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



VFD-M-V-Z

Delta VFD-M-V-Z Series

Specific AC Motor Drives for Treadmill
Comfortable, Smooth, Low-noise;
Stable output power, Quiet operation



Delta VFD-M-Z Series

VFD-M-Z

VFD-M-Z Series

VFD-M-Z Series

Characteristics

• Features

- 1-16-bit CPU, SPWM Control
- 2-Output frequency up to 400Hz for speed change
- 3-Low noise, carrier frequency from 1 to 16kHz
- 4-Sensorless vector control, low speed and high torque
- 5-Auto voltage regulation
- 6-Adjustable LV level
- 7-Easy to adjust
- 8-Analog and pulse speed change
- 9-Standard Modbus Protocol
- 10-Reverse inhibit function

• Comparison

Items	General-purpose AC Motor Drives (VFD-M)	Specific AC Motor Drives for Treadmill (VFD-M-Z)
Operation Panel	Yes	Option
Carrier Frequency	9kHz(Vector)	16kHz
Electromagnetic Noise	High	Very Low
LV Level	200V dc	150~200V dc(adjustable)
Brake Chopper	Built-in	VFD007M:No VFD015M:No VFD022M:No
Phase Loss Protection	Yes	No
Parameter Setting	Complex by application	Easy
Control Method	V/f and vector	Vector(recommended)

Trial Run

Motor: 0.75kW; 3-phase 220/50Hz;
1400rpm; 3.1Amps

Basic setting

P03=100Hz (Max. Output Frequency)
P04=50Hz (Base Frequency)
P05=220V (Rated Voltage)



Motor parameters auto tuning

P52=3.1 Amps(Motor rated current)
P53=1.6 Amps(Refer to nameplate or auto tuning)
P103=01 Auto tuning R1 (motor doesn't run)
02 Auto tuning R1 + No-load Test (with running motor)
P104=5820 mohm(Motor stator resistor)
(Manual input or auto tuning)
P106=3.33Hz(Motor rated slip)

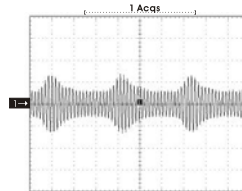


Enable sensorless vector control function:
P105=1

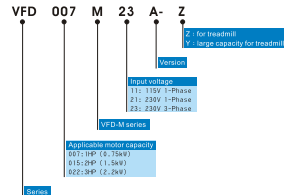
Enjoy running



• Actual current waveform



• Model Explanation



Delta VFD-M-Z Series

Comfortable · Stable · Low Noise

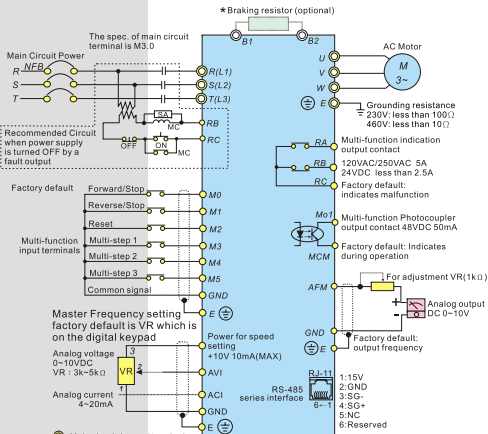
PLC1

Delta VFD-M-Z Series

VFD-M-Z Basic Wiring Diagram

VFD-M-Z Specifications

Basic Wiring Diagram



● Main circuit (power) terminals

○ Control circuit terminals

□ Shielded leads

* If it is single phase model, please select any of the two input power terminals in main circuit power.

* Single phase model can be input 3-phase power.

Specifications

Voltage Class		115V Class
Model Number	VFD-___ M	007
Max. Applicable Motor Output (kW)		0.75
Max. Applicable Motor Output (hp)		1.0
Rated Output Capacity (kVA)		1.6
Rated Output Current (A)		4.2
Maximum Output Voltage (V)		3-phase proportional to twice the input voltage
Output Frequency (Hz)		0.1-400Hz
Carrier Frequency (kHz)		1-16
Rated Input Current (A)		Single phase
Rated Voltage/Frequency		16
Voltage Tolerance		Single phase: 100-120V · 50/60Hz
Frequency Tolerance		±10%(90-132V) ±5%(47-63Hz)
Cooling Method		Fan cooled
Weight (kg)		2.2
Approvals		CE, UL, FCC

Voltage Class		230V Class					
Model Number	VFD-___ M	007M21A-Z	015M21A-Z	015M21B-Z	022M21A-Z	022M23B-Z	022M23B-Y
Max. Applicable Motor Output (kW)		0.75	1.5	1.5	2.2	2.2	2.2
Max. Applicable Motor Output (hp)		1.0	2.0	2.0	3.0	3.0	3.0
Rated Output Capacity (kVA)		1.9	2.7	2.7	3.8	3.8	3.8
Rated Output Current (A)		5.0	7.0	7.0	10	10	10
Maximum Output Voltage (V)		3-phase proportional to input voltage					
Output Frequency (Hz)		0.1-400Hz					
Carrier Frequency (kHz)		1-16					
Rated Input Current (A)		Single phase		3-phase		Single/3-phase	
		11.5	15.7	15.7	27	12.5	27/12.5
Rated Voltage/Frequency		200-240V · 50/60Hz					
Voltage Tolerance		±10%(180-264V)					
Frequency Tolerance		±5%(47-63Hz)					
Cooling Method		Fan Cooled					
Weight (kg)		1.5	1.5	2.2	3.2	2.2	2.2
Approvals		UL, CE, UL, FCC, CE, UL, FCC, CE, UL, FCC, CE, UL, FCC, CE, UL, FCC					

