✧ Forward

Thank you for selecting CA100 series economical servo drive manufactured by Shenzhen Simphoenix Electric Technology Co., Ltd.

The CA100 series servo drive is an economical medium and small-power AC servo drive researched and developed by Simphoenix. Adopting RS485 communication and in combination with the upper machine, multiple servo drive can work simultaneously. Supported by such functions as stiffness coefficient setting, inertia identification and load monitoring, the servo drive can be easily operated and is applicable to the textile and engraving industries for rapid and precise positioning, speed control and torque control.

This manual is the user manual for CA100 series servo drive, and will provide you all relevant details and instructions concerning installation, wiring, running, debugging and troubleshooting of CA100 series servo drive.

In addition, this manual is randomly provided as accessories which should be kept properly for future overhauling and maintenance.

Owing to constant improvement of products, data provided by our company may be changed without notice.

This manual is a simple version. Please refer to our official website for detailed version.
CA100 Series Servo Drive
Version V1.2
Revision Date: 2016-12-22

Table of Contents

Chapter 1 Product Introduction

1.1 Servo Drive and Motor Model

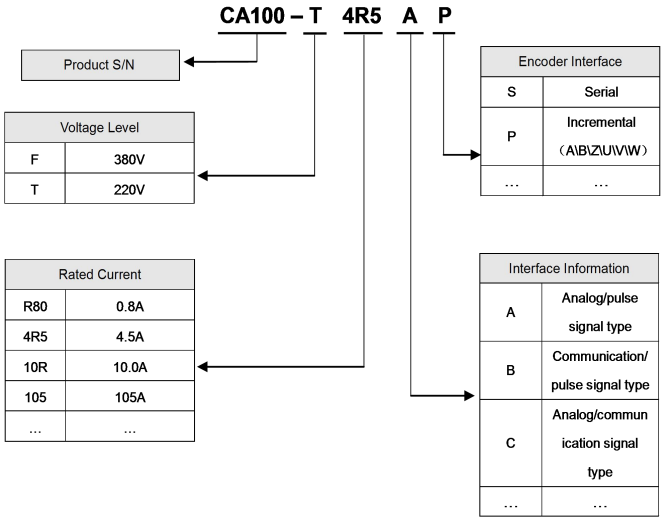


Figure 1-1 Servo Drive Model Introduction

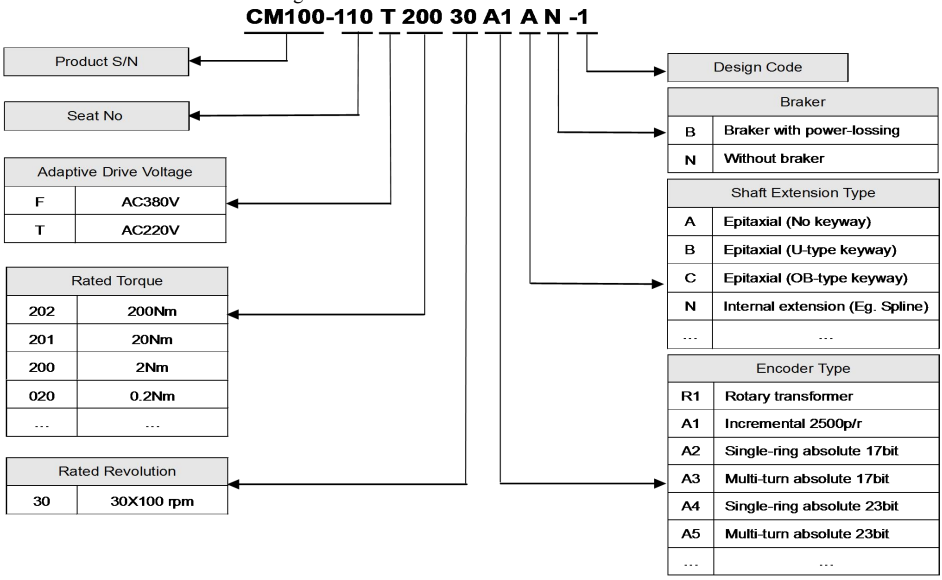


Figure 1-2 Servo Motor Model Introduction

Note: Please refer to "**Annex 1 CM105, CM102 and CM100 servo motor & servo drive selection table**" for servo motor parameter selection and serial number.

1.2 Wiring for Servo System

Power supply	Single-phase AC220V	CA100-T1R8, T3R0, T4R5 (L3 is vacant terminal.
	Three-phase AC220V	CA100-T4R5, T6R0, T7R5, T10R
	Three-phase AC380V	CA100-F4R0, F6R0, F8R5, F12R, F20R

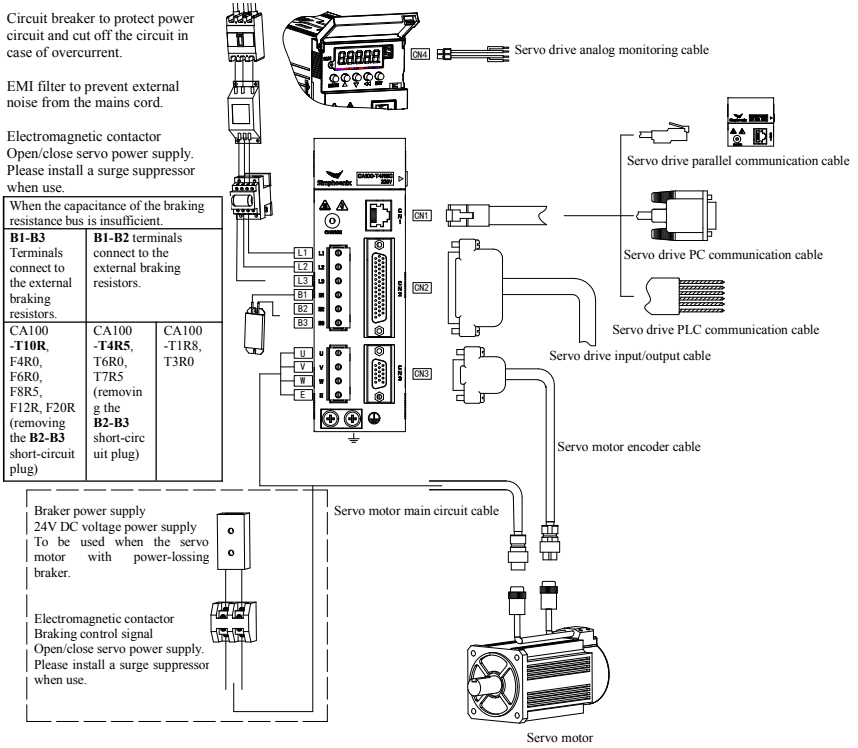


Figure 1-3 Servo Drive Wiring Diagram

Note: Please strictly execute wiring as Figure 1-3 shown, and configure related accessories.

1.3 Rated Values and Specifications of Servo Drive

■ Rated Values

(a) AC 220V Series

AC 220V	T1R8	T3R0	T4R5	T6R0	T7R5	T10R
Continuous output current[A]	1.8	3.0	4.5	6.0	7.5	10
Instant max. output current	5.4	9.0	13.5	18.0	22.5	30
Main loop power supply	Single-phase 220V		Single/three phase 220V	Three-phase 220V		
Overvoltage level	III					

(b) AC 380V Series

AC 380V	F4R0	F6R0	F8R5	F12R	F20R
Continuous output current[A]	4.0	6.0	8.5	12.0	20.0
Instant max. output current	12	18	25.5	36.0	50
Main loop power supply	Three-phase AC 380V 50/60Hz				
Overvoltage level	III				

■ Technical Specifications

Technical specifications	Drive model		CA100T	1R8 3R0 4R5 6R0 7R5 10R	Single/three-phase AC 220V -15% ~ +10% 50/60Hz
			CA100F	4R0 6R0 8R5 12R 20R	Three-phase AC 380V -15% ~ +10% 50/60Hz
	Control mode		Torque, speed, position , speed/position , torque/position, torque/speed		
	Feedback		Incremental encoder 2500P/R (CA150 series servo support 17bit and 23bit single-ring/multi-turn absolute encoder)		
	Work conditions	Temperature	Working Temperature: 0°C~+45°C (For ambient temperature over +45°C, please use it at lower rated values)		
			Storage Temperature: -20°C~+60°C °C		
		Humidity	90%RH below, no condensation		
		Ventilation	0.5G (4.9m/s²)		
		Protection	IP10		
		Altitude	1000m below (>1000m, please reduce the rated values)		
		Others	1. No electrostatic interference, strong electric field, strong magnetic field, radiation and so on; 2. Free of corrosive gas, combustible gas, water, oil, and medicine spray; 3. The environment with less dusts, dirt, salts and metal powders.		
	Structure		Base installation type		
speed control	Control input		1. Internal command 8 segments, which can be switched within 8 segments of internal speed through control input; 2. External analog command; 3. ZEROSPD.		
	Control output		Speed arrival judgment: 3 kinds of judgment ways		
	Analog input		● Input speed commands according to the analog voltage, and the max. input voltage is ±12V; ● DC 300rpm/V [factory default], and input ratio setting can be changed.		
	Torque limit command		It is applicable to separately limit the positive and negative torque.		
	Speed ratio		1:6000		
	Speed variation speed*Note (1)		Load fluctuation	0 - 100% load: ±0.02% below (≤ rated revolution)	
			Voltage fluctuation	Rate voltage ± 10%: 0% (≤rated revolution)	
			Temperature fluctuation	25 ±25°C: ± 0.1% below (≤rated revolution)	
	Torque control precision		±1% (recurrent)		
	Soft start time		0 - 30s (Acceleration and deceleration can be set separately)		
	Frequency response characteristics		1.5kHz (Max.)		

Position mode	Command pulse	Input pulse type	1. Symbol＋ pulse column, 2. A, B Orthogonal pulse, 3. CCW+CW pulse column
		Input pulse form	Live drive (＋5V level), open collector (＋5V, ＋12V, ＋24V level, see relevant circuit instructions for specific connection.)
		Input pulse frequency	Max. 500 Kpps(difference) / 200 Kpps (collector)
	Electronic gear ratio	3 groups of electronic gears setting, 1~32767	
	Control input	Deviation counter clearing signal, command pulse forbidden input , internal position 8 segments	
	Control output	Orientation completion signal, orientation approaching judgment	
Torque control	Control input	1. Internal torque 4 segments, can be judged by the control input 2. Analog command input	
	Control output	Torque approaching judgment	
	Analog input	● Conduct torque command input according to the analog voltage, and the max. input voltage is ±12V, ● DC 30%/V [factory default], and input ratio setting can be changed.	
	Speed limit	3 kinds of limiting modes	
Input output signal	Input signal	8DI terminal 2AI terminal	
	Output signal	5DO terminal 2AO terminal (for debugging and monitoring)	
	pulse output	A, B, Z differential signal output, Z pulse open collector output	
	Protection	Overcurrent, overvoltage, undervoltage, overload, main loop circuit detection abnormal, radiator overheating, overspeed, encoder abnormal, CPU and parameters abnormal etc.	
	Communication	RS485 1:N (N<128), and other communication methods can be extended.	
	Indicator	Built-in keyboard, Power Charge	

Note 1: The revolution change rate is defined by following formula.

$$\text{Revolution change rate} = \frac{\text{Unloaded speed-full load speed}}{\text{Rated speed}} \text{X100\%}$$

1.4 Installation Dimension and Method of Servo Drive

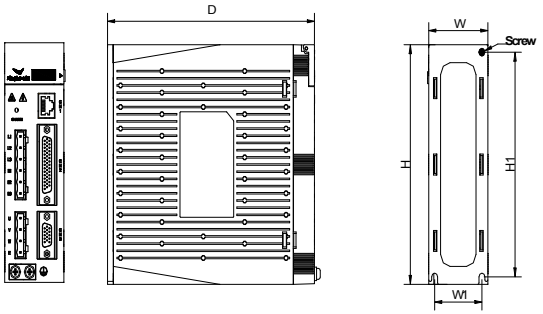


Figure 1-4 Drive Installation Dimensional Diagram

Servo drive model	W1 (mm)	W (mm)	H1 (mm)	H (mm)	D (mm)	Screw specifications
CA100-T1R8□□	40	50	150	160	175	M4
CA100-T3R0□□						
CA100-T4R5□□	60	70	150	160	175	M4
CA100-T6R0□□						
CA100-T7R5□□						
CA100-T10R□□	89	100	169	180	200	M5
CA100-F4R0□□						
CA100-F6R0□□						
CA100-F8R5□□						
CA100-F12R□□						
CA100-F20R□□	80	126	268	278	210	M5
CA100-F28R□□						

