



EtherCAT[®]
Conformance tested

EM3E

Network Stepper Drive

Passed the conformance testing of ETG

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- ▶ Support CoE control and CiA 402 protocol
- ▶ Maximum communication rate of 100 Mbps
- ▶ Simplicity & High reliability
- ▶ Excellent performance
- ▶ 60% lower cost than EtherCAT servo

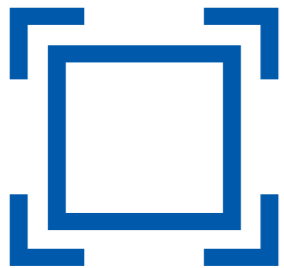
EM3E Series

These newly released EM3E series drives support CANopen over EtherCAT (CoE) control and CiA 402 operating modes including Profile Position (PP), Profile Velocity (PV), Homing(HM), Cyclic Synchronous Position (CSP). The products can be matched with most of EtherCAT controller/PLC such as Leadshine, Beckhoff, Omron, etc. The EM3E series has excellent performance including enhanced reliability, super-low stepper noise, anti-resonance, low-speed ripple smoothing and remains 60% less cost than EtherCAT servo at least.



EM3E Series Advantages

No.1 stepper products manufacturer in terms of shipment volume globally nowadays.



- High Reliability:**
 Successfully passed the conformance testing of the ETG, and applied in rich applications since released in 2016.
- Enhanced Communication Rate:**
 Maximum rate of 100Mbps to ensure real-time control in automation environments.
- Excellent performance:**
 Adopt Leadshine mature DSP control technology which enables super-low noise, anti-resonance, low-speed ripple smoothing, etc.