VFD-M-Z General Specifications

VFD-M-Z Options and Dimensions

General specifications

Control Characteristics	Control System		SPWM (Sinusoidal Pulse Width Modulation) Control (V/f for sensorless vector control)
	Frequency Setting Resolution		0.1Hz
	Output Frequency Resolution		0.1Hz
	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 0.1~400Hz
	Accel / Decel Time		0.1to 600 seconds (2 Independent setting of Acc/Decel Time)
	Stall Prevention Level Frequency Setting		20to 200%, Setting of Rated Current
	DC Injection Braking		Operation frequency 0.1~60.0Hz, output 0~100% rated current Start time 0~5 seconds, stop time 0~25 seconds
	Braking Torque		Approx. 20% (up to 125% possible with option brake resistor or brake unit externally mounted)
Operating Characteristics	V/f Pattern		Adjustable V/f pattern
	Frequency Setting	Keypad	Setting by ▲▼
		External Signal	Potentiometer-5k(1)/0.5W, 0 to +10VDC, 4 to 20mA, RS-485 interface; Multi-function Inputs 1 to 6 (7 steps, Jog, up/down)
	Operation Setting Signal	Keypad	Set by RUN and STOP
		External Signal	2 wire/3 wire (FWD, REV, RUN), jog, RS-485 serial interface (MODBUS), Auto-RUN function
	Multi-Function Input Signal		Multi-step selection 0 to 7, jog, accel/decel inhibit, first to forth accel/decel switches, counter, PLC operation, external Base Block (NC, NO), auxiliary motor control is invalid, selections, driver reset, UP/DOWN key settings, sink/source selection
	Multi-Function Output Indication		AC drive operating, frequency attained, non-zero, Base Block, fault indication, local/remote indication, PLC operation, auxiliary motor output, drive is ready, overheat alarm, emergency stop
	Analog Output Signal		Analog frequency/current signal output
	Alarm Output Contact		1 Form C contact (change-over contact) or open collector output
	Operation Functions		AVR, S-Curve, over-voltage, over-current stall prevention, fault records, adjustable carrier frequency, DC braking, momentary power loss restart, auto tuning, frequency limits, parameter lock/Reset, vector control, counter, PID control, PLC, MODBUS communication, reverse inhibition, abnormal reset, abnormal re-start, digital frequency output, sleep/revival function, 1st/2nd frequency source selections
Protection Functions		Self-testing, over voltage, over current, under voltage, overload, overheating, external fault, electronic thermal, ground fault	
Environmental Conditions	Display Keypads		6-key, 4-digit, 7-segment LED 4status LEDs, master frequency, output frequency, output current, custom units, parameter values for setup review and faults, RUN, STOP, RESET, FWD/REV
	Protection Level		IP20
	Pollution Degree		2
	Installation Location		Altitude 1,000 m or lower, keep from corrosive gasses, liquid and dust
	Ambient Temperature		-10°C to 40°C (-10°C to 50°C without blind plate) 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

Accessories(Optional)



EMI Filter



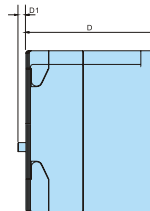
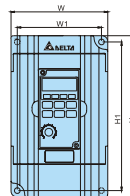
Digital Keypad



Digital Keypad (for communication)

Plug in and play, easy to operate
Built-in read/write parameters function
RS-485 communication cable
Can save 4AC motor drives' parameters

•Dimensions



unit:mm

Model	W	W1	H	H1	D	D1	Fan
VFD007M11A-Z	100(3.94)	89(3.50)	151.0(5.94)	140.0(5.51)	116.5(4.59)	10.5(0.41)	Yes
VFD007M21A-Z	85(3.35)	74(2.91)	141.5(5.57)	130.5(5.14)	113.0(4.45)	10.0(0.39)	Yes
VFD015M21A-Z	85(3.35)	74(2.91)	141.5(5.57)	130.5(5.14)	113.0(4.45)	10.0(0.39)	Yes
VFD015M21B-Z	100(3.94)	89(3.50)	151.0(5.94)	140.0(5.51)	116.5(4.59)	10.5(0.41)	Yes
VFD022M21A-Z	125(4.92)	110(4.33)	220.0(8.66)	205.0(8.07)	166.3(6.55)	8.2(0.32)	Yes
VFD022M23B-Z	100(3.94)	89(3.50)	151.0(5.94)	140.0(5.51)	116.5(4.59)	10.5(0.41)	Yes
VFD022M23B-Y	100(3.94)	89(3.50)	151.0(5.94)	140.0(5.51)	116.5(4.59)	10.5(0.41)	Yes