

S2 series servo motor driver

Technical Manual (simple version)

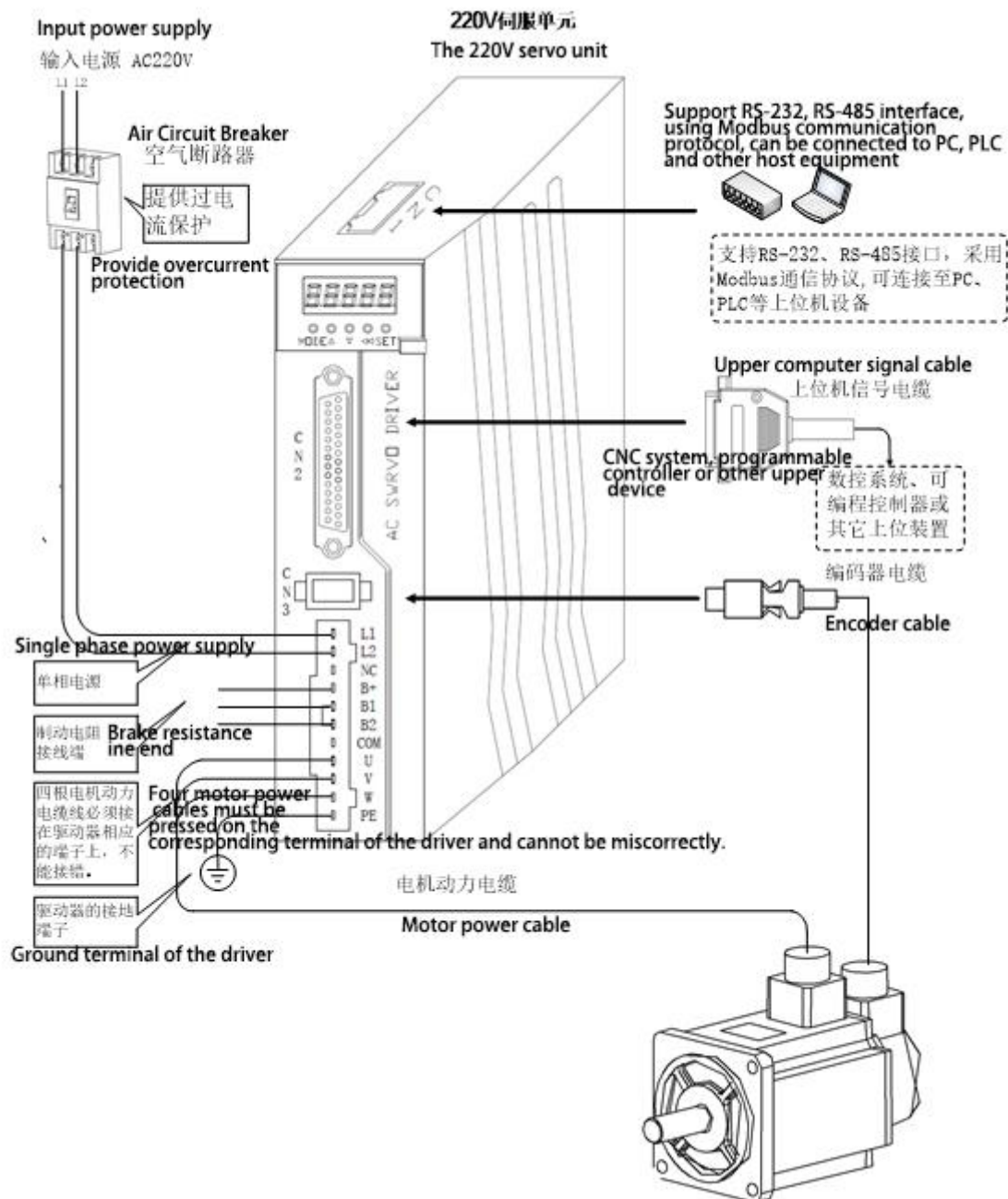
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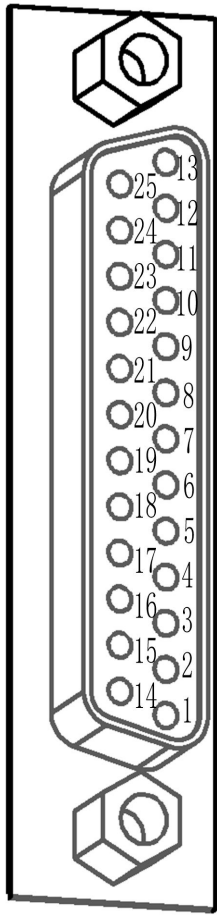
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Chapter 1 Wiring

1.1 Wiring diagram of S2-SVD servo driver



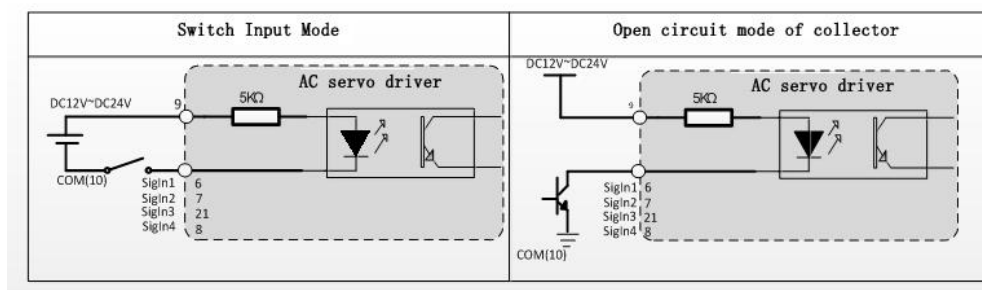
1.2 Definition of control port CN2 pin

	Pin	Interface No	name	function
	DC12~24V COM	9 10	Power supply and ground of control signal	Input power and ground of input/output control signal
	SigIn1 SigIn2 SigIn3 SigIn4	6 7 21 8	Input command signal	Input command signal. Functions assigned to each input signal port at the factory: SigIn1: servo enable SigIn2: Alarm reset SigIn3: position deviation clearing SigIn4: pulse input disabled
	SigOUT1 SigOUT2 SigOUT3 SigOUT4	11 23 12 24	Output command signal	Output command signal. Functions assigned to each output signal port at the factory: SigOUT1: Servo ready SigOUT2: alarm detection SigOUT3: positioning completed SigOUT4: emergency stop detection
	PV PP+ PP- PD+ PD-	2 3 14 4 5	Command pulse input port	PV: open collector input power supply The command pulse can be input in three different ways: 1: Command direction and pulse input 2: Clockwise/counterclockwise pulse input 3: Quadrature pulse input with 90 degree phase difference
	empty empty empty empty empty	20 19 18 17 15	Encoder signal output	Contact the manufacturer for encoder output function

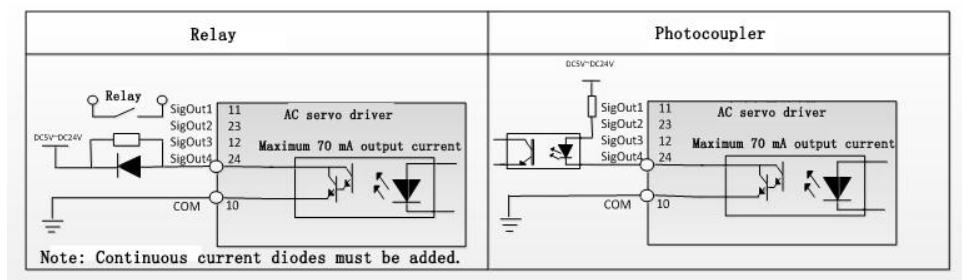
	empty	16		
	OZ	22		
	GND	1		
	Vref	25	Analog input	Analog voltage input port. When speed or torque is controlled, it is used to receive speed or torque commands. Voltage input range: -10V~+10V.
	AGND	13		

1.3 CN2 port type

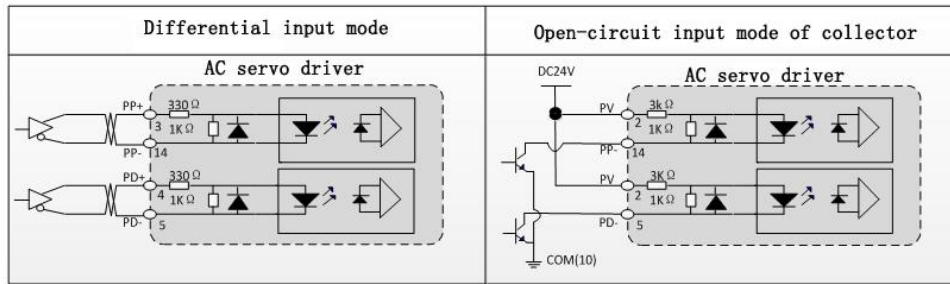
1. Digital input interface section composition



2. Digital output interface section composition



3. Section composition of position pulse command interface



Note: 1. 5V pulse signal wiring: 5V pulse+ --- PP+(3 pins) 5V pulse ---- PP - (14 pins)

