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Delta presents you with an ideal drive for door applications

Automation for a Changing World

Delta Door Drives and Motors

VFD-DD series



VFD-DD_C_EN_20111125

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Delta Door Drives - Main Functions and Features

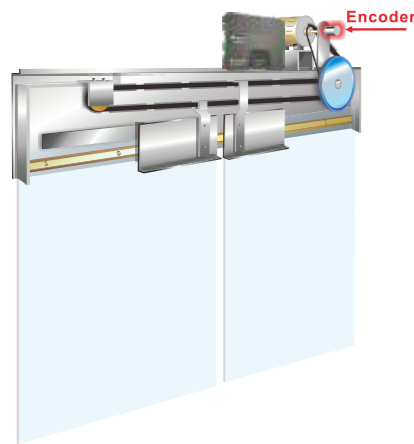
User Friendly Design



Multiple Door Control Solutions

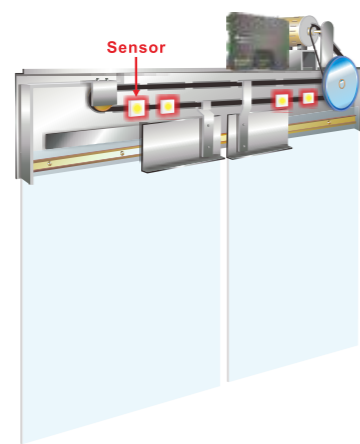
Distance Control Mode

Uses encoder feedback to provide precise door open and door close control.



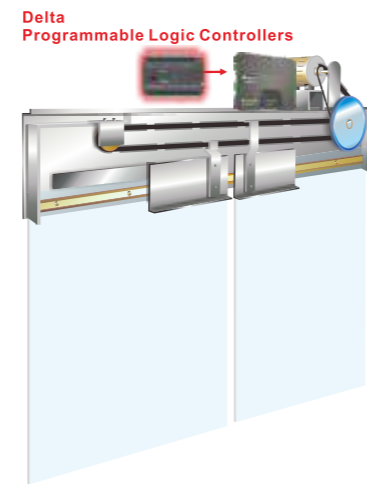
Speed Control Mode

It supports both induction motor (IM) and permanent magnet motor (PM) by using four sensor components to execute precise door open and close commands.



Multi-step Speed Control Mode

Uses PLC to control multi-step speeds



Built-in Door Control Functions

Door Width Auto-tuning

Determination of door width in 3 steps: 1) Door comes to a complete close to detect the door position at "CLOSE" ; 2) Door reopens and measures the door width at a complete "OPEN" ; 3) Door closes again to confirm the accuracy of door width measured and then the parameter is saved.

Smooth Door Curve

When blockage is detected in door "CLOSE" direction, door will "OPEN" again with a smooth curve to minimize vibration.

Demo Mode

The door structure and controller have gone through serial tests to ensure quality.

Induction Motor (Asynchronous) and Permanent Magnet Motor (Synchronous)

Permanent magnet motor provides large torque in a compact size which supports flexible applications: A,B,Z, -Z and Delta permanent magnet motor ECMD-B9160GMS. Induction motor supports open collector and voltage output encoder (5~12VDC).

Safety Protection

Blockage detection is still functioning even when hardware safety devices fail. Door will "OPEN" when a rise of current caused by blockage is detected.

Blockage Detection

4 steps: precise torque detection at blockage, door remains at current position for a few seconds, door "OPEN/CLOSE" time-out, force open.

Specifications

VFD-DD series 230V offers 200W and 400W models.

Model Number VFD-__DD	002	004
Max. Applicable Motor Output (W)	200	400
Rated Output Capacity (KVA)	0.6	1.0
Rated output current for constant torque (A)	1.5	2.5
Maximum output voltage (V)	Proportional Input Voltage	
Output Frequency (Hz)	0.00~120.00Hz	
Carrier Frequency (kHz)	10 kHz	
Rated Input Current (A)	4.9A	6.5A
Voltage Tolerance	Single Phase 200 -20% ~ 240V +10% (160~264V)	
Frequency Tolerance	50/60Hz±5% (47~63Hz)	
Cooling Method	200W natural cool /400W natural cool	
Frame	W170mm x L215 x H55mm	
Motor specification: Maximum speed 240RPM, 8 pole-pairs(16 poles)		

