ES600 Servo

Driver Manual(V393)



User Manual

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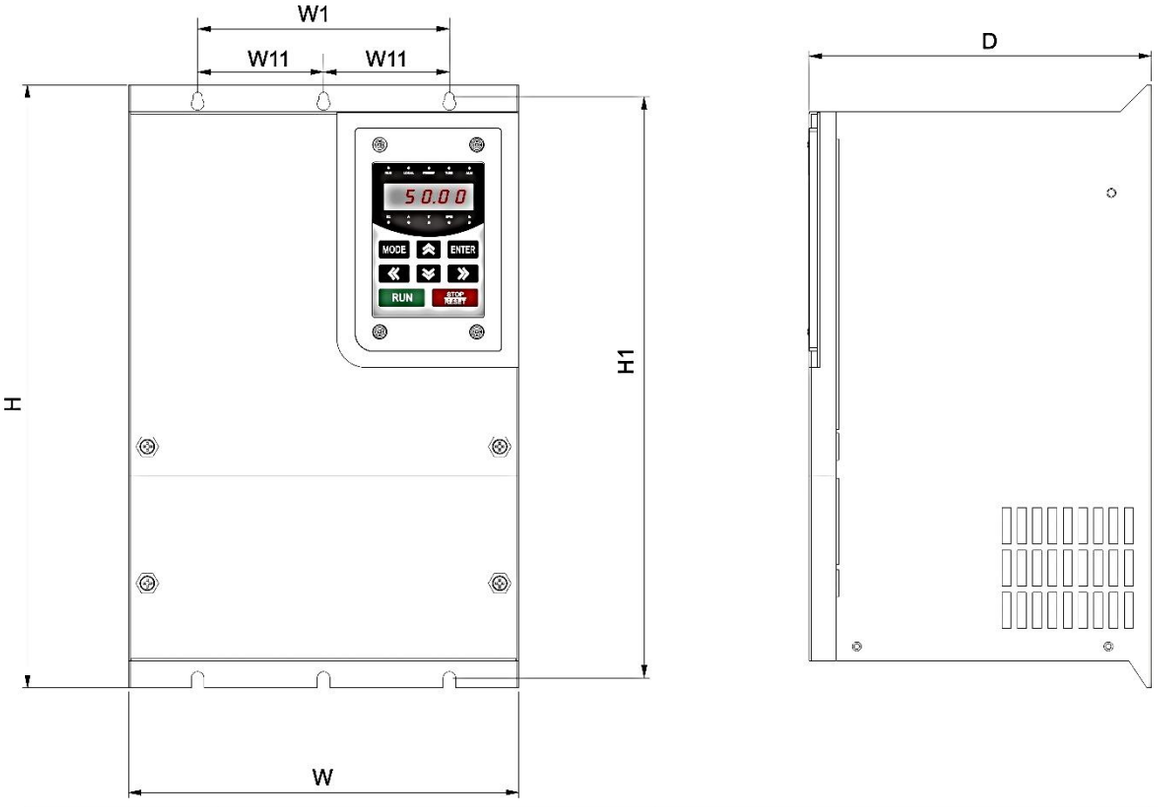
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1. Naming rules

ES600 – T - 025

- 025：The rated output current of the drive is 25A
- T: Three phase 380V
- ES600：Products series number

2. List of Servo Drive Structure Parameters



Model	Dimensions(mm)			Installation size(mm)				
	W （width）	H （height）	D （depth）	W1	W11	H1	Mounting hole diameter	Weight
ES600T017	200	305	180	140	-	290	Φ6	7kg
ES600T025	200	305	180	140	-	290	Φ6	7kg
ES600T032	200	305	180	140		290	Φ6	7kg
ES600T037	285	463	228	235		447	Φ6	7kg
ES600T045	285	463	228	235		447	Φ8	20kg
ES600T060	285	463	228	235	-	447	Φ8	20kg
ES600T075	385	600	265	260		580	Φ8	20kg
ES600T091	385	600	265	260	-	580	Φ10	32kg
ES600T112	385	600	265	260		580	Φ10	32kg

ES600T150	473	700	307	343		678	Φ10	47kg
ES600T175	473	700	307	343	-	678	Φ10	47kg
ES600T210	579	930	375	449		905	Φ10	90kg
ES600T253	579	930	375	449		905	Φ10	90kg
ES600T304	579	930	375	449		905	Φ10	90kg

3. Servo drive specifications

1. Technical characteristics

- The given mode of CANBUS and analog communication is optional, with fast response speed and simple operation.
- Using CANBUS communication, it is easy to realize the parallel connection of single machine and multiple pumps, and the control of merging and splitting
- Drive with motor temperature protection function
- Oil pressure sensor power supply short-circuit protection function
- Easy to realize dual pump high and low pressure control

2. Advantages

- Energy saving: precise speed control to achieve maximum energy saving.
- High precision: the speed control is more accurate, and the product repeatability is high.
- Professional: Specially designed for oil pump control, easy to debug and install.
- High reliability: large design margin, using metal structure resolver as the speed feedback element, adapt to hydraulic machinery in high temperature, oil pollution, vibration environment.
- Low noise: The servo drive specially designed for hydraulic machinery makes full use of the high performance of the servo motor, and the noise during the operation of the whole machine is significantly reduced.

3.1 Technical Parameters

Overview of drive technical parameters		
Basic parameter	Carrier frequency	0.5kHz～16kHz; the carrier frequency can be adjusted automatically according to the load characteristics
	way to control	Closed loop vector control
	Speed ratio	1:1000
	Stable speed accuracy	±0.02%
	Overload capacity	150% rated current 60S, 180% rated current 5S
	Starting torque	0Hz/180%

Power supply		See the table below
Control terminal	Input terminal	One motor PTC protection input terminal Five digital input terminals, compatible with NPN and PNP input modes Three analog input terminals, AI1, AI2 can only input voltage signals, AI3 can input voltage or current signals
	Output terminal	Three relay output terminals, one NO/NC optional, two NO Two analog output terminals, 0～10V
	Communication terminal	CAN communication terminal RS485 communication terminal (reserved)
	Power Output	10V power output 13V power output
	Control panel model	See the table below for details
Keyboard	LED	Display parameters
	Button	9
surroundings	Altitude	Below 2000m
	Use place	Indoor, avoid direct sunlight, no corrosion, flammable gas, no oil mist, water vapor, etc.
	Ambient temperature	-10℃～40℃
	Vibration	Less than 0.6g
	Storage temperature	-20℃～60℃
	Humidity	Humidity below 90%RH

Driver power supply parameters and control terminal model					
Drive model	Rated power	Rated output current	Rated input current	Voltage frequency	Voltage range
ES600T017	7.5KW	17A	20A	Three pahse 380V AC, 50/60Hz	340～456V AC
ES600T025	11KW	25A	26A		
ES600T032	15KW	32A	34A		
ES600T037	18.5KW	37A	38A		
ES600-T-045	22KW	45A	46A		

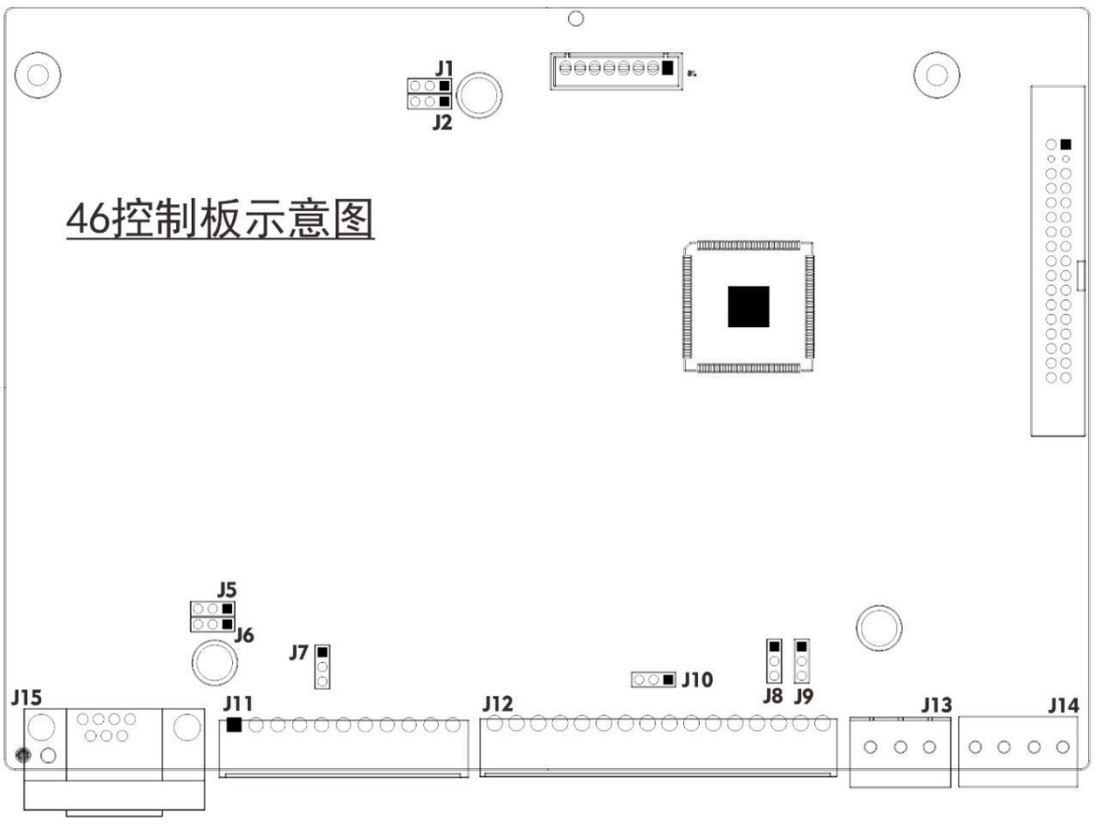
ES600-T-060	30KW	60A	62A		
ES600-T-075	37KW	75A	76A		
ES600-T-091	45KW	91A	92A		
ES600-T-112	55 KW	112A	113A		
ES600-T-150	75 KW	150A	157A		
ES600-T-176	90 KW	176A	180A		
ES600-T-210	110 KW	210A	214A		
ES600-T-253	132 KW	253A	256A		
ES600-T-304	160 KW	304A	307A		

3.2 Wiring

3.2.1 Main circuit terminal description

Terminal mark	Name	Description
R、S、T	Three-phase power input terminal	AC three-phase 380V power input connection terminal
(+)、(-)	DC bus positive and negative terminals	DC bus positive and negative terminals
(+)、PB	Braking resistor connection terminal	Braking resistor connection point
U、V、W	Driver output terminal	Connect a three-phase motor
⏚	Earth terminal	Protective earthing

