High Performance / Flexible Extension / Micro Type AC Motor Drives
Variable Speed AC Motor Drive

**VFD-E Series**

**Features**

*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 (0.5~15hp)

*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

*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.
Variable Speed AC Motor Drive

Basic Wiring Diagram

- **External Parts**
  - Switch to ON for 50Hz
  - Switch to ON for free run to stop
  - Switch to ON for setting frequency source to ACI(P 02.00=2)
  - Keypad mounting port
  - Mounting port for extension card
  - ACI terminal ACI/AVI12 switch
  - NPN/PNP
  - RS-485 port(RJ-45)

- **Control Terminals**

- **Model Explanation**
  - **Series Name**
    (Variable Frequency Drive)
  - **Applicable Motor Capacity**
    - 11:115V 1-Phase
    - 21:230V 1-Phase
    - 23:230V 3-Phase
    - 43:480V 3-Phase
  - **Mains Input Voltage**
    - 220V:0.25hp(0.2kW)
    - 004:0.5hp(0.4kW)
    - 007:1hp(0.75kW)
    - 015:2hp(1.5kW)
    - 022:3hp(2.2kW)
    - 037:5hp(3.7kW)
    - 055:7.5hp(5.5kW)
    - 075:10hp(7.5kW)
    - 110:15hp(11kW)
Variable Speed AC Motor Drive

**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 medium/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
- Pulverizer
- Treadmill
- Feeder
- Liquid mixer
- Industrial washing machine
## Variable Speed AC Motor Drive

### Specifications

<table>
<thead>
<tr>
<th>Voltage Class</th>
<th>115V Class</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model Number</strong></td>
<td>VFD__E</td>
</tr>
<tr>
<td><strong>Max. Applicable Motor Output (kW)</strong></td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Max. Applicable Motor Output (hp)</strong></td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Rated Output Capacity (kVA)</strong></td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Rated Output Current (A)</strong></td>
<td>1.6</td>
</tr>
<tr>
<td><strong>Maximum Output Voltage (V)</strong></td>
<td>3-phase, proportional to twice the input voltage</td>
</tr>
<tr>
<td><strong>Output Frequency (Hz)</strong></td>
<td>0.1 - 180Hz</td>
</tr>
<tr>
<td><strong>Carrier Frequency (kHz)</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Rated Input Current (A)</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Rated Voltage/Frequency</strong></td>
<td>Single phase 100-120V - 50/60Hz</td>
</tr>
<tr>
<td><strong>Voltage Tolerance</strong></td>
<td>±10% (90-132V)</td>
</tr>
<tr>
<td><strong>Frequency Tolerance</strong></td>
<td>±5% (47-63Hz)</td>
</tr>
<tr>
<td><strong>Cooling Method</strong></td>
<td>Natural Cooling</td>
</tr>
<tr>
<td><strong>Weight (kg)</strong></td>
<td>1.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voltage Class</th>
<th>230V</th>
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</thead>
<tbody>
<tr>
<td><strong>Model Number</strong></td>
<td>VFD__E</td>
</tr>
<tr>
<td><strong>Max. Applicable Motor Output (kW)</strong></td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Max. Applicable Motor Output (hp)</strong></td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Rated Output Capacity (kVA)</strong></td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Rated Output Current (A)</strong></td>
<td>1.6</td>
</tr>
<tr>
<td><strong>Maximum Output Voltage (V)</strong></td>
<td>3-phase, proportional to twice the input voltage</td>
</tr>
<tr>
<td><strong>Output Frequency (Hz)</strong></td>
<td>0.1 - 600Hz</td>
</tr>
<tr>
<td><strong>Carrier Frequency (kHz)</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Rated Input Current (A)</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Rated Voltage/Frequency</strong></td>
<td>Single phase 200-240V - 50/60Hz</td>
</tr>
<tr>
<td><strong>Voltage Tolerance</strong></td>
<td>±10% (180-264V)</td>
</tr>
<tr>
<td><strong>Frequency Tolerance</strong></td>
<td>±5% (47-63Hz)</td>
</tr>
<tr>
<td><strong>Cooling Method</strong></td>
<td>Natural Cooling</td>
</tr>
<tr>
<td><strong>Weight (kg)</strong></td>
<td>1.1</td>
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<table>
<thead>
<tr>
<th>Voltage Class</th>
<th>480V</th>
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</thead>
<tbody>
<tr>
<td><strong>Model Number</strong></td>
<td>VFD__E</td>
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<tr>
<td><strong>Max. Applicable Motor Output (kW)</strong></td>
<td>0.4</td>
</tr>
<tr>
<td><strong>Max. Applicable Motor Output (hp)</strong></td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Rated Output Capacity (kVA)</strong></td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Rated Output Current (A)</strong></td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Maximum Output Voltage (V)</strong></td>
<td>3-phase, proportional to twice the input voltage</td>
</tr>
<tr>
<td><strong>Output Frequency (Hz)</strong></td>
<td>0.1 - 600Hz</td>
</tr>
<tr>
<td><strong>Carrier Frequency (kHz)</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Rated Input Current (A)</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Rated Voltage/Frequency</strong></td>
<td>Single phase 380-480V - 50/60Hz</td>
</tr>
<tr>
<td><strong>Voltage Tolerance</strong></td>
<td>±10% (342-528V)</td>
</tr>
<tr>
<td><strong>Frequency Tolerance</strong></td>
<td>±5% (47-63Hz)</td>
</tr>
<tr>
<td><strong>Cooling Method</strong></td>
<td>Natural Cooling</td>
</tr>
<tr>
<td><strong>Weight (kg)</strong></td>
<td>1.2</td>
</tr>
</tbody>
</table>

