Installation and Wiring for SV-X2E Series Servo Drive

Hardware Instruction

Manual Number	HPPD0140000EN
Manual Version	V2.2
Date	Mar.2020

Quantity

http://www.hcfa.com.cn

Thank you for purchasing this product. This manual mainly describes the safety use, installation and wiring for SV-X2E series servo drive.

For more details, please refer to <SV-X2E Series Servo Drive User Manual>. Confirm the following items when unpacking:

Number Name

1	Servo drive				
		Connecting terminal	1		
2	A	Cold-pressed terminal	9		
2	Accessories	Crowbar	1		
3	Installation and V	nstallation and Wiring for SV-X2E Series Servo Drive Hardware Instruction			
4	Certificate of C	Certificate of Quality			
		2 Accessories 3 Installation and V	2 Accessories Connecting terminal Cold-pressed terminal Crowbar 3 Installation and Wiring for SV-X2E Series Servo Drive Hardware Instruction		

OCheck if there are some damage to the products during transportation. Any Oquestions, please contact the HCFA Technology

Safety precautions (Read carefully before use)

Please pay attention to the following safety precautions anywhere and any time during acceptance inspection, installation, wiring, operation and maintenance. In this manual, the safety precautions are ranked as "DANGER" and "CAUTION"

DANGER Indicates that incorrect handling may result in death or severe injury. Indicates that incorrect handling may result in medium or slight CAUTION personal injury or physical damage

\bigcirc	Indicates "Prohibitions"(Indicates what must not be done.)
	Indicates "Forced".(Indicates what must be done.)

	DANGER	
	Installing and wiring	
\bigcirc	Do not connect the motor to the commercial power.	To prevent fire or malfunction.
\bigcirc	Do not place the combustibles around the servo motor and drive.	To prevent fire.
	Be sure to protect the drives through the case, and leave specified clearances between the case or other equipment and the drive.	To prevent electric shock, fire or malfunction.
	Install it at the place free from excessive dust and dirt, water and oil mist	To prevent electric shock, fire , malfunction or damage
	Install the equipment to incombustibles, such as metal.	To prevent fire.
	Any person who is involved in wiring and inspection should be fully competent to do the work.	To prevent electric shock.
	FG terminal of motor and drive must be grounded.	To prevent electric shock.
	Perform the wiring correctly after cut off the breaker.	To prevent electric shock, injury, malfunction or damage
	Have the insulation processing when connecting cables.	To prevent electric shock, fire or malfunction.
	Operation and running	
	During operation, never touch the internal parts of the drive.	To prevent burns or electric shock.
	The cables should not be damaged, stressed loaded, or pinched.	To prevent electric shock, malfunction or damage.
	During operation, never touch the rotating parts of the servo motor.	To prevent injury.
	Do not install the equipment under the conditions with water, corrosive and flammable gas.	To prevent fire.
	Do not use it at the location with great vibration and shock.	To prevent electric shock, injury or fire.
	Do not use the servo motor with its cable soaked in oil or water.	To prevent electric shock, malfunction or damage

	Operate the switches and wiring with dry hand.	To prevent electric shock, injury or fire.
	Do not touch the keyway directly when using the motor with shaft-end keyway	To prevent injury.
\bigcirc	Do not touch the motor and drive heat sink, as they are very hot.	To prevent burns or parts damaged.
	Do not drive the motor by external drive.	To prevent fire.
	Other safety instructions	
	Confirm the equipment's safety after the earthquake happens.	To prevent electric shock, injury or fire.
0	Installing and setting correctly to prevent the fire and personal injury when earthquake happens.	To prevent injury, electric shock, fire, malfunction or damage.
	Provide an external emergency stop circuit to ensure that operation can be stopped and power switched off immediately.	To prevent injury, electric shock, fire, malfunction or damage.
	About maintenance and inspecti	on
•	As there's dangerous and high-voltage parts inside the drive, before wiring or inspection, turn off the power and wait for 5 minutes or more. Moreover, do not disassemble the drive.	To prevent electric shock.

	▲ CAUTION	
	Installing and wiring	
	Please follow the specified combination of the motor and drive.	To prevent fire or malfunction
	Do not touch the terminals of connector directly.	To prevent electric shock or malfunction.
	Do not block intake and prevent the foreign matters from entering into the motor and drive.	To prevent electric shock or fire
0	Fix the motor and have the test run away from the mechanical system. After confirming the operation, the motor can be securely mounted to mechanical system.	To prevent injury.
	The servo motor must be installed in the specified direction.	To prevent injury or malfunction
	Install the equipment correctly in accordance with its weight and rated output.	To prevent injury or malfunction
	Operation and running	
	Do not climb or stand on servo equipment. Do not put heavy objects on equipment.	To prevent electric shock, injury, fault or damage.
Į	The parameter settings must not be changed excessively. Operation will be instable.	To prevent injury.
\mathcal{D}	Keep it away from the direct sunlight.	To prevent malfunction.
	Do not put strong impact on the motor, drive and motor shaft.	To prevent malfunction.
	The electromagnetic brake on the servo motor is designed to hold the servo motor shaft and should not be used for ordinary braking.	To prevent injury or malfunction
	When power is restored after an instantaneous power failure, keep away from the machine because the machine may be restarted suddenly (design the machine so that it is secured against hazard if restarted).	To prevent injury.
•	Do not install or operate a faulty servo motor or drive.	To prevent injury, electric shock or fire
	Check the power specification.	To prevent fault.
	The electromagnetic brake may not hold the servo motor shaft. To ensure safety, install a stopper on the machine side.	To prevent injury.
	A sudden restart is made if an alarm is reset with the run signal on.	To prevent injury.
	Connect the relay for emergency stop and for brake in series.	To prevent injury or malfunctior
	Transportation and storage	
2	Do not subject the equipment to the place with rain, waterdrop, poisonous gases or liquids.	To prevent malfunction.
У	Do not carry the servo motor by the cables, shaft or encoder during transportation.	To prevent injury or malfunction
	Do not drop or dump the motor during transportation and installation.	To prevent injury or malfunction
	If you want to store it for a long time, follow the instruction manual.	To prevent malfunction.
	Store the unit in a place in accordance with the instruction manual.	To prevent malfunction.
	Other safety instructions	
	Please dispose the battery according to your local laws	and regulations.
	When disposing of the product, handle it as industrial w	vaste.
	Maintenance and inspection	
2	Do not disassemble and/or repair the equipment on customer side.	To prevent malfunction.
	Do not turn on or switch off the main power frequently.	To prevent malfunction.
Z	Demot touch the serve drive heat sink removes the	To prevent burns or electric
<u> </u>	Do not touch the servo drive heat sink, regenerative resistor, servo motor etc. Their temperatures may be high while power is on or for some time after power-off.	shock.
D	resistor, servo motor etc. Their temperatures may be	

About maintenance and inspection

< Warranty period> The term of warranty for the product is 18 months from the date of manufacture. It's exceptional to brake motors as they are warranted when acceleration / deceleration times is not beyond the specified service life.

- 1 -

However, even during warranty period, the repair cost will be charged on customer in the following cases. 1) A failure caused by improper storing or handling, repair and modification A failure caused by the parts which have dropped down or damaged during transportation
 A failure caused by the parts which have dropped down or damaged during transportation
 A failure caused when the products have been used beyond the product specification
 A failure caused by external factors such as inevitable accidents, including but not limited

(a) A failure catagota by external factors such as inevitable accidents, including but not limited to fire, earthquake, lighthing stroke, windstorm disaster, flood, salt damage, abnormal fluctuation of voltage and other natural disaster.
5) A failure caused by the intrusion of water, oil, metal and other foreign matters. The warranty coverage is only for the product itself. We assume no responsibilities for any losses of opportunity and/or profit incurred by you due to a failure of the product

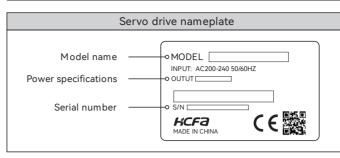
This warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are stated in the instructio

1. Product introduction and model selection

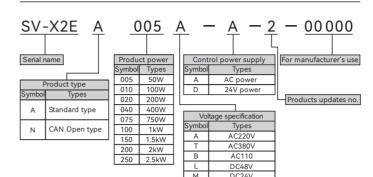
Introduction for servo drive nameplate

< Warranty coverage >

manual and user manual for the Product.