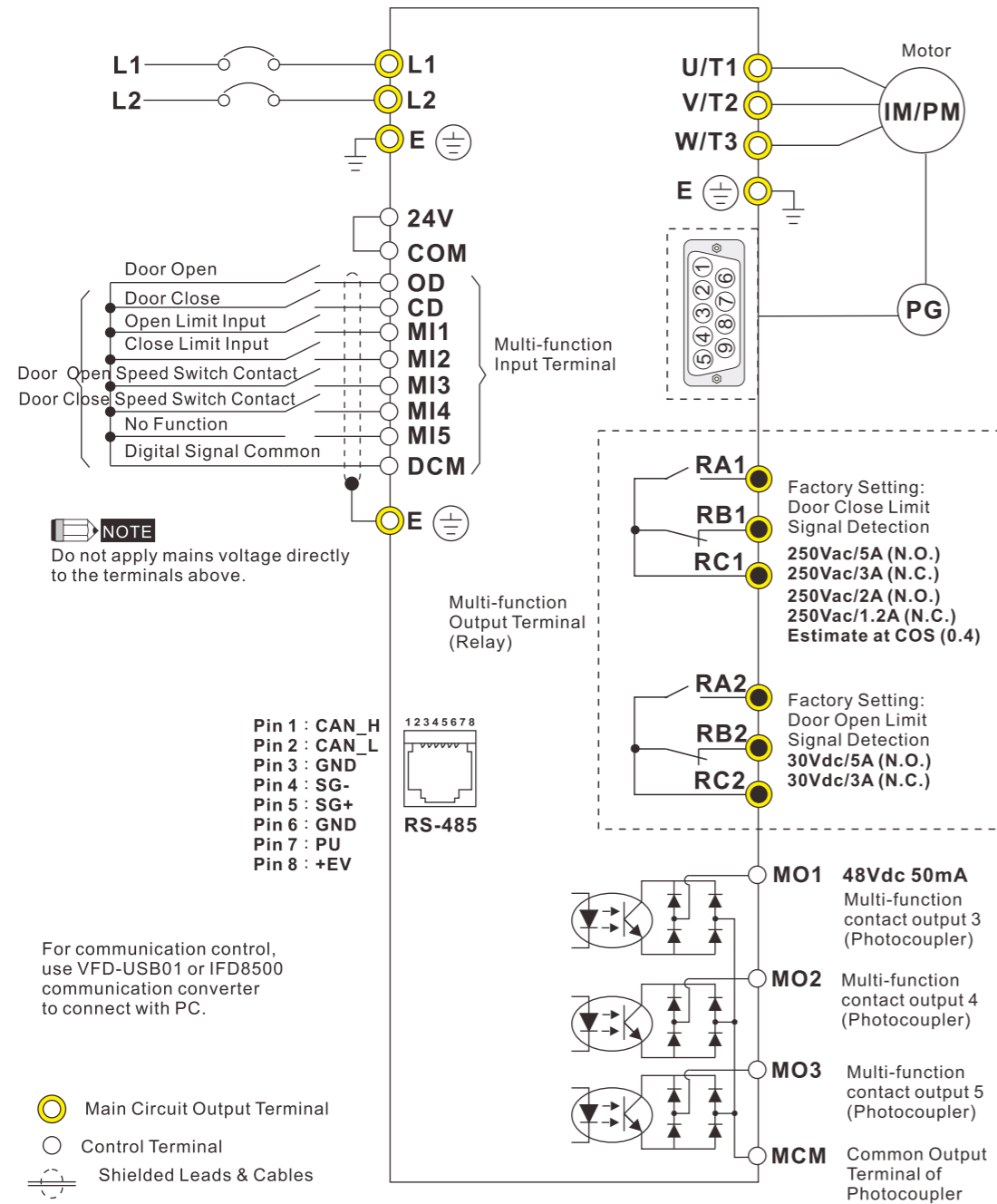
General Specifications

Control Characteristics	Starting Torque	Starting torque at 0.5Hz is more than 150%, at 0 Hz is FOC+PG control mode	
	Speed Control Range	1:100(external PG installation can achieve 1:1000)	
	Speed Control Accuracy	±0.5% (external PG installation can achieve 0.02%)	
	Speed Response Ability	5Hz (vector control can attain 30Hz)	
	Max. Output Frequency (Hz)	0.00 to 120.00 Hz	
	Output Frequency Accuracy	Digital command ±0.005%	
	Frequency Setting Resolution	Digital command ±0.01Hz	
	Torque Limit	200% torque current as maximum	
	Accel/Decel Time	0.00~600.00 sec	
	V/F Curve Pattern	Adjustable V/F curve of 4 independent points	
Operating Characteristics	Frequency Setting Signal	Keypad	By parameter setting
		External Signal	Multi-function input selection 1~5 (15 step speeds; JOG), parameter setting on serial communication port (RS-485)
	Operation Setting Signal	Keypad	Set by RUN, STOP key
		External Signal	2 wires (Fwd, Rev, RUN), JOG operation, RS-485 serial interface, demo mode
	Multi-Function Input Signal	Multi-step speed selection MI1~MI15, Jog, first to second accel/decel switches, demo mode, force stop, emergency stop, operation command source, parameter lock, driver reset, open/close limit signal, door open prohibited signal, force open signal, reposition, 2nd step open/close curve selection	
	Multi-Function Output Signal	(RC1,RA1,RB1) , (RC2,RA2,RB2) , (MO1,MO2,MO3 and MCM) AC drive operating, frequency attained, fault indication, over torque, over voltage, operation mode, alarm indication, demo mode indication, overheat alarm, drive is ready, emergency stop, braking signal, zero speed indication, PG indication error, position detection, limit signal, re-open/close indication, position finished	
