

# LD3 Direct Drive Series AC Servo Drives

Empowering the Upgrade of  
Industrial Automation Industry



# Limon

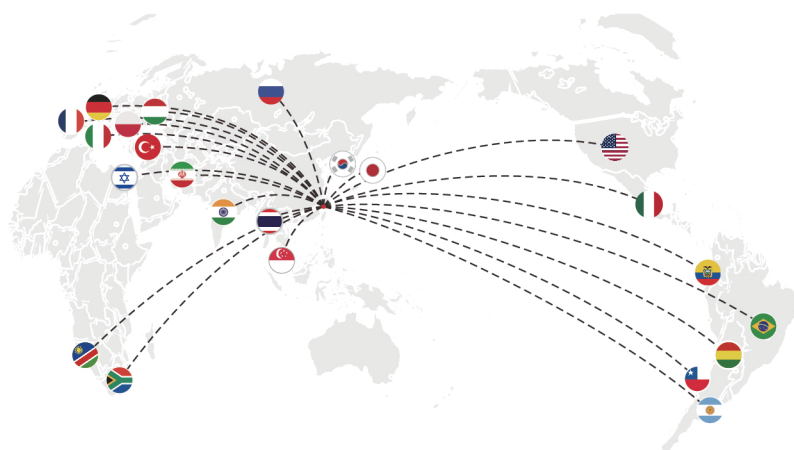
## Pioneering Smart Manufacturing in China



Established in 2013, Limon headquartered in the port city of Ningbo, China, specializes in smart manufacturing. With robust independent research and development capabilities, Limon has successfully introduced automation system solutions widely applied in key sectors such as new energy batteries, new energy vehicles, photovoltaics, 3C electronics, semiconductors, LCD panels, biomedicine, and engineering machinery, demonstrating strong market competitiveness.

### Global Business Deployment

Limon adheres to a customer-centric service philosophy, establishing service points nationwide to provide customers with prompt and professional technical support and services. Moreover, Limon actively expands into international markets, with business operations covering over 30 countries and regions globally, delivering more than 2300 innovative solutions to customers worldwide and earning extensive international acclaim.



## Gathering Elite Talent in the Intelligent Equipment Industry

Driven by innovation, Limon has assembled a core technical team composed of renowned experts from both domestic and international arenas, focusing on underlying automation technologies, continually innovating and iterating to deliver products with outstanding performance, excellent quality, and high cost-effectiveness to customers.



## "Full-Cycle, Full-Process, All-Around" Service

### ○ Project Manager Service System

Limon implements a project manager service system, taking full responsibility for pre-sales consultations, product selection, order processing, logistics, and other aspects to ensure on-time delivery.

### ○ Professional After-Sales Customer Service Team

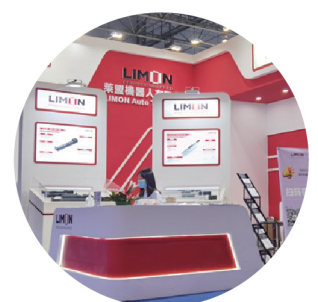
Limon boasts a professional customer service team, promptly responding to customers' after-sales needs to ensure efficient and high-quality service.

### ○ 30-Day Free Sample Loan

Customers interested in showcasing and testing products can consult Limon's sales engineers for complimentary sample loans.

### ○ Exhibitions/Networking Events

Limon regularly participates in industry exhibitions and hosts peer networking events, actively engaging in industry technical discussions and knowledge sharing.

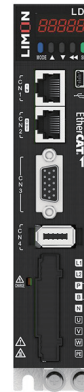


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# One、 Basic Features of Servo drives

## 1、 Product Introduction

In the industry, there are servo drives with extremely compact size and high precision, featuring ingenious structural design and a sleek appearance. They come with unique real-time monitoring and protection functions to ensure system safety and reliability. Gain parameter self-tuning and vibration suppression capabilities provide worry-free service to customers. Combined with highly competitive price, they meet the needs of various scenarios and offer optimal solutions for different requirements.



## 2、 Typical Application Scenarios

The LD3 drive supports various encoders such as incremental ABZ and absolute BISS, and is widely used in industrial automation scenes including photovoltaic, lithium batteries, 3C (computers, communications, consumer electronics), and semiconductors.



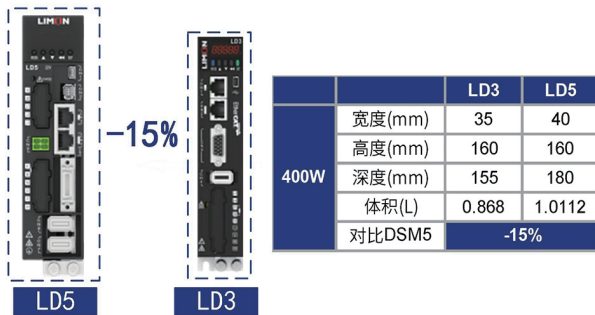
AC servo application scenario 1: Photovoltaic



AC servo application scenario 2: Semiconductor

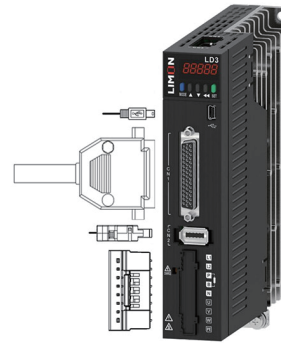
### 3、Key Advantages

#### (1) Compact Size



The new generation LD3 series servo driver adopts an innovative design scheme, the appearance is simple and beautiful, and the volume is reduced by nearly 15% compared with LD5, the power density is further improved, and it is more suitable for the development trend of miniaturization and compactness of equipment.

#### (2) Easy Installation



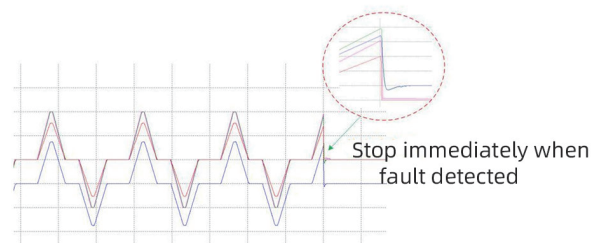
The LD3 features simplified wiring terminals, reducing wiring complexity and facilitating, easier installation and maintenance. Innovative color-coded soft keys enhance usability and provide a more comfortable operation experience.v

#### (3) User-Friendly Tuning



Supporting functions such as automatic gain parameter self-tuning and vibration suppression, coupled with guided backend commissioning software, enable automatic identification of optimal parameters, significantly reducing user commissioning difficulties and improving its efficiency.