Model name identification



Drive parts name

CANOPEN/485 communication port Settingpanel, parameter setting, adjustment, status display CN3PC communication port Dedicated software^rServostudio •••• to set and adjust parameters Ø Cn1 user I/O interface, command inpu Ø parallel I/O and ABZ output 000 Cn2 encoder interface for connecting L1,L2,L3 220VAC power input interface For 1.5KW or more, "-" is "L3". ø R R R R R Regenerativeresistor interface P&C for connecting regenerative resistor UVW motor power output interface UVW output 0 PE, FG terminals to the ground FG terminal, M4 screw:8mm with spring vasher, chrysanthemum washe

Model selection of peripheral braking resistor

lated output	50W	100W	200W	400W	750W	1kW	1.5kW	2kW
Resistance	40~50Ω	40~0Ω	40~50Ω	40~50Ω	40~ 50Ω	40Ω	40Ω	30Ω
Capacity	40W	40W	40W	40W	40W	50W	60W	80W

2. Product specification

Servo drive specification

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Model Name SV-X2EA:DDLA-A-2-00000 005 010 020 040 075 100 150 200 2 Image: Straight of the			Itomo		Specification								
Applicable motor 50W 100W 200W 400W 750W 10W 15KW 25.8 Dimension H(mm) 165 165 169 Dimension D(m) 151 151 151 Input power Single-phase 200-240V ± 10%; 50%0Hz Single-phase 200-240V Single-phase 200-240V <td< td=""><td colspan="5"></td><td colspan="7"></td><td></td></td<>													
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Protect Air input pulse frequency General inputs: Up to 500KHz, pulse width larger than 12s High-speed inputs: Up to 4MHz, pulse width larger than 12s Depencement of the pulse frequency Protect Input pulse trequency Differential input; Up to 200Kpps, pulse width larger than 12s Depencement of the pulse form Protect Input pulse type Differential input; open-collector Input pulse form Pulse+ direction, A-Phase + B-Phase, CW+CCW Electronic gear ratio AB A: 1~1073741824 B: 1-1073741824, Encoder resolution/10000000 < A/B <encoder 2.5<="" resolution="" td=""> Smoothing Smoothing filter, FIR filter Output pulse form A-Phase; B-Phase; Differential output Z-Phase; Differential output Division ratio Arbitrary frequency division Output pulse Encoder pulse or position Pulse instruction(can be set) Digital input signals Servo ON, alarm reset, speed instruction neversal, zero-spee clamp, internal speed corrol, external forward/reverse torqu limiting, speed limiting, zero-speed clamp, cather off, speed reached, torque limiting, speed limiting, zero-speed clamp, cather off, speed reached, torque limiting, speed limiting, zero-speed clamp, cather off, speed reached, torque limiting, speed limiting, zero-speed clamp etc. Digital output signals Alarm state, servo ready, brake off, speed reached, torque limiting etc. Torque command input Default, setting range adjustable by function</encoder>													
Proto Differential input, open-collector Input pulse type Differential input, open-collector Input pulse form Pulse+ direction, A-Phase + B-Phase, CW+CCW ArB A: 1~1073741824 B: 1-1073741824 Electronic gear ratio ArB A: 1~1073741824 B: 1-1073741824 Smoothing Smoothing filter, FIR filter Output pulse form A-Phase; Differential output Division ratio Arbitrary frequency division Output pulse Encoder pulse or position Pulse instruction reversal, zero-speed clamp, internal speed control, external forward/reverse torqu limit, emergency stop etc. Digital output signals Alarm state, serv oready, brake off, speed reached, torque limiting, speed limiting, zero-speed output, etc. Digital output signals Servo ON, alarm reset, torque instruction negation, zero-speed clamp etc. Digital output signals Servo ON, alarm reset, torque instruction negation, zero-speed clamp etc. Digital output signals Servo ON, alarm reset, torque instruction codes Digital output signals Alarm state, servo ready, brake off, speed reached, torque limiting, zero-speed clamp etc. Digital output signals Servo ON, alarm reset, torque instruction codes Speed limit Positive/ negative speed limit PO3.27, PO3.28 Vibrati				Max input pulse frequency	General inputs: Up to 500KHz, pulse width larger than 1us								\$
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Frede Spectrum Output puise form Z-phase: Differential output or open collector output Division ratio Arbitrary frequency division Division ratio Arbitrary frequency division Output puise Encoder pulse or position Pulse instruction(can be set) Output pulse Encoder pulse or position Pulse instruction reversal, zero-spect clamp, internal speed control, external forward/reverse torque limiting, speed limiting, speed control, external forward/reverse torque limiting, speed climiting, zero-speed output, etc. Digital output signals Alarm state, servo ready, brake off, speed reached, torque limiting, speed climiting, zero-speed climititing, zero-speed climititing, zero-speed climititing,		1 con		Smoothing									
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		ă											
Overvoltage, power supply error, overcurrent, overheat, overload, encoder error, over speed, position deviation too large, parameter error		5			Adj us	st by S							

Note 1) The installation of regenerative resistor is decided by setting panel. For details, refer to 「selection of external regenerative resistors」.Please select the resistor with higher resistance and power when the temperature is too high. Note 2) For input pulse forms, refer to the User Manual

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Common Parameters

5. Wiring

Note 1: Internal 24V power (24V, G24V) can be used as I/O power. But the maximum output current is 150mA, and when driving the output such as relay and brake, please use external independent power. Note 2: Please connect protective circuit (diode) when driving load with inductive component such as relay. Note 3: Output pins can output high level or low level, based on different wiring mode. So perform the wiring

Installation environment conditions

About the environmental conditions, make sure to follow the company's instructions. If you need to use the product outside the scope of the environmental conditions, please consult hcfa Corporation in advance.

- ①Keep it away from the direct sunlight.
- ②Drive must be installed in the cabinet.
- ③Keep it away from the water, oil (cutting oil, oil mist) and moisture.

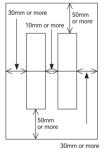
(4) Do not install the equipment under the conditions with water, corrosive and flammable gas.

(5) Free from the dust, iron powder, cutting powder and so on.

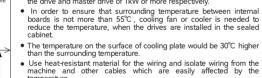
Keep it away from the area with high temperature, excessive vibration and shock

Installation direction and space

Leave sufficient space around the drive to ensure the heat dissipation and convection in the cabinet when installing the drive



Install the drives in the vertical direction. Please use two M5 screws to fix the drive of 750W or less respectively. Use three M5 screws to fix the drive and master drive of 1kW or more respectively.



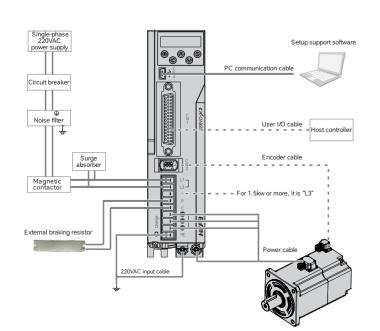
temperature. temperature. • The service life of servo drive depends on the temperature around the electrolytic capacitor. When the electrolytic capacitor is close to the service life, the static capacity will decrease and internal resistance will increase. Consequently, it will lead to overvoltage alarm, malfunction caused by noise and components damage. The service life of electrolytic capacitor is approx. 5 to 6 years under the condition ¹ average annual temperature 30°C, load rate 80% and operation of lear the 20 hours a day on purcerage. less than 20 hours a day on average,

Drive dimension

<u>+₩+</u> +							
	Model			-	Dimensior		Weight
	SV-X2EA	ША-А	4-2-00000	W(mm)	H(mm)	D(mm)	(kg)
т	005	010	020	42	165	151	0.8
	040	075	100	52	165	151	0.9
	150	200	250	65	169	151	1.2

4. Wiring explanation for servo motor and drive

Wiring diagram



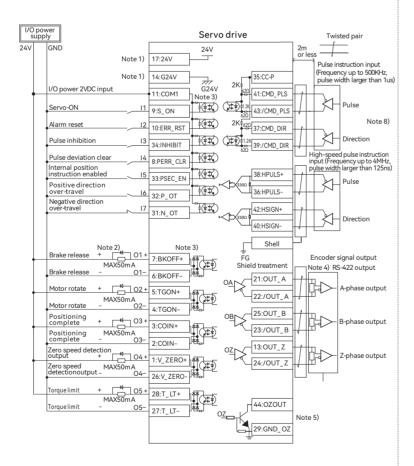
[Points for correct wiring] * A twisted-pair shielded cable should be used when I/O cable length is over 50cm. % The encoder cable should be less than 20m.

A Caution

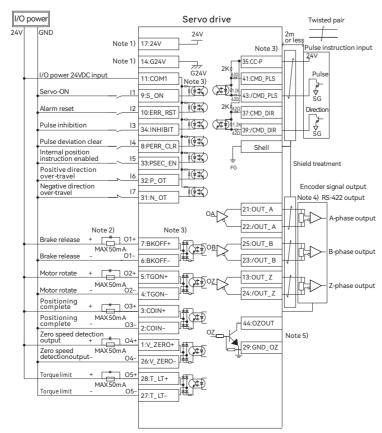
 Please note that there is high voltage in the solid line of wiring diagram when wiring and using. ② The broken lines in the wiring diagram indicates the non-dangerous voltage circuit.

Wiring for user I/O connector (CN1)

Pulse instruction differential input



Pulse instruction 24V open collector input



Note 4: The connecting terminal of differential pulse output signal, differential signal of 485 communication circuits and CANOPEN communication circuits need to be connected the terminal resistor.

Note 5: C2OUT is open-collector output and no manual configuration required. Note 5: C2OUT is open-collector output and no manual configuration required. Note 6: Two kinds of wiring according to the pulse generation mode: NPN and PNP. Note 7: If 5V open-collector circuit is required, be sure to connect an external 3000 resistor. Note 8) Please choose one according to the field demands between pulse instruction input and high-speed pulse input. * DI function can be configured by function code flexibly. DI becomes valid when connected and the positive/ negative logic can be changed by function code.

※ DO function can be configured by function code flexibly. DO becomes valid when connected and the positive/ negative logic can be changed by function code.