	Communication Interface	Built-in MODBUS, customize CAN Bus	
	Alarm Output Contact	Contact "ON" when malfunctions occurs (relay with a "C" or "A" contact, or 2 open collector outputs)	
	Operation Function	AVR, 4 set fault records, reverse inhibition, DC brake, auto torque/slip compensation, auto tuning, adjustable carrier frequency, output frequency upper and lower limits, parameter reset, vector control, MODBUS communication, abnormal reset, abnormal re-start, PG feedback control, fan control, demo mode, door width auto-tuning	
	Protection Function	Over voltage, over current, under current, external fault, overload, ground fault, overload, overheating, electronic thermal, PG feedback error, external limit signal error, re-open/re-close	
	Digital Keypad	7 function keys, 4-digit 7-segment LED, 4 status LEDs, master frequency, output frequency, output current, custom units, parameter values for setup, review and faults, RUN, STOP, RESET, FWD/REV	
Protection Characteristics	Motor Protection	Electronic thermal relay protection	
	Over Current Protection	The current forces 220% of the over-current protection and 300% of the rated current	
	Overload Capacity	150% for 60 seconds : 180% for 10 seconds	
	Voltage Protection	Over-voltage level: Vdc>400; low-voltage level: Vdc<200	
	Over-voltage Protection for Input Power	Varistor (MOV)	
	Overheat Protection	Built-in temperature sensor	
Environment	Enclosure Rating	IP20	
	Operation Temperature	-10°C~40°C	
	Ambient Temperature	-20°C~60°C	
	Ambient Humidity	Below 90% RH (non-condensing)	
	Vibration	1.0G less than 20Hz, 0.6G at 20~60 Hz	
	Installation Location	Altitude 1,000m or lower, keep from corrosive gasses, liquid and dust	