5V direction+ --- PD+(4 pins) 5V direction --- PD - (5 pins)

2. 24V pole electric collector output wiring (Panasonic, Mitsubishi PLC):+24V -- PV (2-pin) pulse -- PP - (14 pin)
direction -- PD - (5-pin)

3. 24V emitter output wiring (Siemens PLC): pulse string 2K resistance -- PP+(3-pin) directional string 2K
resistance -- PD+(4-pin)

0V --- PP -, PD - (14, 5 pins)

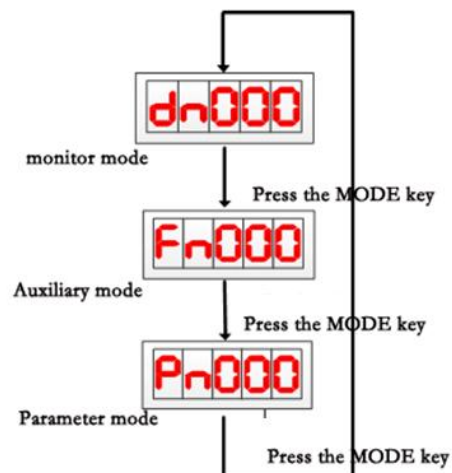
Chapter 2 Display and Operation

2.1 Display screen and keys

Keys	Key name	function
MODE	Mode selection key	1 Mode switching 2 Return to the parent directory
▲	Number increase key	Increase the number, and long press will have repeated effect
▼	Number reduction key	Decrease the number, and long press has a repeating effect
◀◀	Shift key	Cursor shift
SET	OK key	1 Determine the setting 2 End parameter setting

Note: If all 5 decimal points on the display screen are flashing, an alarm will be given. The alarm must be cleared before the driver can work properly.

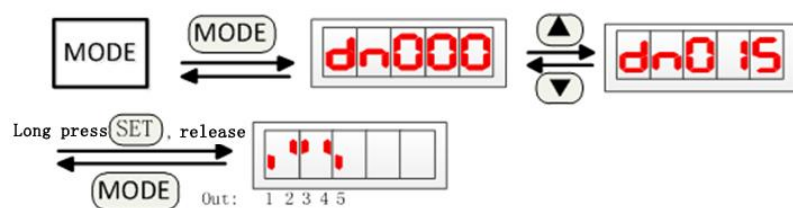
2.2 Display mode power conversion



Note: When the display screen shows Fnxxx, Dnxxx, Pnxxx, it is in the top directory, and the mode key is the mode switching function, which can directly switch to other modes. Otherwise, the mode key is the function of returning to the upper directory.

2.3 Monitoring mode (Dn) operation

For example, check the monitoring parameter dn015. At this time, the sigOut1 and sigOut5 ports are at low level, and the sigOut2, sigOut3 and sigOut4 ports are at high level.



2.4 Auxiliary mode (Fn) operation

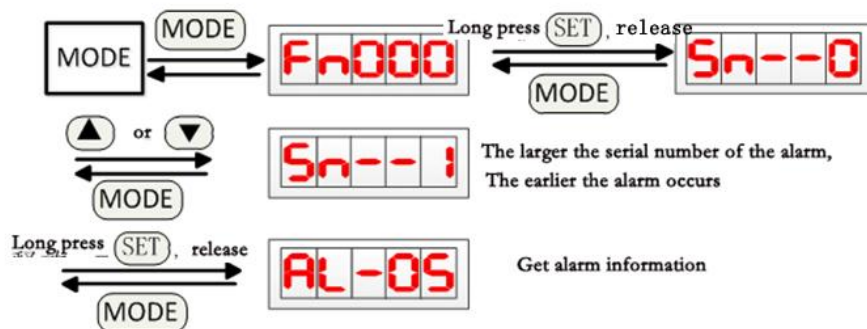


Auxiliary mode Function number


● List of auxiliary functions

number	explain
Fn000	Alarm record query
Fn001	User parameters are permanently written, and all parameters are written into EEPROM.
Fn002	JOG commissioning operation
Fn003	Clear the currently detected alarm
Fn004	Restore the parameters of Pn000~Pn280 in the parameter table to the factory default values according to the settings of Pn000.
Fn005	Position deviation clearing
Fn006	SigOut port forced output. The forced status is only valid in this operation. 0: Cancel the forced status. 1: Forced output high level. 2: Forced output low level.
Fn007	Analog torque command voltage correction
Fn008	Analog speed command voltage correction
Fn009	Bus voltage correction
Fn010	Temperature correction
Fn011	Alarm record initialization
Fn012	Encoder zeroing
Fn015	Absolute encoder multi turn data zeroing
Fn016	Absolute encoder alarm reset
Fn018	Load inertia estimation

2.4.1 Fn000 alarm function query



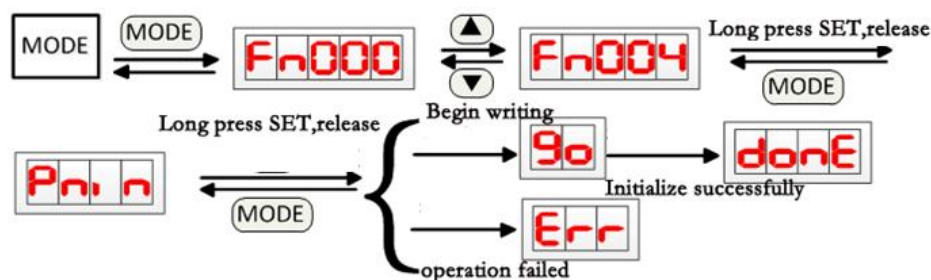
Operation mode	explain
0	Jog mode. Press and hold ▲ or ▼ key, the motor will rotate clockwise or counterclockwise; Release the ▲ or ▼ key, the motor will stop rotating and be in the power off state.
1	Enter the speed regulation mode, and the motor is powered on. The driver is in the speed loop mode, and the operating speed is entered by pressing ▲ or ▼. Other menu operations can be performed during motor operation. If the motor stops rotating, please enter Jog_2 mode.
2	Exit the speed regulation mode, and the motor is powered off.

Note: If the operation displays or, the possible reasons are: 

1: The motor has been enabled or rotated. Before JOG trial operation, the motor must be in non working state. It is recommended that no control line be connected to the control interface of the servo driver during the trial operation.

2: The servo driver has given an alarm and the alarm has not been cleared.

2.4.3 Fn004 Parameter Initialization



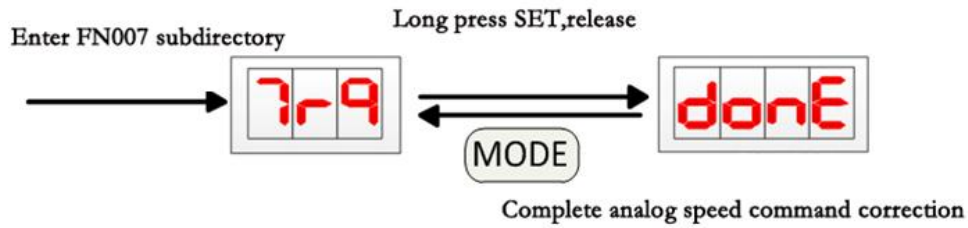
Note 1: If the last operation displays, the possible causes are: 

1: The driver is performing a write operation.

2: Parameter Pn000 has no open parameter initialization function.

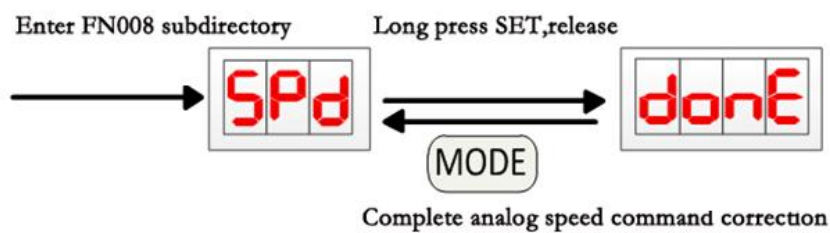
Note 2: You must wait for the completion of writing before powering off, or the contents of the memory chip may be damaged after restarting (AL-01 alarm).

3.4.4 Fn007 analog torque command voltage correction



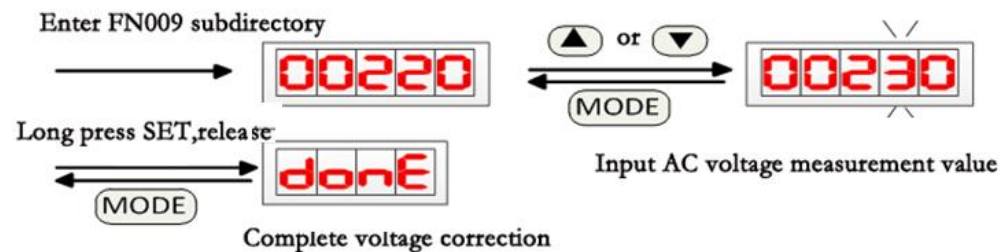
Note 1: Before correction, connect the analog voltage input port Vref (pin 25) of CN2 to the reference zero voltage.