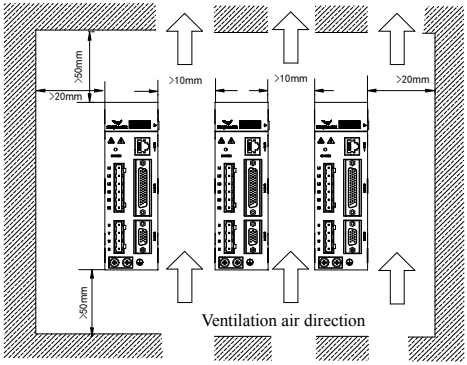


Figure 1-5 Servo Drive Installation Method

Chapter 2 Connection and Wiring

2.1 Servo Drive Terminal Layout

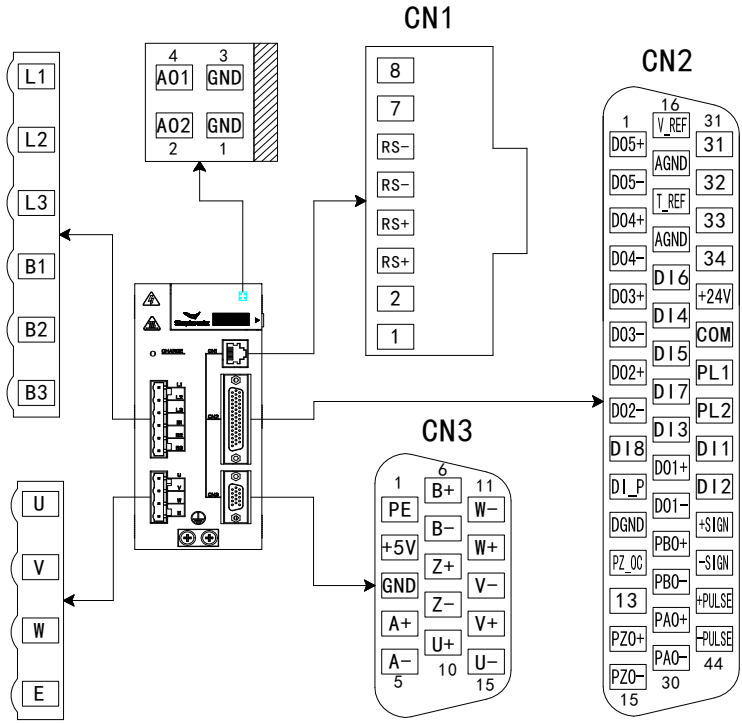


Figure 2-1 Servo Drive Terminal Layout

Note: NC of CA100-T10R, F4R0, F6R0, F8R5, F12R and F20R is empty terminal

2.1.1 Servo Drive Terminal Wiring Instruction

Name and functions of main loop terminals are shown in Table 2-1.

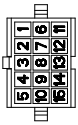
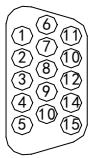
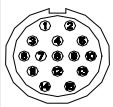
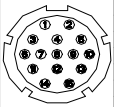
Table 2-1 Name and Function of Main Loop Terminals

Terminal No.	Name of Terminal	Driver Model (CA100-□□□)	Function of Terminal
L1 L2 L3	Power input terminal for main loop	T1R8□□、T3R0□□	For power input of the main loop. Terminal L1 and L2 are connected to the single-phase AC 220V power and L3 is an empty terminal.
		T4R5□□	For power input of the main loop. Terminal L1, L2 and L3 are connected to the 3-phase AC 220V power; At single-phase power operation, terminal L1 and L2 are connected to the single-phase AC 220V power.

		T6R0□□、T7R5□□、T10R□□	For power input of the main loop. Terminal L1, L2 and L3 are connected to the 3-phase AC 220V power.
		F4R0□□、F6R0□□、F8R5□□、F12R□□、F20R□□	For power input of the main loop. Terminal L1, L2 and L3 are connected to the 3-phase AC 380V input power.
NC	Reserved terminal		It is a reserved terminal and no wiring is allowed.
B1 B2 B3	Terminal to connect an external regenerative braking resistor	T1R8□□、T3R0□□	No built-in braking resistor is available. When the braking ability is far away to satisfy the operation, the braking resistor between B1 and B2 can be used. But, the braking resistor should be otherwise purchased.
		T4R5□□、T6R0□□、T7R5□□、	Built-in braking resistor is included. When the built-in braking resistor is used, B2 and B3 are shot connected. When the braking ability is far away to satisfy the operation, the short jumper between B2 and B3 can be removed and an external braking resistor could be connected between B1 and B2. The externally connected braking resistor should be otherwise purchased.
		T10R□□、F4R5□□、F6R0□□、F8R5□□、F12R□□、F20R□□	Built-in braking resistor is included. When the built-in braking resistor is used, B2 and B3 are shot connected. When the braking ability is far away to satisfy the operation, the short jumper between B2 and B3 can be removed and an external braking resistor could be connected between B1 and B3. The externally connected braking resistor should be otherwise purchased.
NC	Reserved terminal		It is a reserved terminal and no wiring is allowed.
U V W	Terminal to connect power line of the servo motor	It is a terminal to connect the power line of the servo motor, and is connected to U, V and W line of the motor respectively. (Note: Wrong sequential order of the phase will result in motor non-rotation or speed alarm).	
E	Protecting ground terminal	It is connected to the power grounding terminal and the motor grounding terminal for ground protection.	

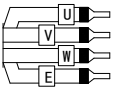
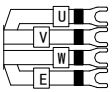
2.1.2 Servo Motor Encoder Terminals Wiring Instruction

For selection of connecting cables for CM100, CM102, CM105 servo motor and CA100 servo drive encoder, refer to Appendix 2 "Selection of Servo System Power Lines and Encoder Cables". Specific meanings and electric connections for the terminals are shown in the table below.

Motor Terminal							Drive Terminal		
Motor Type	Terminal	Terminal No.	Motor and Drive Terminals Wiring Mapping Table				Terminal No.	Terminal	Drive Type
CM102-60~90 series CM105-60~90 series			1	PE	1				CA100-T1R8A CA100-T3R0A CA100-T4R5A CA100-T6R0A CA100-T7R5A
			2	+5V	2 对绞				
			3	GND	3 对绞				
			9	A+	4 对绞				
			13	A−	5 对绞				
			4	B+	6 对绞				
			14	B−	7 对绞				
			7	Z+	8 对绞				
			5	Z−	9 对绞				
			15	W−	11 对绞				
			11	W+	12 对绞				
			12	V−	13 对绞				
			10	V+	14 对绞				
			8	U−/PS−	15 对绞				
			6	U+/PS+	10 对绞				
CM100-80 series			1	PE	1				CA100-T10RA CA100-F4R0A CA100-F6R0A CA100-F8R5A CA100-F12RA CA100-F20RA
			2	+5V	2 对绞				
			3	GND	3 对绞				
			4	A+	4 对绞				
			7	A−	5 对绞				
			5	B+	6 对绞				
			8	B−	7 对绞				
			6	Z+	8 对绞				
			9	Z−	9 对绞				
			15	W−	11 对绞				
			12	W+	12 对绞				
			14	V−	13 对绞				
			11	V+	14 对绞				
			13	U−/PS−	15 对绞				
			10	U+/PS+	10 对绞				
CM102-110~180 series CM105-110~180 series CM100-110~180 series									

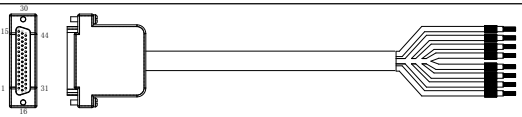
2.1.3 Servo Motor Power Line U, V and W Terminal Wiring Instruction

For selection of connecting cables for power line of CM100, CM102, CM105 servo motor and CA100 servo drive, refer to Appendix 2 "Selection of Servo System Power Lines and Encoder Cables". Specific meanings and electric connections for the terminals are shown in the table below.

Motor Terminal				Drive Terminal	
Motor Type	Terminal	Terminal No.	Motor and drive terminals wiring mapping table	Terminal No.	Drive Type
CM102-60~90 series CM105-60~90 series			1 —— U 2 —— V 3 —— W 4 —— E		CA100-T1R8A CA100-T3R0A CA100-T4R5A CA100-T6R0A CA100-T7R5A
CM100-80 series			2 —— U 4 —— V 3 —— W 1 —— E		
CM102-110~180 series CM105-110~180 series CM100-110~180 series					CA100-T10RA CA100-F4R0A CA100-F6R0A CA100-F8R5A CA100-F12RA CA100-F20RA

2.1.4 Servo Drive Control Cable Terminal Wiring Instruction

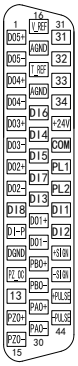
Wiring instructions for control terminals connecting the servo motor and PLC of the host computer are shown below:



Drive wiring terminal PLC wiring terminal

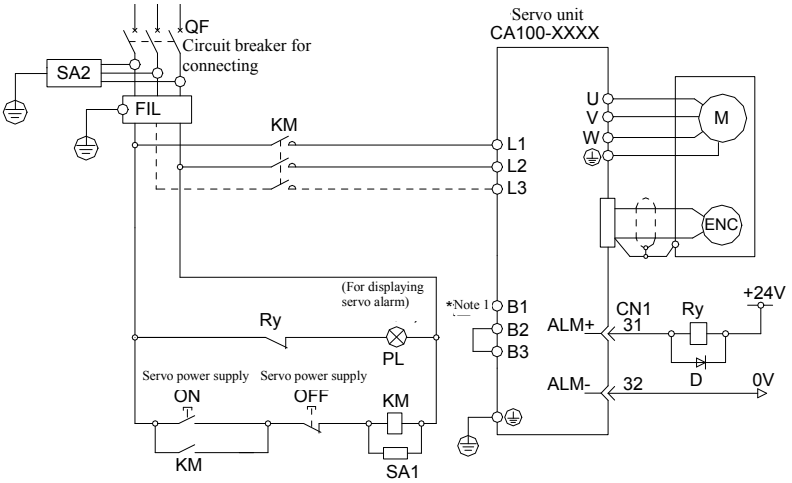
Drive CN2	Drive Wiring Terminal		PLC Side Bulk Cable		Twisted Pair Introduction	Signal Cable Color
CN2 Signal Name	Pin No.	Signal Name	Pin No.	Signal Name		
	1	DO5+	1	DO5+	Twisted pair	Brown
	2	DO5-	2	DO5-		Orange
	3	DO4+	3	DO4+	Twisted pair	Yellow
	4	DO4-	4	DO4-		Green
	5	DO3+	5	DO3+	Twisted pair	Cyan
	6	DO3-	6	DO3-		Blue
	7	DO2+	7	DO2+	Twisted pair	Purple
	8	DO2-	8	DO2-		Black
	9	DI8	9	DI8	Twisted pair	White
	10	DI_P	10	COM+		Grey
	11	DGND	11	DGND	Twisted pair	Pink
	12	PZO_C	12	PZ_OC		Red
	14	PZO+	14	PZO+	Twisted pair	Maroon
	15	PZO-	15	PZO-		Light tan
	16	V_REF	16	V_REF	Twisted pair	Blue/White
	17	AGND	17	AGND		Green/White
	18	T_REF	18	T_REF	Twisted pair	Yellow/White
	19	AGND	19	AGND		Grey/White
	20	DI6	20	DI6	--	Brown/White
	21	DI4	21	DI4	--	Red/White
	22	DI5	22	DI5	--	Purple/White
	23	DI7	23	DI7	--	Pink/White
	25	DO1+	25	DO1+	Twisted pair	Grey/White
	26	DO1-	26	DO1-		Orange/White
	27	PBO+	27	PBO+	Twisted pair	Browness/White
	28	PBO-	28	PBO-		Maroon/White
	29	PAO+	29	PAO+	Twisted pair	Light tan/White
	30	PAO-	30	PAO-		Cyan/Blue
	31	Reserved	31	Reserved	--	Blue/Black
	32	Reserved	32	Reserved	--	Green/Black
	33	Reserved	33	Reserved	--	Yellow/Black
	34	Reserved	34	Reserved	--	Cyan/Black
	35	+24V	35	+24V	Twisted pair	White/Black
	36	COM	36	COM		Red/Black
	37	PL1	37	PL1	Twisted pair	Brown/Black
	38	PL2	38	PL2		Orange/Black
	39	DI1	39	DI1	--	Grey/Black
	40	DI2	40	DI2	--	Pink/Black
	41	SIGN+	41	SIGN+	Twisted pair	Purple/Black
	42	SIGN-	42	SIGN-		Sky-blue
	43	PULSE+	43	PULSE+	Twisted pair	Sea-blue
	44	PULSE-	44	PULSE-		Yellow/green
	24	DI3	24	DI3	Twisted pair	Brown/White
	13	Retained	13	Retained	--	Browness

CN2



2.2 Wiring Diagram of the Main Loop Circuit

Power supply	Single-phase AC **220V**	CA100-T1R8, T3R0, **T4R5** (**L3** is vacant terminal.
	Three-phase AC **220**V	CA100-**T4R5**, T6R0, T7R5, **T10R**
	Three-phase AC **380**V	CA100-F4R0, F6R0, F8R5, F12R, **F20R**



QF: circuit breaker for connection
FIL: noise filter
KM: Electromagnetic contactor
D: bypass diode

Ry: relay
PL: displaying indicator
SA1: surge suppressor
SA2: surge suppressor

,Note 1: the regenerative braking resistor connecting to terminal; see section 3.5.1 for the wiring method.