3.2.2 Control signal terminal description (46 control board)



J11放大示意图

PE	AI1	AI2	AI3	GND	10V	13V	GND	AO1	AO2	GND

J12放大示意图

COM	DI1	DI2	DI3	DI4	DI5	COM	OP	24V	PTCP	PTCN	CANH	CANL	CGND	485A	485B

J13放大示意图

T/A1	T/B1	T/C1

J14放大示意图

T/A2	T/C2	T/A3	T/C3

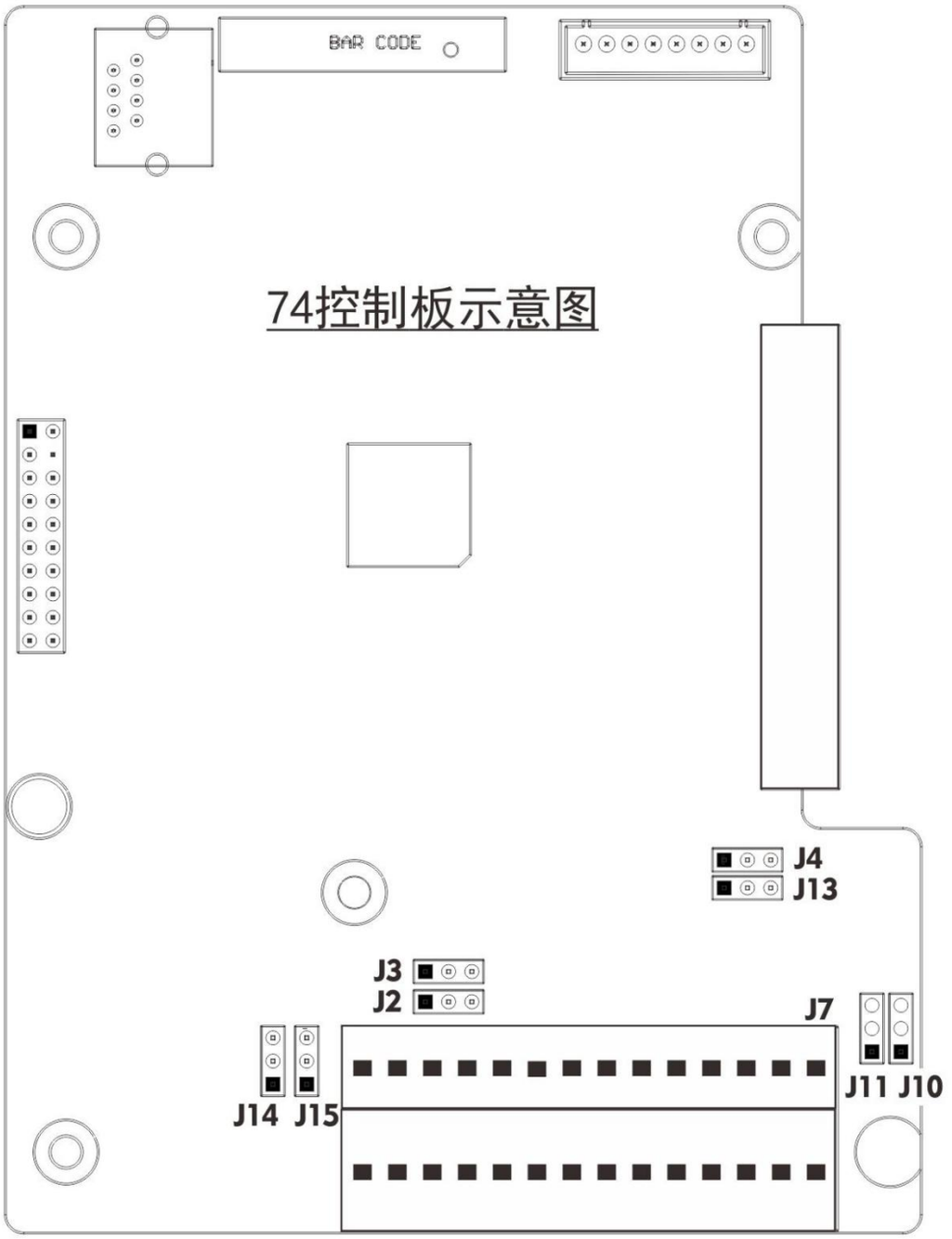
Terminal definition description

Category	Terminal symbol	Terminal name	Description
Power supply	PE	Ground terminal	Signal wire shielding shell ground terminal
	+10V	+10V	10V±10%，Max 10mA
	+13V	Pressure sensor	13±10%，Max 10mA
	+24V	+24V	+24V power supply，used for DI

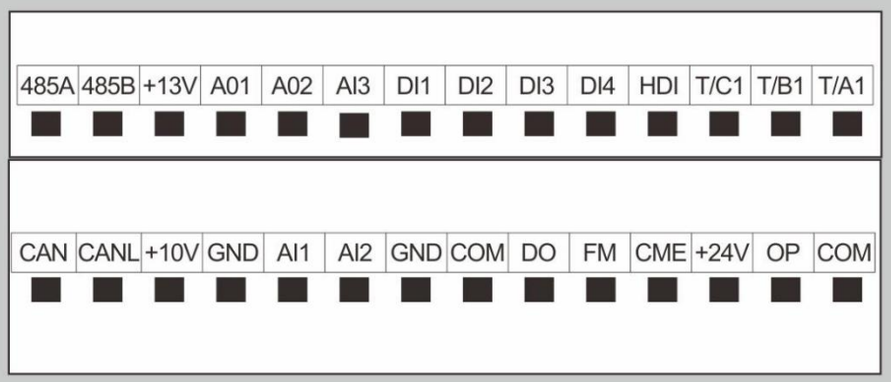
	OP	External power input terminal	When leaving the factory, it is shorted to +24V. When using an external power supply, the OP must be disconnected from +24V
Analog input	AI1	Analog input terminal 1 (The default pressure is given)	Input range: ±10V Input impedance: 100KΩ
	AI2	Analog input terminal 2 (The default flow rate is given)	Input range: ±10V Input impedance: 100KΩ
	AI3	Analog input terminal 3 (The default pressure sensor feedback setting)	Input range: ±10V, 0～20mA is determined by the jumper J7 on the control panel. Input impedance: 100KΩ at voltage input, 500Ω at current input
Digital input	DI1	Digital input 1	Optocoupler isolation input, input frequency is less than 100KHz, input impedance 3.3KΩ Effective voltage input range: 9V～30V
	DI2	Digital input 2	
	DI3	Digital input 3	
	DI4	Digital input 4	
	DI5	Digital input 5	
	PTCP-PTCN	Motor temperature protection	Motor temperature protection, support PTC130，PTC150 etc
Communication terminal	CANH	CAN Communication terminal	Maximum communication speed 1Mbps The J8 jumper on the control board selects whether to connect the terminal matching resistor
	CANL		
	CGND		
	485A	485 Communication terminal	The J5 jumper on the control board selects whether to connect the terminal matching resistor (reserved function)
	485B		
Analog output terminal	AO1	Analog output 1	Output range：0～10V
	AO2	Analog output 2	Output range：0～10V
Relay output	T/A1-T/B1	Normally closed terminal	Contact drive capability： 1. AC250V, 3A 2. DC30V,1A
	T/A1-T/C1	Normally open terminal	
	T/A2-T/C2	Normally open terminal	
	T/A3-T/C3	Normally open terminal	

Note: The control board and PG in the 46 control board are combined together

3.2.3 Control signal terminal description (74 control board)



J7放大示意图



Terminal definition description

Category	Terminal symbol	Terminal name	Description
Power supply	+10V	+10V power supply	10V±10%，Maximum 10mA
	+13V	Pressure sensor power	13±10%，Maximum 10mA
	+24V	+24V power supply	+24V，used for DI
	OP	External power input terminal	When leaving the factory, it is shorted to +24V. When using an external power supply, the OP must be disconnected from +24V
Analog input	AI1	Analog input terminal 1(The default pressure is given)	Input range: ±10V Input impedance: 100KΩ
	AI2	Analog input terminal 2(The default flow rate is given)	Input range: ±10V Input impedance: 100KΩ
	AI3	Analog input terminal 3(The default pressure sensor feedback setting)	Input range: ±10V, 0～20mA is determined by the jumper J3 on the control panel. Input impedance: 100KΩ at voltage input, 500Ω at current input
Digital input	DI1	Digital input 1	Opto-isolator input, input frequency is less than 100KHz, input impedance 3.3KΩ Effective voltage input range: 9V～30V
	DI2	Digital input 2	
	DI3	Digital input 3	
	DI4	Digital input 4	
	HDI	Digital input 5	
Communication terminal	CANH	CAN Communication terminal	Maximum communication speed 1Mbps The J14 jumper on the control board selects whether to connect the terminal matching resistor
	CANL		
	CGND		
	485A	485 Communication terminal	The J15 jumper on the control board selects whether to connect the terminal matching resistor (reserved function)
	485B		
Analog output terminal	AO1	Analog output 1	Output range: ±10V, 0～20mA, the input mode is determined by the jumper J2 on the control board
	AO2	Analog output 2	Output range: 0～10V

Relay output	T/A1-T/B1	Normally closed terminal	Contact drive capability： 3. AC250V, 3A 4. DC30V,1A
	T/A1-T/C1	Normally open terminal	

Note: The control board is separated from the PG in the 74 control board, and the PG card is inserted into the control board by stacking installation.

3.2.4 Definition of resolver terminal signal

9 Core decoder cable definition			
No.	Color	Name	Function
1	Red	EXC	Excitation signal
2	Blue	/EXC	
3	White	SIN	SIN feedback signal
4	Brown	SINLO	
5	Yellow	COS	COS feedback signal
9	Green	COSLO	

3.3 Jumper function description

3.3.1 Jumper function description (46 control board)

Jumper serial number	Jumper position	Function Description	Jumper position	Function Description
J1		COM-Terminal connection to ground capacitance		COM The terminal is not connected to the ground capacitor
J2		GND-Terminal connection to ground capacitance		GND The terminal is not connected to the ground capacitor
J5		GND-Terminal connection to ground capacitance		GND The terminal is not connected to the ground capacitor
J6		COM-Terminal connection to ground capacitance		COM The terminal is not connected to the ground capacitor
J7		AI3-Input by voltage		AI3 Input in current mode
J8		CAN-Communication connection terminal resistance, the terminal adopts when multi-machine communication		CANThe communication is not connected to the terminal resistance, and the middle machine adopts it when multi-machine communication

J9		485 Communication connection terminal resistance, the terminal adopts when multi-machine communication		485 The communication is not connected to the terminal resistance, and the middle machine adopts it when multi-machine communication
J10		DI Use internal power		DI Use external power

Note: The control board and PG in the 46 control board are combined together

3.3.2 Jumper function description (74 control board)

Jumper serial number	Jumper position	Function Description	Jumper position	Function Description
J2		AO1 Output in voltage		AO1 Output in current mode
J3		AI3 Output in voltage		AI3 Output in current mode
J4		COM and CME shorted connection		COM and CME disconnected
J10		GND Terminal connection to ground capacitance		GND The terminal is not connected to the ground capacitor
J11		COM Terminal connection to ground capacitance		COM The terminal is not connected to the ground capacitor
J13		24V is shorted to OP1, DI terminal uses internal 24V power supply		24V is disconnected from OP1, DI terminal uses external 24V power supply
J14		CAN communication is connected to the terminal resistance, the terminal will adopt it when multi-machine communication		CAN The communication is not connected to the terminal resistance, and the middle machine adopts it when multi-machine communication
J15		485 communication is connected to the terminal resistance, the terminal adopts when multi-machine communication		485 The communication is not connected to the terminal resistance, and the middle machine adopts it when multi-machine communication

Note: The control board is separated from the PG in the 74 control board, and the PG card is inserted into the control board in a stacked installation mode.

4. Operation and display



4.1 Function indicator description

RUN: Running status indicator. When the light is off, the drive is in stop state, and when the light is on, the drive is in running state.

LOCAL: Command source indicator, the light off indicates the keyboard control state, the light on indicates the terminal control state, and the light flashes to indicate remote operation.

FWD/REV: Forward and reverse indicator light, when the light is off, it is in the forward rotation state, and when the light is on, it is in the reverse rotation state.

TUNE: Tuning/torque control status indicator, flashing means it is in tuning state, on means it is in torque control state, and off means it is in speed control state.

4.1.1 Unit indicator description

HZ: Frequency unit A: Current unit V: Voltage unit

RMP: Rotation speed unit %: Percent

4.2 Digital display area

5-digit LED display can display the set frequency, output frequency, various monitoring data and alarm codes, etc.

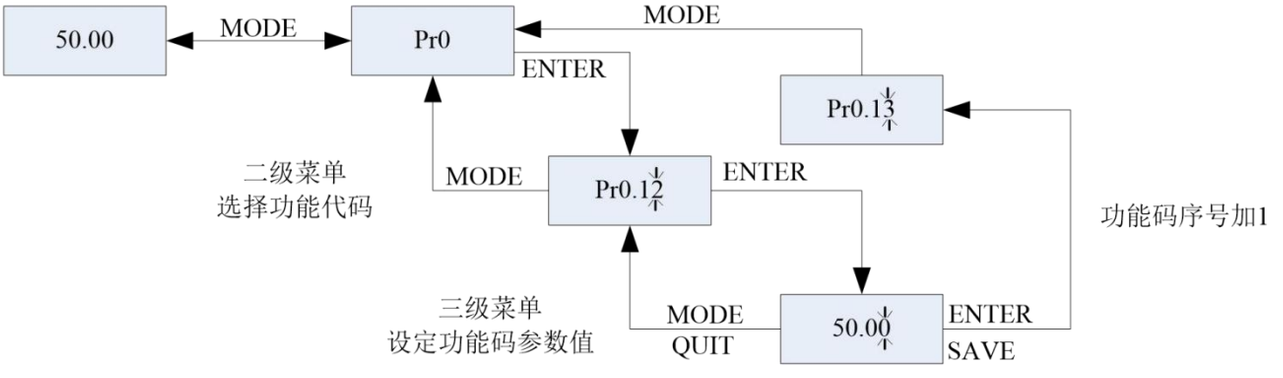
Keyboard button description:

Button	Name	Function
MODE	Mode key	Enter or exit the first level menu
ENTER	Enter	Step by step enter the menu screen, confirm the setting parameters
∧	Increment key	Increment of data or function code
∨	Decrement key	Decrement of data or function code
<<>>	Shift key	In the stop display interface and the running display interface, the display parameters can be selected cyclically; when modifying the parameters, the modification position of the parameters can be selected
RUN	RUN	In the keyboard operation mode, used for running operation
STOP/RES	Stop/reset	In the running state, press this key to stop the drive; in the fault alarm state, this key is used to reset the fault.