3.4.5 Fn008 analog speed command voltage correction



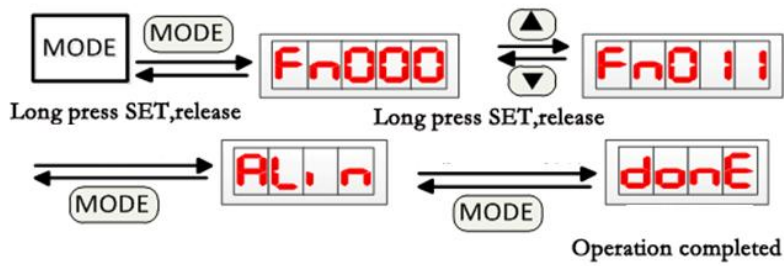
Note 1: Before correction, connect the analog voltage input port Vref (pin 25) of CN2 to the reference zero voltage.

3.4.6 Fn009 bus voltage correction



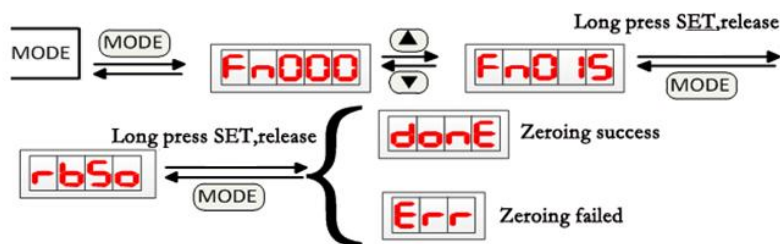
Note 1: During calibration, the control power supply and power supply must be connected, and the AC voltage input by the driver must be measured and input into this operation.

3.4.7 Fn012 encoder zeroing



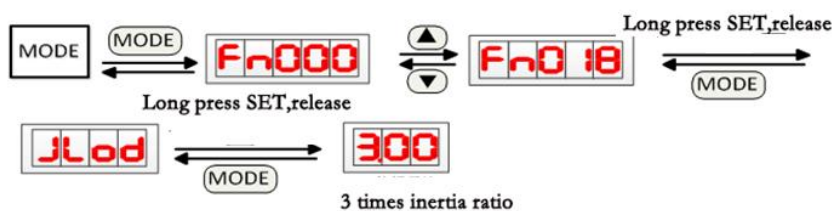
Before zero adjustment, make sure that the setting value of motor code Pn001 is consistent with the actual motor model, otherwise the motor current may be too large and the motor may be damaged. When zeroing, no internal or external enabling motor is required. The motor will rotate forward for several revolutions, and then lock the zero position. When the number of displayed pulse deviations is less than 10, it can be regarded that the motor has been aligned to the zero position.

3.4.8 Fn015 absolute encoder multi turn data zeroing



If the reset is successful, the multi turn data will be set to 0, and all latched encoder alarms will be reset at the same time; On the contrary, it may be that the encoder has a communication fault alarm or the motor is in the enabled state, so that the multi turn data zeroing operation cannot be carried out.

2.4.9 Fn018 Load Inertia Estimation



Note: rigid adjustment

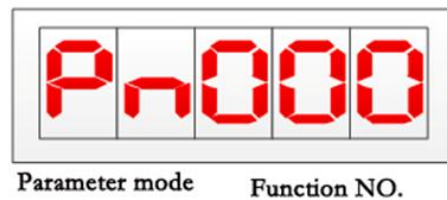
Step 1: The motor is offline (external enable, disconnect enable signal, internal enable, PN003 set to 0).

Step 2: measure the load inertia ratio through FN018 above (if the tested value is 3.00 or more than 20, it is recommended to select a motor with greater inertia or contact the manufacturer for re selection).

Step 3: set the inertia ratio measured in the second step to the parameter PN257, and set PN258 to 1.

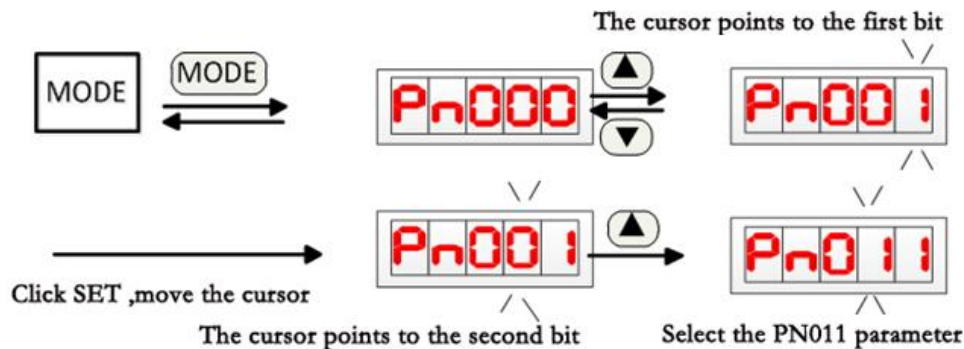
Step 4: Adjust the rigidity level of PN259. If there is vibration, turn down PN259. It is necessary to improve the response speed of the motor and turn up the parameters of PN259.

2.5 User parameter mode (Pn) operation



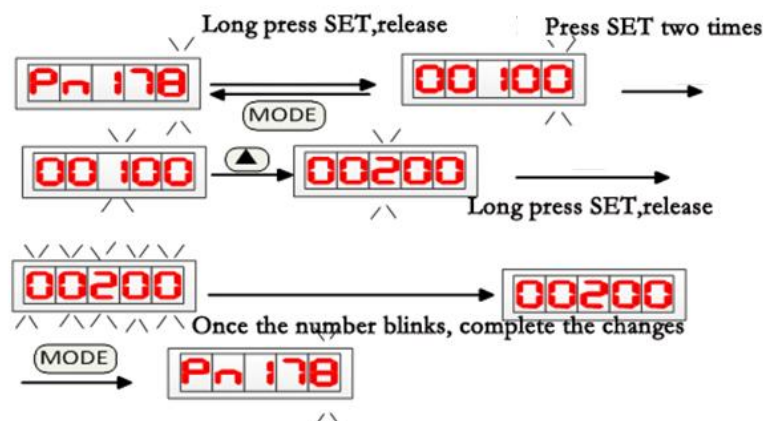
- Select parameter number

For example, select Pn011 parameter.



- Parameter editing

For example, change the current value of Pn178 parameter from 100 to 200, as



follows:

Note: After parameter editing, please wait for 5 seconds before powering off.

Chapter 3 Pn Function Parameters

3.1 List of parameters

- In the column of number, if there is a symbol ▲, it means that after parameter setting, it must be powered on again to take effect; If there is a symbol ◆, it means that the parameters can take effect only after the motor is enabled again after parameter setting; If there is no special symbol, it means immediate effect.

- In the applicable mode column, All indicates that it is applicable to torque, speed and position control, T indicates that it is applicable to torque control, S indicates that it is applicable to speed control, and P indicates that it is applicable to position control.

3.2.1 System control parameters

number	name	Parameter range and description	Default value/unit	apply
Pn000	Parameter editing and initialization	0 Disable parameter initialization 1 Allow application parameter initialization 2 Allow all parameter initialization 3 Cannot modify parameters	1	All
Pn001 ▲	Motor code	0~70	7	All
Pn002 ▲	control model	0 torque 1 speed 2 position 3 position/speed 4 position/torque 5 speed/torque	2	All
Pn003	Servo enabling mode	Port 0 enabling 1 automatically enabling after power on	0	All
Pn004	Servo disabling shutdown mode	0 Inertia stop 1 Press Pn005 to decelerate 2 Electromagnetic brake stop	0	All
Pn005	Disable deceleration time	5~10000	100ms	All
Pn006	Use/not use the forward and reverse driver prohibition function	0 Do not use forward and reverse rotation prohibition 1 Do not use forward and reverse rotation prohibition 2 Do not use reverse rotation prohibition 3 Use forward and reverse rotation prohibition	0	All
Pn007	Forward/reverse inhibit deceleration time	0~10000	60ms	All
Pn008	Internal forward torque limit	0~300	300%	All
Pn009	Internal reverse torque limit	-300~0	-300%	All
Pn010	External forward torque limit	0~300	300%	All
Pn011	External reverse torque limit	-300~0	-300%	All
Pn012	Forward rotation overload 1 alarm	0~300	200%	All

	value			
Pn013	Reverse overload 1 alarm value	-300~0	-200%	All
Pn014	Overload 1 detection time	1~900	250 (0.1S)	All
Pn015	Overload 2 detection time	1~300	80 (0.1S)	All
Pn016 ▲	Encoder frequency division molecule DA	The frequency division value meets: $127 > (DA/DB) \geq 1$. For example: 800 line output, the division value $DA/DB = 2500/800 = 25/8$.	1	All
Pn017 ▲	Encoder frequency division denominator DB		1	All
Pn018 ▲	Encoder pulse AB logic	0 motor forward rotation A leading B 1 motor forward rotation B leading A	0	All
Pn019 ▲	Rated current setting	0.0~100.0	0 Arms	All
Pn020 ▲	Rated speed setting	0~5000	0 r/min	All
Pn021	Reach the preset speed	0~5000	500 r/min	All
Pn022	Reach the preset speed hysteresis value	0~5000	30 r/min	All
Pn023	Reach the preset speed direction	0~2	0	All
Pn024	Reach the predetermined torque	0~300	100%	All
Pn025	Reach the preset torque hysteresis value	0~300	5%	All
Pn026	Reach the predetermined torque direction	0~2	0	All
Pn027	Zero speed detection amplitude setting	0~1000	10 r/min	All
Pn028	Return difference of zero speed detection	0~1000	5 r/min	All