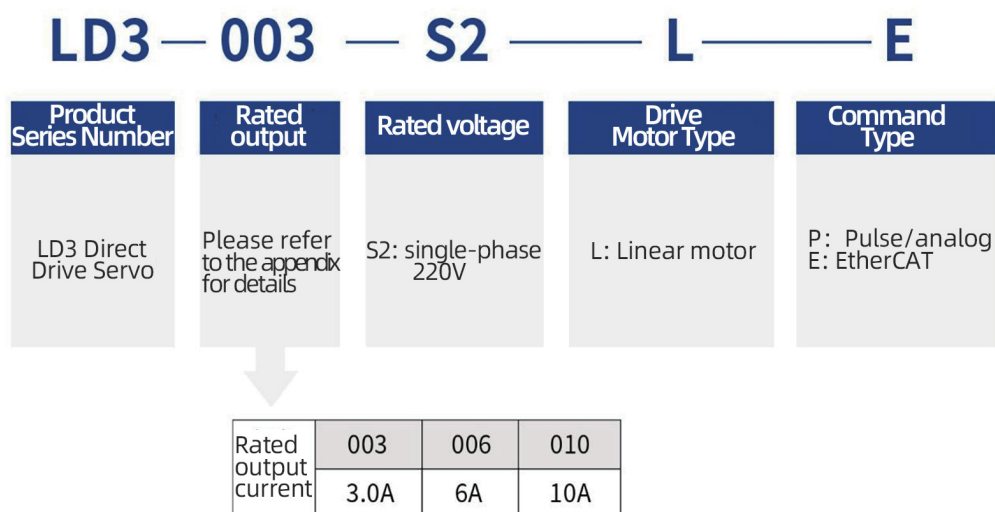
#### (4) Reliability & Safety



Real-time monitoring of servo operation includes voltage, current, position, speed, and other critical information. Precise and rapid real-time detection of faults such as over-voltage, disconnection, overload, and runaway ensures safe and stable operation.

## Two、 Naming Rules

### 1、 Servo Drive Naming Rules



### 2、 Electrical Specifications

Structure Dimension	SIZE- A TYPE	SIZE- B TYPE	SIZE- C TYPE
specification	LD3-003S2XX	LD3-006S2XX	LD3-010S2XX
Rated output current (Arms)	3.0	6.0	10.0
Maximum output current (Arms)	9.0	18.0	28.0
Rated input current (Arms)	5.0	10.0	16.5
Main circuit power supply	Single-phase AC 200V - 240V , -10 ~ +10% , 50/60Hz		
regenerative function <sup>1</sup>	No regenerative resistor	standard configuration: 50 Ω/50W regenerative resistor	standard configuration: 25 Ω/80W regenerative resistor

Note 1: All models support to connect with external regenerative resistors.