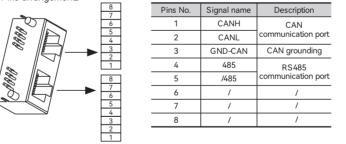
Description of User I/O connector (CN1) terminal arrangements

Terminal arrangements

15 14 13 G24 OUTZ	12 11 10 COM1 12	9 8 11 14	7 6 01+ 01-	5 02+	4 02-	3 03+	2 03-	1 04+	
30 29 28 18 GND_OZ 05+	27 26 05- 04-	25 24 OUTB /OUTZ /	23 22 OUTB /OUTA 0	21 20 UTA 20	19	18	+2	7 1 4V	6
44 43 OZOUT /CMD_PLS	42 41 40 CMD_PLS	0 <u>39</u> 38 /CMD_DIR	37 36 CMD_DIR	СС_Р	34 13	33 15	32 16	31 17	Γ
							_		
 Connector 	15-6-0 C	000	0000	00	00	$) \cap$	27	-1	

485 communication /CANOPEN wiring

Pins arrangements



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Recommended wire/cable

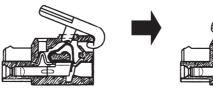
Cable name	AWG	UL	Heat resistance	Remarks
Motor power cable (750W or less)		2517	105℃	
Motor power cable (1KW or more)	14 Note 1)	2501	105°C	
220VAC input (750W or less) ※Including FG cable	18	1015	105℃	
220VAC input (1KW or more) ※Including FG cable	14 Note 1)	1015	105°C	
Encoder	Power: 22 Signal: 24	20276	80°C	5P(10-core) shielded cable: max. 20r (when using twisted shielded cable)
User I/O	26	1007	80°C	Twisted shielded cable Recommend cable: 50m or less
Regenerative resistor connection	18	1015	105°C	
Brake	18	2517	105°C	1P(2-core)
Communication among drives Note 2	28	20539	80°C	10-core, accessories (2.54mm space)

The length of cable depends on the actual situation. Note 1) AWG16 cable can be used for 1kW motor Note 2) For multi-axial drive

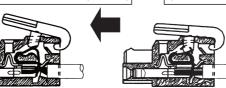
Wiring for power connector (L1/L2/L3,U/V/W) of servo drive

The crowbar bundled in the package is needed when wiring

1). Steps of cable connection



1) Crowbar installed on the bracket (Removable) 2) Press crowbar in the direction of arrow



4) Loosen the crowbar. 3) Insert cable in the direction of arrow while pressing the crowbar.

Parameter Parameter name Description No. Aotor positive direction lefinition P00.00 heck the positive direction of the motor rotation, generally by defaul Set the "Real time auto-tuning" to 1 or 2, change the rigidity, the serve gain parameter adjust automatically. Set it to 0, adjust the gain parameter by manual Real time auto-tuning P00.02 P00.03 Stiffness grade setting P00.04 oad inertia ratio Set up the ratio of the load inertia against the rotor (of the motor) inertia Pulse output positive lirection definition Set the reversal of pulse output B-phase, generally by default P00.16 osition deviation too rge threshold Set excess range of positional deviation by the command unit (defaul P00.19 Select either to use built-in brake resistor or externally install the brak resistor. Default setting: 1 (external). No need to change. P00.21 rake resistor setup Set the external resistor capacity and resistance in accordance with the actual conditions. For the resistance, please refer to Model selection of peripheral braking resistor in Instruction Manual. xternal regenerative esistor capacity P00.22 xternal regenerative sistor resistance value P00.23 P03.08 Torque limit source P03.09 Internal forward torque limi Set the torque limit source and setting value, generally internal torque imit by default. Default value 300%. P03.10 Internal reverse torque limit P03.11 External forward torque limi P03.12 External reverse torque lim P09.00 Modbus/CANOPEN axis addres P09.01 Modbus baud rate Set the parameters related to the communication. P09.02 Modbus data format P09.03 Communication response dela lexadecimal, check from the right to left " digit: 0, CANOpen communication; 1, AO function ^{ed} digit: Allowable message missing value in synchronous mode " digit: EtherCAT synchronization; 0, strict synchronization; 1 Nonextict surpresentation Selection of AO function or CAN communication P09.12 1, Non-strict synchronization th digit: For manufacturer's use Hexadecimal, check from the right to left 1" digit, CAN communication baud rate: 0, 20k; 1, 50k; 2, 100k; 3, 125k; 4, 250k; 5, 500k; 6, 800k; 7, 1M 2rd digit, gear ratio selection: 0: set by the drive; 1: set by the master station. 3" digit, the unit of speed. 0: using internal unit; 1: using user unit 4" digit, the unit of acceleration speed 0: using internal unit; 1: using user unit CAN communication configuration 1 P09.13 Hexadecimal, check from the right to left ^t digit, bus fault detection, 0: OFF, 1: ON AN communication Infiguration 2 P09.14 ^d digit, origin completion flag storage in absolute system 0: No storage; 1: Store

■ Position control mode – External pulse input

Parameter No.	Parameter name	Description
P00.01	Control mode selection	Set it to 0 – Position control mode
P00.05	Position instruction source	Set it to 0-Pulse instruction
P00.07	Pulse train form	Select one of the following pulse format 0-Direction + pulse, positive logic 1-Direction + pulse, negative logic 2-A-phase+ B-phase orthrogonal pulse, 4 multiplication, positive logic
P00.27	High-speed pulse train form	3-A-phase+ B-phase of thogonal pulse, 4 multiplication, negative logi 4-CW +CCW, positive logic 5-CW +CCW, negative logic
P00.08	Instruction units per motor one revolution (32-bit)	0 Unit/Turn ~1073741824 Unit/Turn
P00.10	Electronic gear numerator 1	1~1073741824(Electronic gear is valid when setting P00.08 to 0
P00.12	Electronic gear denominator	1~1073741824(Electronic gear is valid when setting P00.08 to 0

■ Position control mode –Internal multi-stage position command

Parameter No.	Parameter name	Description
P00.01	Control mode selection	Set it to 0 – Position control mode
P00.05	Position instruction source	Set it to 2-Internal position command
P00.08	Instruction units per motor one revolution	0 Unit/Turn ~ 1073741824 Unit/Turn
P00.10	Electronic gear numerator 1	1~1073741824(Electronic gear is valid when setting P00.08 to 0)
P00.12	Electronic gear denominator	1~1073741824(Electronic gear is valid when setting P00.08 to 0)
P08.01	Starting stage number	Set the Start stage No. of internal position command (1-P08.02)
P08.02	Ending stage number	Set the End stage No. of internal position command (P08.01-16)
P08.06	Internal position control 1st stage length	-1073741824 ~ 1073741824
P08.08	Internal position control 1st stage max speed	1 ~ 9000rpm
P08.09	Internal position control 1st stage acceleration/deceleration time	0 ~ 65535ms
P08.10	Waiting time after internal position control 1st stage completed	0 ~ 65535ms
P08.11-P0	08.85	Arrange by the order of parameter from the 1st stage position command, then from the 2nd stage to 16th stage in turn
Notes	When using internal position com (internal position command enab	

■ Relate	Related parameters for internal multi-speed control						
Parameter No.	Parameter name	Description					
P00.01	Control mode selection	Set to 1 – Speed control mode					
P03.00	Speed command source	Set to 3-internal multi-stage speed 1-16 switchover					
P03.14	Acceleration time 1	Set the acceleration/deceleration time, range is between					
P03.15	Deceleration time1	0 and 65535ms					
P03.36- P03.51	Speed from segment 1 to 16	Parameter P03.36 is the 1st stage speed and so on P03.51 the 16th stage speed. Initial value is 0 and make the setting by the actual usage					
Notes	When using internal multi- by the switch combination	stage speed, set the DI function 6-9 and select the speed					