Pn029	Electromagnetic braking zero speed detection	0~1000	5 r/min	All
Pn030	Delay time of electromagnetic brake when the motor is stationary	0~2000	0 ms	All
Pn031	Waiting time of electromagnetic brake when the motor is running	0~2000	500 ms	All
Pn032	Action speed of electromagnetic brake when the motor is running	0~3000	30 r/min	All
Pn033	Trigger mode of origin regression	0 Turn off the origin function 1, triggered by the GOH level 2, triggered by the GOH rising edge 3, automatically executed when powered on	0	All
Pn034	Origin regression reference point mode	0~6 For detailed instructions, please refer to the electronic manual	0	All
Pn035	Origin return to origin mode	0~2 For detailed instructions, please refer to the electronic manual	0	All
Pn036	Origin position offset high position	-9999~9999	0 million	All
Pn037	Origin position offset low order	-9999~9999	0	All
Pn038	First speed of origin regression	1~3000	200 r/min	All
Pn039	Return to the second speed at the origin	1~3000	50 r/min	All
Pn040	Acceleration time of origin regression	5~10000	50 ms	All
Pn041	Deceleration time of origin regression	5~10000	50 ms	All
Pn042	Home position delay	0~3000	100 ms	All
Pn043	Signal delay for completion of origin regression	5~3000	80 ms	All

Pn044	Origin regression execution mode	0~1 For detailed instructions, please refer to the electronic manual	0	All
Pn045	Gain switching selection	0~5 For detailed instructions, please refer to the electronic manual	0	All
Pn046	Gain switching level	0~30000	80	All
Pn047	Gain switching back difference	0~30000	6	All
Pn048	Gain switching delay time	0~20000	20 (0.1 ms)	All
Pn049 ◆	Gain switching time 1	0~15000	0 (0.1 ms)	All
Pn050 ◆	Gain switching time 2	0~15000	50 (0.1 ms)	All
Pn051	Maximum speed limit of motor	0~5000	3000	All
Pn052 ▲	SigIn1 function allocation	-31~31 For details, refer to 4.4.1 SigIN input port function details	1	All
Pn053 ▲	SigIn2 function allocation		2	All
Pn054 ▲	SigIn3 function allocation		19	All
Pn055 ▲	SigIn4 function allocation		20	All
Pn056	SigIn1 filtering time	1~1000	2 ms	All
Pn057	SigIn2 filtering time	1~1000	2 ms	All
Pn058	SigIn3 filtering time	1~1000	2 ms	All
Pn059	SigIn4 filtering time	1~1000	2 ms	All
Pn060 ▲	SigOut1 function allocation	-14~14 Refer to 4.4.2 SigOut Output Port Function Details for details	2	All
Pn061 ▲	SigOut2 function allocation		1	All
Pn062 ▲	SigOut3 function allocation		4	All
Pn063 ▲	SigOut4 function allocation		3	All
Pn064 ▲	communication mode	0 No communication 1 RS-232 2 RS-485	2	All
Pn065	Communication site	1~254	1	All

Pn066 ▲	Communication baud rate	0 (4800) 1 (9600) 2 (19200) 3 (38400) 4 (57600) 5 (115200)	5	All
Pn067 ▲	Communication mode setting	0 (7, N, 2 Modbus, ASCII) No comparison 1 (7, E, 1 Modbus, ASCII) Even comparison 2 (7, O, 1 Modbus, ASCII) Odd comparison 3 (8, N, 2 Modbus, ASCII) No comparison 4 (8, E, 1 Modbus, ASCII) Even comparison 5 (8, O, 1 Modbus, ASCII) Odd comparison 6 (8, N, 2 Modbus, RTU) No comparison 7 (8, E, 1 Modbus, RTU) Even comparison 8 (8, O, 1 Modbus, RTU) Odd comparison	8	All
Pn068	Input function mode selection 1	0~32767	0	All
Pn069	Input function mode selection 2	0~32767	0	All
Pn070	Input function status 1	0~32767	32691	All
Pn071	Input function status 2	0~32767	32767	All
Pn072	Input function mode selection 3	0~1	0	All
Pn073	Input function status 3	0~1	1	All
Pn074	Fan on temperature	30~70	50 °C	All
Pn075	Fan operation mode	0 temperature sensing automatic operation 1 startup operation 2 shutdown	0	All
Pn076	Emergency stop (EMG) reset mode	0 Offline status Manual or port AlarmRst clear 1 Enable or offline EMG becomes ON again, automatically clear	0	All
Pn077	Forward/reverse driver inhibit detection	0 does not give an alarm, deceleration stop 1 gives an alarm, deceleration stop 2 gives an alarm immediately, free shutdown	0	All
Pn078	Under voltage detection	0 not detected 1 detected	1	All
Pn079	System status display item selection	0~30	0	All
Pn080 ▲	Number of incremental encoder	0~16000	0 line	All

	lines			
Pn081	User parameter permanent write operation	0~1 When the parameter value changes from 0 to 1, the driver will perform a write operation. This operation is only valid during communication (Pn064>0).	0	All
Pn082	SigOut port forced output	0~4095	0	All
Pn083	Low voltage alarm detection amplitude	50~280	200 V	All
Pn084	High temperature alarm detection amplitude	0~100	70 °C	All
Pn085 ▲	Number of motor poles	0~100	0 pairs	All
Pn086	Internal use	-	-	-
Pn087 ▲	Selection of braking resistor	0- No resistance 1 Built in resistance 2 External resistance	1	All
Pn088	Braking resistor regeneration overload alarm level	50~250	90%	All
Pn089 ▲	Power of external braking resistor	20~20000	100 W	All
Pn090 ▲	External braking resistance	10~1000	100Ω	All
Pn091	Available regenerative capacity of external braking resistor	5~100	20%	All
Pn092	Overload detection of braking resistor	0 No alarm 1 Alarm	1	All

3.2.2 Position control parameters

number	name	Value range	Default value/unit	apply
Pn096 ▲	Command pulse input mode	0 pulse+direction 1 positive/negative pulse 2 quadrature pulse	0	P
Pn097 ▲	Command pulse input direction logic	0 input positive command, motor forward rotation 1 input positive command, motor	0	P

	selection	reverse rotation		
Pn098	Numerator 1 of pulse electronic gear ratio (valid by default)	1~32767	1	P
Pn099	Electronic gear ratio numerator 2	1~32767	1	P
Pn100	Electronic gear ratio numerator 3	1~32767	1	P
Pn101	Electronic gear ratio numerator 4	1~32767	1	P
Pn102 ▲	Denominator of pulse electronic gear ratio	1~32767	1	P
Pn103	Position deviation exceeds the setting	1~2000	5 million	P
Pn104	Positioning completion range setting	0~32767	10	P
Pn105	Setting of return difference after positioning	0~32767	3	P
Pn106	Positioning approach range setting	0~32767	300	P
Pn107	Position positioning approach return difference setting	0~32767	30	P
Pn108	Position deviation clearing mode	Deviation clearing during 0 Pclear level ON 1 Pclear rising edge (from OFF to ON) deviation clearing	1	P
Pn109 ◆	Acceleration/deceleration mode of position command	0 Do not use filtering 1 Smooth filtering at one time 2 S-shaped filtering	0	P
Pn110 ◆	Primary filtering time constant of position command	5~500	50 ms	P
Pn111 ◆	Position command S-shaped filtering time constant Ta	5~340	50 ms	P
Pn112	Position command	5~150	20 ms	P

◆	S-shaped filtering time constant Ts			
Pn113	Position loop feedforward gain	0~100	0%	P
Pn114 ▲	Position loop feedforward filter time constant	1~50	5 ms	P
Pn115	Position adjuster gain 1	1~2000	100 (1/S)	P
Pn116	Position adjuster gain 2	1~2000	100 (1/S)	P
Pn117	Position command source selection	0 External pulse input 1 Internal position instruction 2 The instruction source is determined by psource. On: internal position command; Off: external pulse input command	0	P
Pn118	Selection of internal position command pause mode	0: When ptrigger is triggered again after pstop acts, it will run according to the currently selected internal position command. 1: When the ptrigger is triggered again after the pstop acts, the remaining internal position command pulse will continue to be completed. 2: Same as 1 function, without pulse deviation.	0	P
Pn119	Internal position pause deceleration time	0~10000	50 ms	P
Pn120	Internal position command 0 pulse number high bit setting	-9999~9999	0 million	P
Pn121	Internal position command 0 pulse number low order setting	-9999~9999	0	P
Pn122	Internal position command 1 pulse number high position setting	-9999~9999	0 million	P