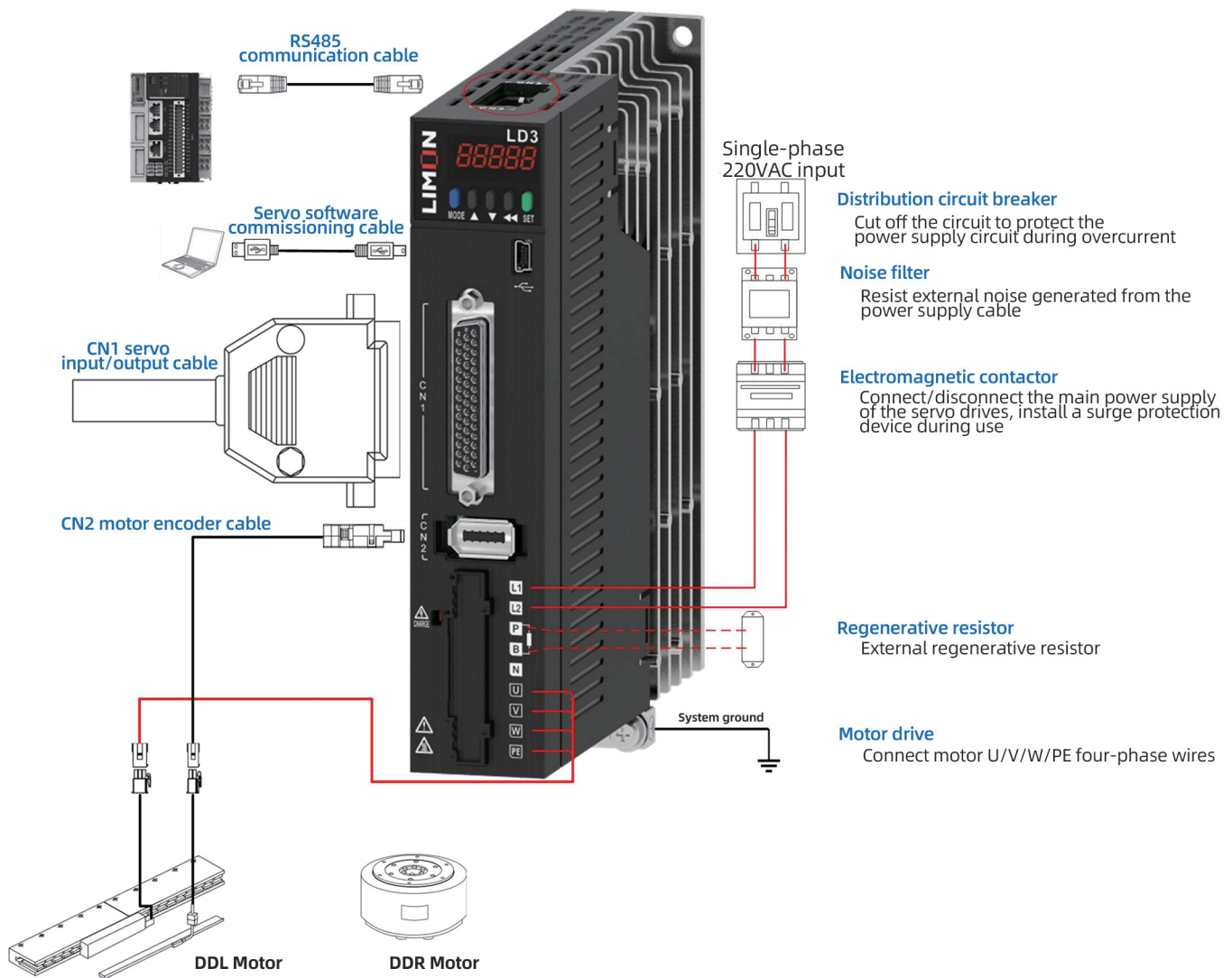
### 3、 General Specifications

Item		Description	
Basic specifications	Control mode		IGBTSPWM Control, sine wave current drive mode 220V: Single-phase full-wave bridge rectification
	Operating Conditions	Operating/Storage Temperature	0~+40 °C/-20~+70°C
		Operating/Storage Humidity	Below 90% RH (non-condensing)
		Vibration/Impact Resistance	4.9m/s <sup>2</sup> /19.6m/s <sup>2</sup>
		IP rating	IP20
		Pollution Level	PD2 grade
Altitude	Up to 5000m. 1000m and below: No derating. Above 1000 m: derate 1% for every additional 100 m. Above 2000 m: contact LIMON.		
Position Control Mode	Performance	Feedforward Compensation	Supports speed feedforward (0~100.0%) setting to eliminate tracking deviation
		Instruction Shaping	Position command low-pass filtering, averaging filtering.
	Frequency Division Output	Output Form	Phase A, Phase B, Phase Z: Differential output.
		Frequency Range	DDL type Motor operates at one pole pitch, capable of outputting any pulse within the range of 140 to P0105[Pole pitch pulse count (N-N)].
Speed/torque control mode	performance	Current Loop Dynamic Characteristics	DDL type Step response: 125us (0-100%); Frequency response: -3dB amplitude attenuation bandwidth, 4000Hz (Command signal: ±15%); -90° phase shift bandwidth, 8000Hz (Command signal: ±15%).
		Speed Loop Dynamic Characteristics	DDL type Step response: 562.5ms (0~1000mm/s); Frequency response: -3dB amplitude attenuation bandwidth, 1500Hz (Command signal: ±50mm/s); -90° phase shift bandwidth, 800Hz (Command signal: ±50mm/s).
	Torque Control Accuracy	±2%	
Input/Output	Digital Input Signals		Configurable functions: Forward limit switch, reverse limit switch, home switch, etc
	Digital Output Signals		Configurable functions: Servo ready, zero speed signal, speed reached, position reached, positioning close signal, torque limit active, warning, servo fault, etc.
Supported Functions	Electronic Gear Ratio		Built-in two sets of electronic gear ratios, supports gear ratio switching function
	Limit Protection		Immediate stop upon activation of forward limit switch or reverse limit switch
	Fault Detection		Overcurrent, overvoltage, undervoltage, overload, main circuit detection error, overheating of heat sink, overspeed, encoder error, parameter error, etc
	Display Function		5-digit LED display, main power supply indicator CHARGE
	Vibration Suppression		Equipped with 4 notches, 50Hz~5000Hz, all of which can be adaptively set.
	Usability		Auto-tuning, speed observer, model tracking
	commissioning Interface		USB
other		Status display, alarm record, JOG operation, etc.	
Note			
Note 1: Please install or store the servo drives within this temperature range			



## Three、Wiring and Port Definition of Servo drives

### 1、Wiring for Pulse-Type



## 2、Port Definitions for Pulse-Type



	CN3 (IN)		CN4(OUT)	
	Pin Number	signal name	Pin Number	signal name
RS485 Communication Terminal	4	RS485+	4	RS485+
	5	RS485-	5	RS485-
	8	GND	8	GND

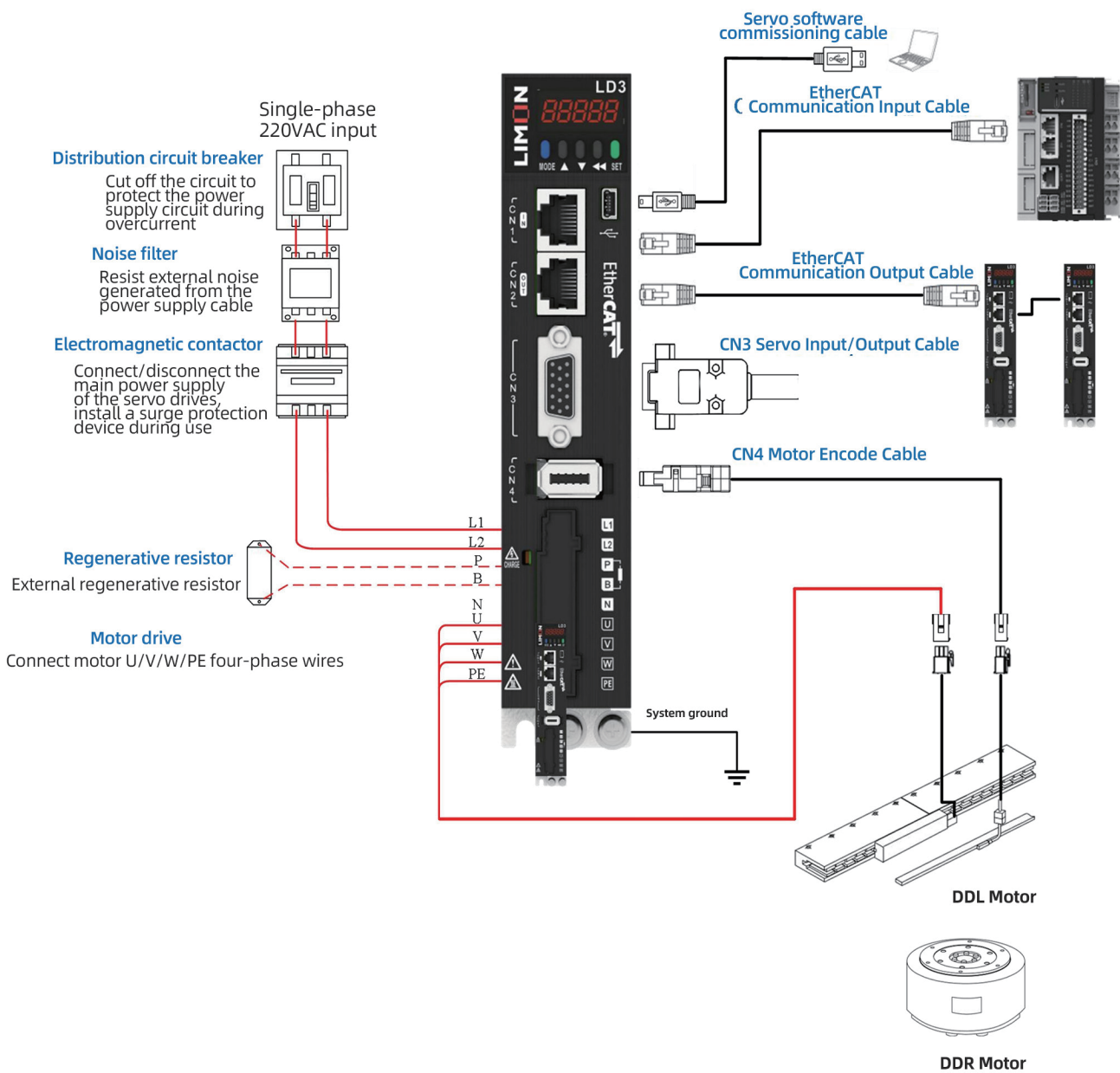
	Pin Number	signal name
MINI USB	1	VBUS
	2	D-
	3	D+
	4	-
	5	GND