Fault and warning code description

Code and name	Cause	What to do
Err. 001: System parameter error	 Control circuit power suddenly drops; After updating servo software, some previously saved parameters exceed settings range. 	 Make sure input power is within specified rang Set P20.06=1 to initialized system parameters.
Err.002: Product model selection fault	 Encoder cable connection broken or loose; Invalid drive or motor model. 	 Check and fasten encoder cable; Replace with valid drive or motor model.
Err. 003: Fault during ' parameter storage	1. Parameter reading/writing too frequent; 2. Parameter storage component fault; 3. Control circuit power unstable; 4. Drive fault.	 Check if upper controller is reading/writing E2PROM too frequent; Check control circuit power cable and ensur control circuit power voltage is within specified range.
Err.004: FPGA fault	Software version fault.	Check if software version is correct.
Err.005: Product matching fault	 Encoder cable connection broken or loose; Use third-party encoder which is not supported; Motor capacity and drive capacity don't match. Motor capacity class is larger than or two levels of the drive; Product model code doesn't exist. 	 Check and fasten encoder cable; Replace products that don't match; Choose correct encoder type or replace the driv
Err.006: Software abnormal	1. System parameter abnormal; 2. Drive internal fault.	Set P20.06=1 to initialized system parameters and restart power.
Err.007: Incremental encoder UVW abnormal	Encoder signal abnormal at power on.	Check or replace encoder cable.
Err.008: Short circuit to ground d etection fault	1. UVW wiring fault; 2. Motor breakdown; 3. Drive fault.	 Check if UVW is short circuited to ground. It so replace cable; Check if motor cable or grounding resistance is abnormal. If so replace the motor.
Err.009: Overcurrent faultA	I. Instruction input is too fast; 2. Regenerative resistor too small or short circuited; 3. Motor cable bad contact; 4. Motor cable grounding; 5. Motor UVW short circuited; 6. Motor burnt; 7. Software detected power transistor overcurrent	 Check instruction input time sequence and input after S-RDY; Replace regenerative resistor; Check and fasten encoder cable; Replace motor if UVW insulation resistor is broken; Check if UVW is short circuited; Replace motor if UVW don't have equal resistance; Reduce load, use bigger drive and motor, increase acceleration/deceleration time.
Err.010: Overcurrent fault B	 Instruction input is too fast; Regenerative resistor too small or short circuited; Motor cable ad contact; Motor cable grounding; Motor UVW short circuited; Motor burnt; Software detected power transistor overcurrent 	 Check instruction input time sequence and input after S-RDY; Replace regenerative resistor; Check and fasten encoder cable; Replace motor if UVW insulation resistor is broken; Check if UVW is short circuited; Replace motor if UVW don't have equal resistance; Reduce load, use bigger drive and motor, increase acceleration/deceleration time.
Err.012: Incremental encoder Z breakage or absolute encoder number of turns abnormal	Incremental encoder: Z-phase signal loss due to cable breakage or encoder fault; Absolute encoder: battery shortage, encoder cable plugging & unplugging during power off, or after P06.47=1 not initialize the encoder.	 Rotate motor shaft manually, if error still occurs, replace cable or encoder; Replace battery if undervoltage; P20.06=7 and initialize.
Err.013: Encoder communication abnormal	 Communicational encoder cable breakage; Encoder not grounded; Communication verification abnormal. 	1. Check or replace encoder cable; 2. Check if encoder is grounded properly.
Err.014: Encoder data abnormal	 Serial encoder breakage or bad contact; Serial encoder data reading/writing abnormal 	Check or replace encoder cable.
Err.015: Encoder battery undervoltage	Encoder battery voltage is less than P06.48 and ten's place of P06.47 is 1.	Replace encoder battery.
Err.016: Speed deviation too large	Speed instruction and speed feedback deviation exceeds settings of P06.45.	 Increase P06.45 value; Increase acceleration/deceleration time or increase system responsiveness; Set P06.45=0 to disable speed deviation to large function.
Err.017: Torque saturation overtime	Torque maintains saturated for time longer than settings of P06.46.	1. Increase P06.46 value; 2. Check if UVW is broken.
Err.019: Tripping	Incorrect wiring may make the control circuit diverge and result in motor stall.	 Check UVW and encoder wiring. Check the motor and drive. Replace it when necessary.
Err.020: Overvoltage	 Input power voltage exceeds 280VAC; Regenerative resistor breakage or not matching; Load inertia exceeds allowable range; Drive broken. 	 Check input power voltage; Check or replace regenerative resistor; Increase acceleration/deceleration time or replace more suitable drive/motor.
Err.021: Undervoltage	 Input power voltage drops; Instantaneous power off; P06.36 setting is too high; Drive broken (Note: No storage record for this fault by default, but can be set by P07.22.) 	1. Make sure input power is stable; 2. Reduce P06.36 value if input power is norma
Err.022: Current sampling fault	Drive internal current sampling fault.	Replace servo drive.

Code and name	Cause	What to do
Err.024: Overspeed	Not enabled: 1. The drive does not match. 2. Incorrect encoder wiring Enabled: 1. Speed instruction exceeds maximum speed setting value; 2. Wrong UVW phase sequence; 3. Speed response over modulation; 4. Drive faulty	Not enabled: 1. Contact manufacturer 2. Check encoder wiring Enabled: 1. Lower speed instruction 2. Check if UVW phase sequence is correct; 3. Adjust speed loop gains to reduce over shoot; 4. Replace drive
Err.025: Electrical angle identification failure	1. Load or inertia too large; 2. Wrong encoder cable wiring	1. Reduce load or increase current loop gains 2. Replace encoder cable.
Err.026: Load identification failure	 Load or inertia too large. Motor cannot run at specified curves; Verification process aborted by other faults. 	1. Reduce load or increase current loop gains 2. Make sure verification process correct.
Err.027: DI parameter setting fault	 Different DOs are assigned with same function; Physical DI and communicational DI have definition conflicts 	Reassign DI functions
Err.028: DO parameter setting fault	Different DOs are assigned with same function	Reassign DO functions
Err.040: S-ON instruction invalid fault	Input S-ON signal after motor is energized by other auxiliary functions	Change incorrect operation.
Err.042: Pulse division output overspeed	Pulse division output is over upper limit.	Adjust pulse division output settings.
Err.043: Position deviation too large	 Servo motor UVW wiring is wrong; Servo drive gain settings are too low; Position instruction pulse frequency is too high; Position instruction acceleration is too large; P00.19 setting is too low; Servo drive/motor faulty; 	1. Reconnect the cables 2. Increase servo gains 3. Reduce instruction frequency, acceleration or adjust gear ratio 4. Set up smoothing parameters; 5. Adjust the value of P00.19 6. Replace the drive
Err.045: Drive output phase loss	1. Motor UVW bad contact; 2. Motor broken	1. Check UVW wiring 2. Replace motor
Err.046: Drive overload	 Motor UVW or encoder cable bad contact or loose Motor blocked or brake not released Wrong UVW/encoder cable wiring for multiple drives/motors Motor/drive too small for load Phase loss or wrong phase sequence Motor or drive broken 	1. Check UVW/encoder cable wiring 2. Check motor is not blocked and brake is released 3. Check there is no wrong UVW/encoder cable wiring for multiple drives/motors 4. Increase acceleration/deceleration time or choose bigger drive/motor 5. Check UVW wiring 6. Replace drive/motor Note: If this fault occurs, please wait for more than 10mins to operate the motor after restarting the power.
Err.047: Motor overload	Motor UVW or encoder cable bad contact or loose Motor blocked or brake not released Wrong UVW/encoder cable wiring for multiple drives/motors Motor/drive too small for load S. Phase loss or wrong phase sequence Motor or drive broken	1. Check UVW/encoder cable wiring 2. Check motor is not blocked and brake is released 3. Check there is no wrong UVW/encoder cable wiring for multiple drives/motors 4. Increase acceleration/deceleration time or choose bigger drive/motor 5. Check UVW wiring 6. Replace drive/motor
Err.048: Electronic gear setting fault	Electronic gear ratio exceeds setting range	Set correct electronic gear
Err.049: Heatsink too hot	1. Fan broken 2. Ambient temperature is too high 3. Too many times of restarting power after overload 4. Inappropriate installation directions and spacing 5. Servo drive faulty 6. Motor or drive broken	 Check fan. Replace fan or drive Measure ambient temperature and improvec cooling conditions for servo drive Check error records and see if there has been overload error. Restart after 30s. Increase acceleration/deceleration time. Install the servo drive according to specifications in this manual. Power off and wait for 5 minutes. If this error persists, replace drive.
Err.050: Pulse input abnormal	 Input pulse frequency is larger than maximum frequency setting Input pulse is interfered. 	 Adjust P06.38 Check wiring grounding conditions. Use twisted-pair shielded cable. Separate UVW cable from encoder cable.
Err.054: User forced fault	User uses DI of function 32 FORCE_ERR to forcibly enter faulty state.	Disconnect DI of function 32.
Err.055: Absolute position resetting fault	Absolute encoder absolute position resetting faulty.	Contact hcfa.
Err.056: Main circuit outage	Power outage or main circuit abnormal	Check if there is instantaneous power failure. Increase power voltage capacity.
Err.060: First start after writing customized software	First start after writing customized software	Initialize the servo drive.
Err.065: CAN bus OFF	CAN bus disconnection or abnormal reception or sending	Check wiring and reconnect
Err.066: Abnormal NMT command	NMT stop command or reset command received at servo-ON	NMT node reset. Do not stop or reset CAN nod at servo-ON.
Err.067: CAN bus fault	CAN bus disconnection or abnormal reception or sending	Check wiring and reconnect
Err.068: External overspeed (reserved)	 Speed command exceeds max. speed UVW phase sequence is wrong Speed response severely overshoot Servo drive faulty 	1. Reduce speed command 2. Check UVW phase sequence 3. Adjust speed loop gain 4. Replace drive