Pn123	Internal position command 1 pulse number low order setting	-9999~9999	0	P
Pn124	Internal position command 2 pulse number high bit setting	-9999~9999	0 million	P
Pn125	Internal position command 2 pulse number low order setting	-9999~9999	0	P
Pn126	Internal position command 3 pulse number high bit setting	-9999~9999	0 million	P
Pn127	Internal position command 3 pulse number low order setting	-9999~9999	0	P
Pn128	Internal position 0 running speed	0~3000	100r/min	P
Pn129	Internal position 1 running speed	0~3000	100r/min	P
Pn130	Internal position 2 running speed	0~3000	100r/min	P
Pn131	Internal position 3 running speed	0~3000	100r/min	P
Pn132	Conditions for torque/speed switching to position	0: Zero speed 1: Decelerate to zero	0	P
Pn133	Deceleration time for torque/speed switching to position	5~10000	100ms	P
Pn134	Fixed length displacement direction	0~1	0	P
Pn135	Fixed length	0~9999	0 million	P

	displacement high position			
Pn136	Fixed length displacement low order	0~9999	100	P
Pn137	Maximum running speed of fixed length	5~5000	200r/min	P
Pn138	Fixed length lock release mode	0~1	1	P
Pn139	Vibration suppression attenuation ratio at stop	10~100	100%	P
Pn140	Vibration suppression waiting time at stop	0~30000	300ms	P
Pn141	Vibration suppression conditions at standstill	0~10000	10 pulses	P

3.2.3 Speed control parameters

number	name	Value range	Default value/unit	apply
Pn146 ◆	Speed acceleration/deceleration mode	0 No acceleration/deceleration 1S Curve acceleration/deceleration 2 Straight acceleration/deceleration	1	S
Pn147 ◆	Speed command S curve acceleration/deceleration time constant Ts	5~1500	80ms	S
Pn148 ◆	Speed command S curve acceleration time constant Ta	5~10000	80ms	S
Pn149 ◆	Speed S deceleration time Td	5~10000	80ms	S
Pn150 ◆	Linear acceleration time constant	5~30000	80ms	S
Pn151 ◆	Linear deceleration time constant	5~30000	80ms	S
Pn152	Speed detection	1~380	1 (0.1ms)	All

▲	filtering time			
Pn153	Speed proportional gain 1	1~2000	80Hz	All
Pn154	Speed regulator integral time constant 1	1~5000	150 (0.1ms)	All
Pn155	Speed proportional gain 2	1~2000	80Hz	All
Pn156	Speed regulator integration time constant 2	1~5000	150 (0.1ms)	All
Pn157 ▲	Analog speed command smoothing filter time	1~500	1 (0.1ms)	S
Pn158	Analog speed command gain	1~1500	300r/min/V	S
Pn159	Analog speed command offset	-5000~5000	0mv	S
Pn160	Analog speed command direction	0: positive voltage forward rotation 1: positive voltage reverse rotation	0	S
Pn161	Analog speed command forced zero interval upper limit	0~1000	0 (10mv)	S
Pn162	Analog speed command forced zero interval lower limit	-1000~0	0 (10mv)	S
Pn163	Zero speed clamping locking mode	0: position control when locking 1 speed control when locking	0	S
Pn164	Zero speed clamping trigger mode	0: ZeroLock trigger 1: Pn165 parameter trigger	0	S
Pn165	Zero speed clamping level	0~200	6r/min	S
Pn166	Zero speed clamping deceleration time	5~10000	50ms	S
Pn167	Internal position gain	1~2000	100 (1/S)	All
Pn168	Speed command source selection	0: simulation+internal 2~8 speed 1: internal 1~8 speed	0	S
Pn169	Internal speed	-5000~5000	0r/min	S

	command 1			
Pn170	Internal speed command 2	-5000~5000	0 r/min	S
Pn171	Internal speed command 3	-5000~5000	0 r/min	S
Pn172	Internal speed command 4	-5000~5000	0 r/min	S
Pn173	Internal speed command 5	-5000~5000	0 r/min	S
Pn174	Internal speed command 6	-5000~5000	0 r/min	S
Pn175	Internal speed command 7	-5000~5000	0 r/min	S
Pn176	Internal speed command 8	-5000~5000	0 r/min	S
Pn177	JOG speed	0~5000	200r/min	S
Pn178	JOG acceleration time	5~10000	100ms	S
Pn179	JOG deceleration time	5~10000	100ms	S
Pn182 ◆	Speed loop PDFF control coefficient	0~100	100	PS
Pn183~	Speed feedback compensation	0~100	0%	PS

3.2.4 Torque control parameters

number	name	Value range	Default value/unit	apply
Pn186	Torque acceleration and deceleration mode	0: Do not use acceleration and deceleration 1: Torque command linear acceleration and deceleration	0	T
Pn187 ▲	Linear acceleration and deceleration time	1~30000	1ms	T
Pn188 ▲	Analog torque command smoothing filter time	1~500	5 (0.1ms)	T
Pn189	Analog torque command gain	1~300	30 (%/V)	T
Pn190	Analog torque offset	-1500~1500	0 (mv)	T

	adjustment			
Pn191	Analog torque command direction	0: positive voltage forward rotation 1: positive voltage reverse rotation	0	T
Pn192	Q-axis proportional gain 1	5~2000	100%	All
Pn193	Q-axis integration time constant 1	5~2000	100%	All
Pn194	Q-axis proportional gain 2	5~2000	100%	All
Pn195	Q-axis integration time constant 2	5~2000	100%	All
Pn196	Torque command filtering time constant 1	1~5000	40 (0.01ms)	All
Pn197	Torque command filtering time constant 2	1~5000	40 (0.01ms)	All
Pn198	Speed limit during torque control	0~4500	2500r/min	T
Pn199	Torque control limited speed source selection	0: Restricted by Pn198 1: Restricted by internal speed 1~8 2: If Pn204=1, that is, all torques are derived from internal torque commands, the speed can be restricted by analog speed commands.	0	T
Pn200	Internal torque 1	-300~300	0%	T
Pn201	Internal torque 2	-300~300	0%	T
Pn202	Internal torque 3	-300~300	0%	T
Pn203	Internal torque 4	-300~300	0%	T
Pn204	Torque command source	0: Analog torque command 1: Internal torque 1	0	T
Pn205	D-axis proportional gain	5~2000	100%	All
Pn206	D-axis integration time constant	5~2000	100%	All
Pn207	Speed feedback regulation coefficient	1~3000	100	T
Pn208	Tracking torque error 1	0~300	5%	T

Pn209	Tracking torque error 2	0~300	2%	T
Pn210	Speed limit determination time	0~2000	15ms	T

3.2.5 Extended Control Parameters

number	name	Value range	Default value/unit	apply
Pn216 ▲	Absolute editing method selection	0: single circle absolute 1: multi circle absolute	1	All
Pn217	Number of absolute output lines	16~16384	2500 lines	All
Pn218	Absolute encoder absolute position data transmission mode	0: output absolute position information in incremental mode 1: output absolute position information in digital encoding mode	0	All
Pn219	Multi circle overflow detection	0: Multi turn overflow not detected 1: Multi turn overflow detected	1	All
Pn220 ▲	SigIn5 function allocation	-31~31	3	All
Pn221 ▲	SigIn6 function allocation	-31~31	4	All
Pn222 ▲	SigIn7 function allocation	-31~31	9	All
Pn223 ▲	SigIn8 function allocation	-31~31	10	All
Pn224 ▲	SigIn9 function allocation	-31~31	11	All
Pn225 ▲	SigIn10 function allocation	-31~31	0	All
Pn226	SigIn5 filtering time	1~1000	2ms	All
Pn227	SigIn6 filtering time	1~1000	2ms	All
Pn228	SigIn7 filtering time	1~1000	2ms	All
Pn229	SigIn8 filtering time	1~1000	2ms	All
Pn230	SigIn9 filtering time	1~1000	2ms	All
Pn231	SigIn10 filtering time	1~1000	2ms	All
Pn232	SigOut5 function	-14-14	9	All

