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# VFD-EL

## Multiple Functions/Micro Type Drive



# VFD-EL



## Features

- Standard MODBUS Protocol** Standard MODBUS Protocol via RS-485
- Built-in EMI Filter (230V 1-phase and 460V 3-phase)**  
 The built-in EMI filter reduces electromagnetic interferences and complies with EN61800-3 standard.
- Compact Design**  
 Space saving and easy DIN rail mounting with optional DIN rail adapter(Built in Frame B)
- Optional Fieldbus Modules**  
 Provide connection to a variety of networks, including PROFIBUS, DeviceNet, LonWorks and CANopen.
- RFI-Switch for IT Mains**  
 Removable "Y" capacitor to use with IT mains supplies.
- Easy DC BUS Sharing**  
 Multiple VFD-EL can be connected in parallel to share the regenerative braking energy. In this way, over-voltage is prevented and the DC-bus voltage stabilized. This function is not for 115V models.
- 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.
- Power Range**  
 1-phase 115V series: 0.2~0.75kW (0.25~1hp)      3- phase 230V series: 0.2~3.7kW (0.25~5hp)  
 1-phase 230V series: 0.2~2.2kW (0.25~3hp)      3- phase 460V series: 0.4~3.7kW (0.50~5hp)
- Side-by-side Installation(40°C)**  
 High-efficiency cooling and flexible space
- Easy Maintenance**  
 Removable cooling fan for easy maintenance