Code ar	nd name		Cause		What to do		
Err.069: Hybrid d too large	leviation	2. Ex	ternal encoder disconne ternal encoder faulty juipment drive failure	ect	 Check/replace external encoder or wiring Check/replace external encoder or wiring Check mechanical drive part and repair it 		
Err.071: Node pro or hearth timeout			esponse when node pro beat monitoring reache		Check if the node is online and NMT node res		
Err.072: Synchronization failure			hronization failure with oller in CANOpen IP mo		NMT node reset, or 6040 send error reset command		
Err.073: CANOpen track buffer underflow			hronous clock lost more s in CANOpen IP or CSF		Check the communication line for interferenc and confirm that the host computer operates normally. NMT node reset, or 6040 send error reset command		
Err.074: CANOpen track buffer overflow		syncł clock	NOpen IP or CSP mode nronous clock is too fast, frequency is inconsisten g value.	or the actual	Check the communication line for interference and confirm that the host computer operates normally and if the clock frequency is consistent with setting value. NMT node rese or 6040 send error reset command		
AL.080: Undervo warning		DC b	us voltage is relatively l	ow.	1. Check main circuit. 2. Adjust P06.36		
AL.081: Drive overload warning		Motor UVW or encoder cable bad contact or loose Motor blocked or brake not released Wrong UVW/encoder cable wiring for multiple drives/motors Motor/drive too small for load Phase loss or wrong phase sequence Motor or drive broken		t released e wiring for bad	1. Check UVW/encoder cable wiring 2. Check motor is not blocked and brake is released 3. Check there is no wrong UVW/encoder cat wiring for multiple drives/motors 4. Increase acceleration/deceleration time or choose bigger drive/motor 5. Check UVW wiring 6. Replace drive/motor Note: if this fault occurs, please wait for more transition to operate the motor after creater the new series of the series o		
AL.082: Motor overload warning		Motor UVW or encoder cable bad contact or loose Z. Motor blocked or brake not released Wrong UVW/encoder cable wiring for multiple drives/motors Motor/five too small for load Phase loss or wrong phase sequence Motor or drive broken		t released e wiring for oad	restarting the power. 1. Check UVW/encoder cable wiring 2. Check motor is not blocked and brake is released 3. Check there is no wrong UVW/encoder cat wiring for multiple drives/motors 4. Increase acceleration/deceleration time or choose bigger drive/motor 5. Check UVW wiring 6. Replace drive/motor Note: If this fault occurs, please wait for more than 10mins to operate the motor after restarting the power.		
AL.083: Paramet modifica needs po restart	ter ition ower	Modify parameters which needs restarting.		ds restarting.	Restart power		
AL.084: Servo no	ot ready	S-ON when servo is not ready.		ły.	S-ON after detecting S-RDY signal.		
AL.085: EEPROM frequency writing warning		Operating EEPROM too frequent.		uent	Reduce EEPROM using frequency. Use communication2 which do not save in EEPRON		
AL.086: Positive over-travel warning		1. P_OT & N_OT valid simultaneously 2. Servo over-travel in some directions. Can be removed automatically.		directions.	Trigger positive limit switch, check operation mode, move the servo towards negative direction. After leaving positive limit switch, th alarm will be removed automatically.		
AL.087: Negative over-travel warning		1. P_OT & N_OT valid simultaneously 2. Servo over-travel in some directions. Can be removed automatically.		directions.	Trigger negative limit switch, check operation mode, move the servo towards positive direction. After leaving negative limit switch, this alarm will be removed automatically.		
AL.088: Positive i overspee	instruction d		ectronic gear ratio too la lse frequency too high	rge	1. Reduce electronic gear ratio 2. Reduce pulse frequency		
	encoder tialization	Angle	e is over 7.2 degree.		Replace motor		
warning AL.093: Regenerative overload		 Regenerative resistor wrong wiring or bad contact; Internal resistor wiring breakage; Resistor capacity insufficient; Resistor resistance too large and causing long time braking; Input voltage exceeds specifications Resistor resistance, capacity or heating time constant parameters settings are wrong; Drive faulty 		akage; ent; ge and cifications city or	1. Check resistor wiring 2. Check internal resistor wiring; 3. Increase resistor capacity 4. Reduce resistor resistance; 5. Reduce input voltage 6. Set correct parameters 7. Replace drive		
AL.094: Regener resistor	rative too small	 External regenerative resistor is less than minimum value Wrong parameter settings 			1. Replace resistor 2. Check parameters P00.21~P00.24		
AL.095: Emerge	ncy stop	Eme	rgency stop is triggered.		This is a normal DI function (function 30)		
AL.096: Homing	error	2. P0 co 3. Co	ming time exceeds P08 8.90 is set is 3, 4, or 5 a ntacted limit switches ntact limit switches twic ing limit switches as orig	nd e when not	1. Increase the value of P08.95; 2. Reduce homing speeds P08.92, P08.93		
AL.097: Encoder undervo		Enco what	der battery voltage is l 's set in P06.48.	ower than	Replace battery.		
DI/D	00 fur	ncti	on code				
DI fun	ction de	scrip					
Value	Sigr	1	Name	lau-li Le	Remarks		
1	S_01	١	Servo enable		rvo disabled vo enabled		
2	ERR_R	ST	Error reset		i continue to work after some error reset. n detecting edge changes.		
3	GAIN_S	EL	Gain switchover	Invalid-Sp	eed loop is PI control.		
3		Gain switchovor		Valid when detecting edge changes. Invalid-Speed loop is PI control. Valid-Speed loop is P control.			

Invalid: present command is A Valid: present command is B

Invalid-No action Valid-Clear pulse deviation

CMD_SEL

PERR_CLR

mmand switchove

Pulse deviation clear

4

5

Value	Sign	Name	Remarks					
6	MI_SEL1	16 operation commands switchover						
7	MI_SEL2	16 operation commands switchover	16 position commands or speed commands can be					
8	MI_SEL3	16 operation commands switchover	executed via DI terminals.					
9	MI_SEL4	16 operation commands switchover	Switchover of control modes(anoid position torow)					
10	MODE_SEL	Control mode switchover	Switchover of control modes(speed, position, torque) when P00.01 is set to 3, 4 or 5.					
12	ZERO_SPD	Zero-speed clamp	Valid-Enable zero-speed clamp Invalid-Disable zero-speed clamp					
13	INHIBIT	Pulse input inhibition	Valid-Disable pulse input Invalid-Enable pulse input					
14	P_OT	Positive over-travel	Use with limit switches for over-travel protections. Valid-Positive over-travel, positive drive disabled Invalid-Normal range, positive drive enabled					
15	N_OT	Negative over-travel	Use with limit switches for over-travel protections. Valid-Negative over-travel, positive drive disabled Invalid-Normal range, positive drive enabled					
16	P_CL	External forward torque limit	Valid-External torque limit enabled Invalid-External torque limit disabled					
17	N_CL	External forward torque limit	Valid-External torque limit enabled Invalid-External torque limit disabled					
18	P_JOG	Positive JOG	Valid-Input instructions Invalid-Stop inputting instructions					
19	N_JOG	Negative JOG	Valid-Reverse input instructions Invalid-Stop inputting instructions					
20	GEAR_SEL1	Electronic gear	GEAR_SEL1 invalid, GEAR_SEL2 invalid: electronic gea GEAR_SEL1 valid, GEAR_SEL2 invalid: electronic gear					
21	GEAR_SEL2	selection	GEAR_SEL1 invalid, GEAR_SEL2 valid: electronic gear 3 GEAR_SEL1 valid, GEAR_SEL2 valid: electronic gear 4					
22	POS_DIR	Position instruction negation	Invalid-Not reverse; Valid-Reverse					
23	SPD_DIR	Speed instruction negation	Invalid-Not reverse; Valid-Reverse					
24	TOQ_DIR	Torque instruction negation	Invalid-Not reverse; Valid-Reverse					
25	PSEC_EN	Internal multi-stage enable	Invalid-Disable internal multi-stage instruction; Valid-Enable internal multi-stage instruction					
26	INTP_ULK	Interrupt positioning release	Invalid-No action; Valid-when P08.86 is set to 2 or 4					
27	INTP_OFF	Interrupt positioning inhibit	Invalid-No action; Valid-When P08.86 is set to non-zero value					
28	HOME_IN	Homing origin point	Can be used as home position signal or deceleration-po position signal					
29	STHOME	Homing start	Start homing.					
30	ESTOP	Emergency stop	Invalid-No action Valid-Emergency stop					
31	STEP	Step enable	Valid-Step enable; Invalid-Instruction is 0					
32	FORCE_ERR	Forced error protection	Invalid-No action Valid-Forced error protection					
34	INTP_TRIG	Interrupt positioning trigger	Invalid-No action; Valid-Valid: when P08.86 is set to non-zero value, can only use DI8 or DI9.					
35	INPOSHALT	Pause generation of internal position command	nvalid: No action Valid: Decelerate and pause internal multi-stage position and interrupt positioning					
37	EN C_SEN	SEN enabled absolute position data sending	Invalid: No action Valid: OAOBOZ send absolute position data, and the se cannot be enabled.					
DOF	unction docor	intion						
	Inction descri		Denvente					
Value 1	Sign S_RDY	Name Servo ready	Remarks Valid-Servo ready					
			Invalid-Servo not ready					

Value	Sign	Name	Remarks
1	S_RDY	Servo ready	Valid-Servo ready Invalid-Servo not ready
2	S_ERR	Servo error	Valid when detecting error
3	S_WARN	Servo warning	Valid when warning signal output (connected)
4	TGON	Motor rotation	Valid-When motor speed is larger than speed limit value. Invalid-Invalid motor rotation signal
5	V_ZERO	Motor speed is 0	Valid-Motor speed is 0. Invalid-Motor speed is non-zero.
6	V_CMP	Speed conformity	Speed control, valid when absolute deviation of motor speed and speed instruction is less than the settings of P04.44.
7	COIN	Positioning completed	Position control, valid when pulse deviation is less than the settings of P04.47.
8	NEAR	Positioning near	Position control, valid when pulse deviation is less than the settings of P04.50.
9	T_LT	Torque in limit	Valid-Motor torque is in limit Invalid-Motor torque is not in limit
10	V_LT	Speed in limit	Valid-Motor speed is in limit Invalid-Motor speed is not in limit
11	BKOFF	Brake release	Valid-Break release Invalid-Break recover
12	T_ARR	Torque reached	Valid when torque feedback reaches the settings of P04.55; allowable fluctuations set in P04.56.
13	V_ARR	Speed reached	Valid when speed feedback reaches the settings of P04.45; allowable fluctuations ±10rpm
15	INTP_DONE	Interrupt positioning complete	Output after interrupt positioning complete
16	DB_OUT	Dynamic brake output	External relay/contactor and current-limiting resistor is require
17	HOME	Homing complete	
18	INTP_WORK	Interrupt positioning working	Interrupt positioning working
19	PCOM1	Position 1 comparison trigger signal	Output trigger signal when position 1 reaches the corresponding range