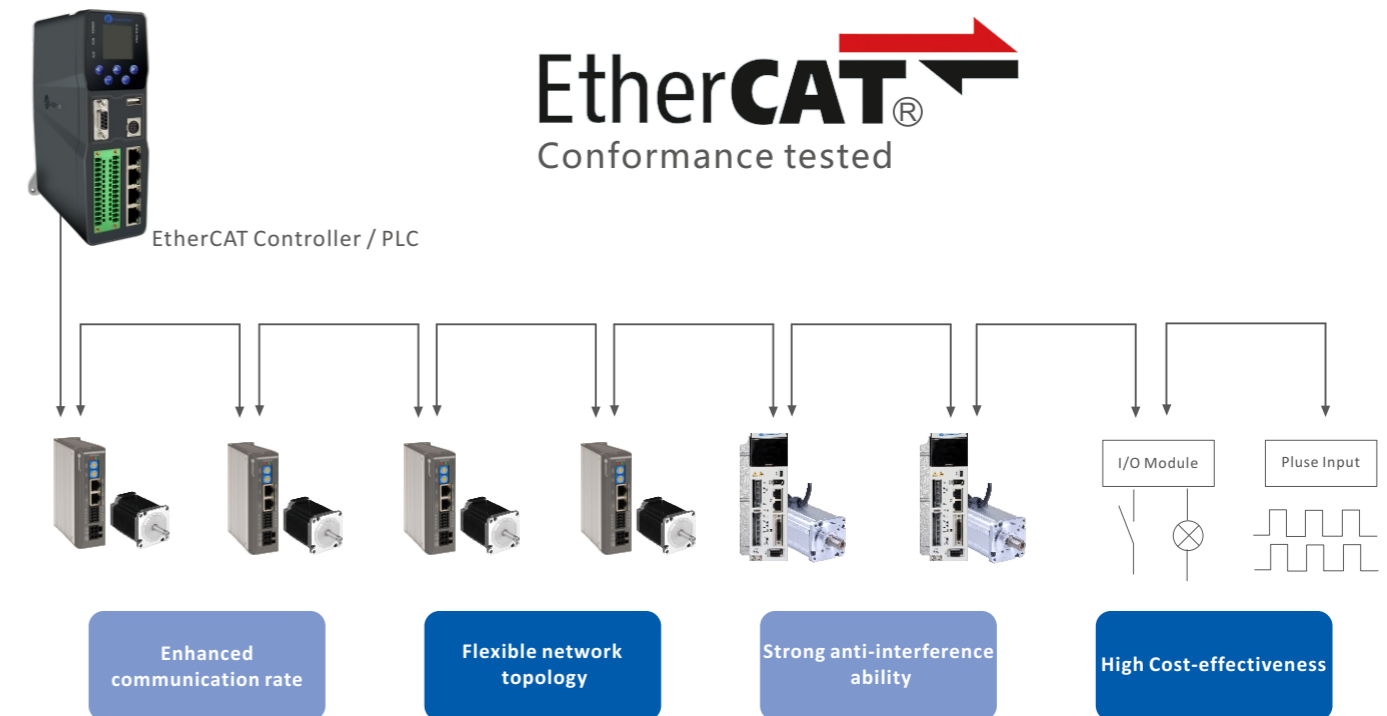
Customer Benefits



- Significantly reduced equipment costs:**
 At least lower 60% cost to replace EtherCAT servo when the required speed of applications under 1500 RPM.
- Significantly reduced potential cost:**
 Lower labor cost, lower cable cost and maintenance cost.
- Real-time data transfer:**
 Online monitoring of the status of motor and drive.

EM3E Series

EtherCAT System Connection Topology



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1. EM3E Series Overview
2. EM3E Series Drives
3. Matching Stepper Motor
4. Cables and Power Supplies
5. Ordering Information

01 EM3E Series Overview

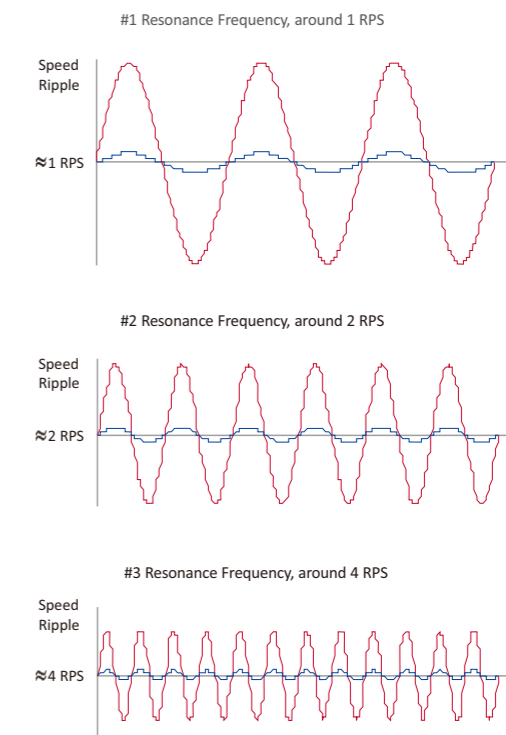
1.1 Overview

	Item	Description
EtherCAT Specifications	Communication protocol standard	CoE (CANopen over EtherCAT)
	Equipment protocol standard	IEC61800-7 CiA 402 Drive Profile
	Control Modes	CSP (Cyclic Synchronous Position) pp(Profile Position) PV(Profile Velocity) HM(Homing)
	Synchronization Modes	DC Synchronization and Free-run mode
	Synchronization cycle	250us, 500us, 750us, 1ms, 2ms, 4ms
	General Specifications	Operating Voltage
	Bus Address Setting	Two 16-bit rotary Code
	Digital Input	5 input signals, include 4 single-ended and 1 differential connections, maximum frequency 20KHz, 5-24V input voltage
	Digital Output	2 output signal, optically isolated, maximum 24/20mA
	Alarm Output	Over voltage, over current, etc.

1.2 Features

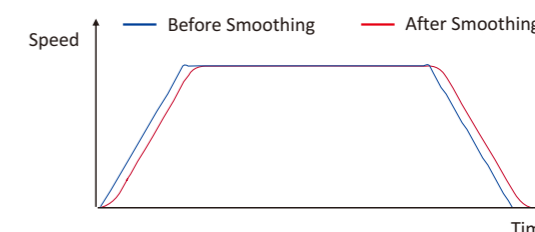
1. Low-speed Ripple Smoothing

Electronic damping for 3 major resonance frequencies for stepper motors at low speed range, eliminating undesirable motor speed oscillation and delivering unique level of smoothness.



2. Command Signal Smoothing

Command signal smoothing can soften the effect of sudden changes in velocity and direction, thus delivering smoother performance and improving system lifetime.



