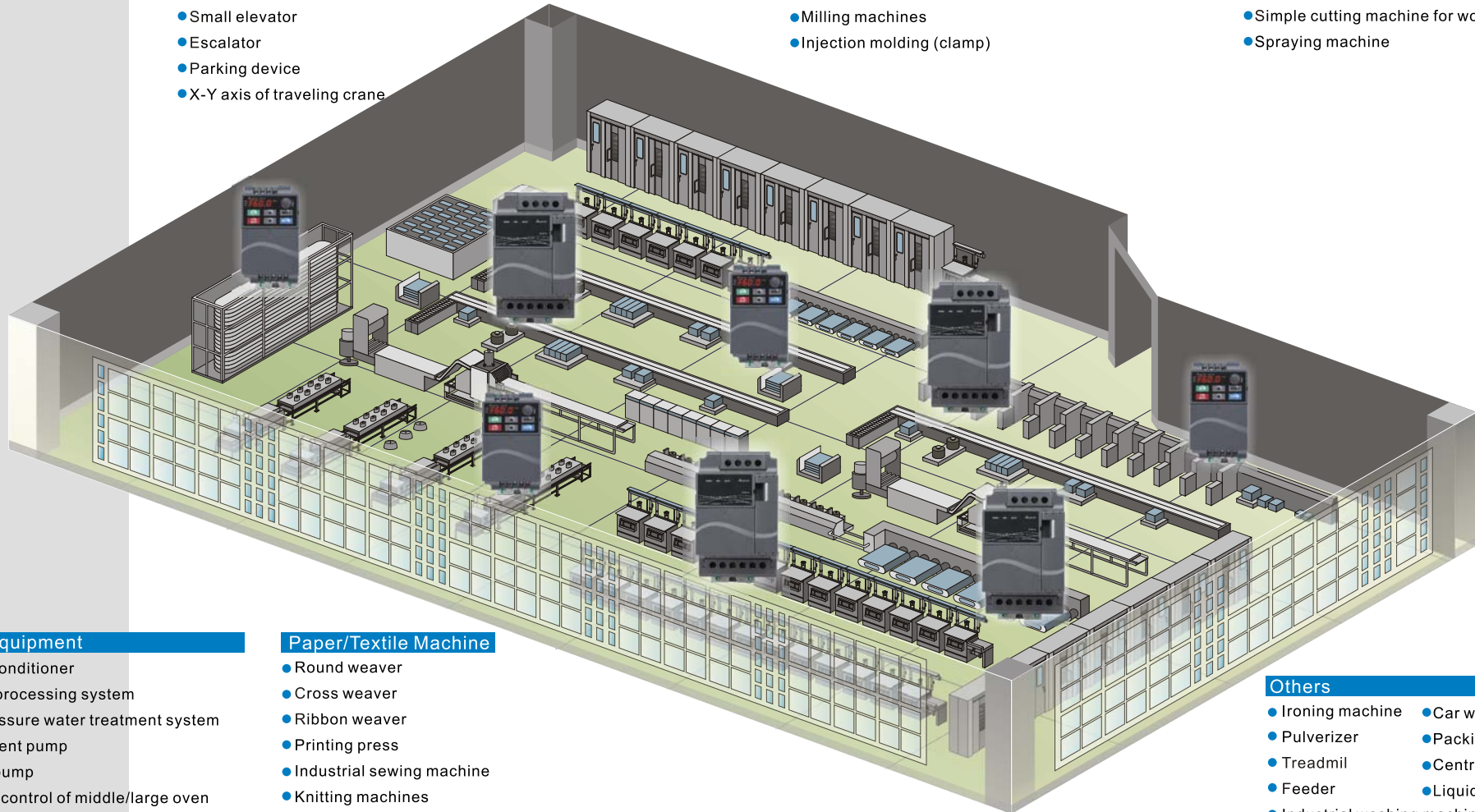
- Dumpling maker
- Food stirrer
- Noodle maker

