



Automation for a Changing World

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



[www.deltaww.com](http://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 % / 60 secs overload capability



Energy-saving



CE certification

## | Easy Maintenance



Natural cooling (Frame A1):  
no maintenance required



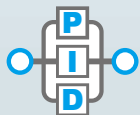
Fan cooling (Frame A2, Frame B):  
easy fan installation, reliable design,  
fast dust removal



## | 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



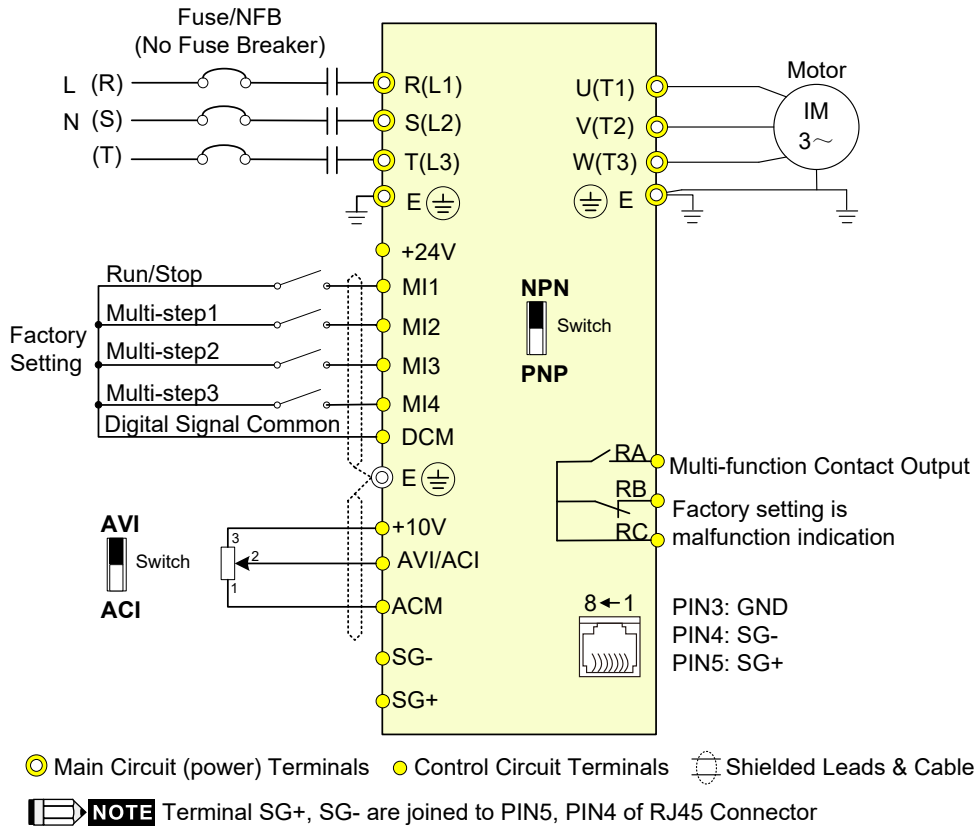
## Constant Pressure Pump

- 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)