4.3 Function code view and modification

ES600 The operation panel of the servo drive adopts a three-level menu structure for parameter setting and other operations.

The three-level menus are: function parameter group (first-level menu) → function code (second-level menu) → function code setting value (third-level menu). The operation flow is shown in the figure below.

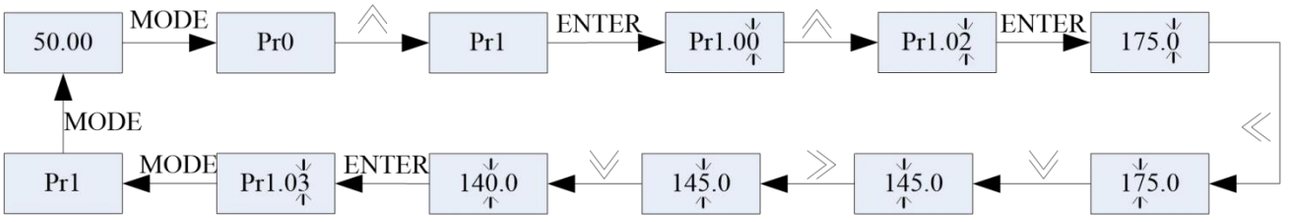


When operating in the third-level menu, press MODE or ENTER to return to the second-level menu. The difference between the two is:

Press ENTER to save the set parameters and return to the secondary menu, and automatically transfer to the next function code;

Press the MODE key to directly return to the secondary menu without storing parameters, and return to the current function code.

Example: Example of changing the function code F1.05 from 175.0 bar to 140.0 bar



5. Braking resistor selection table

Servo Driver Model	Recommended power of braking resistor	Recommended value of braking resistor
ES600T017	500W	⩾65Ω
ES600T025	800W	⩾43Ω
ES600T032	1000W	⩾32Ω
ES600T037	1300W	⩾25Ω
ES600T045	1500W	⩾22Ω
ES600T060	2500W	⩾16Ω
ES600T075	3.7KW	⩾16Ω
ES600T091	4.5KW	⩾16Ω
ES600T0112	5.5KW	⩾8Ω

6. Servo Drive Function Code

Description of parameter change:

★: Parameters can be modified in the stop state

☆: Parameters can be modified in any state

●: Parameters is read-only and cannot be modified

6.1 Drive, servo motor parameter group Pr0

Function code	Function code description	Setting range	Min unit	Factory default	Change description	Contact address
Pr0.00	Motor rated power	7.5KW～400KW	0.1KW		★	0xF000
Pr0.01	Motor rated voltage	0V~440V	1V		★	0xF001
Pr0.02	Motor rated current	17~75A	0.1A		★	0xF002
Pr0.03	Motor rated frequency	0~max frequency	0.01Hz		★	0xF003
Pr0.04	Motor rated rpm	0~30000rpm	1rpm		★	0xF004

Pr0.05	D-axis inductance of permanent magnet motor	0.01mH ～ 655.35mH (Drive power ≤ 55kW) 0.001mH,65.535mH（Drive power >55kW）	1		★	0xF005
Pr0.06	Q-axis inductance of permanent magnet motor	0.01mH ～ 655.35mH (Drive power ≤ 55kW) 0.001mH,65.535mH（Drive power >55kW）	1		★	0xF006
Pr0.07	Permanent Magnet Motor Stator Resistance	0.001Ω～65.535Ω (driver power ≤55kW) 0.0001Ω～6.5535Ω (driver power>55kW)	1		★	0xF007
Pr0.08	Motor running acceleration time	0~65503	1	1024	★	0xF008
Pr0.09	Rotary change direction of permanent magnet motor	0: Forward 1: Reverse	1	0	☆	0xF009
Pr0.10	Permanent magnet motor position sensor installation angle	0° ~359.9°	0.1°	0°	☆	0xF00A
Pr0.11	Number of pole pairs of permanent magnet motor rotary encoder	1~50	1	1	★	0xF00B
Pr0.12	Drive set operating frequency	0.00Hz～maximum frequency Pr013	0.01Hz	50.00Hz	☆	0xF00C
Pr0.13	The maximum operating frequency of the driver	50Hz~300Hz	0.01Hz	200.00Hz	★	0xF00D
Pr0.14	Output torque upper limit	0.0%~250.0%	0.1%	200.0%	☆	0xF00E
Pr0.15	Drive operating upper limit frequency	0～max frequency Pr0.13	0.01Hz	200.00Hz	☆	0xF00F
Pr0.16	Carrier frequency	0.0~6500.0s	0.1s	20.0s	☆	0xF010
Pr0.17	Motor running deceleration time	0.0~6500.0s	0.1s	20.0s	☆	0xF011

Pr0.18	Motor running direction selection	0: consistent with the current direction 1: opposite to the current direction	0	0	☆	0xF012
Pr0.19	Permanent Magnet Motor Back EMF	0~65535V	1		★	0xF013
Pr0.20	Speed loop proportional gain 1	0~100	1	30	☆	0xF014
Pr0.21	Speed loop integral gain 1	0.01~10.00s	0.01s	0.50s	☆	0xF015
Pr0.22	Corner frequency 1	0.00~Pr0.25	0.01Hz	5.00Hz	☆	0xF016
Pr0.23	Speed loop proportional gain 2	0~100	1	20	☆	0xF017
Pr0.24	Speed loop integral gain 2	0.01~10.00s	0.01s	1.00s	☆	0xF018
Pr0.25	Corner frequency 2	Pr022～maximum frequency	0.01Hz	10.00Hz	☆	0xF019
Pr0.26	Driver tuning mode selection	0: no operation 1: static tuning 2: Dynamic tuning 3: Tuning mode 3	1	0	★	0xF01A

6.2 Oil pressure control parameter group Pr1

Function code	Function code description	Setting Range	Min unit	Factory default	Change description	Contact address
Pr1.00	oil pressure control mode	0: non-hydraulic control mode 1: Driver oil pressure control mode 1 (CAN given) 2: Driver oil pressure control mode 2 (analog given) 3: CAN oil pressure mode (dedicated) 4~5: reserved 6: Internal register oil pressure control mode (select the internal register to set pressure and flow through the terminal) 7: Oil pressure mode 7	0	0	★	0xF100

Pr1.01	Maximum speed of injection molding machine	0~3000rpm	1rpm	2000rpm	★	0xF101
Pr1.02	System oil pressure	0.0Kg/C ㎡～the maximum oil pressure of the system (Pr103)	0.1g/C ㎡	175.0Kg/C ㎡	☆	0xF102
Pr1.03	Max oil pressure	System oil pressure (Pr102)～500 Kg/C ㎡	0.1Kg/C ㎡	250.0Kg/C ㎡	☆	0xF103
Pr1.04	Oil pressure command rise time	0ms~2000ms	1ms	20ms	☆	0xF104
Pr1.05	Oil pressure ring proportional gain 1	0.0~800.0	0.1	210.0	☆	0xF105
Pr1.06	Oil pressure ring Integral gain 1	0.001s～10.000s	0.001s	0.100s	☆	0xF106
Pr1.07	Oil pressure ring differential gain 1	0.000s～1.000s	0.001s	0.000s	☆	0xF107
Pr1.08	Oil pressure ring proportional gain 2	0.0~800.0	0.1	210.0	☆	0xF108
Pr1.09	Oil pressure ring Integral gain 2	0.001s~10.000s	0.001s	0.100s	☆	0xF109
Pr1.10	Oil pressure ring differential gain 2	0.000s~1.000s	0.001s	0.000s	☆	0xF10A
Pr1.11	Oil pressure ring proportional gain 3	0.0~800.0	0.1	210.0	☆	0xF10B
Pr1.12	Oil pressure ring Integral gain 3	0.001s~10.000s	0.001s	0.100s	☆	0xF10C
Pr1.13	Oil pressure ring differential gain 3	0.000s~1.000s	0.001s	0.000s	☆	0xF10D
Pr1.14	Oil pressure overshoot control proportional gain	0.0~800.0	0.1	360.0	☆	0xF10E
Pr1.15	Oil pressure overshoot control Integral gain	0.001s~10.000s	0.001s	0.100s	☆	0xF10F

Pr1.16	Oil pressure overshoot control differential gain	0.000s~1.000s	0.001s	0.000s	☆	0xF110
Pr1.17	Maximum reverse speed of injection molding machine	0.0%~100.0	0.1%	20%	☆	0xF111
Pr1.18	Bottom flow	0.0%~50.0%	0.1%	0.5%	☆	0xF112
Pr1.19	Bottom pressure	0.0Kg/C ㎡~50.0Kg/C ㎡	0.1Kg/C ㎡	0.5Kg/C ㎡	☆	0xF113
Pr1.20	AI zero drift automatic correction	0:invalid 1:enable	0	0	☆	0xF114
Pr1.21	Oil pressure sensor failure detection time	0.000s:invalid 0.001s~60.000s	0.001s	0.500s	☆	0xF115
Pr1.22	Pressure control state output maximum speed	0.0%~10.00%	0.1%	10.0%	☆	0xF116
Pr1.23	Output minimum oil pressure in pressure control state	0.0%~10.00%	0.1%	60.0%	☆	0xF117
Pr1.24	Pressure control state output delay time	0.000s~10.00s	0.001s	0.100s	☆	0xF118
Pr1.25	Given oil pressure rise S filter time	0.000s~10.00s	0.001s	0.030s	☆	0xF119
Pr1.26	Speed-to-gain selection in pressure-holding state	0: (Pr0.20,Pr0.21) 1:(Pr7.19, Pr7.20)	1	1	★	0xF11A
Pr1.27	Slave minimum input	0.0%~Pr1.29	0.1%	0.0%	☆	0xF11B
Pr1.28	Slave minimum input corresponding percentage	-100.0%~Pr1.30	0.1%	0.0%	☆	0xF11C
Pr1.29	Slave middle point input	Pr1.27~Pr1.31	0.1%	0.0%	☆	0xF11D

Pr1.30	Input the corresponding percentage from the middle point of the machine	Pr1.28~Pr1.32	0.1%	0.0%	☆	0xF11E
Pr1.31	Slave maximum input	Pr1.29~100.0%	0.1%	0.0%	☆	0xF11F
Pr1.32	Percentage corresponding to the maximum input of the slave	Pr1.30~100.0%	0.1%	0.0%	☆	0xF120
Pr1.33	Given oil pressure rising S filter time 1	0.000s~10.00s	0.001s	0.030s	☆	0xF121
Pr1.34	Given oil pressure drop S filter time	0.000s~10.00s	0.001s	0.030s	☆	0xF122
Pr1.35	Given oil pressure drop S filter time 1	0.000s~10.00s	0.001s	0.030s	☆	0xF123
Pr1.36	Pressure sensor type selection	0： 0.00V~10.00V 1: 1.00V~5.00V	1	0	☆	0xF124
Pr1.37	Pressure transducer failure detection minimum voltage	0.90V~20.00V	0.01V	0.90V	☆	0xF125
Pr1.38	Oil pressure mode 6 When there is no input from the external terminal, the pressure and flow signal are given	Units: Pressure and flow setting when there is no input from the external terminal 0: Set by register 1: Set by external analog input 2: Determined by the tens and hundreds setting values Tens place: flow setting value selection when there is input from the external terminal 0: Set by register 1: given by analog Hundreds place: selection of pressure setting value when there is input from the external terminal 0: Set by register 1: given by analog	1	000	★	0xF126

Pr1.39	Zero servo function setting	0: invalid 1: always valid 2: Terminal function selection	1	0	★	0xF127
Pr1.40	Zero Servo Gain Setting	1~100	1	10	☆	0xF128

6.3 IO parameter set Pr2

Function code	Function code description	Setting Range	Min unit	Factory default	Change description	Contact address
Pr 2.00	DI1 terminal function selection	0: no function 1: Oil pump enabled 2: Fault reset (RESET) 3: Servo oil pump PID selection terminal 1 4: Servo oil pump PID selection terminal 2 5: CAN communication enable 6: Enable from host 7: Oil pressure internal setting 2 8: Oil pressure internal setting 3 9: Oil pressure internal setting 4 10: Flow 2 edge selection 11: flow 4 level selection 12~15: multi-speed terminal 16~17: Acceleration and deceleration time selection terminals 18: Frequency source switching 19: Clear frequency increase or decrease 20: command source switching 1 21: Prohibit acceleration and deceleration 22-28: Reserved 29: Prohibit torque control 30~31: reserved 32: brake 33: External fault normally closed input 34~35: reserved 36: Parking 37: Command source switching 2 38~47: reserved	1	0	★	0xF200
Pr 2.01	DI2 terminal function selection		1	2	★	0xF201
Pr 2.02	DI3 terminal function selection		1	1	★	0xF202