Machine Tool/Metal Processing Machinery

- Grinder
- Drill
- Small lathe
- Milling machines
- Injection molding (clamp)

Wood Working Machinery

- 4 side planer
- Woodcarver
- Wood working machine
- Simple cutting machine for wood working
- Spraying machine



Fan/Pump Equipment

- Building air conditioner
- Wastewater processing system
- Constant pressure water treatment system
- Water treatment pump
- Agricultural pump
- Temperature control of middle/large oven
- Air compressor
- Heat exchange fans
- Building water dispenser system
- Dryer's windmill

Paper/Textile Machine

- Round weaver
- Cross weaver
- Ribbon weaver
- Printing press
- Industrial sewing machine
- Knitting machines

Others

- Ironing machine
- Car washing machine
- Pulverizer
- Packing machine
- Treadmil
- Centrifuge
- Feeder
- Liquid mixer
- Industrial washing machine

Variable Speed AC Motor Drive



Specifications

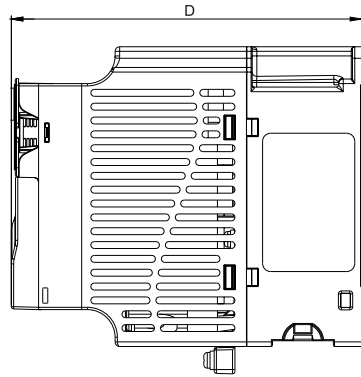
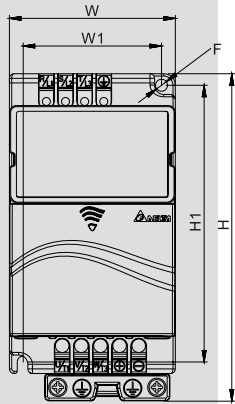
Voltage Class		115V Class		
Model Number VFD-___E		002	004	007
Max. Applicable Motor Output (kW)		0.2	0.4	0.75
Max. Applicable Motor Output (hp)		0.25	0.5	1.0
Output Rating	Rated Output Capacity (kVA)	0.6	1.0	1.6
	Rated Output Current (A)	1.6	2.5	4.2
	Maximum Output Voltage (V)	3-phase proportional to twice the input voltage		
	Output Frequency (Hz)	0.1~600Hz		
Input Rating	Carrier Frequency (kHz)	1-15		
	Rated Input Current (A)	Single-phase		
	Rated Voltage/Frequency	6	9	18
	Voltage Tolerance	Single phase 100-120V · 50/60Hz		
Cooling Method	Frequency Tolerance	±10%(90-132V)		
		±5%(47-63Hz)		
Weight (kg)	Cooling Method	Natural Cooling		Fan Cooling
		1.2	1.2	1.2

Voltage Class		230V							
Model Number VFD-___E		002	004	007	015	022	037	055	075
Max. Applicable Motor Output (kW)		0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5
Max. Applicable Motor Output (hp)		0.25	0.5	1.0	2.0	3.0	5.0	7.5	10.0
Output Rating	Rated Output Capacity (kVA)	0.6	1.0	1.6	2.9	4.2	6.5	9.5	12.5
	Rated Output Current (A)	1.6	2.5	4.2	7.5	11.0	17.0	25.0	33.0
	Maximum Output Voltage (V)	3-phase proportional to input voltage							
	Output Frequency (Hz)	0.1~600Hz							
Input Rating	Carrier Frequency (kHz)	1-15							
	Rated Input Current (A)	Single/3-phase				3-phase			
	Rated Voltage/Frequency	4.9/1.9	6.5/2.7	9.7/5.1	15.7/9	24/15	20.6	26	34
	Voltage Tolerance	Single/3-phase 200-240V · 50/60Hz				3-phase 200-240V · 50/60Hz			
Cooling Method	Frequency Tolerance	±10%(180-264V)							
		±5%(47-63Hz)							
Weight (kg)	Cooling Method	Natural Cooling				Fan Cooling			
		1.1	1.1	1.1	1.9	1.9	1.9	3.5	3.5