Figure 2-2 Wiring Diagram of the Drive Main Loop Circuit

2.3 Connection of Input & Output Terminals under Control Modes

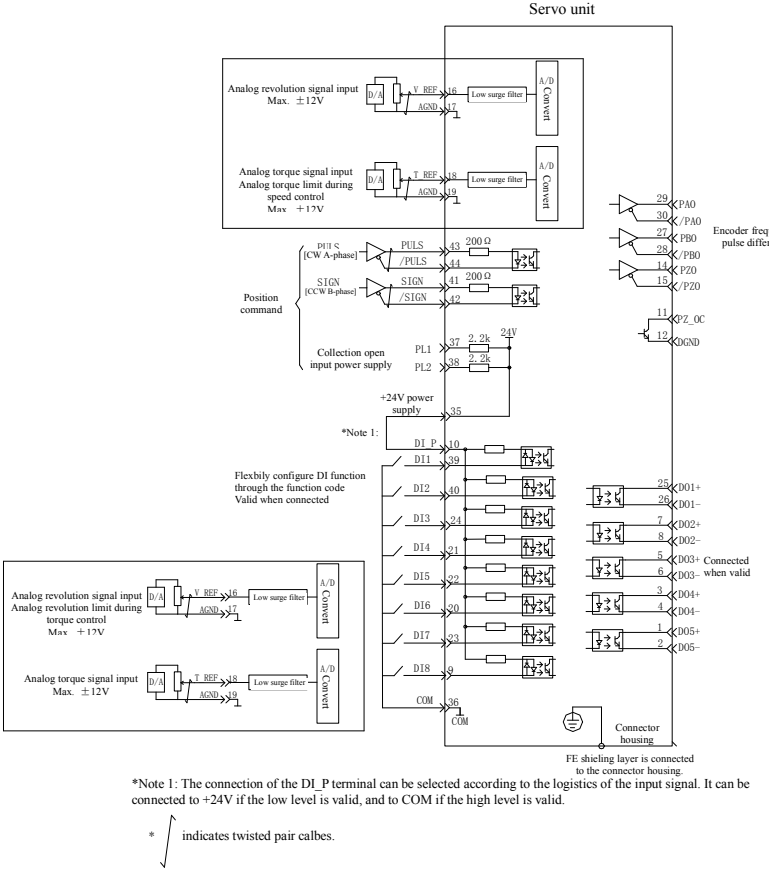


Figure 2-3 Three Kinds of Control Wiring Diagram

2.3.1 Analog Signal Interface

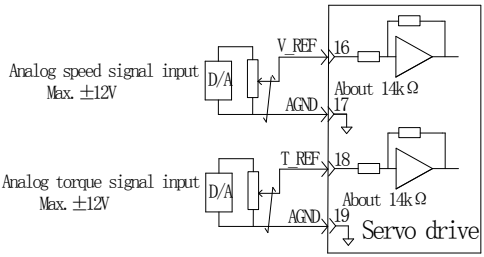


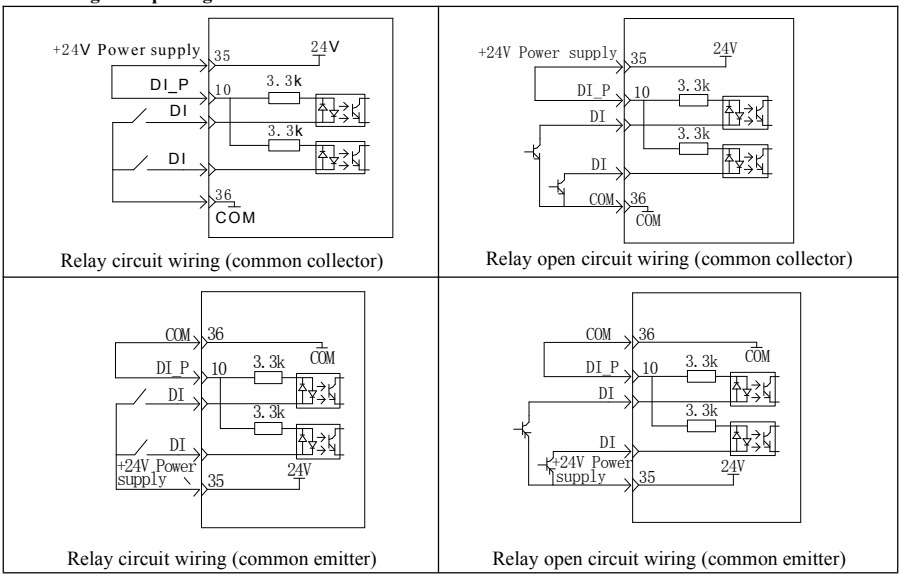
Figure 2-4 Wiring Diagram of Analog Signal

Analog signal is the speed command or torque command signal. Twisted pair cable is used with following input values:

- Analog signal voltage range: ±10V; resolution: 12 bit;
- Maximum allowed voltage: ±12V ;
- Input impedance: above 14kΩ.

2.3.2 Digital Input / Output Signal Interface

a. **Digital Input Signal Interface**



Relay circuit wiring (common collector)

Relay open circuit wiring (common collector)

Relay circuit wiring (common emitter)

Relay open circuit wiring (common emitter)

Figure 2-5 Digital Input Interface Circuit

B. Digital Output Signal Interface

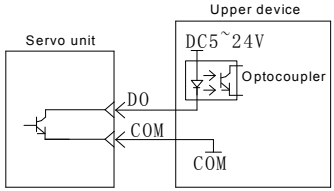


Figure 2-6 Servo Unit Output Driven Optocoupler

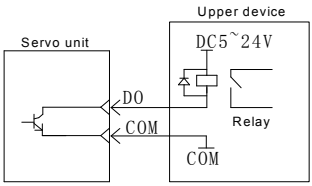


Figure 2-7 Servo Unit Output Driven Relay

Digital output transistor of the servo drive features following maximum voltage and current:

Maximum voltage: DC30V

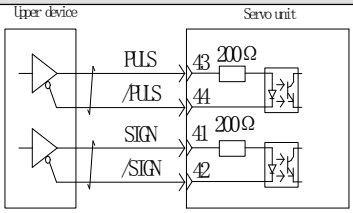
Maximum current: DC50mA

2.3.3 Pulse Command Input Interface

Command pulse input interface circuit is designed to receive the command pulse signal sent by the host computer to the driver. The output of the host computer may be differential linear drive output or open collector output. For the two modes of output, methods of wiring and performance of circuit are different from one another. **Furthermore, twisted pair cables should be used as the connecting cable.** Information about Terminal 43-44 (command pulse input) and Terminal 41-42 (command pulse input) of the CN2 connector is detailed below.

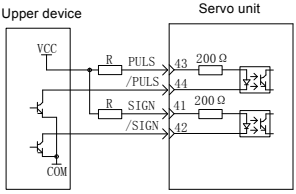
Pulse mode	Max. frequency (pps)	Min. pulse width (us)
Differential linear drive	500k	1
Open-collector	200k	2.5

Differential Linear Signal Drive Output



Differential Linear Signal Drive Output

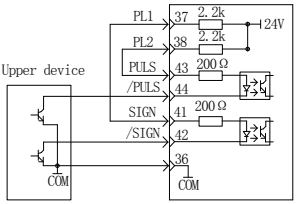
Open-collector Output (Powered Externally)



Please set up values with reference to working resistance R in order to enable the current ranging from 6mA to 10mA:

VCC Voltage	Resistance R
24V	2.4kΩ
12V	1.5kΩ
5V	200Ω

Open-collector Output (Powered by the Driver)



2.3.4 Interface for Encoder Frequency Dividing Output Signal

Encoder frequency dividing output signal outputs the differential signal via the differential driver. It is usually used as a position feedback signal when the host machine carries out position control. At the host machine, differential receiving circuit should be used to receive the signal, as shown in Figure 2-8.

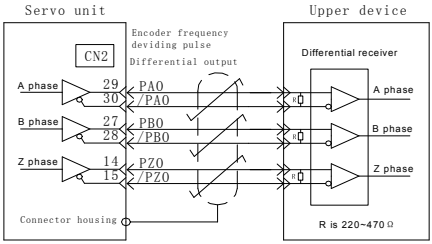


Fig. 2-8 Encoder (Differential Output) and Host Machine Wiring Diagram

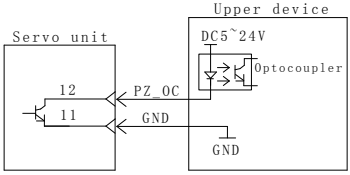


Fig.2-9 Encoder (Open Collector Output) and Host Machine Wiring Diagram

Furthermore, Z phase of the encoder frequency dividing output signal provides open collector output signal, and could provide feedback signal when the servo drive and the host machine form a position control system. At the host machine, optocoupler circuit, relay circuit or bus receiver circuit should be used to receive the signal, as shown in Figure 2-9.

2.4 Selection of Regenerative Braking Resistor

The drive's bus capacitor can absorb partial feedback braking energy, and the maximum braking energy that can be absorbed by each model of drives is listed as below.

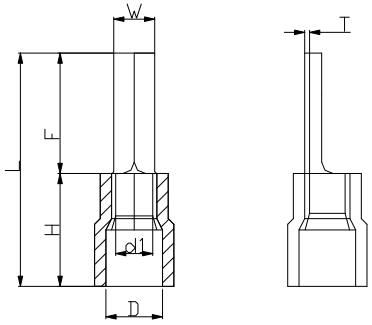
Drive model		Specifications of Built-in Regenerative Braking Resistor		Allowable min. External Resistance (Ω)	Max. Braking Energy Absorbed by the Capacitor E_c(J)
		Resistance (Ω)	Capacitance (W)		
Single-phase AC 220V	CA100-T1R8□□	None	---	50	18
	CA100-T3R0□□	None	---	50	24
Single/three phase AC 220V	CA100-T4R5□□	50	60	45	47
Three phase AC 220V	CA100-T6R0□□	50	60	25	62
	CA100-T7R5□□	25	100	20	76
	CA100-T10R□□	25	100	15	76
Three phase AC 380V	CA100-F4R0□□	100	100	60	67
	CA100-F6R0□□	50	100	45	80
	CA100-F8R5□□	50	100	45	97
	CA100-F12R□□	50	100	45	105
	CA100-F20R□□	40	120	30	120

2.5 **Connection of optional fittings and servo drive**

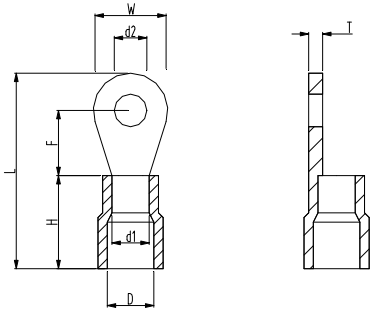
Servo Drive model	**screw specification**	**tightening torque (N*m)**	**Wire gauge(major loop) (mm^2)**	**Servo drive block width (mm)**	**Recommended lug model no**
CA100-T1R8□□	M3.0	0.3~0.5	1.3mm^2	3	PTV1.25-9
CA100-T3R0□□	M3.0	0.3~0.5	1.3mm^2	3	PTV1.25-9
CA100-T4R5□□	M3.0	0.3~0.5	2mm^2	3	PTV2-9
CA100-T6R0□□	M3.0	0.3~0.5	2mm^2	3	PTV2-9
CA100-T7R5□□	M3.0	0.3~0.5	2mm^2	3	PTV2-9
CA100-T10R□□	M4.0	1.2~1.5	2mm^2	9.2	RNY2-4
CA100-T4R0□□	M4.0	1.2~1.5	2mm^2	9.2	RNY2-4
CA100-T6R0□□	M4.0	1.2~1.5	2mm^2	9.2	RNY2-4
CA100-T8R5□□	M4.0	1.2~1.5	2mm^2	9.2	RNY2-4
CA100-T12R□□	M4.0	1.2~1.5	2mm^2	10	RNY2-4
CA100-T20R□□	M4.0	1.2~1.5	5.5mm^2	10	RNY5.5-4

Lug model no		W(mm)	F(mm)	L(mm)	H(mm)	d1(mm)	D(mm)	T(mm)
PVT series	PTV1.25-9	1.9	9	19	10	1.7	4.2	0.8
	PTV2-9	1.9	9	19	10	2.3	4.7	0.8

Lug model no		d2(mm)	W(mm)	F(mm)	L(mm)	H(mm)	d1(mm)	D(mm)	T(mm)
RNY series	RNY2-4	4.3	8.5	7.75	23	11	2.3	4.8	0.8
	RNY5.5-4	4.3	9.5	8.85	26.6	13	3.4	6.7	



PVT series



RNY series

Chapter 3 Running and Debugging

3.1 Operating Panel

It is able to display the status, perform auxiliary functions, set parameters and monitor some parameters of servo unit by operating panel, shown in Figure 3-1:

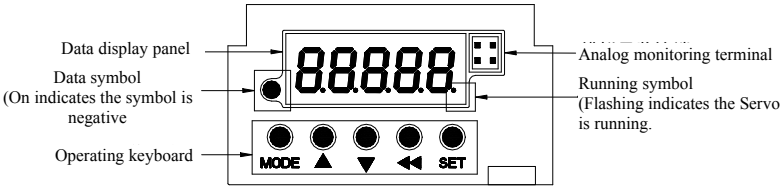
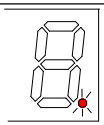
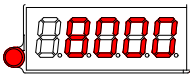
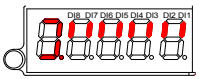
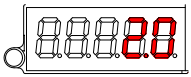
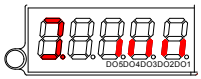


Figure 3-1 Operating Panel

Key and its function as below:

No.	Key Name	Function	Valid Form
1	MODE	Switch between modes	Press
2	▲ UP	Increase the set value	Press /Press & hold
3	▼ DOWN	Decrease the set value	Press / Press & hold
4	◀◀ SHIFT	Move to left	Press
5	SET	Go to sub-menu and confirm	Press

Figure 3-2 Panel Display and Monitoring

Display Status	Definition	Display Status	Definition
---	Parameter is running and cannot be modified, or read only	Er000	Alarm state
0	After the power is on, normal monitoring parameters are displayed and factory default is set to 0.	SAVED	Parameter modified
	The last decimal point is flashing, which indicates the motor is powered on, i.e., the servo driver is running.	JOG	Indicate trial run
	Negative 8000		The left figure represents input signal(DI) are valid, then it is ON; if signal invalid, then related digital tube is off.
	Positive 2.0		The left figure represents output (DO) are valid; if invalid then related digital tube is off.

