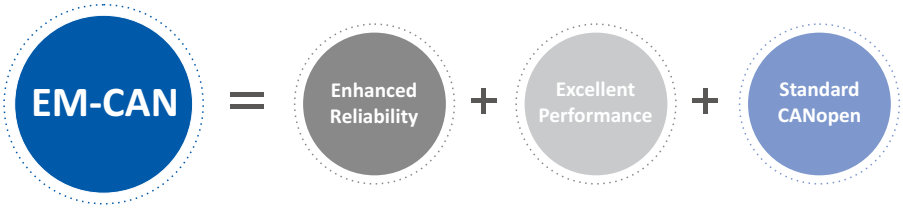
purelogic
research & development

MANUAL

EMA882-CAN
Stepper Drive

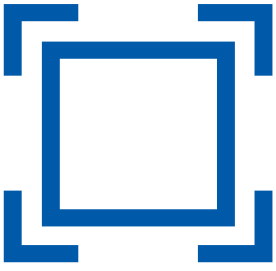
EM-CAN Series

EM-CAN is a new series of digital stepper drives with standard CANopen protocol. The new products have excellent performance include enhanced reliability, super-low stepper noise, anti-resonance, low-speed ripple smoothing. Adding CANopen allows the drives not only to support operating modes including Profile Position (PP), Profile Velocity (PV), Homing (HM), etc, but also to build a CANopen networks with 127 nodes maximumly. Therefore, Leadshine EM-CAN series is an ideal choice for field-bus applications, which need high reliability and good performance.



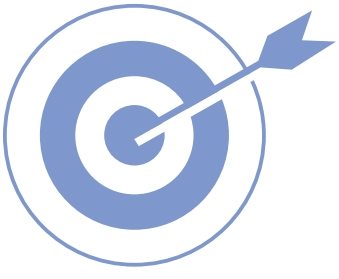
EM-CAN Series Advantages

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



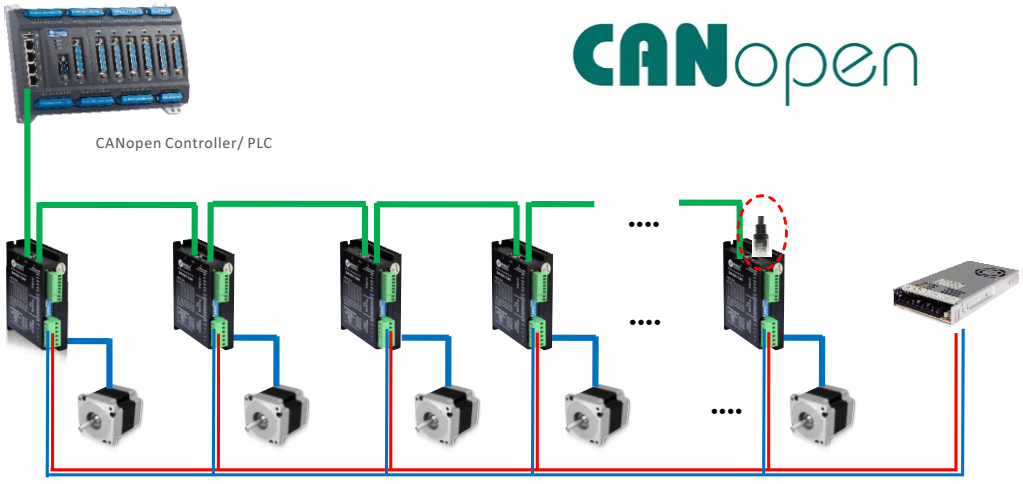
- **High Reliability:**
  19-years continuous improvement & 13-years ISO system implementation.
- **Widely matching CANopen master:**
  Matched with most of mainstream CANopen master brands, such as Leadshine, Schneider, Delta, etc.
- **Excellent performance:**
  Adopt Leadshine mature DSP control technology which enables super-low noise, anti-resonance, low-speed ripple smoothing, etc.

Customer Benefits



- **Significantly reduced equipment cost:**
  60% lower cost to replace field-bus servo when the required speed of application is 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.