Voltage Class		460V							
Model Number VFD-___E		004	007	015	022	037	055	075	110
Max. Applicable Motor Output (kW)		0.4	0.75	1.5	2.2	3.7	5.5	7.5	11.0
Max. Applicable Motor Output (hp)		0.5	1.0	2.0	3.0	5.0	7.5	10.0	15.0
Output Rating	Rated Output Capacity (kVA)	1.2	2.0	3.3	4.4	6.8	9.9	13.7	18.3
	Rated Output Current (A)	1.5	2.5	4.2	5.5	8.5	13.0	18.0	24.0
	Maximum Output Voltage (V)	3-phase proportional to input voltage							
	Output Frequency (Hz)	0.1~600Hz							
Input Rating	Carrier Frequency (kHz)	1-15							
	Rated Input Current (A)	3-phase							
	Rated Voltage/Frequency	1.9	3.2	4.31	7.1	11.2	14	19	26
	Voltage Tolerance	3-phase 380-480V · 50/60Hz							
Cooling Method	Frequency Tolerance	±10%(342-528V)							
		±5%(47-63Hz)							
Weight (kg)	Cooling Method	Natural Cooling				Fan Cooling			
		1.2	1.2	1.2	1.9	1.9	4.2	4.2	4.2

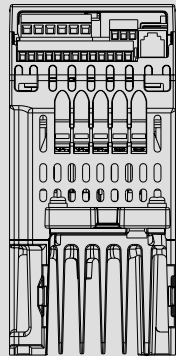
Control Characteristics	Control System	SPWM (Sinusoidal Pulse Width Modulation) Control (V/f for sensorless vector control)	
	Frequency Setting Resolution	0.01Hz	
	Output Frequency Resolution	0.01Hz	
	Torque Characteristics	Including the auto-torque/auto-slip compensation; starting torque can be 150% at 3.0Hz	
	Overload Endurance	150% of rated current for 1 minute	
	Skip Frequency	Three zones, setting range 0.1~600Hz	
	Accel/Decel Time	0.1 to 600 seconds (2 Independent setting of Accel/Decel time)	
	Stall Prevention Level	Setting 20 to 250% of rated current	
	DC Braking	Operation frequency 0.1~600.0Hz, output 0~100% rated current Start time 0~60 seconds, stop time 0~60 seconds	
	Regenerated Braking Torque	Approx. 20% (up to 125% possible with optional brake resistor or externally mounted brake unit. 1-15hp models have brake chopper built-in)	
Operating Characteristics	V/f Pattern	Adjustable V/f pattern	
	Frequency Setting	Keypad	Setting by ▲▼
		External Signal	Potentiometer-5kΩ/0.5W, 0 to +10VDC, 4 to 20mA, RS-485 interface; Multi-function Inputs 3 to 9 (15 steps, Jog, up/down)
	Operation Setting Signal	Keypad	Set by RUN and STOP
		External Signal	2 wires/3 wires (FWD, REV, EF), JOG operation, RS-485 serial interface (MODBUS), programmable logic controller
	Multi-Function Input Signal	Multi-step selection 0 to 15, Jog, accel/decel inhibit, 2 accel/decel switches, counter, external Base Block (NC, NO), auxiliary motor control is invalid, ACI/AVI/AUI selections, driver reset, UP/DOWN key settings, sink/source (=NPN/PNP) selection	
	Multi-Function Output Indication	AC drive operating, frequency attained, non-zero frequency, Base Block, fault indication, local/remote indication, auxiliary motor output, drive is ready, overheat alarm, emergency stop and status selections of input terminals (NC/NO)	
	Analog Output Signal	Output frequency/current	
	Alarm Output Contact	Contact will be On when drive malfunctions (1 Form C/change-over contact or 1 open collector output)	
	Operation Functions	Built-in PLC, AVR, accel/decel S-Curve, over-voltage/over-current stall prevention, 5 fault records, reverse inhibition, momentary power loss restart, DC braking, auto torque/slip compensation, auto tuning, adjustable carrier frequency, output frequency limits, parameter lock/reset, vector control, PID control, external counter, MODBUS communication, abnormal reset, abnormal re-start, power-saving, sleep/wake function, fan control, 1st/2nd frequency source selections, 1st/2nd frequency source combination, NPN/PNP selection	
Protection Functions	Over voltage, over current, under voltage, under current, external fault, overload, ground fault, overheating, electronic thermal, IGBT short circuit, PTC		
Display Keypad	6-key, 7-segment LED with 4-digit, 5 status LED, master frequency, output frequency, output current, custom units, parameter values for setup and lock, faults, RUN, STOP, RESET, FWD/REV		
Environmental Conditions	Built-in EMI Filter	For 230V 1-phase and 460V 3-phase models	
	Enclosure Rating	IP20	
	Pollution Degree	2	
	Installation Location	Altitude 1,000 m or lower, keep from corrosive gasses, liquid and dust	
	Ambient Temperature	-10°C to +50°C (40°C for side-by-side mounting) Non-Condensing and not frozen	
	Storage/Transportation Temperature	-20°C to 60°C	
	Ambient Humidity	Below 90% RH (non-condensing)	
Vibration	9.80665m/s ² (1G) less than 20Hz, 5.88m/s ² (0.6G) at 20 to 50Hz		
Approvals			

