



Automation for a Changing World

Delta Sensorless Vector Control Compact Drive VFD-EL-W Series



www.deltaww.com

 **DELTA**
Smarter. Greener. Together.

Sensorless Vector Control Compact Drive VFD-EL-W Series

*Simple Speed Control
Horizontal Movement
Fixed Load Applications*



Frame A1

Frame A2

Frame B

| Safety and Reliability



150% / 60secs overload capability



Energy-saving



CE certification

| Easy Maintenance



Natural cooling (Frame A1):
no maintenance required



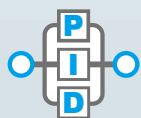
Fan cooling (Frame A2, Frame B):
easy fan installation, reliable design,
fast dust removal



| Complete Functions



Single / multi-pump control:
constant pressure mode & alternative operation



Built-in PID feedback control



Protection: overload, over voltage / over current stall prevention

Applications

Edge Banding Machine

- Communication isolation reduces the interference of HMI
- One drive for two motors in parallel
- Optimized accel. / decel. improve system efficiency
- Small size, lightweight, easy maintenance and installation



Logistics Conveyor

- Built-in RS-485 COM port for high-speed communication
- Fast and stable tension control
- Small and compact design to save installation space



Material Handling Machine

- Multiple speed adjustment modes for different applications
- AVR function to ensure the stability and reliability
- Speed tracking function for continuing operation after power resumes from an instantaneous power failure



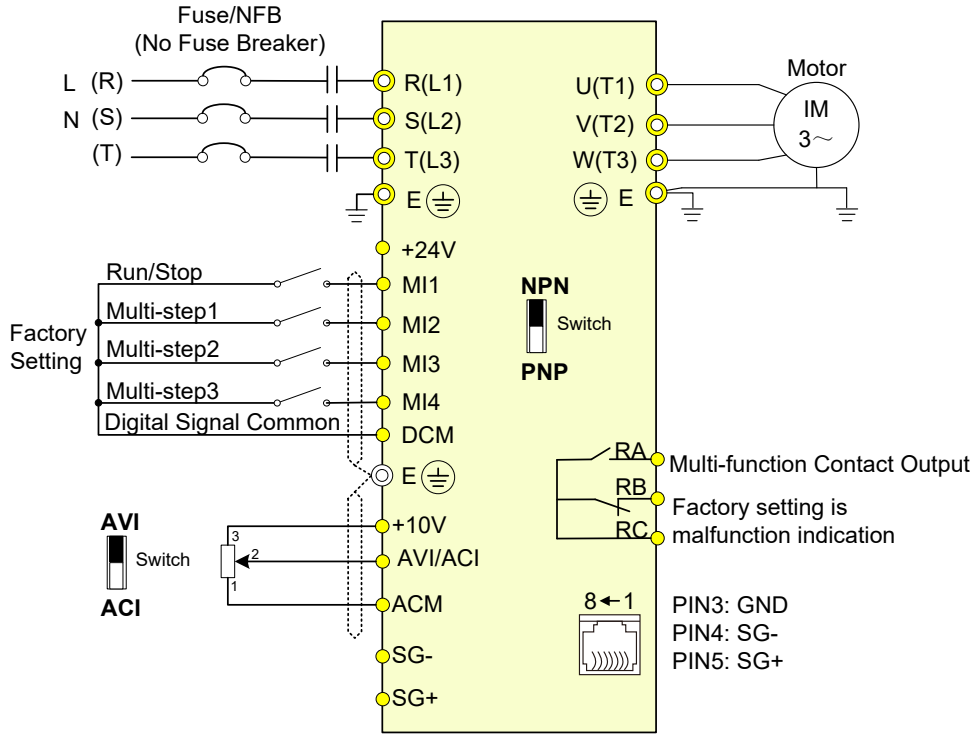
Constant Pressure Pump

- Build-in PID control; no need for external PID device to save system cost
- Built-in automatic inspection and restoration functions in case of water outage; no external PLC needed
- Leakage detection function
- Multi-pump control: alternates pump operation in cycle (One drive supports max. 4 pumps)