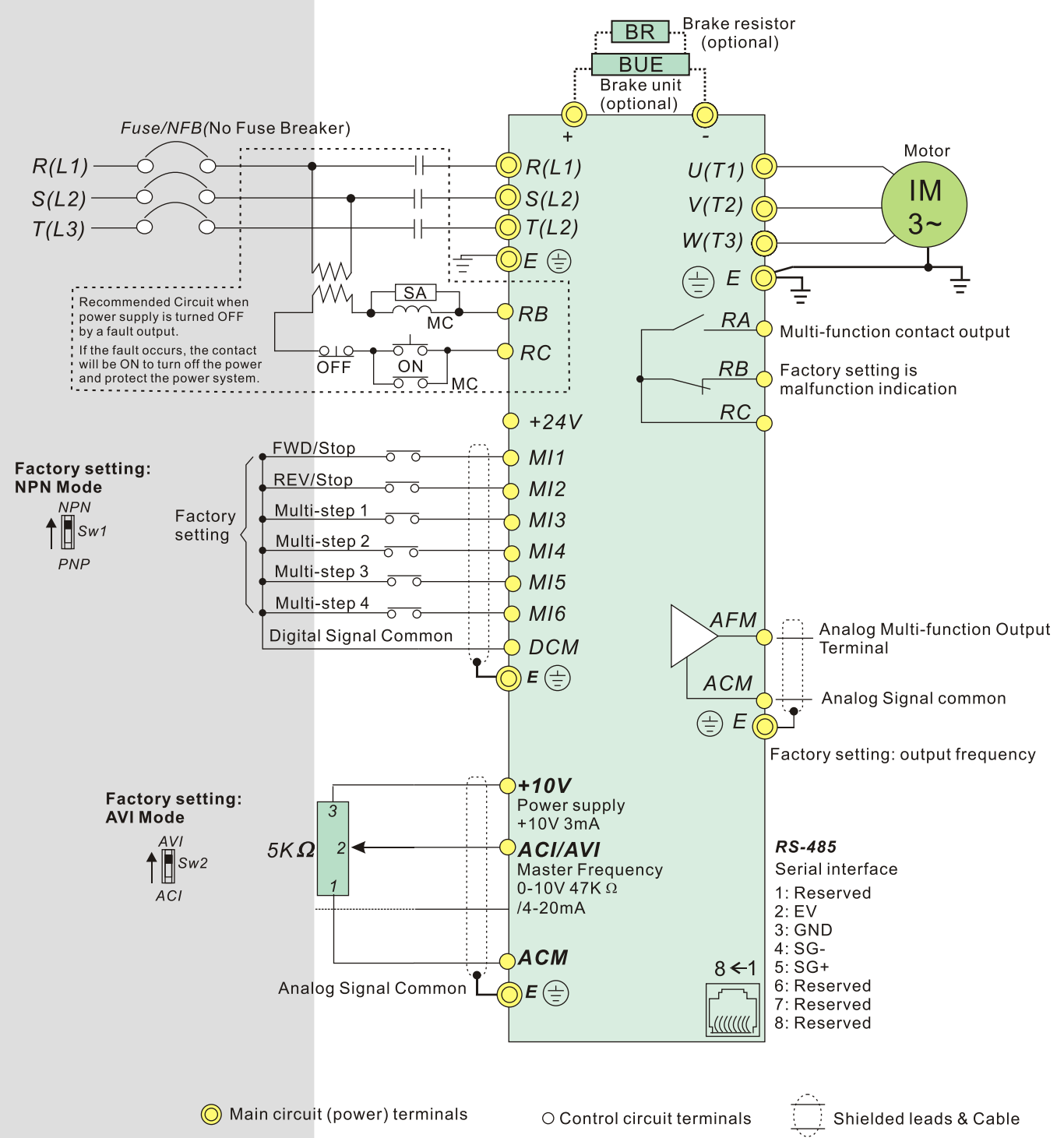


## Application cases

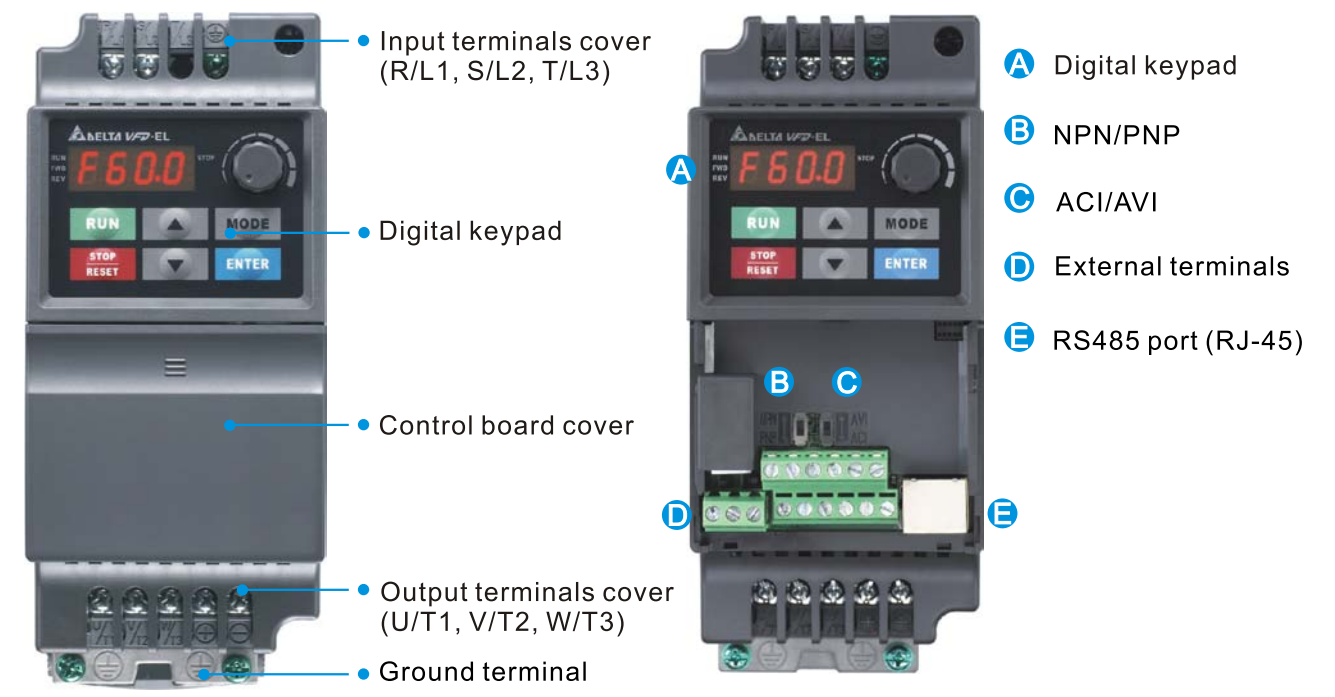
- Conveyor Belts**  
 1. Multi-step speed application: provides multi-step speed settings to meet the needs of conveyor belt.  
 2. Side-by-side installation to save space.  
 3. DC-bus sharing: connect multiple drives in parallel to share the regenerative energy and prevent over-voltage.
- Winders**  
 With auto acceleration/deceleration function, it can have a rapid start/stop to increase productivity and speed.
- Constant Pressure Control of Water Pumps**  
 1. Built-in smart PID controller to save the cost of specific external PID meter.  
 2. Built-in auto detection of water suspension and auto power-on to save the cost of external PLC controller and relay.  
 3. A wide range of input voltages, including 1-phase 110V/230V and 3-phase 230V/460V, for various pump applications and different countries.