Dimensions & Options



Unit: mm(inch)

Model	W	W1	H	H1	D	F
VFD002E11A/11T VFD002E21A/21T VFD002E23A/23T VFD004E11A/11T VFD004E21A/21T VFD004E23A/23T VFD004E43A/43T VFD007E21A/21T VFD007E23A/23T VFD007E43A/43T VFD015E23A/23T VFD015E43A/43T	72.0 (2.83)	60.0 (2.36)	142.0 (5.59)	120.0 (4.72)	152.0 (5.98)	5.2 (0.20)
VFD007E11A VFD015E21A VFD022E21A VFD022E23A VFD022E43A VFD037E23A VFD037E43A	100.0 (3.94)	89.0 (3.51)	174.0 (6.86)	162.0 (6.38)	152.0 (5.98)	5.5 (0.22)
VFD055E23A VFD055E43A VFD075E23A VFD075E43A VFD110E43A	130.0 (5.12)	116.0 (4.57)	260.0 (10.24)	246.5 (9.71)	169.2 (6.67)	5.5 (0.22)
VFD002E11P VFD002E21P VFD002E23P VFD004E11P VFD004E21P VFD004E23P VFD004E43P VFD007E21P VFD007E23P VFD007E43P VFD015E23P	72.0 (2.83)	56.0 (2.20)	155.0 (6.10)	143.0 (5.63)	111.5 (4.39)	5.3 (0.21)



New Models

VFD-E-T: Built-in brake chopper for frame A
VFD-E-P: Plate drive

Accessories

Optional Cards



■ EME-R3AA
Relay card (3 form A/
NO contacts)



■ EME-R2CA
Relay card (2 form C/
Change-over contacts)



■ EME-33A
I/O card
(photocoupler 3in+3out)



■ EME-A22A
Anglog I/O Card(12 bits)



■ EME-PG01
PG card



■ CME-USB01
Second communication card
(USB1.1)

Fieldbus Modules



■ DeviceNet



■ Profibus



■ LonWorks



■ CANopen

Others



■ Digital keypad



■ Brake resistor

- Keypad for communication(PU-06)
- Zero phase reactor
- Keypad cable
- DIN rail(Width35mm)
- EMI Input Filter

- Grounding plate
- Brake unit
- DC Fan
- AC reactor