Digitized 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 % / 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

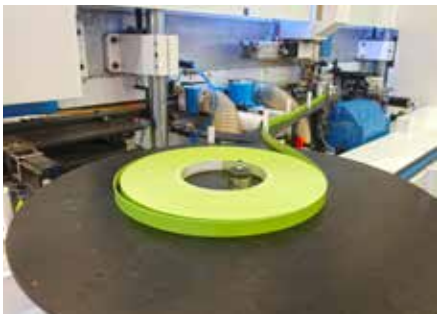
Built-in PID feedback control

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 saves installation space

Material Handling Machine

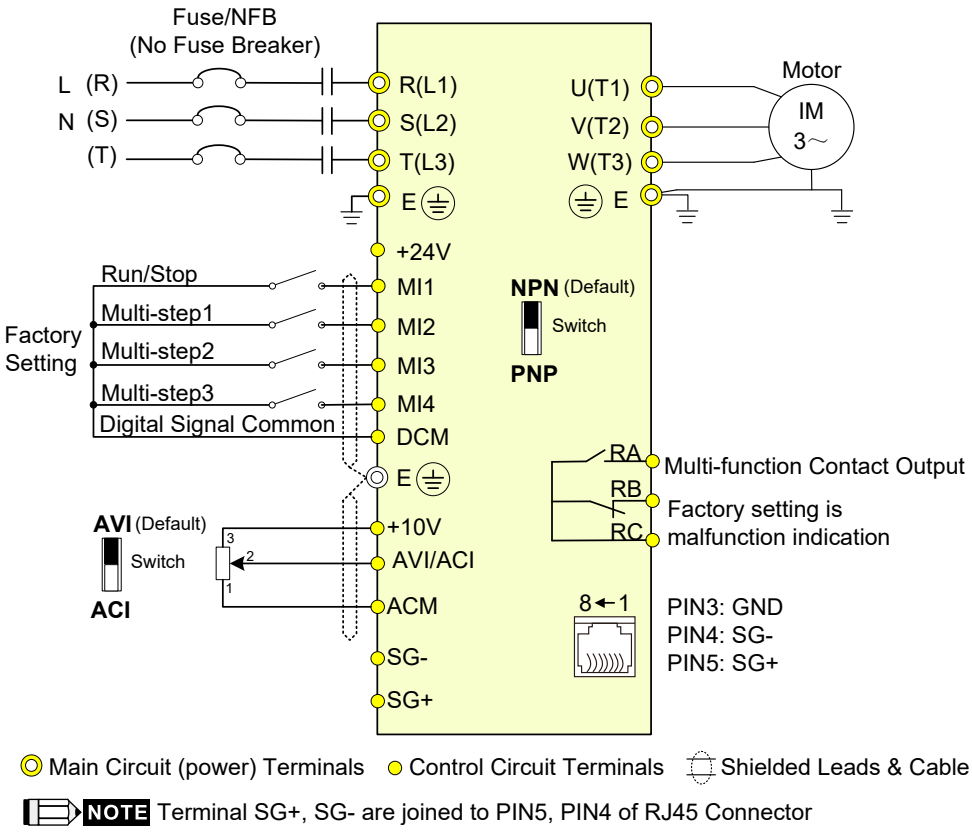
- Multiple speed adjustment modes for different applications
- AVR function to ensure stability and reliability
- Speed tracking function for continuing operation after power resumes from an instantaneous power failure