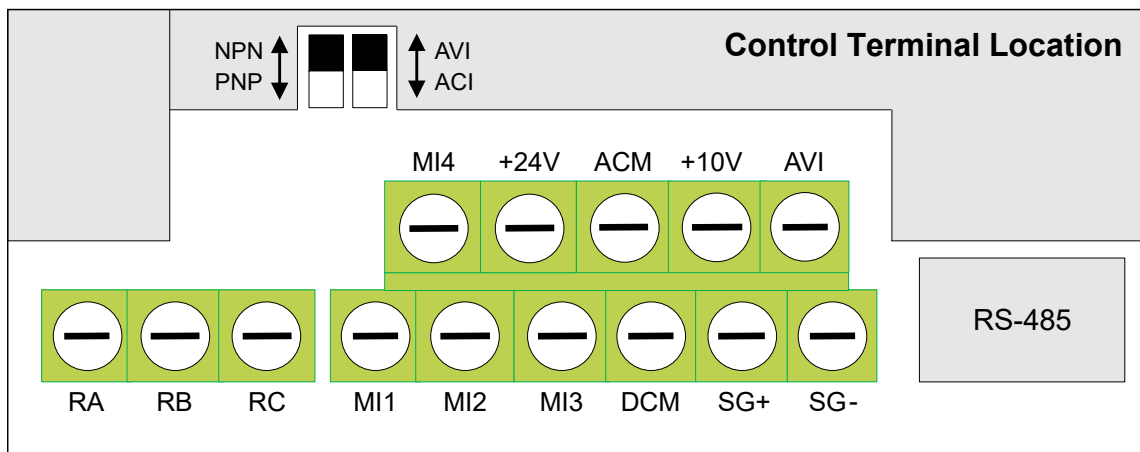
Wiring

230V/460V Models

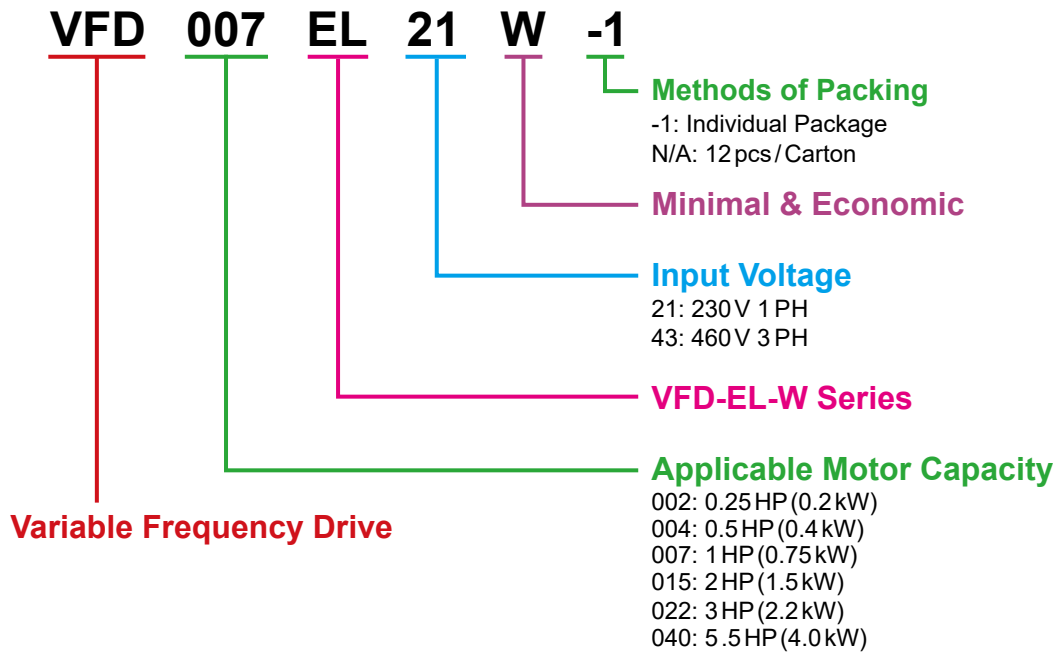


● Main Circuit (power) Terminals
 ● Control Circuit Terminals
 Shielded Leads & Cable
NOTE Terminal SG+, SG- are joined to PIN5, PIN4 of RJ45 Connector