3. Alarm Output

Using alarm indicator and output signal feedback failure such as over-voltage or over-current timely to ensure the safety and reliability of equipment operation.



02 EM3E Series Drives

2.1 Part Number

EM3 - 5 56

① ② ③ ④ ⑤ ⑥

① Series Name:
EM3: EM3 Series

② Communication Modes:
E: EtherCAT





③ DC or AC Power Input:
Blank: DC Input
A: AC or DC Input Optional

④ Operating Voltage:
5: Max 50V
8: Max 80V

⑤ Max Output Current:
56: 5.6A

⑥ Custom Models:

2.2 Electrical Specifications

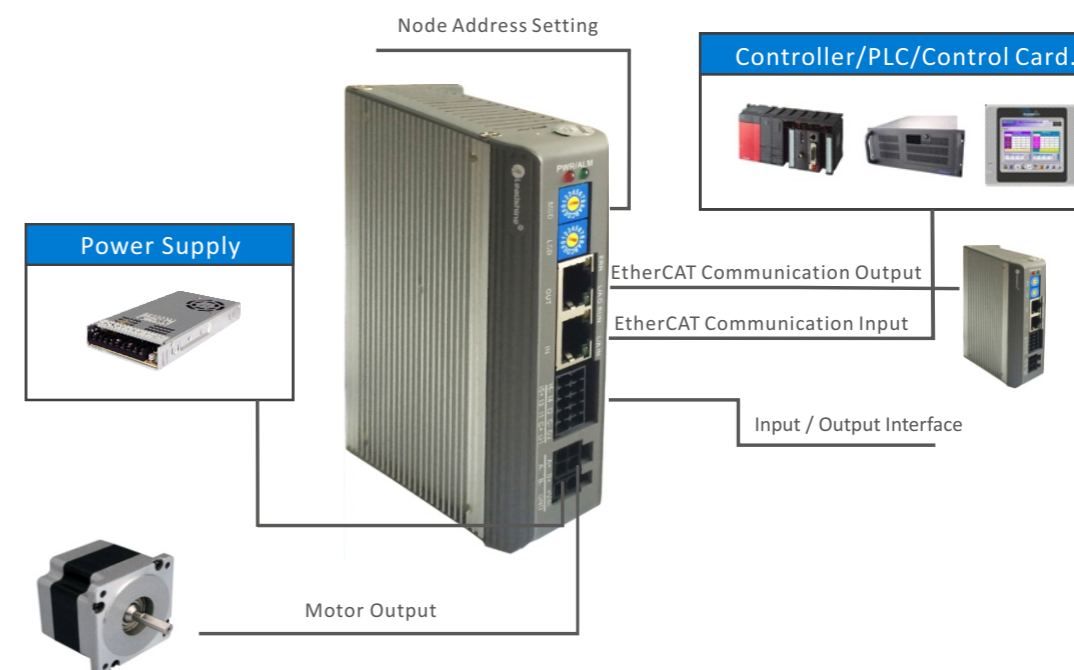
EtherCAT Network Stepper Drives				
Models				
	EM3E-522	EM3E-542	EM3E-556	EM3E-870
Operating Voltage	20-50VDC	20-50VDC	20-50VDC	20-80VDC
Output Current	0.3-2.2A(RMS 1.6A)	1.0-4.2A((RMS 3A)	1.0-5.6A(RMS 4A)	2.1-7.0A(RMS 5A)
Matched Motor	NEMA 8,11,14,17	NEMA 17,23	NEMA 23,24	NEMA 23,24,34

1 DC Power Input

Models	Operating Voltage (VDC)			Output Peak Current ^① (A)		Control Signal Current (mA)		Control Signal Voltage ^② (VDC)	Over Voltage Point (VDC)
	Min	Typical	Max	Min	Max	Min	Max		
EM3E-522	20	24	50	0.5	2.2	7	16	5 - 24	90
EM3E-542	20	24, 36	50	1.0	4.2	7	16	5 - 24	90
EM3E-556	20	24, 36	50	2.1	5.6	7	16	5 - 24	90
EM3E-870	20	48,70	80	2.1	7.0	7	16	5 - 24	160