CN1	Pin Number	signal name	Pin Number	signal name	Pin Number	signal name
IO Connection DB44	1	DO4+	16	GND	31	DI7
	2	DO3-	17	+24V	32	DI6
	3	DO3+	18	AI2	33	DI5
	4	DO2-	19	GND	34	DI3
	5	DO2+	20	AI1	35	PULLHI
	6	DO1-	21	PAO+	36	HPULSE-
	7	DO1+	22	PAO-	37	SIGN+
	8	DI4	23	PBO-	38	HPULSE+
	9	DI1	24	PZO-	39	SIGN-
	10	DI2	25	PBO+	40	HSIGN-
	11	COM+	26	DO4-	41	PULSE+
	12	-	27	DO5-	42	HSIGN+
	13	PZO+	28	DO5+	43	PULSE-
	14	COM-	29	GND	44	OCZ
	15	-	30	DI8		

CN2	Pin Number	signal name	
		ABZ	BISS-C
Encoder Connector 1394-6P	1	5V	5V
	2	GND	GND
	3	A+	-
	4	A-	-
	5	B+	-
	6	B-	-
	7	Z+	CLK+
	8	Z-	CLK-
	9	-	DATA+
	10	-	DATA-

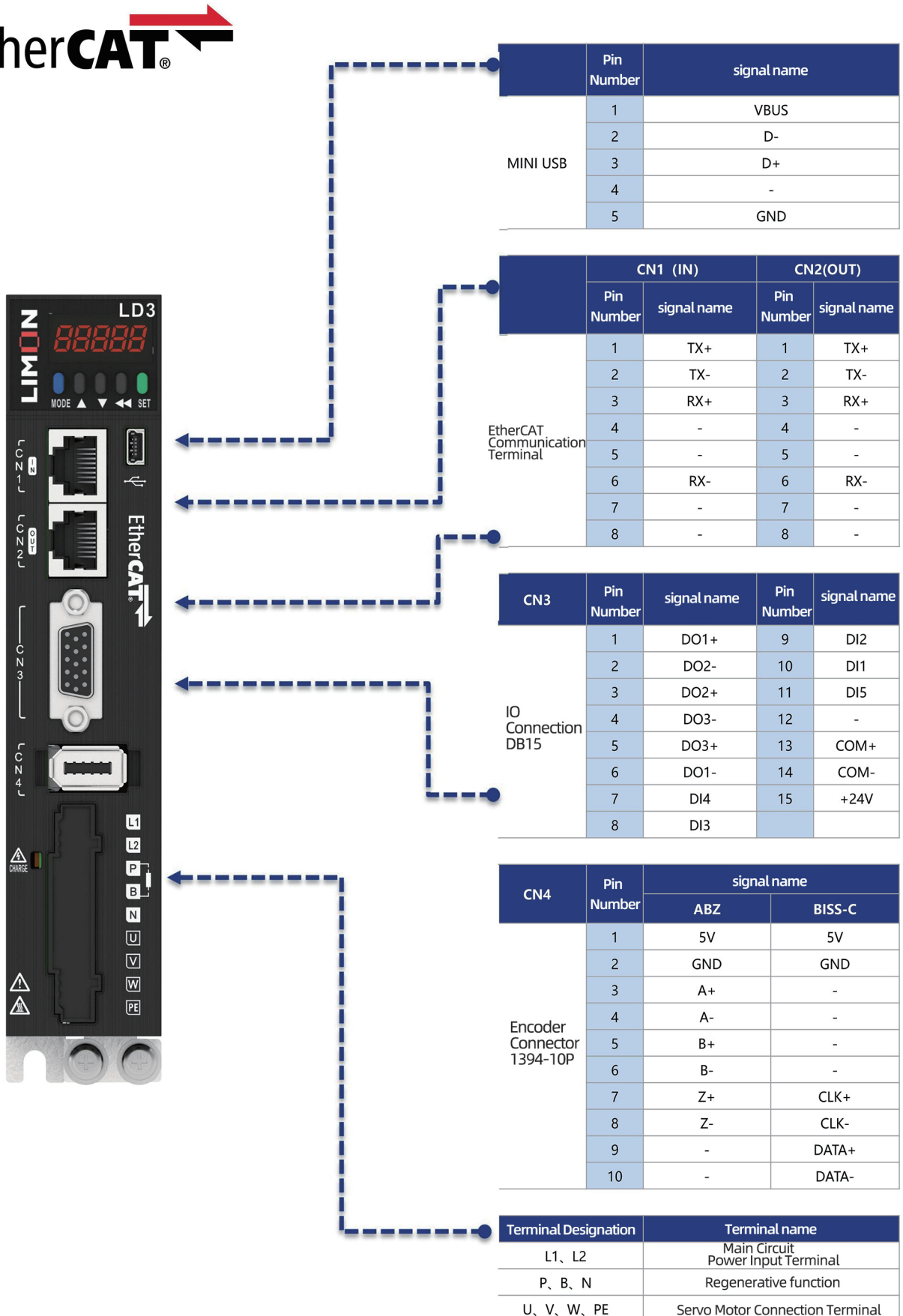
Terminal Designation	Terminal name
L1、L2	Main Circuit Power Input Terminal
P、B、N	Regenerative function

## 3、Wiring for EtherCAT Type Servo Drive



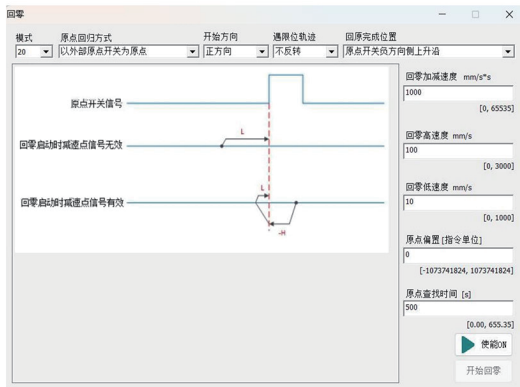
## 4、 Port Definitions for EtherCAT Type Servo Drive