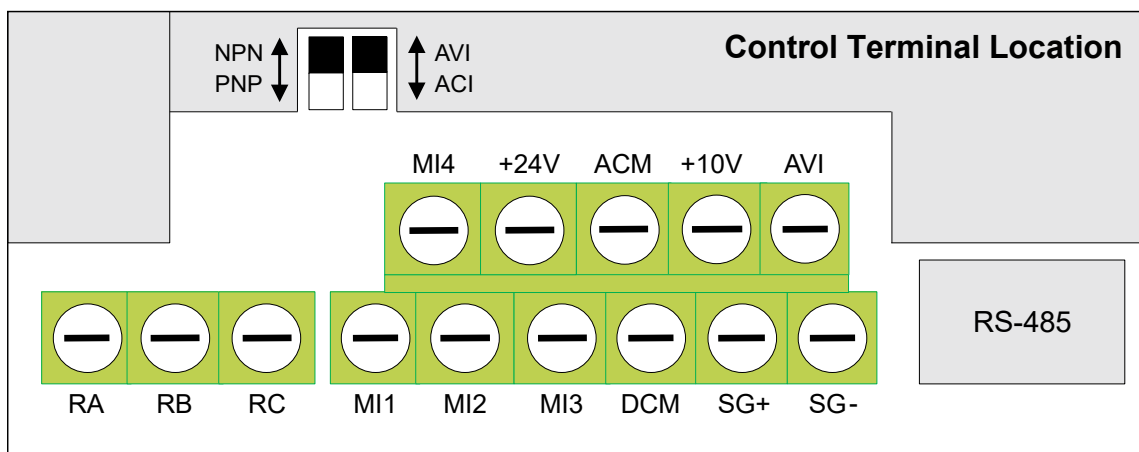


# Wiring

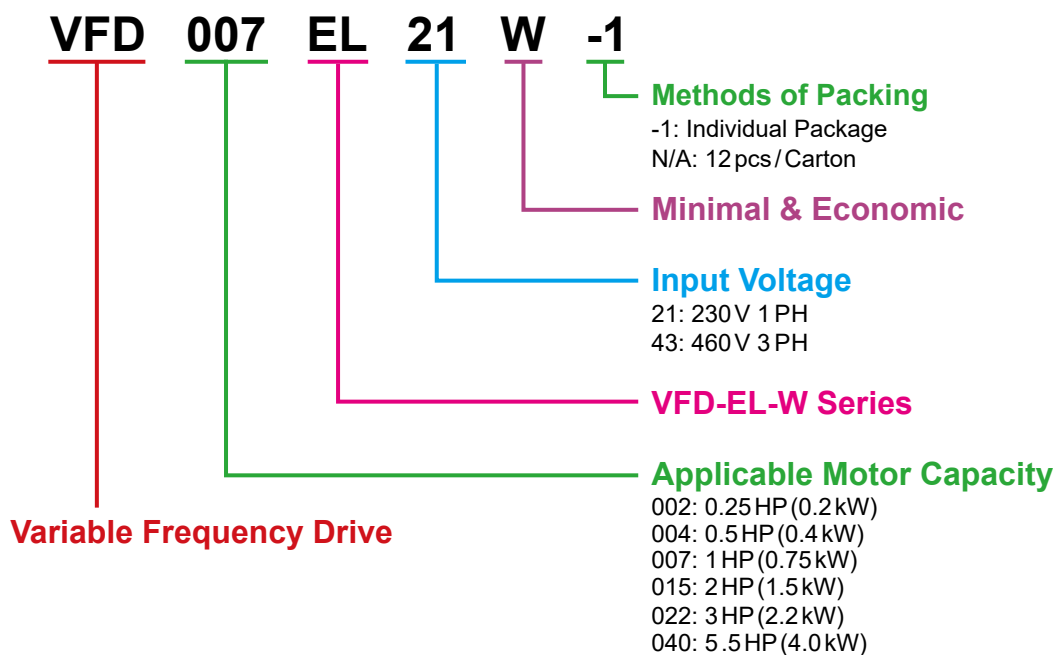
## 230V/460V Models



## Control Terminals

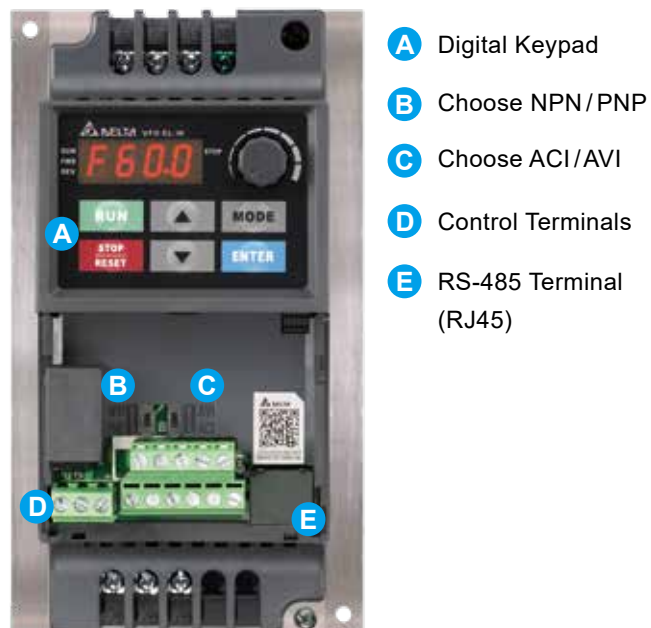


## Model Explanation



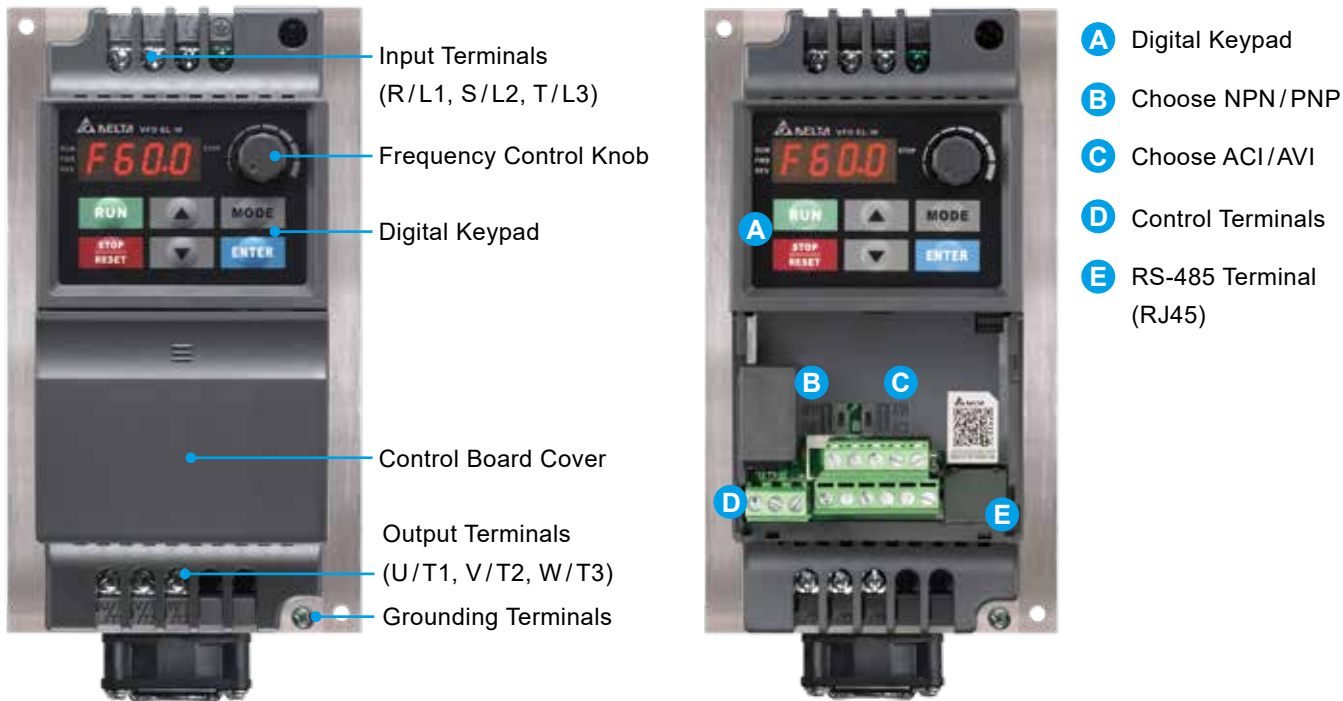