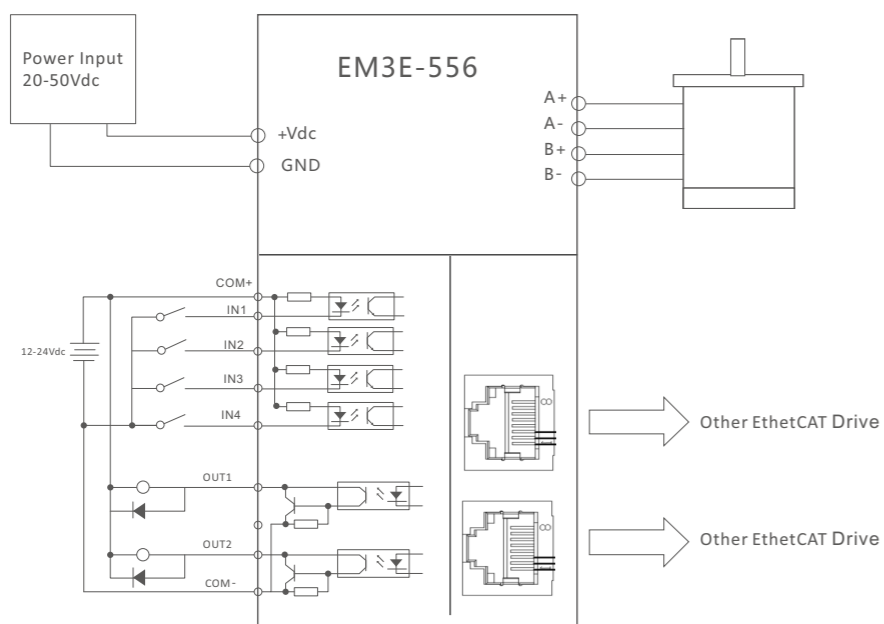
Note: ① The minimum output current is default value, can be set to 0.1A via PC software;
② No additional resistance for 5V, 12V, 24V normally, while recommended to connect 1KΩ or 2KΩ resistance when using 12V or 24V in strong interference condition.