Pr 2.03	DI4 terminal function selection	48: Three-wire control 49: forward jog 50: reverse jog 51: Frequency increase 52: Frequency decrease 53: Turn off PWM output 54: reverse enable 55: Running pause 56: External fault normally open input 57: Flow 4 edge selection 58: Oil pressure/speed mode switching 59: Oil pressure rising S-curve filter time selection 60: Oil pressure drop S curve filter time selection 61: Virtual DO output input point 62: Host selection when multi-machine parallel pump 63: PLC pulse lock function 64: Pressure flow value program setting input	1	1	★	0xF203
Pr 2.04	DI5 terminal function selection		1	1	★	0xF204
Pr 2.05	Relay output selection (T/A1-T/B1-T/C1)	0: no output 1: The driver is running 2: Fault output 3: Frequency level detection FDT1 output 4: Frequency arrival 5: Running at zero speed 6: Motor overload pre-alarm 7: Drive overload pre-alarm 8~11: Reserved 12: run time reached 13: The speed is limited 14: Torque limited 15: Ready to run 16~18: Reserved 19: Undervoltage status output 20: Communication setting 21~22: Reserved 23: Double-displacement plunger pump swash plate switching 1 (NO)	1	0	☆	0xF205
Pr 2.06	Relay output selection (T/A2-T/C2)		1	0	☆	0xF206

Pr 2.07	Relay output selection （T/A3-T/C3）	24: Pressure control state output (NC) 26: Double-displacement plunger pump swash plate switching 2 (NO) 27~28: Reserved 29: Oil pressure mode 7 internal	1	0	☆	0xF207
Pr 2.08	AO1 output function selection	0：run frequency 1：set frequency 2：output current 3：output torque 4：output power 5：output voltage 6：reserved 7：AI1 8：AI2 9：AI3 10：feedback frequency 11：feedback pressure 12~16：reserved	1	10	☆	0xF208
Pr 2.09	AO2 output function selection		1	11	☆	0xF209
Pr 2.10	reserved	-	-	-	☆	0xF20A
Pr 2.11	AO1 bias	-100.0%~100.0%	0.1%	0.0%	☆	0xF20B
Pr 2.12	AO1 gain	-10.00~10.00	0.01	1	☆	0xF20C
Pr 2.13	AO2 bias	-100.0%~100.0%	0.1%	0.0%	☆	0xF20D
Pr 2.14	AO2 gain	-10.00~10.00	0.01	1	☆	0xF20E
Pr 2.15	Terminal control mode selection	0: Two-wire 1 1: Two-wire type 2 2: Three-wire type 1 3: Three-wire type 2	1	0	☆	0xF20F
Pr 2.16	Terminal UP rate of change	0.01Hz/s ～ 100.00Hz/s	0.01Hz/s	0.100Hz/s	☆	0xF210
Pr 2.17	Minimum input voltage of pressure command	-11.00V～11.00V	0.01V	0.02V	☆	0xF211
Pr 2.18	Corresponding percentage of minimum input voltage of pressure command	-100%~100%	0.1%	0.0%	☆	0xF212

Pr 2.19	Maximum input voltage of pressure command	-11.00V~11.00V	0.01V	10.00V	☆	0xF213
Pr 2.20	Corresponding percentage of maximum input voltage of pressure command	-100%~100%	0.1%	100.0%	☆	0xF214
Pr 2.21	Filter time constant of input voltage of pressure command	0.000s~10.000s	0.001s	0.010s	☆	0xF215
Pr 2.22	Maximum input voltage of flow command	-11.00V~11.00V	0.01V	0.02V	☆	0xF216
Pr 2.23	Corresponding percentage of minimum input voltage of flow command	-100%~100%	0.1%	0.0%	☆	0xF217
Pr 2.24	Maximum input voltage of flow command	-11.00V~11.00V	0.01V	10.00V	☆	0xF218
Pr 2.25	Corresponding percentage of maximum input voltage of flow command	-100%~100%	0.1%	100.0%	☆	0xF219
Pr 2.26	Filter time constant of input voltage of flow command	0.000s~10.000s	0.001s	0.005s	☆	0xF21A
Pr 2.27	Minimum input voltage of pressure feedback	-11.00V~11.00V	0.01V	0.02V	☆	0xF21B
Pr 2.28	Corresponding percentage of minimum input voltage of pressure feedback	-100%~100%	0.1%	0.0%	☆	0xF21C

Pr 2.29	Maximum input voltage of pressure feedback	-11.00V~11.00V	0.01V	10.00V	☆	0xF21D
Pr 2.30	Corresponding percentage of maximum input voltage of pressure feedback	-100%~100%	0.1%	100.0%	☆	0xF21E
Pr 2.31	Filter time constant of input voltage of pressure feedback	0.000s~10.000s	0.001s	0.000s	☆	0xF21F
Pr 2.32	DI input filter time setting	1-10	1	4	☆	0xF220
Pr 2.33	Terminal UP/DOWN frequency setting in stop state	0: remain unchanged 1: clear	1	0	☆	0xF221
Pr 2.34	HDI minimum input	0.00kHz～Pr2.36	0.01	0.00	☆	0xF222
Pr 2.35	HDI minimum input corresponding setting	-100.0%～100.0%	0.1	0.0	☆	0xF223
Pr 2.36	HDI max input	Pr2.34～50.00kHz	0.01	50.00	☆	0xF224
Pr 2.37	HDI max input corresponding setting	-100.0%～100.0%	0.1	100.0	☆	0xF225
Pr 2.38	HDI filter time	0.00s～10.00s	0.01	0.10	☆	0xF226
Pr 2.39	Oil pressure mode 7 flow given selection	0: Analog AI2 given flow, AI3 given feedback pressure 1: Pulse HDI given flow, AI2 and AI3 given pressure feedback	1	0	★	0xF227
Pr 2.40	DO1 output delay time	0.00s～360.00s	0.01s	0.00	☆	0xF228
Pr 2.41	DO2 output delay time	0.00s～360.00s	0.01s	0.00	☆	0xF229

6.4 Alarm parameter set Pr3

Function code	Description of function code	Setting range	Minimum unit	Factory value	Change statement	Contact address
Pr 3.00	Motor temperature protecting function enabled	0：forbid 1：valid	1	1	☆	0xF300
Pr 3.01	Motor temperature protection input signal mode	0：DI signal input 1:AI analog input 2~3: reserved	1	0	☆	0xF301
Pr 3.02	First fault code	A.02: Data overflow A.10: Current detection failure A.12: Acceleration overcurrent A.13: Deceleration overcurrent A.14: Constant speed overcurrent A.15: External device failure A.16: MODBUS communication failure A.19: Motor tuning failure A.22: CAN communication failure A.23: Short-circuit fault to ground A.24: Multi-pump parallel flow follower failure A.25: Multi-pump parallel flow multi-master fault A.26: Accumulated running time reached fault A.30: Oil pressure sensor failure A.31: Slave failure pre-alarm A.32: CAN address conflict fault A.41: Undervoltage Fault A.45: Accelerating overvoltage A.46: Deceleration overvoltage A.47: Constant speed overvoltage A.51: Speed Deviation Protection Fault A.62: Brake pipe action time is over A.71: Servo Drive Overload A.72: Input phase loss A.73: Output phase loss A.74: Motor overload A.75: External faults A.76: Communication failure A.77: Contactor failure A.78: Motor Temperature Fault A.7A: Heat sink overheating				0xF302
Pr 3.03	Second fault code				●	0xF303

Pr 3.04	Last fault code	A.81: Code disc failure A.82: Encoder failure A.83: Resolver signal failure A.85: Motor Phase Sequence Fault A.86: Motor Positive Feedback Fault A.92: Hardware accelerated overcurrent A.93: Hardware deceleration overcurrent A.94: Hardware constant speed overcurrent			●	0xF304
Pr 3.05	Motor run frequency in fault	-	-	-	●	0xF305
Pr 3.06	Motor current in fault	-	-	-	●	0xF306
Pr 3.07	Driver bus voltage in fault	-	-	-	●	0xF307
Pr 3.08	Input terminal status in fault	-	-	-	●	0xF308
Pr 3.09	Output terminal status in fault	-	-	-	●	0xF309
Pr 3.10	Rotary change signal fault detection time	0.000s: not detect fault 0.001s~60.000s:	0.001s	0.000	●	0xF30A
Pr 3.11	Input out-phase detection switch	0：forbid 1：allowed	-	1	●	0xF30B
Pr 3.12	Output out-phase detection switch	0：forbid 1：allowed	-	1	●	0xF30C
Pr 3.13	Motor temperature protection mode	0: DI signal input 1: AI analog input 2~3: reserved	1	0	☆	0xF30D
Pr 3.14	Motor temperature protection analog input detection threshold	0~4096	1	2056	☆	0xF30E
Pr 3.15	Motor over-temperature protection value setting (for Pr3.01=2)	100℃~200℃	1	130℃	★	0xF30F
Pr 3.16	Excessive speed deviation detection value	10.00Hz~50.00Hz	0.01	10.00	☆	0xF310

Pr 3.17	Excessive speed deviation detection time	0.0s no detection 0.1s~60.0s	0.1	10.0	☆	0xF311
Pr 3.18	OC signal action setting	0: block output and alarm 1: only block output, no alarm	1	0	★	0xF312
Pr 3.19	Cooling Fan Control	0: The fan runs after the heatsink temperature is reached during operation 1: The fan runs all the time	0	0	☆	0xF313

6.5 CAN communication parameter Pr4.

Function code	Description of function code	Setting range	Minimum unit	Factory value	Change statement	Contact address
Pr 4.00	0.0S	0.0S	1	4	☆	0xF400
Pr 4.01	0.1S~600.0S	0.1S~600.0S	1	1	☆	0xF401
Pr 4.02	0.0S	0.0S	0.1S	0.3S	☆	0xF402
Pr 4.03	Motor control mode selection	0: Id-0 control 1:Id=0 control 2: Maximum torque current ratio control	1	0	★	0xF403
Pr 4.04	Weak magnetic current coefficient	0~500	1	5	☆	0xF404
Pr 4.05	Weak magnetic current adjustment coefficient	50%~120%	1	100%	★	0xF405
Pr 4.06	Weak magnetic area entry adjustment factor	30~60	1	35	★	0xF406
Pr 4.07	Max weak magnetic current coefficient	40~200	1	120	★	0xF407
Pr 4.08	Output phase loss detection time	0.000S~65.000S	0.001S	0.500S	☆	0xF408
Pr 4.09	Weak magnetic control output voltage upper limit	100~150	1	110	★	0xF409

Pr 4.10	Weak magnetic control output voltage upper offset value	0~50	1	5	☆	0xF40A
Pr 4.11	Host address selection when multiple pumps are in parallel	0: The default host address is 1 1: Select the host address through the DI terminal	1	0	★	0xF40B

6.6 User parameter Pr5

Function code	Description of function code	Setting range	Minimum unit	Factory value	Change statement	Contact address
Pr 5.00	User password 1 (valid for all function codes except Pr505)	0~65535	1	0	☆	0xF500
Pr 5.01	Driver parameter initialization	0: no operation 1: Restore factory settings 2: Clear fault records 3: Restore all saved user parameter values 4: Save all user parameter values	N/A	N/A	★	0xF501

6.7 Auxiliary parameter Pr7

Function code	Description of function code	Setting range	Minimum unit	Factory value	Change statement	Contact address
Pr 7.00	Accumulated run time	0h~65535h	1	- - -	●	0xF700
Pr7.01	Set run time	0h~65500h	1	0	☆	0xF701
Pr 7.02	Set time reached action selection	0：continue running 1：halt	1	0	☆	0xF701
Pr7.03	Carrier frequency	0.5kHz~16.0kHz	0.1kHz	Machine type determined	★	0xF703

Pr 7.04	Carrier frequency adjustment selection	0：constant PWM，void carrier frequency temperature adjustment 1：random PWM，void carrier frequency temperature adjustment 2：constant PWM，valid carrier frequency temperature adjustment 3：random PWM，valid carrier frequency temperature adjustment	1	1	☆	0xF704
Pr 7.05	Oil pressure circulatory anti-saturation gain	30~200	1	30	☆	0xF705
Pr 7.06	Speed circulatory anti-saturation gain	30~200	1	30	☆	0xF706
Pr7.07	Reserved	---	---	---	☆	0xF707
Pr7.08	Reserved	---	---	---	☆	0xA708
Pr 7.09	D-axis current circulatory proportional gain	0~65535	1	50	☆	0xF709
Pr 7.10	D-axis current circulatory integral gain	0~65535	1	50	☆	0xF70A
Pr 7.11	Q-axis current circulatory proportional gain	0~65535	1	50	☆	0xF70B
Pr 7.12	Q-axis current circulatory integral gain	0~65535	1	50	☆	0xF70C
Pr7.13	Reserved	---	---	---	☆	0xF70D
Pr7.14	Reserved	---	---	---	☆	0xF70E
Pr7.15	Oil pressure circulatory feed-forward gain	1~999	1	1	☆	0xF70F