## Frames and Appearances

### ■ Frame A1

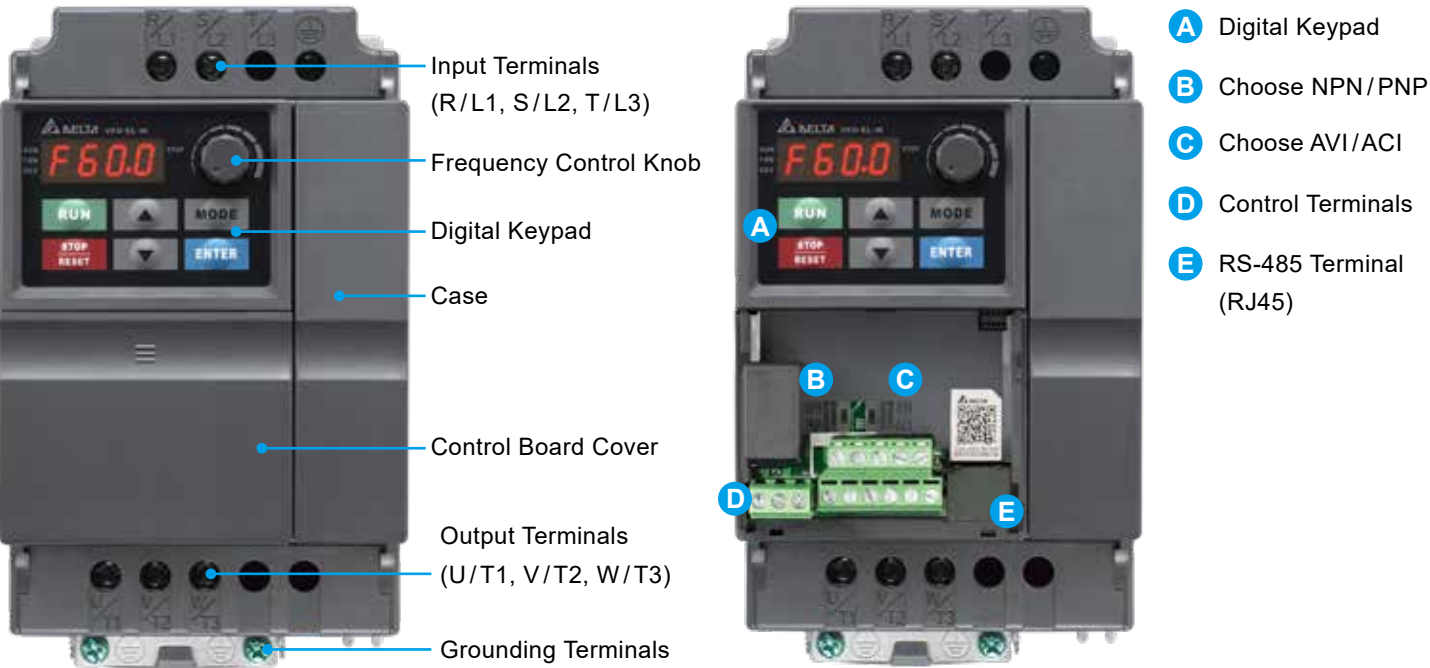


# Frames and Appearances

## ■ Frame A2



## ■ Frame B



# Specifications

## Product Specifications

| 230 V                             |                             |                                       |     |      |             |      |
|-----------------------------------|-----------------------------|---------------------------------------|-----|------|-------------|------|
| 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                                   |     |      |             |      |