3.2 Jog Running (JOG)

In order to ensure safety and carry out trial operation correctly, please check and confirm following matters at first.

(1) Check for correcting the power supply, and pay attention to distinguish **three-phase 220V** and **three-phase 380V**.

(2) Check if the drive is reliably grounded.

(3) Check if the servo motor and servo drive is matching with correct model.

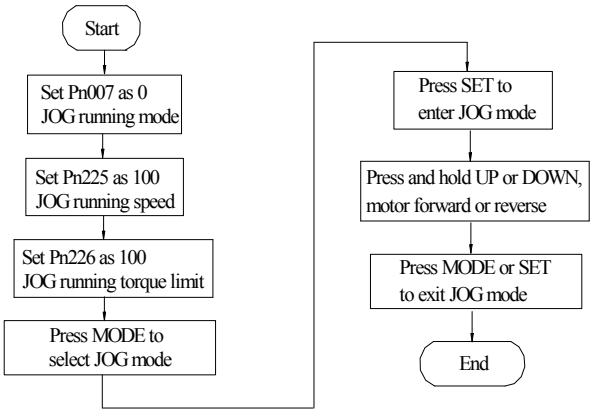
(4) Check if the fastening part of the motor is loose, and all the four screws fastening the motor must be tightened.

(5) The servo motor axis must have a good concentricity with the equipment axial bar.

(6) Check if the drive has selected the correct model of the motor (view and change through the parameter Pn001; for the motor model number, please see the attachment 1 "Product Model Table of Servo Drive and Servo Motor")

After checking, power on the drive and carry out JOG trial run according to following procedure:

Note: The trial run parameters are factory default parameters, and setting the macro parameter Pn003 to 0 completes setting of parameters for JOG trial run. Simply press MODE key to switch to JOG mode.



In case of any unstable revolution or abnormal sound of the motor during trial run, please firstly check the system connection and mechanical installation. If the connection and mechanical installation is normal, it is necessary to adjust the speed loop gain Pn205 and the speed loop integral time Pn206.

3.3 Function Code List

Description of Parameter Groups		Description of the Function Code Symbol	
Pn0xx	System parameter	**R**	Read-only parameter, cannot be modified
Pn1xx	Torque control parameter	■	Servo On running status, cannot be modified
Pn2xx	Speed control parameter	▲	Cannot save parameter after power off
Pn3xx	Position control parameter	●	Parameter modified to be valid after re-power on
Pn4xx	Gain adjustment parameter	☆	Relevent with servo drive model
Enxx	Fault recording parameter	**H**	Hexadecimal parameter, to be changed for each digit.
JOG	Jog mode	※	This function needs configuring DI/DO. Refer to DI/DO functional configuration table.
Erxx	Alarm parameter	**P**	Position control
		S	Speed control
		T	torque control

(a) Pn0xx Function Code Parameters

Function code	Title	Range	Resolution	Factory default	Property	Mode
Pn000	Program version	**8003**	1	☆	**R**	**P S T**
Pn001	Motor code	Check settings in Appendix 1 according to motor model.	1	☆	■	**P S T**
Pn002	Factory parameter	0000~FFFF	1	☆	**R**	**P S T**
Pn003	Macro parameter (retained)	0：JOG mode 1：TRQ internal torque mode 2：SPD internal speed mode 3：POS internal position mode 4：POS external position mode (pulse + direction)	1	☆	■/▲	**P S T**
Pn004	Parameter management	**Units: EPROM setting** 0: Modify EPROM after parameter setting 1: parameter setting and restoring after repowering on **Tens digit: fault parameter clearing** 0: No action 1: Clearing default En parameter (zero clearing after finishing) **Hundreds: Restore to factory parameter** 0: No action 1: Restore to factory default. (zero clearing after finishing 0) **Thousand: parameter copy** 0: No action 1: Copy the parameters into other drives (auto zero clearing)	1	0000	■/H	**P S T**

Pn005	Drive logistics selection	**Units: torque logistics** 0: torque control Positive Logic 1: torque control Negative Logic **Tens digit: speed logistics** 0: Speed control Positive Logic 1: Speed control Negative Logic **Hundreds: Position control logistics** 0: Position control Positive Logic 1: Position control Negative Logic **Thousand reserved**	1	0000	■/H	P S T
Pn006	Drive function selection	**Units: SON function selection** 0: DI terminal (SON) control servo start ※ 1: After power-on, the software compulsive servo starts immediately. **Tens digit: Units parameter save methods when power drop** 0: Save when power drop 1: Don't save when power drop **Hundred: reserved** **Thousand: reserved**	1	0000	H	P S T
Pn007	Control mode	0: JOG mode [Jog, trial run] 1: torque control 2: Speed control 3: Position control 4: Speed/position control ※ 5: Torque/position mode ※ 6: Torque/speed mode ※ 7. Inertia identification(for debugging use)	1	3	■	P S T
Pn008	Torque command source	0: analog command 1: internal command 2: analog command or internal command※ 3: communication command (share address with internal torque command 1)	1	0	■	T
Pn009	Speed command source	0: analog command 1: internal command※ 2: analog command or internal command※(use analog command to supersede internal speed command 1) 3: communication command (share address with internal torque command 1)	1	0	■	S
Pn010	Position command source	0: Pulse command 1: Internal command 2: Communication command (share address with internal torque command 1)	1	0	■	P

Pn011	DI1 function/effective logic	**Units digit + Tens digit :DI function configuration** 0x00~0x1C(00~28, refer to Section 3.6, DI function configuration) **Hundreds digit : DI function effective logic** 0 : ON (switch on) DI function effective 1 : OFF (switch off) DI function effective For wiring, refer to section 2.3.1. **Thousands digit：retained**	1	0001	■/H	P S T
Pn012	DI2 function/effective logic			0004		
Pn013	DI3 function/effective logic			0005		
Pn014	DI4 function/effective logic			0003		
Pn015	DI5 function/effective logic			000B		
Pn016	DI6 function/effective logic			0009		
Pn017	DI7 function/effective logic			000F		
Pn018	DI8 function/effective logic			0002		
Pn019	DI digital input Filtering duration	1~200ms	1ms	5		P S T
Pn020	Normal monitoring display items	0~24 (refer to monitoring display table)	1	0		P S T
Pn021	DO1 digital output function	**Units digit + Tens digit : DO function configuration** 0x00~0x1C(0~12) refer to section 3.5 - DO function configuration **Hundreds digit：DO output logic** 0: normally on, refer to 2.3.1 for wiring 1: normally off, refer to section 2.3.1 for wiring **Hundreds digit: retained** **Thousands digit: retained**	1	0001	H	P S T
Pn022	DO2 digital output function			0002		
Pn023	DO3 digital output function			0003		
Pn024	DO4 digital output function			0004		
Pn025	DO5 digital output function			0009		
Pn026	AO monitoring configuration	**Tens digit + Units digit : AO1 monitoring function configuration** 0x00~0x05 , refer to section 3.5 for reference **Thousands digit + Hundreds digit：AO2 monitoring function configuration** 0x00~0x05 , refer to section 3.5 for reference	1	0000	H	P S T

Pn027	Analog channel functional setting.	**Units: speed analog command polarity** 0: Bipolar 1: Positive unipolar and negative unipolar forced to be 0. 2: Negative unipolar **Tens digit: torque analog command polarity** 0: Bipolar 1: Positive unipolar and negative unipolar forced to be 0. 2: Negative unipolar Hundred: Reserved Thousand: Reserved	1	0000	■/H	**P S T**
Pn028	Speed analog command filtering time	0.2~100.0ms	0.1 ms	2.0		**P S T**
Pn029	Speed analog command ratio	10~3000(rpm)/V	1	300		**S**
Pn030	Speed analog command zero offset	-342~342	1x5.86 mV	0		**P S T**
Pn031	Speed analog command dead zone	0~5000mv	1	0		**P S T**
Pn032	Torque analog command filtering time	0.2~100.0ms	0.1	2.0		**P S T**
Pn033	Torque analog command ratio	1~300%/V	1	30		**S**
Pn034	Torque analog command zero offset	-342~342	1x5.86 mV	0		**P S T**

Pn035	Torque analog command dead zone	0~5000mv	1	0		**P S T**
Pn036	Delay time from band-type brake OFF to motor power off.	0~5000(When motor actual speed is less than 25rpm, it is static band-type brake)	1ms	0		**P S**
Pn037	Electromagnetism brake action speed when the motor is running	0~6000rpm	1rpm	50		**P S**
Pn038	Motor brake waiting delay when the motor is running	100~10000ms	1ms	500		**P S**
Pn039	Max. speed limit	0~6000rpm	1	☆		**P S T**
Pn040	Selection of methods for the servo to get down	**Units digit: getting down by overrun** 0: get down at free run, free run status 1: get down at zero speed, position is locked after stop 2: get down at zero speed, free run after stop **Tens digit：EMG emergency stop** 0: get down at free run, free run status 1: get down at pn1.12 torque, free run status **Hundreds digit : ServoOFF or alarm** 0: motor is powered off; the machine is down at free run status 1: motor is powered off; the electromagnet brakes. **Thousands digit:** get down **by communication failure** 0: get down at free run, free run status 1: Run according to the last received instruction	1	0000	**■/H**	**P S T**
Pn041	Communication status	0000~0066	1	0000	**R**	**P S T**
Pn042	Servo axis address	0~127	1	1	**■**	**P S T**

Pn043	RS485 communication configuration	**Units：Baud rate** 0：2400bps 1：4800bps 2：9600bps 3：19200bps 4：38400bps 5：57600bps 6：115200bps **Tens：Modbus data format** 0：1-8-1 No check(Modbus,RTU) 0：1-8-1 Even check (Modbus,RTU) 2：1-8-1 Odd check(Modbus,RTU) 3：1-8-2 No check(Modbus,RTU) 4：1-8-1 No check(Modbus,ASCII) 5：1-8-1Even check(Modbus,ASCII) 6：1-8-1 Odd check (Modbus,ASCII) 7：1-8-2 No check(Modbus,ASCII) 8：1-7-1 No check(Modbus,ASCII) 9：1-7-1Even check (Modbus,ASCII) A：1-7-1 Odd check(Modbus,ASCII) B：1-7-2No check(Modbus,ASCII **Hundred：Reserved** **Thousand：Reserved**	1	0003	■/H	**P S T**
Pn044	CANopen Communication configuration	**Units digit : CAN communication rate** 0：20Kbps 1：50Kbps 2：100Kbps 3：125Kbps 4：250Kbps 5：500Kbps 6：800Kbps 7：1Mbps **Tens digit: CAN communication enablement** 0: disable CAN communication control 1: enable CAN communication control **Hundreds digit: retained** **Thousands digit: retained**	1	0000	■/H	**P S T**
Pn045	Machine response reply time	0~5000ms	1ms	1	■	**P S T**
Pn046	Communication failed judging time	10~10000ms	1ms	10	■	**P S T**
Pn047 ~ Pn049	Retained					
Pn050	User password	0x0000~0xFFFF	1	0000		**P S T**