Pr7.16	Oil pressure circulatory feed-forward filter time constant	1~999	1	25	☆	0xF710
Pr7.17	Speed circulatory feed-forward gain	1~999	1	150	☆	0xF711
Pr7.18	Speed circulatory feed-forward filter time constant	1~999	1	15	☆	0xF712
Pr7.19	Speed circulatory proportional gain in pressure maintaining status	1~200	1	60	☆	0xF713
Pr7.20	Speed circulatory integral gain in pressure maintaining status	0.01~10.00s	0.01s	0.15s	☆	0xF714
Pr7.21						0xF715
Pr7.22 ～ Pr7.24						0xF716 ～ 0xF718
Pr7.25	Analog multi-point correction selection	0: Pressure and Flow two-point calibration 1: Pressure signal multi-point correction, Flow signal two-point correction 2: Two-point correction of pressure signal, multi-point correction of Flow signal 3: Multi-point correction of pressure and Flow signal				0xF718
Pr7.25	Keep	-	-	-	-	0xF719
Pr7.26 ～ Pr7.27	485 protocol selection	0: Standard protocol 1: Dedicated agreement	1	0	☆	0xF71A ～ 0xF71B

Pr7.28	Hardware DI version selection	0: Built-in PG card control board 1: External PG card control board	1	0	★	0xF71C
Pr7.29	Back EMF compensation function Enable	0：Prohibit 1：Enable	1	0	★	0xF71D
Pr7.30	AI1 Measured voltage1	0.500V～4.000V	0.001	2.000	☆	0xF71E
Pr7.31	AI1 Display voltage1	0.500V～4.000V	0.001	2.000	☆	0xF71F
Pr7.32	AI1 Measured voltage2	6.000V～9.999V	0.001	8.000	☆	0xF720
Pr7.33	AI1 Display voltage2	6.000V～9.999V	0.001	8.000	☆	0xF721
Pr7.34	AI2 Measured voltage1	0.500V～4.000V	0.001	2.000	☆	0xF722
Pr7.35	AI2 Display voltage1	0.500V～4.000V	0.001	2.000	☆	0xF723
Pr7.36	AI2 Measured voltage2	6.000V～9.999V	0.001	8.000	☆	0xF724
Pr7.37	AI2 Display voltage2	6.000V～9.999V	0.001	8.000	☆	0xF725
Pr7.38	stop Way setting	0：Deceleration stop 1：Free stop	1	0	★	0xF726
Pr7.39	Frequency detection value (FDT1)	0.00Hz～Maximum frequency	0.01	50.00Hz	☆	0xF727
Pr7.40	Frequency detection hysteresis value （FDT1）	0.0%～100.0%（FDT1 Level）	0.1%	5.0%	☆	0xF728
Pr7.41	Frequency reached detection width	0.0%～100.0%（Maximum frequency）	0.1%	0.0	☆	0xF729
Pr7.42	Terminal DOWN change rate	0.01Hz/s～100.00Hz/s	0.01Hz/s	0.100Hz/s	☆	0xF72A
Pr7.43 Pr7.44	Lower limit frequency setting	0.00Hz～Upper limit frequency（P0.15）	0.01Hz	0.00Hz	☆	0xF72B 0xF72C
Pr7.45	Set frequencyFrequency setting below lower limit	0：Low frequency operation1：stop 2：Zero speed run	1	0	☆	0xF72D

Pr7.46	Motor temperature KTY84 Sampling voltage1	0.100V～2.500V	0.001V	0.683V	☆	0xF72E
Pr7.47	Motor temperature KTY84 Display voltage1	0.100V～2.500V	0.001V	0.683V	☆	0xF72F
Pr7.48	Motor temperature KTY84 Sampling voltage2	0.100V～2.500V	0.001V	1.200V	☆	0xF730
Pr7.49	Motor temperature KTY84 Display voltage2	0.100V～2.500V	0.001V	1.280V	☆	0xF731
Pr7.50	Keep	-	-	-	-	---
Pr7.51	Keep	-	-	-	-	---
Pr7.52	Action selection without pressure given and feedback	0：Run according to the current state 1：stop	1	0	★	0xF734
Pr7.53	Multi-speed priority function	0: disabled 1: enable	1	0	★	0xF735
Pr7.54	Jog function during operation	0: disabled 1: enable	1	0	☆	0xF736
Pr7.55	Jog frequency setting	0.00Hz~ Pr0.13	0.01Hz	2.00Hz	☆	0xF737
Pr7.56	jog acceleration time	0.0s～6500.0s	0.1s	20.0s	☆	0xF738
Pr7.57	Jog deceleration time	0.0s～6500.0s	0.1s	20.0s	☆	0xF739
Pr7.58	The brake pipe is turned on and controlled in different states	0: valid at runtime 1: Valid all the time (valid during operation, shutdown and failure)	1	0	★	0xF73A
Pr7.59	Brake pipe action maximum time setting	0.00s～600.0s	0.01s	30.00s	☆	0xF73B
Pr7.60	PLC pulse lock function setting	Units digit: 0: disabled 1: enable Tens digit: 0: no alarm when the machine is locked	1	00	★	0xF73C

		1: Alarm code A.27 when the machine is locked				
Pr7.61	PLC pulse lock frequency setting	1.000KHz ～ 65.536KHz	0.001KHz	10.000	☆	0xF73D
Pr7.62	PLC pulse unlocking frequency setting	1.000KHz ～ 65.536KHz		5.000	☆	0xF73E

6.8 Simple PLC parameters P8

Function code	Function code description	Setting Range	Minmum unit	Factory default	Change description	Contact address
Pr8.00	Multi-section frequency setting command 0	0～Pr0.15	0.1Hz	0.0	☆	0xF800
Pr8.01	Multi-section frequency setting command 1	0～Pr0.15	0.1Hz	0.0	☆	0xF801
Pr8.02	Multi-section frequency setting command 2	0～Pr0.15	0.1Hz	0.0	☆	0xF802
Pr8.03	Multi-section frequency setting command 3	0～Pr0.15	0.1Hz	0.0	☆	0xF803
Pr8.04	Multi-section frequency setting command 4	0～Pr0.15	0.1Hz	0.0	☆	0xF804
Pr8.05	Multi-section frequency setting command 5	0～Pr0.15	0.1Hz	0.0	☆	0xF805
Pr8.06	Multi-section frequency setting command 6	0～Pr0.15	0.1Hz	0.0	☆	0xF806

Pr8.07	Multi-section frequency setting command 7	0～Pr0.15	0.1Hz	0.0	☆	0xF807
Pr8.08	Multi-section frequency setting command 8	0～Pr0.15	0.1Hz	0.0	☆	0xF808
Pr8.09	Multi-section frequency setting command 9	0～Pr0.15	0.1Hz	0.0	☆	0xF809
Pr8.10	Multi-section frequency setting command 10	0～Pr0.15	0.1Hz	0.0	☆	0xF80A
Pr8.11	Multi-section frequency setting command 11	0～Pr0.15	0.1Hz	0.0	☆	0xF80B
Pr8.12	Multi-section frequency setting command 12	0～Pr0.15	0.1Hz	0.0	☆	0xF80C
Pr8.13	Multi-section frequency setting command 13	0～Pr0.15	0.1Hz	0.0	☆	0xF80D
Pr8.14	Multi-section frequency setting command 14	0～Pr0.15	0.1Hz	0.0	☆	0xF80E
Pr8.15	Multi-section frequency setting command 15	0～Pr0.15	0.1Hz	0.0	☆	0xF80F
Pr8.16	Simple PLC operation mode selection	0: stop at the end of a single operation 1: Keep the final value at the end of a single run2： Keep looping	1	0	☆	0xF810

Pr8.17	Power down stop memory selection	Units digit：Power down memory selection 0：No memory when power off 1: Power down memory Tens digit: stop memory selection 0: stop does not remember 1: stop memory	01	00	☆	0xF811
Pr8.18	0th stage running time setting	0.0～6553.6	0.1	0.0	☆	0xF812
Pr8.19	0th stage Acceleration and deceleration time selection	0～3	1	0	☆	0xF813
Pr8.20	1st run time setting	0.0～6553.6	0.1	0.0	☆	0xF814
Pr8.21	1st Acceleration and deceleration time selection	0～3	1	0	☆	0xF815
Pr8.22	2nd run time setting	0.0～6553.6	0.1	0.0	☆	0xF816
Pr8.23	2nd Acceleration and deceleration time selection	0～3	1	0	☆	0xF817
Pr8.24	3rd run time setting	0.0～6553.6	0.1	0.0	☆	0xF818
Pr8.25	3rd Acceleration and deceleration time selection	0～3	1	0	☆	0xF819
Pr8.26	4th run time setting	0.0～6553.6	0.1	0.0	☆	0xF81A
Pr8.27	4th Acceleration and deceleration time selection	0～3	1	0	☆	0xF81B
Pr8.28	5th run time setting	0.0～6553.6	0.1	0.0	☆	0xF81C
Pr8.29	5th Acceleration and deceleration time selection	0～3	1	0	☆	0xF81D
Pr8.30	6th run time setting	0.0～6553.6	0.1	0.0	☆	0xF81E

Pr8.31	6th Acceleration and deceleration time selection	0～3	1	0	☆	0xF81F
Pr8.32	7th run time setting	0.0～6553.6	0.1	0.0	☆	0xF820
Pr8.33	7th Acceleration and deceleration time selection	0～3	1	0	☆	0xF821
Pr8.34	8th run time setting	0.0～6553.6	0.1	0.0	☆	0xF822
Pr8.35	8th Acceleration and deceleration time selection	0～3	1	0	☆	0xF823
Pr8.36	9th run time setting	0.0～6553.6	0.1	0.0	☆	0xF824
Pr8.37	9th Acceleration and deceleration time selection	0～3	1	0	☆	0xF825
Pr8.38	10th run time setting	0.0～6553.6	0.1	0.0	☆	0xF826
Pr8.39	10th Acceleration and deceleration time selection	0～3	1	0	☆	0xF827
Pr8.40	11th run time setting	0.0～6553.6	0.1	0.0	☆	0xF828
Pr8.41	11th Acceleration and deceleration time selection	0～3	1	0	☆	0xF829
Pr8.42	12th run time setting	0.0～6553.6	0.1	0.0	☆	0xF82A
Pr8.43	12th Acceleration and deceleration time selection	0～3	1	0	☆	0xF82B
Pr8.44	13th run time setting	0.0～6553.6	0.1	0.0	☆	0xF82C
Pr8.45	13th Acceleration and deceleration time selection	0～3	1	0	☆	0xF82D
Pr8.46	14th run time setting	0.0～6553.6	0.1	0.0	☆	0xF82E
Pr8.47	14th Acceleration and deceleration time selection	0～3	1	0	☆	0xF82F

Pr8.48	15th run time setting	0.0～6553.6	0.1	0.0	☆	0xF830
Pr8.49	15th run time setting Acceleration and deceleration time selection	0～3	1	0	☆	0xF831
Pr8.50	Running time unit	0：s 1：h	1	0	☆	0xF832
Pr8.51～ Pr8.52	Reserved	---	---	---	---	0xF833 ～ 0xF834

6.9 Communication setting parameters Pr9

Function code	Function code description	Setting Range	Min. unit	Factory default	Change description	Contact address
Pr9.00	Baud rate setting	0：300BPS 1：600BPS 2：1200BPS 3：2400BPS 4：4800BPS 5：9600BPS 6：19200BPS 7：38400BPS 8：57600BPS 9：115200BPS	1	5	☆	0xF900
Pr9.01	Data format setting	0: No check: Data format <8,N,2> 1: Even inspection: data format <8,E,1> 2: Odd parity: data format <8,O,1> 3: No verification: data format <8,N,1>	1	0	☆	0xF901
Pr9.02	Local address setting	1～247，0 is Broadcast address	1	1	☆	0xF902
Pr9.03	Response delay	0～20ms	1	2	☆	0xF903
Pr9.04	Communication overtime time	0.0 s（invalid） 0.1～60.0s	0.1	0	☆	0xF904
Pr9.05	CAN communication data format selection	0: Default mode, only some parameters can be read 1: Standard mode, all parameters can be read and written on the panel	1	0	☆	0xF905