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DO fu	unction descr	iption	
Value	Sign	Name	Remarks
20	PCOM2	Position 2 comparison trigger signal	Output trigger signal when position 2 reaches the corresponding range
21	PCOM3	Position 2 comparison trigger signal	Output trigger signal when position 3 reaches the corresponding range
22	PCOM4	Position 4 comparison trigger signal	Output trigger signal when position 4 reaches the corresponding range

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Parar num	neter iber	Description	Co P	ntrol m	ode T
	20	First vibration attenuation frequency	•	•	-
σр	21	First vibration attenuation filter setting	•	•	-
02	22	Second vibration attenuation frequency	•	•	-
Gr	23	Second vibration attenuation filter setting	•	•	-
02 Group Vibration uppression Parameters	31	Resonance point 1 frequency	•	•	•
p ∨i P P	31		•	•	•
bra ara	33	Resonance point 1 bandwidth	•	•	•
tion		Resonance point 1 amplitude	•	•	•
ters	34	Resonance point 2 frequency	•	-	-
	35	Resonance point 2 bandwidth	•	•	•
	36	Resonance point 2 amplitude	•	•	•
_			Ca	ntrol m	odo
Parar num		Description		1	
nun			Р	S	Т
	00	Speed instruction source selection	-	•	-
	03	Speed instruction digital setting	-	•	-
	04	JOG speed setting	-	•	-
	08	Torque limit source	•	•	-
	09	Internal forward torque limit	•	•	-
	10	Internal reverse torque limit	٠	•	-
	11	External forward torque limit	•	•	-
	12	External reverse torque limit	•	•	-
<u> </u>	14	Acceleration time 1	-	•	•
P03 G roup Speed & Torque Control P arameters	15	Deceleration time 1	-	•	•
3 G	16	Acceleration time 2	-	•	
S PC	17	Deceleration time 2	-	•	-
ara	19	Zero-speed clamp function	-	•	•
spe	20	Zero-speed clamp threshold value	-	•	•
ete	22	Torque instruction source	-	-	•
1 &	25	Torque instruction digital setting value	-	-	•
Tot	26	Speed limit source in torque control	_	-	•
rqu	27	Internal positive speed limit	_	_	•
ē	27	Internal negative speed limit	_	-	•
	20	Hard limit torque limit	•	•	•
	30	Hard limit torque limit Hard limit torque limit detection time	•	•	•
			•	<u> </u>	•
	31	Internal speed instruction segment number selection mode	-	•	-
	32	Acceleration time selection for internal speed segment 1-8	-	•	-
	33	Deceleration time selection for internal speed segment 1-8	-	•	-
	34	Acceleration time selection for internal speed segment 9-16	-	•	-
	35	Deceleration time selection for internal speed segment 9-16	-	•	-
	36~51	Segment 1~16 speed	-	•	-
	00	Normal DI filter selection	•	•	•
	01~08	DI1~DI8 terminal function selection	•	•	•
	11~18	DI1~DI8 terminal logic selection	•	•	•
PO	21~25	DO1~DO5 terminal function selection	•	•	•
P04 Group	31~35	DO1~DO5 terminal logic selection	•	•	•
ro	41	FunINL signal unassigned state (Hex)	•	•	•
	42	FunINH signal unassigned state (Hex)	•	•	•
Dig	43	Motor rotational signal threshold	•	•	•
gita	44	Speed conformity signal width	-	•	-
-	45	Speed reached designated value	•	•	•
ndı	47	Positioning completion range	•	-	-
ťо	48	Positioning completion output setting	•	-	-
utp	49	Positioning completion holding time	•		
Ę		Postdorning completion nording time	•	-	-
	50	Positioning near (NEAR) threshold	-	-	-
Par	50 51		•	- -	- -
Paran		Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0	•	- - •	- -
Paramet	51	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion	•		
Digital Input/output Parameters	51 52	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion	•	•	•
Parameters	51 52 53 55	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value	• • • • • • • • • • • • • • • • • • • •	•	• •
Parameters	51 52 53 55 56	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width	• • • • • •	• • •	• • •
Parameters	51 52 53 55 56 57	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment	• • • • • • • • • • • • • • • • • • • •	• • •	• •
Parameters	51 52 53 55 56	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width	• • • • •	• • • •	• • •
Parameters	51 52 53 55 56 57 58	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold	• • • • • • • • • • •	• • • •	• • •
Parameters	51 52 53 55 56 57 58 00	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit)	• • • • • • • • • • • • •	• • • •	• • • •
Parameters	51 52 53 55 56 57 58 00 02	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit)	• • • • • • • • • • • • • •	• • • •	• • • •
Parameters	51 52 53 55 56 57 58 00 02 02 04	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit)	• • • • • • • • • • • • • • • • • • •	• • • •	• • • •
Parameters	51 52 53 55 56 57 58 00 02 02 04 06	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function	• • • • • • • • • • • • • • • • • • •		• • • • • • • • • • •
Parameters	51 52 53 55 56 57 58 00 02 04 06 09	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Position deviation clearance function Electronic gear ratio switchover delay			• • • •
Parameters	51 52 53 55 56 57 58 00 02 04 06 09 10	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation			• • • • • • • • • • •
	51 52 53 55 56 57 58 00 02 04 06 09 10 11	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections			• • • • • • • • • • •
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Electronic gear numerator 4(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation			• • • • • • • • • • •
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Reverse rotation friction torque compensation			• • • • • • • • • • •
	51 52 53 55 56 57 58 00 02 04 06 09 00 02 04 06 09 10 11 12 13 14	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Reverse rotation friction torque compensation Viscous friction compensation			• • • • • • • • • • •
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Reverse rotation friction torque compensation			
	51 52 53 55 56 57 58 00 02 04 06 09 00 02 04 06 09 10 11 12 13 14	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Reverse rotation friction torque compensation			
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Viscous friction compensation Friction compensation time constant	0 0		
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Viscous friction compensation Friction compensation time constant Friction compensation low speed interval	0 0		
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Reverse rotation friction torque compensation Friction compensation time constant Friction compensation low speed interval Parameter identification rate	0 0		
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19 20	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation PO6.10 / Friction compensation Reverse rotation friction torque compensation Reverse rotation friction torque compensation Friction compensation time constant Friction compensation time constant Parameter identification rate Parameter identification acceleration time			
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19 20 21	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached seignated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06. 10 / Friction corque compensation Reverse rotation friction torque compensation Friction compensation time constant Friction compensation low speed interval Parameter identification rate Parameter identification mode selection		0 0	
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19 20 21 22 23	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached seignated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Viscous friction compensation Friction compensation low speed interval Parameter identification rate Parameter identification mede selection Initial angle identification current limit	0 0	0 0 0 0 0 0	
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19 20 21 22 23 24	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Reverse rotation friction torque compensation Viscous friction compensation Friction compensation lime constant Friction compensation low speed interval Parameter identification acceleration time Parameter identification acceleration time Parameter identification mode selection Initial angle identification current limit Instantaneous power failure protection		• •	
Parameters P06 Group Expansion Parameters	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19 20 21 22 23 24 25	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation PO6.10 / Friction compensation memory selections Forward rotation friction torque compensation Reverse rotation friction torque compensation Friction compensation time constant Friction compensation time constant Priction compensation ince onstant Priction compensation mode selection Initial angle identification current limit Instantaneous power failure deceleration time		0 0 0 0 0 <	
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19 20 21 22 23 24 25 26	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation PO6.10 / Friction compensation memory selections Forward rotation friction torque compensation Reverse rotation friction torque compensation Viscous friction compensation Friction compensation time constant Friction compensation low speed interval Parameter identification rate Parameter identification current limit Initial angle identification current limit Instantaneous power failure protection Servo OFF stop mode selection		0 0	
	51 52 53 55 56 57 58 00 02 04 06 09 10 01 11 12 13 14 15 16 19 20 21 22 23 24 25 26 27	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached seignated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear numerator 4(32-bit) Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Reverse rotation friction torque compensation Priction compensation time constant Friction compensation low speed interval Parameter identification acceleration time Parameter identification mede selection Initial angle identification mode selection Instantaneous power failure potection Second category fault stop mode selection		0 0	
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19 20 21 22 23 24 25 26 27 28	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached seignated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear numerator 4(32-bit) Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Viscous friction compensation Friction compensation time constant Friction compensation low speed interval Parameter identification rate Parameter identification mode selection Initial angle identification mode selection Initial angle identification current limit Instantaneous power failure protection Second category fault stop mode selection Over-travel input setting		0 0 0 0 0 0 0	
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19 20 21 22 23 24 25 26 27 28 29	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached seignated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Viscous friction compensation Friction compensation low speed interval Parameter identification acceleration time Parameter identification mode selection Initial angle identification mode selection Instantaneous power failure protection Second category fault sop mode selection Over-travel input setting Over-travel stop mode selection		0 0 0 0 0 <	
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19 20 21 22 23 24 25 26 27 28 29 30	Positioning near (NEAR) threshold Servo OFF delay time after holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached designated value Torque reached designated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 4(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Position deviation clearance function Potential energy load torque compensation PV6.101 / Friction compensation memory selections Forward rotation friction torque compensation Reverse rotation friction torque compensation Priction compensation time constant Friction compensation time constant Priction compensation mode selection Initial angle identification acceleration time Parameter identification deceleration time Parameter identification deceleration time Parameter identification current limit Instantaneous power failure protection Servo OFF stop mode selection Over-travel input setting Over-travel stop mode selection Input power phase loss protection		0 0 0 0 0	
	51 52 53 55 56 57 58 00 02 04 06 09 10 11 12 13 14 15 16 19 20 21 22 23 24 25 26 27 28 29	Positioning near (NEAR) threshold Servo OFF delay time after holding brake taking action when speed is 0 Speed setting for holding brake to take action in motion Waiting time for holding brake to take action in motion Torque reached seignated value Torque reached signal width Z-pulse width adjustment Zero-speed output threshold Electronic gear numerator 2(32-bit) Electronic gear numerator 3(32-bit) Electronic gear numerator 4(32-bit) Position deviation clearance function Electronic gear ratio switchover delay Potential energy load torque compensation P06.10 / Friction compensation memory selections Forward rotation friction torque compensation Viscous friction compensation Friction compensation low speed interval Parameter identification acceleration time Parameter identification mode selection Initial angle identification mode selection Instantaneous power failure protection Second category fault sop mode selection Over-travel input setting Over-travel stop mode selection		0 0 0 0 0 <	