### Control System
- **SPWM (Sinusoidal Pulse Width Modulation)**
- **Control:** V/F or 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:** 100% of rated current for 1 minute
- **Skip Frequency:** Three zones, setting range 1 - 600Hz
- **Accel/Decel Time:** 0.1 to 600 seconds (2 independent setting of Accel/Decel time)
- **Stall Prevention Level:** Setting 20% to 25% of rated current
- **DC Braking:** Operation 0.1 - 600Hz, output 0 - 100% rated current, start time 0 - 60 seconds, stop time 0 - 60 seconds
- **Regenerated Braking Torque:** Approx. 20% of rated motor load
- **V/I Pattern:** Adaptive V/I pattern
- **Setting by:** ▶

### Operating Parameters
- **Frequency Setting:** Keypad
- **External Signal:** Potentiometer: 0-10V, 0-10VDC, 4 to 20mA, RS-485 interface, Multi-function input 3 photocells (15 steps, Jog, up/down)
- **Operation Setting:** Keypad
- **External Signal:** 2 wires/wire (FWD, REV, EN), JOG operation, RS-485 serial interface (MODBUS), programmable logic controller
- **Operation Functions:** Multi-step selection, JOG, external, switch, encoder, stepper, auxiliary motor control, and other optional settings
- **Protection Functions:** Over voltage, under voltage, current overload, thermal overload, ground fault, motor fault, communication failure, failure alarm, emergency stop, and other protection mechanisms

### Alarm Output Contact
- Contact will be On when drive malfunctions (1 Form C/Change-over contact or 1 open collector output)

### Display Keypad
- 6-key, 7-segment LED with 6-digit, 5 status LED, master frequency, output frequency, output current, custom units, parameter values for setup and lock, faults, RUN, STOP, RESET, FWD/REV

### Built-in EM Filter
- For 230V 1-phase and 480V 3-phase models

### Enclosure Rating
- IP20

### Pollution Degree
- 2

### Installation Location
- Altitude: 1,000 m or lower, keep it from corrosive gases, liquid and dust
- Temperature: -10°C to +50°C (40°C for side-by-side mounting)
- -20°C to +60°C

### Non-Condensing
- Below 90% RH

### Vibration
- 9.806555m/s² (1g) < 10Hz, 5.68m/s² (0.6g) at 20 to 50Hz

### Approvals
- CE, UL
Variable Speed AC Motor Drive

Dimensions & Options

<table>
<thead>
<tr>
<th>Model</th>
<th>W</th>
<th>W1</th>
<th>H</th>
<th>H1</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFD002E11A/1T</td>
<td>72.0</td>
<td>60.0</td>
<td>142.0</td>
<td>152.0</td>
<td>5.2</td>
</tr>
<tr>
<td>VFD002E21A/21T</td>
<td>72.0</td>
<td>60.0</td>
<td>142.0</td>
<td>152.0</td>
<td>5.2</td>
</tr>
<tr>
<td>VFD004E11A/1T</td>
<td>90.0</td>
<td>74.0</td>
<td>174.0</td>
<td>182.0</td>
<td>5.5</td>
</tr>
<tr>
<td>VFD004E21A/21T</td>
<td>90.0</td>
<td>74.0</td>
<td>174.0</td>
<td>182.0</td>
<td>5.5</td>
</tr>
<tr>
<td>VFD008E23A</td>
<td>120.0</td>
<td>100.0</td>
<td>250.0</td>
<td>268.0</td>
<td>5.5</td>
</tr>
<tr>
<td>VFD008E43A</td>
<td>120.0</td>
<td>100.0</td>
<td>250.0</td>
<td>268.0</td>
<td>5.5</td>
</tr>
<tr>
<td>VFD015E23A</td>
<td>150.0</td>
<td>126.0</td>
<td>306.0</td>
<td>324.0</td>
<td>5.5</td>
</tr>
<tr>
<td>VFD015E43A</td>
<td>150.0</td>
<td>126.0</td>
<td>306.0</td>
<td>324.0</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Unit: mm (inch)

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: Analog I/O Card (12 bits)
- EME-PG01: PG card
- CME-USB01: Second communication card (USB1.1)

Fieldbus Modules
- DeviceNet
- Profibus
- LonWorks
- CANopen

Others
- Keypad for communication (PU-06)
- Zero phase reactor
- Keypad cable
- DIN rail (Width 35 mm)
- EMI Input Filter
- Digital keypad
- Brake resistor
- Grounding plate
- Brake unit
- DC Fan
- AC reactor