Control Terminals

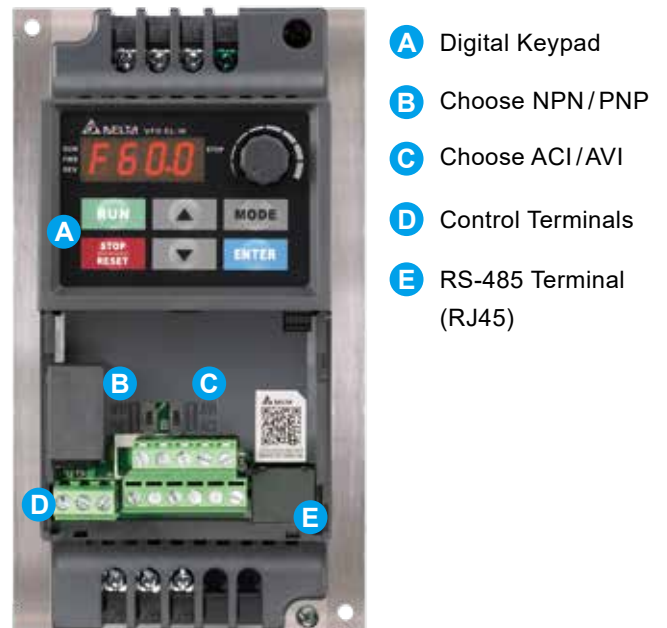


Model Explanation



Frames and Appearances

■ Frame A1



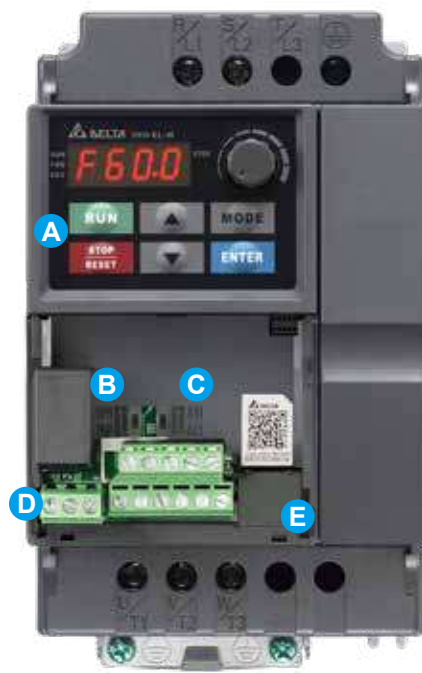
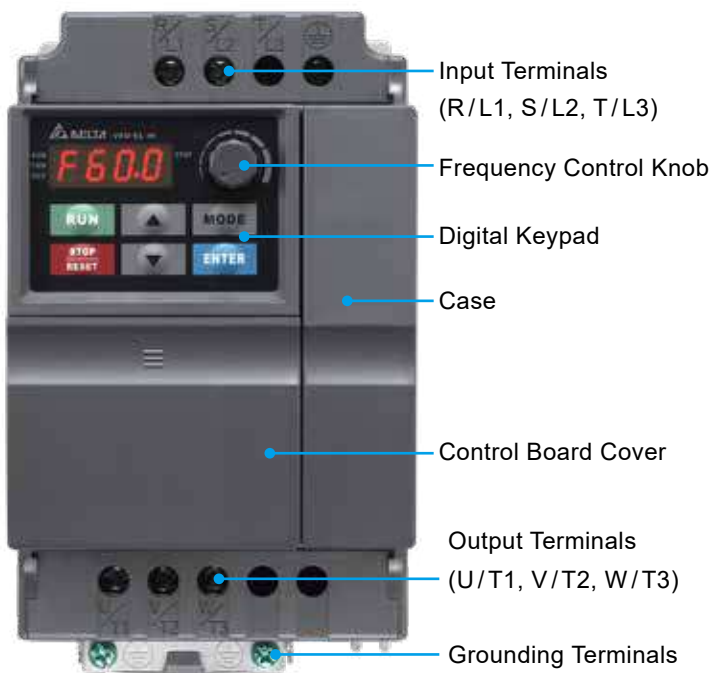
Frames and Appearances

■ Frame A2



- A** Digital Keypad
- B** Choose NPN/PNP
- C** Choose ACI/AVI
- D** Control Terminals
- E** RS-485 Terminal (RJ45)

■ Frame B



- A** Digital Keypad
- B** Choose NPN/PNP
- C** Choose AVI/ACI
- D** Control Terminals
- E** RS-485 Terminal (RJ45)