Pr9.06	driver command source selection	0: Operation panel command 1: Terminal command 2: Serial communication command	1	0	☆	0xF906
Pr9.07	Main frequency source X selection	0: Digital setting UP, DOWN (not memorized) 1: Digital setting UP, DOWN (memory) 2: AI1 3: AI2 4: AI3 5: Keep 6: Multi-stage speed command 7: Keep 8: Keep 9: communication setting	1	0	☆	0xF907
Pr9.08	Auxiliary frequency source Y selection	0: Digital setting UP, DOWN (not memorized) 1: Digital setting UP, DOWN (memory) 2: AI1 3: AI2 4: AI3 5: Keep 6: Multi-stage speed command 7: Keep 8: Keep 9: communication setting	1	0	☆	0xF908
Pr9.09	Reserved	---	---	---	☆	0xF909
Pr9.10		---	---	---	☆	0xF90A
Pr9.11	Frequency source setting	0: Main frequency source 1: Main frequency source + auxiliary frequency source 2: Main frequency source and auxiliary Frequency source switching 3: Switch between main frequency source and (main frequency source + auxiliary frequency source) 4: Auxiliary frequency source and (main frequency source + auxiliary frequency source) switch	1	0	☆	0xF90B

		5: The main frequency source and the auxiliary frequency source are automatically switched, and the auxiliary frequency source has priority 6: The main frequency source and auxiliary frequency source are automatically switched, and the main frequency source has priority				

6.10 Pressure signal multi-segment calibration parameter PA

Function code	Function code description	Setting Range	Minimum unit	Factory default	Change description	Contact address
PrA.00	Pressure command input intermediate point 0	Pr2.17～PrA.02	0.01V	0.73V	☆	0xFA00
PrA.01	Pressure command input voltage midpoint 0 Corresponding percentage	Pr2.18～PrA.03	0.1%	7.1%	☆	0xFA01
PrA.02	Pressure command input intermediate point 1	PrA.00～PrA.04	0.01V	1.44V	☆	0xFA02
PrA.03	Pressure command input voltage midpoint 1 Corresponding percentage	PrA.01～PrA.05	0.1%	14.2%	☆	0xFA03
PrA.04	Pressure command input intermediate point 2	PrA.02～PrA.06	0.01V	2.15V	☆	0xFA04
PrA.05	Pressure command input voltage midpoint 2 Corresponding percentage	PrA.03～PrA.07	0.1%	21.4%	☆	0xFA05

PrA.06	Pressure command input intermediate point 3	PrA.04～PA.08	0.01V	2.87V	☆	0xFA06
PrA.07	Pressure command input voltage midpoint 3 Corresponding percentage	PrA.05～PrA.09	0.1%	28.5%	☆	0xFA07
PrA.08	Pressure command input intermediate point 4	PrA.06～PrA.10	0.01V	3.58V	☆	0xFA08
PrA.09	Pressure command input voltage midpoint 4 Corresponding percentage	PrA.07～PrA.11	0.1%	35.7%	☆	0xFA09
PrA.10	Pressure command input intermediate point 5	PrA.08～PrA.12	0.01V	4.29V	☆	0xFA0A
PrA.11	Pressure command input voltage midpoint 5 Corresponding percentage	PrA.09～PrA.13	0.1%	42.8%	☆	0xFA0B
PrA.12	Pressure command input intermediate point 6	PrA.10～PrA.14	0.01V	5.00V	☆	0xFA0C
PrA.13	Pressure command input voltage midpoint 6 Corresponding percentage	PrA.11～PrA.15	0.1%	49.9%	☆	0xFA0D
PrA.14	Pressure command input intermediate point 7	PrA.12～PrA.16	0.01V	5.72V	☆	0xFA0E
PrA.15	Pressure command input voltage midpoint 7 Corresponding percentage	PrA.13～PrA.17	0.1%	57.1%	☆	0xFA0F

PrA.16	Pressure command input intermediate point 8	PrA.14～PrA.18	0.01V	6.43V	☆	0xFA10
PrA.17	Pressure command input voltage midpoint 8 Corresponding percentage	PrA.15～PrA.19	0.1%	64.2%	☆	0xFA11
PrA.18	Pressure command input intermediate point 9	PrA.16～PrA.20	0.01V	7.14V	☆	0xFA12
PrA.19	Pressure command input voltage midpoint 9 Corresponding percentage	PrA.17～PrA.21	0.1%	71.4%	☆	0xFA13
PrA.20	Pressure command input intermediate point 10	PrA.18～PrA.22	0.01V	7.86V	☆	0xFA14
PrA.21	Pressure command input voltage midpoint 10 Corresponding percentage	PrA.19～PrA.23	0.1%	78.5%	☆	0xFA15
PrA.22	Pressure command input intermediate point 11	PrA.20～PrA.24	0.01V	8.57V	☆	0xFA16
PrA.23	Pressure command input voltage midpoint 11 Corresponding percentage	PrA.21～PrA.25	0.1%	85.7%	☆	0xFA17
PrA.24	Pressure command input intermediate point 12	PrA.22～PrA.26	0.01V	9.28V	☆	0xFA18

PrA.25	Pressure command input voltage midpoint 12 Corresponding percentage	PrA.23～PrA.27	0.1%	92.8%	☆	0xFA19
PrA.26	Pressure command input intermediate point 13	PrA.24～PrA.28	0.01V	10.00V	☆	0xFA1A
PrA.27	Pressure command input voltage midpoint 13 Corresponding percentage	PrA.25～PrA.29	0.1%	100.0%	☆	0xFA1B
PrA.28	Pressure command input intermediate point 14	PrA.26～PrA.30	0.01V	10.00V	☆	0xFA1C
PrA.29	Pressure command input voltage midpoint 14 Corresponding percentage	PrA.27～PrA.31	0.1%	100.0%	☆	0xFA1D
PrA.30	Pressure command input intermediate point 15	PrA.28～PrA.32	0.01V	10.00V	☆	0xFA1E
PrA.31	Pressure command input voltage midpoint 15 Corresponding percentage	PrA.29～PrA.33	0.1%	100.0%	☆	0xFA1F
PrA.32	Pressure command input intermediate point 16	PrA.30～PrA.34	0.01V	10.00V	☆	0xFA20
PrA.33	Pressure command input voltage midpoint 16 Corresponding percentage	PrA.31～PrA.35	0.1%	100.0%	☆	0xFA21

PrA.34	Pressure command input intermediate point 17	PrA.32～PrA.36	0.01V	10.00V	☆	0xFA22
PrA.35	Pressure command input voltage midpoint 17 Corresponding percentage	PrA.33～PrA.37	0.1%	100.0%	☆	0xFA23
PrA.36	Pressure command input intermediate point 18	PrA.34～Pr2.19	0.01V	10.00V	☆	0xFA24
PrA.37	Pressure command input voltage midpoint 18 Corresponding percentage	PrA.35～ Pr2.20	0.1%	100.0%	☆	0xFA25

6.11 Flow Signal multi-segment calibration parameters PrB

Function code	Function code description	Setting Range	Minimum unit	Factory default	Change description	Contact address
PrB.00	Flow Command input intermediate point 0	Pr2.22～PrB.02	0.01V	1.00V	☆	0xAB00
PrB.01	Flow Command input voltage midpoint 0 Corresponding percentage	Pr2.23～PrB.03	0.1%	10.0%	☆	0xAB01
PrB.02	Flow Command input intermediate point 1	PrB.00～PrB.04	0.01V	2.00V	☆	0xAB02
PrB.03	Flow Command input voltage midpoint 1 Corresponding percentage	PrB.01～PrB.05	0.1%	20.0%	☆	0xAB03

PrB.04	Flow Command input intermediate point 2	PrB.02～PrB.06	0.01V	3.00V	☆	0xAB04
PrB.05	Flow Command input voltage midpoint 2 Corresponding percentage	PrB.03～PrB.07	0.1%	30.0%	☆	0xAB05
PrB.06	Flow Command input intermediate point 3	PrB.04～PrB.08	0.01V	4.00V	☆	0xAB06
PrB.07	Flow Command input voltage midpoint 3 Corresponding percentage	PrB.05～PrB.09	0.1%	40.0%	☆	0xAB07
PrB.08	Flow Command input intermediate point 4	PrB.06～PrB.10	0.01V	5.00V	☆	0xAB08
PrB.09	Flow Command input voltage midpoint 4 Corresponding percentage	PrB.07～PrB.11	0.1%	50.0%	☆	0xAB09
PrB.10	Flow Command input intermediate point 5	PrB.08～PrB.12	0.01V	6.00V	☆	0xAB0A
PrB.11	Flow Command input voltage midpoint 5 Corresponding percentage	PrB.09～PrB.13	0.1%	60.0%	☆	0xAB0B
PrB.12	Flow Command input intermediate point 6	PrB.10～PrB.14	0.01V	7.00V	☆	0xAB0C
PrB.13	Flow Command input voltage midpoint 6 Corresponding percentage	PrB.11～PrB.15	0.1%	70.0%	☆	0xAB0D

PrB.14	Flow Command input intermediate point 7	PrB.12～PrB.16	0.01V	8.00V	☆	0xAB0E
PrB.15	Flow Command input voltage midpoint 7 Corresponding percentage	PrB.13～PrB.17	0.1%	80.0%	☆	0xAB0F
PrB.16	Flow Command input intermediate point 8	PrB.14～ Pr2.24	0.01V	4.50V	☆	0xAB10
PrB.17	Flow Command input voltage midpoint 8 Corresponding percentage	PrB.15～ Pr2.25	0.1%	45.0%	☆	0xAB11

6.12 Internal pressure setting parameter PC

Function code	Function code description	Setting Range	Minimum unit	Factory default	Change description	Contact address
PrC.00	Internal pressure setting value 0	0.0～Pr1.02	0.1	0.0	☆	0xFC00
PrC.01	Internal pressure setting value 1	0.0～Pr1.02	0.1	0.0	☆	0xFC01
PrC.02	Internal pressure setting value 2	0.0～Pr1.02	0.1	0.0	☆	0xFC02
PrC.03	Internal pressure setting value 3	0.0～Pr1.02	0.1	0.0	☆	0xFC03
PrC.04	Internal pressure setting value 4	0.0～Pr1.02	0.1	0.0	☆	0xFC04
PrC.05	Internal pressure setting value 5	0.0～Pr1.02	0.1	0.0	☆	0xFC05
PrC.06	Internal pressure setting value 6	0.0～Pr1.02	0.1	0.0	☆	0xFC06
PrC.07	Internal pressure setting value 7	0.0～Pr1.02	0.1	0.0	☆	0xFC07
PrC.08	Control mode selection	0：Speed mode 1：Torque mode	1	0	☆	0xFC08
PrC.09	Driving torque upper limit source selection	0: PrC.11 setting 1: AI1 input 2: AI2 input 3: AI3 input 4: Reserved	1	0	☆	0xFC09

		5: communication setting 6: Reserved 7: Reserved				
PrC.10	Reserved	-	-	-	-	0xFC0A
PrC.11	Drive torque upper limit	50.0～250.0	0.1	200.0	☆	0xFC0B
PrC.12	Torque command Filter time	0.00S～10.00S	0.01S	2.00	☆	0xFC0C
PrC.13	Torque mode forward Maximum frequency	0.00～P0.13	0.01	50.00	☆	0xFC0D
PrC.14	Torque mode reverse Maximum frequency	0.00～P0.13	0.01	50.00	☆	0xFC0E
PrC.15	Reserved	-	-	-	-	0xFC0F
PrC.16	Reserved	-	-	-	-	0xFC10
PrC.17	Overpressure relief point setting	120%～150%	1%	130%	☆	0xFC11
PrC.18	Undervoltage protection factor	60.0%～140.0%	0.1%	100.0%	☆	0xFC12
PrC.19	Reserved	-	-	-	-	0xFC13
PrC.20	Input phase loss Detection protection threshold	0～65535	1	Model determination	☆	0xFC14
PrC.21	Pressure status output setting hysteresis width	1.0%～20.0%	0.1%	10.0%	☆	0xFC15
PrC.22	Speed mode Lower torque upper limit source	0: P0.14 setting 1: AI1 input 2: AI2 input 3: AI3 input 4: Reserved 5: communication setting 6: Reserved 7: Reserved	1	0	☆	0xFC16
PrC.23	Reserved	-	-	-	-	0xFC17
PrC.24	Digital Set frequency stop memory selection	1: No memory 2: Memory	1	1	☆	0xFC18
PrC.25	Reserved	-	-	-	-	0xFC19