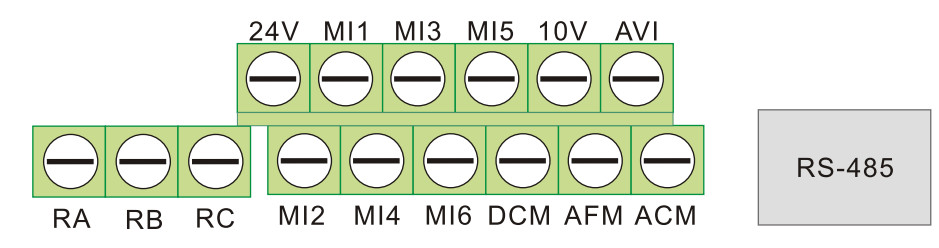
## Standard Wiring Diagram



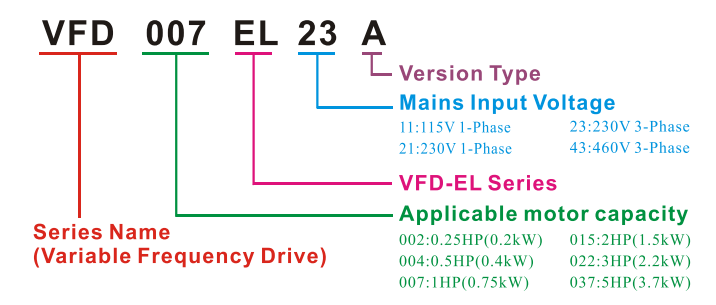
## External Parts



## Control Terminals



## Model Explanation





## Application Fields

### Conveyor and Transportation Machinery

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

### Food Processing

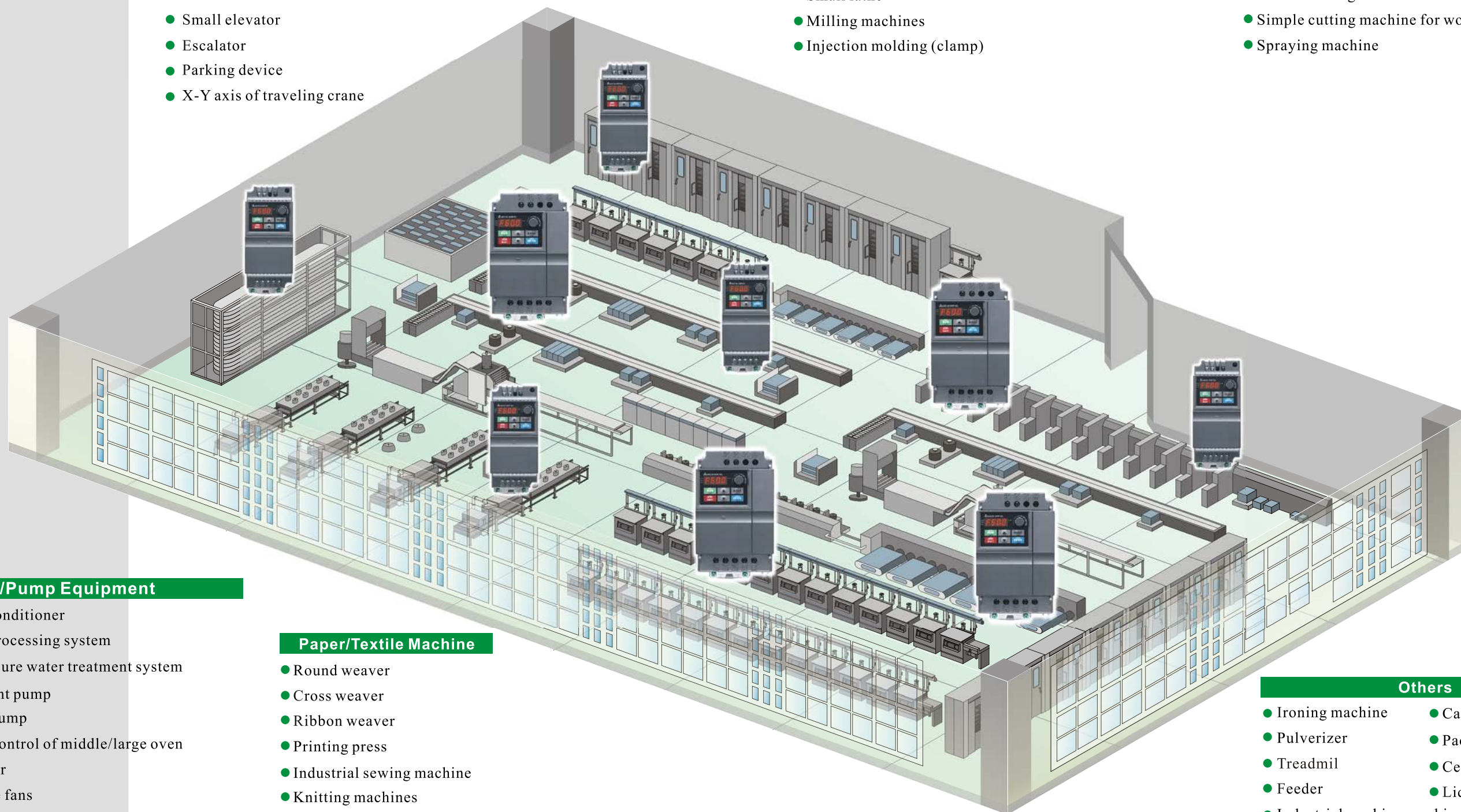
- Dumpling maker
- Food stirrer
- Noodle maker

### Machine Tool/Metal Processing Machinery

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

### Wood Working Machinery

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



### Fan/Pump Equipment

- Building air conditioner
- Waste water 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
- Pulverizer
- Treadmil
- Feeder
- Industrial washing machine
- Car washing machine
- Packing machine
- Centrifuge
- Liquid mixer



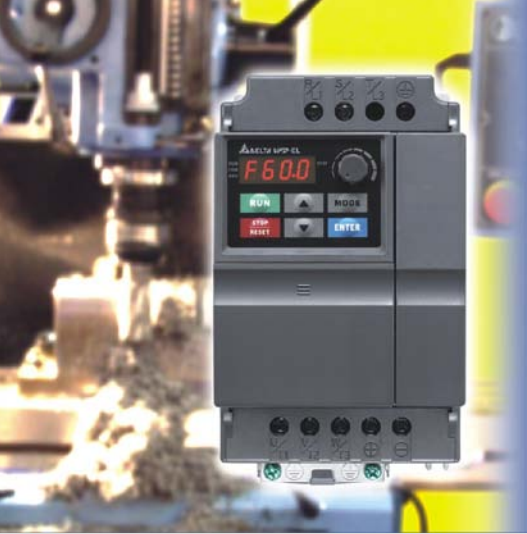
## Specifications

Voltage Class		115V		
Model Number VFD-___ EL	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)	0.1~600 Hz		
	Carrier Frequency (kHz)	2-12		
Input Rating	Rated Input Current (A)	Single-phase		
		6.4	9	18
	Rated Voltage/Frequency	Single phase, 100-120V, 50/60Hz		
	Voltage Tolerance	± 10%(90~132 V)		
Frequency Tolerance	± 5%(47~63 Hz)			
Cooling Method	Natural Cooling			
Weight (kg)	1.1	1.1	1.4	

