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*We reserve the right to change the information in this catalogue without prior notice



DELTA ELECTRONICS, INC.

VFD-EL

Multiple Functions/Micro Type Drive



VFD-EL



Features

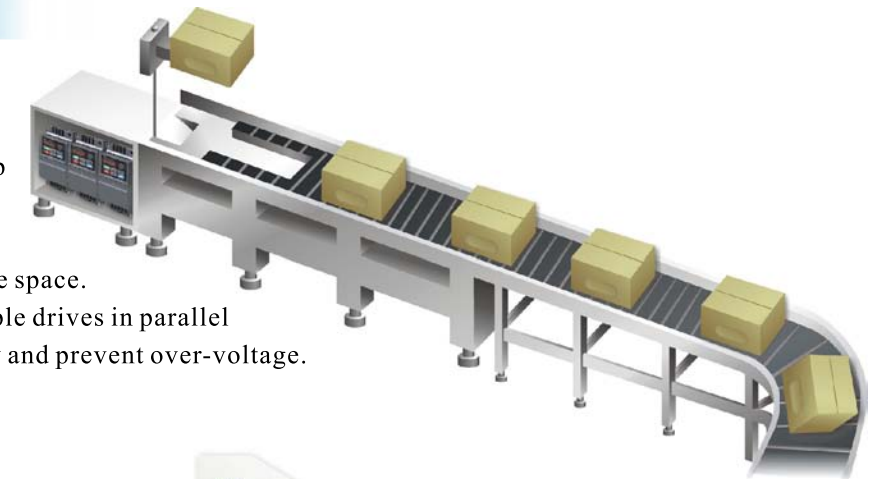
- **Standard MODBUS Protocol** Standard MODBUS Protocol via RS-485
- **Built-in EMI Filter (230V 1-phase and 460V 3-phase)**
The built-in EMI filter reduces electromagnetic interferences and complies with EN61800-3 standard.
- **Compact Design**
Space saving and easy DIN rail mounting with optional DIN 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)
1-phase 230V series: 0.2~2.2kW (0.25~3hp)
3- phase 230V series: 0.2~3.7kW (0.25~5hp)
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

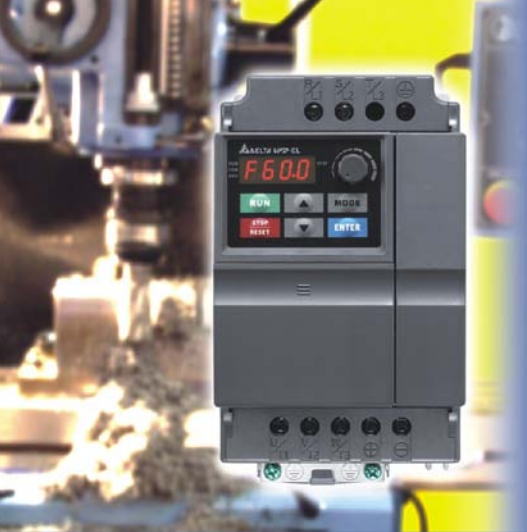
With auto acceleration/deceleration function, it can have a rapid start/stop to increase productivity and speed.