Pn051	DI mandatory input	**Tens digit + Units digit : DI mandatory input value** 0x00 : DI1~DI8 mandatory input low level 0xFF : DI1~DI8 mandatory input high level **Thousands digit + Hundreds digit : DI mandatory input enablement** 0x00 : DI1~DI8 mandatory input invalid 0xFF :DI1~DI8 mandatory input valid	1	0000	▲/H	P S T
Pn052	DO mandatory output	**Tens digit + Units digit: DO mandatory output value** 0x00 : DO1~DO5 mandatory output off 0x1F : DO1~DO5 mandatory output on **Thousands digit + Hundreds digit : DI mandatory output enablement** 0x00 : DO1~DO5 mandatory output invalid 0x1F : DO1~DO5 mandatory output valid	1	0000	▲/H	P S T
Pn053	AO1 mandatory value	0~7200 Corresponding analog for 0 is -5V Corresponding analog for 3600 is 0V Corresponding analog for 7200 is 5V	1	0		P S T
Pn054	AO2 mandatory value	0~7200 Corresponding analog for 0 is -5V Corresponding analog for 3600 is 0V Corresponding analog for 7200 is 5V	1	0		P S T

(b) Pn1xx Function Code Parameters

Function Code	Name	Range	Resolution	Factory Default	Attribute	Mode
Pn100	Torque function selection	**Units: torque limit selection** 0: Basic limit: internal + external 1: Min [basic limit , analog limit] ※ 2: Basic limit +internal torque segment ※ **Tens digit : torque reaching judging method** 0: Press Pn1.13 for nonpolarity judgment 1: Press Pn1.13 for polarity judgment 2: Judging reaching as per the torque command Hundred digit: reserved Thousand digit: reserved	1	0	■/H	P S T

Pn101	Selection of torque control time speed limit	0: Basic limit [Pn1.02] 1: Min [basic limit , analog limit] ※ 2: Min [basic limit ,Internal speed segment] ※	1	0	■	**T**
Pn102	Speed limit under torque control	0~3000rpm	1	100		**T**
Pn103	Torque feed-forward gain	0~100.0%	0.1	0		**P S**
Pn104	Torque feed-forward filtering time	0.5~500.0ms	1	20		**P S**
Pn105	Torque filter 1	0.1~50.0ms	0.1	1.0		**P S T**
Pn106	Torque filter 2	0.1~50.0ms	0.1	1.0		**P S T**
Pn107	Torque command acceleration and deceleration time	0~60000ms	1	0		**T**
Pn108	Forward torque limit	0~300%	1%	300%		**P S T**
Pn109	Backward torque limit	-300~0%	1%	-300%		**P S T**
Pn110	External forward torque limit ※	0~300%	1%	100%		**P S T**
Pn111	External backward torque limit ※	-300~0%	1%	-100%		**P S T**
Pn112	Emergency stop torque limit	0~300%	1%	300%		**P S**
Pn113	Torque reaching judging value	-300~300%	1%	100%		**P S T**
Pn114	Torque reaching judging return difference	0~300%	1%	5%		**P S T**
Pn115	Internal torque command 1 ※or communication torque command	-300~300%	1%	0		**T**
Pn116	Internal torque 2 ※	-300~300%	1%	0		**T**
Pn117	Internal torque 3 ※	-300~300%	1%	0		**T**
Pn118	Internal torque 4※	-300~300%	1%	0		**T**
Pn119	Retained					
Pn120	Torque observation enablement	0~1	1	0		**S T**
Pn121	Disturbance torque compensation coefficient	0~100	1	100%		**S T**
Pn122	Load torque identification K	-30000~+30000	1	☆		**S T**
Pn123	Load torque identification g	0~30000	1	☆		**S T**
Pn124	Reserved					

(c) Pn2xx Function Code Parameters

Function Code	Name	Range	Resolution	Factory Default		模式
Pn200	Selection of zero speed clamping function	**Units: trigger mode** 0: Not use zero speed clamping function 1: Zero speed judging +ZCLAMP-ON ※ 2: ZCLAMP ON ※ 3: Zero speed judging **Tens digit: clamping mode** 0: Enter position control, position locking 1: Conduct speed control still, external force will rotate Hundred digit: reserved Thousand digit: reserved	1	0000	■/H	S
Pn201	Zero speed clamping speed judging value	5~1000rpm	1	10		S
Pn202	Zero speed detection range	0~100rpm	1	5		S
Pn203	Speed feed-forward gain	0~100%	1	0		P
Pn204	Speed feed-forward filtering time	0~64.0ms	1	1.0		P
Pn205	Speed loop gain 1	1~200	1	30		P S
Pn206	Speed loop integral time 1	0~100	1	10		P S
Pn207	Speed detection filtering 1	0~20.0ms	0.1	0		P S T
Pn208	Speed loop gain 2	1~200	1	30		P S
Pn209	Speed loop integral time 2	0~100	1	10		P S
Pn210	Speed detection filtering 2	0~20.0ms	0.1	0		P S T
Pn211	Speed loop stiffness coefficient	0~100	1	50		P S
Pn212	Speed command acceleration speed	0~30000ms	1	0		S
Pn213	Speed command deceleration time	0~30000ms	1	0		S
Pn214	Consistent speed judging mode	0: Detection based on the speed command 1: Judging as per Pn2.15 nonpolarity 2: Judging as per Pn2.15 polarity	1	0		S T
Pn215	Consistent speed detection value	-3000~3000rpm	1	☆		S T
Pn216	Consistent speed detection range	0~100rpm	1	20		S T
Pn217	Internal speed 1※ or communication speed command	-3000~+3000rpm	1	200		S
Pn218 ~ Pn224	Internal speed 2~ Internal speed 8 ※	-3000~+3000rpm	1	200		S
Pn225	JOG running speed	-3000~3000rpm	1	100		

Pn226	JOG running torque restricted	0~300%	1	100		
Pn227	Retained					
Pn228	Retained					
Pn229	Retained					

(d) Pn3xx Function Code Parameters

Function Code	Name	Range	Resolution	Factory Default	Attribute	Mode
Pn300	Position control command form selection	**Units: command pulse form** 0: pulse + direction 1: Forward/reverse pulse 2: orthogonal pulse **Tens digit: PE_CLR clearing signal form※** 0: Clear deviation counter under ON status 1: Clear deviation counter when OFF turns to ON 2: Clear deviation counter under OFF status 3: Clear deviation counter when ON turns to OFF **Hundreds: clearing action** 0: Servo OFF or CLR signal clearing 1: Only clear CLR signal 2: Clear when alarming **Thousand: Multi-segment position triggering** 0: after PTRG is triggered, complete remain pulses 1: after PTRG is triggered, run as per new position segment.	1	0000	■/H	P
Pn301	Position command filtering time	0~1000ms	1	0		P
Pn302	Accelerated speed feed-forward gain	0~100%	1%	0		P
Pn303	Accelerated speed feed-forward filtering time	0.2~64.0ms	0.1	1.0		P
Pn304	Position loop gain 1	1~100	1	5		P
Pn305	Position loop gain 2	1~100	1	5		P
Pn306	Electronic gear -numerator 1	1~32767	1	1		P
Pn307	Electronic gear -numerator 2	1~32767	1	1		P
Pn308	Electronic gear -numerator 3	1~32767	1	1		P
Pn309	Electronic gear -denominator	1~32767	1	1		P
Pn310	Locating completion judging value	0~50000 pulse	1	10		P
Pn311	Locating completion return difference	0~50000 pulse	1	5		P

Pn312	Locating approaching judging value	0~50000 pulse	1	25		**P**
Pn313	Position excessive deviation alarm value	0~500.00 circles	1	10.00		**P**
Pn314	Internal position command 1 circle number or communication command circles	-30000~30000 circles	1	0		**P**
Pn315	Internal position command1 pulse number or communication command pulse	-9999~9999 pulse	1	0		**P**
Pn316	Internal position command1 speed	0~3000rpm	1	200		**P**
Pn317	Circle number of internal position command 2	-30000~30000 circles	1	0		**P**
Pn318	Internal position command 2 pulse number	-9999~9999 pulse	1	0		**P**
Pn319	Internal position command 2 speed	0~3000rpm	1	200		**P**
Pn320	Internal position command 3 circle number	-30000~30000 circles	1	0		**P**
Pn321	Internal position command3 pulse number	-9999~9999 pulse	1	0		**P**
Pn322	Internal position command3 speed	0~3000rpm	1	200		**P**
Pn323	Internal position command 4 circle number	-30000~30000 circles	1	0		**P**
Pn324	Internal position command 4 pulse number	-9999~9999 pulse	1	0		**P**
Pn325	Internal position command4 speed	0~3000rpm	1	200		**P**
Pn326	Internal position command 5 circle number	-30000~30000 circles	1	0		**P**
Pn327	Internal position command 5 pulse number	-9999~9999 pulse	1	0		**P**
Pn328	Internal position command 5 speed	0~3000rpm	1	200		**P**
Pn329	Internal position command 6 circle number	-30000~30000 circles	1	0		**P**
Pn330	Internal position command 6 pulse number	-9999~9999 pulse	1	0		**P**
Pn331	Internal position command6 speed	0~3000rpm	1	200		**P**
Pn332	Internal position command 7 circle number	-30000~30000 circles	1	0		**P**
Pn333	Internal position command 7 pulse number	-9999~9999 pulse	1	0		**P**
Pn334	Internal position command 7 speed	0~3000rpm	1	200		**P**

Pn335	Internal position command 8 circle number	-30000~30000 circles	1	0		**P**
Pn336	Internal position command 8 pulse number	-9999~9999 pulse	1	0		**P**
Pn337	Internal position command 8 speed	0~3000rpm	1	200		**P**
Pn338	Selection of control by regression through the origin	**Units digit：Way of triggering** 0: Disable the function of regression through the origin 1: Triggered by GOH high level 2: Triggered by GOH rising edge 3: Triggered by the first Servo On **Tens digit: regression pattern** 0：Go backward to get Z pulse as the origin 1：Go forward to get Z pulse forward as the origin 2： Directly take the reference point as the origin **Hundreds digit: selection of reference point** 0： Rotate clockwise to get REF rising edge as the reference point 1: Rotate anti-clockwise to get REF rising edge as the reference point 2: Rotate clockwise to get POT falling edge as the reference point 3: Rotate anti-clockwise to get POT falling edge as the reference point 4: Rotate anti-clockwise to get Z pulse as the reference point 5: Rotate anti-clockwise to get Z pulse as the reference point **Thousands digit: retained**		0000	**■/H**	**P**
Pn339	The origin back to the first speed (high speed)	1~3000rpm	1	100		**P**
Pn340	The origin back to the first speed (low speed)	1~3000rpm	1	50		**P**
Pn341	Upper original position deviation	-32767~+32767 circles	1	0		**P**
Pn342	Lower original position deviation	-9999~+9999 pulse	1	0		**P**
Pn343	Retained					
Pn344	Retained					

(e) Pn4xx Function Code Parameters

Function Code	Name	Range	Resolution	Factory Default	Attribute	Mode
Pn400	Gain type application switch	**Units: P/PI Mode switch** 0: With torque command as condition pnx 1: With speed command as condition Pnx 2: With speed command as condition Pnx 3: With position deviation pulse as condition Pnx 4: Use external terminal P-SEL as the condition ※ 5: No mode switch function **Tens digit: Gain switching condition** 0: With torque command as condition pnx 1: With speed command as condition Pnx 2: With acceleration command as condition Pnx 3: With position deviation pulse as condition Pnx 4: Use external terminal G-SEL as condition※ 5: First gain fixed 6: Second gain fixed **Hundreds: auto gain enabling** 0: Manual adjustment of gain 1: Auto adjustment of gain **Thousand: positioning vibration** self-tuning 0: Off 1: Enable	1	1000	**H**	**P S**
Pn401	Load inertia ratio	0.0~100.0 times	0.1	2.0	■	**P S T**
Pn402	Mode switch-torque value	0~300%	1	200		**P S**
Pn403	Mode switch- speed value	0~5000rpm	1	☆		**P S**
Pn404	Mode switch-acceleration	0~30000rpm/s	1	☆		**P S**
Pn405	Mode switch-position deviation	0~50000pulse	1	0		**P**
Pn406	Gain switching-torque value	0~300%	1	200		**P S**
Pn407	Gain switching-speed value	0~5000rpm	1	0		**P S**
Pn408	Gain switching-acceleration	0~30000rpm/s	1	0		**P S**
Pn409	Gain switching-position deviation	0~50000pulse	1	0		**P**
Pn410	Gain switching waiting time 1	0~10000ms	1	0		**P S**

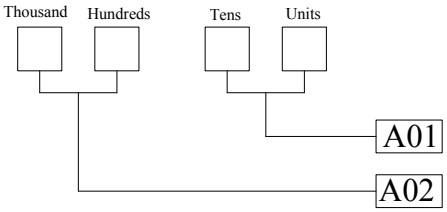
Pn411	Gain switching waiting time 2	0~10000ms	1	0		**P S**
Pn412	Gain switching time 1	0~10000ms	1	0		**P S**
Pn413	Gain switching time 2	0~10000ms	1	0		**P S**