**EtherCAT®**

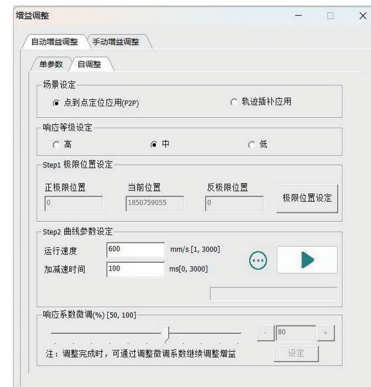


# Four、Commissioning Software

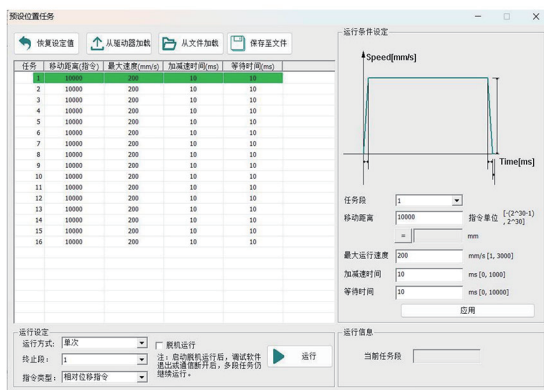
## (1) Visualization



Configurable homing trajectory



Tuning scene matching



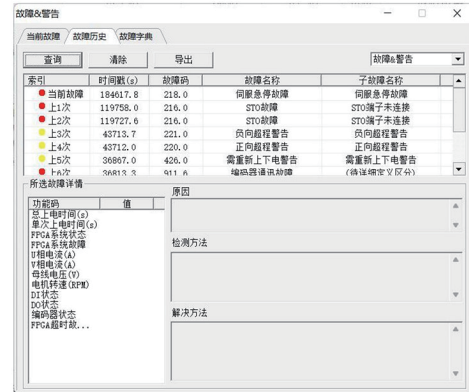
Preset trajectory planning



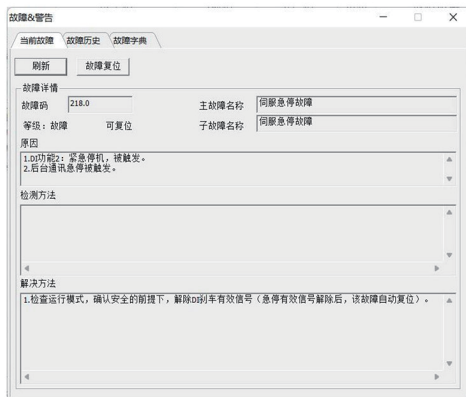
Position JOG visualization

## (2) Fault diagnosis

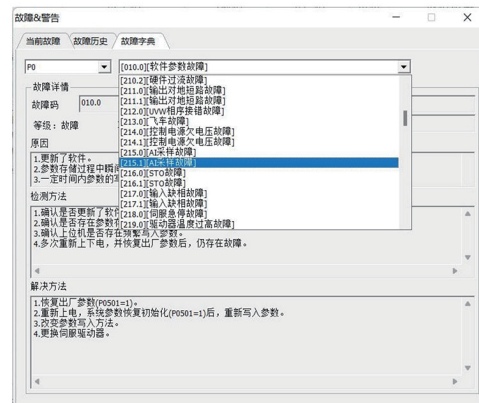
Real-time alert of fault information, and provide troubleshooting methods. Historical fault tracing, supports viewing parameter information from up to 10 past fault occurrences, to help locate faults. Fault dictionary covering all LD3 series fault information, enabling quick fault queries.



### Historical fault tracing



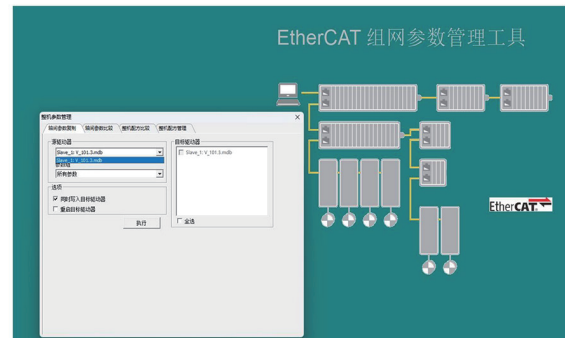
### Real-time fault diagnosis



### Fault dictionary query

### (3) Multi-axis recipes

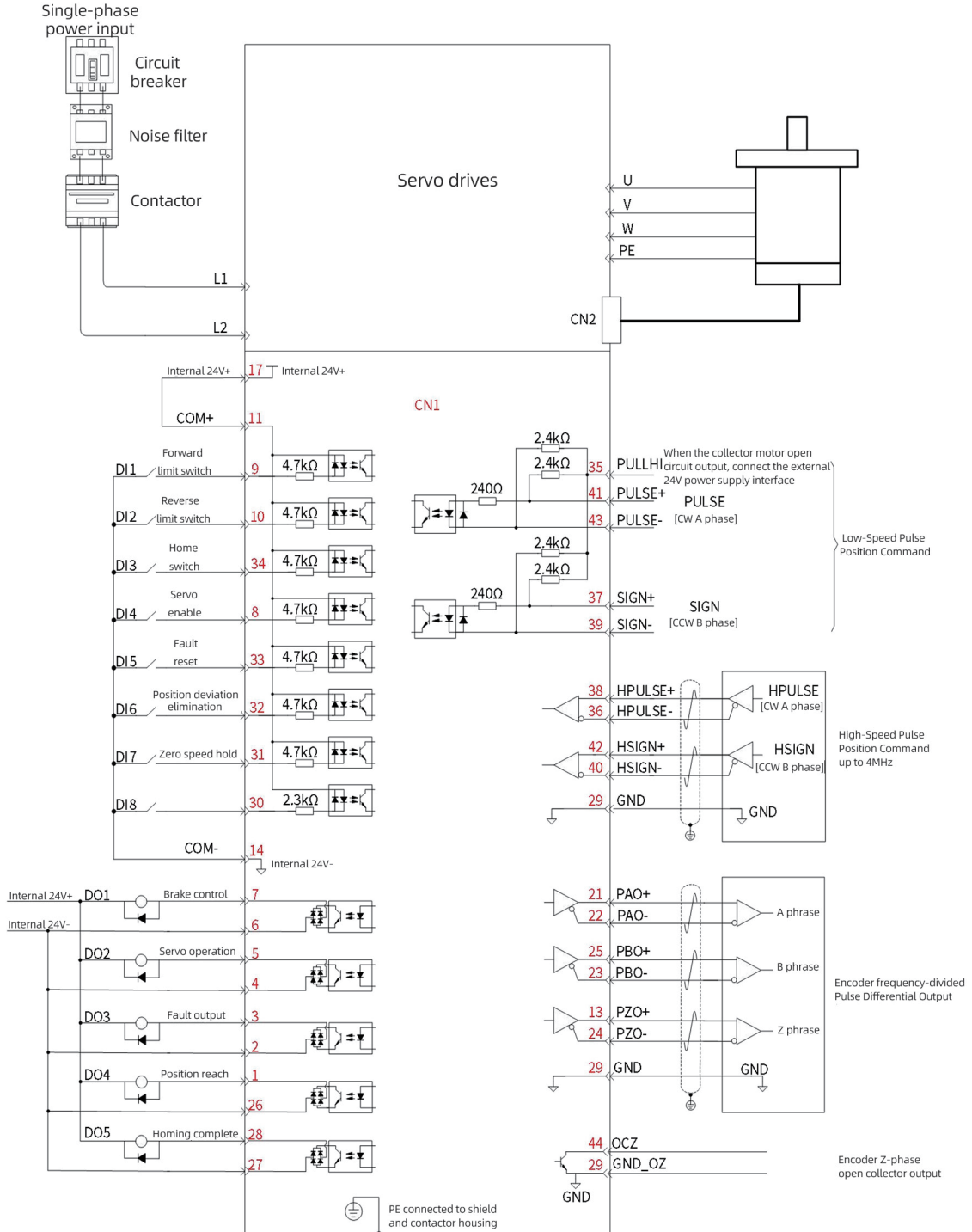
In the context of multi-axis EtherCAT servo networking:  
**Support multi-axis parameter modification**  
**Multi-axis recipe saving.**  
**Axis parameter comparison**  
**Axis parameter copying.**