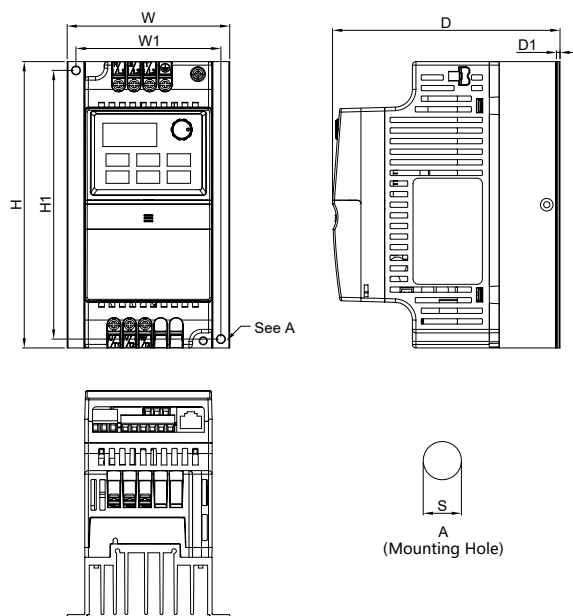
| 460 V                             |                             |                                       |      |             |     |      |
|-----------------------------------|-----------------------------|---------------------------------------|------|-------------|-----|------|
| Frame                             |                             | 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 380 V ~ 480 V, 50/60 Hz   |      |             |     |      |
|                                   | Voltage Tolerance           | ± 10 % (342 V ~ 528 V)                |      |             |     |      |
|                                   | Frequency Tolerance         | ± 5 % (47 Hz ~ 63 Hz)                 |      |             |     |      |
| 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<br>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: 5kΩ/0.5W, 0 to +10VDC, 4 to 20mA<br>Multi-function input MI2 ~ MI4 (8 steps: Including the main speed, jog, up/down);<br>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,<br>RS-485 serial interface (Modbus)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                           | Multi-function Input Signal                |                 | 8-speed switch (including the main speed): ban commands for acceleration/deceleration,<br>2-speed switch for accel./decel., counter, jogging (inching), external base block, driver reset,<br>NPN/PNP inputs, AVI/ACI analog inputs<br><br>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<br>base block, operating modes, anomaly alarm, overheating alarm, emergency stop                                                                                                                                                                                                                                                                                                                                                                                 |
| Protection Functions      |                                            |                 | Over voltage, over current, under voltage, anomalies, overload, overheating, multiple motors,<br>electronic thermal relays, PTC overheating protection                                                                                                                                                                                                                                                                                                                                                                                                         |
| Operation Functions       |                                            |                 | Built-in voltage regulators, accel./decel. S-curve, over-voltage/over-current stall prevention,<br>5 anomalous logs, reverse ban, restart for instantaneous power outage, DC brake, automatic<br>torque/slip compensation and motor parameter adjustment, carrier frequency setting, output<br>frequency limits, parameter reset, PID control, external counter, Modbus protocol, reset and<br>restart for anomalies, energy-saving, fan control (for models with fans), 1 <sup>st</sup> /2 <sup>nd</sup> frequency<br>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,<br>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;<br>1.0 G, 55–512 Hz; compliant with IEC 60068-2-6                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Certification             |                                            |                 |  , RoHS, GB 12668.3                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