2.3 Typical Configuration



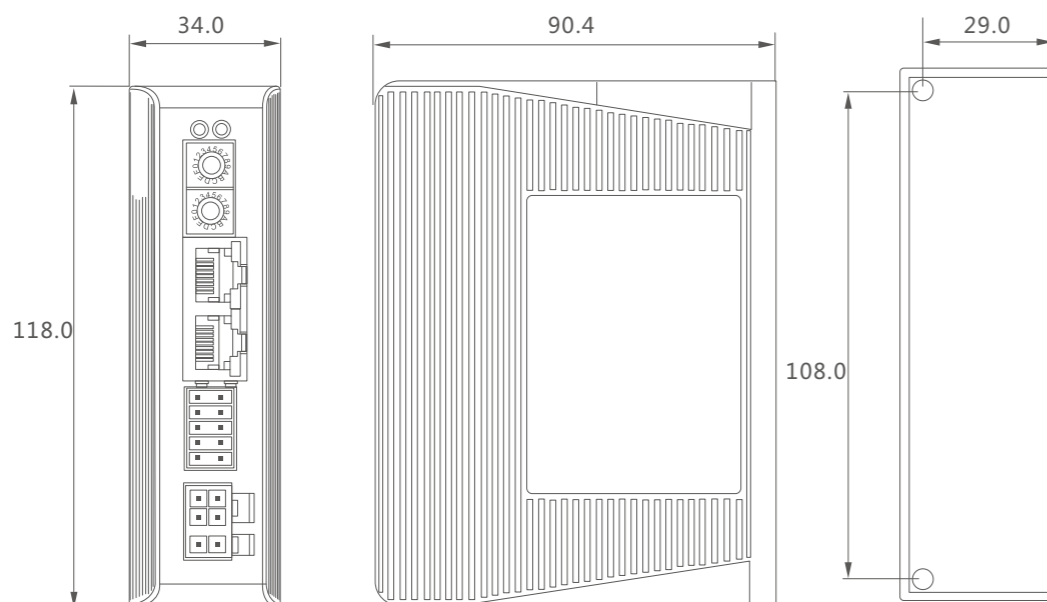
2.4 Connector Description

EM3E Connector Description



2.5 Mechanical Specifications

Unit: mm 1inch=25.4mm



03 Matching Stepper Motor — CM Series

3.1 Part Number

57

CM
06
-
(
A
)
-

- ① **Motor Frame Size**
 42: NEMA 17 motor
 57: NEMA 23 motor
 D57: NEMA 23 motor with larger body
 60: NEMA 24 motor
 86: NEMA 34 motor
- ② **Motor Phase**
 Blank: 2 phase motor
 3 : 3 phase motor
- ④ **Holding Torque**
 For NEMA 8/11/14 motor:
 Divide the value by 100
 044 : 0.44N.m
 For NEMA 17/23/24/34 motor:
 Divide the value by 10
 06: 0.6N.m
- ⑤ **Motor Rate Current**
 Blank: Standard rate current
 4A : Rate current 4A
- ⑥ **Standard Customized Specification**
 SZ : Double shaft motor
 BZ : Brake motor
 FS : Waterproof motor
- ⑦ **Customized model**

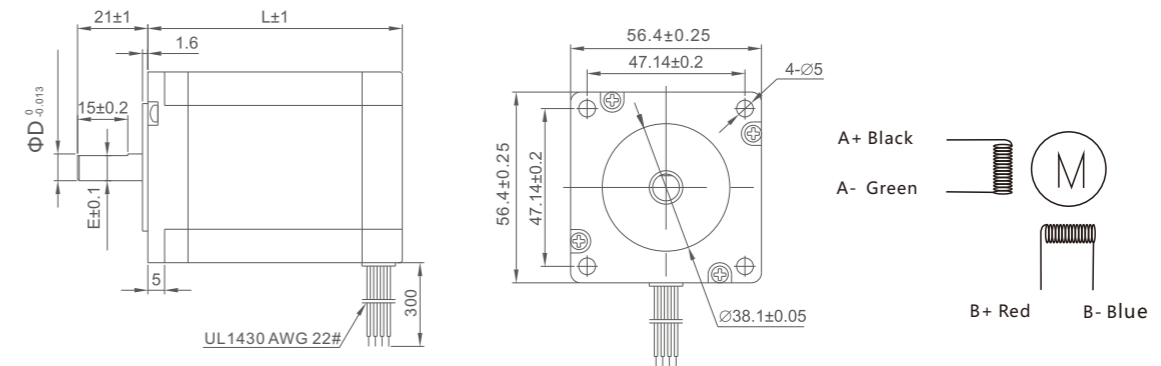
3.2 Models

Motor Size	Model	Holding Torque (N.m)	Standard Type Length (mm)	Rate Current (A)	Matched EtherCAT Drive
NEMA 8	20CM003	0.03	33	0.6	EM3E-522
	20CM005	0.05	45	0.6	EM3E-522
NEMA 11	28CM006	0.06	32	1.2	EM3E-522
	28CM010	0.10	41	1.2	EM3E-522
	28CM013	0.13	51	1.2	EM3E-522
NEMA 14	35CM015	0.15	31	1.5	EM3E-522
	35CM044	0.44	47	1.5	EM3E-522
NEMA 17	42CM02	0.2	33	1.5	EM3E-522/EM3E-542
	42CM04	0.4	40	1.5	EM3E-522/EM3E-542
	42CM06	0.6	47	2.5	EM3E-542
	42CM08	0.8	60	2.5	EM3E-542

Motor Size	Model	Holding Torque (N.m)	Standard Type Length(mm)	Rate Current (A)	Matched EetherCAT Drive
NEMA 23	57CM06	0.6	41	3	EM3E-542/EM3E-556
	57CM13	1.3	56	4	EM3E-542/EM3E-556
	57CM23	2.3	76	5	EM3E-556
	57CM23-4A	2.3	76	4	EM3E-542/EM3E-556
	57CM26	2.6	84	5	EM3E-556
	57CM26-4A	2.6	84	4	EM3E-542/EM3E-556
	D57CM21-4A	2.1	67	4	EM3E-542/EM3E-556
	D57CM31-4A	3.1	88	4	EM3E-542/EM3E-556
	D57CM21	2.1	67	6	EM3E-556/EM3E-870
	D57CM31	3.1	88	6	EM3E-556/EM3E-870
NEMA 24	60CM22X	2.2	67	5	EM3E-556/EM3E-870
	60CM30X	3.0	85	5	EM3E-556/EM3E-870
NEMA 34	86CM35	3.5	66	4	EM3E-556/EM3E-870
	86CM45	4.5	80	6	EM3E-870
	86CM80	8.0	98	6	EM3E-870
	86CM85	8.5	118	6	EM3E-870
	86CM120	12	129	6	EM3E-870