Special function

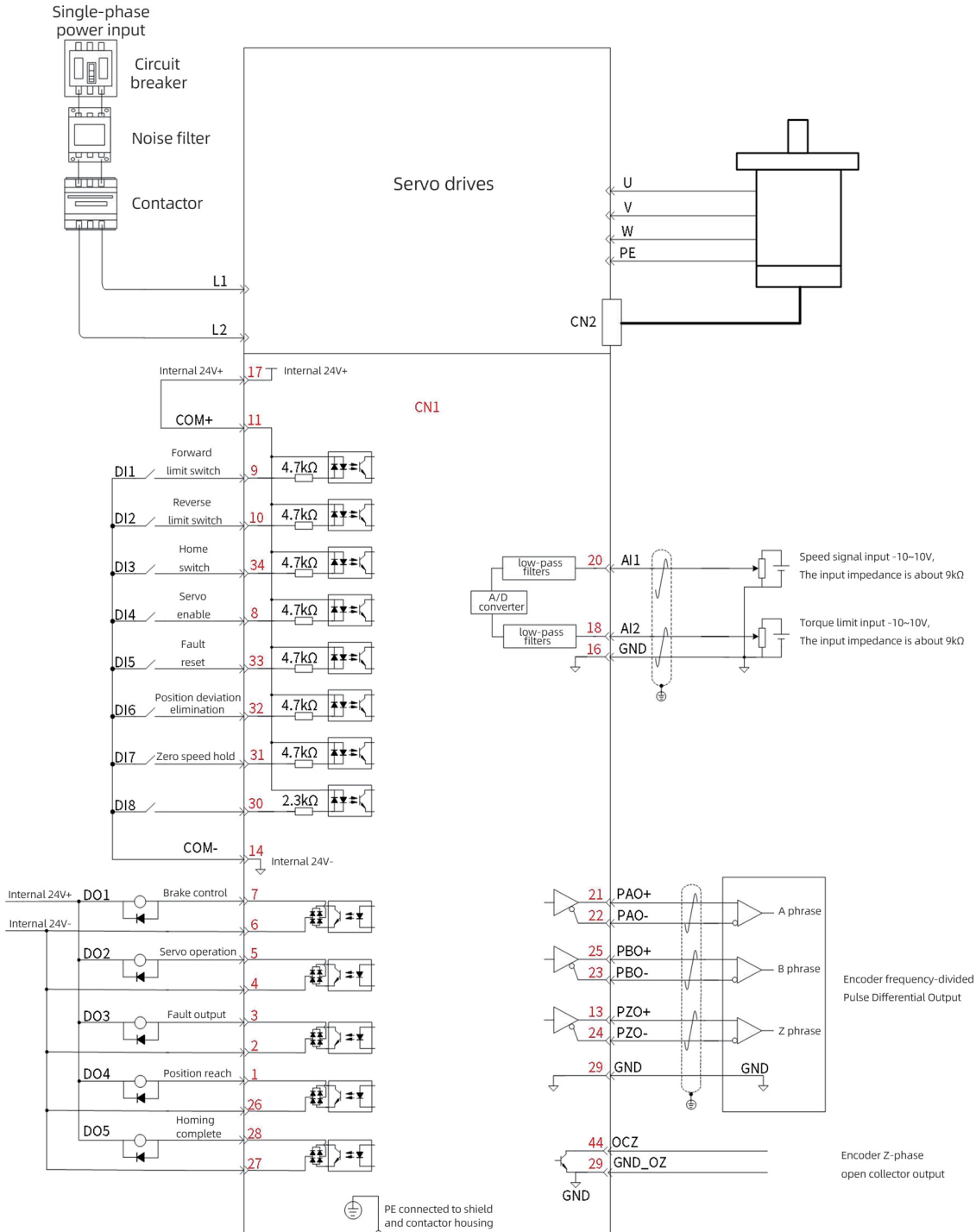
# Five、Wiring Diagrams for Servo Drives Control Modes