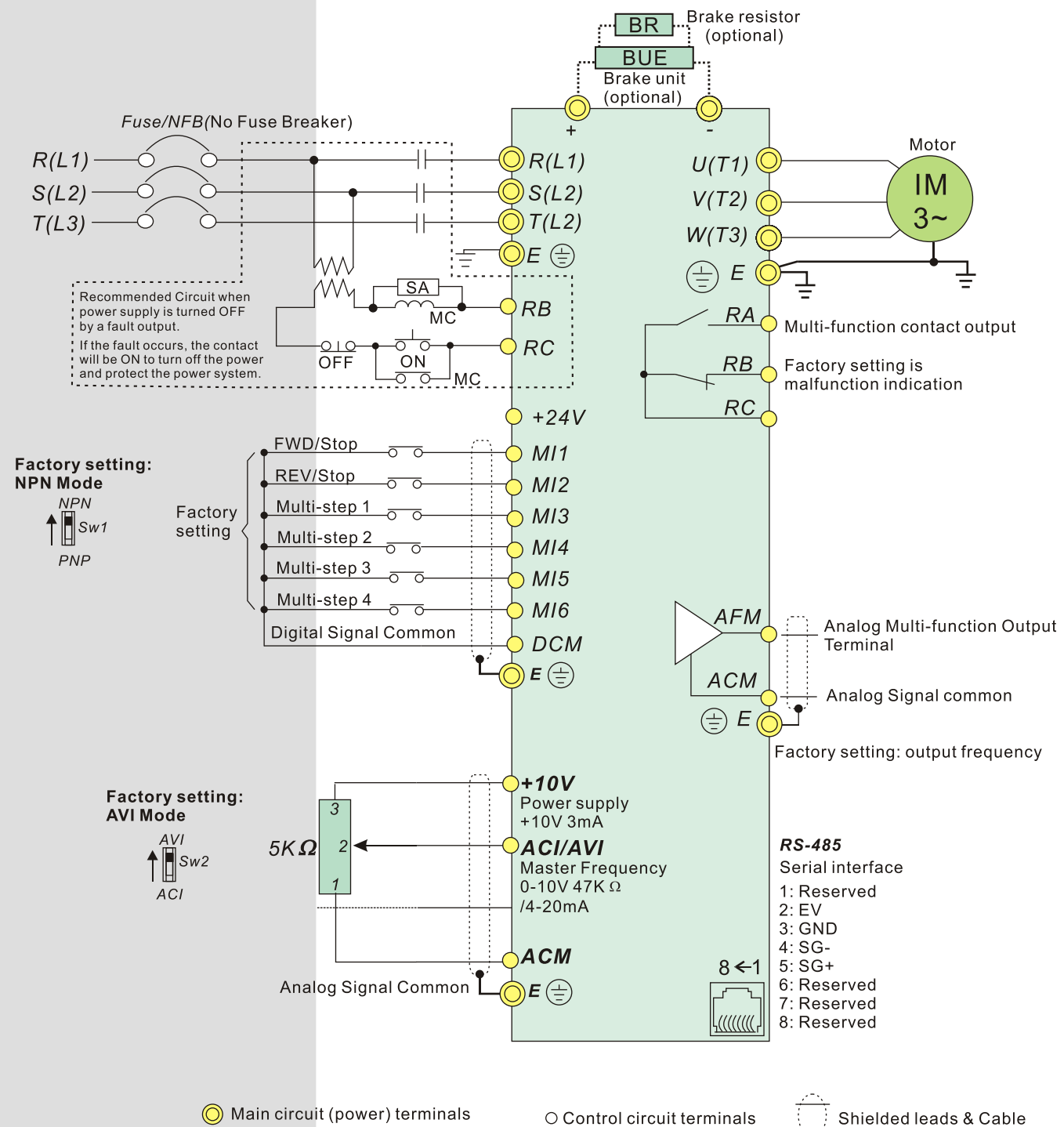
Constant Pressure Control of Water Pumps

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.