NEMA23

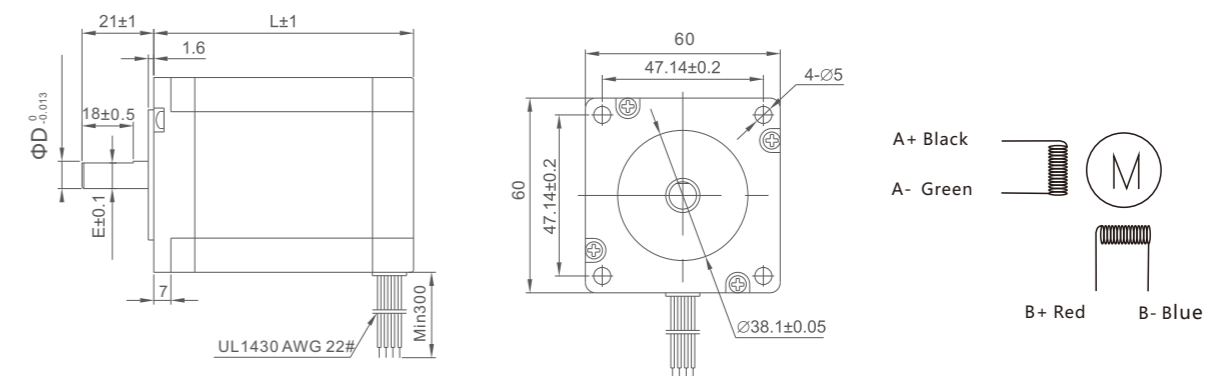
Model	Standard Type Length(mm)	Holding Torque (N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance / Phase (mH)	Inertia (Kg.cm ²)
57CM06	41	0.6	3	0.7	1.4	0.12
57CM13	56	1.3	4	0.42	1.4	0.3
57CM23	76	2.3	5	0.38	1.75	0.48
57CM26	84	2.6	5	0.44	2.0	0.52



Model	L (mm)	D (mm)	E (mm)
57CM06	41	6.35	5.8
57CM13	56	6.35	5.8
57CM23	76	8	7.5
57CM26	84	8	7.5

NEMA23(Continous)

Model	Standard Type Length(mm)	Holding Torque (N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance / Phase (mH)	Inertia (Kg.cm ²)
D57CM21	67	2.1	4/6	0.21	0.75	0.57
D57CM31	88	3.1	4/6	0.26	1.18	0.84



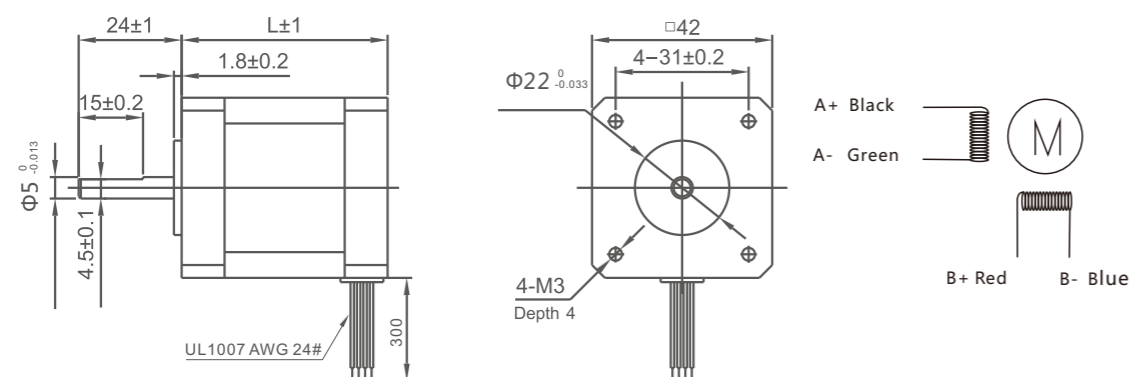
Model	L (mm)	D (mm)	E (mm)
D57CM21	67	8	7.5
D57CM31	88	8	7.5