	meter nber	Description	Co P	ntrol m S	ode T		meter nber	
	33	Tripping protection function	•	•	•		00	Mod
	34	Overload warning value	•	•	•		01	Mod
-	35	Motor overload protection coefficient	•	•	•		02	Mod
P06 Group Expansion Parameters	36	Undervoltage protection point	•	•	•	SP	03	Com
Gr	37	Over-speed error point	•	•	•	P09 Group Commun Setting Parameters	04	Com
oup	38	Maximum input pulse frequency	•	-	-	Group Communication ing Parameters	05	Com
Ē	39	Short circuit to ground detection protection selection	٠	•	•	Par	06	Com
́сра	40	Encoder interference detection delay	•	•	•	Co	07	Com
nsi	41	Input pulse filtering setting	•	-	-	ete	08	Com
on	42	Input pulse inhibition setting	•	-	-	Srs 2	09	Com
Pa	43	Deviation clearance input setting	•	-	-	lica	10	Com
ran	44	High speed DI filtering setting	•	•	•	tion	11	Com
lete	45	Speed deviation too large threshold	•	•	-		12	AO f
SLS	46	Torque saturation overtime setting	•	•	•		13/14/15	CAN confi
	47	Absolute system setting Encoder battery undervoltage threshold	•	•	•		16	Ethe
	49	High-speed pulse input filter	•	•	•		10	Euro
							16	Posi
	00	Panel display selection	•	•	•		17	1 ^{sт} р
	01	Panel monitoring parameter setting 1	•	•	•	po P 1	19	2 nd p
	02	Panel monitoring parameter setting 2	•	•	•	7 E	21	3 rd p
PO	03	Panel monitoring parameter setting 3	•	•	•	P 17 Expansion position contro	23	4 th p
07 (04	Panel monitoring parameter setting 4	•	•	•	cor	25	Effe
ŝro	05	Panel monitoring parameter setting 5	•	•	•	ntro	26	Effe
dn,	08	Function selection 1	•	•	•		27	Effe
Aux	09	Function selection 2	•	•	•		28	Effe
P07 Group Auxiliary function Parameters	10 11	User password Instant power failure immediate memory function	•	•	•		29	Disp
TV I	12	User password screen-lock time	•	•	•	PZP		
fun	14	Fast deceleration time	•	•	•	P 18 Group Motor Parameters	00	Mot
ctic	16	Function selection 3	•	•	•	roup		1100
ň	17	Maximum division number pre motor one revolution	•	_	_	0 -	I I	
ar	19	Function selection 5	•	•	•		00	Pane
me	20	Function selection 6	•	•	•	nte	01	Faul
ete	21	Function selection 7	•	•	•	rfac	03	Para
rs	22	Function selection 8	•	•	•		06	Syst
	23	Faultreset	•	•	•	arai arai	08	Com
	24	Positive soft limit(32-bit)	•	•	•	ame	09	Com
	26	Reverse soft limit(32-bit)	•	•	•	P20 Group Panel and Communication Interface Parameters	11	Mult
							12	Hom
	00	Multi-stage position execution pattern selection	•	-	-		00	C.e.r.
	01	Starting stage number	•	_	_		00	Serv Moto
	02	Ending stage number Restarting pattern of residual stags after pausing	•	_	_		01	Spee
	03	Position instruction type selection	•	_	_		03	Inter
	04	Unit for waiting time	•	_	_		04	Phas
	06/08/09	1 st stage length (32-bit), max speed, acceleration/deceleration time	•	_	_		06	DC
	10	Waiting time after 1 st stage completed	•	-	-		07	Abso
	11/13/14	2 nd stage length (32-bit), max speed, acceleration/deceleration time	•	-	-		09	Elec
	15	Waiting time after 2 nd stage completed	٠	-	-		10	Mec
	16/18/19	$3^{\rm rd}$ stage length (32-bit), max speed, acceleration/deceleration time	•	-	-		11	Load
	20	Waiting time after 3 rd stage completed	•	-	-		12	Spee
	21/23/24	$4^{\rm th}$ stage length (32-bit), max speed, acceleration/deceleration time	•	-	-		13	Posi
	25	Waiting time after 4 th stage completed	•	-	-		15	Inpu
	26/28/29	5 th stage length (32-bit), max speed, acceleration/deceleration time	•	-	-		17	Feed
	30	Waiting time after 5 th stage completed	•	-	-		19	Posi
	31/33/34	6 th stage length (32-bit), max speed, acceleration/deceleration time	•	-	-		21	Digit
	35	Waiting time after 6 th stage completed	•	-	-	P21	23	Digit
-	36/38/39	7 th stage length (32-bit), max speed, acceleration/deceleration time	•	-	-	_ କ	24	Enco
300	40	Waiting time after 7 th stage completed	•	-	-	l ou	25	Tota Mod
P08 Group Gain adjustment	41/43/44 45	8 th stage length (32-bit), max speed, acceleration/deceleration time Waiting time after 8 th stage completed	•	-	-	Group Status Parameters	31 32	Mod Num
Ino.	45 46/48/49	9 th stage length (32-bit), max speed, acceleration/deceleration time	•	_	_	ät	32	Sing
p G	50	Waiting time after 9 th stage completed	•	_	_	sP	36	Vers
ain	51/53/54	10 th stage length (32-bit), max speed, acceleration/deceleration time	•	-	_	ara	37	Vers
ad	55	Waiting time after 10 th stage completed	•	-	_	me	38	Vers
jus	56/58/59	11 th stage length (32-bit), max speed, acceleration/deceleration time	•	-	-	Sal	39	Proc
tme	60	Waiting time after 11 th stage completed	•	-	-		40	Faul
ent	61/63/64	12 th stage length (32-bit), max speed, acceleration/deceleration time	•	-	-		41	Faul
	65	Waiting time after 12 th stage completed	•	-	-		42	Time
	66/68/69	13 th stage length (32-bit)	•	-	-		44	Moto
	70	Waiting time after 13 th stage completed	•	-	-		45	U-ph
	71/73/74	$14^{\rm th}$ stage length (32-bit), max speed, acceleration/deceleration time	•	-	-		47	DC b
	75	Waiting time after 14 th stage completed	•	-	-		48	Inpu
	76/78/79	15 th stage length (32-bit), max speed, acceleration/deceleration time	•	-	-		49	Outp
	80	Waiting time after 15 th stage completed	•	-	-		50	Cust
	81/83/84	16 th stage length (32-bit), max speed, acceleration/deceleration time	•	-	-		51	Accu
	85	Waiting time after 16 th stage completed	•	-	-		52	Reg
	86	Interrupt positioning setting	•	-	-		53	Inter
	88	Homing start modes	•	-	-		54	Inter
	89	Homing modes	•	-	-		55	Cust
	90 92	Limit switch and Z-phase signal setting at homing	•	-	-		56	High
		Origin search high speed	•	-	-		58	High
	93 94	Origin search low speed Acceleration/deceleration time at origin search	•	-	-			
	1 74		•	-	-			
	95	Homing time limit						
	95 96	Homing time limit Origin point coordinate offset (32-bit)	•	_	-			