Specifications

Product Specifications

| 230V | | | | | | |
|-----------------------------------|-----------------------------|---------------------------------------|------|-------------|------|------|
| Frame | A1 | | | B | | |
| VFD □□□ EL21W (-1) | 002 | 004 | 007 | 015 | 022 | |
| Max. Applicable Motor Output (kW) | 0.2 | 0.4 | 0.75 | 1.5 | 2.2 | |
| Max. Applicable Motor Output (Hp) | 0.25 | 0.5 | 1.0 | 2.0 | 3.0 | |
| Output Rating | Rated Output Capacity (kVA) | 0.6 | 1.0 | 1.6 | 2.9 | 4.2 |
| | Rated Output Current (A) | 1.6 | 2.5 | 4.2 | 7.5 | 11.0 |
| | Maximum Output Voltage (V) | 3-Phase Proportional to Input Voltage | | | | |
| | Output Frequency (Hz) | 0.1 ~ 400 | | | | |
| | Carrier Frequency (kHz) | 2 ~ 12(Default: 8) | | | | |
| Input Rating | Rated Input Current (A) | 4.9 | 6.5 | 9.3 | 15.7 | 24.0 |
| | Rated Voltage / Frequency | Single Phase, AC 200V ~ 240V, 50/60Hz | | | | |
| | Voltage Tolerance | ±10% (180V ~ 264V) | | | | |
| | Frequency Tolerance | ±5% (47Hz ~ 63Hz) | | | | |
| Weight (kg) | 1.0 | 1.0 | 1.0 | 1.4 | 1.4 | |
| Cooling Method | Natural Cooling | | | Fan Cooling | | |
| Brake Unit | N/A | | | | | |
| DC Choke | N/A | | | | | |
| EMI Filter | N/A | | | | | |

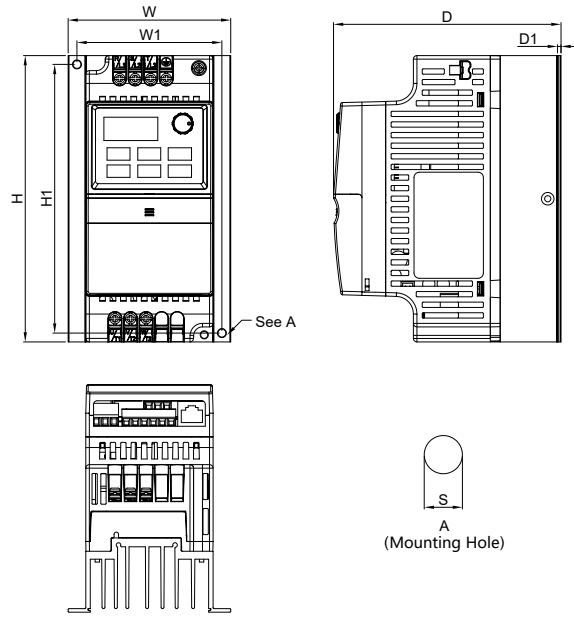
| 460V | | | | | | |
|-----------------------------------|-----------------------------|---------------------------------------|-----|-------------|-----|------|
| Frame | A1 | | A2 | B | | |
| VFD □□□ EL43W (-1) | 004 | 007 | 015 | 022 | 040 | |
| Max. Applicable Motor Output (kW) | 0.4 | 0.75 | 1.5 | 2.2 | 4.0 | |
| Max. Applicable Motor Output (Hp) | 0.5 | 1.0 | 2.0 | 3.0 | 5.5 | |
| Output Rating | Rated Output Capacity (kVA) | 1.2 | 2.0 | 3.3 | 4.4 | 7.4 |
| | Rated Output Current (A) | 1.5 | 2.5 | 4.2 | 5.5 | 9.0 |
| | Maximum Output Voltage (V) | 3-Phase Proportional to Input Voltage | | | | |
| | Output Frequency (Hz) | 0.1 ~ 400 | | | | |
| | Carrier Frequency (kHz) | 2 ~ 12(Default: 8) | | | | |
| Input Rating | Rated Input Current (A) | 1.8 | 3.2 | 4.3 | 7.1 | 10.0 |
| | Rated Voltage / Frequency | 3-Phase, AC 380V ~ 480V, 50/60Hz | | | | |
| | Voltage Tolerance | ±10% (342V ~ 528V) | | | | |
| | Frequency Tolerance | ±5% (47Hz ~ 63Hz) | | | | |
| Weight (kg) | 1.0 | 1.0 | 1.0 | 1.4 | 1.4 | |
| Cooling Method | Natural Cooling | | | Fan Cooling | | |
| Brake Unit | N/A | | | | | |
| DC Choke | N/A | | | | | |
| EMI Filter | N/A | | | | | |