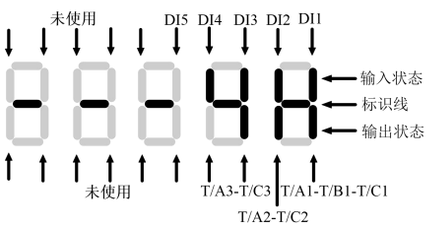
6.13 Brick Machine Parameter group Pd

Function code	Function code description	Setting Range	Minimum unit	Factory default	Change description	Contact address
Prd.00	DI terminal input delay setting	0.0s～3600.0s	0.1s	0.0s	★	0xAD00
Prd.01	DI terminal logic selection	0～65535 Bit00: DI1 logic selection 0: Positive logic 1: Inverse logic Bit01: DI2 logic selection 0: Positive logic 1: Inverse logic Bit02: DI3 logic selection 0: Positive logic 1: Inverse logic Bit03: DI4 logic selection 0: Positive logic 1: Inverse logic Bit04: DI5 logic selection 0: Positive logic 1: Inverse logic	1	00000	★	0xFD01
Prd.02	Hydraulic mode7 Enable	0：Prohibit 1：Enable	1	0	★	0xFD02
Prd.03	Hydraulic mode7 Multi-stage pressure setting 1	0.0～ P1.02	0.1	50.0	☆	0xFD03
Prd.04	Hydraulic mode7 Multi-stage pressure setting time1	0.00s～60.00s	0.01s	3.00s	☆	0xFD04
Prd.05	Hydraulic mode7 Multi-stage pressure setting 2	0.0～ Pr1.02	0.1	80.0	☆	0xFD05
Prd.06	Hydraulic mode7 Multi-stage pressure setting time2	0.00s～60.00s	0.01s	5.00s	☆	0xFD06
Prd.07	Hydraulic mode7 Multi-stage pressure setting 3	0.0～ Pr1.02	0.1	110.0	☆	0xFD07
Prd.08	Hydraulic mode7 Multi-stage pressure setting time3	0.00s～60.00s	0.01s	3.00s	☆	0xFD08

Prd.09	Hydraulic mode7 Multi-stage pressure setting 4	0.0～ Pr1.02	0.1	150.0	☆	0xFD09
Prd.10	Hydraulic mode7 Multi-stage pressure setting time4	0.00s～60.00s	0.01s	3.00s	☆	0xFD0A
Prd.11	Hydraulic mode7 Multi-stage pressure setting 5	0.0～ Pr1.02	0.1	175.0	☆	0xFD0B
Prd.12	Hydraulic mode7 Multi-stage pressure setting time5	0.00s～60.00s	0.01s	3.00s	☆	0xFD0C
Prd.13	Hydraulic mode7 Multi-stage pressure setting 6	0.0～ Pr1.02	0.1	175.0	☆	0xFD0D
Prd.14	Hydraulic mode7 Multi-stage pressure setting time6	0.00s～60.00s	0.01s	3.00s	☆	0xFD0E
Prd.15	Hydraulic mode7 Multi-stage pressure setting 7	0.0～ Pr1.02	0.1	175.0	☆	0xFD0F
Prd.16	Hydraulic mode7 Multi-stage pressure setting time7	0.00s～60.00s	0.01s	3.00s	☆	0xFD10
Prd.17	Hydraulic mode7 Segment setting	0～7	1	5	☆	0xFD11
Prd.18	Reserved	-	-	-	☆	0xFD12
Prd.19	Reserved	-	-	-	-	0xFD13
Prd.20	Reserved	-	-	-	-	0xFD14
Prd.21	Reserved	-	-	-	☆	0xFD15
Prd.22	Reserved	-	-	-	☆	0xFD16
Prd.23	Reserved	-	-	-	-	0xFD17
Prd.24	Reserved	-	-	-	-	0xFD18
Prd.25	Reserved	-	-	-	☆	0xFD19
Prd.26	Reserved	-	-	-	☆	0xFD1A
Prd.27	Reserved	-	-	-	☆	0xFD1B
Prd.28	Reserved	-	-	-	☆	0xFD1C
Prd.29	Reserved	-	-	-	☆	0xFD1D

Prd.30	Pressure fault detection feedback value ratio	0.0%～30.0%	0.1%	10.0%	☆	0xFD1E
Prd.31	Flow command rise time	0ms～50000ms	1ms	30ms	☆	0xFD1F
Prd.32	Flow instruction fall time	0ms～50000ms	1ms	30ms	☆	0xFD20

6.14 Monitoring parameters Ur0

Function code	Function code description	Setting Range	Minimum unit	Factory default	Change description	Contact address
Ur0.00	Motor Operating frequency	0.00Hz～Maximum frequency	-	-	●	0x7000
Ur0.01	Motor Set frequency	0.00Hz～Maximum frequency	-	-	●	0x7001
Ur0.02	bus voltage	0V～830V	-	-	●	0x7002
Ur0.03	The output voltage	0V～Motor rated voltage	-	-	●	0x7003
Ur0.04	Output current	0.01A～655.5A	-	-	●	0x7004
Ur0.05	Output Power	7.5KW～37KW	-	-	●	0x7005
Ur0.06	Output torque	0.0%～Torque upper limit	-	-	●	0x7006
Ur0.07	Terminal DI/DO signal status				●	0x7007
Ur0.08	Reserved	-	-	-	●	0x7008
Ur0.09	AnalogAI1 Input voltage value	-10.500V～10.500V	-	-	●	0x7009
Ur0.10	AnalogAI2 Input voltage value	-10.500V～10.500V	-	-	●	0x700A
Ur0.11	AnalogAI3 Input voltage value	-10.500V～10.500V	-	-	●	0x700B
Ur0.12	Motor Actual operating position	0°～359.9°	-	-	●	0x700C
Ur0.13	Oil pressure given value	0.0Kg～System oil pressure（P1.02）	-	-	●	0x700D
Ur0.14	Oil pressure feedback value	0.0Kg～Maximum oil pressure（P1.03）	-	-	●	0x700E

Ur0.15	Flowgiven value	0.00Hz～Maximum frequency	-	-	●	0x700F
Ur0.16	Motor Running speed	-9999rpm～30000rpm	-	-	●	0x7010
Ur0.17	Reserved	-	-	-	●	0x7011
Ur0.18	Radiator temperature value	0.0℃～100.0℃	-	-	●	0x7012
Ur0.19	Software version number1	-	-	-	●	0x7013
Ur0.20	Software version number2	-	-	-	●	0x7014
Ur0.21	Multi-pump CAN receive data PCS number	-	-	-	●	0x7015
Ur0.22	Multi-pump CAN sending data PCS number	-	-	-	●	0x7016
Ur0.23	Multi-pump CAN sending data high	-	-	-	●	0x7017
Ur0.24	Multi-pump CAN sending data low	-	-	-	●	0x7018
Ur0.25	Hydraulic ring proportional gain	-	-	-	●	0x7019
Ur0.26	Hydraulic ring proportional gain	-	-	-	●	0x701A
Ur0.27	Multi-pump CAN sending data low	-	-	-	●	0x701B
Ur0.28	Motor Phase sequence	0：UVW 1：UWV 2：VWU 3：WUV 4：WVU 5：VUW	-	-	●	0x701C
Ur0.29	Control chip temperature value	-	-	-	●	0x701D
Ur0.30	Motor temperature value (Display when P3.01 is set to 2, and display 0 in other cases)	-	-	-	●	0x701E

Ur0.31	Temperature Sensor Voltage value	-	-	-	●	0x701F
Ur0.32	Hydraulic mode7 Current segment number	1～7	-	-	●	0x7020
Ur0.33	Hydraulic mode7Current running time	0.00s～60.00s	-	-	●	0x7021
Ur0.34	Torque upper limit setting value	0.0%～250.0%	-	-	●	0x7022
Ur0.35	Pulse input frequency	-	-	-	●	0x7023
Ur0.36	KTY temperature resistance corresponding to the input voltage value	-	-	-	●	0x7024
Ur0.37	KTY temperature resistance value	-	-	-	●	0x7025

7. Injection molding machine oil pump debugging steps

7.1 Motor Trial Run

1. Correctly set the motor parameters in the Pr0 group (Pr0.00～Pr0.04, Pr0.19)
2. Set the number of pole pairs of the rotary encoder (Pr0.11)
3. Set the driver to non-Oil pressure control mode (Pr1.00=0)
4. Motor tuning (Pr0.26):

①Pr0.26=0: No operation

②Pr0.26=1: Static tuning, used when Motor Back EMF (Pr0.19) is known. Motor runs at low speed during tuning and can be performed without opening the overflow valve.

③Pr0.26=2: Dynamic tuning, used when Back EMF (Pr0.19) is unknown, Motor runs at high speed during tuning, it is recommended to open the overflow valve.

7.2 Servo oil pump application debugging

7.2.1 Oil pressure control mode selection（Pr1.00=0）

Pr1.00=0： No oil pressure control mode

Pr1.00=1： Driver oil pressure control mode1，CAN provides oil pressure commands and Flow commands, AI3 Analog channels provide oil pressure feedback commands, and the driver performs oil pressure control.

Pr1.00=2：Driver oil pressure control mode2，AI1 Analog channel provides oil pressure command, AI2Analog channel provides Flow command, AI3 Analog channel provides oil pressure feedback command, and driver performs oil pressure control.

Pr1.00=3：CAN oil pressure control mode(dedicated)，P1.oil pressure control parameter group invalid。

Pr1.00=6：Select the corresponding oil pressure and frequency commands through the external DI terminal, AI3Analog provides oil pressure feedback commands, and driver performs oil pressure control

7.2.2 Oil pressure control mode -Automatic parameter setting

When switching from non-Hydraulic mode (F1.08=0) to Hydraulic mode (F1.08≠0), related parameters will be automatically set, as shown in the following table:

Function code	Function code description	Setting
Pr0.16	Motor running acceleration time	0.0S
Pr0.17	Motor deceleration time	0.0S
Pr2.00	DI1Terminal function selection	1（Run Enable）
Pr2.01	DI2Terminal function selection	7（Pressure 2 Flow 2 Enable Signal）
Pr2.02	DI3Terminal function selection	9（Pressure 3 Flow 3 Enable Signal）
Pr2.03	DI4Terminal function selection	11（Pressure 4 Flow 4 Enable Signal）
Pr2.04	DI5Terminal function selection	2（Fault reset）
Pr2.05	DO1Terminal function selection	2（Fault output）
Pr2.06	D02Terminal function selection	23（Dual displacement plunger pump swash plate switching NO）
Pr2.07	DO3Terminal function selection	24（NC output under pressure control）

7.2.3 AI Zero drift automatic correction（Pr1.20）

Set AI Zero drift automatic correction parameter Pr1.20 to 1, and the driver will perform an AI Zero drift automatic correction operation. The driver will automatically read the Voltage value corresponding to the current Pressure command, Pressure feedback, and Flow command, and write the corresponding Voltage value to the Pressure command, Pressure feedback, and Flow Command Minimum input voltage value.

7.2.4 Oil pump Related parameter settings

Pr1.01: Maximum speed, set the maximum motor speed, that is, the motor speed corresponding to 100% of the Flow command.

Pr1.02: System oil pressure, set the maximum Pressure of the system.

Pr1.03: Maximum oil pressure, set the Pressure range of the Pressure sensor.

7.2.5 Pressure relief setting（Pr1.17）

Pr1.17：The maximum reverse speed during pressure relief corresponds to the percentage setting of the maximum speed (Pr1.01). Used to set the maximum reverse running speed of Motor.

7.2.6 Bottom flow and Bottom pressure（Pr1.18，Pr1.19）

Due to the internal leakage of the Oil pump, when the system does not give Flow and Pressure commands, the hydraulic oil in the oil circuit will flow backwards, causing air to enter the oil circuit, resulting in system operation noise and instability. Therefore, given a certain Bottom flow (Pr1.18, corresponding to the percentage of the maximum speed Pr1.01) and Bottom pressure (Pr1.19).

7.2.7 System response (oil pressure PID control)

Servo driver provides 4 groups of PID , according to the best selection of input terminals DI2 and DI3, corresponding to the following:

DI3	DI2	PID Group
0	0	1st Group PID: Pr1.05, Pr1.06, Pr1.07
0	1	2nd Group PID: Pr1.08, Pr1.09, Pr1.10
1	0	3rd Group PID: Pr1.11, Pr1.12, Pr1.13
1	1	4th Group PID: Pr1.14, Pr1.15, Pr1.16

The larger the proportional gain Kp is, the smaller the integral time Ki is, and the larger the differential time Kd is, the faster the response will be. If the response is too fast, it will easily cause overshoot and cause the system to oscillate and become unstable.

The smaller the proportional gain Kp, the larger the integral time Ki, and the smaller the differential time Kd, the slower the response. If the response is too fast and slow, the efficiency will drop and the product will be unstable.

8. Fault diagnosis and countermeasures

ES600 series Servo driver has a total of 38 warning information and protection functions. Once an abnormal fault occurs, the driver will stop output and display the fault code on the driver display panel. Before seeking service, users can conduct self-examination according to the prompts in this section, analyze the cause of the failure, and find out a solution. If you cannot solve it, please seek service, contact the agent of the driver you purchased or contact our company directly.