EM-CAN Series
Field-bus System Connection Topology



Fast communication rate

Long communication distance

Lower cost

Strong anti-interference ability

Contents

01 EM-CAN Series Overview

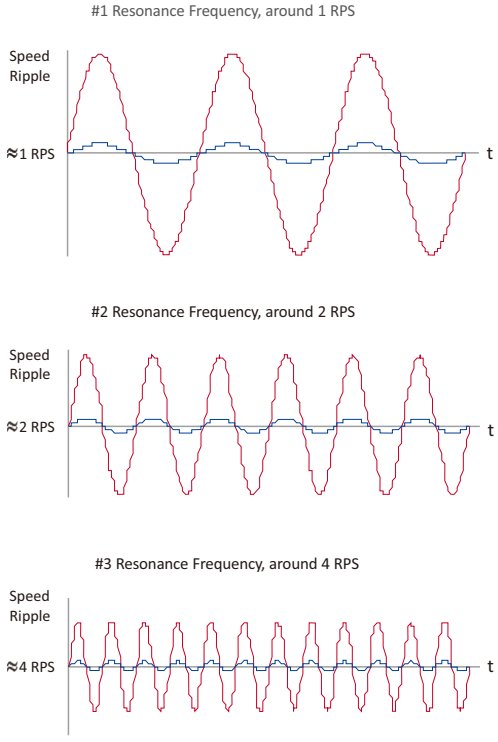
1.1 Overview

Item		Description
CANopen Specifications	link layer protocol	CAN Field-bus
	Application layer protocol	CANopen protocol
	CAN-ID Type	CAN 2.0A
	Communication Rate	1Mbit/s, 500Kbit/s, 250Kbit/s, 125Kbit/s, 100Kbit/s, 50Kbit/s, 20Kbit/s
	Sub-protocol	DS 301 V4.02: CANopen application layer protocol and communication protocol DSP 402 V2.0: Device profile for drives and motion control
	CANopen length	0 - 8bit
	Support service	NMT: Network Management Service SDO: Service Data Objects PDO: Process Data Object Devices Monitor: Node protection and heartbeat message SYNC: Synchronous generator and synchronous detection, applied to the PDO transmission EMCY: Emergency object Services
	PDO transmission modes	Time trigger, event trigger, synchronization trigger
	PDO number	3 TPDOs, 3 RPDOs
	Control modes	PP (Profile Position) PV (Profile Velocity) HM (Homing)
General Specifications	Input Power	20 - 80VDC or 20 - 80VAC
	Bus Address Setting	DIP switch or PC software
	Digital Input	Max 4 input signals, include single - ended / differential connections, maximum frequency 20KHz, 5-24V input voltage
	Digital Output	Max 2 output signal, optically isolated, maximum 24/20mA
	Alarm Output	Over voltage, over current, etc.

1.2 Features

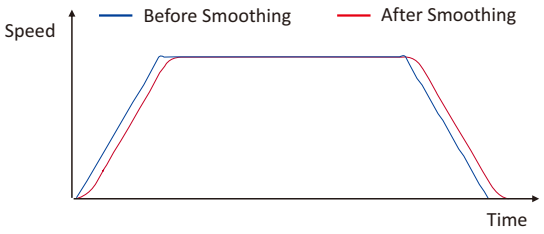
1. Low-speed Ripple Smoothing

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-voltageor over-current timely to ensure the safety and reliability of equipment operation.