3.3 Motor Specifications

Unit: mm 1 inch=25.4mm

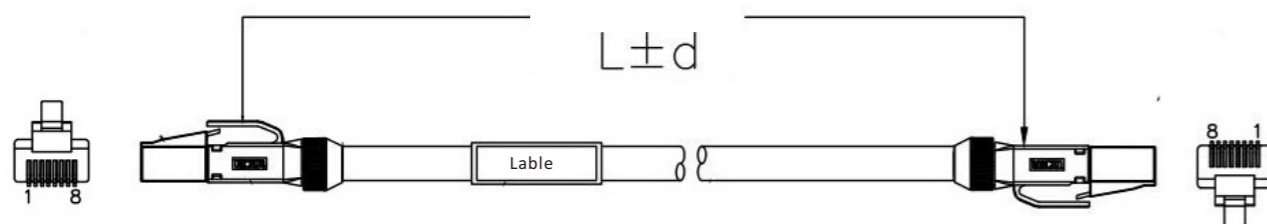
NEMA17

Model	Standard Type Length(mm)	Holding Torque (N.m)	Rate Current (A)	Resistance/Phase(Ω)	Inductance / Phase (mH)	Inertia (Kg.cm ²)
42CM02	33	0.2	1.5	1.4	1.4	0.035
42CM04	39	0.4	1.5	2.4	4.3	0.054
42CM06	47	0.6	2.5	0.9	1.6	0.072
42CM08	60	0.8	2.5	1.0	2.4	0.11



4.2 Cables

1 Cables for Communication



2 Specification

Model	Length (L)	Tolerance (d)
CABLE-TX0M1-BUS RoHS	100mm	±10mm
CABLE-TX0M2-BUS RoHS	200mm	±10mm
CABLE-TX0M3-BUS RoHS	300mm	±10mm
CABLE-TX0M5-BUS RoHS	400mm	±10mm
CABLE-TX1M0-BUS RoHS	1000mm	±10mm
CABLE-TX1M5-BUS RoHS	1500mm	±10mm
CABLE-TX2M0-BUS RoHS	2000mm	±10mm
CABLE-TX3M0-BUS RoHS	3000mm	±10mm
CABLE-TX5M0-BUS RoHS	5000mm	±10mm
CABLE-TX7M0-BUS RoHS	7000mm	±10mm
CABLE-TX10M0-BUS RoHS	10000mm	±10mm
CABLE-TX15M0-BUS RoHS	15000mm	±10mm
CABLE-TX20M0-BUS RoHS	20000mm	±10mm

05 Ordering Information

CANopen Drive Model	Input Power Voltage	Output Peak Current(A)	Matched Motor	Holding Torque (N.m)			
EM3E-522	20 - 50 (Vdc)	0.5 - 2.2 (A)	20CM003	0.03			
			20CM005	0.05			
			28CM006	0.06			
			28CM010	0.10			
			28CM013	0.13			
			35CM015	0.15			
EM3E-542	20 - 50 (Vdc)	1.0 - 4.2 (A)	35CM44	0.44			
			42CM02	0.2			
			42CM04	0.4			
			42CM06	0.6			
			42CM08	0.8			
			EM3E-556	20 - 50 (Vdc)	2.1 - 5.6 (A)	57CM06	0.6
57CM13	1.3						
57CM23	2.3						
57CM23-4A	2.3						
57CM26	2.6						
57CM26-4A	2.6						
D57CM21-4A	2.1						
D57CM31-A4	3.1						
EM3E-870	20 - 80 (Vdc)	2.1 - 7.0 (A)				D57CM21	2.1
						D57CM31	3.1
			60CM22X	2.2			
			60CM30X	3.0			
			86CM35	3.5			
			86CM45	4.5			
			86CM80	8.0			
			86CM85	8.5			
			86CM120	12			
			Accessories	Cables of communication			