▲	allocation			
Pn233	Internal use	-	-	-
Pn234	Maximum frequency of pulse command	20~2000	550KHZ	P
Pn235	Pulse command filtering time	0~255	0 (100ns)	P
Pn240	Forward soft inhibit multi turn value	0~32000	0 turns	All
Pn241	Forward soft inhibit single turn value	0~9999	0 (0.0001 turns)	All
Pn242	Reverse soft inhibit multi turn value	0~32000	0 turns	All
Pn243	Reverse soft inhibit lap value	0~9999	0 (0.0001 turns)	All
Pn244	Approach range of origin regression	0~3000	20	All
Pn245	Absolute encoder type	0~1	0	-
Pn246	Absolute pulse factor 1	1~32767	1	-
Pn247	Absolute pulse factor 2	1~32767	1	-
Pn248	Start voltage of regenerative discharge	50~300	0	
Pn257	Load moment of inertia ratio	0.0~100.0	1.00 times	PS
Pn258	Gain adjustment mode	0: Manual gain adjustment 2: Automatic gain adjustment	0	PS
Pn259	Selection of rigidity grade	0~20	5	PS
Pn260	Inertia real-time estimation mode	0: FN018 offline estimation 1: online estimation Dn30 view	0	All
Pn263	Inertia estimation acceleration and deceleration	20~500	80ms	All
Pn264	Presumptive	150~1000	400r/min	All

◆	allowable maximum speed			
Pn265 ◆	Estimated pause interval	0~10000	500ms	All
Pn266 ◆	Estimated value of estimated inertia ratio	1.00~20.00	3.00x	All
Pn267 ▲	Rated torque of motor	0~320.00	0N · m	All
Pn268 ▲	Maximum output torque of motor	0~300.00	0 times	All
Pn269 ▲	Motor moment of inertia	0~320.00	0Kg · M ^ 2 · 10 ^ -4	All
Pn270 ▲	Motor torque coefficient	0~100.00	0N · m/Arms	All
Pn271 ▲	Maximum speed of motor	80~5500	80r/min	All
Pn272	Pulse counting edge selection	0~1	0	P
Pn276	Turn on the PLC	0~1	0	All
Pn277	Single lap data offset low order	-32768~32767		All
Pn278	Single lap data offset high position	-32768~32767		All
Pn279	Multi turn data offset low order	-32768~32767		All
Pn280	Multi turn data offset high order	-32768~32767		All

3.3 Port Function Details

3.3.1 Details of SigIn input port functions

number	symbol	function	Function description
0	NULL	No function assignment	The driver does not take any action on the input state.
1	Son	Servo enable	OFF: The driver is not enabled, and the motor is not powered on.

			ON: driver enable, motor power on Note: Pn003 parameter or Son status determines.
2	AlarmReset	Alarm reset	When there is an alarm and the alarm can be cleared, the alarm will be cleared when the rising edge of the input signal (OFF to ON).
3	CCWL	Forward driver inhibit	OFF: prohibit the forward rotation of the motor ON: motor forward rotation allowed Note 1: To use the forward driver inhibit function, first set the Pn006 parameter, enable the function, and then assign it to a specific input port. By default, this function is not used. Note 2: When the motor operates normally, the CCWL must be in the normally closed contact (ON state) Note 3: This function is invalid when the origin is regressed.
4	CWL	Reverse driver inhibit	OFF: prohibit motor reverse rotation ON: allow the motor to reverse
5	TCCW	External forward torque limit	OFF: CCW direction torque is not limited by Pn010 parameter ON: CCW direction torque is limited by Pn010 parameter Note: No matter whether TCCW is valid or invalid, CCW direction torque is also limited by Pn008 parameter.
6	TCW	External reverse torque limit	OFF: CW direction torque is not limited by Pn011 parameter ON: Torque in CW direction is limited by Pn011 parameter Note: No matter whether TCW is valid or invalid, the torque in CW direction is also limited by Pn009 parameter.
7	EMG	Emergency stop	OFF: the driver is prohibited from driving the motor and cutting off the motor current ON: allow the driver to driver the motor normally
8	ZeroLock	Zero speed clamping	During speed control: OFF: do not lock the motor shaft ON: lock the motor shaft

9	SP1	Internal speed selection 1	When the control mode of the driver is in the speed control mode, the speed command source is determined by the SP1, SP2 and SP3 of SigIn:
10	SP2	Internal speed selection 2	
11	SP3	Internal speed selection 3	

SP3	SP2	SP1	Speed command
0	0	0	Internal speed 1/ External simulation Speed command (Pn168 selection)
0	0	1	Internal speed 2
0	1	0	Internal speed 3
0	1	1	Internal speed 4
1	0	0	Internal speed 5
1	0	1	Internal speed 6
1	1	0	Internal speed 7
1	1	1	Internal speed 8

Note 1: 0 means OFF, 1 means ON.

Note 2: If the SigIn port does not specify SP3, SP2 and SP1 functions, the default state is OFF. Note: 0 means OFF, 1 means ON

12	TR1	Internal torque command selection 1	When selecting the internal torque control mode, four torque commands can be selected by using the combination of TR1 and TR2.																	
13	TR2	Internal torque command selection 2	TR2	TR1	Torque command															
			0	0	Internal torque 1/external analog torque command (Pn204 selection)															
			0	1	Internal torque 2															
			1	0	Internal torque 3															
			1	1	Internal torque 4															
14	Cmode	Control mode switching	When parameter Pn002 is 3, 4 and 5, the control mode can be switched.																	
15	Cgain	Gain switching	When parameter Pn045 is 2, switch gain combination through Cgain: OFF: first gain ON: Second gain																	
16	Gn1	Electronic gear molecular selection 1	Select electronic gear molecules 1~4 through combination of Gn1 and Gn2 <table><tr><td>Gn2</td><td>Gn1</td><td>Electronic gear ratio numerator N</td></tr><tr><td>OFF</td><td>OFF</td><td>The first numerator</td></tr><tr><td>OFF</td><td>ON</td><td>2nd numerator</td></tr><tr><td>ON</td><td>OFF</td><td>3rd numerator</td></tr><tr><td>ON</td><td>ON</td><td>4th numerator</td></tr></table>			Gn2	Gn1	Electronic gear ratio numerator N	OFF	OFF	The first numerator	OFF	ON	2nd numerator	ON	OFF	3rd numerator	ON	ON	4th numerator
Gn2	Gn1	Electronic gear ratio numerator N																		
OFF	OFF	The first numerator																		
OFF	ON	2nd numerator																		
ON	OFF	3rd numerator																		
ON	ON	4th numerator																		
17	Gn2	Electronic gear molecular selection 2																		
18	CINV	Instruction negation	In speed or torque control mode, the command of speed or torque is reversed. OFF: normal command ON: instruction negation																	
19	Pclear	Position deviation clearing	Clear the value of position deviation counter. The clearing method is determined by Pn108 parameter:																	
			Pn108	mode																
			0	Pclear level ON period																
			1	Pclear rising edge time (from OFF to ON)																

20	INH	Pulse input inhibit	OFF: Input command pulse is valid ON: Invalid input command pulse, ignored																	
21	PC	Proportional control	When the speed loop is PI control structure (Pn182=100): OFF: speed loop PI control ON: speed loop P control																	
22	GOH	Origin regression trigger	See the electronic manual for details																	
23	REF	Origin regression reference point																		
24	Pos1	Internal position selection	<table><tr><td>Pos2</td><td>Pos1</td><td>Internal position command N</td></tr><tr><td>Off</td><td>Off</td><td>Internal position command 0</td></tr><tr><td>Off</td><td>On</td><td>Internal position command 1</td></tr><tr><td>On</td><td>Off</td><td>Internal position command 2</td></tr><tr><td>On</td><td>On</td><td>Internal position command 3</td></tr></table>			Pos2	Pos1	Internal position command N	Off	Off	Internal position command 0	Off	On	Internal position command 1	On	Off	Internal position command 2	On	On	Internal position command 3
Pos2	Pos1	Internal position command N																		
Off	Off	Internal position command 0																		
Off	On	Internal position command 1																		
On	Off	Internal position command 2																		
On	On	Internal position command 3																		
25	Pos2	Internal position selection																		
26	Ptrigger	Internal position trigger																		
27	Pstop	Pause internal position command																		
28	Psource	Internal and external position command selection	When Pn117=2, the pulse instruction source can be determined by Psource: OFF: external position command On: internal position command																	
29	Pdistance	Fixed length displacement interruption	When SigIn: Pdistance changes from On to Off, the driver will perform the fixed length function.																	
30	Punlock	Fixed length unlocking	When Pn139=1, after executing the fixed length distance, the servo is in the fixed length locking state. Only when sigIn: Punlock changes from On to Off, the driver can respond to the position command normally.																	
31	Sen	Absolute position request	It is used for the upper computer to read the absolute position information of the absolute encoder. See "Chapter 10 Use of Absolute Servo Unit" for details.																	