## 1、Wiring Diagram for Position Control Mode

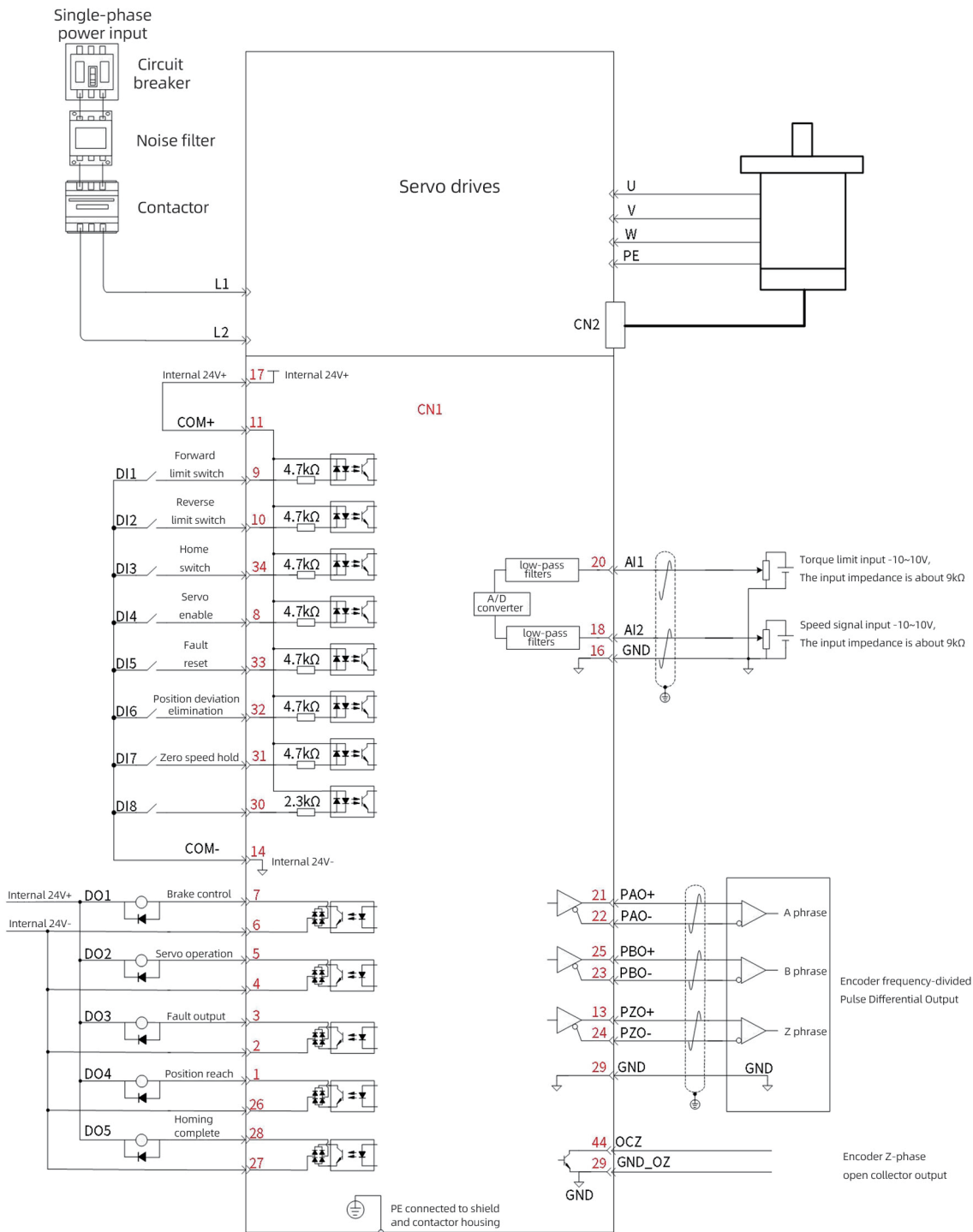




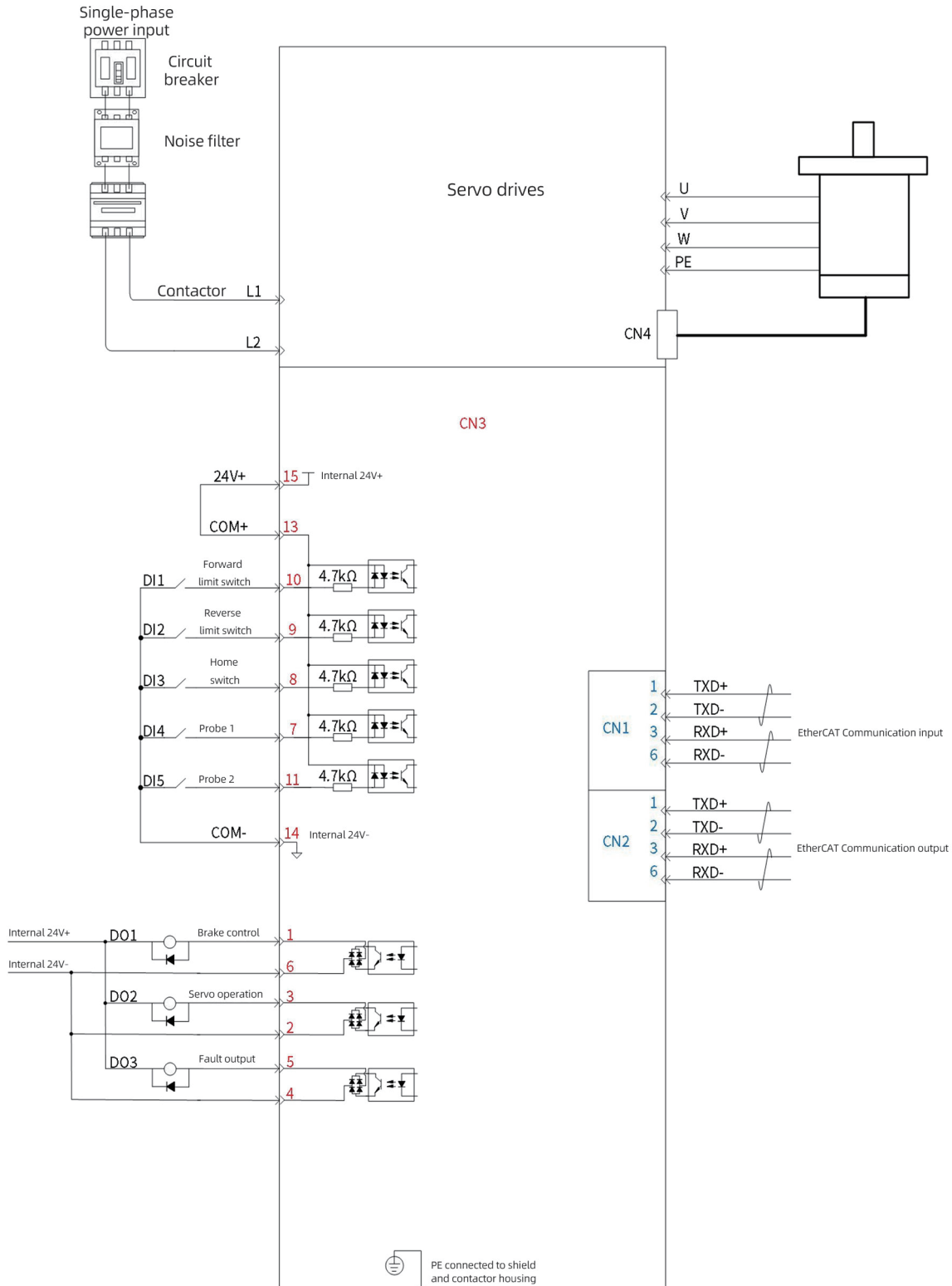
## 2、Wiring Diagram for Speed Control Mode