3.4 Panel Monitoring Parameter Breakdown

Pn020 Setting	Internal Variable	Range
0	Motor revolution	0~±6000RPM
1	Motor current	0~3times rated circuit
2	Motor torque	0~±300%
3	Position command speed	0~±6000RPM
4	Speed control command	Motor mechanical revolution (RPM)
5	Torque command	0~±300%
6	Torque analog command voltage	0~±12.00V
7	Torque analog command value	0~±300%
8	Speed analog command voltage	0~±12.00V
9	Speed analog command value	0~±6000RPM
10	Encoder position	0~9999
11	Position deviation at lower bit	0~±99999 pulse
12	Position deviation upper bit	0~50 circles
13	Drive bus voltage	0~400.0V/800.0V
14	Drive current temperature	-40.0~100.0
15	Accumulative load rate	0~100%
16	Regenerative brake load rate	0~100%
17	DIDO status monitoring	Refer to Section 4.2
18	Accumulative communication fault	0~65536
19	U-phase current sampling	2048±20
20	V-phase current sampling	2048±20
21	Accumulative running time at lower bit	0~9999.9S
22	Accumulative running time at higher bit	0~500
23	System status monitoring at lower bit	Hexadecimal, for factory fault diagnosis
24	System status monitoring at upper bit	

3.5 AO Monitoring Parameter Breakdown

Pn026	AO Monitoring Configuration	Torque Revolution Position			
	Range	Resolution	Factory default	Attribute	Running Mode
	--	1	0000	H	P S T



Parameter Setting	Function
00	Motor actual revolution 3000rpm/5V
01	Speed command 3000rpm/5V
02	Motor torque (5V/300%)
03	Position deviation (500P/5V)
04	Position command speed 3000rpm/5V
05	Force output

3.6 DO/DI Functional Configuration Table

(a) DI Functional Configuration

Di Functional Configuration Table				
S/N	Symbol	Function	Function Description	
0	NULL	No function configuration	Input status has no influence on the system	
1	SON	Servo enabling	OFF	Servo not enabled, motor not powered on
			ON	Servo enabled, motor powered on
2	EMG	Emergency shutdown	OFF	Servo working normally
			ON	Servo shutdown, motor powered off
3	AL_CLR	Alarm clearing	When the alarm is allowed to be cleared, it will be cleared when OFF is switched to ON. Note: only some alarms can be cleared.	
4	POT	Forward driving forbidden	OFF	Forward driving allowed
			ON	Forward driving forbidden

<table>
<tr><td rowspan="2">5</td><td rowspan="2">NOT</td><td rowspan="2">Reverse driving forbidden</td><td>OFF</td><td>Reverse rotation allowed</td></tr>
<tr><td>ON</td><td>Reverse rotation forbidden</td></tr>
<tr><td rowspan="3">6</td><td rowspan="3">TCCW</td><td rowspan="3">External forward torque limit</td><td>OFF</td><td>CCW forward not limited by Pn110</td></tr>
<tr><td>ON</td><td>CCW forward limited by Pn110</td></tr>
<tr><td colspan="2">Note: whether TCCW is effective or not, , forward torque is limited by Pn108.</td></tr>
<tr><td rowspan="3">7</td><td rowspan="3">TCW</td><td rowspan="3">External reverse torque limit</td><td>OFF</td><td>CW reverse not limited by Pn111</td></tr>
<tr><td>ON</td><td>CW reverse limited by Pn111</td></tr>
<tr><td colspan="2">Note: whether TCW is effective or not, , reverse torque is limited by Pn109.</td></tr>
<tr><td rowspan="3">8</td><td rowspan="3">CZERO</td><td rowspan="3">Null command</td><td colspan="2">In the torque or speed mode , the current command is:</td></tr>
<tr><td>OFF</td><td>Normal command</td></tr>
<tr><td>ON</td><td>Null command</td></tr>
<tr><td rowspan="2">9</td><td rowspan="2">ZCLMP</td><td rowspan="2">Zero speed clamping</td><td>ON</td><td>Refer to Pn200 function.</td></tr>
<tr><td>OFF</td><td>Invalid</td></tr>
<tr><td>0A</td><td>CMOD</td><td>Drive control mode switching</td><td colspan="2"><table>
<tr><td>Pn007</td><td>COMD terminal</td><td>control mode</td></tr>
<tr><td rowspan="2">4</td><td>OFF</td><td>Speed control</td></tr>
<tr><td>ON</td><td>Position control</td></tr>
<tr><td rowspan="2">5</td><td>OFF</td><td>Torque control</td></tr>
<tr><td>ON</td><td>Position control</td></tr>
<tr><td rowspan="2">6</td><td>OFF</td><td>Torque control</td></tr>
<tr><td>ON</td><td>Speed control</td></tr>
</table></td></tr>
<tr><td rowspan="3">0B</td><td rowspan="3">GAIN</td><td rowspan="3">Gain switching</td><td>OFF</td><td>Use the first group of gains</td></tr>
<tr><td>ON</td><td>Use the second group of gains</td></tr>
<tr><td colspan="2">Note: supported by parameter Pn400</td></tr>
<tr><td rowspan="3">0C</td><td rowspan="3">PCSEL</td><td rowspan="3">Control mode switching</td><td>OFF</td><td>Speed loop not using PI control</td></tr>
<tr><td>ON</td><td>Speed loop using P control</td></tr>
<tr><td colspan="2">Note: supported by parameterPn400</td></tr>
<tr><td rowspan="4">0D
0E</td><td rowspan="4">GEAR1
GEAR2</td><td rowspan="4">Electronic gear selection 1
Electronic gear selection 2</td><td colspan="2"><table>
<tr><td>GEAR2</td><td>GEAR1</td><td>Electronic gear numerator</td></tr>
<tr><td>OFF</td><td>OFF</td><td>Electronic gear-numerator 3Pn308</td></tr>
<tr><td>OFF</td><td>ON</td><td>Electronic gear-numerator 3Pn308</td></tr>
<tr><td>ON</td><td>OFF</td><td>Electronic gear-numerator 3Pn308</td></tr>
</table></td></tr>
<tr><td rowspan="2">0F</td><td rowspan="2">INH</td><td rowspan="2">Position pulse input forbidden</td><td>OFF</td><td>External position pulse command effective</td></tr>
<tr><td>ON</td><td>Ignore external position pulse command</td></tr>
<tr><td rowspan="2">10</td><td rowspan="2">PE_CLR</td><td rowspan="2">Position deviation clearing</td><td>OFF</td><td>Invalid (refer toPn300)</td></tr>
<tr><td>ON</td><td>Clear position deviation counter</td></tr>
</table>

<table>
<tr><td rowspan="9">11
12
13</td><td rowspan="9">POS1
POS2
POS3</td><td rowspan="9">Internal position command selection 1
Internal position command selection 2
Internal position command selection 3</td><td>POS3</td><td>POS2</td><td>POS1</td><td>Position command</td></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Internal position 1</td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>Internal position 2</td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>Internal position 3</td></tr>
<tr><td>OFF</td><td>ON</td><td>ON</td><td>Internal position 4</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>Internal position 5</td></tr>
<tr><td>ON</td><td>OFF</td><td>ON</td><td>Internal position 6</td></tr>
<tr><td>ON</td><td>ON</td><td>OFF</td><td>Internal position 7</td></tr>
<tr><td>ON</td><td>ON</td><td>ON</td><td>Internal position 8</td></tr>
<tr><td rowspan="9">14
15
16</td><td rowspan="9">SPD1
SPD2
SPD3</td><td rowspan="9">Speed command selection 1
Speed command selection 2
Speed command selection 3</td><td>SPD3</td><td>SPD 2</td><td>SPD 1</td><td>Speed command</td></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Internal speed 1</td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>Internal speed 2</td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>Internal speed 3</td></tr>
<tr><td>OFF</td><td>ON</td><td>ON</td><td>Internal speed 4</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>Internal speed 5</td></tr>
<tr><td>ON</td><td>OFF</td><td>ON</td><td>Internal speed 6</td></tr>
<tr><td>ON</td><td>ON</td><td>OFF</td><td>Internal speed 7</td></tr>
<tr><td>ON</td><td>ON</td><td>ON</td><td>Internal speed 8</td></tr>
<tr><td rowspan="6">17
18</td><td rowspan="6">TRQ1
TRQ2</td><td rowspan="6">Torque command selection 1
Torque command selection 2</td><td>TRQ2</td><td>TRQ1</td><td colspan="2">Torque command</td></tr>
<tr><td>OFF</td><td>OFF</td><td colspan="2">Analog torque command/[Pn115]</td></tr>
<tr><td>OFF</td><td>ON</td><td colspan="2">Internal torque command[Pn116]</td></tr>
<tr><td>ON</td><td>OFF</td><td colspan="2">Internal torque command[Pn117]</td></tr>
<tr><td>TRQ2</td><td>TRQ1</td><td colspan="2">Internal torque command[Pn118]</td></tr>
<tr><td rowspan="3">19</td><td rowspan="3">PTRG</td><td rowspan="3">Internal position command triggering</td><td colspan="4">Note: effective when the internal command conducts position control and along the effective terminal</td></tr>
<tr><td>Rising edge</td><td colspan="3">Trigger internal position command</td></tr>
<tr><td>Other</td><td colspan="3">Invalid</td></tr>
<tr><td rowspan="3">1A</td><td rowspan="3">CINV</td><td rowspan="3">Command negation</td><td colspan="4">Only effective in the speed or torque control mode</td></tr>
<tr><td>OFF</td><td colspan="3">Normal command</td></tr>
<tr><td>ON</td><td colspan="3">Negation of the current command</td></tr>
<tr><td rowspan="2">1B</td><td rowspan="2">REF</td><td rowspan="2">Homing reference point</td><td>OFF</td><td colspan="3">Invalid</td></tr>
<tr><td>ON</td><td colspan="3">Refer to Pn338</td></tr>
<tr><td rowspan="2">1C</td><td rowspan="2">GHOM</td><td rowspan="2">Homing triggering signal</td><td>OFF</td><td colspan="3">Invalid</td></tr>
<tr><td>ON</td><td colspan="3">Homing enable, refer to Pn338</td></tr>
</table>

(b) DO Functional Configuration

Hundreds digit of Pn021~Pn025 is configured as 0, i.e., normally ON. Corresponding DO functions and meanings are described below.

DO Terminal Function Description				
Setting	Symbol	Function	Function Description	
0	NULL	No function configuration	OFF status	
1	RDY	Servo ready	OFF	Abnormality during power-on of the servo drive or there is any alarm.
			ON	Servo power-on and initialization is normal, no alarms.
2	ALM	Servo abnormity (alarm)	OFF	Servo works normally
			ON	Servo shutdown, motor power-off
3	ZSP	Zero speed PST	OFF	Not reaching the zero speed.
			ON	Reaching the zero speed; referring to Pn200 parameter
4	BRK	Electromagnetic brake BRK	OFF	Electromagnetic brake enabled
			ON	Electromagnetic brake released
5	COIN	Locating finishing P	OFF	Locating not finished
			ON	Locating finished (refer to Pn310 parameter)
6	NEAR	Locating approaching P	OFF	Position deviation counter more than Pn312
			ON	Position deviation counter less than Pn312
7	SPA	Speed reached	OFF	Speed not reached
			ON	Speed reached, refer to Pn214 parameter
8	TQA	Torque reached	OFF	Speed not reached
			ON	Speed reached, refer to Pn113 parameter
9	RUN	Servo running	OFF	Servo motor not powered on for running
			ON	Servo motor powered on and running
0A	SPL	Speed limit T	OFF	Motor speed hasn't reached the limit.
			ON	Motor speed reached the limit.
0B	TQL	Torque limit	OFF	Motor torque hasn't reached the limit.
			ON	Motor torque reached the limit.
0C	HOM	Homing	OFF	Homing uncompleted
			ON	Homing completed

3.7 Communication Protocol Address

CA100 servo driver is available for function parameter change via communication. It features of RS485 interface, supports Modbus protocol and is compatible with ASCII and RTU mode with options of 12 data formats and 7 Baud Rate settings. It is designed to connect up to 127 drivers. Refer to parameter Pn042, Pn043 and Pn045 for related function codes.