nun	meter	Description	<u> </u>	ntrol m	
	nber		P	S	T
	00	Modbus axis address	•	•	•
	01 02	Modbus baud rate Modbus data format	•	•	•
сΩ	02	Communication overtime	•	•	•
909 Sett	03	Communication response delay	•	•	•
Gr	05	Communication DI enabling setting 1	•	•	•
Pa	06	Communication DI enabling setting 2	•	•	•
P09 Group Communication Setting Parameters	07	Communication DI enabling setting 3	•	•	•
	08	Communication DI enabling setting 4	•	•	•
	09	Communication DO enabling setting 1	•	•	•
ica	10	Communication DO enabling setting 2	•	•	•
tion	11 12	Communication instruction holding time AO function or CAN communication selection	•	•	•
_		CAN communication configuration 1/CAN communication	•	-	•
	13/14/15	configuration 2/CAN communication for configuration 3	•	•	•
	16	EtherCAT disconnection detection	•	•	•
	16	Position comparison output mode	•	-	-
	17	1 ^{sr} position(32-bit)	•	-	-
P1 pos	19	2 nd position(32-bit)	•	-	-
P17 Expansion position control	21 23	3 rd position(32-bit)	•	-	-
xpa on c	23	4 th position(32-bit) Effective time 1	•	_	_
nsi	25	Effective time 2	•	_	-
rol	20	Effective time 3	•	-	-
	28	Effective time 4	•	-	-
	29	Display delay	•	-	-
סצס					
P 18 Group Motor P arameters	00	Motor model code	•	•	•
hup ters					
	00	Panel JOG	•	•	•
P20 Con	00	Fault reset	•	•	•
) Gr nmi rfac	03	Parameter identification function	•	•	•
ce P	06	System initialization function	•	•	•
P20 Group Panel Communication Interface Parame	08	Communication operation instruction input	•	•	•
0	09	Communication operation status output	•	•	•
⁹ 20 Group Panel and Communication nterface Parameters	11	Multi-stage operation selection by communication	•	•	-
s Id	12	Homing start by communication	•	-	-
	00	Servo status	•	•	•
	00	Motor speed feedback	•	•	•
	03	Speed instruction	•	•	•
	04	Internal torque instruction (relative to rated torque)	•	•	•
	05	Phase current effective value	•	•	•
	06	DC bus voltage	•	•	•
	07	Absolute position counter (32-bit)	•	٠	•
	09	Electrical angle	•	•	•
	10	Mechanical angle (relative to encoder zero point)	•	•	•
	11	Load inertia identification value	•	•	•
	12	Speed value relative to input instruction	•	•	•
	13	Position deviation counter (32-bit)	•	•	•
	15	Input pulse counter (32-bit)	•	•	•
	17	Feedback pulse counter (32-bit)	•	•	•
	19	Position instruction deviation counter unit (32-bit)	•		•
		Digital input signal monitoring		•	-
ъ	21	Digital input signal monitoring Digital output signal monitoring	•	•	•
P21	23	Digital output signal monitoring			-
P21 Grc		Digital output signal monitoring Encoder status	•	•	•
P21 Group	23 24	Digital output signal monitoring	• •	• • •	• •
P21 Group Sta	23 24 25	Digital output signal monitoring Encoder status Total power-on time (32-bit)	• • •	• • •	• • •
P21 Group Status	23 24 25 31	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature	• • • •	• • •	• • • •
P21 Group Status Pai	23 24 25 31 32	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1	• • • •	• • • •	• • • •
P21 Group Status Param	23 24 25 31 32 34 36 37	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2	• • • • • •	• • • • •	• • • • •
P21 Group Status Parameter	23 24 25 31 32 34 36 37 38	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3	• • • • • • • • •	• • • • • • • • • •	• • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code	• • • • • • • • • • • • •	• • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code Fault record display	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code Fault record display Fault code	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41 42	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 2 Version code 3 Product series code Fault record display Fault code Time stamp upon selected fault (32-bit)	• • • • • • • • • • • • • • • • • • •	• •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code Fault record display Fault code	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41 42 44	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code Fault record display Fault code Time stamp upon selected fault (32-bit) Motor speed upon selected fault	• •	• •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41 42 44 45	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code Fault record display Fault code Time stamp upon selected fault (32-bit) Motor speed upon selected fault U-phase current upon selected fault	• • • • • • • • • • • • • • • • • • •	• •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41 42 44 45 47	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code Fault record display Fault code Time stamp upon selected fault (32-bit) Motor speed upon selected fault U-phase current upon selected fault DC bus voltage upon selected fault	• • • • • • • • • • • • • • • • • • •	• •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41 42 44 45 47 48	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code Fault record display Fault code Time stamp upon selected fault (32-bit) Motor speed upon selected fault U-phase current upon selected fault DC bus voltage upon selected fault Input terminal status upon selected fault	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41 42 44 45 47 48 49	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 2 Version code 3 Product series code Fault record display Fault code Time stamp upon selected fault (32-bit) Motor speed upon selected fault U-phase current upon selected fault DC bus voltage upon selected fault Input terminal status upon selected fault Output terminal status upon selected fault	• • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •	• •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41 42 44 45 47 48 49 50	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 2 Version code 3 Product series code Fault record display Fault code Time stamp upon selected fault (32-bit) Motor speed upon selected fault U-phase current upon selected fault DC bus voltage upon selected fault Input terminal status upon selected fault Output terminal status upon selected fault Customized serial number	• •	• •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41 42 44 45 47 48 49 50 51 52 53	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code Fault record display Fault record display Fault code Time stamp upon selected fault (32-bit) Motor speed upon selected fault DC bus voltage upon selected fault Output terminal status upon selected fault Output terminal status upon selected fault Customized serial number Accumulative load ratio Regenerative load ratio Internal warning code	• • • • • • • • • • • • • • • • • • •	• •	• • • • • • • • • • • • • • • • • • •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41 42 44 45 47 48 49 50 51 52 53 54	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code Fault record display Fault code Time stamp upon selected fault (32-bit) Motor speed upon selected fault U-phase current upon selected fault DC bus voltage upon selected fault Input terminal status upon selected fault Output terminal status upon selected fault Customized serial number Accumulative load ratio Regenerative load ratio Internal warning code Internal warning code	0 0	0 0	• •
P21 Group Status Parameters	23 24 25 31 32 34 36 37 38 39 40 41 42 44 45 47 48 49 50 51 52 53	Digital output signal monitoring Encoder status Total power-on time (32-bit) Module temperature Number of turns of absolute encoder (32-bit) Single turn position of absolute encoder (32-bit) Version code 1 Version code 2 Version code 3 Product series code Fault record display Fault record display Fault code Time stamp upon selected fault (32-bit) Motor speed upon selected fault DC bus voltage upon selected fault Output terminal status upon selected fault Output terminal status upon selected fault Customized serial number Accumulative load ratio Regenerative load ratio Internal warning code	• •	• •	

Parameter list

Control modes: P: Position control S: Speed control T: Torque control • means applicable – means not applicable

	meter nber	Description	P	ntrol m	
nun		Mater positive direction definition		S	T
	00	Motor positive direction definition Control mode selection	•	•	•
	01	Real time auto-tuning	•	•	•
	02	Stiffness grade setting	•	•	•
P00 Group Basic Parameters	03	Load inertia ratio		•	•
	04	Position instruction source	•	•	•
	07	Pulse train form	•	-	-
	08	Instruction units per motor one revolution (32-bit)	•	_	_
G	10	Electronic gear numerator 1 (32-bit)	•	_	_
no.	10	Electronic gear denominator (32-bit)	•	_	_
B	14	Pulse output counts per motor one revolution (32-bit)	•	_	_
asi	14	Pulse output positive direction definition		•	•
сР	17	Pulse output OZ polarity	•	_	-
ara	18	Pulse output function selection	•		_
me	19	Position deviation too large threshold	•	•	•
eter	21	Braking resistor setting	•	•	•
ŝ	22	External resistor capacity	•	•	•
	23	External resistor resistance value	•	•	•
	24	External resistor heating time constant	•	•	•
	24	Brake voltage point	•	•	•
	26	Step value setting	•	-	-
	20	High-speed pulse train format	•	_	_
	/			L	L
	00	Position loop gain 1	•	-	-
	01	Speed loop gain 1	•	•	-
	02	Speed loop integral time 1	•	•	-
	03	Speed detection filter 1	•	•	•
	04	Torque instruction filter 1	•	•	•
	05	Position loop gain 2	•	-	_
	06	Speed loop gain 2	•	•	-
	07	Speed loop integral time 2	•	•	-
	08	Speed detection filter 2	•	•	•
	09	Torque instruction filter 2	•	•	•
	10	Speed regulator PDFF coefficient	•	•	-
	11	Speed feedforward control selection	•	-	-
P	12	Speed feedforward gain	•	-	-
2	13	Speed feedforward filtering time	•	-	-
P01 Group Gain Tuning Parameters	14	Torque feedforward control selection	•	•	-
ģ	15	Torque feedforward gain	•	•	-
Gai	16	Torque feedforward filtering time	•	•	-
1 L	17	Digital input GAIN-SWITCH function selection	•	•	-
nin	18	Position control gain switchover mode	•	•	-
gPa	19	Position control gain switchover delay	•	•	-
arar	20	Position control gain switchover class	•	•	-
nete	21	Position control gain switchover hysteresis	•	•	-
sus	22	Position control gain switchover time	•	•	-
	23	Speed control gain switchover mode	-	•	-
	24	Speed control gain switchover delay	-	•	-
	25	Speed control gain switchover class	-	•	-
	26	Speed control gain switchover hysteresis	-	•	-
	27	Torque control gain switchover mode	-	-	•
	28	Torque control gain switchover delay	-	-	•
	29	Torque control gain switchover class	-	-	•
	30	Torque control gain switchover hysteresis	-	-	•
	31	Observer enabled	•	•	•
	32	Observer cutoff frequency	•	•	•
	33	Observer phase compensation time	•	•	•
	34	Observer inertia coefficient	•	•	•
	00	Position instruction smoothing filter	+ -		
	00	Position instruction smoothing filter Position instruction FIR filter	•	-	_
PO	01			•	•
2 (02	Adaptive filtering mode Adaptive filter load mode	•	•	•
Gro	03	First notch filter frequency (manual)	•	•	•
P02 Group Vibration Suppression Parameters	04		•	•	•
/ibra	05	First notch filter width First notch filter depth	•	•	•
atio	06	Second notch filter frequency (manual)	•	•	•
n Su	07	Second notch filter frequency (manual) Second notch filter width	•	•	•
ddn	08		•	•	•
res		Second notch filter depth	•	<u> </u>	•
sior	10	Third notch filter frequency	•	•	•
۱Pa	11	Third notch filter width		•	
iran	12	Third notch filter depth	•	•	•
nete	13	Fourth notch filter frequency		l	
SLE	14	Fourth notch filter width	•	•	•
	15	Fourth notch filter depth	•	•	•