Constant Pressure Pump

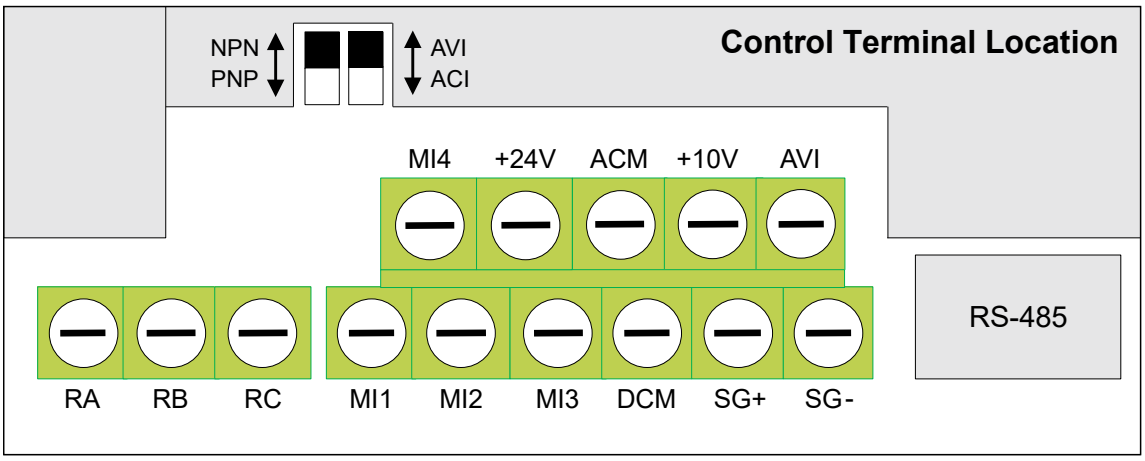
- Build-in PID pressure control; no need for external PID device to save system cost
- Built-in automatic inspection and restoration functions in case of water outage; no external PLC needed
- System leakage control function
- Multi-pump control: alternates pump operation in cycle (One drive supports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

Wiring

230V/460V Models



Control Terminals



Frames and Appearances

Frame A1/A2

Input Terminals
(R/L1, S/L2, T/L3)

Frequency Control Potentiometer

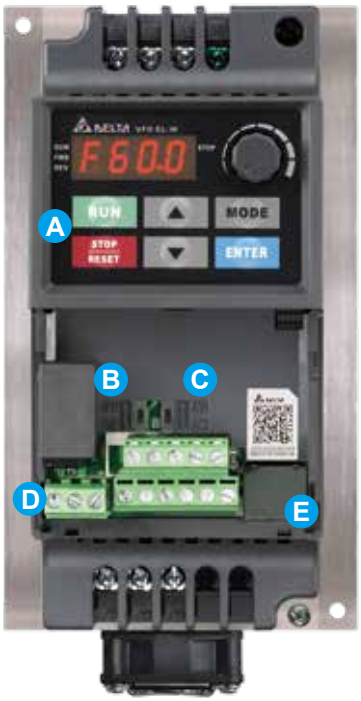
Digital Keypad

Control Board Cover

Output Terminals
(U/T1, V/T2, W/T3)

Grounding Terminals

Cooling Fan
* Frame A1 does not include a cooling fan



A Digital Keypad

B Choose NPN/PNP

C Choose ACI/AVI

D Control Terminals

E RS-485 Terminal
(RJ45)

Frame B

Input Terminals
(R/L1, S/L2, T/L3)

Frequency Control Potentiometer

Digital Keypad

Case

Control Board Cover

Output Terminals
(U/T1, V/T2, W/T3)