02 EM-CAN Series Drives

2.1 Part Number

EM □ 5 56 - CAN □□□

① ② ③ ④ ⑤ ⑥

① Series Name:
EM - EM Series

② DC or AC Power Input:
Blank: DC Input
A: AC or DC Input Optional

③ Operating Voltage:
5: Max 50V
8: Max 80V

④ Max Output Current:
56: 5.6A

⑤ CAN:
CANopen

⑥ Custom Models

2.2 Electrical Specifications

CANopen Field-bus Stepper Drives						
Models						
	EM522-CAN	EM542-CAN	EM556-CAN	EM870-CAN	EM882-CAN	EMA882-CAN
Operating Voltage	20 - 50VDC	20 - 50VDC	20 - 50VDC	20 - 80VDC	20 - 80VDC	20 - 80VDC or 30 - 110VDC
Output Current	0.5 - 2.2A (RMS 1.6A)	1.0 - 4.2A (RMS 3A)	1.0 - 5.6A (RMS 4A)	2.1 - 7.0A (RMS 5A)	2.1 - 8.2A (RMS 5.8A)	2.1 - 8.2A (RMS 5.8A)
Matched Motor	NEMA 8,11,14,17	NEMA 17,23	NEMA 23, 24	NEMA 23, 24, 34	NEMA 34	NEMA 34

1 DC Power Input

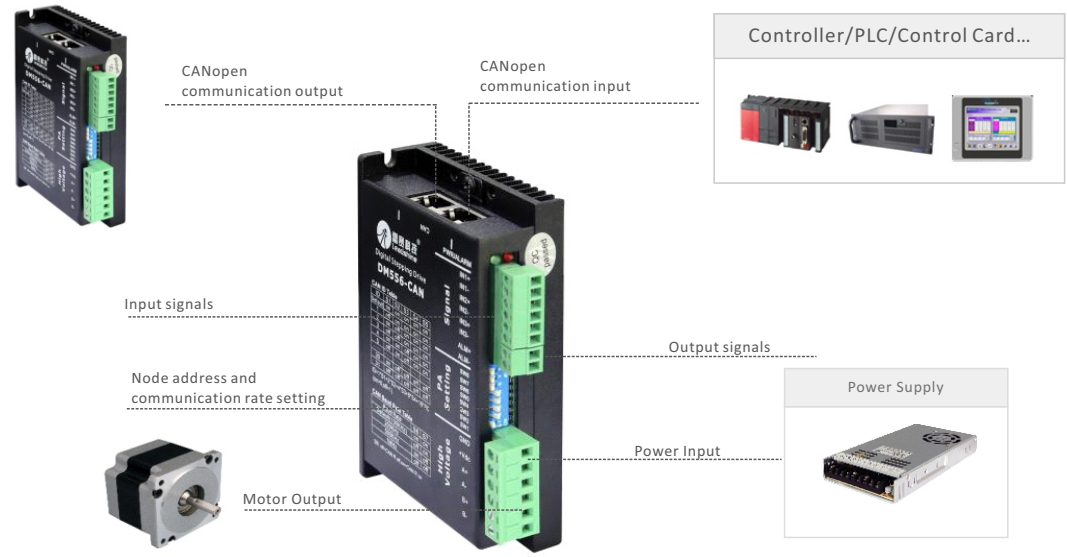
Models	Operating Voltage (VDC)			Peak Output Current① (A)		Control Signal Current (mA)		Control Signal Voltage② (VDC)
	Min	Typical	Max	Min	Max	Min	Max	
EM522-CAN	20	24	50	0.5	2.2	6	16	5 - 24
EM542-CAN	20	24, 36	50	1.0	4.2	6	16	5 - 24
EM556-CAN	20	24, 36	50	1.0	5.6	6	16	5 - 24
EM870-CAN	20	48, 70	80	2.1	7.0	6	16	5 - 24
EM882-CAN	20	70	80	2.1	8.2	6	16	5 - 24

2 AC Power Input

Models	Operating Voltage (VDC)			Peak Output Current① (A)		Control Signal Current (mA)		Control Signal Voltage② (VDC)
	Min	Typical	Max	Min	Max	Min	Max	
EMA882-CAN	20VAC 30VDC	70VAC 95VDC	80VAC 110VDC	2.1	8.2	6	16	5 - 24