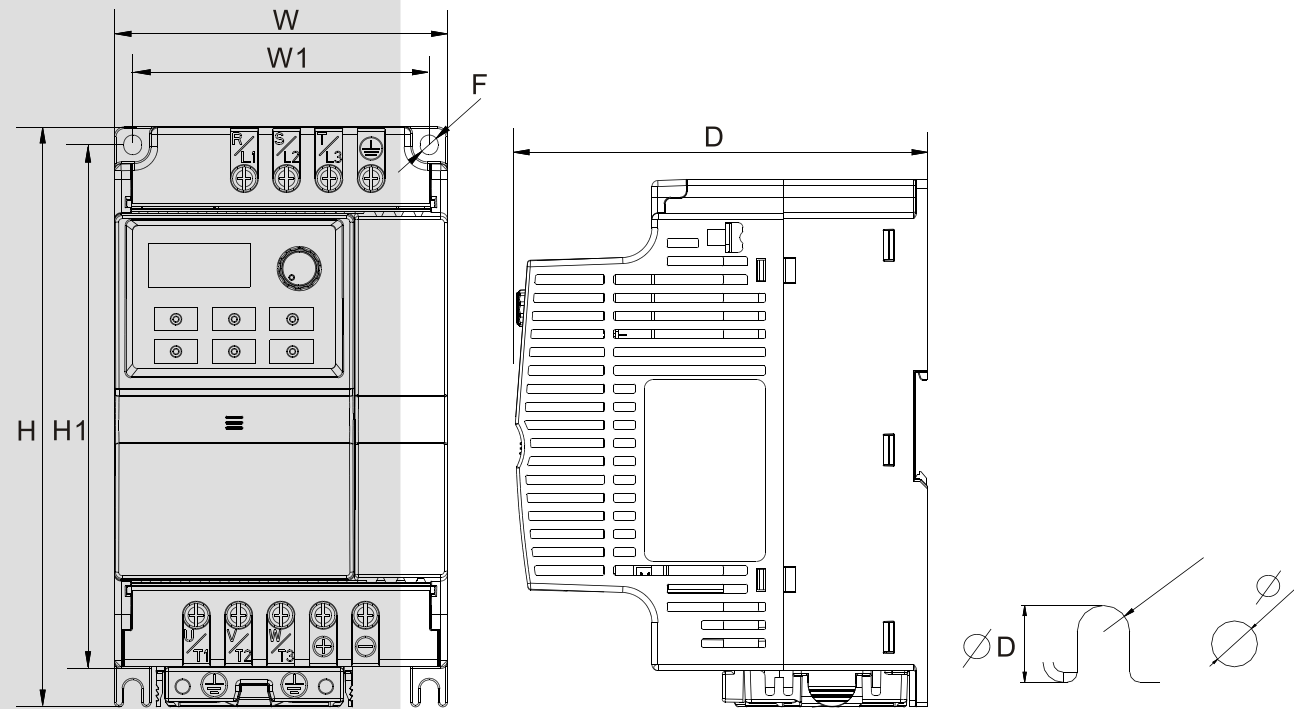
Voltage Class		230V					
Model Number VFD-___ EL	002	004	007	015	022	037	
Max. Applicable Motor Output (kW)	0.2	0.4	0.75	1.5	2.2	3.7	
Max. Applicable Motor Output (HP)	0.25	0.5	1.0	2.0	3.0	5.0	
Output Rating	Rated Output Capacity (kVA)	0.6	1.0	1.6	2.9	4.2	6.5
	Rated Output Current (A)	1.6	2.5	4.2	7.5	11.0	17.0
	Maximum Output Voltage (V)	3-Phase Proportional to Input Voltage					
	Output Frequency (Hz)	0.1~600 Hz					
	Carrier Frequency (kHz)	2-12					
Input Rating	Rated Input Current (A)	4.9	6.5	9.5	15.7	24	--
	L21A Rated Voltage/Frequency	1-phase, 200-240V, 50/60Hz					
	Rated Input Current (A)	1.9	2.7	4.9	9	15	20.6
	L23A Rated Voltage/Frequency	3-phase, 200-240V, 50/60Hz					
Voltage Tolerance	± 10%(180-264V)						
Frequency Tolerance	± 5%(47-63Hz)						
Cooling Method	Natural Cooling			Fan Cooling			
Weight (kg)	1.2	1.2	1.2	1.7	1.7	1.7	