Grounding Terminals

A Digital Keypad

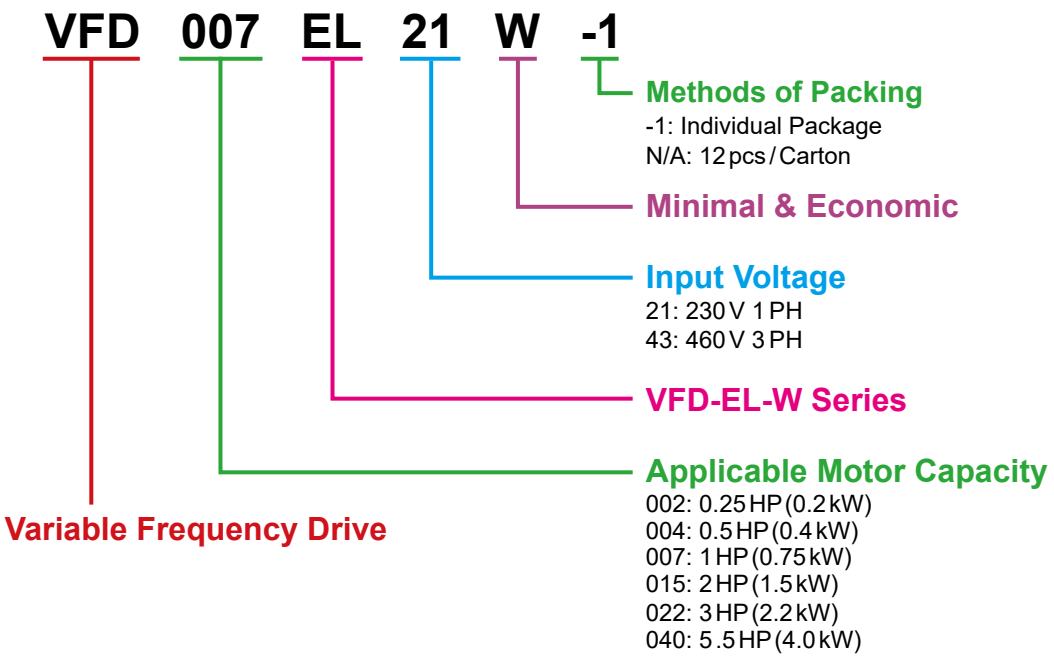
B Choose NPN/PNP

C Choose AVI/ACI

D Control Terminals

E RS-485 Terminal
(RJ45)

Model Explanation



Specifications

Product Specifications

Voltage		230 V					460 V				
Frame		A1			B		A1		A2	B	
Model	VFD-__EL21W(-1) VFD-__EL43W(-1)	002	004	007	015	022	004	007	015	022	040
Max. Applicable Motor Output (kW)		0.2	0.4	0.75	1.5	2.2	0.4	0.75	1.5	2.2	4.0
Max. Applicable Motor Output (HP)		0.25	0.5	1.0	2.0	3.0	0.5	1.0	2.0	3.0	5.5
Output Rating	Rated Output Capacity (kVA)	0.6	1.0	1.6	2.9	4.2	1.2	2.0	3.3	4.4	7.4
	Rated Output Current (A)	1.6	2.5	4.2	7.5	11.0	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 kHz)									
Input Rating	Rated Input Current (A)	4.9	6.5	9.3	15.7	24.0	1.8	3.2	4.3	7.1	10.0
	Rated Voltage / Frequency	Single Phase, AC 200 V ~ 240 V, 50 / 60 Hz					Three Phase, AC 380 V ~ 480 V, 50 / 60 Hz				
	Voltage Tolerance	±10 % (180 V ~ 264 V)					±10 % (342 V ~ 528 V)				
	Frequency Tolerance	±5 % (47 Hz ~ 63 Hz)									
Weight (kg)		1.0			1.4		1.0			1.4	
Cooling Method		Natural Cooling			Fan Cooling		Natural Cooling		Fan Cooling		
Brake Unit		N/A									
DC Choke		N/A									
EMI Filter		N/A									

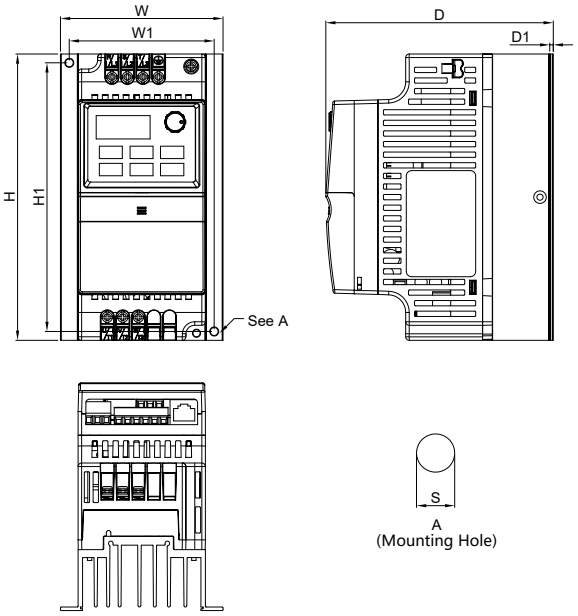
Specifications

General Specifications

Control Characteristics	**Control System**		SPWM (Sinusoidal Pulse Width Modulation) control (V/F Control, Vector 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 / 0.5 W, 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, 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 toque/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), 1st/2nd 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