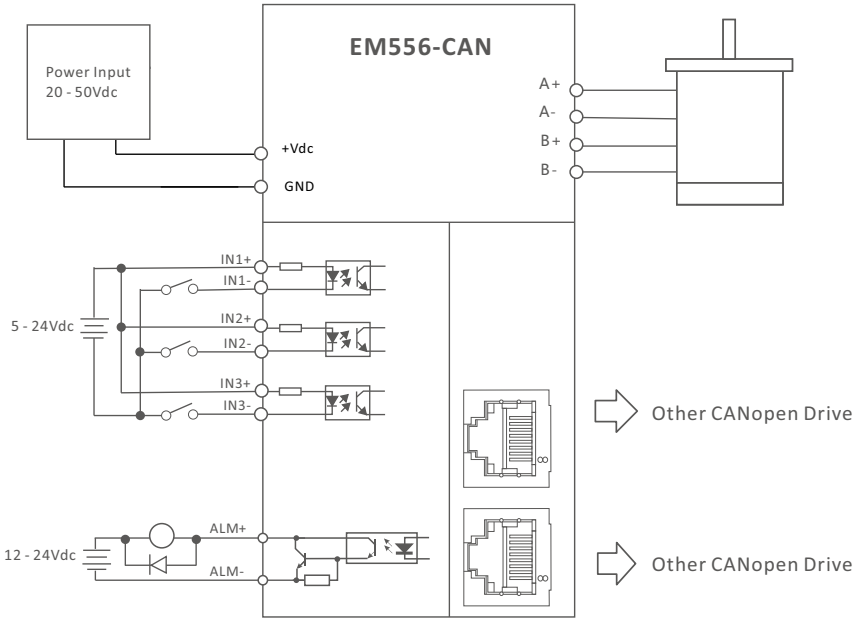
Note: ① The minimum output current is default value, can be set to 0.1A via PC software;
② No additional resistance for 5V, 12V, 24V normally, while recommended to connect 1KΩ or 2KΩ resistance when using 12V or 24V in strong interference condition.

2.3 Typical Configuration

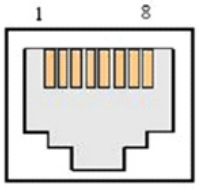


2.4 Connector Description

EM-CAN Connector Description

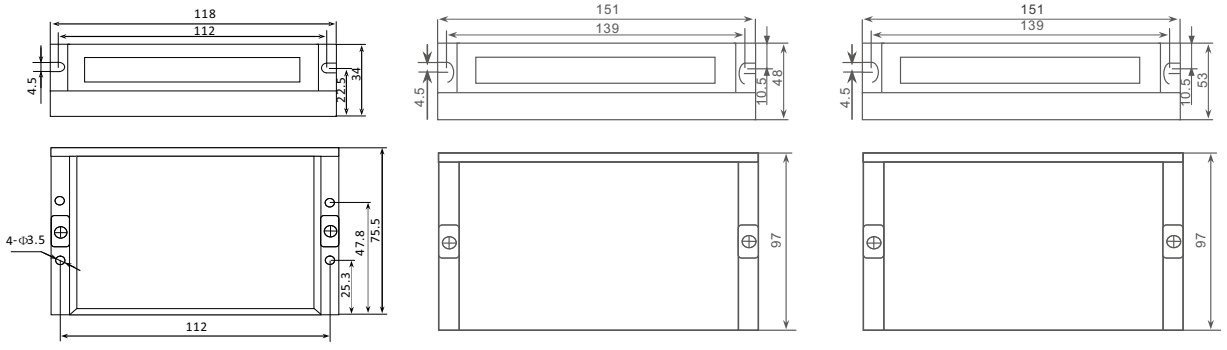


RJ45 Connector:
CAN connector uses binary RJ45 terminals with shielding (standard RJ45specifications as below)

RJ45 Picture	PIN	Name	Description
	1	CAN_H	CAN signal high
	2	CAN_L	CAN signal low
	3	CAN_GND	CAN signal ground
	4~5	NC	Reserved
	6	NC	
	7	---	
	8	NC	