# Dimensions

## ■ Frame A1



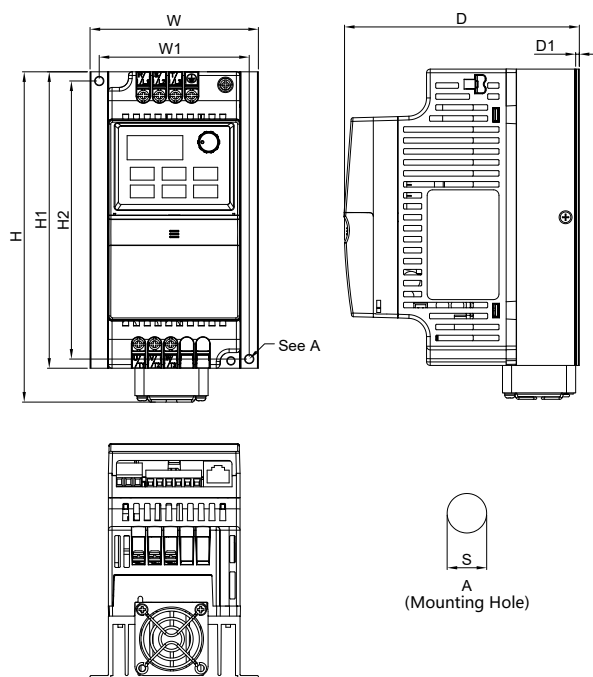
### Model

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



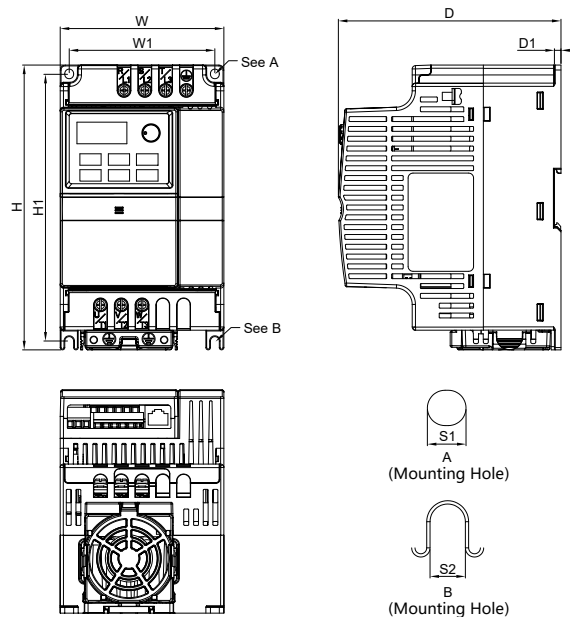
### Model

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>B</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℃～50℃              | 230 V: 0.2～0.75 kW<br>460 V: 0.4～0.75 kW   | VFD002EL21W(-1)<br>VFD004EL21W(-1)<br>VFD004EL43W(-1)<br>VFD007EL21W(-1)*<br>VFD007EL43W(-1) |
| Frame A2 |  | Fan Cooling     |                       | 460 V: 1.5 kW                              | VFD015EL43W(-1)                                                                              |
| Frame B  |  |                 |                       | 230 V: 1.5 ~ 2.2 kW<br>460 V: 2.2 ~ 4.0 kW | VFD015EL21W(-1)<br>VFD022EL21W(-1)<br>VFD022EL43W(-1)<br>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.



Smarter. Greener. Together.

## Industrial Automation Headquarters

### Delta Electronics, Inc.

Taoyuan Technology Center  
No.18, Xinglong Rd., Taoyuan District,  
Taoyuan City 33068, Taiwan  
TEL: 886-3-362-6301 / FAX: 886-3-371-6301

## Asia

### Delta Electronics (Shanghai) Co., Ltd.

No.182 Minyu Rd., Pudong Shanghai, P.R.C.  
Post code : 201209  
TEL: 86-21-6872-3988 / FAX: 86-21-6872-3996  
Customer Service: 400-820-9595

### Delta Electronics (Japan), Inc.

Tokyo Office  
Industrial Automation Sales Department  
2-1-14 Shibadaimon, Minato-ku  
Tokyo, Japan 105-0012  
TEL: 81-3-5733-1155 / FAX: 81-3-5733-1255

### Delta Electronics (Korea), Inc.

Seoul Office  
1511, 219, Gasan Digital 1-Ro., Geumcheon-gu,  
Seoul, 08501 South Korea  
TEL: 82-2-515-5305 / FAX: 82-2-515-5302

### Delta Energy Systems (Singapore) Pte Ltd.

4 Kaki Bukit Avenue 1, #05-04, Singapore 417939  
TEL: 65-6747-5155 / FAX: 65-6744-9228

### Delta Electronics (India) Pvt. Ltd.

Plot No.43, Sector 35, HSIIDC Gurgaon,  
PIN 122001, Haryana, India  
TEL: 91-124-4874900 / FAX : 91-124-4874945