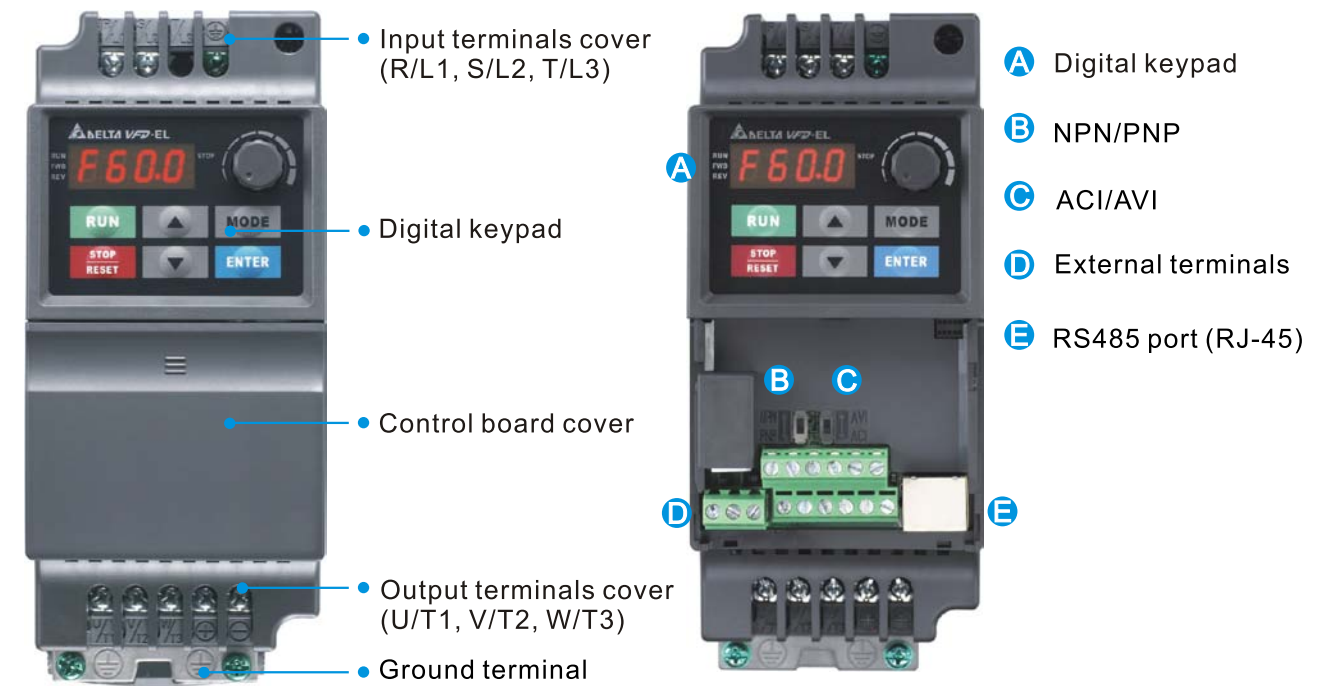




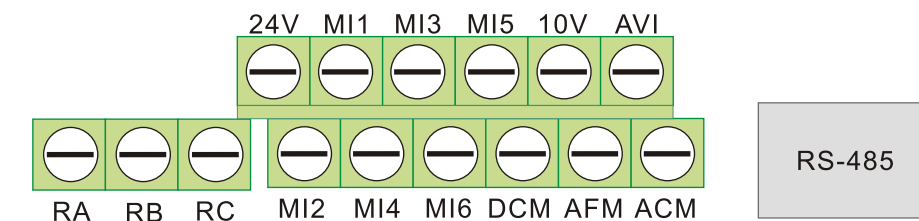
Standard Wiring Diagram



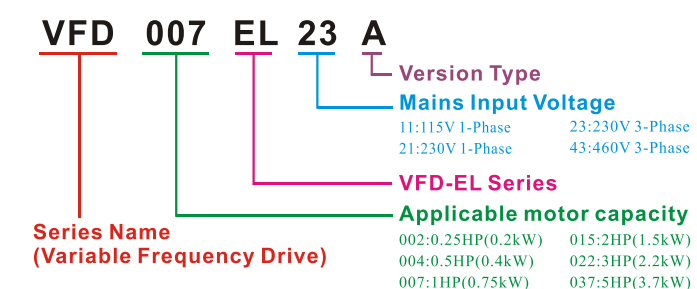
External Parts



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

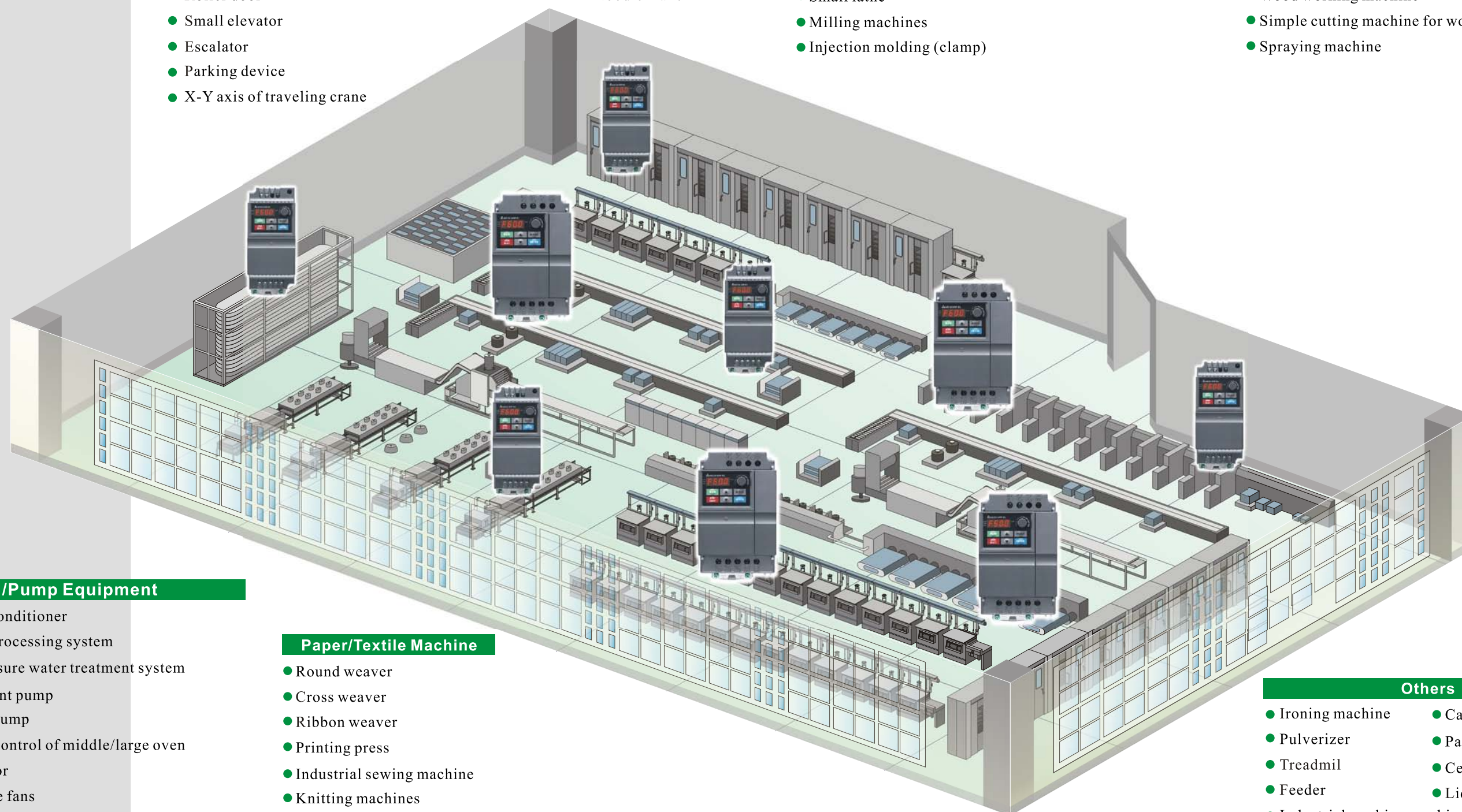
- Dumpling maker
- Food stirrer
- Noodle maker

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
- Car washing machine
- Pulverizer
- Packing machine
- Treadmil
- Centrifuge
- Feeder
- Liquid mixer
- Industrial washing machine



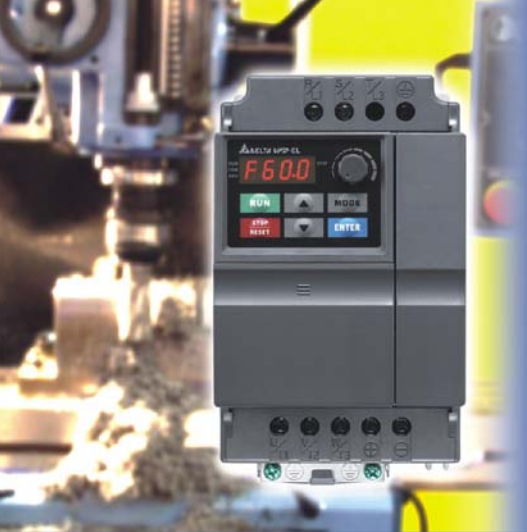
Specifications

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		
Input Rating	Carrier Frequency (kHz)	2-12		
	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