Voltage Class		460V Class				
Model Number VFD-___ EL	004	007	015	022	037	
Max. Applicable Motor Output (kW)	0.4	0.75	1.5	2.2	3.7	
Max. Applicable Motor Output (HP)	0.5	1.0	2.0	3.0	5.0	
Output Rating	Rated Output Capacity (kVA)	1.2	2.0	3.3	4.4	6.8
	Rated Output Current (A)	1.5	2.5	4.2	5.5	8.2
	Maximum Output Voltage (V)	3-Phase Proportional to Input Voltage				
	Output Frequency (Hz)	0.1~600 Hz				
	Carrier Frequency (kHz)	2-12				
Input Rating	Rated Input Current (A)	3-phase				
		1.8	3.2	4.3	7.1	9.0
	Rated Voltage/Frequency	3-phase, 380-480V, 50/60Hz				
	Voltage Tolerance	± 10%(342~528V)				
Frequency Tolerance	± 5%(47~63Hz)					
Cooling Method	Natural Cooling			Fan Cooling		
Weight (kg)	1.2	1.2	1.2	1.7	1.7	

Control Characteristics	Control System	SPWM(Sinusoidal Pulse Width Modulation) control (V/f 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 5.0Hz	
	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 settings for 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 (0.75-11kW) models have brake chopper built-in)	
V/F Pattern	Adjustable V/f pattern		
Operating Characteristics	Frequency Setting	Keypad	Setting by ▲ ▼
		External Signal	Potentiometer-5k/0.5W, 0 to +10VDC, 4 to 20mA, RS-485 interface; Multi-function Inputs 3 to 6 (15 steps, Jog, up/down)
	Operation Setting Signal	Keypad	Set by RUN and STOP
		External Signal	2 wires/3 wires ((MI1, MI2, MI3)), 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, ACI/AVI selections, driver reset, UP/DOWN key settings, NPN/PNP input selection	
	Multi-function Output Indication	AC drive operating, frequency attained, counter attained, zero speed, Base Block, fault indication, overheat alarm, emergency stop and status selections of input terminals	
	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	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, adjustable carrier frequency, output frequency limits, parameter lock/reset, PID control, external counter, MODBUS communication, abnormal reset, abnormal re-start, power-saving, fan control, sleep/wake frequency, 1st/2nd frequency source selections, 1st/2nd frequency source combination, NPN/PNP selection, constant pressure function		
Protection Functions	Over voltage, over current, under voltage, external fault, overload, ground fault, overheating, electronic thermal, IGBT short circuit, PTC		
Display Keypad	6-key, 7-segment LED with 4-digit, 4 status LEDs, master frequency, output frequency, output current, custom units, parameter values for setup and lock, faults, RUN, STOP, RESET, FWD/REV		
Built-in EMI Filter	For 230V 1-phase and 460V 3-phase models.		
Environmental Conditions	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 <sup>2</sup> (1G) less than 20Hz, 5.88m/s <sup>2</sup> (0.6G) at 20 to 50Hz		
Approvals	  		



## Dimensions



Unit: mm(inch)

Model	W	W1	H	H1	D	F
VFD002EL11A						
VFD002EL21A						
VFD002EL23A						
VFD004EL11A						
VFD004EL21A	72.0	59.0	174.0	151.6	136.0	5.4
VFD004EL23A	(2.83)	(2.32)	(6.86)	(5.97)	(5.35)	(0.21)
VFD004EL43A						
VFD007EL21A						
VFD007EL23A						
VFD007EL43A						
VFD015EL23A						
VFD015EL43A						
VFD007EL11A						
VFD015EL21A						
VFD022EL21A	100.0	89.0	174.0	162.9	136.0	5.4
VFD022EL23A	(3.94)	(3.50)	(6.85)	(6.42)	(5.35)	(0.21)
VFD022EL43A						
VFD037EL23A						
VFD037EL43A						

## Fieldbus Modules

● DeviceNet  
CME-DN01



● Profibus  
CME-PD01



● LonWorks  
CME-LW01



● CANopen  
CME-COP01



## Accessories

● Zero phase reactor  
RF220X00A



● Keypad for communication  
VFD-PU06



● DIN Rail (Width 35mm)

MKEL-DRA



(Frame A is optional)

MKEL-DRB



(Frame B is built-in)

● Grounding plate  
MKE-EP



● Brake resistor



● Brake unit

BUE-20015 BUE-40015  
BUE-20037 BUE-40037