3.3.2 SigOut output port function details

number	symbol	function	Function description
0	Null	No function assignment	
1	Alarm	Alarm detection	OFF: with alarm ON: without alarm
2	Ready	Servo ready	OFF: with alarm or fault ON: without alarm or fault
3	Emg	● Emergency stop detection	OFF: not in emergency stop state ON: in emergency stop state
4	Prech	Positioning completed	OFF in position mode: position deviation is greater than the value set by parameter Pn104 ON: position deviation is less than or equal to the value set by parameter Pn104
5	Sreach	Speed Arrival	OFF: the speed is less than the value set by Pn021 ON: the speed is greater than or equal to the value set by Pn021
6	Treatment	Reach the predetermined torque	OFF: torque is less than the value set by Pn024 ON: torque is greater than or equal to the value set by Pn024
7	ZeroSpeed	Zero speed	OFF: the speed is greater than the value set by Pn027 ON: the speed is less than or equal to the value set by Pn027
8	Run	Servo motor power on	OFF: the motor is not energized ON: the motor is energized
9	BRK	Electromagnetic braking	OFF: electromagnetic brake ON: electromagnetic brake release
10	HOME	Origin regression completed	
11	Pnear	Positioning approach	When in position control OFF: position deviation is greater than the value set by parameter Pn106 ON: position deviation is less than or equal to the value set by parameter Pn106
12	TRQL	Torque limiting	OFF: motor torque is not limited ON: motor torque is limited When the torque command reaches the minimum parameter value in Pn008, Pn009, Pn010 and Pn011, TRQL is ON.

13	SPL	Speed limiting	During torque control OFF: motor speed does not reach the limit value ON: The motor speed has reached the limit value See Pn198, Pn199 description.
14	TCMDreach	Tracking torque command arrival	When in torque control: OFF: The motor torque does not reach the torque command value set by the upper computer ON: The motor torque reaches the set torque command value set by the upper computer See Pn208, Pn209 description

Chapter 4 Monitoring Parameters and Operation

4.1 List of monitoring parameters

number	explain
Dn-00	The monitoring display option (the default is the motor running speed) displays different monitoring states by setting Pn079 parameters.
Dn-01	Speed command (unit: r/min)
Dn-02	Average torque (unit:%)
Dn-03	Position deviation (-9999~9999) (unit: piece)
Dn-04	AC supply voltage in volts
Dn-05	Maximum instantaneous moment (unit:%)
Dn-06	Pulse input frequency (unit: KHZ)
Dn-07	Heat sink temperature (unit: °C)
Dn-08	Current motor running speed (unit: r/min)
Dn-09	Valid input command pulse cumulative value low order (-9999~9999) (unit: piece)
Dn-10	High order (-5000~5000) of valid input command pulse cumulative value (unit: 10000) (if the high order of pulse cumulative value exceeds ± 5000 , the high order will be 0, the low order will not change, and the counting will be repeated)
Dn-11	During position control, encoder effective feedback pulse cumulative value low order (-99999~9999) (unit: piece)
Dn-12	During position control, the encoder effective feedback pulse cumulative value high order (-5000~5000) (unit: 10000) (if the high order of the feedback pulse cumulative value exceeds \pm

	5000, then the high position is 0, the low order remains unchanged, and the count is repeated)
Dn-13	Load rate of regenerative braking
Dn-14	Input port signal status, from left to right, is SigIn1~SigIn10 (upper half of nixie tube is on: high level; lower half is on: low level)
Dn-15	Output port signal status, from left to right, is SigOut1~SigOut5 (upper half of nixie tube is on: high level; lower half is on: low level)
Dn-16	Analog torque command voltage (unit: V) when the motor is enabled
Dn-17	Analog speed command voltage (unit: V) when the motor is enabled
Dn-18	Output function status register
Dn-19	After the servo is powered on, the cumulative value of motor feedback pulse is low (-99999~9999) (unit: piece)
Dn-20	After the servo is powered on, the cumulative value of feedback pulse of the motor is high (-5000~5000) (unit: ten thousand) (if the cumulative value of feedback pulse high exceeds ± 5000 , then the high position is 0, the low position remains unchanged, and the count is repeated)
Dn-21	driver software version
Dn-22	Encoder UVW signal is the level state of UVW signal from left to right (1: high level; 0: low level) (incremental encoder)
Dn-23	Absolute position of rotor (incremental encoder)
Dn-24	driver model
Dn-25	Absolute value encoder single turn data low order (0~9999) (unit: piece)
Dn-26	Absolute encoder single turn data high bit (0~9999) (unit: 10000)
Dn-27	Absolute value encoder multi turn data low order (-9999~9999) (unit: turn)
Dn-28	Absolute value encoder multi turn data high bit (-9999~9999) (unit: 10000 turns)
Dn-30	Load moment of inertia ratio
Dn-34	Absolute value encoder single turn data low order (hexadecimal)
Dn-35	Absolute value encoder single turn data high bit (hexadecimal)
Dn-37	Absolute value encoder multi turn data low order (hexadecimal)
Dn-38	Absolute value encoder multi turn data high bit (hexadecimal)
Dn-36	Cause diagnosis of motor not rotating

Note: Dn-18 output function status register is the function logic status of SigOut port. Each bit is shown in the following table:

Bit bit	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
function	Run	ZeroSpeed	Treatment	Sreach	Prech	Emg	Ready	Alarm
Bit bit	Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8
function	-	-	TCMDreac	SPL	TRQL	Pnear	HOME	BRK

			h					
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Bit bit is 0, indicating that the function is in ON status, and 1 indicates that it is in OFF status.

4.2 dn-36: motor non rotation diagnosis

P -- Position control E -- Torque control S -- Speed control

number	Error name	Correlation mode			content
		P	S	T	
00	No reason	○	○	○	
01	Non servo ready state	○	○	○	The main power supply is not connected or in the alarm state (the decimal point flashes).
02	Servo not enabled	○	○	○	Servo is not enabled
03	driver inhibit input is valid	○	○	○	CCWL or CWL driver inhibit signal is valid.
04	The forward torque limit is set too small	○	○	○	The internal or external forward torque limit is set below 5% of the rated value
05	The reverse torque limit is set too small	○	○	○	The internal or external negative torque limit is set below 5% of the rated value
06	INH input is valid	○			Pulse inhibit input signal is valid
07	Pulse input frequency is too low	○			The pulse receiving frequency is too small. Please set the pulse input mode correctly, check whether the wiring is correct and whether the upper computer has pulse output.
08	Pulse clear input is valid	○			Pclear pulse clear input signal is valid.
09	Zero speed clamping input is valid		○		Zero lock zero speed clamp input is valid.
10	External speed command is too small		○		Analog speed command is less than 0.06V
11	Internal speed command is too small		○		Internal speed command is less than 30rpm
12	External torque command is too small			○	Analog torque command is less than 1V
13	Speed limit is too small			○	Speed limit is less than 30rpm
14	Internal torque command is too small			○	Internal torque command is less than 10% of rated value
15	Other reasons	○	○	○	The causes of 1--14 are eliminated, but the motor is still below 20 [r/min]. (Small command,

					heavy load, locking, conflict, driver, motor fault, etc.)
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Chapter 5 Alarm and Handling

5.1 Alarm contents and countermeasures

Alarm display	Clear Mode	Abnormal alarm description	Exclusion method
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AL-01	Power on again	Abnormal memory content	Initialize the parameters and observe the situation.
AL-02	Reset	Alarm when the DC bus voltage is lower than 200V when the low voltage insufficient alarm is turned on.	1: Use a voltmeter to measure the external power supply voltage, and use the auxiliary mode Fn009 to correct the bus voltage. 2: Observe the displayed voltage through dn004. If the difference between the displayed voltage and the actual voltage is too large, the internal components will be damaged. Replace the servo amplifier.
AL-03	Power on again	Internal DC bus voltage is too high	
AL-04	Power on again	Alarm directly generated by intelligent power module	1: Check whether the motor power lines U, V, W are short circuited to each other or to the ground. 2: If the temperature of the heat sink is high, turn off the power supply and power on again 30 seconds later. If the alarm still appears, the internal power module may be damaged. Please replace the servo amplifier. 3: The proportional integral parameters of speed loop and current loop are set improperly.
AL-05	Reset	Overload 1	Within the time set by Pn014 parameter, the current is continuously greater than the multiple set by the overload capacity parameter Pn012 or Pn013. 1: Check whether motor wires U, V, W and encoder wires are normal. 2: The acceleration and deceleration frequency of the motor is too high, extend the acceleration and deceleration time, reduce the load inertia or select a servo motor with higher power capacity.
AL-06	Power on again	Overload 2	Within the time set by Pn015 parameter, it is more than 3 times of rated load continuously. Refer to Overload 1 for troubleshooting. Note: Some motors can only bear 2.5 or 2 times of the rated load, so 3 times is not calculated.
AL-07	Reset	Motor speed is too high	1: Check whether motor wires U, V, W and encoder wires are normal. 2: Reduce the pulse frequency of input command, or adjust the electronic gear ratio.