### Delta Electronics (Thailand) PCL.

909 Soi 9, Moo 4, Bangpoo Industrial Estate (E.P.Z),  
Pattana 1 Rd., T.Phraksa, A.Muang,  
Samutprakarn 10280, Thailand  
TEL: 66-2709-2800 / FAX : 662-709-2827

### Delta Electronics (Australia) Pty Ltd.

Unit 20-21/45 Normanby Rd., Notting Hill Vic 3168, Australia  
TEL: 61-3-9543-3720

## Americas

### Delta Electronics (Americas) Ltd.

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

### Delta Electronics Brazil

São Paulo Sales Office  
Rua Itapeva, 26 - 3º, andar Edifício Itapeva,  
One - Bela Vista 01332-000 - São Paulo - SP - Brazil  
TEL: 55-12-3932-2300 / FAX: 55-12-3932-237

### Delta Electronics International Mexico S.A. de C.V.

Mexico Office  
Gustavo Baz No. 309 Edificio E PB 103  
Colonia La Loma, CP 54060  
Tlalnepantla, Estado de México  
TEL: 52-55-3603-9200

## EMEA

### Headquarters: Delta Electronics (Netherlands) B.V.

Sales: Sales.IA.EMEA@deltaww.com  
Marketing: Marketing.IA.EMEA@deltaww.com  
Technical Support: iatechnicalsupport@deltaww.com  
Customer Support: Customer-Support@deltaww.com  
Service: Service.IA.emea@deltaww.com  
TEL: +31(0)40 800 3900

### BENELUX: Delta Electronics (Netherlands) B.V.

De Witbogt 20, 5652 AG Eindhoven, The Netherlands  
Mail: Sales.IA.Benelux@deltaww.com  
TEL: +31(0)40 800 3900

### DACH: Delta Electronics (Netherlands) B.V.

Coesterweg 45, D-59494 Soest, Germany  
Mail: Sales.IA.DACH@deltaww.com  
TEL: +49(0)2921 987 0

### France: Delta Electronics (France) S.A.

ZI du bois Challand 2, 15 rue des Pyrénées,  
Lisses, 91090 Evry Cedex, France  
Mail: Sales.IA.FR@deltaww.com  
TEL: +33(0)1 69 77 82 60

### Iberia: Delta Electronics Solutions (Spain) S.L.U

Ctra. De Villaverde a Vallecas, 265 1º Dcha Ed.  
Hormigueras – P.I. de Vallecas 28031 Madrid  
TEL: +34(0)91 223 74 20

Carrer Llacuna 166, 08018 Barcelona, Spain

Mail: Sales.IA.Iberia@deltaww.com

### Italy: Delta Electronics (Italy) S.r.l.

Via Meda 2-22060 Novedrate(CO)  
Piazza Grazioli 18 00186 Roma Italy  
Mail: Sales.IA.Italy@deltaww.com  
TEL: +39 039 8900365

### Russia: Delta Energy System LLC

Vereyskaya Plaza II, office 112 Vereyskaya str.  
17 121357 Moscow Russia  
Mail: Sales.IA.RU@deltaww.com  
TEL: +7 495 644 3240

### Turkey: Delta Greentech Elektronik San. Ltd. Sti. (Turkey)

Şerifali Mah. Hendem Cad. Kule Sok. No:16-A  
34775 Ümraniye – İstanbul  
Mail: Sales.IA.Turkey@deltaww.com  
TEL: + 90 216 499 9910

### GCC: Delta Energy Systems AG (Dubai BR)

P.O. Box 185668, Gate 7, 3rd Floor, Hamarain Centre  
Dubai, United Arab Emirates  
Mail: Sales.IA.MEA@deltaww.com  
TEL: +971(0)4 2690148

### Egypt + North Africa: Delta Electronics

Unit 318, 3rd Floor, Trivium Business Complex, North 90 street,  
New Cairo, Cairo, Egypt  
Mail: Sales.IA.MEA@deltaww.com