### 3、Wiring Diagram for Torque Control Mode

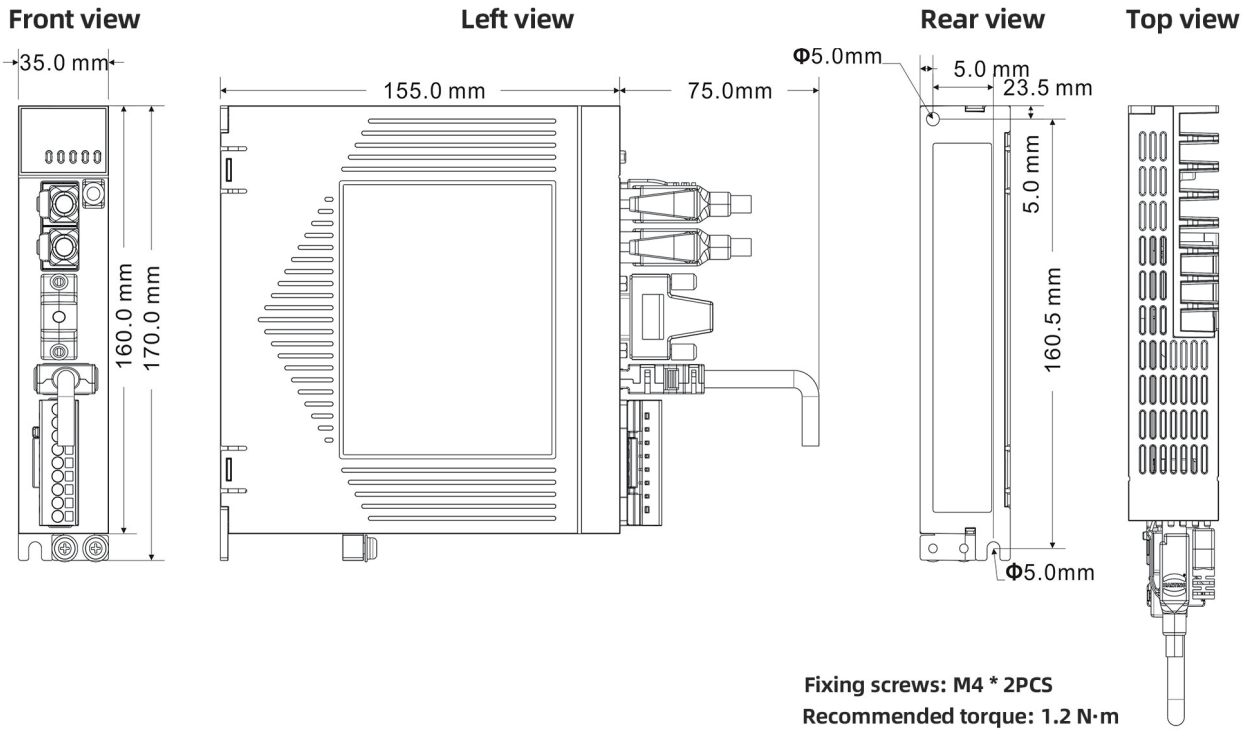


## 4、Wiring Diagram for EtherCAT type Control

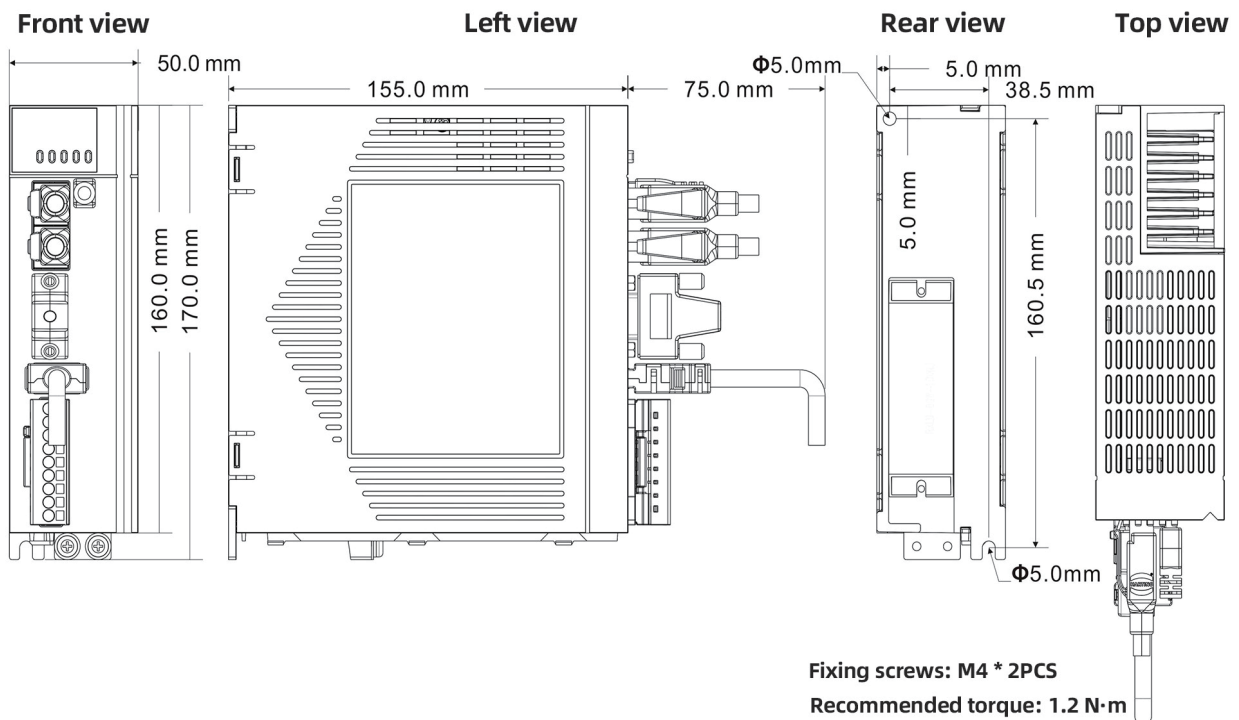


## Six、 Installation Dimensions of Servo drives

### ● SIZE-A



### ● SIZE-B



## Seven、 Servo Drive Selection List

command type	Model	Rated Current	Maximum Current	Supply Voltage	SIZE
Pulse/analog	LD3-003S2LP	3.0A	9.0A	Single-phase 220V	SIZE-A
	LD3-006S2LP	6.0A	18.0A	Single-phase 220V	SIZE-B
	LD3-010S2LP	10.0A	28.0A	Single-phase 220V	SIZE-C
EtherCAT	LD3-003S2LE	3.0A	9.0A	Single-phase 220V	SIZE-A
	LD3-006S2LE	6.0A	18.0A	Single-phase 220V	SIZE-B
	LD3-010S2LE	10.0A	28.0A	Single-phase 220V	SIZE-C

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