CA100 servo driver offers the following commonly used Modbus function codes:

0x03: read setting values of application parameters and real-time value of status parameter for the servo driver;

0x06: Write data into the application parameter of the servo driver;

Access address of application parameters:

Parameter identifier	RAM access address	EEPROM access address
Pn0.00 ~ Pn0.54	0x2000 ~ 0x2036	0xE000 ~ 0xE036
Pn1.00 ~ Pn1.24	0x2037 ~ 0x204F	0xE037 ~ 0xE04F
Pn2.00 ~ Pn2.29	0x2050 ~ 0x206D	0xE050 ~ 0xE06D
Pn3.00 ~ Pn3.44	0x2064 ~ 0x209A	0xE064 ~ 0xE09A
Pn4.00 ~ Pn0.54	0x209B ~ 0x20C7	0xE09B ~ 0xE0C7
CF0.00~CF0.35	0x20C8 ~ 0x20EB	0xE0C8 ~ 0xE0EB

Note 1: CF0.00~CF0.55 is used only for commissioning by the manufacturer

Note 2: En0.00~En0.19 is a read-only parameter

Note 3: Related Modbus function code: 0x03 and 0x06

Access address of status parameters:

Pn020 corresponding value	Address
0 ~ 24	0x3000 ~ 0x3018
25~40 (internal monitoring variable)	0x3019 ~ 0x3028
41~50 (customized monitoring variable)	0x3029 ~ 0x3032

Note 1: Related Modbus function code: 0x03

Special attention is needed when communication function is used:

For parameters that are not necessarily stored for a long time or during power off, write the parameter values to RAM. Write values for parameters that need to be stored for a long time or during power off into EEPROM. Frequent write-into EEPROM will reduce service life of ROM.

Application example as following:

(1) Give position command via communication in position mode

Set the position command source as an internal command (Pn010=1), and then modify communication parameter Pn314 (internal position command 1 - circles), Pn315 (internal position command 1 - pulse) and Pn316 (internal position command 1 - speed).

Set value of Parameter Pn314 (internal position command 1 - circles) as 2:

The host computer sends out requested data frame:

Slave address	Function code	High-order bit of register address	Low-order bit of register address	High-order data	Low-order data	CRC Low-order bit	CRC High-order bit
01	06	20	7C	00	02	C2	13

The slave computer responds to the data frame (the slave computer returns the dame data requested by the host computer):

Slave address	Function code	High-order bit of register address	Low-order bit of register address	High-order data	Low-order data	CRC Low-order bit	CRC High-order bit
01	06	20	7C	00	02	C2	13

Set value of Parameter Pn315 (internal position command 1 - pulse) as 500:

The host computer sends out requested data frame:

Slave address	Function code	High-order bit of register address	Low-order bit of register address	High-order data	Low-order data	CRC Low-order bit	CRC High-order bit
01	06	20	7D	01	F4	12	05

The slave computer responds to the data frame (the slave computer returns the dame data requested by the host computer):

Slave address	Function code	High-order bit of register address	Low-order bit of register address	High-order data	Low-order data	CRC Low-order bit	CRC High-order bit
01	06	20	7D	01	F4	12	05

Set value of Parameter Pn316 (internal position command 1 - speed) as 1500rpm:

The host computer sends out requested data frame:

Slave address	Function code	High-order bit of register address	Low-order bit of register address	High-order data	Low-order data	CRC Low-order bit	CRC High-order bit
01	06	20	7E	05	DC	E0	DB

The slave computer responds to the data frame (the slave computer returns the dame data requested by the host computer):

Slave address	Function code	High-order bit of register address	Low-order bit of register address	High-order data	Low-order data	CRC Low-order bit	CRC High-order bit
01	06	20	7E	05	DC	E0	DB

Note: When speed or torque command needs to be given via communication at speed or torque mode, the same applies. Set the speed command source (Pn009) or torque command source (Pn008) as internal command, and modify the setting value of Parameter internal speed 1 (Pn217) or Parameter internal torque 1 (Pn115) via communication.

（2）Switching between modes via communication at position/speed combined mode

Modify Parameter Pn051 via communication, and mandatorily set the value of DI terminal for mode switching (CMOD) as 1 to enable switching at combined mode. In the following table, DI8 is set as the terminal for mode switching (CMOD).

The host computer sends out requested data frame:

Slave address	Function code	High-order bit of register address	Low-order bit of register address	High-order data	Low-order data	CRC Low-order bit	CRC High-order bit
01	06	20	33	80	80	12	65

The slave computer responds to the data frame (the slave computer returns the dame data requested by the host computer):

Slave address	Function code	High-order bit of register address	Low-order bit of register address	High-order data	Low-order data	CRC Low-order bit	CRC High-order bit
01	06	20	33	80	80	12	65

(3) The host computer reads monitoring parameters (rotation speed, corresponding address of 0x3000)

The host computer sends out requested data frame:

Slave address	Function code	High-order bit of register initial address	Low-order bit of register initial address	High-order bit of register quantity	Low-order bit of register quantity	CRC Low-order bit	CRC High-order bit
01	03	30	00	00	01	8B	0A

Data frame of monitoring parameter sets returned by the slave computer:

Slave address	Function code	Data length	First High-order data of the register	First Low-order data of the register	CRC Low-order bit	CRC High-order bit
01	03	02	03	E8	B8	FA

3.8 Macro-Related Self-Setting Parameter Table

(a) Pn003=0 JOG Mode

parameter	JOG Mode	
	Setting	**Description**
Pn007	0	JOG mode
Pn225	200	Revolution
Pn226	100	Torque limit

(b) Pn003=1 Internal Torque Command Mode

parameter	Pn003=1 Internal Torque Command Mode	
	Setting	**Description**
Pn007	1	Torque mode
Pn008	1	Internal torque
Pn011	1	Servo enabled
Pn012	4	Forward driving forbidden
Pn013	5	Reverse driving forbidden
Pn014	3	Alarm clearing
Pn015	11	Gain switching
Pn016	9	Zero speed clamping

Pn017	23	Torque command 1
Pn018	24	Torque command 2
Pn020	0	Observing revolution
Pn021	1	Servo ready
Pn022	2	Servo alarm
Pn023	3	Zero speed
Pn024	4	Electromagnetic brake/motor running
Pn025	8	Torque reached
Pn100	0000	Torque using basic limit
Pn101	0	Speed selection Pn102
Pn102	500	Speed limit
Pn115	100	Internal torque1

(b) Pn003=2 Internal Speed Command Mode

Parameter	**Pn003=2 Internal Speed Command Mode**	
	Setting	**Description**
Pn007	2	speed mode
Pn009	1	Internal revolution
Pn011	1	Servo enabled
Pn012	4	Forward driving forbidden
Pn013	5	Reverse driving forbidden
Pn014	3	Alarm clearing
Pn015	11	Gain switching
Pn016	9	Zero speed clamping
Pn017	20	Revolution command 1
Pn018	21	Revolution command 2
Pn020	0	Observing revolution
Pn021	1	Servo ready
Pn022	2	Servo alarm
Pn023	3	Zero speed
Pn024	4	Electromagnetic brake/motor running
Pn025	7	Revolution reached
Pn100	0000	Torque using basic limit
Pn108	100	Forward torque limit
Pn109	-100	Reverse torque limit
Pn217	500	revolution

(d) Pn003=3 Internal Position Command Mode

parameter	Pn003=3 Internal Position Command Mode	
	Setting	Description
Pn007	3	Position mode
Pn010	1	Internal position
Pn011	1	Servo enabled
Pn012	4	Forward driving forbidden
Pn013	5	Reverse driving forbidden
Pn014	3	Alarm clearing
Pn015	11	Gain switching
Pn016	15	Position pulse input forbidden
Pn017	16	Position deviation clearing
Pn018	25	Internal unknown command triggered
Pn020	11	Position deviation at lower bit
Pn021	1	Servo ready
Pn022	2	Servo abnormal alarming
Pn023	3	Zero speed
Pn024	4	Electromagnetic brake/motor running
Pn025	5	Locating completed
Pn306	1	Electronic gear -numerator 1
Pn309	1	Electronic gear -denominator
Pn314	1	Internal position command 圈数 1
Pn315	0	Internal position command pulse 1
Pn316	500	Internal position command speed 1

(e) Pn003=4 External Position Command (Pulse + Direction) Mode

Parameter	External Position Command (Pulse + Direction) Mode	
	Setting	Notes
Pn007	3	Position mode
Pn010	0	Pulse command
Pn300	0000	“Pulse + direction” pulse shape
Pn011	1	Servo enabled
Pn012	4	Clockwise rotation drive prohibited
Pn013	5	Anti-clockwise rotation drive prohibited
Pn014	3	Alarm cleared
Pn015	11	Gain switch
Pn016	15	Position pulse input prohibited
Pn017	16	Zero position deviation
Pn018	25	Internal position command triggered

Pn020	11	Low positional deviation
Pn021	1	Servo preparation completed
Pn022	2	Servo abnormality alarm
Pn023	3	Zero speed
Pn024	4	Electromagnet brakes/motor runs
Pn025	5	Positioning completed
Pn306	1	Electronic gear - Numerator 1
Pn309	1	Electronic gear - Denominator

3.9 Warning, Alarm Diagnosis and Measures

(a) Alarm Display

Function Code	Name	Possible Causes	Resolutions
ER.001	Servo drive overcurrent	Please check if the parameter is set reasonably.	Lacking phase of the motor, external short circuit, parameters not reasonably set.
ER.002	IPM fault	[IPM short circuit, overheating]	Drive output short circuit and long-term overload.
ER.003	Overload [exceeding instant max. load]		
ER.004	Reserved		
ER.005	Fault of the channel adopted by the U-phase current	Detected circuit fault of U-phase current or disconnection of Drive U-phase	
ER.006	Fault of the channel adopted by the V-phase current	Detected circuit fault of U-phase current or disconnection of Drive V-phase	
ER.007	Detected fault of W-phase current		
ER.008	Regenerative braker overload or overcurrent	Braking power too high	Please add external braking resistance.
ER.009	DC bus undervoltage	DC bus voltage lower than 230V	Braking
ER.010	DC bus overvoltage	DC bus voltage higher than 390V	
ER.011	Motor overspeed		
ER.012	Drive radiator overheating	Ambient temperature too high, radiating fan faulty	
ER.013	Reserved		
ER.014	EPROM reading/writing fault	Verification error	

ER.015	Parameter copy fault	Unable to copy parameters to other drives	Different program version and machine model, abnormal connection or disconnection of communication tables
		Check if the communication cable is connected or not, or connected reliable.	
ER.016	Excessive position deviation	Excessive deviation between the set position and the actual position.	Check for mechanical fault, or the detected value of the set max. position deviation is too high.
ER.017	Serial encoder fault	Encoder not connected, poor contact and encoder fault.	Connect the encoder cable reliably.
ER.018	Encoder ABZ signal abnormal	ABZ signal not connected or poor contact.	
ER.019	Encoder UVW signal abnormal	UVW signal not connected or poor contact.	Connect the encoder, or make sure reliable connection.
ER.020	Encoder abnormal	Encoder connected, but logistics code error.	Check the encoder cable or if the encoder can work normally.
ER.021	Speed measuring abnormal	Excessive high velocity measurement of the encoder.	The encoder signal is severely interfered or the encoder is faulty.
ER.022	Encoder initial signal interfered		
ER.023	Electromagnetic interference 1	Motor not powered on, and the driving locking circuit interfered.	Check for reasonable wiring of the secondary loop, and reliable grounding of the drive, or consult the manufacturer's customer service center.
ER.024	Electromagnetic interference 2	When the motor is running, the driving locking is interfered.	Refer to the resolution for ER.023.
ER.025	Electromagnetic interference 3	Motor not powered on, and the drive is triggered by overcurrent signal.	Refer to the resolution for ER.023.
ER.026	Electromagnetic interference 4	IPM alarms hen the motor is not powered, and the radiator temperature <70°.	Refer to the resolution for ER.023.
ER.027	Motor connection abnormal	Not connected.	Please connect the motor correctly.
ER.028	Lacking phase of main loop circuit input, lacking phase of L1, L2, L3		
ER.029	Drive 24V abnormal	Drive 24V power supply is faulty, or the drive's internal flat cables are not reliably connected.	Check the drive's flat cables, and check the drive's internal 24V.