General Specifications

| | | | |
|---|---|--|--|
| Control Characteristics | Control System | | SPWM (Sinusoidal Pulse Width Modulation) control (V/F control) |
| | Frequency Setting Resolution | | 0.01 Hz |
| | Output Frequency Resolution | | 0.01 Hz |
| | Torque Characteristics | | Including the auto-torque, auto-slip compensation; starting torque can be 150 % at 5 Hz |
| | Overload Endurance | | 150 % of rated current for 1 minute |
| | Skip Frequency | | Three zones, setting range 0.1 ~ 400 Hz |
| | Accel./Decel. Time | | 0.1 to 600 secs (2 independent setting for accel./decel. time) |
| | Stall Prevention Level | | Setting 20 to 250 % of rated current |
| | DC Brake | | Operating frequency 0.1~400 Hz, Output 0 ~ 100 % rated current Start time 0~60 secs, stop time 0~60 secs |
| V/F Pattern | | Adjustable V/F pattern | |
| Operating Characteristics | Frequency Setting | Keypad | Setting by ▲ ▼ |
| | | External Signal | Potentiometer: 5k Ω /0.5W, 0 to +10 VDC, 4 to 20 mA Multi-function input MI2 ~ MI4 (8 steps: Including the main speed, jog, up/down); RS-485 serial interface |
| | Operating Setting Signal | Keypad | Setting by RUN and STOP |
| | | External Signal | RUN/STOP by MI1 (default) or 2-wire/3-wire control (MI1, MI2, MI3), jog operation, RS-485 serial interface (Modbus) |
| | Multi-function Input Signal | | 8-speed switch (including the main speed): ban commands for acceleration/deceleration, 2-speed switch for accel./decel., counter, jogging (inching), external base block, driver reset, NPN/PNP inputs, AVI/ACI analog inputs Switch to a speed as the default. |
| Multi-function Output Signal (only Relays) | | AC drive operating, frequency attained, zero speed, counter, over-torque inspection, external base block, operating modes, anomaly alarm, overheating alarm, emergency stop | |
| Protection Functions | | Over voltage, over current, under voltage, anomalies, overload, overheating, multiple motors, electronic thermal relays, PTC overheating protection | |
| Operation Functions | | Built-in voltage regulators, accel./decel. S-curve, over-voltage/over-current stall prevention, 5 anomalous logs, reverse ban, restart for instantaneous power outage, DC brake, automatic torque/slip compensation and motor parameter adjustment, carrier frequency setting, output frequency limits, parameter reset, PID control, external counter, Modbus protocol, reset and restart for anomalies, energy-saving, fan control (for models with fans), 1 st /2 nd frequency sources and combination, NPN/PNP inputs | |
| Display Keypad (optional) | | 6 function keys, 4-digit 7-segment LED, 4 status LEDs, adjustable frequency, self-defined units, parameter settings and lock function, anomaly alarms, Run/Stop/Reset buttons | |
| Environmental Conditions | Enclosure Rating | | IP20 |
| | Pollution Degree | | 2 |
| | Installation Location | | Altitude 1,000 m or lower, keeping from corrosive gases, liquids and dust |
| | Operating Temperature | | -10°C to 50°C (VFD007EL21W(-1) (requires fan accessories) |
| | Storage/Transportation Temperature | | -20°C to 60°C |
| | Ambient Humidity | | Below 90 % RH (non-condensing) |
| Vibration | | 1.0 mm, peak to peak 2~13.2 Hz; 0.7~1.0 G, 13.2~55 Hz; 1.0 G, 55~512 Hz; compliant with IEC 60068-2-6 | |
| Certification | |  CE, RoHS, GB 12668.3 | |

Dimensions

■ Frame A1



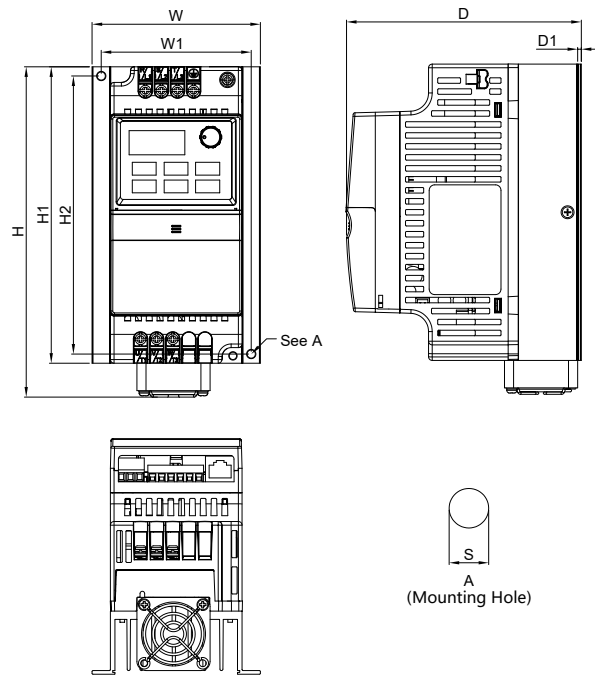
Model

VFD002EL21W(-1)
 VFD004EL21W(-1)
 VFD004EL43W(-1)
 VFD007EL21W(-1)
 VFD007EL43W(-1)