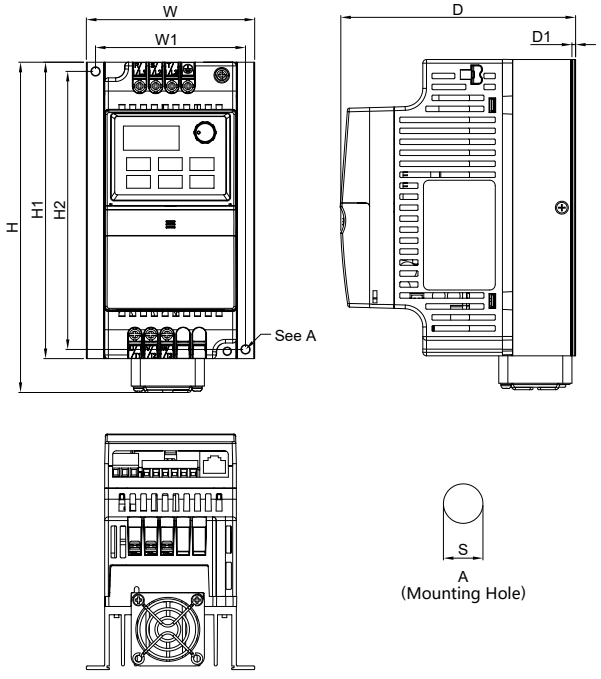


Model

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

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

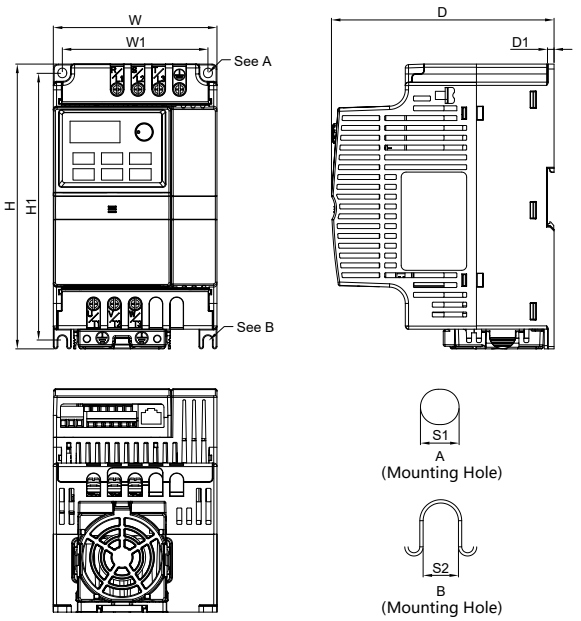


Model

VFD015EL43W(-1)

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)

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

Ordering Information

Frame		Cooling Method	Operating Temperature	Power Range	Models
Frame A1		Natural Cooling	-10℃~50℃	230V: 0.2~0.75kW 460V: 0.4~0.75kW	VFD002EL21W(-1) VFD004EL21W(-1) VFD004EL43W(-1) VFD007EL21W(-1)* VFD007EL43W(-1)
Frame A2		Fan Cooling		460V: 1.5 kW	VFD015EL43W(-1)
Frame B				230V: 1.5~2.2 kW 460V: 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): to reach 50℃ operating temperature, a fan kit MKEL-AFKM1 is required (without derating).
*VFD007EL21W(-1): to reach 40℃ operating temperature, no need for a fan kit (without derating).

Accessories

Keypad CE

VFD-PU06

- 5 digits
- Parameter duplication and recording
- RJ11 connector
- RS-485 communication

VFD-PU08V

- 4 digiits
- RJ45 connector
- RS-485 communication

VFD-PU08

- 4 digits
- RJ45 connector
- RS-485 communication

NOTE

* RJ45 cable is not included for VFD-PU08 & VFD-PU08V.

Cable

RJ45 Cable

No.	Model	Length	
		mm	inch
1	UC-CMC003-01A	300	11.8
2	UC-CMC005-01A	500	19.6
3	UC-CMC010-01A	1000	39.0
4	UC-CMC015-01A	1500	59.0
5	UC-CMC020-01A	2000	78.7
6	UC-CMC030-01A	3000	118.1
7	UC-CMC050-01A	5000	196.8

Fan kit

MKEL-AFKM1

Reactor

RF220X00A