2.5 Mechanical Specifications

Unit: mm 1 inch=25.4mm



EM522/542/556/870-CAN EM882-CAN EMA882-CAN

03 Matching Stepper Motor — CM Series

3.1 Part Number

□ 57 □ CM 06 —(□A)—□ □□

① ② ③ ④ ⑤ ⑥ ⑦

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: Dobule 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 CANopen Drive
NEMA 8	20CM003	0.03	33	0.6	EM522-CAN
	20CM005	0.05	45	0.6	EM522-CAN
NEMA 11	28CM006	0.06	32	1.2	EM522-CAN
	28CM010	0.10	41	1.2	EM522-CAN
	28CM013	0.13	51	1.2	EM522-CAN
NEMA 14	35CM015	0.15	31	1.5	EM522-CAN
	35CM044	0.44	47	1.5	EM522-CAN
NEMA 17	42CM02	0.2	33	1.5	EM522-CAN/EM542-CAN
	42CM04	0.4	40	1.5	EM522-CAN/EM542-CAN
	42CM06	0.6	47	2.5	EM542-CAN
	42CM08	0.8	60	2.5	EM542-CAN

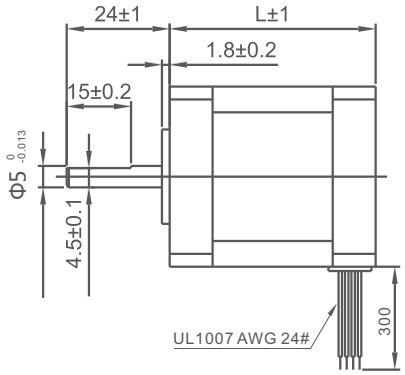
Motor Size	Model	Holding Torque (N.m)	Standard Type Length(A)	Rate Current (A)	Matched CANopen Drive
NEMA 23	57CM06	0.6	41	3	EM542-CAN/EM556-CAN
	57CM13	1.3	56	4	EM542-CAN/EM556-CAN
	57CM23	2.3	76	5	EM556-CAN
	57CM23-4A	2.3	76	4	EM542-CAN/EM556-CAN
	57CM26	2.6	84	5	EM556-CAN
	57CM26-4A	2.6	84	4	EM542-CAN/EM556-CAN
	D57CM21-4A	2.1	67	4	EM542-CAN/EM556-CAN
	D57CM31-4A	3.1	88	4	EM542-CAN/EM556-CAN
	D57CM21	2.1	67	6	EM556-CAN/EM870-CAN
	D57CM31	3.1	88	6	EM556-CAN/EM870-CAN
NEMA 24	60CM22X	2.2	67	5	EM556-CAN/EM870-CAN
	60CM30X	3.0	85	5	EM556-CAN/EM870-CAN
NEMA 34	86CM35	3.5	66	4	EM870-CAN/EM882-CAN/EMA882-CAN
	86CM45	4.5	80	6	EM870-CAN/EM882-CAN/EMA882-CAN
	86CM80	8.0	98	6	EM870-CAN/EM882-CAN/EMA882-CAN
	86CM85	8.5	118	6	EM870-CAN/EM882-CAN/EMA882-CAN
	86CM120	12	129	6	EM870-CAN/EM882-CAN/EMA882-CAN