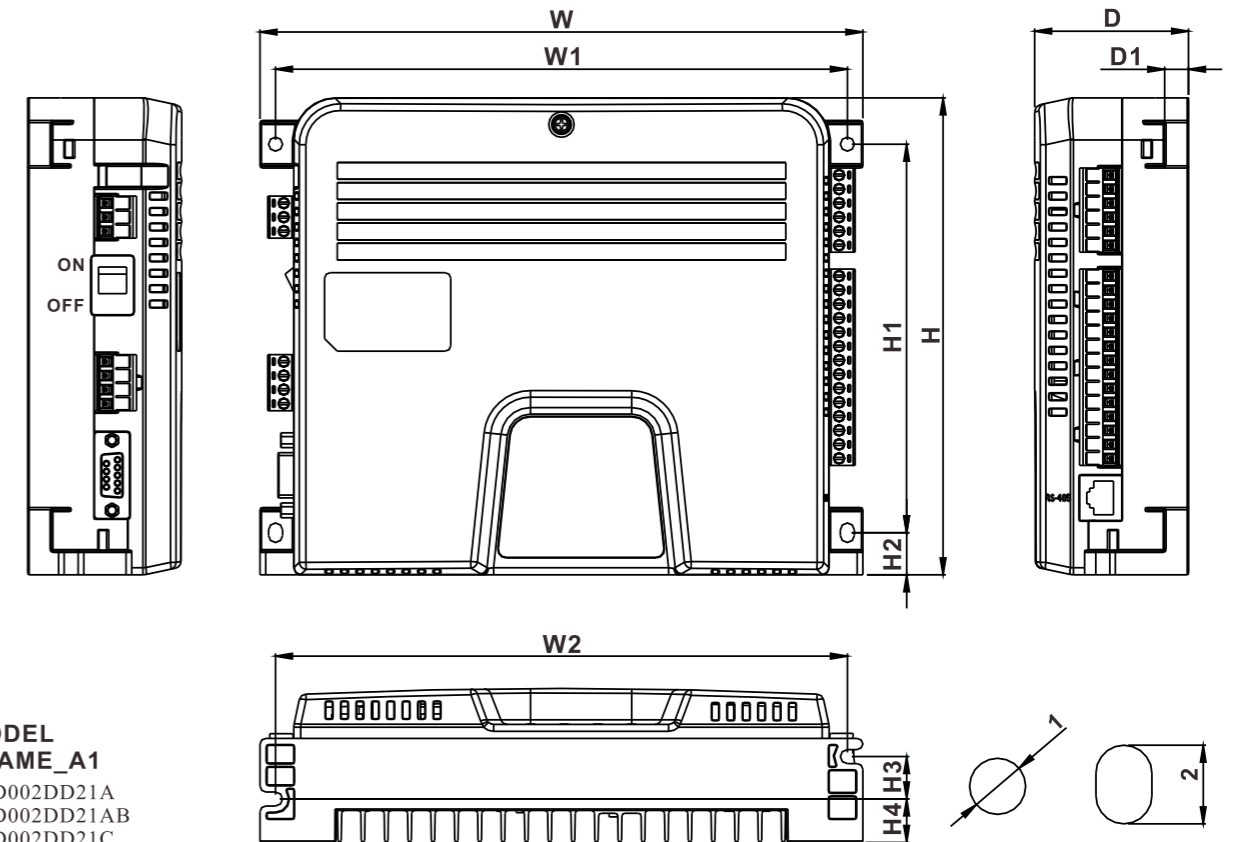




Delta Door Drives - Standard Wiring



Dimensions

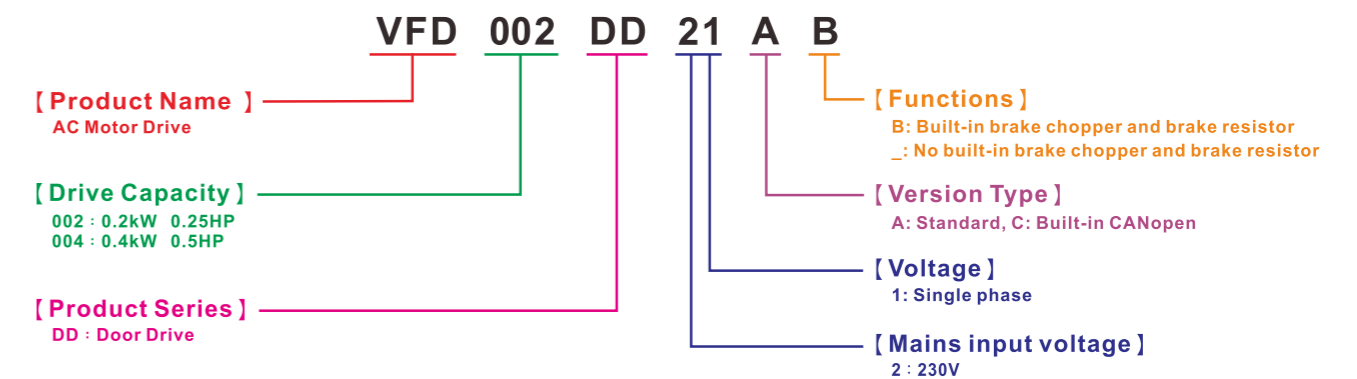


MODEL FRAME_A1

- VFD002DD21A
- VFD002DD21AB
- VFD002DD21C
- VFD002DD21CB
- VFD004DD21A
- VFD004DD21AB
- VFD004DD21C
- VFD004DD21CB

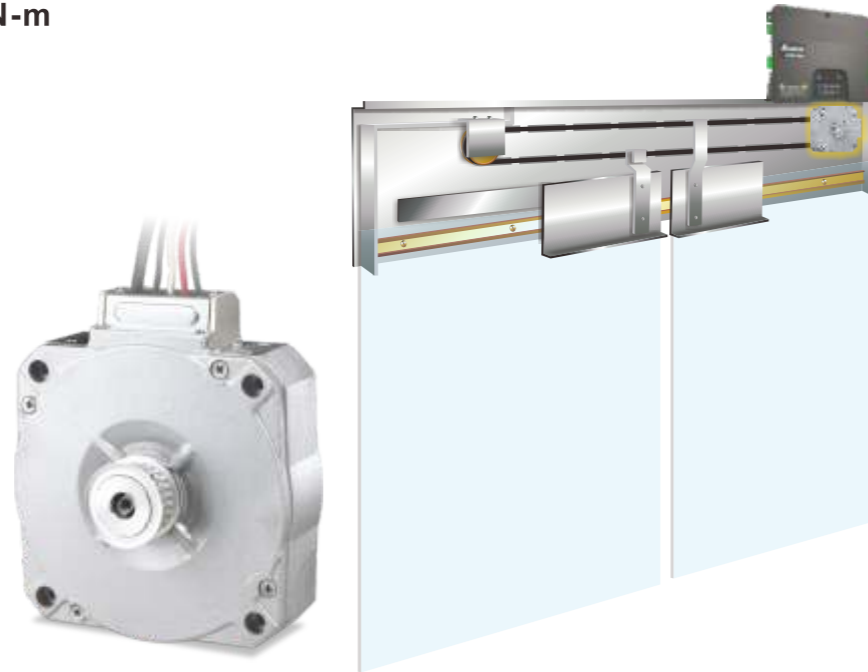
Model Name	W	H	D	W1	W2	H1	H2	H3	H4	D1	1	2	
A1	mm	215.0	170.0	55.0	204.0	204.0	138.5	15.0	15.1	15.5	8.5	5.0	7.0
	inch	8.46	6.69	2.17	8.03	8.03	5.45	0.59	0.59	0.61	0.34	0.20	0.28

Model Name



DD Motor Features and Functions

- 55mm thin design
- Instant torque up to 3N-m
- Flexible installation
 - Front side installation
 - Back side installation