ER.030	Excessive communication faults		
ER.031	Single plate tooling testing QC label, NG		
ER.032	QC testing label before aging, NG		
ER.033	Label for 12-hour aging testing, NG		
ER.034	Label for whole machine testing after aging, NG		
ER.039	Control panel faulty ID		
ER.040	Motor selection logistics error		

(b) Historical Fault Record

En0.00	Last fault record	0~128	1	0	R	Historical fault record
En0.01	Historical fault 1	0~128	1	0	R	
En0.02	Historical fault 2	0~128	1	0	R	
En0.03	Historical fault 3	0~128	1	0	R	
En0.04	Historical fault 4	0~128	1	0	R	
En0.05	Historical fault 5	0~128	1	0	R	
En0.06	Historical fault 6	0~128	1	0	R	
En0.07	Historical fault 7	0~128	1	0	R	
En0.08	motor revolution	-6000~6000	1rpm	0	R	Last faulty running status
En0.09	Target revolution	-6000~6000	1rpm	0	R	
En0.10	U-phase instant sampling	-400~400%	1%	0	R	
En0.11	V-phase instant sampling	-400~400%	1%	0	R	
En0.12	Output feedback current label	0.0~3000.0A	0.1A	0	R	
En0.13	Output voltage	0~1000.0V	0.1V	0	R	
En0.14	DC side voltage	0~1000.0V	0.1V	0	R	
En0.15	Equipment max. temperature	-40.0~150.0	0.1°C	0	R	
En0.16	Running status word at higher bit			0	R/H	
En0.17	Running status word at lower bit			0	R/H	
En0.18	Accumulative running time during the last fault.	0~65535	1H	0	R	
En0.19	Interval between last two times of faulty running	0~65535	1H	888	R	

Annex1 Adaptive Model Table of CM105、CM102、CM100 Series Servo Motor and CA100 Servo Drive

Note1: Servo motor code is setted by Pn001

Note2: This code is adaptive to servo motor whose software version is 8003 and above (to check software version by Pn000)

CM105 Series Servo Motor and Adaptive Servo Drive

220V						
Rated Torque (Nm)	Revolution (rpm)	Power (W)	Flange	Servo Motor Model	Drive Model	Motor Code
0.60	3000	200	60	CM105-60T06030A1□□□□	T1R8 A	2001
1.27	3000	400	60	CM105-60T13030A1□□□□	T3R0 A	2025
			80	CM105-80T13030A1□□□□	T3R0 A	2028
1.90	3000	600	60	CM105-60T19030A1□□□□	T4R5 A	2055
2.00	3000	600	110	CM105-110T20030A1□□□□	T3R0 A	2024
2.39	3000	750	80	CM105-80T24030A1□□□□	T3R0 A	2027
2.40	3000	750	90	CM105-90T24030A1□□□□	T3R0 A	2029
3.50	2000	730	80	CM105-80T35020A1□□□□	T3R0 A	2026
			90	CM105-90T35020A1□□□□	T3R0 A	2030
	3000	1100	80	CM105-80T35030A1□□□□	T4R5 A	2052
4.00	2000	800	110	CM105-110T40020A1□□□□	T4R5 A	2048
	2500	1000	80	CM105-80T40025A1□□□□	T4R5 A	2050
			90	CM105-90T40025A1□□□□	T4R5 A	2056
			130	CM105-130T40025A1□□□□	T4R5 A	2049
	3000	1200	80	CM105-80T40030A1□□□□	T4R5 A	2053
			110	CM105-110T40030A1□□□□	T6R0 A	2074
5.00	2500	1300	130	CM105-130T50025A1□□□□	T6R0 A	2075
	3000	1500	110	CM105-110T50030A1□□□□	T6R0 A	2076
6.00	2000	1200	110	CM105-110T60020A1□□□□	T4R5 A	2054
	2500	1500	130	CM105-130T60025A1□□□□	T6R0 A	2077
	3000	1800	110	CM105-110T60030A1□□□□	T6R0 A	2079
7.70	2500	2000	130	CM105-130T77025A1□□□□	T7R5 A	2082
10.00	1000	1000	130	CM105-130T10110A1□□□□	T4R5 A	2051
	1500	1500	130	CM105-130T10115A1□□□□	T6R0 A	2078
	2500	2600	130	CM105-130T10125A1□□□□	T10R A	2107
15.00	1500	2300	130	CM105-130T15115A1□□□□	T10R A	2106
380V						
Rated Torque (Nm)	Revolution (rpm)	Power (W)	Flange	Servo Motor Model	Drive Model	Motor Code
10.00	1000	1000	130	CM105-130F10110A1□□□□	F4R0 A	4012

	1500	1500	130	CM105-130F10115A1□□□□	F4R0 A	4013
	2500	2600	130	CM105-130F10125A1□□□□	F6R0 A	4031
15.00	1500	2300	130	CM105-130F15115A1□□□□	F6R0 A	4030
	2500	3800	130	CM105-130F15125A1□□□□	F12R A	4067
Rated Torque (Nm)	Revolution (rpm)	Power (W)	Flange	Servo Motor Model	Drive Model	Motor Code
19.00	1500	3000	180	CM105-180F19115A1□□□□	F8R5 A	4049
21.50	2000	4500	180	CM105-180F22120A1□□□□	F12R A	4068
27.00	1500	4300	180	CM105-180F27115A1□□□□	F12R A	4070
35.00	1000	3700	180	CM105-180F35110A1□□□□	F12R A	4069
	1500	5500	180	CM105-180F35115A1□□□□	F12R A	4071
48.00	1500	7500	180	CM105-180F48115A1□□□□	F20R A	4083

CM102 Series Servo Motor and Adaptive Servo Drive

220V						
Rated Torque (Nm)	Revolution (rpm)	Power (W)	Flange	Servo Motor Model	Drive Model	Motor Code
0.60	3000	200	60	CM102-60T06030A1□□□□	T1R8 A	2000
1.27	3000	400	60	CM102-60T13030A1□□□□	T3R0 A	2021
2.39	3000	750	80	CM102-80T24030A1□□□□	T3R0 A	2023
3.50	2000	730	80	CM102-80T35020A1□□□□	T3R0 A	2022
4.00	2500	1000	80	CM102-80T40025A1□□□□	T4R5 A	2045
			130	CM102-130T40025A1□□□□	T4R5 A	2044
	3000	1200	110	CM102-110T40030A1□□□□	T6R0 A	2068
5.00	2500	1300	130	CM102-130T50025A1□□□□	T6R0 A	2069
	3000	1500	110	CM102-110T50030A1□□□□	T6R0 A	2070
6.00	2000	1200	110	CM102-110T60020A1□□□□	T4R5 A	2047
	2500	1500	130	CM102-130T60025A1□□□□	T6R0 A	2071
	3000	1800	110	CM102-110T60030A1□□□□	T6R0 A	2073
7.70	2500	2000	130	CM102-130T77025A1□□□□	T7R5 A	2081
10.00	1000	1000	130	CM102-130T10110A1□□□□	T4R5 A	2046
	1500	1500	130	CM102-130T10115A1□□□□	T6R0 A	2072
	2500	2600	130	CM102-130T10125A1□□□□	T10R A	2105
15.00	1500	2300	130	CM102-130T15115A1□□□□	T10R A	2104
380V						
Rated Torque (Nm)	Revolution (rpm)	Power (W)	Flange	Servo Motor Model	Drive Model	Motor Code
4.00	3000	1200	110	CM102-110F40030A1□□□□	F4R0 A	4007
5.00	2500	1300	130	CM102-130F50025A1□□□□	F4R0 A	4009
	3000	1500	110	CM102-110F50030A1□□□□	F6R0 A	4025
6.00	2000	1200	110	CM102-110F60020A1□□□□	F4R0 A	4008

	2500	1500	130	CM102-130F60025A1□□□□	F4R0 A	4011
	3000	1800	110	CM102-110F60030A1□□□□	F6R0 A	4026
10.00	1500	1500	130	CM102-130F10115A1□□□□	F4R0 A	4010
	2000	2000	130	CM102-130F10120A1□□□□	F6R0 A	4028
	2500	2600	130	CM102-130F10125A1□□□□	F6R0 A	4029
Rated Torque(Nm)	Revolution (rpm)	Power (W)	Flange	Servo Motor Model	Motor Code	Motor Code
15.00	1500	2300	130	CM102-130F15115A1□□□□	F6R0 A	4027
	2000	3000	150	CM102-150F15120A1□□□□	F8R5 A	4044
	2500	3800	130	CM102-130F15125A1□□□□	F8R5 A	4045
	2500	3800	150	CM102-150F15125A1□□□□	F12R A	4060
17.20	1500	2700	180	CM102-180F17115A1□□□□	F8R5 A	4043
18.00	2000	3600	180	CM102-150F18120A1□□□□	F8R5 A	4048
19.00	1500	3000	180	CM102-180F19115A1□□□□	F8R5 A	4047
21.50	2000	4500	180	CM102-180F21120A1□□□□	F12R A	4061
23.00	2000	4700	150	CM102-150F23120A1□□□□	F12R A	4065
27.00	1000	2900	180	CM102-180F27110A1□□□□	F8R5 A	4046
	1500	4200	180	CM102-150F27115A1□□□□	F12R A	4064
		4300	180	CM102-180F27115A1□□□□	F12R A	4062
	2000	5500	150	CM102-150F27120A1□□□□	F20R A	4080
	2500	6800	150	CM102-150F27125A1□□□□	F20R A	4081
35.00	1000	3700	180	CM102-180F35110A1□□□□	F12R A	4063
	1500	5500	180	CM102-180F35115A1□□□□	F12R A	4066
48.00	1500	7500	180	CM102-180F48115A1□□□□	F20R A	4082

CM100 Series Servo Motor and Adaptive Servo Drive

220V						
Rated Torque(Nm)	Revolution (rpm)	Power (W)	Flange	Servo Motor Model	Motor Code	Motor Code
1.30	3000	400	80	CM100-80T13030A1□□□□	T3R0 A	2020
2.00	3000	600	110	CM100-110T20030A1□□□□	T4R5 A	2040
2.40	3000	750	80	CM100-80T24030A1□□□□	T4R5 A	2042
3.30	3000	1000	80	CM100-80T33030A1□□□□	T4R5 A	2043
4.00	2500	1000	130	CM100-130T40025A1□□□□	T4R5 A	2041
	3000	1200	110	CM100-110T40030A1□□□□	T6R0 A	2061
5.00	2000	1000	130	CM100-130T50020A1□□□□	T6R0 A	2060
	2500	1300	130	CM100-130T50025A1□□□□	T6R0 A	2062
	3000	1500	110	CM100-110T50030A1□□□□	T6R0 A	2064
6.00	2000	1500	110	CM100-110T60020A1□□□□	T6R0 A	2063
	2500	1500	130	CM100-130T60025A1□□□□	T6R0 A	2065

	3000	1800	110	CM100-110T60030A1□□□□	T10R A	2100
7.70	2000	1600	130	CM100-130T77020A1□□□□	T6R0 A	2067
	2500	2000	130	CM100-130T77025A1□□□□	T7R5 A	2080
	3000	2400	130	CM100-130T77030A1□□□□	T10R A	2101
10.00	1500	1500	130	CM100-130T10115A1□□□□	T6R0 A	2066
	2500	2600	130	CM100-130T10125A1□□□□	T10R A	2103
15.00	1500	2300	130	CM100-130T15115A1□□□□	T10R A	2102
380V						
Rated Torque (Nm)	Revolution (rpm)	Power (W)	Flange	Servo Motor Model	Motor Code	Motor Code
2.00	3000	600	110	CM100-110F20030A1□□□□	F4R0 A	4000
4.00	2500	1000	130	CM100-130F40025A1□□□□	F4R0 A	4001
	3000	1200	110	CM100-110F40030A1□□□□	F4R0 A	4005
5.00	2000	1000	130	CM100-130F50020A1□□□□	F4R0 A	4002
	2500	1300	130	CM100-130F50025A1□□□□	F4R0 A	4004
	3000	1500	110	CM100-110F50030A1□□□□	F6R0 A	4020
6.00	2000	1200	110	CM100-110F60020A1□□□□	F4R0 A	4003
	2500	1500	130	CM100-130F60025A1□□□□	F6R0 A	4021
	3000	1600	110	CM100-110F60030A1□□□□	F6R0 A	4023
7.70	2000	1600	130	CM100-130F77020A1□□□□	F4R0 A	4006
	2500	2000	130	CM100-130F77025A1□□□□	F6R0 A	4024
	3000	2400	130	CM100-130F77030A1□□□□	F8R5 A	4040
10.00	1500	1500	130	CM100-130F10115A1□□□□	F6R0 A	4022
	2500	2600	130	CM100-130F10125A1□□□□	F8R5 A	4042
15.00	1500	2300	130	CM100-130F15115A1□□□□	F8R5 A	4041

Annex2 Servo Power Cable and Encoder Cable Selection Table

Motor Series	Flange	Servo Drive	Motor Power Cable Model	Motor Encoder Cable Model
CM105 CM102	60、80、90 60、80	T1R8 A T3R0 A T4R5 A	SP-WM0313DI-01 3m SP-WM0513DI-01 5m SP-WM1013DI-01 10m	SP-WD0315AI-01 3m SP-WD0515AI-01 5m SP-WD1015AI-01 10m
CM100	80	T3R0 A T4R5 A	SP-WM0313DB-01 3m SP-WM0513DB-01 5m SP-WM1013DB-01 10m	SP-WD0315AB-01 3m SP-WD0515AB-01 5m SP-WD1015AB-01 10m
CM105 CM102 CM100	110、130 110、130、150 110、130	T3R0 A T4R5 A T6R0 A T7R5 A	SP-WM0320DH-01 3m SP-WM0520DH-01 5m SP-WM1020DH-01 10m	SP-WD0315AH-01 3m SP-WD0515AH-01 5m SP-WD1015AH-01 10m
		T10R A F4R0 A F6R0 A F8R5 A F12R A	SP-WM0320EH-01 3m SP-WM0520EH-01 5m SP-WM1020EH-01 10m	
		F20R A	SP-WM0355EH-01 3m SP-WM0555EH-01 5m SP-WM1055EH-01 10m	
CM105 CM102	180	F8R5 A F12R A	SP-WM0320EJ-01 3m SP-WM0520EJ-01 5m SP-WM1020EJ-01 10m	
		F20R A	SP-WM0355EJ-01 3m SP-WM0555EJ-01 5m SP-WM1055EJ-01 10m	