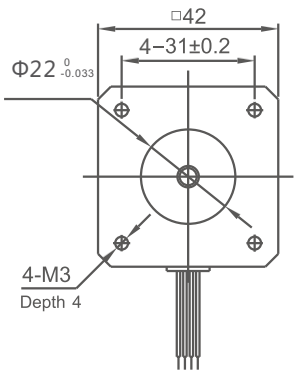
3.3 Motor Specifications

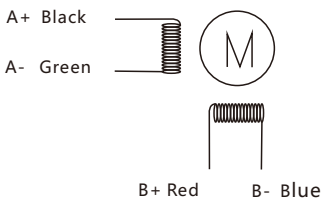
Unit: mm **1 inch=25.4mm**

■ 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

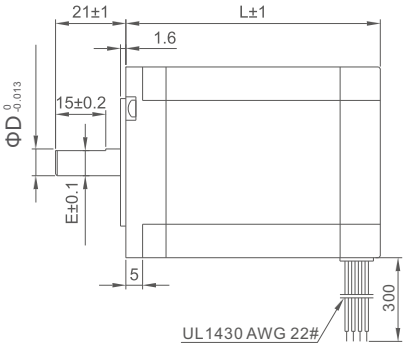


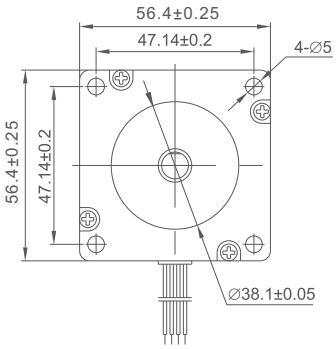


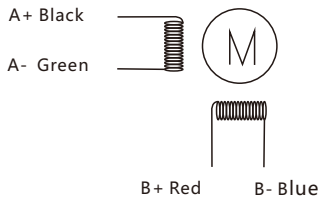


NEMA23

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



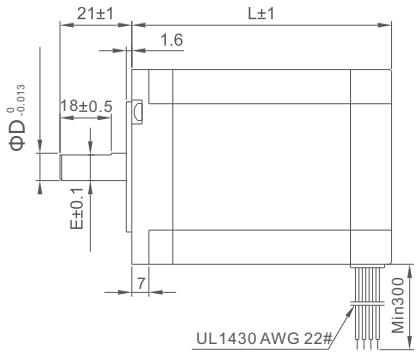


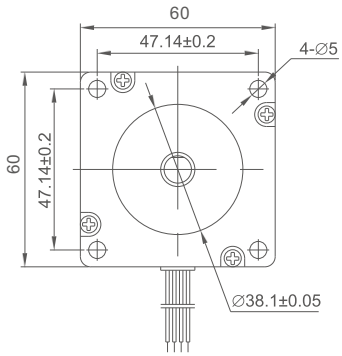


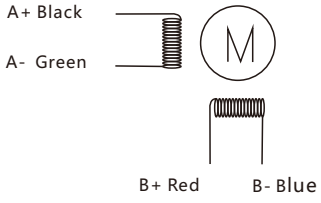
Model	L (mm)	D (mm)	E (mm)
57CM06	41	6.35	5.8
57CM13	56	6.35	5.8
57CM23	76	8	7.5
57CM26	84	8	7.5

NEMA23(Continious)