			3: The proportional integral parameters of the speed loop are adjusted improperly and readjusted.
AL-08	Reset	The servo amplifier radiator is overheated, and the actual temperature has exceeded the Pn084 set value	1: Repeated overloads will cause overheating of the driver. Please change the motor operation mode. To extend the service life of the server, it should be used at the ambient temperature below 60 °C, and the recommended temperature should not exceed 50 °C. 2: The average braking power is overloaded.
AL-09	Power on again	Encoder abnormality	1: Check whether the motor encoder wiring is connected to the driver. 2: Check whether the motor encoder interface is faulty soldered, short circuited or dropped, and whether the encoder power line is connected normally.
AL-10	Reset	The actual received pulse frequency is too high, exceeding the Pn234 setting value	1: Reduce the pulse frequency of input commands
AL-11	Reset	Position pulse deviation is greater than the set value	1: Check whether motor wires U, V, W and encoder wires are normal. 2: Check whether the motor dynamic speed reaches the maximum speed.
AL-12	Reset	The current sampling circuit may be damaged.	1: The instantaneous current is too large and beyond the detectable range. 2: Check whether the motor wires (U, V, W) are loose or fall off, or short circuit to ground and other abnormal connections. 3: The sampling circuit is damaged, replace the servo amplifier.
AL-13	Power on again	CPU internal failure	1: If the external interference is too large, reduce the interference (check the grounding wire). 2: CPU chip is damaged, replace servo amplifier.
AL-14	Reset	Emergency stop signal is valid	Check whether the port is equipped with the emergency stop function and whether the signal contact is in the normally closed state (ON)
AL-15	Reset	driver inhibit exception, Ccwl or Cwl is OFF	1: Check whether CCWL, CWL wiring and signal contact are in the normally closed state (ON).

			2: If the driver inhibit function is not used, pn006 parameter can be set to mask it.
AL-16	Reset	The input power supply voltage is too high Or the braking load rate reaches more than 85%	1: Use the monitoring mode to check whether the input voltage is out of the normal range 2: Reduce the start stop frequency 3: External regenerative braking resistor with higher power (without internal braking resistor, it cannot be connected in parallel) 4: Increase deceleration time 5: Whether the power value and resistance value of regeneration resistor are set correctly 6: Replace the motor and driver with higher power
AL-17	Power on again	The encoder output division ratio set is improper.	Reset parameter values of Pn016 and Pn017, which must meet DA/DB>=1.
AL-18	Power on again	The current driver model does not support the set motor model	Refer to the driver and motor model adaptation table and reset Pn001.
AL-19	Reset	Power module overheating	The temperature of the power module is too high and the heating is serious. It needs to be cooled for a period of time, or the service life of the module will be reduced.
AL-20	Power on again	The same function is assigned to multiple input ports	View all SigIn ports and remove the ports with duplicate settings.
AL-21	Power on again	The memory contents are completely damaged	1: Initialize the parameters and observe the situation. If the alarm occurs again frequently, please replace the servo amplifier. 2: The internal chip is damaged, replace the servo amplifier.
AL-22	Power on again	Watchdog timer overflow	1: Power on again. If it occurs repeatedly, please replace the servo amplifier. 2: External interference is too large to reduce external interference.
AL-23	Power on again	Current zero drift compensation abnormality	1: Power on again. If it occurs repeatedly, the components of the current sampling circuit may be damaged.
AL-24	Power on again	Abnormal programmable logic chip	1: Power on again. If it occurs repeatedly, please replace the servo amplifier. 2: External interference is too large to reduce

			external interference.
AL-25	Power on again	DSP chip is abnormal	Power on again. If it occurs repeatedly, please replace the servo amplifier.
AL-26	Power on again	Unsupported origin regression combination	Refer to Appendix F and reset Pn034 and Pn035.
AL-27	Power on again	The resistance value of the external brake resistor is less than the allowable minimum resistance value of the driver model.	Re purchase the external brake resistor.
AL-28	Power on again	The regenerative overload rate of the braking resistor exceeds the Pn090 set value, and the resistance surface has generated a high temperature rise. The resistance must be cooled for more than 15 minutes before it is powered on, or it may cause the resistance to burn out and cause fire if it is powered on again for a short time.	1 Enter Dn013 to check the load rate of electric braking regeneration.
AL-29	Power on again	Servo short-term continuous braking is abnormal	1 Enter Dn04 to check whether the input power voltage is too high. 2 The wiring falls off or the braking resistor is not connected
AL-31	Power on again	Absolute encoder battery low voltage warning	The battery voltage is lower than $3.1 \pm 0.1V$. Please replace the battery immediately, or multiple cycles of data will be lost.
AL-32	Power on again	Battery voltage of absolute encoder is too low	The battery voltage has been lower than $2.5 \pm 0.2V$. Check whether the battery is loose; Check whether the battery voltage is normal. Please execute Fn015 operation to reset the multi turn information to remove the alarm.
AL-33	Power on again	Absolute encoder multi turn count overflow	During servo power on or power off, the multi turn counter count exceeds the counting boundary. Please execute Fn015 operation to reset the multi turn information. If multi turn overflow detection is

			not required in practical application, Pn219 parameter can be set to turn off multi turn overflow alarm.
AL-34	Power on again	Absolute encoder counting error	During power on, the motor speed is too high. Please power on again.
AL-35	Power on again	Power on error of absolute encoder	When the encoder is powered on, the motor is rotating and the speed is higher than 100r/min. When powered on, the motor must be at a standstill or low speed.
AL-36	Power on again	Absolute encoder multi turn error	An error occurred in the multi turn count. Please execute Fn015 operation to reset the multi turn information.
AL-37	Power on again	Motor overheat	1 If the internal temperature of the motor exceeds 110 °C, please cool it for a while. 2. The motor is over used, please use a motor with larger capacity
AL-38	Power on again	Absolute encoder detects overspeed alarm	The battery is not connected or the battery voltage is too low; The battery is normal, but the driver is not connected to the power supply, and the motor acceleration is too high due to external rotation. Please check the battery, and then execute Fn015 operation to reset the multi turn information.
AL-41	Power on again	Communication fault, no response from absolute encoder	1: Check whether the motor encoder connector is connected to the driver. 2: Check whether the motor encoder interface has faulty soldering, short circuit or falling off; Whether the wiring sequence of encoder signal line is correct; Whether the encoder power cable is connected normally. 3: The encoder is damaged.
AL-42	Power on again	When communicating with absolute encoder, there are too many consecutive errors	1: Check whether the connector of motor encoder is in poor contact and whether the encoder wire is too long. 2: Check the wiring of encoder cable, try to avoid winding with strong interference sources such as motor line and power line, and keep a considerable distance. 3: Encoder interface circuit fault

			4: External interference is too large to reduce external interference
AL-43	Power on again	Absolute encoder internal storage unit data error	The storage unit is not initialized or the data is damaged. Please execute Fn017 to reinitialize the data.
AL-44	Power on again	Absolute encoder frequency dividing circuit fault	Encoder abnormal or motor running speed too high
AL-45	Power on again	Reset absolute encoder multi turn error operation error	Refer to AL-42 treatment measures
AL-46	Power on again	Error in single turn error operation of resetting absolute encoder	Refer to AL-42 treatment measures

5.2 Other fault phenomena and treatment measures

In the case that the servo driver does not send an alarm, the fault conditions and handling measures are shown in the table below. If the abnormal situation cannot be eliminated after handling, please contact our technical personnel.

Fault phenomenon	reason	Inspection methods and treatment measures
Servo motor fails to start and run	Control power is not connected	Check the voltage between the control power terminals
	Main circuit power supply is not connected	Check the voltage between the main power terminals
	The control line (CN2 connector) is wrongly wired or falls off	Check the installation and wiring of CN2 connector
	Servo enable (SON) input is OFF	Check whether the input pin falls off or is connected incorrectly, and check the port input status displayed by Dn014; You can also directly set the internal enable of the driver (Pn003=1)
	The input torque, speed or position command is too small, zero or none	Check whether the input pin falls off or is connected incorrectly; Increase input command; The torque, speed or position command source selection parameter settings are not as expected
	The driver does not respond to the pulse command sent by the upper computer	Check whether the input pin falls off and the wiring sequence is disordered; Check Dn006 to see if the receiving pulse frequency is

		consistent with the frequency sent by the upper computer; Check whether the motor works in position mode and is in enable status; Check whether the SigIn port specifies the Pclear and INH functions, and whether the signal status is valid
	Error specifying input port function number	Check whether the SigIn port function parameters are set correctly
	Excessive system load	Carry out no-load JOG test run to check whether the driver operates normally
	Pclear remains ON	Check Pclear input signal, port and wiring, and check the port input status displayed by Dn014
	CCWL and CWL input signals remain OFF	Check CCWL and CWL input signals, ports and wiring, and check the port input status displayed by Dn014
	Motor power line (UVW) wiring error	Check whether the power line wiring sequence is correct
	Servo driver fault	The internal circuit board of the driver is faulty and must be repaired
	Torque limit valid	The internal or external torque limit value (Pn008~Pn011) is valid and the limit value is too small
	Command pulse frequency is too low	The command pulse input mode is incorrect. Check Dn007 to display the input pulse frequency; The ratio of numerator to denominator of electronic gear ratio (Pn098~Pn112) is too small; The command pulse input mode (Pn096) is inconsistent with the pulse mode sent by the upper computer, and the wiring sequence is wrong
Servo motor stops after instantaneous operation	Zero speed clamping status during speed control	SigIn: zero_Lock signal is on; Within the range of zero speed clamping level (Pn165);
	Motor wiring error	Check whether the wiring order of motor power line is correct
	Encoder cable wiring error	Check whether the encoder wiring sequence is correct