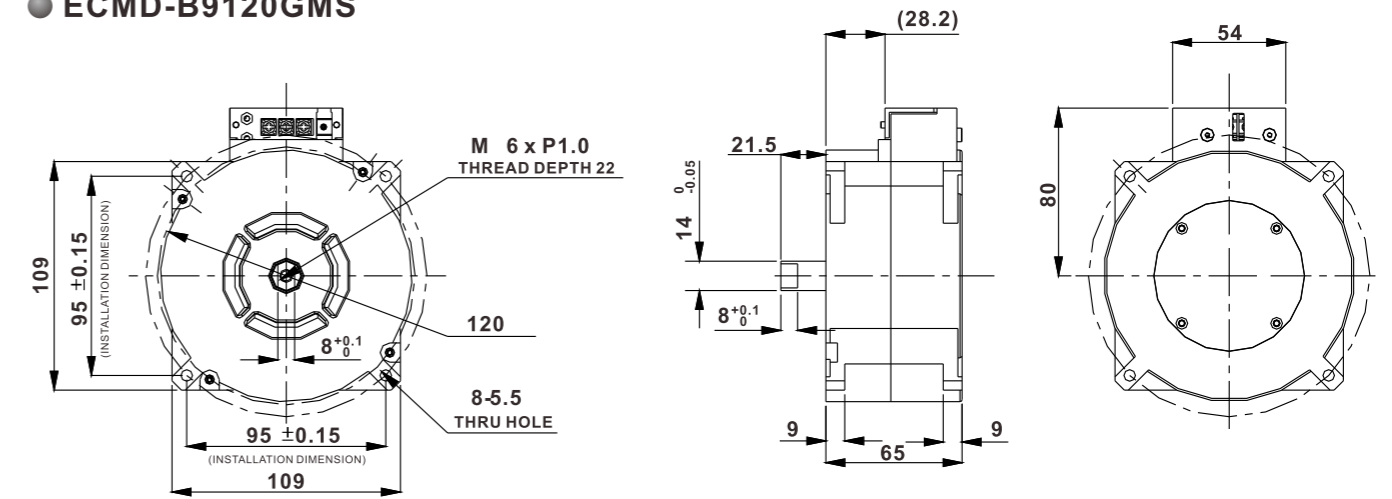


Product specifications

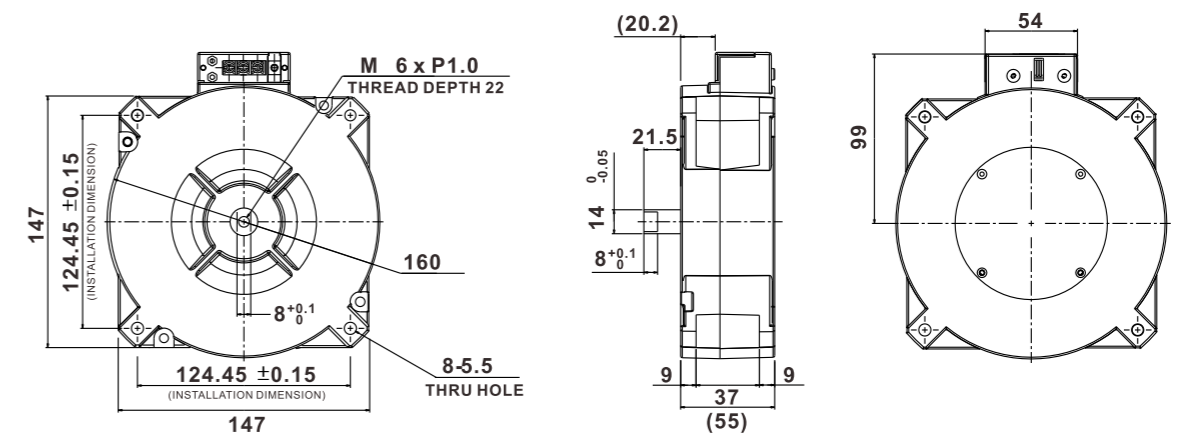
	Frame	ECMD-B9120GMS	ECMD-B9160GMS
Rated specification	Rated Power	70	65
	Rated Voltage (V)	220	220
	Rated Torque (N-m)	1.9	2.5
	Rated Speed (rpm)	350	250
	Rated Current (A)	0.84	1.0
	Continuous Stall Torque (N-m)	1.9	2.5
	Maximum Torque (N-m)	3.0	3.0
	Maximum Speed (rpm)	750	300
	Maximum Current	1.5	1.3
	Rotor Moment of Inertia (Kg.m ²)	3.0×10^{-4}	4.9×10^{-4}
Motor Specification	Armature Resistance (Ohm)	17.5	14.0
	Armature Inductance (mH)	198.0	169.4
	Mechanical Time Constant (ms)	2.45	2.86
	Electrical Time Constant (ms)	11.3	12.1
	Insulation Class	B	B
	Insulation Resistance	10MΩ DC500V	10MΩ DC500V
	Insulation Strength	1.5 kVAC, 1 min.	1.5 kVAC, 1 min.
	Max. Radial Shaft Load (N)	98	98
	Max. Thrust Shaft Load (N)	49	49
	Weight (kg)	2.5	3.0
Environment	Maximum Winding Temperature	130°C	
	Operating Temperature	5~45°C	
	Storage Temperature	-10~50°C	
	Operating Humidity (%RH)	20~95%RH (Non-condensing)	
	Storage Humidity(%RH)	20~95%RH (Non-condensing)	
	IP Rating	IP20 (Standard); IP44(Optional)	

Dimensions

● ECMD-B9120GMS



● ECMD-B9160GMS



Model Name