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



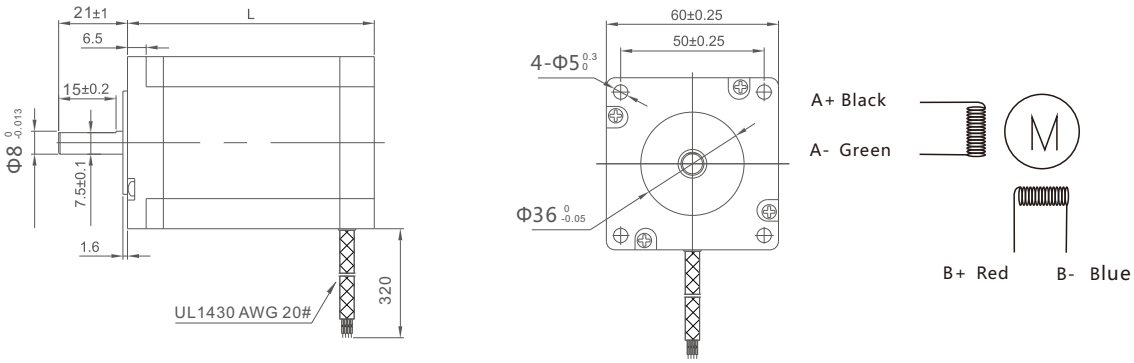




Model	L (mm)	D (mm)	E (mm)
D57CM21	67	8	7.5
D57CM31	88	8	7.5

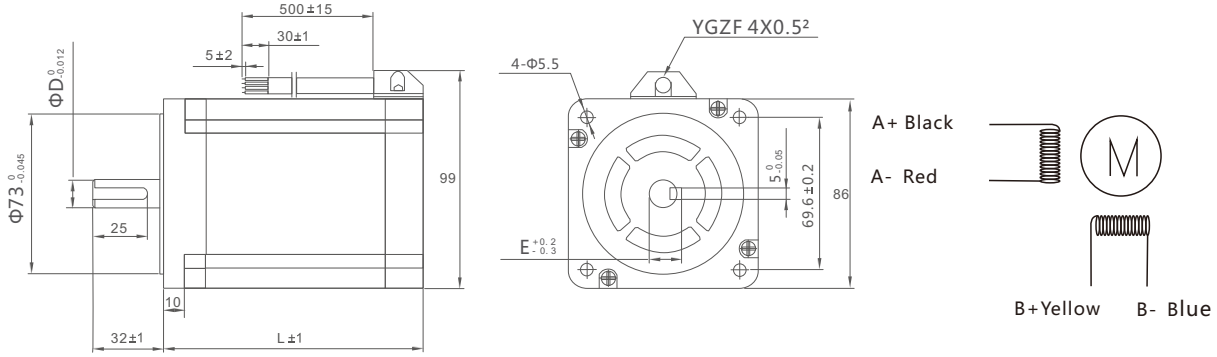
NEMA24

Model	Standard Type Length(mm)	Holding Torque (N.m)	Rate Current (A)	Resistance/ Phase(Ω)	Inductance / Phase (mH)	Inertia ($Kg.cm^2$)
60CM22X	67	2.2	5	0.33	1.05	0.49
60CM30X	85	3.0	5	0.46	2.0	0.69



NEMA34

Model	Standard Type Length(mm)	Holding Torque (N.m)	Rate Current (A)	Resistance/ Phase(Ω)	Inductance / Phase (mH)	Inertia ($Kg.cm^2$)
86CM35	66	3.5	4	0.42	2.67	1.0
86CM45	80	4.5	6	0.43	2.95	1.4
86CM80	98	8.0	6	0.63	4.0	2.5
86CM85	118	8.5	6	0.53	4.25	2.7



Model	L (mm)	D (mm)	E (mm)
86CM35	66	12.7	14.7
86CM45	80	12.7	14.7
86CM80	98	12.7	14.7
86CM85	118	12.7	14.7

Note:
① NEMA 8/11/14 stepper motors are coming soon
② Contact Leadshine for special type motor such as brake, double shaft, waterproof, etc.

04 Cables and Power Supply

4.1 Power Supplies

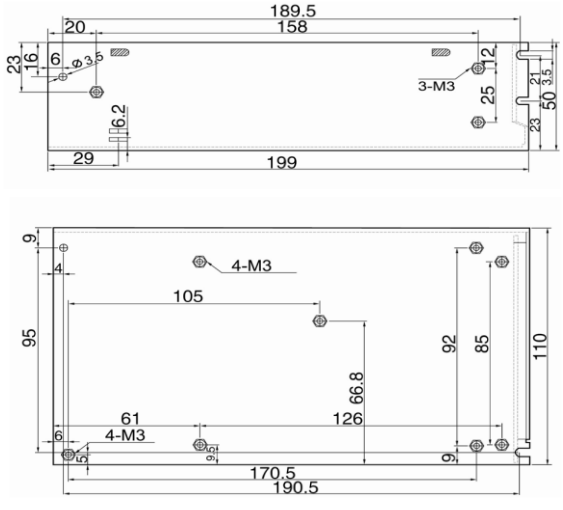
1 SPS Series Power Supplies

- **Features**
  - Specially Designed Power Suppliers for Stepper and Servo Controls
  - Compact Size, Light in Weight
  - Wide Input Voltage Range, 220VAC ± 10% or 110 VAC ± 10%
  - Shortcut, Over-current, Over-voltage, Low-voltage Protections Big
  - Power with High Efficiency
  - Easy to Use