Fault type	malfunction name	Cause Analysis	Solutions
A.02	EEPOM Fault	Driver related circuit is abnormal	Repair driver
A.10	Current detection failure	Driver current detection circuit is abnormal	Repair driver
A.12	Acceleration overcurrent	1. There is a short circuit or ground fault on the driver output 2. Acceleration time is too short	1. Check and eliminate load short circuit or ground fault 2. Increase the acceleration time

		3. No motor parameter tuning before vector control 4. Start the drive while the motor is spinning 5. There is a sudden change in the load during acceleration	3. Tuning the parameters of the motor 4. Set speed tracking or start DC braking 5. Eliminate load changes during acceleration
A.13	Deceleration overcurrent	1. There is a short circuit or ground fault on the driver output 2. The deceleration time is too short 3. No motor parameter tuning before vector control 4. There is a sudden change in the load during deceleration	1. Check and eliminate load short circuit or ground fault 2. Increase the deceleration time 3. Tuning the parameters of the motor 4. Eliminate load changes during deceleration
A.14	Constant speed overcurrent	1. There is a short circuit or ground fault on the driver output 2. No motor parameter tuning before vector control 3. There is a sudden load during operation 4. The drive power is too small	1. Check and eliminate load short circuit or ground fault 2. Tuning the parameters of the motor 3. Cancel the sudden load 4. Increase the drive power
A.15	External device failure	1. The external device is faulty 2. The DI input detection circuit is abnormal	1. Check external devices 2. Repair the driver
A.16	MODBUS communication failure	1. The upper computer is not working properly 2. The communication line is abnormal 3. The setting value of parameter Pr9.04 is incorrect	1. Check the wiring of the host computer 2. Check the communication cable 3. Correctly set the parameter value
A.19	Motor Parameter tuning failure	1. The wiring between Motor and driver is loose 2. Motor nameplate parameter setting is incorrect	1. Check the lead between Motor and driver 2. Correctly set Motor nameplate parameters
A.22	CAN communication interruption failure	1. Check if there is any error in the CAN communication cable 2. Check whether there is any error in the CAN communication parameter setting 3. There is an error in CAN communication	1. Check for wiring errors 2. Modify related parameters 3. Repair the driver
A.23	Motor short circuit to ground	1. The motor has a ground fault 2. The ground detection circuit of the driver is abnormal	1. Check the motor ground fault 2. Repair the driver

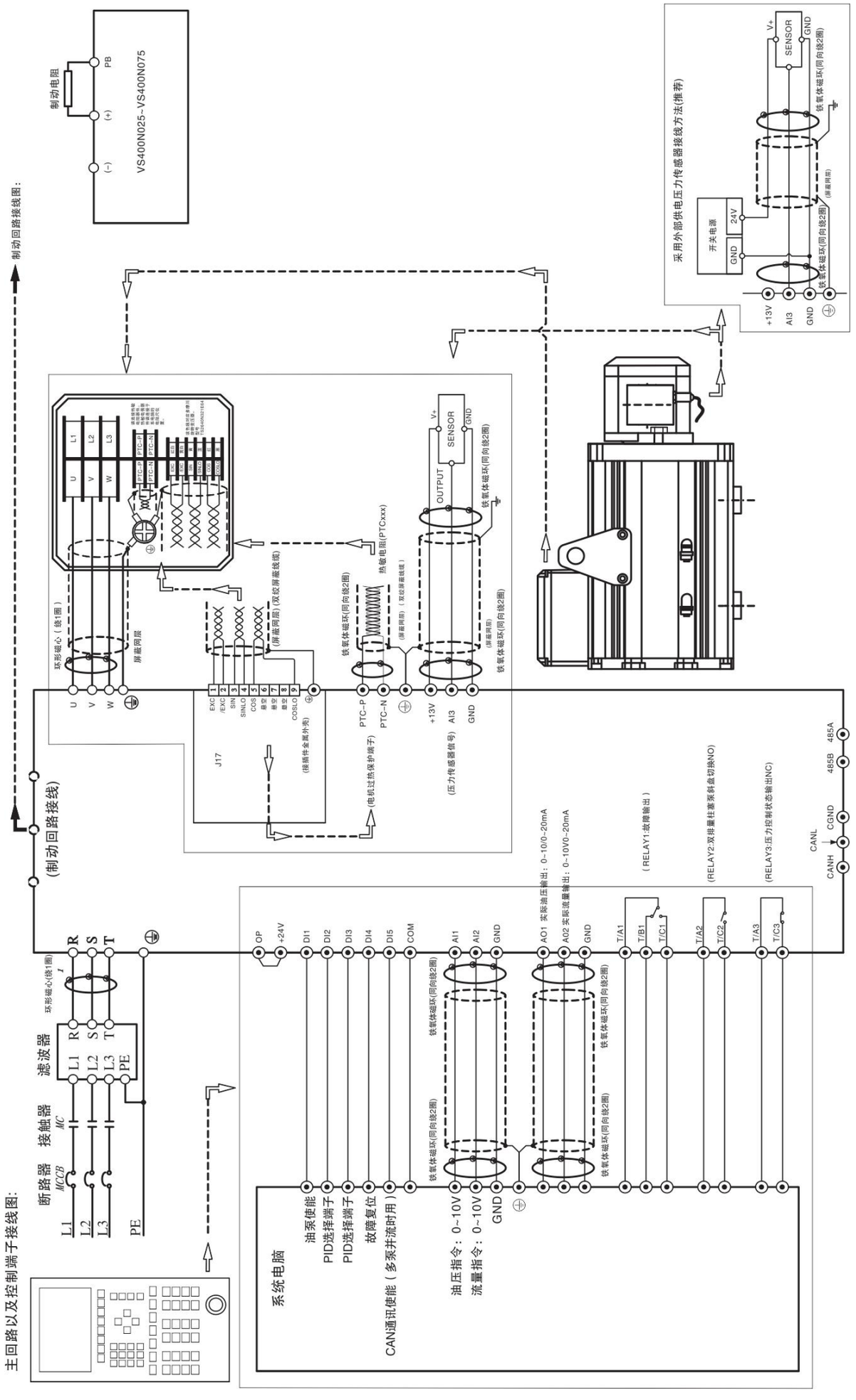
A.24	Multi-pump parallel flow slave machine failure	Slave failure when multiple pumps are paralleled or split	1.Check the slave driver
A.25	Multi-pump parallel flow multi-host failure	1. When pumping in parallel, the DI terminals of multiple machines are valid (the terminal function is set to 62)	1. Check the driver DI terminal parameter setting value and DI terminal status
A.26	Cumulative running time reached fault	1. The cumulative running time reaches the set value	1. Set the values of parameters Pr7.01 and Pr7.02
A.30	Oil pressure sensor failure	1. Check whether the oil pressure sensor connection is wrong 2. Check whether the power supply of the oil pressure sensor is normal 3. Check whether the output of the oil pressure sensor is normal	1. Eliminate connection errors 2. Troubleshoot power supply failure 3. Eliminate Oil pressure sensor failure
A.31	Pre-alarm for slave failure	Troubleshoot slave errors	Repair driver
A.32	CAN address conflict	Check the CAN communication parameter settings for errors	Reset CAN communication parameters
A.41	Bus undervoltage	1. There is a momentary drop in the input grid voltage 2. The input grid voltage continues to be low 3. The drive bus voltage detection circuit is abnormal 4. The drive rectifier bridge or buffer circuit is abnormal	1. Reset fault and restart 2. Troubleshoot power grid faults 3. Repair the driver board or control board 4. Repair drive rectifier or buffer circuit
A.45	Acceleration overvoltage	1. The input voltage is too high 2. During the acceleration process, there is an external force to drive the motor 3. Is the acceleration time too short? 4. Is there a braking resistor installed?	1. Check whether the input voltage is normal 2. Cancel external force or install braking resistor 3. Increase the acceleration time 4. Install braking resistor
A.46	Deceleration overvoltage	1. Input Voltage is too high 2. There is external force to drag Motor during deceleration 3. The deceleration time is too short 4. Whether equipped with braking resistor	1. Check whether the input Voltage is normal 2. Cancel external force or install braking resistor 3. Increase the deceleration time 4. Install braking resistor
A.47	constant speed overvoltage	1. Input Voltage is too high 2. There is external force to drag Motor during operation	1. Check whether the input Voltage is normal 2. Cancel external force or install braking resistor

A.51	Excessive speed deviation fault	1. Check the encoder installation and whether the wiring is loose 2. Check whether the Motor power cable is loose	1. Re-fix 2. Re-fix
A.62	Brake tube operation time timeout	1. The bus voltage is higher than the braking voltage for a long time 2. The setting value of the brake working voltage is unreasonable	1. Check whether the input voltage is too high 2. Correctly set the parameter value of the overpressure relief point
A.71	Driver overload	1. The motor is blocked 2. The load is too large	1. Check the motor stall fault 2. Increase the drive power
A.72	Input phase loss	1. There is a lack of phase in the three-phase input power supply 2. The driver lacks phase detection circuit is abnormal	1. Check the power grid lack of phase fault 2. Repair the driver lack phase detection circuit
A.73	Output phase loss	1. There is a lack of phase in the lead from the driver to the Motor side 2. Driver three-phase output is unbalanced 3. The driver current detection is abnormal	1. Check the lack of phase of the motor line 2. Repair the driver 3. Repair the driver
A.74	Motor overload	1. The motor overload protection coefficient is set too small 2. The motor is blocked 3. The load is too large	1. Increase the motor overload protection coefficient 2. Check the motor stall fault 3. Increase the motor power
A.76	communication failure	1. The host computer communication is terminated 2. The driver's communication line is abnormal 3. The communication baud rate, calibration and other parameters are not set correctly	1. Check the communication of the host computer 2. Check the communication line 3. The communication parameters set by the host computer and the driver are consistent
A.77	Contactor failure	1. Check whether the drive board and power supply are normal 2. Check whether the contactor is normal	1. Replace the drive board or power board 2. Replace the contactor
A.78	Motor temperature Overheating failure	1. Check whether the motor temperature overheating protection PTC connection is wrong 2. Check whether the Motor temperature is overheated	1. Eliminate connection errors 2. Reduce Motor load, increase cooling fan, and increase Motor capacity
A.7A	Module overheating	1. The ambient temperature is too high 2. The driver air duct is blocked 3. The driver fan is damaged 4. Excessive load	1. Lower the ambient temperature 2. Clean the driver air duct 3. Replace the driver fan 4. Reduce load or increase Drive power

		5. Driver temperature detection or driver board failure	5. Repair the driver
A.81	Encoder failure	1. The encoder wiring is loose or incorrect 2. The encoder pulse number is not set correctly 3. The encoder is damaged	1. Check the wiring of the encoder 2. Correctly set the encoder pulse PCS number 3. Replace the encoder
A.82	Motor parameter identification Encoder failure	1. Check whether the encoder model matches 2. Check whether the encoder connection is wrong 3. Motor rated speed, whether the rated frequency is set incorrectly 4. Driver encoder feedback is wrong	1. Selection matching encoder 2. Eliminate connection errors 3. Reset the parameters 4. Repair the driver
A.83	Resolver signal failure	1. Check whether the encoder connection is correct	1. Eliminate connection errors
A.85	Motor phase sequence error	1. Check whether the UVW phase sequence of the motor power line is correct 2. Check whether the resolver wiring is correct	1. Eliminate connection errors 2. Eliminate connection errors
A.86	Motor positive feedback fault	1. Check Motor power line UVW line sequence 2. Check the encoder wiring	1. Eliminate wiring errors 2. Eliminate connection errors
A.92	Acceleration Overcurrent	1. There is a short circuit or ground fault on the driver output 2. The acceleration time is too short 3. Motor parameter tuning is not done before vector control 4. Start the drive while the motor is spinning 5. There is a sudden change in the load during acceleration	1. Check and eliminate load short circuit or ground fault 2. Increase the acceleration time 3. Tuning the parameters of the motor 4. Set speed tracking or start DC braking 5. Eliminate load changes during acceleration
A.93	Deceleration Overcurrent	1. The driver output has a short circuit or a ground fault 2. Deceleration time is too short 3. Motor parameter tuning is not done before vector control 4. There is a sudden change in load during deceleration	1. Check and eliminate load short circuit or ground fault 2. Lengthen the deceleration time 3. Parameter tuning for Motor 4. Eliminate load changes during deceleration

A.94	Constant speed overcurrent	1. There is a short circuit or ground fault on the driver output 2. Motor parameter tuning is not done before vector control 3. There is a sudden load during operation 4. Drive power is too small	1. Check and eliminate load short circuit or ground fault 2. Tuning the parameters of the motor 3. Cancel the sudden load 4. Increase the drive power

9. System wiring diagram



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