Unit: mm [inch]

| Frame | | W | W1 | H | H1 | D | D1 | S |
|-------|------|------|------|-------|------|-------|------|------|
| A1 | mm | 92.0 | 82.0 | 162.0 | 152 | 128.7 | 2.00 | 5.4 |
| | inch | 3.62 | 3.23 | 6.38 | 5.98 | 5.07 | 0.08 | 0.21 |

■ Frame A2



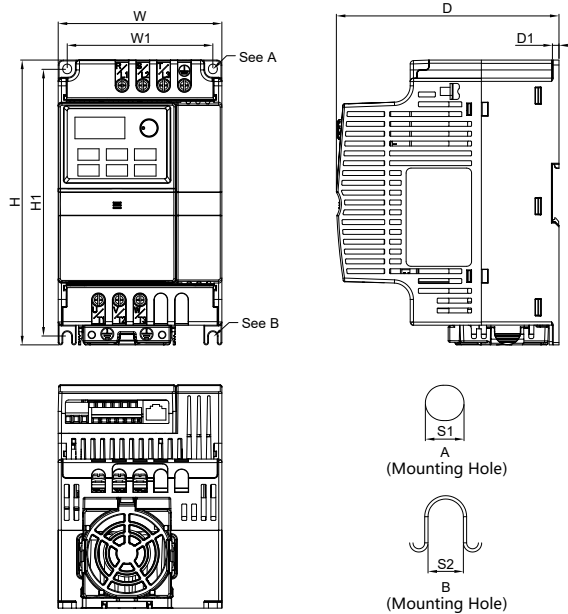
Model

VFD015EL43W(-1)

Unit: mm [inch]

| Frame | | W | W1 | H | H1 | H2 | D | D1 | S |
|-------|------|------|------|-------|-------|------|-------|------|------|
| A2 | mm | 92.0 | 82.0 | 180.5 | 162.0 | 152 | 128.7 | 2.00 | 5.4 |
| | inch | 3.62 | 3.23 | 7.11 | 6.38 | 5.98 | 5.07 | 0.08 | 0.21 |

■ Frame B



Model

- VFD015EL21W(-1)
- VFD022EL21W(-1)
- VFD022EL43W(-1)
- VFD040EL43W(-1)

Unit: mm [inch]

| Frame | | W | W1 | H | H1 | D | D1 | S1 | S2 |
|----------|------|-------|------|-------|-------|-------|------|------|------|
| B | mm | 100.0 | 89.0 | 174.0 | 162.9 | 136.0 | 4.0 | 5.9 | 5.4 |
| | inch | 3.94 | 3.50 | 6.85 | 6.42 | 5.35 | 0.16 | 0.23 | 0.21 |

Accessories



■ Keypad
VFD-PU06



■ Keypad
VFD-PU08



■ Reactor
RF220X00A

Ordering Information

| Frame | Cooling Method | Operating Temperature | Power Range | Models |
|----------|-----------------|-----------------------|--|--|
| Frame A1 | Natural Cooling | -10°C ~ 50°C | 230 V: 0.2~0.75 kW 460 V: 0.4~0.75 kW | VFD002EL21W(-1) VFD004EL21W(-1) VFD004EL43W(-1) VFD007EL21W(-1)* VFD007EL43W(-1) |
| Frame A2 | Fan Cooling | | 460 V: 1.5 kW | VFD015EL43W(-1) |
| Frame B | | | 230 V: 1.5 ~ 2.2 kW 460 V: 2.2 ~ 4.0 kW | VFD015EL21W(-1) VFD022EL21W(-1) VFD022EL43W(-1) VFD040EL43W(-1) |

NOTE VFDxxxELxxW-1 and VFDxxxELxxW share the same electrical specifications.

*VFD007EL21W(-1) requires fans to ensure the operating temperature up to 50°C.



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