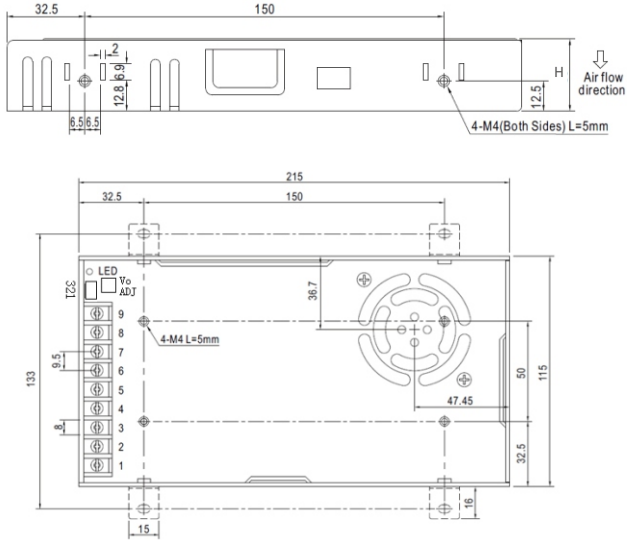
- **Electrical Specifications**

Model	Output Voltage (VDC)	Continuous Current (A)	Peak Current (A)	Input Voltage	Matching Drives	Dimensions	Weight (Kg)
SPS2410(V2.0)	24	10	30	220VAC± 10% or 110 VAC ± 10%	CS-D403/ CS-D508	199*110*50mm	0.8
SPS3611(V2.0)	36	11	33		CS-D508	215*110*30mm	0.6
SPS488(V2.0)	48	8.3	24.9		CS-D508/CS-D808	215*110*30mm	0.6
SPS4810(V2.0)	48	10	30		CS-D508/CS-D808	215*110*50mm	0.8
SPS606(V2.0)	60	6.7	20.1		CS-D808/CS-D1008	215*110*30mm	0.6

- **Mechanical Specifications**



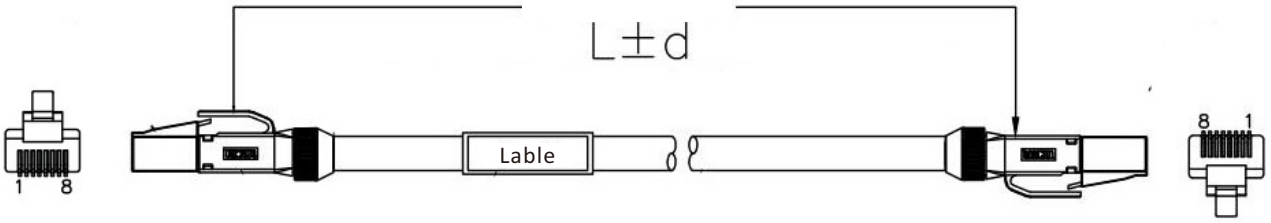
SPS2410(V2.0)



SPS3611(V2.0)/SPS488(V2.0)/SPS606(V2.0) H=30mm
SPS4810(V2.0) H=50mm

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

3 Terminate Resistance

Model	Picture
RJ45 Terminate Resistance	

Note: Please connect a terminate resistance in the end node

05 Ordering Information

CANopen Drive Model	Input Power Voltage	Output Peak Current(A)	Matched Motor	Holding Torque (N.m)
EM522-CAN	20 - 50 (VDC)	0.3 - 2.2 (A)	20CM003	0.03
			20CM005	0.05
			28CM006	0.06
			28CM010	0.10
			28CM013	0.13
			35CM015	0.15
			35CM044	0.44
EM542-CAN	20 - 50 (VDC)	1.0 - 4.2 (A)	42CM02	0.2
			42CM04	0.4
			42CM06	0.6
			42CM08	0.8
EM556-CAN	20 - 50 (VDC)	1.0 - 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
			D57CM31-4A	3.1
EM870-CAN	20 - 80 (VDC)	2.1 - 7.0 (A)	D57CM21	2.1
			D57CM31	3.1
			60CM22X	2.2
			60CM30X	3.0
EM882-CAN	20 - 80 (VDC)	2.1 - 8.2 (A)	86CM35	3.5
			86CM45	4.5
			86CM80	8.0
			86CM85	8.5
			86CM120	12
EMA882-CAN	20 - 80 (VAC)	2.1 - 8.2 (A)	86CM35	3.5
			86CM45	4.5
			86CM80	8.0
			86CM85	8.5
			86CM120	12
Accessories	Cables of communication			
	Terminate resistance			

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Пн	Вт	Ср	Чт	Пт	Сб	Вс
	8^{00}-17^{00}			8^{00}-16^{00}	выходной	