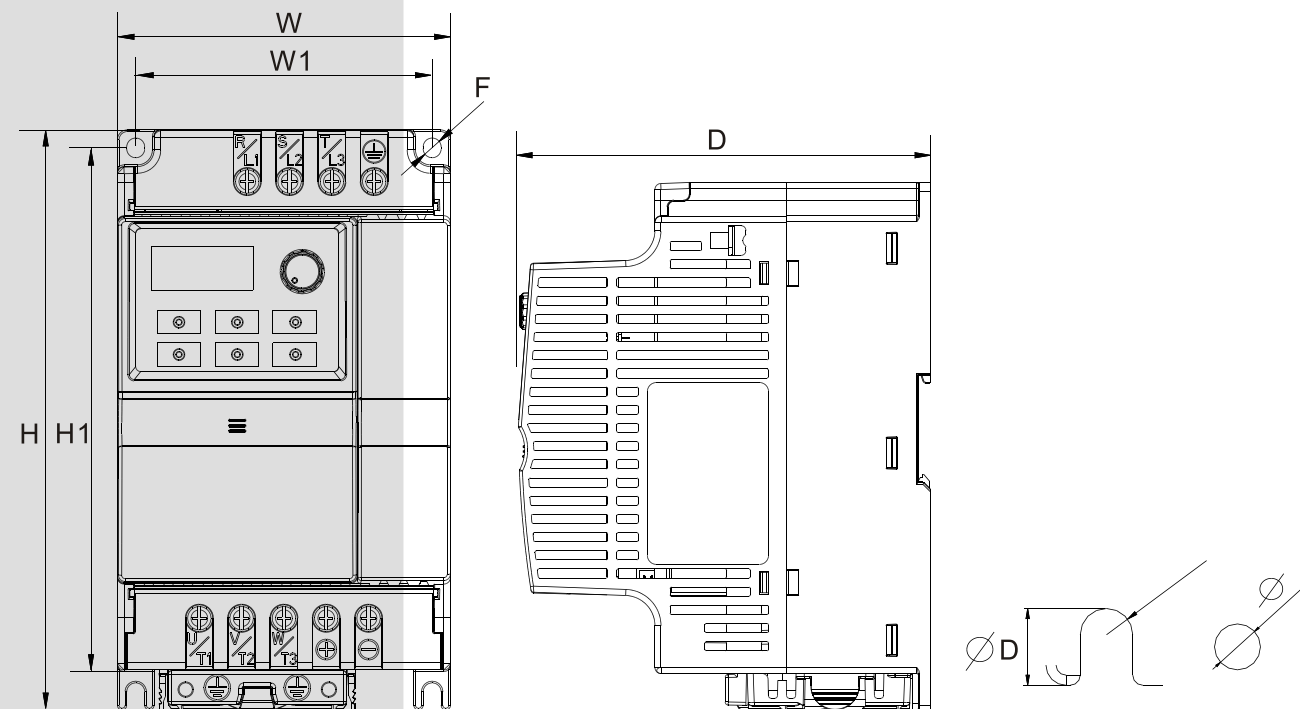
Voltage Class		230V					
Model Number VFD-___ EL		002	004	007	015	022	037
Max. Applicable Motor Output (kW)		0.2	0.4	0.75	1.5	2.2	3.7
Max. Applicable Motor Output (HP)		0.25	0.5	1.0	2.0	3.0	5.0
Output Rating	Rated Output Capacity (kVA)	0.6	1.0	1.6	2.9	4.2	6.5
	Rated Output Current (A)	1.6	2.5	4.2	7.5	11.0	17.0
	Maximum Output Voltage (V)	3-Phase Proportional to Input Voltage					
	Output Frequency (Hz)	0.1~600 Hz					
Input Rating	Carrier Frequency (kHz)	2-12					
	Rated Input Current (A)	4.9	6.5	9.5	15.7	24	--
	Rated Voltage/Frequency	1-phase, 200-240V,50/60Hz					
	Rated Input Current (A)	1.9	2.7	4.9	9	15	20.6
	Rated Voltage/Frequency	3-phase, 200-240V,50/60Hz					
	Voltage Tolerance	± 10%(180-264V)					
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				
Input Rating	Carrier Frequency (kHz)	2-12				
	Rated Input Current (A)	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)
Operating Characteristics	V/F Pattern		Adjustable V/f pattern
	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
Environmental Conditions	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.
	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 ² (1G) less than 20Hz, 5.88m/s ² (0.6G) at 20 to 50Hz
Approvals		  	



Dimensions



Unit: mm(inch)

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

